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AMERICAN ASSOCIATION OF  
STATE HIGHWAY OFFICIALS

Published by the Association  
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Washington, D. C.  
1962

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1962





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LEROY C. MOSER, Chief, Division of Rights-of-Way, State Roads Commission, Balti-  
more, Maryland

## PREFACE

Very special thanks and acknowledgement are extended to the Automotive Safety Foundation whose grant made this project and the publication of this text possible.

## Foreword

It is certainly no exaggeration to say that the right-of-way agent in the State highway department is a unique individual. He is at one time or another called upon to be part appraiser, part lawyer, part engineer, and part public relations expert. He is, by the very nature of his duties, acting as both the representative of the general public and of the private individual whose property he is appraising or acquiring. And yet this person in whom the acquiring agency, and ultimately the Nation, has come to place its highest trust and its deepest responsibility, may be a man who has had only limited formal training in his professional field. He has come from the college campus or the business world with only a limited background in this field. The fact of the matter is that there is no formal background training yet available in the right-of-way acquisition profession.

It is only as he enters State employment that this individual begins to receive his education in right-of-way acquisition. Much of this training is of a very informal nature, coming under the heading of "experience." However, there is an increasing tendency on the part of many States to supplement this needed informal training with a series of formal, academic in-service right-of-way training courses conducted by State-sponsored instructors.

In order to encourage the development of educational programs in all of the States, the American Association of State Highway Officials and its Committee on Right-of-Way have been vitally concerned with the lack of nationally-oriented formal training materials that could be used in these programs. In the fall of 1961, a special subcommittee\* was formed to bring this goal from the state of cherished ideal to that of practical reality.

It was realized that no matter how sincere or earnest any State organization might be about the desirability of conducting such a right-of-way training program, it was still faced with the very practical problem of where to obtain the materials necessary to carry out such a program. Admittedly, over the years a vast amount of extremely valuable information and substantive materials have been produced in the right-of-way field, but they were contained in a scattered myriad of individual papers, individual talks, and subject treatments, which, while individually valuable, did not lend themselves to a coordinated, concise actual study program.

The basic purpose of this text is to fulfill this need and to provide, within one concise volume, many of the essential building blocks upon which to erect a solid, substantial training course for the right-of-way trainee. Admittedly, this one volume will not provide *all* the answers to *all* the areas of a complete right-of-way training program; but like a simple building block, this text achieves its lasting value when it is combined with other building blocks in the atmosphere of a State training program, to provide the finished structure of a right-of-way professional.

Now that this text has been completed, both the opportunities and the responsibilities of the States in the field of right-of-way training acquire a new perspective. The responsibilities and the obligations of the States are already fully known and appre-

\* This subcommittee was constituted with Robert L. Hyder (Missouri) as Chairman; David R. Levin (Bureau of Public Roads) as Secretary; and Archie Christian (Texas), Victor H. Eichhorn (Michigan), Rudolf Hess (California), John W. Jenkins (Pennsylvania), Emil V. John (Iowa), and LeRoy C. Moser (Maryland) as members.

ciated by each of the States, but for the first time, each now has available the means to launch a truly worthwhile and comprehensive right-of-way training program. Every member of the AASHO organization and of the AASHO Committee on Right-of-Way stands ready to assist every State in the realization of the dynamic new potentials and opportunities offered by this text.

It is recognized that it would be impossible to include all of the pertinent information on every facet of right-of-way acquisition in each of the States in one volume, no matter how complete it might be. Rather, the attempt has been made to compile a basic substantive reference of right-of-way information that will provide a solid foundation for the individual State training programs.

The tenor and the approach utilized in most of this text have been purposely developed for the apprentice right-of-way trainee, exposed for the first time to the concepts of right-of-way acquisition. At the same time, the wealth of materials contained herein makes his text equally well adaptable for use as the basis for more advanced training programs.

It is a basic premise of this text that it is to be utilized in connection with State right-of-way training programs. The generally-oriented approach employed herein will require qualifying and explanatory statements on the part of instructors to relate this material to the particular procedural and operational aspects of each local jurisdiction.

To aid the instructors in identifying the local variations and to provide the student with a ready reference to them, a special section entitled "Notes" has been provided at the end of this text. It is suggested that each instructor and student mark and add his own explanatory footnote in this section for a permanent reference.

The material contained herein has been contributed by some of the foremost authorities in the right-of-way acquisition field. The approach and development of the individual subjects were left substantially to the discretion of the authors, subject to final coordination and review by the editorial staff, to join the individual chapters together, reduce repetition, and contain the entire publication within a reasonable size. The views and the methods expressed by the authors are felt to be those generally accepted in the right-of-way field, but their inclusion in this text does not necessarily constitute any overall endorsement by the American Association of State Highway Officials or by the organizations employing the authors. The attempt has been made to offer acceptable study materials, with the understanding that it is the prerogative of the individual instructor or reader to accept, interpret or question any of the treatments or viewpoints of the contributors. In essence, this text presents materials for consideration, with the hope that they will increase the knowledge of some, present new viewpoints to others, and open up fertile new fields of thought to everyone in the right-of-way profession.

This publication is not to be considered the "final word" in the field of right-of-way training, for it is expected that the general usage of this text will reveal the need for later revisions and additions to conform to constantly changing conditions in the acquisition of right-of-way.

Grateful acknowledgment must be made to the many individuals, highway departments, and professional organizations who freely contributed their time and talents to this project. It is a tribute to the right-of-way profession that it possesses within its ranks persons so endowed with professional pride and spirit of service. The committee's thanks are extended to Charles M. Fornaci of the Bureau of Public Roads, who, with the assistance of Ralph C. Bordley, also of the Bureau of Public Roads, edited and carried this volume through to completion.

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# The Professional Right-of-Way Man

FRANK C. BALFOUR

*Executive Secretary  
American Right of Way Association*

The expansion and acceleration of the highway programs of the various States and the Federal Government have focused national attention upon the acquisition of right-of-way for highway purposes. There has also been a change in the size and type of acquisitions that are necessary for the highways that are to be built under these programs. These factors have accelerated the evolution of the acquisition of right-of-way from a mere vocation to a profession.

The basic premise of any profession is that a body of technical knowledge exist in the subject field. However, the mere performance of certain technical operations within this body of knowledge does not qualify the operator necessarily as a professional man. True professional status requires a knowledge of the theory, the principles and the essential techniques upon which to base a determination of the most expedient method of analyzing and solving the various problems that are encountered.

The necessary body of knowledge has been built up through the years and the present application of this knowledge in the day-to-day acquisition of right-of-way is gaining the desired professional acceptance. It is the duty and responsibility of every man engaged in the acquisition of right-of-way to protect and promote this hard-won professional status.

The modern right-of-way professional must have, or develop, a pleasing personality and the ability to get along with people. He must like his fellow man and enjoy associating with him. He must have the knack of making people enjoy his company and feel secure in the placement of their confidence in his judgment and integrity.

The right-of-way man must maintain good health and a neat personal appearance—a man's personality, to a great extent, is controlled by his physical condition.

The minimum education and training for the modern right-of-way professional must include:

1. A thorough training in title and real estate law applicable in the area in which he works.
2. A practical working knowledge of highway engineering, planning and construction procedures.

3. An ability to interpret legal descriptions and highway design plans clearly and competently for the affected property owner.
4. A knowledge of the local and State laws that pertain to zoning and setback procedures and requirements.
5. A knowledge of the cost of moving and/or altering buildings and other improvements that are affected by the proposed construction, and the various zoning and construction requirements encountered in connection therewith.
6. A knowledge of manufacturing, merchandising and farming operations and the probable cost of reconstructing or altering these operations on an affected property.
7. A thorough knowledge of the methods of evaluating all types of real property that may be encountered in right-of-way acquisitions.
8. A broad knowledge of the valuation and costs that are applicable to various types of buildings and other improvements encountered in right-of-way valuation procedure.
9. A thorough knowledge of land economic study procedures, the methods of making such studies and the studies that are available covering comparable situations to those with which he might be confronted.
10. A thorough knowledge of the effective communication of ideas, including communication with individuals, public speaking, English composition and letter writing.
11. A knowledge of public utility installations and alteration costs, including the relocation of transmission lines, pole lines and pipelines.
12. A knowledge of the law of eminent domain, the court procedures and the rules of evidence in the State in which he is employed.
13. A thorough knowledge of the policies, procedures and practices of the State highway department he represents and especially of the right-of-way section.
14. A thorough understanding of proper procedure in right-of-way negotiation work and the meaning and purposes of sound public relations.
15. The ability to understand the mental reactions of an affected property owner and to instill a feeling of trust and confidence in the individuals with whom he must negotiate.

The most basic and important characteristic of the right-of-way man is complete honesty and integrity in all of his operations. The very nature of the work of a right-of-way professional necessitates that more confidence and trust be placed on him than on any other employee of the highway organization. He is the sole representative of the highway department that most affected property owners meet face to face, and

his organization and its operations are judged by the property owner on his method of operation and his conduct.

He must never become involved in any outside interests or activity that could remotely represent a conflict of interest that would affect his complete loyalty to the organization and to the taxpayers.

The right-of-way professional must accept the fact that he will oftentimes be subjected to great provocation by a property owner; and that even though the owner, in the heat of discussion, might display outbursts of temper or resort to disrespectful language, as a successful right-of-way professional, he must take such rebuffs in stride and handle these difficult situations in a tactful and courteous manner. He must exert maximum patience and understanding and have the ability to place himself in the property owner's position; and while the right-of-way practitioner must develop and exercise outstanding ability as a salesman, he must never allow himself to be classified as a high-pressure "hardsell" salesman.

Before he can ever hope to successfully conclude a negotiation, he must develop the ability and knowledge to sell the competence, integrity, judgment and fairness of the highway organization he represents. He must have sufficient knowledge of the overall proposed highway program to fully explain its importance to the community and to the State.

The right-of-way valuation team should not express opinions of value applying to either land damages or improvements to the affected owner. Although they should always try to interview the property owners to secure all of the available factual information, they should keep clearly in mind that their field activities may have a major effect upon the activities of the negotiating team.

The composite structure and operations of the right-of-way man must, at all times, guide him along the straight line of fairness, integrity and competence, and his good judgment should dictate to him that any attempt on his part to acquire the right-of-way at the cheapest possible price can only lead him into a justifiable reputation as a "horse trader."

The end effect of the activities of the State highway right-of-way professional should be that every property owner is paid the fair and just compensation to which he is entitled and that every settlement is also fair to all of the other taxpayers. When this becomes the end result of his negotiations, the right-of-way practitioner has developed the desired qualifications and characteristics that make a professional right-of-way man; and his activities will become a credit to the profession.

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*PART I*

*Legal Principles*

## CHAPTER 1

# Fundamentals of Real Property

JOSEPH MONTANO

*Assistant Attorney General, Department of Law  
Colorado Department of Highways*

The term *eminent domain* is generally defined as the right or power to take property for the benefit of the public. Courts have not always agreed as to the origin of this right or power. Early decisions expressed the idea that the right stems from property law because of titles originating in the sovereign and that eminent domain is a reserved right comparable to an easement which the government simply resumes when it exercises the right. This view was later rejected by the U. S. Supreme Court in *Kohl v. United States*, 91 U.S. 367 (1875) wherein the Court stated that the right or power of eminent domain is the offspring of political necessity and is inseparable from sovereignty, unless denied to it by its fundamental law.

Whatever may have been the origin of the right of eminent domain, it has been restrained by constitutional limitations for the protection of individual property rights. The limitations are that property shall not be taken except upon payment of just compensation and then only in accordance with recognized principles of due process of law.

As a result of these limitations there has evolved a field of law with which it is necessary to be generally familiar in order to perform an efficient job in acquiring right-of-way for highway purposes.

The following is intended to familiarize right-of-way personnel in general terms with some of the legal principles of eminent domain.

### Fundamentals of Real Property

Whether or not the origin of eminent domain stems from property law, an understanding of this law is essential to the application of the principles of eminent domain. The land sought to be acquired for highway right-of-way must be viewed and analyzed in light of the things which are a part of it and those which are not. Further, an understanding of the types of estates and interests in the land and the means by which they can be acquired or disposed is essential.

*Land and things affixed thereto* — Property is classified as *corporeal* or *incorporeal*. The former is that property which is tangible and is material and physical in its nature and is referred to as real or personal property. The latter consists of intangibles, i.e., rights not related to physical things, but related to the relationships between persons, natural or corporate, which the law recognizes. The type of property which the right-of-way personnel will be acquiring is corporeal.

*Real property*, under the early common law and now, except as modified or superseded by statute, consists of such things as are permanent, fixed, and immovable as "lands, tenements and hereditaments" of all kinds, i.e., those things which are not annexed to the person, or cannot be moved from the place in which they subsist. The term covers all that goes to make up the earth in its natural condition.

The term *personal property* in its general or ordinary significance, embraces all objects and rights which are capable of ownership except real and incorporeal property.

*Distinction between real and personal property and fixtures as they apply to eminent domain* — The type of property acquired by the exercise of the right of eminent domain for highway purposes is real property. But it is important to be able to distinguish between real and personal property for the reason that property, which in its initial form or substance was personal, may later become real property if it has been affixed to the land. Where this has taken place, the property is generally referred to as *fixtures*.

Since the property being acquired is real, the question to be determined is whether or not the property involved, or parts of it, is still personal. If so, such property is not being acquired and is not subject to the right of eminent domain. If, on the other hand, it has become real property, that is, a fixture or fixtures, it is being acquired and it must be considered in determining the compensation to be paid to its owner.

The courts are not in agreement concerning the criteria to be employed in determining whether or not a specific item, or groups thereof, is a fixture. The criteria recognized by some courts are not applicable in all instances. Therefore, each situation must be determined on its own merits and according to the law of the jurisdiction where the property is located. For this reason, it is important to obtain all of the facts pertinent to the property involved and submit them to legal counsel for an opinion as to whether or not the property is personal or whether it is now a fixture.

While no rule of law has been laid down which is applicable in all instances, the following general tests have been recognized in determining whether or not the article is a fixture.

- a. Annexation to the realty, either actual or constructive.

- b. Adaptation or application to the use or purpose to which that part of the realty to which it is connected is appropriated.
- c. Intention to make the article a permanent accession to the realty.

### Estates and Rights in Real Property

There are various interests which a person, natural or corporate, may have in real property. These interests are called *estates in land* and are defined as interests in land which are possessory or may become possessory. These estates may be classified according to the period of their potential duration.

Those estates with which right-of-way personnel are or will be generally confronted are: Fee simple, life estate and estate for years.

*Fee simple estate* — A fee simple estate is the largest estate known to law. It may be subdivided into numerous lesser estates, but the sum total of all existing estates in any piece of land is equivalent to a fee simple absolute. Any fee simple estate is potentially of perpetual duration. It will continue in the successive heirs and assigns including the heirs of the assigns, until such time as the current title holder shall die without heirs. At that time, the estate will cease and the property will escheat (revert) to the State.

*Joint estates* — It is legally possible for two or more persons to have concurrent and simultaneous estates or interests in the same parcel of land whether or not the estate in land is fee simple, a life estate or an estate for years. Such cases of co-ownership are called *tenancy by the entirety*, *joint tenancy*, *tenancy in common* and *community property*.

a. *Tenancy by the entirety*. The common law treated the husband and wife as one person. By reason of this concept of unity, a conveyance to the husband and wife created a tenancy by the entirety. This form of tenancy resembles a joint tenancy because in it is inherent the right of survivorship. A divorce terminates this type of tenancy and converts it into a tenancy in common. This type of tenancy has now been abolished or superseded by statutory enactments in many jurisdictions.

b. *Joint tenancy*. A relationship subsisting between two or more persons in respect to an interest together in the same parcel of land, with each person having exactly the same right in that interest as his cotenant or cotenants.

Joint tenancy can exist only where all joint tenants have:

1. An equal interest in the subject property
2. The interest is granted under the same limitations, simultaneously
3. It is granted in the same deed or will which declared the joint tenancy as above

4. These comprise the common law requirements of unity of title, possession, and interest.

Joint tenants have an equal and concurrent right of possession. Upon the death of one joint tenant, his title in the subject property terminates, leaving the surviving joint tenants as owners of the whole.

Joint tenancy may be terminated by:

1. Partition by any joint tenant
2. Conveyance by one or more joint tenants of their undivided interests in the property
3. Any transaction involving the subject property which is inconsistent with the continuation of the joint tenancy. ✓

✓ c. Tenancy in common. Tenants in common exist where two or more persons have distinct but undivided shares in an estate or interest in property. Each share is several and distinct from the share of the cotenants.

1. Tenants in common may acquire their interests at different times, under different instruments, from different persons. The interests need not be of the same duration.
2. The interests of tenants in common need not be equal. But if tenants in common receive their several interests at the same time and under the same instrument, equality will be presumed unless specifically otherwise stated.
3. Each tenant in common may deal with this undivided interest independently and separately from the interests of any other tenant in common. Upon death of a tenant in common, his interest in the subject property will descend to his heirs or pass under his will.

4. A tenant in common has the right to have the subject property partitioned, in which case it will be physically divided between the tenants in common, so that each will receive a part in accordance with his proportionate share or if this is not practicable, the property will be sold and the proceeds divided among the tenants in common according to their respective interests.

5. Tenants in common (and this also applies to joint tenants) have equal, concurrent rights of possession.

(a) No tenant in common may so use or occupy the common property as to prevent any other tenant in common from making an equal use of the subject property.

(b) However, any tenant in common may use the subject property without accounting to his cotenants if they shall fail to exercise their right of concurrent use and occupation.

(c) But, with respect to mines, a cotenant who chooses to operate the mine must account to his other cotenants for the profits of the operation. He is not entitled to contribution for losses if they do not choose to join him.

d. Community property. Where the community property system prevails, all property acquired by either husband or wife or both during the marriage, except for that acquired by gift, descent and devise, belongs to both as a *community* and not to either as an individual.

The death of either the husband or wife dissolves the community and the survivor's interest becomes absolute. Where the decedent dies intestate leaving no descendants or ancestors, such decedent's interest goes to the surviving spouse. In some States when it is the wife who has died, title to the entire property passes to the husband.

The community property system is a creature of statute. For this reason no statement concerning community property is deemed to be applicable in all instances. An examination of the statutes of the State where the land is located is essential in order to resolve any problem involving community property.

Where title to a property sought to be acquired is held in concurrent or joint ownership, it will be necessary to obtain a conveyance from any and all concurrent or joint owners.

*Life estate* — An estate for life is an estate which is not terminable at any fixed or computable period of time, and cannot last longer than the life or lives of one or more persons. A life estate may arise by operation of law, or may be created by act or agreement of parties.

The most common of the estates are estates created by marital rights and are called *tenancy by the curtesy* and *dower*. A tenancy by the curtesy is a life estate to which, at common law, the husband is entitled in all the lands and tenements of which he and his wife were owners, in the right of the wife, in fee simple during the marriage, providing that there was issue born alive capable of inheriting the estate. Dower at common law was a life estate to which a widow was entitled on the death of her husband in a third of the lands of which her husband was owner in fee simple, at any time during the marriage.

Tenancy by the curtesy and dower have now been abolished in many jurisdictions and superseded by homestead and other similar laws.

A life estate created by the acts of the parties arises when the conveyance limits the duration of the created estate by the life or lives of one or more identified and existent persons, or when the conveyance, viewed as a whole, manifests the intent of the transferor to create an estate measured by the life or lives of one or more existent

persons. A life estate can be conveyed but the life tenant cannot convey a greater estate than his own.

*Estate for years* — An estate for years is an estate the duration of which is definitely fixed by the instrument of conveyance, or can be definitely computed, in units of a year, a month, a week, or a day, or multiples or fractions thereof. This type of estate is generally referred to or called a leasehold created by a lease.

*Leasehold interest* — There are various types of leasehold estates, i.e., estates for years as mentioned above:

- a. Tenancy at will. An estate or tenancy at will is an estate which is terminable at the will of either the landlord or tenant and has no other specific duration. This type of estate may be created by an express agreement between the parties that possession shall be held so long as both parties agree. This type of estate at common law could be terminated by either party giving notice to the other party of his desire to terminate the tenancy with the estate thereupon brought to an end. The relationship between the landlord and tenant at will is personal in its nature and therefore such tenancy is terminated by the death of either party.
- b. Tenancy at sufferance. A tenancy at sufferance is a possessory interest in land which exists when a person who had an estate in land wrongfully continues in possession of the land after the termination of such estate. Notice to terminate is not essential, unless specifically required by statute.
- c. Tenancy from period to period. This type of tenancy arises in a case where the tenancy is automatically renewed at the end of each period unless, prior to the end of any given period, appropriate notice to terminate has been given. The length of time within which the notice must be given before the end of the period is regulated by statute. The periodic tenancy may endure and continue for successive periods of a year, or successive periods of a fraction of a year. The typical one at common law is the estate from year to year; however, there is also the estate from month to month and from week to week.

*Easement* — An easement is an interest in land consisting of the right to do an act, otherwise unprivileged, on the land of another. Where the easement is restricted to the use of land it is appurtenant (annexed) to the designated land and consequently will pass with a transfer of the land. To create this type of easement, such as a right-of-way, the same formalities as those necessary in a conveyance are usually required. An easement may be created by a reservation or an exception in a deed or it may be created by implication in cases of strict necessity. Also, it may be created by prescription, i.e., by the use of an easement for a long period of time where the

use was adverse to the landowner. Acquisition of interests in land by adverse possession will be discussed later.

An easement may be of an indefinite or definite duration. If the easement is terminable at will, it is a mere license in which instance it is not an interest in land.

### The Acquisition of Title to Real Estate

*Grant or conveyance* — The term *conveyance* subject to a more particular statutory definition, connotes a deed whereby the title to land is transferred from one person to another.

*Descent* — Should the owner of real property die without leaving a will, his property will become vested in his heirs at law according to the laws of descent and distribution of the State wherein the property is located. The term *descent* is therefore defined as hereditary succession. It is the title whereby a man, on the death of his ancestor, acquires his estate by right of representation as his heir at law; an heir being one upon whom the law casts the estate immediately at the death of the ancestor, the estate so descending by the inheritance.

While title descends at the instant of the death of the ancestor, the estate of the decedent will have to be administered according to the law of the State wherein the property is located before clear title to the property can be transferred by the heir at law in whom the title vested.

*Devise* — An owner of property may, before he dies, make a will which is an instrument executed with the formalities of law, whereby he makes disposition of his property to take effect after his death. Where real property is disposed of by will, *devise* is the term used to denote disposing of the realty. A devisee is one who receives realty under the will. Before the devisee can convey clear title to the property which he has received, the will must be admitted to probate and the estate must be closed according to the applicable law of the State where the property is located.

*Adverse possession* — Title to real property may be acquired by possession by wrongful entry continuing for a period of time regulated by statute.

The possession must be actual and exclusive, open and notorious. It must be continuous for the period provided by the statute. The possession of one adverse claimant may be tacked to the possession of successive adverse claimants, provided there is privity of estate as between such claimants, that is, provided they all hold adversely, one after another, without any interruption in the chain of adverse possessors. In some States, a shorter statutory period is provided where there is color of title and where the adverse claimant has paid taxes.

*Escheat* — Where an owner of property dies without leaving a will and without any heirs at law, or where there is no one in existence able to make a claim to the decedent's estate, the property escheats (reverts) to the State. The term

*escheat* is defined as the primary right of the State to an estate left vacant where there is no one in existence able to make a claim thereto. The estate does not escheat to the State until after a certain period of time has elapsed after the death of the owner of the property. The period of time is governed by State law.

*Condemnation* — The term *condemnation* denotes the acquisition of property by the exercise of the right or power of eminent domain. Pursuant to this right or power the sovereign, whether it is the Federal or State government or an agency to whom there has been delegated this right or power, may, upon payment of just compensation, acquire property for the benefit of the public.

*Execution sale* — Execution is a remedy afforded by law for the enforcement of a judgment. It is a judicial writ issued to an officer authorizing and requiring him to execute the judgment of the court. It is the usual process for the enforcement of a judgment for the payment of a sum of money, and it is generally the appropriate remedy for the subjection of tangible property to the satisfaction of the judgment. The writ of execution is followed by a levy, or taking property into the possession of the officer, usually the sheriff, and then by a sale by the sheriff of the property. The sale is completed upon there being executed a deed of conveyance by the sheriff (usually called a *sheriff's deed*) which is delivered to the purchaser.

*Accretion* — Accretion is the increase of riparian land by the gradual deposit, by water, of solid material, whether mud, sand, or sediment, so as to cause that to become dry land which was before covered by water. The owner of the riparian land thus acquires title to all additions by means of accretion and conversely loses title to such portions as are washed away or encroached upon by the water.

*Patent* — Because titles to property originate in the sovereign, all interests or estates in land are therefore acquired from the sovereign, i.e., from the State or Federal governments. Title to property originally in the sovereign is vested in persons, individual or corporate, upon there being issued by the sovereign a document called a patent.

### Conveyancing

As pointed out above, title to real property may be acquired by a grant or a conveyance. The conveyance is accomplished by the execution by the owner of a document called a deed by which the property is transferred to another party. Deeds are classified as follows according to the degree of promissory protection which the grantor gives to the grantee.

*General warranty deed* — A general warranty deed is one in which the grantor warrants the title against defects arising at any time, either before or after, the grantor became connected with the land.

*Special warranty deed* — A special warranty deed is a deed in which the grantor warrants the title against defects arising after he acquired the land but not against defects arising before that time.

*Quitclaim deed* — A quitclaim deed is a deed in which the grantor warrants nothing; he merely transfers what title he has, if any.

*Bargain and sale deed* — A bargain and sale deed is one in which the grantor does not warrant the title in any respect.

*Grant deed* — The word *grant* when used in a conveyance conveys fee title and any after-acquired title of the grantor, unless a different intent is expressed in the deed.

The distinguishing feature among the deeds mentioned above is to be found in the type of language used. There is no fixed and absolute language for each instance. The language recognized at common law has been superseded in some States by statute. It is therefore mandatory to check the pertinent statute to determine whether or not the common law has been superseded.

The general and special warranty deed as well as the bargain and sale deed pass after acquired title of the grantor but this is not the case with a quitclaim deed.

*Highway easement deed* — An easement, whether it be for highway or other purposes, may be created by grant. The instrument of grant creating an easement for highway purposes can generally be referred to as a highway easement deed. The deed must be executed with the same formalities as any other deed in order that it may convey such an easement. The wording must not be so uncertain, vague and indefinite as to prevent identification of the easement with reasonable certainty. Generally, a description which identifies the land that is the subject of the easement is all that is necessary. However, it is far better practice to clearly and definitely identify the land other than in general terms.

*Escrow principles* — To complete a transfer or conveyance of real property, it is essential that the deed be delivered to the purchaser; however, the delivery may be made to a third party upon conditions. This is the situation presented in the usual escrow transaction. The validity of an escrow transaction is made to depend upon the existence of a specifically enforceable contract to convey land.

An escrow is a written instrument which by its terms imports a legal obligation and which is deposited by the grantor with a stranger or third party to be kept until the performance of a condition or the happening of a certain event, and then to be delivered over to the grantee.

The usual type of escrow transaction is where the grantor and third party who in turn delivers the deed to the grantee as per agreement.

## CHAPTER 2

### Contracts

CHARLES M. FORNACI

*Right-of-Way Specialist,  
Bureau of Public Roads*

In most jurisdictions, the final agreement between the acquiring agency and the individual property owner must be reduced to an explanatory and complete written agreement embodying all the terms of the contemplated conveyance. Every transaction that is thus reduced to writing operates within the framework of existing contract and real estate law, which has certain guidelines and principles that are of paramount importance to the right-of-way agent, since, in most cases, he becomes the individual who ultimately draws up the particular contract with the property owner.

Although the individual right-of-way agent has no essential powers to bind the State to any contract he writes, he does undertake, at the very least, certain moral obligations when he drafts and secures an owner's signature on an option, sales contract or deed conveying land to the State. He would soon lose any standing in the community as a reliable, reputable, and trusted negotiator if his contracts were subsequently repudiated by the administrative-level State officials, or if they were subsequently invalidated in an appropriate court of law.

#### CONTRACTS IN GENERAL

The law of contracts forms the oldest branch of the law relating to business or commercial transactions. Just as the safety of the person and of property depends upon the rules of criminal law, so the security and stability of the business world are dependent upon the law of contracts.

In general terms, a contract is an agreement between two or more persons consisting of a promise or mutual promises which the law will enforce, or the performance of which the law in some way recognizes as a duty.

A contract is really the point at which the courts will enforce legal obligations. It should be distinguished from a mere agreement because not all agreements are enforceable at law. Thus, if A and B agree with each other to meet at a certain place at a certain time each promising the other to be there, although an agreement has been

... obligation has been created since it is obvious that both parties intended a social engagement and neither intended a contract. The promise creates moral duties of performance, but not legal duties.

In order to create an enforceable contract one must understand thoroughly the essentials which make up a contract and, by applying these requirements to each agreement entered into, one will readily recognize when a party is legally bound by the courts of law to a contract. The true objective test is when the acts of both parties create legally enforceable mutual obligations. The courts long ago recognized and enforced contracts where there was no so-called "meeting of the minds" between the parties.

### General Requirements of a Contract

The general requirements for the formation of an informal contract are:

1. Mutual assent.
2. Consideration.
3. Two or more parties having legal capacity.
4. The object of the contract must be a lawful one.

An informal contract comes into existence when these four requisites are present. If any one is absent, no legal obligation upon either party is created. Thus, if one party to the contract is an infant or is insane, he can avoid the obligation created. If the purpose of the contract is unlawful, at least one of the parties can avoid his obligation by pleading the illegality.

In addition to the above, the contract must be in the form required by law. For example, if the contract is oral though of the kind required to be in writing by the "Statute of Frauds," the party sued may plead the Statute as a complete defense.

The two most important elements necessary in any contract are mutual assent and consideration.

### Mutual Assent

The first requisite of an agreement which the law will enforce is that each of the contracting parties assent to the same bargain. Mutual assent is not strictly what one of the parties had in his mind, but rather the controlling factor is what his actions conveyed.

For example, a property owner agrees to sell the State all of his land and improvements at a stated price, forgetting that his newly erected shed, which he did not intend to sell, is on the land to be conveyed. The State subsequently accepts the contract, and the question arises whether the State is entitled to have the shed. Certainly the owner never intended or desired to sell his shed but, nevertheless, the State now has a legal right to it since it is the legal effect of his action and not what he intended to sell that

is controlling. By the State's acceptance of the contract, the owner came under a legal duty to sell his whole property, including the shed.

### Consideration and Its Sufficiency

Two elements are essential to create a legally sufficient consideration. Something which the law regards of value must be given for the promise, and that which was given must have been agreed upon by the parties as the agreed exchange for the promise. The fairness of a contract is legally irrelevant. The law will not inquire into whether the price paid is inadequate in value to the performance promised so long as it has some value. It is the general rule that the courts will not inquire into the adequacy of the consideration.

In this connection, the right-of-way agent may occasionally encounter a situation wherein an owner will claim, at some later date, that because of fraud or coercion on the part of the negotiator, the consideration stated in the contract signed by him was insufficient in value for the land to be acquired. If the contract is sought to be voided on the grounds of fraud or undue influence, the consideration may be inquired into, and inadequacy of consideration will be regarded as corroborative evidence in support of the action. However, a mere allegation of inadequacy of consideration alone is not sufficient to warrant interference by the court.

Often there is a desire by a party to make a legally enforceable gift by putting it in the form of a contract. It is generally clear both from the relationship of the parties as well as the insignificance of the agreed price that no actual bargain was ever intended. For example, suppose A wishes to make a binding promise to convey to his son B a farm worth \$10,000. Being advised that a gratuitous promise is not binding, A writes and offers to B "in consideration that you pay me \$1, I promise to convey my farm to you." B accepts and pays his father \$1. In this case it is obvious that the consideration was not the agreed upon exchange for the promise. The law requires the consideration to be bargained for, and there is no bargain in this instance. Here the father's sole motive is to make an enforceable gift promise. This instance would differ from the general rule that the law will not inquire into the adequacy of the consideration, for that rule is only operative if the parties actually *intended a bargain* even though it proved to be a bad one for the promisor.

### CONTRACTS FOR THE SALE OF REAL ESTATE

The basic elements of an enforceable sales contract for the transfer of real estate are:

- a. All contracts for the sale of land must be in writing, and any verbal contract or agreement to sell land is unenforceable.

- d. There must be a promise on the part of the seller to convey.
- c. There must be expressed some consideration or thing of value passing from the buyer to the seller.
- d. There must be an adequate description of the land and premises that will enable the parties to define it and understand its boundaries.
- e. There must be some expression as to the extent of the interest to be conveyed by the seller.
- f. The contract must contain the names of both parties.
- g. It must be signed by the seller or his authorized agent, to be enforceable by the buyer, or by the buyer or his authorized agent to be enforced by the seller.

There are other essentials to a good sales contract which should also be included, such as the time limitation during which conveyance is to be made, the full price, the terms of payment, method of conveying as to the names and the interests to be conveyed to the respective grantees, the manner of settlement, and the provision for meeting the incidental expenses of the transaction or such contingencies as clearing a title defect.

A sales contract is terminated by any one of several events. If the buyer and seller perform their respective promises, it comes to an end. If the contract is rescinded or cancelled by mutual agreement, it is terminated. The death of one of the parties to a contract ordinarily terminates it, unless he has specifically bound his heirs in the contract. However, in a contract for the sale of real estate, death of a party does not release the parties from the transaction. The execution and delivery of the deed will terminate the contract.

In the event one of the parties refuses to perform his promise under the contract, the other party may seek money damages in an action at law for breach of contract, or he may go into an equity court to obtain specific performance of his contract. A contract for the sale of land is always capable of being specifically enforced, whereas in the case of some other types of contracts, the offended party is limited to an action for money damages. Where a buyer cannot perform under a sales contract for realty, a forfeiture may be declared.

#### Statute of Frauds

Any contract calling for the sale of land operates within the basic framework of the so-called "Statute of Frauds." This statute, enacted at an early date in English history, provided that certain contracts could not be enforced unless they were reduced to writing and were signed by the parties sought to be bound thereby. It was designated the Statute of Frauds because its purpose was to prevent fraud on the part of those who attempted to establish a valuable contract by the false testimony of their friends.

Thus it is that the Statute of Frauds in almost every State requires agreements for the sale of real property to be in writing and to be signed by the party against whom they are to be enforced. It should be noted, however, that merely writing a purported contract will not comply with the statute unless all the essential terms of the contract appear therein.

As a general rule, evidence which would change or contradict a written sales contract will not be admitted in court. For example, evidence could not be introduced to show that the parties had orally agreed on a price other than that contained in the writing, or that some different piece of land was to be sold. Exceptions occur, however, when the evidence does not change or contradict the written contract but rather shows that because of fraud the writing never constituted a valid contract, or it clarifies some part of the writing which is ambiguous. Since under the prevailing view the parties may not modify, by a subsequent oral agreement, an essential provision of a contract not carried out, it is important that all such provisions be explicitly included in the original contract of sale.

This observation is extremely important in right-of-way agreements, for complaints will occasionally arise on the part of the property owner that substantive matters that were agreed to by the negotiator were not included in the written contract. Although the State will normally have a strictly legal defense by noting the usual clause that the contract embodies the full extent of the agreement, the possibility always exists of further litigation, or at the very least, of ill-will on the part of the owner and perhaps of the community as well.

#### Options

Many State organizations utilize an option procedure as the initial agreement stage in the acquisition of title through amicable negotiations. Basically, in the present context, an option is a contract by which a landowner unilaterally agrees that the State shall have the privilege of buying the required right-of-way at a stated price within a specified time, if it so chooses. Upon the acceptance of the option by an appropriate State official, there is a contract of sale binding upon both parties. A true option cannot be withdrawn by the seller during the period specified; but since an option is a contract, it must be supported by consideration, and if a so-called "option" is given by a landowner without consideration, it is merely an offer which may be revoked at any time prior to acceptance. One dollar is usually held to be sufficient consideration to make this offer an irrevocable option, although in general real estate practice, the consideration is usually somewhat more. The consideration for an option is not deducted from the purchase price of the land unless expressly so provided. Generally, time is of the essence; that is, the right of the party holding the option (in this case, the State) expires without any further notice unless the option to buy is exercised within the time specified.

### Marketable Title

As a rule, a covenant (or enforceable promise) that the seller will convey a marketable title is implied in the absence of some express contractual provision to the contrary. "Marketable title" means that the seller must convey a good title free from defects. In other words, every buyer of land, the State included, has a right to demand a title which shall put the purchaser in reasonable security against loss or annoyance by litigation. For example, if, unknown to the buyer, the land sold is subject to a lien for taxes; the title conveyed is not marketable. The buyer is entitled to expect absolute ownership for his money, and he naturally does not receive this if he takes the land subject to the preexisting obligations or liabilities of the seller.

√ Normally, this situation would not occur in the vast majority of State acquisitions, since the State would be aware of any title defects because of its closing procedures or escrow practices, and would gain a merchantable title with all interests of lienholders and mortgagors cleared. Where a title defect does occur and normal curative measures are not feasible or practical, recourse may be had to an uncontested or "friendly" condemnation to clear title.

### Jurisdiction

Generally, the rights and liabilities of the parties to a land contract are governed by the law of the jurisdiction in which the land being sold is located, although in some cases these rights and liabilities are controlled by the law of the place where the contract is made or is to be carried out. However, even in the latter cases, the law of the jurisdiction where the property is located may prevail if it has a rule of property law on the point, or if the parties intended to contract with reference to the law of this jurisdiction.

### Risk of Loss

The courts have generally held that the purchaser of land bears the risk of its injury or destruction. For instance, if the landowner sells certain land with a building thereon to the State and the building burns down after the contract is signed but before the deed and purchase price are exchanged, the State would still be compelled to carry out the contract. When it receives the deed to the land from the seller it must pay the full purchase price originally agreed upon. This rule applies, however, only where the injury or destruction occurs through no fault of the seller. To protect the buyer a clause is often inserted in the sales contract or option to the effect that if, prior to the delivery of the deed, the buildings or other improvements on the land shall be destroyed or materially damaged by fire or some other casualty, the contract shall become null and void at the option of the buyer.

Since the State as buyer does not want the contract to become null and void, many State organizations guard against possible loss by immediately insuring all acquired buildings against damage by fire, storm, or other injury.

#### **Taxes and Assessments**

Where the parties to a contract do not expressly agree as to the payment of taxes and assessments, the general rule is that the seller is liable for those liens prior to delivery of possession, and the purchaser is responsible for any liens attaching to the property thereafter. Either party may be responsible for the burden of paying real estate taxes accruing between the date the contract is executed and the delivery of the deed, depending upon the provisions and agreement of the parties. However, the draftsman of a contract of sale should attempt to anticipate such a possible dispute between the buyer and seller and provide expressly in the contract as to which party shall bear this responsibility. In the State right-of-way organization, this matter is usually handled in accordance with departmental policy, or a specific ruling of the legal department or the attorney general.

Generally the examination of title, tax certificate, conveyancing and notary fees, and all recording charges are at the expense of the purchaser, unless upon examination the title is found defective, in which case the seller usually pays the cost of examination of title. However, the other remaining costs would still be paid by the purchaser. The particular liability for these items as between the landowner and the State may again vary according to local practice and departmental policy.

#### **Adjustment of the Purchase Price**

If the seller is unable to carry out all the terms of the agreement, the buyer may still desire to purchase the property and consequently will be entitled to a reduction of the purchase price. For example, if the examination of title uncovers a mortgage running on the land, the buyer upon completion of the transfer can assume the liability of the mortgage, and therefore would be entitled to a proportionate reduction of the purchase price.

#### **Is Time of the Essence?**

In the absence of a contrary provision in a contract for the sale of land, time is not of the essence. This means that the exact date specified in the contract for the transfer is not vital, and each party is given a reasonable time after such date to carry out his obligations under the contract. Thus if the seller is not ready to transfer his title on the date specified, the purchaser will not be relieved of his obligations under the contract. Time may however be made of the essence from the beginning, and such a

provision to that effect is usually included in the right-of-way contract. If such a provision is inserted in the normal real estate contract, the effect will be to relieve the non-defaulting party of any further obligation, although in the case of a State's acquisition of property, it will normally demand through a competent court that the contract be carried out.

### **Installment Land Contracts**

In some jurisdictions the contract of sale is used as an instrumentality for the long-range financing of the purchase of land. When so used, the arrangement is usually referred to as an installment land contract. Under such a contract the purchaser goes into possession immediately and is obligated to pay specified installments of the purchase price from time to time, with the deed from the seller to be delivered upon completion of such payments. The seller's security comes from his right to repossess the land on the failure of the purchaser to meet the installment payments. This means that the purchaser's default subjects him to allegedly harsh treatment because he loses not only the land but the payments he has already made. The apparent harshness of this treatment has caused legislation to be passed in some States designed to soften the blow to the purchaser as a result of the default.

### **Conclusion**

In the end analysis, the individual right-of-way agent bears a strong personal responsibility in the treatment of the property rights of the landowner and the interests of the State, and his performance of this duty and his guarantee of the mutual rights of both parties will only be proportionate to his knowledge and appreciation of the basic tenets applicable in this field.

It is obvious that the treatment in this chapter has been extremely generalized, since the intent has been merely to provide a broad introduction to real estate contract law. Further reference is recommended to the many fine texts in this field for a fuller and more definitive analysis of the subject area.

## CHAPTER 3

# Eminent Domain Concepts, Laws and Limitations

EDWARD E. LEVEL

*Assistant Attorney General  
Washington Department of Highways*

The term *eminent domain* has been defined as "the power to take private property for public use."<sup>1</sup> This power to take private property is an attribute of sovereignty. Since both the Federal and State governments are sovereign within their respective spheres of activity, both have such power. This power is limited only by applicable constitutional provisions and may be delegated to subdivisions and agencies of government according to the legislative will.

### LIMITATIONS ON THE POWER

Although the exercise of the power of eminent domain generally assumes a taking without the owner's consent, in this nation it must follow a procedure established by law assuring adequate protection to the owner rather than acquisition by force. The protection accorded the property owner is based upon the Constitution and statutes of the United States, the constitution and statutes of the State in which the property is located, and rules of construction imposed by both Federal and State courts.

#### Constitutional Limitations

The power of the sovereign over property within its limits is restricted and controlled by limitations contained in the Federal and State constitutions.<sup>2</sup> The following are some of the principal constitutional restrictions placed on this power:

*Just Compensation* — The most common form of constitutional limitation is that no private property shall be taken without the payment of just compensation. This is found in the Fifth Amendment to the Constitution of the United States. The same provision, although differently worded, appears in the constitution of every State except North Carolina.<sup>3</sup>

1. BLACK, *Law Dictionary* (4th ed. 1951).

2. 1 NICHOLS, *Eminent Domain*, § 1.3 (3d ed. 1950) [hereinafter cited as NICHOLS].

3. *Ibid.*; Highway Research Board Special Report 50, *State Constitutional Provisions Concerning Highways*, pp. 19-21 (1959).

It may be said generally that any entry upon lands which interferes with the use and enjoyment of such lands, which interference would be actionable at common law and which is an incident of a lawful public improvement, is a taking of property in a constitutional sense, whether there be any formal condemnation or not.

- (a) *"Take" vs. "take or damage."* Some State constitutions cover not only the "taking" of private property, but also the "damaging" of such property.<sup>4</sup> This variation of phraseology, as well as the divergent views taken by State courts of their own constitutional and statutory provisions, results in certain acts of the sovereign requiring compensation in one jurisdiction and not in another. An example of this may be found in the treatment of a change in the grade of an existing street. In the State of Washington, the constitution of which requires compensation where property is "taken or damaged," compensation must be paid where the established grade of a street is changed.<sup>5</sup> In the neighboring Oregon, the constitution of which applies only to takings, it was held that compensation need not be paid for such a grade change.<sup>6</sup>
- (b) *Possession.* Some State constitutions require payment judicially arrived at before possession may be taken of property or property rights sought under the power of eminent domain.<sup>7</sup> In the absence of express constitutional requirements, however, compensation need not be paid in advance of the taking or damaging of private property, provided reasonably certain and adequate provisions are made for the ultimate ascertainment and payment of just compensation to the owner.<sup>8</sup>
- (c) *Trial by jury.* In many States there are specific constitutional requirements that just compensation be determined by jury trial. Constitutions also require that the right to jury trial remain inviolate. Procedures vary as to when there shall be a jury trial in the course of determination of compensation, many States permitting preliminary determination of compensation by viewers or commissioners prior to trial by jury. The law also varies as to whether or not the right to trial by jury extends to the condemner as well as the owner.
- (d) *What is Just Compensation?*

"Compensation," as used in the constitutional provision as a limitation upon the power of eminent domain, implies a full and

4. 2 NICHOLS, § 6.44; Highway Research Board Special Report 50, *op. cit.* footnote 3, p. 19.

5. *Brown v. City of Seattle*, 5 Wash. 35, 31 Pac. 313 (1892).

6. *Barrett v. Union Bridge Co.*, 117 Ore. 220, 243 Pac. 93, 45 A.L.R. 521, *rehearing denied*, 117 Ore. 556, 245 Pac. 308 (1926). This holding has been abrogated by statute.

7. Highway Research Board Special Report 33, *Condemnation of Property for Highway Purposes* (Part II), p. 20 (1958).

8. 3 NICHOLS, § 8.71.

complete equivalent (usually monetary) for the loss sustained by the owner whose land has been taken or damaged.<sup>9</sup>

"Just" should mean just to the condemner as well as the owner.<sup>10</sup> The compensation to be paid must be the equivalent of the property and property rights taken. Except as to properties which are held for special purposes and infrequently sold, this equivalent is found in a consideration of the market value of the property taken or damaged. A detailed discussion of the measure of compensation is contained in Chapter 4.

*Due Process* — The Fifth Amendment to the Federal Constitution prohibits the taking of life, liberty, or property without "due process of law." Equivalent provisions are found in the constitution of most States.<sup>11</sup> Due process requires a course of procedure in accord with prescribed forms which affords adequate protection to the rights of the individual.<sup>12</sup> It protects the individual against arbitrary or capricious exercises of governmental power. For example, it may operate to prevent the taking of property for other than public use.<sup>13</sup> Due process always requires adequate notice and opportunity to be heard before an owner can be deprived of his property.<sup>14</sup> The requirements of due process are generally satisfied where property is acquired for public uses permitted by statutory and constitutional provisions and where such provisions for the determination of just compensation are followed.

#### Public Use and Necessity

*Public Use* — In the absence of express constitutional exceptions, private property cannot be taken by eminent domain except for public use.<sup>15</sup> A taking for a "private" as distinguished from a "public" use will not be allowed.

The phrase *public use* is not clearly defined, but varies with circumstances and conditions and with the social and economic background of the period in which the particular problem presents itself for consideration.<sup>16</sup> A general definition is as follows:

It is a public use for which property may be taken by eminent domain,

(1) To enable the United States or a state or one of its subdivisions or agencies to carry on its governmental functions, and to preserve the safety, health and comfort of the public whether or not the individual members of the public may make use of the property so taken, provided the taking is made by a public body;

9. 3 NICHOLS, § 8.6 at p. 28.

10. *Id.* at § 8.6(1).

11. 1 NICHOLS, § 4.1.

12. See 1 NICHOLS, §§ 4.4 *et seq.*

13. 1 NICHOLS, § 4.7.

14. *Id.* at § 4.103.

15. Cf. 2 NICHOLS, § 7.1.

16. *Dorman v. Philadelphia Housing Authority*, 331 Pa. 209, 200 Atl. 834 (1938).

(2) To serve the public with some necessity or convenience of life which is required by the public as such and which cannot be readily furnished without the aid of some governmental power, whether or not the taking is made by a public body, provided the public may enjoy such service as of right;

(3) In certain special and peculiar cases, sanctioned by ancient custom or justified by the requirements of unusual local conditions, to enable individuals to cultivate their land or carry on business in a manner in which it could not otherwise be done, if their success will indirectly enhance the public welfare, even if the taking is made by a private individual and the public has no right to service from him or enjoyment of the property taken.<sup>17</sup>

Uses for various public highway purposes are generally recognized as proper public uses.<sup>18</sup>

The question of public use is ultimately determined judicially rather than by legislative or executive action. Deference may be given to legislative purposes as to what constitutes a public use.<sup>19</sup>

*Necessity* — The necessity of a particular acquisition is not to be confused with the issue of public use.

Two separate and distinct requirements are included within the term "public necessity". One is that the admittedly public use, such as a highway, be needed by the community. The other is that the specific parcel of property sought be necessary for the establishment of that highway.<sup>20</sup>

The necessity of a particular taking, as distinguished from its public use, generally lies within the discretion of the legislature and is not a judicial question.<sup>21</sup> This rule, however, is not without limitation.

The expediency of constructing a particular public improvement and the extent of the public necessity therefor are clearly not judicial questions; but it is obvious that, if property is taken in ostensible behalf of a public improvement which it can never by any possibility serve, it is being taken for a use that is not public, and the owner's constitutional rights call for protection by the courts. So, also, the due process clause protects the individual from spoliation under the guise of legislative enactment, and while it gives the courts no authority to review the acts of the legislature and decide upon the necessity of particular takings, it would protect an individual who was deprived of his property under the pretense of eminent domain in ostensible behalf of a public enterprise for which it could not be used.<sup>22</sup>

17. 2 NICHOLS, § 7.22 at pp. 444-45.

18. *Id.* at § 7.512.

19. *Id.* at § 7.4(1).

20. Highway Research Board Special Report 59, *Condemnation of Property for Highway Purposes* (Part III), p. 49 (1960).

21. 1 NICHOLS, § 4.11.

22. *Id.* at § 4.11 (2); (p. 337).

Two particular problems are raised with respect to highway acquisitions:

*Acquisitions for Future Use.* In a sense, property is always acquired in anticipation of future use. As the anticipated use becomes more remote in time, the taking tends to come into conflict with the requirement that there be a need for the property. Also, as the time of the intended use becomes more remote, the need for the particular property tends to become more uncertain, hence unnecessary.<sup>23</sup> Necessity will generally be found where the use is "within a reasonable time," provided that the particular use to be made of the property can be established at the time of acquisition.<sup>24</sup> The condemner will not, however, be limited to acquisitions that are required for its immediate needs only, but may anticipate future needs.<sup>25</sup>

*Excess Land.* Condemner may desire to acquire more property than is needed for a particular public project. This may be prompted by a desire to avoid the losses resulting from damages done to remaining property. For example, where a remainder is landlocked, the condemner may wish to acquire this isolated remainder when the appraised value of the parcel is tentatively damaged near its full value. Statutes have expressly authorized acquisition of such remainders.<sup>26</sup>

As distinct from this situation would be the instance where the condemner may wish to purchase additional lands anticipating a benefit from the improvement and ultimate sale at some profit so as to reduce its over-all costs of acquisition. Condemnations of land for this purpose in excess of that actually needed for the particular public use involved would appear to be in conflict with the requirements that the property be necessary and that it be acquired for a public use. It is doubtful if such latter takings would be sustained over the owner's objection.<sup>27</sup>

*Reservations* — The condemner may expressly limit the use of the land taken in the initial pleadings of the condemnation action. Often the use may be limited, or promissory statements or stipulations regarding the use of the property may be made before or during the trial to determine compensation. Such stipulations may be in two forms: There may be an express statement which becomes binding on the condemner and recognizes certain uses, such as a farm crossing, which the owner may make of the property being acquired; or the State may present evidence and agree to be bound as to the actual construction to be made on the property acquired. The weight of authority allows the use of one or both of these devices to minimize damages,

23. Highway Research Board Special Report 27, *Acquisition of Land for Future Highway Use*, p. 23 (1957).

24. *Ibid.*

25. *City of Spokane v. Marriam*, 80 Wash. 222, 141 Pac. 358 (1914).

26. 2 NICHOLS, § 7.5122(1).

27. *Ibid.*

preclude the fixing of damages to the remainder based on a use more onerous than the public intends to make.

### Statutory and Judicial Limitations

Although it is an attribute of sovereignty, the power of eminent domain lies dormant until legislative action establishes the occasions, the modes, conditions, and agencies for the exercise of the power.<sup>29</sup> The legislature, subject to constitutional limitations, may select the organizations to which to delegate its power. The grant of the authority to condemn is generally restricted to prescribed uses and procedures. Courts tend to construe statutes and procedures relating to eminent domain strictly against the condemner.<sup>30</sup>

### DATE OF VALUATION

There is a divergence of authority concerning the date to be used as the basis for just compensation.<sup>31</sup> The majority of jurisdictions utilize the date of trial or award. Others value as of the date of commencement of the action, or actual acquisition of the property if acquired before the trial to determine compensation.

The date as of which the property is valued may materially affect the compensation which the condemner must pay. For example, if market values are rising, compensation will be greater if a later date be utilized. It is therefore incumbent upon the right-of-way agent and the appraiser to see that the proper date of the valuation be utilized.

By the date of evaluation the pending highway improvement may have had some effect on the value of the property being taken or damaged. This effect will generally be in the form of enhancement in value but knowledge of the highway plans can also depress property values. Because it would not appear to be in accord with either equity or common sense to permit the owner to be enriched or be penalized because of the proposed improvement, compensation generally cannot include such enhancement nor be diminished by depressed valuation.

The general rule is that any enhancement in value which is brought about in anticipation of and by reason of a proposed improvement is to be excluded in determining the market value of such land, although there is some authority which, contrariwise, unqualifiedly allows recovery for such enhanced value. The rule of exclusion

28. See generally Anno., 7 A.L.R.2d 364 (1949).

29. *City of Tacoma v. Washington*, 4 Wash. 64, 66, 29 Pac. 847, 848 (1892) (quoting from *Constitutional Limitations*, Cooley).

30. 1 NICHOLS, § 3.213 *et seq.*

31. 3 NICHOLS, § 8.5; 4 NICHOLS, § 12.23; Highway Research Board Special Report 59, *op. cit.* footnote 20, pp. 20 *et seq.*

has been applied also to consideration of the effect of the taking in depressing the value. It has been said that ordinarily the fact that property is, or is about to be, condemned for public purposes does not diminish or destroy its value.<sup>32</sup>

To this extent valuation as of a particular date may be adjusted.

#### PERSONS ENTITLED TO COMPENSATION

All persons having any legal interest in the property sought by condemnation are generally entitled to compensation to the extent of their interest or the depreciation in the value of their interest caused by the taking.<sup>33</sup> Whether all such persons need be joined in the condemnation action may turn on whether their interests are deemed proprietary or not.<sup>34</sup> As condemnation proceedings are construed as proceedings *in rem*, service on unknown owners or nonresident owners may be made by publication.<sup>35</sup> The fact that the title of certain persons may be doubtful or in dispute will not prevent an exercise of power of eminent domain where the condemner has given adequate notice to those persons having an interest in the property as indicated by public records, or otherwise.<sup>36</sup>

Under the majority rule once a suit has been instituted against the required interested parties, the condemner's obligation extends only to the determination and payment of a lump sum which represents full value of the land taken and severance damages caused to the remainder of the undivided estate. The condemner is not required to value the separate interests in the property and is not required to participate in the apportionment of the lump sum award made for all interests.<sup>37</sup> Apportionment is usually accomplished by supplemental proceedings participated in only by the various claimants. The award is considered as being equivalent to the land and the claimants participate in the award to the extent of their interest in the land.

It is impossible to consider here all of the various pieces into which the totality of legal ownership may be divided. In addition to owners of mortgages, liens and other security interests, life tenants and remaindermen, reversioners and owners of easements or restrictive covenants, some of the more common divisions of ownership are the following:

*Vendor-vendee* — Both the vendor and the vendee in an executory contract of sale of land subsequently involved in condemnation are generally entitled to participate in the award.<sup>38</sup> If lands are sold after the institution of the condemnation but

32. 4 NICHOLS, § 12.3151 at pp. 202-05.

33. See 2 NICHOLS, §§ 5.1 *et seq.*

34. Cf. 2 NICHOLS, §§ 5.74, 5.741.

35. 1 NICHOLS, § 4.103(2).

36. 2 NICHOLS, §§ 5.2(2) *et seq.*

37. 4 NICHOLS, § 12.36(1).

38. 2 NICHOLS, § 5.21(1).

the award.<sup>39</sup> If a piece of property is sold after award in condemnation has been made or after there has been a taking or damaging of it contrary to constitutional provisions, the right to compensation will not be considered as running with the land but will remain the personal property of the vendor.<sup>40</sup>

*Mortgagor-mortgagee* — Where mortgaged property is taken by eminent domain, the mortgagee's rights follow the award and he may participate in the award to the extent necessary to satisfy the debt or to share in the award to the extent that the security interests are impaired by the condemnation.<sup>41</sup> This is generally true as to all lien holders. There is some conflict as to whether or not mortgagees or lien holders need be named in condemnation actions.<sup>42</sup>

*Lessor-lessee* — The lessee, as well as the lessor, is classed as an owner. Generally he will be required to participate in the lump-sum award rather than having a separate determination of his interest.<sup>43</sup>

The condemnation award which is paid to the lessee when his entire interest is taken is the fair market value of his unexpired leasehold; partial takings will involve a consideration of the difference in the market values of this leasehold before and after the acquisition. Computation of the market value of the leasehold in either situation will generally involve a consideration of the present worth of the amount which the market or economic rent of the premises exceeds the rental which the lessee is required to pay under his lease. If the market rental value of the unexpired term does not exceed the rent payable under the lease, the lessee is generally held not entitled to any allowance as compensation for his interest.<sup>44</sup>

The parties to a lease may include in it a provision respecting their rights in the event of condemnation, which provision will control on the problem of distribution of the award or termination of the lease.<sup>45</sup>

*Taxes* — The law is not uniform with respect to the necessity of joining holders of tax liens in condemnations.<sup>46</sup> As with other liens, a tax lien shifts from the land and is payable out of the award.

Problems similar to those on sales of land, both as to the liability for the tax and participation in the award, may arise where the taxes become a lien after the date of appropriation.<sup>47</sup>

39. *Id.* at § 5.21.

40. *Ibid.*

41. See 2 NICHOLS, §§ 5.74 *et seq.*

42. *Id.* at §§ 5.74, 5.741.

43. *Id.* at § 5.23; 4 NICHOLS, §§ 12.42 *et seq.*

44. See generally Anno., 3 A.L.R.2d 286 (1949).

45. See generally Anno., 98 A.L.R. 254 (1935).

46. 2 NICHOLS, § 5.744.

47. See generally Anno., 45 A.L.R.2d 522 (1956).

## The Measure of Compensation

LEONARD I. LINDAS

*Chief Counsel,  
Oregon State Highway Department*

### MARKET VALUE

Fair cash market value is the normally accepted standard for the measure of compensation. It is generally stated that fair cash market value is the amount of money which a purchaser, willing but not obligated to buy the property, would pay to an owner willing but not obligated to sell it, taking into consideration all uses to which the land was adapted and might in reason be applied.<sup>1</sup>

#### Present and Anticipated Use

In determining the fair cash market value of the property taken, the owner is not limited to the value of the property for the purposes for which it was actually used. The valuation of property should be based upon its most profitable legal use. Any reasonable future use to which the land might be adapted or applied may be considered in arriving at the present market value. This is distinguished and separate from the owner's vague plans or hopes for the future which are completely irrelevant.<sup>2</sup>

The value of property for the use to which reasonable men would devote it if owned by them must be taken as the ultimate test.<sup>3</sup>

#### "Before and After" Rule

When only a portion of the land is taken, the better rule of valuation seems to be the "before and after" method. This consists of determining the difference between the market value of the entire property before the taking and its value after the taking.<sup>4</sup> It has the advantage of eliminating the double compensation problem by simply subtracting the value of the remainder after the taking from the value of the whole before

1. Nichols, *Eminent Domain*, 3rd Ed., Vol. 4, Section 12.2(1), 1951.

2. *Id.* at Section 12.314.

3. *Ibid.*

4. Jahr, *Eminent Domain, Valuation and Procedure*, Section 98, 1953.

the taking. It has the disadvantage, however, of being susceptible to padding, since noncompensable items of damages can be wrongfully reflected in the estimated after value, and thus may be included as part of the purported severance damages. The other rule accepted by the courts in partial taking cases is the determination of the value of the land taken, together with the severance damage to the remainder, without going into the entire tract value before and after the taking.

### Comparable Sales

Comparable sales may be evidence of the market value of the land in question if they are not forced sales, family sales or sales of property where one consideration is paid for a combination of real estate and personalty.<sup>5</sup> Sales to public authorities having the power of eminent domain are not generally admissible.

Sales of similar property in the vicinity provide a theoretically accurate method of determining true value, because if there are enough valid sales of similar property in the vicinity which have taken place within a reasonable time before the condemnation suit, there is a pattern which should portray a fairly accurate picture of the fair cash market value of the property. The disadvantage of this method is that only in exceptional cases are two pieces of property exactly alike.

*Sales of subject property* — Proof of sales of the same property may be a guide to value under certain circumstances, if the sale was made within a reasonable time before commencement of the condemnation suit, and all other conditions of sale were legitimate.

In several jurisdictions, it has been held that upon the issue of the market value of land taken or damaged by the exercise of the power of eminent domain, evidence of the price for which the claimant of compensation or damages has sold or contracted to sell the land in question to a third person, is relevant and admissible, provided the sale transaction was *bona fide* rather than forced, was relevant in point of time, and was not merely an unsubstantiated offer to purchase.

### Reproduction and/or Substitute Utility

The prevailing rule is that evidence of reproduction cost is admissible in all cases, provided the buildings or improvements are fairly adapted to the land upon which they are located. Before evidence of reproduction cost of improvements taken by eminent domain can be accepted as valid, it is incumbent on the party making such proffer to establish that the improvements are proper, adequate and reasonably adaptable to the land upon which they are located.

On the other hand, depreciation or obsolescence present in the property being appraised should be taken into consideration in the final estimate of value, since it is

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5. *Id.* at Section 139.

obvious that a building which is so old or obsolete as to have little or no value could not be considered in the same category or as having the same value as a new and modern building.

Mere age is not in and by itself necessarily a sign of depreciation in value, because if the building has been well kept it has been of necessity repaired from time to time so that it has to some extent preserved its useful life and its reproduction value.<sup>6</sup>

The cost of reproducing a building which is to be condemned may, in some cases, be essential in determining just compensation. There are cases where a building has little or no market value, in the sense that it is impossible to find a person or corporation which would purchase the property for little more than the land upon which the building is situated. In such cases, after determining the value of the land upon which the building is situated, it would be necessary to estimate the cost of reproduction less depreciation to determine the value, if any, contributed to the property by the improvements.

### Special Purpose Properties

Real estate on which specialized buildings and structures adapted to the peculiar manufacturing, processing or service activities of a particular industry or utility are located, together with the property of colleges, churches, hospitals etc., are generally described as "special purpose" properties. Frequently market value is nonexistent in this class of cases, for these are exceptions to the usual market value rule. Evidence is usually permitted to show the replacement cost of improvements with a depreciation allowance less than would be otherwise established for a market value appraisal of the property. The rule is frequently stated to the effect that before the owner may resort to such evidence he must show that it is impossible to prove the value of his property by reference to market value. (See chapter 34, "The Appraisal of Special Purpose Properties.")

In the "special purpose" property category, the courts usually award more than the "fair market value" concept would require. The award is generally the total of the market value of the land and the replacement cost or sound value of the improvements and fixtures with a restricted depreciation allowance in the last two items.

## DAMAGES

### Taking and Damages

Here a distinction must be made between a "taking" of property and a mere damage to property because of the different provisions of State law on the subject. Some State constitutions contain the clause that just compensation must be paid for

6. *Id.* at Sections 157-158.

taking or damaging private property, while others provide for just compensation for the taking only and make no mention of payment for damages to private property. At the outset, it is noted that some States construe the term "taking" in its strictest sense. In these States, under their constitutional requirements, compensation will be allowed only when private property is seized, acquired, and appropriated, and the owner thereof is divested of all right, title or interest. There must be a *physical* "taking" of the property and dispossession of the owner for public use. Other States adopt a more liberal approach to a "taking" and recognize a serious invasion of property rights as a constructive taking, and hence as grounds for compensation, even though there is no actual physical taking.

A consideration which is helpful to determine whether compensation will be allowed the owner whose property is damaged but not actually taken is whether such damages were compensable under common law. If they were compensable, then the owner would undoubtedly have a right to recover for his damages; but if it was a case of *damnum absque injuria* (loss, hurt or harm without injury in the legal sense), the owner would not receive compensation. (If the State constitution allows compensation for "taking or damage" then there is no real problem.)

### Severance Damages

However, in the case of a partial taking of property, the decisions of the courts have been uniform. It matters little whether the State constitution contains provisions requiring compensation for property taken or whether it has the provision authorizing compensation for property "taken, injured or damaged."<sup>7</sup> In all jurisdictions severance damages are allowed. Severance damages include, among others, damages resulting from dividing a property into two or more parts, or severing a piece of property from the whole, thus reducing the size and changing the shape of the remainder. Any diminution in value of the remainder area by reason of the severance therefrom of the parcel taken for public use is considered to be damage that is an inescapable sequel to the "taking" and, is therefore compensable.<sup>8</sup>

A partial taking results from taking a portion of an entire tract. It is necessary that tangible real property remains for the owner after the taking, and even then there must be a physical relationship between the property taken and the property remaining.<sup>9</sup> Severance damages are then awarded for the loss sustained by the owner of the property remaining after the taking for the damage to the remainder. *Incidental* damages to the property remaining such as noise, dust, fumes, etc., are not generally recoverable damages.

7. *Id.* at Section 47.

8. Nichols, *op. cit.* footnote 1, Vol. 4, Sections 14, 14.1(3).

9. Jahr, *op. cit.* footnote 4, Section 97.

The general rule is that where a part of a larger tract is taken and the part taken is a vital and integral part of the whole, and its taking diminishes the usability of the entire tract, the owner is entitled to the diminution in value of the entire tract caused by the taking.<sup>10</sup>

*Unity of use* — As to what constitutes a single tract rather than separate tracts, it has been held that this does not depend on physical contiguity, but on integrated use, actual or readily possible.

It has been stated<sup>11</sup> that unity of use is the principal test to be used in determining what constitutes a separate and independent parcel of land. Parcels of land, whether contiguous or not, with *common use* and *ownership* (unity of title) are not considered separate and independent parcels merely because they were acquired at different times or are separated by an imaginary line. When parts of the same ownership are separated by intervening private land, they are considered as independent parcels, unless they are so inseparably connected in their use that the damage to or taking of one must necessarily and permanently injure the other.

*Before and after value* — The most widely accepted formula for estimating severance damages is the "before and after rule" previously described. As a general rule the courts have held that if the destruction or impairment of such element of use has no effect upon the market value of the remainder area, it may not be considered.

The usual formula, in applying the before and after rule to specific cases, is stated in Nichols:<sup>12</sup>

"Value of entire parcel before taking minus value of remainder area after taking equals just compensation."

For instance, severance damages may accrue when the size and shape of the remainder of the parcel are such that the land cannot be put to its most advantageous use. The uses to which the property might have been put prior to the taking may be shown, along with the limited uses to which the remainder may be devoted after the taking.

Assume a parcel of land is worth \$10,000 as a unit. One-half of this parcel is condemned, so the actual physical taking is \$5,000 worth of land. But the other half now has a market value of only \$3,000. Applying the above-stated formula, the value of the entire parcel before the taking is \$10,000, minus the value of remainder area after the taking or \$3,000, equals just compensation of \$7,000. The damage to the remainder is \$2,000 because of the reduction in size of the parcel.

The illustration assumes an equal value on all portions of the parcel, but the same result occurs when that portion taken is equal to one-half of the total value of

10. McCormick, *Damages*, Section 136, 1935.

11. 18 Am. Jur., *Eminent Domain* p. 910 (1938).

12. Nichols, *op. cit.* footnote 1, Vol. 4, Section 14.23.

the entire parcel. The portion of the parcel fronting on a busy thoroughfare may be taken, and this would normally be more valuable property than the portion adjacent to other private land not fronting the thoroughfare, although less than one-half of the parcel is taken. Or the parcel may be cut diagonally or at such an angle that the parcel remaining is usable only for a limited or specific use with its value being thereby reduced. Here, severance damages are obviously proper and a direct result of the taking.

*Loss of access* — As a general rule the loss of access to a parcel of land may be considered in the valuation of property under a condemnation action.

Using the same example as above, the condemning authority takes a piece worth \$1,000 but completely destroys access to the remainder of the land. Theoretically, this landlocked remnant has no value to the owner, since he has no access to it and the only possible market for it would be to the adjoining property owner who may not show any apparent interest in acquiring it at any price.

Thus, applying the formula, with the assumed land value before the taking of \$10,000, minus an assumed "absorption" value of the remainder parcel after the taking of \$1,000, will equal just compensation of \$9,000. The damage for loss of access is therefore \$8,000.

Easements of access to conventional public ways are normally a valuable property right of the abutting owner.<sup>13</sup> Loss of this right of access which leaves the remaining portion landlocked is compensable by severance damages in the manner computed in the above illustration. The right of the abutting owner is limited, however, to access and does not extend to loss of traffic and a possible consequential loss of business.<sup>14</sup>

Construction of new limited access highways or "freeways" often entails the problem of the abutting owners being denied rights of access to the new freeway. This construction may or may not sever the parcel, and access will normally still be available on the already established streets or roads. Most States that have made a judicial determination on this point have held that where a freeway is constructed on a new location the property owner does not lose access rights since no highway existed previously.

*Proximity damages* — This type of damage is due to the proximity of the highway or other structure to some improvement, usually a dwelling, on the condemnee's property. Because proximity damage is usually accompanied by a taking of land, and inasmuch as the proximity affects the value of the property remaining, such damage, though speculative, is compensable.

Again using the previous example, when the entire land was worth \$10,000, the condemnor takes a piece of land worth \$500 and builds a highway through the owner's front yard. After this highway is built, the remainder is worth

13. *Id.* at Vol. 3, Section 5.72.

14. *Id.* at Section 5.76.

only \$5,000. So, by applying the formula with a before value of \$10,000, minus the value of the remainder or \$5,000, equals just compensation of \$5,000. The proximity damages are \$4,500 in this case.

*Operational damages* — Uneconomic operation of the remainder area as a result of the taking is usually allowed as a proper item for consideration insofar as it might affect market value, even though a number of courts have held this item is too speculative. This problem might arise when the condemner would go through the middle of a farm and isolate one small piece from the remainder.

Using the assumed example, the condemner takes land worth \$1,000, and the remainder taken together would be worth \$9,000. But there is a piece isolated and, while it does have access, it is so uneconomic in its effective use as a part of the farm that the remaining land is worth only \$7,000. Thus, the operational use damage would be \$2,000 in this case.

This damage of uneconomic operation is closely related to, and often caused by, other forms of compensable damage, such as loss of access, proximity, the odd shape of the remaining property, or the division of one parcel into two separate tracts. Although this damage may be closely related to the other elements of compensable damages, a double or overlapping award will not be made in applying the formula of the value before the taking and the value of the remainder after the taking, since the remainder can have only one after value irrespective of the various elements of damages.

This example of assumed severance damages should be clearly differentiated from mere circuity of travel caused by loss of the former direct route to and from an owner's property. If, for instance, the most direct route into market for a farmer is cut off, necessitating a detour over various other roads, the farmer suffers no compensable inconvenience of use damage to his remaining property. Circuity of travel may result in inconvenience to the owner of the property without effecting the operational use or market value of the remaining property for which severance damages are proper.

*Other types of severance damages* — Injuries for which severance damages have been awarded include inconveniently separating the parcel by deep cuts or embankments, injuries from surface or subsurface water, polluting waters or disturbing water supplies, and additional fencing.<sup>15</sup>

It has been noted and should be re-emphasized that severance damages cannot take into consideration losses which are too remote, speculative, incidental or inconsequential to the taking, such as the loss of traffic caused by a new route diverting such traffic from the old traveled route with the sometimes inevitable loss of business resulting therefrom, or by loss of a direct route of travel.

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15. 18 Am. Jur., *supra* footnote 11, p. 906.



## CHAPTER 5

### Non-compensable Damages in Eminent Domain Proceedings

MAURICE F. BISHOP

*Special Assistant Attorney General  
State of Alabama*

The power to acquire property and property rights by condemnation is inherent in the sovereign,<sup>1</sup> but use of the power is subject to constitutional limitations and payment of just compensation. The basic requirement for just compensation in eminent domain proceedings where the Federal Government, or one of its agencies, is involved, is found in the Fifth Amendment, which provides in pertinent part as follows:

Nor shall private property be taken for public use, without just compensation.

Similar provisions are found in the constitutions of all the States except two.<sup>2</sup> However, even without such a State constitutional guarantee, payment of just compensation is required for the taking of land for public use by the Fourteenth Amendment.<sup>3</sup>

There are numerous elements that arise in the trial of almost any condemnation case that are noncompensable even though the market value may be adversely affected thereby. Trial lawyers and valuation witnesses should be thoroughly familiar with these elements so that the compensation ultimately allowed will be just but not munificent, adequate but not excessive, and so that the eminent domain process will not be encumbered and the burden of appeals will be lessened. Generally speaking, all real damages, as compared with those which are speculative or imaginary, and all direct damages, as compared with those which are merely incidental, are recoverable by the property owner.

#### Elements of Damages Generally Excluded

As a general rule, everything which affects the market value of the remainder area resulting from the taking of a part should be considered, but there are certain types of damage which have been rejected by the courts and which, therefore, are "non-

1. COOLEY, *Constitutional Limitations*, pp. 1109-10 (8th ed. 1927); *Jones v. Nashville, C. & St. L. Ry.*, 141 Ala. 388, 37 So. 677 (1904).
2. Just compensation provisions are found in the constitutions of all jurisdictions except New Hampshire and North Carolina, although the provision in Kansas (Kan. Const., Art. 12, §4) relates to corporations only.
3. *McCoy v. Union Elevated R.R.*, 247 U.S. 354, 38 Sup. Ct. 504, 62 L.Ed. 1156 (1918).

compensable." First, where the injury is common to all the land in the neighborhood and to the public in general, it may not be considered. By way of example, in *Department of Public Works v. Hubbard*, 363 Ill. 99, 1 N.E.2d 383 (1936), the Supreme Court of Illinois had for consideration the question whether a trial court had erred in considering the necessity of crossing a highway where it divided a property owner's land, and the danger incident thereto, in fixing damages to his remaining land which was not taken. Of course, the owner would be entitled to severance damages, if any, but whether the necessity for crossing the highway should be included as an element was determined by application of the following rule:

Danger in crossing a highway is too remote and speculative to be considered as an element of damages to land not taken, yet where there is specific evidence of danger of loss by killing livestock or inconvenience and expense in herding them across the highway, and where such danger or inconvenience in fact depreciates the value of land not taken, such become [sic] a proper element to be considered in determining the damage to land not taken.<sup>4</sup>

Increased traffic and the influx of undesirable persons as a result of the proposed construction are not compensable elements of damage.<sup>5</sup> The courts generally have held that possible damage due to the anticipated future negligence of the condemner may not be considered in determining damages which the owner may recover.

The possibility—or probability—that damages may arise from the killing of stock by cars on the highway or the possible necessity of additional fencing on the land, for example, are not compensable but are considered too remote and speculative to be considered.<sup>6</sup> Nor is the owner entitled to compensation for any values of necessities peculiar to the owner or to the enhanced value because of the taking or improvement.

#### Diversion of Traffic

It is almost universally held that a property owner has no right to compensation for diversion of traffic by the relocation of a highway where no part of his property is taken for the new project.<sup>7</sup> The rule is that ordinarily no person has a vested right in the maintenance of a public highway in any particular place. The public owes no individual the duty to send traffic past his door. It is also generally held (Alabama excepted) that no compensation is due for diversion of traffic where part of the

4. 363 Ill. at 104, 1 N.E.2d at 385.

5. *State Hwy. Comm'n v. Chatham*, 173 Miss. 427, 161 So. 674 (1935).

6. See *Alabama & Fla. R.R. v. Burkett*, 46 Ala. 569 (1871). While this case concerns the possibility of stock being killed by railroad trains, it is believed that the same principle would be applicable with regard to highways.

7. In fact, all states except Alabama hold that diversion of traffic is not compensable. See *Anno.*, 118 A.L.R. 921 (1939), and cases there cited, as well as the Alabama exception of *Pike County v. Whittington*, 263 Ala. 47, 81 So. 2d 288 (1955), which was subject to an excellent dissenting opinion and has been widely criticized.

owner's property is required for the relocated or new highway. The general rule is well stated in *Board of County Comm'rs v. Slaughter*, 49 N.M. 141, 147, 158 P.2d 859, 863 (1945), as follows:

Mere diversion of traffic alone, regardless of the fact that the new road may run over a portion of the claimant's land for which portion compensation is paid, will not support a judgment for consequential damages.

The owner of land abutting on a highway has no property or other vested right in the continuance of it as a highway at public expense and he is not entitled to compensation or damages for its discontinuance, although such discontinuance diverts traffic from his door and diminishes his trade and this depreciates the value of his land.

#### Changed Use of a Public Way

When a city, county or State changes or adds to a roadway sometime after the original condemnation, but within its right-of-way, an adjacent landowner may feel that his property has suffered an additional loss of value, but there is no liability where the road is put to such additional use in consonance with the general purpose of the public way.<sup>8</sup> However, the purposes for which a street or highway may be used without imposing on the public to pay additional compensation are not unlimited. The purposes must be appropriate and it seems that an abutting landowner has a right to hold his property free from any subjection of the road to "non-highway" uses.<sup>9</sup>

Although the point is not free from doubt, it has been held that a *local* street railway may be allowed to use a street without imposing an additional servitude;<sup>10</sup> however, where such a road is used, or attempted to be used, by a *railroad*, the rights of adjacent landowners have been held to be damaged.<sup>11</sup> The distinction generally drawn is that a railroad would carry traffic which would not ordinarily pass over the street, whereas a purely local line merely adopts new means of carrying old traffic.

In *Hobbs v. Long Distance T. & T. Co.*, 147 Ala. 393, 41 So. 1003 (1906), the Alabama Supreme Court held that the erection of telephone lines along the margin of a highway is not such an additional burden as to entitle the abutting owner to compensation. This decision was reached by a divided court in 1906, and is contrary to the weight of authority holding that poles and wires of a telephone company erected along a highway constitute an additional servitude upon the fee for which the owner must be compensated.

8. *Wagner v. Bristol Belt Line Ry.*, 108 Va. 594, 62 S.E. 391 (1908).

9. 2 NICHOLS, *Eminent Domain*, § 6.4444 (3d ed. 1950).

10. See *McClintock v. Richlands Brake Corp.*, 152 Va. 1, 145 S.E.2d 425 (1928); *Morris v. Montgomery Traction Co.*, 143 Ala. 246, 38 So. 834 (1905); *Baker v. Selma St. & S. Ry.*, 130 Ala. 474, 30 So. 464 (1901).

11. *H. Rouw Co. v. Thompson*, 194 S.W.2d 120 (Tex. Civ. App. 1946).

## Owner Not Entitled to Recover an Enhancement in the Value of the Land Taken due to the Proposed Improvement

In anticipation of the construction of a public improvement, the value of land in the vicinity frequently rises before the actual taking is effected by condemnation. Necessarily, there is some time lag between the announcement of the project or its final financial approval, and acquisition of the property therefor or the start of construction. Thus, the question arises whether this increment in the value of the land taken for the improvement, due to the proposed construction, is an element to be considered in arriving at just compensation.

The leading case affirming the general rule that the owner is not entitled to recover an increase in the value of his land due to the proposed improvement is *United States v. Miller*, 317 U.S. 369, 63 Sup. Ct. 276, 87 L.Ed. 336 (1943). There the Government sought to condemn the property in question as a right-of-way for the relocation of rail lines, which relocation was made necessary by flooding resulting from construction of the Sacramento River Dam. Each valuation witness was asked to state his opinion with regard to the market value of the land taken as of December 14, 1938, the date of the filing of the Government's complaint. Government counsel objected to the form of the question on the ground that, since the United States had become definitely committed to the project on August 26, 1937, the landowners were not entitled to have any increment in value due to the Government's authorization of or commitment to the project included in an estimate of value as of December 14, 1938, the date on which the lands were taken.

In affirming the trial court, the United States Supreme Court declared:

The question then is whether the respondent's lands were probably within the scope of the project from the time the Government was committed to it. If they were not, but were merely adjacent lands, the subsequent enlargement of the project to include them ought not to deprive the respondents of the value added in the meantime by the proximity of the improvement. If, on the other hand, they were, the Government ought not to pay any increase in value arising from the known fact that the lands probably would be condemned. The owners ought not to gain by speculating on probable increase in value due to the Government's activities.<sup>12</sup>

### Damages as a Result of the Exercise of the Police Power are Noncompensable

Private rights relative to highways may be regulated in many ways under the police power without compensation, but if the action of the State amounts to a "taking" of land, constitutional principles control, and the State must proceed by condemnation. Unfortunately, the statement of the rule does not answer the question

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12. 317 U.S. at 377, 63 Sup. Ct. at 281, 87 L.Ed. at 344.

involved, but, as noted in *State Hwy. Comm'n v. Burk*, 200 Ore. 211, 230, 265 P.2d 783, 792 (1954):

In general, the regulation of highway traffic is within the police power. This includes the establishment of one-way streets, the establishment of traffic lanes, regulations as to speeding and parking, regulations of abutting owners, along with the general travelling public involving circuitry of travel, as where one living on a southbound divided street desires to go north, regulations limiting permissible "U" turns, and changes in the highway system resulting in the reduction or increase of the volume of traffic on the highway fronting the property of an owner.

Placing a dividing strip in the center of the street separating lanes of opposing traffic has been upheld under the police power.<sup>13</sup>

Eminent domain is the power of the State or sovereign to take or damage private property for a public purpose on payment of just compensation. Police power is the power of the State to restrict property rights, without paying compensation, by regulations tending to promote the public health, safety, morals and general welfare.

The question usually involved where the police power is brought into play is, how far can the sovereign proceed under the police power—where does the police power end and the power of eminent domain begin? It has been well-stated that police power is the power to restrict a property right because it is necessary.<sup>14</sup> Eminent domain is the power to restrict a property right because it is useful.<sup>15</sup> The question, therefore, is, when does the taking of a property right cease being useful and start being necessary?

Compensation is not required where only the police power is exercised. The power of the State to regulate traffic without liability for payment of compensation allows, among other things, (1) diversion of traffic away from a business location,<sup>16</sup> (2) prohibiting access or cross-overs between separated traffic lanes,<sup>17</sup> (3) designating one highway or lane to have right-of-way and its traffic to have precedence over intersecting highways, lanes, and traffic,<sup>18</sup> (4) prohibiting left turns,<sup>19</sup> (5) prohibiting

13. *Holman v. California*, 97 Cal. App. 2d 237, 217 P.2d 448 (1950); *City of Fort Smith v. Van Zandt*, 197 Ark. 91, 122 S.W.2d 187 (1938).

14. See *City of Philadelphia v. Scott*, 81 Pa. (31 P.F.S.) 80, 85-88 (1876).

15. See 11 McQUILLIN, *Municipal Corporations*, § 32.04 (3d ed. 1950).

16. *Quin v. Mississippi State Hwy. Comm'n*, 194 Miss. 411, 11 So. 2d 810 (1943); *In re Appointment of Viewers*, 344 Pa. 5, 23 A.2d 880 (1942); *In re Board of Supervisors*, 257 App. Div. 1058, 13 N.Y.S.2d 730 (1939); *Nelson v. State Hwy. Bd.*, 110 Vt. 44, 1 A.2d 689, 118 A.L.R. 915 (1938); *City of Stockton v. Marengo*, 137 Cal. App. 760, 31 P.2d 467 (1934); *People v. Gianni*, 130 Cal. App. 584, 20 P.2d 87 (1933); *Wolff v. City of Los Angeles*, 49 Cal. App. 400, 193 Pac. 862 (1920); *Elks v. Board of Comm'rs.* 179 N.C. 241, 102 S.E. 414 (1920).

17. *Jones Beach Blvd. Estate v. Moses*, 268 N.Y. 362, 369, 197 N.E. 313, 316, 100 A.L.R. 487, 491 (1935).

18. 42 C.J. *Motor Vehicles* § 48 (1927).

19. *Cavanaugh v. Gerk*, 313 Mo. 375, 280 S.W. 51 (1926).

or regulating parking,<sup>20</sup> (6) restricting speed, weight, size and character of vehicles allowed on certain highways,<sup>21</sup> (7) prescribing one-way traffic,<sup>22</sup> (8) creating a cul-de-sac by closing a highway just beyond a tract of land, if access is left in one direction to the general network of highways.<sup>23</sup> On the other hand, as discussed below, it has been held that closing of an intersection to eliminate a grade crossing of a highway entitled property owners on the first block from the dead end thus created to compensation.<sup>24 25</sup>

### The "Cul-de-sac" Problem

Limited access highways often block streets which formerly intersected the highway but which, after construction, will terminate in a dead end at the highway, creating what is known as a "cul-de-sac." The cases are sharply divided on the question whether the owner of property abutting on a street turned into a cul-de-sac is entitled to compensation. Many of the authorities are collected in *Bacich v. Board of Control*, 23 Cal. 2d 343, 144 P.2d 818 (1943), where the court concluded that the right of access extends in both directions to the next intersecting street, and stated that:

Many authorities and writers have either declared or intimated that the creation of a cul-de-sac, that is, the blocking of access to the next intersecting street in one direction, is compensable, although the access still exists in the opposite direction to an intersecting street. In other words, the easement is of that extent. (Citations omitted.) There are cases to the contrary (citations omitted), but some of them are based upon a constitutional provision which allows compensation for taking alone, no mention being made of a damaging.<sup>26</sup>

As noted, there is considerable authority that the owners on the first block are not entitled to compensation, either because their right of access has not been

20. *State ex rel. Audrain County v. City of Mexico*, 355 Mo. 612, 197 S.W. 2d 301 (1946); *City of Clayton v. Nemours*, 353 Mo. 61, 182 S.W.2d 57 (1944); *Wilhoit v. Springfield*, 237 Mo. App. 775, 171 S.W.2d 95 (1943); *Kimmel v. City of Spokane*, 7 Wash. 2d 372, 109 P.2d 1069 (1941); *Rhodes v. Raleigh*, 217 N.C. 627, 9 S.E.2d 389, 130 A.L.R. 311 (1940). See also *Grimes, The Legality of Parking Meter Ordinances and Permissible Use of Parking Meter Funds*, 35 Cal. L. Rev. 235-51 (1947).
21. *Wilbur v. Newton*, 301 Mass. 97, 16 N.E.2d 86, 121 A.L.R. 570 (1938); *People v. Linde*, 341 Ill. 269, 173 N.E. 361, 72 A.L.R. 997 (1930); *State v. Swagerty*, 203 Mo. 517, 102 S.W. 483 (1907). See also 40 C.J.S. *Highways* § 233 (1944); 25 Am. Jur., *Highways* § 267 (1940); 5 Am. Jur., *Automobiles* § 48 (1936).
22. *Cavanaugh v. Gerk*, *supra* note 19, *Jones Beach Blvd. Estate v. Moses*, *supra* note 17. See also 5 Am. Jur., *Automobiles* § 49 (1936); 42 C. J. *Motor Vehicles* § 46 (1927).
23. *Wilson v. Kansas City*, 162 S.W.2d 802 (Mo. 1942).
24. *Bodemer v. County of Northampton*, 101 Pa. Super. 492 (1930); *cf. In re Vacation of Melon St.*, 182 Pa. 397, 38 Atl. 482 (1897).
25. *Bacich v. Board of Control*, 23 Cal. 2d 343, 144 P.2d 818 (1943); *People v. Ricciardi*, 23 Cal. 2d 390, 144 P.2d 799 (1943). However, the better reasoning is to be found in the dissenting opinions. Perhaps the statutory definition of property in California (Cal. Civ. Code, §§ 658-62, as set out in the *Ricciardi* opinion) creates new property rights which would not exist at common law.
26. 23 Cal. 2d at 352-54, 144 P.2d at 824-25.

impaired, or because impairment has been accomplished through exercise of the police power.<sup>27</sup>

#### Circuity of Travel is Generally Held to be Noncompensable

Circuity of travel generally is held to be noncompensable.<sup>28</sup> The claim for such damages generally arises where the location of the highway is changed, and where the traffic flow is regulated through exercise of the police power such as where median strips are constructed.

#### Removal Costs are Noncompensable

The condemnation of property frequently puts the owner or the lessee to the expense of moving his personal property or business from the land. Such removal costs generally are held to be noncompensable.<sup>29</sup> A taking does not include personal property not affixed to the land, and damage for injury to it or the expense of moving it are noncompensable. This is true whether the condemnee is an owner or a tenant. In *United States v. 40,558 Acres of Land*, 62 F. Supp. 98 (Del. 1945), compensation was not allowed to a farmer who was required to move and dispose of his livestock, machinery, etc., "within a matter of hours." The court held that:

There may be no separate compensation for claimant's losses upon sale of livestock, farming tools, machinery and equipment, deprivation of "profits and emoluments," *the cost of moving*, or the items going to show "loss of business or occupation."<sup>30</sup> (Emphasis supplied.)

In some States the cost of removal of personalty is allowed by statute, and the decisions have not been unanimous in denying compensation for removal costs. Some courts have allowed recovery generally on the construction of a statute or constitutional provision, but occasionally on the ground that removal costs should be allowed.<sup>31</sup> Typical of these cases is *Oil Fields & S.F. Ry. v. Treese Cotton Co.*, 78 Okla. 25, 187 P. 201 (1920), where the cost of removing a cotton gin and setting it up in another location was considered a proper element of damage to be considered.

27. *New York, C. & St. L. R.R. v. Busci*, 128 Ohio St. 134, 190 N.E. 562 (1934); *In re Hull*, 163 Minn. 439, 204 N.W. 534 (1925); *Freeman v. City of Centralia*, 67 Wash. 142, 120 Pac. 886 (1912).

28. Circuity of travel is non-compensable: *Dougherty County v. Hornsby*, 213 Ga. 114, 97 S.E.2d 300 (1957); *Iowa State Hwy. Comm'n v. Smith*, 248 Iowa 869, 82 N.W.2d 755 (1957); *Turner v. State*, 213 Md. 428, 132 A.2d 455 (1957); *Brady v. Smith*, 138 W.Va. 259, 79 S.E.2d 851 (1954); *Wilson v. Kansas City*, *supra* note 23. These cases hold contrary to the rule in Alabama, as expressed in *Pike County v. Whittington*, 263 Ala. 47, 81 So. 2d 288 (1955), and followed in *Blount County v. Campbell*, 268 Ala. 548, 109 So. 2d 678 (1959), and *Blount County v. McPherson*, 268 Ala. 133, 105 So. 2d 117 (1958).

29. See Annotations in 156 A.L.R. 397 (1945), 90 A.L.R. 59 (1934), 41 A.L.R. 1026 (1926), and 34 A.L.R. 1523 (1925). See also I ORGEL, *Valuation Under Eminent Domain*, § 69 (2d ed. 1953).

30. 62 F. Supp. at 101.

31. I. ORGEL, *supra* note 29, § 69 and cases cited therein.

Some things which appear to be personal property can become real property for which damages may be collected. In *In re Slum Clearance of Detroit*, 332 Mich. 485, 52 N.W.2d 195 (1952), the condemnee had huge vats of chemicals and molten metal which were used in electroplating, and since they could not be moved to another location, the court considered them a part of the real estate as a fixture and allowed compensation therefor.

#### Loss of Business, Profits and Goodwill are Generally Noncompensable

An established business or "goodwill" has never been held to constitute property in a constitutional sense. The interruption of business, the removal thereof a considerable distance away, and the consequent loss of the greater part of the customers of the business are not compensable. In *United States v. General Motors Corp.*, 323 U.S. 373, 65 Sup. Ct. 357, 89 L.Ed. 311 (1945), the court laid emphasis on the noncompensable loss by stating that value of "goodwill," injury to the business, or proof of value peculiar to the owner, "must be excluded from the reasoning." Most States have been uniform in holding that loss of profits, whether present or future, are noncompensable. Efforts to obtain compensation for these elements of damage have been a source of challenge and concern to courts and lawyers, particularly during the past several years. In *Stephenson Brick Co. v. United States ex rel. TVA*, 110 F.2d 360 (1940), the Fifth Circuit Court of Appeals dealt with land taken under the TVA Act. A portion of a brick plant on the south bank of the Tennessee River at Decatur, Alabama, was taken, so that in the words of the court:

The severance of the part taken did destroy the usefulness and value of the plant, so that what remained had the value only of disorganized land and buildings, and the machinery comprised in the plant had only the value of such second-hand property.<sup>32</sup>

The court held:

That the plant was making money may be considered in fixing its value for sale, but the business is not to be valued as such, nor is any loss of future profits to be compensated.<sup>33</sup>

The court further held that:

What it would cost to reproduce the plant, less a fair depreciation, may be considered.

The owner is entitled to be compensated not only for the separate value of the land taken, but also for the loss in value of the remainder of the tract in the use that was made of it at the time of the taking.<sup>34</sup>

32. 110 F.2d at 101.

33. *Ibid.*

34. *Ibid.*

Some States have adopted statutes which allow recovery for the loss of business or goodwill. Naturally, in such cases the statutory requirements must be followed and applied by the court.<sup>35</sup>

Resourceful counsel frequently find other channels to present the income and profits derived from the business which is being disturbed or destroyed by the taking. Illustrative of the narrow distinctions sometimes drawn is *City of St. Louis v. Paramount Shoe Mfg. Co.*, 237 Mo. App. 200, 168 S.W.2d 149 (1943), which involved a partial taking of lands presently in use and lands held for future expansion. The court admitted extensive evidence as to (1) hindrance of the expansion, and (2) the special adaptation of the land to the use to which it was being put. This ruling made admissible practically all of the evidence as to the business condition.

In *City & County of Denver v. Quick*, 108 Colo. 111, 113 P.2d 999 (1941), the Supreme Court of Colorado stated that:

Evidence of the character and amount of the business conducted upon the land may be admitted as tending to show one of the uses for which the land is available.<sup>36</sup>

#### Temporary Blockade of Street or Highway

Damages cannot be recovered for injuries to business or for temporary loss of the use of property during the construction of a public improvement, if the work is prosecuted with reasonable diligence. In *Thompson v. City of Mobile*, 240 Ala. 523, 199 So. 862 (1941), the plaintiff operated a general produce and vegetable business and as a part of his business it was necessary to have free access to the building from the street, for loading and unloading produce and vegetables. The city blockaded this street from April 1st to November 30th—eight months—to construct a sewer and to repair the street following such construction. The Alabama Supreme Court held that there was no liability in such a case, observing that a city was not liable for any consequential damages to private property resulting from the construction of duly authorized public improvements, where there has been no negligence and where there is a *temporary* inconvenience and resulting loss of trade. A different result may be reached where the injuries are of a permanent nature.<sup>37</sup>

#### Where Property Has Been Used Unlawfully

There are cases where the landowner has used his property for a number of years in violation of statute or ordinance, which has not been rigidly enforced, and where

35. *Baker v. State*, 176 Misc. 928, 29 N.Y.S.2d 623 (Ct. Cl. 1941); *Oldfield v. City of Tulsa*, 170 Okla. 329, 41 P.2d 71, 98 A.L.R. 953 (1935).

36. 108 Colo. at 115, 113 P.2d at 1001 (quoting from 2 NICHOLS, *Eminent Domain*, § 446 at p. 1173 (2d ed. 1917)).

37. See cases cited in *Thompson v. City of Mobile*, 241 Ala. at 529, 199 So. at 867.

the owner then claims damages incident to such use when the land is sought to be acquired in condemnation. Illustrative of such cases is *Hammer v. City of Dallas*, 273 S.W.2d 646 (Tex. Civ. App. 1954), where the landowner used "head-in" parking in connection with his business, in violation of a city ordinance. The court properly held that there was no allowable compensation for the loss of this parking to his business in a partial taking. These cases frequently arise where service station operators have been permitted to service customers' cars within a right-of-way area which is required when the highway is widened, or when the operator is required to cease servicing such customers' cars as a safety factor.

#### Enhancement

Frequently, construction of the proposed improvement will result in benefit to the property involved. One of the principal problems in such instances is whether the benefits flowing from construction of the project should be off set or deducted from the value of the land taken or damage to the remainder, or both. When only part of a parcel is taken in eminent domain proceedings, and the value of the remainder is enhanced, justice requires that the acquiring agency should be credited with such enhancement by having the value of the benefits deducted from the value of the land taken and damages to the remainder, or only from the latter, depending upon the constitutional provisions, statutes or decisional law of the particular jurisdiction.

To a varying extent, practically every jurisdiction in the United States permits set off of benefits. There is a great diversity of opinions among the various States as to the extent to which enhancement may be used to set off the value of the part taken and damage to the remainder.

To the extent to which constitutional provisions permit legislative discretion to act, the statutes of the various States governing eminent domain must furnish the answer to the question whether and to what extent enhancement is permitted. The Constitution of the United States contains no prohibition against allowing enhancement to be deducted in arriving at the just compensation to be paid, and in *Bauman v. Ross*, 167 U.S. 548, 17 Sup. Ct. 966, 42 L.Ed. 270 (1897), the Supreme Court held that no such prohibition could be implied. In *McCoy v. Union Elevated R.R.*, 247 U.S. 354, 38 Sup. Ct. 504, 62 L.Ed. 1156 (1918), the Supreme Court held that the Fourteenth Amendment, which prohibits the taking of private property without due process of law and, consequently, without just compensation, does not restrict the power of the States to regulate the question whether benefits should be set off against or deducted from damages or compensation in eminent domain proceedings.

The courts generally group benefits into two categories—general or special. In 3 NICHOLS, *Eminent Domain*, § 8.6203 (3d ed. 1950), the difference is summarized as follows:

General benefits are those which arise from the fulfillment of the public object which justified the taking, and special benefits are those which arise from the peculiar relation of the land in question to the public improvement.

The distinction between general and special benefits is often hazy and given more discussion than actual effect by the courts. The distinction becomes relevant, however, when courts designate the type of benefit to be set off against damages or compensation. Jurisdictions throughout the United States may be grouped into the following five categories in relation to the manner in which they handle benefits:

- (1) Benefits cannot be considered.
- (2) Special benefits may be set off against damages to the remainder, but not against the value of the part taken.
- (3) Benefits, whether general or special, may be set off against damages to the remainder, but not against the value of the part taken.
- (4) Special benefits may be set off against both damages to the remainder and the value of the part taken.
- (5) Both general and special benefits may be set off against both damages to the remainder and the value of the part taken.

A more exhaustive treatment of this subject may be found in an excellent Annotation in 145 A.L.R. 7 (1943), or in Bishop & Phelps, *Enhancement in Condemnation Cases*, 13 Ala. L. Rev. 123 (1960).

#### Limited Access Highways—Deprivation of Access

All of the appellate courts (Alabama excepted)<sup>38</sup> which have been called upon to determine the issue have held that, where the landowner had a pre-existing right of access to an existing highway, the mere fact that a limited access highway is built adjacent to his property will not create in him a right of access to the new highway which the State must then condemn.<sup>39</sup> The general rules applicable to limited access highways may be summarized as follows:

- (1) Where an expressway is constructed on a new right-of-way, the courts have uniformly held that the abutter is not entitled to compensation for a right

38. *Pike County v. Whittington*, 263 Ala. 47, 81 So. 2d 288 (1955), followed in *Blount County v. Campbell*, 268 Ala. 548, 109 So. 2d 678 (1959), *Blount County v. McPherson*, 268 Ala. 133, 105 So. 2d 117 (1958).

39. *California*—*Schnider v. State*, 38 Cal. 2d 439, 241 P.2d 1, 43 A.L.R.2d 1068 (1952); *City of Los Angeles v. Geiger*, 94 Cal. App. 2d 180, 210 P.2d 717 (1949). *Idaho*—*State v. Fonburg*, 80 Idaho 269, 328 P.2d 60 (1958). *Kentucky*—*Smick v. Commonwealth*, 268 S.W.2d 424 (1954). *Mississippi*—*Collins v. Mississippi Hwy. Comm'n*, 233 Miss. 474, 102 So. 2d 678 (1958). *Missouri*—*State v. Clevenger*, 365 Mo. 970, 291 S.W.2d 57 (1956). *New York*—*Robinson v. State*, 207 Misc. 325, 137 N.Y.S.2d 673 (Ct. Cl. 1955). *Oregon*—*State Hwy. Comm'n v. Burk*, 200 Ore. 211, 265 P.2d 783 (1954). *Washington*—*State v. Calkins*, 50 Wash. 2d 716, 314 P.2d 449 (1957). *Wisconsin*—*Carazalla v. State*, 269 Wis. 593, 71 N.W.2d 276 (1955).

## CHAPTER 6

### General and Special Benefits

CLIFTON W. ENFIELD

*Minority Counsel, Public Works Committee  
House of Representatives*

*and*

WILLIAM A. MANSFIELD

*City Attorney,  
City of Medford, Oregon*

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The editor also wishes to note that the footnote section of this chapter is quite extensive, and because of the many explanatory remarks and amplifications is worthy of careful and close attention in its own right.]

Before delving into the law of benefits in public land acquisition, examination should first be made of this thing called benefits to determine why it is important. Briefly, when a public authority takes (or damages) private property, it is required to pay compensation for that taking (or damaging), but it may, in certain instances, show that the remaining property of the owner will be specially benefited as a result of the proposed project for which the taking is necessary. To the extent of these special benefits, the public authority may set-off or mitigate the amount of payment.

An example of the application of the law of benefits is where the public takes land for highway purposes, and the project as constructed results in more desirable drainage of the owner's remaining land. Such effect upon the remaining land is considered a special benefit; and to the extent allowed by the law of the particular jurisdiction the benefit may be used to lessen the amount of compensation to be paid to the owner.<sup>1</sup>

Obviously, it is important that highway officials recognize and use the concept of benefits, for thereby much needed highways may be built with greater economy to the public. While, of course, a public officer is bound to consider the rights of the land-

## Actual Benefits

The third test, the requirement that the project for which a part of one parcel is taken must necessarily benefit the other parcel, seems obvious. Thus, even though an adjoining tract has the same title and is used together with the tract from which a part is taken, benefits may nevertheless not be deducted if the project does not in fact benefit the adjoining parcel.

### GENERAL VS. SPECIAL BENEFITS

Comment will first be made on benefits without distinguishing between the classes. In order to be deductible at all, the benefit must be something more than conjectural or speculative,<sup>20</sup> and must effect the market value of the land,<sup>21</sup> rather than the necessities of the owner.<sup>22</sup>

In addition, the benefit must be caused by, or flow from, the improvement for which the taking is made,<sup>23</sup> although when there is a general plan of improvement the benefit which flows from the entire plan may be deducted.<sup>24</sup>

The reason for distinguishing between general and special benefits is that a majority of jurisdictions preclude the setting off of general benefits,<sup>25</sup> with many cases repeating the rule.<sup>26</sup>

Although it means little to give a rule distinguishing the two, one distinction is that benefits which are "peculiar to the estate of the owner" are special, whereas benefits "which are common to [or are shared by] the public" are general.<sup>27</sup>

What are the reasons for limiting the deduction to special benefits? The reason most frequently given is based on the equality of benefits and burdens between the condemnee and his neighbors. The argument is that the neighbors of the condemnee share the general benefits which flow from the improvement, but since no part of their land is taken, they are not required to pay for those benefits (except, of course, as a taxpayer of the condemning body). Thus, it is said that it is unfair for the condemnee to bear his share when his neighbors are not so required.<sup>28</sup>

### Geographical Standard

Writers and courts have classified benefits according to the "geographical standard,"<sup>29</sup> whereby benefits are determined to be general or special depending on the size of the area which they affect. Under this classification a benefit is distinguished as: *a.* "community benefit," or one benefiting the entire community; *b.* a "neighborhood benefit," or one affecting only the immediate neighborhood; or *c.* an "individual benefit," which, of course, affects only one tract of land.<sup>30</sup>

It is quite uniformly held that community benefits are general.<sup>31</sup>

As to neighborhood benefits, there is a split of opinion,<sup>32</sup> some jurisdictions calling them special,<sup>33</sup> and others denominating them as general benefits.<sup>34</sup>

An individual benefit, or one which is peculiar to a single tract, is special and deductible.<sup>35</sup>

#### Physical Benefits

It is quite clear that where the benefit physically affects only the land of the condemnee it is a special benefit.<sup>36</sup> While the law is clear that a direct and physical benefit is special,<sup>37</sup> it is not always easy to determine whether the benefit is *direct* and *physical*.<sup>38</sup>

#### Nonphysical Benefits

Nonphysical benefits usually arise in the form of an increase in the market value of the remaining land. There is inconsistency in the several jurisdictions as to whether a nonphysical benefit is special. In some of the cases they are deductible as special benefits;<sup>39</sup> whereas, some cases announce that the benefit must be physical.<sup>40</sup>

#### Market Value

Writers sometimes refer to the market value test in determining whether a benefit is deductible.<sup>41</sup>

Most right-of-way personnel are well aware of the classic measure of damages in partial takings, *viz.*, the "before and after rule." To apply that test without qualification requires the jury to examine the market value of the property both before and after the taking, the difference being the compensation to be paid. In so far as that test is applied without qualification the result is that benefits, both general and special, are deducted,<sup>42</sup> as well as adding both legally compensable and noncompensable damages.

Some courts will require that market value be enhanced as a prerequisite to naming a benefit as special, but the fact that market value is enhanced is not conclusive—rather other tests are used.<sup>43</sup> In other jurisdictions, the market value test seems to be conclusive.<sup>44</sup>

#### The Subjective Test

It is quite disheartening to say that we have no clear cut method by which to determine whether a benefit is general or special, but it is submitted that such is the fact. It is admitted that in some cases with the aid of the market value test or the geographical classification or the physical v. nonphysical test, and armed with the pronouncements of the local court of last resort, a determination can be made that a given benefit is special or general. When, however, one is floundering in the area between the two (and it is a wide area), he does well to be able merely to present a reasonable argument in support of his contention.

One of the reasons for the difficulty in distinguishing the two is caused by the courts denominating a benefit as general after they have first determined that it does not qualify as a benefit at all.<sup>45</sup>

Secondly, there are a good many instances where the public improvement is, under the court's reiterated (but not necessarily followed) rules, both a general and a special benefit.<sup>46</sup> The court will determine whether the benefit should be deducted and then throw the spotlight where it wishes in order to support its decision.

#### SPECIAL BENEFITS SET-OFF RULES

It will be recalled that when there is a partial taking, the compensation is measured by the value of the land taken and the damages to the residue. The question is whether the deductible benefits can be set-off against both, which could conceivably result in a net compensation of zero, or whether the benefits are limited to being set-off against the damages to the residue only.<sup>47</sup> Many of the States which do not allow set-off against value of the land taken base their rule on the constitutional requirement that property should not be taken without compensation and that compensation means money—not benefits.<sup>48</sup> It is submitted that such reasoning is somewhat questionable (except, of course, where a constitutional provision specifically provides for the rule), because as a matter of "basic justice" the damages to the remainder are as necessary to compensate a landowner as the value of the part taken; and if it is bad to set-off benefits against the value of the part taken, then arguably it is equally bad to set-off benefits against the damages to the residue.

Of the jurisdictions in which the set-off rule is reasonably clear, 9 States and the Federal courts allow set-off of benefits against both the value of the land taken and the damages to the residue;<sup>49</sup> whereas, 18 States allow set-off of benefits only against the damages to the residue.<sup>50</sup> Four States apparently do not permit benefits to be set-off at all,<sup>51</sup> and in 17 States the law is not clear as to what elements of value or damages benefits may be set-off against.<sup>52</sup>

#### PERMANENCY OF BENEFITS

As can well be imagined, condemnees occasionally worry about the permanency of the benefits for which they are about to pay. Everyone realizes that public works will not last forever, and further, there is always the possibility that changes will be made to fit changing conditions.

To begin the discussion, recitation is made of the well known rule that in the absence of special damages an abutting property owner has no right to compensation for the vacation of a street or highway and that loss of business or diversion of traffic is not a compensable damage.<sup>53</sup>

There are cases, however, which indicate that deductions cannot be made for benefits unless the condemnee has a legal right to the continuance of that benefit, or conversely, the right to compensation for its loss.<sup>54</sup>

Does this mean that when deductions have been made for benefits the landowner has a vested right to the continuance of these benefits? This is an important matter to consider before embarking on a crusade for the deduction of bigger and better benefits.<sup>55</sup>

No attempt is made to cut the Gordian knot but only to suggest a rule which, if followed, will go a long way to throw light on the problem. The rule followed by many jurisdictions is that in deducting benefits, there need not be a legal right to compel the continuance of the benefit; but instead the benefit need only increase the market value of the remaining land,<sup>56</sup> with the degree of permanency of the benefit being reflected in the amount of increased market value.

The important corollary of this market value (as opposed to legal right) principle is that it precludes all possibility of the condemnee gaining a vested right by virtue only of a benefit having been "deducted." This theory has support,<sup>57</sup> and it is felt that it would be advisable to urge it in those jurisdictions which presently do not adhere to it. Not only is the rule favorable to highway departments, but it is submitted that it is sound law.<sup>58</sup>

The rule that a benefit to be deductible need not be legally enforceable to infinity has been noted with enthusiasm. Does the rule precluding the setting off of speculative benefits<sup>59</sup> conflict with the market value principle? It is thought not, although it is submitted that the difference is only one of degree. Thus, to weld the two rules together, the fact that a benefit is not legally enforceable does not prevent it from being set-off; but at some point a benefit can become so speculative as to not be deductible at all, even though it still has some effect on market value.

#### PLEADING SPECIAL BENEFITS IN CONDEMNATION

As a final topic, examination should be made of the problem of pleading special benefits in condemnation proceedings. There is a dearth of material on this subject; nevertheless, it is a necessary consideration for those who intend to pioneer in the field of special benefits, and it merits attention.

Generally, the condemnee has the burden of proving damages to the remainder of the tract,<sup>60</sup> and the condemner bears the burden of proving special benefits.<sup>61</sup> It would seem in view of the general rule that he who has the burden of proof also has the duty to plead,<sup>62</sup> that such duty is on the condemner.

There are two Oregon cases which are of some assistance. In *Schmidt v. City of Portland*, the court came close to stating that the condemner must plead special bene-

fits;<sup>63</sup> and in *Portland-Oregon City Ry. Co. v. Penney*, the court intimated that it was the duty of the condemner to plead special benefits in detail.<sup>64</sup>

Seemingly contra is *Rourke et al., v. Holmes St. Ry. Co.*,<sup>65</sup> where the court held that the defendant-condemner could introduce testimony concerning special benefits without so pleading. The court stated that benefits "were an ingredient . . . of the plaintiff's measure of damages," and therefore could be shown under the issue of compensation.<sup>66</sup>

The same reasoning prevails in *Smith v. City of Greenville*.<sup>67</sup> The court held that since the benefit rule was prescribed by law, benefits became "an ingredient in [plaintiffs'] measure of damages" and thus could be shown under the city's general denial without the necessity of special pleading.<sup>68</sup>

It would be desirable to furnish more answers and less supposition on this matter of pleading, but under the present state of the law the door can merely be opened.

#### FOOTNOTES

1. See *Washburn v. Milwaukee, etc., R. Co.*, 59 Wis. 364, 18 N.W. 328 (1884).
2. *Guyandotte Valley Ry. Co. v. Buskirk*, 57 W. Va. 417, 50 S.E. 521 (1905). See also syllabus by court in *Housing Authority v. Iron Works*, 91 Ga. App. 881, 87 S.E.2d 671 (1955).
3. 4 NICHOLS, *Eminent Domain* § 12.21 (3rd ed. 1951).
4. In discussing the three tests it is well to note that generally the same law which determines whether severance damages apply to a certain tract also determines whether benefits to that tract may be deducted. In support of this, see Note, 145 A.L.R. 117, footnote 330 (1943), and *Re Queen Anne Blvd.*, 77 Wash. 91, at 105, 137 Pac. 435, at 441 (1913), where the court said "In the text of 15 Cyc. p. 768, it is said: 'The benefit resulting to one lot or tract from an improvement cannot be set off in determining the compensation or damages due to the same owner for the taking or injuring of a separate and distinct, although contiguous, tract.' . . . It is, in principle, the same as where resulting damages are sought to a tract of land not a part of the tract from which appropriated land is taken. That is, in each case, it is only the tract of land physically invaded that is to be considered in assessing either damages or benefits." (Emphasis added.)
5. Note, 145 A.L.R. 115 (1943).
6. *McIntyre v. Board of County Commissioners*, 168 Kan. 115, 211 P.2d 59 (1949). In that case husband and wife each owned a tract, the two tracts being contiguous and farmed together as one unit. Land was taken from one of the tracts for road purposes and the court held that the other tract was not part of the residue. In *State ex rel. Wirt v. Superior Court*, 10 Wash.2d 362, 116 P.2d 752 (1941), three individuals were each separately record owners of a quarter section, all three tracts being farmed as one unit. Condemnor took a strip out of one of the tracts and the other two tract owners moved for intervention in order that they might get severance damages. The court (after disposing of the intervenors' contention that a parol document providing for equitable ownership by the three of the entire three tracts as tenants in common was effective as against the condemnor) held that severance damages are limited so as to not apply beyond property held under the same title as that taken.
7. In *Tilman v. Lewisburg, etc., R. Co.*, 133 Tenn. 554, 182 S.W. 597 (1916), the Tillmans, husband and wife, owned a large tract as tenants by the entirety; and Mrs. Tillman owned in severalty a smaller adjoining tract (actually the tracts were separated by a public road but the court specifically declined to rest the decision on that ground), the two tracts being farmed together as one unit. The railroad company condemned a strip through the larger tract and Mrs. Tillman asked for severance damages to the smaller. The court refused her request and held that in order to recover, the two tracts must be held under the same title. The court hypothesized that if it held otherwise and if a strip were taken out of a tract which was held in common by ten persons, and each of those persons owned an adjoining tract, each could recover severance damages to his adjoining tract.

This requirement of holding under identical title does not require identical derivation of title. Thus, where two tracts are held in fee by the same person but are held under different deeds from different grantors, the unity of title rule is satisfied. See *Baetjer v. United States*, 143 F.2d 391 (CCA1 1944).

Also germane are: *Potts v. R.R. Co.*, 119 Pa. 278, 13 Atl. 291 (1888); *Duggan v. State*, 214 Iowa 230, 242 N.W. 98 (1932); and *Glendenning v. Stahley*, 173 Ind. 674, 91 N.E. 234 (1910). In the latter case the court stated at page 683: "It is settled that in determining the amount of special benefits or damages sustained by any one proprietor, all land belonging to him lying in a contiguous body and used together for a common purpose will be considered as one tract of farm, without regard to governmental subdivisions. . . . This principle cannot be extended to cover lands owned by different proprietors, although contiguous and used under one management for a common purpose. One person may not recover damages sustained by another, and manifestly special damages suffered by one proprietor could not be compensated by benefits accruing to another."

8. *State Highway Commission v. Dodson*, 207 Miss. 229, 42 So.2d 179 (1949); *People v. R.R. Co.*, 32 Cal.2d 406, 196 P.2d 570 (1948); 29 C.J.S., *Eminent Domain* § 140; 18 Am. Jur., *Eminent Domain* § 270. Note that these cases involve the question of damages, but the principle is the same. See also the excellent dissent in *City of Chicago v. Equitable Life Assurance Society*, 8 Ill.2d 341, 134 N.E.2d 296 (1956).
9. 137 Cal. App. 760, 31 P.2d 467 (1934).
10. Note in the *Marengo* case that the question of what constitutes a single parcel was stated to be a question of law to be determined by the court.
11. 18 AM. JUR., *Eminent Domain* § 270.
12. Note 9, *supra*.
13. See Note, 6 A.L.R.2d 1201 (1949).
14. *Wilcox v. St. Paul, etc., R. Co.*, 35 Minn. 439, 29 N.W. 148 (1886). The thinking in the *Wilcox* case was that the division into separate lots was presumably done for a purpose and that such plat lines should not be put asunder unless evidence is brought forth to rebut. This rule was followed in *Re Queen Anne Blvd.*, 77 Wash. 91, 137 Pac. 435 (1913).
15. 67 Ore. 102, 134 Pac. 1024 (1913).
16. The matter of what evidence would be necessary to rebut the presumption of separateness is also discussed in *Re Queen Anne Blvd.*, 77 Wash. 91, 137 Pac. 435 (1913). Perhaps evidence of past unity of use could be introduced as tending to show adaptability.
17. *L. & N. R. Co., v. Chenault*, 214 Ky. 748, 284 S.W. 397 (1926). The same court three years later appears to have backed down from that position, although not admittedly. In *L. & N. R. Co., v. Hargis*, 230 Ky. 806, 20 S.W.2d 991 (1929), the court considered an entire farm as a unit for the purpose of severance damages despite the fact that part of the acreage was across a county road. See also *White v. Metropolitan, etc., R. Co.*, 154 Ill. 620, 39 N.E. 278 (1894), where the court in effect stated that physical disconnection by a public street made two tracts as separate despite unity of use.
18. 143 F.2d 391 (CCA1 1944).
19. In that case the condemnees, trustees of a sugar producer's trust, owned two tracts on the island of Vieques, which is ten miles distance from Puerto Rico. The two tracts were six miles apart and might be called the "central tract" and the "east tract." On the "central tract" were located the dock facilities which were used in transporting the products from both tracts to the island of Puerto Rico where condemnees owned more land devoted to the raising and refining of sugar. U. S. took the entire "east tract" and part of the "central tract" leaving, however, the part of the "central tract" on which was situated the dock facilities.  
Condemnee contended that the properties on both islands were devoted to an unified use and that severance damages should be allowed for diminution in value of the remaining land on Vieques and Puerto Rico.

The court held that physical separation will not in itself preclude other tracts from being considered part of the residue. The court explained that unity of use or "integrated use" is the test and that physical separation is material, but only insofar as it is probative on the principle question. Thus, a great distance between two tracts tends to show that the two tracts in fact are not used as one, but is not conclusive.

It is also interesting to note that the court did not require a present unity of use but seemed to feel that a probability of future integrated use would suffice.

See also *United States v. Powelson*, 118 F.2d 79 (CCA4 1941).

20. *Amory v. Commonwealth*, 321 Mass. 240, 72 N.E.2d 549 (1948). In *Denver v. Joint Stock Land Bank v. Board of Commissioners*, 105 Colo. 366, 98 P.2d 283 (1940), condemnor took strip for highway out of large agricultural tract. At the trial condemnor gave evidence to show that the highway would make the tract more accessible so as to enable the division of the tract into small agricultural units at a "profit." The court held the admission of such evidence error since there was no showing that there would be a demand for such subdivision within the reasonable future.
21. See *People v. McReynolds*, 31 Cal. App.2d 210, 87 P.2d 734 (1939).
22. See *Tyson Creek R. Co., v. Empire Mill Co.*, 31 Idaho 580, 174 Pac. 1004 (1918). Arguably, however, these are mere words without meaning since normally a benefit to an owner who is using the land for its highest and best use automatically results in an increase to the market value of the land. See also 3 NICHOLS, *Eminent Domain* § 8.6201 (3rd ed. 1951).
23. In *City of Atlanta v. Nelson*, 142 Ga. 324, 82 S.E. 899 (1914), the owner of property affected by a change in grade was suing to recover damages. The trial was held several years after the construction of the viaduct which changed the grade, and the court on appeal commented that it would be proper for the city to show an increase in travel past the landowner's property, but that this evidence should be limited in time so as to properly reflect increase caused by the construction. Thus, the evidence could not encompass such an extended time after the construction so as to possibly include increase in travel due to other causes. See also Note, 145 A.L.R. 110 (1943).
24. 18 AM. JUR., *Eminent Domain* § 297. It is not necessary, however, that the benefit flow solely from the improvement on the land taken. See, for example, *Louisiana Highway Commission v. Grey*, 197 La. 942, 2 So.2d 654 (1941), where State took a strip out of defendant's farm land in order to construct a new highway. The court allowed a deduction of benefits stemming from the increased market value of the remaining abutting land. In that case it can be seen that the benefit did not flow solely from the improvement on the land taken from defendant, since if it had not been for the other connecting sections of highway there would be no market value increase to defendant's remaining land.
25. 29 C.J.S., *Eminent Domain* § 183; Note 145 A.L.R. 40 (1943).
26. *Denver Joint Stock Land Bank Co., v. Board of Commissioners*, 105 Colo. 366, 98 P.2d 283 (1940); *Schwartz v. City of New London*, 20 Conn. Sup. 21, 120 A.2d 84 (1956); *City of Corsicana v. Marino*, 282 S.W.2d 720 (Tex. Civ. App. 1955). *Contra*, see *Carazalla v. State*, 269 Wis. 593, 70 N.W.2d 108, 71 N.W.2d 276 (1956) (as to highways apparently based on statute); *Gallimore v. State Highway and Public Works Commission*, 241 N.C. 350, 85 S.E.2d 392 (1956); (as to highways, apparently based on statute); *Board of Commissioners v. Gardner*, 57 N.M. 478, 260 P.2d 682 (1953). (The rule enunciated was based on construction of constitution, statute, and necessity of saving the public funds.) The above list showing the *contra* rule is not intended to be comprehensive.
27. See *Petition of Reeder*, 110 Ore. 484, 222 Pac. 724 (1924).
28. *Petition of Reeder*, *supra.*; *Prudential Insurance Co., v. Irrigation District*, 139 Neb. 114, 296 N.W. 752 (1941). This thought is rejected by the courts which allow general benefits to be set-off. Although most of the decisions which announce the rule of deduction of general, as well as special benefits involve a construction of statute or constitution, the thought is sometimes advanced that the landowner is in fact receiving the general benefits, that they are real benefits and that he cannot, therefore, be heard to complain just because some other person not a party to the proceeding is receiving a windfall. See *Young v. Harrison*, 17 Ga. 30 (1855); *McCoy v. Union Elevated R. Co.*, 247 U.S. 354, 62 L.ed. 1156, 38 S.Ct. 504 (1918).  
The theory of deducting only special benefits exhibits a desire to financially equate all landowners in a benefited area, *Jones v. City of Clarksburg*, 84 W.Va. 257, 99 S.E. 484 (1919), and because of this it is submitted that it is quite unrealistic. To be consistent, such idealism would require an adjustment between the condemnor and all noncondemnees who were specially benefited by the project. This means, then, that any landowner who is specially benefited by the project, even though he had no land taken from him, should be required to pay for the same much like the taxation of an assessment—such is not done under eminent domain. To go further in reducing this to complete consistency, all individuals who are benefited in any way should be required to pay their fellow nonbenefited taxpayers for such benefit in order to expand this "island of equity" to the full extent of the condemning unit.  
Our system of justice embodies the idea that when one unit, whether it be human, corporate or political, is in litigation with another, the tribunal can do no more than create justice between the parties to the proceeding; where the condemnee has received, he should

- pay his benefactor (in the form of a deduction) and should not be heard to complain that some third person received but was not required to pay.
29. 145 A.L.R. 49 (1943).
30. *State v. Pope*, 228 Mo. App. 888, 74 S.W.2d 265 (1934). It can be readily seen that such classification is necessarily quite arbitrary in view of the lack of precise definition between the "community" and the "neighborhood" types. Indeed, fact situations could be conceived in which the benefit could be easily fit into each of the three classifications. For example, a main highway through a small town could be reasonably argued to benefit the community, or the neighborhood or an abutting landowner.
31. 145 A.L.R. 50 (1943).  
In *Mantorville Ry. Co., v. Slingerland*, 101 Minn. 488, 112 N.W. 1033 (1907), the court denominated the benefit which a landowner would get by virtue of the railway company bringing transportation facilities to his stone quarry a community benefit, and from there, of course, reasoned that the benefit was general.  
See also, *City of Corsicana v. Marion*, 282 S.W.2d 720 (Tex. Civ. App. 1955), where the city took a strip from defendant's residence for street-widening purposes. The opinion did not state what the contended benefit to defendant's property consisted of, but it was indicated that the whole of the evidence showed that any benefit to defendant would have been shared by all in the community and thus not deductible. *Quaere*: Is it not just as possible that the benefit to defendant in this case was actually a neighborhood benefit? Did not the court first determine that it was not deductible and then summarily denominate it a community benefit?
32. Note, 31, *supra*.
33. In *Koelsch v. State Highway Commission*, 223 Ark. 529, 267 S.W.2d 4 (1954), and *Ball v. Independence County*, 214 Ark. 694, 217 S.W.2d 913 (1949), we learn that the benefit accruing to each lot or farm fronting on a highway or improvement is probably a neighborhood benefit and that a neighborhood benefit is special.  
In the *Ball* case, the condemnor took land from Ball in order to replace a gravel road with a paved highway. It is not clear, but it is presumed that the benefits which were so much in discussion were the increases in value of the premises caused by the improved highway. The court at p. 696 quoting *Herndon v. Pulaski County*, 196 Ark. 284, 117 S.W.2d 1051 (1938), stated that the fact that other owners received the same benefits does not preclude such benefits from being special.
34. In *State v. McCann*, 248 S.W.2d 17 (Mo. App. 1952), the highway department took a strip through defendant's farm. The court stated that the benefits which defendant would receive by virtue of enhanced value caused by the new highway passing through his farm would also be enjoyed by all other landowners in the neighborhood, and that such benefits are therefore general and not deductible.
35. See *State v. McCann*, 248 S.W.2d 17 (Mo. App. 1952).
36. In *Isenberg v. Gulf, etc., R. Co.*, 152 S.W. 233 (Tex. Civ. App. 1912), the railroad company took a strip through the center of plaintiff's large agricultural tract and in doing so fenced its new right of way. In that case plaintiff's land on one side of the right of way was tillable; whereas, the land on the other side was suitable for grazing purposes only, thus relieving plaintiff of the expense of such a fence. The court held the benefit to be special.  
Another example of a physical and completely peculiar benefit is found in *Jones v. City of Clarksburg*, 84 W.Va. 257, 99 S.E. 484 (1912), where the court by dictum gave the following hypothetical: A city paves and otherwise improves a street abutting on a line of lots and in so doing fills in and removes a "malodorous mudhole" immediately in front of one of the tracts. The benefit to the adjacent lots was said to be special in so far as it removed the odors which wafted to the adjacent lot (and supposedly to none others). But the court said that to the extent that the paving increased the value of the lot, this was shared with other landowners and was general.  
Another example is found in *Jones v. City of Clarksburg*, *supra*, where the city had changed the grade and paved the street in front of a line of lots. It is difficult to determine what was actually done for plaintiff in creating a physical access, but the court pointed out that where the project had physically improved plaintiff's access to the street, plaintiff would be specially benefited.  
In *People v. Thomas*, 108 Cal. App.2d 832, 239 P.2d 914 (1952), the plaintiff introduced evidence to show that a fence would be constructed and maintained along the right-of-way of the new controlled access freeway and that it would be an integral part of the high-

way. The jury under proper instructions found that the fence would specially benefit the defendant whose remaining ranch land abutted the freeway, and the court affirmed the entire judgment.

37. 3 NICHOLS, *Eminent Domain* § 8.6203 [2] (3rd ed. 1951).
38. Assume that a landowner has a small residential tract in a rural area, the tract lying very near the base of an unstable cliff. The property is not dangerous as a residence but appears dangerous to the extent that the occupants are subjected to the fear of a slide. Material does fall from the cliff but does not fall onto the property, nevertheless the value of the property is low because of the physical surroundings. Then the highway department builds a highway along the base of a cliff for which a small strip of the residential property is necessary. The construction of the highway results in the cliff being cut back to a stable angle of repose which is a benefit to the residential property. Is this a physical benefit? What about where a paved highway is constructed through an agricultural tract which was previously served only by a road which was almost inaccessible in wet weather? Does the construction of the paved highway result in a physical benefit, or is it a matter of increased value?
39. In *Louisiana Highway Commission v. Grey*, 197 La. 942, 2 So.2d 654 (1941), the defendant owned 172 acres of agricultural land just outside the Shreveport city limits. The plaintiff took a strip for a highway through the center of the tract with apparently no access restrictions to the abutting land. The court stated that the defendant would be able to sell small tracts fronting the new highway at an enhanced value and that the enhanced value "is a benefit which will not be shared by the community and is therefore a special benefit."

The court went on to say that benefits which would be shared by all property owners in the neighborhood or community would be general benefits. What the court did not discuss was the possibility that the next tract in the same "neighborhood" might share in the same type of benefit. The impression of the case is that the idea of exclusiveness of benefit is nothing more than shallow words, but rather the spotlight should point to the word "direct." The court later had much to say about the directness of benefit and how the fact that other landowners receive a similar benefit would not prevent it from being special. Admittedly the word "direct" is also a fuzzy one, but it is submitted that what the court is actually groping for is to charge landowners with actual real benefits, which is in effect a refutation of the "island of equity" principle and a refutation of the distinction between general and special benefits.

*Cf. State v. McCann*, 248 S.W.2d 17 (Mo. App. 1952) where court held that benefit caused by defendant being able to sell off lots along new highway was not deductible because too speculative.

40. See *Gallatin Valley Electric R. Co., v. Neible*, 57 Mont. 27, 186 Pac. 689 (1919) where the court by citation of a text indicated that the benefit must be physical.

In *People v. Loop*, 127 Cal. App.2d 786, 274 P.2d 885 (1954), the court did not hold that nonphysical benefits could not be deducted but in that case refused to allow the benefit to be deducted. The State condemned a triangular piece, and at the trial defendants showed that the highest and best use was for a parking garage. One of the State's value witnesses testified that the taking would result in the occupants of a large hotel and office building a few blocks away being able to see the property and any parking garage constructed thereon, and included this fact in his determination of special benefits. It is not clear how the taking would cause observability from the hotel, but the court held that this was not a special benefit. The court approved a requested instruction to the effect that benefits resulting from other sources, such as the construction or operation of the hotel or the growth of population are not special. Is it possible that here the benefit was not allowed because it was not "direct," or too speculative?

41. Note, 145 A.L.R. 49 (1943).
42. *Townsend v. State*, 257 Wis. 329, 43 N.W.2d 458 (1951); 3 NICHOLS, *Eminent Domain* § 8.6204 (3rd ed. 1951). An interesting statement as to measure of damages is found in *Lanier v. Town of Greenville*, 174 N.C. 311, 93 S.E. 850 (1917), where it was said that the measure of damages is "the difference in value before and after the taking, less the special benefits. . . ." Does this mean that the jury is to, in effect, deduct the special and general benefits in their determination of before and after values and then deduct special benefits again? The only other explanation is, of course, that the court did not realize that the before and after test automatically deducts special benefits. See also, *City of Corsicana v. Marino*, 282 S.W.2d 720 (Tex. Civ. App. 1955), where the court first stated the unqualified before and after rule, then proceeded to indicate that general benefits are not deductible. More accurate is the

- rule found in *Gregory v. Kirkman*, 193 Iowa 579, 187 N.W. 553 (1922), where the test was said to be difference in value before and after the taking, "not taking into consideration any [general] benefits that have resulted or may result. . . ." See also *Peddichord v. County Court*, 121 W.Va. 270, 3 S.E.2d 222 (1939), where the test was said to be difference between "before and after value" but that general benefits could not be considered in determining the "after value," since general benefits may well affect the "after" value as well as special benefits.
43. See, for example, *State v. McCann*, 248 S.W.2d 17 (Mo. App. 1952) where the court used the geographical standard, but stated that in order to be a special benefit it must increase the market value of the land. See also *Tyson Creek R. Co., v. Empire Mill Co.*, 31 Idaho 580, 174 Pac. 1004 (1918).
44. *Cate v. Crawford County*, 176 Ark. 873, 4 S.W.2d 516 (1928).
45. See, for example, *Denver Joint Stock Land Bank Co., v. Board of Commissioners*, 105 Colo. 366, 98 P.2d 283 (1940) where the real reason for denial of deduction was that it was too speculative.
46. Take an ideal example where a large area, perhaps county-wide, has very little population but a great resource, for instance a tourist attraction. The county has no tourist business, however, because it would not pay to develop it commercially, the reason being that the only road near the tourist area is highly inadequate and off the path of the main tourist lanes. Now the highway department decides to route one of its main through highways through the county in such a manner that the county will "boom." Smith, the landowner, owns 40 acres on the edge of the principal town, and the highway is going to split it, leaving a row of potential frontage lots on both sides of the highway. When one looks at the benefit which the highway gives Smith by going through his, and not some other forty, under the rules of a good many jurisdictions it is a direct and special benefit. *Ball v. Independence County*, 214 Ark. 694, 217 S.W.2d 913 (1949). When, however, one looks at the benefit which the highway gives Smith by going through the county, it can be seen that the benefit is clearly not peculiar—it has raised land values over the entire community—that kind of benefit inures to the whole community and is general. *Mantorville Ry. Co., v. Slingerland*, 101 Minn. 488, 112 N.W. 1033 (1907).
47. In *Board of Commissioners v. Gardner*, 57 N.M. 478, 260 P.2d 682 (1954), the various set-off rules are described as: (1) Benefits cannot be considered at all; (2) special benefits may be set-off against damages to the remainder only; (3) special and general benefits both may be set-off against damages to the remainder; (4) special benefits may be set-off against the value of the part taken and the damages to the remainder; (5) special and general benefits may be set-off against the value of the part taken and the damages to the remainder.
48. Note, 145 A.L.R. 24 (1943).
49. UNITED STATES. Special benefits may be set-off against both the value of the land taken and the damages to the remainder. *Aaronson v. United States*, 79 F.2d 139 (CCA D.C. 1935); *United States v. Miller*, 317 United States 369, 82 L.ed 336, 63 S.Ct. 276 (1943).
- ALABAMA. *Morgan County v. Hill*, 257 Ala. 658, 60 So.2d 838 (1952), indicates that at least for highways the rule is that benefits may be set-off against both the value of the land taken and the damages to the residue. It almost appears as if general benefits as well as special benefits may be deducted since the court discusses the market value rule.
- ARKANSAS. Special benefits may be set-off against both the value of the land taken and damages to the residue. *Cullum v. Van Buren Co.*, 223 Ark. 525, 267 S.W.2d 14 (1954); *Koelsch v. State Highway Commission*, 223 Ark. 529, 267 S.W.2d 4 (1954).
- KANSAS. In public road cases, special benefits may be set-off against both the value of the land taken and the damages to the residue. See *Collins v. State Highway Commission*, 145 Kan. 598, 66 P.2d 409 (1937). See also *Zook v. State Highway Commission*, 156 Kan. 79, 131 P.2d 652 (1942), which implies that the rule is still in effect.
- MISSOURI. Special benefits may be set-off against both the value of the land taken and the damages to the remainder. *State v. Powell*, 226 S.W.2d 106 (Mo. App. 1950).
- NEW MEXICO. Special and general benefits may be set-off against both the value of the land taken and damages to the remainder. *Board of Commissioners v. Gardner*, 57 N.M. 478, 260 P.2d 682 (1953).
- NORTH CAROLINA. G.S., § 136-19 (1952), as amended, dealing with the acquisition of land for highway purposes provides that "general and special benefits shall be assessed as offsets against damages." In *Gallimore v. State Highway and Public Works Commission*, 241 N.C. 350, 85 S.E.2d 392 (1955), the unmodified before and after rule was given indicating

set-off against everything. In *Yancey v. State Highway and Public Works Commission*, 221 N.C. 185, 19 S.E.2d 489 (1942), it is stated that special and general benefits may be set-off against value of the land taken. See also *Proctor v. State Highway and Public Works Commission*, 230 N.C. 687, 55 S.E.2d 479 (1949), and *State Highway and Public Works Commission v. Hartley*, 218 N.C. 438, 11 S.E.2d 314 (1940).

OREGON. Special benefits can be set-off against both the value of the land taken and incidental injuries. See *Petition of Reeder*, 110 Ore. 484, 222 Pac. 724, (1924).

SOUTH CAROLINA. South Carolina Code of Laws, 1952, § 33-136, relating to benefits in any condemnation proceeding instituted by the State Highway Department provides that "benefits to be derived by reason of the proposed road construction . . . shall be taken into consideration in determining the amount of compensation. . . ." This statute was enacted in 1951 and there appear to be no cases directly construing the provision. However, *Smith v. City of Greenville*, 93 S.E.2d 639 (1956), contains material with which it could be argued that in State highway cases benefits are to be set-off against both the value of the land taken and the damages to the remainder.

In South Carolina the constitutional provision relating to eminent domain for private corporations prohibits the consideration of benefits; whereas, the provision which applies to governmental agencies says nothing of benefits. In the *Smith* case, *supra*, the statutes relating to condemnation by municipalities provided that benefits should be considered. The court held that such statutory requirement was valid since the two constitutional provisions, when read together, imply that benefits are to be considered in cases where the condemner is not a private corporation. Consequently, when we turn to the highway statute (S.C.C.L., 1952 § 33-136) we can be reasonably certain that it will be upheld.

Now it becomes necessary to construe the highway statute in order to determine the set-off rule. In the *Smith* case, *supra*, the statute relating to condemnation by municipalities was construed to mean that benefits could be set-off against both the value of the land taken and the damages to the residue. That statute does not appear to be any stronger in the direction of a liberal set-off rule than the State highway statute. (Arguably it is weaker since it divides compensation into value of land and "damages" and allows the consideration of benefits in considering the "damages.") From that, it could be argued that *a fortiori* the highway statute would be construed to allow the liberal set-off rule, which is a setting off of benefits against both the value of the land taken and the damages to the residue. Furthermore, the court refers to the highway statutes and very strongly implies that the highway statutes provide for the liberal set-off rule. The court pointed out that except for corporations, all the benefit statutes spring from the same constitutional provisions and presumably all mean the same. It is to be noted, however, that the court did not appear to consider the question of construction of the highway statute, but rather seemed to assume that it provided for the liberal set-off rule.

One additional reason for believing that the court would construe the highway statutes liberally as regards set-off rule is the court's apparent strong belief in the soundness of a liberal set-off rule.

WASHINGTON. By statute offset is allowed of special benefits against both compensation for the land taken and injury to the remainder. See *State v. Ward*, 41 Wash.2d 794, 252 P.2d 279 (1953).

50. CALIFORNIA. Special benefits may be set-off against damages to the residue. By statute the jury assesses damages and special benefits separately and the offsetting is done by the court. *People v. Schultz Co.*, 123 Cal. App.2d 925, 268 P.2d 117 (1954).

COLORADO. By statute benefits to the residue shall not be set-off against value of the land taken. *Boxberger v. State Highway Commission*, 126 Colo. 526, 251 P.2d 920 (1952).

GEORGIA. At least as to highways, benefits may be set-off only against consequential damages. *State Highway Board v. Bridges*, 60 Ga. App. 240, 3 S.E.2d 907 (1939). This rule was implied in *Andrus v. State Highway Department*, 93 S.E.2d 174 (Ga. App. 1956).

IDAHO. Special benefits may be set-off only against the damages to the residue. See *State v. Duncklick, Inc.*, 286 P.2d 1112 (Idaho 1955). Idaho Code, 1947, § 7-711.

ILLINOIS. Where property is taken, benefits cannot be set-off against the value of the property taken as per constitutional interpretation. *Kane v. City of Chicago*, 392 Ill. 172, 64 N.E.2d 506 (1946).

INDIANA. Previously under section 6 of the Eminent Domain Statute (Acts 1905, c. 48, p. 59, § 7685, Burns Ann. Ind. St. 1926, Burns Ind. Stat. Ann., 1933, § 3-1706) the State was precluded from deduction of any benefits in determining the compensation to be

paid for a taking for State highway purposes. *State v. Reid*, 204 Ind. 631, 185 N.E. 449 (1933). This was amended by Acts 1935, c. 76, § 3, p. 228, to allow the State, where taking land for a public highway, to deduct benefits and to set them off against damages to the residue. Instruction that special benefits can be set-off against the residue was affirmed in *State v. Ahaus*, 223 Ind. 629, 63 N.E.2d 199 (1945).

LOUISIANA. In *Louisiana Highway Commission v. Grey*, 197 La. 942, 2 So.2d 654 (1941), the rule was announced that special benefits may be used to set-off against the damages to the remaining land. This applies at least to a taking for highway purposes.

MONTANA. Revised Code Montana, 1947, § 32-1615 provides that condemnation for highways is to be instituted under R.C.M. § 93-9901 to 93-9926. R.C.M. § 93-9912 in effect provides that benefits shall be set-off only against damages to the remainder.

NEBRASKA. *Crawford v. Public Power and Irrigation District*, 154 Neb. 832, 49 N.W.2d 682 (1951) appears to cover all condemnation. In that case the rule is announced that special benefits may reduce damages to remaining land but cannot be set-off against value of the land condemned. Although the Nebraska Highway Code was repealed and replaced 1955 (L. 1955, c. 148), there has been no apparent change in the benefit rule.

NEVADA. Under Nev. C.L., 1929, § 9163, benefits are to be set-off only against damages to remainder.

NEW YORK. Condemnation Law, section 3 (1950), indicates that the Condemnation Law is to apply to all condemnation proceedings. New York Condemnation Law, section 14 (1950), as amended, indicates that in fixing the amount of compensation there shall be no deduction of benefits. This, however, is construed to mean that benefits are to be set-off against residual damages but shall not be set-off against "value of property taken." *Gilmore v. State*, 208 Misc. 427, 143 N. Y. S.2d 873 (Ct. Cl. 1955). Rule given in State highway cases. *Reese v. State*, 190 Misc. 316, 72 N. Y. S.2d 209 (1947). See *Re East 5th Street*, 146 N. Y. S.2d (S.Ct. 1955).

NORTH DAKOTA. North Dakota Revised Code, 1943, § 32-1501, provides generally for the set-off of benefits against the damages to the remainder only. General benefits may not be set-off. *Lineburg v. Sandven*, 74 N. D. 364, 21 N.W.2d 808 (1946).

OHIO. In *Re Adjudication of Claims*, 121 N.E.2d 695 (Ohio C. Pl. 1953), a case involving the condemnation of lands for the State, the court held that it was proper for the jury to consider special benefits and to set them off against the damages to the residue. In *Re Appropriation of Easement for Highway Purposes*, 93 Ohio App. 179, 112 N.E.2d 411 (1952), involving condemnation for State highway purposes, the court indicated that special benefits are to be set-off against the value to the residue.

TEXAS. Benefits must be special in order to be set-off. See *City of Corsicana v. Marino*, 282 S.W.2d 720 (Tex. Civ. App. 1955). Benefits may be set-off only against damages to the remaining land. See *Steele v. City of Anson*, 229 S.W.2d 948 (Tex. Civ. App. 1950); *State v. Carpenter*, 126 Tex. 604, 89 S.W.2d 194 (1936).

UTAH. Utah Code, 1953, § 88-34-10, provides in effect that benefits are set-off against residual damages only.

VIRGINIA. Virginia Code, 1950, § 33-73, relating to eminent domain for highways, bridges and ferries, provides that the enhancement in value of the remaining property caused by the highway improvement shall be offset against the damage to the remaining property but shall not be set-off against the value of the property taken. This was deemed constitutional in *Long v. Shirley*, 117 Va. 401, 14 S.E.2d 375 (1941), and the effect seems to be that special, and general benefits (anything that enhances market value) can be set-off against damages to the residue.

WEST VIRGINIA. Under West Virginia Code, 1955, § 5380, dealing with eminent domain generally, special and general benefits may be set-off against the damage to the remainder.

WISCONSIN. Wisconsin Statutes, 1953, § 32.10, as amended by Wis. L. 1955, c. 417 provides: "Where part of a parcel of land is condemned severance damages shall be allowed if shown to exist. Special benefits accruing to the property and affecting its market value because of the planned public improvement shall be considered and used as an offset to damages, but in no event shall benefits be allowed in excess of damages." That statute before amendment was construed to allow special and general benefits to be set-off against "damages" recoverable by the landowner. The statute is cited in [1956] Wis. L. Rev. 345.

51. IOWA. The Iowa Constitution, Art I, § 18, as amended, prohibits the deduction of benefits in a taking case. In *Stoner v. Iowa State Highway Commission*, 227 Iowa 115, 287 N.W.

269 (1939), the court said at p. 274: "Of course, it would have been improper for the jury to consider any advantage to the property in determining the amount of plaintiff's damages and the court properly so instructed the jury." See also *Schoonover v. Fleming*, 239 Iowa 539, 32 N.W.2d 99 (1948) where it is intimated that such is still the rule.

KENTUCKY. In *Electric Cooperative Corp., v. Thurman*, 275 S.W.2d 780 (Ky. App. 1955), a condemnation by an electric cooperative, it was said that the defendant was entitled to compensation in money, and not by resulting benefits. In *Commonwealth v. Combs*, 244 Ky. 204, 50 S.W.2d 497 (1932), a suggested instruction by the court indicated that enhancements in value of the remainder by reason of the construction and use of highway was not to be considered. In *Commonwealth v. Powell*, 258 Ky. 131, 79 S.W.2d 411 (1935), a highway condemnation case, an instruction to consider benefits was held in error.

MICHIGAN. The latest case found is *In Re Bagley Avenue*, 248 Mich. 1, 226 N.W. 688 (1929), where it is said that damages are to be awarded without consideration of the question of benefits. This appears to cover all eminent domain.

OKLAHOMA. The Oklahoma constitution is construed to forbid the offsetting of any benefits. *Finley v. Board of Commissioners*, 291 P.2d 333 (Okla. 1955).

52. ARIZONA. Const., Art II, § 17 precludes the use of benefits by condemnor corporations. See, however, *Water Conservation District v. Warford*, 69 Ariz. 1206, P.2d 1168 (1949), where the measure of damages was said to be the "depreciation in market value of the whole tract."

CONNECTICUT. Dictum in *Hoyt v. City of Stamford*, 116 Conn. 402, 165 Atl. 357 (1933), implies that set-off can be made against both value of the land taken and damages to the residue. This was a street-widening case but does not appear to be based on special statute.

DELAWARE. The rule is not at all clear, but in *State v. Morris*, 93 A.2d 523 (Del. Super. 1952), a highway case, the court instructed the fact finders to set-off benefits "against whatever loss, detriment or disadvantage" the owners may have sustained by reason of the taking. This indicates that benefits may be set-off against both the value of the land taken and the damages to the residue.

FLORIDA. Art. XVI, § 29 of the Florida Constitution prohibits the use of benefits by any "corporation or individual." There is apparently no material dealing with set-off rules as concerns State highways.

MAINE. The latest authority found is *Boober v. Towne*, 127 Me. 332, 143 Atl. 176 (1928), where a dictum states that in an eminent domain case special benefits are to be considered in determining compensation. That case cites *In Re Penley*, 89 Me. 315, 36 Atl. 397 (1896) where a statement is made, the effect of which is that benefits may be set-off against both the value of the land taken and damages to the residue.

MARYLAND. Ann. Code Md., Art. XXXIII A, § 17 (1951) pertaining to eminent domain in general, states that this article may be used by the State Roads Commission at its discretion, but that the article shall not apply to change existing law and procedure for condemnation for road purposes. Section 24 of the same article states: "The jury shall be at liberty to consider and assess any special benefits against the defendant . . . whose property is sought to be acquired; provided, said benefits shall not exceed the damages to which the jury might consider said defendant . . . to be entitled by reason of the taking." The word "damages" could be construed to mean either damages to the residue alone, or both value of the land taken and damages to the residue. The latest highway case found indicates that benefits are not to be set-off against the value of the land taken. See *Pumphry v. State Roads Commission*, 175 Md. 498, 2 Atl.2d 668 (1938).

MASSACHUSETTS. Under the Highway Act (Ann. Laws Mass., c. 81 § 7 (1952)) the Department of Public Works is to pursue condemnation under the Eminent Domain Act (Ann. Laws Mass. c. 79). Section 12 of that act states that where there is a partial taking, "there shall be deducted the benefits accruing to the part not taken [unless there is a better assessment]." The statute does not make clear the set-off rule and no cases have been found clarifying the matter. In 3 NICHOLS, *Eminent Domain*, § 8.6211 [22] (3rd ed. 1951), it is stated that the rule is based on the particular statute; in highway cases set-off is allowed against the value of the land taken as well as damages to the remainder, and a general tendency toward the liberal set-off rule is indicated.

MINNESOTA. In *McKeen v. City of Minneapolis*, 170 Minn. 124, 212 N.W. 202 (1927), an award of zero dollars was allowed to stand, where the city had taken land for street widening, despite the fact that "damages" and benefits were (erroneously) not separately

stated. The case implied that benefits may be set-off against both the value of the land taken and the damages to the residue.

MISSISSIPPI. In 3 NICHOLS, *Eminent Domain*, § 8.6211 [25] (3rd ed. 1950), it is said that no benefits of any kind can be set-off against anything. This, however, is not at all clear. In *State Highway Commission v. Buchanan*, 175 Miss. 157, 166 So. 537 (1936), it is held that "shared" benefits are not to be set-off, implying perhaps that special benefits are to be so set-off. See also *State Highway Commission v. Hillman*, 189 Miss. 850, 198 So. 565 (1940). Cf. *State Highway Commission v. Chatham*, 173 Miss. 427, 161 So. 674 (1935).

NEW HAMPSHIRE. There are apparently no modern cases dealing with the set-off rule in New Hampshire.

NEW JERSEY. There are apparently no modern cases dealing with the set-off rule in New Jersey.

PENNSYLVANIA. In highway cases the statutes are construed to mean that only special benefits can be deducted. *Servedia v. Lawrence Co.*, 48 D. & C. 675 (Pa. Com. Pl. 1943); see *Petition of Johnson*, 344 Pa. 5, 23 A.2d 880 (1942). As to set-off rule, the court's instruction in the *Servedia* case, *supra*, implies that set-off is to be made against both value of the land taken and damages to the remainder. Cf. *Henry v. Somerset County*, 105 Pac. Super 441, 161 Atl. 881 (1932), which deals with the matter but is not at all conclusive. Generally, Pennsylvania tends to favor a setting off against both the damages to the remainder and the value of the land taken. 3 NICHOLS, *Eminent Domain*, § 8.6211 [39] (3rd ed. 1950). *Andrews Land Co., v. City of Erie*, 21 Erie 149 (Pa. Com. Pl. 1935), although a condemnation by a city, purports to state the law generally to allow offset against both the value of the land taken and the damages to the remainder. In Note, 145 A.L.R. 263 (1943), it is said that absent a statutory prohibition of benefits, special benefits are set-off against both the value of the land taken and the damages to the remainder.

RHODE ISLAND. There are apparently no modern cases relating to the setting off of benefits.

SOUTH DAKOTA. South Dakota Code, 1939 § 28.13A09, relating to acquisition of land for highways provides that "In all cases of taking or damaging property, the jury shall take into consideration the benefits which may accrue to the owner thereof as a result of the proposed improvement."

TENNESSEE. *Department of Highways and Public Works v. Templeton*, 5 Tenn. App. 485 (1927) states that special benefits may be set-off against "incidental damages." This appears to be the latest material on the subject.

VERMONT. Vermont Statutes, § 5137, (1947), relating to compensation for the construction of highways, provides: "In estimating the damages sustained by a person owning or interested in lands, by reason of laying out or altering a highway, the benefits which such person may receive thereby shall be taken into consideration."

WYOMING. C.S., 1945, § 48-312, relating to the viewer's report of damages, provides that the viewer shall include the benefits to the property owners along the line of the highway.

53. 18 AM. JUR., *Eminent Domain* § 223. *Holloway v. Purcell*, 35 Cal.2d 220, 217 P.2d 665 (1950), is an excellent illustration of this rule. There condemnees brought a bill to enjoin the relocation of a section of State highway which abutted on their premises. This relocation did not cause the landowners to be landlocked to be placed in a *cul de sac*, but instead the principal damage was loss of business. The court held that the landowners had no vested interest in the continuation of a highway in a specific location, indicating in beautiful prose that an individual cannot enforce a "changeless road in a changing world."
54. See *In Re Water Front*, 190 N. Y. 350, at 358, 83 N.E. 299, at 302 (1907) where the court asked: "If, then, under the settled law of this State land acquired in fee for a public use can be forever diverted from the owner, and there is no obligation to continue the public use for which it was appropriated and no cause of action arises in favor of the landowner for the abandonment of the improvements, how is it possible to assert that the benefits that result from such an improvement can be considered as compensation for deprivation of the land?" In *Moran v. State Highway Commission*, 223 Iowa 936, 274 N.W. 59 (1937), the court refused a deduction where the condemnor offered to provide a water system for defendant's farm, the reason being that defendant had no legal right to enforce the offer. In *Zook v. State Highway Commission*, 156 Kan. 79, 131 P.2d 652 (1942), the State testified that a stock pass would be installed for defendant's benefit in operating his farm, but the court held that such was not a deductible benefit and assigned as one of the reasons the fact that there was nothing to show that the State was bound to make such an improve-

- ment. See also, *Lewis v. Seattle*, 5 Wash. 741, 32 Pac. 794 (1893) and *Re Exterior Street*, 285 N. Y. 455, 35 N.E.2d 39 (1941).
55. Consider this hypothetical: We are in a State which allows deduction for the increase in market value resulting from a higher and better use of the condemnee's remaining land caused by bringing the highway through his land. The highway department puts an arterial highway through Mr. Farmer's property which happens to be on the edge of the city, and Mr. Farmer immediately leases segments of his property for service stations and other assorted commercial ventures. The highway has limited access, but the department builds frontage roads, and in the ensuing trial extensive benefit deductions are made from the compensation to be paid Farmer. Ten years later, for good reason, the highway department decides to abandon this section of highway to the county and to put the arterial highway on a different location. The question, of course, is whether Farmer may recover damages for the loss in value to his commercial properties resulting from the diversion of traffic, for which benefits he has paid.
  56. *People v. Thomas*, 108 Cal. App.2d 832, 239 P.2d 914 (1952), is directly in point. In that case the condemnees complained that special benefits should not be levied against them where the State produced evidence showing that certain fences would be built and maintained, since the fences were not mentioned in the condemnation resolution or the complaint, and that, therefore, there was no legal duty attached. The court disposed of the contention by admitting that there did not appear to be a legal duty but that it was not required. Instead of a legal duty, the court implied that it was necessary that the benefit affect the market value, and that the possibility of a change in the benefit properly entered into the matter, but only insofar as it affected market value.
  57. 3 NICHOLS, *Eminent Domain* § 8.62 [1] (3rd ed. 1951).
  58. Also of value is *Reichelderfer v. Quinn*, 287 U. S. 315, 77 L.ed 331, 53 S.Ct. 177 (1932).
  59. *Denver Joint Stock Land Bank Co., v. Board of Commissioners* 105 Colo. 266, 98 P.2d 283 (1940).
  60. *United States v. Crary*, 2 F.Supp. 870 (W.D. Va. 1932). Apparently *contra*, *State Highway Commission v. Treas*, 197 Miss. 670, 20 So.2d 475 (1945).
  61. *United States v. Crary*, 2 F. Supp. 870 (W.D. Va., 1932); *State v. Baumhoff*, 230 Mo. App. 1030, 93 S.W.2d 104 (1936); 18 Am. Jur., *Eminent Domain* § 342.
  62. Clark, *CODE PLEADING* (Hornbook Series, 2d ed.) § 96 (1947).
  63. 83 Ore. 583, 163 Pac. 1159 (1917). The benefits involved were assessments levied under the taxing power, and furthermore the question of pleading does not appear to have been in issue. The court, however, stated at p. 591: "When the general statutes are resorted to for the condemnation of land for a public use, the owner is entitled to *allege and prove* not only the value of the realty taken but also the damage to the remainder of the tract; and, ordinarily the appropriator may in turn offset the damages by *showing* that the remaining land is specially benefited, but the burden of *showing* special benefits is on the party seeking to condemn." (Emphasis supplied.)
  64. 81 Ore. 81, 158 Pac. 404 (1916). Plaintiff was condemning a strip through defendant's premises for railroad right-of-way. Defendant alleged total damages, and plaintiff by reply set up special benefits by an extensive series of allegations. In each separate "count" in the reply, plaintiff alleged in detail the "facts" which tended to show what each benefit would be and why such benefit would specially apply to the land of defendant. In all the counts except the fourth, plaintiff alleged the amount of benefit, in dollars, which would inure to the land of defendants by reason of the proposed project.

The court held that under the applicable statute benefits were not deductible, and also intimated that they were general benefits so not deductible on that ground. The court also stated, however, that the fourth "count" was not fully pleaded in that it did not allege the sum in which defendant would be benefited.

Of course, by the time the court got to the matter of requiring the "full pleading" of special benefits any statement requiring such pleading was thoroughly diluted.
  65. 177 S.W. 1102 (M. App. 1915). In that case a landowner whose property abutted a street on which defendant had built an elevated railway brought an action in the nature of inverse condemnation to recover damages for the interference of air, light, and access. The opinion does not quite make it clear whether there was a taking or only a damaging. The court did hold, however, that plaintiff had a clear legal right to compensation for damages. The defendant did not plead special benefits but used that defense at the trial.
  66. Presumably plaintiffs alleged damages in the complaint; therefore defendant's general denial put the question of compensation in issue. Where, however, condemnor brings the proceeding and

does not allege value (as is allowed in at least some jurisdictions, 18 AM. JUR., *Eminent Domain* § 324) and condemnee fails to allege value (as is allowed in some jurisdictions, 18 Am. Jur., *Eminent Domain* § 326), it could be at least argued that evidence of special benefits may not be introduced. The better reasoning, however, where a court does not allow benefits under the issue of damages, would be that benefits may be urged even though compensation is not a pleaded issue, the basis being that even where not pleaded, the question of compensation is in issue, much in the nature of an *ex parte* matter. See 18 Am. Jur., *Eminent Domain* § 326.

67. 92 S.E.2d 639 (1956) where the court construed the statutes and constitution to require a set-off of benefits against both the value of the land and the damages to the residue.
68. Cf. Cal. Code Civ. Proc. § 1248, which explicitly sets out benefit rule and in addition requires the finder of fact to make separate findings of value of part taken, damages to remainder and benefits to remainder. It is submitted that such a statute as the California statute would present even a stronger case for the rule announced in the *Smith* case.

## Condemnation Proceedings

ROBERT E. REED

*Chief, Division of Contracts and Rights of Way  
California Division of Highways*

*and*

MARC SANDSTROM

*Attorney, State Department of Public Works  
State of California*

"Condemnation Proceedings" is an imposing, almost ominous term. As enunciated by a property owner or his attorney (particularly in court) it may sound more like "bureaucratic despotism." For the right-of-way agent it is often synonymous with delay and seemingly needless extra work.

Actually, a condemnation proceeding is the necessary, although sometimes cumbersome, solution to a practical problem faced by every condemning agency. The problem simply stated is that all acquisitions cannot be concluded with amicable settlements. If public works are ever to be completed, at some point during negotiations both the condemner and condemnee must be able to refer their dispute to an assumedly disinterested and objective tribunal, commission, or jury.

Although the problem of stalemated negotiations is common to all jurisdictions, the Federal Government and the 50 States have adopted a wide variety of procedural solutions. This discussion is intended to briefly outline the main features of a condemnation proceeding and point up some of these variations as related to highway right-of-way acquisitions. However, for detailed information it will be necessary to refer to the current constitutional and statutory provisions in each jurisdiction, taking into account the judicial interpretation of these various provisions.

### Constitutional Provisions

As explained previously, the power of eminent domain or condemnation is an inherent attribute of the Federal Government and the sovereign States.

*Federal Constitutional Provisions* — Procedurally this sovereign power of the various States is limited primarily by the equal protection and due process clauses of

the 14th Amendment of the Federal Constitution. The due process clause has been interpreted by the courts to require the payment of just compensation (substantive due process) and the establishment of a procedure for determining the amount of just compensation in a particular case. "Due process" does not require a jury trial or a right of appeal or any particular form or method of procedure. The requirement is satisfied if a person is given reasonable notice and a reasonable opportunity to present his claim or defense. The 5th Amendment of the Federal Constitution applies these same requirements to the Federal Government.

The equal protection clause requires only that similar procedures be utilized by and applied to all persons. However, under this clause procedures can differ if there is a reasonable basis for the distinction or classification. For example, the procedure adopted and applied to State highway acquisitions need not be similar to the procedures followed in railroad or utility right-of-way acquisitions. In a similar manner, an action brought by or against a sovereign State can be governed by different rules than those applied to litigation between private individuals so long as the differences are reasonable. Within this broad framework the legislatures of the several States have complete authority to enact a condemnation procedure subject only to those additional restrictions or requirements set out in the individual State constitutions, which provisions are widely varied in content.

*State Constitutional Provisions* — A great many State constitutions contain language similar to that appearing in the 5th Amendment of the Federal Constitution, providing that private property shall not be taken for public use without just compensation. However, a number of States have engrafted onto this basic concept a variety of additional restrictions and limitations. Among the most common variations are the following:

a. While the Federal Constitution requires payment for property "taken," over one-half of the States have added a provision requiring that compensation be paid for property "damaged for public use" as well. This slight change in wording has resulted in numerous court decisions which construe the effect of the added words, "or damaged."

b. A majority of State constitutions require that compensation be "first" paid before property can be taken or damaged for public use. Generally the courts have held that this type of provision standing alone would prohibit legislation authorizing the taking of possession prior to payment of just compensation. Therefore, several States having such a payment first clause have adopted further constitutional provisions permitting immediate possession to be taken by certain classes of condemners, or for certain purposes, or after following a designated procedure.

c. Also, as of 1959, 22 States had constitutional provisions which guaranteed the right of a jury trial in eminent domain actions.

While there are countless other special provisions they are not deemed common enough to list herein.

### Methods of Condemnation

Within the framework of the constitutional provisions noted above, condemnation procedures have developed which can be typed into two general categories—the administrative approach and the judicial method of condemnation. This dual classification is an over-simplification, since any individual jurisdiction may utilize somewhat of a hybrid procedure, or they may further complicate either one of the general procedures mentioned. Brief explanations of the general differences between these two methods follow:

*Administrative Method of Condemnation* — The administrative method of condemnation is employed by eight States, all of which trace a similar pattern except for technical variances. When a right-of-way is necessary, the State agency or municipal corporation having the requisite authority from the legislature, meets and passes a resolution or adopts an ordinance designating specific property and stating the necessity for its acquisition. This is an *ex parte* proceeding and notice need not be given to the affected property owners, although it is not unusual that hearings have been held previously concerning route selection or location.

The duly adopted resolution or ordinance is in most cases then filed with the registry of deeds or similar office in the county or township where the land is located. In some jurisdictions both title and the right to possession automatically pass to the condemner after this filing (Maine, Massachusetts, Pennsylvania, Wisconsin). In the other jurisdictions only right to possession passes at this time (Connecticut, New York, Ohio, Rhode Island). Additionally, one-half of the jurisdictions (Connecticut, Maine, Ohio, Wisconsin) require that the condemner's estimate of the award or value of the land be deposited at the same time, subject to withdrawal by the landowners.

Notice of these filings is then given to the landowner and he is allowed a certain period to institute further proceedings seeking a higher award from a jury or other impartial tribunal if dissatisfied with the deposit or offer. The landowner initiates these legal proceedings by filing a complaint or petition naming the condemner as defendant. Thereafter, the action is tried in a manner similar to that utilized in condemnation actions by judicial system jurisdictions. The main difference is that of labels, since the property owner is designated plaintiff rather than defendant.

As can be seen, the main features of the administrative method are that:

- a. Possession can be obtained at the outset by the filing of an intent to take, and in some cases a monetary deposit, and
- b. The burden is placed on the property owner to institute a further proceedings if he is dissatisfied with the amount deposited or offered.

*Judicial Method of Condemnation* — The judicial method is the more common way of condemning land. Under the judicial system, a State agency or municipal corporation having the legislatively granted power of eminent domain initiates a proceeding or suit against those persons whose land must be acquired. The affected landowners are given notice of this proceeding and allowed an opportunity to appear and defend their interests.

At such hearing or trial a condemning agency must first establish its authority to condemn. Once this requirement is satisfied the amount of compensation to be awarded each owner is determined by the court, commissioners, or jury as required by local statutes or constitutions.

In 25 States before this issue of just compensation can be presented to the court or jury, a board of viewers or similar body is selected to make a preliminary finding. In the majority of these jurisdictions the court appoints three disinterested persons in the area who act as a board of viewers and fix the amount of compensation due a particular landowner.

The board usually views the property, hears testimony, and then submits a report to the court. If either the condemnee or condemner is dissatisfied with the board's findings they may demand a jury or court trial. Often this demand can be made before the appointing court has taken any action on the board's report. When a further jury or court trial is demanded by either party, it is a trial *de novo* and the question of just compensation is litigated as if there had been no prior proceedings or report by the board of viewers.

In most instances the condemning agency has the right to abandon the proceeding at any time prior to payment of the award, subject in a majority of jurisdictions to the payment of the condemnee's costs and expenses.

Upon payment of the amount awarded, title passes to the condemning agency, although in six States possession and title pass prior to the institution of legal proceedings upon satisfactions of certain statutory conditions precedent.

In judicial method jurisdictions, constitutional or statutory provisions usually exist allowing the condemner to take possession prior to payment of the award. These provisions often require that a deposit be made by the condemner prior to exercising this right of immediate possession, and establish a procedure for fixing the amount of the deposit.

Because of its nationwide application, mention should be made of condemnation in the Federal courts. Prior to August of 1951 the Federal court followed the procedure and practice of the State in which they were sitting. However, Federal Rule of Civil Procedure 71A adopted in 1951 established a uniform rule of procedure for all Federal eminent domain actions.

Under Rule 71A the action is initiated by the filing of a complaint by the Federal agency and notices of this filing are served on the named property owners. The landowner then has 20 days in which to file an answer objecting to the taking, i.e., claiming the Federal agency had no authority, etc. If no answer is filed within this period the only issue at the trial will be just compensation.

In Federal takings the method of trial is by jury unless the court orders trial by a three man commission or Congress has provided another procedure for the particular project (i.e., The TVA Act provides for the use of commissioners to fix value).

In Federal actions possession is obtained under the "Declaration of Taking Act." At the time of filing of the complaint or at any time prior to judgment, a declaration of taking may be filed. This declaration is required to contain:

- a. A statement of the authority and public use for which the land is acquired.
- b. A description of the land.
- c. A plan of the land.
- d. An estimate by the condemning authority of the amount of just compensation.

When this declaration is filed and the deposit is made, title vests in the Government. However, the Government also thereby loses its right to abandon the proceeding. This deposit can be withdrawn by the landowner by following the statutory procedure.

Actual possession, however, cannot be obtained until the Government moves for a judgment on the declaration ordering that possession be surrendered on a designated day. Prior to the granting of such a judgment of possession the court must determine that the taking is authorized by law.

The distinguishing feature of the judicial method, including the Federal procedure, is that the burden is placed on the condemner to initiate the legal action. This can be a beneficial feature since it avoids the problem of procrastinating landowners who can cause delays under the administrative method by not promptly filing suit.

#### Pleadings and Process

A legal pleading is no more than a document filed with a court, requesting or "pleading" for some form of relief. The statutes and court decisions of the particular jurisdiction dictate the name, form, content, and manner of filing the pleading or document. These elements will vary with the nature of the action, the parties involved, and the court with which the pleading is filed. Therefore, any discussion of the pleadings of several jurisdictions must by necessity be merely illustrative, pointing up a pattern rather than listing details.

*The Complaint* — In most judicial method jurisdictions a condemnation action is commenced when the condemner files a *complaint* or *petition*. The complaint or petition will set forth the allegations required by that jurisdiction's statute. In California, as in most jurisdictions, by statute, a complaint must contain:

- a. The name of the condemner who is labeled the plaintiff.
- b. The name of the property owners who are designated defendants.
- c. A statement of the condemner's authority to condemn.
- d. A map showing the location, general route and termini of the right of way sought.
- e. A description of the property sought to be condemned.

Some jurisdictions also require a statement that the parties are unable to agree on the amount of compensation, or that the plaintiff set forth the exact nature of the defendant's interest. This complaint or petition is concluded by a prayer or request that the property be condemned to plaintiff's use and that just compensation be determined and assessed.

*The Answer* — The defendant property owner's response to the complaint is appropriately labeled an *answer*. This answer will set forth the nature of the defendant's interest and in many jurisdictions the amount of damages (just compensation) to which the landowner claims he is entitled. The answer may also be used to question the plaintiff's authority to condemn, or to allege that the taking is not for a public use.

In still other jurisdictions, an answer is not required or is merely permissible. However, even in California where an answer is mandatory, failure to comply means only that the defendant cannot participate in the proceedings. Just compensation still must be paid and the court is required to fix the amount.

*The Cross Complaint* — A third pleading utilized in various States is the *cross-complaint* or *cross-petition*. In California, the main function of a cross-complaint is to raise the conflicting claims of various landowners to the same parcel of land. For example, Landowner Smith will cross-complain against defendant Brown, alleging that Brown has no interest in the subject parcel. In Illinois by statute a cross-complaint may also be filed by a person interested in the property, who has not been made a party to the proceeding or by a mortgagee, who is a party and seeks to have a lien imposed on the award.

Finally, in certain jurisdictions where a landowner files an action against a condemning agency seeking an injunction or damages for a claimed illegal entry or trespass (e.g., the flowing of highway drainage waters across his land) the condemner may file a statutory cross-action. By cross-petition the condemner can request that the right in question (e.g., a flowage easement) be condemned to its use upon payment of just compensation.

Though the primary pleadings have been discussed above, there exist many other legal pleadings, such as the *demurrer*, which is used to point up defects or omissions in the complaint, answer, or cross-complaint.

It should be noted also that in the jurisdictions using the administrative method of condemnation the roles are reversed. The landowner condemnee who initiates the proceeding would file the petition or complaint and the condemner would reply by way

of answer. Therefore, in these jurisdictions the allegations contained in the complaint and answer would also be reversed.

### Trial Practice

In order to fully appreciate the purpose and workings of a condemnation action, familiarity with the following basic elements is essential:

- a. The issues which can be litigated.
- b. Which party has the burden of proof on these various issues, and
- c. The function of the court and jury.

While this discussion will be focused primarily on the jury trial as utilized by a majority of jurisdictions, it must be recognized that in several States a jury trial is not used, or is available only after a commission or board of viewers have made a preliminary determination.

*Issues in a Condemnation Action* — The major issues that are open for determination by the court or jury in a condemnation action are:

- a. *Does the condemner have authority to exercise the power of eminent domain?*

Since the State legislature must specifically delegate the sovereign authority to condemn, this issue usually revolves around the interpretation of the enabling statute.

- b. *Was the taking for a public use?*

As explained previously, the power of eminent domain must be exercised for a public use or purpose. Therefore, the condemnee can always question an acquisition on the ground that it is for a *private* use. The extent of the evidence which can be presented on this issue depends entirely upon the rules of the particular jurisdiction. In some States it is allowable to show the motives of the condemner. For example, the court might admit evidence showing that the condemner intended to trade the property acquired in an unauthorized manner to a private party. Further, in ruling on the issue of public use the court may or may not give weight to the legislative declaration of public use. In either event the authorizing statute or resolution is generally strictly construed in favor of the landowner.

- c. *Was the taking necessary?*

In most States the necessity or wisdom of the acquisition is not a justiciable issue. The enabling ordinance or resolution is deemed to conclusively establish the necessity of the acquisition. No inquiry is permitted into the reasons behind that declaration so long as the taking is for public use.

However, in some few States necessity can be made an issue, and evidence is allowed bearing on the wisdom, practicality, and *bona fides* of the acquisition.

- d. *What is just compensation?*

In the vast majority of cases tried the sole issue is the amount of damages to which the landowner is entitled. Under this general heading evidence is introduced con-

cerning value of the property acquired and damages and benefits, if any, to the remaining property. It is this seemingly simple issue that has produced the hundreds of judicial decisions and multitude of statutes in each jurisdiction.

*Burden of Proof* — The party having the burden of proof on an issue must prove that issue by a preponderance of evidence, that is, introduce evidence that will outweigh, no matter how slightly, the evidence produced by the other party. If this burden of proof is not met, the issue must be decided against the party having the burden. As a general rule a party has the burden of proving those items he is required to affirmatively allege in the complaint, answer, or cross-complaint.

Where the condemner must in the complaint allege its authority to acquire, or that the taking is for public use, or that the taking is necessary, the condemner has the burden of proving those items. The answering landowner has the burden of proving the value of the land taken and the damages to the remainder, if any. In a jurisdiction that allows general or special benefits to be off set against the value of the land taken or the damages to the remainder, the burden is placed on the condemner to show the amount of these benefits.

*Function of Court and Jury* — In a majority of cases a jury's sole function is to act as a fact finder with all legal questions being resolved by the court. Theoretically, it is the jury's duty to determine the amount of compensation by weighing all the evidence including the opinions of the expert witnesses. In this deliberation they are guided by the court which instructs the jury on the law to be applied and makes all the necessary legal determinations during the course of the trial. In the minority of jurisdictions where necessity can be made an issue, the practice varies as to whether the court or jury reexamines the condemner's declaration of necessity.

The court in most jurisdictions is the exclusive arbiter of such legal items as:

- a. The authority of the condemning agency.
- b. Whether the taking is for a public use.
- c. What evidence is admissible.
- d. What is the larger parcel.
- e. What items of damage are compensable, i.e., business loss, loss of view, etc.
- f. What benefits are general or special.
- g. Title and description controversies.

Although the above examples may at times all involve factual disputes, primarily they require the application of legal principles beyond the scope of the jury's function.

Some few jurisdictions vary this practice and delegate the court to the role of advisor, leaving all issues, both factual and legal, to be determined by the jury. Finally, in all jurisdictions it is permissible for both parties to waive a jury thereby allowing the court to determine all issues.

## Outline of a Trial

The segments of a "typical" condemnation action in chronological outline form are:

- a. The selection of a jury of 12 men or women.  
The number of jurors can be varied downward by statute.
- b. Opening statements by counsel for the respective parties.  
This is ideally a nonargumentative statement telling the jury what the case is about and what evidence will be produced.
- c. The introduction of a *prima facie* case by the condemner.  
• This is the production of a resolution authorizing the taking, and in partial taking, testimony and exhibits showing the construction in the manner proposed. In some jurisdictions this showing of authority, etc., is made at a separate preliminary hearing.
- d. Introduction of evidence by the defendant landowner on the value of the land taken and damages, if any, on partial takings.  
Since the defendant has the burden of proof on the issue of value he is required to put his case on first. This is sometimes called the defendant's case in chief and it is during this segment that his "expert witnesses" will testify.
- e. Introduction of evidence by the condemner on the issues of value and special benefits, if any.  
This is the condemner's opportunity to introduce its "experts" and is labeled the plaintiff's case in chief. In some jurisdictions the condemner may reserve its opening statement until right before its case in chief.
- f. Rebuttal evidence by the landowner.  
This is the defendant's opportunity to counter new matters raised by plaintiff, such as the existence of special benefits.
- g. Surrebuttal by the condemner.  
Plaintiff's chance to counter new evidence produced by the defendant.
- h. Jury view of the subject parcel.  
The allowance of a view of the property being acquired lies within the discretion of the trial judge. The court also determines when during the trial the view will be had.
- i. Final argument.  
Here both sides have an opportunity to evaluate the case for the jury.
- j. Instructions by the court.  
At this time the court instructs the jury on the law which governs the action.
- k. Jury verdict.  
The end product of a lot of work.

## CONCLUSION

The foregoing should be convincing proof that condemnation procedures are as varied as the many jurisdictions and all statements concerning "general," "typical," "majority," and "most" are themselves subject to numerous exceptions.

Further insight into these procedural complexities can be obtained by referring to some of the highway laws studies issued by the Highway Research Board of the National Academy of Sciences. These exhaustive and authoritative legal and statistical studies are excellent. Attention is directed particularly to Special Reports 32, 33, 50 and 59. Several survey type treatises have also been published dealing with eminent domain which would provide additional source material; for example, Nichols, *EMINENT DOMAIN*, 3rd Ed.; Orgel, *VALUATION UNDER EMINENT DOMAIN*, 2nd Ed.; *AMERICAN JURISPRUDENCE*, Vol. 18; and Kaltenbach, *JUST COMPENSATION*. Your attention is also directed to the annual reports of the Committee on Condemnation and Condemnation Procedure of the American Bar Association, which contain digests of the important eminent domain cases in the various jurisdictions.

## CHAPTER 8

### Appraising for Condemnation

HERMAN N. KRAMER

*Director, Division of Right-of-Way Acquisitions & Titles  
New Jersey State Highway Department*

Appraisals are the means by which public agencies may determine the best possible estimate of the amount of compensation due owners because of the taking of their property for public purposes. Other chapters of this text cover in detail the appraisal functions, the basic approaches to value and appraisal and legal theory in general.

This chapter is devoted to the elementary fundamentals of highway condemnation appraising geared to the level of the right-of-way trainee. Practicality has been stressed and unusual or very complicated problems have not been included except where deemed essential in the explanation of the other approaches to value.

The rules followed in this outline apply to sound appraisal principles. Should the laws in any particular state prohibit the application of any of these principles, the outline may be adjusted to conform with the policy and legal criteria of the jurisdiction concerned.

#### Sound Appraisals—Keystone of Sound Right-of-Way Acquisitions

The Federal highway program is probably the largest project short of all-out war that our country has ever undertaken. Last year there was a national expenditure of over 500 million dollars for rights-of-way and it is estimated that before the presently planned Interstate program is completed, 750,000 parcels at a cost of \$5,300,000,000 will have to be acquired. This is only a part of the picture, since it does not include the many more thousands of parcels and the additional billions that will be expended in the next decade by the individual States in the enlargement and improvement of their primary and secondary road systems.

With appraisals being the primary means by which the amount of compensation paid to owners is established and by which the State and Federal governments document their records as the basis of each right-of-way expenditure, the condemnation appraiser is faced with a grave responsibility. Upon his judgment and experience hundreds of millions of dollars will be expended annually. He must, therefore, supply appraisal

figures that represent the just compensation to which property owners are entitled and which are just and fair to the taxpaying citizens.

### Compensation—Market Value as a Measure of Loss

Valuation under eminent domain is based on the constitutional provision of the Fifth Amendment to the United States Constitution that no property shall be taken for public use without "just compensation" therefor.

Over the years many legal expressions and opinions have been developed in an attempt to formulate an equitable interpretation of the intent of the Fifth Amendment. The practical solution of the problems presented in determining just compensation (subject to exception in isolated cases) has been resolved by the courts in adopting the "fair market value" concept as being the most accurate and practical measure of just compensation.

Since fair market value is presumed to be established in the open market, it follows that this interpretation by the courts is both fair and equitable. The public in general by their sales and purchases of property tend to set the going worth of properties.

Since market value is a figure presumed to be established in the market, it follows that sales are usually the best evidence of market value. By comparing the property to be condemned with actual open market sales and by adjusting for differences in time, location, and general desirability, a substantive indication of the public's opinion of value as applied to a specific property will result.

### Partial Takings

There is one notable exception to the rule that the acquiring authority pays for only what it actually acquires. This is when a part of a property is taken. Then in addition to the actual value of the land taken, payment must be made for severance damages, if any.

The law does not furnish a clear-cut dictionary type definition of severance damage but the measurement of such damages is one of the most important functions of the condemnation appraiser. If partial takings never arose, litigation would be reduced to a minimum; because in most cases involving competent appraisers on both sides; there is usually little difference of opinion as to the value of an entire property.

Wide differences in opinions of value frequently arise, however, over the question of damages resulting from severance. These differences become understandable when it is realized that the subject presents many borderline legal and factual applications. Further, until the advent of the recent economic and severance damage studies, there had been little or no basis with which to establish and support values and sales histories of severed remainders, except the appraiser's unsupported opinion and judgment.

### Severance Damages

Severance damages are usually defined as loss in value to the remainder of an owner's property after a part has been taken, as compared with the value of the remainder before the taking. Severance damages can only occur in those acquisitions where the takings are part of a larger parcel under one ownership and are only compensable when there is a demonstrable impairment or depreciation of the market value of the remainder which directly results from the acquisition of a part of the property.

The most frequent severance damages to properties result from one or more of the following basic causes:

1. Proximity
2. Denial or impairment of access
3. Reduction in size
4. Severance from a larger parcel
5. Consequential damages (not compensable)

### Unity-of-Use Concept

A rare exception to the severance damage rule pertaining to the requirement that the ownership of the property affected must be one contiguous unit is the case of separate properties under one ownership which may have a street or an alley between them or may even be some distance apart. If there is a common unity-of-use they may have to be evaluated as one large property, should the taking create damage to one or the other of the properties involved.

An example of the application of the unity-of-use principle might be an oil company having river front docks on one side of a street and a refinery on the other. If the acquisition took the river front dock property and thereby severed the refinery from its oil tanker transport supply which furnished crude oil to the plant, there could very well be a compensable damage to the refinery under the unity-of-use principle.

The whole question of unity-of-use is a complicated legal matter and the appraiser should never proceed without first thoroughly examining the legal application as it applies in his State.

### The "Before and After" Appraisal

Where partial takings are concerned, the accepted appraisal procedure for estimating the value of the part to be acquired and the amount of damages to the remainder as a result of the taking is to separately determine the fair market value of the property as it exists before the proposed acquisition and to then determine the fair market value of that part of the property which remains after the taking.

The difference between the two results constitutes the value of the part taken and the amount of any severance damages to the remainder. This concept is known as the *before and after approach* and is the basic evaluation technique followed in appraising partial takings.

Figure 1 demonstrates the basic application of the before and after principle. In the examples shown, there is a tract of land fronting on a county road which is improved with a dwelling and a small barn before the taking. By market comparison the value of this property as a unit has been established at \$35,000 for land and improvements combined.

The proposed highway acquisition severs this property into two tracts. It has been determined that the remaining tract on the west could readily be sold on the market for \$7,000 and that the remaining tract on the east would sell for \$8,000. The improvements are destroyed by the taking and add no increment of value to the remaining easterly tract.

The total value of the property after the taking is therefore \$15,000. This value deducted from the before value produces the sum of \$20,000, which is the value of the land and improvements taken and of damages to the remaining land.

#### **Exceptions to Before and After Approach**

A permissible exception to the before and after procedure would be a very small fee taking or a very small easement where there are obviously no damages and the taking itself is nominal. In such exceptions only the part taken need be evaluated.

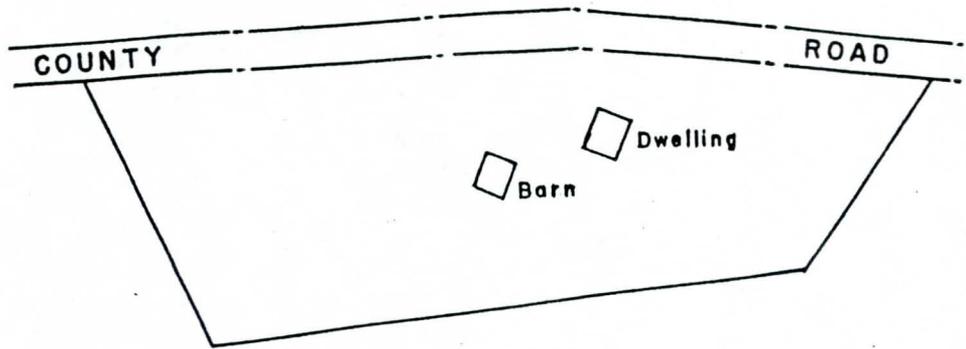
This principle is demonstrated by the following example. The property consists of a large 200 acre tract of vacant land fronting on a State road. The State desires to improve the road and eliminate a sharp curve. This necessitates the acquisition of 0.50 acre of land. The severed remainder still contains 199.5 acres. It is not damaged and will still sell at the same unit acreage rate as before the taking. In this isolated circumstance it is permissible for the appraiser to evaluate only the 0.50 acre part taken and to not make a complete before and after evaluation. See Figure 2.

#### **Cost-to-Cure Method**

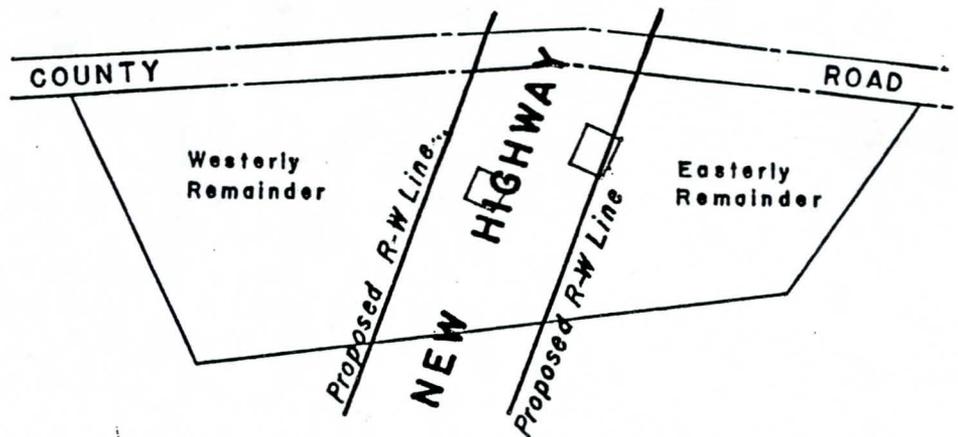
Another permissible exception to the application of the before and after procedure is the cost to cure method. This method is frequently adopted where the condemning agency may be acquiring a part of a railroad, a water company or a power line right-of-way. In such instances the value of the part taken, plus the cost to cure the damage by restoration of the taken facility, may be the most practical method of valuation.

For example, in evaluating a railroad, if the appraiser were required to appraise the entire railroad or power transmission line on a "before and after basis," where would he stop? Obviously he can not appraise the entire right-of-way from New York

# PROPERTY-BEFORE-TAKING



# PROPERTY-AFTER-TAKING



## EVALUATION

### VALUE BEFORE

Land .....	\$20,000
Dwelling .....	12,000
Barn .....	3,000
	<u>\$35,000</u>

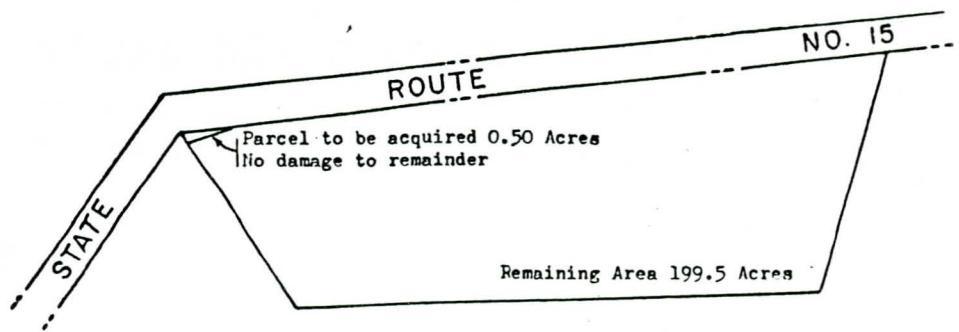
### VALUE AFTER

Easterly land .....	\$ 7,000
Westerly land .....	8,000
Dwelling .....	0,000
	<u>\$15,000</u>

## SUMMARY

Value before .....	\$35,000
Value after .....	<u>15,000</u>
Value of part taken and damages .....	\$20,000

Figure 1



**VALUATION**

0.50 acres of land @ \$500 per acre .....	\$250.00
---	----------

Figure 2

to Chicago. The practical solution would be to evaluate the part taken and to estimate the "cost-to-cure" the damages to the railroad.

One illustration of the "cost-to-cure" approach is that of a multimillion dollar paper mill strategically located along a river. This enterprise requires enormous quantities of water which local municipalities cannot provide. The company, therefore, pumps its own water from the river.

The State desires to acquire a tract of land for a new highway which will take 5 acres of the company's river front acreage including the pump house and appurtenant facilities which supply water to the plant. Without water, the plant will become inoperative and by the usual before and after premise the damage would be almost immeasurable. The cost-to-cure method would then be applicable. Real estate appraisers determine the value of the 5 acres taken. Industrial engineering appraisers determine that it is possible to restore the pumping facilities and the river front intake chamber at a new location on the owner's remaining river front property.

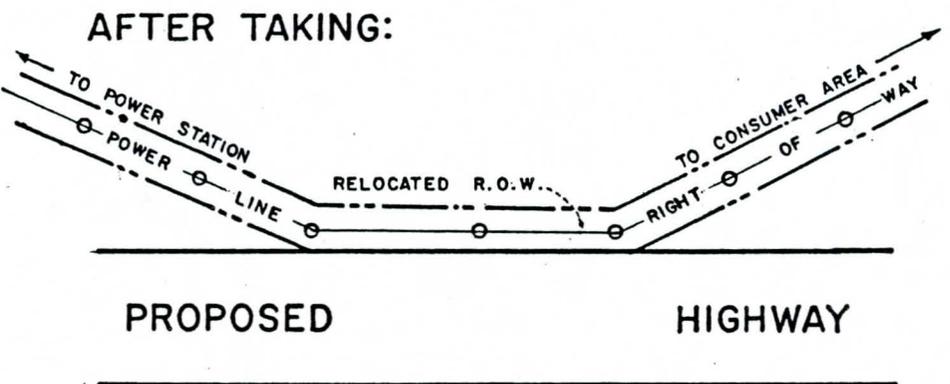
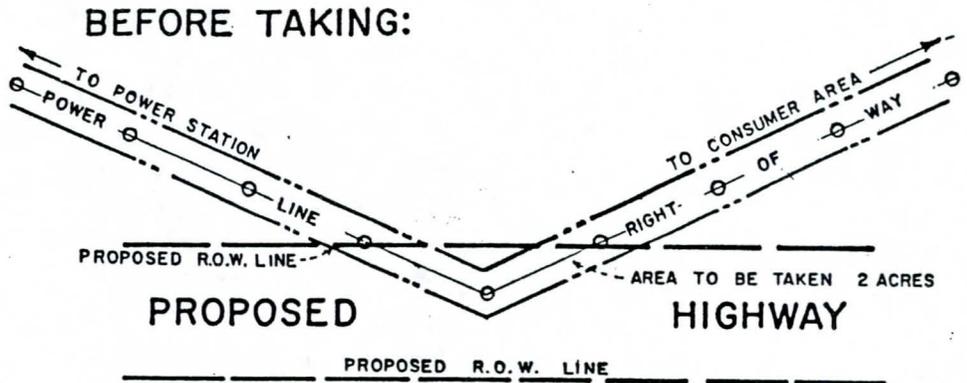
The construction of these facilities will restore the water supply and eliminate damages to the plant. Thus on a cost-to-cure basis the approach to value is payment of the value of the 5 acres taken plus cost to the owner to restore the pumping facilities which will mitigate the severance damages.

Figure 3 demonstrates the cost-to-cure method as applied to an acquisition from a power line right-of-way. The land value has been established by comparison at an average rate of \$1,000 an acre. The power company has the right of condemnation and can acquire land needed to replace the land taken at the same rate. The cost of relocating the operating facilities to the power company's new right-of-way is estimated and agreed upon by both State and utility company engineers as being \$50,000, for a total on a cost-to-cure basis of \$52,000. This approach to value avoids the question

of severance damages to the entire operating facilities which are dependent on the right-of-way in question.

**Special Purpose Properties**

At times the fair market value concept may fall short as a measure of just compensation when it is applied in the evaluation of such properties as armory build-



**EVALUATION SUMMARY**

2 acres taken average @ \$1,000 per acre .....	\$ 2,000
Cost to relocate operating facilities .....	50,000
Value of part taken and the cost-to-cure damages .....	<u>\$52,000</u>

Figure 3

ings, municipal buildings, libraries, schools, parks and other publicly owned properties which have a peculiar value in their existing ownership. In condemnation appraisals of this type, where an estimate of fair market value may not provide a way to measure just compensation, the cost of replacing the property taken "in kind" may be the only proper method of estimating value.

This application is based on the concept that special purpose properties are unique properties built for a sole functional utility. They are not usually marketable and frequently serve as an integral part of an over-all operation. As such, they have a "value in use" equal to the cost of providing an equally functional replacement.

This approach should be utilized only after careful and thorough examination of the legal application as it applies in the appraiser's State and after a determination as to whether or not an architect's study or special engineering report may be desirable to back up the real estate appraiser's reports.

#### Noncompensable Damages

Although laws vary in individual State jurisdictions, the following types of damages are generally considered as being noncompensable in highway acquisitions and should not be included in appraisal evaluation reports.

1. Loss of business
2. Expense incurred for moving personal property
3. Loss of good will
4. Raising or lowering grade of highway (when no taking occurs)
5. Damage resulting from the owner's inability to obtain an acceptable new location
6. Loss of profits
7. Traffic noise and fumes from increased traffic
8. Circuity of travel
9. Diversion or rerouting of traffic
10. Damage to potential improvements or for items highly speculative in nature

Damages to the remainder of a property that are a direct result of severance, caused by the acquisition of a part of the original ownership for highway purposes, are compensable. Damages to the remainder of a property that are an incidental consequence of such a taking are not compensable.

As both types of damage may occur to a property following a taking, it would at first appear to be an inconsistency that the one is compensable and the other is not. The reason for the difference rests with the origin of the damage. For instance, the owner of land fronting on a highway has no vested right in its continuance as a public highway. So long as his right of ingress and egress is maintained, he cannot

claim damages which result as a consequence of the discontinuance or relocation of a public highway, even though the discontinuance or relocation may divert traffic from his door and thereby diminish trade.

The appraiser frequently encounters a similar problem where the construction of a new highway to by-pass an older, more circuitous route practically closes down the businesses on the old road. This diminution in trade and possible loss of value to properties on the old route are not compensable, even if parts of the new highway right-of-way are taken from the affected owner's properties.

The basis of the fairness of this concept is that the damage to these properties was not the result of the taking of land for the new highway but was a consequence of the public's preference to use the newer, more direct route that will now be available. As the State is not obligated to send customers past a merchant's door, it cannot be expected to pay for such damages.

In the acquisition illustrated in Figure 4, the owner has a large farm property. The section fronting on the existing highway is improved with a produce stand and a gas station. The construction of a new throughway to replace the old route requires the taking of 5 acres from the rear of this property.

While it is indicated that there may be some diminution in trade as a result of the public's preference to use the newer route which by-passes the produce stand and the gas station, this is a condition which is a consequence of the taking and is not compensable. It is up to the owner, not the State, to find customers. Thus, in the before and after approach to value which has been utilized, there are no compensable damages indicated as directly resulting from the State's use of the 5 acres of rear land for highway purposes.

#### **Benefits**

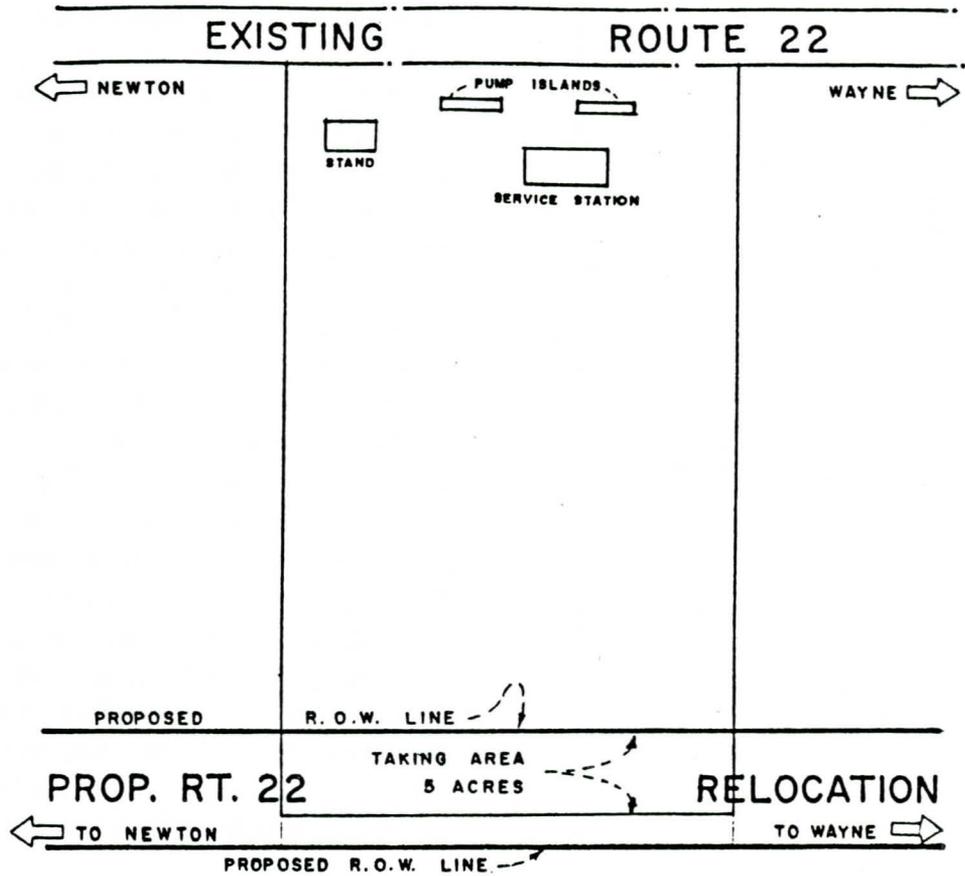
Admittedly, owners are entitled to just compensation for property taken for highway purposes. On the other hand, unless benefits are taken into consideration, the rights of the general taxpaying public will not be protected. Appraisers must, therefore, be thoroughly familiar with the various benefits that affect a remainder property after a partial taking. They must be cognizant of which types of benefits may be used to cancel damages sustained by the owner and with the appraisal principles involved.

Benefits fall into two major categories: general benefits and special benefits.

#### *General Benefits*

General benefits are those which result to an area in general following the opening or improvement of a highway. They spring from growth in population, increase in traffic, time saving features, etc. They affect a whole community or neighborhood and

NONCOMPENSABLE DAMAGE PROBLEM:



EVALUATION

VALUE BEFORE

Land 500 front ft. @ \$50. . . . .	\$25,000
Stand . . . . .	3,000
Gas station . . . . .	10,000
Rear land 50 acres . . . . .	20,000
	<u>\$58,000</u>

VALUE AFTER

Land 500 front ft. @ \$50. . . . .	\$25,000
Stand . . . . .	3,000
Gas station . . . . .	10,000
Rear land 45 acres . . . . .	18,000
	<u>\$56,000</u>

SUMMARY

Value before . . . . .	\$58,000
Value after . . . . .	<u>56,000</u>
Value of 5 acres taken . . . . .	\$ 2,000
(No compensable damages)	

Figure 4

are enjoyed by many others along a highway as well as the affected property owner. If they arise at all they are in the future, while the basis of compensation must be as of the date of taking. Such general benefits may not be used to cancel out damages which an affected property owner sustains from the taking of his land.

### *Special Benefits*

Special benefits are those which the affected property alone derives as a direct result of the taking of a part of the property for highway purposes. Such benefits are apart and separate from any general benefits which the highway construction may create in the area.

Some of the special benefits that may affect individual properties and should be considered in appraising are:

1. Removal of traffic hazards by creation of a frontage road
2. Improvement of ingress and egress
3. Formation of a corner property where none existed before
4. Draining or filling of low land
5. Increase of highway frontage abutting the remainder property
6. Removal of obstructions so as to enhance value by an increase in visibility

Depending upon the jurisdiction and the particular circumstances, such special benefits may be used to offset damages to a remaining property. The required circumstances are that they must be peculiar to the land in question and they must directly result from the highway improvement contemplated.

Generally speaking, and again subject to the jurisdiction, the appraisal rule is that special benefits can be set off against severance damages but cannot be set off against the value of the land taken. Actually many States have no specific legislation regarding the subject of benefits, yet the higher courts have had very few cases appealed to them by owners who have challenged the right of the State to offset damages through special benefits.

It is believed that the reason for this acceptance by owners of the benefits concept, even where legislation is nonexistent, is that the subject becomes more or less immaterial when correct evaluation principles are followed. In the before and after approach to value, special benefits which directly result from the contemplated construction are automatically considered in determining the fair market value of that part of the property which remains after the taking.

Therefore, unless there is local legislation or other State procedure providing for the handling of special benefits, there would be no occasion for separately dealing with the subject when the before and after evaluation approach has been followed.

## Access Rights

It has long been recognized that property owners have access rights in existing streets, roads and highways. These access rights are in addition to the rights these owners have along with the general public to travel from point to point.

While such rights are recognized, the history of their origin is not clear. It is believed by those who have closely studied the subject that they began with the earliest land service roads. These roads gave access from one property to the next. They were frequently created by donation when a rural owner, who wanted access to more urban points, would set aside a portion of his own land for public road usage. By this action it was understood that he reserved access to his abutting lands and by reason of his allowing other owners to pass through his property, they in turn would extend the same courtesy to him. This ancient concept was gradually passed down and eventually became the basis for our present concept of an owner's right of access in land service roads.

There are two methods by which an owner's right of access may be denied or restricted:

1. Police power regulation
2. Exercise of the right of eminent domain

Police power regulation is enforced on the basis that the action taken is essential for public health, safety and welfare. Theoretically such regulation enables a State to deny an owner's right of access without purchase. There are very few instances, however, where the States have been able to enforce such an action along existing roads and police power access regulations are usually confined to regulation of the direction of travel and control of driveway locations.

The question that then arises is just how far police power regulation can deny access and just where eminent domain begins. The general procedure followed in most areas is that police power regulation of access may be enforced to a point where such regulation results in a damage to an owner's property. This, being tantamount to a taking, then requires the exercise of eminent domain and compensation to the owner for the access rights taken.

## Access Right Evaluation

Access right evaluation is encountered by the appraiser in the conversion of existing routes into freeways or parkways, and in the construction of new freeways through locations where no road previously existed. Where the taking is entire, the market value of the property is the measure of loss to the owner. Where the takings are partial,

the evaluation approach is the before and after method. The difference between the before and after value is the measure of value for the part taken and damages to the residue which result from denial of access.

### **Conversion of Access Rights**

In the acquisitions illustrated in Figure 5, the properties both front on Route 4. One also has a second frontage on the county road. The conversion of Route 4 into a freeway takes the highway access rights of both properties. As property "A" will be landlocked, the remainder is severely damaged. While property "B" also loses all its highway frontage, it suffers no damage other than the value of the road frontage from the denial of access since it will still have access and land service facilities by way of the county road.

### **Denial of Access to a New Freeway**

In the acquisition in Figure 6, the State is constructing a new freeway which takes the rear section of the owner's property. As the freeway was never intended to provide access or land service, the owner loses no access whatsoever by reason of this taking. He still has all of his access in the county road and suffers no damages as a result of being denied access to the freeway.

### **Appraising Highway Easements**

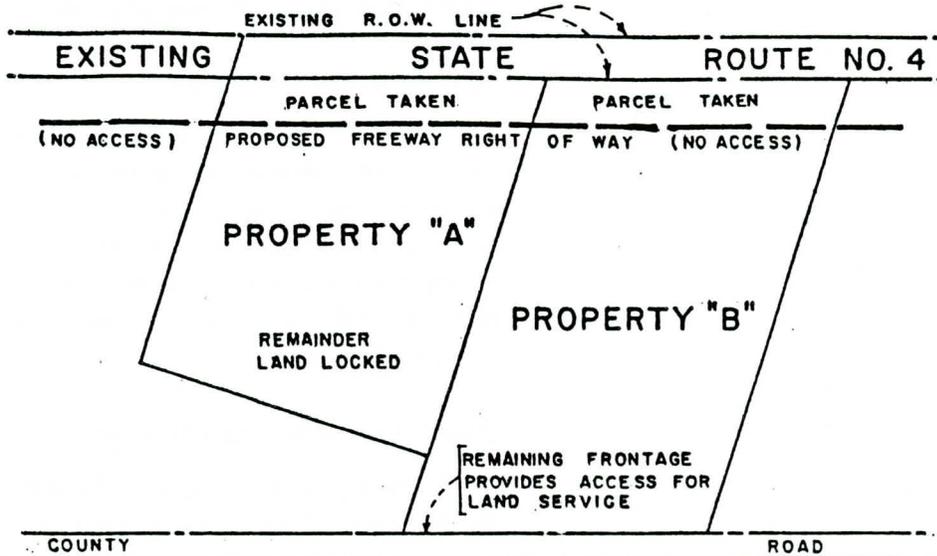
An easement is a right. It runs with the land and is not revocable. Where highways are concerned, such rights are acquired for the benefit of the dominant property owner (the State) and encumber the servient (the owner's) property.

Easements that the highway condemnation appraiser most frequently will encounter include:

1. Slope right easements
2. Drainage right easements
3. Easements for construction and maintenance of a highway
4. Sight easement rights
5. Temporary easement rights

These easements may be required from a property either individually, in combination with other easements, or in combination with a partial taking in fee. Their effect upon the subject property varies not only with the area concerned but by reason of the nature of the highway construction and the definition of the rights conveyed to the State in the purchase agreement.

# CONVERSION OF ACCESS RIGHTS:



### EVALUATION PROPERTY "A"

VALUE BEFORE

200 ft. frontage @ \$30 . . . .	\$ 6,000
6 acres rear land @ \$500 ..	3,000
	\$ 9,000

VALUE AFTER

5.5 acres (landlocked) . . . .	\$ 275
--------------------------------	--------

#### SUMMARY

Value before . . . . .	\$ 9,000
Value after . . . . .	275
	\$ 8,725

Value of part taken & damage from denial of access rights . . . . . \$ 8,725

### EVALUATION PROPERTY "B"

VALUE BEFORE

200 ft. frontage @ \$30 . . . .	\$ 6,000
7 acres rear land @ \$500 ..	3,500
200 ft. frontage on county road @ \$10 . . . . .	2,000
	\$11,500

VALUE AFTER

200 ft. on county road . . . . .	\$ 2,000
6.5 acres @ \$500 . . . . .	3,250
	\$5,250

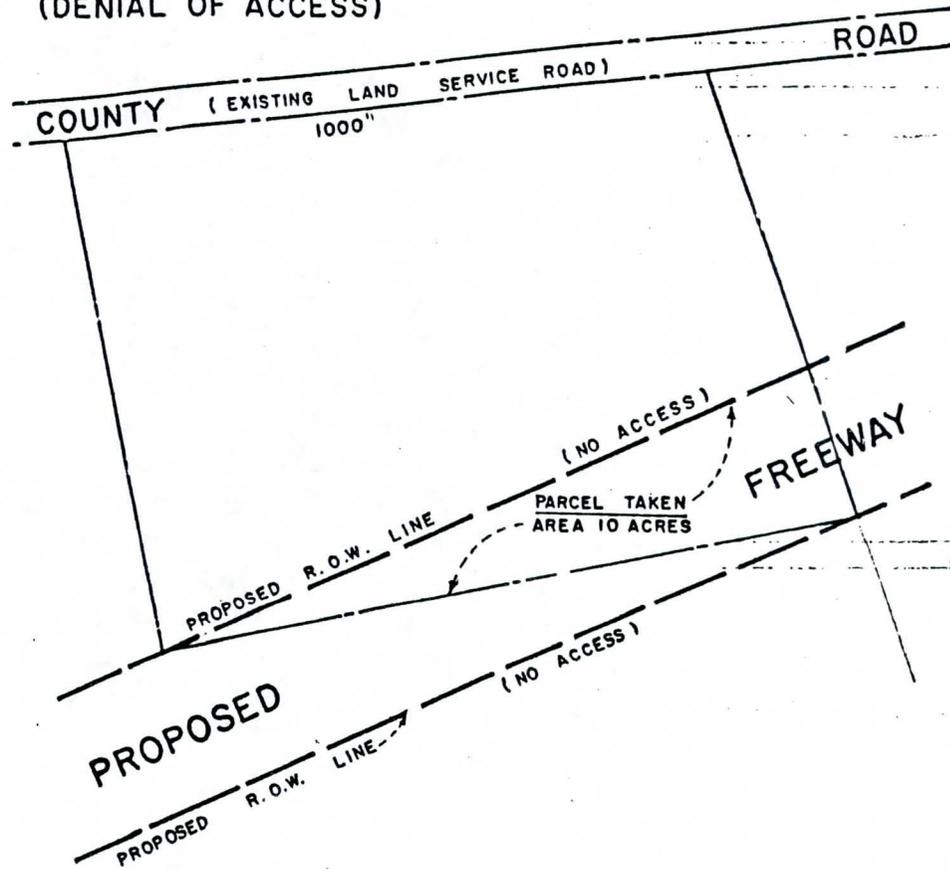
#### SUMMARY

Value before . . . . .	\$11,500
Value after . . . . .	5,250
	\$ 6,250

Value of part taken & damage from denial or access rights . . . . . \$ 6,250

Figure 5

**FREEWAY VALUATION PROBLEM:  
(DENIAL OF ACCESS)**



**EVALUATION**

**VALUE BEFORE**

1000 front ft. @ \$10 .....	\$10,000
50 acres rear land @ \$200..	10,000
	<u>\$20,000</u>

**VALUE AFTER**

1000 front ft. @ \$10 .....	\$10,000
40 acres rear land @ \$200..	8,000
	<u>\$18,000</u>

**SUMMARY**

Value before .....	\$20,000
Value after .....	<u>18,000</u>
Value of part taken & damage to remainder .....	\$ 2,000

Figure 6

Easements are intangible. They convey only rights. The rights conveyed may be minor or so extensive as to leave the owner with merely a useless title. So long as the owner retains any title, the entire ownership has not been conveyed. The evaluation of an easement, therefore, takes on the features of a partial taking and the before and after approach to value is the method of appraisal.

In embracing this approach to easement evaluation, relatively little difficulty is encountered with the determination of the before value. Difficulty is encountered in supporting the after value due to a frequent lack of sales of properties encumbered with similar highway easements. The economic and severance damage studies now being made in most States will ultimately make available a wealth of such sales. In many States the courts allow as evidence settlements made by agreement. In such States, the appraiser may then utilize recent settlements made by the State in support of his after value in easement acquisitions.

The acquisitions shown in Figure 7 demonstrate the before and after method of treating easement evaluations.

In this problem the State desires to widen Route 6 so as to eliminate a sharp curve. This project necessitates the acquisition of three parcels. One consists of a taking in fee plus slope rights. The second consists of a taking in fee plus slope and drainage rights. The third consists of slope rights only. However, these rights pass through the house and necessitate its demolition. In each instance, regardless of the combination of rights or size of the fee taking concerned, the value of the property on the market before the taking and the value of the property on the market after the taking develops the value of the taking and the amount of damages to the remainder.

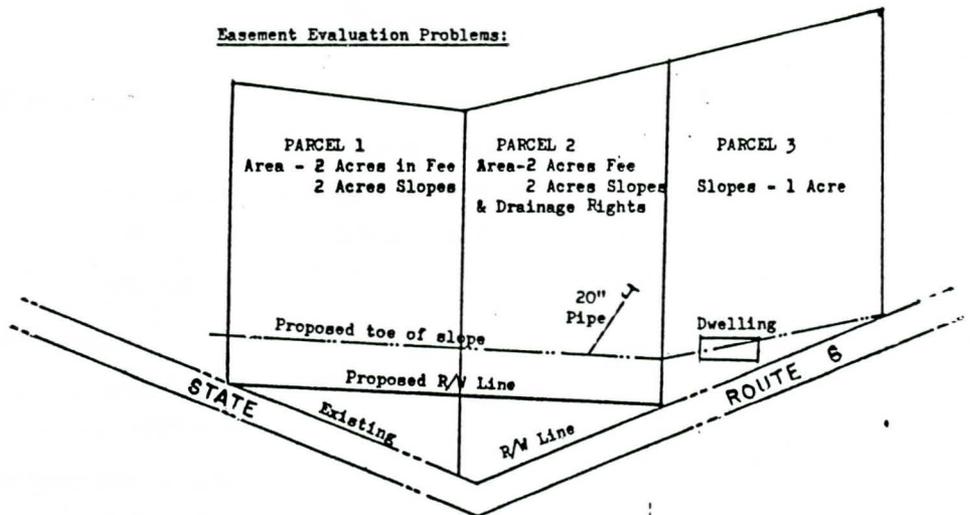


Figure 7

EVALUATION

Parcel 1

VALUE BEFORE

20 acres Average @ \$500 .....\$10,000

VALUE AFTER

16 acres @ \$500 ..... \$8,000

2 acres (encumbered by slopes) @ \$250..... 500

\$ 8,500

SUMMARY

Value before ..... \$10,000

Value after ..... 8,500

Value of part  
taken & damages ..... \$ 1,500

EVALUATION

Parcel 2

VALUE BEFORE

20 acres @ \$500 ..... \$10,000

VALUE AFTER

16 acres @ \$500 ..... \$8,000

Less effect of drainage right  
(arbitrary nominal amount) ..... 50

\$7,950

2 acres (encumbered by slope rights) @ \$250..... 500

\$ 8,450

SUMMARY

Value before ..... \$10,000

Value after ..... 8,450

Value of part  
taken & damages ..... \$ 1,550

EVALUATION

Parcel 3

VALUE BEFORE

Dwelling .....\$12,000

20 acres @ \$500 ..... 10,000

\$22,000

VALUE AFTER

Dwelling .....	\$	—	
19 acres @ \$500 .....		9,500	
1 acre (Encumbered by Slopes) @ \$250 .....		250	
		<hr/>	\$ 9,750

SUMMARY

Value before .....	\$22,000
Value after .....	<hr/> 9,750
Value of easement & damages .....	\$12,250

*Field Work*

While other sections of this text introduce material pertaining to the appraisal format, no outline specifically concerning the fundamentals of condemnation appraising would be complete without touching on the important subject of field work. No matter how well the appraiser may have applied himself in the classroom, it is only in the field that a practical application of what he has learned can be made.

Sound appraisals will result only if the new appraiser applies himself to his field work in the same manner as he has had to while under close instructive supervision. There are no acceptable short-cuts to good appraisals except those resulting from a thorough knowledge of the subject and the appraiser's ability to properly organize and budget his time. While the appraiser may at times be torn between the need for sufficient production and the need for adequate documentation, he must always strike the balance in favor of documentation. Inevitably time will prove him right, if care and accuracy have been his watchwords.

## CHAPTER 9

### The Right-of-Way Agent in the Condemnation Trial

ROBERT R. STONE

*Senior Right-of-Way Agent  
California Division of Highways*

In any condemnation proceeding there is only one departmental representative who has participated in all phases of the total acquisition process, from the initial contact with the property owner to the final judgment, and this person is the right-of-way agent. Being thus exposed to every segment of this chain relationship, the right-of-way man represents the most informed individual available at the time of ultimate litigation.

The trial attorney has for the asking a comprehensive, if somewhat untapped, reservoir of knowledge in the agent. The degree to which this source is utilized will, of course, depend upon the attorney's thoroughness and zeal for preparation.

The right-of-way man's contribution to a condemnation trial begins many months before the actual trial. To pinpoint its inception we must go back to the agent's first call on the property owner. It is here that the preparation begins, for the agent has no other alternative than to assume on this first call that this parcel may later proceed to trial.

So we see from the outset one of the major phases of the agent's contribution—the pre-trial or preparatory stage. The other phase, that of the actual trial assistance and testimony, is just a natural follow-up in this process.

In this first phase, the spade work commences with the initial contact with the property owner. A detailed accounting of this meeting as well as every successive meeting should be made. The diary thus compiled should include the date and place of the meeting, the individuals present, a recapitulation of all the topics discussed, the offer made, the property owner's reactions, and his statements and contentions.

The agent cannot rely solely on his memory for he cannot expect to recapture the details of these meetings a year or so later when they will be needed at the trial; and thus a full written report of each call made on the defendant is important if this background material is to be of any later assistance to the trial attorney.

No other party on the department's team is as familiar with the subject property as the right-of-way agent. Most appraisers, whether they be staff or independent, will make only one or two trips through the property before trial; whereas the agent may

visit the property a half dozen times or more. These are not casual walk-through trips, but may last for several hours.

In the course of these many visits he not only gets to know the property, but even more important, he has ample opportunity to study the owner himself. He knows intimately the exact contentions of the owner—his claims, his objections and reasoning. This character study, properly transmitted to the attorney, will prove of great assistance to counsel in the preparation of his case, and preparation is the major part of any condemnation trial. What better source has the attorney for a revealing character analysis of the defendant than the agent's contacts?

The subject owner is only one of a dozen or so property owners this agent has dealt with in the immediate area. The feelings and responses of the other owners are also at the agent's finger tips. Their fears, apprehensions, questions and doubts that arose over the department's proposed construction may be pertinent in a later trial. Again, in this phase the only source the attorney has is the man who has been in the field—the agent. It is this same agent who has been subject to all the questions, interrogations and remarks of the neighborhood. He has been the representative of the department in the district, and even though the appraisers may meet the property owners, they often have been advised because of department policy or the attorney's request, not to discuss the case with the defendants.

Another aspect which will strengthen the department's case is a complete knowledge of the physical side of the neighborhood. The agent is intimately familiar with the recent construction, the local landmarks, such as churches, historical buildings, etc., the location of schools and playgrounds, the traffic flow, the growth pattern, the public transportation, the available shopping facilities, and the general neighborhood trend. Having worked the area for weeks, perhaps months, eaten his meals there, driven through and around the area constantly, the neighborhood has become a second home to the right-of-way man.

#### Field Inspections

Every attorney will want to make at least one field trip to inspect the subject property personally. Guided by the right-of-way agent, this can be a most rewarding experience, for the agent can readily point out how the proposed construction will affect both the general neighborhood and the subject property. The effect of cuts, grades, slopes, bridges and underpasses can be amplified on. Recent sales, listings, and State purchases can be shown the attorney. In the case of partial takings, the field inspection is of particular value and importance. Attempting to visualize the effects of construction in the office is often a hazardous and unrealistic undertaking. To be guided by the most experienced man in the department cannot help but afford the attorney an advantage in trial.

## Policy Matters

In many departments the volume of condemnation cases is not sufficiently large to permit the retention of a staff of attorneys specializing in condemnation matters. These organizations must then accept the services of an attorney who is assigned from some other department and is not too familiar with either departmental policy or condemnation proceedings.

In such a relationship the agent's contribution can be twofold. He can impart the department policies and procedures to the attorney, as well as assist him in the many pitfalls of condemnation work. Where such conditions exist it is the responsibility of both the department and the agent assigned to see that the attorney receives all the assistance that it is humanly possible to give.

Not all title information that is needed by the attorney can always be found in a title report. Often information in the right-of-way man's files can prove of help. Conditions that do not appear of record, such as unrecorded deeds, leases, easements, etc., may have been uncovered by the agent in his many field contacts. Such information must be transmitted to the attorney for him to be adequately prepared. Occasionally too, a specific title search may be warranted, or a search of other public records such as the voter registration, marriage and death records, might be needed, and this is something a trained agent can readily do.

Special research in some specific field is sometimes required to have sufficient data for court. Such an example would be the zoning history of a property, including the petitions, record of hearings, rulings or variances granted. Again, this is a task that the right-of-way man knows and can effectively perform.

An effective court presentation will require photographs, especially pictures taken before construction. No one is in a better position to make a complete photographic coverage of the property in question than the agent. He will also be of assistance in the construction of any special models for court display, of map exhibits, charts and drawings.

Some organizations rely on outside appraisal work entirely. Here is a case of non-departmental men attempting to appraise property for the State without the background and pool of information available to the staff appraiser. The right-of-way man can assist the fee appraiser with information as to the policies and findings of his department, and this is especially true of severance damage cases where a wealth of pertinent information is usually available from the department.

It is customary to have several pre-trial conferences at the attorney's discretion. The agent's presence at these conferences is vital. It is here that he can supplement his written reports by oral observations and comments. It is here also that the unity is welded between the right-of-way department, the legal department and the outside valuation experts. By thrashing out mutual problems, exchanging ideas and opinions, and

experiencing a trial run of the court proceedings that are to come, the final techniques of effective court presentation are sharpened into a winning effort.

### Actual Trial Assistance

The role the agent plays in the actual trial often depends, of course, on the policies of his own department. Some readily use the agent as a valuation witness, believing that a man trained by them, knowing all the facets of the business, can better present the case. Some departments still prefer to use only independent appraiser witnesses who are in business for themselves but do mostly governmental work. Even with the use of the independent witness the agent plays the strong role of liaison man between the independent witnesses, his own department and the legal department.

A third group of organizations uses both the agent and the independent witness for valuation testimony. One agent will be assigned a case along with an independent appraiser. When the agent is to be used as a valuation witness his preparation must be as meticulous and painstaking as any independent witness, and perhaps more so. He not only has the cumulative records and studies of his own organization to draw from, but as stated before, a familiarity with the job itself, and perhaps even the parcel to be appraised. His narrative appraisal report should be well written, complete in every respect and fair—fair to the organization which employs him and fair to the owner whose property is being condemned. All comparable sales used in his report should be personally verified by him, and all valuation conclusions should be his, predicated on the exhaustive study he has made of the property.

The agent's court room conduct must be exemplary. Courtesy, attentiveness, proper attitude and conservative dress are basic requirements, along with the required education and appraisal experience. Since he is a member of the condemning body, his testimony must appear as impartial as possible, carefully considered and well presented in clear, confident voice.

Even in those organizations that still use independent witnesses for their valuation testimony the right-of-way man may be called upon to testify as to his previous contacts, offers and conversations with the defendant property owner. It is in such an assignment as this that the carefully prepared, detailed diary the agent wrote a year ago will pay dividends.

Many times the attorney will call the agent to the stand to refute some erroneous claim of the property owner. If the agent is poised, well-armed, and confident he can materially aid the State's case.

Additionally, some departments will have right-of-way men with engineering backgrounds for use in trial proceedings. These agents may be used to give specific engineering testimony on such matters as slopes, grades, sight distances, results of compaction tests, drainage problems, etc. Since highway departments deal in engineering matters, a

considerable time saving of staff engineers can be realized by sparing them the task of preparing for court by substituting a qualified right-of-way man.

The agent may never be called upon for direct testimony, yet may still be of tremendous help to his attorney by remaining at the counsel table during the trial. By being present, and listening to the testimony of the opposing witnesses, he can instantly pick up any flaws, misstatements or weaknesses in their presentation and pass these immediately on to the State's attorney. Information known only to the agent, such as other purchases made by his department in the area, may be needed during the course of the trial, and in these circumstances the attorney need only turn and ask the agent.

As the trial proceeding progresses the attorney may quickly need some information not available in court. A trained man who can leave the court, procure accurate information with skill and dispatch regardless of the search required, is a definite asset.

#### Agent's Presence at Pre-trial Hearings

It is now common practice in all States whose court systems have adopted the pre-trial hearing procedure to have the right-of-way agent present.

Right-of-way departments seldom delegate to their legal representatives the authority to negotiate a settlement. The authority to settle at a figure above the appraisal is vested in the right-of-way agent, not the attorney. During the pre-trial hearing, if a reasonable and fair settlement is proposed the agent can authorize its acceptance. In addition, many matters may arise at the hearing that only the agent has knowledge of, and here again he can be of assistance.

#### Conclusion

One concluding contribution the agent can make which will help his own department and the legal department is writing a complete report of the trial. A synopsis of this report can then be circulated to all the right-of-way men in the office to keep every one informed and posted on recent court decisions affecting property in the area. This record of trial should be a complete report of the court proceedings, giving the testimony of the defendant's witnesses as well as the plaintiff's, and the claims and contentions of both sides with the findings of the court, the number of days of trial, etc.

These records can then be analyzed to indicate any trend that is taking place, the effectiveness of the witnesses, the cost of each trial, the spread that exists between witnesses' testimony and jury reaction to certain types of cases.

So we see the role of the right-of-way man in the condemnation process is a most useful one. He is the cohesive force between the appraisers, the attorneys and his own department. He is the sole member of a condemning team that has participated in the entire process, starting from the initial contact with the property and ceasing only when the final judgment has been handed down.

The agent's knowledge and skills should be utilized to the fullest extent. In requesting condemnation, the right-of-way department should "follow through" and make every effort to assist the legal department. Liaison must be exercised, and the attorney must not be left to fend for himself, or to repeat much of the spade work that has already been done by the right-of-way department. The right-of-way agent's fund of knowledge should be tapped so that teamwork may exist and cohesive support be achieved.

## Highway Access\*

### INTRODUCTION

A good highway system must serve two functions. It must serve the landowners or occupiers of a particular area by providing a means of local access and travel. Secondly, it must provide an adequate network for longer distances or through traffic.

Before the widespread use of the automobile, the second function involving through traffic, was relatively unimportant. Roads were needed mainly by local residents to get to the county seat and by farmers to get to market. Today, while roads must still be built and maintained to serve this local function, the increased mobility of the population has elevated the importance of providing highways to serve through traffic as well as local service.

Since conventional highways were primarily constructed to serve local traffic rather than through traffic, the many intersecting public roads and private driveways made travel not only hazardous, but annoyingly time-consuming and uneconomical. Thus, a specially designed highway with a limited number of planned access points became necessary.

The terms, limited-access highway, controlled-access highway, expressway, express highway, access highway, throughway, parkway, freeway, and others have been applied to this specially designed highway. In this analysis, the term *expressway* will be used to denote this modern type of facility, and the terms parkway and freeway will be used to refer to certain types of expressways.<sup>1</sup>

Perhaps the most obvious need for expressways is to expedite traffic movement. Numerous grade intersections slow down traffic considerably, and the many turning movements on conventional highways greatly reduce their carrying capacity. Driving on such highways is not only wearing on the motorist's nerves, but on his vehicle as well. It results in a waste of time, energy, gasoline, rubber and steel.

Expressways are more economical from the taxpayer's point of view also. Many of the conventional highways have become functionally obsolete in some cases solely or largely because of the lack of access control. They are incapable of handling the present traffic load, necessitating expensive relocations and the construction of new highways to meet traffic demands.

\* Adapted from Highway Research Board Special Report 26, "Expressway Law, An Analysis," 1957.

Expressways are needed in the interests of conservation. The most valuable national resource of any nation is its human beings. Last year (1961) 38,000 persons lost their lives on the highway, and many thousands of others were injured.<sup>2</sup> Many of these accidents occurred at intersections. This factor assumes special importance in view of the fact that highways with full control of access were found to have an average of 2.4 fatalities per 100 million vehicle miles, whereas the fatality ratio on those highways with no control of access was 5.2. In other words, the highway designed with full control of access has been found to be over twice as safe in terms of fatalities as a highway without control of access.

The construction of expressways may decrease traffic hazards not only on the expressways themselves, because of the fewer number of intersections, but on conventional highways as well, by relieving traffic congestion.

Expressways are important not only from the point of view of the safety of individuals, but as an aid in the preservation of the nation. At a time of national emergency, an adequate highway system is a necessity for defense purposes and for survival.

The contemporary high standard of living, which has enabled a large percentage of Americans to own automobiles, coupled with the fact that everybody has more and more leisure time, has made the tourist activity an increasingly important one. A well-designed expressway may make it possible for people to travel greater distances in a shorter period of time and also appeal to the esthetic sense.

In order to preserve the controlled access feature on the Interstate System, Title 23, U.S.C., Section 112 of the 1956 act provides in part:

All agreements between the Secretary of Commerce and the State highway department for the construction of projects on the Interstate System shall contain a clause providing that the State will not add any points of access to, or exit from, the project in addition to those approved by the Secretary in the plans for such project, without the prior approval of the Secretary. Such agreements shall also contain a clause providing that the State will not permit automotive service stations or other commercial establishments for serving motor vehicle users to be constructed or located on the rights-of-way of the Interstate System.

The engineering aspects of the expressway have already been developed to an advanced stage, both from the standpoint of geometric design and operational features. It is important that a good legal framework be also developed to provide the sharpest tools possible for the important expressway programs now underway as well as for those contemplated for the future.

Although the expressway as a highway facility is a comparatively new creation, it is basically a product of evolution. The concept of controlling access is not a new one. There was some regulation of access to highways long before the first modern expressway was constructed. For example, access has been limited to one direction only

(one-way traffic) and restrictions as to the nature and number of private driveways have been imposed. The median strip on a divided highway has been another early form of limitation on access.

Thus, it is necessary to look to the common law to ascertain to what extent access to a highway could be controlled. Or to look at the question from the abutting property owner's point of view, what special rights does he have in the highway and to what extent are these rights protected? It is but logical, then, for the first portion of this chapter to deal with the common law relating to the protection of and restrictions on the rights of the abutting owner prior to the construction of modern expressways.

The second portion of this chapter is an analysis of the statutory law in existence at the present time. Because the expressway is a specially-designed highway, important special legal implications concerning it exist. Since 1937, all of the States have enacted specific legislation to deal with the special problems of the expressway.

The scope of inquiry into the statutes was necessarily limited to those sections which specifically pertain to expressways. Consequently, in some cases, where a State's expressway law does not cover a particular situation, the general highway law may be applicable, although it is not indicated in this report. In the absence of a judicial decision so stating, a determination that a provision in the general highway code applies to expressways would be speculative, at best.

#### THE COMMON LAW BACKGROUND

The study of the common law prior to the era of modern expressways is of more than mere historical interest. It is necessary to ascertain the extent of the rights of the abutting property owner or occupant in the conventional highway, in order to find out how far the highway authorities may go toward creating a highway with control of access. Important legal questions may be raised in connection with the creation of an expressway. For example, how may an abutter be prevented from coming directly onto the expressway? To what extent must an abutting owner be compensated for loss of this right to come onto the highway?

In the field of highway law, as in every area of the law, the major objective is effectively to balance the conflicting public and private interests involved. What interests are involved in the establishment of an expressway? In general, the major interest groups are as follows:

- (1) The *government* has as one of its fundamental functions the responsibility of constructing and maintaining the highway system. It is the duty of the legislature to provide for the best possible highway system which is adapted to the needs of the times at the least expense to the taxpayer and the highway user. At the present time, heavy high-speed traffic has created a demand for

may not be completely deprived of all ingress to and egress from his property. Vehicular access may be prohibited from the front of the property if there is access another way. Or if that is not possible, vehicular access may be restricted to the hours of least traffic congestion. The rules and regulations must be reasonable, balancing the public safety with individual interest.<sup>13</sup>

As has been suggested, access may be regulated to some extent under the police power. On the other hand, the power of government to deny access altogether is limited by the constitutional requirement that compensation be paid for the taking (and in some States, the damaging) of property.<sup>14</sup>

As has been indicated, the courts have considered the right of access to be a property right appurtenant to the land abutting the highway. As the Kentucky Supreme Court has phrased it:

The private right of the lot-owner in the adjacent street being conceded to be property, such appropriation or obstruction of the street as deprives him of its reasonable use deprives him to that extent of his property, and no reason is perceived why this species of property can be taken without just compensation rather than any other.<sup>15</sup>

An examination of the judicial decisions wherein the abutter has claimed compensation on constitutional grounds reveals that the courts are substantially in agreement as to the rules of law which apply, though there is some variation among the jurisdictions as to its application to particular fact situations.

Before an abutter is entitled to compensation for the impairment of his access rights, he must show that he suffers a special injury, differing in kind and not merely in degree from that suffered by the public in general.<sup>16</sup> The abutter is generally not entitled to compensation if the obstruction of his access merely causes him inconvenience or requires him to reach the system of highways by a more circuitous route. For example, where an abutter was compelled to travel one block further in one direction and two blocks in the other because of a highway improvement, it was held that he suffered only inconvenience and was not entitled to compensation.<sup>17</sup> The theory is that the public's interest in the road as an artery of travel is superior to the abutter's interest, and mere inconvenience to the abutter is not compensable.

The abutter is not entitled to access at *all* points of his property, and as long as a suitable means of access is left him, he has suffered no legal injury.<sup>18</sup> But in cases where the obstruction deprived the abutter of a "suitable" means of access<sup>19</sup> or where impairment of access resulted in loss in value of the property,<sup>20</sup> the abutter has been awarded compensation. In such situations, the abutter is deemed to have suffered a special injury differing from that suffered by the general public.<sup>21</sup> Of course, where all access is completely cut off and the owner is left landlocked, the abutter must be compensated since this is a taking of the property right of access.<sup>22</sup>

It has been held that if the property abuts the street, but does not abut the obstructed or vacated portion thereof, the abutter is not entitled to recover, the theory being that he has suffered no special injury differing from that suffered by the general public.<sup>23</sup> (See Fig. 1.)

On the other hand, there have been cases in which the property did not abut the vacated portion of the street and the owner was allowed compensation. The theory in these instances has been that the test is not whether the property abuts the vacated portion, but whether or not the owner has suffered a peculiar injury by being forced to use a dangerous route<sup>24</sup> or whether the property was left in a *cul-de-sac*, impairing the value of the property.<sup>25</sup> The Oklahoma court summed up the situations in which the landowner suffers special injury in the case of *Siegenthaler v. Newton*.<sup>26</sup>

1. Where the obstruction is in front of the abutting owner's property.
2. Where the obstruction, although not in front of the owner's property, is in such proximity that the use and enjoyment of his property is destroyed or greatly interfered with and the value of the property is thereby impaired.
3. Where the obstruction is not on the highway that abuts the owner's property but on a highway which is the *only* means of ingress and egress.

To allow compensation whenever the property is left in a *cul-de-sac* ipso facto does not seem consistent with the principle that circuitry of travel and inconvenience are not compensable. Access is obstructed in only one direction in a *cul-de-sac* and causes the owner to travel, in many instances, no more than a block further. (See Fig. 2.)

However, some courts have awarded the property owner compensation for his land being placed in a *cul-de-sac* on the theory that he is entitled to access in both directions.<sup>27</sup> In other instances, the courts have held that a property owner in a *cul-de-sac* is entitled to compensation if he suffers special injury through the material impairment of his right of ingress and egress.<sup>28</sup>

In the famous California case, *Bacich v. Board of Control of California*,<sup>29</sup> the plaintiff owned property on a street between two parallel streets. (See Fig. 3.) He thus had access from his property to either street. One of the parallel streets was closed. Although the plaintiff's property did not abut the closed crossing and he still had access

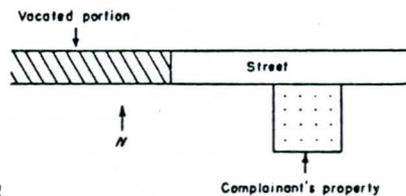


Figure 1. If property abuts the street but does not abut the obstructed or vacated section, access has not been impaired.

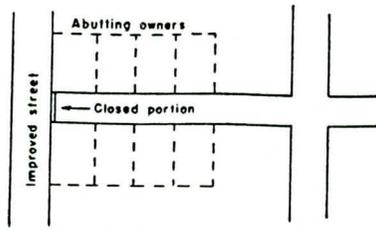


Figure 2. The courts are frequently confronted with the problem of whether to allow compensation for the creation of a *cul-de-sac* or dead-ending of existing streets.

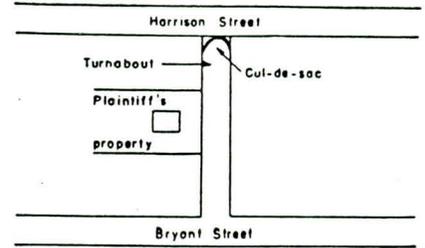


Figure 3. The location of the property involved in the *Bacich* case. Formerly the plaintiff had an outlet via both Bryant and Harrison Streets but now can use only Bryant Street. The grade of Harrison Street was lowered 50 feet.

to the other, he was awarded damages. In other words, the California court considered that the easement of access extends in both directions to the next intersecting street. A dissenting opinion thought that the court was repudiating the rule that circuity of travel is not compensable. On the same theory, the property owner in the situation diagrammed in Figure 4 was allowed compensation.<sup>30</sup>

However, circuity of travel beyond an intersecting street is deemed by the courts not to be compensable. In the illustration in Figure 5 the property owners were not allowed damages since it was not a *cul-de-sac* situation—they were not *deprived* of access in one direction, but the route was merely less convenient.<sup>31</sup>

Although it has been held that abutters in a *cul-de-sac* are entitled to compensation for loss of access, the better rule would seem to be that as long as the abutter still has access to the city street system he suffers only the inconvenience of more circuitous travel—an injury differing only in degree from that suffered by the general public—and is not entitled to compensation.<sup>32</sup> There is little reason to treat the *cul-de-sac* situation any differently from the other situations which cause more circuitous travel.

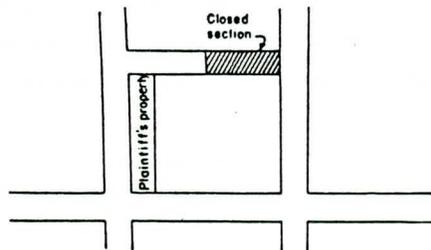


Figure 4. The *Beals* case in California. Recovery was permitted the property owner because of the resulting *cul-de-sac*.

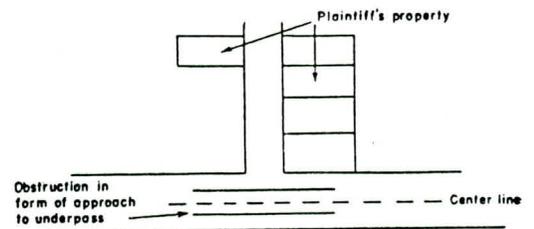


Figure 5. No recovery was permitted for obstruction of access in this case.

In many residential subdivisions *cul-de-sacs* are deliberately incorporated into the design, for reasons of safety and general amenities of living.<sup>33</sup>

### Air, Light and View

Although we are primarily concerned with access rights in connection with expressway law, the companion rights of air, light and view are also important, particularly in connection with grade separations or the raising or lowering of the grade. The proximity of an expressway to structures and buildings in congested urban areas also involves these rights. The rights of an abutter to air, light and view to and from the highway have been recognized by many courts as easements of property rights which "run with the land." For example, in a court case where a hotel owner sought to enjoin the construction of a large theater marquee below him because it obstructed air, light and view, an injunction was granted the hotel owner on the theory that an abutting owner has an easement of air, light and view over a highway as well as an easement of access.<sup>34</sup>

There has been much litigation involving the construction of elevated railroads causing injury to the abutter's easement of air, light, view and access.<sup>35</sup>

In a New York case, the plaintiff claimed compensation for damage to his rights of access, light and air and for invasion of privacy in the upper stories. It was held that he was entitled to compensation; that in addition to the right of passage, which the plaintiff had as one of the public, the plaintiff had other special rights—the rights of access, light and air, which were appurtenant to his lot. The court said that these were property rights within the meaning of the constitution.<sup>36</sup>

There is authority to the effect, however, that interference with air, light and view are only consequential damages when caused by some public improvement and such interference does not amount to a constitutional taking of property<sup>37</sup> or that only the property owner who abuts the obstructed part is entitled to compensation.<sup>38</sup>

The abutter's right of access arose because the primary function of the early roads was land service—i.e., to afford access to and from adjacent lands. It might be argued that this function of access does not afford a proper basis to give rise to the rights of light, air and view; that the function of the roads was merely to provide access and nothing more.

What kind of property right is the right of view? May it be bought and sold separately from the land or is it merely incidental to the use of the land? This question becomes important in relation to billboard control along expressways or any other kind of highway, for that matter.

It has been held that the easement of view is limited to the right appurtenant to a particular parcel of land. In 1943, a Vermont advertising corporation claimed that a statute regulating billboards was unconstitutional in that it deprived the corporation of property without due process of law. The court held, however, that the right of

view includes the right to display only goods or advertising matter which pertains to the business conducted thereon and the right cannot be transferred for general commercial use.<sup>39</sup>

### Typical Situations Involved in the Creation of an Expressway

In light of the foregoing discussion of the relation of the rights of the abutter to the power of the government to control and regulate such rights, let us examine typical situations which might arise in connection with the creation of an expressway. In general, an expressway may be established in two ways—by construction on an entirely new right-of-way or by designating an existing highway as an expressway and improving it to expressway standards.

*Where a new right-of-way is used* — The rights of access, air, view and light in a conventional highway spring into existence because the conventional highway is designed to serve the abutting landowner. Since an expressway is designed primarily to serve through arterial traffic and not the abutter, the very reason for these rights to accrue does not exist. Where an expressway is constructed on a new right-of-way, no rights previously existed, so nothing has been taken away. The courts have held that the abutter is not entitled to compensation for a right he never had.<sup>40</sup> Thus, where no land or improvement is taken, the abutting owner is entitled to no compensation. (See Fig. 6.)

The same reasoning applies where part of the abutter's land is taken. The abutter is not entitled to compensation for the failure to give him access to the expressway. (See Fig. 7.)

The situations in these two illustrations differ little except for the fact that in the second case part of the abutter's land is taken. Since the highway is on a new location, no right of access existed prior to construction so there is no *loss* of access to be compensated for. In either case, access rights do *not* become vested in the abutter at any time.

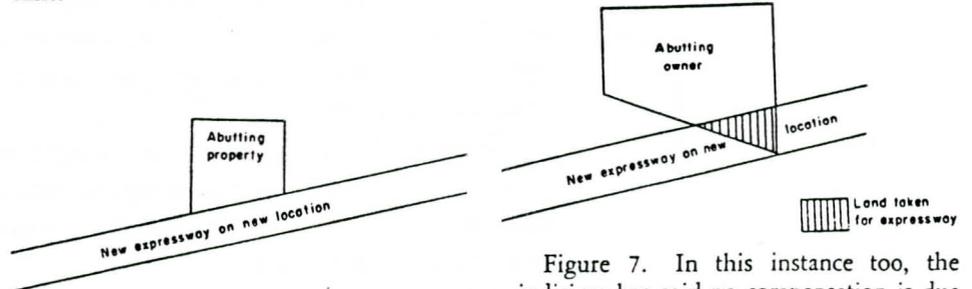


Figure 6. The courts are saying that abutting property is not entitled to compensation for access rights under these physical circumstances.

Figure 7. In this instance too, the judiciary has said no compensation is due the abutter for failure to give him direct access. He is paid, of course, for the land taken and damages to the remainder, if any.

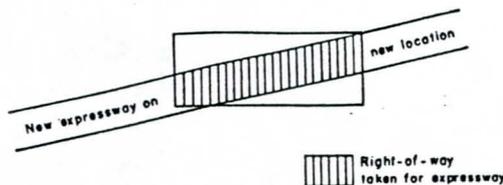


Figure 8. Here again, no access rights accrue to the abutter, because an expressway on a new location is involved, but compensation for land taken must be made and heavy severance damages to the remainder would seem to be involved in this instance.

The same reasoning is followed in situations where property is severed by a new right-of-way. (See Fig. 8.) The abutter is not entitled to compensation for lack of direct access.<sup>41</sup> In this situation, however, the fact that the property is severed with no direct access between the two parts of the land may materially impair the value of the remaining land not taken.<sup>42</sup> The general rule in measuring damages where land is taken for highway purposes is the current market value of the land taken plus the injury to the remainder, or the difference in the value of the land before and after taking.<sup>43</sup>

Even though an expressway is constructed on a new location, it is possible that previously-existing access is cut off from part of the land. (See Fig. 9.) If the abutter is thereby left without reasonable means of access to the general highway system, he is being deprived of property and is entitled to compensation.

*Where an existing highway is converted into an expressway* — Where the whole or a part of an existing conventional highway is converted into an expressway, existing access rights often must be acquired by the highway department. In such cases, (Figs. 10 and 11) even though no land is taken, access to the old highway may be cut off in whole or in part. If the landowner is left without reasonable access to the general highway system, he has a constitutional right to compensation. The value of the access which the landowner in Figure 11 had to the old highway would probably be

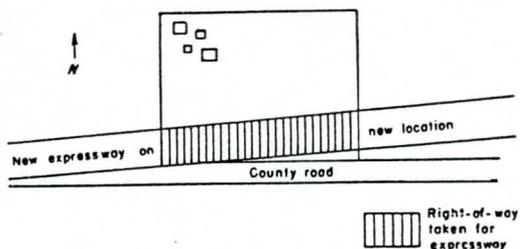


Figure 9. The expressway interferes with and obviously cuts off pre-existing access from the remaining land to the county road; it may even be land-locked. Compensation, in some form, must be made for injury to such access.

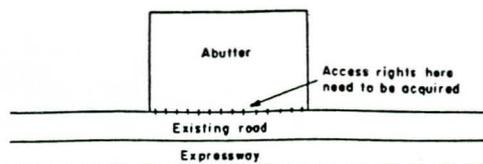


Figure 10. An existing conventional highway is converted to one of expressway design. If the abutter is deprived of access, his access rights must be acquired.

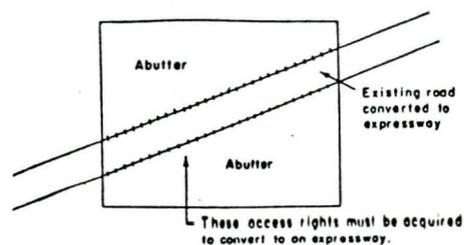


Figure 11. Access to the new expressway must be acquired from the abutting lands where the abutter is deprived of access. Compensation for these access rights will probably be much more substantial than in the previous illustration (Fig. 10).

much greater than that involved in the case in Figure 10; but the legal principles involved would be the same, since no land is taken in either case. Access rights must be acquired and paid for in both instances.

Where part of the abutter's land is taken (Figs. 12 and 13) and the abutter no longer has reasonable access to the system of highways, he must be paid for the loss of access as well as for the land taken for expressway right-of-way and damages to his remainder. In the situation shown in Figure 13, as in Figure 11, the value of the right of highway access would probably be greater. The denial of access might also be reflected in the damage to the remaining land not taken.

### Conclusions

The judicial decisions clearly indicate that all access cannot be completely denied without compensating the abutter. Even the most liberal interpretation of the police power has not allowed this. However, since the general rule is that circuity of travel and mere inconvenience of access are not compensable, it is possible that all direct access to an expressway could be denied without payment if the abutter has reasonable indirect access by means of another highway or frontage road. The reasoning applies only where the right of access is considered to be a right of reasonable ingress and egress to the general highway system. Naturally, the cost of access regulation achieved via the police power is much less than the cost of purchase or condemnation of access rights.

✓ However, the regulation of access under the police power does not work an undue hardship on the abutter, since his main concern is to have reasonable access to the general highway system, which the law assures him, and not to receive a windfall benefit at the taxpayer's expense. The regulation of access may cause inconvenience to the

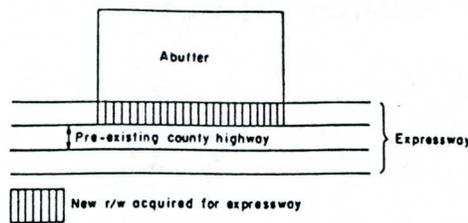


Figure 12. A portion of the abutter's property is taken for expressway right-of-way, which incorporates a pre-existing county highway as well. Access rights must be acquired and paid for in this instance unless the abutter has reasonable access by way of other public roads or streets.

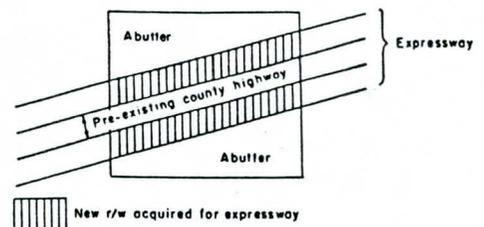


Figure 13. Essentially the same situation exists here as in Figure 12, except that access rights may concern a larger abutting frontage and severance damage might be involved.

abutter by forcing him to take a more circuitous route, but some inconvenience to the individual may be justified in the public interest, when better and safer facilities for travel are sought to be provided at reasonable cost.

#### THE STATUTES

Although the common law may grow and develop to meet the problems of changing times, to a great extent the hands of the judges are bound by precedent and if a new problem arises, frequently they can do nothing but apply the old rules of law. If the old law is inadequate, it is within the province of the legislature to change or clarify it.

✓ The State legislatures have generally thought that the common law principles relating to the control of highway access were insufficient to meet all the problems which arise in connection with expressways, and that new legal tools in the form of statutes were needed. Even though special legislation may not have been absolutely necessary in some of the States, it was perhaps felt that it was safer to enact a statute than to risk an adverse decision by the court. Also, certain other problems arising out of modern highway improvement, such as providing for roadside services, intergovernmental arrangements, local consent, and special traffic regulations for expressways, may merit statutory consideration.

In addition to the general provisions found in all types of legislation, such as "Separability or Severability," "Designation of Terms and Definitions," and "Declaration of Legislative Purpose," legislative provisions for expressways generally fall into the following categories:

## Governmental Unit Authorized to Construct or Designate Expressways

Expressway statutes generally specifically delegate the authority to plan, establish, improve, regulate, vacate and maintain such highways to the appropriate highway authorities so there is no doubt who is responsible for establishing and maintaining the expressway system. Many States have also given the authority to establish and maintain such modern highways to the county, city, town or village highway authorities within their respective jurisdictions, as well as to the State highway department.

### General Extent and Limitation of Authority

*Legislative standard for exercising administrative authority* — A general rule of administrative law is that in delegating authority to an administrative agency, a sufficient standard for the exercise of the authority must be spelled out by the legislature. Otherwise, the act may be held to be an unconstitutional delegation of arbitrary power. Such standards to guide highway officials in establishing expressways have been embodied in a number of expressway statutes. The standards are usually in broad terms so as not to restrict unnecessarily the legitimate activities of highway authorities. In general, they authorize the highway agency to act when traffic conditions, present or future, justify expressway facilities. Their inclusion in the law is based on the premise that legislative authority may not be delegated to an administrative agency without appropriate ground rules; otherwise such delegation may be construed as unconstitutional by the courts.

*Intergovernmental agreements* — Because of the complex nature of the highway systems, it is frequently impractical to establish an expressway without some kind of cooperation among several units of government. Accordingly, highway authorities in the majority of the States are specially authorized in the expressway statute to cooperate and enter into agreements with the Federal Government and with any Federal, State, or local agency, in order to facilitate the construction and maintenance of expressways. Such intergovernmental agreements include preliminary planning, financing, acquisition of land, construction, maintenance, operation, policing and traffic control.

*Requirement of consent of local governments* — An expressway may make drastic changes in traffic and land use patterns in cities and villages, thereby substantially affecting the life of the inhabitants. In order to preserve the interests of a municipality in its local streets, many States have subjected the action of the State highway administrative agency to the consent of the local governing authority having jurisdiction over the public highway in question. Generally, whatever local consent requirements, if any, may now exist in a particular State may be made applicable to the expressway program.

## Provisions Relating to the Construction of Expressway Projects

*Designation of both old and new roads as expressways* — If the authority to create an expressway is limited to the construction on new location only, an entirely new right-of-way would have to be acquired for each expressway. However, it is sometimes more practical to convert an existing road or a portion thereof into an expressway, and sometimes this is the only feasible course from an engineering point of view. The expressway statutes of many States give the highway authorities the power to control access on *existing* highways as well as on *new* highways on *new* locations.

*Elimination of intersections and railroad grade crossings* — When an expressway on a new location is constructed or an existing highway is converted into an expressway, some provision must be made for prohibiting or eliminating railroad grade crossings and highway intersections at grade with other existing highways which are not made a part of the expressway facility. The elimination of an intersection at grade might be accomplished either by closing off the intersection entirely, constructing an underpass or overpass, by a separation structure, or substituting a loop street or frontage road allowing access to the expressway at a different point. Highway authorities are generally empowered to eliminate these hazardous intersections; also, in many cases, the law requires the consent of appropriate highway authorities before any new street may intersect an expressway at grade, thus protecting the facility for the purpose intended. As previously stated, section 112 of the Federal-Aid Highway Act of 1956, Title 23 U.S.C., provides that all agreements between the Secretary of Commerce and the State highway department for the construction of projects on the Interstate System shall contain a clause providing that the State will not add any points of access to, or exits from, the project, in addition to those approved by the Secretary.

*Frontage roads* — Although an expressway is primarily designed for through traffic, the adjacent areas cannot be completely cut off from the expressway, particularly where such development is reasonably intense. The cost of acquiring the necessary property and property rights for the construction of the project might be greater if the adjacent area were completely deprived of both direct *and* indirect access, unless the expressway is established on new location. As an alternative, many of the States have provided by statute for the construction of frontage roads to provide access to adjacent property. Frontage or service roads or streets are local roads or streets designed to serve abutting owners and adjacent areas by providing a designed means of getting to and from the expressways.

The desirability of specific statutory legislation authorizing the closing of an existing road at its intersection with the expressway is illustrated by two recent court decisions. In one, the court held that the highway department did not have the authority to vacate or close intersecting highways since there was nothing in the

expressway statute specifically authorizing such action.<sup>44</sup> In the other, the court noted that the State's expressway law specifically provided for the closing of an intersecting road, and for this reason it was not necessary for the highway department to resort to the general street-closing procedure.<sup>45</sup>

When a frontage road is constructed to provide access where direct access has been cut off, there is some question as to whether the abutting landowner is entitled to compensation for impairment of his access, particularly where he or visitors (or customers) seeking access to his property may be required to travel a considerable distance to gain entrance to or exit from the main traveled roadway. Although circuitry of travel is not ordinarily considered compensable, some of the courts have taken the view that the placing of an abutting owner on a frontage road could result in sufficient impairment of his access to constitute an actual taking of his property. At the present time, analysis of court decisions handed down in a number of States indicate that each case is being decided on the merits.<sup>46</sup>

*Design* — It is axiomatic that not all expressways should be of exactly the same design. For example, an expressway may be designed to serve all types of vehicular traffic or only noncommercial traffic. Controlled access highways may then be either freeways or parkways. Provision has been made in the several statutes for the establishment of different types of expressways to accommodate different traffic and land use needs. If an expressway is defined as a highway with either full or partial control of access, as a number are, further opportunity is provided for relating the design to traffic and land use requirements.

In addition, many States have explicit design provisions in their expressway laws which authorize the highway authorities to design the facility so as to best serve traffic needs, and to divide the facility into separate roadways with physical separations. Provisions relating to the elimination of intersections and the construction of frontage or service roads also imply design features.

#### Acquisition of Property

More than half of the States have special provisions in their controlled-access or expressway legislation for acquiring property. Although there is some question as to whether such provisions are needed, since the highway authorities are already authorized to acquire land for highway purposes in the general highway law, authority to acquire the rights of access, air, light, and view is peculiarly necessary in the construction of expressways, since these rights cannot be completely extinguished under the police power. Also, a special property acquisition section might expedite the construction of these facilities. The most common elements of the acquisition provisions for expressways are as follows:

*Authority to acquire both private and public property* — In constructing an expressway, the best route may be one that requires the acquisition of land already in public ownership. Since it might prove very impractical and uneconomical if the highway authorities were allowed to acquire only private property, the majority of the States have included in their expressway statutes the power to acquire public, as well as privately-owned property.

*Methods of acquiring property* — The authority to acquire property for public use by eminent domain is inherent in sovereignty. The constitution and statutes of a particular jurisdiction generally spell out for what purposes and in what manner this power may be exercised. Thus, the constitution and statutes may be said to provide limitations or restrictions on an otherwise unlimited power of eminent domain.

The situation prior to the enactment of any expressway legislation was, in general, that compensation must be paid for the taking (and in some States, the damaging) of property for public use. This requirement is found in the due process clauses of the Federal and State constitutions. In every State, the highway authorities are authorized to acquire property for highway purposes, either by constitutional provision or by statute. Thus, the highway authorities' general authority is limited to "highway purposes" and compensation has to be paid for property acquired by condemnation.

The questions which arise in connection with expressways are: (1) Does the authority to acquire property include the authority to acquire rights of access, air, light and view? (2) Was the authorization to acquire property for highway purposes meant to include the authority to acquire property for expressways? That is, may the highway authorities acquire property for expressways in the same manner that they acquire property for conventional highways? It might be contended that only the conventional highway was thought of at the time this authorization was granted; since the authorization is in the nature of a limitation, it might be contended that the intent was to limit the authority to conventional highways.

The most common provision stipulating the means by which property may be acquired is to the effect that the authorities may acquire property by gift, devise, purchase or condemnation in the same manner as now authorized by law.

*Authority to acquire a fee simple title* — Although the general highway laws of the States frequently authorize the highway department to acquire a fee simple interest in property for highways, it is possible that, in the absence of special statutory authority, the courts might hold that the fee simple provision applies only to the conventional highways, since expressways were not considered by the legislatures at the time the general highway statutes were passed.

Additionally, the expressway is a creature differing substantially from a highway of conventional design. Its very nature presumes a greater degree of control than is involved with ordinary highways. Apparently many State legislatures have felt that such

necessary control can be achieved only through the acquisition of a greater type of property ownership than merely an easement, and have specifically authorized the highway departments to acquire, in appropriate instances, a fee simple interest in property for expressways. Acquisition of full title to property is considered by many States as the most effective way to exercise the kind of controls needed for highways of modern design.

*Authority to acquire rights of access, air, light and view* — In general the rights of access, air, light and view are controlled, within certain limitations, either by regulation under the State police power and without compensation to the abutter, or by acquiring such rights through purchase or condemnation on payment of just compensation to the abutter.

An existing highway might be converted into an expressway by regulating, rather than acquiring, access rights. Courts have said that mere circuity of travel is not compensable; and so long as an abutter has a reasonable means of access to the highway system, he is not entitled to compensation under the constitution.

On the other hand, in the process of laying out an expressway, the hardship to a particular abutter may be so great that the courts find it amounts to more than a mere regulation of access (or of air, light or view), and that it amounts to deprivation of property for which the constitution requires the payment of just compensation. In such a situation, if the authorities do not have the power to purchase or condemn these rights, the expressway plans would be thwarted. For this reason, specific provision for acquiring such rights and for compensating the abutter for his loss of property is included in the expressway statutes.

It might be repeated here that when an expressway is constructed on a *new location*, it is generally held that no rights of access accrue to the abutting owner.<sup>47</sup> Since no rights of access previously existed, nothing is taken from the landowner so the State need not pay compensation. However, in order to prevent these rights from arising, the highway must be designated as a controlled-access highway at the time of acquiring the right-of-way.

*Authority to acquire land in addition to immediate right-of-way needs* — In the interest of economy, some of the State legislature have authorized the highway departments to acquire land in excess of immediate right-of-way needs. If the highway departments are authorized to acquire only a sufficient amount of property for immediate right-of-way needs, the acquisition of additional land for highway improvements at a later date may be very costly to the taxpayer. For example, increased traffic in the future may make necessary an additional lane, but as a result of local economic conditions, the value of the land may have gone up considerably since the time of the original acquisition of the expressway right-of-way. For this reason, the statutes

of a number of States provide for acquisition of property for "present or future highway needs," as discussed in chapter 41.

When a parcel of property is severed by an expressway, the value of the taking and the damage to the remainder of the property not taken may be as great as the total value of the entire parcel. If access to part of the property is cut off completely, the portion that is thus landlocked may be rendered completely useless and worthless. Consequently it would be more economical for the highway authorities to acquire the whole parcel of land. To provide for this contingency, the majority of the States have included provisions in their expressway law to the effect that highway departments may acquire an entire lot, block or tract of land, if the interest of the public would be best served thereby, even though the entire amount is not needed for the right-of-way proper.

To demonstrate the effect of these statutory provisions, the following discussion and illustrations may be helpful:

In Figure 14, B's land is severed by the expressway right-of-way. If the triangular parcels on either side of the right-of-way are thereby rendered practically useless, the cost to the States may be as great if they pay severance damages as it would be if they acquired all of B's property. None of A's land is presently needed for the expressway right-of-way. However, the rate of increase in volume of traffic indicates that it will be necessary to acquire land adjacent to the presently-needed right-of-way five years from now, which will necessitate acquiring part of A's property, as indicated. The cost to the States five years from now may be much greater than at present, if the value of A's property responds to the superior highway improvement provided, as it is likely to do, or if there continues to be a rising land market.

To summarize the illustrations: (1) If the statute authorizes only acquisition of land for present expressway right-of-way, the shaded area shown in Figure 15

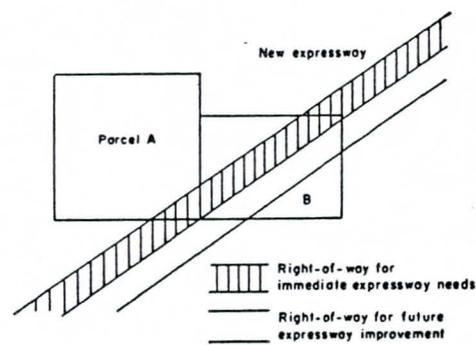


Figure 14. An illustration of the usefulness of having the legal authority to acquire an entire lot or tract of land in special cases where remnants or severance damages are involved.

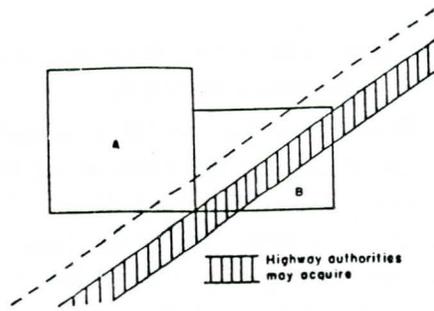


Figure 15. Where right-of-way can be acquired only for immediate needs for expressway right-of-way.

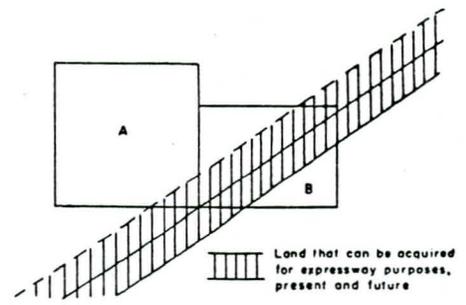


Figure 16. Statutory authority to acquire land for both present and future needs.

could be acquired. (2) If the statute authorizes acquisition for present and future right-of-way, the shaded area in Figure 16 could be acquired. (3) If the statute authorizes the acquisition of an entire parcel of land if it would be more economical to do so, the shaded area in Figure 17 could be acquired. (4) If the statute authorizes both (2) and (3) above, the shaded area shown in Figure 18 could be acquired.

### Provisions Relating to the Use of the Project

In general, there are two types of legislative provisions relating to the use of the project, designed to preserve the controlled-access features of expressways: (1) Provisions which deny or limit access, applying to all users of the facility, including the abutting owners, and (2) provisions regulating traffic on the expressway.

*Provisions denying or limiting access* — A large number of States specifically provide for denying or limiting access to ensure that no new rights of access, air, light or view shall accrue to an abutter and destroy the controlled-access nature of the expressway. Generally, these statutes provide that no person shall have any right

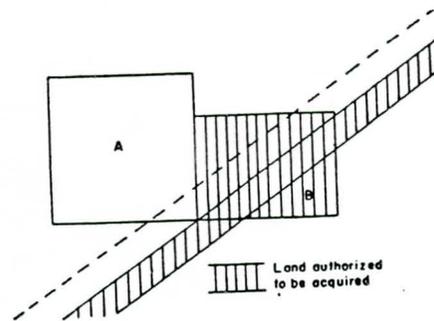


Figure 17. Authority to acquire an entire parcel of land.

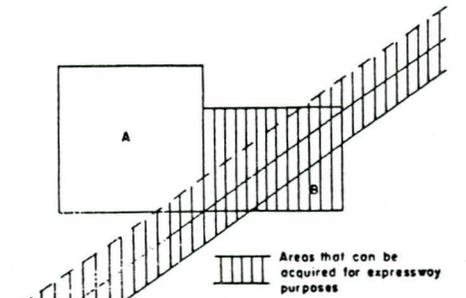


Figure 18. Authority to acquire land for both present and future needs and authority to acquire an entire parcel of land.

of ingress or egress to, from or across the controlled-access facility to or from abutting land, except at designated points at which access may be permitted, upon such terms and conditions as may be specified from time to time. It should be noted that this provision applies to all persons—travelers, abutter, invitees, licensees and others—so that it constitutes, in effect, both a traffic regulation and a specific denial of access to abutting land.

Some of the States also have provisions authorizing the highway departments to provide a crossing when land is severed by an expressway. Generally, these designated crossings are effective only as long as the two parcels are under one ownership. If the owner sells one parcel, he loses his rights with respect to the crossing. In some cases, the use for which the crossing is provided is also specified, for farm purposes, for example, or for a one-family residence. Such a qualification could serve to prevent a more intensive use of the crossing in the future, if, for instance, the use of the abutting land was converted to an apartment development.<sup>48</sup>

*Traffic regulations* — It is axiomatic that traffic regulations are necessary in connection with the use of all highways, in order to minimize traffic accidents and promote the most efficient operations of the facilities. Motorists are not permitted to drive in any direction on any lane they please or drive at any speed they wish, even on a conventional highway. The regulation of the conduct of the highway user has long been considered necessary in the public interest.

More than half of the States have special provisions for the regulation of traffic on expressways, either by spelling out specific regulations in the legislative enactment or generally authorizing the highway department to regulate the use of the project. The very nature of an expressway, being a highway with controlled access, makes necessary further regulation of its use. The two most common provisions at this time read as follows:

- (1) It is unlawful for any persons:
  - (a) to drive a vehicle over, upon, or across any curb, central traffic section, or other separation or dividing line on controlled-access facility;
  - (b) to make a left turn or U-turn except through openings provided for that purpose;
  - (c) to drive any vehicle except in the proper lane and to the right of the central dividing curb or line;
  - (d) to drive any vehicle onto a controlled-access facility from a local service road, except through an opening provided for that purpose.
- (2)
  - (a) No person shall drive onto or from any limited-access roadway except at such entrances and exits as are established by public authority.
  - (b) The State highway department, the motor vehicle department, with the approval of the governor, or local authorities may by ordinance with respect to any controlled-access highway under their respective jurisdictions prohibit the use of any such limited-access roadway by pedestrians, bicycles, or other nonmotorized traffic or by motorcycles.

## FOOTNOTES

1. See definitions of these terms officially adopted by the American Association of State Highway Officials, Appendix A.
2. Accident Facts, 1962.
3. *Barham v. Grant*, 185 Ga. 601, 196 S.E. 43 (1938); *Puples v. Aydelott*, 125 Ark. 50, 187 S.W. 671 (1916); *Town of Norwalk v. Podmore*, 86 Conn. 658, 86 Atl. 582 (1913); *Mayor of City of Macon v. Wing*, 113 Ga. 90, 38 S.E. 392 (1901); *Elizabethtown, Lexington & Big Sandy R.R. Co. v. Combs*, 73 Ky. (10 Bush.) 382, 19 Am. Rep. 67 (1874); *Hubbard v. Deming*, 21 Conn., 356 (1851).
4. *Northio-Theatres Corp. v. 226 Main Street Hotel Corp.*, 313 Ky. 329, 231 S.W.2d 65 (1950); *Liddick v. City of Council Bluffs*, 232 Iowa 197, 5 N.W.2d 361 (1942); *Lowell v. Pendleton Auto Co.*, 123 Ore. 383, 261 Pac. 415 (1927); *Fry v. O'Leary*, 141 Wash. 465, 252 Pac. 111 (1927); *Davis v. Spragg*, 72 W. Va. 672, 79 S.E. 652 (1913); *Williams v. Los Angeles Ry. Co.*, 150 Cal. 592, 89 Pac. 330 (1907); *State v. Superior Court*, 30 Wash. 219, 70 Pac. 484 (1902).
5. See *Raskin Hotel Co. v. City of Cincinnati*, 97 Ohio App. 424, 126 N.E.2d 922 (1954); *Adams v. Grapotte*, Tex. Civ. App., 69 S.W.2d 460 (1934); *Yates v. Big Sandy Ry. Co.*, 28 Ky. Law Rep. 206, 89 S.W. 108 (1905); *Ross v. Thompson*, 78 Ind. 90 (1881).
6. *Chesapeake and Ohio Ry. Co. v. Rice*, 20 Ky. Law Rep. 1930, 50 S.W. 541 (1899).
7. See, *Greenberg v. L. I. Snodgrass Co.*, 95 Ohio App. 307, 119 N.E. 2d 114 (1953); *County Park Commission of Camden County v. Kimble*, 24 N.J. Super 221, 93 A.2d 647 (1952); *State Highway Board v. Baxter*, 167 Ga. 124, 144 S.E. 796 (1928); *Town of Norwalk v. Podmore*, 86 Conn. 658, 86 Atl. 582 (1913). A fee simple title is a complete bundle of interests in lands possessed by the owner, his heirs and assigns forever, and without limitation or condition. An easement in land is a more limited right; it is the right to use the land of another for a special purpose not inconsistent with the general property in the owner. See *Black's Law Dictionary* (4th Ed. 1951).
8. *Hathaway v. Sioux City*, 244 Iowa 508, 57 N.W.2d 228 (1953); *Leslie v. Mathewson*, Mo. App., 257 S.W.2d 394 (1953); *State Highway Board v. Baxter*, 167 Ga. 124, 144 S.E. 796 (1928); *Haynes v. Thomas*, 7 Ind. 38 (1855); In *Anderlik v. Iowa State Highway Commission*, 240 Iowa 919, 38 N.W.2d 605 (1949), the court held the same to be true of the rights of air, light and view.
9. See *Adams v. Commissioners of Town of Trappe*, 204 Md. 165, 102 A.2d 830 (1954); *McGowan v. City of Burns*, 172 Ore. 63, 137 P.2d 994 (1943); *King v. Stark County*, 66 N.D. 467, 266 N.W. 654 (1936); *State v. Nelson*, 189 Minn. 87, 248 N.W. 751 (1933).
10. *City of Memphis v. Hood*, 208 Tenn. 319, 345 S.W. 2d 887 (1961); *Chissell v. Mayor & City of Baltimore*, 193 Md. 535, 69 A.2d 53 (1949); *Cavanaugh v. Gerk*, 313 Mo. 375, 280 S.W. 51 (1926); *Commonwealth v. Nolan*, 189 Ky. 34, 224 S.W. 506 (1920).
11. *Department of Public Works and Bldgs. v. Mabee*, 22 Ill. 2d 202, 174 N.E.2d 801 (1961); *New Way Family Laundry, Inc. v. City of Toledo*, 171 Ohio St. 242, 168 N.E.2d 885 (1960); *State v. Ensley*, 240 Ind. 472, 164 N.E.2d 342 (1960); *Muse v. Mississippi State Highway Department*, 223 Miss. 694, 103 So.2d 839 (1958); *Walker v. State*, 48 Wash. 2d 587, 295 P.2d 328 (1956); *Brady v. Smith*, 139 W. Va. 259, 79 S.E.2d 851 (1954); *City of Fort Smith v. Van Zandt*, 197 Ark. 91, 122 S.W.2d 187 (1938); *But see Dougherty County v. Hornsby*, 213 Ga. 114, 97 S.E.2d 300 (1957) in which the court held that a county was liable to an abutting landowner for depreciation in value of his property caused by construction of a dividing strip.
12. *Jones Beach Boulevard Estate v. Moses*, 268 N.Y. 362, 197 N.E. 313 (1935). See also *Walker v. State*, Wash., 295 P.2d 328 (1956); *Raskin Hotel Co. v. City of Cincinnati*, 97 Ohio App. 424, 126 N.E.2d 922 (1954); *Simpson v. City of Los Angeles*, 4 Cal.2d 60, 47 P.2d 474 (1935); *Home Laundry Co. v. City of Louisville*, 168 Ky. 499, 182 S.W. 645 (1916).
13. *Breinig v. County of Allegheny*, 332 Pa. 474, 2 A.2d 842 (1938). However, in this case the court held that the authorities abused their discretion in revoking the plaintiff's permit. Although the authorities had the *power*, in this instance traffic conditions did not warrant the revocation of the driveway permit. See *Alexander Co. v. City of Owatonna*, 222 Minn. 312, 24 N.W.2d 244 (1946); *Anzalone v. Metropolitan District Commission*, 257 Mass. 32, 153 N.E. 325 (1926).

14. State constitution citations omitted, United States Constitution, Fifth Amendment. In *Sauer v. New York*, 206 U.S. 536 (1906) the United States Supreme Court said that nothing in the Federal Constitution obliges the States to recognize any particular interests of an abutting landowner in access to the highway. The determination of whether the right of access is a property right is left up to the State concerned.
15. *Elizabethtown, Lexington and Big Sandy Railroad Company v. Combs*, 73 Ky. (10 Bush) 382, 389, 19 Am. Rep. 76 (1874). See also *State Roads Commission v. Franklin*, 201 Md. 549, 95 A.2d 99 (1953); *Sweet v. Irrigation Canal Co.*, 198 Ore. 166, 254 P.2d 700 (1953); *State v. Kauer*, 156 Ohio St. 347, 102 N.E.2d 703 (1951); *L-M-S Inc. v. Blackwell*, Tex. Civ. App., 227 S.W.2d 593 (1950); *Newman v. Mayor of Newport*, 73 R.I. 385, 57 A.2d 173 (1948); *Brown v. Hendricks*, 211 S.C. 395, 45 S.E.2d 603 (1947); *State v. Department of Highways*, 200 La. 409, 8 So.2d 71 (1942); *Stock v. Cox*, 125 Conn. 405, 6 A.2d 346 (1939); *Chesapeake and Ohio Ry. Co. v. Eastham*, 249 Ky. 136, 60 S.W.2d 361 (1933); *Occo Realty Co. v. New York, C. St. L. R. Co.* 33 Ohio App. 414, 169 N.E. 719 (1929); *Mayor of City of Macon v. Wing*, 113 Ga. 90, 38 S.E. 392 (1901).
16. See *Drane v. Avery*, 72 Ariz. 100, 231 P.2d 444 (1951); *Myers v. Strauss*, 17 Kan. 91, 229 P.2d 774 (1951); *Floyd v. Blacksher Co.*, 254 Ala. 32, 47 So.2d 168 (1950); *West v. Keith*, 154 Wash. 682, 283 Pac. 198 (1929); *Humphrey v. Krutz*, 77 Wash. 152, 137 Pac. 806 (1913); *Wilson v. West & Slade Mill Company*, 28 Wash. 312, 68 Pac. 716 (1902), where the abutter was held to be entitled to an injunction against the obstructing of his access or entitled to abatement as a nuisance because he suffered special injury. See also *Daniels v. Blake, R.I.*, 99 A.2d 7 (1953); *Leitzsey v. Fellers*, 181 S.C. 401, 187 S.E. 740 (1936); *Richmond v. City of Hinton*, 117 W. Va. 223, 185 S.E. 411 (1936); *Sohn v. Cambern*, 106 Ind. 302, 6 N.E. 813 (1886); *McGowan v. Whitesides*, 31 Ind. 235 (1869), where the abutter was denied relief because he failed to show injury peculiar to himself not common to the public.
17. *Lingo v. Page County*, 201 Iowa 906, 208 N.W. 327 (1926).
18. *Johnson v. Burke County*, 101 Ga. 747, 115 S.E.2d 484 (1960); *Iowa State Highway Commission v. Smith*, 248 Iowa 869, 82 N.W.2d 755 (1957); *State v. Linzell*, 163 Ohio St. 97, 126 N.E.2d 53 (1955); *U.S. v. Alderson, W. Va.* 53 F. Supp. 528 (1944); *State v. Department of Highways*, 200 La. 409, 8 So.2d 71 (1942); *Fecher v. Allegheny County*, 313 Pa. 191, 169 Atl. 87 (1933); *Newton v. New York, New Haven and Hartford R. Co.*, 72 Conn. 420, 44 Atl. 813 (1899). *But see Smith v. State Highway Commission*, 185 Kan. 445, 346 P.2d 259 (1959) permitting compensation to owner whose access was restricted to one point.
19. *Holmes v. State*, 282 App. Div. 278, 123 N.Y.S.2d 170 (1953); *Mayor of Athens v. Gamma Delta Chapter House Corp.*, 86 Ga. App. 53, 70 S.E.2d 621 (1952); *Bennett v. Nations*, 49 N.M. 389, 164 P.2d 1019 (1946).
20. *City of Atlanta v. Dinkins*, 46 Ga. App. 19, 166 S.E. 429 (1932).
21. *Bennett v. Nations*, 49 N.M. 389, 164 P.2d 1019 (1946); *Husband v. Cotton*, 171 Ky. 177, 188 S.W. 380 (1916).
22. See *In re Platte Valley Public Power & Irrigation District*, 132 Neb. 822, 273 N.W. 268 (1937).
23. *Handlan-Buck Company v. State Highway Commission, Mo.*, 315 S.W.2d 219 (1958); *In re East Fifth Street, Borough of Manhattan*, 1 Misc.2d 977, 146 N.Y.S.2d 794 (Sup. Ct. 1955); *Hanson v. City of Omaha*, 157 Neb. 403, 59 N.W.2d 622 (1953); *Christy v. Chicago, B. & Q. R. Co.*, 240 Mo. App. 632, 212 S.W.2d 476 (1948); *McGrath v. Stevenson*, 194 Wash. 160, 77 P.2d 607 (1938); *City of Lynchburg v. Peters*, 156 Va. 40, 157 S.E. 769 (1931); *Freeman v. City of Centralia*, 67 Wash. 142, 120 Pac. 886 (1912); *Ponsichil v. Hoquiam Sash and Door Co.*, 41 Wash. 303, 83 Pac. 316 (1906); *Dantzer v. Indianapolis Union Ry. Co.*, 141 Ind. 604, 39 N.E. 223 (1894).
24. *Mabe v. State*, 300 P.2d 799 (Idaho 1961); *Denver Union Terminal Ry. Co. v. Glodt*, 67 Colo. 115, 186 Pac. 904 (1920).
25. *City of Rock Hill v. Cothran*, 209 S.C. 357, 40 S.E.2d 239 (1946). See also *Cooke v. City of Portland*, 136 Ore. 233, 298 Pac. 900 (1931).
26. 174 Okla. 216, 50 P.2d 192 (1935).
27. See *Grand River Dam Authority v. Misenhimer*, 195 Okla. 682, 161 P.2d 757 (1945); *Bacich v. Board of Control of California*, 23 Cal.2d 343, 144 P.2d 818 (1944); *Felton v. State Highway Board*, 47 Ga. App. 615, 171 S.E. 198 (1933); *Oler v. Pittsburgh C. O. and St. L. Ry. Co.*, 184 Ind. 431, 111 N.E. 619 (1916); *Park City Yacht Club v. City of*

- Bridgeport, 85 Conn. 366, 82 Atl. 1037 (1912). See also *In re William and North William Sts.* 177 N.Y.S. 318, 188 App. Div. 668 (1919).
28. *Atchison, T. & S.F. Ry. Co. v. Terminal Oil Mill Co.*, 180 Okla. 496 71 P.2d 617 (1937). *Falender v. Atkins*, 186 Ind. 455, 114 N.E. 965 (1917).
  29. 23 Cal.2d 343, 144 P.2d 818 (1944).
  30. *Beals v. City of Los Angeles*, 23 Cal.2d 381, 144 P.2d 839 (1944).
  31. *Beckham v. State*, 64 Cal. App. 2d 487, 149 P.2d 296 (1944).
  32. *City of Bellevue v. Stedman*, 138, Ohio St. 281, 34 N.E.2d 769 (1941); *Licht v. State*, 251 App. Div. 524, 298 N.Y.S. 136, 277 N.Y. 216, 14 N.E.2d 44 (1938).
  33. See *Legal Aspects of Controlling Highway Access*, David R. Levin, Public Roads Administration, Federal Works Agency, 1945.
  34. *Northio Theatres Corp. v. 226 Main Street Hotel Corp.*, 313 Ky. 329, 231 S.W.2d 65 (1950); see also *Anthony Carlin Co. v. Halle Bros. Co.*, 23 Ohio App. 115, 155 N.E. 398 (1926); *Seattle Transfer Co. v. City of Seattle*, 27 Wash. 520, 68 Pac. 90 (1902); *Lamm v. Chicago St. P.M.&O. Ry. Co.*, 45 Minn. 71, 47 N.W. 455 (1890); *Galway v. Metropolitan El. Ry. Co.*, 58 Hun. 610, 12 N.Y.S. 47 (1890); *Mattlage v. New York El. R. Co.*, 58 Hun. 603, 11 N.Y.S. 482 (1890); *Adams v. Chicago B.&N.R. Co.*, 39 Minn. 286, 39 N.W. 629 (1888); *Barnett v. Johnson*, 15 N.J. Eq. (2 McCart) 48 (1856). See *Anderlik v. Iowa State Highway Commission*, 240 Iowa 919, 38 N.W.2d 605 (1949); *Single v. State*, 186 Misc. 452, 59 N.Y.S.2d 536 (1946); *People v. Ricciardi*, 23 Cal.2d 390, 144 P.2d 799 (1943); *Schwede v. Hemrich Bros. Brewing Co.*, 29 Wash. 21, 69 Pac. 362 (1902), where easements of access also were involved.
  35. See *New York Cent. R. Co. v. Harrison*, 272 App. Div. 531 (1947); 74 N.Y.S.2d 333 (1947) *Harrison v. New York Cent. R. Co.*, 255 App. Div. 183, 6 N.Y.S.2d 978 (1938); *In re Elevated Railroad Structures*, 229 App. Div. 617, 243 N.Y.S. 665 (1930); *In re Forty-Second St. Spur of Mnahattan Ry. Co.*, 126 Misc. 879, 216 N.Y.S. 2 (1926); *Rourke v. Holmes St. Ry. Co.*, 221 Mo. 46, 119 S.W. 1094 (1909); *Muhlker v. New York and H.R. Co.*, 197 U.S. 544, 25 S.Ct. 522, 49 L.Ed. 872 (1905); *State v. Superior Court*, 30 Wash. 219, 70 Pac. 484 (1902); *State v. Superior Court*, 26 Wash. 278, 66 Pac. 385 (1901); *Lewis v. New York and H.R. Co.*, 25 Misc. 13, 54 N.Y.S. 434 (1899); *Metropolitan W.S. El. R. Co. v. Springer*, 171 Ill. 170, 49 N.E. 416 (1897); *Lamm v. Chicago, St.P.M.&O. Ry. Co.*, 45 Minn. 71, 47 N.W. 455 (1890); *Adams v. Chicago B. & N.R. Co.*, 39 Minn. 286, 39 N.W. 629 (1888); *Lohr v. Metropolitan Elevated R. Co.*, 104 N.Y. 268, 10 N.E. 528 (1887); *Story v. New York Elevated R.R.*, 90 N.Y. 122, 43 Am. Rep. 146 (1882).
  36. *Story v. New York Elevated R.R. Co.*, 90 N.Y. 122, 43 Am. Rep. 146 (1882). But see *Sauer v. New York*, 206 U.S. 536 (1907).
  37. *Weir v. Palm Beach County*, 85 So.2d 865, Fla. (1956); *Mayor and City Council of Baltimore v. Himmelfarb*, 172 Md. 628, 192 Atl. 595 (1937); *Perlmutter v. Greene*, 259 N.Y. 327, 182 N.E. 5 (1932); *In re Soldiers' & Sailors' Memorial Bridge*, 308 Pa. 487, 162 Atl. 309 (1932); *Henry Gauss & Sons Mfg. Co. v. St. Louis, K. & N.W. Ry. Co.*, 113 Mo. 308, 20 S.W. 658 (1892).
  38. *Kemp v. City of Seattle*, 149 Wash. 197, 270 Pac. 431 (1928); *Taft v. Washington Mutual Savings Bank*, 127 Wash. 503, 221 Pac. 604 (1923).
  39. *Kelbro, Inc. v. Myrick*, 113 Vt. 64, 30 A.2d 527 (1943). See *Wilson, Ruth I., Billboards and the Right to be Seen from the Highway*, 30 Geo. L.J. 723 (1942).
  40. *Lehman v. Iowa State Highway Commission*, 251 Iowa 77, 99 N.W.2d 404 (1959); *State v. Calkins*, 50 Wash. 2d 716, 314 P.2d 449 (1957); *State of Missouri v. Clevenger*, 365 Mo. 970, 291 S.W.2d 57 (1956); *Carazalla v. State of Wisconsin*, 269 Wis. 593, 71 N.W.2d 276 (1955); *Robinson v. State*, 207 Misc. 325, 137 N.Y.S.2d 673 (1955); *Smick v. Commonwealth, Ky.*, 268 S.W.2d 424 (1954); *State Highway Commission v. Burk*, 200 Ore. 211, 265 P.2d 783 (1954); *Schnider v. State*, 38 Cal.2d 439, 241 P.2d 1 (1952). *Contra Blount County v. Campbell*, 268 Ala. 548, 109 So.2d 678 (1959).
  41. But see *Riddle v. State Highway Commission of Kansas*, 184 Kan. 603, 339 P.2d 301 (1959) in which the court held that the owner of land, a portion of which was taken for an expressway on new location was entitled to compensation for injury to his remaining land.
  42. *Arkansas State Highway Commission v. Union Planters National Bank*, 231 Ark. 907, 333 S.W.2d 904 (1960).
  43. See *United States Gypsum Co. v. Mystic River Bridge Authority*, 329 Mass. 130, 106 N.E.2d 677 (1952); *State v. Rozzelle*, 101 Utah 464, 120, P.2d 276 (1941); *Smith v. Mississippi*

- State Highway Commission, 183 Miss. 741, 184 So. 814 (1938); *Watson v. Chesapeake & Ohio Ry. Co.*, 238 Ky. 31, 36 S.W.2d 641 (1931), on the right of view.
44. *Hulbert v. Linzell*, 167 Ohio St. 350, 148 N.E.2d 675 (1958).
  45. *Warren v. Iowa State Highway Commission*, 250 Iowa 473, 93 N.W.2d 60 (1958).
  46. For a comprehensive discussion of this matter, see *Covey, Frontage Roads: To Compensate or Not to Compensate*, *Northwestern University Law Review*, Vol. 56, No. 5, November-December 1961, p. 587.
  47. Case cited note 40 *supra*.
  48. It might be noted parenthetically that in the absence of such provisions the courts have upheld the highway department's authority to (1) restrict access to a farm crossing (*State v. Wolfe*, 80 Idaho 563, 335 P.2d 884 (1955)), and (2) limit access to such traffic as would be used by a one-family residence (*State v. Superior Court*, 47 Wash. 2d 335, 287 P.2d 494 (1955)). On the other hand, where no comparable statutory provision existed, a U.S. court held that an easement of access reserved by owners of agricultural property in connection with a donation of land for the highway permitted access thereto from an apartment and shopping center development constructed by subsequent owners (*United States of America v. Belle View Apartments*, 217 F.2d 636 (1954)).

## CHAPTER 11

### Land Titles

WILKIE CUNNYNGHAM

*Assistant Chief Counsel,  
Missouri State Highway Commission*

*and*

RALPH C. BORDLEY

*Right-of-Way Specialist  
Bureau of Public Roads*

The possession of land has always been one of man's most zealously guarded rights. Land was originally held by the right of conquest and the size of the holding was limited only by the strength of the possessor. With the joining together of families into tribes, the possession of land was vested in the tribe and held by the chief. Later, as the tribes evolved into nations, this possession was transferred to a super-chief or a king who granted the use of the tracts of land under his control to his subchiefs. The extent of the king's holdings was usually defined by natural geographic boundaries or lines of defense but the limitations on his grants of use did not have such easily distinguishable boundaries. Since the king wished to maintain peace within his realm, it became necessary to define the limitations of these grants of use to prevent their extension through the right of conquest.

In 1086, by order of William the Conqueror, a minute and accurate survey of the lands of England was made and recorded in the Domesday Book. In later years, these surveyed tracts were further subdivided and grants were made to others. Possession of these tracts was transferred, upon death, to the eldest son, by the right of succession. The grant of use evolved into a title to the land and a statute of frauds was enacted that required all land transactions to be put into writing. These written documents were preserved so that they would be available for future reference.

The most significant exception to the adoption of English law in the American colonies was the abandonment of feudal tenure in favor of allodial tenure, that is, the ownership of land without any obligations to any lord or superior. The importance to the economy of the free alienability and the unencumbered salability of land was recognized along with the fact that these qualities depend upon the assurance of a

title to the land. In 1640, the Colony of Massachusetts enacted a Registry Act to establish the priority of rights and the protection of subsequent purchasers against all secret and unknown rights and encumbrances. This act, which became the cornerstone for the American recording system, was, to a certain degree, unique as at that time there was not an exact foreign prototype of it.

From this has evolved our present system of land records whereby it is possible to trace the ownership of a parcel of land through all of the owners to the point where it first came under the control of a sovereign body. This unbroken record of ownership is known as the chain of title and in any conveyance of land it is necessary to trace this chain of title to determine if the conveyer has the sole right to convey the land or whether the approval of another party or parties is also necessary.

In the acquisition of a right-of-way for the construction of a highway, this chain of title will be investigated several times, and in various degrees of thoroughness. This information will be utilized in the appraisal of the land to be acquired and by the person who will make a complete search of the title and provide an abstract of this search. This abstract will inform the right-of-way man of all of the parties whose approval he will have to obtain to complete the transfer of title to the land. When the approval of all parties having an interest in the land has been obtained or a court of law has required them to acquiesce to the acquisition, it is necessary to make one more search of the title, to ascertain if any changes have taken place since the first complete search.

In some jurisdictions every phase of the title investigation is handled by a title guaranty company under a blanket contract. The title company also acts as the escrow agent and the closing attorney, thus completing the entire job from start to finish. In other areas only a portion of the title investigation is contracted to private attorneys or title companies and in still others the entire job may be handled by a special section of the legal staff of the highway department.

The acquisition of the necessary title information required for appraisal and negotiation purposes and for the actual transfer of the title to the land is probably handled differently by each State. The following breakdown of the various segments of information does not necessarily correspond to that in use by any State. It is used to show the sequence of events that take place and how the various segments of information are obtained and used in the acquisition of right-of-way for highway purposes.

#### **Preliminary Ownership Report**

When it becomes necessary for a survey party to enter upon the land of an individual property owner, common courtesy, good public relations and, usually, department policy dictate that the party chief call upon the property owner and request

permission to enter upon his land. During the course of this meeting, the party chief will determine the name and address of the fee owner or owners and the source from which they derived this ownership. If the possession was conveyed by a deed, he will attempt to obtain the deed reference, and the page and book in which the deed is recorded in the local land records. If this reference is not available, he will determine, as closely as possible, the date on which the transfer took place and the person or persons from whom the land was transferred. If the occupant of the property is not the fee owner, the party chief will determine the degree and terms of his possession and the source, date and term of this possession. He will also inquire into the existence of any mortgages, liens or any other claims against the land. Before leaving he will request the occupant to show him the boundaries of the property and to name the adjacent property owners. In this way, he will be sure that he has not missed any parcel of land along the route of the survey, and incidentally he will be able to greet the adjoining property owner by his name, which usually creates a good impression.

In some areas, he may be required to check his information in the land or will records and in others he may not, but in many cases he will want to copy the exact description, as recorded in the deed, of the property or to establish the location of a stone or marker with reference to the property or to a known point on his survey line. To obtain this information, he will have to conduct a search of the chain of title in the land records until he comes to a deed description that is satisfactory for his purposes. This search will consist of merely a check of the deed from the former owner to the present owner, the owner prior to him to the former owner, and so on back down the line.

The information that is obtained by the survey party chief cannot, in any instance, be considered a title search but it will provide the basic information with which to begin a title search.

The party chief will also make copies of any plats of any subdivisions or commercial developments that have been filed in compliance with zoning or building permit regulations. These plats will be tied into his survey along with plats of water, sewer, transmission or other utility lines or facilities that are located within the area to be surveyed.

That portion of the information that is pertinent to the highway construction will be platted on the right-of-way plats and construction plans. Then all of it will be turned over to the right-of-way section for their use.

Should the initial surveys be conducted by photogrammetry, this information will ordinarily have to be obtained by the right-of-way man when the project is turned over to him, except in those States where all of the phases of title data are secured by a

title guaranty company or a special section of a State agency that is charged with this responsibility.

Under ideal circumstances, the title search would be ordered as soon as there was enough information to positively identify the property and it would be completed before any phases of the appraisal or negotiations were begun. This situation seldom occurs due to the length of time required to complete a title search and the time limit allocated to the right-of-way department to complete the acquisition. Therefore, there is often a duplication of effort by the right-of-way agent and the title abstracter in the investigation of the title.

#### Intermediate Title Report

When the information noted above is obtained by the right-of-way agent, either through his own efforts or from another source, he will verify it with the occupant of the land and in the land records, the will records (office of the clerk of the probate or surrogate court or the office of the recorder of wills), the tax assessor's office, and the zoning or building permit office. Any title information that pertains to functions of municipalities or public utilities, such as water lines, etc., will have to be verified with the municipality or utility. There is often a lapse of many months between the time of the survey and the time the acquisition takes place, during which this data may have changed.

The right-of-way agent will determine from the land and tax records the correct name of the fee simple owners of the property, their correct addresses and their respective estates. He will then follow the chain of title back through at least five years. The consideration for the land that is indicated by the recordation stamps will be noted and this price will be verified with the grantor, the grantee or any other party who has a definite personal knowledge of the transaction, such as a real estate broker or an attorney. He will follow the chain of title back until a complete and clear deed description of the property is available. A verbatim copy will be made of this description and the descriptions of any out-conveyances that have been made since the deed description was drawn. Should the present owner's deed convey several contiguous tracts, the chain of title of each tract will have to be traced and a deed description of each out-conveyance will have to be secured as, being under the same ownership and use, the several tracts are considered as a single unit. If there are additional parcels of property owned by the same party, they should be noted, as they may be used in conjunction with the subject tract, and a reduction in size or damage to the subject property may affect the value of the other tracts.

When the right-of-way agent is completely satisfied that he has determined the ownership of the property in question, he will ascertain if there are any other parties that have an interest in, a claim against, or a right to the use of the land in question.

The land records will disclose any mortgages of record on the property and these should be verified with the mortgagors, to determine if they are still in effect. Leases of record will also be listed and their terms should be copied verbatim, so that they will be available for appraisal purposes. Any rights-of-way, easements, covenants or grants of use attached to the property will also be listed in the land records and the terms and descriptions of these documents should be noted for future reference. Judgments, mechanics' liens, pending litigation, etc., can be checked in the clerk of the court's office, along with recent marriages or divorces of any of the parties with an interest in the land in question. It may also be necessary to determine the heirs, by will or by law, of a recently deceased interested party. The tax assessor's office will provide the agent with the present status of taxes and the zoning office, if there is one, will inform him as to the present allowable use of the land and the possible potential use in the immediate future. Individual cases may require additional research in the records of various other departments of the local government, such as the health, sewerage, and water departments or irrigation district office, agriculture agent's office, etc. If an interest in the land is held in the name of a corporation, it will be necessary to determine the names of the officers of the corporation and the corporate address from the tax records.

While the right-of-way agent is obtaining this information from the various offices, he may pick up leads for the comparable sales that will be used in the appraisal process. The tax records of the area in which the subject property is located should show any recent transfers of property. These transfers should be noted so that they can be checked for comparability at a later stage. It is often useful to note the assessed valuations listed in the tax records, although it should be thoroughly understood that they are not an indication of value, but they can be used to verify the number and type of improvements and the distribution of the land among its various usages. The yearly tax bill should also be noted for use in the expense section of the income statement of the income approach appraisal.

The information that he has gathered will assist the right-of-way agent in many ways besides providing the foundation for the actual title search. The names, addresses, and degrees of interest of the various owners, mortgagors, lessees, etc., will tell him the parties with whom it will be necessary to negotiate to obtain a clear title to the property, and where they can be reached. The platted deed description, the existing leases, the tax assessment breakdown, the zoning, the utilities available, the consideration given for the subject property and comparable properties in the immediate area, and the restrictions on the use of the property created by covenants, easements, rights-of-way, etc., will provide the information from which the appraisal will be made, and will be the selling points of the appraisal during negotiations.

Prior to the actual acquisition, either by negotiation or legal proceeding, a complete title search will have to be made by an attorney, title guaranty company, title abstracter or some other person who has been trained and is experienced in this field. A title search and the signed abstract that is derived from it should be made only by a person skilled in this field since the estates created by a title, the limitations of these estates, the restrictions imposed by a lease, a mortgage, a covenant in a deed and other instruments very often require a legal determination that the average right-of-way agent is not qualified to make.

If the acquisition is allowed to proceed without a title search by a qualified abstracter, one or more of the many and varied interests in a property may be overlooked. This would create embarrassment and poor public relations and could prove very costly to the acquiring agency if the owner of the overlooked interest instituted legal proceedings to recover the value of his interest. Construction could be stopped by an injunction and the contractor would have a just claim for losses caused by this delay. The compensation due to the overlooked interest would have to be paid and then an attempt made to recover this amount from the other parties to the transaction. Additional legal fees would be incurred in the injunction suit and possibly an entirely new condemnation proceeding would have to be instituted to acquire the missing interest.

When the taking is of a very minor nature, it is the policy in some jurisdictions to take a calculated risk and utilize the title examination made by a qualified right-of-way agent instead of expending a sum greater than the appraised value of the taking for a title search. This is a matter of policy within the agency but even those departments that utilize this procedure do so only in minor cases and in all other instances obtain an abstract from a qualified attorney.

#### Complete Title Report

A complete and idealized title search requires that the ownership of the property in question be traced back, in an unbroken chain in the public records, from the present owner of record to the original governmental owner, except in those cases where the statute of limitations or a judicial decree affords a complete bar against any adverse claim. In addition to listing every change of ownership that has occurred and the latest complete description of the property (by metes and bounds or the section system) and every out-conveyance, including rights-of-way, easements, etc., the abstract should list the patent, grant or confirmation of the last governmental owner or the statute or judicial decree which constitutes the bar to adverse claims. All covenants, restrictions and reservations as to the use of the land, that are contained in the chain of title, should be spelled out specifically. The appointment or authority of all executors, guardians or curators who executed any of the conveyances in the chain of title should be examined, along with the order of the probate or surrogate court that approved

the conveyance. The execution and acknowledgment of a power of attorney should be examined when the conveyance is made by an agent or an attorney in fact. Any active or pending litigation that might affect the ownership of the land should be noted, as should the marriage, divorce or death of any party having an interest in the property. A sale or transfer of title under court order or the default in a debt secured by a deed of trust or a mortgage would create a change in ownership that would affect the various rights of the parties empowered to convey the property. All encumbrances on the title, both property rights in, and remedies against, the land should be investigated to determine if they are still in effect. These would include, but not be limited to, deeds of trust, mortgages, liens (tax, mechanics', vendors', etc.), judgments, attachments and special assessments. Federal liens against the lands of any person who owned the property during the life of the lien would have to be checked in the office of the clerk of the Federal court. All current taxes and assessments that are due on the property would be listed along with any limitation or regulation of the use and enjoyment of the land by any governmental authority, such as zoning, building restrictions, development requirements, etc.

In addition to the information obtainable from the official records, any pertinent information that is obtainable from any other sources that are within the actual knowledge of the agency, its employees or agents, or regarding which the acquiring agency is given such notice or put on such inquiry as would lead a prudent person to determine its existence, should also be investigated. This would include, but not be limited to, utility lines, party walls, signs, oil or mineral producing equipment and oral or unrecorded leases, agreements, licenses, etc., the existence of which are indicated in the public records or in any oral or written statement that comes to the knowledge of the agency, its employees or agents.

To determine who owns what estate, rights and interests in land, it is necessary to assemble all of the pertinent facts concerning the title to the land and to apply all of the pertinent rules of law to these facts. The application of these rules of law should be made by qualified attorneys who are practicing in this field. Title guaranty companies employ abstracters to assemble the facts and attorneys to pass on all legal questions raised by such facts. To a certain degree, a right-of-way agent can act as an abstracter but, since this is only a small portion of his work, he would normally confine his search to that information that is necessary for the appraisal of the property and the negotiations necessary to secure its acquisition plus enough information to positively identify, without any question, the tract of land in which he is interested. Any other interests, encumbrances or parcels of land that might be affected by the taking from the subject parcel would also be noted for use in the title search.

Except in very minor takings, title searches should be done by those best qualified, and they should issue a signed certificate of title or title guaranty. A certificate of title

certifies that all of the pertinent matters of record are correctly shown in the record. It does not claim to pass on any question of law or render an opinion, nor does it cover facts not shown in the record. A title guaranty not only takes care of facts which are of record and conclusions of law from these facts but it also takes care of facts that are not of record, such as forged signatures and acknowledgments, frauds, heirs whose existence is unknown, etc. If an acquiring agency utilizes its own legal staff to pass on the conclusions of law from the facts, prior to the transfer of title or the filing of condemnation proceedings, a certificate of title would be sufficient; however, a title guaranty would not only provide this additional service but it would assume the liability for omissions, mistakes or incorrect conclusions.

### Torrens Title

When a title is registered under a Torrens statute, practically all of the problems of a title search are eliminated. A Torrens title is a certificate of title, issued by a public authority, under a system wherein all deeds and documents affecting real property are registered. There is a definite procedure common to most of the Torrens statutes. A person desiring to have his title registered commences a suit by filing a verified petition. Notice is served in a prescribed manner and the title is referred to an examiner for a preliminary investigation and report. Any person having an interest in or a claim to the land is given an opportunity to file an answer. After a court hearing, a decree of confirmation and registration is entered and a certified copy of the decree is filed with the register of titles. A certificate of title is issued to the person named in the decree and a duplicate copy is entered in a special volume in the register's office. When the land is sold, the grantor must turn in his certificate and a new certificate is issued to the grantee.

To date less than one-fourth of the States have statutes authorizing the Torrens system of registering land titles and, in the majority of those States in which the system is authorized, it is not used throughout the State. The system constitutes somewhat of a paradox in that the initial registration is costly and time-consuming, but, once the title is registered, the mechanism for the transfer of the title is much more efficient, and less costly than the ministerial or judicial transfers of land that are in general use. In addition to these advantages, many courts have taken the broad view that registration of the title creates an indefeasible title in the person adjudged to be the owner. The potential savings which the widespread use of the Torrens system would facilitate in connection with the acquisition of lands for highway purposes are vast, but the initial cost and delay inherent in the registration procedure probably will not encourage the adoption of this system on a large scale.

In the absence of a Torrens title, which could be secured quickly and relied upon completely, a copy of the certificate of title or title guaranty should be obtained

by the right-of-way department as early as possible. Generally speaking, an investigation of the title will be made by the appraiser, and this information will be used by the negotiator, but until the complete title search is made an area of doubt will exist. Until this area of doubt is eliminated, the appraisal will be subject to corrections and the negotiations cannot be terminated. Any interest that is overlooked will have to be considered and, since the whole cannot be greater than the sum of the parts, any subsequent correction of the appraisal will probably necessitate a reduction in the share of the other interests. From a practical standpoint, it is much easier to conclude negotiations at a lower figure if the higher figure has never been offered.

#### Closing Title Check

This final investigation into the title is made immediately prior to the payment for the acquisition or the filing of a condemnation. The main purpose of this operation is to find all changes in any title or interest which may have occurred since the completion of the title search.

It will consist of bringing up-to-date the investigations that were made in the title search, to make sure that the parties who have agreed to the transfer of title are still in a position to convey a good and marketable title to the property. It also offers one final chance to correct any mistakes that might have been made on the original search. The vast majority of closing title checks will not disclose any changes, but the few that are disclosed will be well worth the cost of the entire group.

#### Conclusion

When an acquiring agency initiates a program for the acquisition of property for the construction of a highway, they assume the responsibility of securing a good and marketable title for the land they acquire and seeing that every possessor of an interest in or a claim against a property taken receives his just compensation. To accept a doubtful title is depriving the State (and thereby every citizen) of the right to protection in the ownership of property, and to take possession of property without compensating every one of the interests in that property would be confiscation. Both of these situations are in direct conflict with the goal, intent and letter of real property law, which is the protection of the individual in his ownership of real property.

The requirements of the appraisal and negotiation segments of the right-of-way man's job demand a knowledge of the various estates and interests in property, but the final determination of these estates and interests should be made by someone especially trained and experienced in this field. The right-of-way man can abstract the facts from the records and utilize these facts in the appraisal or the negotiations, but any conclusions that are drawn from these facts should be made by a qualified attorney who is practicing in real property law.

## CHAPTER 12

### Planning and Design Principles

T. S. HUFF

*Chief Engineer of Highway Design  
Texas Highway Department*

*and*

A. H. CHRISTIAN

*Right-of-Way Engineer  
Texas Highway Department*

In correlating the right-of-way function with engineering, the initial responsibility of the right-of-way staff is to act in a consulting capacity to the engineering staff in determining proper location and design as will best fit the land usage, with minimum disturbance to individual properties and area development, and with appropriate consideration of right-of-way costs. The final decision on route, location and design is the engineer's responsibility but, in his consideration of traffic desire lines, area planning, alternate routes, and location and design refinements, he must have before him all the facts on which to base good decisions. With right-of-way cost constituting a material percentage of the project cost, it represents a major element which must receive due consideration along with all engineering factors in weighing the overall economics of the proposed facility. The right-of-way staff is expert in property evaluation and it is their responsibility to supply comparative right-of-way cost data, as needed, to complete the study of alternate routes and locations.

After the location has been selected and tentative right-of-way requirements have been determined, it is the responsibility of the right-of-way staff to make a detailed examination of the effects upon property and to pinpoint to the engineer the spots of maximum disturbance, such as the costly taking of improvements or the probability of high severance damage. It may be possible that a minor change in alignment can be made to reduce right-of-way costs without sacrifice to good engineering judgment. Or possibly, the proposed right-of-way width may be slightly adjusted without sacrifice to good design, thereby effecting a savings in right-of-way costs greater than any resulting increased construction cost. However, if engineering requirements do not permit changes, the right-of-way staff benefits by becoming familiarized with the controlling factors and thus is better equipped for intelligent acquisition.

In the actual function of right-of-way acquisition the right-of-way staff must have a basic knowledge of engineering principles. These principles must be understood as they apply to the particular project on which right-of-way is to be acquired. This is necessary to intelligently appraise and negotiate for the property and to do so in such a manner as to give the public a better understanding of highway engineering problems and objectives, and thereby attain the best public relations. The right-of-way man must be able to read engineering drawings prepared in plan, profile, and cross section, and be familiar with engineering terminology. He must be able to explain, in a simple fashion, the traffic studies which are made to establish traffic desire lines and the anticipated volume, speed, and class of traffic to be served. He must be able to explain how these basic planning factors, coordinated with the type of terrain traversed, not only control route and location but also determine the class of highway to be constructed and its basic design elements. This applies to plan and profile requirements, right-of-way widths, drainage, the possible need for access control, and all roadway and pavement geometrics. It is the usual practice of the highway departments to express the coordination of all of these factors in design manuals or tables which should be carefully studied and understood by the right-of-way staff.

The following discussion of highway engineering with supporting explanation of affiliated terms is considered the basic material leading to an understanding of engineering functions by the right-of-way staff.

#### HIGHWAY PLANNING

An adequate highway system is the backbone of our nation's economy. In order that we may enjoy the best system which can be developed, within the limits of reasonable public expenditure, it is necessary that each segment of the highway system be designed and constructed so that it will provide the highest level of service attainable for the least possible expense. The desired level of service must necessarily be determined to a large extent by the amount and type of traffic which must be served by the facility. The traffic served will, in turn, designate the minimum geometric design standards which must be met for each individual highway.

Highway planning is the broad term given to the preliminary compilation of data and the consideration of factors that will lead to the development of plans and the actual construction of the proposed facility. Once the need for a highway development or improvement has been established, information relative to all existing or proposed highways in the area, streets, roads, residential areas, commercial developments, industrial complexes, public service institutions, etc., should be assembled for study by the highway planner in order to insure that the highway under consideration will satisfactorily serve its intended purpose.

### Traffic Analysis

In order to design a structure, it is necessary that an engineer know the loads which will be applied; similarly, traffic information serves to establish the "loads" for geometric highway design. The necessary traffic data is generally available through the State-wide planning surveys of the highway departments. This data includes daily traffic volumes, hourly traffic volumes, origin and destination surveys, and vehicle distribution by type and weight. The designer can also determine trends in traffic development within the area from which anticipated future traffic volumes can be estimated.

The design of any improvement must be based on the future traffic volumes which are expected to utilize the facility. These volumes are generally projected over a 20-year period. The summary of traffic expected to utilize the facility would include a projection of current traffic which could logically be assigned to the route and the generated traffic which is expected to be diverted from other routes and attracted to the new facility. Since both of the above sources of traffic are inherently dependent upon the growth of the area traversed, the designer must have some concept of the extent and type of adjacent development which can be anticipated during the period over which traffic is projected.

### Area Development

The economic development of an area has a considerable effect upon the design of a highway. The level of traffic service on the highway must be established during the earliest phases of planning in order to insure that the facility will provide adequate capacity for the expected traffic. However, the presence of extensive development or plans for the same must also be reflected in the degree of service provided by the facility, for otherwise, the highway may become obsolete or substandard upon completion or shortly thereafter. The highway engineer has a two-fold obligation to the public, for he must not only provide a facility that safely and efficiently serves predominantly through-traffic but he must incorporate adequacy in his design so that circulation to local development will not be impaired. In order to insure that adequacy will be preserved, the ultimate needs of the facility should be established during the preliminary planning stages. Sufficient right-of-way for the ultimate design should be a basic consideration although the initial construction may encompass only the provision of sufficient features to serve the current or intermediate needs of the area.

### Route Selection

Highway location involves the selection of the most advantageous route between two control points as determined by an analysis of topography, physical features, land

use of the area traversed, and traffic service potentiality. In selecting a route, the highway engineer is primarily concerned with the cost of the proposed improvement and the general value resulting therefrom. He must evaluate the required expenditures for right-of-way, construction, maintenance, and operation in relation to the services to the community and highway users that will accrue therefrom. A road user-benefit analysis is often a useful tool in evaluating alternate highway routes; however, due to its broad economic limitations, it should not be regarded as a precise design control.

Route determination is generally confined to an analysis of the advantages and disadvantages presented by the existing facility, if such exists, as compared to one or more alternate highway routes on new location. To insure that the highway location chosen is the most appropriate, it is necessary that all feasible routes between two control points be evaluated. The engineer must carefully consider the economics of creating and perpetuating the improvement and maintenance of two road systems, where possibly one facility could be devised that would properly serve traffic. Highway location in rural areas is usually determined by selecting the shortest and most economical route that will conform with established design standards. Moreover, in sparsely developed areas, the incidence of commercial development is such that it normally does not constitute the major consideration insofar as right-of-way costs are concerned. Since rural areas are predominantly given over to farming and ranching operations, the land value of these interests will normally determine the appropriate route, particularly if considerable severance of large tracts is involved. In some rural areas, however, care should be exercised in selecting a new route for an existing location. Unless the advantages offered by a new route completely overshadow those presented by an existing route, consideration should be given toward expanding the present facility so that the habitual circulation and established trade in the area is not impaired.

Selection of a route in an urban area is understandably a much more complex and difficult problem, since the proximity of businesses and other developments that depend on free flowing traffic facilities often preclude the improvement of inadequate existing streets or highways without either damaging or obliterating these developments. On the other hand, if the highway is relocated to avoid destroying the development adjacent to the existing route, circulation to these establishments and areas can be impaired.

Once the necessary traffic service features have been determined, the question of where to locate the facility is contingent upon the cost of the right-of-way necessary for the construction of the facility. As a general rule, the construction of a freeway, or similar high volume arterial, through a highly developed commercial, industrial or residential area will involve high right-of-way costs. Often, it is possible to acquire a complete city block width of right-of-way upon which to provide a facility. However,

unless the highway is on new location, such an expanse of right-of-way would destroy all the established development along the existing facility or the location engineer would be presented with the selection of which side of the street to leave intact and which side to destroy. The resultant dissatisfaction of the property owners who are forced to sell their property and improvements to the highway department often leads to extended controversy and ill will.

In those cases where the highway improvement will not be of the freeway type, the acquisition of adjacent improvements and property would not be as extensive, but the selection of a route is no less complex. Whenever any existing facility is widened, a considerable amount of property damage and right-of-way expense is necessarily encountered. In addition, sufficient parking space must be provided for adjacent homes and businesses. Normally, a narrower width right-of-way is acquired along an existing location as compared to the width of right-of-way acquired on a new location. This is understandable since existing improvements along the original route will often be so expensive as to make the cost of right-of-way prohibitive, and therefore, the absolute minimum width is acquired. On a new location, possible future expansion of the new facility can be considered and a desirable right-of-way width can often be procured.

Obviously, any preliminary planning must necessarily encompass the consideration of right-of-way costs and damage to adjacent properties. Public support of certain routes should also enter into the route studies since opposition will often result in awards considerably in excess of the appraised values. Where a highway is intended to be a limited or fully controlled access facility, a study of property lines during the preliminary stages of development will often ascertain the best possible location involving the minimum severance of individual land tracts. An appreciable reduction in the cost of the right-of-way damages may be achieved by such a study. Design requirements and resultant construction costs may also be influenced in this respect by minimizing the number of landlocked parcels for which access provisions must be furnished.

#### HIGHWAY DESIGN

The design elements of a highway are dependent upon the traffic volume to be served, the topography, the physical features, and the land use of the area traversed. Topography is a major factor in determining the physical location of a highway and exercises a pronounced effect upon the alignment, gradient, sight distance, cross section, and other design elements. Hills, valleys, steep slopes, rivers, and lakes often impose limitations upon both location and design. In the case of flat land areas, topography alone may exercise little, if any, control on location; but it may cause difficulties in some design elements such as drainage or grade separations. On the other hand, rugged terrain may virtually govern certain design features and location considerations.

Manmade features may have as much effect on design as does topography. Land uses, such as agricultural, industrial, commercial, residential, or recreational, have a decided bearing on the design of a facility. In industrial and commercial areas, special design adjustments may be required for large trucks, particularly at intersections, driveways, and terminal facilities. Recreational routes, such as highways through parks, generally receive special consideration in regard to aesthetics and recreational roadside development.

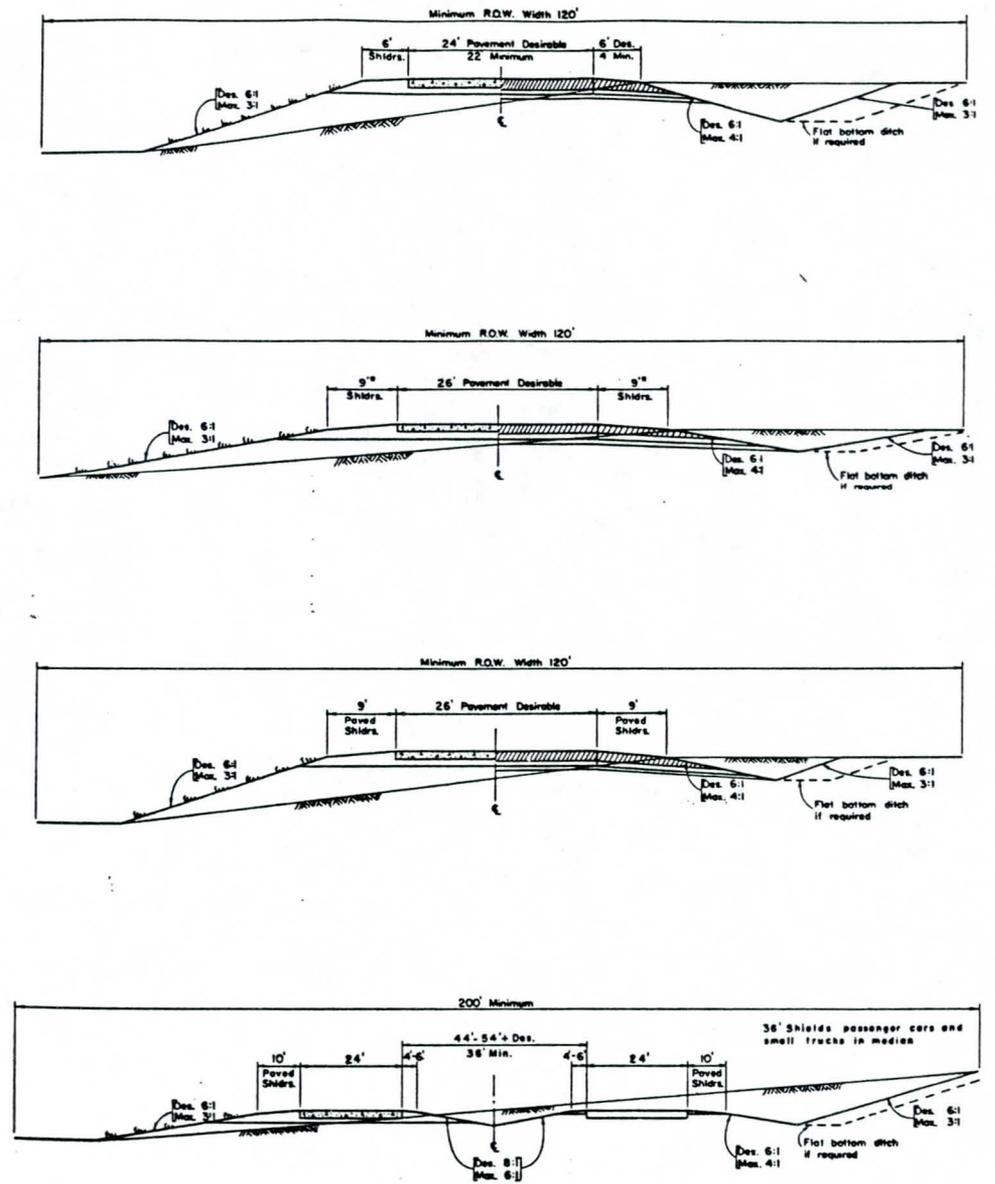
Figures 1 through 4 are examples of two-lane and multilane highways and illustrate how the basic right-of-way width is dependent upon the roadway features which must be enclosed within the limits of construction.

Whenever a substandard existing facility is improved on the same general location, the basic roadway features are revised to conform with current design standards; however, it is often necessary to modify the vertical and horizontal alignment so that the improved facility will present sufficient sight distances. In many cases, improved horizontal alignment can be attained only by relocating the highway in the vicinity of sharp curves. Adequate sight distances can often be obtained only by reconstructing the roadway to a higher or lower elevation thus increasing the right-of-way required to encompass either the sideslopes or backslopes. Experience has also indicated the desirability of providing wide drainage ditches between the sideslope and backslope since they are easier to maintain and reduce the hazards of maintenance machinery interfering with normal traffic flow. In built-up areas, where the cost of acquiring additional right-of-way would be exorbitant, riprap and/or retaining walls may be required where the grade line is raised or lowered to provide adequate sight distance. However, if the cost between wider right-of-way and the provision of riprap or retaining walls is comparable, the wider right-of-way should be obtained. In evaluating the design for any improvement, a comparison of the cost of additional right-of-way versus the use of such slope protection should be made at an early date in order to determine the proper design.

If at all possible, a uniform right-of-way width should be obtained in order to avoid constant undulations in the right-of-way limits. From an aesthetic standpoint, a uniform right-of-way can present a pleasing, well-kept appearance. Moreover, constant widths of right-of-way lend themselves more readily to landscape maintenance operations insofar as mowing is concerned. Adjustments or variations in right-of-way width may be warranted in certain instances where excessive costs are evident, where it is possible to avoid topographical or drainage features, or where local development cannot be adjusted, removed, relocated, or eliminated without incurring an extremely high cost. These less than desirable requirements should be used, however, only as a matter of design or economic necessity and not as a matter of policy. Wherever the right-of-way is constricted due to the above considerations, care should be exercised

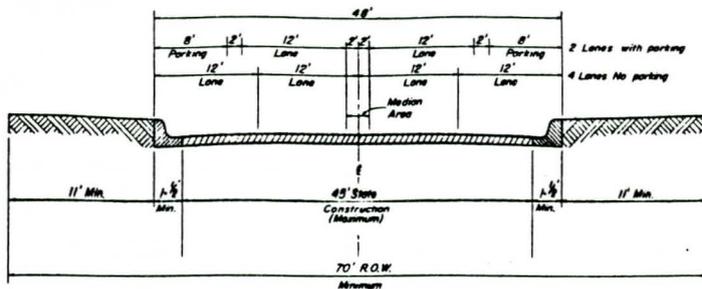
STANDARDS OF DESIGN FOR TWO LANE & MULTILANE  
RURAL HIGHWAYS

Full Standards (New Location)

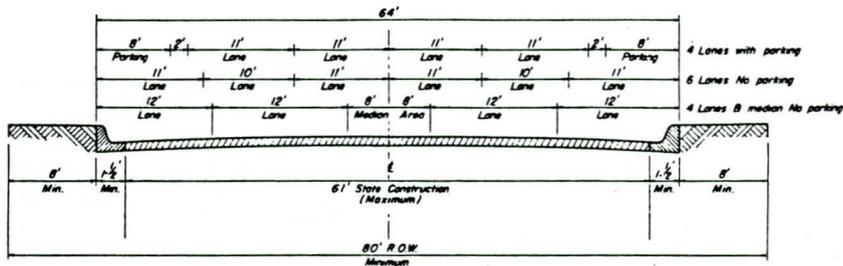


MULTILANE  
Existing ADT 3500 And Over

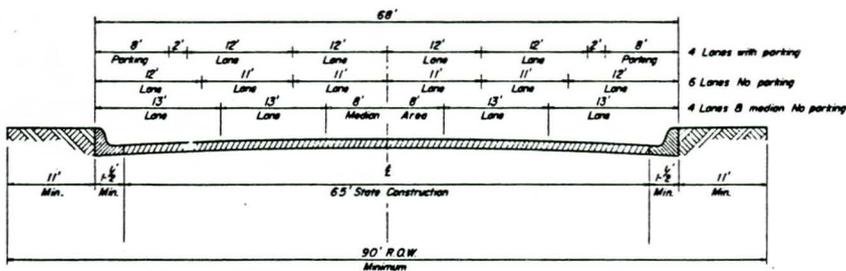
Figure 1



70 FOOT R.O.W. - 45' STATE  
CONSTRUCTED PAVEMENT  
2 LANES WITH PARKING  
4 LANES NO PARKING



90 FOOT R.O.W. - 61' STATE  
CONSTRUCTED PAVEMENT  
4 LANES WITH PARKING  
6 LANES NO PARKING  
4 LANES & MEDIAN NO PARKING



90 FOOT R.O.W. - 65' STATE  
CONSTRUCTED PAVEMENT  
4 LANES WITH PARKING  
6 LANES NO PARKING  
4 LANES & MEDIAN NO PARKING

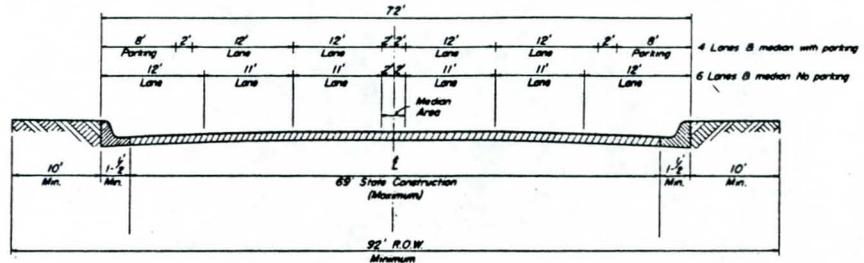
Figure 2

in determining the minimum width necessary in order that off-highway maintenance vehicles and machinery such as mowers, road graders, etc., will be furnished sufficient space in which to operate in the restricted area without having to encroach upon the highway lanes and thus introduce hazards to traffic.

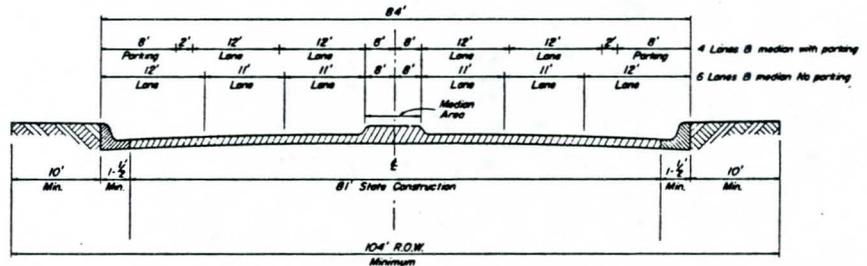
The normal right-of-way required for a highway must oftentimes be expanded to provide for structures at stream crossings, railroad crossings, grade separations or interchanges. Since high embankments at these structures are often the rule rather than the exception, sufficient right-of-way for the inclusion of such approach embankments and/or connecting roadways must be acquired.

#### HIGHWAY ENGINEERING TERMINOLOGY

There are many technical terms used in the various phases of highway engineering. The following list has been prepared to exclude those which are considered



100 FOOT R.O.W. 69' STATE  
CONSTRUCTED PAVEMENT  
4 LANES WITH PARKING & MEDIAN  
6 LANES & MEDIAN NO PARKING



120 FOOT R.O.W. 81' STATE  
CONSTRUCTED PAVEMENT  
4 LANES WITH PARKING & MEDIAN  
6 LANES & MEDIAN NO PARKING

#### NOTES

1. The treatment of the narrow Median area will be dependent on the conditions on the particular project.
2. Where parking lanes are provided initially the pavement should be of such width that the parking area can be converted to use as an efficient moving traffic lane if future conditions warrant this.
3. Where narrow 4' median is indicated a wider median and left turn lanes shall be provided at important intersections.

#### STANDARD CROSS SECTIONS FOR CURB AND GUTTER SECTIONS

Figure 3

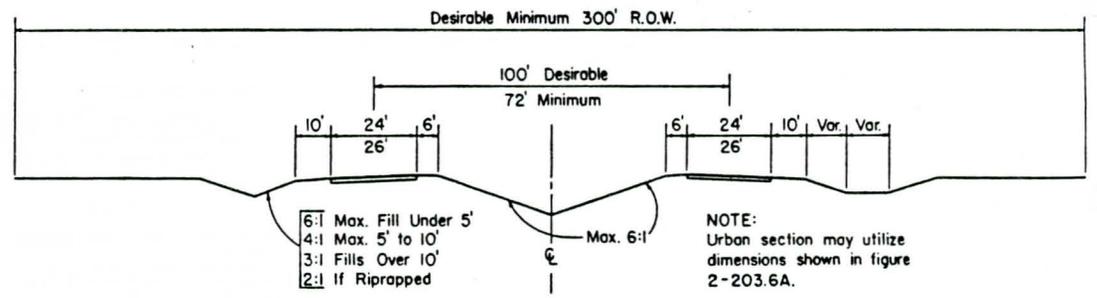
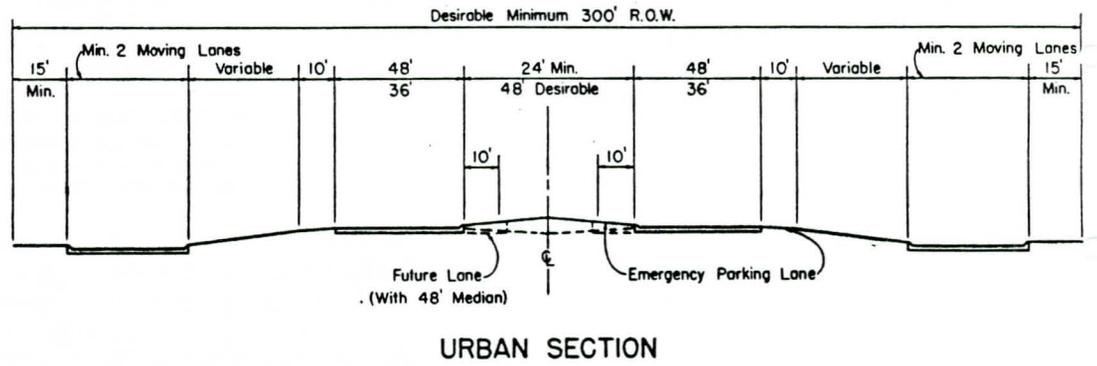
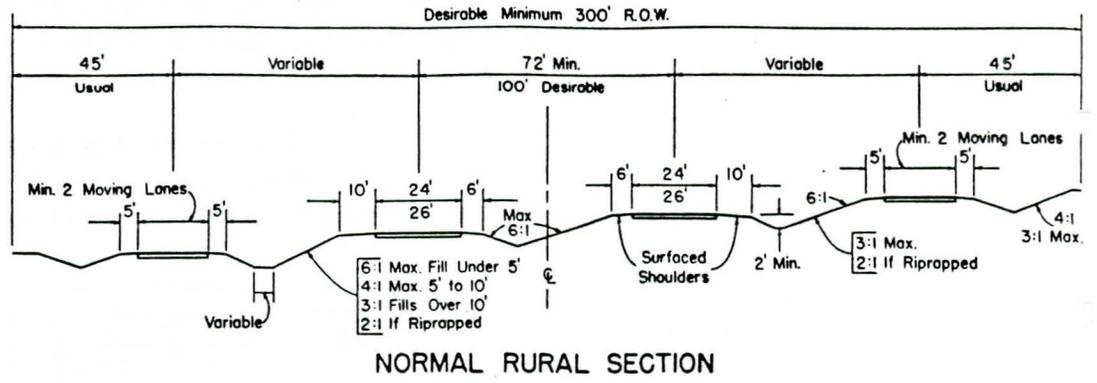


Figure 4

of little concern to the right-of-way function, but to include those terms with which the right-of-way staff should have a basic knowledge in order to understand engineering principles and to more effectively discharge their responsibilities of right-of-way acquisition.

### General Terms

*Route.* The general position of a highway relative to major features of topography such as centers of population or important terrain features.

*Location.* The fixed position of the highway on the ground, including curves and tangents.

*Geometric Design.* Design of the visible dimensions and elements of a highway, street or road.

*Schematic Layout.* A preliminary layout showing generally the proposed method of providing for the various traffic movements, not necessarily to scale.

*Geometric Layout.* A preliminary plan showing all the general geometric features to be included in the proposed project without indicating detail design information.

*Structural Layout.* The bridge layout that is prepared on structural plan and profile sheets showing the plan of the proposed structure and a profile along the centerline of the proposed structure.

### Operational Costs

*General.* A comparison of construction costs versus road user benefits indicates the economic value of a new facility. An analysis of operational costs is a valuable index regarding the relative merits of alternate routes or alternate geometric designs of a proposed improvement. When two alternate facilities of comparable design and equal cost are proposed, the one having the lower operational cost should be used. A road user benefit analysis, although important, should not be the only decisive factor in determining the location and geometric design features. Major operational costs that should be considered are time, distance traveled, elevation change and accident experience.

*Time.* One of the greatest benefits from any roadway improvement is the saving in travel time. To commercial operators, travel time is directly related to driver's wages, equipment cost and maintenance. The saving in time for passenger vehicles is not as important as for trucks and busses; however, it is generally accepted that assignment of some value is justified.

*Distance.* Distance traveled is directly related to vehicle cost such as fuel, lubricants, tire wear, vehicle depreciation and maintenance. Estimated vehicle miles are based on projected traffic volumes and distance traveled on the facility.

*Rise In Grade.* Running speeds and resultant unit costs are affected by the profile and gradients involved. The differences in gradient is relatively unimportant in comparison to the difference in elevation between two points.

*Safety.* An analysis of road user benefits should consider the saving resulting from a reduction in accident rates. Statistics have been compiled indicating definite differences in the accident rate for various types of highways and design features. Accident cost is based on projected traffic volume and distance traveled combined with accident rates for the specific type of highway.

## Traffic Data

*General.* Traffic data, in rural areas, may include traffic volumes for an annual average day of the year, volumes by hours of the day, at specified points on the rural highway system and the distribution of vehicles by types and weight.

In urban areas, the high concentration of traffic in restricted space dictates the need for current and comprehensive data. Anticipated volumes and types of traffic expected to use a highway improvement determine the type of highway and the geometric features of the design.

*Projected Traffic.* Design of proposed improvements must be based on projected traffic volumes. Normally a 20 year period is recommended for design purposes.

*Average Daily Traffic.* The average 24 hour volume is the total volume during a stated period divided by the number of days in that period. Unless otherwise stated, the period is a year. The term is commonly abbreviated as ADT. The ADT volume is important in determining usage of a highway or street as justification for proposed improvements and design of structural elements. The direct use of ADT in geometric design, however, is not appropriate since it does not indicate the variations in traffic which occur during the year.

*Peak Hour Traffic.* The traffic pattern on any highway shows considerable variations in traffic volumes during the different hours of the day and even a greater fluctuation in hourly volumes through the year. The hourly traffic used in design should neither be greatly exceeded nor be so high that the traffic would rarely make full use of the resulting facility.

*Design Hourly Volume.* A volume determined for use in design, representing traffic expected to use the highway. The design hourly volume, abbreviated as DHV, should be the 30th highest hourly volume (30HV) of the future year chosen for design. Exception may be made on roads with high seasonal fluctuation, where a higher design hour volume may be required. The 30HV criterion applies, in general, to urban areas; but, where the fluctuation in traffic flow may be

radically different from that on rural highways, other relations may have to be considered.

*Composition of Traffic.* Traffic on rural and urban highways is composed of passenger cars, trucks and busses. For the purposes of design, light delivery trucks, such as panels and pickups, take on the operational characteristics of passenger cars and are included as such. Other trucks, truck-trailers and busses are referred to as trucks.

In order to determine adequate design, it is essential that the designer have available an estimate of the composition of traffic which will be expected in the design year. Assuming that the design hour has been established, the per cent of trucks which will occur in this hour must be determined.

*Design Speed.* A speed determined for design and correlation of the physical features of a highway that influence vehicle operation. It is the maximum safe speed that can be maintained over a specified section of highway when conditions are so favorable that the design features of the highway govern. The choice of design speed is influenced principally by the character of the terrain, traffic volume, the extent of man made features and economic considerations. Every effort should be made to design for as high a speed as is consistent with the desired degree of safety, mobility, efficiency and economy. Once the design speed is selected, all of the pertinent features of the facility should be related to it in order to obtain a balanced design.

### Highway Capacity

*General.* Highway capacity is a measure of the ability of a roadway to accommodate traffic. Capacity of a roadway is affected by the composition of traffic, roadway alignment, profile, number and width of traffic lanes, adjacent development, vehicular speed and weather. The term, design capacity, is used in conjunction with the design of new facilities or contemplated improvements, whereas reference to practical capacity generally pertains to existing facilities in operation.

*Basic Capacity.* The maximum number of passenger cars that can pass a given point on a lane or roadway during one hour under the most ideal roadway and traffic conditions that can be attained.

*Possible Capacity.* The maximum number of vehicles that can pass a given point on a lane or roadway during one hour under the prevailing roadway and traffic conditions regardless of their effect in delaying drivers and restricting their freedom to maneuver.

*Practical Capacity.* The maximum number of vehicles that can pass a given point on a lane or roadway during one hour under the prevailing roadway and

traffic conditions, without unreasonable delay or restriction to the driver's freedom to maneuver.

*Design Capacity.* The practical capacity or lesser value determined for use in designing the highway to accommodate the design volume.

### Design Loads

*General.* To provide a road that will stand up under traffic without excessive maintenance, it is necessary to determine the loads to which the road will be subjected and design the facilities in accordance with the anticipated loads. Design loads to be used should take into account the heavy wheel loads that are to be expected, the frequency at which the loads will be applied and the anticipated life of the highway. These design loads should be selected on the basis of the relative importance of the road, the traffic volume and the nature of land development in the area.

*Structures.* Design loads to be used for planning of structures must provide for passage of all loads that will be applied, without permitting any damage to the structure.

*Roadbed.* Design loads to be used for structural design of the roadbed should take into account the loads to be expected, coupled with the allowable maintenance costs and anticipated life of the project.

### Geometrics

*Cross Section.* A view cutting through the roadway showing the relationship of the various components of the roadway.

*Right-of-Way.* A general term denoting land, property or interest therein, usually in a strip, acquired for or devoted to a highway for the construction of the roadway and its appurtenances.

*Roadway.* The portion of a highway included between the outside line of slopes, gutters or side ditches, including all the appertaining structures and all slopes, ditches, channels and waterways necessary for proper drainage.

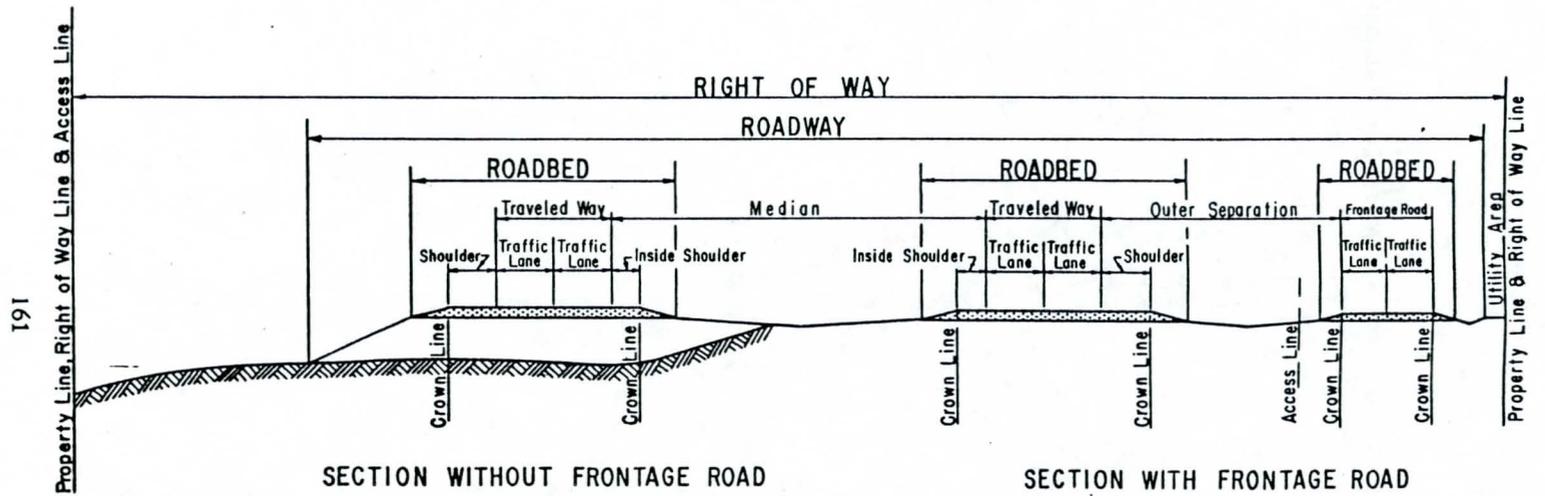
*Roadbed.* That portion of the roadway between the shoulder line; i.e., the subgrade plus the shoulders.

*Median.* That portion of a divided highway separating opposing traffic.

*Outer Separation.* The portion of a highway between the traveled ways of roadway for through traffic and a frontage street or road.

*Utility Area.* The area adjacent to the right-of-way line that may be available for the various utilities.

*Traveled Way.* The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.



### CROSS SECTION NOMENCLATURE

Figure 5

*Shoulder.* The portion of the roadway contiguous with the traveled way (on either side) for accommodation of stopped vehicles, for emergency use and for lateral support of base and surface courses.

*Lane.* A portion of the traveled way for the movement of a single line of vehicles.

*Roadside.* A general term denoting the area adjoining the outer edge of the roadway. Extensive areas between the roadways of a divided highway may also be considered roadside for design purposes.

*Sideslope.* That portion of the roadway between the outside edge of shoulder or crown line and the adjacent drainage ditch, usually measured as a ratio of horizontal distance versus each foot of decrease in elevation.

*Backslope.* That portion of the roadway between the side drainage ditch and the top of cut, usually measured as a ratio of horizontal distance versus each foot of increase in elevation.

*Drainage Ditch.* The depressed area within the roadway given over to the collection and handling of surface drainage within the right-of-way.

*Riprap.* Slope protection placed on steep cut banks or embankments to eliminate the occurrence of erosion, usually consisting of a thin concrete slab, although grouted rock, wire fabric or heavy stone blankets are often used.

*Retaining Walls.* Vertical concrete walls, usually constructed adjacent to the roadbed, normally placed where restrictive right-of-way or design will not permit the use of normal slopes in embankment or cut sections.

*Sight Distance.* The length of roadway visible to the driver of a passenger vehicle at any given point on the roadway when the view is unobstructed.

*Stopping Sight Distance.* The distance required by a driver of a vehicle, traveling at a given speed, to bring his vehicle to a stop after an object on the roadway becomes visible. The distances used in design are calculated based on the driver's ability to see a 4 inch object in the road ahead when his eye level is 4½ feet above the roadway surface.

*Passing Sight Distance.* The minimum sight distance that must be available to enable the driver of one vehicle to pass another vehicle traveling 10 MPH slower than design speed, safely and comfortable, without interfering with the speed of an oncoming vehicle traveling at the design speed should it come into view after the overtaking maneuver is started.

*Grade Line.* The slope in the longitudinal direction of the roadbed, usually expressed in per cent which is the number of units of change in elevation per 100 units horizontal distance.

*Profile.* A line indicating ground elevations of a vertical section along a survey line.

*Vertical Curve.* A curve drawn tangent to two intersecting grade lines to provide a smooth transition from one grade to another.

*Horizontal Curve.* A curve joining two straight portions of alignment.

### Highway Structures

*Bridge.* A structure of over 20 foot span. (Batteries of pipe culverts regardless of their length are not bridges.)

*Culverts.* All drainage structures not defined as bridges.

*Storm Sewer.* An underground conduit for drainage of surface water.

*Causeway.* A bridge or raised way constructed over marshy land or water. It may be either an earth fill or bridge type structure.

*Tunnel.* A subterranean passageway designed for the accommodation of vehicular traffic.

*Highway Overpass.* A grade separation where the subject highway passes over an intersecting highway.

*Highway Underpass.* A grade separation where the subject highway passes under an intersecting highway.

*Highway-Railroad Overpass.* A grade separation where the highway passes over a railroad.

*Highway-Railroad Underpass.* A grade separation where the highway passes under a railroad.

*Pedestrian Overpass.* A grade separation designed to carry pedestrian traffic over the highway.

*Pedestrian Underpass.* A grade separation designed to carry pedestrian traffic under the highway.

*Pass.* A facility for private use which separates the highway lanes from the cross movement of persons, animals (stockpass), vehicles and/or machines, (equipment pass).

*Cattle Guard.* A structure placed in a fence line to permit the passage of vehicles but exclude the passage of animals.

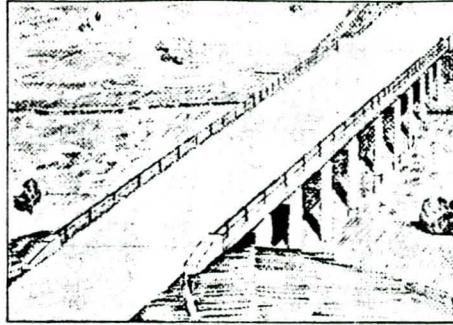
### Drainage and Hydraulics

*General.* Drainage design should provide for removal of rainfall from the roadway and for carrying runoff water from the upstream side of the highway to the downstream side. These functions should be accomplished without causing objectionable backwater, creating excessive water velocities and unduly affecting the operation of traffic on the highway.

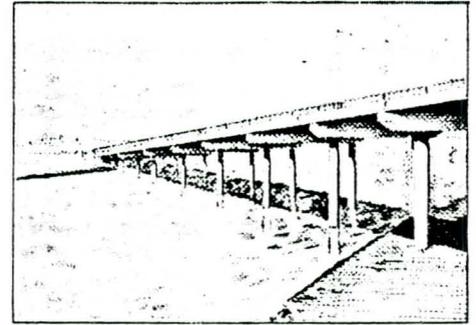
*Storm Sewers.* Many highways, particularly in urban areas, are constructed on a narrow right-of-way where there is not sufficient space to provide longitudinal

# HIGHWAY

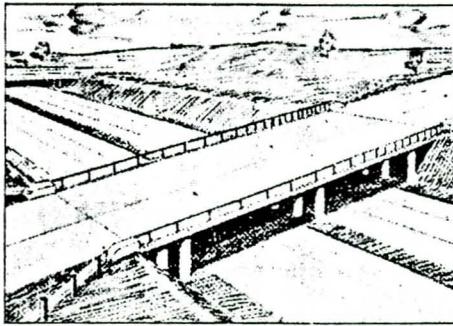
# STRUCTURES



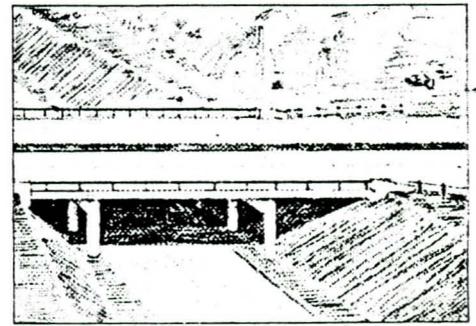
BRIDGE



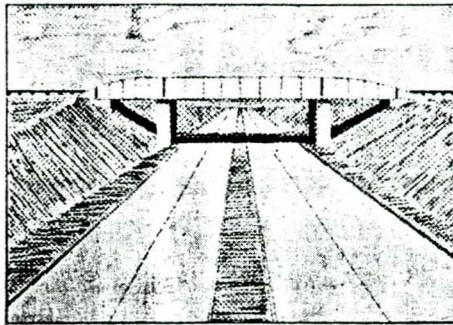
CAUSEWAY



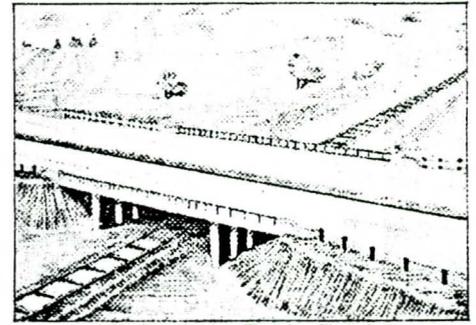
HIGHWAY UNDERPASS



HIGHWAY OVERPASS



HIGHWAY RAILROAD  
UNDERPASS



HIGHWAY RAILROAD  
OVERPASS

Figure No. 6

ditches for roadway drainage. This condition usually requires continuous curb and gutter with storm sewer drainage.

*Cross Drainage.* Consideration should be given to the present and future use of the adjacent property in establishing the allowable backwater head. The permissible head is a matter of engineering judgment, but in no case should flood water be allowed to damage any part of the highway.

*Design Frequency.* The period of recurrence of rainfall intensity which is selected for use in designing a drainage structure.

*Time of Concentration.* The time required for water to flow from the most distant point of the drainage area to the point under consideration.

*Runoff.* That part of the rainfall on an area that flows off as free surface water.

*Flow Line.* The profile of the low point on the inside of a drainage structure or channel.

*Drainage Area.* The defined area to be drained by a given drainage facility.

*Rainfall Intensity.* A value in inches per hour that is a function of frequencies and time of concentrations for each separate locality derived from extended studies and records of actual rainfall for the particular area under study. The term "one inch per hour of rainfall" equals approximately one cubic foot per second per acre.

#### Interchanges, Separations and Intersections at Grade

*Interchange.* A system of interconnecting roadways in conjunction with a grade separation or grade separations providing for the interchange of traffic between two or more intersecting highways.

*Grade Separation.* A crossing of two highways or a highway and a railroad at different levels.

*Intersection at Grade.* The general area where two or more highways join or cross within which are included the roadway and roadside facilities for traffic movements in lieu of direct crossings.

# TYPICAL INTERCHANGES

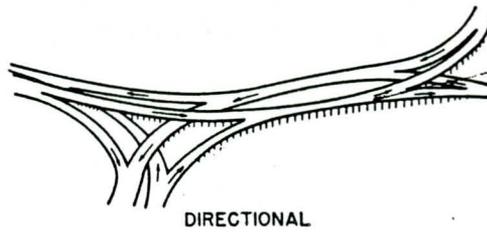
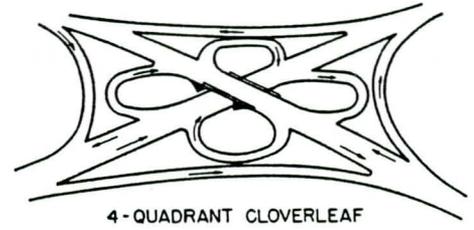
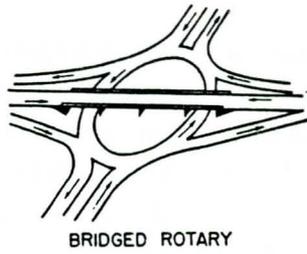
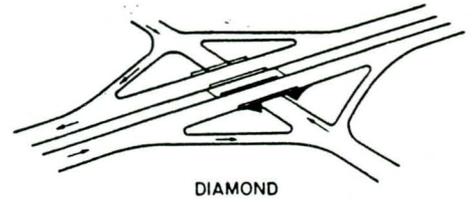
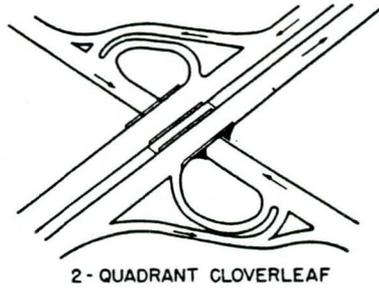
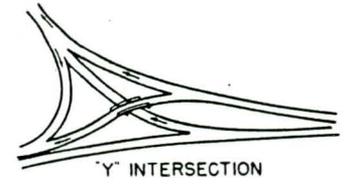
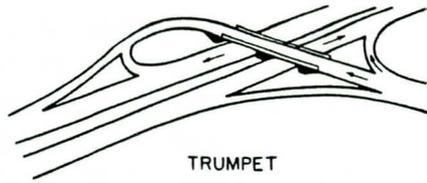


Figure 7

*PART II*

*Engineering Principles*

## Highway and Land Surveying

L. J. WALLIS

*Special Right-of-Way Consultant  
Iowa State Highway Commission*

The term "survey," when used in the sense applicable to its usage in highway work, may be generally defined as "the act or operation of finding and delineating the contour, dimensions, position, etc., of a part of the earth's surface for the purpose of preparing a measured plan and description of any portion of the land or of a road or line through it."

It is necessary in right-of-way work to be able to interpret all of the various design features shown on the highway plan. Without an elementary knowledge of how the data is obtained for preparing this design, one has considerable difficulty in interpreting the information which the plan is expected to convey. A right-of-way agent must be able to read the highway plan; and in addition he should be able to explain the proposed design in layman's language for the benefit of the property owner with whom he is negotiating.

The conventional survey is the old established method where all of the survey work is done on the ground. It is still generally used, and for the purpose of this instruction this method will be illustrated. It affords a more comprehensive picture of the procedure used in obtaining the data which is required to prepare a highway plan. Also, the land survey must be made by the conventional method.

A surveyor must have certain equipment and instruments which he uses in the practice of his profession. A description and explanation of their use will render the procedures in survey work more easily understood. They are:

The *engineer's steel tape* is a flat band tape 100 feet in length. This 100-foot length constitutes one station on a survey. The tape is graduated in 1-foot lengths with every 5th foot numbered. The end foot of the tape is graduated in tenths (0.1) of a foot for precise measurements. Surveyors commonly call this tape a "chain" and speak of its use in measurement as "chaining." This term is a "carry over" from the days when all land surveys were made with the 4-rod (66 ft.) "Gunter's Chain" composed of 100 equal links.

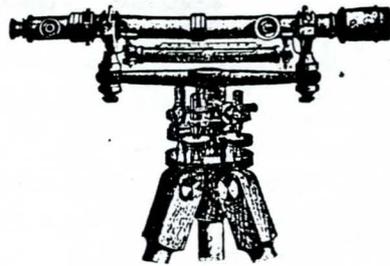
The *engineer's metallic tape* is a tape either 50 or 100 feet in length, which is wound on an encased reel. It is called a metallic tape because fine metal wires are woven into the warp of the cloth, helping it retain an accuracy far superior to an ordinary cloth tape. It is used for making short measurements as in cross-sectioning or taking topography. All field right-of-way agents should be equipped with a tape of this type.

The *engineer's level* (Figure 1) consists of a telescopic line of sight with a bubble vial attached for leveling. The telescope rotates through a full circle on a vertical axis. The instrument is mounted on a tripod when in use. The level is always used in conjunction with a level rod (Figure 2) which is usually a telescoping rod graduated from 0 to 13 plus feet when fully extended. Graduations are marked at each foot and tenth (0.1) of a foot with intermediate graduations of one hundredth (0.01) foot. This instrument is used for determining the elevation of various points as required by the survey.

The *hand level* is a simple line of sight with a bubble vial which is held in the hand while reading the rod. As long as the operator does not change his stance, he will be able to determine the difference in elevation of nearby points where no great degree of accuracy is required. Right-of-way field men should carry a hand level and a folding 6-foot rule, graduated in feet and tenths (0.1) of a foot on one side, which can be used as a rod. It will prove useful on many occasions.

The *engineer's transit* (Figure 3) is the most complex and also the most versatile of the surveyor's instruments. It is used for: (1) Prolonging lines, (2) measuring horizontal angles, (3) measuring vertical angles, (4) as a level for reading elevations, and (5) for making stadia surveys.

A transit consists of two parts: The alidade (called the upper motion) is mounted on an inner vertical spindle which turns within an outer annular vertical spindle (called the lower motion) which carries a horizontal circle graduated from 0 to 360 degrees. A vernier on the alidade permits the reading of this horizontal circle to the nearest  $\frac{1}{2}$  or  $\frac{1}{3}$  of a minute depending upon the instrument. A telescopic line of sight, with a bubble vial attached for leveling, is mounted on a horizontal axis on the alidade. A vertical circle, with a vernier, is attached to this telescope. This circle can be read from 0 to 90 degrees in each direction, the 0 degree reading being when the line of sight is set exactly at a 90 degree angle with the vertical axis of the alidade. This horizontal axis permits the telescope to be reversed in altitude (which is called "plunging") after which the line of sight will be in exactly the opposite direction from its former position. This is one method for prolonging a line and the result is the same as if the alidade had been turned through a horizontal angle of 180 degrees. A magnetic needle with a graduated circle is also mounted on the



ENGINEERS' WYE LEVEL.

FIG. 1



COMPLETE TRANSIT.

FIG. 3



FIG. 2

alidate below the telescope. Its main use today is to provide a check on the deflection angles, when both compass readings and deflection angles are recorded in the field notes. The upper and lower motions on a transit can be moved independently. Either motion can be clamped in a stationary position while the other motion is revolved.

There are a number of other miscellaneous items of equipment such as ranging or flag poles, chaining pins, plumb bobs, stakes, hatchets, axes, etc., which do not require detailed explanation.

#### THE CONVENTIONAL HIGHWAY SURVEY

*The alignment survey* is the work of laying out on the ground the exact location of the centerline of the proposed highway. It is the "backbone" of the highway

survey since all other survey work is referenced to this centerline. All land surveys and descriptions must be tied into this line before the right-of-way to be acquired from abutting owners can be determined.

In ordinary practice, the location engineer will have determined the route of the proposed highway within narrow limits prior to the ground survey. This may be done by the use of aerial photographs or field reconnaissance, or both. When the route is definitely decided, the ground survey party proceeds to make an accurate survey on the line as proposed by the location engineer.

The highway alignment consists of a series of straight lines called tangents. When the alignment changes direction from one tangent to another, this point is called the P.I. (point of intersection) of the tangents. The tangent ahead is called the "fore" tangent and the one on which the survey has been proceeding is the "back" tangent. The horizontal angle, left or right, which the fore tangent makes with the back tangent is called the deflection angle (written " $\Delta$ ").

Starting at the B.O.P. (beginning of project) the survey proceeds along the first tangent to the first P.I. The P.I. Station 12+30 (Figure 4) means that this point is exactly 12 stations plus 30 feet, or 1230 feet, from Station 0+00. We should note, however, that all surveys do not start with the 0+00 stationing. When the survey is a continuation of a prior survey, the prior stationing may be carried on. The B.O.P. of the new survey would then have the same station number as the E.O.P. (end of project) of the older survey, and the stationing would be carried on from there.

With the transit set on the P.I. station, the line of sight is set at an angle of 180 degrees with the back tangent. From this position the telescope is turned to the fore tangent by sighting on the next P.I. and the horizontal deflection angle is

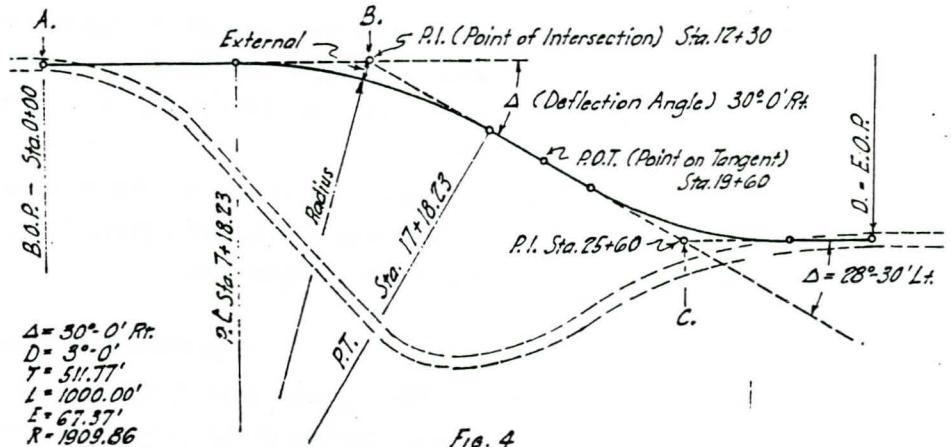


Fig. 4

measured. Since modern highways do not have angles in them, it is necessary to fit a curve between the back and fore tangents. The degree of curvature is usually determined in advance by the location engineer.

The stationing on the survey line is measured along these curves, therefore, it will be necessary to compute the data for this curve before proceeding. The surveyor, having the deflection angle and the predetermined degree of curve, can obtain from his handbook the data necessary for this computation. He must first find the tangent distance (T) that is the exact distance from the P.I. along the back tangent to the P.C. (point of curvature). By subtracting this distance (T) from the P.I. station, he can determine the station of the P.C., where the curve leaves the back tangent. Then this same distance (T) measured from the P.I. along the fore tangent will give the location of the P.T. (point of tangency) where the curve ends. The length of curve (L) is the distance which, added to the P.C. station, will give the station of the P.T. and the measurement of the stations along the fore tangent from the P.T. proceeds from this point to the next P.I. where the process is repeated.

All P.I., P.C., and P.T. stations are staked, usually with iron pins set below the ground surface, and tied in to reference points so that they can be found for future use.

The curve illustrated in Figure 4 is called a simple circular curve. This type of curve is most commonly used in highway work. They are specified as curves of a certain degree (D), which means that they are part of a circle where (D) degrees of central angle will subtend an arc of 100 feet. The abbreviation (R) means the radius of the circle or curve, and (E) is the external distance from the P.I. to the mid-point of the curve.

The spiral curve (Figure 5) is also called an easement or transition curve. It provides for a gradual change from a straight line tangent to a circular curve or vice versa. Its degree varies constantly with the distance along the curve. When it is necessary to use a sharp degree of circular curve, the use of a spiral curve at each end makes the transition more gradual and results in a safer and easier riding curve. Used originally by the railroads it is now widely used in modern highway design.

The compound curve (Figure 6), which is seldom used today, is composed of two simple circular curves of different radii which are tangent to each other at a common point, with both curves on the same side of the tangent. The two curves are laid out as separate circular curves, the P.T. of the first coinciding with the P.C. of the second at a point on their common tangent which is called the P.C.C. (point of compound curvature).

Modern highway design will always interpose a tangent between two curves of different degree, even if its length must be short. The compound curve on a highway

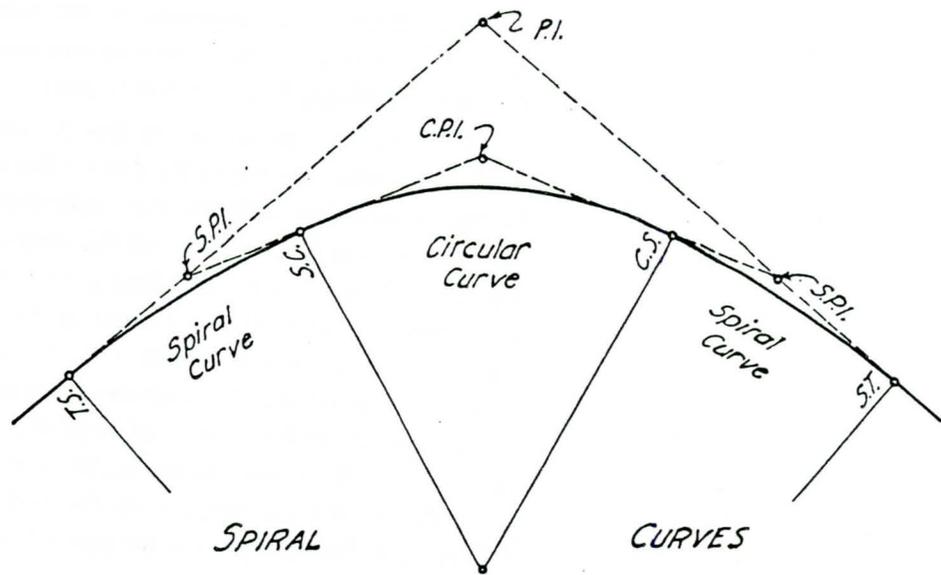
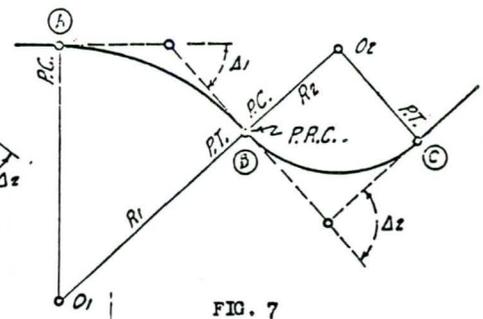
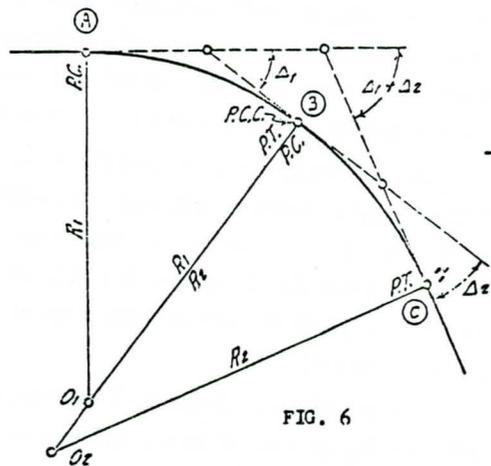


Fig.5

is a dangerous feature since an unwary driver may be thrown off the road by a sudden change in the degree of curvature.

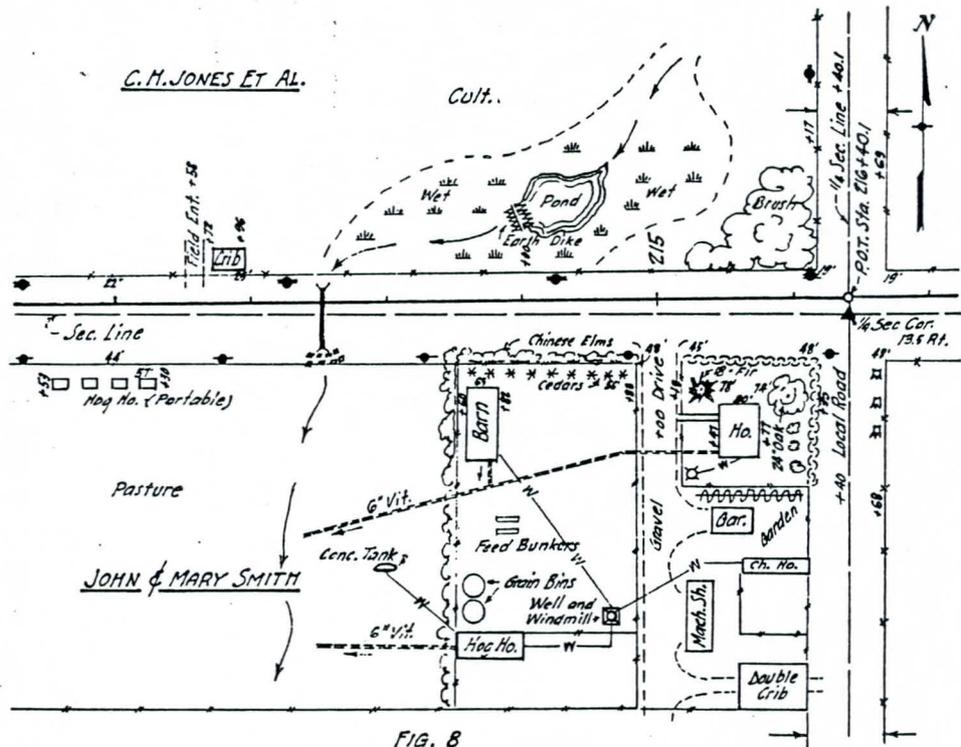
The reverse curve (Figure 7) is only used under conditions of absolute necessity. It is composed of two simple circular curves of the same or different radii lying on opposite sides of a common tangent. They are laid out as two separate circular curves with the P.T. of the first coinciding with the P.C. of the second at a point on their common tangent called the P.R.C. (point of reverse curvature).



## Topographical Data

Topographical data is usually taken by the alignment party. This consists of locating and recording in the field notes all of the features, both natural and in the form of improvements, located on the terrain through which the survey passes and which can possibly be affected by the proposed highway construction. The size, type of construction, and condition of all buildings are usually obtained. Fences and fence corners, driveways, intersecting roads, trees, hedges, windbreaks, ponds, tile lines, pole lines, pipe lines, etc., are noted. The type of land use such as cultivated, pasture, timber, etc., is important. Any land or lot corners discovered should be carefully tied in for future use. Figure 8 shows topographical information plotted on a highway plan.

Topographical data is referenced to the centerline of survey by station and measured distances right or left. When the right-of-way is laid out, this information is essential, since the location of improvements may have a definite bearing on how the right-of-way is to be taken. The appraiser needs this information, especially in the appraisal of partial takings. He must know what is being taken and in addition he may have a proximity damage to some of the improvements not taken. He must have the correct relationship of the proposed highway centerline to these improvements in order to reach his determination of the amount of damage.



A good topographical picture is almost a necessity for the negotiator. A plan showing a farmstead, with all of the improvements located and plotted to scale, will enable the owner to understand how the proposed highway construction will affect his property. Its value as a visual aid is very important in this respect.

### Elevations

The level work in a highway survey consists of securing and recording elevations. The alignment and topography will give the highway a plan, but the work of the level party is needed to add the vertical dimension. Elevations are essential in the design and construction of a modern highway.

The work of the level party begins with the establishment of the datum which is the plane or surface of reference from which all of the elevations on the survey are reckoned. This may be sea level if a U.S. Coast and Geodetic Survey bench mark is available; otherwise, some point of a permanent nature is selected which can be readily located for future reference. An arbitrary elevation is assigned to this point, such as 1,000.00 feet, and this becomes the survey datum. Bench marks are then established at convenient points along the route of the alignment survey. These are permanent points selected for future reference in leveling operations. They are located outside of the zone of construction since they will also be used during and after the highway construction. They are described and located by station and distance, right or left of centerline. Each is numbered and its elevation is accurately determined to the nearest one hundredth (0.01) of a foot.

The method by which elevations are carried from a bench mark by means of the engineer's level is illustrated graphically in Figure 9. By reading a rod placed on the bench mark and adding this reading to the bench mark elevation, the levelman determines the H.I. (height of instrument). He can now find the elevation of any point on which he is able to obtain a rod reading. He has only to subtract this rod reading from the H.I. to determine the elevation of the point. When, because of terrain or distance, he is unable to see the rod, he must choose a turning point (T.P.) and after

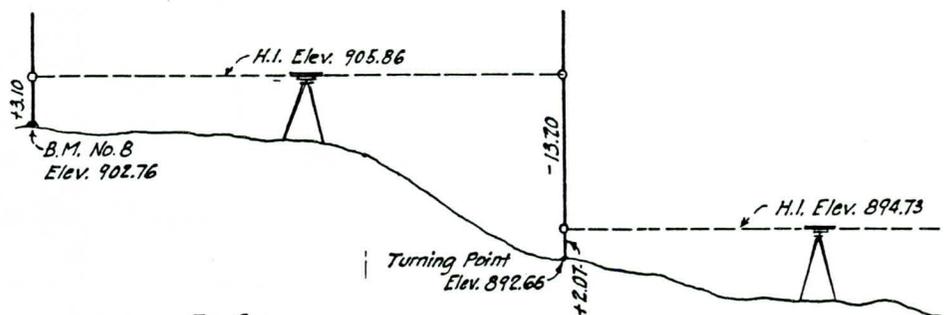


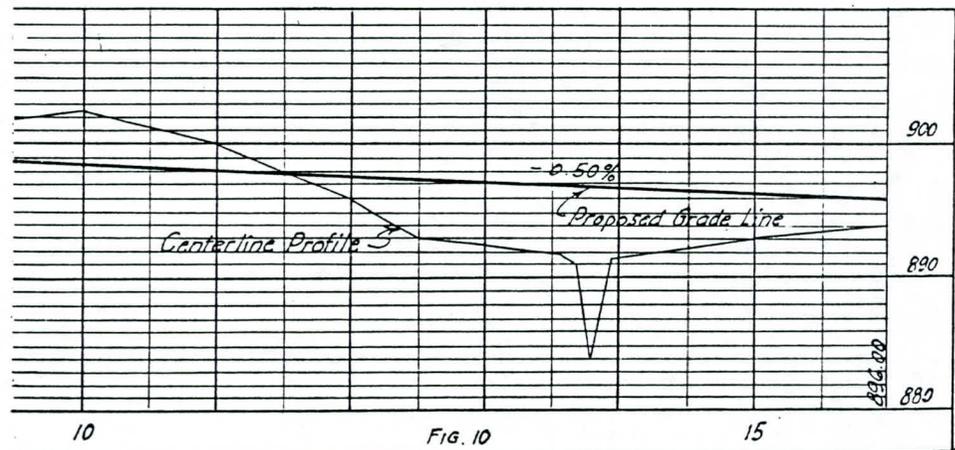
FIG. 9

a careful sight he determines the elevation of the T.P. He then moves his level to a location where he can read the rod on the T.P. and also on the point desired. He determines the new H.I. from the elevation of the T.P. and continues as before.

*Profile leveling* consists of finding the relative elevations of a series of representative points along a surveyed line which may be the center of a highway, an intersecting road, a driveway, or a stream bed. These elevations when plotted will show the profile or vertical section of this line. The elevations are taken at the measured stations and also at the intermediate points where there are breaks or irregularities in the terrain. The profile of the ground on the centerline of a highway survey is sometimes run as a separate item of work but more often these centerline elevations are secured at the time when cross sections are taken. In Figure 10 a small section of highway centerline profile is illustrated.

*Cross sections* might be termed as profiles of the ground taken in both directions from the highway centerline and at right angles to it. They are taken on all stations and at intermediate points where ground irregularities are such that they will be needed to give a true picture of the terrain. These cross sections are used for computation of the material that will be needed for cuts and fills. They give a picture to the right-of-way man not only of the cut or fill that will be built on the centerline but, where it is more important to the adjacent land owner, also on the shoulders where it abuts his land.

The survey work in cross sectioning is fairly simple. When the H.I. of the level is determined (see Figure 9), the rod is read at all breaks in the ground and the right-angled distance from centerline measured at the same time (Figure 11). When these elevations are computed and plotted at their respective distances from centerline, we have a cross section of the ground at this particular station. In Figure 12 some



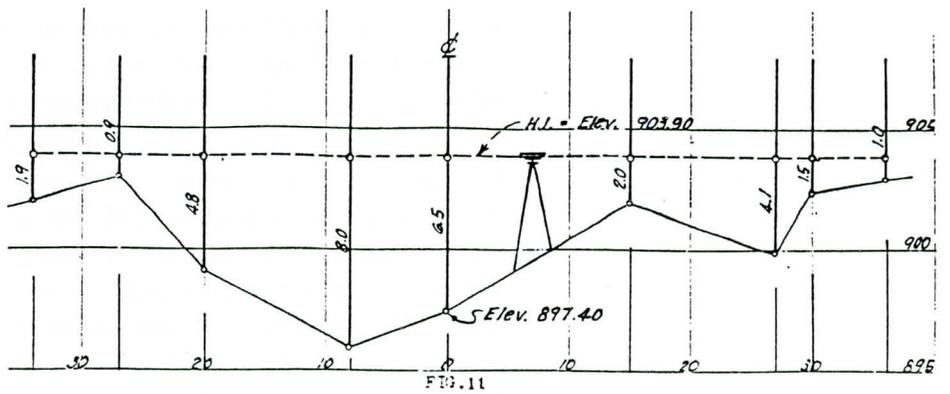


FIG. 11

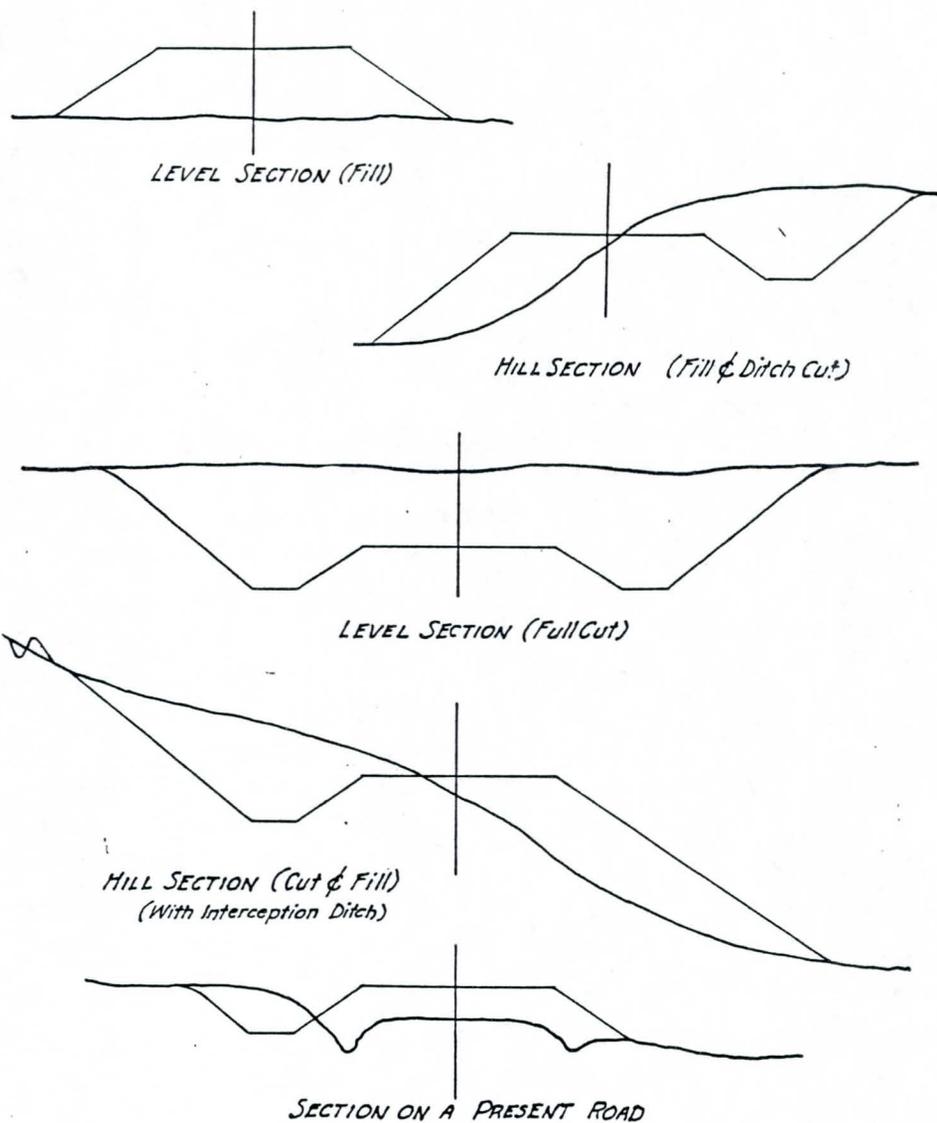
typical cross sections are illustrated with the proposed grading templates superimposed showing both cut and fill sections.

Occasionally the level is used to make a *contour survey*. Contours are lines on the ground which are at a constant elevation at all points. When plotted they are drawn at uniform intervals of 1 foot, 2 feet, or more. First, one or more base lines must be run through the area. These are measured lines similar to the lines run on the alignment survey. The level party will then cross section from these lines in the same manner as they do on the highway. The cross sections should cover the entire area taking into account all the irregularities of the ground. When the elevations are computed and plotted in their correct position on the area, contour lines may be plotted by interpolating between these elevations. Figure 13 is a sketch of a contour map of an area showing the base line tied to the highway centerline, and the stations on the base line where the cross sections were taken. The contours are shown plotted but the elevations of the various points have been omitted for lack of space.

The *stadia survey* is a form of topographic survey which is often used in highway work when elevations are needed at various points over a rather large area. An example would be when data is required for laying out and estimating a major channel change for a large stream. The stadia survey is also used whenever it is desired to prepare a contour map of considerable extent. For this type of work the accuracy of stadia is usually sufficient and results in the saving of considerable work which would otherwise be required in running auxiliary base lines and cross sectioning.

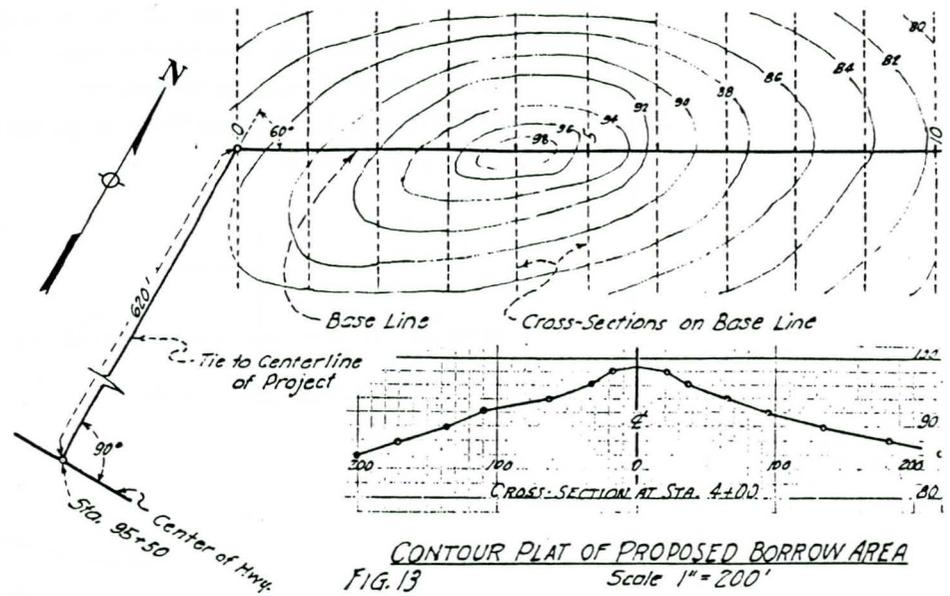
The transit, for stadia, must be equipped with a vertical circle and with the crosshairs and bubble vial used for level work. The telescope must also have two additional crosshairs set above and below the crosshair used for leveling. (See Figure 15). A stadia rod having a special form of marking is used in this work. (See Figure 14). The markings on this rod can be read at a much greater distance than the graduations on an ordinary level rod.

To make a stadia survey the transit must be set up at some point of known location and elevation. This point is usually chosen on the survey centerline. Another point of known location is chosen, which generally is also on the survey centerline, and the straight line between these two points is the "line of reference" for the stadia survey. (See Figure 16).



TYPICAL CROSS-SECTIONS WITH GRADING TEMPLATES SUPERIMPOSED

Fig. 12



The transit is sighted on the reference point and the horizontal circle is set with a  $0^{\circ}$ - $360^{\circ}$  reading on the line of reference. The height of the horizontal axis of the telescope is measured to obtain the H.I. and this exact height is marked on the stadia rod. The rodman then sets his rod at all points where elevations are desired.

The transit man, with the transit lower motion clamped, now sights on the rod for line and also sets the center horizontal crosshair on the H.I. as marked on the stadia rod. He then reads from the rod the intercept, or the interval on the rod, which is visible between the upper and lower horizontal crosshairs. He reads the vertical circle to get the angle of inclination which his line of sight makes with a level line, and he reads the horizontal circle to obtain the azimuth or the horizontal angle (from  $0^{\circ}$  to  $360^{\circ}$ ) which his line of sight makes with the line of reference. (See Figure 16). With this data recorded it is possible to compute the elevation and distance to the stadia point and to plot its location in regard to the transit point and the line of reference.

#### LAND SURVEYING

The primary function of the land survey is to secure the necessary data from which a written description can be made and a plat drawn for a specific tract of land. This is necessary before the title to the tract can be conveyed from one individual to another. A legal description to be adequate for this purpose must be one which can be located on the ground with reasonable certainty by a competent surveyor either with or without additional external evidence.

There are basically two kinds of land surveys:—original surveys and resurveys.

*Original surveys* are made for the purpose of establishing monuments, corners, lines, dividing lands, etc. The government survey of a township or a section, a survey for a new townsite, a new addition to a city or the survey for a new subdivision would be examples of an original survey. The function of the surveyor is to make an accurate survey; to establish permanent monuments, corners, and true markings; and to make a complete record of his work in the form of field notes and plats.

*Resurveys* are made for the purpose of locating monuments, corners, lines, and boundaries which have previously been established. The function of the surveyor is to find where the original monuments, corners, lines, and boundaries were, not where they ought to have been. When the original corners are lost or where the description is vague or ambiguous, he will re-establish the corners and lines to the best of his ability. He may use external evidence such as existing boundary fences



STADIA ROD  
FIG. 14

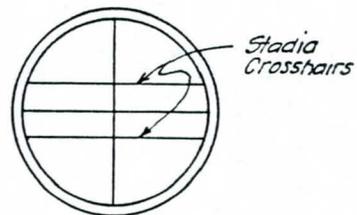


FIG. 15

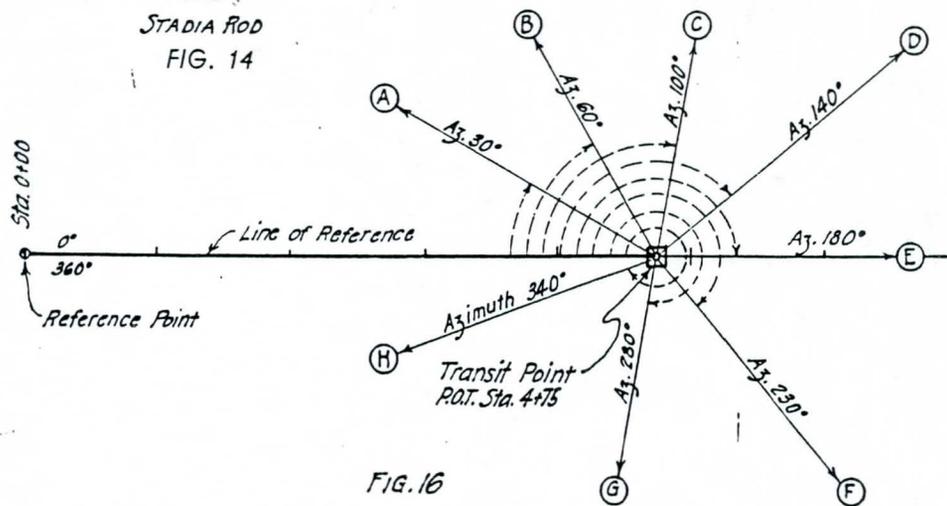


FIG. 16

and the testimony of witnesses who remember the location of original corners or lines if such information is available. The surveyor making a resurvey has no official power to decide disputed points. He may serve as an expert witness in the case, but unless the interested parties agree with his decisions the court must settle the question.

In right-of-way acquisition, the primary interest is in the original survey. It is only when a resurvey has been authenticated and accepted by all interested parties, or has received court approval, that it can be considered of value in land descriptions.

There are in general two basic systems of original land surveys. The surveys in the United States were first made by the *Metes and Bounds System*, but for the most part these surveys were very irregular and often involved complex and conflicting conditions. The original colony States and the State of Kentucky were surveyed in this manner and further examples are found in the French surveys in Michigan, Indiana, Illinois, Missouri, Louisiana, etc. The Spanish surveys in Texas, California, etc., were also made by this system. The *U.S. Rectangular System* was adopted by Congress in 1785 and, with subsequent revisions, this method has since been used in U. S. Government surveys.

### The Rectangular System

*The U.S. Rectangular System* was first authorized by Congress in the Land Ordinance of 1785. This was followed by the Land Act of 1796 which was the first law relative to land surveys passed under the Constitution. This act made radical changes in the methods of survey as originally conceived. This Land Act was amended by Congress in 1800 and again in 1805, and by this time the system was firmly established. During the period from 1805 to 1855 a number of General Instructions were issued to the Government surveyors from time to time. The General Instructions 1851-1855 set the general pattern which is in use today.

The U.S. Rectangular System consists of a system of coordinates. The land is subdivided into townships approximately 6 miles square, each containing 36 sections approximately 1 mile square. However, since it is obviously impossible to obtain a true rectangular system on a spherical surface, the survey requires that corrections be made for the convergence of the meridian lines. The details of the present method of survey are briefly as follows:

*Initial Points*, from which to start the survey, are established whenever necessary under special instructions prescribed by the Commissioner of the U. S. General Land Office.

A *Base Line* is extended east and west from the initial point on a true parallel of latitude. The proper township, section and  $\frac{1}{4}$  section corners are

established on this line with meander corners set at the intersection of the base line with all meanderable lakes, streams, or bayous.

The *Principal Meridian* is extended either north or south or in both directions from the initial point on a true meridian line. Corners are set when running the base line.

*Standard Parallels*, which are also called "correction lines," are extended east and west from the Principal Meridian at intervals of 24 miles north and south of the base line and are to be run on true parallels, following the procedure used in running the base line.

*Guide Meridians* are extended north from the base line and the standard parallels at 24 mile intervals, measured both east and west from the Principal Meridian. They are run on true meridian lines and in the same manner as the Principal Meridian.

The foregoing provides for a grid system measuring 24 miles from south to north with the south line of each square being 24 miles in length but the north line will be somewhat less due to the convergence of the meridians (Figure 17). This 24 mile square is now divided into 16 townships, each approximately 6 miles square. The north-south lines are run on meridian lines and the east-west lines on the parallels. The townships are identified by numbering each according to its distance north or south from the base line and east or west from the Principal Meridian (See Figure 17). To avoid confusion in description, the tiers of townships running north and south from the base line are called ranges. A description such as T80N, R20W of the 5th P.M. means that this particular township is located in the 80th row north of the base line and in the 20th tier or range west of the 5th Principal Meridian.

The township is subdivided into 36 sections which are numbered beginning with one in the northeast corner then proceeding west to number 6 in the northwest corner, thence east to number 12 and so on alternately until the number 36 in the southeast corner. (See Figure 18).

The method of subdivision is to first establish the true meridian line north from the southeast corner of the township. The lines forming the east and west boundaries of the sections are then run parallel to this meridian until the west line of the township is reached. The lines forming the north and south boundaries of the sections are run parallel to the south line of the township. This would theoretically result in 30 sections 1 mile square with 6 fractional sections along the west boundary of the township caused by the convergence of meridians. Practically, however, the surveys of the townships were seldom, if ever, so perfect that they would be of the exact dimensions they should have been. This being the case, the excess or deficiency in the exterior township lines was thrown into the western and northern half sections

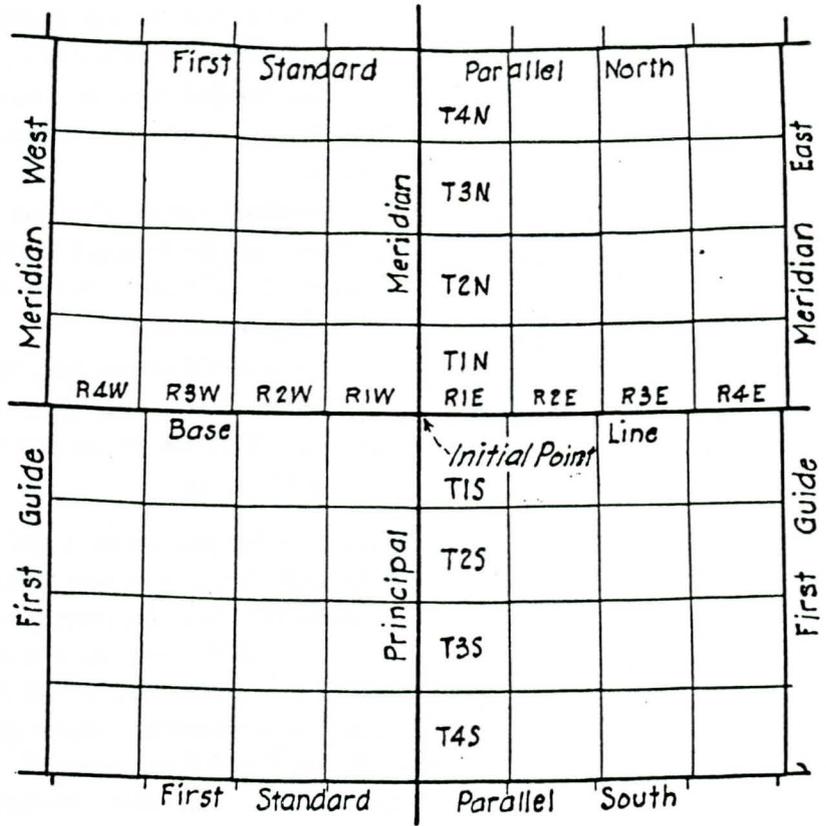


FIG. 17

bounded by the township line on the west and north. This is shown in Figure 19—8 is an interior section, 5 is a section on the north boundary, 7 is a section on the west boundary, and 6 is the section in the northwest corner.

The Government surveyors set the corners of the sections, and in most cases the quarter section corners. They did not set the quarter-quarter corners, this being done later in private surveys. There are a few general rules which are controlling upon the location of all lands that have been granted or patented and govern the retracement of the original Government surveys and further subdivision of sections. These are:

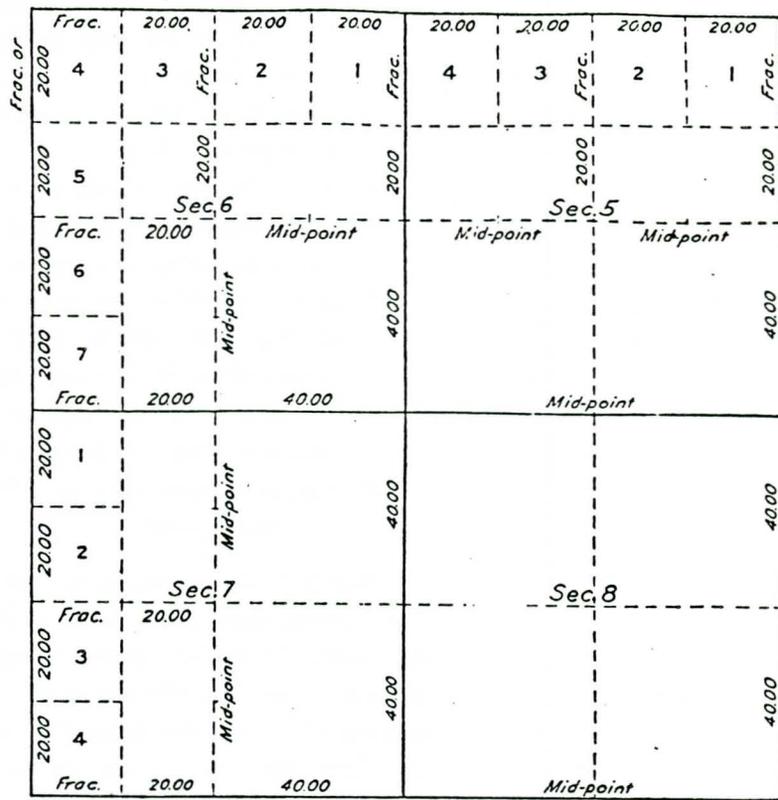
1. The boundaries of public lands established and returned by the duly appointed Government surveyors, when approved by the surveyor general and accepted by the Government, are unchangeable.
2. The original township, section and quarter section corners established by the Government surveyors, must stand as the true corners they are intended to represent, whether the corners be in the place shown by the field notes or not.

3. Quarter-quarter corners not established by Government surveyors shall be placed upon the straight lines joining the section and quarter section corners and midway between them, except on the last half mile of section lines closing on the north and west boundaries of the township or on the lines between fractional or irregular sections.
4. The subdivisional lines of a section running between the original quarter corners must be straight lines running from the proper corner in one section line to its corresponding corner in the opposite section line.
5. In a fractional section where no corresponding quarter corner has been or can be established, the centerline must be run from the proper quarter section corner, as nearly in a true east and west or north and south direction as the case may be to the meander line, reservation, or other boundary of such fractional section, as due parallelism with the section boundaries will permit.
6. Lost or obliterated corners will be restored to their original locations whenever it is possible to do so.

The original Government surveys ran meander lines on all navigable rivers and other streams three chains or more in width. These lines were run at the ordinary high water line on both banks, taking into account the general courses and distances of their sinuosities. Meanders were run on larger lakes and ponds of "sufficient magnitude to justify the expense" (General Instruction of 1834 and 1843) or where they were "40 acres or more (in area) which were not likely to dry up" (General

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

FIG.18



Showing normal subdivision of sections.

FIG. 19

Instruction of 1846). In later surveys these meanders were run on lakes, navigable bayous and deep ponds of the area of 25 acres or more. Meander corners were established where meander lines cross base lines, township lines, or section lines.

Government lots are the fractional parts of the quarter-quarter units of a fractional section which result from the subdivision of such sections. They are found on the north and west boundaries of a township (See Figure 19) and where the sections are invaded by meandered streams and bodies of water or by private claims. (See Figure 20). They may also be caused by a reservation or other irregular boundary which renders such a section fractional. These illustrations show the method used in numbering these Government lots for their identification under various conditions.

### The Metes and Bounds System

*The Metes and Bounds System* was used prior to the Land Ordinance of 1785 in the original colony States and Kentucky and by the French and Spanish surveyors in

various areas as we have previously noted. This system, as the name indicates, is a survey which measures and establishes the limits or boundaries of a tract of land. From the data obtained in this survey the surveyor can write a description, prepare a plat, and determine the area of the land involved.

This form of survey is still used extensively where irregular shaped tracts are involved. It is used also for rectangular shaped tracts which must contain an exact acreage or for those which cannot be readily described as regular subdivisions of a section under the rectangular system. In searching the deed records one finds many tracts which were conveyed in accordance with metes and bounds descriptions, and to interpret and plot these descriptions, it is necessary to have a knowledge of this form of survey.

In older times the land surveyor was equipped with a surveyor's compass and a "Gunter's" chain. The former consisted of a sight line attached to a compass mounted on a vertical spindle for horizontal rotation. When the line of sight was turned, the graduated circle turned and the needle remained pointed to the magnetic north. By reading the horizontal circle (usually in degrees and  $\frac{1}{2}$  degrees) the surveyor could determine the deviation of his line of sight to the east or west of the north point or the south point.

The four sections or quadrants of a compass are NE, NW, SW, and SE. (See Figure 21). The cardinal points are due north, south, east, and west. The bearing of a line is determined by its direction. If it falls in the north half of the compass it will be so many degrees and minutes either east or west of north. In the south half, this deviation is read from the south end of the needle as east or west of south. From this it is self evident that a compass bearing will never exceed  $89^{\circ}59'$  since at  $90^{\circ}$  it would be designated by its cardinal direction either east or west.

In Figure 22 the method of recording the bearing of a line is illustrated. You will note that the same straight line may have two different bearings as  $N35^{\circ}E$  or  $S35^{\circ}W$  depending upon its direction from the compass location.

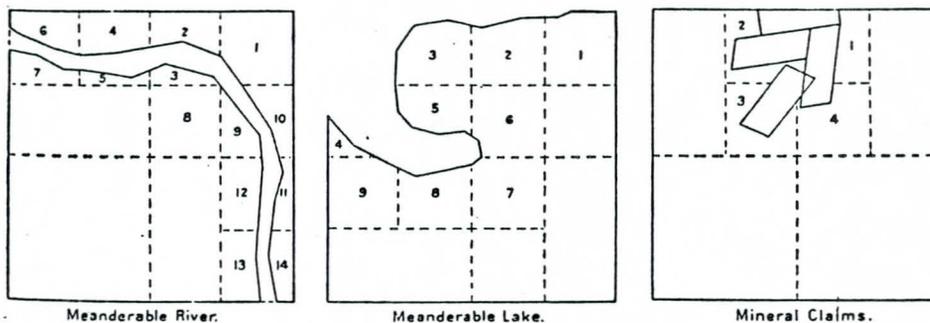


FIG. 20

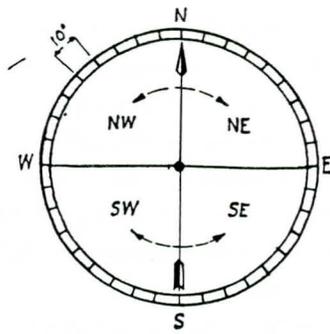


FIG. 21

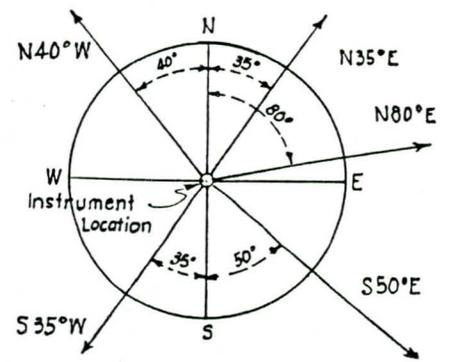


FIG. 22

In most of the older land surveys the surveyor's or "Gunter's" chain was used for the measurement of distances. This chain was 66 feet (or 4 rods) in length and was composed of 100 equal links each 0.66 of a foot in length. This length had some advantage since a 1-chain square tract contained 16 square rods or one-tenth of an acre. As the links became worn with use their lengths varied and required constant adjustment, and for this reason it was eventually replaced by the engineer's steel tape which is used today. However, one must be prepared to translate the old deed measurements into feet and decimals of a foot. For example, a distance of 8 chains and 12 links (or 8.12 chains) is  $8.12 \times 66 = 535.92$  feet.

In present day metes and bounds surveys the surveyor's compass and chain have been supplanted by the engineer's transit and steel tape. Deflection angles are measured with an accuracy far beyond that possible with the compass and its somewhat erratic magnetic needle. While the transit is equipped with a compass today, its use is only for a check as the bearings are computed from the deflection angles of the traverse around the area. The distances are measured to the nearest decimal of a foot. The traverse is run similar to the traverse of a highway centerline except that the traverse of an area must close by returning to its "point of beginning."

The metes and bounds survey must have a definite, fixed, starting point of a permanent nature which can be readily located. It may be natural or artificial. A known section corner, or quarter section corner is a good example. This may not be "the point of beginning" of the land description which must, of necessity, be a point on the perimeter of the tract being surveyed. It may in fact be some distance away, and to avoid having two "points of beginning" most surveyors today use the following form: "Commencing at the northwest corner of Sec. 21 thence . . . . . to the point of beginning, etc."

In Figure 23 is shown an example of a metes and bounds survey which can be easily platted and from which an accurate description can be made. The survey can be retraced by any competent surveyor should the need arise.

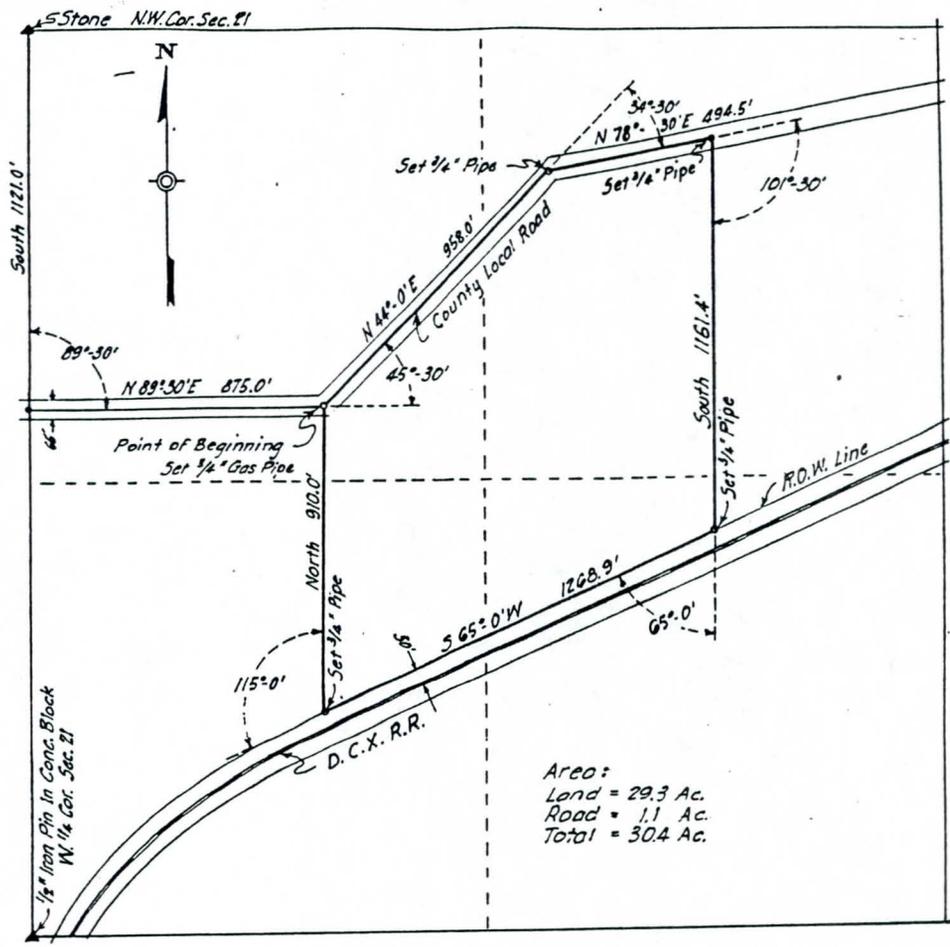


FIG. 23

## Photogrammetry

T. S. HUFF

*Chief Engineer of Highway Design  
Texas Highway Department*

*and*

A. H. CHRISTIAN

*Right-of-Way Engineer  
Texas Highway Department*

The photogrammetric survey involves first, the taking of aerial photographs of the proposed highway route. These photographs are taken so that they can be reproduced on a predetermined scale. For preliminary reconnaissance this scale is usually 1,000 feet to the inch. The photographs which are used for the detailed work on alignment, topography, and for obtaining the elevations necessary for profiles, cross sections, contours, etc. are prepared on a scale of 500 feet to the inch.

In the use of these photographs a very ingenious instrument called the "Kelsh plotter" magnifies the scale five times and corrects the error, which is present in all photographs, to give a true dimensional picture. The operator of the Kelsh plotter is able to obtain data from these photographs with sufficient accuracy to lay out alignment and plot topographical data and also to read elevations for profiles, cross sections, and contour maps. Some ground survey work is necessary to establish control points from which the plotter works, but the bulk of the work is done from the aerial photographs. The Kelsh plotter, however, is not adaptable to land surveys which must be made on the ground.

Aerial photography is the process of photographing the earth's surface with exposures taken either vertically or at an angle. Angle photographs, commonly called "obliques," are used principally for illustrative purposes while vertical photography under carefully controlled conditions can furnish the basic information needed for preparation of accurate engineering maps. The process of preparing these engineering maps from base photographs is called photogrammetry, defined as "the science or art of obtaining surveys by means of photographs."

In recent years, the use of photogrammetry has been introduced into nearly every phase of highway engineering. Chief benefits are in route and location, determination of drainage requirements, development of geometrics, preparation of plan and profile, determination of earthwork quantities, and the determination of right-of-way requirements. Experience has proven that complete construction plans and exact right-of-way requirements can be determined by the photogrammetric process with only a minimum of supporting field work.

Many State highway departments have facilities and personnel to develop photogrammetric maps with their own forces, while others purchase such maps by contract. A combination of the two may be considered most feasible as it allows the flexibility of being able to do phases of the work which are difficult to handle by contract and yet does not require the expanded operation necessary to take care of peak loads.

Regardless of which agency makes the map, the requirements are the same and the finished product should be the same. Basically, the requirements for data for right-of-way maps and for field notes for deeds in urban areas, to be compiled by photogrammetric methods, are planimetric and topographic maps at a scale of 20 feet to 1 inch with horizontal errors not to exceed 0.5 foot and vertical errors not to exceed 0.3 foot. The normal width of coverage for a map of this type is 760 feet, which is the area covered by one flight line using a 9" x 9" negative and a 6-inch focal length camera. Each additional flight line will increase this width approximately 500 feet.

Ground control surveys for photogrammetric maps of this type require second order horizontal control and third order vertical control, and it is recommended that the survey be tied to the State Plane Co-ordinate System. The primary traverse is made between known first or second order monuments of the U.S. Coast and Geodetic Survey, the U.S. Geological Survey, or other competent agencies who engage in making basic control surveys. Intermediate markers are set throughout the project and tied into the project-control survey. Many of the larger cities have marked the center of intersecting streets and have information on file regarding the accepted street intersections. These points can also be tied into the project-control survey and the coordinates of the block corner established.

The number of points to be established on the ground and shown on the map will vary with the complexity of the project. On some projects, it has been found advisable to establish all four corners of a block in order to tie in the subdivision plat accurately. On other projects, only the base line survey with the minimum number of points to control the pictures is established.

On a planimetric map of this scale and accuracy, it is not a matter of what can be obtained in the way of planimetric detail, but more a matter of deciding what should and should not be shown. It is possible, when detailing with a 6-inch accuracy, to show such things as individual steps on houses, projections from buildings including

window air-conditioners; and even the position of switches in railroad yards will be shown as open or closed. The important thing, however, is to show details which are relative to the purposes for which the map is to be used, as shown in Figure 1.

In many suburban and rural areas, maps compiled at a scale of 40 feet to 1 inch which utilize second order ground control but allow a maximum horizontal error of 1 foot, are considered acceptable for use in right-of-way development when the properties involved are large tracts. A flight line width of 1,200 feet is normal for this scale map and a vertical accuracy with errors not to exceed 0.3 foot can be maintained.

In addition to all the aforementioned planimetric details, the topographic maps include contours as shown in Figure 2. These topographic maps are valuable for cross section and drainage data which can be obtained without the usual field survey.

One of the most important points of the photogrammetric method is the latitude afforded the engineer in determining the location and the limits of the right-of-way. The property owners are not disturbed by field parties measuring houses and stepping in flower gardens; tenants are not upset about having to move; and no one knows that a survey is in progress.

The accuracy of each map is carefully checked in all aspects before it is accepted for use. A field edit is made in which the type and condition of each improvement is noted on a print of each planimetric map. This is done as a check for omissions of



Figure 1. A typical planimetric map.



Figure 2. The topographic map shows contours in addition to planimetrics.

improvements and can be used when making economic studies in determining the right-of-way takings.

Maps and plats of official recorded subdivisions and additions are obtained from the office of the County Clerk, as well as prints of county plats of each survey or city block through which the new project is to be developed. These are usually photo copies, but any type of legible reproduction is acceptable. These plats furnish a good check on the dimensions of each block and are used to verify the owner's deed.

With the ownership data acquired from the County Clerk's office or title companies, the block lines and street rights-of-way can be developed on the planimetric maps. This is done by one of two methods.

The first method is by calculation. In the areas where the city has actually established and marked the street intersections, the coordinates of each block corner are computed from the ties to the intermediate station markers. The distances between each corner are then checked against the official plat and the owners' deeds. If no appreciable discrepancy exists within a given block, the lot lines and property lines are then plotted on the planimetric maps.

The second method of developing the property lines is by scaling. This method has to be resorted to in the areas where the city has never established or marked the street intersections. The planimetric sheets are first laid out on a large table and each sheet

carefully matched and taped to the adjoining sheet so as to form a picture of either the whole project or a good portion of the whole project. Thread lines are then stretched from one end of a street to the other and adjustments are made until all dimensions check with the dimensions shown on the official plats. The block lines and lot lines are then plotted on the map as shown in Figure 3.

When appreciable discrepancies occur, a field survey will be required to determine which is in error. These planimetric maps are very helpful to the field party as they afford them a view of the entire block which they are to survey.

After all of the property has finally been developed on the planimetric sheets, these maps are then laid over a roadway layout. This layout has the slope and ditch lines shown thereon as well as possible retaining wall locations, as shown in Figure 4. This overlay is carefully studied, taking into consideration the types and conditions of improvements which might be bisected if the right-of-way is based on slopes rather than retaining walls. Economic studies are made by both engineers and appraisers when items of major right-of-way expense are involved.

After these studies have been made, the right-of-way lines are drawn on the planimetric property map as shown in Figure 5 in a location to provide the necessary right-of-way width to accommodate the proposed construction. The exact location of



Figure 3. Planimetric map showing block and ownership lines.

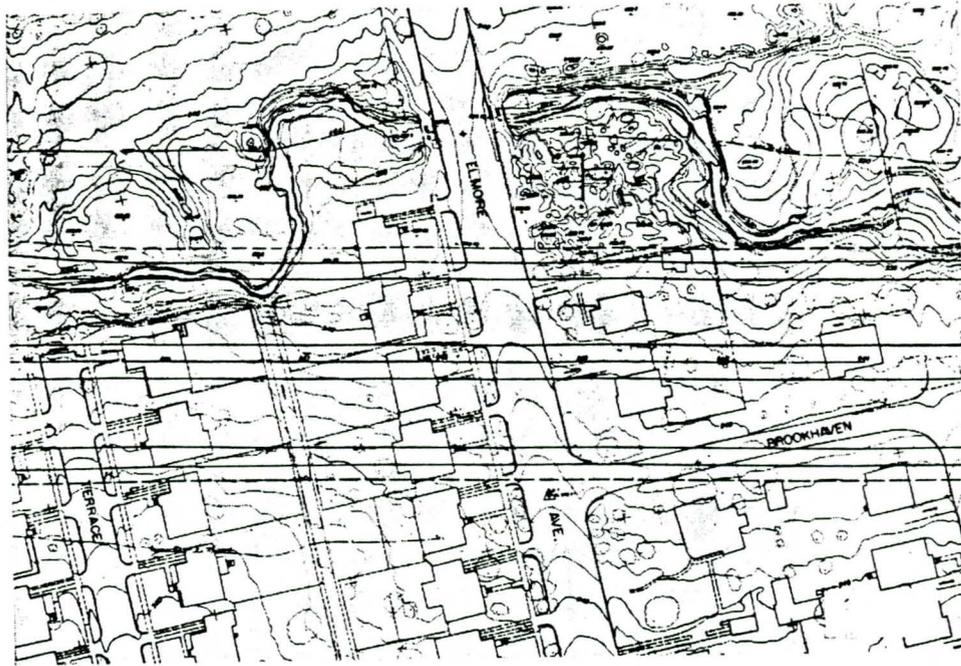


Figure 4. Topographic map with slope and ditch lines for preliminary study of right-of-way requirements.

the intersection of each property line with the right-of-way is determined by scaling a distance to the outside corner of each property and subtracting this set distance from the total dimension called for in the owner's deed.

The deed descriptions are written to clearly define the remaining property so that should the owner have this remainder surveyed, it would only affect the location of the right-of-way line a maximum of 6 inches in urban areas and 1 foot in rural sections.

When the entire limits of a project are completed on the large scale maps, each map is photographed and a negative at the desired scale is obtained. These negatives are spliced together at match lines and reproducible plan-size sheets (22" x 36") are made from this continuous negative roll.

As shown in Figure 6, the roadway geometrics and access control lines are added to the standard plan-size sheets and all are bound under a title sheet to form the completed right-of-way plans.

The planimetric and topographic maps, as used for right-of-way map and deed preparation, may also be used as exhibits in eminent domain proceedings. The State, however, should be prepared to testify that the data shown on the maps has been verified by field survey. The witness, to be as effective as possible, should be an engineer within the highway department, since he will have to give factual and specific testimony regarding the data.



Aerial photography is important to the right-of-way process not only through photogrammetry but also by use of the aerial photographs themselves. In area planning and route and location studies, it is the responsibility of the right-of-way staff to assist the engineer by estimating probable right-of-way costs. During this preliminary phase of work, photographs are very useful to the right-of-way staff in establishing comparable sales data and general land values. Estimated costs on several routes may be studied from one set of photographs, or the cost of widening an existing facility can be compared with potential new locations. In preparing preliminary appraisals for route and location, the appraiser can coordinate his field examination of individual properties with the photographs and comparable sales data and can classify the properties within neighborhood ranges of value.

After engineering has advanced to the point that design and right-of-way requirements are known, aerial obliques with a minimum amount of art work can be used to portray the finished highway facility long before the project is ready for construction. While planimetric, topographic, and other engineering drawings are confusing to the general public, aerial obliques showing "before and after" conditions are understandable and highly useful in public hearings, general publicity, and in right-of-way negotiation and acquisition.

Photographs are particularly useful in the actual detailed appraisal process for right-of-way purchase. They show the general land use, development trends, and, in many cases, the degree of potential which the land possesses for subdivision, commercial, or industrial development. Whole properties of large size can be outlined on the photographs and many advantages or disadvantages can be observed by the appraiser which might be hidden from view during a ground inspection. These photographs also afford a means for more intelligent review of the completed appraisals by the review appraiser.

Aerial photographs are valuable assets to negotiation. The parcel can be studied prior to owner contact and compared to other parcels and oriented in relation to existing roads, the proposed construction, streams, and other features. Damages and enhancements as assessed during the appraisal process may be examined as well as neighborhood characteristics and the general terrain involved. Property boundaries can be outlined on the photograph. A copy that has been retouched to show the right-of-way boundaries and the proposed facility gives the property owner a concept of what is proposed for construction on his property and the relative position of the property in relation to the highway facility. Photographs of similar properties on completed projects are effective in negotiation by showing how property develops after a highway has been constructed.

In eminent domain proceedings, aerial obliques can clearly show aspects and features which could not be as effectively shown to the jury or special commissioners

in any other way. Vertical exposures may be used to show comparable properties. Photographs with overlays or with the artist's conception of the completed facility can show benefits to property remainders to offset claims of excessive damages. A valuable use can be made of photographs showing completed highway construction and abutting property development that is comparable to the area in question. In partial takings where the project is in operation before eminent domain proceedings are completed, photographs of the completed project can be most effective, particularly where enhancement in value has taken place in the area by reason of the highway construction.

In the general public relations effort, aerial photographs, particularly obliques, afford the best means to catch the public's eye. Traffic operational conditions, area development, elimination of slums, improvement of drainage problems, proposed planning, and many more features can be used as the basis for publicity releases. Photographs are the focal point of attention to support the written material.

Some typical uses of aerial photographs are outlined in the following illustrations:

Figure 7 is a medium altitude oblique. Without any touch-up work, the base photograph may be used for preliminary study of the general area where the highway facility will be constructed. With the right-of-way lines superimposed it is possible to study the exact highway requirements and their relationship to the general terrain, buildings, or other improvements. The size and shape of the parts to be acquired and the remaining property are readily determined. Obliques of this type help the appraiser to establish general land values and to locate comparable properties in the area. Such photographs minimize the amount of time the appraiser must spend in the field.

Figure 8 is the same base oblique as Figure 7, modified to show the construction as it will appear upon completion of the project. This type photograph is frequently used at public hearings and in general publicity, and is an effective aid to negotiations. Both Figures 7 and 8 could be admitted in eminent domain proceedings to show "before and after" conditions.

Figures 9, 10, 11, 12, and 13 are examples of obliques with proposed highway facilities superimposed by an artist. These may be used at public hearings, in appraisal work, negotiations, and eminent domain proceedings.

Figures 14, 15, and 16 show developments and enhancements which are a direct result of the completed highway facility. Such photographs are useful in negotiating for residential properties, to show that homes are built along freeways, and to overcome the misconception that a "flare" taken off the corner of a lot will severely damage the remainder.

Figure 17 illustrates the commercial developments which take place in interchange areas and which are directly attributable to the highway construction. This type of oblique is useful in negotiations and eminent domain proceedings.

Figures 18 and 19 are low altitude obliques showing a completed Interstate highway facility. Their primary use is for general publicity and to show completed conditions in eminent domain jury trials. This particular project was built in the area of a creek subject to frequent overflow. The cross street shown in the upper portion of Figure 18 and in Figure 19 was frequently impassable. The highway drainage system was coordinated with a city drainage project shown in the upper foreground of Figure 19 and the drainage problem alleviated. Obliques best show these features and afford the general public a better understanding of the community improvement.

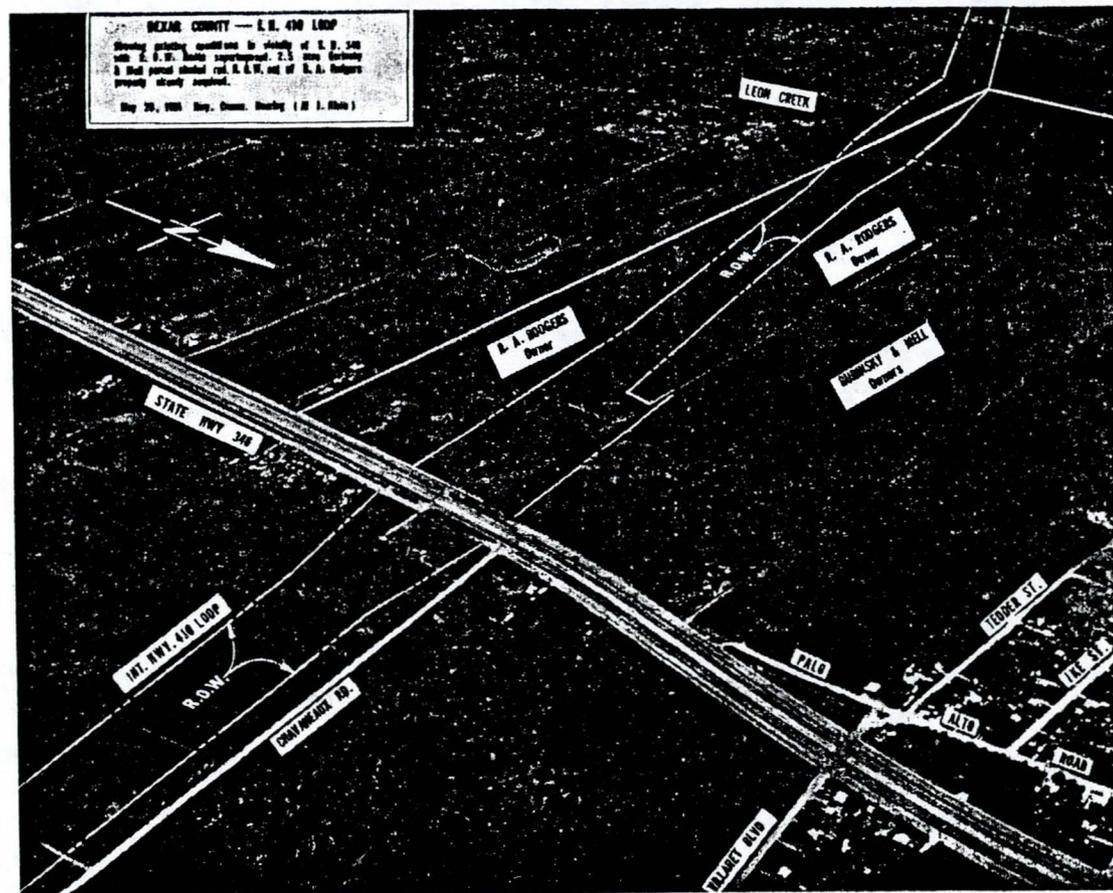


Figure 7

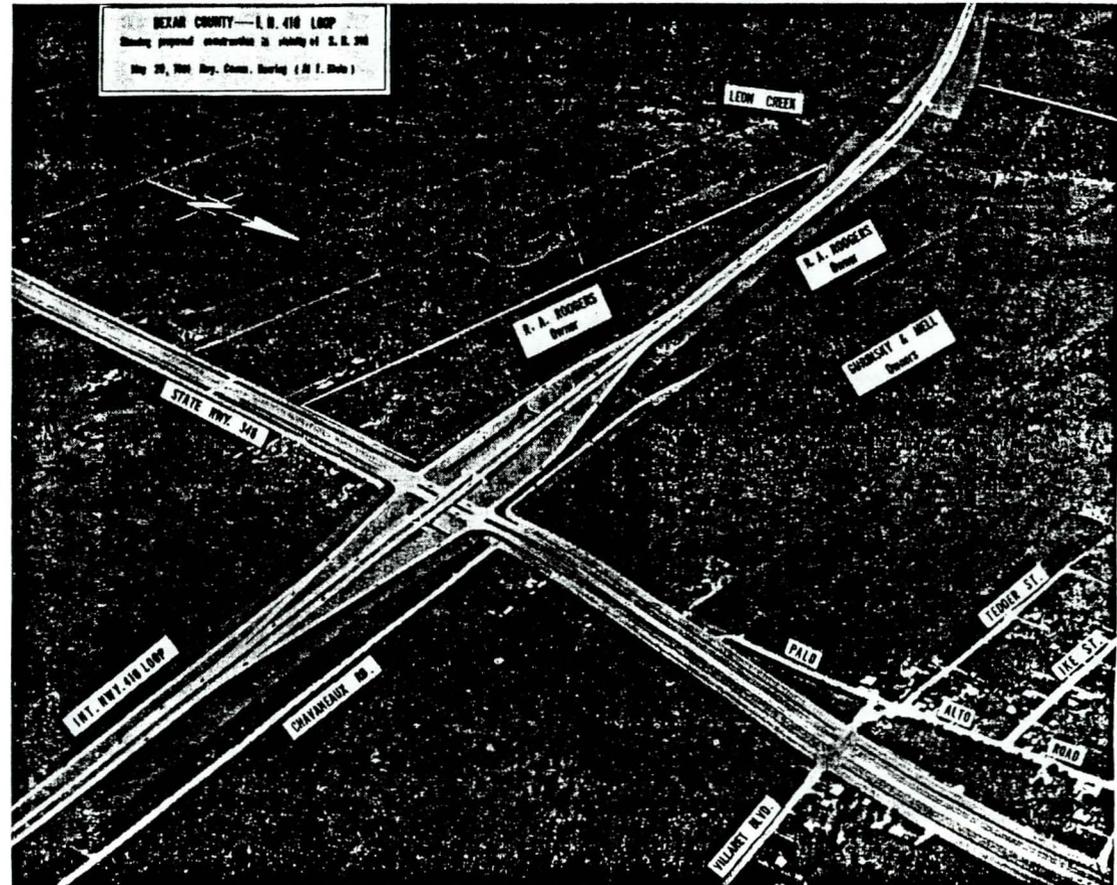


Figure 8

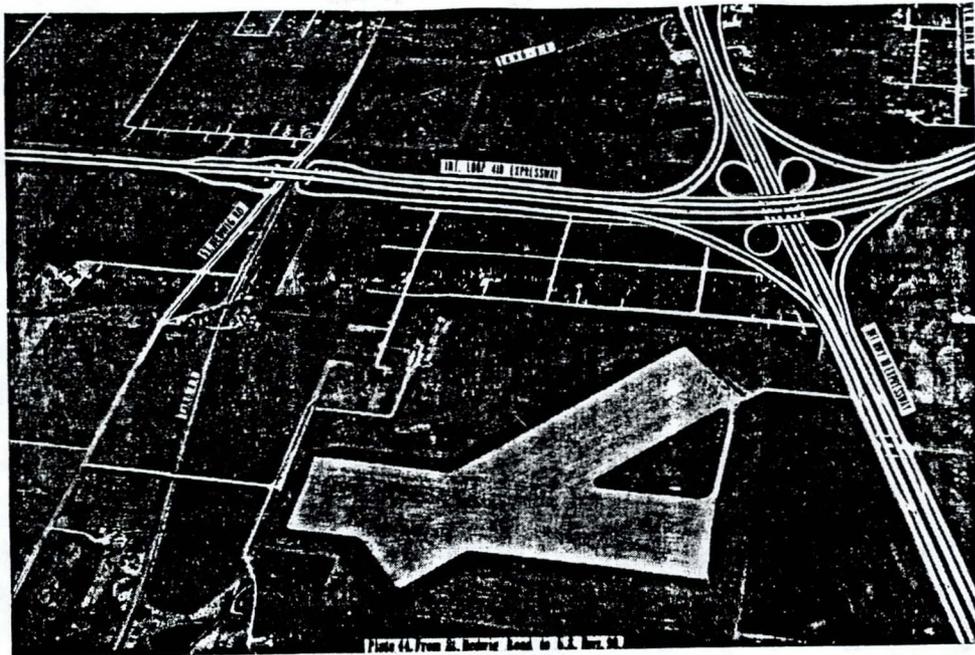


Figure 9

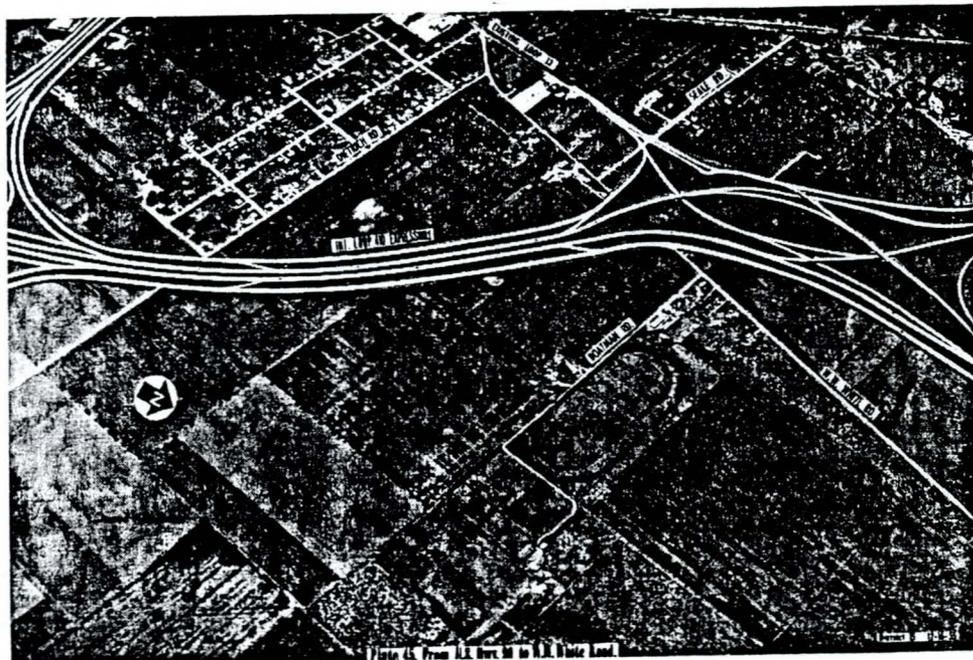


Figure 10



Figure 11

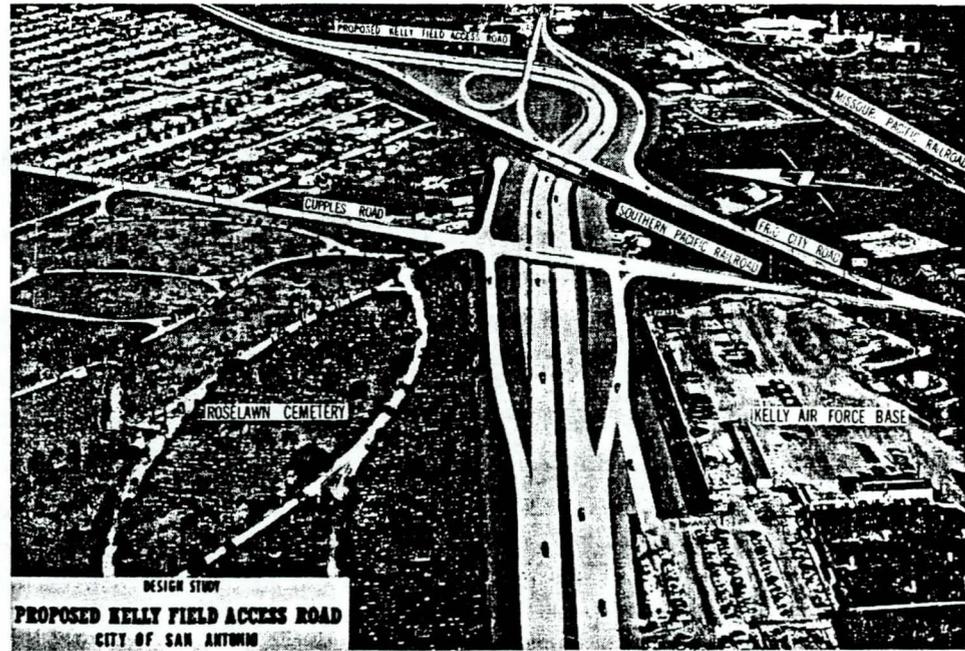


Figure 12

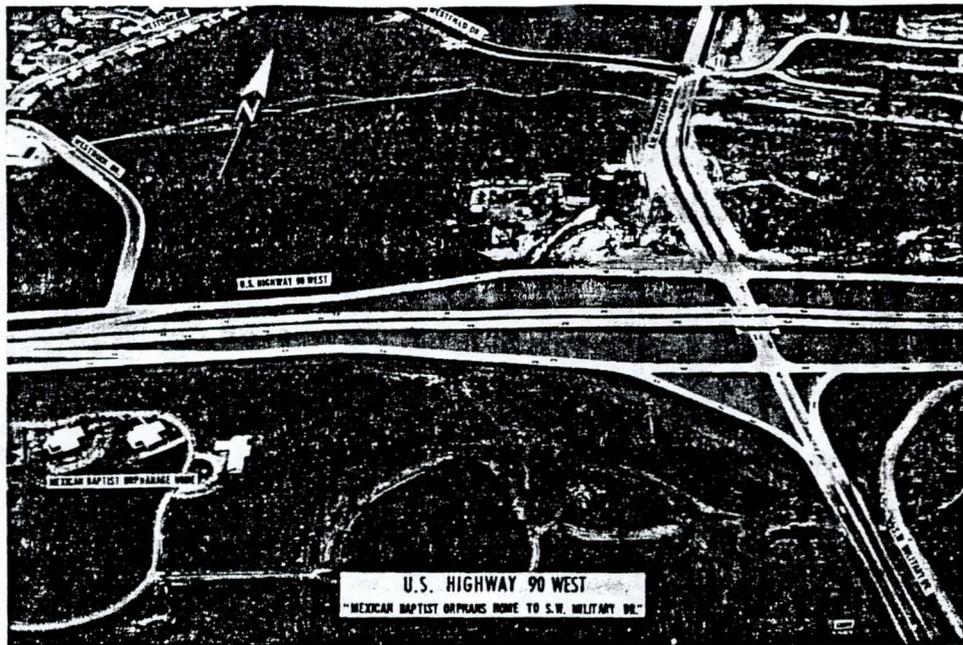


Figure 13

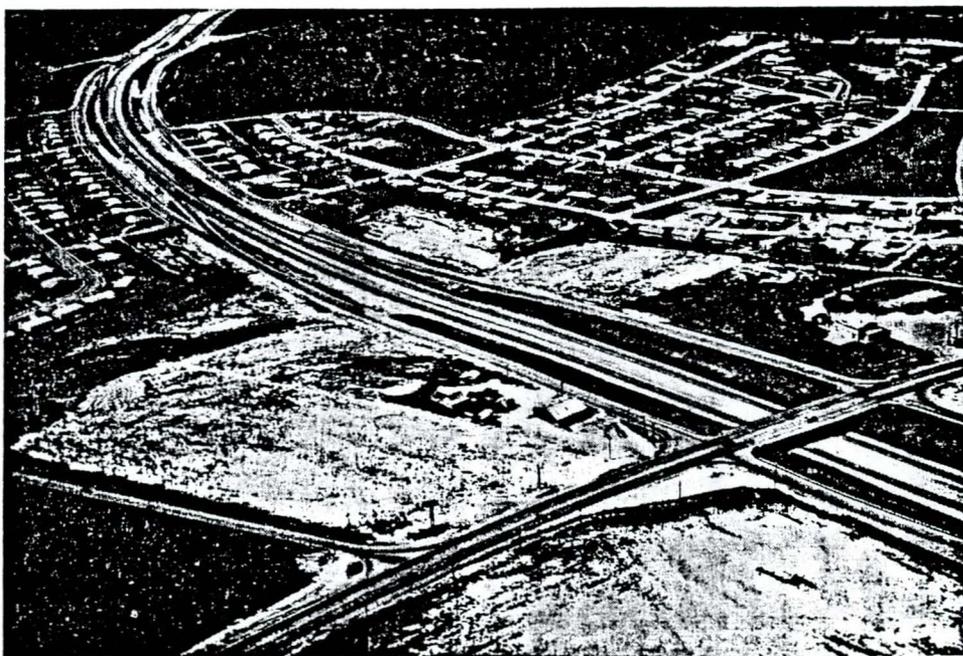


Figure 14

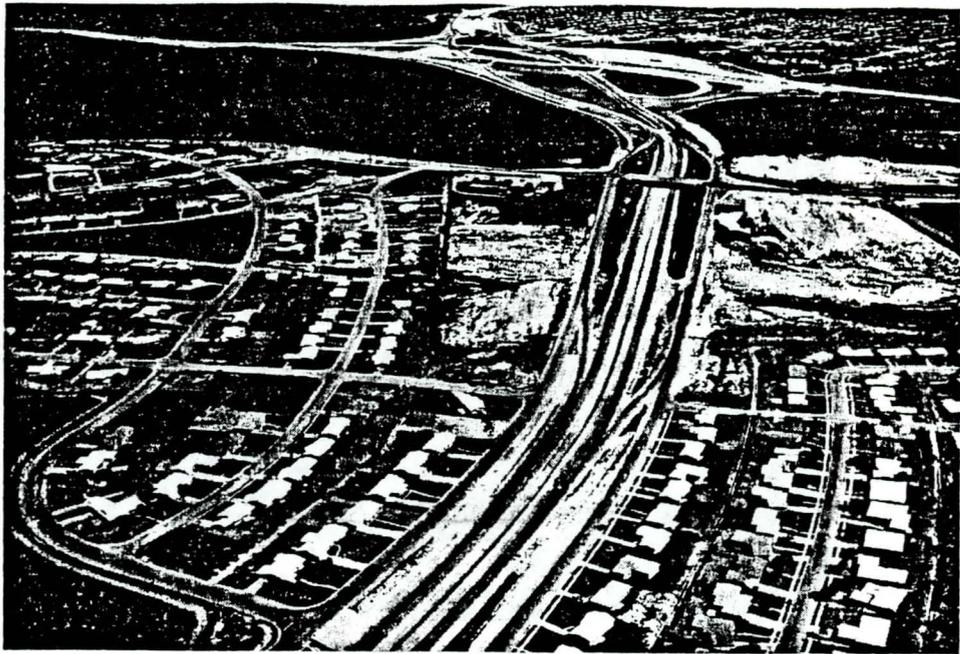


Figure 15



Figure 16



Figure 17

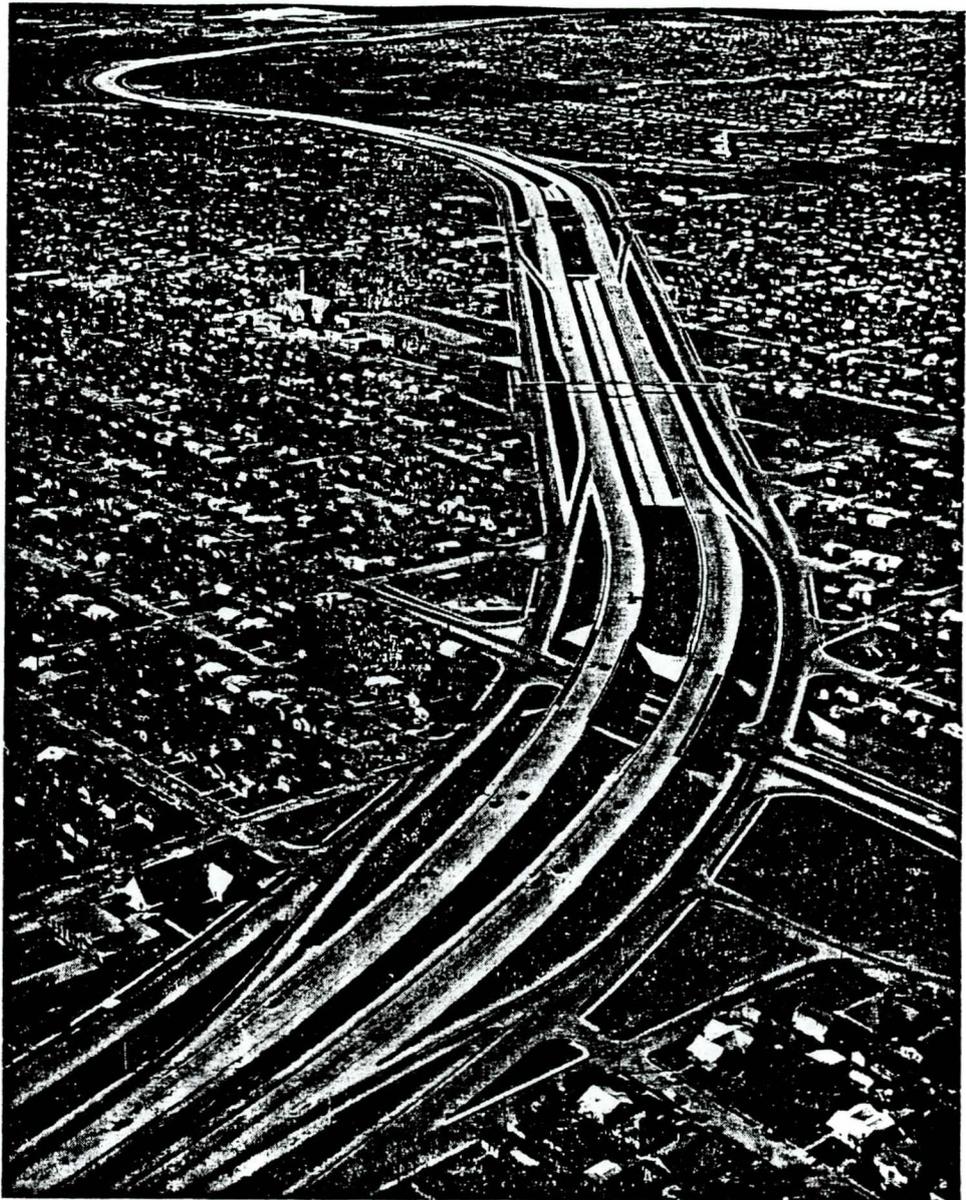


Figure 18



Figure 19

## Highway Plan Reading

L. J. WALLIS

*Special Right-of-Way Consultant  
Iowa State Highway Commission*

[*Editor's note:* In developing the general engineering principles in this chapter, reference is made to particular Iowa symbols, plan sizes and procedures. While these may differ slightly in other States, the general principles and applications would still apply.]

When one speaks of a highway plan, in the general sense, he is referring to the completed design of the proposed improvement. This will include all of the detailed information on grading, paving, draining, bridging, right-of-way, etc., which the construction engineer and contractor will need to reproduce in actuality what the plan shows in the form of drawings and notes. The right-of-way agent should be conversant with this highway plan. He is not expected to be able to understand all of the intricacies of the design work, but he should be able to interpret the information shown on the plan sheets sufficiently to visualize the proposed construction. This is especially true of those details which will affect the property of abutting owners with whom he must negotiate for right-of-way. A general knowledge of highway surveys is essential since the plan reproduces, in drawings and notes, the data previously secured by the survey party. The design engineers have added to this delineation of present conditions all of the details which are necessary to show the proposed highway as it will be constructed.

For the purpose of this instruction the general highway plan will be divided into three main divisions: the plan, the profiles, and the cross sections. The usual highway plan sheet shows the centerline of highway, or alignment, in a plan view on the top half of the sheet. This is projected in a vertical section, or profile, directly below on the bottom half of the sheet. The vertical cross sections at right angles to the centerline are shown on separate sheets.

### Highway Plans

The *alignment plan* is a view of the highway from above, somewhat similar to an aerial photograph. The centerline as surveyed is plotted on this sheet, usually on

a scale of 1 inch equals 100 feet in rural areas. In congested areas and on urban plans, scales of 1 inch equals 50 feet or even 1 inch equals 20 feet are quite commonly used. The survey stations are marked on this centerline with every fifth station numbered. All transit points which have been set on survey are plotted, giving their stationing with the reference points (or ties) shown so that they can be located on the ground. The centerline curves are drawn in and the curve data is noted on this sheet.

This plan view always has the north point designated by means of an arrow so that the plan sheet can be oriented, since it is not practicable to plat the survey centerline on the plan view with the north point consistently in the same direction on all sheets.

On all highway plans certain abbreviations have become practically standardized. The small section of centerline plotted (Figure 1) shows many of the survey points, and the list following translates the abbreviations.

All transit points used in the preliminary survey are usually marked by iron pins set flush with, or below, ground level. On the plan sheet references are shown (see Figure 1) so that these points can be located for future use during the survey and also for the subsequent construction work.

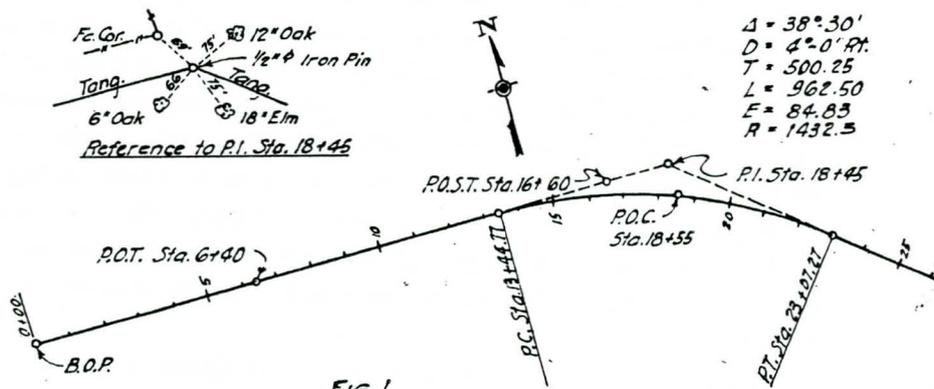


FIG. 1

- |          |                                     |                          |                                |
|----------|-------------------------------------|--------------------------|--------------------------------|
| B.O.P.   | = Beginning of Project              | Curves (not illustrated) |                                |
| P.O.T.   | = Point on Tangent                  | P.C.C.                   | = Point of Compound Curvature  |
| P.O.S.T. | = Point on Sub-Tangent              | P.R.C.                   | = Point of Reverse Curvature   |
| P.I.     | = Point of Intersection of Tangents | T.S.                     | = Tangent to Spiral            |
| P.O.C.   | = Point on Curve                    | S.C.                     | = Spiral to Curve              |
| P.C.     | = Point of Curvature                | C.S.                     | = Curve to Spiral              |
| P.T.     | = Point of Tangency                 | S.T.                     | = Spiral to Tangent            |
| E.O.P.   | = End of Project                    | S.P.I.                   | = Spiral Point of Intersection |

Office relocations of a part of the survey centerline are often made in the process of design. These are shown on the finished plan as a solid line marked "office relocation." The survey centerline where the relocation is made is shown as a dashed line. The stationing on the relocation at the beginning is the same as on the survey but when the relocated line returns to the survey line, its stationing will be different. This requires an equation in the stationing at this point since the two lines will vary in length. In Figure 2 this situation is illustrated. The length of the survey line from P.C. Sta. 9+65 to P.T. Sta. 41+38.30 is 3173.30 feet while on the relocated line it is only 2975.10 feet. After the equation, the regular survey stationing is again resumed. This is important in right-of-way, especially in area computations. When a distance is figured between stations by subtracting one from another this equation must be considered, because, if the equation between the two stations is inadvertently overlooked, the distance will be incorrect.

The plan view, in addition to the centerline alignment, also shows the topographical features of the terrain through which the centerline passes. In reading this plan the right-of-way agent will find many abbreviations and symbols which are used to represent such topographical features. When these are understood, the plan reading becomes relatively as simple as looking at an aerial photograph. See Figures 3 and 4.

At the time the survey is being made these topographical features are located by station and distance right or left of centerline. When this data is plotted on the plan sheet, it is drawn to the same scale as the centerline survey. The important measurements will be given and those of less importance can usually be scaled from the plan. In Figure 5 a small section of a highway plan sheet is shown which illustrates how a farmstead might appear on the plan view.

The proposed right-of-way lines are drawn on this plan (Figure 5) in their proper relation to the centerline. The appraiser can now see to what extent the right-of-way taking will affect the improvements and the negotiator will be able to show the property owner just where the new right-of-way line is to be.

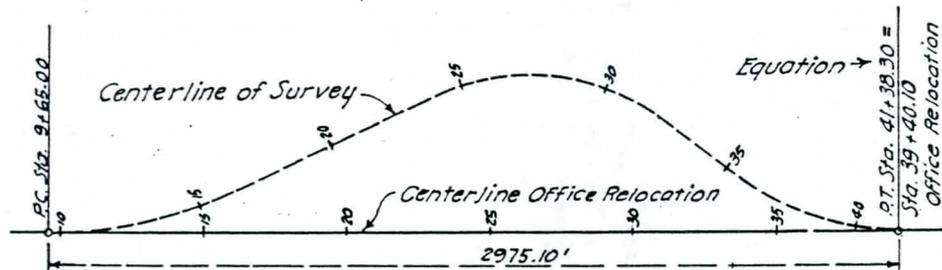


FIG. 2



The highway profile drawings are shown on the bottom half of the standard highway plan sheet. The profile is a vertical section of the plan view as it would appear if a vertical cut was made on the survey centerline and the cut face exposed to view.

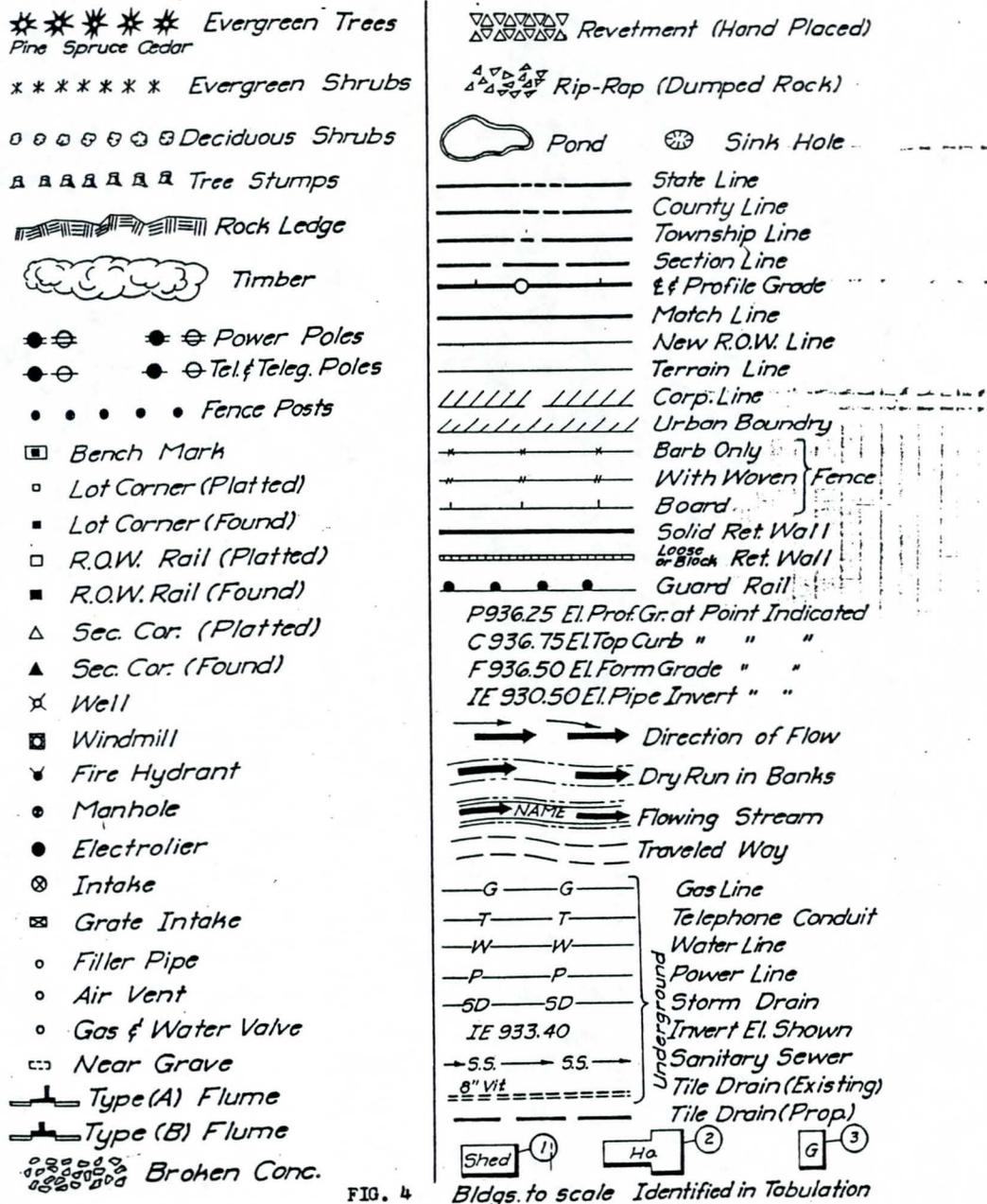


FIG. 4

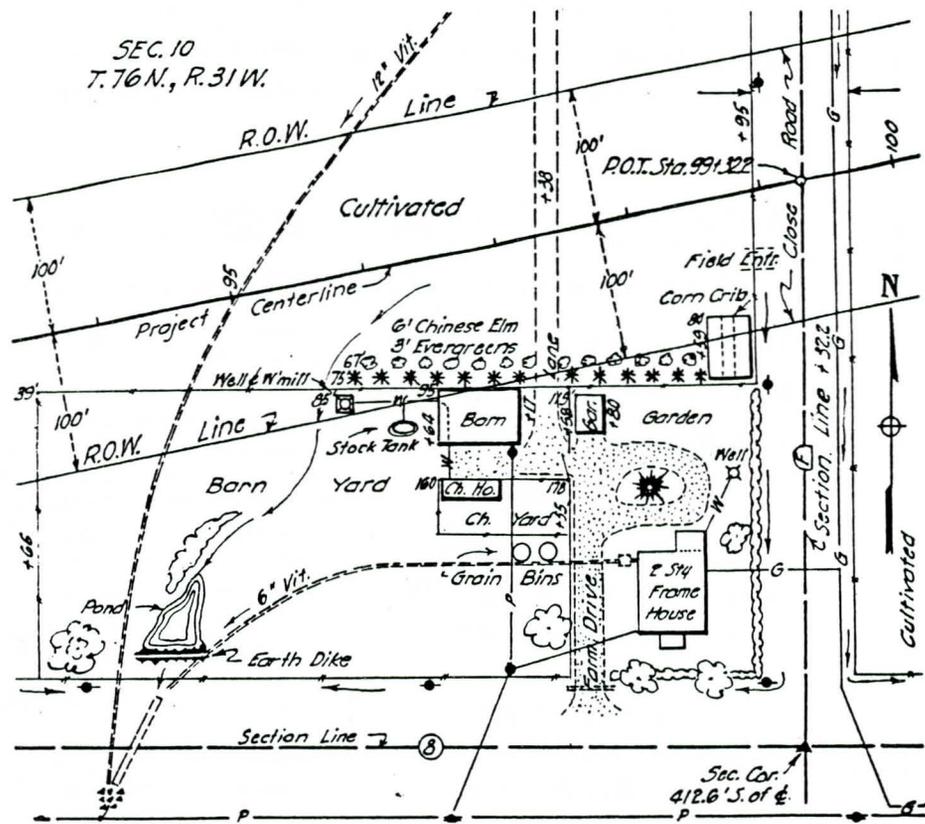


Figure 5

This half of the sheet is ruled with vertical lines spaced  $\frac{1}{2}$  inch apart and horizontal lines spaced  $\frac{1}{10}$  inch apart.

Profiles are drawn on a distorted scale. The horizontal scale will be the same as used on the plan view but the vertical scale will be different. For example, if the plan is drawn as 1 inch equals 100 feet, this will be the horizontal scale of the profile, but the vertical scale will probably be 1 inch equals 10 feet. This is done to facilitate the reading of elevations, and it also gives a much clearer idea of the profile than would be possible if drawn on a natural scale.

On the profile sheet the stations are marked at five station intervals along the bottom edge of the sheet. These are the same stations that are shown on the plan view. At each side of the sheet the elevations are marked at one inch intervals or at every tenth ruled line. With these coordinates the elevations can be plotted for all points along the survey centerline. When this is done and a line drawn through these points, the profile is plotted of the natural ground on centerline. (See Figure 6.)

There is also another centerline profile shown on this sheet. This is the proposed highway grade line. This grade line is determined by the road designer and shows the proposed elevation of the new highway at all points. The relationship of the proposed grade line to the present ground line is evident at a glance, and the amount of cut or fill to be made on centerline can be readily determined.

The highway grade, like the alignment, consists of a series of straight lines which are connected at their points of intersection by curves. These lines and curves operate in a vertical direction, however, and are called grade lines and vertical curves. Grade lines are designated by their per cent of grade which is the vertical rise or fall in 100 feet. For example, a grade line rising at the rate of 3 feet in 100 feet, in the direction of survey, is a plus (+) 3% grade. A fall of 3 feet in the same direction would be a minus (-) 3% grade. (See Figure 6.)

Vertical curves are used to connect the grade lines at their points of intersection for the purpose of eliminating sharp changes in grade thus making an easier riding highway. These curves are usually designed as parabolic curves and are shown on the profile sheet. The elevations of points on the vertical curve are given on the bottom of the profile sheet usually at intervals of 25 or 50 feet.

It is common practice to plat the profiles of driveways and road intersections on this profile sheet. To illustrate (see Figure 7), driveway profiles are plotted at Sta. 6+82 Right and 8+70 Left by showing them 10 feet below and above their actual elevation. The proposed highway centerline grade can be plotted on this small profile and the right-of-way agent is then able to determine and explain what can be done about each driveway. This is illustrated at Sta. 8+70 left and shows that to maintain about the same driveway grade will require the grading to be extended some 40 feet further left. The drive at Sta. 6+82 will obviously be improved by the small cut.

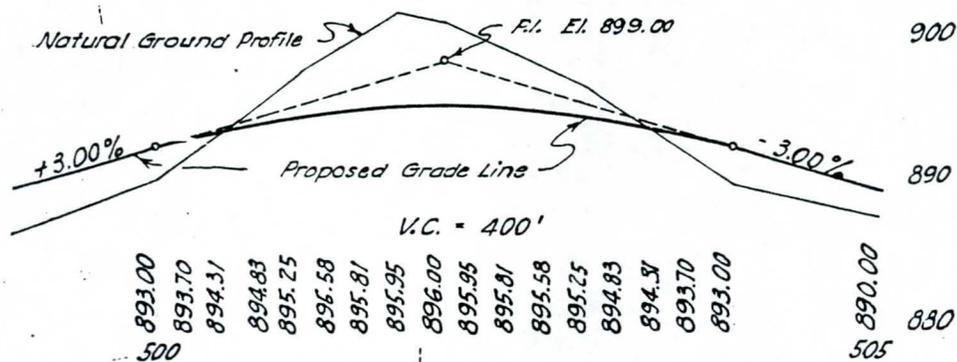


FIG. 6

The flowlines of both present and proposed drainage structures are shown on the profile drawing (see Figure 7). It should be noted that the inlet of the proposed culvert at Sta. 10+00 will be raised 3 feet which may help an erosion problem, but the possibility of flooding or ponding by raising the inlet should be noted.

At the very top of the profile drawing the earth quantities are tabulated. These show the computed quantities of material to be cut or filled in each station, or part of a station if so noted. The designer, from these quantities, determines and locates the balance points. Every section, when balanced, will have the cut and fill quantities equalized. If the cut is not sufficient for the fill, a "borrow" may be required. If the cut is greater than the fill, the excess will have to be "wasted."

In Figure 8 there is a small section of the profile sheet showing a tabulation of the cuts and fills and a short balanced section. The fill quantities were increased by 30 percent in this case to provide for "shrinkage." This is caused by the fact that earth placed in road fills is compacted to a greater density than it will have in its natural state. The amount of this shrinkage factor must be added to the fill quantities before the balance can be computed. This balance will require 947 cubic yards of material in addition to the cut and this must be obtained outside the area of the plan cross sections as borrow. All quantities of material are computed in cubic yards.

### Cross Sections

Cross sections are plotted on separate sheets from the plan and profile. They are actually vertical profiles at right angles to the centerline. If one were to make a vertical cut at right angles to any point on the survey line, the cut section thus exposed would be the cross section at that point.

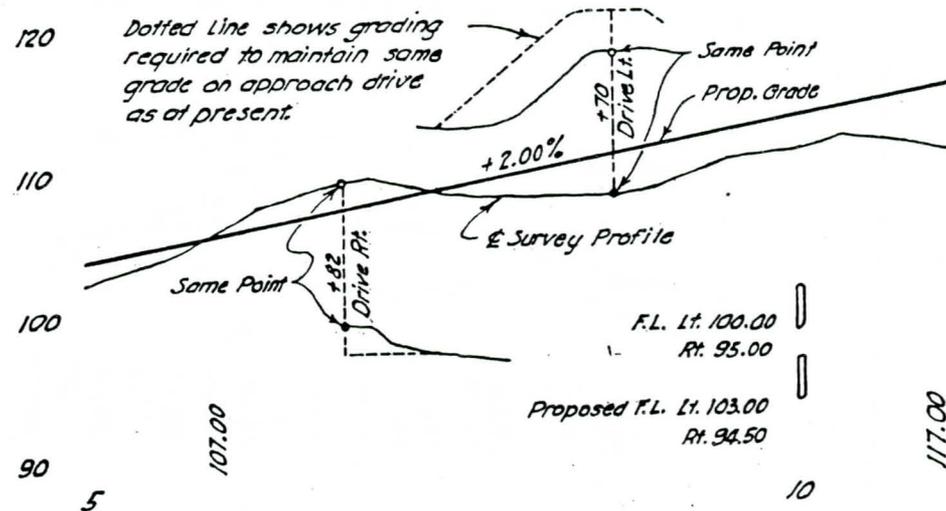


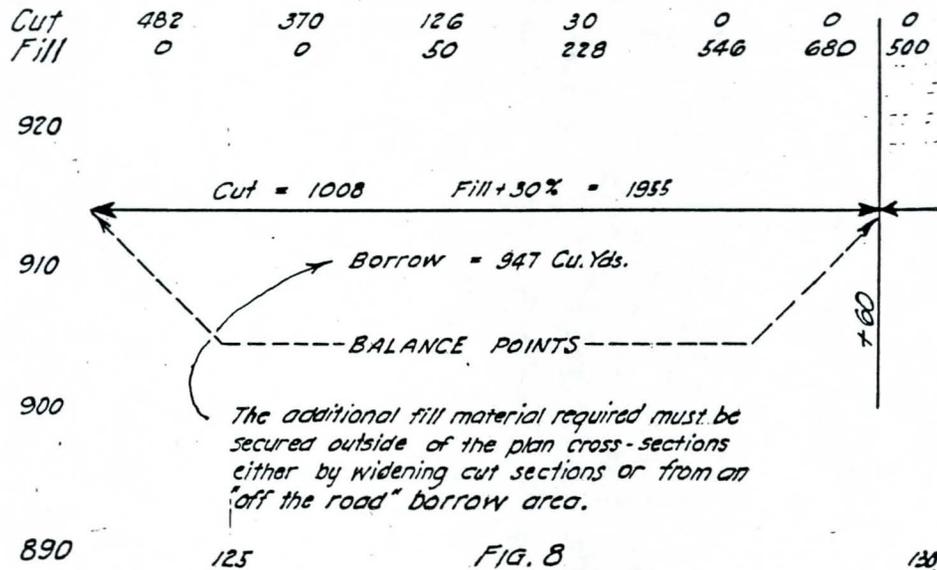
FIG. 7

The road designer superimposes a templet (which is a cross section of the proposed grading) on the survey cross sections and computes the area of cut or fill required at each station. By averaging these end areas and multiplying by the distance between the sections, he can compute the amount of material needed to build the grading section. These cut and fill quantities are shown on the profile sheet (see Figure 8).

Cross sections are usually drawn on a distorted scale of 1 inch equals 10 feet horizontal and 1 inch equals 5 feet vertical, but this is not always true, so before using cross sections the scale should be noted. Cross section paper used in plotting is ruled both horizontally and vertically in one inch squares which are in turn divided by lighter lines into one tenth (0.10) inch squares. The elevation of the proposed grade line on centerline is usually noted at each cross section.

The right-of-way agent is primarily interested in the cross sections which lie adjacent to the property for which he is negotiating. The width of the section is the determining factor in deciding how much right-of-way will be necessary. The height of fill or depth of cut at the new right-of-way line is important when explaining to an owner just what the future construction will be like.

In working with cross sections the term "slope" is used frequently. A slope is simply the hypotenuse of a right triangle and is designated by the relationship of the horizontal distance to a vertical height of one. For example, a 3 to 1 slope extends 3 feet horizontally for each vertical foot of rise or fall. Slopes which extend downward from the shoulder of a highway grade to natural ground or the



bottom of a side ditch are called "foreslopes." Those which extend upward from the bottom of a cut to the natural ground at the extremities of a section are called "backslopes" (see Figure 9).

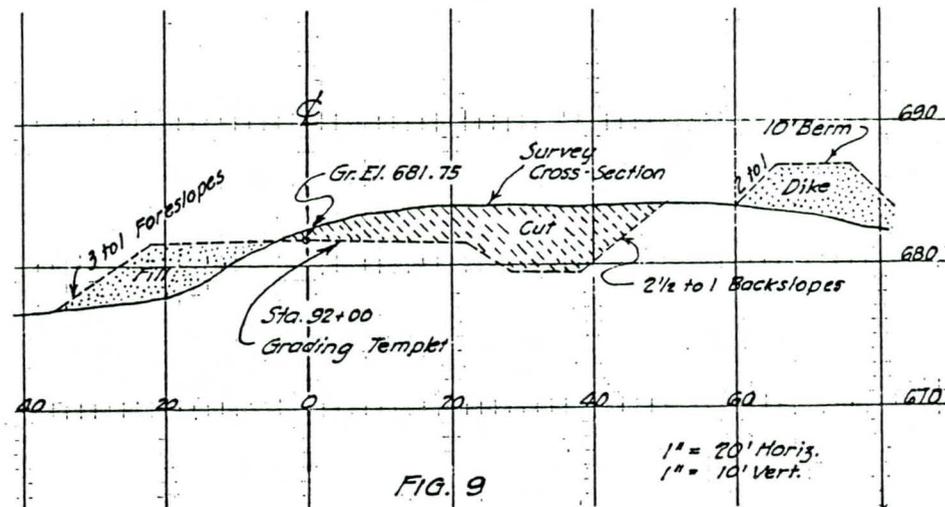
Slopes are determined primarily by the stability of the soil. If too steep a slope is constructed, it will slip and slide until it has reached the natural slope or "angle of repose" for that particular material. Flat foreslopes, such as the 4 to 1 slope commonly used on the Interstate System, are also a much safer slope. A car driven off of the road with a 4 to 1 foreslope has a far better chance of survival than it would have on a  $2\frac{1}{2}$  to 1 slope.

The word "berm" is often used in conjunction with slopes. It is not itself a slope but a level place, usually with slopes on either side. The flat top of a dike is a good example. (see Figure 9) Berms are sometimes built into the construction of long foreslopes and backslopes for more stability and erosion control, or perhaps to provide a place to build a fence when it is desired to keep a straight line across a short section of cut backslope.

The foregoing will perhaps clarify some of the questions which will come up in the reading of plans. There is no substitute, however, for experience.

### Right-of-Way Plans

In many States it is the standard procedure to issue right-of-way plans that are separate and distinct from the highway design plans. These plans contain all of the information necessary for the acquisition of the required right-of-way that is found on the design plans, plus any additional information that will be utilized in the acquisition process. These States have felt that the additional cost and drawing time necessary to



prepare a separate set of plans for each phase of the work is more than offset by the saving in time and the cost of appraising and actual acquisition, particularly in urban areas.

These plans show the width of the right-of-way to be acquired, the right-of-way lines, the proposed limits of the slopes, the stationed centerline—with appropriate ties to the intersecting property lines and any changes in the right-of-way width—and the lines and areas of any additional easement areas that it is necessary to acquire. They also show a parcel identification number, the property ownership lines, the name of the property owners, and the area, in square feet or acres, of the part to be taken and of the remainder of a partial taking. Any pertinent data affecting the cost of the right-of-way, such as improvements, access or land service roads, intersecting local roads and entrances, both private and commercial, fences, etc., are indicated on the plans. Access control lines and all approved points of entry to or exit from the highway are also shown. There is sufficient dimensional and angular data to permit ready identification and correlation with the legal description of all parcels and easement areas that are required for the highway project.

[*Editor's note:* For a comprehensive discussion of right-of-way plans, see Land Acquisition 1961, Highway Research Board Bulletin 314, p. 44, "Standards for Right-of-Way Plans," by J. E. Kirk, Chief, Engineering Correlation Branch, Right-of-Way Division, Bureau of Public Roads.]

## Area Computations

L. J. WALLIS

*Special Right-of-Way Consultant  
Iowa State Highway Commission*

When it becomes necessary to acquire a tract of land for highway right-of-way purposes, it is not only helpful, but usually a practical necessity that the tract and its dimensions be plotted and the area thereof computed. The information thus obtained is essential in both the appraisal and negotiation phases of right-of-way acquisition.

The appraiser will find the size and area information of prime importance in his calculations of market value, under the circumstances of both a partial or an entire taking. This data is especially necessary in the case of a partial taking, where the property is split into two or more parts, and the areas of the respective parcels is required for a proper appraisal valuation.

The appraiser for his part needs this same information in order to properly convey an accurate understanding of the proposed taking to the property owners. The owners, of course, usually have a relatively accurate knowledge of the land they own, but under the circumstances of an eminent domain acquisition, they are vitally interested in ascertaining exactly how much land is being acquired, with the relative areas and shapes of any remaining portions.

The selection of the method for computing right-of-way areas will depend upon the accuracy required in the result. Where the area must be exact, a mathematical computation of all necessary dimensions is made and the area is then computed accurately by using these dimensions. The result obtained can then be checked mathematically for errors by another person. In this method the plat does not have to be drawn to an exact scale since all dimensions are calculated. When the determination of the area does not require this exact mathematically correct solution, it is possible to obtain reasonably close results by scaling the necessary dimensions. This, however, requires the drawing of an accurate plat. The larger the plat and the more carefully it is drawn, the less chance there is for error in the scaled dimensions. This method saves time in computation, but unless an approximate area is sufficient, the time saved will be off set by the time required to draw the necessary plat.

When using prints or plats or road plans it should be noted that the paper is inclined to either shrink or stretch in the reproduction process. If scaling from a reproduced print, this should be checked by scaling a measured dimension shown on the plan and if a correction is needed this should then be applied proportionately to all dimensions scaled for use in area computation.

### Computation of Area A, B, C, D, E (Figure 1) by the Method of Counting Squares

A quick and easy method of determining the area of an irregular tract is to plot the tract to an accurate scale on a sheet of standard cross section paper. If the plotting is carefully done, the area can be computed by counting the number of squares within the boundaries and then multiplying this result by the square feet in each 1 inch square. If a scale of 1 inch equals 100 feet is used, as in Figure 1, each 1 inch square represents 10,000 square feet and each small 1/10 inch square is 100 square feet.

In using this method first outline all of the full 1 inch squares. Then count the number of small squares in each of the fractional 1 inch squares that are left. The total number of full squares plus the sum of all the fractional parts of squares when multiplied by 10,000 will give the area in square feet.

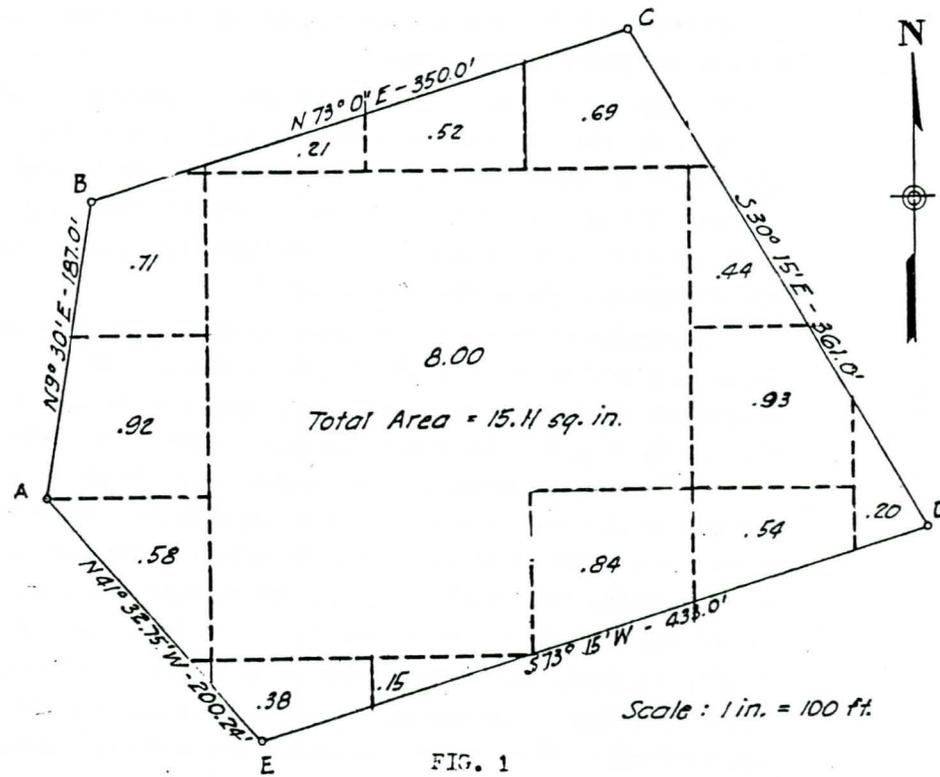


FIG. 1

The results of counting the squares should be noted on the plat as shown in Figure 1. The summation in this illustration amounted to 15.11 inch squares.

$$15.11 \times 10,000 = 151,000 \text{ sq. ft.} \times .000023 = 3.473 \text{ (3.47) Acres}$$

To convert an area computed in square feet to acres, multiply by the decimal equivalent of  $1/43560$  or  $.00002295$ . For practical purposes multiply the square feet by 23 and point off six decimal places.

#### Computation of Area A, B, C, D, E (Figure 2) Using Scaled Dimensions

Divide the area into three triangles ABE, BCD and BED, the last two having a common side BD. Drop perpendicular line (Ax) through point A to line BE and perpendicular lines (Cy and Ez) through points C and E to line BD.

$$BD = 558'$$

$$BE = 350'$$

$$Ax = 82'$$

$$Cy = 220'$$

$$Ez = 272'$$

#### Area Computation:

$$\frac{1}{2}(Cy + Ez)BD = \frac{1}{2}(492 \times 558) = 137268 \text{ sq. ft. (Area BCDE)}$$

$$\frac{1}{2}(BE \times Ax) = \frac{1}{2}(350 \times 82) = 14350 \text{ sq. ft. (Area ABE)}$$

$$\text{Total Area} = 151618 \text{ sq. ft.}$$

$$151,618 \text{ sq. ft.} \times .000023 = 3.4877 \text{ (3.49) Acres}$$

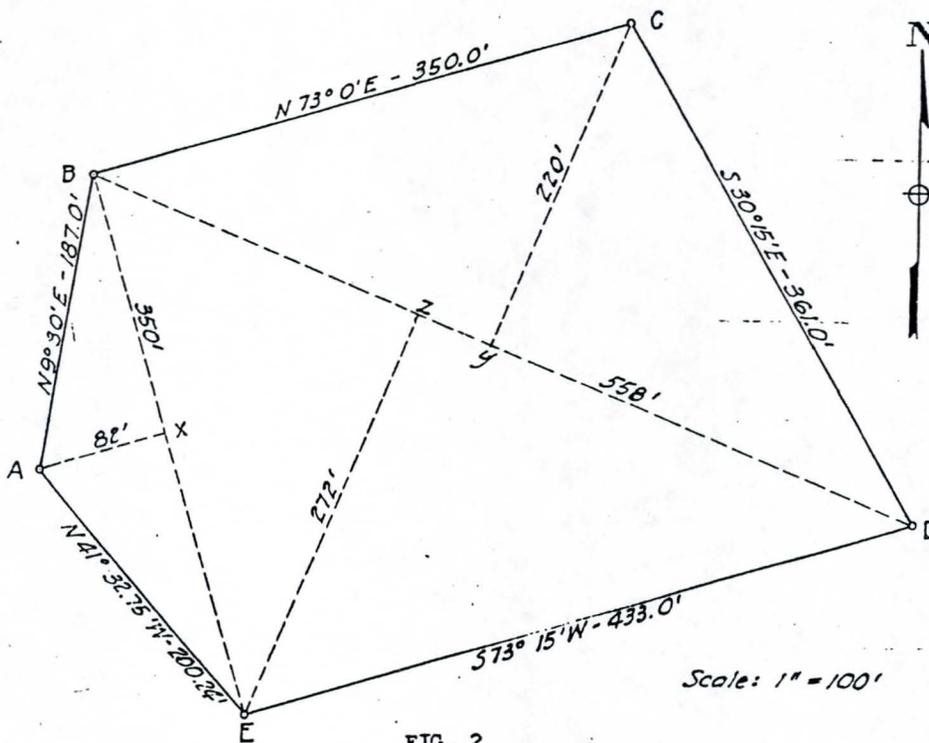


FIG. 2

### Area Computation by Subdivision into Simple Geometric Figures

In Figure 3 the area is divided into 5 right triangles and 2 rectangles by drawing meridian (vertical) lines through points B, C, and E and then drawing horizontal lines (at right angles) through points A, B, and D. Each triangle now has a hypotenuse of known length formed by a boundary line of the survey. The bearing of this line will be an adjacent interior angle of the triangle.

By use of a table of natural trigonometric functions, the lengths of the other two sides of the triangle are calculated. This is done by multiplying the length of the hypotenuse by the sine and cosine respectively of the bearing angle. For example in triangle ABw (Figure 3):

$$Aw = AB \times \sin 9^{\circ}-30' = 187.00 \times .165048 = 30.86 \text{ ft.}$$

$$Bw = AB \times \cos 9^{\circ}-30' = 187.00 \times .986286 = 184.44 \text{ ft.}$$

The sides of the other triangles are calculated in a like manner and noted on the plat. The dimensions of the rectangles are now obtained by addition and subtraction. The area computation will be as follows:

Triangles:

$$ABw = 30.86 \times 184.44 \times \frac{1}{2} = 2846 \text{ sq. ft.}$$

$$BCr = 102.33 \times 334.71 \times \frac{1}{2} = 17125 \text{ sq. ft.}$$

$$CDt = 181.86 \times 311.84 \times \frac{1}{2} = 28356 \text{ sq. ft.}$$

$$DEu = 124.79 \times 414.63 \times \frac{1}{2} = 25871 \text{ sq. ft.}$$

$$EA v = 132.80 \times 149.86 \times \frac{1}{2} = 9951 \text{ sq. ft.}$$

Rectangles:

$$Brsw = 184.44 \times 334.71 = 61734 \text{ sq. ft.}$$

$$stuv = 25.07 \times 232.77 = 5835 \text{ sq. ft.}$$

$$\text{Total Area} = 151718 \text{ sq. ft.} \times .000023 = 3.489 \text{ (3.49) Acres}$$

### Area Computation by Double Meridian Distance (D.M.D.) Method

Area computation by the D.M.D. method has several advantages. (1) It is accurate. (2) It provides a check on the closure of the metes and bounds survey. (3) The tabulation on latitude and departure sheets (see Figure 5) simplifies the work and once the method is learned it becomes almost a mechanical process. (4) The computation by this method is rapid and does not require a plat drawn to the accuracy required in other methods.

While it is possible to compute areas by simply learning the rules for this mechanical process, one should understand what mathematical foundation is used in deriving these rules. This is illustrated in Figure 4 and is briefly as follows.

A meridian (north and south) line Y-Y is drawn through the point A on the plat. From this meridian line perpendiculars are drawn to all corners of the tract. This forms 3 trapezoids and 2 triangles, one figure for each of the five sides of the tract. The area enclosed is equal to  $(trCD + tuED) - (AsB + sBCr + AuE)$ . This is the difference between the sum of all the areas formed by the lines running southward and the sum of all the areas formed by the lines running northward. The area of any of the trapezoids or triangles is equal to the average distance of the extremities of the course, or line, from the initial meridian, multiplied by the projection of that course on the meridian. However, in computing the areas by the double meridian distance method (D.M.D.) we use the *sum* of the distances from the ends of each course to the initial meridian (Y-Y). The averaging of these distances is provided for in the final computation when the total area is divided by two. This is an easier and more convenient method.

In tabulating the data for computing the D.M.D. the courses must be taken in a consecutive order around the traverse. The D.M.D. of the first course AB is  $sB$  which is also the departure for this course. The D.M.D. of the second course BC is  $sB + rC$  which equals  $2sB + Bx$  or the D.M.D. of course AB plus the departure of BC. This gives rise to the following rules.

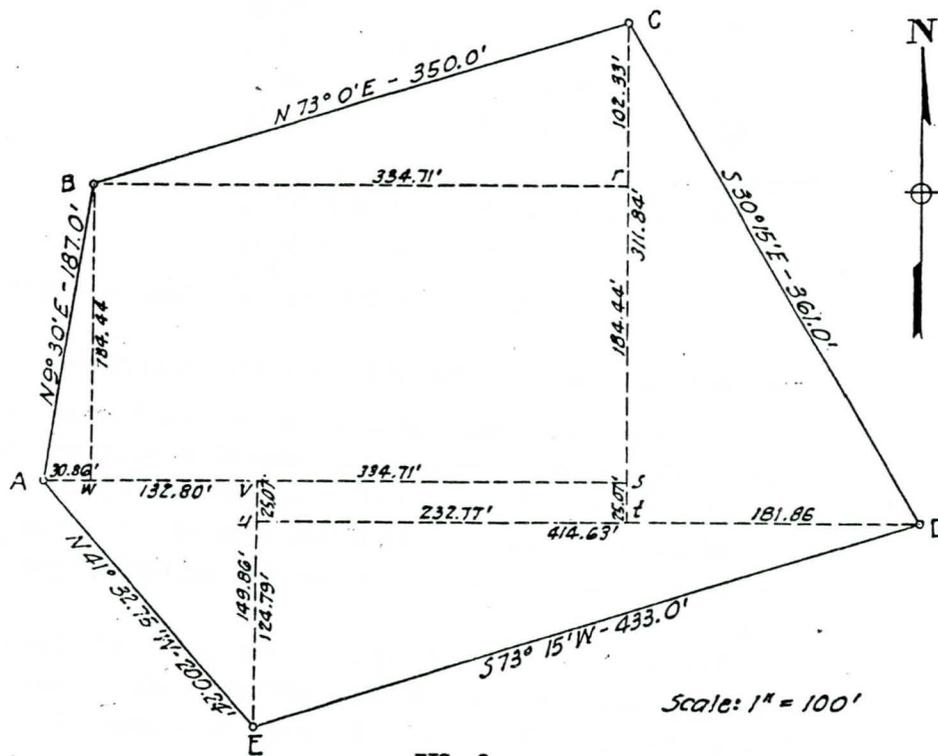


FIG. 3

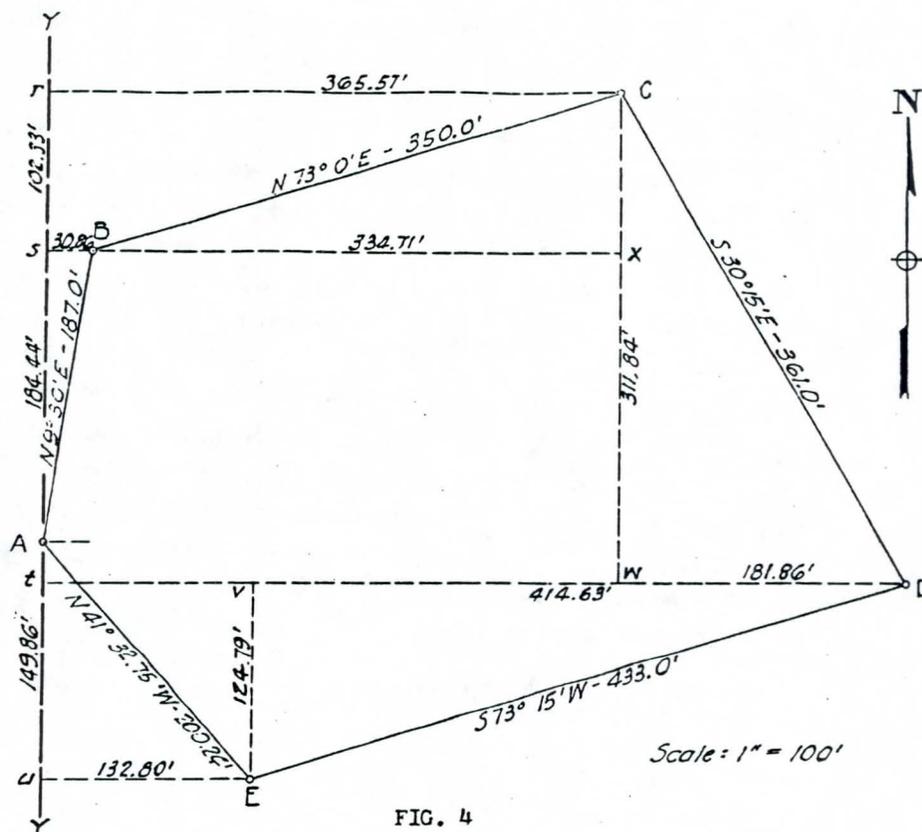


FIG. 4

1. The D.M.D. of the first course starting from the initial meridian is the departure of the course itself.
2. The D.M.D. of any course equals the D.M.D. of the preceding course plus the departure of the preceding course plus the departure of the course itself.
3. The D.M.D. of the last course is numerically equal to its departure but with the opposite sign.

The double area is calculated for each course by multiplying the D.M.D. of the course by its latitude. This is recorded under the Areas as plus (+) or minus (-) as the case may be. The algebraic sum of all the north (+) areas and the south (-) areas will equal twice the area of the tract and must be divided by two. The sign of the result is immaterial since it is the numerical difference between the north and south areas that is used in computing the area.

#### Area Computation of Tract Having an Irregular Curved Boundary

A reasonably accurate area computation can be made of a tract of land having a curved or irregular boundary, such as a varying slope easement area, by dividing

the plat into a series of parallel strips of equal width and spaced closely enough to take the irregularities into account. In this manner the curved line is reduced to a series of short straight lines and the area computation is simplified into the calculation of the area of a number of small trapezoids.

In Figure 6-B a tract is shown with the scaled dimensions for computation. A perpendicular base line (AX) is dropped from point A where the curved boundary intersects the north side of the tract. The irregular part of the tract lying west of this base line is then divided into 11 equal 30 ft. strips drawn at right angles to the base line and having various horizontal lengths between 0 on the north and 125 ft. on the south.

To compute the area, add the length of all horizontal distances on the west of the base line. (813.0 ft.) Deduct  $\frac{1}{2}$  the sum of the two horizontal distances on the north and south boundaries west of base line.  $\frac{1}{2}(0 \text{ ft.} + 125 \text{ ft.}) = 62.5 \text{ ft.}$  Multiply the remainder by the width of one parallel strip, (30 ft.). This gives the area of the irregular portion. Add the area of the rectangle lying east of the base line to complete the area of the whole tract.

$$813.0 \text{ ft.} - \frac{1}{2}(0 \text{ ft.} + 125 \text{ ft.}) = 750.5 \text{ ft.} \times 30.0 \text{ ft.} = 22,515 \text{ sq. ft.}$$

$$150.0 \text{ ft.} \times 330.0 \text{ ft. (east of base line)} = 49,500 \text{ sq. ft.}$$

$$\text{Total Area} = 72,015 \text{ sq. ft.}$$

$$72,015 \text{ sq. ft.} \times .000023 = 1.656345 \text{ (1.66 Acres)}$$

#### Area Computations Involving a Circular Curve on the Boundary

There are many right-of-way areas where part of the boundary line consists of a circular curve. The corner lot shown in Figure 7 is such a tract. The part of this area shown between the chord and the arc of the circular portion is a segment of a circle and cannot be calculated exactly by any short formula. In this illustration the area of the segment is not computed directly.

The area of the sector of a circle consists of that part which is enclosed between two radii and the included arc. The formula for this is:  $A = \frac{1}{2}lr$ , (1) being the length of arc and (r) the radius of the circle. The formula for the length of arc is:  $l = I^\circ \times 0.017453 \times r$ , ( $I^\circ$ ) being the central angle of the circular portion (in degrees) and (r) being the radius. The formula for the area of a sector can be written:  $A = \frac{1}{2}lr = \frac{1}{2}(I^\circ \times 0.017453 \times r^2)$ .

In computing the area of Figure 7 three areas are calculated. (1) The area of the trapezoid ABCD. (2) The area HECF, consisting of two right triangles. (3) The area of the sector HEGF. With these areas calculated the area of the tract will be:  $ABEFD = (1) ABCD - (2) HECF + (3) HEGF$ .

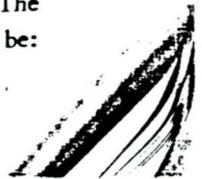


Figure 5

Computation:

Enter the factors for the Bearings in the Functions column from the Sine and Cosine sections of a trigonometry table.

Compute the Latitudes and Departures:

The Distance multiplied by the Cosine equals the Latitude, N is plus (+) and S is minus (-).

The Distance multiplied by the Sine equals the Departures, E is plus (+) and W is minus (-).

BEARING	FUNCTIONS		DISTANCE	LATITUDES		DEPARTURES		LAT.	D.M.D.	+ AREA	- AREA
	Sine	Cosine		N+	S-	E+	W-				
N9° —30'E	.165048	.986286	187.00	184.44		30.86					
N73° — 0'E	.956305	.292372	350.00	102.33		334.71					
S30° —15'E	.503774	.863836	361.00		311.84	181.86					
S73° —15'W	.957571	.288196	433.00		124.79		414.63				
N41° —32.75'W	.663219	.748425	200.24	149.86			132.80				
TOTALS				436.63	436.63	547.43	547.43				

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The totals of the N and S columns in the Latitudes should be equal and the totals of the E and W columns in the Departures should be equal. If they are not equal the metes and bounds description will not close.

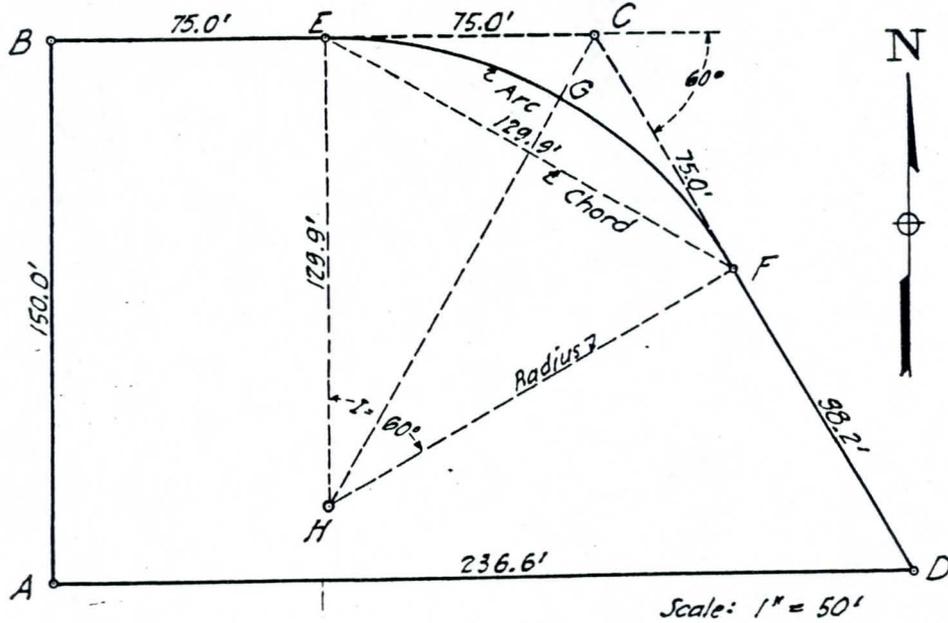
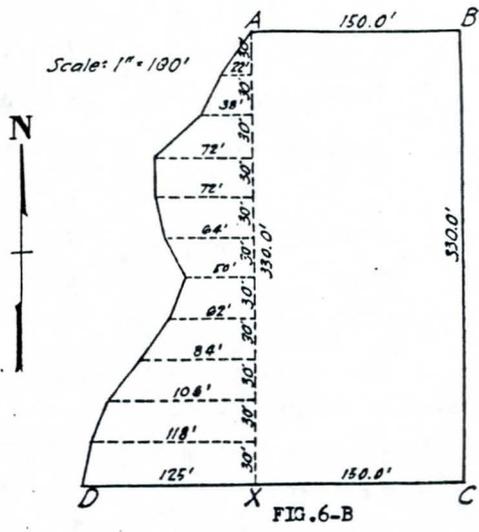
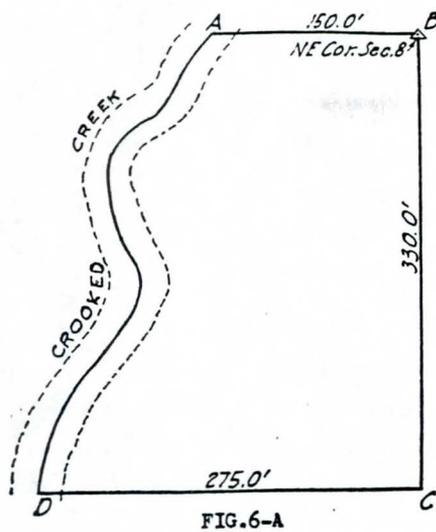
BEARING	FUNCTIONS		DISTANCE	LATITUDES		DEPARTURES		LAT.	D.M.D.	+ AREA	- AREA
	Sine	Cosine		N+	S-	E+	W-				
N9° —30'E	.165048	.986286	187.00	184.44		a 30.86		+ 184.44	+ 30.86	5692	
N73° — 0'E	.956305	.292372	350.00	102.33		b 334.71		+ 102.33	c + 396.43	40567	
S30° —15'E	.503774	.863836	361.00		311.84	d 181.86		- 311.84	e + 913.00		284710
S73° —15'W	.957571	.288196	433.00		124.79		f 414.63	- 124.79	g + 680.23		84886
N41° —32.75'W	.663219	.748425	200.24	149.86			h 132.80	+ 149.86	i + 132.80	19905	
TOTALS				+ 436.63	- 436.63	+ 547.43	- 547.43			66164	369596

Subtract the TOTALS	369596	
	<u>66164</u>	
Remainder	303432	
Divide by 2	<u>303432</u>	= 151716
	2	
Multiply by .000023	151716	
	<u>.000023</u>	
	3.4895 acres	
OR		
Divide by 87,120	<u>303432</u>	= 3.4895 acres
	87120	

229

Bring the first Departure (a) over into the D.M.D. column with its sign. To the first D.M.D. add the first Departure (a) and the second Departure (b) to equal the second D.M.D. (c). Continue in this manner for the rest of the D.M.D. values: (c+b+d = e), (e+d-f = g), (g-f-h = i). Then "i" and "h" should be equal but with different signs.

Transfer the N and S values into the Lat. column with their signs and multiply them by the numbers in the D.M.D. column. If the answer is plus (+), put it in the +AREA column. If the answer is minus (-), put it in the -AREA column. Total the +AREA column and the -AREA column and subtract the smaller from the larger. Divide the remainder by 2 and multiply the answer by .000023 to convert the square feet into acres. Another way to convert into acres would be to divide the remainder by 87,120 (twice the number of square feet in an acre).



$$\begin{aligned}
 (1) \text{ ABCD} &= 150 \times \frac{1}{2}(150 + 236.6) &&= 28,995 \text{ sq. ft.} \\
 (2) \text{ HECF} &= 75 \times 129.9 \text{ (subtract)} &&= 9,743 \text{ sq. ft.} \\
 &&& \underline{19,252 \text{ sq. ft.}} \\
 (3) \text{ HEGF} &= \frac{1}{2}(60 \times 0.017453 \times 129.9^2) \text{ (add)} &&= 8,835 \text{ sq. ft.} \\
 \text{Area ABEFD} &&&= \underline{28,087 \text{ sq. ft.}}
 \end{aligned}$$

$$28,087 \text{ sq. ft.} \times .000023 = 0.646 \text{ (0.65) Acres}$$

### Use of the Polar Planimeter for Determining Right-of-Way Areas

The polar planimeter is an ingenious device by which the area of a tract of land can be determined by tracing its outline from a plat drawn to scale. The theory of how this instrument achieves this result presents a rather involved problem in calculus and is beyond the scope of this instruction. A line drawing of a polar planimeter is shown in Figure 8.

The instrument has two arms BO and HP. BO is of fixed length and is anchored to the paper by a needle point O which is held down by a small weight. This arm is connected by a pivot to a collar C through which the tracer arm HP can slide. P is the tracer point which is moved along the outline of the area to be measured. The length CP on the tracer arm is variable and is changed as necessary to conform to the scale of the plat being measured. A graduated wheel with a vernier, "S," and a small disk wheel, "D," which records the number of full revolutions of the wheel "S," record the area in units.

The planimeter is designed to give accurate results with a perfectly drawn plat coupled with perfect operation. These requirements will ordinarily limit its use to area determination where exact mathematical accuracy is not too essential and a reasonably correct result will be sufficient.

The use of the planimeter will prove to be a great timesaver, especially when irregular areas are involved. While it is seldom carried in the field, one is usually available in any drafting room or engineer's office and every right-of-way agent should be familiar with its use and operation.

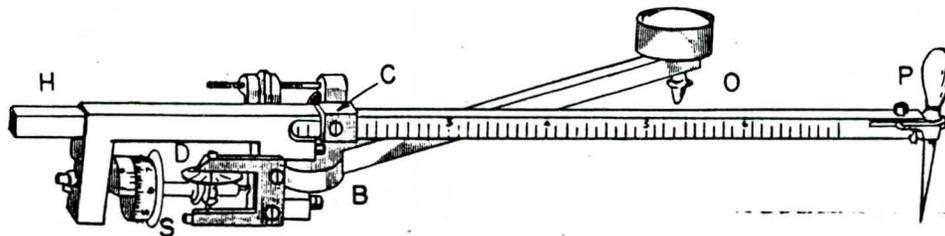


Figure 8

## Plotting Deed and Property Descriptions

L. J. WALLIS

*Special Right-of-Way Consultant  
Iowa State Highway Commission*

In real estate terminology a "deed" is a written instrument which transfers the title, or ownership, of land from one party to another. Among other requirements this deed must contain a description of the real estate which it conveys. An adequate legal description has been defined as one that can be located on the ground by a competent land surveyor either with or without extrinsic evidence.

An adequate deed description is also one which can be plotted from recorded data. At times this may require looking up recorded plats of surveys which are referred to but not recited in the deed itself. This is true when the land conveyed is a lot, or lots, in an urban subdivision. Also, it is not uncommon to find a deed description which refers to the conveyance of the same tract by a prior deed. For example, a deed description might read ". . . all land which was conveyed to the grantor by a deed dated March 1, 1920, as recorded in Book 240 Page 200 of Land Deed Records in Blank County, Iowa."

Sometimes in a deed a description is found which is tied to a private survey made of an adjoining property. It might read as follows: "Beginning at the northeast corner of a tract conveyed to John Doe by deed recorded in Book 285, Page 326, etc.; thence south along the east line of said tract, etc." In this case one can only trace back through the records of John Doe's property to find the information necessary to plot the description from some identifiable starting point.

In right-of-way acquisition it is essential to have a description and plat of all properties from which right-of-way is to be taken for the following reasons:

1. The appraiser must have a description and plat before he can begin his work. This plat will show the whole property and also the right-of-way to be taken. The area of the total property, the area taken for right-of-way and the area of the remaining portion, or portions, in partial taking are necessary for his appraisal.
2. The negotiator also requires a property plat of a similar nature; first, that he may be able to interpret the work of the appraiser for his own information,

and second, so that he will be able to explain to a property owner just what is to be taken as right-of-way. A property plat for use as a visual aid in negotiation is almost a necessity.

3. When right-of-way is acquired by the State, either by purchase or condemnation, an accurate description of what is being taken is normally prepared for recording, along with a plat showing the entire property and the right-of-way which is being acquired.

A certain minimum amount of equipment is needed when plotting deed or property descriptions. In a well equipped drafting room everything necessary is at hand, but since the first plat is usually made in the field, the right-of-way agent should have the following:

1. An engineer's scale — the beveled 6" scale having scales of 10, 20, 40, and 50 divisions to the inch seems to be the favorite. A triangular 12" scale having scales of 10, 20, 30, 40, 50 and 60 divisions to the inch is very handy at times but is not so easily carried.
2. A transparent protractor of about 5" diameter. This may be either a  $\frac{1}{2}$  circle graduated from 0 to 180 degrees or a full circle of 0 to 360 degrees. The former is commonly used but the latter has some advantages.
3. Two transparent triangles — a 5" 45 degree and a 30-60 degree having about a 5" short side length are a good size and convenient to carry.
4. An ordinary pencil compass (which can be purchased at most dime stores) will be sufficient in most cases.
5. Draftsman's pencils — 4H or 5H are better than the softer leads for accurate plotting. A draftsman's pad of sandpaper for sharpening the points, and a good eraser are also helpful.
6. Paper — plats can be drawn on almost any paper when necessary but for good work and convenience it is advisable to carry a supply. The following list is recommended:
  - a. A supply of printed section plats on standard  $8\frac{1}{2}$  x 11 sheets with a full section at 800 feet to the inch. These can be used for an entire section or when the tract is small the scale can be 400, 200, or 100 feet to the inch if desired.
  - b. Some graph or cross section paper is almost necessary when plotting a survey using only the compass bearings.
  - c. Plain white tracing paper is good for plotting when using deflection angles on the traverse of the area.
  - d. A few sheets of ordinary onion skin typewriter paper are very handy to trace a plat from a county plat book and a pad of ruled legal paper is good for notes and copying descriptions.

The first step in plotting a deed or property description is to make an accurate and exact copy of the description and also to list the book and page of the county deed record where the deed is recorded.

There are different forms of description commonly encountered in deeds. In general they will fall into one of the following categories:

1. Subdivision of sections in the U.S. Rectangular System.
2. Metes and bounds descriptions.
3. Town lots in urban subdivisions which may have been surveyed under either system.
4. The right-of-way centerline description used frequently by the States.

In the older deeds surveyed under the metes and bounds system, the distances will often be given in chains and links. The old time surveyor's chain was 66 feet (or 4 rods) in length and was composed of 100 equal links, each 0.66 of a foot long. When a description is found written in this manner, convert the measurements to feet and decimals of a foot. For example, a distance of 8 chains and 12 links, or 8.12 chains, is multiplied by 66. Thus,  $8.12 \times 66 = 535.92$  feet.

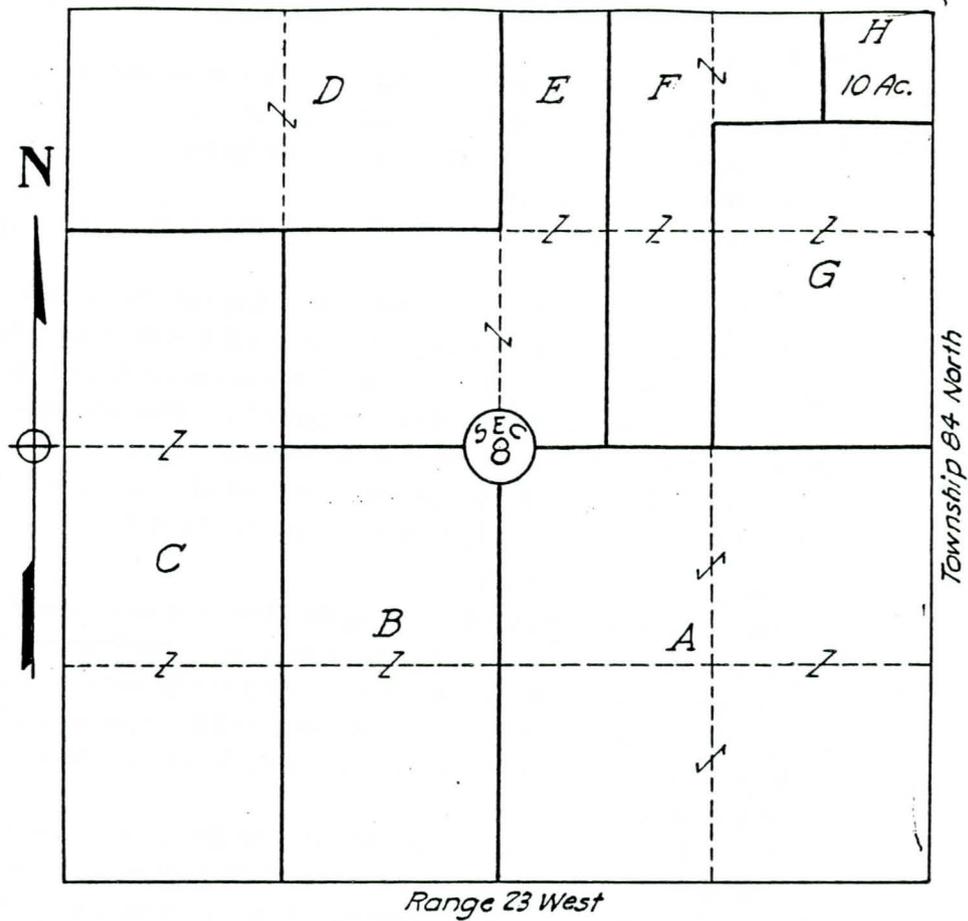
#### Plotting Under the Section System

Plotting deed descriptions which are regular subdivisions of a section is a relatively simple matter. Land conveyed by this method must be in accordance with the government survey. An exact resurvey of the tract will probably show a variation in the acreage which it purports to convey and the area will be "more or less." The plat of the property for most purposes is drawn as if the subdivision of the section had been theoretically correct.

In plotting a description of this type, take the description in the reverse order from the way it is written. For example, a tract is described as the NE quarter of the NW quarter of the SW quarter of Section 10, etc. First show the SW quarter of Section 10, then its NW quarter and then the NE quarter of that. The last is the tract to plot.

Where tracts are encountered where the subdivision of a fractional section or quarter section has been made, all or part of the property may be described as lots into which the fractional section or quarter section has been divided. If this is the case, the data from the original survey by which these lots were laid out will have to be obtained from the county records or from other supplemental government records. This may involve a great deal of research and normally the same plotting that is shown on the county plat books and which is used by the county assessor in determining the taxable acreage of such lots will be reproduced.

Figure 1 shows a plat of an entire section which has been subdivided into eight different hypothetical properties. These are marked as A, B, C, D, E, F, G, and H, with the description of each of these tracts given below this section plat.



A = Southeast quarter, Section 8, Township 84 North, Range 23 West of the 5th Principal Meridian, in Story County, Iowa.

(This is commonly abbreviated as follows)

= SE $\frac{1}{4}$ , Sec. 8, T84N, R23W of 5th P.M., Story Co., Iowa.

B = E $\frac{1}{2}$  SW $\frac{1}{4}$ , Sec. 8, etc.

C = W $\frac{1}{2}$  SW $\frac{1}{4}$ , SW $\frac{1}{4}$  NW $\frac{1}{4}$ , Sec. 8, etc.

D = N $\frac{1}{2}$  NW $\frac{1}{4}$ , Sec. 8, etc.

E = SE $\frac{1}{4}$  NW $\frac{1}{4}$ , W $\frac{1}{2}$  W $\frac{1}{2}$  NE $\frac{1}{4}$ , Sec. 8, etc.

F = E $\frac{1}{2}$  W $\frac{1}{2}$  NE $\frac{1}{4}$ , N $\frac{1}{2}$  NE $\frac{1}{4}$  NE $\frac{1}{4}$  Except E. 10 Ac., Sec. 8, etc.

G = SE $\frac{1}{4}$  NE $\frac{1}{4}$ , S $\frac{1}{2}$  NE $\frac{1}{4}$  NE $\frac{1}{4}$ , Sec. 8, etc.

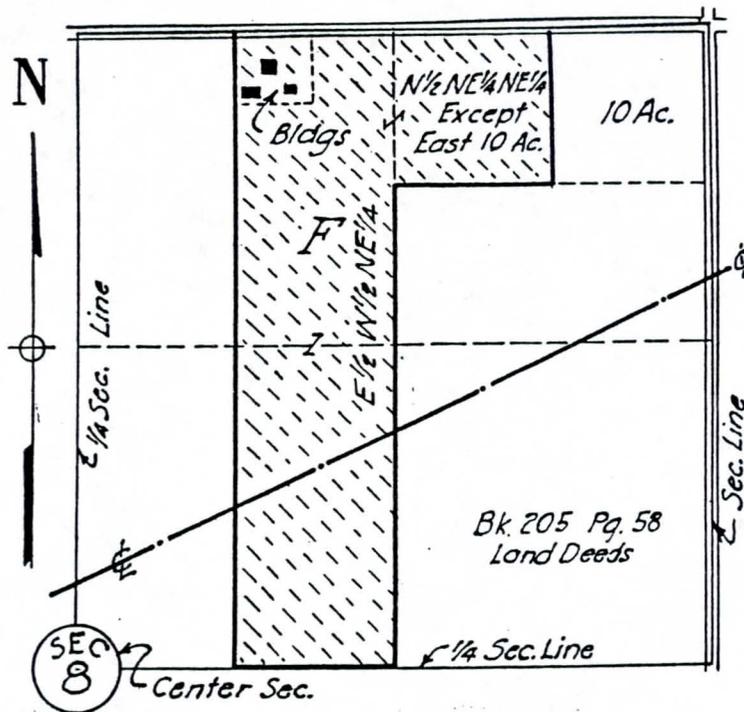
H = E. 10 Ac. of N $\frac{1}{2}$  NE $\frac{1}{4}$  NE $\frac{1}{4}$ , Sec. 8, etc.

Figure 1

When making a plat of a single one of these properties it is not always necessary to show the drawing of the entire section in the plat. For example a plat of the quarter section may be all that will be needed or perhaps even of the quarter-quarter or 1/16 section may be sufficient. In such case it is necessary to show the exact identification to tie the property plat to the specific section, township, etc.

Tract F and the 10 acre tract H deviate from the regular subdivision. The NE $\frac{1}{4}$  NE $\frac{1}{4}$  NE $\frac{1}{4}$  might be 10 acres but it will probably run more or less, but with the description as written, H owns exactly 10 acres, no more nor less. F will therefore own, not the NW $\frac{1}{4}$  NE $\frac{1}{4}$  NE $\frac{1}{4}$ , but the N $\frac{1}{2}$  NE $\frac{1}{4}$  NE $\frac{1}{4}$  Except the East 10 acres thereof. This may run more or less than 10 acres. To determine the exact dimensions of tract H will require a resurvey of the NE $\frac{1}{4}$  of Section 8. If this is done, it would be better to describe H as the East "x" ft. of the N $\frac{1}{2}$  NE $\frac{1}{4}$  NE $\frac{1}{4}$  instead of giving its area. The description as illustrated is quite often used, however, and is considered adequate.

A plat is shown in Figure 2 for a single property. This is tract "F" as shown in Figure 1. The description of this tract is: E $\frac{1}{2}$  W $\frac{1}{2}$  NE $\frac{1}{4}$ , N $\frac{1}{2}$  NE $\frac{1}{4}$  NE $\frac{1}{4}$  Except



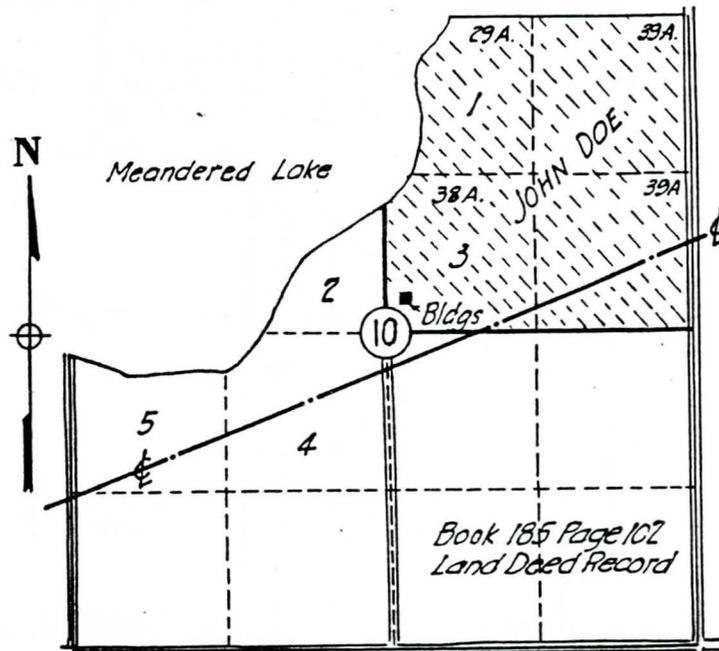
PLAT OF PROPERTY "F"  
 IN THE NE  $\frac{1}{4}$  SEC. 8, T 84 N, R 23 W OF 5TH P.M.  
 STORE COUNTY, IOWA

Figure 2

the East 10 Ac., Sec. 8, T84N, R23W of 5th P.M. It will be noted that the plat carries sufficient information to locate the property specifically without further need of the description. This plat also gives other information such as the location of present roads, the farm buildings and the approximate centerline of the proposed highway. The north point is also shown, although as a general rule all plats are drawn with the top of the plat being north.

Figure 3 is a plat of a property described as: E $\frac{1}{2}$  and Lots 1 and 3 of the NE $\frac{1}{4}$  of Fract. Sec. 10, T84N, R23W of 5th P.M. In plotting this property with the lots as shown and numbered in the county records, the entire section has been shown. These lots are the quarter-quarter (1/16) parts of the section which have been rendered fractional by the invasion of a meandered lake. This plat shows the present roads, the location of the farm buildings, the approximate location of the proposed highway centerline and also shows the area of the lots in taxable acres as computed by the county assessor.

Figure 4 shows a fractional section on the north boundary of a township. When the township was divided into sections, the over or under run was thrown into the last half mile of the section. In this case the under run resulted in the quarter-



PLAT OF THE JOHN DOE PROPERTY  
IN THE NE  $\frac{1}{4}$  FRACT. SEC. 10, T 84 N, R 23 W OF 5TH P.M.  
STORY COUNTY, IOWA

Figure 3

quarter (1/16) sections on the north containing considerably less than the normal 40 acres. Sometimes these quarter-quarter sections have been given lot numbers but when the variation has not been great they have not been so designated. The descriptions may be written somewhat differently depending upon the writer.

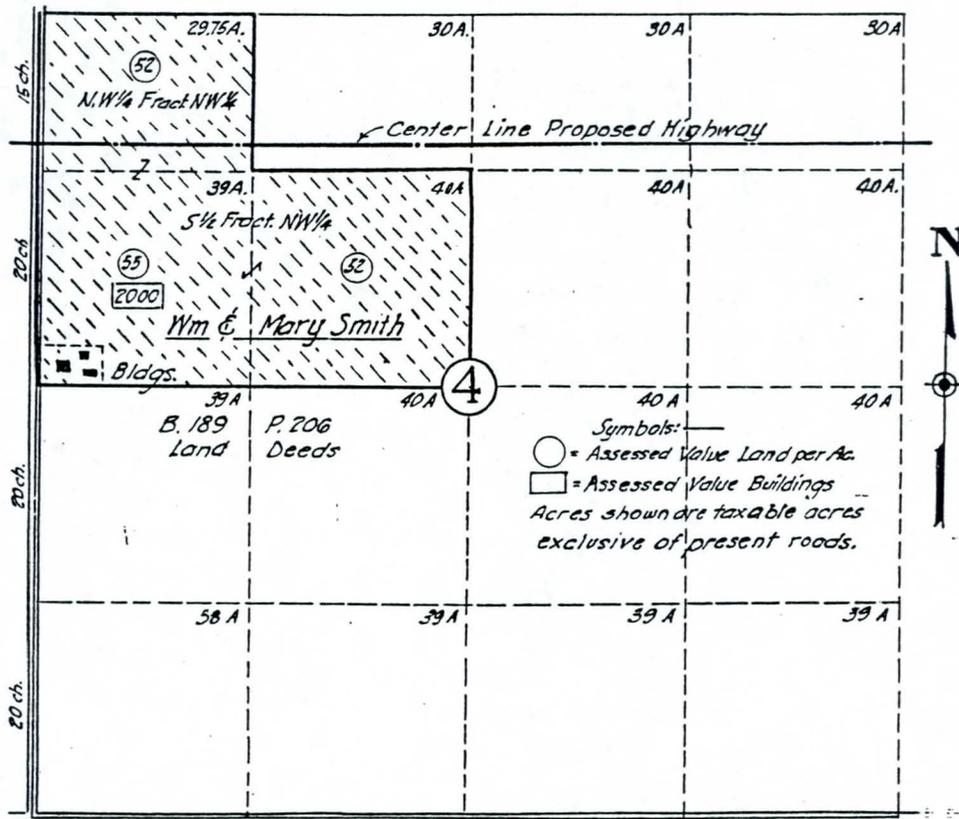
The property shown in Figure 4 may be described as follows:

- $S\frac{1}{2}$  NW $\frac{1}{4}$ , NW Fractional  $\frac{1}{4}$  NW $\frac{1}{4}$ , Sec. 4, T84N, R23W of 5th P.M.
- $S\frac{1}{2}$  and NW $\frac{1}{4}$  of the Fractional NW $\frac{1}{4}$  of Sec. 4, etc.
- $S\frac{1}{2}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  NW $\frac{1}{4}$ , Fractional Sec. 4, etc.

All of these descriptions would be construed as the property shown in Figure 4.

#### Plotting by Metes and Bounds

The metes and bounds system of land survey antedated the U.S. Rectangular System in the colony States and in other areas which were settled prior to the adoption



PLAT OF THE PROPERTY OF WILLIAM AND MARY SMITH  
IN THE NW FRACT.  $\frac{1}{4}$  OF SEC. 4, T 84 N, R 23 W OF 5TH P.M.  
STORE COUNTY, IOWA

Figure 4

of the latter method. It is still used when a tract of land cannot be readily described for any reason under the rectangular system.

The plotting of a property described by metes and bounds is simply drawing on paper a picture of the work done in making the survey. There are two methods which are ordinarily used. The *meridian method* plots the bearings and distances from each point after a true meridian line has been established through the point. In this method the bearings are plotted direct. The *deflection method* wherein the direction of a course is determined from the deflection angle which it makes with the preceding course produced. When only bearings are recited in the description, the deflections must be computed from them. It does, however, eliminate the necessity for drawing the meridian line at each point and for this reason is more commonly used. The plotting is the same as used in plotting the highway centerline survey except that in this case the traverse must close, i.e., return to the point of beginning.

The following hypothetical description will be used to illustrate these two methods:

Beginning at a point on the south line of Section 10, Twp. 84 N, R23W of the 5th P.M. in Story County, Iowa, which is 155.0 ft. east of the south quarter corner of said section; thence N 15° E—925.0 ft.; thence N 48½° W—928.0 ft.; thence N 70½° E—1815.0 ft.; thence S 52½° E—1550.0 ft.; thence S 25° W—1291.7 ft. to the south line of said Section 10; thence W—1939.0 ft. along the south line of said section to the point of beginning. The south line of the SE¼ of Section 10 is assumed to be due east and west.

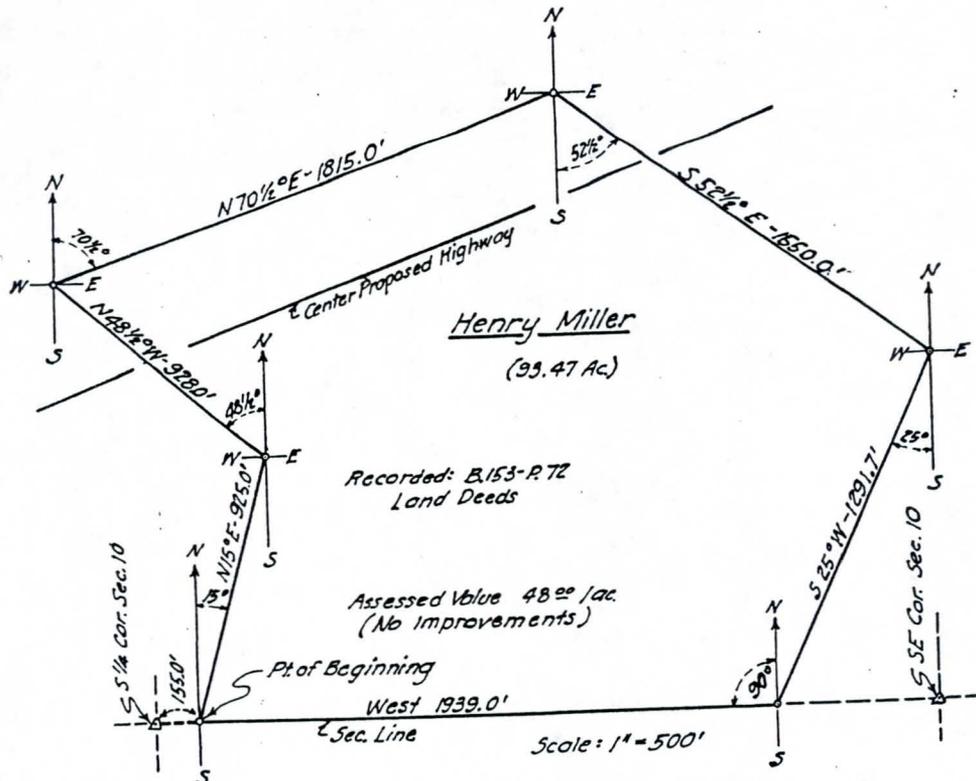
From this description, which has been copied from the deed, the first step is to tabulate the bearings and distances:

Bearing	Distance
N 15° E	925.0 ft.
N 48½° W	928.0 ft.
N 70½° E	1815.0 ft.
S 52½° E	1550.0 ft.
S 25° W	1291.7 ft.
West	1939.0 ft.

In Figure 5 the foregoing description is shown plotted. The meridian lines and the E-W lines are shown at each point with the angles as indicated by the bearings. These do not need to be shown on a regular property plat and they are shown here only for clarification. The plat will show all points and the courses with the bearings and distance marked along them. This description moves in a clockwise manner around the area. If the description moved counter-clockwise all of the bearings would be reversed in direction. Note on the plat any additional information that may be of value.

The method of plotting the first course of this description (N 15° E) is illustrated in Figure 6. The routine steps are as follows:

1. Draw the meridian line through the point of beginning.
2. Place protractor with the center on the point of beginning and align the 0°-180° line exactly on the meridian line. Since this bearing is in the northeast quadrant, the protractor is placed on the right or east side of the point.
3. With the protractor placed, locate the 15° angle which the bearing makes with the meridian line. Mark this point at the edge of the protractor.
4. Remove the protractor and draw a straight line from the point of beginning through the point which has been just marked with the protractor.
5. Scale the distance (925.0') from the point of beginning along this line; mark the point and circle it.



PLAT OF THE PROPERTY OF HENRY MILLER  
IN ACCORDANCE WITH AN IRREGULAR SURVEY IN  
S 1/2 OF SEC. 10, T 84 N, R 23 W OF 5TH P.M.  
STORY COUNTY, IOWA

Figure 5

To plot the second course as shown in Figure 7:—(1) Draw the meridian line through the point located in Figure 6; (2) place protractor on this point as before except that since the bearing is in the NW quadrant the protractor is placed on the left or west side of the point; (3) mark the  $48\frac{1}{2}^\circ$  bearing west from the meridian line; remove protractor and draw a line from the new point through the point marked with your protractor; and (4) scale the distance (928.0') along this new line; mark and circle the next point. The second course is now plotted.

Plotting the remainder of the description will be simply a repetition of what has been illustrated. When the last course is plotted, it should close on the point of beginning. If it does not, either the description is in error or the plotting has been inaccurate—with the odds very much against the plotting.

To illustrate the *deflection method* of plotting metes and bounds, the description of the tract will be the same as used in the meridian method. However, since the deflection angles at all corner points must be computed, the tabulation should be expanded to include these angles. In Figure 8 these deflection angles are shown with A at the point of beginning and points B, C, etc., following in a clockwise order around

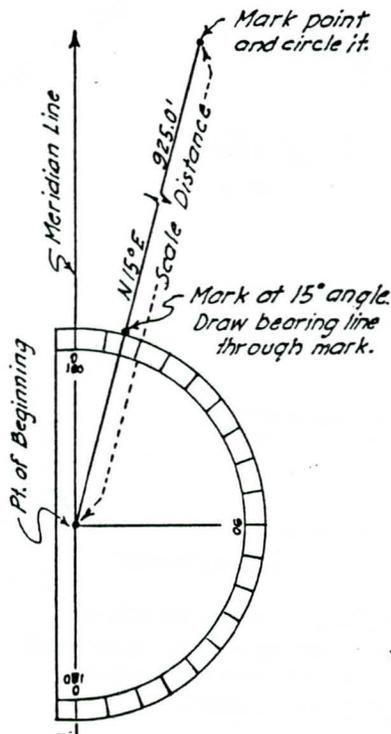


Figure 6

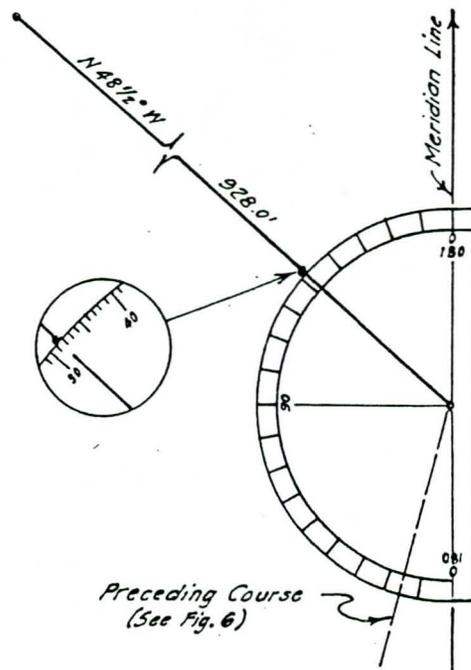


Figure 7

the area. The deflection angle (shown circled) is the angle, right or left, that the new course makes with the preceding one.

After computing the deflection angles, the description is tabulated as follows:

	Bearing	Distance	Deflection Angle
From $\frac{1}{4}$ cor. Sec. 10 to A	East	155.0'	
A	N $15^\circ$ E	925.0'	$75^\circ$ Left
B	N $48\frac{1}{2}^\circ$ W	928.0'	$63\frac{1}{2}^\circ$ Left
C	N $70\frac{1}{2}^\circ$ E	1815.0'	$119^\circ$ Right
D	S $52\frac{1}{2}^\circ$ E	1550.0'	$57^\circ$ Right
E	S $25^\circ$ W	1291.7'	$77\frac{1}{2}^\circ$ Right
F	West	1939.0'	$65^\circ$ Right

Plotting by the deflection method is relatively simple after the deflection angles are computed and tabulated. In Figure 9 the description has been plotted by this method. Since in this case the description has one course which runs in the cardinal direction east and west, this course determined the orientation of the plat.

From an inspection of a description, or a rough freehand sketch, first determine where the point of beginning should be located so that the plat will not run off the sheet. The following procedure can then be used:

1. Spot and circle the point of beginning (marked A in Figure 9) and then for orientation draw a vertical meridian line through it.

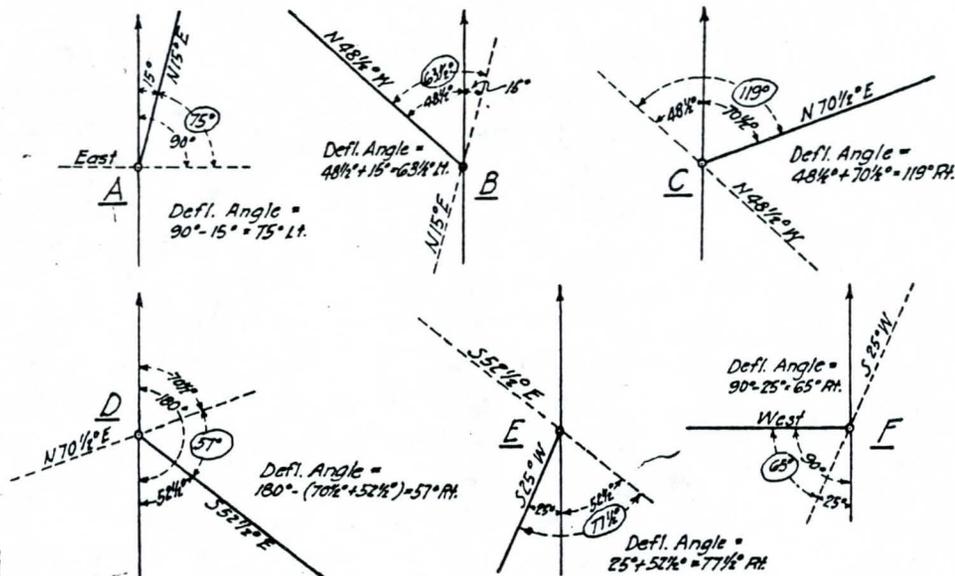
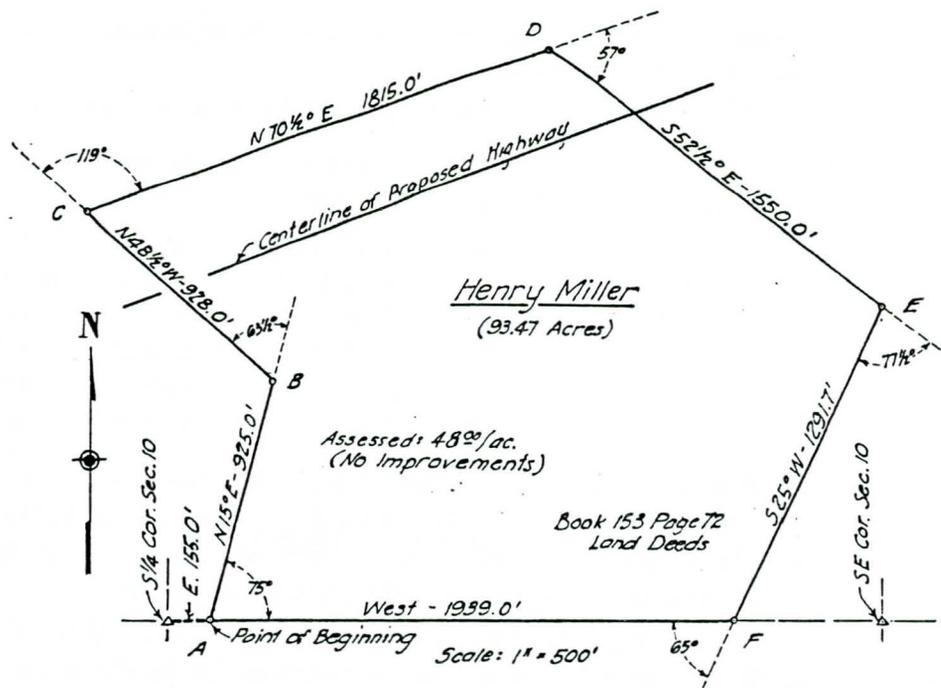


Figure 8



PLAT OF THE PROPERTY OF HENRY MILLER  
 IN ACCORDANCE WITH AN IRREGULAR SURVEY IN  
 S 1/2 OF SEC. 10, T 84 N, R 23 W OF 5TH P.M.  
 STORY, COUNTY, IOWA

Figure 9

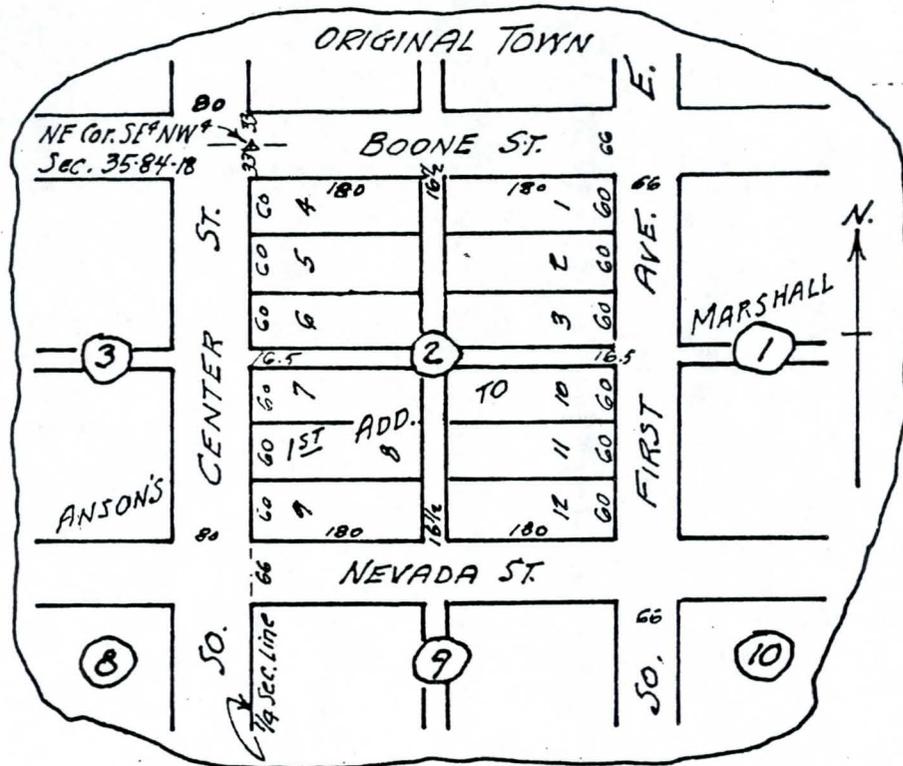
- Place the center of the protractor on A, align with 0° on the meridian line and lay out the first course (N 15° E) drawing the line long enough so that it will extend a little more than half the radius of the protractor beyond point B when plotted.
- Scale the distance (925.0') from A to B. Spot and circle point B.
- Place center of the protractor on point B with the 0°-180° line on the line AB produced. Measure off the 63 1/2° deflection to the left from this line and draw in line BC extending it through and beyond C.
- Scale distance BC and spot point C. Move protractor to point C, align on line BC produced, measure off the deflection angle of 119° right and draw in line CD, etc. etc., until the entire description has been plotted and closed on point A, the point of beginning.
- Show the bearings and distances on the plat as in Figure 9; show the north point with an arrow; show the tie to the 1/4 section corner to locate the plat—and the plat is completed.

It is not necessary to show the deflection angles as in Figure 9 since the bearings provide the information required to check the plat.

### Urban Properties

Plotting an urban property description ordinarily consists of making a scale drawing of a recorded plat or a portion thereof. Normally the land in cities and towns has been surveyed and plotted as follows: the original town, additions, and subdivisions. These in turn are divided into blocks and lots of various sizes and shapes. The streets and alleys are also shown on these recorded plats. (See Figure 10.)

In preparing a plat of a city or block, one is expected to show its size, shape, and location. The average city map will seldom contain sufficient information since it is generally drawn on too small a scale. This information can be found in the "Town Lot Plat Book" of the county auditor. If this source does not furnish all of



BLOCK OF 2 ANSON'S FIRST ADDITION  
TO THE TOWN OF MARSHALL, IOWA  
(From Co. Auditor's Plat Book)

Figure 10

the data necessary, the recorded plat of the original survey for this particular area can usually be found in the county recorder's office.

An onion skin tracing is often made from these plat books. This sketch is made to acquire data rapidly to draw an individual plat of a property. Figure 10 is an illustration of such a sketch or tracing.

In copying the deed description of a part of a lot or block, particular care should be taken to copy it exactly. For instance, a lot may be plotted as 60 ft. x 150 ft. If the conveyance is for the west half of the lot, that is one thing; but if the deed conveys all of the lot except the east 75 ft., it may be another. These appear the same but a resurvey may show that the lot is actually 151 ft. deep, in which case the remaining east half would be 75.5 ft.; but where the east 75 ft. was excepted in the conveyance, it would still be the 75 ft. as specified.

In Figure 11 is illustrated a plat of a part of a city lot. This is laid out from the sketch (Figure 10) in accordance with the following description:

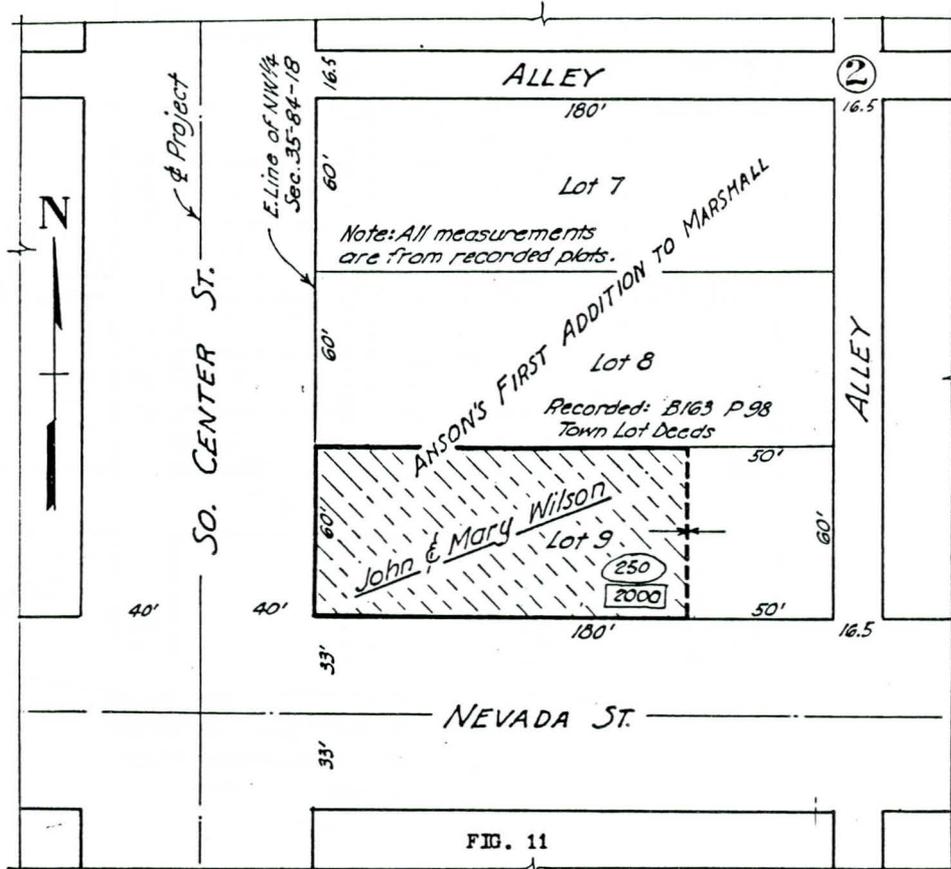


FIG. 11

"All that part of Lot 9 in Block 2 of Anson's First Addition to the Town of Marshall, Iowa, except the east 50 feet thereof."

The following information can be found on this plat. (Figure 11).

1. Name of the record owner
2. Book and page of recording
3. Location:
  - (a) Number of lot
  - (b) Number of block
  - (c) Name and number of addition
  - (d) Name of town or city
  - (e) Names and widths of abutting streets
4. Assessed valuation:
  - (a) Lot (in circle)
  - (b) Buildings (in rectangle)
5. Location of project centerline
6. North point

In addition it will be noted that no definite dimension is shown for the depth of that portion of the lot described. The plat dimensions indicate that this would be 130 ft. after the east 50 ft. is excepted. However, should an accurate resurvey find the lot to be more or less than the 180 ft. as shown on the recorded plat, the over or under run would apply to the property described.

#### Highway Centerline Description

The description of a right-of-way taking using the metes and bounds method can often become a long and complex procedure. The "highway centerline description" has been evolved to simplify the average description of these tracts. It is only used, at the present time, in deeds for the conveyance of right-of-way.

The use of bearings and distances in this method is, to a certain extent, similar to the metes and bounds system. A definite starting point is selected such as a known section corner. The description then ties in this point to some specific survey station on the highway centerline. From this station the description then follows the center of the highway for a sufficient distance to extend through or beyond the tract of right-of-way to be described.

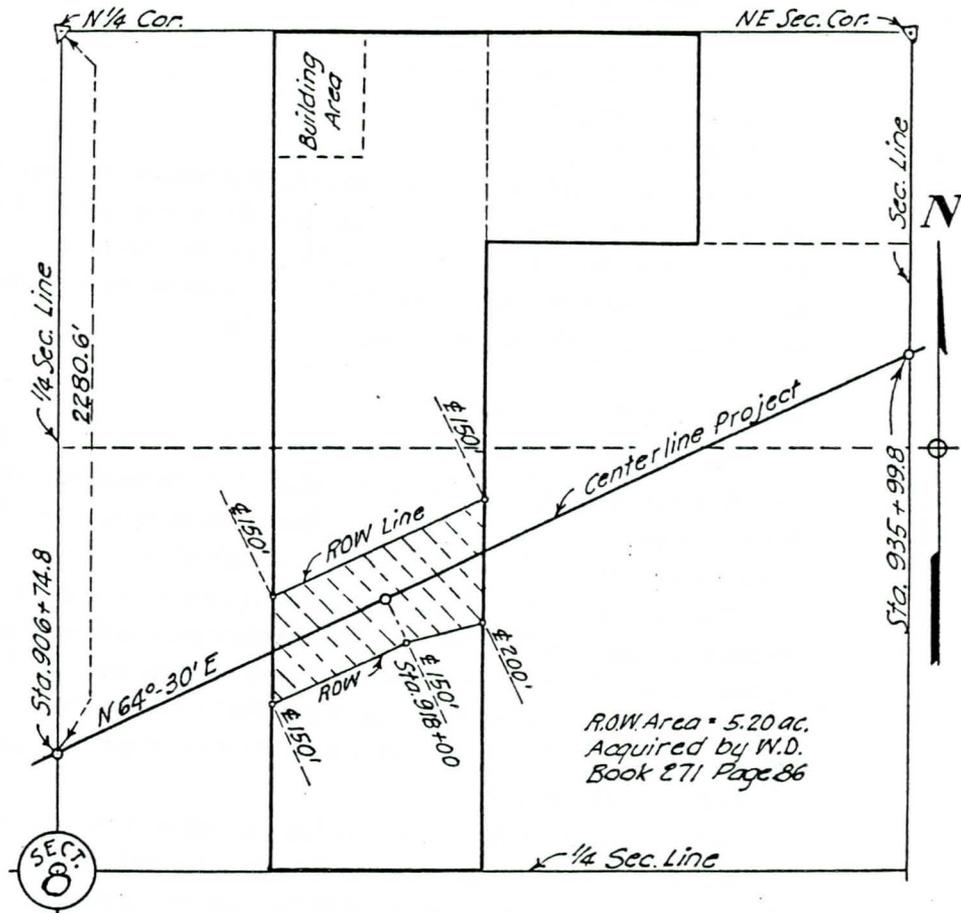
After this is done the right-of-way lines on one or both sides of the centerline are described from one property line to the other. Normal, or right angled, distances from centerline are given at each property line, and at any points between, where the right-of-way line angles or changes in width. The centerline survey station is given for the purpose of locating any such intermediate points.

For an example of a simple highway centerline description the right-of-way taken from Property "F" in Figure 2, might be described as follows:

A parcel of land located in the  $E\frac{1}{2} W\frac{1}{2} NE\frac{1}{4}$  Sec. 8, T84N, R23W of 5th P.M., Story County, Iowa, lying on both sides of part of the following described centerline of Primary Road No. U.S. 00 as shown on Official plans for Proj. F-000.

The centerline, designated by station points 100 ft. apart, numbered consecutively from southwest to northeast, is described as follows: Beginning at Sta. 906+74.8, a point 2280.6 ft. south of the  $N\frac{1}{4}$  corner of said Sec. 8, on the west line of said  $NE\frac{1}{4}$ , thence  $N64^\circ 30'E$  2925.0 ft. to Sta. 935+99.8, a point on the east line of said  $NE\frac{1}{4}$ .

Said parcel is described as follows: All that part of said  $E\frac{1}{2} W\frac{1}{2} NE\frac{1}{4}$  that lies south of a line which is parallel to and 150 ft. normally distant northwesterly from



PLAT OF RIGHT OF WAY ACQUIRED FROM PROPERTY "F"  
IN THE  $E\frac{1}{2} W\frac{1}{2} NE\frac{1}{4}$  SEC. 8, T 84 N, R 23 W OF 5TH P.M.  
STORY COUNTY, IOWA

Figure 12

centerline and that lies north of a line beginning at a point 150 ft. normally distant southeasterly from centerline, on the west line of said  $E\frac{1}{2}$   $W\frac{1}{2}$   $NE\frac{1}{4}$ , thence to a point 150 ft. normally distant southeasterly from Sta. 918+00, thence to a point 200 ft. normally distant southeasterly from centerline, on the east line of said  $E\frac{1}{2}$   $W\frac{1}{2}$   $NE\frac{1}{4}$ .

Said parcel contains 5.20 acres more or less.

The property just used to illustrate the plotting of a right-of-way centerline description was described under the rectangular system of survey. If a property is described by metes and bounds the same procedure will be followed. In either case the steps are as follows:

1. Plot the whole property in accordance with its deed description.
2. Plot the exact location of the highway centerline through the property following the data given in the centerline description.
3. Plot all points at the distances given, normal to centerline, on both property lines and at any intermediate points between as stated in the centerline description.
4. Draw in the right-of-way lines connecting these plotted points and the plat of the right-of-way through the property is completed.

## CHAPTER 18

### Elements of Soil Engineering

EDWIN C. BEETHOVEN

*Foundations Specialist; Bridge Division  
Bureau of Public Roads*

The effects of soil engineering are evident in the design plans for a highway or bridge structure as well as in the construction operations undertaken by the contractor in building the proposed improvements. Since details on right-of-way are an integral part of such facility plans, an elementary knowledge of what constitutes soil engineering as regards the effects noted is considered desirable. A right-of-way agent should be conversant with the basic technical terms used in soil engineering and be able to explain, when necessary, the effects of such work. He is not expected to be a soils engineer. In fact, if this brief summary of "Elements of Soil Engineering" only impresses upon the agent the need for reliance upon the advice of the State's highway soils engineer whenever a problem in soil engineering arises, it will have served a useful purpose.

Soil engineering may be simply described as learning what strains or changes in characteristics of soil will result from stresses or condition changes likely to happen with various design schemes and thus obtain a design result. The science of stresses and deformations as applied to the material, soil, is termed soil mechanics. This science allows the soils engineer to evaluate the physical properties of a soil which in turn enables him to evaluate what load may be placed on a soil as a foundation, what amount of settlement may be expected on a structure, what forces the soil will exert against a retaining wall, and to what slope a soil bank may be safely cut without fear of slipping.

#### Soil

To understand what soil engineering is requires, of course, an understanding of what is meant by the word "soil." Engineers working with soil have had to carefully and clearly define it so as to allow an intelligent exchange of ideas and working knowledge among themselves and with others who are associated with any work involving this material. In so defining soils, they use terms which may seem to compound

the difficulties but such usage is necessary to avoid, as much as possible, any misunderstanding. The soils engineer is not trying to effect an unnatural aura of mystery about soil.

Soil has been given various definitions by those who are concerned with it. The agricultural engineer and farmer have described soil as "finely divided rock material mixed with decayed vegetable and animal matter, constituting that portion of the earth's surface in which plants grow." The highway engineer who is concerned with the design and construction of engineering structures which most often involve consideration of soil at depths not conducive to the growth of plants, refers to soil as constituting "a natural aggregate of mineral grains that can be separated by gentle mechanical means such as agitation in water." Rock, on the other hand, is interpreted as a natural aggregate of mineral grains connected by strong and permanent cohesive forces. To the geologist, the term "rock" implies all the material which constitutes the earth's crust and soil as only the portion capable of sustaining plant growth.

It is most important, therefore, to always know in what manner the term soil and also rock are being used. Soil, as used in this section, will refer to materials that unquestionably satisfy the highway engineering usage described.

Soil may be visualized as an assemblage of mineral particles interspersed with open spaces called voids or pores which may contain air, water, or some gaseous combinations.

#### Terms Used to Describe Soil

Soil is usually referred to or named by a classification term such as sand, clay, silt, or gravel, or a combination thereof such as silty sand, sandy clay, etc. Since soil is an abstract word, encompassing a mass of many parts not clearly distinguishable one from the other, it has been found necessary to describe the physical characteristics of the mass as a whole, including how it reacts under changes in moisture and the feel and appearance of the mass, and then to break it down into its constituent parts to describe them. By setting up arbitrary, definite boundary size limits for the mineral particles and limits for the quantity of each size or range of sizes and for certain physical characteristics of the units altogether in the mass, classification systems have been developed. A standard commonly used is the one set forth in *AASHTO Designation M145-49*. This standard describes size limits used for the various descriptive terms and also sets forth a system including groups of soils. Detailed information may be obtained by reference to this noted standard but a few excerpts are here given:

*Gravel* — Material passing sieve with 3-inch square openings and retained on the No. 10 sieve.

*Coarse sand* — Material passing the No. 10 sieve and retained on the No. 40 sieve.

*Fine sand* — Material passing the No. 40 sieve and retained on the No. 200 sieve.

*Combined silt and clay* — Material passing the No. 200 sieve.

*Boulders* (retained on 3-inch sieve) should be excluded from the portion of the sample to which the classification is applied, but the percentage of such material, if any, in the sample should be recorded.

*Silty* is the term applied to fine material having plasticity index of 10 or less and the term *clayey* is applied to fine material having plasticity index of 11 or greater.

Sieve numbers indicate approximate number of openings per inch; thus, the No. 200 sieve indicates a sieve with 200 openings to the inch. Each such opening would be somewhat less than 1/200 inch in size.

The limits used in other classification systems may vary somewhat from those given in the AASHTO Standard.

A sand soil is one in which the individual grains can be seen and felt readily. A silt soil is a fine textured soil that will crumble easily when dry, whereas a clay soil breaks into hard lumps when dry and is sticky when wet. These texture terms indicate, therefore, the feel and appearance of the soil.

Many combinations of the basic size ranges of particles are likely in a soil mass. Descriptive terms of two or more of the textural names are thus generally used to describe a soil. Examples are: *silty sand* — a soil principally a sand but with a large percentage of silt; and a *gravelly sandy clay* — a soil principally a clay, but with a large percentage of sand and a lesser percentage of gravel.

Other terms are also commonly used to describe a soil. These are:

*Color* — generally varies with moisture content of soil. Standard practice is to define the color of a soil while in a moist condition.

*Structure* — describes the pieces resulting when a soil breaks up. It may be prismatic, blocky, granular, etc. Structure is indicative of the drainage characteristics of the soil.

*Moisture content* — the amount, expressed as a percentage, of water per unit of dry weight of soil. Water may be that which is free to move downward from the force of gravity, or that which is held by capillary forces; these are referred to as free water. Hygroscopic water is that which is held by each soil grain in the form of a very thin film. This is also often referred to as air-dry moisture content.

*Soil profile* — refers to a vertical cross section of soil layers. In the pedological system of defining soils, this is composed of four major layers designated the "A", "B", "C", and "D" horizons. "A" horizon is the original top layer of soil having one color and texture throughout its depth. The "B" horizon is the layer of about one color and texture throughout its depth, located below the "A" horizon and

which is a zone of accumulation of the fine particles removed from the "A" by percolating waters. The "C" horizon, located below the "B", is referred to as the parent soil material. A "D" horizon is the underlying stratum which is not parent material but which may have some significance to the developed soils above it.

### Physical Properties of Soil

Soils have properties that influence their behavior and value. The more common properties which are used in highway engineering work are the following:

*Internal friction* — the resistance to sliding within the soil mass varying with the pressure upon the sliding plane. Gravel and sand have high internal friction and the greater the percentage of gravel and sand in a soil mass, the higher its friction. For a sand, the internal friction is dependent on the gradation, density, and shape of the soil grains and is relatively independent of the moisture content. A clay soil will have low internal friction which will be dependent on its water content.

*Cohesion* — the mutual attraction of soil particles due to molecular forces and the presence of moisture films. Cohesive force in a particular soil will generally vary with the moisture content of the soil. Clays have high cohesive forces whereas sands and silts have little, if any. Pressure has little effect other than to densify the soil and in that manner increase cohesion.

*Shearing strength* — the effective combination of friction and cohesion. It generally includes both of these properties, although not in equal proportions.

*Capillarity* — action by which a liquid will rise, in a channel, above a supply of free water. The number and sizes of the channels or capillary pipes determines the amount of capillarity. Thus in a soil, the number and size of the openings between particles are the factors determining the capillarity or degree of rise of water. Capillarity in a clay soil is high but a considerable time is required because of the very small sizes of the channels and the high frictional resistance to water flow in these small pores. Silt soils have high degree of capillarity at a relatively rapid rate. Sand soils have little, if any, capillarity because of the large sizes of the channels.

*Elasticity and compressibility* — properties of soil that cause the soil to rebound or remain compressed after compaction. *Compaction* is the forcing together of the soil particles by some mechanical means. If soil tends to rebound, it is *elastic*. If it does not, it is compressible.

*Consolidation* — property of a soil to readjust, because of stress changes, the internal relationship between its voids and its particles. The voids may or may not be filled with water. Stress changes are the result of application or release of

loads. Fine-grained soils, such as clays, have a high percentage of voids and can, therefore, experience considerable consolidation. Sands, although porous appearing, have a lesser percentage of voids and, therefore, experience little consolidation. Rate of time required to consolidate a soil is dependent on the permeability of the soil.

*Permeability* — rate at which water is transmitted through the soil by a defined unit of force. This property varies with such factors as the void volume, size, and distribution of mineral grains, and structure and degree of saturation. The coefficient of permeability defines that quantity of water that will flow through a defined area, in a given time, under a known pressure head of water.

#### Changes in Soil Properties

The properties of soil change primarily as a result of a change in moisture content, filling or emptying the voids or pores with water, and by readjustment of the mineral grains because of stress or load changes. Changes in moisture content and loading conditions are the usual result of any construction.

#### Investigation of Soil Conditions

A study is made of the geological history of the area in question; then field subsurface explorations are made and samples obtained; laboratory tests are performed on the samples to identify them and to determine the reaction under changes in moisture content and stresses; and analyses are made, relating all the information obtained to what is to be built or engineered. Each and every part of the investigation is closely interrelated.

*Geological history* — A study of this gives an understanding of types and extents of soil materials likely to be encountered.

*Explorations and sampling* — Holes may be dug, augered, or bored into the earth to examine what conditions exist. A log record is kept on each hole indicating the nature and extent of each material encountered and other pertinent information such as water levels. Samples where desired are obtained. They may be either disturbed type or undisturbed type. The latter are generally used for strength and performance testing. Geophysical methods are also often used to evaluate extent and character of subsurface deposits.

*Seismic methods* — This is based on the principle that sound waves travel at different velocities through different soils and bedrock. The shock wave is generated by a sharp explosion or other means; the travel time for the impulses are recorded at various surface points by geophones; and depths of strata under the point where the shock wave originates are determined from a time-distance analysis of the recordings of each geophone.

*Resistivity method* — This consists of measuring the drop in electric potential between electrodes embedded in the ground at selected spacings. The voltage between two inner electrodes is measured while a direct current is applied to two outer electrodes. From these data, a resistivity is computed for the depth equal to the spacing of the electrodes. Electrode spacing is changed and variations in resistance with depth is indicated.

A geophysical survey should always include correlation borings. Even so, such a survey method is generally rapid, economical, and often more practical than borings only. One decided advantage is minimum disturbance of surface features since the only major disturbance is that caused by the few correlation explorations.

*Testing* — Various tests may be performed on the soil samples. They generally include those to determine classification items, such as grain sizes, to determine effects of water as regards plasticity characteristics, and to determine shearing strength and consolidation characteristics under various loading conditions and to determine the other properties of a soil, previously described.

Several physical test constants are used to indicate the results of such tests. These are significant in soil engineering:

*Atterberg limits:*

These are moisture contents at which a soil changes from one major physical condition to another under standardized testing procedures:

*Plastic limit (PL)* — change from a semisolid to a plastic state.

*Liquid limit (LL)* — change from a plastic to a liquid state.

*Plasticity index (PI)* — numerical difference between PL and LL. Indicates range in moisture contents in which a soil is in a plastic condition.

*Voids ratio* — volume of the voids to the volume of solid particles.

*Density* — indicates the weight per unit volume. This is variable and can be controlled to a considerable extent whenever the soil is handled or manipulated.

*Shrinkage ratio* — volume change per volume loss of water.

*Volumetric change* — volume change per unit dry volume based on a certain defined moisture change.

*Unconfined compressive strength* — strength, or resistance to deformation and failure, evidenced by a soil without lateral confinement.

*Shear strength* — strength evidenced by a soil when subjected to shearing forces.

*Consolidation data* — characteristics of the soil when subjected to a long time applied load. Amount of consolidation per change in stress and time rates are determined.

*Bearing value* — strength of a soil in units of load per unit area in regard to the support of an applied load. Generally indicative only of shearing strength of soil. May be evaluated by laboratory and field tests in conjunction with exploration logs.

Testing may be described as falling in two major groups: the classification tests and performance tests.

#### Use in Highway Engineering

A primary use of the information is to understand what type soil material is going to be encountered and relating its performance to the desired performance. Often, because of classification constants, the engineer can relate the material to be encountered directly to recorded performances of similar material.

Economical selection of design dimensions such as thickness of base and subbase courses under a wearing surface necessary to carry the design loads, determination of construction requirements such as degree of compaction control on embankment material or selection of borrow sites, and interpretation of problem areas where special treatment must be used are thus allowed. In the problem areas, samples may be obtained for laboratory performance testing and, in conjunction with this, field performance tests may also be made to allow determination of a satisfactory design treatment.

Stability refers to whether a soil material will remain in its desired place under the design loads it will have to experience in the completed job. Thus, if an embankment is placed over an area, the supporting soils must remain stable under the applied load. Likewise, if a large cut is made through a hillside, the release of the load originally imposed by the excavated material may be such as to unbalance the material remaining and a tendency to readjust, called sliding in this instance, will take place unless the material in the cut slopes is sufficiently strong to resist it.

A little thought at this time, regarding the fact that land surfaces are always readjusting themselves and will ultimately return to a generally stable condition if disturbed, will bring to mind many applications of stability. A retaining wall, designed to hold back earth, must be sufficiently strong to resist the tendency of the retained earth to slide. A structural foundation must resist longtime applied loads. A highway base must resist repeated loadings. There are many others.

Shearing strength of the soil mass can often be modified by increasing drainage and thereby lessening the water content of the mass. Also, in construction of soil embankments, judicious selection of those soils which show the most advantageous shear strengths is made and construction control methods are established which aid in obtaining the best conditions.

Consolidation test data will allow an interpretation of how a footing or other applied load will permanently deform the soils and the rate and duration of time

in which this action will take place. Changes in strength because of consolidation may prove useful.

The line and grade of a completed facility are the end results of many considerations and one of the major ones is information determined by soil engineering.

#### Relation to Right-of-Way Acquisition

Since soil engineering is an integral part of highway engineering, right-of-way acquisition for highways is affected by soil engineering. The right-of-way limits shown on the engineering drawing for a new facility are determined by such decisions as how much land is going to be needed to build the designed embankments with stable slopes; will stability berms be needed; how flat must the slopes be in cut sections to be assured of stability of the cut faces; will drainage benches be required, etc.?

The value of property acquired in right-of-way acquisition should be dependent to a degree on the probable use that could be made of the property if not purchased for highway use. An understanding of some of the elements of soil engineering and how this information will allow an evaluation of treatment that would be required if a property is to be put to a specific use, will allow a clearer understanding of a property's value. In this regard, it is specifically pointed out that there are often occasions where a property may be unsatisfactory for a large building site because the cost of a foundation treatment for such a building at the particular site may be excessively high. Soil engineering will allow such an evaluation.

This discourse was not intended to make the right-of-way man aware of all the considerations necessary; it was intended to merely acquaint him with some of the basic elements.

## CHAPTER 19

### Hydraulics

LESTER A. HERR

*Chief, Hydraulics Branch; Bridge Division  
Bureau of Public Roads*

In highway construction, the engineer is confronted with many problems related to water. Floods on natural streams, runoff from rain and snow falling on the right-of-way, and ground water seepage must be carried from the right-of-way at a reasonable cost and without damaging the abutting property. Many of these drainage problems are quite complex and often require that construction extend beyond the normal limits of the right-of-way. Agents who negotiate for right-of-way have an obligation to both the highway agency and the general public, and should have a general understanding of the drainage problems involved.

#### Floods

Newspaper writers measure the magnitude, occurrence, and duration of floods by such expressions as "once-in-a-lifetime" or "in the last 50 years." These are qualitative measurements and are not sufficient for highway design purposes. The highway engineer is interested in "How much flood water? How often does it occur? How deep is it?" and sometimes, "How long does it last?"

Water is measured in various units. In highway work the quantity denoting magnitudes of floods or the hydraulic capacity of structures is measured in cubic feet per second (c.f.s.). This quantity is the cubic feet of water passing a given point in one second. Sometimes, when referring to the capacity of pumps, gallons per minute is used.

During any one flood the discharge passing a given point in a stream increases to a maximum and then decreases to some lower discharge after the flood is over. In some instances, a stream becomes dry soon after the rain ends and is called intermittent. For different floods on the same stream, the maximum discharge can vary depending on a number of conditions, including the amount of rainfall or snow melt and the condition of the watershed when the runoff occurs. In highway design, primary concern is with maximum discharges or the peak discharge of major floods that could come to drainage structures during their lifetime, since it is usually assumed that lower discharges will

be carried satisfactorily by all structures that are designed for the larger or infrequent flood discharges.

Records of streamflow measurements on a given stream show that peak discharges of low magnitudes occur frequently, perhaps several times a year, while peak discharges of high magnitudes occur less frequently. In other words, floods vary considerably in magnitude and some standard for comparison of flood peaks and their respective frequencies is necessary. Hydrologists have developed a procedure for analyzing streamflow data to obtain the average recurrence of a particular peak discharge. This procedure, when applied to the discharge records of a stream, will estimate what is known as a 10-year, a 25-year, or a 50-year peak discharge.

A 10-year peak discharge does not necessarily occur at the end of each 10-year period, but is one that may normally be expected to be equalled or *exceeded* on an average of once every 10 years or, more accurately stated, 10 times in 100 years. A 25-year peak discharge may be expected to be equalled or exceeded in an average of 4 times in 100 years. A 50-year peak discharge would be expected to be equalled or exceeded on an average of twice in a century. The periods of time in which, on the average, a given discharge will be equalled or exceeded is called a recurrence interval or a return period. The words "equalled or exceeded" are used because floods of greater magnitudes must occur in some period of time; therefore, the procedure gives the number and *not* the magnitude of excessive peaks for a given return period. For instance, if a culvert were designed to carry a 25-year peak discharge so that the upstream pond would just approach the roadway profile grade, there would be a good chance that one flood would reach or overtop this embankment in a 25-year period, or that 4 floods would reach or overtop the roadway in a century. The magnitude of these four floods and the damage caused by them would likely differ. A culvert designed for a 50-year flood with the same roadway grade would cause floods to reach or flow over the roadway on an average of twice in a century. The magnitude of a 50-year flood is generally much less than twice the magnitude of the 25-year flood.

The height or stage of a stream is the elevation of water surface measured in feet above some datum. The stage at a given cross section in a stream varies for different quantities of flow and for other reasons, including controls set up by reservoirs and stages in downstream rivers. In highway design, the stages or elevations reached by flood waters are important in establishing highway grade lines and in determining the potential flooding of property by a highway embankment or a drainage structure. If stream-gaging records are not available, considerable computation and experience are necessary to estimate stages of floods of various frequencies in a natural stream.

The duration of floods or the time interval elapsed while the water is high varies considerably both from stream to stream and for different periods of the year on the same stream. Floods on small streams in a thunder storm area could reach a maximum

peak flow and decrease to practically no flow in less than an hour, while floods on larger rivers flow with a high stage for days or weeks. Information on the duration of floods must be obtained from long-term streamflow records collected by local, State, and Federal agencies. Fortunately, the duration of floods is not generally significant in most highway work.

The determination of peak discharges, their return period, depth or stage, and duration is included in the science of hydrology. It is not a science which gives answers of great accuracy. Floods at some stream crossings are measured or gaged; some are not. Statistical analyses and regional flood studies are necessary to give estimates of floods on ungaged streams. The magnitude and probability of occurrence of a flood of a given magnitude are estimated only on the past record, which is a very small sample in the space of time. Statements relative to floods, their magnitude, occurrence, depth, and duration, and the adequacy of drainage structures should be made with caution, and then after considerable study by an engineer experienced in this field. Maximum floods of record can be exceeded, and they can be exceeded tomorrow!

### **Rainfall**

Floods are caused by excessive rainfall or rapid snow melt, or the combination of both. For this reason many engineers believe that precipitation data can be used to predict floods. Studies indicate, however, that precipitation alone is not adequate for this purpose because of the numerous factors affecting rain or snow as it moves from its point of origin on the ground to the stream crossing of interest. The variability of rainfall itself, both in intensity and surface distribution, makes it useless for estimating discharges, except for very small drainage areas.

In the absence of better methods, a formula which uses rainfall is used for computing the magnitude of floods from small drainage areas, say up to 200 acres. This formula is called the "Rational Formula" and is made up of factors of rainfall, area of watershed, and a coefficient for adjusting the runoff because of the type of ground cover.

Rainfall data in inches per hour is analyzed similar to streamflow records previously described to obtain the average return period of various intensity rainfalls. Examination of rainfall records shows that considerable geographical variation in rainfall is common. For example, the 25-year rainfall in Portland, Oregon, is 0.9 inch per hour, and in Mobile, Alabama, it is 3.3 inches per hour. Runoff from similar small watersheds in these two cities is naturally quite different because of this big difference in rainfall.

### **Hydraulic Design**

After a hydrological study of the stream crossing is made to determine how much water can be expected, drainage structures or channels suitable for the conditions at the

site are designed by hydraulic principles. In preparing such designs, many factors are considered in arriving at an economical structure. Selection of a structure should not be based on size or cross-sectional area alone without regard to the other factors that affect hydraulic capacity.

If the maximum possible peak discharge of a stream were known, it normally would be uneconomical to design a structure for such a flood. The method of relating peak discharges to various return periods gives the designers some yardstick for measuring the risk of flood damage or washout. It is the usual practice to use longer return periods (higher floods) on high type roads, and shorter return periods (lower floods) on low type roads. There are cases, however, where upstream or downstream property values dictate that relatively conservative designs should be used on minor roads.

The construction of a highway changes the local topography and drainage pattern. Drainage structures, if economical, will constrict most flood flows to some extent, with the result that water is backed up to varying degrees. The potential damage caused by such constriction must be evaluated. In some cases it may be more economical to purchase a drainage easement than to invest in larger structures.

### Legal Considerations

Laws pertaining to water, especially flood water, vary considerably throughout the country. Drainage law usually follows the Roman civil law, the English common law or, in some cases, statutory law passed by legislative bodies or local codes. Recently, however, courts have had a tendency to substitute ordinary negligence and eminent domain principles for the traditional laws in considering water damage. In general, most drainage laws place the responsibility for damage on any person or organization which alters the natural stream pattern of a watershed or creates an obstacle which blocks the flow of a natural water course. Because of the wide variation in drainage laws and their interpretation, each highway agency should prepare adequate guide lines on this subject for use by their highway engineers and right-of-way agents.

The right-of-way agent is the one representative of the highway agency who makes close contact with the property owner affected by highway construction, and therefore, it is imperative that he understand the legal responsibility of the highway department and the liabilities assumed because of construction, particularly in the case of drainage. This aspect is extremely important in that costs of the highway facility, and damages from erosion, silting, and flooding are not always understood or anticipated by either the highway agency or property owners. Such misunderstandings lead to criticisms, charges of incompetence, and damage suits. Therefore a good right-of-way agent will understand the law, and recognize the possible damages that might occur. The advice of a competent hydraulic engineer should often be secured on drainage problems.

Drainage problems can lead to costly litigation proceedings, thus it is imperative that each right-of-way agent be alert to recognize potential problems. Often flooding or erosion is acknowledged as an existing problem by property owners during the course of right-of-way negotiations. If so, easements for drainage or other means of protection should be considered, if they are not already so provided for on the plans. In any event, proper and complete documentation of the history and status of the existing problems (including photographs) is of utmost importance for defense should damage suits be filed after construction. Juries generally attribute damages cited in a complaint to the highway construction regardless of the real cause.

In addition to drainage laws relating to property owners and the highway agencies, laws involving the responsibility and authority of other public agencies over certain waterways must be considered in negotiations for right-of-way. Although highway designers should have contacted all interested agencies and prepared plans to meet with their approval, the right-of-way agent should be aware of the jurisdiction of existing drainage districts or other agencies controlling water in the area in order to make equitable allowances for damages. In the Western States, where irrigation is paramount to the economy of the area and the livelihood of the individuals, a thorough knowledge of the laws governing or regulating irrigation waters is essential.

## CHAPTER 20

### Drainage Facilities

LESTER A. HERR

*Chief, Hydraulics Branch; Office of Engineering  
Bureau of Public Roads*

In highway drainage many types of structures are used to convey water. Among these are bridges, culverts, storm sewers, drain pipes, and channels. The type of structure selected for a particular location can vary for many reasons, but the selection is usually made on overall cost, availability of materials, and the hydraulic performance of the structure in times of floods.

Plans used for right-of-way acquisition customarily show existing and proposed facilities for handling water. These facilities include streams, culverts, storm sewers, irrigation canals, and sub-surface drainage systems. The location and type of drainage facility is usually shown on the plans, but further details are seldom given because the space is needed for other necessary information.

Land owners, however, are becoming increasingly aware of problems created by water and many wish to discuss the proposed drainage design in detail during right-of-way negotiations. They may wish to discuss channel changes, sizes and locations of structures, ponding of flood waters and erosion problems. This presents a need for understanding of drainage problems by the right-of-way agent and for drainage-design plans to supplement right-of-way plans. In complicated designs, the assistance of a hydraulic engineer is not only helpful, but necessary, since the right-of-way agent will not ordinarily possess the very specialized knowledge necessary in this field.

#### Bridges

Highway bridges, with the exception of grade separation structures, are usually built to carry vehicular traffic across waterways. Besides meeting the requirements of the roadway traffic, bridges must provide adequate waterway openings to pass floods and, in some cases, must provide clearance for boat traffic. These requirements and other problems common to bridge design have led to many different types of bridges, ranging from large suspension spans to structures that are submerged during periods of high water.

For economic reasons a highway bridge is usually designed to constrict the flow in the natural channel, particularly when the stream is carrying an unusual or infrequent flood. Piers are placed in the water to shorten spans and thereby reduce the size of bridge members. Approach earth embankments are used extensively on flood plains to reduce the length of expensive bridge structures. The constriction of the waterway by bridge and embankment causes an increase in velocities of flow and a backing up of the water upstream, usually to a minor degree.

Because most bridges constrict the flow of an unusual flood, highway engineers are cognizant of the risks and uncertainties connected with stream crossings. The more progressive highway agencies prepare bridge site reports which contain such information as aerial photos, vicinity maps, a flood-frequency analysis, a history of past floods, an investigation of bank and stream bed stability, stage discharge curves and computations showing stream velocities and increased depths of water (backwater) caused by various lengths of waterway openings. The contents of these reports are invaluable to the designer and should be very helpful to right-of-way agents who will negotiate the purchase of right-of-way or drainage easements.

### Culverts

Culverts provide an opening through a highway embankment for the passage of water, pedestrians, vehicles or livestock. Some culverts serve more than one purpose. There is no hard-and-fast definition of a culvert and many culverts are similar to a bridge. This is particularly true of concrete box structures having a natural earth bottom and the top slab serving as a roadway pavement. The length of span is often used as a criterion for distinguishing between a culvert and a bridge. Twenty feet is one of the more common span lengths used to make the arbitrary division. For this discussion, a culvert is a structure of various geometric shapes, constructed under a highway embankment for the passage of water.

It is common for the layman to rate the flow capacity of a culvert by comparing its cross-sectional area with the cross-section area of some flood flow or the cross section of an empty channel. This method of evaluating the capacity of a culvert is very approximate and should be used as a guide only. Many factors other than cross-sectional area affect the hydraulic capacity of a culvert and considering only one factor does not give reliable results.

A culvert changes the flow characteristics of the natural stream considerably. In many instances a culvert acts as a constriction and water is ponded at the entrance and accelerated in the barrel, thus creating velocities at the outlet which are greater than those existing in the natural stream. Because of this increased velocity, a scour hole usually develops at the outlet unless the streambed is composed of rock or other non-erodable material. Sometimes a drainage easement beyond the normal right-of-way

limits is required to accommodate special outlet structures and to protect the highway agency from damage claims.

Culverts carrying the flow of a particular stream can differ in size depending on the type of culvert and the circumstance of installation. Important factors controlling the capacity of a culvert are the shape and cross-sectional area, roughness, length and slope of the barrel, type of inlet, and the tailwater and headwater conditions. Headwater is the depth of ponding at the culvert entrance and tailwater is depth of a flow at the outlet. These factors can vary considerably for each installation, making it necessary to perform hydraulic computations to determine culvert capacity.

In designing a culvert, a certain risk is involved because floods that exceed the design flood can occur during the lifetime of a structure. Excessive ponding and high outlet velocities caused by these unusual floods can damage upstream or downstream properties, erode stream channels, and perhaps, wash out portions of the highway. The risk of possible damage is a very real problem in culvert design and should be considered in selecting the culvert and determining the need for drainage easements.

Oftentimes culverts can be constructed to serve two or more types of traffic. For instance, a culvert can serve as a cattle pass and a waterway, thus reducing overall project costs by eliminating the need for two structures.

### Channels

Channels include natural watercourses and those drainage ditches constructed to prevent water from reaching the roadway, or to remove water from the roadway area. These features of the design are of particular interest to landowners during right-of-way negotiations because they may create or accentuate erosion and flood problems.

Streams frequently present problems in design because it is often necessary to follow natural watercourses to attain a better alinement and grade of the highway at the minimum cost. Many streams meander and change course making the highway vulnerable to damage by erosion. Some streams are easily controlled with bank protection while others are not, making it necessary to keep some distance from critical points in streams even at additional cost in roadway construction. Highway engineers, in order to improve roadway alinement and reduce the number of stream crossings, sometimes resort to channel changes which eliminate river bends and move main channels.

Channel changes are of major concern in right-of-way acquisition since additional land is required to make these changes. Landowners become concerned with the mention of channel realinement and request details of the planned construction. Such details should be a part of the contract plans. Cross sections and the location of the finished channel and the erosion protection proposed for both the channel and the adjacent areas should be shown. Sometimes notes such as "directed by the engineer"

are used in lieu of detailed notes or drawings, but such vague notes are poor procedure and should be avoided.

Although it is customary to construct channel changes to a neat line and grade, it is seldom that the channel remains in this form after the first few floods. In most new channel changes material is deposited downstream and the streambed and banks upstream are eroded. Sometimes the effect of the channel change extends for considerable distances. Only under the most unusual conditions or where considerable protection is provided will channel changes remain as constructed. Statements on the performance of channel changes should be made with caution since the science of this phase of hydraulics is not well developed and the final outcome of such stream changes cannot be predicted with complete confidence.

In many States flood control or drainage districts and fish and wild life commissions are directly concerned with stream channels. A well organized highway department contacts these agencies as well as city and county governments directly involved when highway drainage plans are being studied. Frequently, it is possible to work out joint solutions of common drainage problems with an overall saving to taxpayers and better protection from floods for all parties concerned. Usually a sharing of cost of construction of channels or other features is necessary since highway funds can be spent only for highway purposes and benefits.

### **Irrigation Systems and Wells**

Highways located in arid and semi-arid regions cross many irrigation facilities. These facilities include open channels, siphons, and pipes which transport water from storage areas to points of distribution, usually for agricultural irrigation. Some of these facilities are simple and quite primitive while others are modern and expensive. Highway agencies are obligated, when crossing these facilities, to replace service in kind, although modification of the facility is sometimes necessary.

Usually irrigation water is consumed by many individuals some located at great distances from the highway, and any disruption in water service can mean inconvenience to users and sometimes the loss of a whole crop. For instance, sediment introduced into irrigation water by poor design and construction can destroy sprinkler nozzles in a few hours and give cause for claims against highway agencies.

In many areas, shallow wells are a source of supply for domestic and irrigation water. These wells can be affected by deep highway cuts or channel changes which disturb the natural ground water flow. Although the cost of digging a well is relatively minor, digging a new well is no guarantee that the water supply will be replaced once it is disrupted by highway construction.

Agents representing the highway agencies in negotiating with land owners should give particular attention to irrigation facilities and wells by discussing these aspects

of the highway plans thoroughly with interested parties. It is ideal to draw up agreements which state specifically the type and methods of construction and the responsibilities of all parties concerned.

### Drain Fields

In some sections of the country subsurface drainage fields are used to drain agricultural land to permit cultivation. These drainage fields usually consist of tile placed at various depths in patterns depending upon the topography and character of the soil being drained. Highways crossing such an area are very likely to disrupt the subdrainage installations and the highway plans should include provisions for the necessary ditch and drainage pipe to adequately maintain the existing drainage system.

### Conclusion

Highway agencies should encourage good public relations and frank discussion in the right-of-way acquisition phase of the construction program so that all interested parties are aware of proposed drainage plans and the problems related thereto. Such a procedure enables the designers to make any necessary changes and aids in negotiating a more equitable right-of-way settlement. Landowners are less apt to make claims and initiate litigation proceedings against the highway agency if drainage problems are discussed and proper easements obtained before construction is begun.

Understanding and agreement with landowners will be easier to obtain if local agencies responsible for flood control and soil conservation are brought in on the highway planning. In fact, where such districts already exist the highway agency would be foolish not to work out mutually acceptable designs before any right-of-way is purchased.

*PART III*

*Appraisal Principles*

*The Appraisal Function\**

In this age of growing right-of-way specialization, expert knowledge of values is of paramount importance, since every proposed right-of-way acquisition must at some one point in time resolve itself to a consideration and definite determination of the value of the property to be acquired by the public agency. In these acquisitions, as in all transactions in real estate, the ultimate purchase price must be based upon some estimate of the value of the property involved. In private dealings, the informal estimate of property value may at times be quite sufficient, but it is a particular and especial responsibility of the public acquiring agency that the appraisals made for the properties to be acquired be as technically correct and professionally sophisticated as possible.

**Definition of an Appraisal**

Any decision about the value of real estate must be based upon an appraisal. An appraisal is an estimate and an opinion, and as such, may or may not be accurate. The accuracy depends upon the basic competence and integrity of the appraiser, and by the soundness and skill with which he processes the available and pertinent data. In essence, the appraisal may be defined as the written statement of an estimate of the value of an adequately described property as of a specified date and is supported by the presentation and analysis of factual and relevant data.

**The Purpose and Functions of Real Estate Appraisals**

The fundamental purpose of an appraisal is to estimate value, with the value most commonly sought being that of market value. There are other types of value, depending upon the function for which the appraisal is made, but in the context of right-of-way acquisition, the estimation of market value is the value of central importance. Demands for appraisals of market value develop out of a wide variety of needs including these:

1. *In connection with the transfer of ownership:*
  - a. To help prospective buyers decide on offering prices.
  - b. To help prospective sellers determine acceptable selling prices.

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- c. To establish a fair basis for exchange of real property.
  - d. To estimate value as a basis for reorganization or for merging the ownership of multiple properties.
  - e. To estimate value for the distribution of an estate's assets.
2. *In connection with financing and credit:*
- a. To arrive at the essential security offered for a proposed mortgage loan.
  - b. To provide an investor with a sound basis for deciding whether to purchase real estate mortgages or bonds.
  - c. To establish a basis for a decision regarding the insuring or underwriting of a loan on real property.
3. *To establish just compensation in condemnation proceedings:*
- a. To estimate value as a whole or before the taking.
  - b. To estimate value after the taking.
  - c. To allocate values between the part taken and damages to the residue.
4. *To establish a basis for taxes:*
- a. To distribute assets into depreciable items such as buildings and nondepreciable items such as land, and to estimate applicable depreciation rates.
  - b. To determine gift or inheritance taxes.

There are other functions that may call for a finding which is not market value such as:

- 1. *Insurable value*—to serve the needs of insured, insurer, and adjuster.
- 2. *Going concern value*—to serve for corporate mergers, the issuance of stock, revision of book figures, and the like.
- 3. *Liquidation value or price*—for forced sale or auction proceedings.
- 4. *Assessed value*—to establish a uniform schedule and tax roll for ad valorem taxation, as this schedule may or may not be distinguished from a market value base.

This list does not include all the functions of real estate appraisals but it does indicate the broad scope of the appraisal activities.

The major point is to differentiate between the purpose of the appraisal (to estimate a specified type of value) and the function for which the estimate of value is required. A requirement of every formal appraisal is a statement of the purpose of appraisal. It is usually also in order to state the function of appraisal, if known to the appraiser.

Real property has significance only as it satisfies man's needs and desires. Man's utilization of real property gives it character, and man's collective desire for real property gives it value. Real property is an indispensable concomitance to human life and activity. The measure of a property's value is the degree of its usefulness or utility and the scarcity of comparable utilities. Land so remote from human activity that man cannot make use of it, has no value.

Land acquires value when an individual desires and can use it. The value thus endowed on a particular parcel of real property is not limited solely to the individual whose desires created it. Reflections of that value have significance for every other individual whose welfare is or can be affected by its utilization.

Land is more than a mere physical foundation. It is vitally necessary to man's existence, for it is the source of his food as well as the foundation for the structures necessary in all his social and economic activities. It is an accessory to the satisfaction of most of man's needs and desires. Since every man uses land in some manner whether or not he owns it, an understanding of real property is based on an understanding of land's utilization by and for man.

#### Legal Concept of Real Estate

The legal concept of real estate is more comprehensive than is generally realized since the legal theory holds that land:

... includes not only the ground or soil, but everything which is attached to the earth, whether by course of nature, as trees and herbage, or by the hand of man, as houses and other buildings. It includes not only the surface of the earth, but everything under it and over it. Thus, in legal theory, a tract of land consists not only of the portion on the surface of the earth, but is an inverted pyramid having its tip or apex at the center of the earth, extending outward through the surface of the earth at the boundary lines of the tract, and continuing on upward to the heavens.<sup>1</sup>

This concept that ownership of land extends from the center of the earth to the periphery of the universe was based upon the ancient maxim, *cujus est solum, ejus est usque ad coelum et ad inferos* (whose is the land, his is also that which is above and below it). It is merely a figurative phrase to express the idea of full and complete ownership and is not established law or a rule of property. For example, the ownership of the unlimited air space above the surface of the earth is no longer vested in the ownership of land. The Congress by the Air Commerce Act of 1926 and Civil Aeronautics Act of 1938, has declared that the United States has complete sovereignty in the air space over the nation.

1. Robert Kratovil, REAL ESTATE LAW (3rd ed.), Prentice-Hall, Inc., Englewood Cliffs, N.J., 1958, p.3.

These acts, as interpreted by the courts, still leave vested in the surface owner the right to exclusive control of the immediate reaches of the enveloping atmosphere to the extent necessary for his full enjoyment and exploitation of his property. Rights of ownership of land may then be said to include its surface, everything affixed thereto, and the space above and below it to the extent necessary for enjoyment and exploitation of the property. But even this ownership, in fact, is limited by the powers of government and private restrictions. These powers and restrictions are considered later in this chapter in the discussion of rights of ownership.

### Value as Used in Appraising

Since value can have many interpretations, the meaning used in the valuation of real property is important. In the *Appraisal Terminology and Handbook*<sup>2</sup> it has been defined as the relationship between a thing desired and a potential purchaser. The important word in this definition is *relationship*. This means that the value of an object is related to something. As has been pointed out, there must be a need for an object to give it value. But that does not go far enough; there must be some other factor or factors present. The belief that need alone creates value would imply that value is some characteristic inherent in the object itself. If this concept were true, then bread would be intrinsically valuable because it is needed to satisfy hunger. But hunger is limited. If bakers were to produce twice as much bread as needed to satisfy all normal hunger, then half would have little, if any, value. So the bread's value is not intrinsic, but depends upon the relationship between bread and hunger.

An object cannot have value unless it has utility, that is, unless it has the ability to arouse the desire for possession and has the power to give satisfaction. This ability depends in most instances on the usefulness of the object, but utility encompasses more than pragmatic usefulness. In fact, a useful object may and may not have utility at the same time, depending on the desires of different individuals. Thus, bread has utility to a hungry man but little or no utility to a man who is not hungry.

While value cannot exist without utility, utility alone is not sufficient to give an object value. Another factor, scarcity, must also be present before value exists. Air has the highest possible utility, but air is not scarce. It is available in superabundance, far more than anyone could desire. Therefore, it may be said that no object, including a parcel of real estate, can have value unless it possesses in some degree the two factors of utility and scarcity.

Finally, as in the case of utility alone, the presence of only utility and scarcity do not create value. Another factor is necessary if an object is to have value as the appraiser

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2. American Institute of Real Estate Appraisers, *APPRAISAL TERMINOLOGY AND HANDBOOK*, Chicago, Illinois, 1954, pp. 115-116.

defines it. This factor is purchasing power, or the ability of the individual to participate in the market in order to satisfy his desire.

The appraiser's interpretation of value can then be summarized as follows:

Value is not a characteristic inherent in an object (real property) itself, but depends on the desires of man. It varies from man to man and from time to time as individual desires vary.

An object (real property) cannot have value unless it has utility. Utility is the ability to arouse desire for its possession.

Utility alone does not give an object (real property) value. It might also be relatively scarce. So utility plus scarcity are two of the elements creating value.

Utility and scarcity together do not confer value unless they arouse desire in the market of a purchaser who has the resources (purchasing power) to buy.

The characteristic of permanence complicates the estimation of the value of real property. Unlike goods which are rapidly consumed and the utility obtained at once, the reaping of the benefits of real property is a long-term proposition. Land and its improvements have a useful life extending over decades. The full value of real property, consequently, is equal to the present and all future utilities of the property. Estimating the value of all future uses poses the paramount problem in real estate appraising. Any estimate of value must take into consideration social and economic trends which may influence the value of future utilities. The appraiser must have a clear understanding of current conditions and the perception to recognize the forces which modify and change those conditions. He should have the ability not only to estimate the influence of these forces on the value of real property in the present but to distinguish those of longer duration, to gauge the probable extent of their influence, and to estimate their effect on the future utilization of real property.

#### Value in Use versus Value in Exchange

The preceding discussion of value provides a basis for examining some of the misunderstanding which exists with respect to the interpretation of its meaning. One of the many distinctions in defining value is that between value in use and value in exchange. The distinction here is that a property may have one value in use and quite a different value in exchange. Take, for example, a building in which two different products are manufactured. To confine dust and noise, the owner constructs a brick wall down the center separating the two operations. While the dual usage of the property continues, the wall is of value. If, however, the building is to be sold and the purchaser requires the entire floor area for his type of production, the wall becomes not only worthless, but the cost of removing it is a penalty against its value in exchange. The design of a building can be so highly individualistic that its value in use could only be realized by another individual engaged in exactly the same type of business operation.

The varied interpretations of value reflected in the decisions and opinions of the courts have also contributed to the confusion. Not all courts subscribe to identical definitions of value, but generally they rely upon prices paid for comparable properties as the major evidence. There have been exceptions in the field of condemnation occasionally and in public utility valuation generally. A legal determination may settle a controversy, but such court determination should not be regarded as having unquestionable perfection beyond the particular instance to which it was applied.

The fact that many different adjectives have attached themselves to the word "value" is another indication of the extent of the confusion. Some of the more commonly used are assessed value, going concern value, insurable value, liquidation value. This practice of attaching descriptive adjectives to value is frequently found in those areas of the real estate vocation not directly concerned with the estimation of value. Such adjectives are used to identify an idea in connection with the function for which the value estimate will be used.

In an economic sense, value in the market or market value is the important one because market value indicates the reactions of buyers, sellers, and investors. Unless there is no market, market value is always sought and the major portion of the appraiser's assignments involves estimates of market value which has been defined:

(1) As defined by the courts, it is the highest price estimated in terms of money which a property will bring if exposed for sale in the open market allowing a reasonable time to find a purchaser who buys with knowledge of all the uses to which it is adapted and for which it is capable of being used. (2) Frequently, it is referred to as the price at which a willing seller would sell and a willing buyer would buy, neither being under abnormal pressure. (3) It is the price expectable if a reasonable time is allowed to find a purchaser and if both seller and prospective buyer are fully informed.<sup>3</sup>

This definition embodies the subjective premise. It includes the elements of utility, scarcity, and purchasing power. It is somewhat idealized as it infers that buyer and seller are working under equal pressure which is seldom the case. The definition does not state "at a given time," but market value in an appraisal is always stated as of a specific date.

#### THE BUNDLE OF RIGHTS

Land itself, by definition, embraces everything attached to it, under it, and over it. The rights to land are also comprehensive, and their multiplicity is often described as a "bundle of rights." This theory holds that the ownership of real property may be compared to a bundle of sticks wherein each stick represents a distinct and separate right or privilege of ownership. These rights, inherent in ownership of real property and guaranteed by law but subject to certain limitations and restrictions, are the right

3. *ibid.*, p. 163.

to use land, to sell it, to lease it, to enter it, to give it away, and finally the right to refuse to exercise any of these rights.

While the legal definition of land implies complete ownership of land, legal title to land does not in fact convey absolute fee simple title to real property and the unrestricted exercise of the entire bundle of rights. These property rights and privileges are limited by four powers of government:

1. The power of taxation.
2. The power of eminent domain. This is the right reserved by government to take by condemnation private property for public benefit provided it pays just compensation therefor. This right has been extended to quasi-public bodies such as housing authorities and to public utilities. There is an apparent trend toward a broader interpretation of these rights and powers of government as the concept of what constitutes public benefit broadens.
3. The police power. This is the right to regulate property for promoting the public's safety, health, morals, and general welfare. Zoning ordinances, building codes, traffic regulations, and sanitary regulations are based upon the police powers of government.
4. The right to have titular ownership of property return to the State in the event the owner does not pay his taxes or if the owner dies and leaves no heirs.

In addition to governmental restrictions upon property, private agreements may also impose restrictions. These could limit the use or manner of development, or even the manner in which ownership can be conveyed. These are called deed restriction and a purchaser of a property so encumbered is obligated to use the property subject to such restrictions. Other private restrictions include easements, rights-of-way, and party wall agreements. For example, an owner can sell or lease the mineral rights while retaining the rights to use the surface area of his property. An absentee property owner can rent his surface rights to one party and lease the subsurface rights to another. Air rights, whether for construction or aviation, can be sold or leased. Thus some of the rights may have been sold, leased, or given to other parties before a property is acquired.

The remaining rights in the bundle, subject to the limitations imposed by governmental and private restrictions, can be sold, leased, transferred, or otherwise disposed of. Therefore, an appraisal of a property's value involves consideration of the rights remaining with the property and the effect of the loss of any of these private rights on its value. Knowing exactly which rights are under consideration is fundamental in appraising. Their precise definition is customarily a matter of documentation. In the absence of such definition, it may be necessary to obtain legal opinion. The appraiser, however, assumes the responsibility for being familiar with the broad range of property rights, their more common characteristics, and with the usual manner in which they are utilized and transferred.

## Basic Principles of Real Property Value\*

The principles of land utilization are rooted in economics. Since appraising is the valuation of the rights of use of real property, these basic economic principles are the underlying principles of valuation. An understanding of these principles is, therefore, essential to an understanding of the purpose, techniques, and procedures of valuation.

### Principle of Supply and Demand

Demand for any commodity is created partly by its scarcity. Land scarcity is a shortage in the amount of land available in a stated area for a specific purpose. Land scarcity is an economic as well as a physical concept. It is obvious that the greater the scarcity of land desired and available for a specific purpose, the greater is the desirability of that land. This is the reason for the rapid rise in land values in the central business districts of fast growing cities. Usually such cities are surrounded by plenty of land. But this land cannot be utilized conveniently and profitably for office buildings, department stores, hotels, or parking lots. Thus value arises out of land scarcity in the economic sense.

Some of the factors affecting supply and demand are population growth, purchasing power, price levels, wage rates, taxation, government controls, as well as the scarcity of an object. The supply of housing, for example, is partly controlled by rentals and sales prices—that is, it is increased or remains static according to whether or not these rentals and sales prices conform to the temper of the market. A certain combination of factors must be present in the housing market in order to transform rentals and sales prices into stimulants that create additions to the housing supply. This occurs when there is simultaneously a shortage in the supply of housing units, a strong demand for housing, and an effective purchasing power to satisfy the demand at the rentals and prices offered. But those rentals and sales prices must be high enough to encourage builders to construct new units. If demand is very strong and purchasing power increasing faster than the ability of the supply to satisfy it, the rentals and sale prices for units available will rise. When such increased rentals or prices continue to find a ready market, more builders will enter the market, thus accelerating

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the pace at which additions are made to the supply. This is part of the familiar building cycle and represents the rising curve of that cycle.

There are other factors which enter into the housing market besides the prices and rentals offered. Scarcity of labor, accompanied by high wage rates, can affect the housing supply by increasing its cost beyond the purchasing power of the market, thus discouraging builders from adding to the supply. Taxation by increasing the cost ownership of a home or the rent of an apartment above the means of owner or tenant can affect the supply by restricting demand. Such governmental regulations as rent control, the tightening of money, and zoning regulations shape supply and demand by the limitations they impose.

### Principle of Change

No material thing remains static. The evidences of change which are so apparent in the general physical world apply with equal forcefulness to real property. Change is ever present, irresistibly affecting individual properties, neighborhoods, and cities. These changes can be so slowly evolving that their movement is hardly discernible. The appraiser must always view real property and its environment with the law of change uppermost in his mind so that his eyes instinctively see not only the obvious but the imperceptible indications of change. For it is the future, not the past, which is of prime importance in estimating value.

The appraiser should always appreciate that he is looking at transition, not permanence. He should be ever alert to recognize the economic and social forces at work and to understand the effect these forces are having and will probably have on real property within his sphere of interests. However, even the most astute appraiser cannot determine with absolute assurance what forces will be operating in the future to change the character of a city, a neighborhood, or a specific property. Such omnipotence is not required of him. But reasonable determinations are a matter of judgment based on experience and knowledge so that the more trends and influences the appraiser discerns, understands, and interprets correctly, the more accurately he can estimate their effect and judge their duration and course.

The appraiser has more than his own resources to assist him in formulating his opinion. As in nearly every aspect of the process utilized to estimate value, the appraiser has the attitude of the market to guide him in reaching this opinion. In the market the value of a property is not customarily based on a price paid for it in the past nor by the cost of its creation, but is indicated by what prospective owners believe it will do for them in the future. The attitude of the market will reveal to the appraiser, for example, the length of time an informed investor in the type of property under consideration would expect to receive future benefits from it. Or, the attitude of the

market with respect to property in a certain neighborhood will reflect the opinion of informed buyers as to the neighborhood's future trend.

### Principle of Substitution ✓

This principle holds that the less costly service or product prevails over similar services or products when their utility is substantially the same. Or to state it another way, when two or more commodities or services with substantially the same utility are available, then the one with the lowest price receives the greatest demand and widest distribution. The importance and application of this theory can be found in many segments of our economy. In the real estate segment, for example, if the advantages of several apartments are approximately the same, the prospective tenant selects the one with the lowest rental.

Application of this principle is found in each of the three approaches to value. As applied in the market data approach the principle may be stated: when a property is replaceable in the market, its value tends to be set at the cost of acquiring an equally desirable substitute property, assuming no costly delay in making the substitution. In the cost approach: no man is justified in paying more for a property than that amount by which he can obtain by purchase of a site and construction of a building, without undue delay, a property of equal desirability and utility. In the income approach: value tends to be set by the investment necessary to acquire, without undue delay, a comparable substitute income property offering an equally desirable net income return.

The appraiser should neither underemphasize nor overemphasize the possibility of substituting one property for another in the process of estimating the value of real property. The more prevalent the type of property involved, the more readily it can usually be substituted. Here the application of the market data approach, based as it is on the value in the market of comparable substitute properties, is considered the best indication of such a property's value. In appraising for condemnation the value of the property to be taken is customarily its value in the market, that is, based upon recent sales of comparable properties.

There are, of course, properties such as schools, churches, transportation terminals, and hospitals which, because of their specific use characteristic, exist in a limited number. Obviously, in the valuation of a property of this type it would be almost impossible to find a value indication by trying to locate comparable substitute properties. Thus the use of the market data approach is but rarely appropriate. The cost approach is usually the most effective method to obtain a value indication for this type of property. In this approach the application of the principle is present in the estimation of the current cost to produce a comparable new property affording equal utility and

benefits. Since the property being evaluated is not new, the cost new figure must be adjusted to reflect the estimated loss in value due to depreciation.

This principle of substitution is responsible for these useful premises:

1. The value of a property tends to coincide with the value indicated by the actions of informed buyers in the market for comparable properties.
2. The cost of producing, through new construction, an equally desirable substitute property usually sets the upper limit of value.
3. The compensation to which an owner is entitled when deprived of the use of his property is based on that value "indicated by the actions of informed buyers in the market for comparable properties."

### Principle of Highest and Best Use

Fundamental to the concept of value is the theory of highest and best (or most profitable) use. Briefly it can be defined as that use which at the time of appraisal is most likely to produce the greatest net return over a given period of time. This definition employs a key phrase which should be carefully noted. It is "net return" which means whatever is left from gross yield after all costs are met. But it is important to realize that this cannot always be interpreted strictly in terms of money. Net return sometimes takes the form of amenities. An attractively wooded urban site may, for example, have its highest and best use as a public park, or a private dwelling may render a net return in the form of agreeable living far outweighing a monetary net rental yield.

The second key phrase in this definition is "over a given period of time." The appraiser cannot foresee whether the use which produces the greatest net yield to the land at the time of appraisal will continue indefinitely or even for a stated period of time. The appraiser does, however, attempt to think as would the typical purchaser in the market place. Thus his decision as to the probable period of time the highest and best use will continue to be effective, will reflect the opinion of informed buyers.

As has been stated, land has no value until man can use it, but the degree of value according to this principle depends on the character of that use. Since the owner of real property desires to reap the greatest possible return from his property, he will ordinarily select that use which will achieve the results desired. Usually the present use of a property is its highest and best use. But since change is ever present, the original use of the land may no longer conform to its highest and best use. For example, there are parcels of land in the central business districts of most large cities devoted to parking lots. In an area usually characterized by scarcity of land and a high use-density, utilizing such land for a parking lot would seem to be the antithesis of highest and best use. Consideration of all the factors involved may indicate that such use is, in fact, its most profitable use at the time. "At the time" clarifies the apparent incongruity. In other words, analysis of the condition in the market revealed that the

supply of land already being devoted to the type of uses characteristically found in central business districts was more than needed to satisfy current demand. Any change in the use of the land calling for the investment of additional capital would not yield the owner as high a return as he was receiving from the parking lot utilization.

A study of the past experience of the central business areas of large cities will disclose many instances of shifts in land usage from what would appear to be a highest and best use to a less profitable use. A number of examples could probably be found where tall office buildings had been razed and their sites developed as a parking lot or with one or two-story structures. At the time the change in use was made, the net return to the land from the proposed new use would be higher than had existed under the former use.

In describing the preceding example, the expression "use-density" is used in relation to supply. In any consideration of highest and best use, this relationship is important because supply here means more than physical quantity. The use of land must yield a profitable net return and the quantity of land devoted to any specific use will be that quantity which will yield a satisfactory return to each owner. When the supply of land devoted to such a use is in balance with the demand for such utilization, it can be said that the quantity of land so devoted has reached its highest density of use. If more land physically available were to be converted to such use, increasing the use-density, the formerly satisfactory net return would have to be shared by a larger number of owners.

Use-density is the important factor in almost every analysis underlying an opinion of highest and best use. As an illustration, most metropolitan areas contain old residential districts in which will be found a scattering of multifamily dwellings. If an appraiser were to conclude from only these two facts that this district was in transition and ripe for development as an apartment district, he could be right but he could also be wrong. He had not gone far enough. He had forgotten to relate the apartment usage to the demand in the market for apartments and to check the supply of such units in other districts. If on further investigation, the appraiser found there was a strong demand for apartments and a tight supply, and all other factors such as location of the district being favorable, he would then be right in his conclusion that that district was ready for a higher density and more profitable use.

In most communities there can be found land vacant and available but undeveloped. Sometimes such land may even be zoned for the predominant use in its area, but because of market conditions it has not been so developed. In fact, the highest and best use of such land may not be that for which it is zoned. Long arterial city streets zoned for commercial property are examples of this situation. All such land can rarely, if ever, be developed profitably to commercial use at the same time.

Under the law of eminent domain in most jurisdictions, the type of value evidence which the courts will accept permits the appraiser to consider a property's highest and best use in formulating his opinion of its market value. In most takings, the highest and best use is customarily the one which is permitted by zoning ordinances or private restrictions. If the land manifestly has more valuable use than that permitted by law and if there is strong possibility that a change in its use will be permitted, then the appraiser can properly consider this element as a factor affecting its value just as a buyer or a seller might consider it. However, the rule is that speculative elements must be disregarded. Only those uses which are natural, probable, and legally permissible may properly be considered and be given only such weight as would be considered reasonably tenable.

### ✓ Principle of Balance

The law of balance, as it applies in appraising, holds that value is created and maintained in proportion to the equilibrium attained in the amount and location of essential uses of real estate. The degree of value of a property is governed by the balance or proportioning of the four agents in production which are:

1. *Labor*, that is, wages.
2. *Coordination*, that is, management (entrepreneur).
3. *Capital*, that is, the investment in buildings and equipment.
4. *Land*.

Maximum value, therefore, is achieved when the agents in production are in proportionate balance, one to the other. There is a theoretical point of balance in every property which will produce the greatest net return. An imbalance occurs where a building is too small or too large for the investment in its site, that is, an underimprovement or overimprovement. It also occurs when the cost and amount of services such as elevator, maid, and switchboard provided in an apartment building are too little or too much as related to the character of the building, its tenancy, and its rent schedule. These are examples of conditions under which the principle of balance affirms that disadvantage or loss in value attends any excess or deficiency in the contribution of the four productive agents as they relate one to another.

These four agents in combination produce goods and render services which earn money and so produce gross income. Labor has the first claim on gross income. The costs of coordination are next in line to receive their just due after wages have been paid. The costs of capital have the third claim. These include interest on and amortization of the funds invested in the man-made part of the project such as buildings, equipment, and furnishings. The source of these funds will shrink and eventually disappear if these costs are not paid.

In classic economic theory land has the last and the least claim upon the gross income. Any remainder from gross income after the prior claims of labor, coordination, and capital have been satisfied, can be credited to the land for its part in producing the gross income. The cost of land means a reasonable rate of return on a reasonable land value. This reasonable rate of return could be sufficient to provide for a decline in value in the future, that is, the rate of return will reflect the possibility of depletion of a natural resource such as a gravel pit or mine, or the possibility of a decline in land values due to any of the many causes which could change the character of a district.

In appraisal practice, recovery of all or part of the capital invested in land is not provided as an allowance set aside for such purpose as it is done in many business activities. Any uncertainty as to the future value of the land is reflected in the rate necessary to attract an investor. For example, an investor might consider 8 percent to be a reasonable rate of return for land with an uncertain outlook. At the same time he might consider a 6 percent rate sufficient if the land were in a well-preserved neighborhood.

### Principle of Increasing and Decreasing Returns

The principle of increasing and decreasing returns affirms that larger and larger amounts of the agents in production will produce greater and greater net income up to a certain point (the law of increasing returns). At this point, the maximum in value will have been developed (the point of decreasing returns). Any additional expenditures after this point will not produce a return commensurate with these additional investments (the law of decreasing returns). The operation of this principle is simply demonstrated by fertilization of farm land. Increasing the fertilizer will increase the yield up to a certain point. Increasing the use of fertilizer beyond this point will not earn an additional return sufficient to warrant the additional cost.

It is frequently necessary, as was pointed out in the discussion of highest and best use, to determine the size of the improvement which will enable the land to produce the greatest net yield. It could be of any size from a single story to 20 stories, 30 stories, and so on. At one particular floor, the point of diminishing returns will be reached and the economic height will also have been reached. To ascertain this point the appraiser works out hypothetical combinations of probable income and expense factors and capital requirements for a building of varying heights. He usually finds that one certain combination represents the turning point from an upward trend in probable net yield to a downward trend in net income.

This process of developing hypothetical improvements to obtain that combination of the agents in production which will return the greatest net yield to the land clearly illustrates the principle of increasing and decreasing returns. It likewise

applies in the estimation of highest and best use since it is that use indicated by greatest net yield.

### Theory of Surplus Productivity

Surplus of productivity is defined as the net income which remains after the costs of labor, coordination, and capital have been paid. This surplus can be credited to the land and it tends to fix the land's value. Surplus productivity is dependent upon the principle of balance, the law of increasing and decreasing returns, and the proper proportioning of the four agents in production. It is the greatest net return to the land which, when capitalized at the proper rate, gives the value of the land. Or, highest and best use of land is indicated by the greatest net yield derived by the trial and test process of proportioning the agents in production.

### Principle of Contribution

The principle of contribution is really the principle of increasing and decreasing return as it applies to some portion of a real property. According to the principle of contribution, the value of an item in production is measured by its contribution to the net return of the enterprise. Enterprise in this sense means the combination of all items in production such as land, buildings, and all other improvements.

An example in which this principle would apply is in the valuation of income properties where, due to poor design or layout, possible income-producing space is wasted. For example, in a four-story apartment and store building there is a large obsolete lobby. This wasted lobby space is making no contribution to the income from the property; rather its potential rental value is a charge against the other income producing units. It is found that it would be possible to remodel the lobby area into another store unit and still provide an entrance lobby of more economic but still acceptable size. Based on the rentals of the other stores, the new unit could be expected to earn \$300 a month. In other words, the spacious lobby could contribute \$300 to the building's income. But as long as it does not so contribute, it may be said that the regular rental units must bear the burden of this lost income.

This principle of contribution, as can be seen, has practical bearing in many valuation problems. Its application is fundamental in any consideration involving the feasibility of undertaking a remodeling or modernization project. It is equally applicable in the evaluation of lots of varying depths since it is necessary to know what value, if any, the additional land contributes to its parcel over and above the value of the standard lot in the area. In the reverse situation where a lot is shorter than standard, its value would reflect this loss of contribution by the value of that portion by which it falls short of conformity to the standard.

### Principle of Competition

The principle of competition derives from the fact that profit tends to breed competition and excess profit tends to breed ruinous competition. Excess profit is defined as surplus productivity or that portion of the net income produced by real property over and above the costs of labor, coordination, capital, and land. To avoid confusion it should be pointed out that profit as applied to real property is not the same as the profit obtained from the operation of a business. Normal business profit is the customary money incentive and reward for an investment in capital and land. The yield on a real property is also the customary money incentive for investment in land and buildings. Profit then as it is applied by the appraiser in the analysis of income and expense statements of real property is the net income (surplus productivity) in excess of operating costs and normal returns on land and buildings.

The merchants who are first to locate in an outlying area where merchandising services have long been needed make unusually large profits. Competing merchants are thus attracted to the district. These newcomers share in the total amount of available business. The volume of business initially enjoyed by the pioneer merchants declines, and so do their net incomes. Such a process can continue to a point where few, if any, of the merchants make a satisfactory return.

All profit can ultimately disappear if the development of these competitive services continues beyond the point of economic demand.

Competition is one of the most familiar and readily recognized forces present at all levels of economic activity. Reasonable competition is a stimulant to further creative contribution, but carried to excess can destroy that which it attempts to create. The appraiser must not only recognize its presence in normal situations but be able to recognize those situations in which it is weakening value and, if unchecked, could destroy it. He also recognizes that competition is a product of supply and demand. He knows that a study as to highest and best use of real property will take into consideration current supply and demand factors to judge the strength of the competition they are arousing and the resulting probable use-density of the types of land use under consideration in his study.

### Principle of Conformity

The principle of conformity holds that the maximum of value is realized when a *reasonable* degree of homogeneity, sociological as well as economic, is present. Thus conformity in use is usually a highly desirable adjunct of real property since it creates and/or maintains maximum value and it is maximum value which affords the owner the maximum returns. It is well, however, to note that word "reasonable" used to modify homogeneity. Conformity, then, must be a reasonable similarity, not monotonous uniformity.

Theory aside, it is generally appreciated that land must be utilized in conformity with the standards governing the area in which it is located. One of the primary reasons for zoning regulation is to protect an area from infiltration of or conversion to inharmonious uses. A residential neighborhood, no matter how attractive, would quickly decline in value if it were not so protected. Families would leave and experience has taught that when this occurs the superseding occupancies usually contribute less to value.

These elements of conformity are not preconceived standards of residential development established years ago. Rather they have evolved out of the common social experience as our cities have grown and land uses have multiplied. Homeowners were among the first to recognize the advantages of living in neighborhoods designed, laid out, and developed so as to provide the facilities or amenities that enhance the benefits of their ownership and to protect those assets by restrictive covenants and zoning. Not until the middle of the 20th century did industry as a whole discover the advantages of locating in an exclusively industrial area. Like the residential area, these industrial areas or parks are designed, laid out, and developed to provide the facilities and installations industry requires. So successful has been this concept that many industrial parks carry conformity even farther by restricting occupancy to either light or heavy industry.

#### Principle of Anticipation

The principle of anticipation affirms that value is created by anticipated benefits to be derived in the future. It is not the past but the future which is important in estimating value. The primary significance of past experience, as was pointed out in the discussion of the principle of change, lies in the ability to indicate possible future trends and conditions. An investor in income property does so in anticipation of the income he will receive from the property. However, in reaching his decision to buy the property, he had to examine its past income. In examining this income experience he had to discover all the factors, plus or minus, which had made it possible for the property to produce that income. The buyer then had to analyze the income data and weigh all the factors before he could form an opinion as to whether the income stream would continue unabated, or would begin to decline in a few years, or would be likely to increase in the near future. While value is defined as the worth of all present and future benefits deriving to ownership, in nearly all instances the quality, quantity, and duration of these benefits in the future must be estimated against past experience.

No appraiser, however experienced and competent he may be, can know with absolute certainty what forces may arise to change the character of a city, a neighborhood, or even a specific property. Therefore the appraiser must anticipate, as best he can,

what all the future benefits are likely to be. In his analysis of the forces and factors which will create or influence future benefits, the appraiser must consider the possibility of each benefit from the viewpoint of a prospective owner, giving each the weight and significance a buyer would accord it.

### Other Principles

The process of growth and change is of basic importance to the appraiser. He is always interested in knowing what phase of a property's life cycle he is observing, or what stage in a neighborhood's life it has reached. Just as a doctor wants to know a patient's age in analyzing his physiological condition, so the appraiser wants to know the property's age in analyzing its situation. In doing so, the appraiser works in accord with the principle of integration and disintegration which affirms that all existence is characterized by three stages: First, integration (development); second, equilibrium (static state); and, third, disintegration (decline or decay).

Individual properties, districts and neighborhoods, and sometimes entire cities and towns, follow this same pattern of growth in desirability, of passing through a static existence, and then declining in desirability and usefulness.

Consideration of the growth factor in this cycle also includes consideration of the principles of regression and progression. Like the principle of integration and disintegration, they are an extension of the principles of conformity and change and there is a relationship between them. The principles of regression and progression deal with the interrelationship of properties or things.

Regression maintains that between dissimilar properties or things in the same classification, the worth of the better property or things will be affected adversely by the presence of the lesser. For example, in a residential block of homes where the average value is \$12,000 to \$15,000, there is a high quality home which if it were located in a comparable environment, would be valued at \$25,000. In its actual location its value would tend to be at a level somewhat more comparable to its neighbors. People in the market for homes in the \$12,000 to \$15,000 range look for them in neighborhoods where that price range predominates. They might appreciate the additional features and amenities of the \$25,000 house, but they would be unable to purchase it. A few might be able to pay \$1,000 or \$2,000 more to get such a home, but rarely, if ever, would the owner of the \$25,000 home be able to obtain \$25,000 for his property.

The principle of progression, as the term implies, is the antithesis of regression; that is, the worth of a lesser object is enhanced by association with better objects of the same type. If the situation in the preceding example were reversed and it were a \$12,000 house amidst \$25,000 homes, the \$12,000 house could probably bring a higher value in the market. People aspiring to live in such a neighborhood but unable

to afford \$25,000 homes, would very likely be glad to pay more than the house's value in order to satisfy their desire.

### Summary

The principles discussed in this chapter have been treated separately as a convenience but with an occasional reference to the existence of relationship and interdependence between them. Actually, there is a high degree of relationship and interdependence because these principles are concerned with the behavior of many of the same social and economic forces and factors which in turn are interdependent and interrelated.

These principles are not just academic theories but keys to understanding why, how, and when certain things transpire. If an appraiser in examining a situation found certain factors present and certain forces operating, he would recognize immediately that one principle was being acted out. Understanding the principle, the appraiser could anticipate the outcome and so be able to formulate an opinion or make a decision based on knowledge, not guess work.

From the discussion of these principles and their application in the appraisal of real property the following observations and premises can be deduced with respect to:

#### SUPPLY AND DEMAND

1. Scarcity influences supply.
2. Demand is synonymous with desire.
3. Desire to be effective must be backed by purchasing power.

#### CHANGE

1. Change is ever present.
2. Change is fundamentally law of cause and effect.
3. Today evolved out of yesterday, and is shadow of tomorrow.
4. Cities, neighborhoods, and individual properties undergo process of change.

#### SUBSTITUTION

1. The value of a replaceable property tends to be indicated by the value of an equally desirable substitute property.
2. The value of a property tends to coincide with the value indicated by the actions of informed buyers in the market for comparable properties.
3. The cost of producing, through new construction, an equally desirable substitute property usually sets the upper limit of value.

#### HIGHEST AND BEST USE (Balance)

1. Value is created and maintained in proportion to the equilibrium (balance) attained in the amount and location of essential uses of land.
2. Maximum value of land is created and maintained in proportion to the equilibrium (balance) in the amount (contribution) of the four agents in production.
3. Highest and best use is that use which at time of appraisal is most likely to produce the greatest net return.

4. This greatest net return is the surplus productivity resulting from the proper proportioning or balance of the agents in production.
5. Use-density equates the amount and location of essential uses of land.
6. Increasing and decreasing returns affirm the proper proportioning of land and improvements to achieve maximum land value.

#### SURPLUS PRODUCTIVITY (Balance)

1. Agents in production are labor, coordination, capital, and land.
2. Land has the last claim on the surplus productivity of the agents in production.
3. Disadvantage attends any excess or deficiency in the supply of the agents in production, relatively one to another.
4. Excess usually results in overimprovement; deficiency in underimprovement.
5. Contribution is a corollary of surplus productivity since it holds that value of any individual agent in production depends upon how much it adds to the net income because of its presence, or detracts from it by reason of its absence.

#### INCREASING AND DECREASING RETURNS

1. The application of larger and larger amounts of the agents in production will produce greater and greater net income (increasing returns) up to a point (surplus productivity).
2. The point of maximum contribution of agents in production (point of decreasing returns) attests to proper proportioning of agents resulting from highest and best use.
3. Any further increase in amount of agents will decrease margin between cost of agents and gross income they will produce, resulting in decreasing net income returns.
4. Law of decreasing returns arises from law of supply and demand and affirms that the greater the amount of any commodity offered for sale in the market, the lower will be the price paid for it.

#### CONTRIBUTION

1. This principle may be said to be the principle of increasing and decreasing returns as it applies to some portion of improvement.
2. It is, as pointed out, a corollary of the principle of surplus productivity as it relates to the proportioning of the agents in production.
3. Its application is basic in any study of the feasibility of a proposed remodeling or modernization program and in valuation of lots of varying depths.

#### COMPETITION

1. Competition derives from profits, or profits create competition.
2. Excess profits breed ruinous competition.
3. Profit in the appraisal sense denotes an excess or surplus over and above satisfactory returns to labor, coordination, capital, and land.
4. Competition tends to dissipate the major portion of an excess profit, although some part may remain and contribute to an increased land value.
5. The major portion of the profit is temporary so is not capitalized in the estimate of the value of the land. For its duration, it is treated as a short-term annuity.

#### CONFORMITY

1. Highest and best use will usually conform to essential and permissible land uses.
2. Conformity comprises a reasonable degree of social and economic homogeneity.

3. Zoning regulations and private restrictions affirm the value of conformity.
4. An overimprovement or underimprovement reflect lack of conformity as between one property and its environment.
5. Misplaced improvement is a direct violation of the principle of conformity.
6. Value of an overimprovement sometimes declines (regresses) toward the value level of conforming properties.
7. Value of underimprovement sometimes reaches (progresses) toward the value level of conforming properties.

#### ANTICIPATION

1. Anticipation affirms the definition that value is worth of all present and future benefits deriving to ownership and use of real property.
2. Value of a property is not established by what it sold for in the past nor the cost to create it.
3. Recent sales prices of comparable properties are indications of present worth of what informed buyers and investors in the market anticipated the benefit of ownership would yield them.

## The Appraisal Process\*

Making an appraisal is solving a problem. The solution requires interpretation, in terms of money, of the influences of economic, sociological, and political forces on a specific real property. Characteristics of real property differ widely. This does not mean, however, that there is wide variation in the orderly procedure for solving appraisal problems. The best experience in the appraisal field has crystallized into the *appraisal process*. This process is an orderly program by which the problem is defined, the work necessary to solve the problem is planned, and the data involved is acquired, classified, analyzed, and interpreted into an estimate of value. It is a dependable method of making a thorough, accurate appraisal in an efficient manner. It can also serve as the outline of the appraisal report. Figure 1 illustrates the appraisal process step-by-step.

### Definition of the Problem

The first step in the appraisal process is to write a concise statement of the problem. Any ambiguity about the purpose of the appraisal should be eliminated at the start for the appraiser should be certain he understands precisely the nature of the problem which he has to solve. This he does by taking five basic steps in defining it:

1. He identifies the property to be appraised.
2. He specifies the rights involved.
3. He states the purpose of the appraisal and its function (to estimate market value, for instance, to obtain a mortgage loan).
4. He ascertains the date as of which the estimate is desired.
5. He defines the value to be estimated.

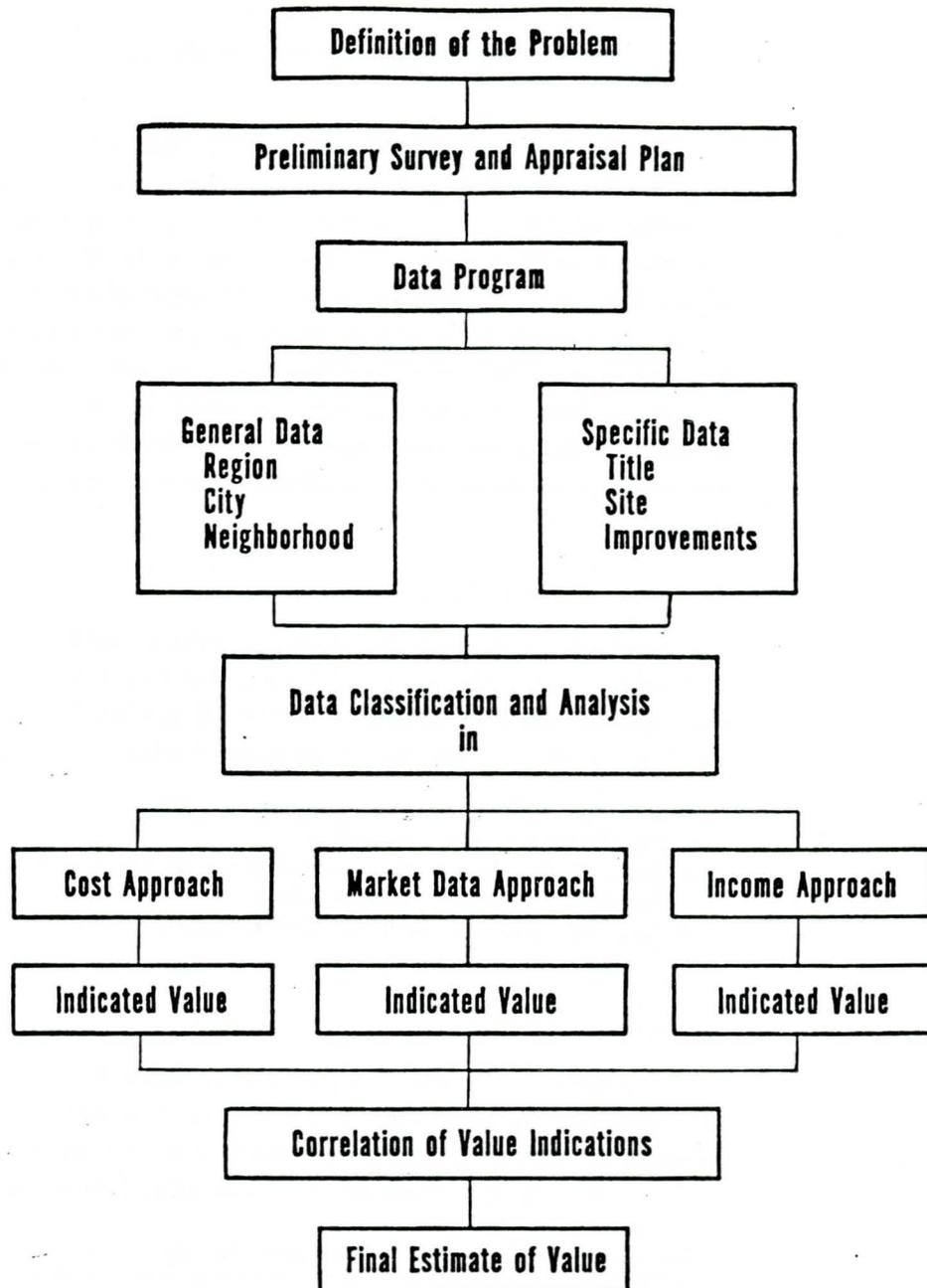
### Identification of Property

A property is first identified physically by means of a mailing address, or other descriptive location, which will enable anyone to go to the property or to identify it by reference to widely recognized landmarks. The property might, for example, be identified as "132 East Ninth Street, Central City, State of Illinois, situated on the

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# The Appraisal Process



west side of the street, just north of Main Boulevard. Land is 100 feet front by 150 feet deep, improved with a two-story and basement building."

The correct legal description of the property is also stated if positive identification is required. This description can be obtained from the existing deed, from a title policy, from the public records, from an existing mortgage, or from an accredited survey. After the appraiser has obtained the legal description he should make certain it describes accurately the exact property to which it applies.

#### Property Rights Involved

The second element in defining the problem is determination of the property rights involved. A real property appraisal is not solely an evaluation of the physical land and improvements. It is an evaluation of the rights which one or more individuals have to the ownership and use of the land and improvements. An appraisal of all rights attached to a specific real property may be desired. Or it may be that an appraisal of only a fractional interest in the property is wanted. Ownership of a property may be held by an individual, by a partnership, by a corporation, or by a group of heirs. When ownership is vested in more than one interest, each may hold an equal share or one may hold more or less than an equal share.

Therefore, the appraiser ascertains at the very outset exactly which rights he is to evaluate. This knowledge permits him to estimate more accurately the magnitude and complexity of the appraisal problem, the extent of research required, the amount of time necessary to complete the assignment, and whether or not additional specialized personnel will be needed.

#### Purpose and Function of the Appraisal

Developing a clear statement of the reason for making the appraisal is the third step in defining the problem. The purpose of the appraisal and the function it is to serve indicates the data to be gathered, the methods to be employed, the type and character of the data and factors likely to wield the most influence, and the type of report required. While the purpose of an appraisal may be to estimate market value, the function for which it is needed will vary. For example:

1. If the purpose is to estimate market value for mortgage financing, the stability or instability of the neighborhood is basically significant because the prospective lender is concerned not only with present worth but with the stability of that value during the period the mortgage will be in force.
2. If the purpose is to estimate market value in connection with condemnation proceedings, current sales of comparable properties are of the first importance since the rule in most jurisdictions as to admissible evidence requires that opinion testimony be based on the reaction in the market of informed buyers and sellers of comparable property.

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3. If the purpose is to estimate market value for possible purchase of a property, current sales of comparable properties, the rate of return the property is producing, and the availability of comparable substitute properties are probably the most pertinent and influencing factors to consider.

In each instance the appraiser would be reporting market value. But the data given the most weight in formulating his final estimate of value and the arrangement of the report would reflect the function for which appraisal was to be used. Therefore, in defining the problem, the appraiser develops an exact statement of the appraisal's purpose and function so that it is clearly understood by and acceptable to both his client and to himself. Such a clear-cut understanding can eliminate misunderstanding as well as needless work and expense.

#### Date of Value Estimate

The fourth element in defining the problem is the date as of which the value estimate obtains. The specific date is important because the value of real property fluctuates. It is rarely constant since the factors which create or destroy value are always in the process of changing. Thus, an opinion of value is valid only for that period in time when it was formulated. Usually an appraisal assignment is for a value estimate as of the time when it is sought. But there are occasions when the appraiser is asked to appraise a property as of some date in the past. Such a value estimate may be required for tax purposes, to settle an estate, or to adjust an insurance claim.

In condemnation appraising it may be months or several years before the appraiser is called upon to testify to his opinion of market value. Depending upon local legal procedure, the appraiser may be testifying to his original market value estimate or he may be called upon to estimate market value as of the date of the filing of the petition to condemn, or as of the date of the trial. In the latter instance he may justifiably alter previous conclusions because of changed conditions.

#### Definition of Value

The fifth and final major element in defining the whole problem is the definition of the value to be estimated. A property has, of course, only one market value as of a given date. But there are occasions when value for a special function is sought. If the value estimate is to be based upon a special set of circumstances or upon alternate sets of circumstances, then the definition of value must be stated with these assumptions plainly set forth.

The widespread lack of understanding among laymen of the exact meaning of terms commonly used by appraisers is still another reason why it is important to include a written definition of the value in the appraisal report. An exact definition of the value sought delineates the problem for both client and appraiser. It also explains

the choice of data considered and the methods used to process that data, thus making the final estimate of value logical and valid.

### Preliminary Survey

Once the problem is defined in terms of the five foregoing essentials, the appraiser is ready to make a preliminary survey. The purpose of this preliminary effort is to determine the character, the scope, and the amount of work it will take to solve the problem. If the problem is to estimate the value of the property without qualification, the first step is to estimate its highest and best (or most profitable) use.

Early in the preliminary survey the character and amount of data likely to be required in the assignment should be estimated. This will depend upon the type of property being appraised since a great deal more information would be required in the appraisal of a hotel than of a residence. The selection of the appraisal approach which will develop the most rational value indication will also indicate the type of data required. In most instances this is market data as most assignments involve an estimate of market value and so the market data approach would be controlling. However, in nearly every appraisal the application of all three approaches is fundamental. Therefore, cost data and income data must also be obtained.

A common example of function indicating the approach most relevant is in the appraisal of a property taken by condemnation. Here the emphasis is on market value as indicated by the application of the market data approach. The income approach as it relates to and applies comparable income data in the market may be acceptable in formulating an opinion of the property's market value. An opinion based primarily on a value indication derived from use of the cost approach is rarely acceptable except where the property type is so individualistic that it is not customarily traded in the market.

### Data Program

The appraiser begins with a definite plan, and this is usually an outline of the proposed contents of the appraisal report. This outline will indicate the main divisions or sections of the report and the data and processes pertinent to each. Such an outline permits the intelligent and orderly assemblage of data and the judicious allocation of time to the various steps involved.

Appraisal data may be divided into two principal classes, general data and specific data. General data relates to facts about and conditions in the region, the city, and the neighborhood, that is, all the elements outside the property which affect its value. Regional and city data have to do with such factors as population characteristics and trends, price levels, levels of employment, and numerous other items. General neighbor-

hood data is less broad in its scope than city or regional data since it pertains to factors present in a smaller area. Neighborhood data would include information as to typical land uses, zoning controls, public utilities, transportation facilities, schools, shopping facilities, and the character and quality of the properties comprising the neighborhood. Neighborhood data would also include a record of the sales of comparable properties to be investigated and analyzed in the appraisal.

Specific data comprises information about the title, the building, and the site. Title information will have been obtained in the course of identifying the property. It is necessary to know who owns the property; the type of ownership (warranty deed or other); what easements and encroachments, if any, exist; zoning regulations controlling; assessed value and taxes; and deed or other restrictions. Building data would include a complete description of the physical improvement and its condition together with an analysis of its layout, style, and design. Information about the site would include such data as a description of the land (size, shape, topographical features) and the presence or absence of public improvements (paving, walks, curbs, water, sewers, gas, electricity). The specific data to be used will depend upon the type of property and the problem to be solved.

### Sources of Data

There are data sources which are used in practically every appraisal and there are some which are used only occasionally. The courthouse or hall of records, for example, is one source constantly utilized since title information is legally on record there. The city hall is customarily the source of information about zoning, traffic regulations, water and sewer lines, and public health and welfare rules. In addition, information about transfers, leases, and assessed values is published and sold in some cities.

Data pertinent to the physical analysis of buildings is to be found in the cost manuals and indices published by reputable organizations. Such manuals usually can be purchased separately or as a part of a continuing service providing current and new data at regular intervals. Local cost indices are published in the larger cities. The appraiser can also obtain data on the local cost of representative construction materials, labor wage scales, and contractors' cost breakdowns. Multiple listing systems, real estate brokers' records, classified advertising, and newspaper items are sources of information about sales and listings of property.

Nothing is more important in the preparation of an effective appraisal than an orderly, systematic listing of the data needed and the sources to be consulted in the course of obtaining this data. A hit-or-miss procedure for obtaining data can prove expensive both in time and money and the appraisal based thereon will probably be unsatisfactory.

### Three Approaches

Appraisers commonly think of value in three ways.

1. The current cost of reproducing a property less depreciation from all sources, that is, deterioration and functional and economic obsolescence.
2. The value the property's net earning power will support, based upon a capitalization of net income.
3. The value indicated by recent sales of comparable properties in the market.

The three approaches—cost, income, and market data—are based on these three facets of value.

In the majority of his assignments, the appraiser utilizes all three approaches. On occasion he may believe the value indication from one approach will be more significant than from the other two, yet he will use all three as a check against each and to test his own judgment. Obviously there are appraisal problems in which they cannot all be applied.

The use of all three approaches is, however, generally pertinent in the solution of most appraisal problems, and their application is well established in appraisal technique and held to be part of the fundamental procedure.

### Cost Approach

In the cost approach, the appraiser obtains a preliminary indication of value by adding to his estimate of the land's value, his estimate of the depreciated reproduction cost of the building and other improvements. This approach is based on the assumption that the reproduction cost is the upper limit of value. This also assumes that a newly constructed building would have advantages over the existing building so the appraiser must also evaluate any disadvantages or deficiencies of the existing building as compared with the new building. The measure of this deficiency is called depreciation.

Depreciation may be one or all of three kinds:

1. Deterioration or the physical wearing out of the property.
2. Functional obsolescence or a lack of desirability in terms of layout, style, and design as compared with that of a new property serving the same function.
3. Economic obsolescence resulting in a loss of value from causes outside the property itself.

The cost approach consists of four steps:

1. The estimate of the land's value as if vacant.
2. The estimate of the current cost of reproducing the existing improvements.
3. The estimate and deduction of depreciation from all causes.
4. The addition of the land's value and the depreciated reproduction cost of the improvements.

In the cost approach, the value of the land is usually estimated either on the basis of the market data approach (sales of comparable sites) or the land residual tech-

nique in the income approach (based on potential earning power). The techniques of this site valuation are discussed later in this text.

Obtaining reliable construction cost figures upon which to base the estimated reproduction cost is one of the practical problems encountered in applying the cost approach. The quantity survey method (detailed cost estimates of labor and materials) is the comprehensive method of estimating replacement cost. This is comparable to an engineering report with supportable and detailed cost estimates. Compiling such a report entails considerable time and money and the decision to do so will depend on the significance of the cost approach as related to the importance of the appraisal. In most appraisals such a highly detailed estimate or reproduction cost is unnecessary. An approximation of reproduction cost obtained by applying square-foot or cubic-foot reproduction cost units to the area or volume of the building will usually suffice.

The cost approach plays an important part in the determination of highest and best use since it involves cost estimates of hypothetical improvements. In order to obtain financing for a proposed project, a value estimate of the development is usually required. Such an appraisal involves estimating the approximate cost of the improvements from a set of plans to which is added the value of the site.

Thus the cost approach is one with which the appraiser must be familiar and which he applies according to the degree of its importance in each specific instance. The value indication by cost approach will be valid if the land value estimate is sound, if the reproduction cost has been estimated accurately, and if the estimate of depreciation from all causes is correct. But physical deterioration and functional and economic obsolescence cannot be measured precisely as a physical object may be measured. Its measurement, or better its estimate, depends in a large part on the experience and subjective judgment of the appraiser. Therefore, a final estimate of value, based solely on reproduction cost less depreciation plus the value of the land, is subject to serious limitations. Therefore, the appraiser relies upon the indications of value found by the market data and income approaches as checks.

### Market Data Approach

The market data approach is essential in almost every appraisal of the value of real property. The value estimated by this approach is frequently defined as "the price at which a willing seller would sell and a willing buyer would buy, neither being under abnormal pressure."<sup>1</sup> This definition assumes that both buyer and seller are fully informed as to the property and state of the market for that type of property, and that the property has been exposed in the open market for a reasonable time.

The application of this approach obtains an estimate of value of a property by comparing it with similar properties of the same type and class which have been

1. APPRAISAL TERMINOLOGY AND HANDBOOK, op.cit., p.163.

sold recently or are currently offered for sale in the same or competing areas. The comparative process utilized in determining the degree of comparability between two properties involves judgment as to their similarity with respect to many value factors such as location, construction, age, condition, layout, and equipment. The sale prices of those properties deemed most comparable tend to set the range in which the value of the subject property will fall. Further consideration of the comparative data will indicate to the appraiser a figure representing the value of the subject property, that is, the probable price at which it could be sold by a willing seller to a willing buyer as of the date of the appraisal.

The data involved in the application of this process concerns comparable properties as well as the subject property and will vary with the type of property. Four categories of data, however, are basic and apply regardless of the type of property. They are:

1. Sales or asking prices of comparable properties.
2. Conditions influencing each sale.
3. Location of each property.
4. Description of land and improvements of each property.

With an income property, for example, gross or net income figures for comparable properties as well as the subject property would be essential; if in a farm appraisal, the acreage production figures would be needed.

The market data approach is often referred to as the comparison approach since the comparison procedure is its basic technique. Actually, of course, comparisons are made in the course of processing any of the three approaches. It would be more accurate to say that the entire appraisal process is a series of comparisons consisting of three phases—cost comparisons, income comparisons, and market comparisons.

Although this approach has such wide application as a method of estimating value and is of first importance in condemnation appraising, there are factors which do or can limit its usefulness. For example:

1. No provision is made for arriving at an estimate of value in those cases where no comparable properties have been sold in recent months or years.
2. No two properties are ever exactly alike. They vary at least in location, even if they are alike in other respects.
3. Depreciation affects value. Houses are dissimilar as to quality of construction and materials so that they depreciate at varying rates. Houses exactly alike when built, depreciate at different rates because of differences in maintenance, occupancy, and use.
4. Amenities being intangible qualities are difficult to compare. The value of otherwise similar houses may not be the same because of the direction in which one house faces or its view.
5. Learning the exact conditions attending each sale is essential so that the validity of the sale as comparative data may be substantiated. If the owner were not that "informed seller" or if the purchaser were not that "informed buyer," the price agreed upon probably would not indicate the property's value in the market.

There are many motivations which lead to the transfer of real property at figures unrelated to the property's market value. The income tax situation of either seller or buyer may be reflected in the sale price. Transfers of property between relatives frequently do not give a true indication of market value.

6. Properties can vary considerably as to their appointments and equipment, that is, heating system, plumbing and electrical equipment and fixtures, insulation, and kitchen facilities such as built-in features. All these factors must be considered in the comparative process, adjusting for the degree of variation. The more factors to be compared and adjusted, the greater the number of decisions and judgments the appraiser must make. Obviously, the more decisions and judgments that must be made, the greater the incident of error.

The market data approach in spite of its limitations has broad application in all appraisal work. Its comparative processes are utilized in the two other approaches. The value estimate found by the use of this approach is usually considered particularly significant because it is expressive of the value established by the reactions of informed buyers and sellers in the market. The appraiser recognizes the limitations of this approach but also recognizes that the techniques of comparison and adjustment afford him the tools to compensate for the limitations.

### Income Approach

In using the income approach, the appraiser is concerned with the present worth of the future potential benefits of a property. This is generally measured by the net income which a fully informed person is warranted in assuming the property will produce during its remaining useful life. After comparison with investments of similar type and class, this net income is capitalized into a value estimate.

\* Selecting the capitalization rate is one of the most important steps in the income approach. A variation of only one-half of 1 percent can make a difference of many thousands of dollars in the capitalized value of the income. The difference between an annual income of \$27,500 capitalized at 5 percent and 5½ percent is \$50,000.

The work to be done in assembling and processing income data is of four kinds:

1. Obtaining the rent schedules and the percentage of occupancy for the subject property and for comparable properties for the current year and for several years in the past. This information provides gross rental data and the trend in rentals and occupancy. This data is then related and adjusted by the comparative method to ascertain the estimate of gross income the subject property should produce to attract investors in the market.
2. Obtaining expense data such as taxes, insurance, and operating costs being paid by the subject property and by comparable properties. The trend in these expenses is also necessary.
3. Estimating the remaining useful economic life of the building to establish the probable duration of its income.
4. Selecting the appropriate capitalization rate and the applicable technique and method for processing the net income.

The income approach is yet another avenue by which the appraiser can estimate value. It has its greatest usefulness in the valuation of income-producing property since the average investor in such property purchases it in order to receive future benefits (income). The man who invests his money in an apartment building, for example, expects a reasonable return on the investment.

#### Correlation, Final Estimate, and the Appraisal Report

The final step in the appraisal process is the correlation of the three indications of value derived by the cost, income, and market data approaches. In correlating these three approaches into his final estimate of value, the appraiser takes into account the purpose of the appraisal, the type of property, and the adequacy of the data processed in each of the three approaches. These considerations will influence the weight to be given to each approach. For example, in the case of an owner-occupied factory, if the appraisal were being made for insurance purposes, the greatest weight might be assigned to the cost approach. In the case of an old and obsolete income-producing property, greater weight would be assigned to the comparative and income approaches. In the absence of conclusive market data, it might be necessary to place more reliance upon the income approach.

The appraiser does not obtain his final estimate of value by averaging the three individual indications of value arrived at by means of the cost, market data, and income approaches. The appraiser instead takes the three preliminary value estimates and examines the spread between the minimum and maximum figures. He places the most emphasis on the approach which appears to be the most reliable as an indication of the answer to the specific appraisal problem. Then he tempers his estimate in accordance with his judgment as to the degree of reliance to be placed on the other two indications of value.

Thus the appraiser arrives at a considered final estimate of value. If the procedure followed and the resulting estimate of value are both understandable and convincing, his report will contain no unexplained discrepancies.

✓  
Economic Trends\*

The appraiser will find it important to possess a knowledge of the basic economic trends affecting the valuation of real property. It has been noted previously how fundamental is the principle of change in real estate appraising, and that value is created and modified by economic, social, and governmental forces which lie outside the property itself. It has been observed that these forces are continually changing and reshaping themselves, often in a cyclical pattern. A series of related changes constitute a trend brought about by a chain of causes and effects. It is not enough to know simply that changes have taken place and are taking place. It is necessary to discern the direction of the trend, to consider its limit, and to determine its possible future effect on property value. Estimating value as of a given date is estimating the future benefits to be obtained from the ownership of the property. These future benefits will be shaped by general and local forces.

**National Economy**

Of primary importance is the state of the national economy. The state of the national economy depends on the conditions within the various economic segments which make up the whole. These conditions include the status of industrial, commercial, and agricultural activity. The health of each of these segments contributes to the pattern of the national economic health.

**Regional Economy**

The national economy may also be said to be a composite of the economic status of the geographical regions of the nation. The economic health of a region depends upon the status of the economic activities within the region. Such activities are the aggregate of the economic activities of the individual areas and communities within its geographical boundaries.

There is an interplay of economic forces pulsating through all levels of the economy. The impact of any change in the economy depends in part on the intensity of its immediate or local effect and its duration. Minor disruptions, for example, can

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seriously affect the economy of a locality but if the state of the economy in the region and nation is strong and healthy, the effect will be insignificant. However, if the general economy is not strongly supported in all its segments, the effect of a minor change in one area could spread, undermining the economy of adjacent areas until the economy of the entire nation is affected.

### General Economy

While the appraiser is immediately concerned with the economic condition in his community and area as they relate to purchasing power, he must also be aware of the trends in such economic weather vanes as commodity price levels, wage levels, interest rates, industrial production levels, and retail sales.

The sensitive interweaving of these many threads in the national and regional economy can to a degree be applied to the general economy. The economic health and well-being of a nation affects all other nations, directly or indirectly, and the greater the intensity of the change and the longer it endures, the wider will be its influence.

### Population

There is a direct relationship between the value of real property and the growth in population. Since land is fixed and the amount of land cannot be increased in response to change in demand, it therefore derives its value from the effective demand for it. Scarcity of land of a particular type in demand will naturally have a higher value. The demand for land is directly an outgrowth of population. Increases in land value consequently reflect population growth.

The demand is always for specific parcels for specific purposes, never for land in general. It is in this sense of specific demand that population combines with industrial development and, in a broad sense, with the entire spectrum of human activity to make or break the value of real property. Rises or declines in value occur in step with the changing geographic pattern of industrial expansion or contraction, and in step with the shifts in population which occur in response to these alterations in the pattern of industrial or other activity.

Since the number of people can affect property values, the appraiser should know the population figures for his region and community and be informed on any shifts in these figures. He can obtain his regional information from private fact finding agencies or from the detailed reports of the Bureau of the Census which are usually available at the public library. Census data is reported for geographically outlined districts called census tracts which enable the appraiser to study trends within the component parts as well as in an entire city, suburb, or metropolitan area. He should know the

rate of population increase or decrease in his area and how this compares with the rate change for his State and for the nation.

### Purchasing Power

There is another facet to population growth. It is purchasing power, or the economic ability of the population to satisfy their desires and needs. Or it can be expressed as the ability to implement their demand.

An individual's capacity to purchase what he desires has previously been described as one of the elements of value. The appraiser realizes, for instance, that the value of residential real estate depends in part on the individual's purchasing power. The appraiser constantly seeks to estimate the residue of purchasing power remaining to the individual with which he can buy real estate. The appraiser watches all developments likely to affect this margin of purchasing power.

The appraiser's approach to his work is constantly governed by this key question: What changes are affecting the incomes of the people in this area—either favorably or unfavorably? He seeks the correct answer in terms of factors which are broad and general in nature as well as those which are local and specific.

Purchasing power as has been stated depends on income of people. But purchasing power does not equal income since a part of income must go for taxes. The balance of this income is spent for a great diversity of commodities and services. The manner in which this income is expended affects the value of the real property involved in providing the commodities and services. So while it may be said that purchasing power indirectly affects in varying degrees the value of all property, it is its direct effect that is of first importance to the appraiser.

Of this balance of income or disposable income a major share will be expended on the necessities of living, including shelter. The remaining disposable income may be entirely spent for nonessential commodities and services or a part could be saved. It is this marginal segment of disposable income which has the most direct effect on property value. The larger it is, the greater its effect. For example, the amount available for the purchase of automobiles can tax the industry's capacity to produce, necessitating new facilities which in turn increase the value of a new property and enhance the values in adjacent areas. On the other hand, it can have the reverse effect when the margin of disposable income shrinks to where it is only sufficient to cover necessities.

The appraiser is concerned with the status of disposable income in his community. The stability of property values depends upon local purchasing power. Any increment in value will depend upon the amount and duration of the marginal disposable income.

Thus it can be said that population growth, coupled with strong purchasing power, not only maintains present values but enhances them and at the same time creates new

values. It is the pressure of population growth plus its disposable income that turns farm acreage into suburban communities, and within those communities the value of certain areas become more valuable as they are developed into shopping centers or industrial parks.

Among statistics which the appraiser may accumulate as having impact on purchasing power are those relating to employment and to disposable income. Newspapers and chambers of commerce frequently make regional studies of employment. Federal and State agencies frequently prepare state-wide, regional, and city-wide studies. A variety of such statistical material is usually available at nominal cost or simply for the asking.

Studies relating to disposable income are reported annually by the magazine *Sales Management* and by other publications. These show relatively, from city to city or trading area to trading area, how much money the average family has to spend after paying income taxes. The trend over a period of several years also is tabulated. Generally speaking, the disposable income per family determines the volume of retail buying. This in turn helps determine how much rent the merchants can pay. And this again in turn influences the value of the real estate occupied by the merchants.

### Price Levels

The value of real property is affected when the price level rises or falls, quite apart from the current level of supply and demand for land and buildings. The reason for this is apparent when we consider that, physically, a building is merely an accumulation of materials. If the price of steel, sand, gravel, cement, and lumber decline, then their dollar value declines whether they are piled in a building supply dealer's yard or assembled in the form of a building. Likewise, when the prices of the individual elements rise, their dollar value rises whether they are separately stored or have already been fabricated into a structure.

The cost of living index which is widely used in business summaries and for the adjustment of wage contracts is an important appraiser's tool. The appraiser may wish also to maintain a record of the wholesale price index or of other selected price indices if he is statistically minded. He should be alert and prepared to prove at any time that the prices of commodities are currently static, inflating, or deflating.

### Building Cycles

As he watches the indices, the appraiser keeps the cyclical nature of business and industrial activity foremost in mind.

The appraiser's keenest interest is focused on the building industry. He knows that real estate is one of the main props of national prosperity. A high rate of building activity is accompanied by a correspondingly active demand for all the commodities

and furnishings which surround the housing of man and his multitude of activities. Conversely, a slowdown of expansion acts as a brake on prosperity.

Overexpansion in the building industry is directly reflected by an excessive supply of improved property and a consequent decline in property values. In identically the same way, a period of curtailed building activity is directly reflected by a shortage and by consequent increase in demand which is in turn reflected by higher property values. In addition, it is important that the influence of the general price level be considered in relation to the principle of supply and demand.

There are four possible combinations of supply of and demand for property and the general price level which are of major importance. These are:

1. A shortage of buildings at the bottom of a cycle followed by a rising demand during a period of rising prices.
2. A shortage of buildings at the bottom of a cycle followed by a rising demand during a period of falling prices.
3. A surplus of buildings at the top of a cycle followed by a decreasing demand during a period of rising prices.
4. A surplus of buildings at the top of a cycle followed by a decreasing demand during a period of falling prices.

For the purpose of estimating future conditions and trends, the appraiser today must temper his interpretation of cyclical movements, by considering what the government is likely to do in the matter of imposing or lifting controls.

The National Bureau of Economic Research has compiled a list of economic indicators based on years of studying peaks and troughs in the nation's economy. This list has been revised from time to time as new experiences were observed to have influence. The list is now divided into three sections. All indicators have their place in predicting a trend. The three sections are called the leaders, the coinciders, and the lagers.<sup>1</sup>

THE LEADERS:

1. Number of new corporations.
2. New orders, manufacturers' durable goods.
3. Industrial stock prices.
4. Wholesale prices, basic commodities.
5. Commercial and industrial construction contracts (floor space).
6. Residential construction contracts (floor space).
7. Average work week, manufacturing.
8. Business failures (total liabilities).

THE COINCIDERS:

1. Production (Federal Reserve Board index).
2. Nonagricultural employment.
3. Unemployment.

<sup>1</sup> Henry M. Platt. *Economic Indications*. Bulletin #21 (Hanover, N.H.: Amos Tuck School of Business Administration, Dartmouth College, 1959), p.9.

4. Bank debits (outside New York City).
5. Freight carloadings.
6. Wholesale prices (except farm and food products).
7. Corporate profits.
8. The gross national product.

THE LAGGERS:

1. Personal income.
2. Retail sales.
3. Consumer installment debt.
4. Bank rates on business loans.
5. Manufacturers' inventories.

### Taxes

Real estate is taxed on an ad valorem basis or an amount of dollars per year related to its assessed value. If the tax rate is \$40 per \$1,000 of valuation and the assessed value of a property is 50 percent of its market value, then this parcel is taxed in the amount of 2 percent per year of its worth. Or if the gross annual rental income is 14 percent of the market value, and if 2 percent is chargeable to real estate taxes, then one-seventh of the gross income goes for taxes.

In some communities perhaps one-tenth or less of the gross rental goes to taxes. In other places, perhaps one-fifth or more of gross income is paid to the local government in taxes. A heavy burden of taxation, such as is inflicted by a city with a heavy bonded indebtedness, can cause a shift of new buildings to suburbs where the rates are lower. New construction may shift away from an entire region under such circumstances. The local tax burden has constantly been increasing but the appraiser should be cautious in areas which are being subjected to unusually severe tax burdens.

Federal income taxes are not treated as an expense in the appraisal process. This tax is levied according to the property owner's financial situation. However, the price at which a property may be offered for sale, or the price which is bid, are undoubtedly affected very frequently by personal tax considerations. Year-end transactions and freak prices are sometimes the result of changes in the Internal Revenue code or may simply reflect a desire to offset gains or losses resulting from some other operation. An income tax situation may account for a trend toward lease-purchase type transactions. Companies frequently find it more advantageous, for example, to lease a property than to own it because rent is 100 percent deductible in computing federal income tax while cost of using owned real estate would have to be amortized over a longer period. Under the existing tax structure, it is also common for property to be offered at less than the buyer's bid or the sale may be closed in some distant year, depending on the income tax advantages.

Some knowledge of federal tax considerations is important to the appraiser because it enables him to understand and to adjust for comparative property prices.

### Building Costs

The cost of reproducing a building tends to follow general price levels over a long period of time. There are, however, sharp differences from time to time and from place to place. Building costs generally decline with a depression as they did, for instance, in 1933. They are inclined to increase with an inflation as they did, for another instance, in 1946. A comparison of the cost of living index and adjusted construction cost index for the 15-year period 1940-1955 is a good example of the effect of a world war followed by inflation, on the economy and building costs.

<i>Year</i>	<i>Cost of Living Index</i>	<i>Adjusted Construction Cost Index</i>
1940 .....	60	52
1945 .....	77	65
1950 .....	101	100
1955 .....	114	126

There are a number of reliable organizations which publish building cost manuals and services which contain cost index figures as to the current cost to build an identical structure in various sections of the United States. The appraiser will find these services useful and a convenient way to keep abreast of the building cost changes taking place in his community.

### Interest Rates

Real estate activity is closely related to the availability of money. Most real estate is purchased subject to mortgages, so transactions are obviously dependent upon the availability of financing. The appraiser must constantly keep himself well posted on the current lending policies of insurance companies, mortgage houses, and other sources of money. This understanding of the money market includes the responsibility for being familiar with the sources of the money being loaned.

The appraiser's study of financial trends will include the activities of several Federal government agencies. Public financing of construction projects results in building activity which might not otherwise be carried on. Such activity can make an otherwise impotent demand fully effective.

It has been pointed out that the value of \$27,500 per year capitalized at (divided by) 5 percent is \$550,000, but is only \$500,000 if capitalized at 5½ percent. A rise in money rates occurred in 1955 after the 20-year period of cheap or low money rates. This, of course, immediately influenced property values. If, for example, it is assumed that the rate went up a full 1 percent, then the \$27,500 income worth \$550,000 is worth only about \$460,000 after the increase.

Where the income has been frozen as, for example, a property leased at a fixed figure for a term of years, the effect of higher interest rates is to reduce the price obtainable for a property so leased. In other instances, the owner is able to increase rental income to compensate for increased mortgage cost, and to improve the equity return. Apartment buildings, where lease terms are customarily of shorter duration, are examples of the latter.

The influence of changes in the money rate is not confined to real property prices. Such changes also influence the demand for various kinds of property. Investments tend to shift from lease-backs to multitenant buildings, for example, in a period when interest rates are increasing.

#### To Summarize

The appraiser should keep himself constantly well informed about economic trends. He should keep in close touch with price levels, purchasing power, population trends, building cycles, government regulations, construction costs, and interest rates. The appraiser's knowledge should include some recent history of these items, their present status, and a logical idea of what to expect from them in the foreseeable future.

## Neighborhood Analysis\*

A property is an integral part of its neighborhood and as such, cannot be treated as an entity separate and apart from its environment. This enclosing environment is the result of the interplay of a multiplicity of economic, social, and civic forces. The value of real property is not intrinsic, and does not reside exclusively in the physical characteristics of the property, but flows into the property from the environmenting forces.

An understanding and analysis of the current status of a neighborhood is not sufficient, for a property's stake in the neighborhood does not begin and end with the present but shares the neighborhood's future. An appraiser must consider and analyze the forces currently influencing a neighborhood, determining the probable trend in order to comprehend the future effect of the neighborhood on the property.

### Neighborhood Patterns

The term "neighborhood" defies easy definition. A neighborhood is a segment of a city, a town, or a community, or, it may be an entire community.

Within a community there is a marked tendency toward the grouping of land uses. The areas devoted to these varied uses are physical neighborhoods. So a neighborhood may be defined as a homogeneous grouping of individuals, buildings, or business enterprises within, or as part of a larger community. Such groupings may be devoted to residential use, trade and service activities, industrial activities, or cultural and civic activities.

Residential neighborhoods assume many of the characteristics of the individuals who live in them. Such neighborhoods express the mutual desires of people with comparable interests, related traditions, and similar social and economic status. Commercial and industrial neighborhoods are areas in which the predominant land use is devoted to either activity.

A downtown commercial district can usually be clearly mapped, with its main streets and transportation lines fanning out to the residential neighborhoods it serves. String-type store districts may appear along the major arteries, punctuated by more

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intensive groupings at transportation transfer points. A neighborhood or a regional shopping center is a cluster of retail trade and service establishments supported by a primary trading area composed of residential neighborhoods.

Industrial neighborhoods once tended to concentrate along waterways or railroads in ribbon-like fashion. Industrial neighborhoods more recently have been developing in the form of industrial centers or parks on the peripheries of cities. Related industries are likely to group themselves in a geographical area to which they have been attracted by availability of natural resources, by the availability of trained labor, by interlocking interests, or by a combination of these.

### Neighborhood Boundaries

Neighborhoods may be of varying sizes but they are generally considered to be homogeneous in some respect. Sometimes neighborhood boundaries may be clearly defined, as for instance, where there is a sharp change in type of land use or in the character of the inhabitants or buildings. Sometimes a natural barrier such as a hill or a man-made barrier such as a wide traffic artery will provide a boundary. The boundaries of a given property's neighborhood encompass not only the improvements adjacent to it, but also the background which determines the use and value of the immediate section. Particularly is this true for a commercial property. Its neighborhood consists not only of the store district, but also of the extent and character of the trading area in which the stores' customers live.

As the appraiser will view it, then, a neighborhood includes a more or less unified area with somewhat definite boundaries and a fairly homogeneous population in which the inhabitants have a more than casual community of interests. In such an area the character of one property affects the character of all others as though they were all cogs in a machine.

### Shifting Nature of Neighborhoods

Neighborhoods are not fixed in character. They are always changing, and they often work against one another. In any relatively stable city, for example, the rapid growth of one district could mean the decline of some other competitive district. As a city grows very large it reaches the point where accessibility to the center is difficult from the more remote outlying districts. In these instances, the establishment of new business centers will better serve the needs of such neighborhoods. Thus commercial subcenters come into being and the city pattern becomes complex. The outlying business centers affect the central business district. The newer residential areas affect the old ones. Generally it may be said that people who can afford to move into the new areas do so. When this happens to older areas the new residents are usually of lower economic status. Or if the neighborhood is so located as to be ripe for conversion

to a more intensive use, the vacated homes are torn down to make way for apartment structures or store buildings.

The growth of the city results in changes in the utility of the parcels of land and the improvements thereon. In some instances, utility is enhanced; in others, decreased. Changes in value result.

This, in a general way, is what happens to residential neighborhoods. They usually grow in desirability for a while after they are established, provided they command public favor, and are built up quite rapidly. They attain a peak of desirability, remain stable for a time, and then deteriorate in quality. Or, another way of stating it is that there are three stages of neighborhood status—integration, equilibrium, and disintegration. If city growth and expansion are rapid, neighborhood change is likely to occur rapidly.

Cities are always changing, and change rather than stability characterizes them. Accordingly, study of the value of real estate involves the study of those factors which shape and influence value.

### Analyzing the Residential Neighborhood

Starting with a broad understanding of the problem's nature, the appraiser can compile, measure, and weigh the relevant factors pertinent to a neighborhood analysis such as the physical, social, economic, and governmental data. The social, economic, and governmental motivating forces are used as categories for the purpose of classification. To these is added a fourth category designated as physical considerations. These physical considerations could be termed economic, social, or political geography.

Each of the four categories breaks down into considerations of varied factors:

#### PHYSICAL CONSIDERATIONS INCLUDE:

1. Relation to the rest of the city.
2. Street patterns and width of streets.
3. Convenience to public transportation.
4. Quality of and convenience to schools.
5. Quality of and convenience to stores and service establishments.
6. Convenience to parks, recreation areas, and churches.
7. Pattern of land use, shape and size of lots.
8. Visual aspects, geographical and topographical features, and climate.
9. Availability and quality of utilities.
10. Nuisances and hazards such as fog, smoke, smog, industrial noises and vibrations.

#### SOCIAL CONSIDERATIONS INCLUDE:

1. Homogeneity as to social and economic characteristics.
2. Prestige in terms of social standing.
3. Attitudes toward law and order.
4. Family sizes and age groups.

ECONOMIC CONSIDERATIONS INCLUDE:

1. Degree of thriftiness and home ownership.
2. Rent and income levels.
3. Vacancy of living units.
4. New construction and vacant land.
5. Attitude of financial institutions.
6. Growth of the neighborhood.
7. Changing use.

GOVERNMENTAL CONSIDERATIONS INCLUDE:

1. Special assessments.
2. Tax burden.
3. Zoning and building codes.

### Physical Considerations in Neighborhood Analysis

While it is not always essential to delineate definite boundaries for the neighborhood under analysis, it is highly desirable to have a knowledge of the extent of homogeneous development radiating in all directions from the property under appraisal. If the area is of considerable size, the likelihood of adverse effect from undesirable developments in adjacent neighborhoods becomes less and less as distance from the outer edges of the neighborhood increases.

Modern city planning provides a street pattern intended to discourage intercity and interneighborhood traffic from penetrating a residential area. Curvilinear and deadend streets reduce traffic hazards. Curving streets and wide boulevards usually make a neighborhood more aesthetically attractive and good street patterns are one of the factors attracting buyers to a neighborhood. The relationship of the neighborhood's street pattern to main traffic arteries and to the overall local transportation situation must be considered as well as the physical relation of the neighborhood with respect to its distance from downtown, from industrial and other employment centers, and from major shopping centers.

### Transportation Pattern

Time consumed in getting to desired destinations, cost of transportation, and frequency of service are all important considerations in making comparisons between various areas. It is to be remembered that the modern trend to superhighway and limited access highway systems is bringing the city and its satellite areas much closer together. The type of transportation facility which will be most efficient will depend largely upon the income level of the people being served. It is not enough to note that transportation exists; one must inquire into what kind of service is given and relate that to the needs of the people to be served.

Adequate public transportation to the downtown area and to principal centers of employment are major considerations in evaluation.

Many people still do not have automobiles so public transportation is important to them. On the other hand, traffic congestion and parking problems deter many people from utilizing their car as transportation to places of employment. Residential property, located in a section which has slow and infrequent public transportation, would tend to command lower rentals and prices than property in areas having better service.

The matter of distance from means of transportation is important only in terms of the people to be served. For two-car families living in an exclusive outlying area it would usually not be imperative to be located close to public transportation lines; but they would not want to be so far that transportation for domestic servants would become a problem. Apartment dwellers, on the other hand, dislike noise and yet as a rule they wish to be within five or ten minutes walking distance to a station. To be too far away, for most of them, is as undesirable as to be too close.

A study of a neighborhood's transportation facilities would consider among other factors the territory through which users of these facilities must pass. People dislike walking along poorly lighted streets and through rundown areas. Another factor is the type and adequacy of transportation to schools and other centers of activity. Generally then, it may be concluded that practically all people, whether they live in homes or apartments, own two cars or none, are interested in transportation. So within reason, the closer to good public transportation, the wider is the market for the subject property.

#### Balance in Land Use Pattern

Families are attracted to a neighborhood by good schools. Parochial schools especially will create a demand for homes. Ready access to the elementary school, either by walking or by school bus, is more important than the accessibility of high schools.

Most people prefer to live within reasonable walking distance of stores and service establishments. This factor, of course, gets less emphasis in a high-value suburban area or in a section devoted to country estates where families with two or more cars are the rule rather than the exception. Despite the widespread desire to be near sources of supplies and services, residential properties bordering on shopping centers or backing up directly to commercial districts may have less salability because of traffic, noise, or unsightliness. The rule is that most people want adequate and convenient shopping but they do not want in adjacent to their homes. And modern shopping centers, whether they are neighborhood or regional, usually afford a sufficiently wide range of goods and services to benefit the neighborhood.

Some of a neighborhood's recreational facilities are commonly associated with its schools. But it is much in a neighborhood's favor when it also possesses ample, well-supervised parks, beaches, pools, baseball diamonds, and tennis courts to help keep children off the streets and out of undesirable haunts. And a neighborhood is improved from the viewpoint of adults if it provides adequate group activities such as fraternal organizations and country clubs.

Churches are definitely a benefit. In many instances they create a demand for property by their members. Cultural institutions such as libraries, colleges, and universities all tend to serve as beneficial factors in the neighborhood pattern.

The highest efficiency in the use of urban land comes from a perfect balance between different types of use. Such a balance is struck when the right amount and kind of land is used for residential purposes; when the proper areas are zoned for commercial and industrial uses; and when land is correctly allocated to other forms of use such as parks and playgrounds.

Value is retained when the land use pattern is correct in this sense of ideal balance between the various uses. Value is reduced when uses are imbalanced. How far actual practice is from any such ideal balance is quickly brought home by consideration of the topsy-turvy patterns of land use displayed by our cities. Some progress is, however, being made by city and regional planning commissions now at work promoting a better understanding of land use principles.

#### **Natural and Manmade Environment**

A neighborhood may be well designed and improved, but its desirability is reduced if it must be approached through unattractive and objectionable districts. First impressions are lasting impressions. Consideration also must be given to the appearance and the condition of streets, sidewalks, lawns, landscaping, buildings, and vacant lots. The architectural styles in a neighborhood also have a bearing on its desirability. A prevalence of a currently popular design is a favorable influence. Good maintenance of older buildings, prompted by a pride of ownership and occupancy, attests the self-respect and the character of the residents.

The presence of a lake or river, a bay or swamp, or a hilly area in or contiguous to a neighborhood may constitute an advantage or disadvantage. Such features may endow an area with a scenic advantage uncommon to other sections. A hill may mean little in a rugged section but an elevated or a well wooded section in a predominantly flat area could enhance the value of property so environed. A river subject to frequent flooding would be disadvantageous, and the value of homes along its banks would reflect risk from such a hazard.

Topographical conditions can endow a neighborhood with protection against wind, fog, or flood. Or they can expose it to danger or damage from these same things.

A geographical feature such as a river, lake, or park, acts as a buffer to protect a residential district from encroachment by commercial or industrial enterprises.

The invasion of a residential neighborhood by commercial or industrial usages is likely to prove a depreciating factor. However, the value of the site occupied by the new use frequently increases. This increase might partially or even entirely offset the lessened value of a specific property. But the encroachment of these non-residential uses can injure the neighborhood as a whole.

Provisions for gas, electricity, water, and telephone service are deemed essential to today's standard of living in municipal areas, as are storm and sanitary sewers. The availability and adequacy of these services will condition a neighborhood's desirability. A deficiency decreases value. If water and sewage facilities must be installed in the future, the value of land is reduced.

#### Social Considerations in Neighborhood Analysis

The value levels in a residential neighborhood will be influenced more by the social characteristics of the people occupying or in prospect of occupying the area than by any other factor. Therefore, too much importance cannot be attached to the social data which the appraiser must consider.

No matter how attractive a particular neighborhood may be from every other angle, it will not possess maximum desirability unless it is occupied by people who will be happy in one another's company and unless it provides the right setting for the rearing of children. Above all else, home purchasers want the best advantages they can afford for their children and this includes desirable neighbors and their children. Thus a wide tolerance or mutuality is involved in matters of race, religion, income, cultural standards, and ways of living.

Race and religion are both touchy subjects. The reasons that this is so are not the appraiser's responsibility. However, he must recognize the fact that values are likely to change whenever people different from those presently occupying the area advance into and infiltrate a neighborhood. Economic status and degree of assimilation of the new groups are kindred infiltration problems. The sequence usually begins with a preliminary period when only a few sales have been made to the new arrivals at or slightly above the typical market price. The older residents next flood the market with offerings. This depresses prices, and a shift in ownerships begins to take place. Usually prices firm as this transition nears completion, with prices tending to advance again.

Neighborhoods tend to be composed of people of similar vocational levels. However, the margin of social difference between the skilled factory worker, the supervisory employee, and the clerical office worker has been disappearing in recent years.

Facts about age distribution of the residents are useful in judging the life stage of a neighborhood. A neighborhood may tend to evolve into a tenant-occupied district as children mature, marry, and move away. Such a development tends to change the neighborhood's social structure and is reflected by a change in values.

### **Economic Considerations in Neighborhood Analysis**

The higher the percentage of home ownership in a neighborhood, the more pride is visible in the appearance of the properties which compose it, and the more community responsibility is felt by its citizens. Pertinent statistics regarding the percentage of home ownership may be available from census data and city directories, or it may take a spot check to acquire them.

Rental data provide clues to the financial capacity of a neighborhood's occupants. Their income levels are also revealed by census information, newspaper surveys, and private studies. Such information indicates the price levels the residents can afford for the rental or purchase of property.

Vacancy statistics, frequently compiled by newspaper and other private fact-finding agencies, help determine the strength of demand and the extent of supply. Such statistics, broken down block by block, help uncover directional trends of growth.

The existence of vacant lots or of acreage suitable for development may forecast busy construction activity. It may on the other hand indicate a lack of demand. Careful study of these factors is helpful in rating the future prestige and desirability of the area.

Much information which is highly useful may be obtained by checking with banks, savings and loan associations, and insurance companies about their loan policies with respect to the area in which the property is located. A good rating results in more favorable financing terms and consequently higher sales prices.

The neighborhood may be growing; it may be static; or it may be deteriorating. The population trend can be learned from census studies, particularly when data is available concerning individual tracts. The trend of population growth is an indication of the neighborhood's economic health just as it is a clue to the economic health of the community of which the neighborhood is a part.

### **Governmental Considerations in Neighborhood Analysis**

Tax burdens are sometimes greater in some areas than in others. Where these areas are in the same community, variations in taxes are of course significant in making comparisons. Sometimes special assessment tax levies in a certain area have become so heavy as to have a very serious effect on the marketability of property. The existence of such liens must not be overlooked. The benefits resulting from special assessments frequently do not enhance the price obtainable in sales. Notwithstanding, the costs must

be defrayed, usually by a series of payments with interest over a period of years long after the benefits have been realized.

Sound judgment about neighborhoods or individual properties cannot be made without adequate data as to public and private restrictions such as those imposed by zoning and fire ordinances: building, plumbing, and sanitary codes, as well as other governmental controls. The appraiser is never justified in assuming the absence of such restrictions.

#### Summary—The Residential Neighborhood

Among the principal factors which improve value in private dwelling neighborhoods are these:

1. Good schools, churches, and recreation facilities.
2. A homogeneous population with a sense of civic responsibility.
3. Prestige and visual appeal.
4. Satisfactory transportation facilities and good approaches.
5. Natural topographical and geographical advantages.
6. Good planning and adequate utilities.
7. Conformity in land use and sensible zoning.

It is the appraiser's minimum task to analyze the neighborhood in accordance with these advantageous factors. It is likewise his responsibility to weigh those factors which depreciate value. These include:

1. A tendency on the part of a neighborhood's present inhabitants to think it is losing desirability because of an influx of people of a different economic, social, or cultural status.
2. The movement of commercial and industrial uses into the area.
3. Various miscellaneous factors such as lack of zoning protection, increasing taxes, reduced rental and sales values of surrounding properties, lack of adequate planning (congestion, mixture of architectural styles, lack of trees), lack of community pride, and nuisances such as smoke, noise, and traffic.

#### Analyzing the Apartment Neighborhood

Apartment districts differ in some degree from single-family residential areas but are in the main influenced by much the same factors as those which affect private homes. A residential neighborhood usually comprises a geographical area of considerable extent. In large cities an apartment district usually covers an extensive area, but in the smaller cities it may be quite limited in size, or not even subject to definition.

The factors and amenities which affect the apartment neighborhood could be outlined in the same way as for the private dwelling district, but with some change of emphasis. Here the appraiser must obtain the answers to questions such as:

1. Is the district conveniently located with reference to places of employment?
2. Is the transportation adequate?

3. Is there convenient access to shopping centers, churches, theatres, and cultural institutions?
4. Does the presence or absence of convenient school facilities mean anything so far as the tenants are concerned?
5. Has the neighborhood a good reputation? Is it free from objectionable social or cultural conflicts?
6. Does the district provide a residential atmosphere, an attractive appearance, and adequate protection against unwanted commercial and industrial intrusion?
7. Is the district close to parks, lakes, rivers, or other natural advantages which make residence there desirable? Do these natural advantages substitute for the privacy enjoyed more directly by the home owner?
8. Is there a supply of vacant apartment sites which are likely to be built upon? Will this enhance the district, or tend to make present accommodations obsolete or less desirable?
9. Is there sufficient parking for tenants and guests?
10. What is the economic status of tenants?
11. What is the situation with regard to vacancies and tenant turnover?

These and other pertinent data form the background for the appraiser's study of rental housing property. In some cities, statistics are available as to the supply of apartments, vacancy, and rent levels. Where statistics are not available, the appraiser will interview managers, owners, and real estate brokers.

### Analyzing the Commercial District

The commercial district and value of its property are influenced by the factors which affect the desirability of residential property in the geographical area served. So in appraising a commercial property, the neighborhood consists of the grouping of stores, plus the trading area which the stores serve.

Depending upon the type of store district, the appraiser will look for the answers to various questions, although basically he is always trying to size up the competitive outlook. Nowhere does the principle of change have more application.

In analyzing the commercial district, the appraiser analyzes and emphasizes the quantity and quality of purchasing power available to the shopping area. This is his prime consideration.

In general, he will seek answers to questions such as these:

1. Where is the core, the 100% location, in the grouping of stores?
2. What is the direction of visible growth?
3. Are the retailers enterprising? Have they invested heavily in inventory and leasehold improvements?
4. What land is available for new stores?
5. What and where is the competition?
6. What is the economic status of the trading area, and in what position in the life cycle is the tributary residential neighborhood?

More specifically, as to strung-out local groupings, the appraiser will look into the zoning situation which governs the supply of competing sites. Reasons for vacancy and business failure will be studied. The level of rents will be considered and compared with the rent for stores in new buildings. Certain types of business, such as delicatessens, repair shops, service establishments, taverns, and service stations will continue to prosper despite present or prospective competition.

Commercial establishments located at transfer points have been adversely affected in recent years by the increasing use of the automobile and the resultant decline in use of public transportation. This does not mean that every such commercial group is in a state of decay. Where surrounded by well-developed apartment neighborhoods, business may continue to be good. Loss of business by this type of retail area has been chiefly to modern neighborhood centers with parking.

The neighborhood shopping center, which might typically include 10 to 30 stores with parking, has been built in great numbers since World War II. The emphasis is placed on staples, with the success of the center keyed to supermarkets, variety stores, and sometimes a branch department store. Depending on size there will be a balance among the types of merchants to provide for day-to-day needs of the customer. Despite the emphasis on parking for automobiles, public transportation and a favorable main street location are important points.

The regional shopping center, self-contained and with large parking lots, numbering 40 to 100 stores, is more than just an oversized neighborhood center. The key tenants are one or more department stores offering a full range of merchandise. There is a major emphasis on apparel stores. Office tenantry may be included—medical, dental, and general. Service establishments, particularly banks, are featured. Then, in addition, are all the other types found in the neighborhood center. The regional center competes with and invades the trade area of the neighborhood center, as the latter did the retail cluster at the transfer point center.

Besides the groupings of retail trade, there are some businesses which are more or less independent of pedestrian traffic and neighborhood support. Automobile agencies, some service stations, and some service establishments will develop an individual value without benefiting adjacent property.

A study of the history of business districts makes it clear that there is a constant shifting in a dynamic economy. A business district may expand and encroach upon land devoted to other uses when the community and hinterland are growing. An entire business district may almost literally leap to an entirely different location if it lacks room for expansion. A district may shift in one direction to leave that part of it lying in the opposite direction virtually stranded. Such a shift is usually in the direction of the better residential sections of the community where the purchasing

power of the inhabitants is highest. The stranded area will eventually drift into a less profitable use.

### Analyzing the Industrial District

In considering an industrial district the appraiser is concerned with:

1. The manufacturing district itself.
2. The residential areas which provide the labor.
3. The availability of materials needed by the plants.
4. The facilities for distribution of the finished products.

Estimating values in an industrial district necessitates obtaining data bearing on the multiplicity of factors pertinent to the above four major categories.

With reference to the district itself, is it an older district composed of multistory buildings lacking adequate yard and parking space? Or is it a new district that affords ample room for expansion? Are public utility services like electricity, gas, and water available in ample quantities? Do zoning regulations provide for the type of industrial uses necessary? Are the inhabitants of the adjacent residential areas apt to object to inevitable noise, smoke, or vibration? Are the prevailing levels of real estate and personal property taxes reasonable?

Coming to questions about the labor supply, is there an ample supply of skilled and trained workers? Is there adequate public transportation for workers in plants in the district? Is there also available an adequate supply of personnel at the supervisory and lower management levels? Must cafeteria facilities be provided? Do feminine employees object to conditions in the district?

In connection with availability of materials, is the district a source of, or at least well located with reference to, needed raw materials? Is it convenient to suppliers of component or required parts or materials? Is it adequately served by rail, motor truck, or waterway facilities for incoming deliveries and for distribution of products manufactured in the district? Is the district located to the satisfaction of the customers it serves?

### Conclusion

One of the important terms in dealing with neighborhood analysis is the word "amenity." It is defined as a condition of agreeable living or a beneficial influence arising from the location.

Other terms of reference are:

*Encroachment*—which refers to the displacement of an existing use by another use (such as the locating of factories in a residential district).

*Infiltration*—which is the displacement of the present residents by people of a lower economic status, and different social and cultural background.

The appraiser is never confronted by a neighborhood which is absolutely static. Changes may be proceeding at a slow pace, which usually is the case, but they are always present.

In analyzing neighborhoods whether for private dwellings, apartments, commerce, industry, or farming, population growth, economic status, prestige, transportation, schools, road pattern, employment, business centers, and many other factors are applicable. There is a difference in the emphasis on the applicability of each, depending on the type of neighborhood being analyzed. The appraiser will recognize and weigh neighborhood factors, as they change and affect the property which he is appraising.

## Site Valuation

WILLIAM D. DAVIS  
*Appraisal Associates,  
Kansas City, Missouri*

Before inspecting the property to be appraised, it is first necessary to secure as much pertinent information as possible from the various governmental offices. This process commences with an examination of the last deed of record, reciting the correct legal description, the exact manner in which the title is held, the consideration (if any is shown), and any reservations or deed restrictions that may be disclosed. Copies of any leases, private agreements, notices of condemnation, or tax liens that may appear of record can be secured from the office of the recorder of deeds.

In addition to this record information, the annual taxes and assessed valuation must be secured from the offices of the tax collector and the tax assessor for the last three or four years to show the trend of taxes and assessments. The public land use restrictions must be obtained from the office of the zoning board, as well as building code requirements from the office of the building inspector, pertinent traffic information from the office of traffic control, and sanitary regulations from the health department.

The office of the recorder of deeds is the most accurate source of information concerning other sales of property in the neighborhood of the subject property that may be similar to the subject and may be persuasive in indicating its fair market value. The essential information, on these other sales, consisting of the name of the seller, the name of the buyer, the type of instrument, the date of the deed, the date of acknowledgement, the book and page of recording, the amount of revenue stamps affixed, the consideration shown, the legal description of the property conveyed, and the reservations or deed restrictions, must be abstracted from the records in the office of the recorder of deeds. A typical index sale sheet that very well serves this purpose is shown on the following page. These other sales of properties are later inspected and described, the terms and circumstances of the sales are confirmed and the transactions analyzed.

### Inspecting the Property

The foundation of good appraising is a careful inspection of the property to be valued. The actual method of making the inspection and the features that should be given particular attention naturally vary with different types of property.

INDEX NO. \_\_\_\_\_

Seller \_\_\_\_\_

Type of Instrument \_\_\_\_\_

Dated \_\_\_\_\_

Acknowledged \_\_\_\_\_

TO

Recorded In Book \_\_\_\_\_ Page \_\_\_\_\_

Revenue Stamps \_\_\_\_\_

Cons. Indicated \$ \_\_\_\_\_

Cons. Shown \$ \_\_\_\_\_

Buyer \_\_\_\_\_

Area \_\_\_\_\_

Legal Description \_\_\_\_\_

\_\_\_\_\_

County \_\_\_\_\_

Location \_\_\_\_\_

\_\_\_\_\_

Cons. Paid was \$ \_\_\_\_\_ or \$ \_\_\_\_\_ per \_\_\_\_\_

\_\_\_\_\_ as confirmed by \_\_\_\_\_ to

\_\_\_\_\_ on \_\_\_\_\_ at \_\_\_\_\_ AM/PM

The property was inspected by \_\_\_\_\_ on \_\_\_\_\_

Land \_\_\_\_\_

\_\_\_\_\_

Improvements \_\_\_\_\_

\_\_\_\_\_

Assessed Valuation: \_\_\_\_\_ Taxes: \_\_\_\_\_

Outstanding Leases or Easements: \_\_\_\_\_

\_\_\_\_\_ Zoning: \_\_\_\_\_

Remarks:

Analysis of Sale (over)

When inspecting a rural property, the first step is to go to the office of the Agricultural Stabilization and Conservation Committee serving the county in which the property is located, and secure from them the necessary information so that it will be possible to order an aerial photograph showing not only the property being appraised but also similar properties that may be persuasive in estimating the fair market value of the subject property. The aerial photograph should then be ordered from the proper supplying office. The information as to where they may be ordered and the blanks for ordering them may be obtained at the Agricultural Stabilization and Conservation Committee Office. The crop allotments may also be obtained from this office with the permission of the farm owner.

If sufficient time is not available to wait for the arrival of the aerial photographs, it then becomes necessary for the appraiser to make a tracing of the property from the aerial photograph maintained in the Agricultural Stabilization and Conservation Committee Office. Permission is usually given to make such a tracing, providing the appraiser is familiar with the proper method of using light tracing paper and of tracing from the aerial photograph in such a way that it is not damaged. This tracing must be so carefully made that it is possible to planimeter the fields and other areas from it, or if the property lines and boundaries cannot be accurately determined from the photograph, then the appraiser must make a plat of the subject property from the deed description. A standard coding may be used on the tracing to show many of the features that are shown on the photograph. A method of coding that is frequently acceptable is one similar to the following:

Cultivated	Red	Dirt Road	=====
Meadow	Yellow	Railroad	===== ----- =====
Pasture	Green	Gravel Road	===== GRVEL =====
Bottom	:::::	Highway	===== HGH NO. =====
Rocky	∨ ∨ ∨ ∨	House	△
Timber	T	Barn	☒
Orchard	+ + +	Other Buildings	□
Well	○	Rock Fence	∨∨∨∨∨∨
Cistern	⊙	Barb Wire Fence	+++++
Spring	∅	Woven Wire Fence	-----
Pond	●	Unfenced Field	-----
Stream	~~~~~	Hedge	XXXXX
Draw	~~~~~	Brush	(((((

With the aerial tracing or aerial photograph in hand, it is then desirable for the appraiser to walk over the entire property. Using a soft lead pencil, he should note upon the aerial photograph or upon the tracing, by appropriate coding, any deviations from the photograph or the tracing. The type and the character of the soil, the field boundaries, the type of fencing, and the land use of each field area should be appropriately indicated and coded. The location and type of each water supply should be transposed to the photograph or the drawing, along with the direction and type of drainage, irrigation or erosion. The slope of the land must be noted, with particular reference to its influence upon the utility of the property. The location and type of roads that run adjacent to and through the property is, likewise, important information that should appear upon the aerial photograph or the tracing. The type of community services, including any zoning that applies to such a property, may also be properly noted on the aerial photograph or the tracing of the aerial photograph.

In connection with the inspection of a rural property, the appraiser should contact the local office of the Soil Conservation Service to study that agency's classification of the soils on the property being appraised. If they have classified the soils, the appraiser should check the classifications that have been made and satisfy himself as to their accuracy and the location of the boundaries of each soil class. If the soils on the farm have not been classified, the appraiser must examine the property carefully, making the necessary soil borings with a soil auger and identifying and classifying the soils either as to class or as to series and type. In either case, the classification must be so carefully done that it is possible to planimeter accurately the acreage of each soil class or soil type.

When the appraiser is charged with the appraisal of a *rurban* property (property immediately adjacent to a major city that is in an agricultural use or a country estate use and is not yet ready for a residential or commercial use) he follows a somewhat different procedure in making the inspection. Such properties are generally of sufficient size that it is desirable either to secure an aerial photograph of the property and of similar properties that may be useful in estimating its market value, or to make a tracing of the aerial photograph. If the property is so small that an aerial tracing or an aerial photograph is not useful, it is desirable for the appraiser to make a tracing from the plat book showing the dimensions of the property, its boundaries and its relationship to the road and to local landmarks. It is extremely important that the community services available to the property, including zoning, should be noted on either the aerial photograph or the tracing, together with any differences that appear upon the subject property but do not appear on the photograph or the tracing.

In the inspection of an urban property, it is likewise desirable to have a drawing made from the plat book showing the dimensions and the character of the property. It is important that the city services available to the property be noted on the plat.

These services include the character and width of the streets, the location and type of public transportation, the location of stores, schools and churches, the location and size of water mains, the location and size of gas mains, the electrical service and the zoning.

With such a plat in hand, the appraiser can then inspect the property carefully. He should note upon the plat any deviations that he finds between the property and the plat which he has prepared. Particular consideration must be given to the topography of the property as it relates to its utility.

After carefully inspecting the land, consideration can be given to its highest and best use. The use estimated must be in accordance with the uses permitted by any restrictions that run with the land and with the zoning regulations. If it can be clearly demonstrated that buyers and sellers of properties similar to the subject property anticipate that they can be zoned for a higher use as indicated by the prices at which they transfer such properties and then later actually secure zoning changes for them permitting such use, then such a use may well be estimated as the highest and best for the subject property, providing all of the facts are shown in the report.

### Measuring the Real Estate Market

Before it is possible to value the land, it is, of course, first necessary to adequately measure the current real estate market. This can be done only by a careful study of sales of similar properties. Thus, the appraiser must select sales that are most similar to the property under appraisal and are nearest to the date to which the value estimate pertains. After each sale has been confirmed as to price and circumstances of sale it must then be carefully inspected and analyzed.

In rural properties, the comparable sales should be analyzed for both the total and the per acre contribution of the improvements; for the total and the per acre contribution of the land as though unimproved; and for the per acre contribution by land use and by land type for each class of land found on the property. This is a difficult and painstaking task and requires a thorough knowledge of agriculture as well as of sound rural appraisal procedures. When the analysis is complete, it will demonstrate clearly the per acre amount contributed generally by buildings in the community, the price per acre paid for the various classes of land generally in the community, and the features that are generally most sought after by the buyers of land in the community in which the property being appraised is located.

In analyzing sales of urban property, it is necessary to analyze the contribution of the improvements because the appraiser is concerned with both the total improvement contribution and the contribution per unit of land. This may be on a per square

foot basis in some types of rural property, however, in most rural properties it is on a per acre basis.

In estimating the contribution of the improvements, the first step is to make a careful inspection of the property and a careful analysis of the contribution that the improvements actually make. This is done by estimating the reproduction cost new less the observed accrued depreciation of all kinds and comparing that contribution with improvements on similar properties.

Another method is to use the building/land ratio indicated by the assessment records. If the assessment records are carefully prepared, it is possible that this relationship may be generally helpful in estimating the contribution of the improvements.

When the estimated contribution of the improvements is deducted from the total consideration, the remaining value is considered to be the contribution of the land. This is usually reduced to a convenient unit of land measurement that can be compared with sales of similar land units in the community.

When analyzing sales, it is possible to be satisfied that the analysis is in accordance with the market only when it is clearly demonstrated that buyers are generally paying about the same price for the same features on the various properties sold. This is the ultimate manner in which the accuracy of the analysis is judged.

When estimating the value of the land, it is always desirable to have available sales of unimproved land. These sales can be compared directly to the land being appraised. However, they must be analyzed for their various soil types and land use if the property is a rural property. If the property is a rural property or an urban property, consideration must be given to the importance of location and to its effect upon the property. Since these properties do not have improvements, they are a much more dependable guide to the value of the unimproved land on the property being appraised because they are not so affected by estimated improvement contributions. However, since there are rarely enough unimproved sales to dependably estimate the fair market value of the property being appraised, it is necessary to rely upon analyzed sales of improved property as an indication of the land value of the property being appraised.

In determining the value of land on a subject property by the use of comparable sales, it is necessary to utilize the per acre value of each class of land on the comparable properties as the basis for the value contribution of the same type of land on the subject property. Thus, "like" land on the sale property is compared with "like" land on the subject property. Since the sale was made at or near the date to which the value estimate pertains and is a property similar to the property being appraised, the price paid by buyers for that particular type of land is persuasive evidence of the fair market value of that same particular type of land on the property being appraised.

In utilizing this approach, it is essential to explain fully and carefully how the market value of each class of land on the sale property indicates the fair market value of that class of land on the subject property. This means that the appraiser must point out the similarities and dissimilarities in location, quality, topography, fertility, and other features that the sale property has in comparison to the subject property. He must explain why, in spite of these similarities or dissimilarities, the value indicated is less, the same, or higher than that paid by the purchaser of the sale property. This can be done only after a careful study of both the sale and the subject property, and after a careful analysis of how each transaction tends to indicate the value of the property being appraised.

The per acre value contributed by each class of land on the property being appraised is then multiplied by the acreage of that land class to arrive at the total value contributed by the land class. The sum of the value contributed by all of the land classes is the total value contributed by the land. This estimate is then usually reduced to an average per acre basis so that it may be tested against the per acre sale price of whole unimproved properties as a further guide.

In appraising rural properties, it is desirable to utilize the unit land value, indicated by the comparable sales, in estimating the value contributed by the land. Since the type of neighborhood, the location, the services available to the property, and the general appearance of the property are quite important in the valuation of rural property, it is essential that the appraiser clearly describe the similarities and the dissimilarities between the sale and the subject properties. From a thorough and complete discussion of the similarities and dissimilarities, he can explain why the unit value on the sale property indicates the same value, a lower value, or a higher value for the property under appraisal. Then the adjusted unit value multiplied by the number of units on the property being appraised indicates the total land value of the rural property being appraised.

In urban properties, the unit of land value for comparison is generally either per square foot of land area or per front foot on a major street. When the sale is analyzed by these units of comparison, the unit figure may then be applied directly to the property being appraised. Here again, the appraiser must be quite careful to point out the similarities and the dissimilarities of each sale with the property being appraised. The similarities and dissimilarities should cover such important features as location, utilities, services, traffic, zoning, land character, and other important features that are relied upon by buyers and sellers. In each case the appraiser must explain, carefully and fully, how each sale leads him to the conclusion reached on the property being appraised. This can only be done by a careful examination and explanation of all of these features. When the unit sale price is multiplied by the number of

units on the property being appraised, then the total value is indicated for the land on the property being appraised.

The valuation of the land requires that the appraiser explain in specific detail exactly how a particular sale led him to the value indicated for the site. An example of how a competent appraiser may explain this indication in an urban appraisal is as follows:

Sale No. 17, Cook to Phillips is the sale, this year, of a 50,000 square foot, industrial-zoned site with 100 feet of frontage on the south side of "Q" Street, for \$50,000.00 to a national distributor, for a distribution warehouse. The sale property has a railroad spur the full depth of the property, combination sewer, and adequate gas, water and electricity. "Q" Street is paved and has curb, gutter and sidewalk.

The subject property is 200 feet west on the south side of "Q" Street. It has adequate gas, water and electricity and the same kind of street and sidewalk as the sale property. However, it does not have a railroad spur or a combination sewer. To provide a railroad spur similar to the spur on the sale property will require 500 feet of track at \$12.00 per foot or a total of \$6,000.00. This will be an expense that a purchaser will expect to pay. In order to have the services of a sanitary sewer, it will be necessary to reimburse the sewer district at the rate of \$15.00 per linear foot for running the sanitary sewer from the center of the south line of Sale No. 17 to the center of the south line of the subject property. This is a distance of 300 feet and involves a cost of \$4,500.00. The subject property is the same size as the sale property.

It is the considered judgment of the appraiser that a prudent prospective purchaser will anticipate an expenditure of \$10,500.00 in order to make the subject lot as desirable as the sale lot. However, arranging for work of this type involves a considerable amount of supervision and risk so that the cost might be higher than the estimate. Further, such a purchaser will probably have this additional cost invested some time before a sale can be made.

Considering these facts, it is the judgment of the appraiser that this sale at \$50,000.00 indicates a value of \$35,000.00 for the subject property because the subject property requires a substantial expenditure for a railroad spur and for a combination sewer. Further, the purchaser of such a property will anticipate that supervision, risk and delay are involved in such an undertaking and will reflect this in the price he will be willing to pay.

## The Cost Approach

WILLIAM D. DAVIS

*Appraisal Associates,  
Kansas City, Missouri*

The cost approach consists of estimating the fair market value of the land as though bare and subject to improvement and then adding to this value the depreciated reproduction cost new of the improvements that are upon it. Thus, the value indicated by the cost approach is the fair market value of the land plus the depreciated reproduction cost new of the improvements.

The fair market value of the land as though bare and subject to improvement is estimated in the manner discussed in chapter 26, "Site Valuation." The depreciated reproduction cost new of the improvements is the appraiser's estimate of the amount by which they enhance the fair market value of the land to which they are attached. The total amount of the contribution of these improvements to the fair market value of the entire property is limited to the difference between the fair market value of the land, bare and subject to improvement, and the fair market value of the entire property as it is improved. Thus, the depreciated reproduction cost new of the improvements is the amount by which they enhance the fair market value of the land, bare and subject to improvement.

### Inspecting the Improvements

The first step toward estimating the reproduction cost new of the improvements is to carefully inspect them. Experience has demonstrated the wisdom of following an orderly procedure in the inspection of each of the improvements. This procedure usually consists of, first, photographing and measuring the exterior of each of the improvements, with the second step being the description of the exterior of each of these improvements. Measurements of the improvements should be made in feet and tenths so that the mechanics of calculating the square foot area or the cubic foot content is simplified. When writing the description of the exterior of the building it is desirable to describe, first, the foundation, then the walls, and then the roof from each elevation, in order.

It is also desirable to follow an orderly procedure in describing the interior of the building. The best procedure is to describe one room at a time, usually starting

with the basement and then proceeding to the upper floors. When entering each room, note first its use, then its dimensions, floor, walls, ceiling, and fixtures. When this orderly procedure has been followed, all of the important features of each room are certain to have been inspected and reported.

At the conclusion of the inspection, calculate the single floor area, the total floor area, and the cubic content. The square foot floor area is the multiplication of the length by the width of the outside measurements of the building for each floor and adding the results for each floor together to get the total for the building. To calculate the cubic content of the building, take the outside measurements and multiply width by depth by mean height. This gives the number of cubic feet of space in the building. The mean height is measured from the basement floor to the mean height of the roof. The mean height of a gable roof is one-half the distance from the top of the ceiling joists to the roof; and the mean height of a hip roof is one-third of this same distance. If the building does not have a basement, the method of cubing is the same except that the height is measured from one foot below the top of the first floor or from grade whichever is lower. The net usable floor area or the net rentable floor area is the sum of the interior measurements of the individual rooms that are available for a tenant's use. (The Building Owners and Managers Association in many major cities have prescribed a method of computing the net rentable area that should be relied upon in appraising office buildings in those cities.)

After carefully inspecting, measuring and describing each building, it is necessary to estimate its reproduction cost new. *Reproduction cost new* is the present cost of reproducing the improvement with one of *exactly or highly similar material*. There are three generally recognized methods of estimating reproduction cost new. They are the quantity survey method, the unit-cost-in-place method, and the square foot and cubic foot method.

#### Quantity Survey Method

The quantity survey method is the method of cost estimation generally used by contractors. It consists of estimating the quantity of materials needed, the labor required, and the indirect costs, overhead and profit required by an owner and his contractor to construct the building. It is, in all probability, the most accurate and provable method of cost estimating because it gives the cost of each step in detail. However, it is a very laborious and time-consuming method.

In addition to the cost of materials and labor, it is necessary to include all of the indirect costs of construction. These indirect costs include: Permits; insurance, taxes, water, electricity, gas, and interest during construction; job supervision; architect's and engineer's fees; contractor's overhead, and charge for risk and profit; title examination;

legal fees; surveys; recording fees; and administrative expense during construction. The total of all these estimates is the reproduction cost new calculated by the quantity survey method.

#### Unit-in-Place Method

The unit-in-place method of estimating the reproduction cost new of a structure consists of estimating the installed prices for the various materials employing units convenient to use, rather than computing the exact totals of the individual component items. To these costs must be added the owner's indirect costs which are the architect's engineering, and recording fees, survey, permits, electric service, legal and financing expense, interest during construction, insurance, social security, title expense, taxes during construction, and general supervision. Overhead and profit for the general contractor must also be included in this calculation.

In using the unit-in-place method, the first step is to estimate the quantity of materials that are required to construct the building. The quantities estimated consist of installed units such as the cubic yards of excavation, foundation, and concrete needed, the board feet of framing and finished lumber, the squares of roofing, the square feet of interior and exterior wall surfacing, the square feet of floor surfacing, the pounds of steel in the framing, the bricks and concrete blocks, the doors and windows, the plumbing fixtures, the heating and air conditioning units, the electrical fixtures, and the number and type of other items that are required for the construction of the building. All of these installed quantities may be estimated from the plans and specifications or from a direct inspection of the building.

The appraiser then secures from contractors who are active in the construction field, the present unit cost in place of each of the construction components required. These costs are then multiplied by the units required to arrive at an estimate of the total reproduction cost new exclusive of indirect costs. The indirect costs are then added to the cost of the various components. Thus, the total estimate of the reproduction cost new by the unit-in-place method is the sum of the unit cost in place estimates for each construction component plus all of the indirect costs.

#### Square Foot and Cubic Foot Method

The square foot and cubic foot method of estimating reproduction cost new is the application of a carefully estimated unit cost per square foot or per cubic foot to the number of square feet or cubic feet in the building. The square foot or cubic foot unit cost used is considered to be accurate only when it is derived from the recent construction of very similar buildings and includes all of the construction costs. Certain industry cost services may be used for these estimations, however, great care must be exercised to adjust them to local conditions.

The most accurate method of arriving at the unit cost in a particular community is to secure the actual price of constructing a building similar to the subject building. This actual cost must, in fact, be the total for the building and must include the cost of all the construction components in place and all of the indirect costs. Then the newly constructed building must be measured in the manner described earlier in this chapter to arrive at the total floor area and the total cubic content. This floor area or cubic content is divided into the total actual cost of the building to arrive at the cost per square foot of floor area or the cost per cubic foot of content. Then, these costs are applied to the square foot area or the cubic foot content of the subject building to arrive at a reasonably dependable estimate of the reproduction cost new.

### Depreciation

After estimating the reproduction cost new, it then is necessary to estimate the observed accrued depreciation of the various structures. The accrued depreciation is the difference between the value contributed by the buildings and the cost of reproducing them new on the same date. Perhaps a more complete definition is that the total amount of the accrued depreciation from all causes is the difference between the present reproduction cost new of the structure and the amount of money by which it enhances the fair market value of the land upon which it is located. Thus, the total amount of the accrued depreciation is clearly demonstrated by actual transactions between buyers and sellers in the current real estate market.

Three types of observed accrued depreciation are generally considered. They are deterioration, functional obsolescence and economic obsolescence. Deterioration is generally considered as rehabilitation, curable deterioration and incurable deterioration. Functional obsolescence is generally considered to be partly curable and partly incurable. Economic obsolescence is considered to be incurable.

*Deterioration* is the loss in value due to age, wear and tear, the action of the elements, etc. Rehabilitation includes the repairs that would typically be made immediately. *Curable* deterioration is the loss in value of the various building items which are in part worn out and which are customarily repaired or replaced but are not immediately due for replacement. *Incurable* deterioration is the loss in value of the remaining parts of the building due to age, wear and tear, etc.

*Functional obsolescence* is the loss in value suffered by the building due to its inability to perform satisfactorily the functions for which it was designed.

*Economic obsolescence* is loss in value due to changes external to the property, such as neighborhood infiltrations of inharmonious people or property uses, legislation and the like. This loss in value is generally considered to be incurable.

## Estimating Accrued Depreciation

There are five generally recognized methods of estimating accrued depreciation. They are:

- (1) The capitalized income method,
- (2) The market method,
- (3) The straight line method, (age—life depreciation),
- (4) The engineering method, (observed depreciation),
- (5) The breakdown method, (observed depreciation).

*Capitalized income method* — The capitalized income method of estimating accrued depreciation is the difference between the value actually contributed by the building as is indicated by its net income after recapture and its reproduction cost new. In using this method, the value contributed by the building is estimated by the use of the building residual technique (which will be discussed in chapter 28) and is then deducted from the reproduction cost new of the building to arrive at the estimate of total accrued depreciation.

*Market method* — The market method of measuring accrued depreciation is based upon a study of sales of similar properties. In using this method, the value contributed by the building is actually estimated from sales of similar properties with buildings having a similar amount of depreciation. This contribution is then deducted from the estimated reproduction cost new, and the difference is considered to be the total amount of the accrued depreciation.

*Straight line method* — The straight line method of estimating accrued depreciation is the application of an estimated annual percentage loss of value to the estimated reproduction cost new. In using this method, the appraiser first estimates the effective age of the building. This *effective age* is estimated by a careful inspection of the property and may be defined as the age of the subject building as indicated by the age of a similar and typical property of equivalent usefulness, condition, and future life expectancy. Its chronological age may be much greater or may be much less. For example, if its chronological age is 30 years, and it has been so well designed and maintained that it has an effective age of only 20 years when compared with a similar and typical property of equivalent usefulness, condition, and life expectancy, the appraiser estimates the effective age to be 20 years. This estimate of effective age is then added to the estimate of "remaining economic life" to arrive at an estimate of total economic life. *Remaining economic life* is the period over which a prudent investor would expect to recapture his investment in the wasting asset. Then, the effective age divided by the total economic life is the total amount of the accrued depreciation of all kinds. Thus, if the effective age is estimated as 10 years and the remaining economic life is estimated as 30 years, the total economic life is

estimated as 40 years. Therefore, accrued depreciation is  $\frac{10}{10+30} = \frac{10}{40} = .25$  or 25%.

The proportion of the building remaining "good" is estimated to be .75 or 75%.

*Engineering method* — In the engineering method of estimating accrued depreciation, the appraiser relies entirely upon the observed condition of the building. He estimates the total loss in value of each of the component parts of the structure based upon a careful examination of them. He then applies this estimate of accrued depreciation of each of the component parts to the estimated reproduction cost new of each component part. The total of the accrued depreciation estimated by this method is then compared to the estimated reproduction cost new to arrive at the weighted average observed accrued depreciation. This estimated loss in value is then applied to the architectural and engineering fees and to the profit and overhead charges required by the contractor. The total sum of these individual estimates of observed accrued depreciation becomes the total amount of the observed accrued depreciation and is deducted from the estimated reproduction cost new to arrive at the appraiser's estimate of depreciated reproduction cost new.

*Breakdown method* — The breakdown method of estimating accrued depreciation is considered by most professional appraisers to be the preferred method. This method is a complete treatment of all forms of observed depreciation. It involves the following steps:

- a. An estimate of rehabilitation cost
- b. An estimate of deterioration curable
- c. An estimate of deterioration incurable
- d. An estimate of curable functional obsolescence
- e. An estimate of incurable functional obsolescence
- f. An estimate of economic obsolescence

a. The first estimate is the *cost of rehabilitation* of the various items which require immediate repairs. These may be a new roof, some new siding, or some repairs to the air conditioning equipment. It is quite possible that the estimate of the cost to cure may be greater than the reproduction cost of the item as a part of a new structure. This is quite normal because the cost of repairing is frequently greater than the cost of the particular item in a new structure.

b. The second step is the *estimate of accrued deterioration curable*. This treats of the various items which are in part worn out and are customarily repaired or replaced but are not immediately due for replacement. The estimated amount of curable deterioration is the sum of the lump sum estimates in dollars of the cost to cure each item.

c. The third component factor is the *estimate of accrued deterioration incurable*. This treats of the basic structure or the balance of the building that is not customarily

maintained or repaired because it is normally difficult to reach for ordinary maintenance. The total amount of the accrued deterioration incurable is estimated by a careful analysis of the relationship between the chronological age divided by the sum of the chronological age plus the estimated remaining economic life of the building. For example, if the reproduction cost new of the building is \$30,000.00 and the basic structure is estimated to be 60 percent of its total reproduction cost new, then the basic structure is estimated to have a reproduction cost new of \$18,000.00. The building is estimated to have a chronological age of 20 years and a remaining economic life of 30 years. Thus, the accrued deterioration incurable is estimated to be  $\frac{20}{20+30} = \frac{20}{50} = .40$  or 40%. Applying this estimate to the basic structure indicates a total deterioration incurable of  $\$18,000.00 \times .40 = \$7,200.00$ .

d. The fourth estimate is the *amount of functional obsolescence curable*. The curable functional obsolescence is measured by the estimated cost to cure those functional deficiencies that can typically be cured economically. Such work is generally considered as modernization, and the loss in value is estimated to be the cost to cure. Under certain circumstances, it may actually be remodeling. In any case, the measure of the loss in value is the cost to cure if it is typically cured economically.

e. The fifth measurement is the *estimate of functional obsolescence incurable*. The loss in value due to functional obsolescence incurable is computed by estimating the rental loss if such a loss does occur because of the functional deficiency of the structure. In estimating the loss in value as indicated by the rental loss, the appraiser searches for a like building similarly located that is functionally desirable. He then gives consideration to the rental paid for this functionally desirable building, taking into account any differences in economic desirability. He then compares the rental that can be obtained for the structure under appraisal with the rental typically received from the functionally desirable building. The difference between the rentals paid is then generally multiplied by the gross multiplier found in the market to indicate the total amount of the value lost.

For example, if the rental typically received from a functionally desirable building is \$125.00 per month and the rental received for the subject building is \$115.00 per month after adjusting for deterioration, functional obsolescence curable and economic obsolescence, then the estimated rental loss is \$10.00 per month. Should the gross monthly rental multiplier found in the market be 130, then the loss in value due to functional obsolescence incurable is estimated to be  $\$10.00 \times 130 = \$1,300.00$ .

In some cases functional obsolescence incurable may be caused by an over-adequacy of construction. In many of the older buildings, excess foundations were constructed anticipating the adding of additional floors at a later date. Economic conditions have

never permitted the addition of the extra floors and there are no indications that they will be added in the foreseeable future. The amount of loss in value due to this over-adequacy of construction is estimated by the deduction of the estimated reproduction cost new of that over-adequacy less accrued deterioration. The estimated reproduction cost new less accrued deterioration of this over-adequacy in construction is then considered as a part of the loss in value due to incurable functional obsolescence.

f. Since *economic obsolescence* is almost always incurable, it is generally measured by the amount of the rental loss. In measuring the amount of the rental loss, the appraiser considers a building of a similar nature that is located in an area that is desirable. He then finds the rental that this building commands, and compares the rental of the economically desirable building with the typical rental for the building under appraisal. This rental loss is then capitalized by the gross multiplier found to be typical for the property in the market in which it is located to arrive at the total amount of the loss in value due to the accrued economic obsolescence.

For example, if the rental typically received from a building with similar incurable functional deficiencies and similar deterioration but located in an economically desirable area is \$115.00 per month and the actual rental paid for the subject building without any adjustment is \$100.00 per month, then the loss in rental income due to economic obsolescence is estimated to be \$15.00 per month. Should the gross monthly rental multiplier found in the market be 130, then the loss in value due to functional obsolescence incurable is estimated to be \$15.00 x 130 = \$1,950.00 or \$2,000.00.

The estimated loss in value due to each type of accrued depreciation is then deducted from the value remaining after the previous deductions to indicate the contribution of the building to the value of the entire property. For example:

ESTIMATED REPRODUCTION COST NEW OF BUILDING .....		\$30,000
Estimated rehabilitation—new roof .....	—	\$1,000
		<u>29,000</u>
Deterioration curable—estimated cost to cure .....	—	1,500
		<u>27,500</u>
Deterioration incurable—40 percent of basic structure of \$18,000 .....	—	7,200
		<u>20,300</u>
Functional obsolescence curable—estimated cost to cure .....	—	500
		<u>19,800</u>
Functional obsolescence incurable .....	—	1,300
		<u>18,500</u>
Economic obsolescence .....	—	2,000
		<u>16,500</u>
DEPRECIATED REPRODUCTION COST NEW .....		\$16,500

The total value, therefore, indicated by the cost approach is the sum total of the depreciated reproduction cost new of the improvements and the fair market value of the land bare and subject to improvement. It is generally considered as the upper limit of the fair market value estimate because the estimate is arrived at by adding together the value contributed by each of the various parts. Even though the value of the land is tied as closely as possible to the fair market value of similarly unimproved land as indicated by open market transactions, and even though the total amount of the value contributed by the improvements is tied as closely as possible to the indicated contribution of improvements on similar properties recently sold, there is always the possibility that the total amount of the accrued depreciation that has affected the improvements is not accurately measured, with the result that the total of the value indicated by the cost approach may be somewhat above the final correlated estimate of fair market value.

## The Earnings Approach

WILLIAM D. DAVIS

*Appraisal Associates,  
Kansas City, Missouri*

In the earnings approach the anticipated net income is processed to indicate the capital amount of the investment which would produce this net income. The net income estimate must be derived from a careful estimate of typical income and expenses as they apply to the property under appraisal. The recapture rate applied to the improvements must be directly related to the period of time that prudent purchasers in the real estate market are willing to leave their money invested in improvements of a similar nature. The interest rate at which the net income is processed must be estimated from the sales of similar properties in the market that reflect the attitude of buyers and sellers as of the date the appraisal is made.

### Rural Property

In estimating the typical gross income of rural property, the first problem is to estimate the typical cropping pattern. This cropping pattern is best indicated by a study of the land use in the neighborhood in which the property is located. What is actually done with the property under appraisal is persuasive, but the appraiser must also consider the cropping pattern generally found in the neighborhood; taking into account the crop allotments, the soil type and quality, the general layout of the property, and all other features that would be considered by a typical purchaser. The cropping pattern used in the final estimate of the property being appraised must be directly related to the physical layout of the property, to the soil types that are on the property, and to the land capability classifications of the property.

Typical yields on a rural property are most persuasively indicated by a study of yields that are typical in the neighborhood. Actual yields of the past several years on the property being appraised are quite helpful; however, consideration must be given to the fact that they may be above or below what would be typical for the property because of the efficiency or lack of efficiency of the current management. Therefore, the yield estimated for the subject property must be tested by comparison with similar properties in the neighborhood. It is desirable also to examine them in relation to long-term

county yields, giving full consideration to the differences in soil fertility between the subject property and the average for the county.

Typical on-the-farm prices at which farm products are estimated to sell are generally the prices that have been received for the last two or three years, adjusted to the future price outlook at the time the appraisal is made. This is a reflection of the attitude of buyers and sellers who generally remember most vividly the agricultural prices of the most recent years and temper their judgment by an analysis of the outlook for future agricultural prices. These typical on-the-farm prices can be checked against average on-the-farm prices available through reports of the various agricultural statistical sources. The actual price estimated for the property under appraisement must be typical for that property rather than an average reported for a large area.

The rental share applicable to the land is best indicated by a study of the rental shares that are typical in the neighborhood for the use of similar land. This division of income is arrived at through bargaining between the landlords and the tenants over a period of years and it results in a division that is fair to both the landowner and to the tenant, at the time the agreements are made.

The typical acreage of the crop grown, the typical price received for it, and the typical share paid for the use of the land indicates the typical gross income that will be produced by each crop selected for use in the cropping pattern of the land. Pasture income, however, must be estimated on the basis of the carrying capacity of the pasture. This is generally done by estimating the rental paid per month for the pasturing of mature animals in the neighborhood, and estimating the carrying capacity of the pasture on the subject property. The estimated rental per head, per month, multiplied by the estimated carrying capacity gives an indication of the total pasture rental.

If it is typical to pay cash rental for buildings in the neighborhood in which the property is located, then this rental income on the subject property must be estimated. These estimates can be made from studies of rental arrangements on similar properties. The total of the rent paid to the land by the crops that are grown upon it, the rent typically paid for the use of the pasture, and the rent, if any, typically paid for the use of the buildings develops the estimated gross income of the property.

Crop allocations assigned by the Agricultural Stabilization and Conservation program generally limit the acreage of such crops. These crops include cotton, corn, wheat, peanuts, rice, etc. Income from land that is in the feed crop reserve program is generally considered by the appraiser in the same light as any other land income, however, a greater degree of risk must be assigned to this income stream because there is no assurance that the contract covering the land can be transferred to a prudent purchaser and the continuation of the program beyond the expiration date of the contract is not assured.

In estimating typical ownership expenses on rural property, care should be exercised to be certain to include taxes, insurance on improvements, maintenance of improvements, maintenance of soil, and all other expenses that a farm owner will typically have to pay. In addition, an amount sufficient to recapture the investment in the improvements over the period of years that a prudent investor would be willing to leave his money invested must be included as an ownership expense. While this bears some relationship to the remaining useful life, since many owners are willing to use them as long as they contribute to the income of the farm, the remaining useful life is not the final guide. Changes in the methods of farming take place so rapidly that a prudent farm owner may not continue to use buildings that are still performing the functions for which they were designed if these functions do not conform to the usage of the current farming program.

The interest rate at which the net income will be capitalized can be estimated by an analysis of the sales of similar rural properties. In this analysis, the typical net income produced by the sale property is divided by the price paid for the property to arrive at the interest rate at which the purchaser indicated acceptance by making the purchase and the seller by making the sale. This is an adaptation of the formula  $R = I/V$  in which "R" is the interest rate, "I" is the net annual income and "V" is the price paid for the property. For example, if the property sold for \$55,500.00 and typically produced a net income of \$2,500.00 per year then  $R = I/V = \$2,500.00$  divided by  $\$55,500.00 = 0.045$ .

The interest rate indicated by the analysis of the sale must be checked by both the band of investment theory and the summation theory. In the band of investment theory, the appraiser deducts the product of the interest rate paid for money borrowed in a typical first mortgage loan times that portion of value that a typical first mortgage would cover, from the analyzed interest rate, with the remainder considered as being applicable to the equity. This is then compared with other equity returns.

*For example:*

Interest rate indicated by the analysis of sale .....	.045
The farm loan rate—60 per cent of value at 6% annum .....	.036
Leaving available for equity return on the 40 per cent equity .....	.009
The .009 remaining, which is actually nine-tenths of one percent, when divided by the 40 per cent which represents the equity interest, indicates a 2.25 per cent rate available for the equity return.	

In checking the interest rate indicated by the analysis of a sale by the summation theory, the appraiser follows the procedure of deducting from the interest rate indicated by the analysis of the sale, the safe rate at which money without risk is loaned, the rate for non-liquidity, and the rate for the management of the money.

The interest return that is remaining is available for risk in the investment. An example of the analysis of the .045 rate indicated by the sale is as follows:

The interest rate indicated by the analysis of the sale .....	.045
Less:	
The safe rate (The rate on Series E Government Bonds) .....	.0375
The rate for non-liquidity (Estimated by the appraiser) ..	.00125
The rate for the management of the money (Estimated by the appraiser) .....	.00125
Total deductions .....	<u>.040</u>
Leaving as the rate for risk .....	.005

This .005 or 1/2% interest rate remaining for risk is the amount for compensation to the owner for the risk of the investment. Although this is an extremely low return, if the rate is typical of the market and the analysis of the sales indicates that it is, then the 0.045 interest rate indicated by the sale analysis is accepted by the appraiser as the typical interest rate.

The capitalization of the net income estimated for the property under appraisal, by the interest rate found in the market, develops the value indicated by the earnings approach. This is generally considered as the lower limit of the fair market value estimate because it gives little consideration to the amenities of the farm. The value indicated by the earnings approach will be very close to the values indicated by the cost approach and the market data approach if the gross income estimate is typical for the neighborhood, the ownership expenses estimated are typical for the neighborhood, and the interest rate estimated is typical for the neighborhood.

An example of the use of the earnings approach in the appraisal of a corn belt farm, utilizing the typical rental share paid, is as follows:

THE VALUE OF A CORN BELT FARM  
INDICATED BY THE EARNINGS APPROACH

Typical Income:

Irrigated Corn—71 A. @ 70 bu. = 4,970 bu. @ \$0.85	
= \$4,224.50 x 2/5 share = .....	\$1,689.80
Dry Alfalfa—36 A. @ 2 T. = 72 T. @ \$16.00	
= \$1,152.00 x 1/2 share = .....	576.00
Native Hay—10 A. @ 1 T. = 10 T. @ \$15.00	
= \$150.00 x 1/2 share = .....	75.00
Pasture Rental—34 A.—Pasture will carry 12 head of mature cattle at 2.75 acres per head at an average annual pasture charge of \$15.00 per head per year or .....	180.00
Building Rental—estd. ....	<u>480.00</u>
Total Gross Income .....	\$3,000.80

#### Typical Expenses:

Real Estate Taxes—161 A. @ \$1.96 per A. ....	\$316.38
Insurance—Bldgs. \$7,455.00 x 75 per cent x \$1.08 per \$100.00 value .....	60.39
Fertilizer—	
Corn—71 A. @ \$6.40 per A. ....	454.40
Alfalfa—36 A. @ \$2.00 per A. ....	72.00
Alfalfa Seed—\$2.10 per A. each 3 yrs. or .....	25.20
Bldg. & Well Depreciation & Maintenance @ 5 per cent ..	462.75
Fence Maintenance—1,300 rods @ 5c per rod .....	65.00
Irrigation Water Costs—\$2.00 per irrigated acre .....	142.00
Total Expenses .....	<u>1,598.12</u>

Total Net Income ..... \$1,402.68

Value Indicated by the Earnings Approach Net Income Capital-

ized @ 0.45 ..... \$31,170.66  
161 Acres @ \$193.60 per A. .... or \$31,200.00

#### Rurban Properties

In the use of the earnings approach on rurban properties, rentals typically received and expenses typically paid by the owner of such a property are given consideration. These facts, ascertained by inquiry in the neighborhood, are utilized as a guide to typical income and expenses on the property under appraisal. The interest rate at which men of prudence and judgment are willing to invest their money is reflected by the price they are willing to pay for such rurban properties. It is usually a very low interest rate because such purchasers typically anticipate a substantial enhancement in fair market value due to the probability of a change in the highest and best use—from a rurban use to a residential or commercial use. This rate can be estimated by properly analyzing the sales of similar properties in the neighborhood in the same manner that was discussed in the analysis of the interest rate at which rural properties are purchased. It should be tested by both the band of investment theory and the summation theory wherever possible. However, many times the interest rate at which such properties are bought and sold is so low that the actual purchase price reflects little regard for earnings. The purchase price is primarily related to the anticipated enhancement in fair market value due to a probable change in the highest and best use from rurban use to residential use.

#### Urban Properties

In an urban property the typical gross income is estimated from the rental of similar properties in the neighborhood. In considering the rentals of similar properties, the appraiser must give careful consideration to the similarities and dissimilarities between the rental properties and the subject property. Further consideration must be

given to the quality of the income stream. If the income is on a month-to-month basis, then it is considered to be a nonstable income stream. If the income is on a long-term lease basis, that is a lease of five or ten years or more, and the tenant is financially strong, it is possible that the income may possess the characteristics of an annuity. If it is a stable income, the net income before depreciation will be treated differently than if it is a nonstable income.

Vacancy and collection losses that are typical for the neighborhood and for the type of property under appraisal are deducted from the typical rentals to indicate the total stabilized gross income. Although it is true that rental losses have been quite low in recent years, experience indicates that there have been periods of substantial losses due to the inability to collect rent. Since this analysis is concerned with estimating the present worth of the future income stream, the probability of these future rental losses must be reflected.

The typical ownership expenses of the cost of the management of the property, the annual taxes, the insurance on the improvements, the typical maintenance on the improvements and provision for the replacement of items that wear out more quickly than the rest of the building are deducted from the stabilized gross income and the remainder is the typical net income before interest and recapture.

### Interest Rate and Recapture Period

In urban properties the interest rate must also be estimated from sales of similar properties in order to be truly representative of the market. Careful consideration must be given to the quality of the income stream and care must be taken to be certain that the property relied upon as an indication of the interest rate has an income stream of the same quality as the property being appraised. An example of the analysis of a sale property with a nonstable income stream for the actual rate of interest that it indicates is as follows:

Net annual income before recapture .....	\$12,000.00
Sale price .....	\$120,000.00
Land estimated as 20% or .....	24,000.00
Estimated building contribution .....	\$ 96,000.00
Estimated building recapture 25 yrs. or .04 per year or .....	3,840.00
Remaining for interest on land and building .....	\$ 8,160.00
Interest rate indicated by the sale is $R = I/V = \$8,160$ divided by $\$120,000 =$ .....	0.068

This estimated interest rate should then be checked by the band of investment theory in the following manner:

Interest rate indicated by the analysis of the sale .....	0.068
First mortgage—60 per cent of value @ .06 = .....	0.036
Second mortgage—20 per cent of value @ .075 = .....	0.015
Total deductions .....	0.051
Available for return on the equity (20 per cent of the value) .....	0.017

The .017 remaining for the equity when divided by the 20 per cent of value remaining as equity indicates an actual equity return of .085. If this is in line with the return that other purchasers seem willing to accept on the equity, then it strongly indicates that the interest rate indicated by the sale is the interest rate at which such properties are being exchanged in the market.

This indicated interest rate should also be checked by the summation theory in the following manner.

Interest rate indicated by analysis of sales .....	0.068
Less:	
The safe rate (Rate on series E Government Bonds) ....	0.0375
The rate for lack of liquidity .....	0.005
The rate for the management of the money .....	0.005
The total deductions .....	0.0475
Leaving the rate for risk .....	0.0205

If this risk rate indicated by the market is typical for properties of this same type, it is a very strong indication that the rate indicated by the analysis of the sale is the actual interest rate considered by investors as being typical for the market at that time.

A careful estimation of the period over which prudent investors are willing to recapture their investment in the buildings is very important. The best indication of this investor demand is the analysis of the actual purchases and sales in the market. This analysis is made in a manner similar to the analysis of the interest rate and it can be made satisfactorily, after the rate of interest has been estimated, by an analysis of a sufficient number of sales to demonstrate the actual interest period in the market at that time. The period of recapture can be easily estimated by applying the typical interest rate to properties that are relatively similar in both use, age, and condition to the property under appraisal. An example of estimating the recapture period required by the investors from a particular sale having a nonstable income stream is as follows:

Net annual return before interest or recapture .....	\$10,000.00
Sale price .....	\$110,000.00
Interest on land and building—0.068	
Annual interest required in dollars .....	7,480.00
Annual recapture indicated in dollars .....	\$ 2,520.00
Estimated contribution of land—20 per cent	
Estimated contribution of improvements—80 per cent or .....	\$88,000.00

Thus, this sale indicates a recapture period of \$88,000.00 divided by \$2,520.00 or 34.9 years. This is 0.0286 per year.

If the sale property is under a long term lease to financially strong tenants, the income stream is considered as a stable income stream or an annuity. The analysis of the sale to find the interest rate it indicates is as follows:

Net annual income before recapture .....	\$12,000.00
Sale price .....	\$120,000.00
Land estimated as 20 per cent or .....	24,000.00
Estimated building contribution .....	\$ 96,000.00
Estimated Interest Rate—9 percent	
Estimated building recapture 25 yrs.	
Inwood factor for 25 yrs. at 0.09 is 9.823	
$\$96,000 \div 9.823 = \$96,000 \times \frac{1}{9.823}$ (or 0.101802)	
Therefore annual building interest and recapture is	
$\$96,000.00 \times 0.101802 =$ .....	\$9,772.00 or 9,773.00
Remaining for interest return on land .....	\$ 2,227.00
Interest rate indicated by sale	

$$R = I/V = \$2,227 \text{ divided by } \$24,000 = 0.0928$$

Since the interest rate indicated is 0.0928 after estimating a 0.09 rate for the partial payment factor, it is probable that the appraiser will estimate the interest rate indicated by the sale as 0.09. This indicated interest rate should then be tested by both the band of investment theory and the summation theory in the same manner as it was tested in the nonstable income example.

Estimating the recapture period indicated by the market, for properties whose income streams have the characteristics of an annuity, is somewhat different than in the case of a nonstable income. An example of the analysis of such a sale is as follows:

Net annual return before interest or recapture .....	\$10,000.00
Sale price .....	\$110,000.00
Estimated contribution of land—20 percent or .....	\$ 22,000.00
Interest on land—@ 0.09	
Annual interest required on land in dollars .....	1,980.00
Annual interest and recapture on building in dollars .....	\$ 8,020.00
Estimated contribution of improvements—80 percent	
or .....	\$88,000.00
Thus this sale indicates a present worth of \$1.00	
per annum (Inwood coefficient) factor of R	
$= V/I = \$88,000 \text{ divided by } \$8,020 = 10.72568$	

An examination of the 0.09 present worth of \$1.00 per annum (Inwood coefficient) table indicates a factor of 10.961683 for 50 years and 10.974021 for 51 years. Therefore, the recapture period indicated is between 50 and 51 years.

## Capitalization

The selection of the proper method of capitalization is based upon the duration and stability of the income stream. If the income stream is of long duration, that is rental paid on leases of five to ten years duration or more, and the lessees are financially stable, then it may be said to have the characteristics of an annuity. When the income stream has the characteristics of an annuity, it should be processed as a level income stream utilizing the present worth of \$1.00 per annum (Inwood coefficient) compound interest valuation table.

Most urban properties, however, are rented on leases of less than five to ten years duration to tenants whose financial standing is not considered to be prime. Under those circumstances the income stream is considered to be a nonstable income. Such income streams are processed by the straight-line capitalization method because this method tends to reflect the lack of stability of the income stream. Such income streams may generally be expected to decline slightly over the period of the recapture of the investment in the buildings, and this decline is reflected in the straight-line capitalization method.

In using the straight-line capitalization method, the period of time over which prudent investors have demonstrated their willingness to leave their money invested in the buildings is divided into the unit one to indicate the amount of annual recapture that is required. That is to say, that if the market has demonstrated that investors are willing to leave their money in the type of building under appraisal for a period of 35 years, then the annual recapture rate is estimated to be 0.0285. This recapture rate is then added to the interest rate to develop the capitalization rate, which is the sum of the interest rates and the recapture rate. The capitalization rate is then applied to the net income attributable to the improvements to indicate the value contributed by the improvements.

The straight-line capitalization method indicates a regularly declining income stream during the estimated recapture period. The rate of decline is calculated by multiplying the formula interest rate times the rate of recapture which is divided by the interest rate plus the rate of recapture. An example of calculating the annual rate of decline anticipated in the net income, before interest and recapture, for a structure having an estimated recapture rate of 0.0285 per year and an interest rate of 0.068 is as follows:

Annual anticipated rate of decline in the net income before interest and recapture =  $0.068 \times 0.0285 \div 0.068 + 0.0285 = 0.00194 \div 0.0965 = 0.0201$  per year.

It is recommended that each time the straight-line method of capitalization is used, the appraiser calculate the anticipated rate of decline and compare it with actual experience with buildings of the same type, under typical management.

The appraiser relies upon the annuity method of capitalization for those properties having stable incomes provided for by long-term leases to financially stable tenants. When the property is leased to a stable tenant for a long period and is of a size that is typically owned by individual investors, the income stream is typically processed by the use of the present worth of \$1.00 per annum (Inwood coefficient) compound interest valuation table. This method of capitalization provides for an income, in equal annual amounts, sufficient to satisfy recapture and interest requirements. The recapture installments are lowest at the beginning of the period and increase each year throughout the recapture period. The interest received each year is based on the remaining amount of the investment. The recaptured amounts of the investment are considered to be invested at the same rate as the interest rate estimated for the property as a whole. At the end of the recapture period, the total amount of the recaptured principal, plus the compounded interest on the recaptured principal, will equal the amount of the investment to be recaptured.

In using this method of annuity capitalization (Inwood coefficient), the appraiser simply multiplies the annual net income remaining to the improvements, before recapture, by the factor for the number of years of the recapture period at the interest rate, to arrive at the value contributed by the income stream. This is the actual value contributed by the building to the value of the property as a whole. For example:

Net income to building before interest and recapture .....	\$ 7,500.00
Estimated recapture period—35 years	
Estimated interest rate—0.07	
Present worth of \$1.00 per annum (Inwood coefficient) for 35 years	
@ 0.07 factor 12.948	
The value contributed by the income attributable to the improvements	
\$7,500.00 x 12.948 .....	\$97,110.00
	or \$97,100.00

### Residual Techniques

In order to estimate the contribution of the land or the building to the value of the entire property or to estimate the value of the land or the building, certain residual techniques are utilized. In these techniques, a portion of the income is processed as a requirement for either the land or the building, whichever the appraiser is able to value by other means, and the remaining income is processed to indicate the value of the remaining land or building.

*Building residual technique* — The most favored residual technique is the building residual technique, because when this technique is used the actual value contributed by the building to the value of the entire property is indicated by the net income that it produces. This technique is used when it is possible to accurately estimate the market value of the land, bare and subject to improvement, from sales of

similar land. In the use of this technique the income required to pay the interest on the fair market value of the land is deducted from the net income, before interest and recapture. The remaining net income is considered to be the income attributable to the improvements. This income is then processed to indicate the value contributed by the improvements, utilizing either the straight-line capitalization method or the present worth of \$1.00 per annum (Inwood coefficient). An example of the building residual technique utilizing these methods of capitalization is as follows:

Using the *building* residual technique and *straight-line* capitalization:

Net income before interest and recapture .....	\$ 8,900.00
The land requirement:	
Fair market value of the land—\$20,000.00	
The estimated interest rate—0.07	
The annual land requirement—\$20,000.00 x 0.07 .....	1,400.00
Net income available to the improvements .....	\$ 7,500.00
Estimated recapture period—35 years or 0.0285 per year	
Estimated interest rate—0.07	
Capitalization rate— $0.07 + 0.0285 = 0.0985$	
The value contributed by the improvements—\$7,500.00 divided by 0.0985 = \$76,142.13 or \$76,100.00	
The total property value indicated by straight-line capitalization using the building residual technique	
The fair market value of the land .....	\$20,000.00
The value contributed by the improvements .....	76,100.00
The value of the property .....	\$96,100.00

An example of the *building* residual technique using the *present worth* of \$1.00 per annum (Inwood coefficient) is as follows:

Net income before interest and recapture .....	\$ 8,900.00
The land requirement:	
Fair market value of the land—\$20,000.00	
The estimated interest rate—0.07	
The annual land requirement—\$20,000.00 x 0.07 .....	1,400.00
Net income available to the improvements .....	\$ 7,500.00
Estimated recapture period—35 years	
Estimated interest rate—0.07	
Present worth of \$1.00 per annum (Inwood coefficient) factor 12.948	
The value contributed by the improvements—\$7,500.00 x 12.948 = \$97,110.00 or \$97,100.00	
The total property value indicated by the present worth of \$1.00 per annum (Inwood coefficient) using the building residual technique	
The value contributed by the land .....	\$ 20,000.00
The value contributed by the improvements .....	97,100.00
The total value indicated .....	\$117,100.00

*Land residual technique* — The land residual technique may be used when it is not possible to estimate accurately the fair market value of the land, the building is in new condition and the land is improved to its highest, best and most profitable use. In the use of this method, the net income required to service the buildings, based upon the estimated depreciated reproduction cost new of the buildings, is deducted from the net income before interest and recapture. The remaining net income is then processed to indicate the fair market value of the land.

An example of the *land residual technique* using *straight-line capitalization* is as follows:

Net income before interest and recapture .....	\$ 8,900.00
The requirement of the improvements:	
Estimated depreciated reproduction cost new of the improvements	
\$86,600.00	
Estimated recapture period—35 years or 0.0285 per year	
Estimated interest rate—0.07	
Capitalization rate— $0.07 + 0.0285 = 0.0985$	
The requirements of the improvements— $\$86,600.00 \times 0.0985 =$	8,530.10
Net income available to the land .....	\$ 369.90
The value contributed by the land— $\$369.90$ divided by .07	
= $\$5,284.28$ or .....	\$ 5,300.00
The total property value indicated by straight-line capitalization using the land residual technique	
The value contributed by the land .....	\$ 5,300.00
The value contributed by the improvements .....	86,600.00
The total value indicated .....	\$91,900.00

If the characteristics of the income stream are such as to indicate the use of the present worth of \$1.00 per annum (Inwood coefficient) table, this capitalization method may be applied to the land residual technique.

Using the *land residual technique* and the *Inwood coefficient*:

Net income before interest and recapture .....	\$ 8,900.00
The requirement of the improvements:	
Estimated depreciated reproduction cost new of the improvements	
—\$86,600.00	
Estimated recapture period—35 years	
Estimated interest rate—0.07	
Present worth of \$1.00 per annum (Inwood coefficient) factor for 35 years @ 0.07 is 12.948	
The requirement of the improvements— $\$86,600.00$ divided by 12.948 = .....	6,688.29
Net income available to the land .....	\$ 2,211.71
The value contributed by the land— $\$2,211.71$ divided by 0.07	
= $\$31,595.85$ or .....	\$ 31,600.00

The total property value indicated by the present worth of \$1.00 per annum (Inwood coefficient) using the land residual technique	
The value contributed by the land .....	\$ 31,600.00
The value contributed by the improvements .....	86,600.00
The total value indicated .....	\$118,200.00

*Property residual technique* — When it is not possible to estimate with reasonable accuracy either the value of the land or the value contributed by the improvements, the appraiser may be required to rely upon the use of the property residual technique. Two capitalization methods are utilized in the application of the property residual technique. The first capitalization method utilized is known as direct capitalization, in which the overall capitalization rate is used to capitalize the net income, before interest and recapture, to indicate the value of the property. This overall capitalization rate is estimated by simply dividing the total sale prices of similar properties by their net incomes before recapture. This will produce the average or adjusted overall capitalization rate which will include the recapture of the building, the interest on the building, and the interest on the land.

The second method of using the property residual technique is in connection with the present worth of \$1.00 per annum (Inwood coefficient) and is only applicable to a stable income stream of long duration. In the use of the property residual technique with this capitalization method the net income, before recapture and interest, is processed for the period over which a prudent man will expect to recapture his investment in the improvements. Then the land value is estimated for the purpose of reversion. The land value is then reverted to indicate the present worth of the right to receive it at the end of the recapture period on buildings.

This is an example of the *property residual technique using direct capitalization*:

Net income before interest and recapture .....	\$ 8,900.00
The overall capitalization rate indicated by sales of similar properties— 0.0968	
The value indicated by the property residual technique using straight-line capitalization—\$8,900 divided by 0.0968 = .....	\$91,942.10 or \$91,900.00

This is an example of the *property residual technique using the present worth of \$1.00 per annum (Inwood coefficient)*:

Net income before interest and recapture .....	\$ 8,900.00
Estimated recapture period—35 years	
Estimated interest rate—0.07	
Present worth of \$1.00 per annum (Inwood coefficient) factor for 35 years at 0.07 is 12.948	
Therefore, the present worth of the income stream is \$8,900.00 x 12.948 = .....	\$115,237.20
Estimated fair market value of land for purpose of reversion— \$20,000.00	

Present worth of \$20,000.00 in 35 years with interest @ 0.07—factor  
 $0.937 \times \$20,000.00 = \dots\dots\dots 1,874.00$

The total value indicated by the property residual technique using the  
 present worth of \$1.00 per annum (Inwood coefficient) = . . . . \$117,111.20  
 or \$117,100.00

In the proper use of the earnings approach in the valuation of urban properties, the appraiser estimates both the interest rate and the recapture period required from the analysis of sales of similar properties. The capitalization method by which the net income, before interest and recapture, is processed is indicated by the characteristics of the income stream. If the income stream is of short duration and is unstable, then it is capitalized on a straight-line basis. If the income is a stable stream under a long-term lease signed by a financially competent tenant and the property is of such a nature that it is typically purchased by individuals, then the income stream is properly processed using the present worth of \$1.00 per annum (Inwood coefficient).

In selecting the proper residual technique, the appraiser is limited by the information that is available to him. If it is at all possible, he relies upon the building residual technique because in properly utilizing this technique, he estimates the actual contribution of the improvements to the fair market value of the land. In utilizing this technique he has only to estimate the fair market value of the land from market transactions. Then the income remaining to the improvements indicates, with accuracy, the actual contribution of the improvements.

If the property is in new condition and it is improved to its highest, best and most profitable use, the appraiser may use the land residual technique, providing he is not able to estimate the fair market value of the land from market transactions with reasonable accuracy, but can estimate the depreciated reproduction cost new of the improvements with reasonable accuracy. In this technique the net income remaining, after deducting the amount required for the improvements, is capitalized at the interest rate found in the market to indicate the fair market value of the land. When it is not possible to estimate the fair market value of the land and when the building is not in new condition or when the land is not improved to its highest, best, and most profitable use, the appraiser must rely upon the value indicated by the property residual technique. When utilizing the property residual technique, the net income produced by the property is either capitalized at an overall rate including the recapture on the building, interest on the building, and interest on the land, or is capitalized for the estimate of recapture period applicable to the improvements and the estimated value of the land is reverted to its present worth at the time the appraisal is made. Thus, the conditions surrounding the appraisal dictate both the capitalization method and the residual technique that may logically be applied to the property at hand.

## The Market Data Approach

WILLIAM D. DAVIS

*Appraisal Associates  
Kansas City, Missouri*

In the market data approach the fair market value of the subject property is estimated by comparing it with other similar properties in the same neighborhood that have recently been sold in the open market. The sales that are relied upon must be as similar as possible to the property under appraisal as to location, community services, size, time of sale, and the terms of the transaction. Ideally, the sale property must be so similar to the property under appraisal that it would have been an acceptable substitute for the subject property if a prospective purchaser had an opportunity to buy either of them.

In the use of the market data approach the entire property under appraisal is compared with the entire sale property in order to estimate its fair market value. This is an excellent example of the principle of substitution in that the fair market value of the subject property is estimated by comparing it with similar properties, recently sold, that would have been as equally acceptable to a potential buyer of the subject property.

In applying the market data approach great care must be used in recognizing and reflecting the important points of similarity and dissimilarity of each of the comparable sales to the subject property.

### Comparing the Rural Property

In a rural property the important individual points of similarity and dissimilarity that are given particular consideration are location, size, soil classification, land use, agricultural allotments, drainage, irrigation and erosion control improvements, water supply, buildings, community services, zoning, taxes, minerals, timber growth, time of sale, and terms and circumstances of sale. In each case the subject property is compared with the sale property in order to measure the degree of similarity and dissimilarity.

The market data approach requires that the appraiser explain in detail exactly how a particular sale led him to the value indicated by the market data approach.

An example of how a competent appraiser may explain this indication on a rural property is as follows:

Sale No. 43, Jones to Smith, made this year, the sale of an improved 320 acre farm located one-half mile from the subject property on the same road, for a total confirmed consideration of \$80,000.00. The subject property is a 320 acre improved farm in a very similar location and has about the same type of soil. However, the soil has had better care on the subject property and the subject property has a larger percentage of its land in cultivation than the sale property. The subject property is also better improved than the sale property.

A careful analysis of Sale No. 43 indicates that the improvements contribute approximately \$12,000.00 to the value of the sale property. The depreciated reproduction cost new of the improvements on the subject property totals \$15,000.00. Thus, it is the judgment of the appraiser that the buildings on the subject property contribute \$3,000.00 more to its value than do the improvements on the sale property. This is primarily because the house on the subject property is newer than the house on the sale property and has central heat while the sale house is heated by propane-fired space heaters.

The subject property has a good spring in the pasture for stock water. This is more desirable, in the judgment of the appraiser, than the ponds on the sale property. From a study of sales of similar properties, it is the judgment of the appraiser that this desirable water supply contributes \$1,000.00 to the value of the subject property over the sale property.

The sale property has 250 acres of Class I soil and the balance is Class II soil. The subject property has 240 acres of Class I soil and the remainder is Class II soil. Since the analysis in the cost approach indicates that the Class I soil contributes \$50.00 more per acre than the Class II soil, it is the judgment of the appraiser that this indicates that the subject property has a disadvantage of \$500.00 compared to the sale property.

The Class I soil on the subject property has had better rotation and has a higher level of fertility and organic matter than does the Class I soil on the sale property. It is the judgment of the appraiser that a prudent, prospective purchaser will consider that this higher level of fertility will contribute about \$20.00 per acre or a total of about \$4,800.00.

It is, therefore, the judgment of the appraiser that Sale No. 43 at \$80,000.00 made this year indicates a value of \$88,300.00 for the subject property. This is because the subject property has better buildings, a better stock water supply and more fertile Class I soil than the sale property.

### **Comparing the Rurban Property**

In comparing a rurban property the points of similarity and dissimilarity include location with particular reference to neighborhood, size, topography, load bearing capacity of the soil, land cover, water supply, buildings, community services including zoning, streets, traffic patterns, water, sewer, gas, electricity, and public transportation

for both people and products, the trend of the neighborhood, restrictions of record, the time of sale, and the terms and circumstances of the sale. Although each individual feature of similarity and dissimilarity is considered and reported, such properties are considered as whole properties just as the prospective purchaser will consider them in arriving at a decision as to which property to buy.

### Comparing the Urban Property

In appraising an urban property, particular consideration is given to the factors of neighborhood, size, topography, load bearing capacity, water supply, buildings, community services including zoning, streets, traffic patterns, water, sewer, gas, electricity, and public transportation for both people and products, the trend of the neighborhood, restrictions of record, and the time and circumstances of the sale. Each point of similarity and dissimilarity is carefully considered and its influence in leading the appraiser to the conclusion he has reached must be clearly analyzed and reported.

An example of how a competent appraiser might explain in detail exactly how a particular sale led him to the value indicated by the market data approach for a single-story warehouse property is as follows:

Sale No. 5, the Joe Doker Company to the M. M. Martins Company, was made this year for a total consideration of \$75,000.00, all cash to the seller. The sale property is on East 46th Avenue, as is the subject property, and is also served by a spur from the AT&SF Railroad and by sanitary and storm sewers. Since the sale is only 1,000 feet west of the subject property, it has the same traffic pattern for trucks and the same railroad freight and switching charges as the subject property. Both properties are improved with single-story warehouse buildings with a very similar proportion of the total area in air-conditioned and heated office space and with the warehouse space heated for warehouse use and equipped with similar truck and rail docks.

The warehouse building on the sale property contains 6,400 square feet of area compared to 6,000 square feet of area in the building on the subject property. The depreciated reproduction cost new of the building on the sale property is \$6.25 per square foot. Therefore, it is the judgment of the appraiser that this difference indicates that the subject property is 400 square feet at \$6.25 per square foot or \$2,500.00 less valuable than the sale property.

There is a substantial amount of deferred maintenance needed on the building on the subject property while the building on the sale property is in condition new. The appraiser estimates that even though both buildings cost about the same amount per square foot to build, a prudent purchaser will estimate that it will cost him about \$0.35 per square foot to cure this deferred maintenance on the subject property. This deficiency, in the judgment of the appraiser, indicates that the subject property is 6,000 square feet at \$0.35 per square foot or a total of \$2,100.00 less valuable than the sale property.

Although the sale property and the subject property have equally desirable locations, the sale property has 35,000 square feet of land while the subject property has 30,000 square feet of land. While the quantity of land available for outdoor storage, parking and future expansion is fully adequate on both properties, the subject property has 5,000 square feet less land than does the sale property. The land in this highly developed industrial area is selling freely at \$1.00 per square foot. Therefore, it is the judgment of the appraiser that this difference indicates that the subject property is 5,000 square feet at \$1.00 per square foot or a total of \$5,000.00 less valuable than the sale property.

This sale at \$75,000.00, in the judgment of the appraiser, indicates a value of \$65,400.00 for the subject property because the subject property has a smaller building and less land than the sale property, and because the building on the subject property has considerable deferred maintenance. Except for these differences, it is the judgment of the appraiser that the sale property and the subject property are equally desirable.

The key to the use of the market data approach is to fully explain how each comparable sale that was considered led the appraiser to the conclusion reached. In this process it is necessary to discuss each of the actual points of similarity and dissimilarity between the subject property and each comparable sale used in order to demonstrate why the subject property has a fair market value that is higher, lower, or the same as the price at which the comparable sale changed hands. A careful and thorough discussion of each sale is the only way the appraiser can demonstrate to the user of the appraisal the reasons why the value estimated by the market data approach is truly the fair market value indicated by the sales of comparable properties.

The value estimated by the market data approach is generally considered to be the most persuasive indication of the fair market value of the subject property. This is particularly true if the comparable sales are *truly comparable* to the subject property and when the appraiser has convincingly explained in detail how each comparable sale led him to the value indicated in the market data approach.

### Correlating the Three Approaches

In the final correlation of value, the estimate indicated by the cost approach is generally considered to be the upper limit of fair market value, because it is arrived at by adding together the individual values contributed by the various component parts of the property. Although every effort is made to be certain that the value contributed by each class of land is actually the fair market value of that class of land, and every care is taken to make certain that the value finally estimated to be contributed by the improvements is the amount by which they enhance the fair market value of the land, making these estimates with complete accuracy is extremely difficult. For

example, it is probable that in many cases the appraiser does not reflect all of the loss in value suffered by the improvements that is reflected in the market. For that reason, it is generally considered that the value indicated by this approach is the upper limit of the fair market value estimate.

In the estimation of value by the earnings approach, the appraiser has estimated both income and expense items as they apply to the property under appraisal. Although care has been exercised to base these estimates upon the property itself and upon similar properties, there is always the possibility that all of the potentials or deficiencies and all of the net income producing ability of the property being appraised will not be fully recognized. Further, there is the possibility that the current management of the property may have an undue influence upon the value estimate. In addition, the estimates of the interest rate and the recapture period involve the analysis of sales of properties that are as similar as possible to the property under appraisal; but since no two properties are exactly alike, either the interest rate or the recapture rate indicated may be slightly different than that which would probably be applied to the subject property by typical purchasers and sellers. In the selection of the proper method of capitalization and in the selection of the proper residual technique, the possibility of estimating the quality, the quantity, and the durability of the income stream in a manner that is not in strict accord with the facts, as they pertain to the subject property, may sometimes lead to a value estimate that is not in full accord with the market. Finally, little consideration is given to the amenities of the property in this approach. Thus, the value indicated by the earnings approach is generally considered to be the lower limit of the fair market value estimate.

Since the value indicated by the market data approach is the value indicated by comparison with sales of similar properties, this approach is generally considered to be the most reliable indication of fair market value. The indication of value by this approach is actually the value derived from sales of whole similar properties and it is therefore more similar to what actually occurs in the buying and selling of similar properties. This approach is generally selected as the most persuasive estimate of fair market value.

## Correlation and Final Value Estimate\*

The correlation of the data and indicated value estimates made in the three approaches is the last major step in the appraisal process. Correlation quite literally means bringing together the facts and fitting them together in such a way as to conform to cause and effect relationships. It is the bringing of the elements into balance with each other to constitute a unified and coherent whole.

The process of correlation runs through the entire appraisal from beginning to end. It is a guiding principle in each of the major steps: the definition of the problem, the preliminary survey, the data program, the cost approach, the income approach, and the market data approach. In each of these major steps the data must be integrated so as to make a convincing support for the conclusion that is formed. In the end, all of the steps are correlated to reach the final estimate of value.

The scope of the final correlation is dependent upon the purpose of the appraisal, the complexity of the appraisal problem, the adequacy or inadequacy of pertinent data, and the care with which the various processing procedures have been carried out. The application of each of the three approaches results in an indicated value of the property. In theory, these three preliminary estimates would be exactly the same, *if* the appraiser had *all* pertinent data before him and carried out each step in each of the three approaches with proper care. The following sections deal in summary form with the various factors considered in the standard approaches to value.

## Review of the Cost Approach

In the application of the cost approach the appraiser has done six things:

1. He has estimated the value of the land.
2. He has estimated the cost to reproduce the structure new.
3. He has estimated in terms of dollars the amount of loss the subject structure has suffered by reason of:
  - a. Physical deterioration.
  - b. Functional deficiencies.
  - c. Adverse economic influences.
4. He has deducted the total amount of the estimated depreciation from the estimated cost of reproducing the structure new.

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5. He has by the same means estimated the depreciated reproduction cost of minor structures and land improvements (unless these latter are included in the estimated value of the land).
6. He has added the depreciated cost of the structure and other improvements to the estimated value of the land.

The value estimated by the cost approach *is* the value of the property *if*:

1. The estimated value of the land is correct.
2. The estimated reproduction cost is correct.
3. The physical deterioration and the functional and economic obsolescence have all been estimated correctly.

But the exact amount of loss due to physical deterioration in hidden parts of the structure is difficult to estimate. Equally difficult is the estimation of incurable functional obsolescence. Loss in value due to adverse economic influences cannot be measured precisely. For these reasons, the appraiser knows that his cost approach estimate must be considered as preliminary and subject to review and modification if the income or the market data approach develops value estimates which are at considerable variance with the cost approach estimate.

### Review of the Income Approach

In applying the income approach the appraiser has done seven things:

1. He has estimated the gross income, including
  - a. The potential gross income (economic rent plus services).
  - b. The effective gross income (potential less vacancy and credit loss).
  - c. The short-term surplus or excess income, if any (segregated for later treatment).
2. He has estimated the total cost of operation broken down into detailed items of expense, each one of which conforms to current operating cost standards.
3. By subtraction, he has computed the expected net income before recapture (or net before depreciation).
4. He has selected one of the three basic residual techniques which he believes to be appropriate and acceptable for use in the solution of the problem.
5. He has selected one of the basic methods of capitalizing the net income.
6. He has selected or developed a capitalization rate which he considers to be appropriate.
7. He has carried out the mathematical calculations necessary to arrive at an indication of value.

The value estimate by the income approach *is* the value of the property *if*:

1. The gross income has been accurately forecast.
2. The operating cost estimates have been made with exactness.
3. The capitalization rate is correct in all respects.
4. The correct techniques and methods have been used.
5. The mathematical processes have been without error.

There are many points in the income approach where the appraiser cannot be sure he has all the data. For this reason he knows that he must consider his estimate by

the income approach as approximate and preliminary until he has checked it and correlated it with other approaches.

### Review of the Market Data Approach

In applying the market data approach the appraiser has done five things:

1. He has found similar properties in the area for which pertinent sales, listings, offerings, and rental data are available.
2. He has qualified the prices as to terms, motivating forces, bona fide nature, etc.
3. He has compared the important characteristics of the subject property with the corresponding characteristics of each of the comparable properties, under the general divisions of time, location, and physical factors.
4. He has evaluated each of the important characteristics of the subject property in terms of the degree to which the corresponding characteristics of the comparable properties are more or less desirable.
5. In the light of the comparisons thus made he has formulated an opinion of the relative value of the subject property as a whole, or by units, compared with each of the similar properties.

The estimate of value by the market data approach *is* the value of the property *if*:

1. There is an adequate amount of market data available.
2. The relative merits and demerits of the subject property as compared with similar properties for which there is adequate data have been properly weighted.

But it may happen frequently that the appraiser cannot obtain an adequate number of comparable properties or complete enough information about these properties to enable him to make adequate comparative and weighted estimates. In such cases, his estimate by the market data approach has less weight. He will, therefore, check the indicated value by the market data approach against the results of the other two approaches before he is willing to come to a final conclusion.

### Correlating the Value Indications

The appraiser knows that whatever his final estimate of value is, it must be reasonable and capable of being convincingly supported. With this in mind he may proceed in any one of a number of different ways, depending upon his own mode of thinking and upon various aspects of the appraisal problem, to correlate his estimate. As good a way as any to start the process of correlating is to analyze and review the indicated value figures that limit the range of reasonable value. In doing so the appraiser contemplates the width of the indicated value range between the upper and lower figures in order to determine the reason for the spread between the figures.

Such a process usually involves an objective and critical reexamination of each step and phase of the appraisal process as it has been executed. At each point in his review the appraiser will ask himself such questions as: Have I been correct here;

have I given the proper weight to the factors I have considered pertinent; and have I overlooked any significant data? After completing the review of each approach he will ask himself: Am I justified in changing my preliminary estimate? Can I convincingly support another figure from the facts?

The critical review of the approaches setting the upper and lower estimates may result in bringing them closer together. Then the appraiser considers whether or not the spread is reasonable or unreasonable. He knows that somewhere within the bracket lies the figure he will finally select as the estimate of value he will report.

But before choosing this figure, he may ask himself another series of questions, such as:

1. Do the figures I have before me adequately reflect:
  - a. The effects of private and public restrictions?
  - b. The attitude of typical users of this property toward:
    - (1) Social standards and trends?
    - (2) Economic conditions and prospects?
    - (3) Political trends?
2. Which one of the three approaches do typical purchasers of this type and class of property consider most important?
3. What figure within the bracket can be most convincingly substantiated by the facts?
4. Am I, in my own thinking, leaning more toward one approach than the other two because I happen to have more reliable data for use in that approach? If this is true, am I sure that I have assembled all of the available data in the other two approaches?

The appraiser does not average the indications of value by the three approaches. He selects the one which is most applicable, and rounds to a final figure.

Finally, if applicable, the appraiser will consider any excess or deficiencies which are applicable to the particular property, and will add or subtract accordingly.

Through such a process of thinking and reasoning, keeping at all times an unbiased and impartial point of view, the appraiser finally arrives at an estimate of value which his own conscience tells him is fair and reasonable.

## Leases

LEROY C. MOSER

*Chief, Right-of-Way Division  
Maryland State Roads Commission*

The practice of leasing property is rooted in ancient history. When the Romans swept over the continent of Northern Europe and the British Isles, they introduced the practice of leasing land in these areas. Early rulers exercised absolute control over the land and apportioned it among the favored few, who thus became the lords of the land, usually with an obligation to pay some type of tribute to the ruler for the favor bestowed upon them. These lords, being able to use only a small portion of the land themselves, devised a leasing system in which the lord became the lessor and the tenant the lessee. With variations, this custom has continued until this day.

The practice of leasing property became very deep rooted in England and was carried by the English colonists to America. In this country, leases for terms of years, particularly for long terms, began to gain extensive use about the beginning of the eighteenth century in the cities of Baltimore and Philadelphia, which were settled largely by English colonists. These early American leases were the familiar "ground rents" which played such an important part in the residential real estate development in the city of Baltimore and, to a lesser degree, in Philadelphia. They were usually for a term of 99 years, and quite commonly with a clause making them renewable forever. Some of the old English leases, however, were for longer periods, which occasionally have original terms of 999 years.

Just why leases came to be made for periods of 99 years or even 999 years is uncertain. It is supposed by some that there was an old English common law that prevented the leasing of property for periods in terms of centuries, such as 100 or 1,000 years, and therefore, leases were made for a somewhat briefer period of 99 or 999 years; however, no real evidence has ever been found to substantiate this theory.

Generally speaking, any agreement entered into by an owner of land with another person to use the land is a lease. Leases may be either verbal or written and extend for varying lengths of time. They may run for a day, a month or a year; others may run for 5 years, 10 years and the ground leases, for 99 or even 999 years. Many provide for fixed terms, which are further capable of limited or indefinite extension through

renewals provided for in the lease. Many have no fixed terms, but continue on indefinitely by mutual consent or by custom or operation of law.

Although the practice of making leases is age-old and was introduced to America during colonial times, its adaptation to the needs of American cities is comparatively new. The kind of building leases which are now being written differ materially from the old-type leases, of which there are so many in England. The modern American 99 year ground lease is also a much more elaborate and comprehensive document than any conceived up to 30 or 40 years ago and it is being constantly refined and enlarged to care for new problems which appear.

All States have laws governing leases. Any person making a lease, appraising a leased property, or carrying out any function involving a lease, should first be familiar with the laws of the State that govern the relationship between landlord and tenant. The laws of most States provide that a lease for more than one year must be in writing to be valid. Another common requirement for validity is that they must be recorded if the life of the lease is greater than a certain specified length of time. A few States, however, permit oral leases for longer periods than one year. In Maryland, for example, leases for more than three years must be in writing to be valid and, if for more than seven years, must also be acknowledged and recorded, like deeds, in the office of the county circuit court clerk, or, if located in Baltimore City, in the office of the Clerk of the Superior Court for records in that city.

#### DEFINITIONS

Basic to an understanding of leases is a clear conception of the meaning of terms used in connection with this contractual relationship between the owner of the property and the person to whom he transfers the use thereof. The owner is the landlord and the user is the tenant. Following are some of the major terms used in this relationship and their generally accepted definitions.

*Bonus value* — The value of any rental in excess of the rent reserved in the lease which the tenant could obtain if he sublet the premises on the open rental market. It is the difference between the lease rent (contract rent) and the rent being paid by other tenants for comparable space in the vicinity of the subject lease (economic rent). If a tenant is paying a lower rent under a lease than the rent being paid by tenants in a competitive market for comparable space in a given area, then the subject lease has a *bonus value* for the unexpired term of the lease. This is calculated on a present worth value. Conversely, if the tenant is paying a higher (or equal) rent than that which is being paid competitively by other tenants in the area for comparable space, then the lease has no bonus value.

*Contract rent* — The amount of rent provided for under the terms of the lease; the actual rent that is agreed to be paid. In the written lease it is specifically set

forth as one of the terms; and under an oral rental agreement, if the amount can be proven, it likewise is considered contract rent.

*Economic rent* — The amount of rent that could be reasonably expected if the property were available for rent. It is a fair, proper, and reasonable rental which would result from informed, intelligent, and prudent bargaining in the usual course of business.

Contract rent often differs from economic rent although the former usually tends to approximate the latter at the time the lease is made. However, as time elapses and economic conditions change, their respective values often spread apart. Usually, in a rising economy, the economic rent will rise above the contract rent and during depressions, the economic rent may fall below the contract rent. If the contract rent is equal to, or more than the economic rent, then the lease is said to have no bonus value; but when the economic rent exceeds the contract rent, then, and only then, does the lease have a bonus value.

*Economic life* — The estimated period over which it is anticipated that a property may be profitably utilized. It is the period over which a property will yield a return on, and a return of, the investment over and above the economic rent due to land. This period can never exceed the physical life of the improvements erected on the land and most generally is shorter than their physical life.

*Effective age* — The number of years of age that is indicated by the condition of a building. If a building has been maintained better than average, its effective age is less than its actual age and if it has been inadequately maintained, its effective age probably will be greater than actual age.

*Fair rental value* — The monetary amount reasonably expected for the right to use of the real estate. It may be expressed as an amount per month or other period of time, or per room, per front foot, per square foot, or other unit of property. Usually, it is established by competitive conditions. It is synonymous with economic rent.

*Freehold* — The unencumbered fee simple property, free of any division of interests.

*Gross lease* — A lease of property whereby the lessor is to meet all property charges regularly incurred through ownership.

*Ground lease or ground rent* — The payment made for use of unimproved land; usually, though not necessarily always, on a basis which is completely *net* to the owner.

*Lease* — A contract, written or oral, for the possession of lands and tenements by one party with a recompense of rent or other income by the other party. It is a contract by which one person divests himself of real property and another person takes possession thereof for a determinable and limited time, though not necessarily stated as a period of time.

The term lease, as used in this chapter, usually refers to a written instrument or contract, binding the owner or lessor, and the tenant or lessee, to fulfill certain covenants or agreements. The tenant's interest created thereunder is known as a leasehold estate equity, but is commonly referred to as a leasehold. The lessor's interest is referred to as a leased fee estate, or fee owner's interest and more commonly as a leased fee. An oral agreement is usually referred to as a rental agreement.

*Lease assignment* — The lessee assigns and the new lessee assumes all of the terms of the original lease. The original lessee is relieved of further responsibility and the rent is paid by the new lessee direct to the original lessor.

*Sublease* — This term designates a second lease instrument, when an original lessee re-leases to a new tenant. The original lessee becomes the holder of a sandwich lease and the new lessee the holder of a sublease.

*Lessor* — One who rents real property to another or one who conveys or leases the right of use of real estate to another, the landlord. He usually is the fee owner, but not always, for example a lessee who subleases to another party. The original lessee then also becomes a lessor and the owner of a sandwich lease interest. The lessor's interest is known as the leased fee.

*Lessee* — One who acquires the right of use of the property of another. He is the one to whom the lease is granted or the property is rented under the lease. The lessee's interest is known as the leasehold.

*Leased fee or lessor's interest* — The title to real estate subject to a lease, or a property held in fee with the right of use and occupancy conveyed under a lease to others, with the right to receive rentals over the period of the lease and then ultimately repossess the real estate. The landlord's or lessor's interest is referred to as the leased fee estate, or the fee owner's interest, or more commonly, as the leased fee.

Upon the consummation of a lease, the fee holder becomes the lessor, the possessor of a leased fee estate or a lessor's interest. He is now the holder of two different properties:

- (1) The lease and the income it commands; and
- (2) The title to the fee subject to the lease, which includes the right to recover the property at the expiration of the lease; the reversion.

This interest, therefore, consists of:

- (1) The present worth of the future net rents.
- (2) The present worth of the value of the improvements, if any, at the end of the term of the lease; and
- (3) The present worth of the land at the end of the term of the lease.

*Leasehold or lessee's interest* — A property held under tenure of a lease, consisting of the right of use and occupancy of real property by virtue of a lease agreement.

It is the right of a lessee to use and enjoy real estate for a stated period of time and upon certain conditions, such as the payment of rent. This is the tenant's or lessee's interest, and it is referred to as a leasehold estate equity, but more commonly as a leasehold.

The lessor conveys to the lessee the right to occupy and use the property for the term of time specified in the lease. For this privilege the lessee agrees to pay the lessor the rent specified and also promises to fulfill the various terms and conditions contained in the lease contract. The lessee is now the possessor of certain definite interests in the real property, the primary ones being the right to possession of the property, and the right to collect profits in the form of the excess of any net gain over expenses during the term of the lease. With the signing of the lease, the tenant becomes the lessee and the owner of a leasehold interest that consists of:

- (1) The bonus value in the lease, if any, if the lessee is paying less than the economic rent; and
- (2) The present value (not cost) of improvements owned by the lessee.

*Net lease* — A lease under which the lessee assumes complete responsibility for the operation of a property, including the obligation of operating expenses, and all charges, including taxes, insurance, replacements, and any special assessments.

*Net ground lease* — A lease of unimproved land which provides that the lessee assume all property charges, including charges against land and improvements to be constructed by the lessee.

*Rent* — The payment for the right of use and occupancy of a property.

*Reversion* — The right to repossess and resume the full and sole use and proprietorship of real property which has been temporarily alienated by lease, easement, or otherwise. According to the terms of the controlling instrument, the reversionary right becomes effective at a stated time or under certain conditions such as the termination of a leasehold, abandonment of a right-of-way, or at the end of the estimated economic life of the improvements.

*Surplus income* — A surplus income is an excess rent which a landlord or lessor enjoys over and above the fair rental value when contract rent exceeds economic rent.

Surplus income may arise because of temporary shortage of similar properties, excellent management, a monopoly, or a rapidly increasing rent. The income from a lease of this type should be divided into two amounts before processing into a capitalized value, the amount representing the fair rental value, and the surplus income above the fair rental value. This surplus income should be capitalized at a higher rate because of the risk involved in the collection.

The following factors must be considered when processing surplus income:  
(a) Amount of income; (b) duration; and (c) the credit behind it. The greater the

amount of surplus income, the longer the unexpired term of the lease, and the poorer the credit of the lessee, the greater the risk will become, requiring a higher capitalization rate that should be used in processing the surplus income.

#### TYPES OF LEASES

Leases can be made for either short or long terms, as duration has no effect upon the terms of the lease other than to set the length of time that the terms will apply. The four basic and commonly accepted types of leases are:

- (1) The flat or ungraded lease.
- (2) The graded or step-up lease.
- (3) Revaluation leases, in which new rentals are periodically established.
- (4) Percentage leases on which gross sales serve to establish rental values.

Any of these four types of leases can be made for either vacant land or land that has already been improved with a building. When improved, the contractual rights of the lessor and lessee are subject to somewhat different conditions than those when the lease merely involves the rental of land. These matters are, of course, all provided for by the terms of the lease which establishes the rights and obligations of lessor and lessee.

Another type of lease, which is not often used is the so-called "index-lease." As in the case of the percentage lease, it is another instrument used by the lessor to protect himself against the future. A recognized national index of the value of the dollar is usually used as the basis of the rental payment with rental adjustments being made at designated periods in accordance with this index.

#### Flat or Ungraded Lease

The flat or ungraded type of lease provides that the lessee pay a fixed monthly, semiannual or annual rental for the entire term of the lease. It has been, and probably always will represent, the fairest and most satisfactory type of lease. Any subsequent increase in the earnings of the property, over and above the value of current rental value, are not participated in by the lessor, but remain the property of the lessee. This is as it should be, as the lessee takes most of the risk, usually furnishing the money with which to improve the property, pay the taxes and, through his management and effort, makes the property produce.

#### Graded or Step-up Lease

The graded or step-up type of lease provides that the rental shall be increased or stepped up at the end of various stipulated periods in the future. This type of lease is usually brought about by the insistence of the lessor to participate in expected future

increased earning power of the property. This type of lease may be entered into in order to provide a lower rental during the early life of the lease to enable the lessee to build up his business, become established and lessen the possibility of failure. The rate of mortality of this type of lease is higher than for any other type, because of their speculative nature. The step-ups in rental are often too ambitious especially when they are made during good times and the business outlook is good. However, when a recession or depression strikes, the lessee finds himself paying a peak and often exorbitant rent for the current economic conditions.

Although seldom used, there is a reverse or step-down type of the step-up lease, which provides for higher rents during the first periods of the lease and lower rents during the latter periods. Usually, these leases are made for a special kind of improved property that it is anticipated will produce more stable and greater income when the improvements are new and that the income will decline rapidly as the structure ages.

#### Revaluation Lease

The revaluation lease is another form of lease that is usually dictated by the lessor as an effort on his part to participate in future increase in the economic value of the property by increased rentals. This type of lease usually provides for a flat rent for the initial period and then every five, ten or fifteen years, or at other similar intervals of time, the property shall be revalued, usually by appraisers or arbitrators, and a new rental shall be based upon this valuation. This type of lease is seldom made as it is usually not advantageous to either the lessor or the lessee.

Difficulty usually ensues in arriving at the new appraised value and the establishment of the new rent. The lessee is always reluctant to spend money to improve the property and it is almost impossible to finance improvements under such lease conditions as mortgage and lending agencies usually shy away from them. Invariably, the lessee no sooner reaches a stage where he begins to enjoy a fairly nice profit, then the property is snatched from him by the lessor who demands a higher rental.

#### Percentage of Gross Sales Lease

The percentage, or percentage of gross sales lease, is one that has developed rapidly in recent years. It provides for the lessee paying, as rent, a stipulated percentage of the gross sales actually made on the premises. Usually, the lessor receives five to ten percent of the gross receipts. Often, these lease agreements contain minimum rental clauses, representing from fifty to seventy-five percent of the fair or current rental value, which serves to protect the lessor with at least a small guaranteed investment return in case the business venture does not enjoy anticipated success. Some percentage

leases made to large organizations with proven sales records often contain no minimum rental provision. These can be very hazardous to the lessor, and there is often a recapture clause which will go into effect in the event reasonable revenue returns are not paid for the premises. In this type of lease, the percentage rate will often vary for different types of businesses, as various retail businesses can afford to pay differing percentages, because of their fluctuating operational costs and different mark-up on their sales or services.

If the percentage rental is fair by comparison with the rental normally paid by business of the particular type, such leases will tend to produce the economic rental value of the property. However, operating costs and margins of profits often change and percentage leases, therefore, may produce more or less than the current economic rental value of the real estate. This type of lease seems to enjoy most popularity among the large chain stores, gasoline companies and similar organizations.

#### **Sandwich Lease**

The leasing of a property does not always terminate with the original lessee. Often, the original lessee subleases to a third party, in which case the interest of the original lessee becomes known as the sandwich lease interest, because it lies between the interest of the original lessor and that of the sublessee. The original lessee, or sandwich party, then becomes the lessor to the sublessee. Occasionally, there is still further subleasing which complicates the interests more.

Ordinarily, a sandwich lease involves the subletting of the entire premises, so that the prime or first lessee is no longer the occupant; however, he is still obligated to the original lessor as per the terms of the original lease. Usually, there is a bonus value in a sandwich lease which pays the prime lessee for his lease equity.

#### **Short Term or Long Term Leases**

Leases are usually spoken of as being long term or short term leases. This implies that there is a specific time period which divides all leases into these two groups. As a matter of fact, however, there is no such dividing line. For example, it is customary for the tenants in an apartment house to lease for a period of one year. A 3 or 5 year lease for an apartment would be considered a long term lease. By comparison, a 3 to 5 year lease for a store or other business place would be considered as a short term, rather than a long term lease, which would be for 10 to 25 years. Just where a short term lease ends and a long term lease begins cannot be definitely stated. In real estate parlance, leases are usually classified as short term if they are for periods of less than 10 years and as long term when they are for periods of from 10 to 99 years and more.

## INCOME CAPITALIZATION

It is essential in the appraisal of leasehold estates that the appraiser be familiar with capitalization of income into value and particularly the theory and use of compound interest annuity tables.

All leases involve the matter of future rental payments. It becomes necessary in any appraisal to weigh these payments and calculate their value. The fact that a property is leased for 25 years at \$1,000 annually certainly does not mean that the value today of the right to collect this sum over the next quarter century is worth \$25,000. Deductions must be made for loss of interest. One dollar due 12 months hence, at six per cent, is worth approximately 94 cents today. Consequently, \$1,000 collectable a year hence, is worth \$943.40 today; two years hence, \$890.00; three years hence, \$839.62; and decreasing proportionally as the years increase. Conversely, an investor seeking a six per cent investment can afford to invest \$943.40 today for the privilege of collecting \$1,000 one year hence; \$890.00 for two years hence; and \$839.62 for three years hence. This explains briefly the theory of the present worth of future payments. It is an interest discounting process of compounding order, and it is often referred to as the capitalization or annuity approach.

Capitalization is a procedure in the appraisal process by which the value of real property can be estimated from the *quantity*, *quality*, and *duration* of its net income expectancy. It is the process of determining the value of a property through the use of an interest rate which is believed to represent the proper relationship between the value of the property and the net income it will produce.

There are two kinds of capitalization: the first is capitalization in perpetuity, which is the application of a rate to income or value that does not include an allowance for recapture of the improvements placed on the land; and the second, a capitalization for a limited period of time is the application of a rate to income or value that includes both interest on, and recapture of, the value of the improvements placed on the land. The first rate is an interest rate and the latter is more properly referred to as a capitalization rate.

Capitalization of income in perpetuity, involving no return of the investment, is a simple matter of translating income into value by dividing the income by the interest rate. However, capitalization involving the recapture of the investment in improvements can take a variety of patterns as to the method of handling the recapture. It can be on a straight line basis, i.e., the return of an equal amount each year for a set number of years until the whole is recaptured; it can be on a declining basis, an increasing basis, or a funding with interest basis. When capitalizing income into value including the recapture of capital, although there are a number of methods used, the best known and most frequently used methods are: (1) Straight Line Capitalization, (2) Straight Line Capitalization with Sinking Fund Recapture, (3) Inwood

Compound Valuation Premise, and (4) Hoskold Sinking Fund Valuation Premise. The latter two, Inwood and Hoskold, are annuity premises.

An annuity is a series of periodical payments, usually, although not necessarily, equal in amount and made at equal intervals of time, such as annually or semiannually. In the appraisal process of the today market value of the annuity, it becomes necessary to translate these future payments, which are merely reflections of value, into their present worth. This is accomplished by means of a discounting process wherein the future amounts receivable are discounted for interest.

Actually, either the Inwood or Hoskold Premise could be applied in processing the income from leased properties; however, from an examination of the following tabulation of the characteristics of the two straight line methods and the two annuity methods, it should become apparent that lease income, (except for very short term leases) has more of the characteristics of the two annuity premises than the two straight line premises and that it is more closely related to the characteristics of the Inwood Premise than to the Hoskold Premise.

These characteristics are as follows:

1. In respect to behavior of net income before depreciation:
  - a. The straight line method is based on declining income.
  - b. The straight line with sinking fund recapture method is based on moderately declining income.
  - c. The Inwood premise is based on level or contract income.
  - d. The Hoskold premise is based on level income.
2. In respect to recapture:
  - a. The straight line method calls for regular equal installments.
  - b. The straight line with sinking fund recapture method calls for equal but less than pro rata installments, with the deficiency made up by funding the recapture at interest.
  - c. The Inwood premise calls for initially small installments increasing in size.
  - d. The Hoskold premise calls for equal but less than pro rata installments, with the deficiency made up funding the recapture at interest.
3. In respect to interest:
  - a. The straight line method calls for interest on the outstanding unrecaptured portion of the investment.
  - b. The straight line with sinking fund recapture method calls for interest on the portion not yet recaptured in the fund.
  - c. The Inwood premise calls for interest on the outstanding unrecaptured amount of investment, except that the outstanding amounts are larger than in the case of straight line method.
  - d. The Hoskold premise calls for interest on the original investment.

Where a lease is of very short term and the durability is not substantial enough to warrant the characteristics of an annuity, then straight line capitalization is appropriate.

At this point, it would be well to mention that the Inwood Premise will produce the higher value, the Straight Line with Sinking Fund Recapture Method and the Hoskold Premise (identical results) the intermediate value and the Straight Line Method, the lowest value. This order of production is in accordance with the inherent assumptions, and risks of the several premises. The Inwood Annuity Premise being the most stable and more gilt edge, so to speak, it naturally follows that good, well-secured lease income falls in this category. It represents one of the most stable and soundest types of real estate investments.

#### Use of Annuity Factors

Annuity tables provide for payments at the end of the given period, as for example, at the end of the year. In projecting income into capital value, the base of capitalization under normal circumstances is the annual net income after it has been received. Therefore, when payments are made in advance, or half yearly, or monthly, the factors as found in the annuity tables must be adjusted to meet the conditions.

As an illustration, assume that the annual net rental of a property is \$1,600, the term of the lease is 10 years, and the applicable interest rate is 6 percent. Based on these facts, the following computations will show the difference in treatment of the income stream, on an annual, semi-annual, and monthly basis, as well as advanced and at the end of the period payments.

*Annual payments* — The Inwood factor for the present worth of \$1.00 per annum, payable for 10 years, discounted at 6 per cent, is 7.360. To compute the factor for the present worth of \$1.00 per annum, payable in advance for 10 years, discounted at 6 per cent, it is necessary to determine the factor for 9 years from the tables and add 1.000.

Inwood Factor for present worth of \$1.00 per annum for 9 years, discounted at 6 per cent, is .....	6.802
Plus.....	<u>1.000</u>

Inwood Factor for present worth of \$1.00 per annum for 10 years, discounted at 6 per cent, payable in advance, equals ..	7.802
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#### RENT PAYABLE AT END OF PERIOD—ANNUALLY

\$1,600 x 7.360 = .....	\$ 11,776
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#### RENT PAYABLE IN ADVANCE—ANNUALLY

\$1,600 x 7.802 = .....	\$ 12,483
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*Half-yearly payments* — Instead of 10 annual payments of \$1,600, the rent will be in 20 half yearly payments of \$800 each.

Interest at 6 per cent divided by 2, equals 3 per cent.  
 Inwood Factor for present worth of \$1.00 per annum for  
 20 years, discounted at 3 per cent, is 14.877.

Inwood Factor for present worth of \$1.00 per annum for 19  
 years, discounted at 3 per cent, equals ..... 14.324  
 Plus..... 1.000

Inwood Factor for present worth of \$1.00 per annum for  
 20 years, discounted at 3 per cent, payable in advance, equals 15.324

RENT PAYABLE AT END OF PERIOD—HALF-YEARLY

\$800 x 14.877 = ..... \$ 11,902

RENT PAYABLE IN ADVANCE—HALF-YEARLY

\$800 x 15.324 = ..... \$ 12,259

*Monthly payments* — Instead of 10 annual payments of \$1,600, the rent will  
 be in 120 monthly payments of \$133.33 each.

Interest at 6 per cent divided by 12, equals 1/2 per cent.  
 Inwood Factor for present worth of \$1.00 per annum for  
 120 years, discounted at 1/2 per cent, is 90.073.

Inwood Factor for present worth of \$1.00 per annum for  
 119 years, discounted at 1/2 per cent, equals ..... 89.524  
 Plus..... 1.000

Inwood Factor for present worth of \$1.00 per annum for  
 120 years, discounted at 1/2 per cent, payable in advance,  
 equals ..... 90.524

RENT PAYABLE AT END OF PERIOD—MONTHLY

\$133.33 x 90.073 = ..... \$ 12,009

RENT PAYABLE IN ADVANCE—MONTHLY

\$133.33 x 90.524 = ..... \$ 12,069

Thus, it can readily be seen that leases providing for advance payments are  
 technically worth more than those that provide for payments at the end of the rental  
 period. Likewise, monthly, and half-yearly rentals are worth more than annual rentals.  
 In practice, however, the tendency is to consider the income as if received once a year  
 and at the end of the year. Even if rentals are received monthly or half-yearly, there  
 is bound to be a time lag between receipt of funds and their reinvestment; and since  
 the appraisal process is not an exact science, the extra time consuming calculations  
 are seldom warranted.

**Lessor's and Lessee's Interests in Leased Property**

An undivided ownership of a parcel of property embraces a great number of  
 things, among which are the right to its occupancy and use, the right to sell in whole  
 or in part, the right to transfer by bequeath, and the right to transfer by contract for a  
 specific period of time, and to reserve to one's self all or part of the benefits derived

from occupancy and use of the real estate. These various rights and privileges are known as the bundle of rights concept of real property ownership.

An owner who leases real estate transfers one of these basic rights to another party in accordance with the provisions of the lease contract. He retains for himself all other rights in the bundle. Upon the signing of the lease, there are two separate and distinct interests in the property, that of the landlord or lessor and that of the tenant or lessee. The lessor's interest constitutes what is known as a leased fee estate and the lessee's interest that of a leasehold estate.

The rights and interests of the lessor and lessee are briefly as follows:

1. *Lessor's interest—leased fee*

- a. The right to collect the contract rent provided for in the lease.
- b. The right to repossess the property at the end of the lease term.

This is the total of his interest, and the measure of its value is as follows:

- a. The present worth of the future net rent returns under the terms of the lease; and
- b. The present worth of the property at the end of the lease, which is called the reversionary value. This reversion is subject to any building adjustment clauses pertaining to fixtures, etc., which may be provided for in the lease agreement, if any.

2. *Lessee's interest—leasehold*

- a. The right to occupy and use the property for the duration of the lease;
- b. The right to any profits from the property over and above the contract rent provided for in the lease; and
- c. The obligation to surrender the property at the termination of the lease.

This is the total of his interest, and the measure of its value is as follows:

- a. The present worth of the difference between the economic rent and the contract rent, if the latter is the lower, for the unexpired term of the lease, including any options of renewal. This is also known as the "bonus value" in the lease.
- b. The present value (not cost) of the improvements, constructed by the lessee; and
- c. The present value of any improvement adjustments in favor of the lessee at the end of the lease term for fixtures, etc., attached to the improvements by the lessee and not required to be left for the lessor, as provided for in the terms of the lease, or operation of law.

In order for the lessee to have a valuable interest in a leased property, it is essential that he could sublet the property for a higher rent than that which he is obligated to

pay under the terms of the lease, or that he has made valuable improvements to the property. Expressed another way, the market value, or bonus value, of a lease is the amount that a lessee could obtain as a bonus rental, if he made a sublease.

#### EFFECT OF VARIATION IN CONTRACT AND ECONOMIC RENT ON LESSOR'S AND LESSEE'S INTERESTS

##### **When Contract Rent and Economic Rent are Equal**

When real estate is currently leased at its fair rental value, contract rent and economic rent are the same. Under these circumstances, the lessee has no marketable interest in the property and the leasehold estate cannot be sublet at a profit. In such case, the leased fee estate or lessor's interest constitutes the entire fee simple market value of the property.

##### **When Economic Rent Exceeds Contract Rent**

When economic rent exceeds contract rent, a positive leasehold estate or positive lessee's interest is created. Under these circumstances, the leasehold estate is said to have a bonus value, to the extent that the lease can be sublet at a profit. The lessor has, in fact, conveyed to the lessee an extra portion of his valuable property rights and his leased fee estate is reduced in value proportionally. When economic rent exceeds contract rent, the sum of the lessor's and lessee's interest tends to equal the fee simple value of the property as if no lease existed. However, although the sum of the two cannot be worth more than the fee simple value of the property, it can be worth less.

A lease is a contract in which the property rights are divided between lessor and lessee, in accordance with the terms of the lease. These terms may adversely affect either the lessor's or lessee's interest. They may restrict the utilization of the property to the fullest extent and reduce its productivity both now and for the duration of the lease. Such circumstances can render the combined market value of the lessor's and lessee's interest less than the fee simple market value, as if the lease did not exist.

##### **When Contract Rent Exceeds Economic Rent**

When contract rent exceeds economic rent, a negative leasehold estate or lessee's rent liability is created. The lessee, by virtue of the contractual obligation created by the lease instrument, is liable for payment of the surplus rent, even though he in reality is receiving no value for these excess payments. Under these circumstances, the market value of the combined lessor's and lessee's interests can be and usually are more than the fee simple market value of the property. The property is then composed of both tangible and intangible parts. There is now something more than real estate which is a physical thing composed of land and improvements. We have an added component of an

abstract nature. The two embrace the "real property" concept, that property rights may attach to tangible things, such as real estate and also to intangible things, such as the existence of a lease favorable to the lessor. This excess value is not assignable to either land or buildings, but to the third element of value, the favorable lease.

When contract rent exceeds economic rent, the lessee may possibly default. Legal proceedings to compel payment of the rent may result, or an adjustment in the rent may be agreed upon between lessor and lessee as the only practical solution. However, in the case of a financially strong lessee the situation can be quite different. He probably will not default and will voluntarily meet the contract rent payments, and if he should not, it is almost a certainty that the rent can be collected as a result of legal proceedings, if necessary.

As an example of real property market value, assume two identical properties that are located adjacent to each other and enjoy the same advantages of location. The land areas of both are identical in size, shape and other features. The buildings on each are identical in all respects. Both were constructed ten years ago and both are considered to have a remaining economic life of 40 years. The highest and best use of both properties is the same. The land value of each is well established at \$50,000, through comparable sales. Economic rent for each is well established at \$15,000 per year, net, by comparison with comparable rentals. One of the properties was leased 10 years ago at \$18,000 per year, net, for a term of 50 years. The other property is not presently subject to a lease. A fair rate of return for both land and building is considered to be 6 per cent. A reasonable and fair rate of return on the surplus rent, because of the uncertainties and hazards involved, is considered to be 12 per cent.

*First property—not subject to lease*

Net income to property before recapture .....	\$ 15,000
Less return on land	
\$50,000 x 6% = .....	3,000
Residual net income imputable to building (before recapture) .....	\$ 12,000
Interest .....	— 6%
Recapture .....	— 2½% (40 yr. R.E.L.)
Capitalization rate — 8½%	
Building Value—	
\$12,000 ÷ 8½% = \$141,176, Say .....	\$140,000
Plus land value .....	50,000
Fee simple market value of property (not subject to surplus contract rent) .....	\$190,000

*Second property—subject to lease*

Land (real estate) .....	\$ 50,000
Building (real estate) .....	140,000
Excess value (Intangible) due to excess contract rent of \$3,000 per year for 40 years.	

The present worth of the income stream:

The P. W. of \$1.00 per annum for 40 years, discounted at 12%, is 8.244

Then \$3,000 x 8.244 = \$24,732, Say ..... 25,000

Total market value of property (subject to surplus contract rent) .... \$215,000

The second property has neither a higher land value nor higher building value. It does, however, have a higher market value due to the fact that there is attached to the ownership the right to an extra \$3,000 per year, net rental over and above the current economic rent. The entire market value of the property is a part of the interest of the lessor, with the lessee's position being not only devoid of market value, but conversely the lessee has a rent liability to the extent of the present value of the excess rent, which he is obligated to pay under the terms of the lease.

In cases where only the land is leased, usually under a long term lease, and the lessee has constructed a building on the premises, and the contract rent exceeds the economic rent for the land, the current surplus contract rent may cause the lessor's interest to encroach upon the value of the building. As an example of this situation, assume a property subject to a long term ground lease with a contract rent of \$5,000 per year, net. The lessee has constructed a commercial building and he operates the real estate, which produces for him a net income, before building recapture, of \$10,000 per year over and above his rent obligation and all other expenses of operation. Assume further that the land has a present value of \$50,000, if vacant, for its highest and best use, as substantiated through comparable sales. It is further assumed that 6% represents a fair rate of return on the current land value.

Under these circumstances, if the real estate were not subject to the lease, the return on the building investment over and above the economic rental value of the land would be as follows:

The present annual net income (before recapture) .....	\$10,000
Economic annual rental value of the land—\$50,000 x 6% = .....	3,000
Balance imputable to building (before recapture) .....	\$ 7,000

However, the lessee who owns the building does not own the land. He has possession under a long term net ground lease at \$5,000 per year which results in a balance imputable to the lessee's building as follows:

The present annual net income (before recapture) .....	\$10,000
Contract rent as per ground lease .....	5,000
Balance imputable to lessee's equity in the building .....	\$ 5,000

Therefore, the lessee is paying \$2,000 of his \$7,000 annual building income to the lessor. In effect, the lessor's interest not only embraces a return on his land but also a return on a substantial portion of the building, which was erected and paid for by the lessee.

Conversely, when unimproved land is leased for less than its current economic rent and the lessee erects a building thereon, his interest consists not only of the value of the building but also embraces an interest in the value of the land.

If, in the previous example, the contract ground lease had been \$2,000 per year, net, the lessee's interest would be as follows:

The present annual net income (before recapture) .....	\$10,000
Contract rent as per ground lease .....	2,000
Balance imputable to the lessee's interest in the building and part of the land .....	\$ 8,000
Less income imputable to the building (before recapture) .....	7,000
Balance imputable to the lessee's interest in the land .....	\$ 1,000

Since the land value is \$50,000 and 6% is the accepted rate of return on the land, the lessee's interest of \$1,000 per year in the land represents one-third or \$16,666 of the land value. This is in addition to the value of the building.

#### INTEREST RATES APPLICABLE TO LESSOR'S AND LESSEE'S INTERESTS

Interest rates applicable to a leased fee or lessor's interest tend to correspond to first mortgage rates, and rates for a leasehold or lessee's interest are the counterpart to equity rates. Accordingly, it follows that if the original lessee subleases to a third party, the sublessor's interest, which is known as the sandwich lease, has risk characteristics of a second mortgage and the applicable interest rate would have a similar position.

For example, if it is determined that 6% is appropriate to attract capital to a given well secured leased fee, then, after considering all factors, it may be appropriate to assign an 8% rate to the leasehold interest. On the other hand, if a sandwich lease were involved, a rate in between would be appropriate for this interest, since that interest is not as secure as the leased fee and better secured than the leasehold, and enjoys the in-between position.

Said another way, if the interest rate necessary to attract investors to invest capital in land and buildings as a unit is 7%, then it may be found that the lessor's interest, being the land under most circumstances, may be capitalized at 6% and the lessee's interest, being the building under most instances, may be capitalized at 8%.

If the lessee has a favorable ground lease, that is, if his contract rent is less than the economic rent, and his lease has a bonus value, then the rate applicable to the lessee's interest in the land would be processed at the same rate as that applicable to the lessor's interest.

These comments are intended only as extremely general guides. The appraiser, when selecting the applicable rates, should weigh all the risks involved and whenever possible go to the market to obtain the rates that are being paid in transactions between buyers and sellers.

Lessor's Interest (Leased Fee)

*Examples* — Assume that a parcel of vacant land was leased on January 1, 1950, for a term of 99 years, at a net rental of \$9,000 per year; that 6 percent is a fair rate of return on the lessor's income and it is desired to know the value of the lessor's interest as of January 1, 1962, further assuming that the land has a value of \$150,000 at the time of the appraisal.

Based upon these conditions, the value of the lessor's interest is as follows:

EXAMPLE I

- (1) The present worth of the income stream:  
 The P. W. of \$1.00 per annum for 87 years,  
 discounted at 6 percent, is 16.562.  
 Then \$9,000 x 16.562 = .....\$149,058
- (2) The present worth of the reversion:  
 The P. W. of \$1.00 (a single payment) collectable  
 87 years hence, discounted at 6 percent, is 0.006.  
 The value of the land in 87 years is assumed to be  
 \$150,000 (\$9,000 divided by 6 percent).  
 Then \$150,000 x 0.006 = ..... 900

VALUE OF LESSOR'S INTEREST = ..... \$149,958, or \$150,000

However, if \$200,000 were assumed to be the land value at the time of the appraisal and all other conditions were as stated in Example I, then the value of the lessor's interest would be as follows:

EXAMPLE II

- (1) The present worth of the income stream:  
 Same as in Example I ..... \$149,058
- (2) The present worth of the reversion:  
 \$200,000 x 0.006 = ..... 1,200

VALUE OF LESSOR'S INTEREST = ..... \$150,258, or \$150,000

Then, if the facts were as stated in Example I, excepting that the land value at the time of the appraisal was \$100,000, then the value of the lessor's interest would be as follows:

EXAMPLE III

- (1) The present worth of the income stream:  
 Same as in Example I ..... \$149,058
- (2) The present worth of the reversion:  
 \$100,000 x 0.006 = ..... 600

VALUE OF LESSOR'S INTEREST = ..... \$149,658, or \$150,000

The three examples show that the value of the lessor's interest is made up almost entirely from the income stream and the land reversion is rather insignificant. In fact, if the assumed value of the land at the time of the reversion were 100 percent

in error, it would not affect the total value of the lessor's interest by more than one percent; similarly, the reversion would have only a present worth of about five cents on the dollar, if it were 50 years hence and only about ten cents on the dollar if it were 40 years hence. This demonstrates that the reversion portion of the lessor's interest is negligible in long term leases that still have the greater portion of their term to run.

#### Lessee's Interest (Leasehold)

*Examples* — As an illustration, continue with Example I given before in explaining the lessor's interest. This constitutes the same vacant lot, leased on January 1, 1950, for a term of 99 years, at a net rent of \$9,000 per year, with an assumed land value of \$150,000 and 6 percent as a fair rate of return. In this case, the lessee is paying the full amount of the fair ground rent ( $\$150,000 \times 6 \text{ percent} = \$9,000$ ) and the leasehold, therefore, has no bonus value, and the lessee's interest is zero. It is further assumed that the lessee in this case has not erected any improvements on the leased premises and therefore has no improvement value.

However, if this problem is now modified so that the assumed land value at the time of the appraisal is \$200,000, and as a consequence, the fair rental value (economic rent) is \$12,000 per year ( $\$200,000 \times 6 \text{ percent}$ ), then, since the obligation as set forth in the lease is \$9,000 (contract rent) per year, it follows that the lessee has a plus margin of \$3,000 per year or "bonus value" of this amount for the duration of the lease, which has 87 years yet to run. For the purposes of this illustration, again assume that the lessee has not made any improvements on the leased premises. Then, in this event, the lessee's interest or "bonus value" would be as follows:

#### EXAMPLE I

The present worth of the bonus rent:

The P. W. of \$1.00 per annum for 87 years, discounted at 6 percent, is 16.562

Then  $\$3,000 \times 16.562 = \$49,686$

By reference to the previous examples when explaining the lessor's interest and using a \$200,000 land value, it was found that the lessor's interest was \$150,258. Then the respective interests of the lessor and lessee would be as follows:

VALUE OF LESSOR'S INTEREST . . .	\$150,258
VALUE OF LESSEE'S INTEREST . . .	<u>49,686</u>
TOTAL VALUE OF PROPERTY . . . .	\$199,944, or \$200,000

If the lessee had made any improvements on the leased premises, the present value (not cost) of such improvements would be added to his interest.

Again use the same data as in Example I, under the explanation of the lessor's interest, but assume that the fair rental value of the leased premises is only \$6,000 per year (6 percent  $\times$  \$100,000). The contract rent, however, is \$9,000 per year, which the

lessee is obligated to pay for the remaining 87 year duration of the lease. Then, instead of the lessee having a bonus value in the lease, he has a \$3,000 per year rent liability for the remaining 87 year duration of the lease. This liability would be discounted on a present worth basis, at the rate of normal expected fair return, which in the example has been set at 6 percent. In the event the lessee should have constructed any valuable improvements on the leased premises, the rent liability would be subtracted from the value (not cost) of these improvements, in figuring the lessee's interest. Expressed another way, when a lessee obligates himself under a lease on vacant land to pay more than the fair rental value of that land, and he subsequently erects improvements thereon, he has no equity in his improvements up to the present worth of the rent deficiency. This portion of the building value is part of the lessor's interest, by virtue of his advantage in the lease.

In this example, if it were assumed that the lease is adequately secured, that the lessee is financially strong enough so that it would be expected that the contract rent obligation would be paid throughout the remaining 87 year duration of the lease, then the respective interests of the lessor and lessee would be as follows:

**EXAMPLE II**

*Lessor's interest (leased fee)*

- (1) The present worth of the income stream:  
 The P. W. of \$1.00 per annum for 87 years, discounted at 6 percent, is 16.562.  
 Then \$9,000 x 16.562 = ..... \$149,058
  - (2) The present worth of the reversion:  
 The P. W. of \$1.00 (a single payment) collectable 87 years hence, discounted at 6 percent, is 0.006.  
 Then \$150,000 x 0.006 = ..... 900
- VALUE OF LESSOR'S INTEREST = ..... \$149,958

*Lessee's interest (leasehold)*

- The present worth of the rent liability stream:
- (1) The P. W. of \$1.00 per annum for 87 years, discounted at 6 percent, is 16.562.  
 Then \$3,000 x 16.562 = \$49,686
- LESSEE'S INTEREST (A Liability or Minus Value) ..... 49,686
- TOTAL VALUE OF PROPERTY = ..... \$199,644, or \$200,000

If the lessee should improve the leased premises, he would have no equity in such improvements up to \$49,686 of their value (not cost).

**Distribution of Lessor's and Lessee's Interests**

Assume a property that has a reasonable fair market value of \$600,000, of which \$200,000 is the value of the land, as if vacant, and \$400,000 is the value (not cost) of

the building erected by the lessee, on a long term ground lease. Then the distribution of the total property value between the lessor and lessee would be as follows:

EXAMPLE I

*Lessor's interest (leased fee)*

In land .....	\$200,000
In building .....	NONE

*Lessee's interest (leasehold)*

In land .....	NONE
In building .....	400,000

TOTAL VALUE OF PROPERTY .....	\$600,000
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*Hypothetical case* — assume that a parcel of vacant land was leased on January 1, 1950, for a term of 99 years, at a net rental of \$9,000 per year; that 6 percent is a fair rate of return on the lessor's investment; and it is desired to know the value of the lessor's interest as of January 1, 1962, further assuming that the land has a value of \$150,000 at the time of the appraisal. The lessee has erected a building with a value (not cost) of \$400,000 and if the land were now vacant and available for lease, the fair ground rent would be \$12,000 per year (\$200,000 x 6 percent), rather than \$9,000 per year as per the terms of the lease. Then, under these conditions, the lessee would have a bonus value, all of which would be in the land, and the distribution of the respective interests of the lessor and the lessee would be as follows:

EXAMPLE II

*Lessor's interest (leased fee)*

(1) The present worth of the income stream:  
 The P. W. of \$1.00 per annum for 87 years, discounted at 6 percent, is 16.562.  
 Then \$9,000 x 16.562 = ..... \$149,058

(2) The present worth of the reversion:  
 The P. W. of \$1.00 (a single payment) collectable 87 years hence, discounted at 6 percent, is 0.006.  
 Then \$150,000 x 0.006 = ..... 900

Lessor's Interest—In Land = .....	\$149,958
Lessor's Interest—In Building = .....	NONE
VALUE OF LESSOR'S INTEREST = .....	\$149,958

*Lessee's interest (leasehold)*

The present worth of the bonus rent or profit:  
 The P. W. of \$1.00 per annum for 87 years, discounted at 6 percent, is 16.562.  
 Then \$3,000 x 16.562 = ..... \$ 49,686

In building .....	400,000
VALUE OF LESSEE'S INTEREST = .....	449,686

TOTAL VALUE OF PROPERTY .....	\$599,644, or \$600,000
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However, using the same example as before and assuming that the fair current rent for the land is \$6,000 per year, whereas the lessee is obligated to pay \$9,000 per year, and all other conditions being as before described, the lessee would have a yearly rent liability of \$3,000.

The present worth of this rent liability for the 87 years that the lease still has to run would be \$49,686 ( $\$3,000 \times 16.562$ ), as shown previously.

The distribution of the lessor's and lessee's interests would be as follows:

EXAMPLE III

*Lessor's interest (leased fee)*

In land .....	\$200,000	
In building .....	49,686	
VALUE OF LESSOR'S INTEREST = .....		\$249,686

*Lessee's interest (leasehold)*

In land .....	NONE	
In building .....	\$400,000	
Les Ground Rent Liability .....	49,686	
VALUE OF LESSEE'S INTEREST .....		350,314
TOTAL VALUE OF PROPERTY .....		\$600,000

GRADED OR STEP-UP LEASE

The appraisal of a graded or step-up lease involves the application of the same principles that apply when appraising a flat or ungraded lease, except that each period of the lease must be appraised separately.

To illustrate, assume that a parcel of vacant land was leased on January 1, 1959, for a term of 40 years. The net contract rentals specified in the lease are: the first 5 years at \$8,500 per year, the second 5 years at \$9,600 per year, the third 5 years at \$10,800 per year, and the remaining 25 years at \$12,000 per year. The lessee has constructed a building that has a fair market value of \$400,000 (not cost) which adequately secures the leased fee. The economic life of the building is estimated to be 50 years, and it becomes the property of the lessor at the expiration of the lease. Investigation of the market established \$200,000 as the value of the land by comparison, and a 6 percent rate for the lessor's interest and a 6½ percent rate for the lessee's interest, as of the time of the appraisal, January 1, 1962. It is also ascertained that the economic rent for the land as of January 1, 1962 is \$12,000 per year.

Based upon these facts, the value of the lessor's and lessee's interests are as follows:

*Lessor's interest (leased fee)*

- a. *First 5 Year Period*  
2 years to run.

The present worth of the income stream:

The P. W. of \$1.00 per annum for 2 years, discounted at 6 percent, is 1.833.

Then  $\$8,500 \times 1.833 = \dots\dots\dots \$ 15,581$

b. *Second 5 Year Period*

The present worth of the income stream:

The P. W. of \$1.00 per annum for 7 years, discounted at 6 percent, is  $\dots\dots\dots 5.582$   
(minus)

The P. W. of \$1.00 per annum for 2 years, discounted at 6 percent, is  $\dots\dots\dots 1.833$

The P. W. of \$1.00 per annum for 5 years, discounted at 6 percent, deferred 2 years, equals  $\dots\dots\dots 3.749$

Then  $\$9,600 \times 3.749 = \dots\dots\dots \$ 35,990$

c. *Third 5 Year Period*

The present worth of the income stream:

The P. W. of \$1.00 per annum for 12 years, discounted at 6 percent, is  $\dots\dots\dots 8.384$   
(minus)

The P. W. of \$1.00 per annum for 7 years, discounted at 6 percent, is  $\dots\dots\dots 5.582$

The P. W. of \$1.00 per annum for 5 years, discounted at 6 percent, deferred 7 years, equals  $\dots\dots\dots 2.802$

Then  $\$10,800 \times 2.802 = \dots\dots\dots \$ 30,262$

d. *Final 25 Year Period*

(1) The present worth of the income stream:

The P. W. of \$1.00 per annum for 37 years, discounted at 6 percent, is  $\dots\dots\dots 14.737$   
(minus)

The P. W. of \$1.00 per annum for 12 years, discounted at 6 percent, is  $\dots\dots\dots 8.384$

The P. W. of \$1.00 per annum for 25 years, discounted at 6 percent, deferred 12 years, equals  $\dots\dots\dots 6.353$

Then  $\$12,000 \times 6.353 = \dots\dots\dots \$76,236$

(2) The present worth of the land reversion:  
 The P. W. of \$1.00 (a single payment), collectable 37 years hence, discounted at 6 percent, is 0.116  
 Then \$200,000 x 0.116 = ..... \$23,200

(3) The present worth of the building reversion:  
 Economic life of building — 50 years = 2 percent depreciation per year 10 years R.E.L. at end of lease  
 Then \$400,000 x 2 percent x 10 = ..... \$80,000  
 The P. W. of \$1.00 (a single payment) collectable 37 years hence, discounted at 6 percent, is 0.116  
 Then \$80,000 x 0.116 = ..... \$ 9,280  
 Total for final 25 year period ..... \$108,716

VALUE OF LESSOR'S INTEREST = ..... \$190,549

*Lessee's interest (leasehold)*

a. *First 5 Year Period*

2 years to run.  
 The present worth of the rent margin in the income stream:  
 Economic Rent ..... \$12,000  
 Contract Rent ..... 8,500  
 Rent Margin ..... \$ 3,500  
 The P. W. of \$1.00 per annum for 2 years, discounted at 6½ percent, is ..... 1.821  
 Then \$3,500 x 1.821 = ..... \$ 6,374

b. *Second 5 Year Period*

The present worth of the rent margin in the income stream:  
 Economic Rent ..... \$12,000  
 Contract Rent ..... 9,600  
 Rent Margin ..... \$ 2,400  
 The P. W. of \$1.00 per annum for 7 years, discounted at 6½ percent, is ..... 5.485  
 (minus)  
 The P. W. of \$1.00 per annum for 2 years, discounted at 6½ percent, is ..... 1.821  
 The P. W. of \$1.00 per annum for 5 years, discounted at 6½

percent, deferred 2 years,  
 equals ..... 3.664  
 Then \$2,400 x 3.664 = ..... \$ 8,794

c. *Third 5 Year Period*

The present worth of the rent margin in the income stream:

Economic Rent ..... \$12,000  
 Contract Rent ..... 10,800  
 Rent Margin ..... \$ 1,200  
 The P. W. of \$1.00 per annum for 12 years, discounted at 6½ percent, is ..... 8.159

(minus)  
 The P. W. of \$1.00 per annum for 7 years, discounted at 6½ percent, is ..... 5.485

The P. W. of \$1.00 per annum for 5 years, discounted at 6½ percent, deferred 7 years, equals ..... 2.674  
 Then \$1,200 x 2.674 ..... \$ 3,209

d. *Final 25 Year Period*

(1) The present worth of the rent margin in the income stream:

Economic Rent .. \$12,000  
 Contract Rent .. \$12,000  
 Rent Margin .... NONE

(2) The value (not cost) of the improvement, less building adjustment in favor of lessor, as per terms of the lease:

Present building value ..... \$400,000

Economic life of building—50 years = 2 percent depreciation per year  
 10 years R.E.L. at end of lease.

Then \$400,000 x 2 percent x 10 = . \$80,000

The P. W. of \$1.00 (a single payment), collectable 37 years hence, discounted at 6 percent, is... 0.116

Then \$80,000 x 0.116 = ..... \$ 9,280

Therefore, \$400,000 minus \$9,280 equals \$390,720, the present market value

of the building to the lessee .....	\$390,720
VALUE OF LESSEE'S INTEREST .....	\$409,097
TOTAL VALUE OF PROPERTY .....	\$599,646

The figures should be rounded and the distribution made as follows:

LESSOR'S INTEREST .....	\$191,000
LESSEE'S INTEREST .....	409,000
PROPERTY VALUE .....	\$600,000

#### REVALUATION LEASE

Revaluation leases, or as they are sometimes called, reappraisal leases, are usually unsatisfactory to both lessor and lessee, and those who are informed in such matters discourage their use. Consequently, although they had rather common use around the turn of this century, they are seldom used today.

Properties subject to these leases will not sell to advantage. It is more difficult to arrange financing for such properties. More often than not, the results of the revaluation of the lease develops into dissatisfaction for both the lessor and lessee. Unless a lessee is permitted, under the terms of the lease, to have flexibility and unrestricted opportunity to develop the property to its highest and most productive use, he not only cannot achieve success for himself but likewise the lessor will be deprived of receiving the highest and best return from the property. The very nature of a revaluation lease constantly places the lessee in a position that makes him hesitate to place expensive and adequate improvements on the premises, because the revaluation might later almost confiscate these interests and make it almost impossible to operate the property.

The major and usually the controlling factor in the valuation of a property subject to a revaluation lease is the date specified in the lease for revaluation. As this date approaches, the lessee's, and for that matter also the lessor's, position becomes more uncertain. The only stable income stream that can be projected is for the present unexpired term, which is often for quite short duration. An income projection beyond this point is foolhardy. Under such circumstances, normal annuity capitalization, which is the basis for most lease appraisals, would seldom if ever be warranted. Conservative straight line capitalization for the most part would apply.

Since these leases are not in general use today and the appraiser is seldom called upon to appraise such property, and the problems presented are usually unique to the particular appraisal assignment, generalized examples and their solutions will not be given here. It suffices to say that the appraisal of this type of leased property requires detailed study and analysis and then the application of the usual and accepted normal appraisal practices and techniques and more particularly those principles and techniques that are most applicable to leased properties.

## PERCENTAGE LEASE

Leases in which the rental is based on a percentage of the gross sales have become quite popular in recent years. Often they pose puzzling problems for the appraiser because of their complexity. However, their appraisal involves the application of the same basic principles and techniques, as a flat or ungraded lease or for that matter any other type of lease. Their basic distinction is that they are designed to produce economic rent or near economic rent as a condition of the contract. There usually is little if any problem to apportioning the total value between lessor's and lessee's interest, since only rarely does the lessee have a bonus value in this type of lease.

In percentage leases, where the lessee is paying the maximum rental, which is usually the case, the lessee would not have any bonus value or value that could be sublet at a profit. The lessor's interest would then represent the entire fee simple value of the property. This will be found to be true in the majority of percentage leases unless the lessee has erected a building, or has attached fixtures to a lessor owned building at his own expense; then the lessee's interest would be the market value of the building, if erected by him, or that amount which the fixtures would add to the market value of the building if installed by him. Except for buildings or fixtures owned by him, the only time that a lessee can have a bonus value in a percentage lease is if his agreed base rental rate of percentage on gross sales is less than that for like or similar leased property, selling like or similar merchandise.

The percentage lease is designed so that the lessor will receive, as nearly as possible, the full economic rent for his premises. If the percentage on gross sales, provided for in the lease, is at the same rate as that found in the market for like or similar type leased properties, selling like or similar merchandise, then the economic rent should be produced. When contract rent and economic rent are the same, the lessor's interest represents the entire market value of the property and the lessee's market value is nil.

In determining economic rent, or fair rental value, two comparisons should be made: A comparison of the subject rental with other rentals paid for comparable space, and a comparison of subject sales volume with sales volumes of like or similar tenants.

In percentage leases, the lessor in reality becomes a partner in the business with the lessee. It, therefore, behooves the lessor to select his lessee carefully and also to see that the terms of the lease are not only protective to his interests but are not a burden to the lessee, so that they will allow the tenant to operate efficiently and successfully. Usually, the lessor will insist that the lease contain not only a minimum rental clause but also a recapture clause; so that if the lessee does not operate successfully and reach a desired level of sales within an agreed upon period, the lease may be subject to cancellation.

Management plays a very important part in the value of a property subject to a percentage lease. If the management is poor or inferior and the net income produced falls below the economic rent, then the lessee not only does not have any valuable market value interest in the property, but the lessor's interest is reduced below that which would be normal market value for the property, unless the lease contains an appropriate recapture clause to protect the lessor's interest. Conversely, if the management is superior and produces an income in excess of economic rental, then the property can have a total value greater than the fee simple market value of the property without the lease. Here we would have a real property value, composed of both tangible and intangible parts. This would be an example of the two property concept; one part of the total value being that of the real estate and the other part not assignable to either land or buildings, but to superior management by the lessee. Such added market value would attach only to the lessor's interest and not to the lessee who created it; however, the tenant is not without reward as he will be compensated for his efforts through added business profits.

The appraiser should examine and analyze the percentage payments very critically. He should also examine and analyze data to establish an annual stabilized rent to be used as the basis of determining the fair fee simple value of the real estate as indicated by the income approach. If the stabilized rent is in excess of economic rent, this excess or surplus income must be capitalized separately and at a higher rate to reflect the hazards and uncertainties of this surplus income.

Today, the practice of creating percentage of gross sales leases is used for almost every kind and variety of retail sales operation. They run the whole gamut of the alphabet, from automobile accessory stores, bakeries, cigar stores, drug stores, electrical supply stores, and on through service operations, such as banks, restaurants and theaters. The percentage rates vary in accordance with profit margins and sales volumes for the particular retail line or service. Gasoline service station leases are usually on a percentage basis, such as 1½ cents or 2 cents per gallon, for the gallonage sold on the premises.

Regardless of the type of lease involved, the same standard principles of lease property appraisal apply. For the purpose of this discussion and to demonstrate the principles of appraisal involved in percentage leases, a hypothetical, retail clothing outlet store will be examined.

*Examples* — Assume that a landlord, 10 years ago, erected a one-story brick masonry retail store building on a vacant lot, along with an adequately paved parking area to support the proposed retail sales operation contemplated for the premises. On January 1, 1952, the landlord leased the premises to a men's clothing merchandising chain for a term of 20 years, at a net lease rental (before providing for replacement of improvements) of 6 percent on gross sales volume. The lease further provided for a minimum guaranteed rent of \$6,500 per year; and also if the total rental, based on 6 percent of gross sales volume, is less than \$5,000 for the previous year, the lease

can be cancelled at the option of the lessor on 90 days notice. An appraisal is to be made of the value of the property and the respective interests of lessor and lessee as of January 1, 1962. By comparison, it has been determined that the land, if vacant, has a fair market value of \$25,000. The improvements are estimated to have a present fair market value of \$100,000 and an economic life of 40 years. For the purposes of this example, it will be assumed that the paving on the parking area will have the same life as the building and the entire improvement will be treated as one unit. In practice, they should be separated with a proper economic life assigned for the paving and this item treated separately in the appraisal. After an examination of the income produced by the lease for the past 5 years and in analysis of future trends and indications, the stabilized rent is determined to be \$10,000 per year (including recapture of improvements) and \$7,500 net per year after provision for recapture of improvements. These figures are based upon stabilized gross sales of \$166,000 per year. Further analysis of the market leads to the conclusion that a 6 percent interest rate would be applicable to all phases of the investment.

Based upon these facts, the values of the lessor's and lessee's interests are as follows:

**EXAMPLE I**

*Lessor's interest (leased fee)*

(1) The present worth of the income stream:	
Stabilized contract rent—\$10,000 (before recapture).	
Stabilized contract rent—\$7,500 net (after recapture).	
Economic rent—\$7,500 net.	
The P. W. of \$1.00 per annum for 10 years, discounted at 6 percent is 7.360.	
Then \$7,500 x 7.360 = .....	\$ 55,200
(2) The present worth of the land reversion:	
The P. W. of \$1.00 (a single payment) collectable 10 years hence, discounted at 6 percent, is 0.558.	
Then \$25,000 x 0.558 = .....	13,950
(3) The present worth of the building reversion:	
The P. W. of \$1.00 (a single payment) collectable 10 years hence, discounted at 6 percent, is 0.558.	
Then \$100,000 x 0.558 = .....	55,800
VALUE OF LESSOR'S INTEREST .....	\$124,950
	Rounded to.....
	\$125,000
LESSEE'S INTEREST—LEASEHOLD .....	NONE
PROPERTY VALUE .....	\$125,000

Now assume that the stabilized contract rent produced by 6 percent on gross sales volume (before building recapture) is \$12,000 per year, or \$2,000 more than economic rent. Also assume that it has been determined, after study and analysis, that the surplus

stabilized rent over economic rent, because of uncertainty and hazards, should be capitalized at a 10 percent rate. All other conditions of the problem remain the same.

Under these conditions, the values of the lessor's and lessee's interests are as follows:

**EXAMPLE II**

*Lessor's interest (leased fee)*

(1) The present worth of the income stream:	
Stabilized contract rent—\$12,000 (before recapture)	
Stabilized contract rent—\$9,500 net (after recapture).	
Economic rent—\$7,500 net.	
Surplus rent—\$2,000	
(a) The present worth of the economic rent:	
The P. W. of \$1.00 per annum, for 10 years, discounted at 6 percent, is 7.360.	
Then \$7,500 x 7.360 =	\$ 55,200
(b) The present worth of the surplus rent:	
The P. W. of \$1.00 per annum, for 10 years, discounted at 10 percent, is 6.145.	
Then \$2,000 x 6.145 =	12,290
Total value of income stream	\$ 67,490
(2) The value of reversion:	
The land—	
Same as in Example I	\$ 13,950
The building—	
Same as in Example I	55,800
Total value of the reversion	69,750
VALUE OF LESSOR'S INTEREST	\$137,240
	Rounded to
	\$137,500
LESSEE'S INTEREST—LEASEHOLD	NONE
PROPERTY VALUE	\$137,500

Now assume that the stabilized contract rent produced by 6 percent on gross sales volume (before building recapture) is \$9,000 per year and \$6,500 after recapture and, therefore, \$1,000 less than economic rent. All other conditions of the problem remain the same.

Under these conditions, the values of the lessor's and lessee's interests are as follows:

**EXAMPLE III**

*Lessor's interest (leased fee)*

- (1) The present worth of the income stream:
  - Stabilized contract rent—\$9,000 (before recapture).
  - Stabilized contract rent—\$6,500 net (after recapture).
  - Economic rent—\$7,500
  - Rent deficiency—\$1,000

The P. W. of \$1.00 per annum, for 10 years, discounted at 6 percent, is 7.360.	
Then \$6,500 x 7.360 =	\$ 47,840
(2) The present worth of the reversion:	
The land—	
Same as in Example I	\$ 13,950
The building—	
Same as in Example I	55,800
Total value of the reversion	69,750
VALUE OF LESSOR'S INTEREST	\$117,590
	Rounded to..... \$117,500
LESSEE'S INTEREST—LEASEHOLD	NONE
PROPERTY VALUE (Subject to lease)	\$117,500
FEE SIMPLE VALUE OF PROPERTY (if not subject to lease)	\$125,000

In this situation, not only is the lessor's interest lowered, and the lessee has no valuable interest, but the market value of the property is penalized because of a poor tenant. In practice, this situation seldom should occur, as an alert lessor would insist on having a recapture clause in the lease instrument for the purpose of remedying such situations.

Now assume that all of the conditions set forth in Example I are the same except that the lease calls for 5 percent on gross sales volume rather than 6 percent, which is established as representing the economic or going fair percentage rental for this type of merchandising.

#### EXAMPLE IV

##### *Lessor's interest (leased fee)*

(1) The present worth of the income stream:	
Stabilized contract rent (5 percent x \$166,000)—	
\$8,300 net (before recapture).	
Stabilized contract rent—\$5,800 net, after recapture.	
Economic rent—\$7,500	
Rent saving (bonus value)—\$1,700	
The P. W. of \$1.00 per annum, for 10 years, discounted at 6 percent, is 7.360.	
Then \$5,800 x 7.360 =	\$ 42,688
(2) The present worth of the reversion:	
The land—	
Same as in Example I	\$ 13,950
The building—	
Same as in Example I	55,800
Total value of the reversion	69,750
VALUE OF LESSOR'S INTEREST	\$112,438

##### *Lessee's interest (leasehold)*

The present worth of the rent saving:  
The P. W. of \$1.00 per annum, for 10 years, discounted at 6 percent, is 7.360.

Then  $\$1,700 \times 7.360 = \dots\dots\dots 12,512$   
 VALUE OF LESSEE'S INTEREST  $\dots\dots\dots \$124,940^*$   
 (\*This figure should be \$125,000.)

The figures should be rounded and the distribution made as follows:

LESSOR'S INTEREST	....	\$112,500
LESSEE'S INTEREST	....	12,500
PROPERTY VALUE	....	<u>\$125,000</u>

In this situation the lessor has, in effect, conveyed to the lessee a part of his valuable property rights because of committing himself in the lease to a lower base percentage rate on gross sales than that rate which is established in the market for this type of merchandising.

#### SANDWICH LEASE

If a property is leased and then subleased, the original lessee becomes the owner of a sandwich leasehold. This interest, as the phrase implies, is an in-between interest, created by the two transactions. The first is the creation of a leased fee estate and a leasehold estate by the making of the original lease, which can be either for a short or long term. The second transaction is a sublease from the original lessee to a third party. Without losing his status as a tenant, the original lessee now becomes a landlord as well. The sublessee obtains control, use and occupancy of the physical property. The original lessee is now the owner of the sandwich lease. He receives the rent as agreed upon in the sublease, and is obligated to the original lessor for all the terms of the original lease and the payment to him of the rent reserved in that lease. The difference, if any, between the rent reserved in the original lease and that reserved in the sublease, often referred to as the rent margin, represents the interest of the sandwich leaseholder. Obviously, the sandwich interest can have value only in the event that the rental obligation of the sandwich lessee is less than the rental obligation of the sublessee.

Occasionally, the sublessee will default and, in that event, the sandwich lessee must step in and operate the property. This is an added potential hazard and risk which must be reflected in the interest rate applicable to the sandwich lease.

There are many variations in sandwich leases. They may be for the full remaining unexpired term of the original lease, they may be for a shorter term, but they cannot be for a term longer than the unexpired term of the original lease. In the event that the sublease is for a shorter term than the original lease, then the sandwich leaseholder will have to step in at the expiration of the sublease and operate the property or else create a new sublease. In complex situations, the premises covered by the original lease may be divided, in that only a part of the original leased premises is subleased or several subleases may be created. Sometimes the sublease is further subleased. There

are no particular difficulties in evaluating these intermediate lease positions in a parcel of real property, provided all the facts are known.

The following is an example of the valuation of a sandwich lease:

Assume that a parcel of vacant land was leased by A to B on January 1, 1940, for a term of 99 years at a net rental of \$3,000 per year. On January 1, 1950, B subleased to C for the remainder of the original term of the lease at a net rent of \$5,000 per year. It is desired to ascertain the value of the sandwich lease as of January 1, 1962, the date of the appraisal. It is determined that as of January 1, 1962, the land had a value of \$150,000, by comparison, and the economic rent of the land was \$9,000 net, based on a 6% rate of return.

The value of the three interests are as follows:

*The interest of "A" (leased fee)*

- (1) The present worth of the income stream:  
 The P. W. for \$1.00 per annum for 77 years, discounted at 6 percent, is 16.479.  
 Then \$3,000 x 16.479 = ..... \$ 49,437
- (2) The present worth of the reversion:  
 The P. W. for \$1.00 (a single payment), collectable 77 years hence, discounted at 6 percent is 0.011.  
 Then \$150,000 x 0.011 = ..... 1,650
- VALUE OF LEASED FEE INTEREST ..... \$ 51,087

*The interest of "B" (sandwich lease)*

The present worth of the rental margin:  
 The P. W. for \$1.00 per annum for 77 years, discounted at 6 percent, is 16.479.  
 Then \$2,000 (\$5,000 minus \$3,000) x 16.479 = ..... \$ 32,958

VALUE OF SANDWICH LEASE INTEREST ..... 32,958

*The interest of "C" (sub-leasehold)*

The present worth of the rental margin in the income stream:  
 The P. W. for \$1.00 per annum for 77 years, discounted at 6 percent, is 16.479.  
 Then \$4,000 (\$9,000 minus \$5,000) x 16.479 = ..... \$ 65,916

VALUE OF SUB-LEASEHOLD INTEREST ..... 65,916

TOTAL VALUE OF PROPERTY ..... \$149,961\*

Note: \* This is the value of the land, since no buildings were considered as being erected on the land for purposes of this problem.

Rounding of the figures would produce the following allocation of value:

LEASED FEE .....	\$ 51,000
SANDWICH LEASE ...	33,000
SUB-LEASEHOLD ....	<u>66,000</u>
PROPERTY VALUE ...	\$150,000

## The Appraisal of Leases

LEROY C. MOSER

*Chief, Right-of-Way Division  
Maryland State Roads Commission*

It has been noted in the preceding chapter that appraising properties subject to leases presents some of the most involved problems encountered by a real estate appraiser. Good appraising of real estate requires time consuming effort and analysis. Appraising commercial property, and for the purposes of this chapter discussion is primarily of leased commercial properties, consumes more time and analysis than the average run-of-the-mine appraisal. When another complication is added, that of divided interest, the problem becomes even more involved and time consuming. There are no short cuts. All of the major basic steps necessary for any properly executed appraisal must first be carried out and then the more specialized steps peculiar to the appraisal of leased interests must be applied in the determination and apportioning of the total value between the interests of lessor and lessee.

The following basic steps in the appraisal of leased property should be followed in the order given:

### Examine the Lease

Before beginning any appraisal of real property subject to a lease, first obtain a copy of the lease and examine it in detail. This instrument sets forth the obligations of the respective parties; such as who is responsible for maintenance, who pays the taxes and the insurance, etc. These questions are vital in making an allocation of expenses and a determination of net income for the capitalization approach to value. Many leases have unusual, devious and complicated provisions which may have an effect upon the fee simple value of the property and a serious effect upon the value of the lessor's and lessee's interest. Each lease document requires study and no appraisal of a leased property should ever be made solely upon the basis of the amount of rent stipulated in the lease. Lease documents, especially those for long term leases, are usually quite involved, and they are by no means universal in their terms and provisions.

As the first step in the appraisal problem, the lease instrument must be carefully examined and analyzed from the viewpoint of the property as a whole and then from the viewpoint of both lessor and lessee individually.

### Applying the Appraisal Process

1. Determine the highest and best use of the property.

The highest and best use of a property is the optimum or most profitable likely use to which a property can be put. It is that most profitable, reasonable, continuous use to which the property is adapted and needed or likely to be in demand in the reasonably near future.

In determining this use, take into consideration all relevant regional, local and neighborhood characteristics as well as the physical, functional and economic features peculiar to the particular property. Limitations, such as deed and zoning restrictions, must be considered and weighed.

2. Gather, classify, and analyze all pertinent data.

This involves an orderly process of determining the necessary data that will have a bearing or effect in any way upon the valuation problem and the acquiring, classifying and analysis of this data in a most thorough and efficient manner to serve as tools to establish the value of the subject property.

3. A preliminary estimate of the indicated market value of the property as a whole, by an application of the three classic approaches.

- a. *The Cost Approach* — The reproduction cost new less accrued depreciation, due to physical, functional and economic causes, plus the value of the land as determined from comparable sales of similar land or by the use of a land residual technique.

- b. *The Market Approach* — A comparison with similar properties which have been sold, making allowances for essential differences between the comparables and the subject property.

- c. *The Income Approach* — The capitalization of the net income at a proper rate of return, using either a land, building or property residual technique, the one used being the one best adapted to the facts of the particular case.

4. A correlation and final estimate of fee simple value of the property as a whole.

This is a bringing together into a single final value the preliminary indications of value as developed by the several approaches.

All things being equal, the income approach probably will carry the greatest weight in the final determination of value, primarily because in leased

property, one is dealing strictly in rent income producing property. The two other approaches for the most part should serve as checks and balances in developing a true fair market value of the property. This is a general statement, however, and should not be followed *carte blanche* as, under certain circumstances, there will be exceptions to the general rule.

5. The final step in the appraisal of property subject to a lease is to allocate the total fee simple value between the interests of the lessor and lessee on the basis of the present worth of their future interests in the property.

#### Allocation of Fee Value Between Leased Fee and Leasehold Interests

In the previous chapter, the components of the lessor's and lessee's interests are defined as well as the method of calculating these interests. It is not necessary in every appraisal problem of leased property to calculate both the interest of the lessor and that of the lessee. Usually, it is only necessary to calculate that interest which is the simplest to calculate, and then to subtract this interest from the value of the whole property to determine the other interest. The following procedure is considered not only the most practical but the best method in most cases.

*If the lease is a long term lease,* it is best to make the lessee's interest residual, by deducting the present worth of the lessor's interest from the fee simple value of the property. This is done in the long term lease, because the lessor's interest is the one that is more specifically defined, easier to calculate, and there is less chance of error likely to occur. Where a lease is well secured and runs for 40 or 50 years, the reversion rights are negligible. All that it is really necessary to calculate is the present worth of the fixed, definite, recurring income. However, although the reversion is of little consequence, its discounted value is usually added to present worth of the income stream in figuring the lessor's interest as it completes the theoretical valuation of the interest even though it adds very little to the final result.

*If the lease is a short term lease,* it is best to make the lessor's interest residual by deducting the present worth of the lessee's interest from the fee simple value of the whole property. This is done in the short term lease, because the lessee's interest is the one that is the easier to calculate, usually the minor interest, and there is less chance of error in its calculation.

The following examples illustrate the most commonly encountered distributions made between the lessor's and lessee's interests for both short and long term leases in accordance with the above practice.

In each case, it is assumed that the use is the highest and best use for the land and that improvements, if any, are properly placed.

Allocation of Value between Lessor's and Lessee's Interests

Example I

SHORT TERM LEASE—UNIMPROVED LOT. CONTRACT RENT EQUAL TO ECONOMIC RENT.

Essential facts:

- (1) Contract rent—\$1,200 per year, net.
- (2) Economic rent—\$1,200 per year.
- (3) Unexpired term—5 years.
- (4) Value of fee simple property on comparative basis—\$20,000
- (5) Local investors demand a 6 percent return on land.

Fee simple value of property

By both comparison and income approaches ..... \$ 20,000

Lessee's interest (leasehold)

Since both contract rent and economic rent are equal, there is no leasehold bonus value in the lease.

(Minus) The lessee's interest ..... NONE

Lessor's interest (leased fee) ..... \$ 20,000

Example II

SHORT TERM LEASE—UNIMPROVED LOT. CONTRACT RENT EXCEEDS ECONOMIC RENT.

Essential facts:

- (1) Contract rent—\$1,500 per year, net.
- (2) Economic rent—\$1,200 per year.
- (3) Unexpired term—5 years.
- (4) Value of fee simple property on comparative basis—\$20,000
- (5) Local investors demand a 6 percent return on land.
- (6) Because of the added risk involved, an analysis reveals that the surplus rent would require a 7 percent rate of return.

Fee simple value of property

By both comparison and income approaches ..... \$ 20,000

Lessee's interest (leasehold)

Since the contract rent exceeds the economic rent by \$300 per year, not only is there an absence of a leasehold bonus value in the lease, but the lessee has a rent liability of \$300 each year for the remaining 5 year duration of the lease. This rent liability is:

The present worth of the rent liability stream:

The P. W. of \$1.00 per annum for 5 years, discounted at 6 percent, is 4.212.

Then  $\$300 \times 4.212 = \$1,264$ , say \$1,250, which is the total amount of the lessee's rent liability.

(Minus) The lessee's interest ..... NONE

LESSOR'S INTEREST —(In real estate) ..... \$ 20,000

However, in this case, because of a lease contract favoring the lessor, to the extent of \$300 per year in excess of the economic rent, the

lessor has in this extra rent an added property value over and above the value of the real estate. This is an intangible asset that attaches itself to the lease, and not the real estate. This extra value is as follows:

The present worth of the surplus rent stream:

The P. W. of \$1.00 per annum for 5 years, discounted at 7 percent, is 4.100.

Then  $\$300 \times 4.100 = \$1,230$

LESSOR'S INTEREST (In the lease) .....	1,230
TOTAL LESSOR'S INTEREST (LEASED FEE) .....	\$ 21,230
Rounded to .....	\$ 21,250

### Example III

SHORT TERM LEASE—UNIMPROVED LOT. ECONOMIC RENT EXCEEDS CONTRACT RENT.

*Essential facts*

- (1) Contract rent—\$1,200 per year, net.
- (2) Economic rent—\$1,500 per year.
- (3) Unexpired term—5 years.
- (4) Value of fee simple property on comparative basis—\$25,000
- (5) Local investors demand 6 percent return on land.

*Fee simple value of property*

By both comparison and income approaches ..... \$ 25,000

*Lessee's interest (leasehold)*

Since the economic rent exceeds the contract rent by \$300 per year, there is a leasehold bonus value of this amount each year for the remaining 5 year duration of the lease.

This bonus value is:

The present worth of the bonus rent:

The P. W. of \$1.00 per annum for 5 years, discounted at 6 percent, is 4.212.

Then  $\$300 \times 4.212 = \$1,264$

(Minus) The lessee's interest .....	1,264
<i>Lessor's interest (leasehold fee)</i> .....	\$ 23,736

The figures should be rounded and distribution made as follows:

LESSOR'S INTEREST ....	\$23,750
LESSEE'S INTEREST ....	1,250
PROPERTY VALUE .....	\$25,000

### Example IV

SHORT TERM LEASE—IMPROVED LOT. BUILDING ERECTED BY LESSOR. CONTRACT RENT EQUAL TO ECONOMIC RENT.

*Essential facts:*

- (1) Contract rent—\$6,300 per year, net (before recapture).
- (2) Contract rent—\$4,800 per year, net (after recapture).
- (3) Economic rent—\$4,800 per year.

- (4) Unexpired term—8 years.
- (5) Economic life of the building—40 years.
- (6) Value of lot, if vacant, on comparative basis—\$20,000
- (7) Value of fee simple property—Correlation of 3 approaches—\$80,000
- (8) Value of building (not cost)—\$60,000
- (9) Local investors demand a 6 percent return on land and 8½ percent return on buildings of this type (6 percent interest and 2½ percent recapture).

*Fee simple value of property*

By correlation of the 3 approaches ..... \$ 80,000

*Lessee's interest (leasehold)*

Since both contract rent and economic rent are equal, there is no leasehold bonus value in the lease.

(Minus) The lessee's interest ..... NONE

*Lessor's interest (leased fee)* ..... \$ 80,000

**Example V**

SHORT TERM LEASE—IMPROVED LOT. BUILDING ERECTED BY LESSOR. CONTRACT RENT EXCEEDS ECONOMIC RENT.

*Essential facts:*

- (1) Contract rent—\$6,900 per year, net (before recapture).
- (2) Contract rent—\$5,400 per year, net (after recapture).
- (3) Economic rent—\$4,800 per year.
- (4) Unexpired term—8 years.
- (5) Economic life of the building—40 years.
- (6) Value of lot, if vacant, on a comparative basis—\$20,000
- (7) Value of fee simple property—Correlation of 3 approaches—\$80,000
- (8) Value of building (not cost)—\$60,000
- (9) Local investors demand a 6 percent return on land and 8½ percent return on buildings of this type (6 percent interest and 2½ percent recapture).
- (10) Because of the added risk involved, analysis reveals that the surplus rent would require an 8 percent rate of return.

*Fee simple value of property*

By correlation of the 3 approaches ..... \$ 80,000

*Lessee's interest (leasehold)*

Since the contract rent exceeds the economic rent by \$600 per year, not only is there an absence of a leasehold bonus value in the lease, but the lessee has a rent liability of \$600 each year for the remaining 8 year duration of the lease. This rent liability is:

The present worth of the rent liability stream:

The P. W. of \$1.00 per annum for 8 years, discounted at 6 percent, is 6.210.

Then \$600 x 6.210 = \$3,726, say \$3,750, which is the total amount of the lessee's rent liability.

(Minus) The lessee's interest ..... NONE

LESSOR'S INTEREST—(In real estate) ..... \$ 80,000

However, in this case, because of a lease contract favoring the lessor to the extent of \$600 per year of rent in excess of economic rent, the lessor has in this extra rent an added property value over and above the value of the real estate. This is an intangible asset that attaches itself to the lease, and not the real estate. This extra value is as follows:

The present worth of the surplus rent stream:

The P. W. of \$1.00 per annum for 8 years, discounted at 8 percent, is 5.747.

Then  $\$600 \times 5.747 = \$3,448$

LESSOR'S INTEREST (In the lease) .....	3,448
TOTAL LESSOR'S INTEREST—LEASED FEE .....	<u>\$ 83,448</u>
Rounded to .....	\$ 83,500

### Example VI

#### SHORT TERM LEASE—IMPROVED LOT. BUILDING ERECTED BY LESSOR. ECONOMIC RENT EXCEEDS CONTRACT RENT.

*Essential facts:*

- (1) Contract rent—\$6,300 per year, net (before recapture).
- (2) Contract rent—\$4,800 per year, net (after recapture).
- (3) Economic rent—\$5,400 per year.
- (4) Unexpired term—8 years.
- (5) Economic life of the building—40 years.
- (6) Value of lot, if vacant, on a comparative basis—\$30,000
- (7) Value of fee simple property—Correlation of 3 approaches—\$90,000
- (8) Value of building (not cost)—\$60,000
- (9) Local investors demand a 6 percent return on land and 8½ percent return on buildings of this type (6 percent interest and 2½ percent on recapture).

*Fee simple value of property*

By correlation of the 3 approaches ..... \$ 90,000

*Lessee's interest (leasehold)*

Since the economic rent exceeds the contract rent by \$600 per year, there is a leasehold bonus value of this amount each year for the remaining 8 year duration of the lease. This bonus value is:

The present worth of the bonus rent:

The P. W. of \$1.00 per annum for 8 years, discounted at 6 percent, is 6.210.

Then  $\$600 \times 6.210 = \$3,726$

(Minus) The lessee's interest .....	3,726
<i>Lessor's interest (leased fee) .....</i>	<u>\$ 86,274</u>

The figures should be rounded and distribution made as follows:

LESSOR'S INTEREST ....	\$86,250
LESSEE'S INTEREST ....	<u>3,750</u>
PROPERTY VALUE .....	\$90,000

### Example VII

LONG TERM GROUND LEASE—IMPROVED LOT. BUILDING ERECTED BY LESSEE.  
CONTRACT RENT EQUAL TO ECONOMIC RENT.

*Essential facts:*

- (1) Contract rent—\$3,000 per year, net.
- (2) Economic rent—\$3,000 per year.
- (3) Unexpired term—60 years.
- (4) Economic life of the building—50 years.
- (5) Value of lot, if vacant, on comparative approach—\$50,000
- (6) Value of fee simple property—Correlation of 3 approaches—\$250,000
- (7) Value of building (not cost)—\$200,000
- (8) Local investors demand a 6 percent return on land and an 8 percent return on buildings of this type (6 percent interest and 2 percent recapture).

*Fee simple value of property*

By correlation of the 3 approaches ..... \$250,000

*Lessor's interest (leased fee)*

- (1) The present worth of the income stream:  
The P. W. of \$1.00 per annum for 60 years, discounted at 6 percent, is 16.161.  
Then \$3,000 x 16.161 = ..... \$ 48,483
- (2) The present worth of the reversion:  
The P. W. of \$1.00 (a single payment), collectable 60 years hence, discounted at 6 percent, is 0.030.  
Then \$50,000 x 0.030 = ..... 1,500  
(Minus) The lessor's interest ..... 49,983

*Lessee's interest (leasehold)* ..... \$200,017

The figures should be rounded and distribution made as follows:

LESSOR'S INTEREST ...	\$ 50,000
LESSEE'S INTEREST ...	200,000
PROPERTY VALUE ....	\$250,000

### Example VIII

LONG TERM GROUND LEASE—IMPROVED LOT. BUILDING ERECTED BY LESSEE.  
CONTRACT RENT EXCEEDS ECONOMIC RENT.

*Essential facts:*

- (1) Contract rent—\$4,500 per year, net.
- (2) Economic rent—\$3,000 per year.
- (3) Unexpired term—60 years.
- (4) Economic life of the building—50 years.
- (5) Value of lot, if vacant, on comparative basis—\$50,000
- (6) Value of fee simple property—Correlation of 3 approaches—\$250,000
- (7) Value of building (not cost)—\$200,000
- (8) Local investors demand a 6 percent return on land and an 8 percent return on buildings of this type (6 percent interest and 2 percent recapture).

- (9) Since the lessee's building adequately secures the surplus rent, the same 6 percent interest applicable to land and building would be applicable to the surplus rent.

*Fee simple value of property*

By correlation of the 3 approaches ..... \$250,000

*Lessor's interest (leased fee)*

- (1) The present worth of the income stream:

The P. W. of \$1.00 per annum for 60 years, discounted at 6 percent, is 16.161.

Then \$4,500 x 16.161 = ..... \$ 72,725

- (2) The present worth of the reversion:

The P. W. of \$1.00 (a single payment), collectable 60 years hence, discounted at 6 percent, is 0.030.

Then \$50,000 x 0.030 = ..... 1,500

(Minus) The lessor's interest ..... 74,225

*Lessee's interest (leasehold)* ..... \$175,775

The figures should be rounded and distribution made as follows:

LESSOR'S INTEREST ...	\$ 74,250
LESSEE'S INTEREST ...	175,750
PROPERTY VALUE ....	<u>\$250,000</u>

In this case, the building on the property has a present market value (not cost) of \$200,000. However, despite the fact that this building was erected and paid for by the lessee, he does not completely own it. Since the contract ground rent exceeds the economic rent by \$1,500 per year, the building, to the extent of the present worth of \$1,500 per year for the 60 year remaining term of the lease, is security for the surplus rent obligation. ( $\$1,500 \times 16.161 = \$24,242$ , say \$24,250) To this extent, the lessee, by virtue of the adverse lease, has contracted to the lessor this amount of value in the building.

**Example IX**

LONG TERM GROUND LEASE—IMPROVED LOT. BUILDING ERRECTED BY LESSEE.  
ECONOMIC RENT EXCEEDS CONTRACT RENT.

*Essential facts:*

- (1) Contract rent—\$3,000 per year, net.
- (2) Economic rent—\$4,500 per year.
- (3) Unexpired term—60 years.
- (4) Economic life of the building—50 years.
- (5) Value of lot, if vacant, on comparative basis—\$75,000
- (6) Value of fee simple property—Correlation of 3 approaches—\$275,000
- (7) Value of building (not cost)—\$200,000
- (8) Local investors demand a 6 percent return on land and an 8 percent return on buildings of this type (6 percent interest and 2 percent recapture).

<i>Fee simple value of property</i>	
By correlation of the 3 approaches .....	\$275,000
<i>Lessor's interest (leased fee)</i>	
(1) The present worth of the income stream:	
The P. W. of \$1.00 per annum for 60 years, dis-	
counted at 6 percent, is 16.161.	
Then \$3,000 x 16.161 = .....	\$ 48,483
(2) The present worth of the reversion:	
The P. W. of \$1.00 (a single payment), collectable	
60 years hence, discounted at 6 percent, is 0.030.	
Then \$75,000 x 0.030 = .....	2,250
(Minus) The lessor's interest .....	50,733
<i>Lessee's interest (leasehold)</i> .....	\$224,267

The figures should be rounded and distribution made as follows:

LESSOR'S INTEREST ...	\$ 50,750
LESSEE'S INTEREST ...	224,250
PROPERTY VALUE ....	\$275,000

In this case, since the contract ground rent is \$1,500 less than the economic rent, the lessee has a bonus value of \$1,500 per year for the remaining 60 year term of the lease. Its percent value is the present worth of \$1,500 per year for 60 years at 6 percent (Inwood factor is 16.161). (6 percent is the going rate for this type of investment) Therefore, the bonus value is \$1,500 x 16.161 = \$24,242, say \$24,250. This amount added to the \$200,000 building value accounts for the lessee's total interest of \$224,250. The lessor has in fact, by virtue of making an adverse lease, conveyed to the lessee \$24,250 of the \$75,000 lot value, leaving to himself only a \$50,750 interest in the lot, despite its market value of \$75,000 if vacant and not subject to the lease.

#### Example X

LONG TERM LEASE—IMPROVED LOT. BUILDING ERECTED BY LESSOR. CONTRACT RENT EQUAL TO ECONOMIC RENT.

*Essential facts:*

- (1) Contract rent—\$19,000 per year, net (before recapture).
- (2) Contract rent—\$15,000 per year, net (after recapture).
- (3) Economic rent—\$15,000 per year.
- (4) Unexpired term—20 years.
- (5) Economic life of the building—50 years.
- (6) Value of lot, if vacant, on comparative basis—\$50,000
- (7) Value of fee simple property—Correlation of 3 approaches—  
\$250,000
- (8) Value of building (not cost)—\$200,000
- (9) Local investors demand a 6 percent return on land and an 8 percent return on buildings of this type (6 percent interest and 2 percent recapture).

<i>Fee simple value of property</i>	
By correlation of the 3 approaches .....	\$250,000

*Lessor's interest (leased fee)*

- (1) The present worth of the income stream:  
The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470.  
Then \$15,000 x 11.470 = ..... \$172,050
  - (2) The present worth of the land reversion:  
The P. W. of \$1.00 (a single payment), collectable 20 years hence, discounted at 6 percent, is 0.312.  
Then \$50,000 x 0.312 = ..... 15,600
  - (3) The present worth of the building reversion:  
The P. W. of \$1.00 (a single payment), collectable 20 years hence, discounted at 6 percent, is 0.312.  
Then \$200,000 x 0.312 = ..... 62,400
- (Minus) The lessor's interest ..... \$250,050\*
- Lessee's interest (leasehold)* ..... NONE
- (\* This figure should be \$250,000)

**Example XI**

LONG TERM LEASE—IMPROVED LOT. BUILDING ERECTED BY LESSOR. CONTRACT RENT EXCEEDS ECONOMIC RENT.

*Essential facts:*

- (1) Contract rent—\$20,500 per year, net (before recapture).
- (2) Contract rent—\$16,500 per year, net (after recapture).
- (3) Economic rent—\$15,000 per year.
- (4) Unexpired term—20 years.
- (5) Economic life of the building—50 years.
- (6) Value of lot, if vacant, on comparative basis—\$50,000
- (7) Value of fee simple property—Correlation of 3 approaches—\$250,000
- (8) Value of building (not cost)—\$200,000
- (9) Local investors demand a 6 percent return on land and an 8 percent return on buildings of this type (6 percent interest and 2 percent recapture).
- (10) Because of the added risk involved, an analysis reveals that the surplus rent would require a 10 percent rate of return.

*Fee simple value of property*

By correlation of 3 approaches ..... \$250,000

*Lessor's interest (leased fee)*

(A) Lessor's Interest (In real estate)

- (1) The present worth of the economic rent income stream:  
The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470.  
Then \$15,000 x 11.470 = ..... \$172,050
- (2) The present worth of the land reversion:  
The P. W. of \$1.00 (a single payment), collectable 20 years hence, discounted at 6 percent, is 0.312.  
Then \$50,000 x 0.312 = ..... 15,600

(3) The present worth of the building reversion:  
 The P. W. of \$1.00 (a single payment), collectable 20 years hence, discounted at 6 percent, is 0.312.  
 Then  $\$200,000 \times 0.312 = \dots\dots\dots 62,400$   
 LESSOR'S INTEREST (In real estate)  $\dots\dots\dots \$250,050^*$   
 (\* This figure should be \$250,000)

(B) Lessor's Interest (In the lease)

Since the contract rent is \$1,500 more than the economic rent, the lessor has an added property value over and above the value of the real estate. This is an intangible asset that attaches itself to the lease, and not to the real estate. This extra value is as follows:

The present worth of the surplus rent stream:  
 The P. W. of \$1.00 per annum for 20 years, discounted at 10 percent, is 8.514.  
 Then  $\$1,500 \times 8.514 = \dots\dots\dots 12,771$   
 TOTAL LESSOR'S INTEREST  $\dots\dots\dots \$262,771$   
 Rounded to  $\dots\dots\dots \$262,750$

*Lessee's interest (leasehold)*  $\dots\dots\dots$  \* NONE

\* In this case, since the contract rent exceeds the economic rent by \$1,500 per year, not only is there an absence of a leasehold bonus value in the lease, but the lessee has a rent liability of \$1,500 each year for the remaining 20-year duration of the lease. This rent liability is:

The present worth of the rent liability stream:  
 The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470.  
 Then  $\$1,500 \times 11.470 = \$17,205$ , say \$17,250, which is the total amount of the lessee's rent liability.

Example XII

LONG TERM LEASE—IMPROVED LOT. BUILDING ERECTED BY LESSOR. ECONOMIC RENT EXCEEDS CONTRACT RENT.

*Essential facts:*

- (1) Contract rent—\$19,000 per year, net (before recapture).
- (2) Contract rent—\$15,000 per year, net (after recapture).
- (3) Economic rent—\$16,500 per year.
- (4) Unexpired term—20 years.
- (5) Economic life of the building—50 years.
- (6) Value of lot, if vacant, on comparative basis—\$75,000
- (7) Value of fee simple property—Correlation of 3 approaches—\$275,000
- (8) Value of building (not cost)—\$200,000
- (9) Local investors demand a 6 percent return on land and an 8 percent return on buildings of this type (6 percent interest and 2 percent recapture).

*Fee simple value of property*  
 By correlation of 3 approaches ..... \$275,000

*Lessor's interest (leased fee)*

- (1) The present worth of the income stream:  
 The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470.  
 Then 11.470 x \$15,000 = ..... \$172,050
  - (2) The present worth of the land reversion:  
 The P. W. of \$1.00 (a single payment), collectable 20 years hence, discounted at 6 percent, is 0.312.  
 Then \$75,000 x 0.312 = ..... 23,400
  - (3) The present worth of the building reversion:  
 The P. W. of \$1.00 (a single payment), collectable 20 years hence, discounted at 6 percent, is 0.312.  
 Then \$20,000 x 0.312 = ..... 62,400
- (Minus) The lessor's interest ..... \$257,850

*Lessee's interest (leasehold)* ..... \$ 17,150  
 The figures should be rounded and distribution made as follows:

LESSOR'S INTEREST ...	\$257,750
LESSEE'S INTEREST ...	<u>17,250</u>
PROPERTY VALUE ....	\$275,000

In this case, since the contract rent is \$1,500 less than the economic rent, the lessee has a bonus value of \$1,500 per year for the remaining 20 year term of the lease. Its value is the present worth of \$1,500 per year for 20 years at 6 percent (Inwood factor is 11.470). (6 percent is the going rate for this type of investment.) Therefore, the bonus value is \$1,500 x 11.470 = \$17,205, say \$17,250. The lessor has in fact, by virtue of his making an adverse lease, conveyed to the lessee \$17,250 of the \$275,000 property value, leaving to himself only a \$257,750 interest in the property which, however, would be \$275,000, if the lease were not in existence.

The Rights of the Lessor and the Lessee in Eminent Domain Cases

LEROY C. MOSER

*Chief, Right-of-Way Division  
Maryland State Roads Commission*

The Fifth Amendment to our Federal Constitution provides that private property cannot be taken for public use without the payment of just compensation. The provisions of this amendment are restrictive against the Federal Government. The Fourteenth Amendment, on the other hand, applies to the States and it prohibits the taking of private property for public use without due process of law. Without exception, although varying as to phraseology and details, the constitutions and statutes of all the States provide for due process of law and, with one exception, the payment of just compensation when private property is taken for public use.

A basic principle of real estate ownership is that a tract of land and any improvements erected thereon are looked upon as a bundle of rights. The rights constituting this bundle are many in number, such as the right to the occupancy and use of the property, the right to sell it in whole or in part, the right to bequeath it by will, the right to transfer the benefits to be derived from its occupancy and use for a specified period of time, and many others.

An owner who leases real estate to a tenant transfers one of the rights in his bundle, namely, the right to the use and occupancy in accordance with the terms and provisions of the lease contract. He retains all other rights in the bundle. As compensation for the temporary relinquishment of this right, the owner or the lessor, as he is known, receives rent from the tenant or lessee. This rent constitutes a property separate and apart from the remaining property not transferred to the lessee from the bundle. After the lease is consummated, the lessor is the possessor of two different properties, the lease and the income it commands, and the title to the fee, subject to the lease, including the right to a recovery of the real estate at the expiration of the lease. The lessee obtains a right of temporary use and occupancy, and the right to the benefits from the property during the term of the lease; and in return for these rights, he has an obligation to pay the rent as per the terms of the lease. The interest of the lessor is known as the leased fee estate and the interest of the lessee is termed a leasehold estate.

Even though the ownership of these several rights are divided and vested in different people, they still are property rights just as if they had remained under one ownership. It is, therefore, fundamental that the lessee, as well as the lessor who owns the fee subject to a temporary use by the lessee, is entitled to compensation when all or part of the leased property is taken or damaged under eminent domain proceedings during the term of the lease. This statement is subject to the qualification that the lessee's interest has a market value.

### **Just Compensation**

In measuring the just compensation to which any property owner is entitled under eminent domain taking, the courts have held that it shall be measured in terms of the fair market value. The courts have laid down guide lines for the determination of this fair market that are usually referred to as the willing buyer—willing seller concept, and they are defined as:

The price which would be paid by a willing buyer, not compelled to buy to a willing seller, not compelled to sell, assuming that both buyer and seller are fully informed as to the uses and limitations of the property and that a reasonable time is allowed in which to find a purchaser.

The courts have further held that this is not the "value to the user." What the property may be worth to him individually is immaterial; it is measured as to its value in the free and open market place. The courts have also held that it is not the "going concern value" nor the "valuation that may be found by the summation of the value of the separate interests in a property such as a leased fee and leasehold estate". The one and only fair market value accepted by the courts is the willing buyer-willing seller concept and a consideration of the property as a single entity and, if there are divided interests, they are carved out of the value of the whole.

### **Undivided Fee Rule**

With minor and unusual exceptions it has been held that the sum total to which the lessor and lessee is entitled is the fair market value of the property as a whole. The first step, therefore, in arriving at an appraisal or award for a leased property is to value the entire bundle of rights as if they were under a single ownership. The second step is to apportion this lump sum between the various interests as they appear. If there is a sublease, the leasehold interest is divided and three interests have to be considered: the leased fee, the sandwich lease, and the sublease. Each is entitled to a portion of the award in direct proportion to his ownership of the rights making up the total bundle of rights. This rule, as promulgated by the courts, is referred to as the Undivided Fee Rule and is usually stated:

No contract between owners of different interests in land can affect the right of the government to take the land for public use, or obligate it to pay by way of compensation more than the entire value of the land as a whole.

With but few exceptions, therefore, the appraiser can follow the general rule that compensation must be paid for the real estate that is taken, regardless of the separate interests in the property and that the sum of the separate values of the divided interests may not exceed the value of the whole.

#### **Lessee-Erected Improvements and Fixture Installations**

Generally speaking, in eminent domain takings, a lessee is entitled to compensation for improvements erected by him if he has the right to remove them during, or prior to, the termination of the lease. This is also true of fixtures or other improvements installed by the lessee in the lessor's building if the lessee has the right to remove such fixtures or other improvements. This right could be either through operation of law or as provided for under the terms of the lease contract. Conversely it has been held that a lessee is not entitled to compensation for fixtures or other improvements, installed by him in a lessor's building, when he does not have the right to remove such improvements. Such holdings usually have been in reference to items like electric wiring, pipes, store fronts and similar improvements which, when annexed to the lessor's building, are not adaptable to removal without partial destruction or damage to portions of the building. It has also been held in a number of cases, that although the lessee is not entitled to compensation for fixtures and other improvements installed in a lessor's building, the cost of such improvements may be considered as an element in determining the value of the lessee's interest.

Another problem which is sometimes vexing is whether or not a fixture is personal property, or has become a part of the realty. If it is personal property and readily movable from the leased premises, the lessee, of course, is not entitled to any compensation. Trade fixtures would be classified as personal property. However, it has been held that fixtures are to be regarded as personalty as between the tenant and the landlord so far as the right of removal is concerned, but as between the tenant and the acquiring agency, they are regarded as part of the realty for purpose of allowable compensation so long as they remain fixtures. When, by the exercise of eminent domain, they are taken, destroyed or injured in value, damages may be recovered by the lessee therefor.

Although the law is somewhat complex and confusing, it can be said as a general rule that if fixtures or other improvements, annexed to a lessor's property by the lessee, are determined to be a part of the realty and not personal property, they are considered to be part of the real estate in determining the value of the property as a whole and in the apportionment of this value between the interests of the lessor and lessee. The value is awarded to the lessee if he has the right of removal

during the term of the lease or prior to its termination, otherwise their value is awarded to the lessor.

In most cases involving installed fixtures or improvements made to a lessor's building by the lessee, legal problems are inherent which the appraiser should not attempt to resolve. He should seek the advice of counsel for a determination of what is personal property and what is a part of the realty, and whether they are the property of the lessor or lessee for the purpose of an eminent domain award. Variations in these findings no doubt will occur in different jurisdictions as the law may differ. After these matters are resolved by an attorney, then, and only then, is the appraiser ready to proceed with his evaluation of the property as a whole and, following this, an apportionment of his total valuation between the interest of lessor and lessee.

### Entire Takings

If the entire leased property is taken the lease terminates and the lessee's obligation to pay rent is discharged. In this event the lessee's just compensation is the value of his normal lessee rights as previously defined under "Leases", and for purposes of emphasis is again repeated:

- (1) The present worth of the difference between the economic rent and the contract rent for the unexpired term of the lease, including any options of renewal. This is also known as the "bonus value" in the lease.
- (2) The present value (not cost) of the improvements, constructed by the lessee.
- (3) The present value of any improvement adjustments for fixtures, etc., attached to the improvements by the lessee and not required to be left for the lessor, either by operation of law or as provided in the terms of the lease.

The courts have held that it must be presumed that the lessee will avail himself of any renewal options that are provided for in the lease contract.

In order for the lessee to have a valuable interest in a leased property it is essential that he could sublet the property for a higher rent than he is obligated to pay under the terms of the lease or that he has made valuable improvements on the property. Expressed another way, the market value or bonus value of a lease is the amount that a lease could obtain as a bonus rental, if he made a sublease.

The lessee's interest as defined above is subtracted from the fee simple value of the property and the remainder constitutes the just compensation to which the lessor is entitled. When contract rent and economic rent are equal, the lessee has no marketable interest or bonus value. Similarly, when the contract rent is less than the economic rent, the lessee has no bonus value in the property. In both cases, the lessor is entitled to the entire award. However, where the contract rent is less than the economic rent,

the fair market value of the lessor's interest would be less than the fee simple value of the property. Despite this situation the lessor would receive the full fee simple value of the property as his just compensation since the rule is that the property shall first be appraised under the undivided fee rule and then the total apportioned between lessor and lessee, as their respective interests appear.

It also should be pointed out that the converse can happen to the lessor when the contract rent exceeds the economic rent and the combined interests of lessor and lessee exceed the fee simple value of the property. These instances can occur when land under a lease is not improved and the contract rent exceeds the economic rent, a ground lease is not improved sufficiently by the lessee to offset the difference between contract rent and economic rent, when the former exceeds the latter, and when contract rent exceeds economic rent for an improved property under a lease. Here there is a total property value that exceeds the fee simple value of the property. This value is composed of both tangible and intangible parts. The two embrace the real property concept, that property rights may attach to tangible things, such as real estate and also to intangible things, such as the existence of a lease favorable to the lessor. This excess value is not assignable to either land or buildings but is another element of value. Consequently, although the leased fee could be sold at a price in excess of the value of the fee simple title, in eminent domain takings the owner of this leased fee is entitled to the value of the fee simple property only under the undivided fee rule. Just compensation allowed is for the land and improvements themselves and not for the sum of the different interests therein. The public pays for the market value of land and improvements only. The money awarded stands in the place of the land and improvements and it is divided between lessor and lessee according to the rights of their respective estates. This is the general or common law rule, and can be followed in the vast majority of cases by an appraiser. When very unusual lease problems are encountered they should always be referred to legal counsel for advice and determination before the appraisal is undertaken.

#### Partial Takings

Just as in the case of an entire taking, in the case of a partial taking, the lessee's interest, if any, is subtracted from the fee simple value of the property and the remainder constitutes the just compensation to which the lessor is entitled. However, partial takings are more complicated and involved. The appraiser must first make two appraisals before he can begin with an apportionment between lessor's and lessee's interest. These two appraisals consist of a valuation of the property immediately "before" the taking and a valuation of the remainder immediately "after" the taking. Both are of the fee simple value of the property and both as if the property were not subject to a divided ownership. The difference between the "before" and "after"

appraisals represents the total amount due all of the interests for the taking and the resulting damages to the remainder. The first step preparatory to a consideration of the division between lessor's and lessee's interest is to break down the difference between the "before" and "after" appraisals into the value of the part taken and the resulting damages to the remainder, if any. Next, make an apportionment of the total amount of the award between the interests of lessor and lessee, each to receive his fair share of the total award as his interests appear.

Under the common law rule that is in effect in most jurisdictions, an eminent domain acquisition of an entire property will terminate a lease, but the taking of only a part of a leased property will not affect the lessee's obligations created by the lease. The prevailing rule is that a taking is considered to be only a partial taking unless the premises are rendered untenable. This rule has been superseded by statutory laws in some States and by lease provisions in some cases where the common law rule still applies. These exceptions generally provide for a proportionate abatement of the rent, which is all the lessee would be entitled to if the taking did not affect the utility of the remainder or the lease did not contain a bonus value. In a rent abatement situation, the lessee will not receive his just dues unless consideration is given to a diminution in the value of the remainder as well as the value of the taking when the reduction of the rent is considered. If the lease contained a bonus value, the lessee would be entitled to the present worth of the difference between the economic rent and the contract rent for the remaining life of the lease.

In partial takings the lessee's interest is measured as follows:

- (1) The present worth of the contract rent, not in excess of economic rent, for the portion taken for the unexpired term of the lease, including any option of renewal. This should be computed on a proportionate basis.
- (2) If the lessee enjoys a bonus value in his lease because the economic rent exceeds the contract rent, he is entitled to the present worth of that portion of the bonus value he loses on the part taken for the unexpired term of the lease, including any option of renewal.
- (3) The market value of any buildings, fixtures, or other improvements erected or installed by the lessee and which he has the right to remove during the term of the lease or prior to the end thereof, which are taken or partially taken.
- (4) If the taking results in a damage to the remainder, the present worth of that portion of the contract rent, not in excess of the economic rent, which represents the difference in the rental value of the remainder as a part of the whole and the rental value of the remainder after the taking, for the unexpired term of the lease, including any option of renewal.

- (5) If the lessee enjoys a bonus value in his lease because the economic rent exceeds the contract rent, and also if the taking results in a damage to the remainder, then he is entitled to the present worth of the reduction in bonus value of the remainder as a part of the whole and the remainder after the taking, for the unexpired term of the lease, including any option of renewal.
- (6) The reduction in market value due to the taking of any buildings, fixtures or improvements which remain after the taking, and which were erected or installed by the lessee and which he has the right to remove during the term of the lease or prior to the end thereof.
- (7) The cost or allowance for repairs or adjustments to remaining improvement necessitated by the taking.

#### **Partial Taking; Improvement Destroyed or Requiring Repairs because of Taking**

In following the common law rule, if the entire property is taken, the rent obligation of the lessee ceases. However, when the taking greatly affects or partially destroys the improvements, or renders the remainder of such size, shape, etc., that the property becomes of questionable utility, there is a difficult question to be resolved whether the taking constitutes a total taking and the rent will cease, or whether it constitutes a partial taking and the rent shall continue undiminished as per the terms of the lease agreement.

At common law, the prevailing rule in these cases is that they are considered a partial taking unless the premises are rendered untenable by the taking of a part thereof. Unless the lessor and lessee can mutually resolve this point, it would be necessary to resort to litigation to adjudicate the question.

When there is a severe taking necessitating reasonable repairs to the improvements to make them tenantable, for example, a street widening requiring the construction of a new front on a building, it has been held that the lessee is entitled to that portion of the damages to the remainder represented by the cost of repairs and restoration. This is because a partial taking does not cancel the lease and the lessee must continue to pay the full contract rent. He has no way to force the lessor to repair the building unless there was a clause in the lease to this effect, and consequently, equity demands that this portion of the award go to the lessee to make the remainder tenantable.

#### **Condemnation Clauses in Lease**

Condemnation clauses in the lease can change the common law and perhaps statute law rights of the parties to a contract. In an involved partial taking the apportioning of an award between lessor and lessee, in accordance with the common

or statutory laws, can become difficult in application. A condemnation clause in the lease can clearly spell out the respective rights of lessor and lessee, as agreed upon, in the event of a taking in eminent domain, and if properly conceived and drawn, will protect both lessor and lessee. Competent attorneys should always be engaged to draft such clauses and the appraiser should make sure that he understands the intent and meaning of such clauses before proceeding with the division of his award between lessor's and lessee's interests.

There are four types of condemnation clauses in common use. The first usually provides that the award in the case of a taking under eminent domain shall be divided between the parties in the proportion which the appraised values of their respective estates bear to each other, or to the value of the property as a whole. The second type usually provides that the lessor shall receive that portion of the award which is made on account of land value, and the lessee that portion awarded for building. The third type grants the lessor the capitalized value of the rentals reserved, the balance going to the lessee. The fourth type calls for termination of the lease, and the entire award going to the lessor. Besides these four common types, there are many others containing varied provisions. Because of the great variations in these condemnation clauses, they must be thoroughly studied. Often legal counsel should be obtained by the appraiser before attempting to make an apportionment of the value of the whole between the leased fee and leasehold estates in accordance with the intent and the legal rights of each party under the terms of the contract agreement.

Eminent domain laws vary with the statutes of the several States, and consequently, the appraiser should first be familiar with the basic condemnation laws of the jurisdiction in which he appraises; and secondly, when appraising a property subject to a lease he should always very carefully examine and analyze the terms of the lease, as they may have a definite bearing on his appraisal and the apportionment of the award between the lessor's and lessee's interests.

### Jury Apportioning Award

In the event of condemnation proceedings, the law in most States does not require that the awarding body, whether it be by commissioners or by common law jury, make separate awards for the leased fee and leasehold interests. In such cases the jury award is in a lump sum for the entire taking and damages to the remainder, if any. It is for the court thereafter to hear testimony and then pass orders for the distribution to the respective parties according to their interests. In other jurisdictions, usually by virtue of special statutes or special court rules, express authority is given to the jury to make separate awards to the lessor and lessee. In these States the court will instruct the jury in the rules to be followed in making their awards and these instructions usually will be that the jury first make a finding as

to the fair market value of the taking and resulting damages to the remainder, if any, as if there were no division of ownership, and then to apportion the award between the interests of the lessor and lessee as their respective interests appear and are affected.

Whether the law of the State provides for the jury merely to make a single award for all interests, or provides for the apportioning of the award does not alter the desirability of the appraiser to make an appropriate division in his original appraisal; in fact, the appraisal should not be considered complete until this is done. This is essential in order to arrive at a successful settlement by amicable negotiations. Although, on occasion, the landlord may assume full responsibility for negotiating with his lessee, seldom are the landlord and tenant able to agree as to the rights and values of their respective interests without the advice of the negotiator, supported by an adequate and well-reasoned appraisal of the value of these separate interests.

#### Apportionment of Award Between the Interests of Lessor and Lessee

To illustrate the apportionment of the award between the respective interests of the lessor and lessee, an analysis will be made of the same 12 examples used in chapter 31.

An apportionment between the lessor's and lessee's interests for entire takings under eminent domain acquisitions, in these 12 examples, would be as follows:

ENTIRE TAKINGS		
EXAMPLES	LESSOR'S AWARD	LESSEE'S AWARD
I	ALL ..... \$20,000 The total fee simple value of the property—an unimproved lot.	NONE
II	ALL ..... \$20,000 In this case, the lessor's total property value is \$21,250 or \$1,250 in excess of the fee simple value of the property, because the contract rent exceeds the economic rent. In an eminent domain taking he is only entitled to the fee simple value of the real estate and not the value of the intangible property created by the advantageous lease.	NONE In this case, the lessee who has a \$1,250 rent liability, because the contract rent exceeds the economic rent, will be relieved of this rent liability since the taking of the entire property cancels the lease and thus the lessee is relieved of the requirement to continue to pay rent for the premises.
III	\$23,750 In this case, the fee simple value of the lot is \$25,000; however, since the lessor has made a disadvantageous lease and thus created a bonus value for the lessee, this bonus value of \$1,250 attaches to the land value.	\$1,250 In this case, the lessee has a valuable interest, because the economic rent exceeds the contract rent and thus a leasehold bonus value is created.

ENTIRE TAKINGS

EXAMPLES	LESSOR'S AWARD	LESSEE'S AWARD
IV	<p>ALL ..... \$80,000</p> <p>The total fee simple value of the property consisting of \$20,000 for land and \$60,000 for improvements.</p>	<p>NONE</p>
V	<p>ALL ..... \$80,000</p> <p>In this case, the lessor's total property value is \$83,500, or \$3,500 in excess of the fee simple value of the property, because the contract rent exceeds the economic rent. In an eminent domain taking, he would only be entitled to the fee simple value of the real estate and not the value of the intangible property created by the advantageous lease.</p>	<p style="text-align: center;">NONE</p> <p>In this case, the lessee who has a \$3,750 rent liability, because the contract rent exceeds the economic rent, will be relieved of this rent liability, since the taking of the entire property cancels the lease and thus the lessee is relieved of the requirement to continue to pay rent for the premises.</p>
VI	<p style="text-align: right;">\$86,250</p> <p>In this case, the fee simple value of the property is \$90,000; however, since the lessor has a disadvantageous lease, which created a bonus value for the lessee, this bonus value of \$3,750 attaches to the property value, and reduces the lessor's equity by that amount.</p>	<p style="text-align: right;">\$3,750</p> <p>In this case, the lessee has a valuable interest because the economic rent exceeds the contract rent and thus a leasehold bonus value is created.</p>
VII	<p style="text-align: right;">\$50,000</p> <p>The fee simple value of the land.</p>	<p style="text-align: right;">\$200,000</p> <p>The fee simple value of the improvements.</p>
VIII	<p style="text-align: right;">\$74,250</p> <p>In this case, the lessor leased only the land, and its present fair market value is \$50,000; the difference of \$24,250 is due to the fact that the contract rent exceeds the economic rent, and because of this rent liability of the lessee to the lessor, the lessor's interest automatically carries over into the building value to the extent of this rent liability.</p>	<p style="text-align: right;">\$175,750</p> <p>In this case, the building erected by the lessee has a present fair market value of \$200,000; the difference of \$24,250 is due to the fact that the contract rent exceeds the economic rent and thus creates a rent liability. This rent liability automatically attaches to the lessee's building and reduces his equity by that amount. Since the taking of the entire property cancels the lease, the lessee is relieved of the requirement to continue to pay rent for the premises and his rent liability is therefore cancelled.</p>

ENTIRE TAKINGS

EXAMPLES	LESSOR'S AWARD	LESSEE'S AWARD
IX	<p style="text-align: right;">\$50,750</p> <p>In this case, the fee simple value of the land is \$75,000; however, since the lessor has made a disadvantageous lease and thus created a bonus value for the lessee, this bonus value attaches to the land value.</p>	<p style="text-align: right;">\$224,250</p> <p>In this case, the lessee has a valuable interest because the economic rent exceeds the contract rent and thus a leasehold bonus value is created.</p>
X	<p>ALL .....\$250,000</p> <p>The total fee simple value of the property, consisting of \$50,000 for land and \$200,000 for improvements.</p>	<p style="text-align: right;">NONE</p>
XI	<p>ALL ..... \$250,000</p> <p>In this case, the lessor's total property value is \$262,750 or \$12,750 in excess of the fee simple value of the property, because the contract rent exceeds the economic rent. In an eminent domain taking he is only entitled to the fee simple value of the real estate and not the value of the intangible property created by the advantageous lease.</p>	<p style="text-align: right;">NONE</p> <p>In this case, the lessee who has a \$12,750 rent liability, because the contract rent exceeds the economic rent, will be relieved of this rent liability since the taking of the entire property cancels the lease and thus the lessee is relieved of the requirement to continue to pay rent for the premises.</p>
XII	<p style="text-align: right;">\$257,750</p> <p>In this case, the fee simple value of the property is \$275,000; however, since the lessor has a disadvantageous lease, which created a bonus value for the lessee, this bonus value of \$17,250 attaches to the property value and reduces the lessor's equity by that amount.</p>	<p style="text-align: right;">\$17,250</p> <p>In this case, the lessee has a valuable interest because the economic rent exceeds the contract rent and thus a bonus value is created.</p>

The same 12 examples will now be used assuming a partial taking under eminent domain in each case. Application will be made of the same conditions of partial taking and resulting damages to the remainder for each of the several groups of like or similar properties, but different conditions of taking and resulting damages will be applied to each of these groups. Following this, an analysis will be made of the several partial taking problems and the apportionment of the awards between the interests of lessor and lessee.

This will divide the examples into four groups of three each: Examples I, II and III; Examples IV, V and VI; Examples VII, VIII and IX; and Examples X, XI and XII. The groups of problems, the compilation of the awards and the apportionment of the awards between the interests of lessor and lessee are as follows:

EXAMPLES—I, II AND III

Assume that the taking consists of one-half of the lot and the value of the part taken bears the same proportionate relationship to the whole as it does to the total area. Assume also that after study of the effects of the taking upon the remainder, it has been determined that the remainder will suffer a 20 percent damage because of reduction in size (and any other adverse effects) which affects its utility and thus reduces its fair market value by this amount. Further assume that this has been verified through the use of the "market approach" after a thorough analysis of comparable sales.

EXAMPLE I

Fee simple before value of the property .....	\$ 20,000
Fee simple after value of the property .....	\$ 8,000
Total for taking and damages .....	\$ 12,000

Contract rent and economic rent are the same.

Contract rent—\$1,200 net, per year.

Economic rent—\$1,200 net, per year.

Taking and damage data:

Value of the taking—\$10,000

Contract rent for portion in taking area—\$600

Economic rent for portion in taking area—\$600

Damage to remainder—20 percent or \$2,000

Contract rent for remainder—\$600

Contract rent for depreciated portion of damaged remainder  
—\$120

Economic rent for remainder—\$600

Economic rent for depreciated portion of damaged remainder  
—\$120

*Lessee's award*

- (1) The present worth of the contract rent for the portion taken:  
The P. W. of \$1.00 per annum for 5 years, discounted at 6 percent, is 4.212.  
Then \$600 x 4.212 = ..... \$ 2,527
- (2) The present worth of the reduction in contract rent of the remainder due to damage to the remainder:  
The P. W. of \$1.00 per annum for 5 years, discounted at 6 percent, is 4.212.  
Then \$120 x 4.212 = ..... \$ 505

TOTAL LESSEE'S AWARD ..... \$ 3,032

*Lessor's award* ..... \$ 8,968

These figures should be rounded and apportioned as follows:

TO LESSOR	—\$ 9,000
TO LESSEE	—\$ 3,000
TOTAL AWARD	—\$12,000

EXAMPLE II

Fee simple before value of the property .....	\$ 20,000
Fee simple after value of the property .....	<u>\$ 8,000</u>
Total for taking and damages .....	\$ 12,000

Contract rent exceeds economic rent.  
 Contract rent—\$1,500 net, per year.  
 Economic rent—\$1,200 net, per year.

Taking and damage data:

Value of the taking—\$10,000  
 Contract rent for portion in taking area—\$750  
 Economic rent for portion in taking area—\$600  
 Damages to remainder—20 percent or \$2,000  
 Contract rent for remainder—\$750  
 Contract rent for depreciated portion of damaged remainder  
 —\$150  
 Economic rent for remainder before depreciation—\$600  
 Economic rent for depreciated portion of damaged remainder  
 —\$120

*Lessee's award*

- (1) The present worth of the contract rent for the portion taken:

In this case, the contract rent exceeds the economic rent by \$150 for the part taken. This \$150 of surplus contract rent obligation is not for real estate but for an intangible lease obligation, which is not compensable in eminent domain takings.

The P. W. of \$1.00 per annum for 5 years, discounted at 6 percent, is 4.212.  
 Then \$600 x 4.212 = ..... \$ 2,527

- (2) The present worth of the reduction in contract rent of the remainder due to damage to the remainder:

In this case, the contract rent exceeds the economic rent by \$30 for that portion of the remainder represented by damaged property.

This \$30 of surplus contract rent obligation is not for real estate but for an intangible lease obligation and is not compensable in eminent domain takings.

The P. W. of \$1.00 per annum for 5 years, discounted at 6 percent, is 4.212.  
 Then \$120 x 4.212 = ..... \$ 505

TOTAL LESSEE'S AWARD ..... \$ 3,032

*Lessor's award* ..... \$ 8,968

These figures should be rounded and apportioned as follows:

TO LESSOR	—\$ 9,000
TO LESSEE	—\$ 3,000
TOTAL AWARD	—\$12,000

EXAMPLE III

Fee simple before value of the property .....	\$ 25,000
Fee simple after value of the property .....	\$ 10,000
Total for taking and damages .....	\$ 15,000

Economic rent exceeds contract rent.  
 Contract rent—\$1,200 net, per year.  
 Economic rent—\$1,500 net, per year.

Taking and damage data:  
 Value of the taking—\$12,500  
 Contract rent for portion in taking area—\$600  
 Economic rent for portion in taking area—\$750  
 Damages to remainder—20 percent or \$2,500  
 Contract rent for remainder—\$600  
 Contract rent for depreciated portion of damaged remainder  
 —\$120  
 Economic rent for remainder, before depreciated—\$750  
 Economic rent for depreciated portion of damaged remainder  
 —\$150

*Lessee's award*

- (1) The present worth of the contract rent for the portion taken:  
 The P. W. of \$1.00 per annum for 5 years, discounted at 6 percent, is 4.212.  
 Then \$600 x 4.212 = ..... \$ 2,527
- (2) The present worth of the bonus value, or rent saving, for the portion taken:  
 In this case, the economic rent exceeds the contract rent by \$150 for the part taken. This is a \$150 bonus value or rent saving, under the terms of the leased contract.  
 The P. W. of \$1.00 per annum, for 5 years, discounted at 6 percent, is 4.212.  
 Then \$150 x 4.212 = ..... \$ 632
- (3) The present worth of the reduction in contract rent of the remainder due to damage to the remainder:  
 The P. W. of \$1.00 per annum for 5 years, discounted at 6 percent, is 4.212.  
 Then \$120 x 4.212 = ..... \$ 505
- (4) The present worth of the reduction in bonus value of the remainder due to damage to the remainder:  
 In this case, the economic rent exceeds the contract rent by \$30, for that portion of the remainder of the lot represented by damaged property.  
 This is a \$30 bonus value, or rent saving, under the terms of the lease contract.

The P. W. of \$1.00 per annum, for 5 years, discounted at 6 percent, is 4.212.

Then  $\$30 \times 4.212 = \dots\dots\dots \$ 126$

TOTAL LESSEE'S AWARD  $\dots\dots\dots \$ 3,790$

*Lessor's award*  $\dots\dots\dots \$ 11,210$

These figures should be rounded and apportioned as follows:

TO LESSOR	—\$ 3,800
TO LESSEE	—\$11,200
TOTAL AWARD	—\$15,000

#### EXAMPLES—IV, V AND VI

Let us assume that the taking consists of one-quarter of the lot and one-tenth of the building and that it will cost \$10,000 to tear off and remodel and adjust the building, because of part being within the taking area. Let us further assume that the remainder of the lot will have the same proportional value after the taking that it had to the whole before the taking, and this will also be true of the building, after the cutting off of the part that is within the taking area, and repairs and adjustments are made to the remainder to meet the new conditions.

#### EXAMPLE IV

Fee simple before value of the property $\dots\dots\dots$	$\$ 80,000$
Fee simple after value of the property (after repairs) $\dots\dots\dots$	$\$ 69,000$
Taking and damages $\dots\dots\dots$	$\$ 11,000$
Plus cost to remove part of building and repairs $\dots\dots\dots$	$\$ 10,000$
Total for taking, damages and repairs $\dots\dots\dots$	$\$ 21,000$

Contract rent and economic rent are the same.

Contract rent—\$4,800 net, per year (after recapture)

Economic rent—\$4,800 net, per year (after recapture)

Taking and damage data:

Value of land taking—\$5,000

Value of building taking—\$6,000

Land to building ratio—1 to 3

Contract rent for portion of land in taking area—\$300

Economic rent for portion of land in taking area—\$300

Contract rent for portion of building in taking area—\$360

Economic rent for portion of building in taking area—\$360

#### *Lessee's award*

(1) The present worth of the contract rent for the portion taken:

The P. W. of \$1.00 per annum for 8 years, discounted at 6 percent, is 6.210.

Then  $\$660 (\$300 + \$360) \times 6.210 = \dots\dots\dots \$ 4,099$

(2)*The cost of tearing off and repairing the building . . . .	<u>\$10,000</u>
TOTAL LESSEE'S AWARD . . . . .	<u>\$ 14,099</u>
<i>Lessor's award</i> . . . . .	<u>\$ 6,901</u>

These figures should be rounded and apportioned as follows:

TO LESSOR	—\$ 6,900
TO LESSEE	—\$14,100
TOTAL AWARD	<u>—\$21,000</u>

\* Note: If in a negotiated settlement where it is agreed between the parties that the lessor would assume the responsibility of tearing off the portion of the building that is in the taking and repairing the building, then this \$10,000 cost would go to the lessor rather than the lessee and the apportionment of the award would be \$16,900 to the lessor and \$4,100 to the lessee.

EXAMPLE V

Fee simple before value of the property . . . . .	\$ 80,000
Fee simple after value of the property (after repairs) . . . . .	<u>\$ 69,000</u>
Taking and damages . . . . .	\$ 11,000
Plus cost to remove part of building and repairs . . . . .	<u>\$ 10,000</u>
Total for taking, damages and repairs . . . . .	<u>\$ 21,000</u>

Contract rent exceeds economic rent.

Contract rent—\$5,400 net, per year (after recapture)  
Economic rent—\$4,800 net, per year (after recapture)

Taking and damage data:

Value of land taking—\$5,000  
Value of building taking—\$6,000  
Land to building ratio—1 to 3  
Contract rent for portion of land in taking area—\$338  
Economic rent for portion of land in taking area—\$300  
Contract rent for portion of building in taking area—\$405  
Economic rent for portion of building in taking area—\$360

*Lessee's award*

(1) The present worth of the contract rent for portion taken:

In this case, the contract rent exceeds the economic rent by \$83 (land and building) for the part taken. This \$83 of surplus contract rent obligation is not for real estate but for an intangible lease obligation, which is not compensable in eminent domain takings.

The P. W. of \$1.00 per annum for 8 years, discounted at 6 percent, is 6.210.

Then \$660 (\$300 + \$360) x 6.210 = . . . . . \$ 4,099

(2)*The cost of tearing off and repairing the building . . . .	<u>\$10,000</u>
TOTAL LESSEE'S AWARD . . . . .	<u>\$ 14,099</u>
<i>Lessor's award</i> . . . . .	<u>\$ 6,901</u>

-These figures should be rounded and apportioned as follows:

TO LESSOR —\$ 6,900  
 TO LESSEE —\$14,100  
 TOTAL AWARD—\$21,000

\* Note: If in a negotiated settlement where it is agreed between the parties that the lessor would assume the responsibility of tearing off the portion of the building that is in the taking and repairing the building, then this \$10,000 cost would go to the lessor rather than the lessee and the apportionment of the award would be \$16,900 to the lessor and \$4,100 to the lessee.

EXAMPLE VI

Fee simple before value of the property .....	\$ 90,000
Fee simple after value of the property (after repairs) .....	\$ 76,500
Taking and damages .....	\$ 13,500
Plus cost to remove part of building and repairs .....	\$ 10,000
Total for taking, damages and repairs .....	\$ 23,500

Economic rent exceeds contract rent.

Contract rent—\$4,800 net, per year (after recapture)  
 Economic rent—\$5,400 net, per year (after recapture)

Taking and damage data:

Value of land taking—\$7,500  
 Value of building taking—\$6,000  
 Land to building ratio—1 to 2  
 Contract rent for portion of land in taking area—\$400  
 Economic rent for portion of land in taking area—\$450  
 Contract rent for portion of building in taking area—\$320  
 Economic rent for portion of building in taking area—\$360

*Lessee's award*

(1) The present worth of the contract rent for the portion taken:

The P. W. of \$1.00 per annum for 8 years, discounted at 6 percent, is 6.210.

Then \$720 (\$400 + \$320) x 6.210 = ..... \$ 4,471

(2) The present worth of the bonus value, or rent saving, for the portion taken:

In this case, the economic rent exceeds the contract rent by \$90 for the part taken. This is a \$90 bonus value, or rent saving, under the terms of the lease contract.

The P. W. of \$1.00 per annum for 8 years, discounted at 6 percent, is 6.210.

Then \$90 x 6.210 = ..... \$ 559

(3)\*The cost of tearing off and repairing the building .... \$10,000

TOTAL LESSEE'S AWARD..... \$ 15,030

*Lessor's award* ..... \$ 8,470

These figures should be rounded and apportioned as follows:

TO LESSOR	—\$ 8,500
TO LESSEE	—\$15,000
TOTAL AWARD	—\$23,500

\* Note: If in a negotiated settlement where it is agreed between the parties that the lessor would assume the responsibility of tearing off the portion of the building that is in the taking and repairing the building, then this \$10,000 cost would go to the lessor rather than the lessee and the apportionment of the award would be \$18,500 to the lessor and \$5,000 to the lessee.

#### EXAMPLES—VII, VIII AND IX

Let us assume that the taking consists of one-fifth of the lot and one-tenth of the building, and that it will cost \$20,000 to tear off, remodel and adjust the building, because of the part being within the taking area. Let us further assume that the remainder of the property both lot and building, as a unit, will be reduced in market value 5 percent after the taking, and the tearing off of the portion of the building that is within the taking and the repairs and adjustments made to the remainder to meet the new conditions.

##### EXAMPLE VII

Fee simple before value of the property .....	\$250,000
Fee simple after value of the property (after repairs) .....	\$209,000
Taking and damages .....	\$ 41,000
Plus cost to remove part of building and repairs .....	\$ 20,000
Total for taking, damages and repairs .....	\$ 61,000

Contract rent and economic rent are the same.

Contract rent—\$3,000 net, per year—Ground rent.

Economic rent—\$3,000 net, per year—Ground rent.

Taking and damage data:

Value of land taking—\$10,000

Value of building taking—\$20,000

Land to building ratio—1 to 4

Contract rent for portion of land in taking area—\$600

Economic rent for portion of land in taking area—\$600

Damage to remainder—5 percent or \$11,000

Damage to remainder of lot—\$2,000

Damage to remainder of building—\$9,000 after repairs

Contract rent for remainder of lot—\$2,400

Contract rent for depreciated portion of damaged remainder of lot—\$120

Economic rent for depreciated portion of damaged remainder of lot—\$120

*Lessee's award*

(1) The present worth of the contract rent for the portion taken: The P. W. of \$1.00 per annum for 60 years, discounted at 6 percent, is 16.161. Then \$600 x 16.161 = .....	\$ 9,697
(2) The present value of the portion of the building taken: Erected by lessee—1/10 of \$200,000 = .....	\$20,000
(3) The cost of tearing off and repairing the building .....	\$20,000
(4) The present worth of the reduction in contract rent of the remainder lot due to damage to the remainder: The P. W. of \$1.00 per annum for 60 years, discounted at 6 percent, is 16.161. Then \$120 x 16.161 = .....	\$ 1,939
(5) The depreciation to the building after removal of part and repairs— \$180,000 x 5 percent .....	\$ 9,000
TOTAL LESSEE'S AWARD .....	\$ 60,636
<i>Lessor's award</i> .....	\$ 364

These figures should be rounded and apportioned as follows:

TO LESSOR	—\$ 300*
TO LESSEE	—\$60,700
TOTAL AWARD	—\$61,000

\* Note: In this case the lessor's only interest is the land reversion, 60 years hence, which at 6 percent is \$300.

EXAMPLE VIII

Fee simple before value of the property .....	\$250,000
Fee simple after value of the property (after repairs) .....	\$209,000
Taking and damages .....	\$ 41,000
Plus cost to remove part of building and repairs .....	\$ 20,000
Total for taking, damages and repairs .....	\$ 61,000

Contract rent exceeds economic rent.

Contract rent—\$4,500 net, per year—Ground rent.  
Economic rent—\$3,000 net, per year—Ground rent.

Taking and damage data:

Value of land taking—\$10,000  
Value of building taking—\$20,000  
Land to building ratio—1 to 4  
Contract rent for portion of land in taking area—\$900  
Economic rent for portion of land in taking area—\$600  
Damage to remainder—5 percent or \$11,000  
Damage to remainder of lot—\$2,000  
Damage to remainder of building—\$9,000 after repairs  
Contract rent for remainder of lot—\$3,600

Contract rent for depreciated portion of damaged remainder of lot—\$180  
 Economic rent for depreciated portion of damaged remainder of lot—\$120

*Lessee's award*

- (1) The present worth of the contract rent for the portion taken:

In this case, the contract rent exceeds the economic rent by \$300 for the part taken. This \$300 of surplus contract rent obligation is not for real estate but for an intangible lease obligation, which is not compensable in eminent domain takings.

The P. W. of \$1.00 per annum for 60 years, discounted at 6 percent, is 16.161.

Then \$600 x 16.161 = ..... \$ 9,697

- (2) The present worth of the building taking:

Erected by lessee—1/10 of \$200,000 ..... \$20,000

- (3) The cost of tearing off and repairing the building .... \$20,000

- (4) The present worth of the reduction in contract rent of the remainder due to damage to the remainder:

In this case, the contract rent exceeds the economic rent by \$60 for that portion of the remainder of the lot represented by damages to the remaining portion of the lot. This \$60 of surplus contract rent obligation is not for real estate but for intangible lease obligation and is not compensable in eminent domain takings.

The P. W. of \$1.00 per annum for 60 years, discounted at 6 percent, is 16.161.

Then \$120 x 16.161 = ..... \$ 1,939

- (5) The depreciation to the building after removal of part and repairs—\$180,000 x 5 percent = ..... \$ 9,000

TOTAL LESSEE'S AWARD ..... \$ 60,636

*Lessor's award* ..... \$ 364

These figures should be rounded and apportioned as follows:

TO LESSOR —\$ 300\*  
 TO LESSEE —\$60,700  
 TOTAL AWARD—\$61,000

\* Note: In this case, the lessor's only interest is the land reversion, 60 years hence, which at 6 percent is \$300.

**EXAMPLE IX**

Fee simple before value of the property .....	\$275,000
Fee simple after value of the property (after repairs) .....	\$228,000
Taking and damages .....	\$ 47,000
Plus cost to remove part of building and repairs .....	\$ 20,000
Total for taking, damages and repairs .....	\$ 67,000

Economic rent exceeds contract rent.

Contract rent—\$3,000

Economic rent—\$4,500

Taking and damage data:

Value of land taking—\$15,000

Value of building taking—\$20,000

Land to building ratio—3 to 8

Contract rent for portion of land in taking area—\$600

Economic rent for portion of land in taking area—\$900

Damage to remainder—5 percent or \$12,000

Damage to remainder of lot—\$3,000

Damage to remainder of building—\$9,000 (after repairs)

Contract rent for remainder of lot—\$2,400

Contract rent for depreciated portion of damaged remainder of lot—\$120

Economic rent for depreciated portion of damaged remainder of lot—\$180

*Lessee's award*

- (1) The present worth of the contract rent for the portion taken:

The P. W. of \$1.00 per annum for 60 years, discounted at 6 percent, is 16.161.

Then \$600 x 16.161 = ..... \$ 9,697

- (2) The present worth of the bonus value, or rent saving, for the portion taken:

In this case, the economic rent exceeds the contract rent by \$300 for the part of the lot taken. This is a \$300 bonus value, or rent saving under the terms of the lease contract.

The P. W. of \$1.00 per annum for 60 years, discounted at 6 percent, is 16.161.

Then \$300 x 16.161 = ..... \$ 4,848

- (3) The present worth of the building taking:

Erected by lessee—1/10 of \$200,000 ..... \$20,000

- (4) The cost of tearing off and repairing the building ..... \$20,000

- (5) The present worth of the reduction in contract rent of the remainder due to damage to the remainder:

The P. W. of \$1.00 per annum for 60 years, discounted at 6 percent, is 16.161.

Then \$120 x 16.161 = ..... \$ 1,939

- (6) The present worth of the reduction in bonus value of the remainder due to damage to the remainder:

In this case, the economic rent exceeds the contract rent by \$60 for that portion of the remainder of the lot damaged by the taking. This is a \$60 bonus value, or rent saving, under the terms of the lease contract.

The P. W. of \$1.00 per annum for 60 years, discounted at 6 percent, is 16.161.

Then \$60 x 16.161 = ..... \$ 970

(7) The depreciation to the building after removal of part and repairs—\$180,000 x 5 percent = .....	\$ 9,000
TOTAL LESSEE'S AWARD .....	\$ 66,453
<i>Lessor's award</i> .....	\$ 547

These figures should be rounded and apportioned as follows:

TO LESSOR	—\$ 500*
TO LESSEE	—\$66,500
TOTAL AWARD	—\$67,000

\* Note: As in the previous examples VII and VIII, the lessor's only interest is in the land reversion, 60 years hence. In this case, since the remainder of the lot suffers a damage because of the taking, in theory, the land when received by the lessor, 60 years hence, will have a lower value than if there had been no damage. Consequently, the lessor's interest is affected slightly more than in examples VII and VIII.

#### EXAMPLES—X, XI AND XII

Assume that the taking consists of one-fifth of the lot, and further assume that the taking does not physically encroach into the building. However, the remainder of the property will be reduced in value, both land and building, 10 percent of its original value as a part of the whole, because of the effect of the adverse conditions of access, grades, etc., caused by the proposed construction on the area of the taking.

##### EXAMPLE X

Fee simple before value of the property .....	\$250,000
Fee simple after value of the property .....	\$216,000
Total for taking and damages .....	\$ 34,000

Contract rent and economic rent are the same.

Contract rent—\$15,000 net, per year (after recapture)  
Economic rent—\$15,000 net, per year (after recapture)

Taking and damage data:

Value of the land taking—\$10,000  
Land to building ratio—1 to 4  
Contract rent for portion of land in taking area—\$600  
Economic rent for portion of land in taking area—\$600  
Damage to remainder—10 percent or \$24,000  
Damage to remainder of lot—\$4,000  
Damage to building—\$20,000  
Contract rent for remainder of lot—\$2,400  
Economic rent for remainder of lot—\$2,400  
Contract rent for depreciated portion of damaged remainder of lot—\$240  
Economic rent for depreciated portion of damaged remainder of lot—\$240  
Contract rent for the building—\$12,000  
Economic rent for the building—\$12,000

Contract rent for depreciated portion of damaged building  
 —\$1,200  
 Economic rent for depreciated portion of damaged building  
 —\$1,200

*Lessee's award*

- (1) The present worth of the contract rent for the portion taken:

The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470.

Then \$600 x 11.470 = ..... \$ 6,882

- (2) The present worth of the reduction in contract rent of the remainder due to damage to the remainder:

The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470.

Then \$1,440 (\$240 + \$1,200) x 11.470 = ..... \$16,517

TOTAL LESSEE'S AWARD ..... \$ 23,399

*Lessor's award* ..... \$ 10,601

These figures should be rounded and apportioned as follows:

TO LESSOR	—\$10,500
TO LESSEE	—\$23,500
TOTAL AWARD	—\$34,000

EXAMPLE XI

Fee simple before value of the property .....	\$250,000
Fee simple after value of the property .....	\$216,000
Total for taking and damages .....	<u>\$ 34,000</u>

Contract rent exceeds economic rent.

Contract rent—\$16,500 net, per year (after recapture)  
 Economic rent—\$15,000 net, per year (after recapture)

Taking and damage data:

Value of the land taking—\$10,000  
 Land to building ratio—1 to 4  
 Contract rent for portion of land in taking area—\$660  
 Economic rent for portion of land in taking area—\$600  
 Damage to remainder—10 percent or \$24,000  
 Damage to remainder of lot—\$4,000  
 Damage to building—\$20,000  
 Contract rent for remainder of lot—\$2,640  
 Economic rent for remainder of lot—\$2,400  
 Contract rent for depreciated portion of damaged remainder of lot \$264  
 Economic rent for depreciated portion of damaged remainder of lot —\$240  
 Contract rent for the building—\$13,200  
 Economic rent for the building—\$12,000

Contract rent for depreciated portion of damaged building  
 —\$1,320  
 Economic rent for depreciated portion of damaged building  
 —\$1,200

*Lessee's award*

- (1) The present worth of the contract rent for the portion taken:

In this case, the contract rent exceeds the economic rent by \$60 for the part taken. This \$60 of surplus contract rent obligation is not for real estate but for an intangible lease obligation which is not compensable in eminent domain takings.

The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470.

Then \$600 x 11.470 = ..... \$ 6,882

- (2) The present worth of the reduction in contract rent of the remainder due to damages to the remainder:

In this case, the contract rent exceeds the economic rent by \$144 (land and building) for that portion of the remainder represented by damaged property. This \$144 of surplus contract rent obligation is not for real estate but for an intangible lease obligation, which is not compensable in eminent domain takings.

The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470.

Then \$1,440 (\$240 + \$1,200) x 11.470 = ..... 16,517

TOTAL LESSEE'S AWARD ..... \$23,399

*Lessor's award* ..... \$10,601

These figures should be rounded and apportioned as follows:

LESSOR'S AWARD—\$10,500  
 LESSEE'S AWARD—\$23,500  
 TOTAL AWARD —\$34,000

EXAMPLE XII

Fee simple before value of the property ..... \$275,000  
 Fee simple after value of the property ..... \$234,000  
 Total for taking and damages ..... \$ 41,000

Economic rent exceeds contract rent.

Contract rent—\$15,000 net, per year (after recapture)

Economic rent—\$16,500 net, per year (after recapture)

Taking and damage data:

Value of land taking—\$15,000

Land to building ratio—3 to 8

Contract rent for portion of land in taking area—\$818

Economic rent for portion of land in taking area—\$900

Damage to remainder—10 percent or \$26,000

Damage to remainder of lot—\$6,000

Damage to building—\$20,000  
 Contract rent for remainder of lot—\$327  
 Economic rent for remainder of lot—\$3,600  
 Contract rent for depreciated portion of damaged remainder  
 of lot \$327  
 Economic rent for depreciated portion of damaged re-  
 mainder of lot—\$360  
 Contract rent for the building—\$10,911  
 Economic rent for the building—\$12,000  
 Contract rent for depreciated portion of damaged building  
 —\$1,091  
 Economic rent for depreciated portion of damaged building  
 —\$1,200

*Lessee's award*

- (1) The present worth of the contract rent for the portion taken:  
 The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470.  
 Then \$818 x 11.470 = ..... \$ 9,382
  - (2) The present worth of the bonus value, or rent saving, for the portion taken:  
 In this case, the economic rent exceeds the contract rent by \$82 for the part taken. This is a \$82 bonus value or rent saving, under the terms of the lease contract.  
 The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470  
 Then \$82 x 11.470 = ..... \$ 940
  - (3) The present worth of the reduction in contract rent of the remainder due to damage to the remainder:  
 The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470.  
 Then \$1,418 (\$327 + \$1,091) x 11.470 = ..... \$16,264
  - (4) The present worth of the reduction in bonus value of the remainder due to damage to the remainder:  
 In this case, the economic rent exceeds the contract rent by \$142 for that portion of the remainder of the lot damaged by the taking. This is a \$142 bonus value under the terms of the lease contract.  
 The P. W. of \$1.00 per annum for 20 years, discounted at 6 percent, is 11.470.  
 Then \$142 x 11.470 = ..... \$ 1,628
- TOTAL LESSEE'S AWARD ..... \$ 28,214  
 Lessor's award ..... \$ 12,786

These figures should be rounded and apportioned as follows:

TO LESSOR —\$13,000  
 TO LESSEE —\$28,000  
 TOTAL AWARD—\$41,000

The discussions in this chapter and the representative problems with suggested solutions are by no means intended to be an all inclusive thesis on the subject of leased properties, the interests therein, the appraisal of these interests when private sales are involved or when there is a public taking. This work is rather intended to be elementary and written in a manner that is hoped will provide a better understanding for those not well versed on the subject, and especially those who appraise leased properties in connection with eminent domain takings.

As a word of final caution, when appraising properties subject to a lease, and especially for the purpose of a taking under eminent domain, many problems arise that are legal in nature. *They are not for the appraiser to resolve when matters of legal interpretation are required.* The appraiser should confer with the legal expert before proceeding with his appraisal, and especially when the appraisal involves the apportionment of the fee simple value between the interests of the lessor and lessee. Close cooperation between the appraiser and the attorney, each working in his own field, will result in sounder appraisals that reflect the requirements of law for the particular jurisdiction in which the property is located.

## CHAPTER 34

# The Appraisal of Special Purpose Properties

THOMAS F. MCSWEENEY

*Thomas F. McSweeney Associates  
Consulting and Valuation Engineers  
Hingham, Massachusetts*

### What is a Special Purpose Property?

Probably the best way to open this chapter will be to specify as clearly as possible the meaning of the term "special purpose properties," as it is to be used in this portion of the text, and to show how these differ from the more commonly encountered "general purpose properties," and the valuation techniques that the differences make necessary. A general purpose property is to be understood as one with a fairly broad use value, whose market value can be determined largely, if not entirely, by comparison with truly "comparable" sales and/or rentals of similar properties. Thus, a factory used for the manufacture of shoes may be shown to have significant comparability to one housing a knitting company. Both have approximately the same superimposed live load to carry, and the machinery used in each will fit into the same floor plan. But sometimes the appraiser is confronted by a plant designed, built and occupied by an owner whose product or methods are highly specialized, and perhaps protected by patents. It is quite possible that market data obtained for the shoe factory or the knitting mill simply do not apply, and that the conventional techniques of appraisal cannot be stretched to fit this specialized property. Plants built for a special purpose will probably require special valuation methods, if they are to be fairly and accurately appraised.

The category of special purpose properties clearly applies to the sort of industrial plant whose particular conditions make the use of comparable market data difficult or even impossible. It has also been extended to include other types of valuation where the exact application of the term is not so direct. No all-inclusive list of special purpose properties can be drawn up. The explanations and examples given in this chapter can, at best, be only illustrative for it is not to be expected that in any problem involving special purpose evaluations a clearly marked highway can be mapped out for the appraiser.

The element of special usage is nothing new, but it is one of rapidly growing importance in industrial appraisals with the mushrooming use of what used to be called "labor saving" equipment and which has attained the status now of "automation." Only a few years ago special purpose structures would be designed and built to house the required machinery and, as a sort of afterthought, the automation engineer might be called in to add his gadgets. Today this is all changed, for the new techniques are proving themselves so thoroughly that their design now often precedes everything else, and the machinery is made to fit them instead of the former reversal of this process. The result is increasingly evident in buildings and other structures adapted for a very specialized use, for which the conventional comparability data so necessary in the evaluation of a general purpose property may be of little or no assistance to the appraiser.

It may be helpful in the present discussion to understand something of the history of condemnation proceedings as they apply to special purpose properties. Any such outline as this must necessarily be read with a great deal of caution, for it is intended only to give a layman's background to the particular subject. It certainly is not intended in any way as illustrative of the legal aspects of a condemnation appraisal. Matters of this sort always are under the direct supervision of an attorney, and the appraiser must always be guided by his interpretation of the law either as it applies generally or in the specific jurisdiction.<sup>1</sup>

It would seem that in the case of general purpose properties most courts have felt, even while ostensibly adhering to the willing buyer-willing seller concept, that the value to a "willing buyer" more nearly represents just compensation than that of the "willing seller." All appraisers who have done much testifying in court cases involving condemnation proceedings have probably noted the emphasis placed on the question, "What could you have sold it for?," asked of the owner or of his appraisers. If the property is such that fairly comparable parcels are available in the open market, and if all the factors involved in the willing buyer-willing seller concept can be considered as operating, this attitude may have justification. But, when the property taken by eminent domain is properly to be classified as special purpose, it may well be that more emphasis must be given to the opinions of the seller.<sup>2</sup>

1. This matter of legal background for the type of work under discussion is thoroughly and excellently covered in *The Valuation of Property*, by James C. Bonbright, published by McGraw-Hill Book Company. Several other excellent reference works should be listed, and, although they are written for lawyers, rather than for appraisers, anyone doing much work on eminent domain takings should at least be generally familiar with the standard references in the field. Of particular note are: *A Treatise on the Law of Eminent Domain in the United States* (three volumes), by John Lewis; *Handbook on the Law of Damages*, by Charles T. McCormick; *The Law of Eminent Domain* (three volumes), by Philip Nichols; and *Valuation Under the Law of Eminent Domain*, by Lewis Orgel.
2. Dr. Bonbright opens his discussion of the law as it has developed by noting the "... triangular distinction between three possible values, market value, value to the owner and the value to the taker." Many legal authorities on this matter point out the basic paradox of

It must be clear that the situation resulting from the taking of a piece of property similar to other pieces which are constantly being bought and sold in an open market is entirely different from that resulting in a taking of some other parcel containing, at least in part, elements of value which are irreplaceable or replaceable only with great difficulty. This is not a precise statement of the problem arising when it becomes necessary to assign damages due to the taking of a special purpose property, but it may be accepted as establishing subjectively a difference between the "general purpose" and "special purpose" types of realty.<sup>3</sup>

It must be understood that the type of treatment in a text of this nature must necessarily be general in its character. Valuation, especially of the sort specifically treated here, must follow rules, interpretations and procedures laid down by the legislatures and courts of 50 different States. This text is not a comparative study of valuation law, and at best it will be a review of how the law and the local policies have acted to establish methods followed in a few specific instances. It will be necessary in the particular States to supply the policy statements and legal criteria that are applicable to that individual jurisdiction.

Appraisal work is far from being an exact science, and it is inevitable that differences of opinion will become apparent in the theories set out in the various sections. This is not to be regretted, for such differences are often a healthy sign of growing and improving techniques. But they do place on anyone who hopes to profit from a study of the text the obligation of noting their occurrence, of understanding how and why they exist, and of deciding for himself which one best answers his needs.

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talking about the fair market value of a piece of property at exactly the time when no willing buyer would purchase it, and when the use value, out of which fair market value necessarily arises, had been terminated by the taking. Consider, for example, the problem confronting an appraiser who must place a fair market value on a piece of farm land condemned under eminent domain by a power company which intends to build a dam and flood the area. It can never again be used by the taking authority, supposed to be a willing buyer, or by anybody else for farming. Realty taken by eminent domain has been deprived of its value to the owner; its value to the taker involves consideration of possible enhancements due to the taking, an element supposedly excluded in legal proceedings. In the conventional definition, the willing buyer, if there could be one, would not be buying the land for future valuable use.

3. Before leaving this particular part of the discussion something should be said about the use of the definitions and computations involved in all valuation determinations. Reference has already been made to the willing buyer-willing seller concept of fair market value. All of these definitions are highly subjective and lack scientific rigor; at best they indicate the frame of mind to be adopted by anybody making a valuation study. There is no reason for appraisers or valuation engineers to lament this necessary lack of objectivity in their work. Similar difficulties arise in all types of thought, even in mathematics, which is supposed to be the most objective of all sciences. One school of mathematicians is constantly attempting to remove the subjective elements from their discipline by continuously emphasizing the necessity for "mathematical rigor." A great many other mathematicians and most engineers question the necessity of a strict adherence to this type of thought. The worker in valuation techniques should always strive for more and better objective data, but should remember that his work (especially when and if it gets to court) must conform to rules and limits set up by the decisions of appellate courts and by legislatures. Neither of these has ever been noted for its strict adherence to objectivity, but one must follow their laws and rulings if his work is to be accepted.

Finally before starting the detailed explanations of illustrative appraisals of special purpose properties, it is to be emphasized that in order to arrive at a logical result it may be necessary to stray from familiar paths. At places the going may seem to be hard, but, since the special purpose type of appraisal is the most interesting and challenging of all valuation work, the scenery along the way makes the difficulties worthwhile. There may be other roads to follow, but remember that each of the examples cited represents an actual case tried in court. No one can object and say that the suggested technique is impossible, for it has been used and it has worked. It may be that in some other jurisdiction precedents have been established different from those prevailing in the areas where the cited cases were located. This possibility has been considered in the quoted statement given above that each state will supply local criteria "applicable to the particular jurisdiction."

#### Valuation of Churches and Similar Properties

Consider the first example by asking how much comparable data and how much of a conventional open market an appraiser could expect to find for an 80-year old synagogue. It was, and had been since it was built in 1880, in full and serviceable operation for a strongly established congregation when it was taken by an authority set up to rehabilitate an old and blighted section of the city. The taking was total; the damage was to be measured by the fair market value of the property immediately before the taking was made. The offer made by the authority was unacceptable to the congregation; a lawsuit was necessary; and the property had to be appraised for evidence at the trial.

It was immediately apparent to everybody concerned that no comparable sale or rental data could be expected to apply to this particular case. The only technique to be used was a summation analysis, in which the desired value was to be computed as the sum of the fully depreciated reconstruction cost plus the fair value of the land. It happened that in this case, as the congregation wanted to remain in the same general neighborhood where all available land now belonged to the authority, and as the latter had offered the congregation a suitable lot at an acceptable price, the question of the land value was not in dispute. Both sides agreed that the value of the building could be obtained by computing its reconstruction cost, as of the day of the taking, and subtracting all accrued depreciation.

Experts for both the authority and for the congregation made computations of reconstruction costs, and the figures derived by both were in substantial agreement. These costs were computed by the use of a "quantity survey analysis." In the use of this method, schedules were made of all the materials necessary to complete the buildings involved, applying to each item the unit cost of both labor and materials necessary for its proper erection. Allowance must also be made for all overhead

costs, architects and engineering fees, and the out-of-pocket expenses incurred by the owner during erection. The reconstruction cost thus obtained is used in the summation analysis as indicated in the equation:

$$V = RC - (PD + O)$$

Where V = fair market value; RC = reconstruction Cost; PD = physical depreciation; and O = obsolescence.

Both parties were in substantial agreement as to the first factor in the valuation equation; the next thing to consider was the factor of overall depreciation, including both physical depreciation and all elements of obsolescence. At this point a major disagreement arose, caused chiefly by the significant difference in the understanding of the term "physical depreciation." The authority insisted that any building 80 years old must necessarily have suffered severely from this factor. The representatives of the congregation held that there is a possibility of great difference in a special purpose structure like this between physical depreciation, which is a possible loss in value, and deterioration, which means actual physical impairments such as broken walls and foundation settlements. The two buildings on the property had been very well built and maintained and were in excellent condition. The congregation argued that the building had, by reason of its long service, acquired the same sort of monumental value shared by the old cathedrals of Europe and by such historic shrines as Mt. Vernon or Faneuil Hall.

The same type of disagreement arose over the question of obsolescence. Had the development of new construction forms and changes in architectural techniques and tastes (and there can be no doubt that both are presently affecting the determination of value in many other types of buildings) necessitated the introduction of an obsolescence factor? The authority said yes; the former owner, using the arguments already mentioned, said no. Taking all types of depreciation into consideration the appraisers for the authority used a deduction of 80 percent on their reconstruction cost, while the congregation's experts said that because of the very special nature of the property no depreciation was chargeable.

This case was tried in Massachusetts where no law or existing court decisions furnished guideposts to point the way to an acceptable answer as to the matter of depreciation. To illustrate how local conditions must enter into a question of this sort, consider the Annotated Code of Maryland, Eminent Domain (Article 33A, Section 10), dealing with the acquisition of cemeteries or churches, which says:

(b) Churches.—Whenever State, county or city authorities, or their agents, shall for any public purpose or purposes have the right to acquire or proceed by the power of eminent domain to acquire, property that is used as a church or place of worship, the jury, in assessing damages for said church or place of worship so acquired or to be acquired, shall take into consideration,

in addition to the fair value of the church or place of worship so condemned, the difference between the fair value of the church or place of worship condemned and the cost of erecting or constructing a new church or place of worship of substantially the same size, type, design and character of construction as the structure condemned at some other suitable and comparable location within the State of Maryland to be provided by the authorities of the structure condemned. (Ann. Code, 1951, Sec. 10; 1945, ch. 804, Sec. 9A.)

In the case of the synagogue the court agreed substantially with the congregation. After the verdict came in the authority considered an appeal to a higher court. None was ever made, however, and this one district court decision cannot be considered as establishing the law on this matter, even in the jurisdiction where the trial was held. It is interesting to note, however, that several other cases with similar backgrounds have recently been appraised on the same theory. One was a Baptist missionary property taken in a slum clearance; another was a museum and library of an Armenian Cultural Foundation; and a third was an old and famous school for architects. In the Missionary Society property trial, the appraiser for the society testified that the heating, plumbing and wiring had needed repairs and allowed for their cost, conceding that where deterioration existed it should be taken into consideration. The attorney for the society argued that loss in value due to overall depreciation (rather than to lack of maintenance) in a property such as this was not an element in the determination of value and should be omitted from the computations. The trial jury's verdict was in substantial agreement with this contention.

#### Valuation of Cemeteries

Before leaving the subject of evaluating churches, mention should be made of the very special difficulties that arise whenever it is found necessary to take cemetery property. This highly complex matter is well covered by Section 10 of Article 33A, Annotated Code of Maryland, Eminent Domain.

(a) Cemeteries.—Whenever State, county or city authorities, or their agents, shall for any public purpose or purposes have the right to acquire, or proceed by the power of eminent domain to acquire, property that is used as a cemetery, either public or private, the jury shall, in assessing damages for said land and improvements so acquired or to be acquired, take into consideration in addition to the damages for said land and improvements the cost of removal of bodies, markers and monuments, and the placing of the same at some other suitable or comparable location within the State of Maryland to be provided by the authorities of the cemetery discontinued, and such removal and placing to the location chosen as above provided shall be effected by the authorities of the cemetery discontinued or their agents, before payment is made of the portion of the damages assessed for such purposes. Damages to be assessed in favor of any owner who elects to remove a body, marker or monument to any location other than that chosen as above provided shall be in the same

amount as if the body, marker or monument had been removed to the said specified location.

The subject of cemetery valuation is not as specifically covered in most other States, but it may be assumed (subject again to local criteria applicable to the particular jurisdiction) that the actual practice is quite similar all over the country.

#### Valuation of Schools

Another type of property in which there is no open market to furnish comparison data is illustrated by schools, usually private rather than public schools. The situation they present differs considerably from that described for churches and the like, but because school properties are seldom bought and sold many aspects of the basic problem are the same. The summation technique is almost always indicated. Determinations of reconstruction costs should be made by quantity survey estimates. Allowance should be made for lack of proper repairs caused by faulty maintenance, and serious consideration given to possible deterioration. But, when the questions of physical depreciation and obsolescence, as distinguished from the type of charges mentioned in the last sentence, are to be answered, the appraiser must stop, look and listen to the coming storm of protest from college officials and alumni alike to any suggestion that an ivy-covered dormitory or lecture hall has lost value simply because it has been in use for a hundred years. Perhaps it has lost value, or perhaps the factor of appreciation (this is a negative obsolescence that tends to add value through the years) has entered the picture. The circumstances of each case will vary so greatly that no dogmatic rules can be established. All special purpose valuation work involves ingenuity and understanding on the part of the appraiser, as is well illustrated by this question of school valuation.

It may be of little importance in a condemnation damage determination, but in two recent appraisals of college property it has been found that the school's records carry buildings at current reconstruction cost without depreciation of any type.

An interesting point (quite different from any previously mentioned) as to the value of summer camps was raised in a recent Massachusetts case caused by the taking by the Massachusetts Turnpike Authority of a part of a Girl Scout camp. The Scouts offered as expert witnesses several of their national camp authorities and officials who were to testify as to a summation analysis value based on their general knowledge of such properties. The trial judge, however, excluded their testimony as to value because of their lack of local real estate experience. The authority's witness offered comparison testimony derived from a study of transactions in land sales, mostly consisting of small summerhouse lots on nearby ponds and lakes. The case was appealed to the Supreme Court of the Commonwealth, which overruled the judge and said that the Girl Scout officials' testimony as to value should have been allowed. This decision has

greatly strengthened the use of the techniques already outlined, especially in Massachusetts cases. Because Massachusetts is one of the so-called "strong" States in the acceptance granted its court rulings, it will probably be given consideration in other jurisdictions.

### Valuation of Special Purpose Dwellings

The sort of "special purpose" techniques described may possibly have to be extended to almost any kind of an appraisal. Even if it is found that no free and open market exists for the property, it may be a simple matter to decide on either the price a willing buyer would offer or that a willing seller would accept. The difficulty is that the two figures might vary considerably and cannot be brought together. In this case the criteria of the fair market value definition would not apply. An interesting example was encountered when it became necessary to put a fair market value on a house which would have been almost impossible to sell, but which the owner had no intention of selling under any circumstances. The property had been built before the turn of the century by a local textile mill owner. It was huge; it had little turrets projecting unexpectedly at various parts of the roof and *porte-cocheres* from the walls; some of the windows were stained glass and some were curved plate glass; and last, but not least, it contained three ballrooms. It might be well for anyone considering the appraisal of "special purpose" properties to try to fit such a property into any of the logical appraisal techniques available for the more usual types of dwellings.

### Valuation of Special Purpose Industrial Properties

While the "special purpose" techniques to be used in appraisals of churches, cemeteries, schools, unusual dwellings and the like are both interesting and important, their application to industrial properties is more common and, as has already been noted, the growing use of automation will unquestionably increase the necessity for their use. Because such cases are not usual it is impossible to present any definitive procedure to show how to arrive at the correct solution of all the problems that might be encountered. Almost always the lack of an open market for the specialized property will prevent the establishment of the criteria necessary before the "willing buyer-willing seller" concept can be adopted. It seems logical to assume that the price the prospective buyer would offer for a plant that can be used only by the then owner would differ greatly from the price the owner would be willing or could afford to accept. As in the cases previously cited the only technique usually available is the summation analysis. In the case of the specialized industrial plant it is quite probable that the easy assumption of zero physical depreciation and/or obsolescence, so helpful in the case of the church or school, cannot be used. In most cases of special purpose

commercial or industrial properties, both physical depreciation and obsolescence must be considered and properly evaluated.

Because it is impossible to lay down any general set of rules for this type of work, the most helpful method of explanation will be to go through a few actual cases in some detail. The first example refers to the claim made by the United States Gypsum Company against the Mystic River Bridge Authority for damages caused to their Charlestown, Massachusetts, plant by the building of the bridge, a double-deck section of the elevated express highway across and around Boston.

The plot plan and the two sections shown in the accompanying sketch are offered to help clarify the statement of the problem. The plant is on navigable water on the southwest bank of the Mystic River. It has a wooden marginal pier extending into the stream from a heavy granite masonry sea wall. Behind this wall there are five large concrete silos (numbered 1 through 5 on the plan), a mill building containing among other things two large rotary kilns, a covered train shed with two loading tracks, platforms, etc., as well as a multistory building which houses the equipment needed to make gypsum wallboard, and offices, shipping and storage areas. Before the new bridge was built, an old low-level bridge crossed the river to Chelsea (it is shown as "Old Bridge" on the plan). This bridge did not touch the gypsum plant at any point.

Raw material in the form of gypsum ore was brought to the plant from the company mines in Nova Scotia. It was, and still is, carried by highly specialized ships, built and owned by the company, from their shipping plant in the Minas Basin at the head of the Bay of Fundy. The special purpose aspect of the plant begins with these ships. They are built with belt conveyors running fore and aft below the holds and just above the keel. This conveyor takes the ore to a point near the bow and drops it onto another shorter thwartship belt which runs into a transfer house on the pier outside Silo #1, up a series of vertical lift buckets to another conveyor running across the top of the five silos. From these it is dropped onto still another belt in a tunnel under the silos to be carried to the kilns in the mill. After roasting, some of the gypsum is processed for finishing plaster, and more is transferred to the board mill where it is made into different types of fireproof wallboard. The mill building is actually a cover over and around the patented and highly specialized machinery used in the process. The entire plant was excellently and efficiently usable for a highly specialized process that began in the Minas Basin and ended with the production of closely controlled products. Most of the building and other improvements (with the possible exception of the offices) would have been of little value to anybody but the owner; to him they were exactly what he wanted and needed.

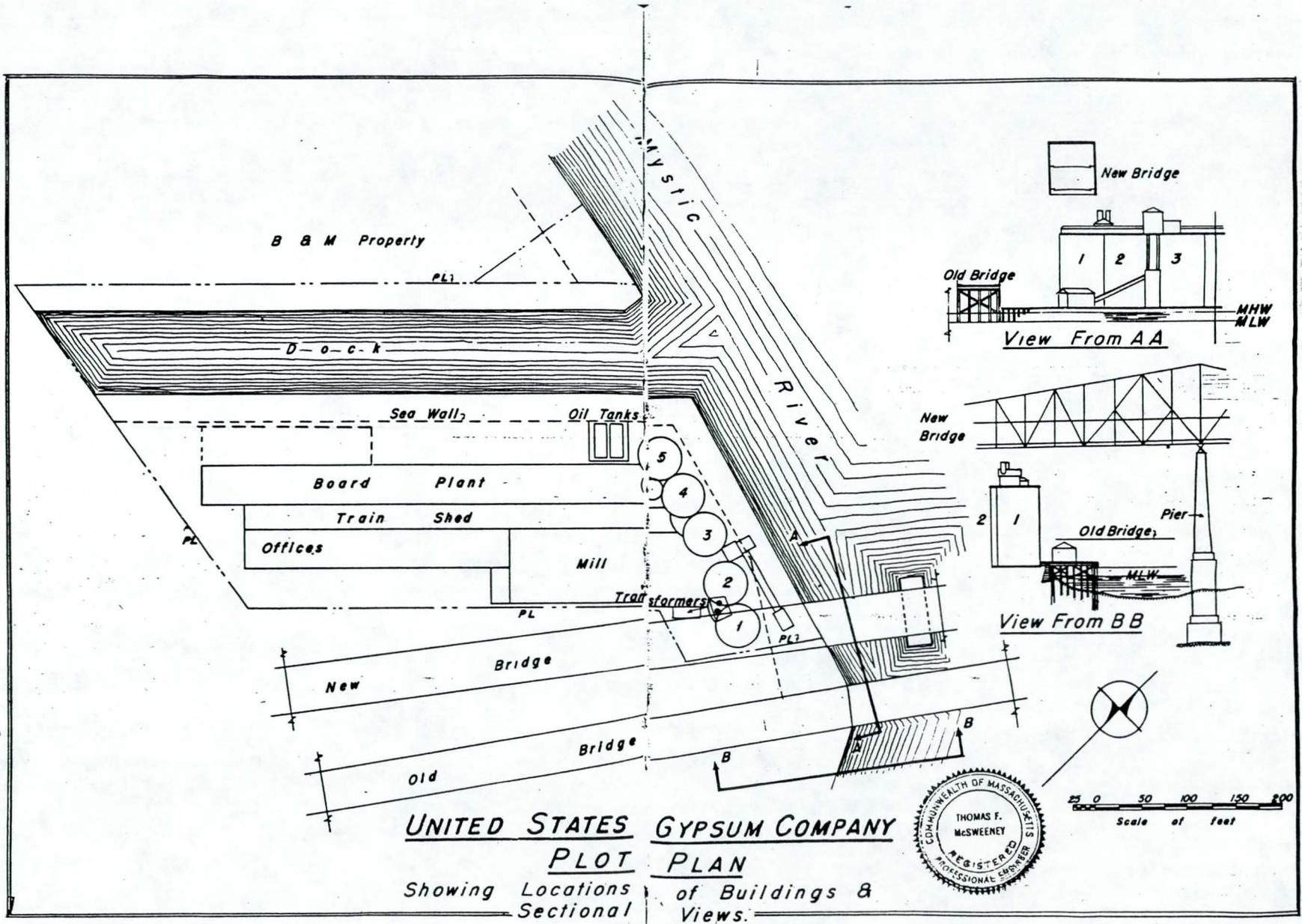
The new Mystic River Bridge passes between the plant and the old bridge, high enough to allow ocean-going vessels to sail under it. It does not touch on any land

owned by the gypsum company, but it does pass over a corner of the property. Silo #1 is almost entirely under the bridge. Far more important is the fact that the two six-foot diameter stacks from the kilns (they are shown as the two black circles near the end of the word "Transformers" on the plot plan) were so nearly under the new structure that it interfered greatly with their functioning. Equally important, a river pier carrying the new bridge lies just off the marginal pier, preventing the gypsum ore carrying ships from tying up where their specially designed conveyor systems could be used. This necessitated the relocation of the shore unloading equipment and caused the stern of the ship to project upstream beyond the company's property. It was necessary, therefore, to:

- a. Relocate the stacks to a point removed from the bridge. This required new foundations and superstructure to carry them. It also necessitated a great deal of reconstruction work inside the plant to provide for proper connections and to insure the maintenance of the necessary draft.
- b. Relocation and rebuilding of the shore installed conveyors and bucket hoists, and the upper hopper from the buckets to the belt running along the tops of the silos.
- c. The purchase of additional land upstream of the existing company property, with the continuation of the marginal pier across the mouth of the dock and far enough upstream to provide new tie-ups for the sterns of the ships.

The lawsuit resulting from the taking was tried in the Suffolk County Superior Court. Witnesses for the company testified that the property was to be considered as "special purpose" and that the difference in fair market value, because of the cost of keeping it that way, was some half million dollars. The expert for the taking authority disagreed totally. He considered the property to be in the same category as any other manufacturing plant; the special facilities it had for the processing of gypsum products were to him something that would not be of any interest to a willing buyer; and that since the bridge did not touch any part of the company property he set the damages at zero. However, since some theoretical air rights were taken, he evaluated these rights at \$2,000.

This may be accepted as a typical example of the wide variation in values derived, in perfect honesty and good faith, by using two different techniques. The judge ruled that the company's concept of "special purpose" valuation was correct, and the jury returned a verdict quite satisfactory to the company, but which was appealed by the authority. The appeal questioned the qualifications of witnesses, the right of an owner to recover for damages resulting from the construction of a pier in navigable water, and most important for the present discussion, the use of the special purpose concept. The Massachusetts Supreme Court upheld the trial judge and the verdict.



B & M Property

D-o-c-k

Sea Wall

Oil Tanks

Board Plant

Train Shed

Offices

Mill

Transformers

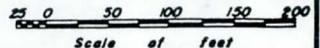
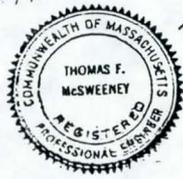
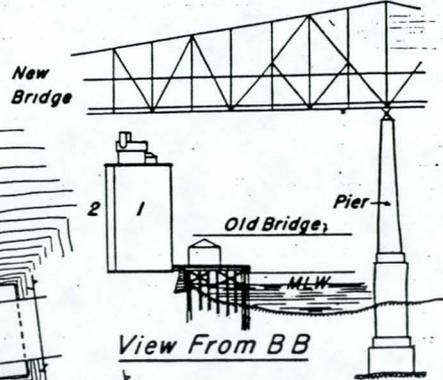
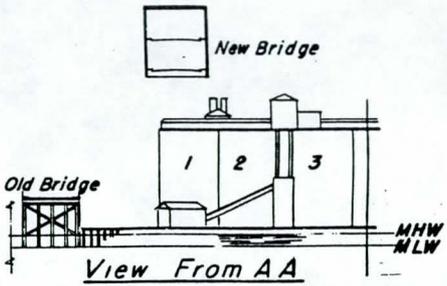
New Bridge

Old Bridge

UNITED STATES GYPSUM COMPANY

PLOT PLAN

Showing Locations of Buildings & Sectional Views.



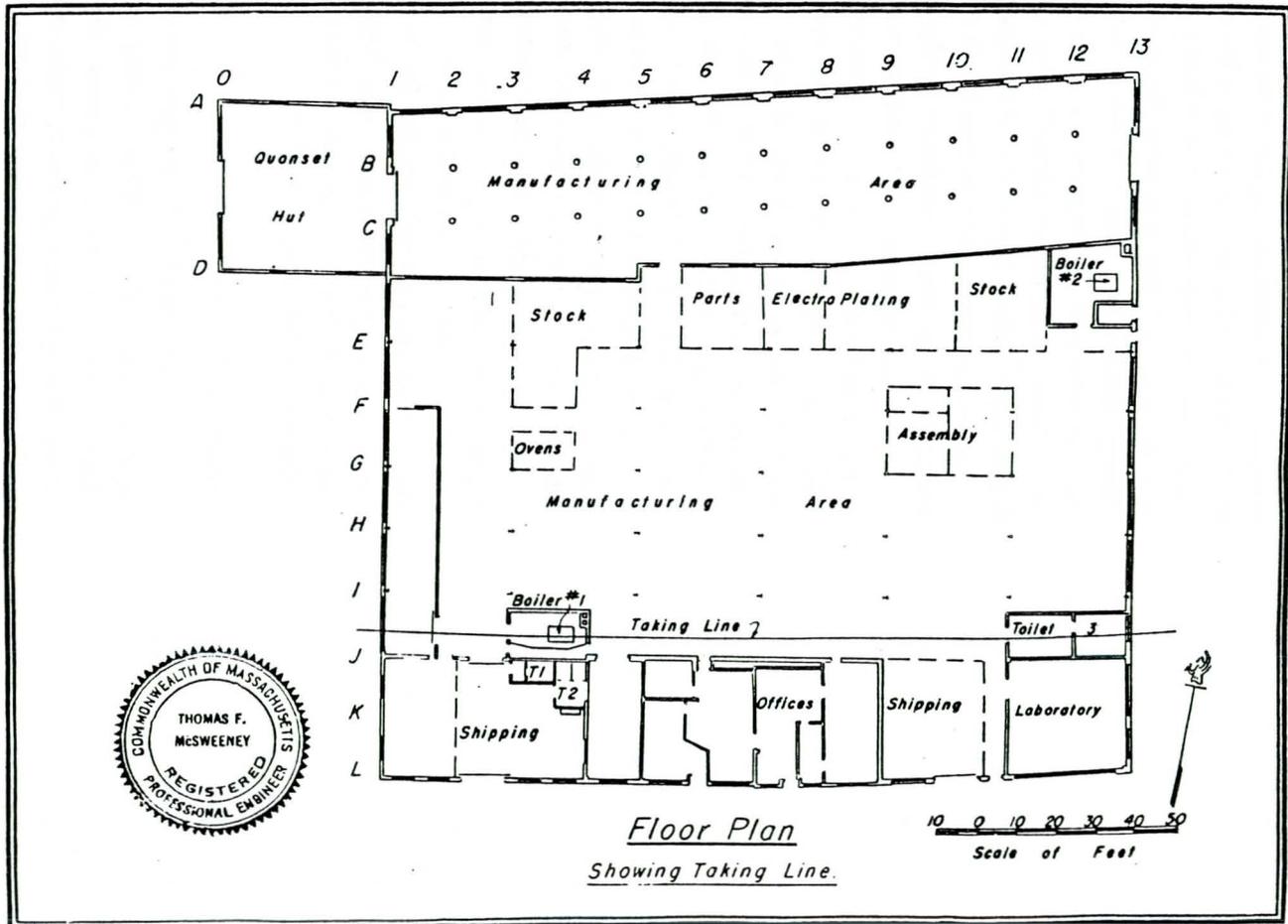
To complete the story of this case, the fair market values of the property before and after the taking were computed by the company expert by the summation analysis technique. The alterations required were computed at their date of taking cost, and the fair market value after the taking as the difference between the two. The before taking figure was made because it set a limit to the total damages. There was no doubt in anybody's mind that this value far exceeded the damages, but the company's attorneys decided that their case would not be complete without it, and it was computed with piers, buildings, silos, tunnels and all. Physical depreciation was taken by the "diminishing balance method" using actual ages of the structures and annual factors varying with the type and use of the separate items involved.

It may be worthwhile to outline briefly another special purpose industrial taking because of the peculiar circumstances involved and the two entirely different results obtained by two appraisers. The building was a one-story structure used at the time of the taking for the manufacture of component parts for electronic products made elsewhere. The taking was not total; it was made in connection with the widening of a heavily traveled automobile boulevard leading into the core city some ten miles distant, and resulted in slicing about 35 feet off the front of the building. The peculiar quality of the taking arose from the fact that this 35 feet contained all the office space, all the sanitary plumbing, all the usable heating equipment (there was another heater in the portion not taken but it had not been used for years and its presence did not offer any solution to the heating problem), all the electric controls, and a very highly classified laboratory used by Federal inspectors who checked the plant product.

A preliminary study of the case indicated that the remaining portion of the building was of enough value to justify a new front wall, but the taking authority's appraiser refused to consider as compensable anything but the minimum cost of this wall. His theory, frequently expressed, was that for the purpose of computing damages he should treat the property as comparable to an "empty garage" rather than as a busy manufacturing plant. For the purpose of this discussion it may be of interest to note that the judge and jury did not agree with him.

#### Valuation of Mineral Rights

The evaluation of land with appurtenant mineral rights is one of the most difficult of all appraisal problems. When the study involves eminent domain takings, especially those for controlled access superhighways, the difficulties are compounded by the probability of complex consequential damages, and by what is perhaps the most perplexing and unsatisfactory phase of eminent domain law. Because of the peculiar legal aspect of the problem, it will be necessary to divide this discussion into two parts. The first will describe what has come to be known as the "engineering approach;" the second will attempt to outline the "legal approach" to mineral rights evaluations.



The "engineering approach" is based on the fundamental definition given by the economist, which says that:

Value is the properly discounted present worth of all future benefits to accrue to the owner of a property by reason of his ownership.

Every appraiser knows and constantly uses this method. A capitalization analysis made to determine the fair market value of an income-producing property, such as an apartment house or of an office building, adheres strictly to this definition. The engineering solution of the mineral rights evaluation uses exactly the same techniques and is everywhere recognized as the proper one to be used, with one very important exception. If an evaluation made by this method were presented in court, it would in all probability be excluded by the presiding judge. But if the engineer is commissioned to report on the value of the minerals in a designated area, to determine how much they would add to the assets of a mining or quarrying operation, to help an operator decide as to the purchase of additional land, to plan for long-term capital improvements to his plant, or to a host of similar problems where court appearance is not required, the "engineering approach" is the logical and accepted technique to use.

Any complete description of this method would be too long and complicated to be covered in an article such as this. There are several excellent texts which treat the subject in sufficient detail, or at least outline the major aspects of the problems involved.<sup>4</sup>

The valuation method accepted without question by these authorities and by their current day followers is described on page 402 of Marston and Agg's book, *Engineering Valuation*:

The value of timberlands, mines, and mineral and ore deposits is estimated upon the basis of the forecasted earnings of the plant developed to produce the material or a product produced therefrom.

4. a. *Examination and Valuation of Mineral Property* by Roland D. Parks. The fourth edition of this book was issued in 1957. The first two editions were issued in 1933 and 1939 by the late Professor Charles H. Baxter and by Professor Parks under the title "Mine Examination and Valuation." The book is published by Addison-Wesley Publishing Co., Inc., Reading, Massachusetts.

b. *Engineering Valuation and Depreciation* by Marston, Winfrey & Hempstead, published by McGraw Hill.

In addition to these two, *Engineering Valuation*, a McGraw-Hill book by Marston and Agg published in 1936 and now out of print, contains excellent data on question of timberlands. And surely any engineer interested in this matter should know Henry Hoskold's pioneering work, *The Engineers Valuating Assistant*, long out of print but still obtainable through rare book dealers. Hoskold was a successful English mining engineer who spent a large part of his life in Argentina as Director of Mines for the Federal Government. He is best known for the two interest rate capitalization formula commonly known as the "Hoskold Equation," but this was only a part of his contribution to our professional techniques. It may be noted in passing that a great part of the methods now used in appraisal work of all types was contributed by mining engineers such as Hoskold, O'Donaghue, Morkell, Craig, Baxter, Parks and others whose writings deserve far more study than they are receiving.

This, of course, is merely a restatement of the "discounted present worth" definition of value. It is implemented and translated into a money value by three quite unrelated lines of study.

1. It is first necessary to determine as precisely as possible the quantity and quality of minerals appurtenant to the property. The means of doing this are too varied and complicated to be described here, but they will undoubtedly require a thorough geological study of the area involved; an examination of outcroppings and (if there are any) of nearby workings, obtaining drill and core samples and the use of engineering ingenuity to become thoroughly informed as to the type and amount of material available. No objective criteria can be established to cover all the possible situations which may arise, but excellent techniques as to sampling and the meaning of results obtained are available, especially in Professor Park's book.
2. Secondly, a study must be made of production methods to determine with all possible precision the cost of extracting the material. If there is a producing plant involved, its cost and value may become a necessary part of this portion of the study.
3. Finally, a market study must be made to find out how much of the material or of the "product produced therefrom" can be sold, the rate at which the market will accept the material, the net selling price to be expected and the time to be involved in the profitable exploitation of the deposit.

In theory at least when these data are at hand, the engineer can set up a schedule of the "future benefits" the owner of the property may fairly expect. Then, when a proper capitalization rate (or perhaps two proper capitalization rates) is established, the computation to obtain the discount present worth is the simplest part of the entire problem.

Very frequently, the computations of the second and third categories can be conveniently telescoped by establishing a proper royalty to be paid for the material. In New England, for example, where gravel is the most valuable mineral produced, it is often possible to set a value in place per unit (almost always per cubic yard) of the available material. After the first set of investigations has been made by geological examinations and borings, the quantity and quality of the gravel can be determined. In many localities, it is usual for the operator to go to the landowner and offer a royalty of so many cents per cubic yard for the material in the bank. The owner has no responsibility for any costs of production except payment of real estate taxes (he usually, but not always, assumes this cost) and less frequently of checking quantities removed.

Parallel customs are often found for other materials in other sections of the country. The royalty rate, when there is one, has presumably been decided after both parties to the contract have given due consideration to the items of plant value, the costs of mining and producing, and of market conditions. When a standard and accepted royalty is available, the engineers' job is made much more simple than it is in these cases where he must compute all the varied elements it covers.

Before going further in this discussion, it should be pointed out that quarries for the extraction of crushed stone, limestone, or of building stones, clay pits, gravel and sand banks, and all types of mines, are included in any discussion devoted to mines and to mineral rights. It might also be noted that such things as coal and other fossil fuels, sand, gravel, and many building stones are technically not to be classified as "minerals." But, as they are always so called in discussions of this sort, they are to be included here.

This very much abbreviated outline has made no mention of any of the complicating factors that always rise up to make the evaluating engineer's task more difficult. In some western States a so-called "Apex Rule" applies to mineral rights and must be considered. This says that the owner of the land where a mineral bearing vein reaches the surface (or comes to its "apex") can exploit all of the vein, even though it runs underground beyond the limits of his surface ownership. Quite frequently when the schedule of future benefits is being established, it is found that the net earnings are far from constant which will complicate the computation. Many instances will be found where two interest rates must be considered (the Hoskold problem); and very often deferred payments or returns are indicated by the nature of the problem. When deferments are to be taken together with a two-rate problem the solution may involve the "O'Donaghue Formula." The variations are practically endless. They are well covered in *Engineering Valuation and Depreciation* and in *Examination and Valuation of Mineral Property* mentioned in footnote 4. A much shorter discussion can be found in the June 1958 edition of *Technical Valuation* in an article by this writer entitled "The Deferment Problem."

The techniques set up in the "engineering approach" are entirely in accord with the basic economic concept of value. They are complicated and require a great deal of careful estimating and computation. If intelligently done by competent engineers, the result should be at least as precise as the ordinary fair market value appraisal prepared by the real estate expert.

The problem specifically under discussion, with its involvement of condemnation and possible court action, cannot be classified as any of those mentioned at the beginning of the short outline of the "engineering approach." It involves the evaluation of property taken by eminent domain, and few appraisals made for this purpose are of

much use unless they can be presented as evidence in a court proceeding. It is necessary, therefore, to consider the reaction of our courts to the "engineering approach."<sup>5</sup>

It is necessary to remember that in any taking, the value to be obtained is for the land; and that anything else, whether buildings, structures, or minerals, are considered not as separate entities, but as things "appurtenant" to the land. All courts apparently agree that land may be valued giving due consideration to any use to which it is clearly adapted including the "highest and best" use. As for appurtenant mineral rights, they may be considered, and the courts will accept proper evidence as to their quantity and quality. Up to this point, the "legal approach" is exactly the same as the "engineering approach," but from here on the two differ radically. It is highly improbable that the court will allow the introduction of testimony as to "forecasted earnings of the plan developed to produce the material or a product produced therefrom," the criterion cited previously as the basis of the "engineering approach."<sup>6</sup>

5. It may be necessary to go on record, most emphatically, by saying that no engineer (unless he has had formal legal training in addition to his engineering studies) should ever try to interpret a legal problem, especially one as complex as the one under consideration. Any mineral rights evaluation in an eminent domain case will have legal counsel in the picture, and it is his job to chart the course the matter must follow through the courts. His decisions are of necessity based on legal precedents, on the accepted rulings of the courts in previous similar cases. No attorney will try to maintain that *stare decisis* is always logical; but despite the statement by such an eminent authority as Justice Douglas that the court might well try to establish precedents rather than to follow them, the lawyer who wants to win his case will almost certainly look up previous rulings and shape his case to conform to them. If the engineer is to avoid utter confusion in the matter of mineral rights valuations, it is necessary for him to know what the legal methods set up for him are to be, even though he does not understand them. A short review of the applicable law, by a layman and for laymen, is probably justified.

To obtain this background, the evaluation engineer should go to a good law library and spend as much time as possible with two standard works, one by Philip Nichols, the other by Louis Orgel, on the law of eminent domain. Both books have, by the addition of periodic supplements containing the most recent decisions, attained the dignity of imposing size contained in many volumes. Far more usable for our present purpose is a sixteen page pamphlet by Lorin J. Broadbent entitled *Eminent Domain Valuation of Land Containing Minerals*, prepared under a grant from the Rocky Mountain Mineral Law Foundation at the University of Utah Law School, and published in *Utah Law Review*, Volume 6, Spring, 1959, No. 3. Broadbent's study is all any engineer needs on this subject, and it possesses the great advantage of fitting with other papers into a briefcase, instead of occupying an entire bookcase.

6. Broadbent begins his pamphlet with the statement that "in the solution of most concrete legal problems, easily stated rules and definitions afford little if any assistance." Because of this undeniable fact, and because this discussion is by a layman for laymen, no purpose will be gained by attempting citations as to decisions to prove the basic difference between the two approaches. Broadbent understands this difference; he recognizes the correctness of the engineer's method, but classifies its use in mineral rights valuations testimony as "naive." The accepted legal opinion may probably be summed up in his statement that: ". . . court cases disclose a wide range in the extent to which opinions of value are based on a proper application of full-fledged engineering approach. Many such opinions would be regarded as palpably erroneous by competent experts oriented in the Baxter Parks methods. On the other hand, the most conscientious and professional appraisals based on proven or estimated ore reserves, cost estimates, and capitalizations are sometimes rejected by the courts as of no help in determining market value." Note that he says engineering valuations are "sometimes" rejected. This undoubtedly is an understatement. It would seem that the risk involved in presenting as evidence a mineral rights evaluation based on a capitalization analysis of future earnings, no matter how well the computations have been worked out or how correct the basic economic theory, may be too great for a litigant to accept.

There are several reasons behind the commonly accepted decisions that bar capitalized future returns analyses of the value of mineral rights. Undoubtedly, one is that some of the judges who established the precedent setting rulings obviously did not understand the theory the early engineers were trying to place into the record; or perhaps it would be more charitable to say the judges feared the jury would not understand. More important, perhaps, was the apparent feeling that the witnesses were attempting to forecast potential profits too problematical to be trusted; and it also is to be remembered that many of the cases still cited in today's litigation took place before modern methods and techniques of valuation had been developed. One case which frequently crops up involved a taking of land containing coal deposits. The witness testified that the coal was worth \$4,000 per acre; the judge decided the land had a value of \$40 an acre. As the \$4,000 figure did not allow for costs of extraction or for discounting deferred income, it is quite possible that the judge was right. But why this century-old decision should still exclude a properly computed evaluation and prevent its introduction in a current case is questionable.

The controlling legal feature in an eminent domain evaluation is the concept of "market (or fair market) value" and it is well established that this must be established in the type of "market" acceptable to the court. The ideal testimony would involve the sale of a nearby entirely "comparable" property with all of the attributes of the "willing buyer-willing seller" concept, and with the transaction having been made at very nearly the same as the taking. In any type of appraising, the matter of comparability is one of difficulty, often greater than many courts seem to realize. When the property involves mineral rights, the question of comparability often, or usually, becomes extremely difficult to prove. This gives rise to an interesting question in litigation involving the matter of evaluating appurtenant mineral rights. If the courts will not accept the objective engineering approach, and if, as usually proves to be the case, no really sound testimony can be produced as to recent sales of nearby comparable properties, it is obvious that the entire matter rapidly becomes almost hopelessly confused. However, a procedure which has worked and obtained the acceptance of the courts in several recent cases may be outlined to indicate one line of attack which may safely and properly be followed.

The first step is to make the complete "engineering approach" analyses previously outlined. It is true that the final steps cannot, in all probability, be offered in evidence; but knowing the answer derived by the discounted present worth capitalization, witnesses who can qualify because of their experience with properties of similar character will be allowed to give expert opinion of the before and after taking values of the property. As in all cases of this type, the damage done is the difference between these two values. This, of course, assumes that the right-of-way taking does not include the entire property as it existed before the taking. In those rare cases where the

taking is total, the damage would be the value of the entire property, and would be derived in the same way as the "before taking" value in the more common partial taking.

With all the objective engineering data computed and available, the witnesses, who are chosen because of their experience in the operation of similar properties, and who are able to judge the validity of the conclusions reached in the engineering analysis can arrive at their opinions of damage. The portions of the engineering analysis covering the quantity and quality of the minerals, the reproduction cost and depreciation reserve to be assigned to the plant (if there is one), the reserves of material available before and after the taking and the effect of the reduction in these reserves on the economic life of the investment in the plant can be put in evidence by the valuation engineer. Then, either he, or some other witness who is expert on operation of similar plants can testify that on the basis of these data, the values before and after the taking are, in his opinion, the two different amounts he will state. He is allowed to take into consideration in arriving at these figures all the capitalization analyses of future profits; but except in the very improbable event that he is asked in cross examination, he will not be allowed to say what the future profits he considered were.

There are, of course, a great many important details implicit in this simple outline, and their nature can be illustrated by a few examples.

- (1) Assume that the engineering study shows an investment of a million dollars in a well-built, efficient plant which has a remaining physical life of 25 years. Before the taking, the reserve of commercial mineral was 50 years; after the taking, this has been reduced to 15 years; and because of other conditions, mining costs have been increased. It is obvious that an obsolescence factor to the value of the plant must be introduced as a part of the damages incurred by the taking. On the other hand, if the available reserves after the taking were good for 30 years, no obsolescence on the plant need be considered.
- (2) Mineral rights properties are usually fairly large in area; right-of-way takings are apt to be long narrow strips which cross the property from one side to another. In the case of "nonaccess" superhighways, such a strip can easily isolate and destroy the value of the appurtenant minerals in parts of the property. For instance, if a superhighway passes between the operating plant and substantial mineral bearing segments of the property, careful study must be given to the possibility of increased costs of extraction and transportation to the plant. Most minerals are heavy, low cost materials, and often the increase of a few cents per ton for trucking charges is enough to extinguish their entire value.

In most cases, there is no real "open market" for appurtenant mineral rights, and the indirect methods outlined are necessary to determine values. But there are some relatively important exceptions to this statement. For instance, oil and natural gas rights, percentages of wells or prospects, and stocks in such properties are commonly bought and sold in some parts of the country. Data on their market prices may often be evidence of the value of the minerals appurtenant to the land. It is equally evident that this *may not* be the case, and such prices should not be accepted until and unless the necessary criteria of value are established.

As illustrative of the general concepts outlined, two condensed case studies are worthy of note:

- a. *Old Colony Crushed Stone Company v. Commonwealth of Massachusetts*
- b. *State Roads Commission of Maryland v. Champion Brick Company*

Plot plans of each of the two properties showing their main features are given to aid in an understanding of the explanations.

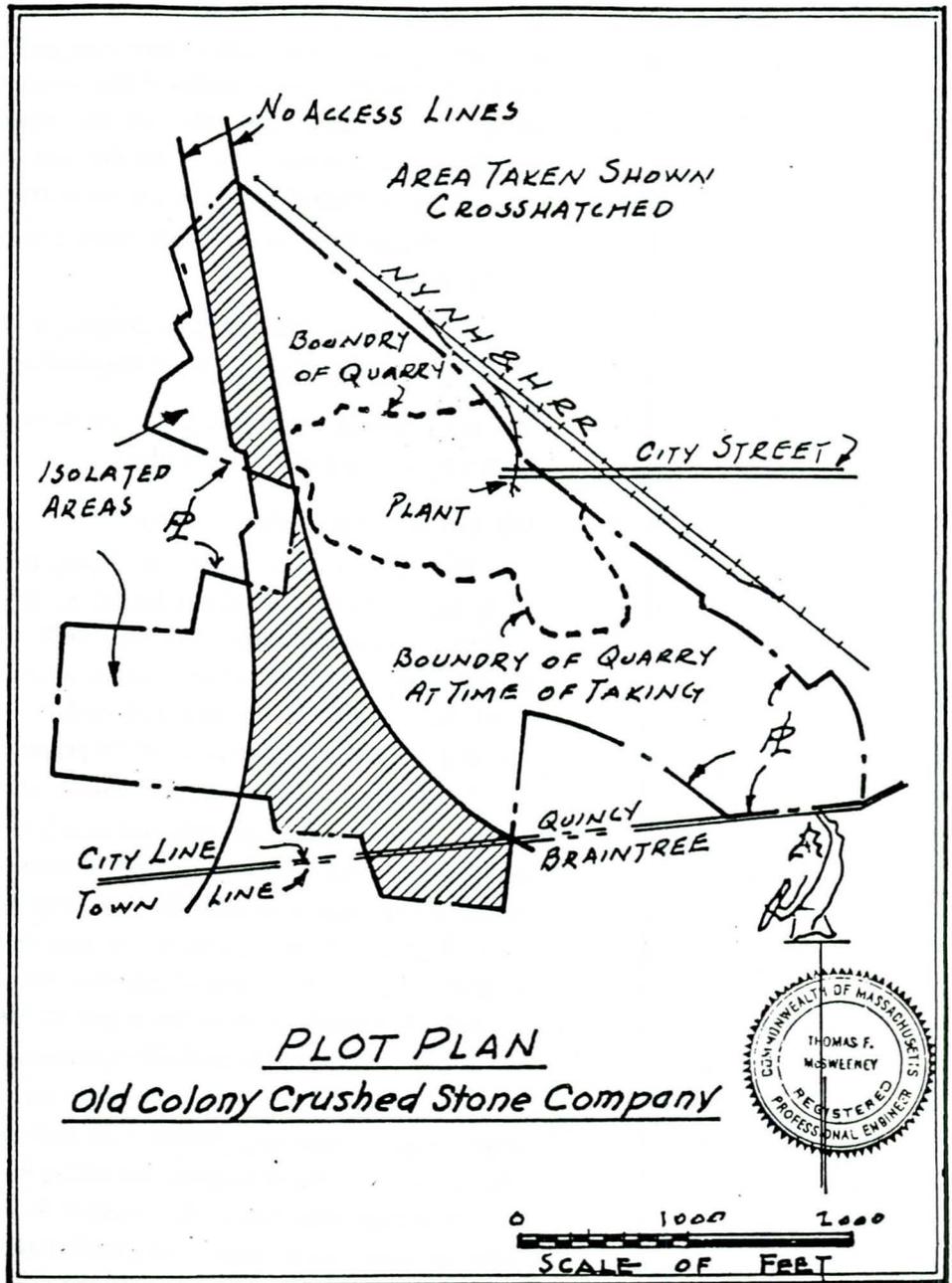
#### *Old Colony Crushed Stone Company*

The company owned a tract of slightly over 220 acres almost entirely in the City of Quincy. The land adjoins a branch of the New York, New Haven & Hartford Railroad from which a spur had been built into the quarry working. The buildings of the plant (and the siding) are at approximately Grade +50. From this low point the land rose to the west and south to an elevation of approximately +250 at and near the southwest boundaries of the property.

The entire area is a glaciated outcrop of a hard, dark granitic rock, with a thin overburden of residual, gravelly soil mostly covered by low scrub oak. This deposit of stone had been worked for some 40 years; it was quarried, crushed, screened and sorted into the various commercial sizes from dust to the larger stone used for roadway subgrade work. More recently a new and modern asphalt plant had been built and various types of black top and highway surfacing had been added to the company's product. The plant is one of the largest in New England, was in excellent condition, thoroughly modern, and in profitable operation.

The takings were made in February and March of 1956 for the new Southeast Expressway, a nonaccess, six-lane road leading south from Boston. At the southern end of the Old Colony property the taking widened out as the expressway approached its interchange with Route 128, another nonaccess expressway. The takings totalled some 50 acres. In addition, two parcels totalling 34 acres were cut off and isolated.

The damages appraised by the Commonwealth and by the company differed drastically. The Commonwealth based its figures on what its attorneys contended were "comparable sales" or areas of the infertile, ledgey backland, far removed from



streets and/or utilities, and for which the ordinary willing buyer would have offered little or nothing. The company saw the matter in an entirely different light. Their operating plant would have cost well over a million dollars to replace. Before the taking, their figures as to quantity and quality of the minerals appurtenant to the land showed their reserve of stone was sufficient to supply this plant for about a half century, which meant that no obsolescence factor was to be assigned to the plant because of any possible shortage of raw material. But in taking and isolating slightly over a third of their land, which included the higher portions where the potential supply was largely located, the life of the property had been reduced to a point where a large obsolescence would have been figured by any willing buyer who was interested in the only use to which the land was obviously available.

At the trial, evidence as to the quantity and quality of the stone (both before and after the taking), the past and probable future market for the company's products, and the cost of reconstructing the existing plant and of its depreciation was presented by the company. Other factors also entered the picture presented to the jury, but the data outlined constituted the main contention of the plaintiff. The jury award, which was not appealed, was over a hundred times the damage figure offered by the Commonwealth.

#### *Champion Brick Company*

The second example cited is the suit brought by the State Roads Commission of Maryland against the Champion Brick Company of Baltimore because of a taking of part of their clay pit near Towson, just outside the city line in Baltimore County. Basically the situation was very similar to the Old Colony Crushed Stone taking just described. Two nonaccess superhighways, the Northeast Expressway and the Baltimore Beltway, intersect on a parcel owned by Champion Brick and used by them as a source of clay to supply their large brickmaking plant some two-and-a-half miles to the southeast on Route 40. The area around the clay pit was being intensively built up with good housing subdivisions, and the State based its original estimate of damages on appraisals of local real estate experts whose estimates were made on the value of the property for housing. But the brick company claimed that the taking had so reduced the potential clay supply to their plant that a large obsolescence factor had been introduced into its value, and that the State computations failed to take this important element into consideration, and that their just compensation should be some 16 times the State offer.

The result of this disagreement was a very complete study of the property, including tests of the clay found there, and appraisal of the plant two-and-a-half miles distant, a market study of its future prospects, and a long and hard-fought trial. All of the contentions of both sides were thoroughly demonstrated to the court. The final



result, after many weeks of testimony and legal maneuvering, was a jury verdict which practically upheld the State's contentions that very little consideration need be given to the large obsolescence on the plant claimed by the company.

The two examples cited form a most interesting contrast in two very similar mineral rights appraisals. In both, the dispute reduced itself to a question of whether or not the takings had created an obsolescence factor in the two plants. Both of these were modern and efficient, and both represented a very large investment. Both cases required geological studies to determine the quantity and quality of the appurtenant minerals; both required studies of the past and probable future market for the product of the production plants; and in both cases depreciated reconstruction cost analyses of these plants were necessary.

These cases illustrate why a complete mineral rights evaluation study, especially one necessitated by an eminent domain proceeding, can be the most interesting (if also the most difficult) of all appraisal problems.

## CHAPTER 35

### Depreciation Factors and Special Purpose Properties

THOMAS F. MCSWEENEY

*Principal Associate, Thomas F. McSweeney Associates  
Hingham, Massachusetts*

The importance of the determination of depreciation arises from one of the fundamental definitions of value, which says:

The value of any object, as of a given date, may be determined by subtracting from the reconstruction cost, as of that date, the total depreciation suffered by the object from the time of its construction or acquisition to the date of the valuation.

This concept, which is becoming of increasing importance in valuation work with the growing necessity for special purpose property valuation studies, may be expressed in a formula as follows:

$$V = R - (PD + O)$$

Where V = value as of the given date; R = reconstruction cost as of the valuation date; PD = physical depreciation to the valuation date; O = obsolescence.

This part of the discussion will be devoted to the concept of physical depreciation and of methods for its quantitative determination. There are two other elements required by the use of this technique that must be introduced into the computations. They are:

*Reconstruction Cost* — This term, under different conditions, might be reconstruction cost (for buildings and/or other structures), replacement cost for personal property items, and sometimes reproduction cost. The particular circumstances in each valuation study will determine the particular usage.

If the item being considered is a building or other physical improvement to the land, its reconstruction cost in practically every case must be determined by a quantity survey analysis. Unit costs (such as cost per square foot or per cubic foot for buildings), or unit of use costs (such as cost of sports stadia as so much per seat, of schoolhouses as so much per room, or of hospitals as so much per bed) should never be used except as first approximations or as rough checks on more precise data. It cannot be over-

emphasized that there is no royal road to good evaluation work, and the unit cost technique which seems so attractively easy simply is not good enough to be used in a careful value study.

*Obsolescence* — This may be defined as the total of all the differences between reconstruction (or replacement or reproduction) cost, and current value which have arisen from causes external to the item being considered. These are usually to be subtracted from cost. But occasionally, and especially in the case of an irreplaceable historical monument such as Mount Vernon or Faneuil Hall, the current value is greater than cost; and the obsolescence becomes a double negative to be added to cost as appreciation.

Obsolescence, when it must be evaluated, is the most difficult element the appraiser will have to treat (physical depreciation runs second in difficulty). It was noted in the previous chapter that in some cases obsolescence can be set at zero, which naturally simplifies the computation greatly. When this cannot be done satisfactorily determinations of obsolescence can usually be made, but the process will probably not be easy. A brief outline of some of the methods available for the evaluation of special purpose properties is given later in this section.

Webster's International Dictionary defines the word depreciation as *the act of lessening, or seeking to lessen, price, value or reputation*, and also as *the falling of value; reduction of worth*. As used in valuation work depreciation is to be understood as a general term, which includes any loss in value the property may have suffered from any cause or combination of causes. This loss is to be deducted from the cost of replacing the property, as new, on the date for which the value is being figured.

In addition to the two elements of (1) physical depreciation and (2) obsolescence, which are to be described in the following pages, several other elements must be mentioned. They are *deterioration* and *depletion*. Neither should be confused with "depreciation" as a partial determinant of value.

For the sake of completeness, a fifth factor should be added to this list. All of the four already mentioned detract from the value. It is possible, however, to find cases where value is greater than cost. The element acting in these cases is *appreciation*. This is actually a negative type of obsolescence frequently important in special purpose studies of properties either wholly or to a large extent irreplaceable.

### Physical Depreciation

Physical depreciation is the measure of the loss of value from the reconstruction or reproduction cost of a property (as of the date of the valuation) caused by wear and tear or by the possibility of wear and tear through time. It covers only the forces acting on the physical structure itself, and is not concerned with the external

forces to be considered under the heading of obsolescence. It must be remembered that in this section discussion is only of the market value concept. For other types, such as "insurable value" or "liquidation value," physical depreciation may be (and usually is) something entirely different from the concept under analysis here.

Physical depreciation is defined as a *loss in value*. Often (as in well-built and well-maintained structures) evidences of actual wearing out are few and small. Usually, however, when any object is able to command less value than an entirely similar though newer one the difference is due, at least in part, to physical depreciation.

If the conception of loss in value is remembered, the common error of confusing physical depreciation and deterioration will be avoided. Deterioration represents an actual impairment of the physical structure; physical depreciation is the loss in value that arises from the existence, or from the possibility of this impairment. A well-built concrete factory 10 years old may have worn so little that the evidences of deterioration will be hard to find; but the factor of physical depreciation may still be a substantial percentage of its reconstruction cost. There is but little need for the term deterioration in a discussion of physical depreciation. If it is to be used at all it must be with full understanding of its true significance.

"Depletion" pertains to the exhausting, by actual removal, of an asset and differs entirely in its nature from physical depreciation. The oil that creates value in an oil well property, or the ore in a mine, or the stone in a quarry, can be taken away. The very fact that these things were there in the first place created the peculiar value the property then possessed. As they are removed this peculiar value changes until it disappears with the final exhausting of the oil or the ore. This loss in value is due to depletion and cannot be computed by the methods of physical depreciation.

*Measurement of Physical Depreciation* — Physical depreciation is a measure of negative value and, like all such measurements, is necessarily subjective. Experience has shown, however, that in many cases it can be determined by simple calculations, and that the result obtained by the use of a proper method should be well within the limits of the precision of the valuation computation.

Before proceeding to describe methods of computing physical depreciation it is necessary to consider the question of proper maintenance. If an object has been neglected, the loss of value may be excessive. On the other hand, if extraordinary care has been used in maintenance, normal physical depreciation may not have accrued. If proper maintenance has not been provided, two methods are available to give due consideration to the excess loss in value which will result. The better method is to figure the cost of the repairs necessary to cover the excess damage, and deduct this amount from the value obtained by using a normal factor for physical depreciation. A less satisfactory method is to use a higher rate than normal in computing the physical depreciation.

## Methods of Determining Physical Depreciation

Three methods of computing physical depreciation will be examined in this section. There are others, but for a valuator they are of minor importance. The three to be discussed are:

- (1) Straight line method;
- (2) Diminishing value methods;
- (3) Sum of years — digits method.

These are the techniques most generally recognized and are the three mentioned by the Bureau of Internal Revenue in its booklet *Your Federal Income Tax for Individuals*.

*Straight Line Method* — In using the straight line method the depreciating object is assumed to have a definite useful life, and the loss in value due to physical depreciation at any time is the ratio of the actual age to the assumed economic life. For example, if it is assumed that a structure has a useful life of 50 years, and it is actually 30 years old, the factor for physical depreciation is  $30/50$  or 60%. Or it may be figured that if the useful life is 50 years, the loss in value is 2% of original cost per year; and for the 30 years the item has actually been in existence the loss in value is  $2\% \times 30 = 60\%$ . This method has at least one virtue, for it is easily understood and easily applied. It has been widely used and has had general acceptance by the courts. It is called the "straight line method" because, if a chart is made with depreciation plotted against age, the resulting graph is a straight line.

Despite its simplicity and apparent utility, there are several serious objections to the use of the straight line method. A few of the most important are discussed in the paragraphs immediately following.

Loss of value does not follow the course implied in the method. Assume the case of a building costing \$100,000 with a useful life expectancy of 50 years. The straight line method postulates that this structure will lose \$20,000 in value due to physical depreciation during the first 10 years, and the same amount between the fortieth and fiftieth year. This probably never happens. Value drops most rapidly during the early years, and the rate of loss becomes progressively less rapid as the structure becomes older.

There are many reasons for this fact. Deterioration is always greatest in the early life of a structure or other item. Consider the damage due to the physical settlement of a building. Unless the structure rests directly on some relatively incompressible material such as rock (and sometimes even then), some destructive settlement due to the consolidation of the underlying strata is inevitable. This consolidation is much more rapid immediately after the load is imposed on the foundations than later. As the underlying strata consolidate, resistance to distortion increases and settlement

slows. The time displacement curve is approximately parabolic, and the greatest damage due to settlement occurs during the earlier years of the structure's life.

Consider also the loss in value due to breaks or leaks. The actual number of these may be increasing at a fairly constant rate, but the earlier ones are far more noticeable. The first break in a smoothly plastered wall is very obvious. But after there have been ten similar breaks, the eleventh is of little consequence. The first leak in a roof may have a serious effect on value; the tenth adds little or nothing to the effect of the first nine.

Another serious objection to the use of the straight line method is that the value becomes zero at the expiration of the assumed useful life. If the annual rate of physical depreciation for a factory building is set at  $2\frac{1}{2}\%$ , what is the value of a building of this type after it has been in use for 45 years? Obviously a rigid adherence to the straight line method will result in a computation which shows the building to be a liability, rather than an asset. And yet every appraiser knows of many cases where such buildings are still in use and still of definite value. The straight line method breaks down for buildings about to reach their assumed life, and is utterly worthless for old structures.

The use of the straight line method has been encouraged by the emphasis placed upon it in Bulletin "F", published by the Bureau of Internal Revenue. The bulletin is entitled *Income Tax Depreciation and Obsolescence—Estimated Useful Lives and Depreciation Rates*. It is obvious from the title that the Bureau is not attempting to set up depreciation standards to be used in the computation of fair market value, but the very fact that the tabulation is available has led to a fairly general use of the Bureau's "useful lives" of buildings of various sorts in appraisal work, even though no claim has ever been made that they apply.

An effort has been made to correct one weakness of the straight line method by assuming a top limit beyond which physical depreciation is not to be continued. For instance, it may be assumed that depreciation stops at 80%. The resulting graph will be a straight line whose slope is determined by the annual depreciation factor assumed, and which suddenly changes its direction when it reaches the 80% ordinate, to continue with no further increase regardless of the age of the depreciating item. It is not necessary to say that nothing ever loses value in this manner. If an effort is to be made to represent the true conditions of physical depreciation, any such method as this cannot be suggested.

#### Diminishing Value Methods

The weaknesses of the straight line method have led to a group of depreciation methods designed to approach more closely to the actual course of value of a physical asset, such as a building or a turret lathe, as it grows older. In these (and in almost

everything else) the rate of depreciation is at a maximum during the early life, and accrues at a slower rate as it grows older. The straight line method assumes that the depreciation is computed from a constant value. The various methods now under discussion may be considered as deducting the depreciation from a constantly diminishing value, which accounts for the name given these methods. The first of these methods to be described is perfectly general and gives results for physical depreciation more nearly in line with actually observed loss in value than any other. Mathematically its use involves a simple exponential equation similar to those used in actuarial tables. It is known usually as the diminishing balance method.

*Diminishing Balance Method* — The diminishing balance method for computing the loss in value due to physical depreciation is based on the assumption that this decrease, for any period, is a fixed percentage of the physically depreciated reproduction cost that remained at the beginning of the period. The time intervals are usually taken as years, although this is not necessary, and longer or shorter periods may be used if desired. If, for example, the annual rate is assumed as 2%, the physically depreciated reproduction cost at the end of the first year is  $100\% - 2\% = 98\%$ . During the second year the drop in value is again 2%, not of the original 100% (as is assumed in the straight line method), but of the 98% which remained at the beginning of the year. The loss in value during the second year is, therefore, 2% of 98%, and the diminishing value at the end of the second year is 96.04%. During the third year the depreciation is 2% of 96.04% and the diminished value at the end of three years is 94.12%.

The simplest way to use this method is to compute the values for each desired rate of depreciation in advance, and either to tabulate the results or to represent them graphically. The computation can be made by simple arithmetic, as suggested in the previous paragraph, but two quicker methods are available.

The formula for the computation of the value remaining after the deduction has been made for loss in value due to the action of the physical depreciation is simple and is expressed as—

$$VR = (1-r)^n$$

Where VR = value remaining after physical depreciation;  $r$  = rate of annual depreciation (as a decimal); and  $n$  = the age of the structure in years.

For the example given on the previous page (where the rate,  $r = 2\%$ , and for ages  $n = 1$ ,  $n = 2$  and  $n = 3$  years) the computations are:

$$VR_1 = (1.00 - .02)^1 = .9800 = 98.00\%$$

$$VR_2 = (1.00 - .02)^2 = .9604 = 96.04\%$$

$$VR_3 = (1.00 - .02)^3 = .9412 = 94.12\%$$

The computations involved in the preparation of a tabulation of these results are simple but laborious. The work may be shortened considerably by the use of logarithms. Two even simpler methods are available. The easiest is by the use of a log log slide rule. Set the end of the "B" scale under (1-r) on the LLO (or LLOO) scale, and read VR on the LLO (or LLOO) scale over "n" on the "B" scale. The tables of diminishing balance depreciation factors given on Table 1 were prepared in this way.

Table 1  
DIMINISHING BALANCE METHOD FOR PHYSICAL DEPRECIATION  
VALUES FOR "VR" IN FORMULA  $VR = (1-r)^n$

$r \backslash n$	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	6.0	8.0	10.0	12.0	15.0	20.0	$r/n$
1	.995	.990	.985	.980	.975	.970	.965	.960	.950	.940	.920	.900	.880	.850	.800	1
2	.990	.980	.970	.961	.951	.941	.931	.922	.902	.883	.846	.810	.775	.722	.640	2
3	.985	.970	.955	.942	.927	.913	.898	.884	.857	.831	.779	.728	.682	.613	.512	3
4	.980	.960	.941	.923	.903	.885	.867	.849	.815	.781	.716	.656	.600	.522	.410	4
5	.975	.951	.927	.904	.881	.858	.837	.815	.774	.733	.659	.590	.528	.444	.328	5
6	.970	.942	.913	.886	.858	.832	.807	.782	.736	.690	.606	.530	.464	.377	.263	6
7	.966	.932	.900	.868	.834	.807	.789	.751	.699	.648	.558	.478	.409	.319	.210	7
8	.961	.923	.886	.851	.816	.783	.757	.721	.664	.610	.513	.430	.360	.271	.168	8
9	.956	.914	.873	.834	.796	.760	.726	.692	.630	.573	.471	.387	.317	.232	.135	9
10	.951	.904	.860	.818	.776	.738	.700	.664	.599	.539	.434	.348	.279	.196	.108	10
11	.946	.895	.847	.801	.756	.716	.665	.639	.570	.506	.400	.314	.246	.167	.086	11
12	.942	.886	.835	.785	.737	.692	.652	.613	.541	.476	.368	.282	.216	.142	.069	12
13	.937	.878	.822	.769	.719	.672	.630	.588	.514	.447	.339	.254	.190	.121	.055	13
14	.932	.869	.809	.754	.701	.652	.608	.566	.488	.420	.312	.229	.167	.103	.044	14
15	.928	.860	.798	.738	.683	.633	.586	.542	.463	.396	.287	.206	.147	.087	.035	15
16	.923	.852	.786	.724	.676	.614	.564	.520	.440	.372	.264	.185	.129			16
17	.919	.843	.774	.710	.649	.596	.545	.500	.419	.350	.242	.166	.114			17
18	.914	.835	.762	.695	.632	.578	.528	.480	.398	.328	.223	.150	.100			18
19	.909	.827	.750	.681	.617	.560	.508	.461	.378	.309	.205	.135	.089			19
20	.905	.818	.739	.667	.602	.543	.490	.442	.358	.290	.189	.121	.078			20
21	.900	.810	.728	.654	.586	.526	.472	.424	.341	.273	.174	.109				21
22	.896	.802	.717	.641	.572	.511	.456	.407	.324	.256	.160	.098				22
23	.891	.794	.707	.628	.558	.496	.440	.391	.308	.240	.147	.088				23
24	.887	.786	.696	.616	.544	.480	.425	.376	.292	.226	.135	.080				24
25	.882	.778	.686	.604	.530	.466	.410	.360	.278	.213	.124	.073				25
30	.860	.740	.636	.546	.467	.400	.342	.294	.214	.156	.082					30
35	.839	.703	.589	.493	.389	.343	.287	.240	.166	.115	.054					35
40	.818	.669	.546	.446	.362	.294	.240	.195	.128	.084	.036					40
45	.798	.636	.507	.402	.319	.254	.201	.159	.100	.062	.023					45
50	.779	.605	.470	.364	.280	.217	.168	.130	.077	.045	.015					50
60	.741	.548	.405	.298	.218	.160	.117	.086								60
70	.705	.494	.347	.243	.170	.117	.082	.057								70
80	.670	.447	.299	.199	.132	.086	.057	.038								80
90	.638	.405	.257	.161	.102	.064	.040	.025								90
100	.605	.366	.220	.133	.078	.048	.028	.017								100

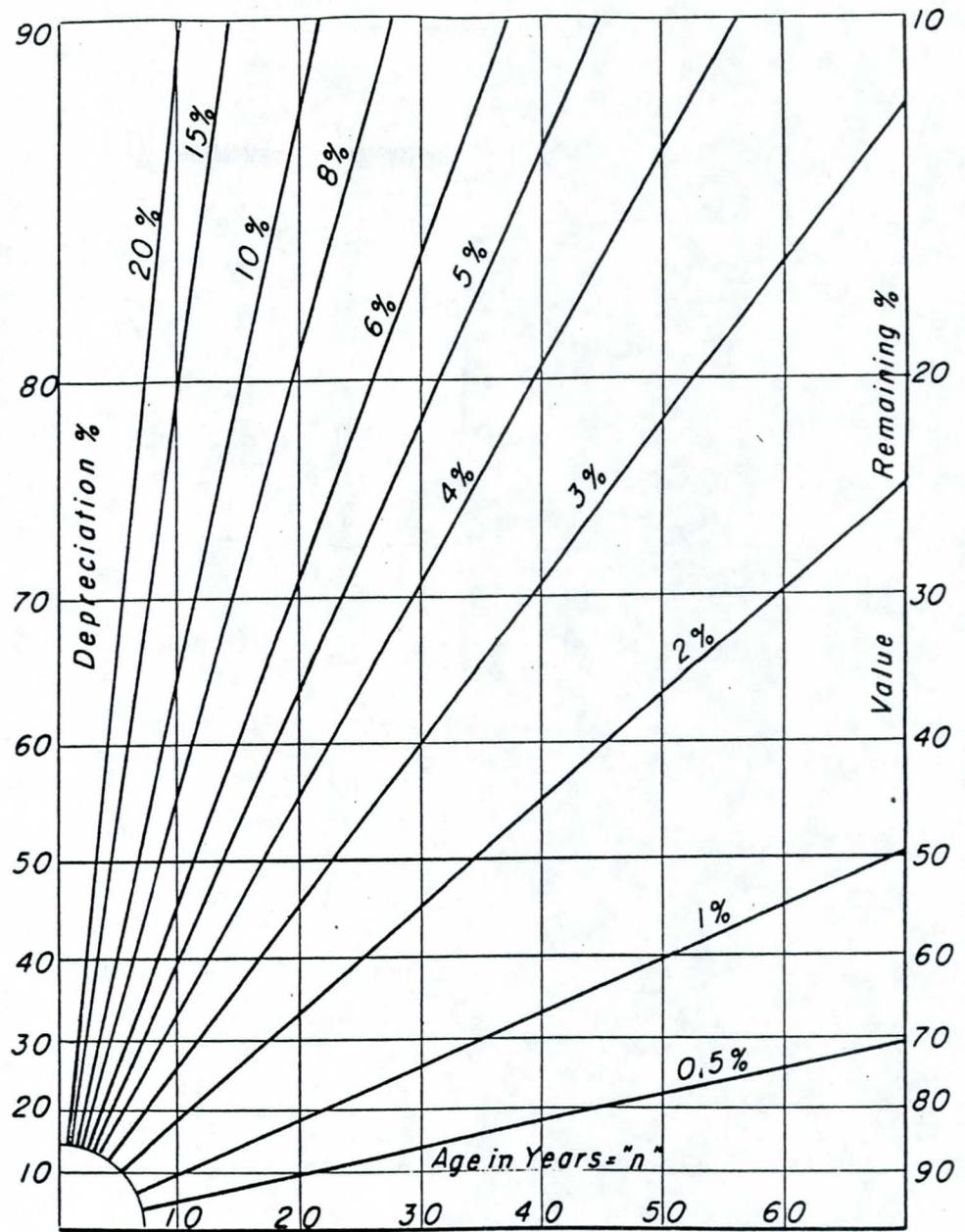
Another simple method is to plot the values of VR on a single cycle semi log graph, with the age in years ( $n$ ) being plotted on the arithmetic scale. A simple exponential equation of this sort results in a straight line graph passing through the origin of coordinates, and consequently but one other point need be computed for any value of "r". A semi log graph of some of the values of "r" is shown as Chart 1; the same data plotted arithmetically are shown as Chart 2.

*Advantages of Diminishing Balance Method* — The diminishing balance method has very definite advantages over any other for the computation of physical depreciation. In the first place the loss in value indicated by this method follows the actual experience of depreciating items. It has already been indicated that physical depreciation is greatest during the early years of the item's life. This is another way of saying that a curve of depreciation through time should be convex upward, as indicated on Chart 2.

In the second place, the resulting curves are asymptotic to 100% loss in value. No matter how old the structure, the value never entirely disappears. This method is just as applicable to structures 60 or 70 years old as to those 10 or 20 years old. Any valuator who has tried to apply straight line depreciation to work in the older parts of this country, where buildings over 50 years old are each year becoming more common, realizes how important this fact may be.

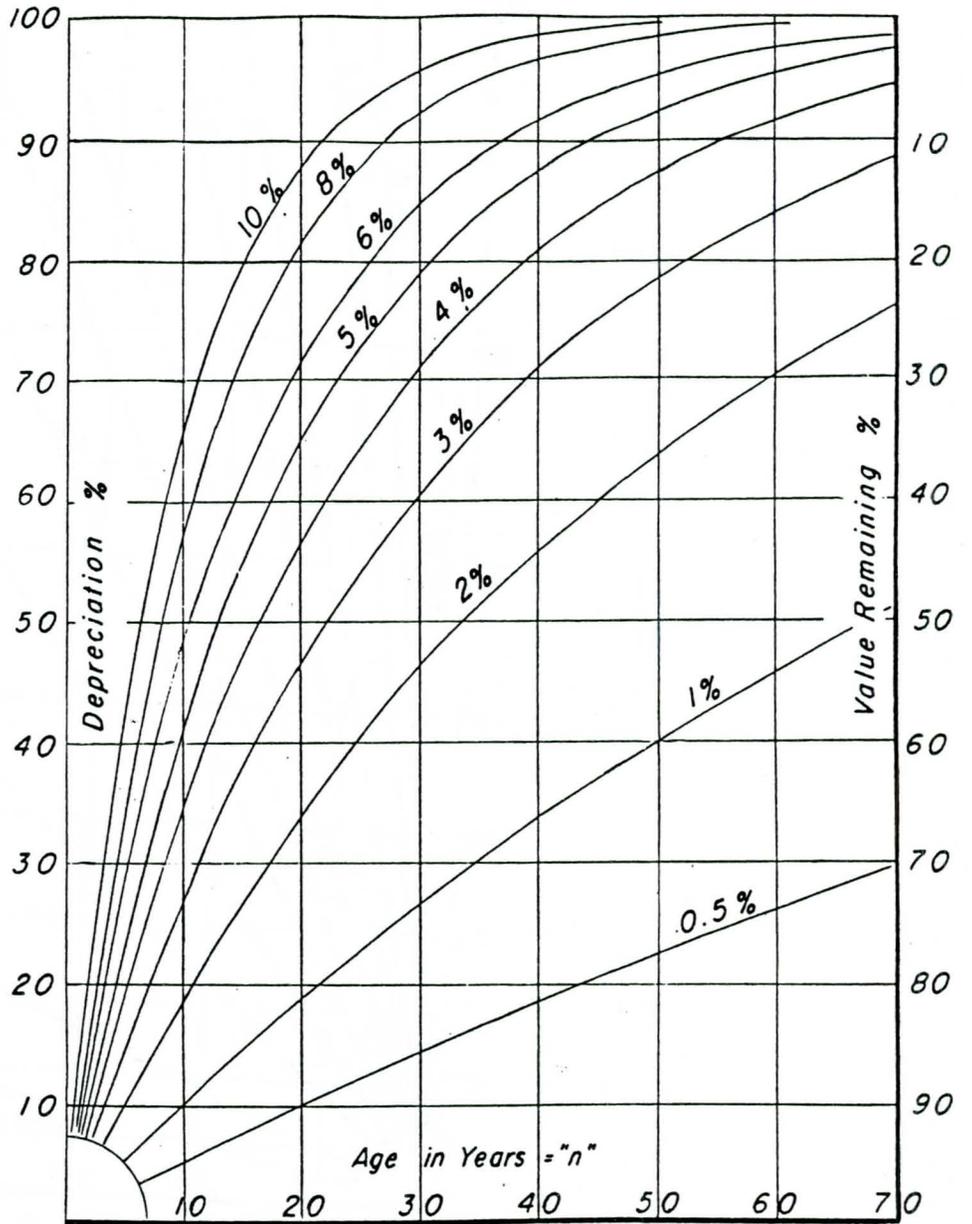
And above all, the results obtained by using the diminishing balance method are consistent with actualities. No matter how logical a method may seem, if it does not work it has no utility. But this particular method, besides being entirely sound in theory, also gives results that are logical and acceptable in practice. This, by the way, cannot be said of any other method of computing physical depreciation in common use. It may also be noted that the use of this method obviates the entirely artificial assignment of some maximum value beyond which physical depreciation cannot be figured. This process has already been described in the discussion of the straight line method, and is also necessary in other methods to be described later.

The diminishing balance method has one handicap which has prevented its use by many appraisers. The equation for computing the factors is exponential, and unless use is made of one of the methods previously described, the process of computation is laborious. The mathematics involved is, however, entirely similar to the figuring of compound interest, or of the retirement factors used in capitalization analysis valuations. There can be little doubt that some vague feeling that the diminishing balance method factors are too hard to compute has prevented its more general acceptance. The underlying theory is simple, and any one who is willing to use an annuity factor of any sort should be equally willing to adopt the most logical and the most accurate method of figuring the loss in value due to physical depreciation.



DIMINISHING BALANCE CHART  
SEMILOGARITHMIC.

Chart 1



DIMINISHING BALANCE CHART.

Chart 2

To use the diminishing balance method, it is necessary to select the proper annual factor, "r", to apply to the particular object under consideration. This may be done in one of two ways;

- a. A factor may be assumed as that fairly applying to the case in point. As an illustration a few typical examples may be given:

<i>Depreciating Item</i>	<i>"r"</i>
Heavy masonry dam	0.5% to 1.5%
Retaining wall	1.0% to 2.0%
First-class fireproof building	1.5% to 2.0%
Second-class (noncombustible walls, timber framing)	2.5% to 3.0%
Wooden, such as a well-built dwelling	2.5% to 3.5%
Wooden, generally	3.5% to 4.0%
Wooden sheds	4.0% to 6.0%
Machinery	4.0% to 15.0%

- b. An arbitrary percentage may be assumed as the value remaining (before obsolescence) after a given number of years. For instance, the appraiser may decide that for a certain structure he is evaluating, the value remaining after 50 years will be 20% of its replacement cost. Reference to the charts will indicate that this involves a factor of slightly over 3% (actual computation shows it to be 3.16%). If the building is 22 years old at the time of the appraisal, the physical depreciation to be applied in this case is 49%.

#### Other Diminishing Value Methods

Several other methods have been suggested to provide a diminishing value curve for physical depreciation. None are particularly important and only two need be mentioned.

Perhaps the most common of these methods is to set up a series of straight line graphs, each with a successively decreasing slope. For instance, an item may be assumed to have a physical depreciation of 5% of total cost per year for five years, 4% of total cost per year for the next five years, 3% of total cost per year for the next three years, and so on. This system is used by some companies in their so-called "scientific," or uniform, systems of determining tax assessment valuations. It was also used by the War Assets Administration when, at the end of World War II, the Federal government sold great quantities of machinery and other items as surplus. The sales price was figured as the original cost less a factor determined by the so-called "Clayton Formula," named after the War Assets Administrator. The method cannot be generally recommended but it has had the unique distinction of receiving the approval of the Congress.

*Clayton Formula* — To use the "Clayton Formula," War Assets first determined the original cost of the machine and the length of time it had been used. If the machine was to be sold to somebody except the contractor who had used it during the war, a factor (known as the "A" factor) determined by the use period, was applied to the original cost to determine the sales price. If the machine was to be sold in place to the original contractor, another factor (called the "B" factor), which was in every case 5% above the "A" factor, was used to multiply the original cost to obtain sales price.

The factors, when plotted against time, give a series of straight lines beginning (for the "A" factor) at 85% for an unused machine and ending at 15% for a machine in use for 25 years. The "A" factor data are shown on Table 2.

Table 2  
CLAYTON FORMULA

<i>Use Period Months</i>	<i>"A" Factor %</i>	<i>Use Period Months</i>	<i>"A" Factor %</i>	<i>Use Period Years</i>	<i>"A" Factor %</i>
0	85.0			5	35.0
1	82.5	31	49.2	6	34.0
2	80.0	32	48.4	7	33.0
3	77.5	33	47.6	8	32.0
4	75.0	34	46.8	9	31.0
5	72.5	35	46.0	10	30.0
6	70.0	36	45.2	11	29.0
7	69.0	37	44.6	12	28.0
8	68.0	38	44.0	13	27.0
9	67.0	39	43.4	14	26.0
10	66.0	40	42.8	15	25.0
11	65.2	41	42.2	16	24.0
12	64.4	42	41.6	17	23.0
13	63.6	43	41.1	18	22.0
14	62.8	44	40.6	19	21.0
15	62.0	45	40.1	20	20.0
16	61.2	46	39.6	21	19.0
17	60.4	47	39.1	22	18.0
18	59.6	48	38.6	23	17.0
19	58.8	49	38.2	24	16.0
20	58.0	50	37.8	25	15.0
21	57.2	51	37.4		
22	56.4	52	37.0		
23	55.6	53	36.6		
24	54.8	54	36.2		
25	54.0	55	36.0		
26	53.2	56	35.8		
27	52.4	57	35.6		
28	51.6	58	35.4		
29	50.8	59	35.2		
30	50.0	60	35.0		

*Note:* This method was applied to actual cost figures to determine War Asset Administration salesprices for surplus machine tools, etc. Times shown are actual use periods for any item to be sold, and not its age. Data given constitute "A" factors, to be used if item is to be sold to anyone other than the contractor for whom it was bought. If sold to him, and if it is in place and operating, add 5% to obtain "B" factor.

The method has one virtue in that it recognizes the need of a diminishing value depreciation. Many of the machines sold had been used in war plants where two or three shifts of only partly trained operators had caused greatly excessive wear, while others had been excellently maintained. Aside from this apparent oversight, it is extremely difficult to understand why the value of any piece of property, whether well cared for or badly abused, should follow the erratic course prescribed for it by Act of Congress. The "A" factors begin at 85% and start to drop at the rate of 2½% per month. After that, at irregular intervals, the rate decreases until, after 5 years, it steadies to 1% per year. The formula is neither logical nor consistent, and was entirely undeserving of the importance set on it by War Assets Administration. It is no longer in general use.

*Sum of Years—Digits Method* — This method has been suggested because it gives a diminishing value type of depreciation which can be computed by simple arithmetic and does not involve the computation of an exponential function. As will be seen, it has little to recommend its general use. It has, however, been recognized in the Internal Revenue booklet on income taxes and for this reason alone merits description.

To use the sum of years-digits method a "life in years" is chosen for the depreciating item. Depreciation for any year is then computed as that fraction of reconstruction (or replacement) cost whose numerator is the remaining life in years, and whose denominator is the sum of the arithmetic series 1+2+3 . . . . m, where "m" is the designated "life in years."

The series used as the denominator

$$(1+2+3 \dots m) = \frac{m(m+1)}{2}$$

and the annual factors for years 1, 2, 3 . . . n (where "n" = any year up to the assumed life span "m"), are as shown in the tabulation on Table 3. The total accrued depreciation (as a fraction of reconstruction or replacement cost) for any year is obtained by adding together the annual factors for all the years up to and including the year to be computed. The total factors have been computed and are given as Table 4.

It is evident that although the arithmetic involved in these computations avoids the use of exponents, it is more laborious than that required for the more logical and precise diminishing balance method. No reason can be advanced to explain why anything should decrease in value as it grows older in the peculiar way suggested by the sum of years-digits method. And finally, this method contains the inherent error noted in the discussion of the straight line method, for when carried beyond the assumed life span the depreciation factor is larger than unity, and the depreciating item must be figured as a liability rather than as an asset. It has again been suggested (as for

Table 3  
Assumed Useful Life "m"

Age "n"	5	6	7	8	9	10	12	15	20	25	30	35	40	50	Age "n"
1	.333	.286	.250	.222	.200	.182	.154	.125	.095	.077	.065	.056	.049	.039	1
2	.367	.238	.214	.194	.178	.164	.141	.116	.090	.074	.062	.054	.047	.038	2
3	.200	.191	.179	.167	.155	.145	.128	.108	.086	.071	.060	.052	.046	.037	3
4	.133	.143	.143	.139	.133	.127	.115	.100	.081	.068	.058	.051	.045	.037	4
5	.067	.095	.107	.111	.111	.109	.103	.092	.076	.065	.056	.049	.044	.036	5
6		.047	.071	.083	.090	.091	.090	.083	.071	.062	.054	.048	.042	.035	6
7			.036	.057	.067	.073	.077	.075	.067	.059	.051	.046	.041	.034	7
8				.027	.044	.055	.064	.067	.062	.056	.050	.044	.040	.034	8
9					.022	.036	.051	.058	.057	.053	.047	.043	.039	.033	9
10						.018	.038	.050	.052	.049	.045	.041	.038	.032	10
11							.026	.042	.048	.046	.043	.040	.037	.031	11
12							.013	.033	.043	.043	.041	.038	.035	.031	12
13								.025	.038	.040	.039	.037	.034	.030	13
14								.017	.033	.037	.036	.036	.033	.029	14
15								.009	.029	.033	.035	.034	.032	.028	15
16									.024	.030	.032	.031	.031	.027	16
17									.019	.027	.030	.030	.030	.027	17
18									.014	.024	.028	.028	.028	.026	18
19									.010	.021	.026	.027	.027	.025	19
20									.005	.019	.024	.026	.026	.024	20
21										.016	.021	.024	.025	.024	21
22										.012	.020	.022	.023	.023	22
23										.009	.017	.020	.022	.022	23
24										.006	.015	.019	.021	.021	24
25										.003	.013	.018	.019	.020	25
26											.010	.016	.018	.020	26
27											.009	.014	.017	.019	27
28											.006	.012	.016	.018	28
29											.005	.011	.015	.017	29
30											.002	.009	.014	.016	30
31												.008	.013	.016	31
32												.006	.011	.015	32
33												.005	.010	.014	33
34												.003	.009	.013	34
35												.002	.007	.013	35
36													.006	.012	36
38													.004	.011	38
40													.005	.009	40
45														.006	45
50														.003	50

TABLE SHOWING YEARLY DEPRECIATION  
"Sum of Years—Digits Method"

Note: Figures show the depreciation accumulating each year for assumed useful lives shown horizontal line across top of Table and for the year shown in first and last vertical columns.

$$\frac{2(m-n)}{m(m+1)}$$

Where m = Assumed Useful Life  
n = Age in Years

Table 4  
Assumed Useful Life

Year	5	6	7	8	9	10	12	15	20	25	30	35	40	50	Year
1	.333	.286	.250	.222	.200	.182	.154	.125	.095	.077	.065	.056	.049	.039	1
2	.600	.524	.464	.416	.378	.346	.295	.241	.185	.151	.127	.110	.096	.078	2
3	.800	.715	.643	.583	.533	.491	.423	.349	.271	.222	.187	.162	.143	.115	3
4	.933	.858	.786	.722	.666	.618	.538	.449	.352	.289	.245	.213	.188	.152	4
5	1.000	.953	.893	.833	.777	.727	.641	.541	.428	.354	.301	.262	.232	.188	5
6		1.000	.964	.916	.867	.818	.731	.624	.499	.415	.355	.310	.274	.224	6
7			1.000	.973	.934	.891	.808	.699	.566	.475	.406	.356	.316	.258	7
8				1.000	.978	.946	.872	.766	.628	.530	.456	.400	.356	.292	8
9					1.000	.982	.923	.824	.685	.583	.503	.443	.395	.325	9
10						1.000	.961	.874	.737	.632	.548	.484	.433	.357	10
11							.987	.916	.785	.678	.591	.524	.470	.388	11
12							1.000	.949	.828	.721	.632	.562	.505	.419	12
13								.974	.866	.761	.671	.599	.539	.449	13
14								.991	.899	.799	.707	.633	.572	.478	14
15								1.000	.928	.832	.742	.667	.604	.506	15
16									.952	.863	.774	.698	.634	.533	16
17									.971	.890	.804	.729	.664	.560	17
18									.985	.915	.832	.757	.692	.586	18
19									.995	.936	.858	.784	.718	.611	19
20									1.000	.955	.882	.810	.744	.635	20
21										.970	.903	.833	.769	.659	21
22										.982	.923	.856	.792	.682	22
23										.991	.940	.876	.814	.704	23
24										.997	.955	.895	.835	.725	24
25										1.000	.968	.913	.854	.745	25
26											.978	.929	.872	.765	26
27											.987	.943	.890	.784	27
28											.993	.956	.905	.802	28
29											.998	.967	.920	.819	29
30											1.000	.976	.933	.835	30
31												.984	.946	.851	31
32												.990	.957	.866	32
33												.995	.966	.880	33
34												.998	.975	.893	34
35												1.000	.982	.906	35
36													.988	.918	36
38													.997	.939	38
40													1.000	.957	40
45														.988	45
50														1.000	50

TOTAL PHYSICAL DEPRECIATION

"Sum of Years—Digits Method"

Note: Figures show total depreciation at the end of the year.

$$\sum_{n=1}^m = \frac{n[2m - (n-1)]}{m(m+1)}$$

the straight line method) that an arbitrary limit (or salvage value factor) be assigned beyond which depreciation should not be carried. The difficulty inherent in this assumption has already been noted.

*Sinking Fund and Retirement Reserve Concepts* — Before leaving physical depreciation a brief reference to the sinking fund and the retirement reserve concept should be made. Actually neither should be considered as pertaining to physical depreciation. Each applies to extinguishing a value during the future; physical depreciation is something that has already happened through the past.

The proper use and the methods of computing both sinking funds and retirement reserves are discussed in most texts on accounting. It is enough to know that each has its use, and that each must be understood. With this understanding will come the realization that neither is to be considered as proper in the determination of physical depreciation.

### Summary of Physical Depreciation Methods

Four methods of computing physical depreciation (in a market value analysis) have been outlined in this section. The methods with a brief comment are listed below:

*Straight Line Method* — The straight line method is the easiest of all depreciation methods to figure. It has received general acceptance in the courts and has, in the past, been used more than any of the other methods.

The disadvantages of the straight line method are that during the early years of the life of the depreciating object the depreciation shown by this method is too small, whereas during the latter years of the object's life the rate of depreciation is too rapid. The method breaks down entirely as the depreciating item nears the end of its assigned life. When the item's age exceeds the assigned life a strict interpretation of the method would show it to be a liability rather than an asset.

*Diminishing Balance Method* — This method is by far the most logical of all ways to figure physical depreciation in a market value analysis. Experience has shown that if a proper annual factor is chosen, the results obtained by the use of the diminishing balance method are more consistent with observed facts than results obtained in any other way. The method is in general and increasing use and is recognized by courts, commissions and other judicial bodies.

*Clayton Formula* — The Clayton Formula was devised specifically to set values for the sale of surplus machinery and equipment to be disposed of by the War Assets Administration at the end of World War II. The method had very little to recommend it and is no longer in general use.

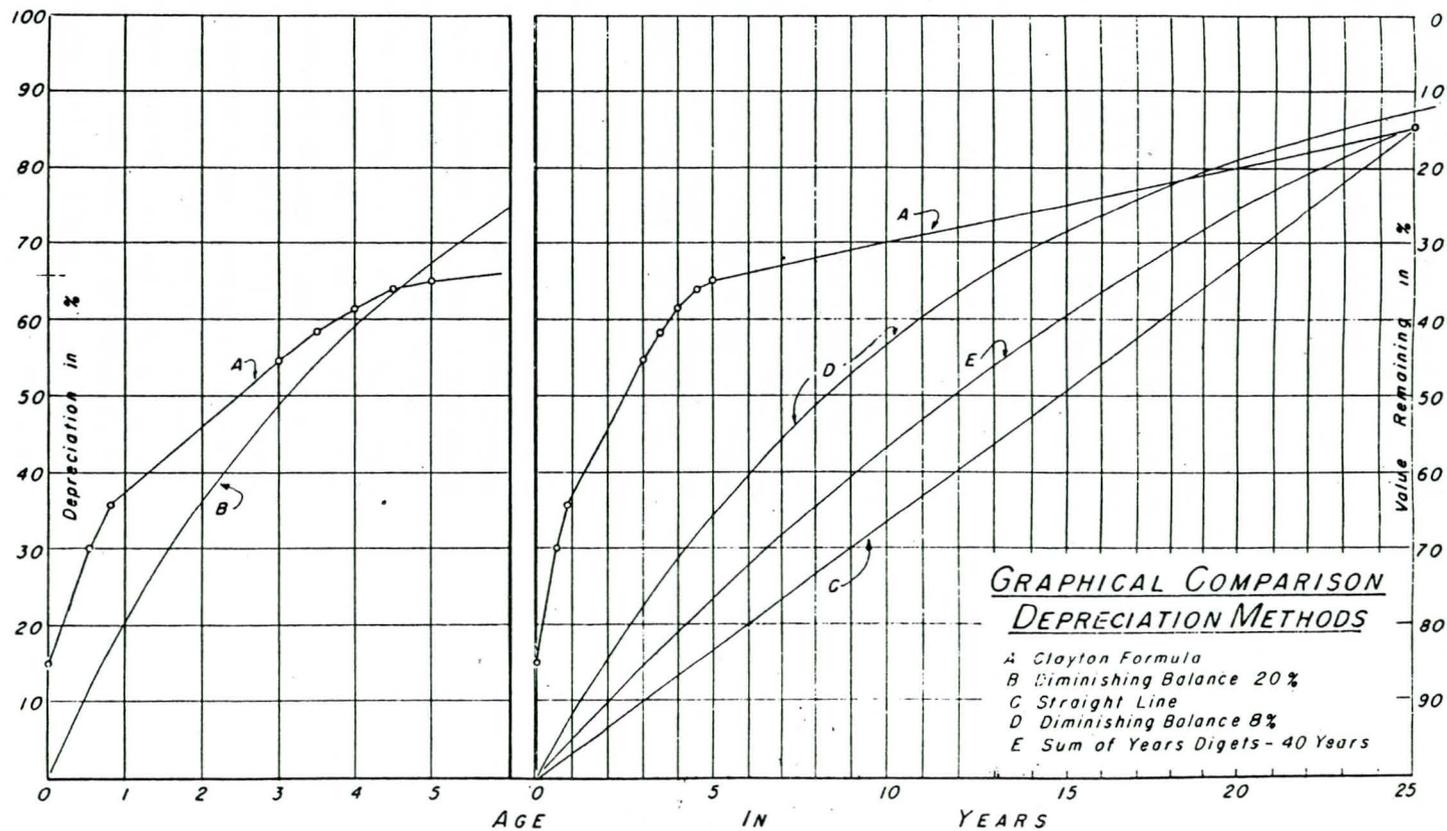
*Sum of Years—Digits Method* — The sum of years—digits method is one of a group of diminishing value methods. As physical depreciation actually follows a

diminishing value curve, the factors resulting from the use of this method are closer to the actual loss in value of the depreciating object than those obtained by the use of the straight line technique, but not to be compared with those obtained by the far more precise diminishing balance method. The sum of years—digits method has received considerable use and has been recognized by courts and other judicial bodies around the country.

Chart 3 has been prepared to illustrate the comparison between the various methods. It is drawn in two sections. The ordinates of each section are the same; the time intervals of the part of the chart to the left are wider than the part of the chart to the right. This is done so that the slope during the early years of the Clayton Formula will be more apparent in the chart on the left than in the section on the right.

The right hand portion of the chart, in which the time scale covers 25 years, shows samples of each of the four curves. Three were selected so that their factors are approximately equal to the factors of the Clayton Formula for ages from 20 to 25 years. Experience has shown that the curve marked "D" (this is a diminishing balance curve with an annual factor of 8%, and is the curve to be chosen for a machine such as a turret lathe, milling machine or other machine tool) gives values for the early years much lower than those obtained from the Clayton Formula and much higher than those obtained from the use of the straight line or the sum of years—digits method. If the diminishing balance method is approximately correct throughout its entire course, as experience has shown it to be, the others must be wrong.

Perhaps the best way to close this discussion of physical depreciation as it applies to a market value analysis is to repeat the statement made at the beginning of the chapter. Physical depreciation is a negative type of value, and like all market value conceptions is necessarily subjective. Experience has shown that by proper selection of a general technique and of annual factors, physical depreciation can in most cases be computed within the precision of the valuation computation. The necessity for care in the selection of the annual factor cannot be emphasized too strongly, and it must always be remembered that problems are constantly arising on which no objective criteria can be applied to the determination of physical depreciation. A few examples of this have been mentioned in the preceding chapter. Other types will occasionally be encountered, and their nature may differ so widely that no hard and fast rules can be set for their solution. Physical depreciation is, next to obsolescence, the most difficult factor the appraiser will meet. The techniques chosen to handle these two elements are very probably the best indications of the skill and ability the appraiser has to offer.



**GRAPHICAL COMPARISON  
DEPRECIATION METHODS**

- A Clayton Formula
- B Diminishing Balance 20%
- C Straight Line
- D Diminishing Balance 8%
- E Sum of Years Digets - 40 Years

Chart 3

## Obsolescence

The second element of overall depreciation to be considered is known as obsolescence. Like physical depreciation this is a change in value measured from reproduction (or reconstruction or replacement) cost and may be defined as the change in value of an item caused by the action of all forces external to the item itself. It has been shown that physical depreciation arises from forces acting within the item. Another way of defining obsolescence is to say that it is the summation of all forces except physical depreciation which make value differ from cost.

Obsolescence is, therefore, a general term with many subdivisions. A few of these might be listed as follows:

*Technological Obsolescence* — This is the measure of loss in value caused by the development of the arts, in design or methods. A building with a brick arch floor costs more than one with a floor of reinforced concrete, but it is worth no more. The difference in cost is an item of technological obsolescence.

*Economic Obsolescence* — When business slumps, the demand for space in buildings of all sorts becomes less. Except for accrued physical depreciation the structures may be just as good as ever, but changing economic and business conditions will affect its value. This change is measured by economic obsolescence.

*Neighborhood Obsolescence* — Neighborhoods change in popularity. If a section of homes, for example, suffers from the competition of some newer development, it may sustain a loss in value to be measured by neighborhood obsolescence.

*Appreciation* — Some structures (usually those possessing a historical value) may increase in value as they grow older. Outstanding examples to be cited are Washington's home at Mt. Vernon, Faneuil Hall in Boston, or Carpenter's Hall in Philadelphia. Authentic colonial houses often show appreciation. The process is to be treated as a negative type of obsolescence.

This list might be extended almost indefinitely, but the examples given are sufficient to illustrate the type of forces which can give rise to obsolescence. The examples all refer to buildings, but exactly the same sort of thing can be found in machinery or furniture or in any other type of physical asset. The discussion is perfectly general and applies to economic goods of all sorts.

It will be immediately apparent that obsolescence is highly subjective and, therefore, may present great difficulty whenever it becomes necessary to evaluate it with a dollar sign. This difficulty has long been recognized and without doubt has done more than any other factor to discourage use of the otherwise entirely logical summation analysis in valuation work. But as the summation technique is often the only one available, it is necessary to have some logical and understandable method of determining

obsolescence available for use, especially when dealing with special purpose appraisals. It is not possible to present any hard and fast set of rules which will work on all cases, but a few methods are suggested to show possible approaches to the problem.

It should be clear by now that especial emphasis is being placed, in this particular discussion, on the appraisal of the special purpose property. In a surprising number of these the difficulties inherent in obsolescence disappear, for a competent study of the situation will often show that no obsolescence factor should be used in the computation. Consider the cases of the church and the college properties, previously mentioned, or an industrial plant built to house specialized, automated and perhaps patented machinery. It is quite possible that for any case such as these a careful study would indicate a zero obsolescence. When this happens the appraiser's job is made much easier and understandable. With a zero obsolescence, value is a function of cost (which can be computed with all the precision to be expected in any valuation computation) and of physical depreciation. It has been emphasized that this latter can never be made entirely objective, but with care it too can be brought within the necessary limits of precision.

It remains to consider the frequently encountered cases where the summation analysis is the only logical technique to be employed in a valuation analysis and in which obsolescence cannot be set as zero. Two examples of actual cases will be cited in the hope that they will suggest other approaches to problems of this sort. Both have been used in court testimony and both worked satisfactorily.

They are based on two concepts, both of which can probably be accepted without too much discussion. One is taken from a Supreme Court decision, while the other is a definition:

- a. The value of a property arises from the use to which it is put, and varies with the profitableness of that use. (*154 U.S. 445; Big Four vs Victor M. Brockus*)
- b. Obsolescence is a change in value from cost. It includes all the elements causing this change except physical depreciation.

If the changed possibilities of profitable use are determined, and if the results of physical depreciation are eliminated, the result is, by the *Brockus* rule, the proper measure of obsolescence to be applied to the item. This method will find its greatest application in special purpose property evaluations. If the property is clearly to be classified as general purpose, it may well be that other valuation techniques should be used; and no determination of obsolescence will be necessary. But for a special purpose appraisal it is generally found that only the summation method is available and obsolescence must be computed. If it is clearly zero, the computation need go no further. If obsolescence is found to be present, a technique such as that to be suggested might be used to determine its magnitude.

In order to make the illustrations to be cited as positive as possible, the data shown are taken from appraisals made in depression days, when the operation of economic forces on values was only too apparent. The first case, illustrated in Table 5, concerns a large foundry plant in upstate New York. The appraisal was made in 1938. It had been ascertained in our study that the last significant change in the plant or in its processes had been made in 1922. Because of this it was assumed that the productive capacity of the plant had not changed since 1923, and that the variations in "profitability of use" were an index of obsolescence.

There are two things to note in the data in Table 5. In the first place they show clearly that obsolescence can vary up or down with changing conditions. Physical depreciation can never lead to upswings in the valuation situation, but obsolescence can and often does. In this particular case the 1938 figure was changed most optimistically in 1939 with the coming of "preparedness" orders, and entirely vanished when World War II actually started. It is also to be noted that the factor is based entirely on the dollar volume of sales, the correct procedure to be used in this case. Value is figured in dollars and must reflect variations in the value of the dollar. When prices started up with the great growth of demand for steel forgings with the coming of

Table 5  
COMPUTATION OF OBSOLESCENCE  
IRON FOUNDRY

COL ①	COL ②	COL ③	COL ④
<i>Year</i>	<i>Annual Gross Sales</i>	<i>Annual Gross Sales Expressed As A Percentage of 1923 Sales</i>	<i>Obsolescence Factor 100-Col ③</i>
1923	\$3,335,000	100.0	00.0
1924	2,526,000	75.5	24.5
1925	2,832,000	84.5	15.5
1926	3,213,000	95.7	4.3
1927	2,720,000	81.3	18.7
1928	2,585,000	77.0	23.0
1929	2,660,000	79.2	20.8
1930	2,013,000	60.1	39.9
1931	1,493,000	44.6	55.4
1932	1,031,000	30.8	69.2
1933	1,195,000	35.8	64.2
1934	1,371,000	41.0	59.0
1935	1,323,000	39.7	60.3
1936	1,780,000	53.1	46.9
1937	1,933,000	57.8	42.2
1938	1,093,000	32.6	67.4

OBSOLESCENCE FACTOR  
Computation for "Special Purpose" Building

hostilities, the value of the plant was strongly influenced by the inflationary trends that started with the advent of "preparedness" and have continued to the present time.

A second example of the application of the *Brockus* rule differs from that given for the foundry in that the change in total sales and profitableness of use was a function not of one product but of several. The data shown in Table 6 are for a mill specially built to manufacture the highest grade of rag stock paper. The figures show not only the creeping paralysis of a great depression, but also reflect the increasing substitution for the expensive rag stock of cheaper sulphide bond paper. There was a decrease in the overall product, chiefly in the better and higher priced stock on which the possibilities of profit were greatest.

A second difference between the cases of the foundry and the paper mill became apparent as the depression years were followed by the "preparedness" period and then by the war boom. As noted, improving general business conditions wiped out the obsolescence in the foundry; but the paper mill, especially built for the making of the finest sort of paper, never recovered from the combined blow of the depression (a typical example of economic obsolescence) and the change in product from rag stock to sulphide bond paper (an equally typical example of technological obsolescence).

Examples of the sort of thing shown in Tables 5 and 6 could be given for many other industries and products. The use of the *Brockus* rule is not as simple as the determination that in a particular case obsolescence can be set at zero, but it frequently furnishes a relatively simple and satisfactory technique to be used in the summation analysis in special purpose property valuations.

Other data are usually available for the determination of obsolescence (if any) but almost without exception they must be used with the greatest caution. For example, the U.S. Bureau of the Census makes a fairly complete study of manufacturing conditions throughout the United States every fifth year. The last one was as of 1958; another is due as of 1963. In addition, sampling data are gathered annually to complement the five year studies. A careful examination of these figures will frequently enable the appraiser to make a satisfactory estimate of obsolescence. But without fairly complete data as to the property being evaluated, and an intelligent understanding of the census figures, it is not possible to outline any objective techniques to follow on a specific case.

In some of the larger manufacturing States excellent economic data are available. For example, the Massachusetts Department of Labor and Industries issues annual studies of industrial conditions in the Commonwealth and in all its cities and larger towns. Figures are given to show, both for the community as a whole and for each of its major industries, the—

1. Number of manufacturing establishments,
2. Capital invested,

3. Cost of stock and materials used,
4. Value of the product,
5. Average number of workers employed,
6. Wages paid.

It is obvious that a study of these figures, particularly as they vary through the years, may enable the appraiser to complete the computations he must make. Some of the compilations available in other parts of the country list another criterion entitled, "value added by manufacturing." It is a very useful figure, but since it is the difference between items 3 and 4 it is not necessary to add it to the six items listed.

All sorts of additional background data are to be found for particular cases. The Harvard School of Business Administration publishes most useful figures on various types of retail businesses; Dun and Bradstreet's manufacturing and commercial analyses are excellent; and general factual data on hotel operations are published periodically by a firm of accountants which has offices all over the country.

It is quite possible that the buildings used by some of the businesses surveyed in these studies should be evaluated by a technique not requiring the determination of

Table 6  
COMPUTATION OF OBSOLESCENCE FACTOR  
PAPER MILL

TYPE OF PAPER	8 YEAR PERIOD 1922-1929			8 YEAR PERIOD 1930-1937		
	①	②	③	④	⑤	⑥
	<i>Average Price Per Pound</i>	<i>Production M Pounds</i>	<i>Factor ① x ②</i>	<i>Price as of January 1, 1938</i>	<i>Production M Pounds</i>	<i>Factor ④ x ⑤</i>
100% Rag Ledger	\$0.370	2,094	775	\$0.320	891	285
100% Rag Bond	.415	2,786	1,156	.360	1,006	363
85% Rag Ledger	.300	8,768	2,630	.260	3,383	880
75% Rag Ledger	.275	3,100	853	.240	1,611	387
75% Rag Bond	.235	32	8	.205	160	33
100% Rag Writing	.310	101	31	.270	360	97
100% Rag Index	.310	1,563	485	.270	1,040	281
50% Rag Ledger				.160	1,079	173
50% Rag Bond				.150	442	66
50% Rag Index				.155	334	52
25% Rag Ledger				.135	456	62
25% Rag Bond				.125	698	87
65% Rag Bond				.175	19	3
Sulphite Bond				.105	161	17
		18,444	5,938		11,640	2,786

$$\text{OBSOLESCENCE FACTOR} = 1.00 - \frac{2786}{5938} = 0.531 = 53.1\%$$

obsolescence. But in the process of making special purpose property appraisals it is seldom known at the start what data are to be used before the analysis is finished. Anybody venturing into this uncertain field should know that figures such as these pertaining to retail businesses, hotels and the like are to be found in the publications mentioned and in many others of similar nature.

This short analysis of a very few of the methods to be considered by anybody attempting a computation of obsolescence is not by any means complete. The subject is so lacking in uniformity that any effort at completeness would be impossible and none will be attempted. When the necessity arises the appraiser will find that all types of data are available if he knows where to look. He must be able to cull out the insignificant figures and act intelligently on those with the type of special meaning that may make them useful.

It should be clear by this time that the statement made earlier that the determination of obsolescence was probably the hardest part of the special purpose appraiser's job is well founded.

## The Precision of the Appraisal

THOMAS F. MCSWEENEY

*Principal Associate, Thomas F. McSweeney Associates  
Hingham, Massachusetts*

[*Editor's note:* This chapter originally appeared in somewhat more extensive form in the 1959 issue of the APPRAISAL AND VALUATION MANUAL published by the American Society of Appraisers. Anyone interested in a fuller treatment of this subject should consult that publication. The portions of that article here used are reproduced with the kind permission of the author and the American Society of Appraisers.]

The study of precision is a branch of the larger field of probability. Any appraiser who attempts anything except the simplest type of evaluation work should have a working knowledge of probabilities, and should understand the precision of his calculations. The general subject, however, is too complicated and too long to be dealt with in this chapter, which cannot hope to do anything more than to touch, perhaps superficially, on some of the more elementary phases of precision as it applies to valuation work.

This discussion will be directed principally to the precision of the *discounted present worth* type of appraisal, although the data to be outlined are applicable in some degree to all valuation work except that based on purely subjective criteria. An example of this latter is furnished by the real estate dealer pricing land in areas where no data but his unsupported opinion can be found. But, whenever objective criteria are available as the basis for valuation calculations, some idea may be obtained as to the precision of the result. Since valuation work always involves a relatively high degree of subjectivity, we cannot hope to make our computations as precise as the highly objective measurements (and the computations based on them) of the engineer or the physical scientist. In this connection it is interesting to note that only a century ago a great deal of the engineering and scientific work being done was as subjective as valuation work is today. The increasing insistence of the workers in the physical sciences that subjective data must be minimized and that the objective approach must be substituted, together with the growing understanding of the true meaning of precision, are among the chief reasons for the tremendous growth of the exact sciences. It is not suggested that as appraisers we can ever hope to attain as great a power in our work, but we should do as much as we can

within the limitations inherent in our computations by making our criteria as objective as possible, and by understanding the degree of precision attainable.

One further preliminary. The *present worth* approach to valuation problems arises directly from the basic economic definition which says that "Value is the properly discounted present worth of all future benefits to accrue to the owner of an economic good by reason of his ownership."

It is not necessary at this time to make any detailed explanation of this method. The application of precision determinations to the problems solved by the discounted present worth formulae should become apparent in the discussion that follows. Before attempting to do this, it will be necessary to define and explain some of the basic terms and concepts to be used.

### The Meaning of Precision

First of all, just what do we mean by "precision"? Webster defines the word "precise" as: "Having determinate limitations; exactly or sharply defined or stated; exact; nice; not vague or equivocal," and further says that *precision* is the quality of being *precise*.

For our present purposes, however, it may be more helpful to consider an explanation than to dwell too long on these excellent definitions. Let us assume that we are to locate two points on the ground 1,000 feet apart. One way to do this would be to pace off the distance. If this were done, the result might be 1,000 feet, or because of the unprecise method used, it might be anywhere from 900 to 1,100 feet. This condition can be expressed by saying the paced-off distance is 1,000 plus or minus 100 feet, or more concisely as  $1,000 \pm 100$  feet. The precision, as a ratio, is  $\pm 10$  per cent.

If, instead of pacing, the distance were to be measured with an old cloth tape, we might expect our result to be  $1,000 \pm 25$  feet, which gives a precision of  $\pm 2.5$  per cent. But if we used the best type of steel tape, correcting our work for the tension in the tape, for its temperature, and for deviations from the horizontal, we could state the result as  $1,000 \pm .01$  feet with a resulting precision of  $\pm .001$  per cent. In our analogy the pace measurement represents too large a proportion of the slipshod valuation work we have all seen; the cloth tape measurement is something we may hope to attain with our present valuation techniques; the refined steel tape precision is probably far beyond our most extreme hopes. The point to remember is that no physical measurement (even the most careful possible with refined instruments), and certainly not a valuation computation, can ever give us a result we know to be absolutely correct. The best we can possibly hope for is to reach an end result which differs from the unattainable "correct" answer by an amount whose maximum magnitude can be expressed with some degree of confidence. The size of this deviation is determined by the care used in establishing the basic data and the validity of the methods used in our computations.

## Accuracy

Another concept to be understood is that of *accuracy*. For our present purposes this may be taken to mean the use of correct theory and of correct arithmetic. Accuracy and precision are two entirely different things. The work in an appraisal can and should be accurate, but even when we are sure (by careful checking) that no mistakes have been made in addition and multiplication, we still may have no measure of the precision of our measurement. To go back to the pacing off of the 1,000-foot measurement, if the pacer goes on the basic assumption that he steps off each 100 feet with 35 paces, his work is accurate if he stops and says, "This is 1,000 feet" after he has taken 350 steps. His precision may be, and probably is, relatively poor. Similarly an appraiser may capitalize \$100 at 5 per cent and get an accurate result of \$2,000. But, if he is uncertain (as he very well may be) as to whether the 5 per cent should actually be 4.5 or 5.5 per cent, his precision is  $\pm 10$  per cent, and the accurate arithmetic is so lacking in precision that it should be expressed as  $\$2,000 \pm \$200$ . In other words, while the most probable answer may be \$2,000, it is probable that the value lies somewhere between \$1,800 and \$2,200. Actually the limits are much greater, but to understand this point requires an understanding of the laws of chance and probability which would be beyond the scope of this treatment. The point to remember is that every appraiser invokes these laws, even though he may not be aware of the fact, and every appraiser should know how they affect his work.

## Significant Digits

Still another term to be understood is *significant digits*. Recently, at a hearing to set up reorganization terms for a large manufacturing plant, a well-known appraiser testified that in his opinion the fair market value of the company's realty was \$2,752,986.41. His explanation of how he had derived this figure indicated that, at the very best, an uncertainty of at least  $\pm 5$  per cent must be taken into consideration. How can anybody seriously discuss a value of  $\$2,752,986.41 \pm \$137,649.32$ ? If the appraiser cannot be sure of his figure to \$138,000, what meaning can he assign to the last six or seven digits of the valuation figure he offered in testimony? A statement that the value was  $\$2,700,000 \pm \$140,000$  is fully as precise as \$2,752,986.41 and avoids the appearance of an entirely fictitious precision given by a long and meaningless row of figures. It would also avoid disclosing that the appraiser is unaware of an important phase of his job.

Examples of this sort of thing could be cited endlessly, for this lack of knowledge as to the significance of figures is all too common. Never continue a figure beyond the point where the digits have a meaning; do not continue beyond the point of *significant digits*. Take the figure \$2,750,000. The first three digits (275) are significant. By

their use you are probably saying that you are sure of the first two, and the error in the third is probably not more than one or two. The four zeros present somewhat of a problem, as they might be significant or they might not be. Scientists and engineers avoid any ambiguity on this point by multiplying their significant digits by the proper power of ten. Thus, if in the example cited above we wanted to show that the first three digits (275) were significant, this fact could be shown by writing our figure as  $\$2.75 \times 10^6$ ; if we wanted to say that the first four (2750) were significant, we would indicate this by writing the figure as  $\$2.750 \times 10^6$  (or  $\$2,750 \times 10^3$ ). For our purposes as appraisers, a device of this sort is unnecessary. Any experienced appraiser seeing a computed value of  $\$2,750,000$  knows without mathematical refinements of the type just mentioned that none of the zeros is significant. A zero is significant when it has some other significant digit to its right. It may or may not be when it is the last digit of a number, or when it is followed by nothing but other zeros.

This does not mean that we should never attempt to carry out a computation with more significant digits than the number suggested in the foregoing paragraph. To illustrate this, let us take the case of the present worth of a series of ten end-of-year payments of  $\$1,000$  with a discount rate of 5 percent. If all of these data are determined by the appraiser as a matter of opinion, the answer must contain a deviation from the most probable result, and the matter of significant digits must be considered. But let us assume that all these data are contained in some sort of a contract and that no subjective opinions are necessary. The problem then resolves itself into a simple arithmetic computation to be carried to the last cent with all the digits being significant. In the latter case, the answer works out to be  $\$7,721.73$ . If the problem is based on the appraiser's subjective judgment, the proper answer is probably  $\$7,700$ , with the added understanding that this figure actually means that the discounted present worth of the payments probably lies somewhere between  $\$7,500$  and  $\$7,900$ . In the first case, each of the six digits has a valid and significant meaning. In the second, any digits beyond the first two are entirely meaningless and should be avoided to keep from suggesting fictitious precision beyond the possibilities of the problem.

#### Cumulative Versus Compensating Errors

To illustrate the question of *cumulative* or *compensating* errors, let us consider the case of a capitalization analysis made to determine the value of an income producing parcel of real estate such as an office building. To make this analysis the appraiser must compute the following:

1. The annual gross income to be fairly anticipated during the remaining economic life of the building.
2. All charges to be deducted from this income, including repairs, insurance, labor, heating, lighting, water, taxes, management, and usually many others.

3. If the analysis is to be building residual, it is necessary to place a value on the land; if it is to be *land residual*, it will be necessary to determine the fully depreciated reconstruction cost of the building.
4. The remaining economic life of the structure.
5. A proper capitalization factor (or factors).

When it is remembered that the appraiser's determinations for each of these items must be projected ahead for as much as a half century in some cases, the opportunity for wide deviations in the computed answer is only too evident. If for any reason the appraiser adopts figures all of which tend to lead to a high (or to a low) result, the error is cumulative and the end result may not be worth much. But when the appraiser rigorously questions every element he introduces into his computation, if he honestly tries to be impartial in his opinions, the errors should be compensating and tend to cancel each other. When this is done, the precision of the computed result can be heightened to a respectable degree, and the appraisal can attain something of the professional competence we all should hope for in our work.

The discussion of this point can be illustrated by another example. Let us assume we are to compute the discounted present worth of a ten-year lease calling for rental payments of \$600 per month, payable in advance, with a proper annual risk rate of 6 per cent. This computation is to be made by solving the formula:

$$P = \frac{N}{r} \left[ \frac{(1+r)^n - 1}{(1+r)^n} \right] + N$$

where  $P$  = Present worth of the series of payments,  
 $N$  = Monthly rental payable at beginning of the  
monthly period (= \$600),

$r$  = Monthly discount rate ( $= \frac{.06}{12} = 0.005$ ),

$n$  = Number of monthly periods (= 120).

$$P = \frac{\$600}{.005} \left[ \frac{(1.005)^{120} - 1}{(1.005)^{120}} \right] + \$600$$

$$= \$54,314.00.$$

Several things are to be noted about this answer. In the first place, it is obtained by using the correct formula solved with seven-place logarithms. The logarithm of 1.005 is 0.0021661 with five significant digits. Because of this, there is nothing to be gained by any attempt to carry the answer to more than five places. Anything beyond this is entirely meaningless.

Next, how precise is our answer? If all the data used were furnished us and our problem is merely an arithmetic computation, the answer is \$54,314.00, with five significant digits as shown. And if our client wanted us to continue the calculation to show the two digits to the right of the decimal point, it would be necessary to use a nine-place logarithmic table, which would be hard to find. Remember that simply because long division, made either the hard way we learned in elementary school or on a computer, will give us as many digits as we want, none of them after the first five can have any meaning in this problem.

But let us now assume that all of the data were determined subjectively by an appraiser using his best judgment on information he has assembled for this particular problem. The values of  $N$ ,  $r$  and  $n$  are subjective, and each must of necessity introduce deviations into the final result. If sufficient care is used in their determination, and if we could assume they were not introducing a cumulative error, we might feel reasonably safe in setting the answer as being between \$52,000 and \$56,000; or if we wanted to use engineering shorthand, as  $\$54,000 \pm \$2,000$ . The probability of any greater precision is too small to be considered.

One last comment as to this problem. Almost all texts on appraising give tabulations of factors to be used in *present worth* evaluation; but the number of factors which would be required, if anything except end-of-year payments are tabulated, are so great that only these latter are given. If one of these tables were to be used because the appraiser either did not know how to compute the proper beginning-of-the-month payments or did not want to go to the trouble of making the necessary computation, the answer is different. The factor from the table is 7.360087; and the present worth of the ten end-of-year payments is \$52,992.72, if the statement of the problem permits seven significant digits; or  $\$53,000 \pm \$2,000$ , if the data were subjectively chosen. This is an incorrect answer based on the use of a tabulated factor not intended for the problem under consideration.

#### Limiting the Deviation

Lack of precision is something inherent in any evaluation computation. It must be accepted. The appraiser should strive to narrow its limits and to understand how great the resulting deviations are. But there can be no excuse for using erroneous techniques. It is true that the two figures are fairly close, but this is not important. The important fact is that there is no way of telling how close they would be without computing both. If this were done, no one would ever offer the answer derived by a method he knew to be wrong. The answer obtained by the erroneous use of end-of-year tables is either wrong or unnecessary and should never have been computed.

It is clearly evident by now that the question of the precision of an appraisal is entirely dependent on probability. A "correct" answer cannot be given; all that can be

done is to say that an answer is the "most probable" and that it contains the "probability" of a deviation. With care and a rigorous adherence to all the objectivity to be given to as subjective a question as valuation, the deviation can be held to respectable limits. Saying this casts no reflection on appraisal work, for any computation depending on measurements, including almost all scientific and engineering work, also contains the same basic elements of uncertainty. The great exception is that the engineer's deviation from his "most probable" answer is so much smaller, and so much better understood than the appraiser's. But the appraiser can study his methods and apply his techniques wherever they are available and applicable. When this has been done a great step forward will have been taken, for appraisal work will acquire a degree of competence it now lacks.

## The Appraisal Report\*

A formal appraisal report is a written document which contains (a) the estimate of value, (b) the date on which the value is estimated, (c) the certification and signature of the appraiser, (d) the purpose of the appraisal, (e) the qualifying conditions, (f) an adequate description of the neighborhood and the property, (g) the factual data, (h) an analysis and interpretation of the data, (i) the processing of the data by one or more of the three different approaches, and (j) other descriptive material (maps, plans, charts, photographs).

The form, length, and contents may vary in different appraisals depending upon the requirements of the client, the type of property, and the specific purpose for which the appraisal is being made. Basically, there are three different forms or media used for the appraisal report: the certificate or letter, standard form reports, and the narrative report.

### Narrative Report

The letter and form type of appraisal reports are abbreviations or variations of the complete narrative form of report. It is the narrative appraisal report which gives the appraiser the best opportunity to support his opinions and conclusions and to convince the reader of the soundness of his estimate. Accordingly, the discussion in this chapter will be primarily confined to the complete narrative form.

In a sense the appraisal report is a summary of all the factual material, appraisal methods, and techniques which the appraiser employed in the appraisal process to arrive at his estimate of value. The report will, at the same time, reflect the appraiser's understanding of basic economic principles, his ability to handle pertinent data, and his judgment in selecting the appropriate appraisal method and applying it to the specific problem involved.

It should, of course, be recognized that the criteria and standards here examined are primarily and particularly geared to appraisal reports prepared by professional fee appraisers. The format and amount of data required by particular State agencies will vary according to the respective standards adopted by these States for their staff and fee

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appraisers. Particular portions may not, therefore, be strictly applicable to staff appraisal reports, but are presented here to delineate the desirable and recommended standards for a proper professional appraisal report.

### Format

In general, the physical format of the report should be dictated by good taste, pride, and a sense of dignity. The arrangement of the written text may be divided into major sections by the use of center headings, usually in full capital letters. Each section or division of the report may be broken down by the use of sideheads to designate the different subjects or topics considered in that section. Each page of the report should be numbered.

In writing the report, the appraiser should strive to select his words carefully, making certain that they convey the meaning he desires. He should avoid as much as possible the use of technical terms or general terms. Sentences should be simple, direct, and brief. Extraneous and irrelevant material should not be included. The appraiser should weigh the presentation of his material as carefully as he has weighed the data in the appraisal process. The actual length of a report has nothing to do with its validity. The specific appraisal problem and its solution will indicate whether the report should be ten pages or a hundred. Regardless of length, the principal consideration is that the report adequately, clearly, and logically presents, in the briefest manner consistent with the subject, the method by which the appraiser arrived at his final estimate of value.

### Outline of Report

Although appraisal reports vary in content and arrangement, there are certain elements common to all. Also, there is an arrangement of the subject matter which experience has shown to be generally satisfactory in the greatest number of instances. This arrangement has the merit of adaptability and is applicable to almost all appraisal purposes and all classes of real property. In effect, the report follows the outline of the appraisal process. Whether carried through in a flowing manner or divided into formalized sections, there are three major parts to a report. These are:

#### PART I—INTRODUCTION

1. Title page.
2. Letter of transmittal (optionally including certification of value).
3. Table of contents.
4. Summary of salient facts and important conclusions.
5. Qualifications of appraiser.

PART II—DESCRIPTION, ANALYSIS AND CONCLUSIONS

6. Statement of purpose and definition of value.
7. Identification of property, legal description.
8. Neighborhood and location factors.
9. Record data—zoning, utilities, taxes.
10. Site description, analysis, statement of highest and best use.
11. Building description, analysis of functional utility and inutility.
12. Analysis and interpretation of factual data.
13. Indication of value by the cost approach.
14. Indication of value by the income approach.
15. Indication of value by the market data approach.
16. Correlation and final estimate of value.
17. Certificate of value (if not combined with letter of transmittal).

PART III—ADDENDA

18. Maps, plots, and pictures.
19. Detailed statistical data.
20. Detailed property data, if too long to be included above.
21. Detailed market data, if too long to be included above.

This general outline is illustrative, and it should not be assumed that the arrangement set forth is inflexible. In practice, the appraiser naturally will use his own discretion and adapt it to his particular requirements.

**Letter of Transmittal**

The letter of transmittal formally presents the appraisal report to the person for whom the appraisal was made. It should be drawn up in compliance with approved practices of business correspondence. It should be as brief as the character and purpose of the report permit. Regardless of its length, it should embody certain essential elements. The reasons for the letter of transmittal are to record the transmittal of the report, and, more importantly, to place the appraiser's conclusions immediately before his client. The essential elements of a good letter of transmittal are:

1. Date of letter and salutation.
2. Street address of the property involved and a brief description if necessary.
3. Statement as to the interest in the property being appraised.
4. Statement that inspection of the property and necessary investigation and analysis were made by the appraiser.
5. Reference that the letter is part of a complete appraisal report.
6. Date as of which the value estimate applies.
7. The value estimate.
8. The appraiser's signature.

Some appraisers prefer to combine the certification of value with the letter of transmittal rather than as the concluding item in Part II. Whether included in the

transmittal letter or as a separate signed page, the appraiser's certification is a highly important part of the appraisal report because it permits him to state his precise position, protecting his integrity and the validity of his appraisal. It should include statements to the effect that:

1. The appraiser has no interest, present or contemplated, in the property (or else he discloses the nature and extent of his interest if he has one).
2. Neither the employment to make the appraisal nor the compensation is contingent on the amount of the valuation reported.
3. The appraiser has personally inspected the property.

A typical combined transmittal letter and value certification is given in Figure 1.

<p>Mr. George Smith 123 East Fifth Street Middletown 3, Indiana</p>	<p>March 2, 19—</p> <p>PROPERTY: The Smith Box Company property, 123 East Fifth Street, Middletown, Indiana, consisting of land with an area of approximately 40,000 square feet, together with one and two story structures, partly modern, and partly 50 years old.</p> <p>After inspection of the above property, and based upon the facts and opinion contained in the attached report, it is the opinion of the undersigned that the present market value of the property is:</p> <p style="text-align: center;">ONE HUNDRED THIRTY-FIVE THOUSAND DOLLARS (\$135,000)</p> <p>No responsibility has been assumed for matters which are legal in nature, nor has any opinion on title been rendered, this appraisal assuming marketable title. Liens and encumbrances, if any, have been disregarded, and the property appraised as though free of indebtedness.</p> <p>I, the undersigned, do hereby certify that to the best of my knowledge and belief, the statements contained in this appraisal, and upon which the opinions expressed herein are based, are correct, subject to the limiting conditions herein set forth; also, that this appraisal has been made in conformity with the Code of Ethics of the American Institute of Real Estate Appraisers.</p> <p>Employment in and compensation for making this report are in no way contingent upon the value reported, and I certify that I have no financial interest in the subject property.</p> <p>Thank you for the privilege of serving you.</p>
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FIGURE 1

## Table of Contents

The different parts or subjects covered in the report are customarily listed in the table of contents in the order in which they appear, referring to the page number on which each item appears. The table of contents may also be arranged in index fashion, listing the subjects or elements alphabetically together with the correct paging. A little thought given to the make-up of the table of contents so that it reflects the breadth and adequacy of the appraiser's investigations and analyses, inspires confidence. A typical table of contents might be set up somewhat as shown in Figure 2.

### Summary of Important Conclusions

This is, in fact, a brief resumé of the essential highlights of the report. The purpose of such a summary is to offer an immediate and convenient reference to the substantiation of the estimate of value set forth in the letter of transmittal. It affords the appraiser an opportunity to point out and stress those salient factors in the

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FIGURE 2

body of the report to which he has given consideration in reaching his final estimate. Among the items which may be included or discussed in such a section are:

1. Estimate of land value and highest and best use.
2. Total reproduction cost new of improvements, cost per square foot and cubic foot.
3. Age of buildings and net depreciated value.
4. Gross rental value on a stated occupancy basis.
5. Net income expectancy.
6. Capitalized value estimate.
7. Estimated market price obtainable, and upon what unit basis.
8. The final estimated value.

Naturally, all of these items will not apply to all appraisal assignments. The list is illustrative of the character of material usually considered in this part of the appraisal report.

The appraiser will find that the summary is needed mostly for long complex reports. In perhaps the majority of appraisal assignments, the summary can be omitted, particularly if some brief discussion of the salient items is included in the letter of transmittal.

#### Identification of Property

The property appraised should be so identified that it could not possibly be confused with any other parcel of real estate. This may be achieved by giving the full legal description. If a copy of the official plat is used, it should be placed in the addenda and referred to here. If a plat is not included, the subject property should also be described by locating it as to name and side of street on which it fronts as well as by street number, and the distance from the nearest cross street. Such a description might read:

The site is 205 North Miami Avenue, being the southwest corner of Miami Avenue and N. W. Second Street. It is rectangular in shape with 150-foot frontage on North Miami Avenue and 100-foot frontage on N. W. Second Street. The two-story stucco hotel and store building with which the site is improved is 90 feet by 150 feet. The west 10 feet of the site is a private concrete paved alley.

The legal description of the above described property is:

Lots One (1) and Two (2), Block 106N., City of Miami, a subdivision of Dade County, State of Florida, as recorded in the public records of Dade County, State of Florida, in Plat Book B at page 41.

It is not only important to identify the actual property being appraised, but there are instances where it is equally important that the particular rights or interests should be clearly defined. This would be where the assignment involved a fractional interest in a property such as an undivided interest, or limited rights such as surface or mineral rights, or the value of the fee subject to a long-term lease, or a leasehold interest.

### Purpose of Report

In this section, the purpose and function of the report is set forth. In short or medium length reports, this section could easily be combined with the identification page. In longer reports, or in condemnation work where the purpose may be multiple in nature, a typical section would read as follows:

The purpose of this appraisal is to estimate:

1. The fair market value of the real property as it now exists, before the taking of land for the Innerbelt Freeway.
2. The fair market value of the property after the taking of 87,523 square feet of land and the improvements thereon.
3. The value of the part taken for highway purposes.
4. Damage to the remainder due to the partial taking.

Market value is defined as: "At a given time, the highest price in terms of money a buyer would be warranted in paying and a seller warranted in accepting, provided both parties were well informed and acted intelligently and voluntarily."

Attention is invited to Exhibit A, a photostated section of the highway department drawing, showing the property outlined in green and that section which is to be taken outlined in red.

### City Data

Under city data should appear all the important facts about the city and its surrounding territory which the appraiser has judged pertinent to the specific appraisal problem. The types of data, their appropriate use in relation to the various classes of property and to specific types of problems, and their degree of influence has been thoroughly discussed previously. In making the appraisal, all pertinent factors will have been considered and weighed, but in the report the appraiser should confine the data discussed to that which he found significant and bearing some influence on the problem under consideration. If the data to be used is of a statistical nature, the type and importance to the discussion will decide whether it should be included as a part of the report proper or placed in the addenda. Usually, where the appraisal problem involves a considerable amount of supporting data—population figures, cost of living indices, payroll figures, and the like—they are placed in the addenda and referred to wherever necessary in the report. In perhaps the majority of reports written, no separate section is needed for city data; pertinent facts may be included as a paragraph in the neighborhood data section.

### Neighborhood and Location Data

The same controlling factors apply in the presentation of neighborhood data in the appraisal report as have been discussed with regard to city data. The selection,

classification, and analysis of neighborhood data have been fully treated otherwise. The types of data which may be included are:

1. Distance and direction from employment centers.
2. Public transportation.
3. Road pattern, layout and width of streets.
4. Proximity to good shopping.
5. Proximity to grade and other schools.
6. Proximity to churches.
7. Proximity to parks and recreation.
8. Proximity to nuisances.
9. Police and fire protection, rubbish collection.
10. Life stage of neighborhood.
11. Population trend.
12. Prevailing nationalities, infiltration.
13. Percent of home ownership.
14. Vocations, wage levels, rent levels.
15. Conformity of development.
16. Vacancy of living or store units.
17. Prestige and/or pride of ownership.
18. Restrictions and zoning.
19. New construction activity.
20. Percent of vacant land.
21. Encroachment, changing use.
22. Level of taxes.
23. Adequacy of utilities and street improvements.
24. Adequacy of parking, street and off-street.
25. Concentration of advertising by retail merchants.
26. Street traffic, type of and amount.
27. Pedestrian traffic, type of and amount.
28. Rail connections and service for freight.
29. Labor supply, quantity and type.
30. Adjacent owners.

The extent of this section as well as of other sections of the report depends upon circumstances. For example, if the appraisal were being made for an out-of-town reader who may not be familiar with the property or even the community, it may be necessary and desirable to include more community and neighborhood data than would otherwise be necessary. If the property were an important business property where the income is derived from the purchasing power of the entire supporting area, it is important to have the most detailed description of that neighborhood and the influence of the population and its purchasing power on the subject property.

#### **Zoning—Utilities—Taxes**

Zoning and utilities may optionally be included in the neighborhood section. Where important, the zoning and private restrictions should be discussed in detail. In cases

where the ordinance itself is included, the text may be reproduced and carried in the addenda. This does not relieve the appraiser of setting forth his conclusions as to the effect of public and private restrictions on the property. Similarly, opinion should be expressed as to adequacy of the public improvements and utilities, not just a listing of sizes or a mention of their presence.

Also, the assessed values and amount of taxes should be discussed, where pertinent, as well as listed.

#### Site Description and Value

The amount of data presented and analyzed will depend upon the purpose of the appraisal. The material used in this section of the report will be those factors which the appraiser deems pertinent to his problem and all of which have been previously discussed in detail. But in most instances they will cover at least the following considerations:

1. Description of the site, area, shape, contour.
2. Best program of utilization (highest and best use).
3. Land valuation on a unit basis.

If the appraiser's estimate of the value of the property is based upon a suggested program to achieve a particular highest and best use, the report should clearly state this fact; and that the estimate of value does not apply unless the future use of the property will be in accordance with the program which has been proposed. If for some reason the property cannot be so adapted and used, then the report must indicate this and state what utilization does underlie the appraiser's value estimate.

Depending upon the most logical arrangement, the land may be valued at this point, or the valuation may be deferred for discussion in the market data approach.

#### Building Description and Land Improvements

Under building analysis the appraiser will set forth and discuss all building data relevant to his problem. In making the appraisal he will have considered and processed a large amount of data applicable to the property itself. In the report he will present the factors and elements which have significance and have influenced his conclusion. Typical of the data which may be presented here for discussion are such items as:

1. Structural and construction detail.
2. Mechanical equipment.
3. Number of units.
4. Age and size of building.
5. General condition.
6. Discussion of functional inutility.

Some of the information about the building may be enhanced through the use of drawings, photographs, floor plans, and elevations. This illustrative material, if not highly pertinent, should be placed in the addenda with other supplementary matter. Also, if the structural and mechanical detail involves a number of pages, it is good practice to outline and emphasize the important items here and place the tedious reading in the addenda.

### Analysis and Interpretation

This section, and correlation, are the heart of the report. In analysis and interpretation, the appraiser marshals the important items of data, and tells the reader how the items are going to be processed. Bear in mind that many persons do not know the mechanics of the three approaches. At this point, the appraiser can explain what he is going to do with the data, and how the data should be interpreted. Three or four paragraphs, well written, will greatly assist the reader. In fact, simple statements as to what each of the three approaches comprise are a great help in understanding what is to follow. After each statement, a sentence or two will chart the course for the reader to follow. For example, in the appraisal of a midlife apartment property, the analysis and interpretation section might read as follows:

The appraisal of this property calls for employment of the basic three approaches to value. These approaches are the cost approach, the income approach, and the market data approach.

In the cost approach, the appraiser estimates cost of reproduction of the building and land improvements, subtracts for depreciation due to wear and tear, design and plan, and neighborhood defects, and then adds for land. In this case, the appraiser will apply a cubic foot reproduction cost factor of \$1.00 per cubic foot to the total cubage previously computed as 340,000 cubic feet. Physical deterioration is considered normal. Some penalty will be applied for the cramped arrangement of kitchens and lack of closet space. The good location is a favorable offsetting factor. Land was previously estimated at a value of \$200 per front foot.

In the income approach, the appraiser estimates fair rental value, deducts for vacancy and other expense, and translates the net income into value by application of interest and capitalization rates. As applied to the subject property, it is believed that the rentals are conservative and could be increased \$5 per suite. The operating statements for 3 years were available for the analysis and determination of a stabilized expense budget.

In the market data approach, the appraiser compares the subject property on a unit basis with similar properties which have sold recently. In this case, four sales of generally comparable apartment buildings are used, and adjustments from these demonstrated prices are made on a per room basis. Also, a further check is afforded by comparing the ratio of gross income to sales prices of these comparable properties.

While this same material could and often is used to preface the three approach sections, there is a good point in presenting a bird's eye view before plunging into the

detail. Writing a report is like teaching. First, you tell what you are going to do, then do it, and finally explain what you did.

### The Approaches

The material contained in the sections devoted to obtaining a value indication have been thoroughly discussed in previous chapters, and summarized in "Correlation and Final Value Estimate." The effort to be made in presenting this material is directed toward a smooth flow. If schedules and statements are long and complex, they should be placed in the addenda. Particular attention should be paid to keeping columns in line, to good paragraphing, and to carrying totals forward from one page to the next. Omission of unnecessary ciphers is considered good practice.

### Correlation and Final Estimate

With correlation, the appraiser resumes the narrative style which he was perforce obliged to abandon to some extent in the development of the figures and computations contained in the three approaches.

The correlation and analysis of the data presented in the report should lead logically to the statement of the appraiser's final estimate of value. This final statement of value should be defined in accordance with the purpose for which the appraisal was undertaken. The concluding statement as to the final estimate of value may be presented in many different ways of which the following example is the simplest:

As a result of my appraisal and analysis it is my opinion that the fair market value of the property in its present condition as of July 31, 19—, is FIFTY THOUSAND DOLLARS.

### Contingent and Limiting Conditions

If there are not too many limiting conditions, they may be stated somewhere in the letter of transmittal, or the combined letter and certification, or in the section which identifies the property. Although these are negative statements, for the appraiser's protection and for the information and protection of the client and others using the report, appropriate contingent and limiting conditions should be set forth. A complete statement might be as follows:

**THIS APPRAISAL IS SUBJECT TO THE FOLLOWING  
LIMITING CONDITIONS:**

The legal description furnished us is assumed to be correct. We assume no responsibility for matters legal in character nor do we render any opinion as to the title, which is assumed to be good. All existing liens and incumbrances have been disregarded and the property is appraised as though free and clear under responsible ownership and competent management.

The sketch in this report is included to assist the reader in visualizing the property. We have made no survey of the property and assume no responsibility in connection with such matters.

We believe to be reliable the information which was furnished to us by others, but we assume no responsibility for its accuracy.

Possession of this report, or a copy thereof, does not carry with it the right of publication, nor may it be used for any purpose by any but the applicant without the previous written consent of the appraiser or the applicant and then only with proper qualification.

We are not required to give testimony or to appear in court by reason of this appraisal, with reference to the property in question, unless arrangements have been previously made therefor.

The distribution of the total valuation in this report between land and improvements applies only under the existing program of utilization. The separate valuations for land and building must not be used in conjunction with any other appraisal and are invalid if so used.

### Qualifications of the Appraiser

A statement of the diversified qualifications of the appraiser is usually included in the appraisal report as evidence that he is qualified to make such an appraisal. Such statements include facts about the appraiser's education, technical training, type and years of experience, trade and professional organizations of which he is a member, and courts in which he has appeared as an expert witness. A typical prepared statement of qualifications is shown as Figure 3.

### Addenda

In this section of the report are usually included photographs, charts, plans, schedules, and data sheets showing such material as the following:

1. Plot plan.
2. Plans and elevations of buildings.
3. Photographs of properties referred to in the text.
4. City, neighborhood, and other maps.
5. Charts and graphs.
6. Abstracts of leases.
7. Historical income and expense data.
8. Specifications of buildings.
9. Detailed estimate of reproduction costs of buildings.
10. Sales and listing data.

The report is now complete. If the report has been properly written with appropriate headings and subheadings for the various points of discussion, the table of contents may be easily prepared by listing the topics. Even in reports of only a few pages, it is usually considered good practice to number the pages regardless of the length of the report.

## QUALIFICATIONS

OF

JOHN Q. DOE

Presently, and since 1946, John Q. Doe is engaged in general real estate practice under name of John Q. Doe & Company, 623 Main Street, Burnside, Iowa. He is head of an organization experienced in the sale and management of real property.

Appraisal assignments executed by him for insurance companies, governmental agencies, banks, estates, and individuals, cover the valuation of all types of property.

In 1948 he valued, for lease-purchase, all retail properties in Iowa, Nebraska, and Missouri of the Percival, Smith Company. In 1951 he valued, for sale, the nonoperating properties of the Burnside Transportation Company, including residential, commercial, and vacant property. Presently employed under contract by the Iowa State Highway Department to appraise all lands in the path of new Route #1.

From 1938 to 1943 served as Chief Appraiser, Mortgage Loan Department, Blankton Mutual Life Insurance Company, reviewing staff appraisals.

From 1936 to 1938 served as staff appraiser, Mortgage Loan Department, Blankton, Mutual Life Insurance Company, appraising residential and farm property.

From 1934 to 1938 associated with Luther & Maguire, Inc., Realtors and Appraisers, Blankton, Iowa.

Graduate, B.S. degree, Blankton University, 1933.

Served in United States Army, 1944-5.

### PROFESSIONAL AFFILIATIONS AND ACTIVITIES

#### AMERICAN INSTITUTE OF REAL ESTATE APPRAISERS

Member, Governing Council (1954-7)

Vice President of Central Region—1958

#### BURNSIDE BOARD OF REALTORS

President (1955)

Chairman, Taxation Committee (1957)

#### MEMBER

Society of Residential Appraisers

The Institute of Real Estate Management

Burnside Chamber of Commerce

Board of Trustees, Blankton University

American Right of Way Association

Figure 3.

### Summary

In conclusion, an appraisal report is a word portrayal of the property, the facts concerning that property, and the reasoning by which the appraiser has developed his estimate of value. The best report is the one which, in the fewest number of words, permits the reader to follow intelligently the appraiser's reasoning and to concur in the conclusions reached thereby. As every report is an answer to a question by a client, it should show the facts considered and clearly outline the reasoning employed by the appraiser in arriving at his answer.

The report should be prepared in an orderly manner and reflect clear, direct reasoning. Its presentation should be systematic and orderly. Essentially, it should state that the appraiser made an appraisal, the purpose for which the appraisal was made, a statement of what he did, a description of the property, the appraiser's reasoning, the appraiser's conclusion, and the fact that he has no conflicting interest in the property. Whether the report is brief or voluminous, these same steps appear, the length of each depending upon the importance and the complexity of the problem.

Finally, the appraiser must keep in mind that the appraisal report is an index to the appraiser's intelligence, learning, skill, ability, experience, judgment, and integrity. He will be meticulous in the preparation of these appraisal reports so that they reflect the care and thought of a conscientiously executed assignment.

*PART IV*

*Additional Aspects  
of  
Right-of-Way Acquisition*

## Negotiations and Public Relations

Any acquisition of private property for public purposes must at some one definite point in time resolve itself to a personal contact between the individual property owner and the representative of the public agency making the acquisition. This process of right-of-way acquisition is not conducted solely in an isolated contemporary vacuum, but operates rather in the full context of both historical precedent and future perspective. Similarly, it operates not only on the basic level of the ultimate "selling" process employed by the right-of-way negotiator, but more importantly, in the full realization of the unique responsibility imposed on the individual agent to perform his every task in strict accordance and knowledge of both the powers of government and the rights of the private citizen.

Into this acquisition and negotiation process, both the right-of-way agent and the owner bring not only their own personal feelings and characteristics, but also the feelings and attitudes of their common neighbors, their community, their culture, and their nation. It is this realization of these factors and their adoption as the basis of action that distinguishes the mere negotiator from the truly professional right-of-way practitioner.

### THE PUBLIC RELATIONS ASPECT OF THE "HIGHWAY STORY"

DEXTER D. MACBRIDE

*Assistant Chief Right-of-Way Agent  
California Division of Highways*

#### Public Understanding and Acceptance

Public acceptance of any project, idea, or theory changes as environment, conditions, and needs change. Such changes reflect public understanding, for what is understood and accepted today may seem irrelevant and unnecessary tomorrow. These statements apply with particular validity to the "Highway Story." A moment's reflection will emphasize the nature and extent of change in attitudes towards highways in America.

Throughout much of our history, roads have been both a necessity and luxury. In our initial development, roads were so important that rights-of-way were donated. In addition, those property owners using the road in the community often had an additional obligation to "work out the road tax" by actually laboring on the roads to build and maintain them.

When land was plentiful and population sparse, highways were a much "wanted" commodity and, consequently, people "understood" and "accepted" the need for highways. Land is not now so plentiful; and while people still "understand" and "accept" highways, they certainly do not do so to the point of donating their land, of "working out the tax" by personally working on road maintenance, or of fighting for a highway improvement anywhere at any time. The need for highways must be clearly demonstrated. Proposed highway improvements today must be "explained", and the product will be thoughtfully and carefully evaluated by a public which has now a passably good road system and has other equally important public projects to consider, such as schools, parks, airports, reservoirs, etc.

Five development eras, or periods, are noted below in order to briefly sketch "the highway story" in America:

1. In the early *exploratory stages* roadways were developed along trails and were improved at great sacrifice. Generally speaking, the traveled way was the important consideration, with the adjacent land relatively unimportant. The exploratory efforts were generally an "east-to-west-movement"; originating in the 13 colonies the roads moved westerly across the mountains to the plains and eventually to the Pacific. Highways moved from the eastern seaboard in successive stages: the exploratory period was sustained from 1600 to the 1750's along the Atlantic Coast; from 1750 to 1775 the trails progressed across the Appalachian Mountains; the 1790's to 1830 marked the entry into the Ohio Valley and the early development across the Mississippi; by the 1840's the Rocky Mountains were crossed by exploratory roads; and as of the 1860's, overland routes served the Pacific Coast.
2. The *improvement* phase of the early exploratory highways followed the same east-to-west pattern, for example, the first State Board of Public Works in Virginia (1816); the National Pike into Illinois in 1840; the Mullan Road from the Dakota Territory to Washington Territory in 1862; and so on.
3. During the 1890's bicycles, pneumatic tires, and automobiles ushered in an almost nationwide "*good roads*" drive. Everyone wanted roads, and wanted them improved. "Necessity" and "luxury" became one and the same.
4. From 1900 to the 1940's was a period of *consolidation*. The Federal Aid Road Act of 1916 coordinated the principal Interstate roads, and the Highway Research projects emerged. Throughout the nation, a uniform sign system was adopted; the Federal Aid Highway System of 1921 formalized many of the Federal-aid procedures; and the National System of Interstate Highways emerged.

State road systems matured into a vast highway system serving the nation, providing the world's finest communication and transportation system. However, this period likewise witnessed the emergence of the urban complexes, and roadways became overburdened with people, machines, and goods. In cities, donations of land for

highways were no longer generally expected, and as the population increased and land became more valuable, people insisted on payment for right-of-way for highway improvements.

5. The new "highway story" emerges in the 1950's and 1960's. New design concepts such as freeways, expressways, and thruways become important, and the role played by the Federal Government assumes intense importance and public interest. The motorist pays for his service-product with special gas tax funds providing for specific roadways. Access control and route selection problems become acute in urban areas. Community planning, community values, the integration of highway plans with urban redevelopment, and recreational areas occupy the focus of attention and discussion. Some "resistance" to highways appears and legislative investigative committees turn their attention to highways.

Highways serve the nation in the movement of people, machines, and goods, and the citizen who pays for these highway facilities through special taxes has expectations in terms of cost, safety, convenience and service which have a direct relationship to his home, business, community, and nation.

Such expectations and relationships are the result of thousands upon thousands of accumulated personal judgments, arrived at through both "firsthand" experience and "secondhand" information. "Firsthand" experience can come through use of the facilities themselves and in contacts with highway personnel. Generally, negotiations for the acquisition of right-of-way are the most important of such contacts, for they directly and personally affect the citizen at the most critical level of his home, business, and bank account.

"Secondhand" information comes from neighbors, newspaper and magazine publications, radio, and television. Often this information is about right-of-way negotiations or factors of route selection, safety, service, and aesthetic criteria.

If the public understands the need for a safe, efficient, maximum-service-potential highway system, acceptance would seem assured. But this is not all. The *means* whereby the *end* (good highways) is achieved are equally important. It is to assure "sound means" that the following is presented:

#### **The Role of the Right-of-Way Man**

The role or part assigned a right-of-way man depends upon the highway organization: its policies and structure. The role varies and, in consequence, the duties, responsibilities, and attitudes vary. The spectrum includes minimum responsibility assignments, as well as those of maximum appraisal, negotiation, and land management functions. Basically, the role may be characterized as being: elementary, intermediate, and advanced.

*Elementary* — In this stage, the agent has a limited role, with little authority. Engineering needs are carried (repeated) to the citizen; and if the offer for right-of-way is unacceptable to the owner on the basis tendered, responsibility is passed to the legal staff for further action.

*Intermediate* — In this category, the agent acts as interpreter and persuader. Although he may not have total experience and responsibility in appraising, negotiating, and land management functions, he does act in a limited way as the liaison between the engineering and legal staffs and is permitted some participation in policies and decisions regarding real estate problems of the organization.

*Advanced* — Here, the right-of-way man has a full role as a member of the staff, with commensurate responsibility for policy matters affecting property acquisition and management problems. In negotiation, he has the full public relations responsibility to represent the acquiring agency as well as the citizen in all matters related to acquisition and property management.

On this level of responsibility, the agent effects full liaison between the engineering, right-of-way, and legal sections of the organization. He adds the full process of communication to his general work of interpretation and persuasion and has a high position of responsibility involving the fiduciary relationship between the government and the public. His work is dominated by the idea and concept of service. The ethical norms are high, and a professional responsibility attaches.

What happens within the highway department if the role of right-of-way negotiator is changed from a limited one (elementary) to one of full responsibility (advanced)?

- a. A more specific area of accountability for right-of-way matters is achieved within the organization.
- b. Specialized techniques and procedures to increase production are more readily developed.
- c. Engineers are released from non-engineering duties and, similarly, attorneys are released to concentrate on trial-oriented case loads.
- d. More effective liaison may be achieved between engineering, right-of-way and legal staffs, as well as between the government and its citizenry.

#### PUBLIC CONTACT

*Dexter D. MacBride*

This area of right-of-way negotiation emphasizes *demeanor* and *conduct*, and is subdivided into contacts between "public groups" and "property owners." The subdivision is an arbitrary one and best serves to illustrate a major difference between official appearances at hearings and similar groups and the more personal, private meetings

with individual property owners. The major difference is that of establishing a "record" of the event.

It should be clear that, basically, the demeanor and conduct of a right-of-way negotiator must be consistent with concepts of honesty; statements made on behalf of the acquiring agency must be based on *fact*; and statements must be conditioned by a sincere desire to render efficient, courteous service to all concerned with the negotiations. These basic factors will not change, whether the negotiator appears before a "public" group or a "private" meeting with a single property owner.

#### Demeanor and Conduct before Public Groups, Hearings, etc.

Statements made by a right-of-way negotiator at public meetings must be conditioned by the area of responsibility permitted by the agency represented. Thus, the agent must thoroughly know the limitations imposed by his assignment.

Organizational limitations can only be learned by careful study and by analysis of the rules, regulations, and policies of the department. Any statements beyond the scope of authority will impose an intolerable burden on the department.

A presentation before public groups requires extensive, careful, and thoughtful preparation. The agent should ask himself many anticipatory questions, e.g.:

What is to be discussed?

What is my exact responsibility in the discussion?

What are to be my limitations during the meeting?

What facts are needed?

What factors are relevant, irrelevant?

What form should my presentation take?

How will my presentation fit into the total framework of the meeting?

Public presentations are "on the record," and pressures from many community areas may conduce to lifting statements out of context. Words, spoken so easily at public meetings may appear harsh, authoritarian, and explosive when they appear in newspaper print.

It should be pointed out that every statement made by a right-of-way negotiator is "on the record" for the negotiator cannot avoid responsibility for his acts and words during the negotiation process. The point of this particular admonition is to remind the negotiator that public presentations often involve a great deal more pressure, and the spotlight of public attention is more directly and clearly focused on the agent when he is acting as a representative of government before a public group.

The right-of-way negotiator represents a service organization, for the provision of highways is a much-needed service-product. Any statements in public should reflect the desire of the negotiator to be of service, and such statements should be factual,

impartial, and objective. Argumentative, pressure-type "sales" presentations should quite definitely be avoided.

Generally, the public needs correct data carefully prepared and forthrightly presented. The public pays for the service-product, and it pays the salaries of those producing the product. Acceptance of the highway product depends on public understanding and appreciation of the service being rendered, and the effective negotiator will understand the service-oriented aspect of his work and his product.

#### **Demeanor and Conduct with Property Owners**

The observations above noted apply with equal force to meetings with property owners, with the one exception as initially discussed below:

As above described, public presentations involve the "on the record" aspect of presentations. Generally, transcripts are made of public hearings, with presentations on behalf of interested agencies generally prepared in advance and filed with a reporter. In the case of private negotiations, however, the right-of-way agent not only has the responsibility for making the presentation and effecting the total process of communication with the property owner, but he has the additional responsibility of "maintaining a record." The right-of-way agent should keep a parcel diary containing a series of notations outlining the dates and places of meetings with property owners and listing the salient details surrounding the negotiation process. In that fashion the negotiator maintains a record of his work which serves in two major aspects: the record assists the agent in analyzing his own negotiation procedures and refreshes his memory on important details; and the parcel diary becomes a part of the organizational file and records and is maintained as a reference check for such future investigations or audits as may occur, affecting the parcel. In either event the "record" kept by the negotiator may prove of great value.

All negotiations should be predicated upon factual data, and should be impartial, free from prejudice, and free from argumentation.

The negotiator's work should be characterized by a sincere desire to be of service. In all negotiations, the entire communication process should be dominated by honesty and a vital concern that the property owner be treated in a fair and courteous manner, to the end that he will receive not only a minimum of inconvenience because of the proposed project, but a maximum of service. In addition, the financial aspects of the transaction should always be determined by fair and equitable application of the "just compensation" concept.

At all times the negotiator's work activity should be characterized by enthusiasm and energy, and the work should be accomplished in as efficient and practical a manner as possible.

The negotiator will be conducting himself in a capable and workmanlike manner only to the extent that the negotiator comprehends the engineering details and the legal aspects involved in the negotiations, and only to the extent that he has thoroughly mastered the appraisal data and applies correct negotiation practices and procedures. To the extent that his workmanship is dominated by ethical norms of fairness and justice, the agent will be representing the right-of-way activity of his organization in a truly professional capacity.

#### PROPER NEGOTIATING TECHNIQUES

*Dexter D. MacBride*

##### Preparation for Negotiations

The negotiator must prepare for his assignments carefully and thoroughly, fully appreciative of the fact that every function within the right-of-way department is directed toward the "main line" purpose of acquisition. All other departmental activities are conducted to support the acquisition agent "in the field."

Preparation may be properly analyzed in three major categories: organization of office work, organization of field work, and analysis of parcel, project, and territory.

*Organization of office work* — Maintain a clean desk and keep folders and files in proper order. The departmental manual containing policy and procedures should be readily available. Any necessary working equipment should be arranged to achieve maximum results at minimum effort.

Parcel diary sheets, pertinent to each transaction and corroborative of basic negotiation details, should be carefully maintained and available for reference. A personal appointment calendar will prove of material assistance. Establish a definite schedule and plan for appointments, telephone calls, inspections, and dictation periods.

*Organization of field work* — Arrange a working schedule for inspecting the project area, analyzing and studying properties involved in appraisals, and contacting the respective property owners.

*Analysis of parcel, project, and territory* — Spend sufficient time in the field to become familiar with the area itself and the local real estate trends and market. Review all comparable sales and listings pertinent to the appraisals and review each parcel and every detail used in the appraisals. Study construction details and become thoroughly acquainted with all the major aspects of the proposed project.

The negotiator must continuously remind himself prior to "calling on the owner" that it is his responsibility to treat the property owner *and* the State fairly and equitably. He should recall that he is the property owner's representative as well as the representative of the State. Every action he takes must be characterized by respect for the owner's

rights, sensitive consideration for the owner's feelings, and *genuine* concern that "just compensation" will be paid for the rights acquired.

#### **Interpretation of Plans and Relevant Materials to Property Owners**

It was noted in the preceding section that construction details must be studied and the agent should become thoroughly acquainted with all major aspects of the proposed highway construction project.

It is important that the agent be able to describe and discuss the public necessity for the proposed improvement. The property owner should be given full information through the use of design maps and other relevant materials as to the effects of the proposed improvement upon the subject property, together with a full explanation of any special benefits or any possible detriments. It will be found helpful and effective to explain to the property owner the functions of the highway department, the capability of the engineering staff, and the careful and exhaustive analysis and planning which has been done to produce the necessary design for the proposed highway improvement.

The above-noted comments refer particularly to the proposed highway construction, but it should be remembered that many right-of-way acquisitions involve the relocation of a grantor's improvements and may also affect the land use development patterns in the area. It is important, therefore, that the agent should also have a sound working knowledge of the cost of moving or altering buildings and should be acquainted with the various zoning and construction requirements which may affect the proposed move or alteration. Additionally, the agent should have a sound knowledge of the cost of reconstructing or altering irrigation pipelines, utility installations, etc. Familiarity with these factors will assist materially in providing the owner with the facts he may need in any contemplated readjustment necessitated by the proposed right-of-way acquisition.

It must be remembered that construction plans and similar materials are difficult for many persons to comprehend easily, and the agent should be able to describe the plans in such a manner that the property owner can visualize the details as they will appear on the ground. The negotiator should use direct, nontechnical language, emphasizing the location of buildings and distances from salient features with which the property owner is familiar.

The agent carries full responsibility for completely acquainting the owner with all pertinent construction factors related to the acquisition of the subject parcel. A change of grade, a change in the direction of the flow of water, and the location of access openings, etc. are all significant factors in the transaction and the eventual agreement which may be achieved. There can be "no meeting of the minds" if significant, major factors are omitted by the agent. The agent must continually remind himself of these obligations and can perhaps assist in this process by constantly "exchanging places"

with the grantor. This transposition will help him to remember that he must treat each grantor as fairly and honestly as he would wish to be treated himself.

#### Explanation of Legal Rights, Obligations, etc.

The right-of-way agent should have a thorough training in title and real estate law and should have a clear working knowledge of the concept of eminent domain, condemnation procedures and the rules of evidence.

It is fundamental that the agent should clearly inform the property owner that the State has the responsibility to pay just compensation for the property rights being acquired and to inform the owner in simple, direct language of the manner in which just compensation is defined (generally in terms of "market value"). The several steps whereby the highway department makes every effort to determine a "just compensation" for the property required should be described, with emphasis upon the fact that it is the *obligation* of the State to see that fair and equitable payment is made in every transaction.

Often a discussion of "legal rights" has to do with condemnation proceedings. It is a basic premise that the negotiator never threatens condemnation, even by inference or implication. His responsibility and function is to explain the condemnation process only when specifically requested to do so. Should this become necessary, the agent should not fail to point out that the condemnation process is based upon certain constitutional and legislative provisions which have been made a part of our democratic procedures in which the concept of private property is protected and the citizen owning private property is safeguarded. Basically, condemnation laws are not a device to *threaten*, but rather have been devised to *protect* the owner of private property.

It should be understood that the threat of court proceedings must never be used to reach a settlement by negotiation. It is, of course, understandable that right-of-way acquisition work for public use is such that the State cannot expect to always reach an amicable settlement with every property owner from whom it is necessary to acquire right-of-way. In cases where it is not possible to reach an agreement with the property owner after negotiations have been carried on for a reasonable length of time, the State (in fairness to both parties) should take necessary steps to place the matter at issue and achieve an early trial of the matter. Throughout this latter process the right-of-way agent should still continue to secure a negotiated settlement with the owner or his agent wherever this procedure is consistent with State policy.

#### The Closing of the Transaction

Fundamental to the negotiation process, and a "key" factor in effecting a closure which is satisfactory to the parties involved, is the matter of *reassurance*. Perhaps more than any other factor, the imparting of assurance and confidence to the property owner

will determine the course (means) and result (end) of the negotiation. Every person needs reassurance and confidence, and for this reason, the agent must be in command of all the facts necessary to a full understanding of the acquisition proposal, and must communicate these facts in a reassuring manner.

There is no "set pattern" or formula for effecting closure, but rather each transaction differs (as property owners, their reactions and environments differ), and it is for this reason that negotiation is basically a person-to-person process requiring personal contact and the skillful application of individual judgment to each negotiation.

Steps which may be conducive to closure are infinitely varied. Some may involve a single "step" and some (generally the majority) require a series of "steps" which produce a cumulative effect. Among the many "steps" leading to a successful closure, the following are noted with the thought that the enumeration will immediately suggest many others of equal importance.

1. "Tour" the property with the owner; become acquainted with both the property and the property owner during this period.
2. Suggest the use of some room or convenient spot where the maps and other pertinent materials can be displayed and a discussion held.
3. Encourage the owner to talk, to ask questions, and to discuss his feelings and attitudes toward the proposed highway improvement and the necessary right-of-way acquisition.
4. Give the property owner full and complete information. Stress the ability of the engineers and the appraisers who have worked on preceding steps which affect the property.
5. Employ the full process of "communication" to the best possible degree. Use the maximum sales ability in every facet of explanation, detailing the reasons why, as a protection to him and every other property owner, the State does not "horse trade," and see that the offer of settlement is the amount of the appraisal based upon a thorough analysis of all the data collected by the appraisal staff.
6. The offer to the property owner is the most important moment of the negotiation process. Don't "overplay" the moment. If feelings of confidence, respect, and assurance have been imparted through the preceding steps in the negotiation, the offer will then be made in a receptive environment.
7. If the offer is productive of agreement, present the documents and secure the necessary signatures after going over all the details to be certain they reflect the understanding. After the explanation and signature process, inform the owner of the procedure necessary to effect the transfer of title and the time interval before he may expect payment. Advise him to make further contact

for any additional information that he feels is needed, and then leave as soon as politely possible.

8. If the offer produces silence or disagreement, explain those items which appear to have caused misunderstanding. Ask questions about the reasons for disagreement. If the owner is simply "holding out for a little more" or "waiting for the next offer" or preparing to "go to a higher authority," point out again that "horse trading" is not countenanced by the department; that the State must treat all property owners alike; that to offer less than just compensation is unfair to the property owner, while to offer more than just compensation is unfair to other property owners in the neighborhood and unfair to all other tax payers. Emphasize the personal responsibility for handling the negotiation and acting as full representative of the department. Do not hesitate to say "no" to a request that the State "horse trade a little."
9. If items have been overlooked which have a bearing on market value and which might require a change in the offer, itemize these matters and subsequently establish another meeting date with the owner to determine these data and to effect a conclusion based upon such changes.
10. If, after the full discussion and offer, the owner requests additional time to "think it over," express your understanding of his need, and set a date (as soon as reason dictates) for the next meeting so the agreement can be reached and the transaction concluded.
11. If a counter offer is made by the owner, ask questions about the reasons on which it is based. Study the owner's facts and ideas, and compare them with the State's comparables at both the appraisal level and owner's asking-price level. Discuss pertinent factors such as age, condition, sales, listings, and comparative desirability. It is during this process that the negotiator must fully exercise his judgment, skill, knowledge, and persuasiveness, and it is here that the true difference is exhibited between effective negotiation and just "making a call."

#### Some "Do's and Dont's"

An almost infinite number of "Do's and Don'ts" may be compiled. Only a few admonitions are listed below. The agent is reminded that these admonitions are "reciprocals," and that the list may be extended by each negotiator according to his needs and experience.

#### *Some of the "don'ts"*

1. Do not permit negotiations to "drag." To prevent "drag," adopt a schedule which will permit the necessary number of "follow-up" meetings, and if nego-

tiations cannot be consummated, promptly initiate procedures to bring matters to issue. This is not only fair to the property owner so that his plans will not be unnecessarily delayed and the negotiation process become intolerable because of passage of time, but it is also fair that the State's business be prosecuted in a definite, efficient manner.

2. Do not expect the property owner to "make the next move." Do not force initiative on the part of the owner in making arrangements for conferences or in undertaking steps which are necessary to conclude the negotiations.
3. Do not assume that "making the calls" is the secret to negotiations. True, the "call" is the first step, but it can only be productive of successful results if the agent plans for the meeting; if he anticipates the problems which will arise; and if he employs the full spectrum of the negotiation process which includes explanation, clarification, interpretation, presentation, and persuasion.

*Some of the "do's"*

1. Know the product.
2. Work to understand how the State and the property owner can best be served. Prepare and adhere to the appointment schedule; keep correspondence, memoranda and diaries current; prepare for each conference; make as many calls as the negotiations require; and conduct appointments and conferences with energy and confidence.
3. Accept full responsibility as the agent in charge of the right-of-way acquisition.
4. Give full energy and talent to the successful completion of assignments.
5. Strive to learn everything possible about every facet of the right-of-way profession, including appraisals, negotiations, land management, and land economic studies.
6. Remember that the agent represents the State and carries an important responsibility and a high trust. He is a professional right-of-way representative and is responsible for the acquisition of right-of-way and the assurance of payment of just compensation, while at the same time acting as the principal public relations representative for the engineering, legal, and right-of-way functions of the highway department of the State.

COMMUNICATION SKILLS

HOMER T. ROSENBERGER

*Chief, Training Branch; Office of Administration  
Bureau of Public Roads*

Communication is one of man's basic problems. In a field such as right-of-way a great deal of communication is carried on in order that policies and regulations can be arrived at, transmitted, interpreted, and applied. Letterwriting, telephone manner,

and oral techniques each play a significant part, for better or worse, in right-of-way operations.

Those who represent the public interest when highway right-of-way is being acquired must deal with many kinds of landowners. Some are reasonable whereas others are unfriendly, angry, dissatisfied, unintelligent, or unfamiliar with right-of-way acquisition procedures. Attempting to see both the landowner's point of view as well as the public's enables agents, appraisers, auditors, and engineers to communicate effectively with them.

One ought to be aware that a part of the apparent hostility and recalcitrance on the part of the property owner is due to his fear of the unknown. He may not realize what the negotiator has in mind and may be totally unfamiliar with appraisal techniques, acquisition procedures, engineering plans, etc. In many instances the owner is at a disadvantage, his weaknesses are exposed, and he is uncertain of his decision-making ability.

To be successful in right-of-way activities, it is almost axiomatic that one must be effective in dealing with people.

### Letterwriting

The purpose of a letter is to convey a message. In many instances the letter is expected to obtain action. Clarity insures that the receiver will *understand* rather than misunderstand the message. Good tone, always courteous but sometimes firm, helps to assure that the receiver will respond cooperatively rather than with hostility.

*Clarity* — When possible to do so it is well to indicate early in the letter, and in clear fashion, the primary problem or the principal concept which is to be conveyed in the letter.

An informative opening can be made by the use of "Subject" at the beginning of the letter or by using the first sentence as a key.

Throughout a letter clarity will save the time of the receiver and will decrease the amount of supplementary correspondence. Clarity will also assist in the shortening of letters, which in turn saves time for those who prepare, type, proofread, analyze, and act upon the letter.

Many words have precise meanings, and when so used, they brighten a letter, giving both clarity and power to the description of complex situations or abstract ideas.

*Tone* — Those who have mastered the art of letterwriting give their letters a tone that causes the addressee to want to do what the letter implies.

### Telephone Manners

Sometimes, in the thick of things, any of us may forget that when placing or receiving a telephone call, our first few words and their tone can create either a favorable or an unfortunate impression. We may be reminded of this fact when we make a call

and are confronted with curtness or that "must I be bothered with the 'phone again" attitude. When making telephone calls in behalf of right-of-way operations, it is well to put the best foot forward and, as representatives of a public agency, this is particularly necessary.

Immediately before calling a landowner, review the details on which you should brief him. Many things of importance may have transpired since your most recent previous contact with him. Tactfully continue the telephone conversation until you obtain from him as many pertinent facts as you believe can thus be obtained.

Do not pass the buck! When contacted by a member of the general public, try to be of service. Answer his inquiry if it is within the range of your competence and authority. If you do not know how to answer the particular question, tell him that you will try to obtain the required information and that you will call him when same is available. If it is necessary to refer the caller to another person, take the time to determine exactly the particular person to whom he should be referred, giving the name of the individual, his title or other summary information about him, and his address or telephone number, or both. If possible, in the great majority of instances, attempt to answer in a positive manner, transmitting to the caller the definite impression that you and your agency are making special efforts to be of genuine assistance to him.

When an irate landowner calls on the telephone, take the time to listen. He is likely to become even more irate if you insist upon giving him your decision before he has been heard, even if this is the tenth time he has called. When appropriate, offer to visit him so as to provide additional information or to further discuss the matter.

Always be courteous on the telephone as well as in other contacts, and regardless of how unreasonable the other person appears to be, avoid arguing. Maintain a pleasant tone of voice. The person to whom you are speaking cannot see your facial expressions so that he gauges meaning only from your words and the tone of your voice.

#### Oral Techniques

The question is often posed as to why some people are much more persuasive than others. Part of the answer may be because they usually observe most of the following guidelines when talking face-to-face with people:

1. Think before you speak!
2. Be businesslike but friendly.
3. Put people at ease when talking to them rather than have them feel that you are cross-examining, or that you are not interested in them.
4. Put a bit of sparkle into conversation. The person who drags on and on in a monotone will not be as convincing as the one who is a bit more engaging in conversation.

5. Avoid taking too much of the other person's time when talking to him.
6. Let him save face when necessary. Heaping embarrassment, sarcasm, ridicule, or humiliation on a person seldom produces desirable results.
7. Let the other person have an opportunity to talk, and freely solicit his ideas.
8. Use a gesture occasionally, with face or hands, when you can do so with effectiveness.
9. Stick to the subject at hand rather than ramble endlessly.

In the attempt to observe guidelines of this type, one has an opportunity to see the other person's point of view, which in turn increases his effectiveness in dealing with people.

The complex nature of right-of-way operations often makes it difficult for the negotiator to explain to the landowner's satisfaction why he takes the position he is compelled to take. In talking with him, the agent should avoid using highly technical terms as much as possible, in order to keep the conversation on a level that the owner understands. At the same time the negotiator must be aware that he represents an engineering organization and that many of the people with whom he deals will expect the same level of exactness that they will expect from other specialists in the highway field. The agent should always show and feel a *genuine* interest in the person with whom he is talking, treating him as an individual and making him aware of the personal concern for him and his interest. Then the owner will know that all is being done for him that public policy permits.

#### PROFESSIONAL ETHICS

FRANK C. BALFOUR

*Executive Vice Chairman*

*American Right of Way Association*

The right-of-way practitioner must maintain the very highest possible code of ethics in practicing his profession if he hopes to be a success and make this field of work his career.

He must at all times recognize his responsibility to the highway department which he represents and to the people of his State. Integrity in every phase of his operations and basic principles of trust, justice, and fair play, together with complete knowledge of his function, must be the guiding principles of his code.

The right-of-way man must at all times keep uppermost in his mind that the very nature of his work is such that his employers must place maximum confidence in his judgment and integrity. He must be ever conscious that from time to time temptation to pick up a "quick dollar" will be placed in his path and that if he avails himself of such an opportunity, regardless of how trivial it may appear at the moment, it can

only lead to ultimate disaster. If this type of situation should arise, his ethics must dictate that he be guided by his loyalty and devotion to his employer and his co-workers.

The professional ethics of right-of-way work require that the right-of-way practitioner avoid any possible activities outside of his employment in the State highway right-of-way organization that could remotely represent any conflict of interest.

The right-of-way man who does not have complete faith in the worthiness of his occupation and who does not prove it by industry, honesty, and courtesy, does not merit a reputation for high quality of service and fair dealing and does not merit continued employment in his profession.

The right-of-way practitioner is not afforded the same privilege as the members of many of the other leading professions—that of being able to secure complete education in right-of-way through established courses in our institutions of higher learning. It therefore becomes incumbent upon him as an individual to establish, as one of the most important items of his personal code of ethics, that he will constantly study and add to his own knowledge of the profession in which he is employed, and will share the richness of his experience and knowledge with his fellow employees.

The right-of-way practitioner must exercise utmost poise and self-restraint at all times and give maximum cooperation to his coworkers and his superiors. Through continued development of these qualities, he must strive at all times to develop confidence and good will with the property owners and with his employers.

The very foundation upon which successful right-of-way negotiations must be based is thoroughly competent and honest right-of-way valuations to develop the fair and just compensation to which each property owner is entitled. To accomplish this result, the right-of-way man must ascertain and objectively weigh all of the facts relative to the property to be acquired. His appraisal thereof must reflect use of the best recognized methods for determining just compensation.

The right-of-way practitioner must at all times recognize the affected property owner's mental reactions and reservations, conducting the negotiations in the most ethical, patient, and competent manner so that he may earn and merit confidence in his knowledge and integrity, and that of his organization.

The very nature of right-of-way work requires the agent's employers, the public, to place maximum confidence in his fairness, ability, and honesty. In return, the agent must be willing to accept his full share of responsibility in constructive service to his community and his State to the end that he is recognized as a responsible leader in the area in which he operates.

The entire operation of the right-of-way practitioner should at all times be aimed toward the goal of attaining and expressing a sincerity of character that will enrich his

human contacts and gain the respect and confidence of all parties with whom he comes into contact.

The results of every transaction the agent concludes must be fair and equitable to the taxpayers he represents and to the property owner. The treatment of the property owner by the negotiator must be such that he may always return to handle future negotiations with the same individual. Then and only then is he living up to the code of ethics of his profession.

Every member of the State highway right-of-way organization should recognize his responsibility to his organization and the taxpayers of the State which employs him. He should maintain the highest possible ethical standards in all of his activities, and he should subscribe to the following code of ethics for his constant guidance and inspiration, predicated upon the basic principles of trust, justice, and fair play.

1. To show faith in the worthiness of his profession by industry, honesty, and courtesy in order to merit a reputation for high quality of service and fair dealing.
2. To add to the knowledge of his profession by constant study and to share the lessons of his experience with fellow workers.
3. To build an ever-increasing confidence and good will with the public and his employers by poise, self-restraint, and constructive cooperation.
4. To ascertain and weigh all of the facts relative to real properties in making an appraisal thereof, using the best and the most approved methods of determining the just and fair market value.
5. To conduct himself in the most ethical and competent manner when testifying as an expert witness in court as to the market value of real properties, thus meriting confidence in his knowledge and integrity.
6. To accept his full share of responsibility in constructive public service to community, state, and nation.
7. To strive to attain and to express a sincerity of character that shall enrich his human contacts—every aiming toward that ideal, "the practice of the Golden Rule."

## Coordination Between Right-of-Way and Other Divisions

LEWIS M. CHITTIM  
*Right-of-Way Engineer*  
*Montana Highway Commission*

and

W. H. WEBB, JR.  
*Chief Right-of-Way Engineer*  
*North Carolina State Highway Commission*

The highway department, like any other successful large scale enterprise, must depend, in the end analysis, on the coordinated functioning of each individual segment of its organizational structure. Thus, although each division of a highway is a relatively separate entity in and by itself, it represents only one effort among many other similar efforts working towards the ultimate goal of a well located and well constructed highway facility and system.

So the right-of-way division, although a complete highway function in itself, must depend upon other divisional units to assist in the culmination of its efforts. And just as importantly, these other units must rely on the consultive services, information, and data of the right-of-way division to properly perform their functions. Teamwork, proper communication and liaison between divisions are absolute requirements of an efficient and smoothly functioning highway organization.

While much can be accomplished with an informal liaison and voluntary coordination of efforts between divisions or units, the desirable goal is that at some one point there be a top level administrative policy definition of the particular points of actual operational procedures where cooperation is to be achieved within the total highway department. There must be a clear and concise delineation of the respective duties, responsibilities, and functions of each of the component parts of the overall organizational structure. With this administrative directive as the working basis for the normal operational functions, each division will know its place and its respective duties and will contribute its fair and equitable share to the finished product.

Even assuming this idealized administrative definition of individual division tasks and areas of required official liaison, there still remains the very important day-to-day

operational coordination to be achieved. It is to some of these aspects that we now turn our attention.

#### LOCATION AND DESIGN STAGES

The ultimate product represented by the completed highway facility can be markedly affected by the actions and coordination achieved in the location and design phases of a project, and the natural advantages accruing from this cooperation are not only reflected in the ultimate physical plant constructed, but as importantly, in the more efficient subsequent operation of each unit of the highway department.

Initially, the right-of-way division must necessarily be a party to the programming operations and the target dates set for advertisement of bids. This coordination makes it possible for the policy makers to program projects realistically. The right-of-way division, for its part, is likewise able to efficiently plan its workload and the assignment of its personnel, for through its consultations it ascertains those projects with the highest priority requiring immediate attention, and those projects which can realistically be deferred to a later date for the commencement of acquisition.

In its preliminary planning function, the location division should normally request estimates of right-of-way costs for their alignment decisions. The location engineer must know the cost differentials in alternate location schemes, and the expert opinions on the routes that will do the least possible damage, not only to the individual properties that are directly affected by the proposed construction, but to whole communities and areas in general. As planning progresses and the alignment becomes more firm, the right-of-way division is normally required to provide more exact route costs for certain critical control areas and to establish reliable figures for definite programming schedules.

With the completion of preliminary plans, right-of-way personnel usually make a walking field inspection of the proposed project in the company of location and design engineers and the resident engineer having the ultimate responsibility for the construction of the project. At this stage most of the right-of-way problems that are encountered in the construction plans can be discussed and resolved right on the ground.

Following this plan-in-hand field inspection, the major contracts will be shifted to the design division. Consultations may be for the purpose of estimating possible damages to individual properties because of proposed changes in grade, or the critical consideration may be the anticipated proximity damages to improvements or building sites. Advice may also be solicited on the establishment of proper right-of-way widths which will be consistent with desirable geometric standards and yet cause the least possible damage. Coordination is absolutely essential on design decisions involving frontage roads, stock and machinery underpasses, access points, and for the provision of access to landlocked parcels. In certain geographic areas, a major item of required consultation

necessary is in regard to irrigated lands and the effects of proposed construction on the irrigation systems of individual owners. In each of these instances, the right-of-way division must make a careful estimate of acquisition costs and any possible mitigation of damages that can be accomplished by incorporating certain remedial construction features in the final plans.

Initial consideration, from the right-of-way standpoint, should be given to fitting the location of a proposed project to the present and potential land use pattern of the area through which the project is to traverse. This should be done so as to interfere with the present use and probable future use of property as little as possible, within the limitations of good design and cost. These considerations should be studied in the projection or location stages of the design.

#### Horizontal Alignment

The planning or locating engineer should have a good knowledge of the location of property lines, the present use of the land and the potential highest and best use of the property before tying down the alignment. For example, a proposed highway location may be planned to run generally parallel to a railroad. At the present time the land lying adjacent to this railroad may be used for farming but the particular circumstances may be such that within a few years the highest and best use of the land would be for industrial sites. If the highway is located adjacent to the railroad right-of-way, the railroad frontage is lost and the right-of-way agent may be confronted with a claim involving heavy severance damages, say \$1,000 per acre for potential development land, rather than the anticipated \$300 per acre for farm land.

Or consider the case of a dairy farm where the selected location of the project may pass between the barns and the bulk of the pasture and cropland. After appraisals are secured, a vehicular underpass for the passage of farm machinery and cattle may be indicated. Had this been considered on the original field inspection, a shift in alignment might have resulted in the saving of 10 to 15 thousand dollars in the cost of providing an underpass or paying severance damage without materially increasing construction costs or adversely affecting geometric standards. Careful study should be made as to the location of property lines, farm access roads, location of buildings, fields, etc. on all properties between fixed control points so as to minimize the overall damages.

Before finalizing any survey, all recorded real estate subdivisions within the location corridor should be shown on the projection map and the best route of crossing the subdivision should be determined. As a rule, predominately land use roads with narrow rights-of-way are generally located to follow a subdivision street within the dedication. For the freeway type project where wider controlled access rights-of-way are required, the best solution may be to occupy one side or the middle of a block or blocks, leaving one or both adjacent streets as frontage roads. If it is not feasible to cross a subdivision

parallel to the established street pattern, the projection should be made to cross in such a manner as to minimize disrupting the traffic pattern within the area and to cross as many undeveloped lots as possible.

With reference to widening existing roads, the highway engineer finds in some instances, usually in urban areas, that roadside development is about equal on both sides of the road. This situation becomes particularly acute when the design right-of-way width closely approximates or exceeds the building line on each side of the road or street. This is the time to call for an experienced right-of-way agent or an appraiser. To follow the existing center line, widening equally on both sides, may result in taking and proximity damages equal to or in excess of the damages that may be incurred by placing all of the widening on one side or the other. In making an intelligent analysis in such a situation, it is necessary to know the depth of lots on both sides of the road or street so that it can be determined if the buildings have to be bought and demolished or if they can be moved back. The value and type of buildings on one side must be weighed against the value and type on the other side. For example, taking the pump and service area from a service station or the parking area from a supermarket on one side, may cause a damage in excess of that caused by taking the front yards, or even the buildings, from four or five rental properties on the other side.

Another factor to be considered is that by shifting the widening to one side, the construction cost may be cut by saving a usable curb line or sidewalk; likewise, a substantial saving may be effected by not disturbing utility lines on one side or the other.

In areas, usually rural, where the roadside development is spotty and may vary considerably from one side to the other, it may be more economical to vary the widening from one side to the other; however, the design engineer and the right-of-way agent or appraiser should check this carefully as the cost of usable pavement and roadbed sacrificed in making transitions may exceed the savings in right-of-way costs brought about by changing sides.

### Vertical Alignment

In properly designing a highway, the grades should be given as careful and considered study as to their effect on abutting property as is given to the horizontal alignment. Extreme care may have been taken to avoid a valuable business property in establishing the horizontal alignment, but the bulk of any savings in right-of-way cost may be lost if the grade is laid so as to seriously impair the access to the property. In laying the grades of a project, especially through developed areas, the design engineer should be constantly aware of damages that might result from changes in grade and should be aware of the fact that some additional cost in excavation might be more than offset by a savings in property damage.

Changes in grade can often cause damages far in excess of the value of the land taken, by impairing or destroying access and by blocking the visibility of the property. In the design of highway separations, right-of-way considerations may be more of a determining factor than the costs of excavation for structures in deciding which highway should be carried over the other. High approach fills in front of developed property can create loss of access damages as effectively as if control of access design requirements were made a part of the project.

Tied in with the question of grades is the determination of the need for retaining walls to eliminate or reduce property damage costs. This is one item that calls for the most careful consideration, based on accurate appraisals and cost estimates. There is a strong tendency on the part of most right-of-way agents to underestimate the cost of walls, and unless there are expensive buildings or special use properties involved, walls can seldom be justified.

The design engineer can also bring about some justifiable savings in right-of-way cost by changing the slopes of cuts or fills to meet a particular situation.

An important right-of-way consideration in determining grades is the presence of underground utilities, such as water and gas mains, sanitary sewer lines and telephone cables. As a rule, conflicts with utilities on new locations result in added cost to the project, while underground utilities in and along existing roads in the majority of States must be adjusted at the cost of the owner of such utilities. Even though the department may not have to bear the cost of adjusting the utilities, the design engineer should endeavor to keep such adjustments to a minimum, consistent with design limitations.

The adjustment of some utilities, such as large diameter gas transmission lines, main water supply lines and large diameter sewer outfalls, are so expensive that the location engineer should endeavor to place the crossing at a point where an adjustment will not be necessary.

The design engineer and right-of-way agent should at all times take into consideration the cost and other problems incidental to utility relocation or adjustment. In making comparative estimates of right-of-way costs for design study, the right-of-way agent or appraiser is often prone to take into consideration all land and building costs and then overlook utilities; whereas, the utilities in some instances could be the controlling factor.

### Drainage

Drainage also has its design problems insofar as right-of-way and property damages are concerned. Compensable damages may occur from diverting water from its natural course, either concentrating or retarding the flow of water. The faulty design of drainage facilities may bring about added property damage claims. One undesirable feature of this type of claim is that the damage resulting from improper design may not become evident until some time after the project is completed and funds are closed out, thereby

imposing the cost of correction onto the maintenance budget rather than into the cost of construction where it properly belongs.

The diverting of a stream channel which also may be a property line may save the cost of an additional culvert but it should also be considered that in so doing it may remove the only source of natural water from a 50-acre pasture that has depended on the branch or creek for its only water supply or it may remove the only source of irrigation water from a farm that can demonstrate increased yields from irrigation.

In designing outlet or tail ditches from drainage structures through developed or subdivided property, it may prove more economical, from a property damage standpoint, to follow lot or property lines than to follow the most direct route to the natural drainage; for instance a ditch cut diagonally across several lots may save a few dollars in excavation costs but may result in destroying the utility of the lots. Through highly improved property, it may be justifiable to pave channel change or ditch banks where buildings or valuable property may be jeopardized by erosion.

#### Control of Access

In the design of a highway project, the principal considerations from a right-of-way standpoint are present and future service to be rendered by the project, the present and potential land usage of the area through which the project must pass, and cost, with the latter being dependent to a large extent on the first two.

In present day highway design, right-of-way falls into three classifications: Full control of access, partial control of access and free or uncontrolled access, with some projects having a combination of the three. For Interstate System projects, full control of access is required by statute and, therefore, the decision as to the degree of control is no problem. For trunk-line primary highways, full control of access is desirable and is usually acquired when the project to be constructed is on new location.

On projects which involve the widening or improvement of existing routes on the trunk-line system, the cost of providing full control of access is often prohibitive and sometimes concessions in desirable design standards have to be made. These concessions may consist of providing frontage roads or providing some predetermined points of access at varying intervals or where roadside development is usually concentrated.

In making these decisions, right-of-way cost estimates should be prepared for the consideration of the planning and design engineers. If funds are limited, it may be decided to acquire the right-of-way to the full desired standard initially and make necessary cost concessions by resorting to stage construction, eliminating for the time being such features as grade separations, dual lane construction, high type pavement, or frontage roads. It should be pointed out that while some features of construction can be deferred and the project still render adequate service until funds can be made available, it is usually not practicable to defer acquiring access control or adequate widths of right-

of-way, for once a new highway is opened to traffic without proper controls, roadside buildup is inevitable with the attendant increase in property values. This is particularly true of urban bypass projects. On such projects, the providing of some control of access is of paramount importance for the city or town invariably grows out to encompass the would-be bypass.

On controlled access projects, the providing of frontage roads poses somewhat of a problem in that often the design of the completed project must be delayed until appraisals have been completed. According to most local policy, the construction of frontage or service roads is contingent upon a corresponding savings in right-of-way and property damage costs equal to or in excess of the cost of constructing the frontage road. If, after appraisals have been made, the amount of severance damage appears to be excessive, plans and cost estimates for a frontage road are called for and re-appraisals, based on providing the frontage road, are made; if the difference in the two appraisals equals or exceeds the cost of the road, the plans for the project are usually revised to incorporate the frontage road. In some instances, the need for the frontage road is so apparent that appraisals are not necessary. Similarly, the design of the project may be altered to provide for vehicular underpasses, overpasses or cattle passes based on right-of-way considerations.

On low traffic primary highways or secondary projects where land service is an equal or paramount consideration to traffic, the design engineer need only concern himself with providing adequate widths of right-of-way to accommodate present and anticipated future construction with sufficient marginal control being provided.

#### CONSTRUCTION PHASE

##### Prior to Acquisition

Perhaps the most significant area of desirable administrative liaison between the right-of-way and construction divisions is in the coordination that might be achieved between these respective divisions on the timing of projected advertising and letting dates for programmed projects. This concept, in its idealized form, would require mutual consent and agreement between all the affected units of the highway department before a particular project could be advertised for construction. Among the criteria that may be established by the right-of-way division in arriving at its particular decision on the most opportune date for the advertisement of bids might be the following:

- a. A projection of the time required to adequately appraise and negotiate for all individual property acquisitions.
- b. The time necessary for the most efficient disposal of improvements within the construction area.

- c. The projected date when the entire right-of-way area will be cleared for construction, including necessary utility relocations.
- d. A determination of the most opportune time in the construction schedule for conducting any necessary condemnation trials. This would likewise include a consideration of any procedural delays in litigation that may influence the availability of certain parcels for actual construction.

It is readily apparent that these considerations are entirely right-of-way oriented and may lose much of their immediate validity when considered in the light of conflicting considerations utilized by other divisions in establishing their projected or desired construction schedules. Questions of weather, the overall economy and benefits to the road users, and the necessity of integrating road networks, etc., may more than offset the right-of-way considerations, but through this coordinating process there will be some justified and weighted administrative decision that will take into consideration all the respective views and differing criteria of each component part of the highway structure.

#### **Coordination on Field Problems**

Just as the actions and decisions of the location and design divisions affect the right-of-way functions, so also do the acts and agreements of the right-of-way division become the final responsibility of the construction division. Whatever is said or done in a right-of-way negotiation or agreement has an ultimate reflection in the construction stage of a project, for each spoken or written word of the right-of-way personnel ultimately resolves itself to an individual construction matter involving a particular tree, a particular ditch, or a particular entrance.

Coordination with the construction division normally falls into two general time categories: the period prior to the commencement of acquisition, and the period during actual field negotiations. In the first area, preliminary consultation on the part of the right-of-way personnel with the field engineers is advisable to ascertain the projected advertising date of the project, the tentative time schedule for clearance of right-of-way limits, and possible general construction modifications that might be allowable in individual instances to lessen anticipated property damages. It is also advisable for the right-of-way personnel to make a detailed tour of the project with the assigned resident engineer to discuss the general construction procedures to be followed on the job, and also to examine certain problem properties where modifications might be possible.

#### **During Acquisition**

In the second area, right-of-way personnel must maintain close liaison with the construction division when the negotiators enter into the discussion phase with property

owners on such matters as the removal and building of fences, time allowances for the removal of improvements, possible modifications of entrances, etc. Coordination is an absolute essential and a normal administrative requirement if the right-of-way personnel feel a modification of plans and standards is justified in order to reach agreements with particular property owners. The construction division is the ultimate arbiter of any such proposals, but its decisions will be reached by an equitable weighing of desirable geometric and design standards against any possible diminution of right-of-way costs.

The point at which the contractor arrives on a project and starts to transform the landscape into a new highway facility is the point where the right-of-way agreements made with the individual property owners become a reality. It is the duty of the resident engineer to transpose the written right-of-way contract into this reality, and because the contract is his only basis of reference, he will normally be extremely dubious about any alleged verbal commitments made by the right-of-way purchaser that are not included in such contracts. If a dispute subsequently arises over an alleged statement, it frequently entails inquiry from the right-of-way division for an interpretation of the contract, or a determination of whether such a statement was made. It is essential, therefore, that all agreements and items of special work be specifically included in the final written contract.

As illustrative of potential problem areas, care should be taken in the initial instance by the negotiator to accurately explain the location of the right-of-way line and the construction limits to the owner in the field, especially at critical points such as in front of buildings, at breaks in the right-of-way line, and at points where the line is in close proximity to trees. Any later misunderstandings or conflicts on this point reflect adversely upon the whole highway department, and through this general unfavorable impression, may jeopardize the necessary give-and-take relationship between the project engineer and the individual property owners during the remainder of the construction phase.

In a similar vein, one of the most important areas of potential conflict relates to the explanation of proposed grade changes. The right-of-way personnel usually think and talk in terms of the profile grade as indicated on the plans for the centerline of the proposed roadway. The property owner, on the other hand, is usually only concerned about the elevation of the land at the right-of-way contiguous to his property line. Thus, the owner may be advised that the grade is going to be lowered two feet, and the statement may be made in good faith by the right-of-way agent using the common terminology with which he is familiar. Lowering the centerline grade two feet on an established road in a cut section sounds like a very minor change to the property owner. However, when other factors such as wider roadway, flatter foreslope and backslope, deeper ditch, and a possible large grade change in the right-of-way adjacent to his

property are taken into consideration, it is not surprising that the resultant situation becomes alarming to the property holder. Unless there has been a careful and explicit explanation by the right-of-way personnel, the owner acquires the wrong impression and is subsequently hard to pacify by the project engineer to whom he logically brings his complaint.

One of the most significant items that becomes the point of extreme emotional reaction is the removal of trees from a homesite. When plats or plans indicate that certain trees are within the right-of-way area, or the contract contains an item of damages for trees, the resident engineer will assume that the property owner is being compensated for the loss of such trees, and will proceed with their removal. Dispute often arises at this point, however, because the owner will allege that he has been assured that such trees will be allowed to remain on the public right-of-way. Unless this item is clearly settled with the owner, and consultation held with the project engineer, an extremely adverse owner reaction will occur.

Replacement of wells is another of those items that can engender long range controversy and continual expenditures by the construction and maintenance divisions. Similarly, another point of potential friction is the right-of-way agreement to replace or replant shrubbery. In areas such as these, unless there has been an obvious offer by the construction and maintenance forces to assume this liability, it is generally more desirable from the construction standpoint for the property owner to be paid to perform the work himself.

In the matter of individual driveways, it is generally understood that the location and design of entrances are established not only to consider the horizontal alignment, but also are planned to take into consideration the vertical profile of the driveway upon completion. From a construction and traffic standpoint, it is certainly much more desirable for an entrance to be constructed so that a loaded vehicle can enter the highway on the level, rather than climbing a steep embankment or descending down a steep approach. However, to satisfy this desirable objective, it is often required that the driveway be constructed at a location where it is necessary to enter private property in order to provide a more suitable approach grade. Should this be necessary, it should be clearly explained and written encroachment privileges should be defined in any pertinent right-of-way contract. In order to solve this problem, and accurately delineate the area affected, considerable detailed study of plans and cross sections is necessary by both the construction and right-of-way personnel.

Caution should also be exercised by right-of-way personnel in making agreements calling for special construction work or items subsequent to the award of the project contract. In some areas, these supplemental work orders are charged for on a cost plus basis or a special work order is required to comply with the contract provisions. It is advisable for the right-of-way personnel to confer with the construction engineer before

agreeing to any such special work provisions after the general contract has been awarded, for at times it may be extremely costly and economically unjustified to perform the desired work.

The point of this discussion has been essentially illustrative, and not intentionally all encompassing. The intent has been to emphasize the need for coordination at the field construction phase, since decisions, statements and impressions left at this phase directly affect individual property owners, and can generate the greatest cumulative effect upon the entire local highway program.

#### LEGAL DIVISION

Because eminent domain administrative structures and procedural steps vary to important extents from jurisdiction to jurisdiction, only generalized concepts can be explored herein on the relationship between the legal and right-of-way divisions. It is understood that not all of the areas noted apply with equal relevance to the policies of every State. The role of the right-of-way agent in the condemnation trial has been otherwise discussed in this text, and this treatment will suffice for this facet except for brief notation.

Depending upon jurisdiction, there are essentially five areas of required or desirable liaison between the respective staffs of the legal and right-of-way divisions.

#### Pre-trial Settlements

In many negotiations, the property owner or his agent will tender a counter-offer in excess of the amount of money originally offered by the right-of-way personnel. While many of these counter-offers will by their very nature be rejected without further consideration, there will occasionally be individual instances where the counter-offer is within the range of reason and is worthy of serious deliberation for a possible compromise settlement.

For a proper examination of the role of the respective divisions, it is necessary to understand some of the motivating factors influencing the ultimate decisions of the respective parties. The legal staff is generally most aware and concerned with the merits of the individual case under consideration, and of the difficulties of a possible trial, of the pattern of local jury awards, and, realistically, of the expense and time consumed in litigation. The right-of-way personnel are more essentially concerned with the precedent that such a settlement might establish for further acquisitions in the area and for future acquisitions in other areas. Additionally, the right-of-way personnel might feel strongly, because of personal knowledge of the property and the owner, that the proposed settlement entails excessive compensation and may wish to press the case to trial as a matter of principle.

While these may at times be divergent views, it is extremely important at this stage that the two divisions reach a joint decision on the proposed settlement, for the action taken will have far-reaching effects upon the acquisition program both in the immediate area and in the State as a whole.

### Preparation of Condemnation Pleadings

Generally speaking, the attorney preparing a condemnation proceeding is not intimately familiar with the details of the description required for the land to be taken and with the nature of the improvements. The right-of-way staff is therefore under obligation to supply the attorney with accurate information to file the requisite condemnation proceedings, including (a) proper plans, (b) proper description of the tracts involved, (c) the names and interests of all owners, (d) the residence of all owners, (e) the possibility of unknown ownerships, and (f) other pertinent title information. In the same area, under the general practice obtaining throughout the various States, the attorney is quite often not in a position to determine in advance of the day of trial whether all the defendants have been served with such process as is necessary to give the court jurisdiction over their persons and the land involved. The right-of-way division should therefore, where appropriate, ascertain the extent of service of summons or be in a position to advise the attorney what service is required to get such jurisdiction, so that the latter may make a proper check.

### Pre-trial Preparation

Should ultimate recourse to administrative hearing or jury trial become necessary, it is the usual practice to hold a pre-trial conference of the various witnesses and experts who are expected to testify on behalf of the condemner. In many respects this conference serves not only to familiarize the attorney with the particulars of the property to be condemned, but also to coordinate the testimony to be presented and develop a trial strategy.

Central to this review of data and the planning of trial strategy is the right-of-way staff. This is not to imply that the right-of-way personnel are to arrogate the functions of the attorney, for the responsibility for the conduct of a hearing or a subsequent trial is entirely within the control of the trial attorney. However, the right-of-way staff is intimately familiar with the property to be acquired, and with the appraisal testimony to be presented by the State and the probable testimony to be presented by the owner, and can offer extremely helpful guides for the development of both the direct and cross-examinations. Additionally, the right-of-way personnel have firsthand knowledge of local conditions, the personality characteristics of the owner and his neighbors, and other particular but possibly unrelated information that can assist in the determination of trial attack and defense.

This conference, with its detailed analysis of the appraisal data to be presented, will often reveal to the attorney that facts or law, having a bearing on the market value of the property were not known to a State's appraiser or fully considered by him. In his approach to a problem, an attorney may be motivated by different considerations and influences; he may draw different conclusions from the same market or other factual data; there may be questions as to proper application of the law to specific facts and as to the effectiveness of available evidence.

The appraisers may not have had the benefit of legal advice as to the measure of compensability of certain elements of value or damages, the offsetting of benefits, the identification of fixtures, the determination of what constitutes the remaining property for assessment of damages, or any number of other pertinent legal considerations. There may be questions as to the adequacy or admissibility of evidence necessary to prove facts in issue; there may be serious doubt as to the highest and best use of the property, or other extremely complex severance damage or other valuation problems that necessarily produce uncertain conclusions as to value, especially in the minds of a jury; there may be uncertainty of State law as to the measure of compensability of particular elements of value or damage; and a showing that the case under consideration is not a good one or that the circumstances are not ripe for a test of the legal questions. Counsel may be impressed by awards of commissioners where the amount of such award is admissible in evidence and is usually given substantial weight as evidence of market value; he may be impressed by recent court or jury awards for similar property in the area that tend to establish value.

In instances such as these, the conference provides a good informal medium for the right-of-way personnel and counsel to review all factors, and if appropriate, recommend a reconsideration of the opinion of value in light of the new information developed. While there may occasionally be differences between counsel and the right-of-way personnel, discussions and exchange of views should ordinarily resolve them.

#### Condemnation Trial

By way of significance, the condemnation trial represents the culmination of the total acquisition process with its accompanying relationship between the legal and right-of-way divisions. While the trial attorney is by definition totally responsible for the actual conduct of the trial itself, many of the preparatory and mechanical phases are by practice assigned to the right-of-way personnel. Thus, the right-of-way staff usually produces all exhibits to be used, including primarily a large scale plat of the property to aid the parties in understanding the testimony at trial. This map should be drawn to scale, delineating the area to be taken, and should include the location and nature of all improvements, and the location of any contiguous improvements or land that may have any influence on the issues in the case. It should show any pertinent

cuts and fills in those cases where the grade of the highway is to vary substantially from natural grade.

The right-of-way staff is usually delegated the responsibility of making certain that there are available good, clear photographs of the property involved. Wherever possible, there should be pictures of the property before and after construction of the project, and these photographs should be enlarged to sufficient size so that the jury can see the details clearly during the trial while the photos are being used to elicit testimony from the witnesses.

As a matter of practice, some attorneys will rely upon the right-of-way staff to hold final conferences to make certain that the expert appraisal witnesses have been well prepared to present their testimony at trial. This duty would involve not only a thorough re-analysis and interrogation on the particulars of the property to be acquired, but as importantly, a demonstrated familiarity with the neighborhood data pertinent to the subject property. In addition, the right-of-way personnel would verify that the witnesses were completely familiar with all details of any comparable properties that would be introduced into evidence. In this context, it would be advisable for all witnesses to be taken to the site of the proposed taking immediately prior to the trial, so that all parties would be completely aware of last minute changes effected on the subject property. This visit acts not only to limit surprise testimony to be introduced at the trial, but also is a very valuable refresher for the witnesses.

During the actual trial, the right-of-way staff can perform a very valuable function by providing the trial attorney with leads and questions to be developed during the direct and cross examinations. Many times the right-of-way staff, because of its long experience with the property and with the general neighborhood, will possess information or particular facts unknown to the attorney, and if this data is brought to the attention of counsel, it may be effectively used in examination.

Part of the responsibility of the right-of-way staff in a trial may require that a complete running record be kept of the major points of the testimony presented by the respective witnesses. It is normally impossible to secure a current record of the official transcript, and where a trial lasts several days, the informal record maintained by the right-of-way staff can provide valuable assistance to the attorney in preparing subsequent examinations or in preparing his final arguments to the jury. Additionally, this record will be helpful to the right-of-way and legal divisions in preparing further condemnation cases in the same area, and in preparing to refute the testimony of certain witnesses that may be expected to testify at these subsequent trials.

On occasion, testimony of a highly surprising nature may be introduced at a trial and, without substantive rebuttal, could have a potentially dangerous effect upon the ultimate verdict rendered. In situations such as these, with no time available for validation and examination of the testimony through normal sources, the trial attorney will

request the right-of-way staff to investigate the fact of the testimony, and if substantial variances are uncovered, will use the right-of-way staff or some other expert witnesses to offer rebuttal testimony. In this same general context, counsel may determine during the course of a trial that testimony by other experts, such as planning and zoning officials, specialized engineering personnel, or other similar experts, may be necessary to refute data offered by the property owner. Normally, the right-of-way staff will be assigned the task of selecting and contacting the respective individuals, outlining the scope of the requested testimony, and arranging for their appearance with any records or corroborative evidence.

#### Post Trial Procedures

Subsequent to the condemnation trial, the only substantive decision is the consideration of an appeal to a higher jurisdiction; and since this decision is made solely on the basis of a question of law, the legal division is the sole judge of this question. However, there will be instances where close liaison is necessary between the respective staffs to secure the prompt clearance of the right-of-way area acquired. Matters such as the expediting of payments for awards over and above court deposits may be procedurally necessary before possession can be obtained of the property acquired in litigation. Usually, the right-of-way division is responsible for processing such payments and accelerating this deposit with the appropriate person or officials, while the legal division will be responsible for preparing any subsequent papers or petitions for possession. Occasionally, even with a completed condemnation case, necessity will arise for a formal eviction notice to be filed against certain procrastinating owners before possession can be obtained. The right-of-way field staff can often eliminate the necessity of filing such formal notices by personally contacting the owner and/or his attorney, and informally arranging for the prompt vacation of the premises.

#### CONCLUSION

Liaison and coordination are not abstract principles existing in a vacuum, but are present to a greater or lesser degree in the every day operations of a highway department. General public policy as represented by a modern highway system will act as the rationale for a realistic teamwork approach to the problems and areas of mutual concern among the component parts of the overall highway structure, and the ultimate public good will be conscientiously served by an awareness, acceptance, and improvement of the cooperative effort needed to achieve this goal.

## Regulations Relative to Federal-aid Reimbursement\*

Under Federal law and regulations, Federal funds may participate in right-of-way and property damage costs incurred by the States for highway projects financed in whole or in part with Federal funds, provided such costs are incurred subsequent to the date of authorization to proceed with the right-of-way portion of the project which has been approved by the Bureau of Public Roads under established program procedures. Provided further that such costs are incurred and paid pursuant to and in conformity with State law and are of a nature that are normally reimbursable in eminent domain proceedings. This latter requirement is necessary in order to insure uniformity of reimbursement to the various States and to assure that payments are not made for items which are not properly a part of the cost of right-of-way for a highway project. Before one can fully understand and appreciate the Bureau's present policies and procedures it is necessary to go back and take a look at the relationship which exists or should exist between the Bureau and the State highway departments.

On January 21, 1915, the Bourne Report made to the 63d Congress stated in part:

To make State highway commissions or State highway engineers subservient to a Federal bureau would be disastrous. It would stifle initiative, discourage original research, and cause all State highway officials to await the action of the Federal authority. The better plan would be to place responsibility upon the State authorities, thus encouraging them to proceed along original lines in accordance with the best interests of their own localities, with the result that all the States would secure the benefit of the experience of that State which proved to be most successful. Instead of establishing one Federal bureau with all others subservient to it, we should encourage the highway commissions of each State to surpass, if possible, the Federal bureau itself in the efficiency of its work and the excellence of its accomplishments. The desideratum is cooperation between the highway officials of the several States, and of the Federal Government and not subserviency of one to the other.

In line with this philosophy the Federal-Aid Road Act was approved on July 11, 1916. Although Federal-aid legislation was first enacted in 1916 it was not until 1921 that much of the Federal-aid procedure was formalized. Twenty-seven years after the passage of the Federal-aid Road Act, Congress recognized that right-of-way cost

\* Part of this chapter is based on a paper presented by S. Z. Phillips, (then) Chief, Policy and Procedures Branch, Right-of-Way Division, Bureau of Public Roads, at the Region One Right-of-Way Conference held at Albany, New York, January 20, 1960; and partially on pertinent sections of PPM 21-4.1.

should be considered a participating item and the cost therefor was made eligible by broadening the definition of the term "construction" to include the cost of rights-of-way as expressed in the Amendment of July 13, 1943.

The Federal Highway Act of 1921 Title 23 U.S.C., provides, among other things, that:

The term 'State Highway Department' includes any State department, commission, board, or official having adequate powers and suitably equipped and organized to discharge to the satisfaction of the Secretary of Agriculture (now Commerce) the duties herein required.

If, therefore, a State is deficient in its organization and procedures concerning the acquisition of rights-of-way it cannot be said that it is "suitably equipped and organized" to discharge the duties required of it by the Secretary. This Act further provides that the construction (including the costs of rights-of-way under the Amendment of July 13, 1943) and reconstruction work and labor in each State shall be done in accordance with its laws and under the direct supervision of the State highway department, subject to the inspection and approval of the Secretary of Commerce and in accordance with rules and regulations pursuant to the Act.

The Federal Government first gave recognition to right-of-way as a full partner of construction in the Defense Highway Act of 1941 which permits Federal payment in whole or in part for rights-of-way required for projects certified as important to the national defense. First, by the Act of July 13, 1943, and again by the Federal-Aid Highway Act of 1944, the term "construction" was redefined to include costs of rights-of-way. At that time Federal participation was limited to 1/3. It was not until the passage of the Federal-Aid Highway Act of 1950 that the Federal share was increased to 50 percent—the amount now permitted on regular Federal-aid projects, commonly referred to as ABC projects. The Federal-Aid Highway Act of 1954 increased Federal participation to 60 percent on projects located on the Interstate System and the 1956 Act raised this ratio to 90 percent.

Upon passage of the 1956 Act it became evident that all States would have to ask for Federal participation in right-of-way on the Interstate System. In order to provide for early acquisition of adequate rights-of-way for this Interstate System, it was essential that the right-of-way organizations and procedures, of both the Bureau and the States, be strengthened. Since few States had requested right-of-way participation in the past, it had not been necessary to have as complete liaison between the Bureau and the States concerning right-of-way matters as would now be required.

The Bureau appointed appraisers and right-of-way engineers in its field offices to provide close and continuing contact between State and Bureau right-of-way personnel, so that many right-of-way problems could be solved administratively and documented in such a way that the fiscal officer would have the entire picture of each transaction

before him when final vouchers are audited. It was hoped that this procedure would eliminate many petty annoyances heretofore encountered by the States at the final voucher stage.

It was mentioned earlier that the Federal Highway Act of November 9, 1921, provides that the State highway departments be suitably equipped and organized to discharge their duties. In order that the Administrator may have firsthand information as to the organization, policies, practices and procedures of the various State right-of-way offices, PPM 21-4.1 requires each State to submit, under the signature of the chief officer of the State highway department, information as to the regulations, procedures, and manner in which right-of-way matters are handled by each State. This requirement is not an innovation insofar as rights-of-way are concerned but follows the precedent set in the early 1920's when States were required to submit a statement of their engineering organization, policies and procedures.

Before Federal funds can participate in expenditures made, there must have been an authorization by the Bureau to the State to proceed with right-of-way acquisition. There must be established some date on and after which Federal funds can participate in costs incurred, and the date of authorization has been established as that date. Any costs incurred after the date of authorization if otherwise eligible are reimbursable with Federal funds. The controlling phrase is "any costs incurred after the date of authorization," and not "any acquisition made after the date of authorization," for there is a difference between the two terms. This obligation may be incurred by a number of different means, for instance, by the actual acquisition as referred to or by entering upon the property and constructing the highway thereon or by filing a condemnation proceeding which obligates the State to pay for the property. There are probably other ways in which a State may become obligated to pay the property owner for the right-of-way and it is for individual determination in each State as to when the right-of-way costs are actually incurred.

Next, the Bureau requires that the State furnish the Bureau with a plan showing a right-of-way to be acquired. At the outset this plan need not be in detail but as a project progresses it is necessary that the plan also progress and at the time that reimbursement is requested an accurate picture of the right-of-way required must be shown on this right-of-way plat.<sup>1</sup>

After the right-of-way to be acquired has been determined and the necessary plans and descriptions have been prepared, the next requirement of the Bureau is that an appraisal or appraisals be prepared for each individual tract of property. These appraisals should be prepared prior to the start of negotiations or prior to the filing of condemnation proceedings to acquire the right-of-way. In those States where blanket

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1. The Bureau has issued a description of these general plan requirements. See paragraph 4 of PPM 40-3.1.

condemnation is filed covering all the tracts on a particular project the appraisals should be made prior to actually proceeding with trial of the case. These appraisals should be made at a time when they will be of service in reaching a settlement either by negotiation or by condemnation and should not be made to support an action already taken. The number of appraisals to be secured is dependent upon the State requirements and also upon the requirements of the Bureau of Public Roads. The Bureau has determined that it would not insist on more than one appraisal where the value of the property to be acquired is less than \$25,000. The Bureau has not required that these appraisals be made by a State employee but they may be made by either such an employee or by an outside appraiser employed by the State highway department. The Bureau does require that these appraisals be independent judgments as to value of the property and that the various appraisers did not prepare them in collaboration with each other. A further requirement is that these appraisals be adequately supported.<sup>2</sup>

After the appraisals have been received, it is felt that a responsible individual in the State right-of-way division should review these appraisals and reach a determination as to the fair market value of the property which amount should govern negotiations. The Bureau has designated such a person as the reviewing appraiser and feels that he should have the authority delegated to him by the State right-of-way division to make such determination and to authorize any changes in that figure if they become necessary. It is felt that the reviewing appraiser, after reviewing the various appraisals submitted to him, should be in the best position to determine the fair market value of the property. If he is in possession of information which indicates that the fair market value of the property is in excess of the amount determined by the appraisers then he must place in the file a record of the reasons why he has made a determination in excess of the appraisals. In a like manner the file should be documented by the administrative officer when a settlement is made which is substantially in excess of the determination made by the reviewing appraiser.

After a determination has been made by the reviewing appraiser the next step is for the State to enter into negotiations with the property owner. The Bureau feels that, in order to prevent collaboration and conflict of interests, these negotiations should be conducted by someone other than the person who made the appraisal of the property. If an appraiser knows that he is to negotiate for a piece of property he might be inclined to place his appraisal higher in order to make the negotiations easier.

When a settlement has been reached with the property owner, it is felt that good business judgment dictates that all of the agreement should be reduced to writing and signed by the parties involved. This writing may take various forms such as an exchange

2. In this connection see PPM 21-4.1, which is attached hereto, Attachment 1, December 30, 1960, "Guidelines for the Preparation of an Appraisal for Right-of-Way Purposes."

of correspondence, or a formal contract, or it may be incorporated in the transfer instrument, but somewhere along the line there should be a written record of the full agreement with the property owner so that no dispute may arise in the future. If the State is to do any construction work for the property owner in mitigation of damages this should definitely be placed in the agreement so that it will be reflected in the record and will indicate that this is part of the compensation paid to the property owner.

After the agreement with the property owner has been consummated and the property owner has been paid for the property, the State is then in a position to request Federal reimbursement for the Federal pro rata of the cost of the right-of-way. If the record has been properly documented as the various steps have taken place it should not be difficult to secure approval of the auditors for reimbursement of the amount claimed. When the voucher is submitted for reimbursement, it is necessary that the State have sufficient data in its files to satisfy the auditors that the payment made is proper. It should be noted at this point that the Public Roads division appraiser does not have the final say as to the amount which shall be reimbursed to the State. This is for determination at the audit stage, but if the Bureau appraiser has been checking properly on the State's procedures, he will know that the record is adequately supported and that the auditors will have no question when they check at the progress voucher or final voucher stage.

Briefly these are some of the requirements of the Bureau of Public Roads for Federal participation in right-of-way costs. In more particular terms, the following points and statements relating to the previously discussed matters are quoted and paraphrased from the Bureau's PPM 21-4.1, which is the basic document establishing the ground rules for the Bureau-State right-of-way relationship and the reimbursement for State right-of-way expenditures, where applicable. These requirements are not the full text or range of this PPM and do not include most of the administrative and procedural matters contained therein, but are furnished to give a synopsis of the more important and particular requirements that should be known to the operating right-of-way agent.

#### **Authorization and General Reimbursement**

The authorization by the division engineer to proceed with acquisition of rights-of-way shall constitute approval of the necessity for the right-of-way to be acquired and the general eligibility for Federal participation in the cost of right-of-way items.

Any expenditure of a type normal to the operation of the State highway department, and incident to the acquisition of rights-of-way, either by negotiation or condemnation, such as those made for surveys, plats, appraisals, abstracts of title, title certificates, title insurance, closing and escrow services, court costs and disbursements, witness fees, recording fees, advertising, economic studies, salaries, fees, and travel

expenses of field representatives of the State, county, or city while engaged in right-of-way acquisition work, and of attorneys engaged in the preparation or trial of condemnation cases, are eligible for Federal participation if properly supported and shown as incidental expenses on the certificate submitted with the voucher and chargeable to highway funds. The administrative and headquarters expenses of the right-of-way offices or of field offices are not eligible for Federal participation.

#### Title Services

A State highway department may employ individuals and firms for abstract or title services, and closing and escrow services if its own organization is inadequate in that respect. The necessity for the procurement of these services must be indicated in the organization, policy and procedures submitted to Public Roads.

#### Appraisal Requirements

Before negotiation or hearing in condemnation, the State highway department shall secure at least one appraisal of each parcel to be acquired or damaged and at least two appraisals of all parcels for which the first appraisal of right-of-way to be taken is in excess of \$25,000, except where the State has submitted a different plan or operation and it has been reviewed and found acceptable. Additional appraisals may be required by the division engineer in any case where he deems such action necessary. Appraisals shall be independently prepared by qualified State employees or qualified fee appraisers. Appraisal reports shall be written and fully documented and include photographs of all principal above-ground improvements or unusual features affecting the value of the property to be taken or the amount of damages. Each such photograph should carry either on itself or by reference to State records unalterable identification showing such information as the date, by whom and position from which taken, owner of the property, street or lot number, and any other information which would establish the parcel or parcels of rights-of-way involved and the authenticity of the photograph. Appraisals shall be dated and signed by the appraiser and shall be in permanent form. Appraisals shall include a tabulation of all sales of the subject property for the five years immediately preceding the date of the appraisal, showing the parties to the transaction, date of purchase, and wherever possible to obtain, the verified purchase price. This five-year record may be prepared by others and incorporated by the appraiser in his appraisal report by reference. Similar information for sales between the date of the appraisal and the acquisition date shall be ascertained by the State and made a matter of record.

The individual appraisal format is dependent upon the property to be acquired and is a State responsibility. Attachment 1 to PPM 21-4.1 sets forth guidelines to enumerate the appraisal elements generally considered essential to an adequately supported opinion of value.

### Appraisal Review

Within each State highway department, one or more individuals, hereinafter referred to as reviewing appraisers, are authorized to determine the fair market value of real property, which amount is to govern negotiations and settlements. In making such a determination, the reviewing appraiser may consider all competent information of value that is available, including appraisals secured by the State highway department and the property owner, recent awards by condemnation juries for similar property in the same area, and any other pertinent value information that is relevant in his determination. The reviewing appraiser, on the basis of additional value information available to him, may adjust the determination as to the fair market value at any time prior to settlement.

If the reviewing appraiser finds that one of the State's appraisals contains adequate presentation of bases of the appraisal and is a competent and reasonable measure of fair market value, he should so indicate by placing his signature and date of determination on such appraisal or on an attachment thereto. In this case the documented appraisal will be accepted as justification for payment of the Federal share of the settlement which does not differ substantially from the value set forth in such appraisal. If the reviewing appraiser determines that the fair market value differs substantially from any of the State's appraisals, he should include in the State's files a signed statement setting forth his determination of fair market value and an explanation of the bases therefor. This supported and documented statement will be accepted as justification for payment of the Federal share of the settlement which does not differ substantially from the value set forth in such statement.

### Negotiations

Federal participation will not be allowed in the cost of any parcel of land where the negotiations were carried on by the same person who made the appraisal. Negotiations shall be conducted by qualified staff employees of the State and its political subdivisions, or by qualified fee negotiators. The negotiator shall maintain adequate records of his negotiations indicating over his signature the amount of each settlement. When right-of-way is acquired by negotiation, the complete agreement between the highway department and the property owner shall be embodied in written instruments appropriately executed.

The employment of private individuals or firms to negotiate for the acquisition of right-of-way for Federal-aid projects must be approved in advance by the division engineer of Public Roads. Such approval shall be granted on a project by project basis and only in those instances where it is clearly shown that such procedure is in the public interest, that individuals or firms to be employed are qualified to perform the

services, and (1) the acquiring agency does not maintain an organization adequate for acquiring such right-of-way as a part of its normal operating staff, (2) that the amount of the fee is not determined on a percentage basis, and (3) that the fee is just and reasonable.

#### **Administrative Settlements**

Prior to filing of condemnation proceedings, the chief administrative officer or other official of the highway department having final authority over right-of-way matters may review the parcel file, giving full consideration to all pertinent information, including the appraiser's opinion of value, the determination of the State's reviewing appraiser, the amount of the State's probable testimony should the case be condemned, and make a determination therefrom as to whether a settlement should be attempted at an amount other than that previously offered the property owner. Where a settlement is made on the basis of an administrative determination and such settlement is substantially in excess of the State reviewing appraiser's determination of value, the parcel file shall contain a statement signed by the chief administrative officer or other official of the highway department having final authority over right-of-way matters, in which he sets forth the reasons for such settlement.

#### **Condemnation Procedures**

Payment may be made on progress vouchers of the Federal share of deposits placed by the State in court in connection with condemnation proceedings to the extent that such deposits are in amounts determined as fair market value by the State's reviewing appraiser, or are established by court order or other means required under State law as a condition of the State's obtaining possession of the right-of-way. The Federal share of the total amount of court deposits, plus the Federal share of any other payments made for expenses incurred on a particular project, cannot exceed the Federal funds included or proposed to be included in the project agreement.

Federal funds will ordinarily participate in the full pro rata share of an award rendered (a) after a contested trial on the merits, or (b) in an amount agreed to by the parties where the court has heard evidence and made an independent judicial determination of the amount of just compensation in accordance with the requirements of State law. However, where there is a substantial variance between an award and the State reviewing appraiser's determination of value, Federal funds will participate only to the extent that the State's action is properly documented and supported in the highway department's files.

Federal funds may participate in the cost of guardianship fees paid by the State in clearing title to right-of-way takings, provided the State makes a showing of legal authority for such payment under local law. Federal funds will participate, if properly

supported on the certificate submitted with the voucher, in the usual costs and disbursements chargeable to a condemning authority under State law as part of a valid cost bill approved by a court in a condemnation proceeding. However, Federal participation will not be permitted in the cost of landowners' (1) attorney fees, (2) appraiser fees, (3) expert witness fees, or (4) similar costs to a landowner based on value of the services rendered to him which are paid by the State in connection with acquisition of rights-of-way, regardless of whether such costs are included in court judgments or court costs in litigated condemnation cases.

Where it is apparent that in determining the amount of an award, the court included elements of damages, or costs which are compensable under State law but not eligible for Federal participation, Federal funds will ordinarily participate in the award reduced by the value of the ineligible elements as determined by the State's reviewing appraiser.

Where a court award is substantially in excess of the State reviewing appraiser's determination of fair market value the parcel file shall include:

(a) A signed statement by legal counsel for the State concerning the trial of the case and including, but not necessarily limited to: (1) an explanation of any substantial variance between the State reviewing appraiser's determination of value and the amount of the State's high testimony at trial, or the amount stipulated to by the parties and submitted to the court for its judicial determination of compensation; (2) a brief factual account of the trial, including the range of testimony by each party and the major issues developed; (3) comments on availability of material legal errors or other bases of appeal; (4) explanation of action regarding motions for remittitur or new trial or the taking of appeal; and

(b) Where applicable, a statement by the State's reviewing appraiser as to his determination of value of ineligible elements; and

(c) A statement signed by the chief administrative officer or other official of the highway department having final authority over right-of-way matters in which he approves or concurs in: (1) the amount of the State's high testimony at the trial or the amount stipulated by the parties and submitted to the court for its independent determination of compensation; and (2) the action of counsel for the State in not moving for a new trial or remittitur or in not prosecuting an appeal where counsel concedes such to be legally feasible.

#### Specific Reimbursement Provisions

Where a highway is legally declared to be a controlled or limited access highway, Federal participation in the cost of acquiring existing access rights, whether or not other property is acquired, is permissible if otherwise eligible. Where right-of-way is

acquired for a controlled access highway on new location, Federal participation will not be permitted in payments made to the owners of abutting properties for access rights to the controlled access highway. If an existing highway is on any Federal-aid system and it is determined to control the access thereon, Federal funds could participate in the cost of controlling such access even though no further construction is contemplated.

Payments made for personal property or the cost of moving personal property, tenant relocation, loss of business, diversion of traffic, and other items of damage or value, not generally compensable in eminent domain, are not considered eligible for Federal participation.

Federal participation will not be permitted in the payment of taxes. However, the State may pay taxes or assessments for the property owner in disbursing the consideration to be paid the property owner for the right-of-way acquired.

The cost of acquiring lands or interest in lands outside the normal right-of-way for obtaining road building material is not eligible for Federal participation as a right-of-way item. The cost of acquiring lands or interests in lands outside the normal right-of-way for temporary use during clearing of the right-of-way or construction is eligible for Federal participation as either a right-of-way or construction item, in accordance with State practices, subject to appropriate program approval and authorization to proceed.

When right-of-way is acquired for a Federal-aid project, Federal funds shall not participate in the cost of acquiring any subsurface mineral rights, other than as may be required for the preservation of the constructed highway itself, if their acquisition will increase the cost of the right-of-way, unless the State demonstrates to the satisfaction of the division engineer that acquisition of such subsurface interests is reasonably necessary to the protection and support of the highway to be constructed on the right-of-way.

Where the whole of a property is acquired and only a portion thereof is needed for right-of-way, Federal participation will be limited to the fair market value of the portion used for highway purposes plus severance damages to the remainder supported by before-and-after appraisals. Where lands in excess of those needed for the right-of-way have been acquired, and the acquiring agency uses such excess lands in payment, or part payment, for other lands needed for the right-of-way, Federal participation will be limited to the actual cost of the excess lands to the State, plus any cash expenditure to the owner of the area to be acquired, or the fair market value of the area to be acquired, whichever is less. In cases where the retention of a remnant is justified, the State so desires, and the division engineer approves, such remnant may be included as part of the finally accepted highway and shown on the right-of-way plans.

Where it is necessary to adjust improvements and to construct betterments or additions to private property as part of the consideration for the right-of-way acquired.

the cost of such work is to be supported to the same extent as any other right-of-way item and is eligible for Federal participation. Where, as assurance to the property owner, certain construction features are recited in the right-of-way agreement, reimbursement to the State for the cost of such features will not be made until the work has been completed.

The amounts required to be paid for lands in public ownership shall be justified in the same manner and to the same extent as though the acquisition involved a private owner.

When public housing units are taken for highway purposes the Federal share of reimbursement must be based on not more than the fair market value at the time of the taking for highway purposes.

When real property is acquired by a State or by a public utility or railroad to replace real property transferred by a public utility or railroad to the State for highway purposes, the cost of such real property will be considered as the cost of the right-of-way for the highway project. The transaction and the cost shall be properly supported.

Where, under State law, benefits may be offset against compensation to be paid, consideration shall be given thereto in determining the amount the property owner is entitled to receive as a result of the taking of his property.

#### **Future Use, Property Management and Disposal**

Project agreements covering the acquisition of rights-of-way shall contain a clause providing for the refund of any payments made by the Federal Government in the event that actual construction of a road on such rights-of-way is not undertaken by the close of the seventh fiscal year following the fiscal year in which the agreement is executed. Where a State, before expiration of the 7-year period, has awarded a contract for construction of a section of highway, upon a reasonable portion of the right-of-way covered by the Right-of-Way Project Agreement, and has proceeded with sufficient actual work to give visual evidence thereof at the construction site, which is in contemplation of and evidences the State's good faith, intention and plan to proceed without delay in an orderly manner to complete construction of the highway upon the entire length of right-of-way covered by the Right-of-Way Project Agreement, such action will be considered as complying with the statutory requirement.

When right-of-way acquired includes areas for future construction, the State should determine a definite and prescribed right-of-way limit, within the overall right-of-way acquired, needed for the immediate construction, and such area shall be cleared of encroachments. This limit shall be shown on the right-of-way and construction plans. Within the areas or strip between this definitely prescribed right-of-way line and the overall right-of-way line (area acquired for future construction), the State may,

subject to the approval by the division engineer of the general use plans therefor, lease, rent, or permit the use of such area or strip with the provision that upon notice that it is needed for highway purposes, the use or occupancy thereof would cease and it would be immediately vacated so that the highway authority could enter thereon. Any such agreement shall provide for complete and prompt vacation of the right-of-way occupied when notice by the State is given that it is required for highway purposes, and shall also provide that no improvements are to be made upon the property during the period of occupancy. On the Interstate System, no direct access is to be permitted from the area or strip of right-of-way leased, rented, or permitted to be used as provided in this paragraph to the portion of the right-of-way used for highway purposes. No additional amount will be paid to the owner at the time the property is to be vacated unless such amount is specially set out in the acquisition agreement.

Where improvements are acquired with no rights reserved to the prior owner, the cost of safety and protective measures is eligible for Federal participation as either a right-of-way or construction item in accordance with State practices.

Where resale or salvage of improvements acquired as part of the right-of-way is feasible, it is expected that the acquiring agency will dispose of such improvements in the manner which will result in the greatest net credit to the project. The cost of adjustment or re-establishment of improvements may properly be considered eligible for Federal participation, provided such adjustment or re-establishment results in an appropriate reduction in the amount which it would have been necessary to have paid the property owner if such adjustment or re-establishment had not been carried out. Justification for such action must be documented by the State.

Where it is determined that improvements acquired as part of the right-of-way should be removed under a clearing contract, such clearing may be handled as a right-of-way or construction item in accordance with State practices, subject to appropriate program approval and authorization to proceed. When handled as a right-of-way item, the agency in charge thereof shall have evidence of record that competition was secured in all cases where practicable. Such contracts are subject to review by the division engineer, but prior approval thereof is not required. When the clearing of the right-of-way is performed as a construction item, the usual requirements for a construction contract shall apply.

Each State shall maintain adequate property records including an inventory of improvements of salvable value acquired as part of the right-of-way and appropriate records of rentals and recovery from sale or salvage of such improvements. The State highway department may employ a property management firm or real estate agency for the collection of rentals or management of acquired property if its own staff is inadequate for such services; The applicable contract shall be submitted to the division engineer for approval.

## Miscellaneous Procedural Requirements

A right-of-way representative from the State and from Public Roads should make inspections in company with the location and design engineers at both the preliminary and final stages of location of the highway.

In limited instances, particularly in cases involving large amounts of money, or complex valuation, or legal consideration, the State may request Public Roads agreement with proposed actions. In any case submitted for advance approval, the highway department files will be documented in accordance with the provisions of this memorandum; the State will provide sufficient time for adequate consideration of the question and will take necessary action to protect its rights in the interim period. If the division engineer finds that the action proposed by the State is satisfactory, he will advise the State in writing of his concurrence.

Federal funds will not participate in the cost of any real property unless Public Roads representatives have been afforded an opportunity to examine such property before the removal or alteration of improvements located thereon and before the commencement of highway construction upon any part of such property. The State shall give written notice to Public Roads of proposed changes to be made to the property, and anticipated date of commencement thereof in sufficient time for such examination to be accomplished. This notice may be given on a project basis.

All plats, appraisals, options, purchase agreements, title evidence, negotiation records, deeds and other data and documents relative to the acquisition of the rights-of-way shall be available for inspection by authorized representatives of the Bureau of Public Roads. If the division engineer determines that the amount claimed for any parcel is not adequately supported, he may approve Federal participation in the amount he determines is adequately supported.

All title transfer instruments should be recorded in the land records of the appropriate jurisdiction where possible. If not recordable they should be retained as a part of the State's permanent records.

Right-of-way for all Federal-aid highways shall be unlimited in vertical dimension, subject to the enjoyment by others of rights beneath the surface of the earth that will not impair the highway or interfere with the free and safe flow of traffic thereon, and except as shown in the approved construction plans or as may be approved by the Administrator in particular instances.

When lands are acquired for right-of-way purposes, all private installations thereon, except utility facilities the retention of which is clearly justified, shall be cleared therefrom prior to acceptance of the completed construction project, and any encroachments on or private use of the right-of-way in the future shall be prevented, except such use or occupancy as may be approved by the Administrator under the Regulations for the Administration of Federal Aid for Highways.

GUIDELINES FOR THE PREPARATION OF AN APPRAISAL  
FOR RIGHT-OF-WAY PURPOSES

The following general guidelines are not for the purpose of presenting a specific pattern to be followed in preparing an appraisal report, since the individual appraisal format is dependent on the property to be acquired and is a State responsibility. They merely enumerate the general appraisal elements considered essential to an adequately supported opinion of value.

Before an appraiser can prepare an acceptable report it is necessary for him to know just what he is to appraise and the purposes of his appraisal. Much of the data and information which he needs to use in making his appraisal can more readily and properly be furnished by others. For this reason, it is desirable that upon assignment of the appraisal, the State highway department furnish the appraiser, among other things, the following information:

Owner's name and title held. Also other interests (if any). Encumbrances on property, such as leaseholds, easements and restrictive covenants.

Rights to be acquired. Where it is desired that the appraiser determine an *after value* based on the premise that certain adjustments of the improvements are to be made, he should be specifically advised that the additional determination is to be made.

Right-of-way plans as required by paragraph 4h of PPM 40-3.1. In addition, it is desirable that the appraiser be furnished a sketch of the entire property showing boundary dimensions, location of improvements and other significant features of the property. He should be furnished information as to pertinent cuts and fills in those cases where the grade of the highway is to vary substantially from natural grade and information of other construction items that might have a bearing upon his appraisal. For a partial taking the sketch should also show the area to be acquired, relation of improvements to the taking area, and area of each remainder. The value to be estimated generally is "market value," and instructions should be given that the appraisal is to follow generally accepted principles and techniques in evaluation of real estate and in accordance with existing State law.

A list of those damage items considered to be noncompensable and request that the appraisal reflect these rulings. The State highway department should obtain the advice of its legal representatives.

Recognized rulings pertinent to benefits and a list of those items which have been recognized as value elements allowed in mitigation of the loss in value brought about by the taking. The State highway department should obtain the advice of its legal representatives.

Advice that where numerous parcels are to be appraised in a project and they are generally comparable, a consolidation of sales and other data would be acceptable, and that reference can be made in the appraisal report to such data by numbers with an explanation of any variance with the subject property.

Advice that it is not necessary to attach the appraisers' qualifications to each appraisal report, so long as a copy of such qualifications has been furnished the State and is available in its files.

Having been furnished adequate instructions the appraiser then is in a position to make his appraisal and prepare the appraisal report. It is not intended to prescribe any particular format for an appraisal. However it should contain, among other matters, the following elements:

1. CAPTION

- a. Project and parcel number.
- b. Owner's name.
- c. Location of property.

- d. Total area in property, in acres or square feet.
- e. Area to be acquired, in acres or square feet.

2. PURPOSE OF APPRAISAL

- a. Statement of value to be estimated.
- b. Type of title on which value is estimated, such as "fee simple," "lease fee and leasehold," "life and remainder interest," etc.
- c. What is to be appraised, such as "entirety," "partial taking," "control of access," "loss of an easement," etc.

3. NARRATIVE DESCRIPTION OF PROPERTY

Briefly state in simple terse wording: General location, total area, land usage, type of improvements and any special features that add to or detract from the value of the property.

In the event of a partial taking after describing the entirety, describe the remaining land and the remaining improvements.

4. DELINEATION OF TITLE (5 years)

<u>From</u>	<u>To</u>	<u>Date</u>	<u>Book</u>	<u>Page</u>	<u>Consideration</u>
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Indicate whether the consideration has been verified. If no transfers within five years, mark "None."

5. METHODS OF APPRAISING

- a. State highest and best use on which the appraisal is based. Where the present land usage, as set forth in the narrative description of the property both before and after the taking, is not the premise on which the estimate is based, it should be explained and supported.
- b. State the approaches to value used, generally three. However, should less than three approaches be used simply explain "not applicable," "insufficient data available to support same," etc.
- c. In those States which follow the *before-and-after* method of valuation, a *before-and-after* appraisal should be used in all partial takings except where it is apparent there is no damage to the remainder land or improvements. In such case a brief statement giving reasons should suffice.

In using a before-and-after method the difference between the two estimates will ordinarily develop the value of the land to be acquired, and the damage to the remainder property. This difference should then be analyzed and tabulated showing the allocation of each allowance.

- d. *Before-and-after* appraisals are subject to an important qualification, and that is that the after valuation must eliminate any consideration of damages or benefits that are not allowable under State law, even though they may, in fact, be reflected in the ultimate value of the remaining property on the market. In any case of doubt, State legal counsel should be consulted.

The after value estimates, both as to land and improvements, should be supported by one or more of the following methods that are applicable:

Sales of comparable properties from which there have been takings for like usage.

Sales of properties comparable to the remainder.

Land economic studies of previously acquired partial takings should be made and the hard facts developed from such studies should be used as evidence in support of estimates of damages and benefits to the remainder land.

A reanalysis of the sales data used to support the before value estimate.

The economic loss or gain brought about by the change in land usage, changes in units of production, costs of operation, changes in rentals, etc.

#### 6. DOCUMENTATION

- a. *Calculations.* Show the calculations used in developing various approaches to value.
- b. *Market Data.* List or make reference to a list of comparable sales data in support of the value estimates, stating date of sales, names of parties to the sale, purchases, location, total area and type of improvements, highest utility, consideration paid, degree of comparability with the subject property being appraised, either *percentage-wise* or in *dollar amounts, plus or minus.*
- c. *Photographs.* Include a sufficient number, properly identified and taken at various angles to show significant features of the property, especially the improvements.
- d. *Right-of-Way Maps.* In addition to right-of-way plans it is desirable that there be provided a sketch of the entire property showing boundary dimensions, location of improvements and other significant features of the property, if not furnished by the State. For a partial taking the sketch should also show the area to be acquired, relation of improvements to the taking area, and area of each remainder.

#### 7. CONCLUSION AND JUSTIFICATION

Give the conclusion and the justification therefor. Where two or more of the approaches to value are used, the correlation of value should be justified.

#### 8. CERTIFICATION BY APPRAISER

- a. That he has personally inspected the property.
- b. That he has no present or contemplated interest in same.
- c. That he has given consideration to the value of the land, and damages and benefits to the remainder land, if any, to the extent benefits are allowed under State law.
- d. That allowances noncompensable under State law have not been included in the estimate.
- e. That in his opinion the value of the taking as of \_\_\_\_\_ is \$ \_\_\_\_\_  
(valuation date)

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date appraisal report submitted.)

## CHAPTER 41

### Acquisition For Future Use

WILLIAM J. GROSS

*Deputy Director, Division of Right-of-Way  
Ohio Department of Highways*

#### GENERAL

##### Introduction

The acquisition of rights-of-way for future use has assumed an important role in recent years in the right-of-way activities of the highway departments of a number of States. As the many advantages of this type of acquisition become more generally understood, it can be expected that early buying will become an integral part of the right-of-way programs of all the States.

This chapter provides a general summary of the more significant aspects of this relatively new technique. It sets forth those characteristics which distinguish the advance acquisition of right-of-way, the objectives and advantages of this type of acquisition, the special planning, financing, and operating procedures involved, and some of the supplemental methods, short of actual purchase, that have been found useful in protecting areas needed for future right-of-way.

##### Need for Advance Acquisition

The spectacular acceleration in highway construction in recent years, combined with the rapidly expanding right-of-way requirements demanded by the evolving design criteria for new freeways and major arterial routes, has made the acquisition of right-of-way for future use not only a desirable, but a necessary component of a properly functioning and integrated highway program.

The transition from the recognition of the need for acquisition for future use, as obvious as its advantages may appear to be, to an effective operating program of buying is not without its problems. A brief outline of the traditional pattern of project development and the early attempts to acquire right-of-way in advance will point up some of the problems requiring solution in one way or another.

## Traditional Pattern Of Project Development

Financing, legal, and engineering concepts in most State highway departments combine to produce a pattern of project development in which the acquisition of rights-of-way often takes place rather late in the plan preparation phase, usually during the period immediately preceding the award of a construction contract. Where financing of highway improvements is from current highway funds, the programming of projects is strongly oriented to the fiscal periods in which funds become available for use. These fiscal periods normally do not exceed one biennium; and where engineering, right-of-way, and construction money is programmed together for a project, the early acquisition of right-of-way is seriously handicapped. The courts in determining the necessity of a taking only recently have begun to deviate from a basis of "immediate need," in which the time between condemnation and actual use was governing, to one of "assured future need," in which emphasis is placed on the reasonable certainty of ultimate need rather than immediacy of construction.<sup>1</sup> The engineering phase of project development has been characterized by a design sequence in which construction limits and right-of-way requirements are determined only after construction plans have reached an advanced state of completion. Thus, for acquisition of rights-of-way for future use to be implemented effectively, certain modifications may be required in current concepts and procedures. These changes will be discussed in more detail later in this chapter.

### Early Actions to Protect Future Right-of-Way

Most new developments begin with an idea, usually expressed in terms of an objective. Then, using existing tools, various methods of achieving the desired goal are attempted, necessary adjustments are made, new tools are designed, and eventually a workable system emerges. Perhaps the earliest efforts to preserve right-of-way for future use consisted of spot buying at obviously critical locations. An example is the purchase in the mid-1940's by Ohio of land on the north side of U.S. Route 40 required to complete an interchange which was partially constructed when U.S. Route 25 was improved from Dayton north to U.S. Route 40. Basically, this was a simple extension of conventional acquisition. The normal acquisition tools were employed, and the acquisition costs were financed from regularly budgeted highway funds. It did, however, represent a recognition of the desirability of advance acquisition and an attempt to do something about it. The shortage of regularly budgeted highway funds limited the extent of spot buying, except in obviously critical locations where the possibility of improvement of the land would entail greatly increased cost if acquisition were delayed.

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1. Highway Research Board Special Report 27, 1957, p. 23.

Very early emphasis was placed on methods to protect future rights-of-way by means of reservation agreements of various types. A number of States, including California, Maryland, and Ohio, devoted considerable effort to this approach. The method had the advantage of conserving current highway funds, while insuring that the land needed would be available later at unimproved prices. For example, in 1945 Ohio initiated a reservation program based on an agreement with the owner not to construct within specified areas any buildings or structures that could not be removed within ten days.<sup>2</sup> During this phase other means of protecting future right-of-way short of actual purchase were employed, such as the official map technique.<sup>3</sup> Also explored extensively at this time was the possible use of police powers to assist in accomplishing the desired protection of future right-of-way.<sup>4</sup> Common to these early approaches was the effort to accomplish the desired objective with a minimum expenditure of current highway funds.

A direct attack on the financing problem which was to have a significant influence on future developments in this field was initiated in 1952. In that year California established by legislation a \$10 million revolving fund (increased the following year to \$30 million) to be expended specifically for the advance acquisition of properties for State highway purposes.<sup>5</sup> In the next few years several other States provided special means of financing early right-of-way acquisition, including New York, Ohio, New Mexico, Washington, and Wisconsin.<sup>6</sup>

Even where fund availability presented no particular problem, there existed a serious question in many jurisdictions as to the legal power to acquire for a projected future use. Some significant pioneering steps were taken in this area, both in the enactment of special legislation (16 States) and in obtaining favorable judicial interpretation of existing statutes (8 States) to permit acquisition for future highway use.<sup>7</sup>

The widespread interest thus evidenced in finding ways and means of acquiring and protecting future right-of-way would probably not have continued through the years if there were not some very important practical advantages inherent in a successful advance acquisition program. These advantages are best summarized in a statement of the objectives of advance acquisition.

#### Objectives of Acquisition for Future Use

At this point, it would be well to examine the conceived contribution of future use acquisition to the right-of-way mission and the mission of the highway organiza-

2. Highway Research Board Bulletin 4, 1946, p. 10.

3. Highway Research Board Bulletin 18, 1949, p. 5 — Reservation of Lands prior to Acquisition—California.

4. Highway Research Board Bulletin 10, 1948, p. 15 — Michigan Studies.

5. Highway Research Board Bulletin 101, 1955, p. 9.

6. Highway Research Board Special Report 27, p. 41.

7. Highway Research Board Bulletin 205, 1958, p. 21.

tion as a whole. Such a statement, expressed in terms of objectives, will furnish a useful frame of reference for a more detailed discussion of the subject.<sup>8</sup>

*Protect desired location and alignment of future highways* — Frequently, highway improvements must be accomplished by stage construction, building first those usable sections most urgently needed, and deferring other segments to future years. Continuing development and changing land use in the vicinity of deferred portions of new highways may require shifts in planned alignment, with consequent delays and added engineering and construction costs. Advance acquisition is an effective solution.

*Minimize right-of-way costs and land speculation* — The steady increase in land values over the years, and the continuing high rate of land improvement, places a high premium on early buying. California estimates that in the first 4 years of operation of their revolving fund, the early acquisition of \$180 million worth of future right-of-way represented a saving of about \$400 million based on the appraised value of the property at the time of construction. Aggravating the normal increase in values with time is the demonstrated trend of real estate costs to pyramid and for land speculators to operate in the area of an announced highway improvement unless acquisition is accomplished early.

*Gain time for orderly acquisition and clearance of right-of-way* — By its very nature, dealing as it is with the human factor represented by thousands of individual property owners, the acquisition of rights-of-way requires adequate time. Early purchase is the most effective method of avoiding the evils of buying against a deadline immediately prior to construction, gaining the time necessary for orderly, effective acquisition and clearance of the right-of-way, and insuring that construction schedules are not delayed for lack of right-of-way.

*Provide time for readjustment and relocation by owners* — Particularly in urban and built-up areas, including improvements on existing locations where strip development has occurred, there exists the special problem of relocation and resettlement of families and business displaced. The potential for serious delay in construction programs is very great. Again, the critical factor is one of time, and the only effective solution is the early start which advance acquisition can provide.

*Minimize economic waste* — Advance acquisition can reduce significantly the economic waste, private and public, which occurs when right-of-way is acquired after land has been improved, and buildings have been erected which must be moved or destroyed to make way for highway construction. Although owners may be compensated, there is a direct economic waste (which is evidenced directly in the cost of the highway) when structures with a remaining useful economic life are displaced.

8. Highway Research Board Special Report 27, p. 2, for a discussion of advantages and disadvantages of acquisition for future use.

*Facilitate compatible development of adjacent areas* — Wherever a highway improvement is made, there is an inevitable adjustment of land use patterns in the area. When right-of-way is acquired in advance, these adjustments can be planned and orderly development can proceed in proper relation to the proposed highway facilities.

*Increase public support* — Public support of the highway program as a whole is enhanced by the evidence acquisition for future use presents that highway planners are providing for their long-range future transportation needs. Adverse local reaction and controversy over specific proposed locations and routes are minimized by the advance notice thus provided affected owners.

#### Limiting Factors

In the development of new procedures there are usually factors which limit or condition their practical effectiveness. Recognition of these factors can facilitate adaptations which will minimize their effect. Some of the more important factors which require careful consideration in implementing a program of acquisition for future use are:

*Continuing evolution of standards of highway design* — Rarely are standards static in any field of endeavor. Experience, research, and changing conditions are continuously operating to produce new and different concepts. In the field of highway engineering there has been almost a revolution in recent years in highway design criteria. There is no reason to believe this process will not continue. Engineers are thus reluctant to project detailed requirements very far into the future.

*Difficulty of determining future alignment* — Analogous to the factor of changing design standards is the matter of location and alignment of proposed highway improvements. Even where master plans have been developed to reflect ultimate highway networks, the resolution of alignment problems at specific locations sometimes requires extensive studies and consideration of alternates. When decisions are made sufficiently in advance to allow early right-of-way acquisition, there is no real assurance that the alignment may not later be changed.

*Availability of funds* — To be worthwhile and achieve its objectives, acquisition for future use must be conducted on a scale at which rights-of-way are obtained at least on a project basis and, where possible, on an area or route basis. This requires the availability of funds in the millions of dollars (Ohio is set up to acquire an average of \$2 million per month for future right-of-way). Obtaining all of the necessary funds from current highway budgets can present serious difficulties, and in most instances will be essentially impossible.

*Legal restrictions on authority to acquire* — In areas where advance acquisition has not been attempted, there may be doubt as to the administrative authority to acquire

for highway use when construction is not contemplated until some time in the future. New legislation may be required to avoid an extended period of developing a body of case law on the subject.<sup>9</sup>

*Federal requirements* — Although recognition is given to the desirability of advance acquisition of rights-of-way, and such a program is specifically encouraged by Section 108 of Title 23, United States Code (Federal Highway Act of 1958), the detailed requirement for establishing eligibility for reimbursement of right-of-way expenditures set forth in Bureau of Public Roads implementing procedures can effectively prevent advance acquisition on a participating basis, unless special steps are taken. Since few States will desire to expend sizable sums of money on Federal-aid highways without reimbursement, Bureau requirements may seriously restrict advance buying, particularly where construction plans have not progressed sufficiently to establish definite right-of-way requirements.

#### Methods of Protecting Future Right-of-Way

Any legal means available for acquiring, protecting, or controlling land for highway purposes may be incorporated into a program of advance acquisition, including purchase, condemnation, and the exercise of the police power. Of particular value in dealing with future requirements are various special agreements such as developmental easements and options which prevent significant increase in value of property pending purchase or condemnation. The authority to purchase or condemn, and later dispose of property excess to the needs of the proposed highway, is very useful. Zoning, subdivision regulations, reservation, and official mapping represent measures available under the police power. Local considerations will govern the extent to which these means will be employed, singly or in combination.

#### Definition of Acquisition for Future Use

As used here, acquisition for future use will be considered to include all actions to insure the future availability of rights-of-way necessary for the construction of proposed highway projects either by purchase, condemnation, or the exercise of police power, taken prior to the time right-of-way acquisition would otherwise normally be scheduled to begin. In most situations this would place advance acquisition activities a minimum of two years before construction. How far in advance of construction acquisition for future use may occur is limited only by the availability of information as to right-of-way requirements, the availability of necessary funds, the extent of the power legally to acquire in advance, and administrative considerations.

9. For information helpful in understanding the legal background of advance acquisition, including a particularly valuable analysis of the essentials of a workable enabling statute for advance acquisition, see Highway Research Board Special Report 27, *supra*.

### Requirement for Advance Planning

Perhaps the most essential prerequisite for an effective program of acquisition for future use, and in many aspects the most difficult to achieve, is that for advance planning and preparation. The acquisition of rights-of-way at any time requires careful planning and coordination to insure an efficient, successful operation. When these activities are conducted out of normal sequence, several years earlier than usual, new conditions and factors are introduced which increase the complexity and the importance of prior planning. These special planning requirements must be recognized and appropriate measures taken to provide for them.

### Nature of the Planning Problem

All highway departments plan their activities in advance, and most States normally project their future construction programs five, seven, or more years in advance. A closer look at this planning function will distinguish between the long-range planning for future years and the more specific planning upon which current operating programs are based. The long-range planning is principally concerned with establishing the broad outline and general phasing of future programs for the purpose of balancing anticipated fund availabilities and other resources with projected future highway needs. Although long-range planning is frequently predicated on lists of specific projects, by type and by year of construction for a number of years in advance, the information available to the planners at this stage is largely tentative and subject to considerable adjustment. Such information is usually not adequate to permit acquisition of rights-of-way. Nevertheless, it is in this long-range group where many of those projects most appropriate for advance acquisition appear.

The planning problem then, insofar as advance acquisition is concerned, resolves itself primarily into the task of developing essential information of the type and detail found in current operating programs from the more general and often incomplete data upon which long-range planning is usually based. In effect, the equivalent of a supplemental operating program must be developed and maintained in a current status specifically for purposes of acquisition for future use. It is this kind of specific and often detailed planning, performed in advance of regular schedule, when information upon which to base firm assumptions and decisions is often tentative at best, that makes advance planning for acquisition for future use complex and frequently very difficult.

### Principal Areas for Advance Planning

The specific planning problems and the detailed arrangements which must be completed will vary according to the program status of a project, its type and location,

Federal-aid category, stage of completion of engineering studies or construction plans, expected date of construction, and other like factors. Regardless of the particular situation, the following areas usually will require careful consideration from the standpoint of advancing planning. These areas are not mutually exclusive; decisions and determinations with respect to one will usually involve planning with respect to the others.

*Selection of projects* — The extent to which an advance acquisition program will accomplish the purposes intended depends in the first instance on the proper selection of projects to be included. Each potential project should be evaluated first in terms of the stated objectives of acquisition for future use. Will there be a significant saving in the cost of the right-of-way? Is the project in an area which is developing rapidly? Is there a significant resettlement problem? Is the type and size of the project such as to require a relatively long right-of-way acquisition lead time? In general, those projects should be selected which promise the greatest return to the State and to the public from early acquisition.

*Project priorities* — Projects selected will vary as to the benefits to be derived from each through advance acquisition. Projects will vary as to urgency. Design status may often determine when buying can start. Limitation on funds, even where special financing arrangements are available, will almost always influence the volume and phasing of acquisition, as will the size of the acquisition organization. The expected time of construction and the estimated time required to acquire the properties involved are factors to be considered. It is thus necessary to organize the selected list of projects according to the order in which it is expected that they will be acquired. This is best accomplished by the assignment of priorities. Such priorities provide a basis of further planning, such as the allocation of funds and the establishment of right-of-way acquisition schedules for future periods.

*Financing arrangements* — The types of money to be used to finance purchases, and the amounts to be provided or encumbered for acquisition for future use activities must be planned well in advance. Frequently, more than one source of supplemental funds, in addition to a portion of regularly budgeted highway funds, is available. Determinations must be made as to which funds will be utilized and in what amounts, and steps taken to obtain or replenish the money required. Frequently, for administrative reasons certain types of funds may be restricted for use on certain classes of projects. For example, money to acquire properties on Federal-aid projects may in some cases be provided only from specially designated funds. Usually, where other than regular highway funds are used, the money has been made available through some type of loan or revolving fund arrangement. Thus, finance planning must also consider and provide for eventual repayment, usually from regular highway funds at the time of construction. For this purpose, controls must be established over the effect the rate of advanced buying will have on the amount of money invested in property at any given time.

*Scheduling acquisition activities* — Although a system of priorities establishes a basic structure governing the order in which projects will be acquired, and in general, the periods in which buying will occur, it is essential for operating purposes to develop specific schedules for advance acquisition. The utilization of the work force available must be planned to insure a desired level of accomplishment. Coordination between the appraising and negotiating functions must be effected. There must also be coordination between the advance acquisition activity and regular right-of-way acquisition operations. To insure proper coordination and to provide the basis for more detailed planning later, general schedules establishing the approximate time each project will be acquired must be planned in advance. The early development of such schedules will aid in obtaining compatibility between right-of-way schedules and design schedules and thus assure availability of plan information on right-of-way requirements when needed.

*Expediting plan information* — Of all the various problems which must be resolved in connection with advance planning for early right-of-way acquisition, perhaps the most troublesome and at the same time essential requirement, is that of obtaining at the proper time sufficiently specific and firm information from design agencies as to the right-of-way needed for a project. For years, it has been the general practice of highway engineers to delay the determination of right-of-way requirements until the design of a project was relatively complete. Under normal conditions this policy has certain advantages. With design complete, right-of-way limits can be firmly established with the assurance that neither too much nor too little land will be taken. The major disadvantage is that frequently by the time right-of-way requirements are established, there remains barely enough time to acquire the right-of-way before construction of the project must start. Sometimes, construction must be delayed until the right-of-way is obtained.

Changing conventional engineering practice is not easy. On the other hand, right-of-way acquisition in most cases requires more than tentative alignments, general statements of right-of-way widths, and project termini. When rights-of-way are acquired there should be reasonable assurance that the properties are required. Real estate is expensive, and funds are always in short supply. There is also the obligation borne by any public agency not to pre-empt private property for public use, except to the extent that there is a demonstrable need. It is thus both desirable from an economic standpoint and necessary from the standpoint of public obligation, that project locations be relatively firm and construction areas sufficiently defined to permit determination of reasonably accurate right-of-way limits before initiating acquisition. To provide this degree of reliability in right-of-way requirements, it is necessary in most instances that engineering studies and detailed plan development have progressed beyond the preliminary stage.

Unfortunately, it is often the case that many of the projects most appropriate for advance acquisition are to be found, plan-wise, not developed to the point where right-of-way buying can be supported unless special steps are taken.

There are certain measures which can be taken in cooperation with the design agencies which will serve to expedite needed right-of-way information. One is to institute a two-stage system of plan development, wherein the design phase is distinct from the contract plan preparation phase. Under this system, the conventional engineering report is expanded in scope to include the resolution of all significant design problems. This so-called design report would develop sufficient information to prepare, as a part of the report, a project right-of-way plan suitable for right-of-way acquisition. This method is most useful for those projects such as major thoroughfare, urban and interstate projects, which often require extended design periods. This is also the type of project which requires a longer right-of-way acquisition period, and is most often included in advance acquisition programs.

In many instances, especially on smaller projects, it is possible to approximate right-of-way requirements adequately very early in the design phase, by the technique of basing construction limits on critical sections and interpolating. Using established line and grade, and applying the typical section at selected critical points, construction limits are estimated. If foundation information is incomplete, assumptions may be made for slope determination. Some intelligent guessing or visualization is required on the part of the engineer, but if right-of-way limits are established on an "adequate" basis, acquisition should be successful.

A special case arises in urban and built-up areas where individual properties are small, and as a result there are a large number of total takes or buy-outs. Here, right-of-way acquisition can be started very early, based only on a centerline location and an approximate minimum right-of-way width. Most of the property needed can be acquired and owners and tenants relocated. Later as construction limits become available, the fringe areas and partial takes can be acquired.

What advance planning can accomplish with respect to expediting right-of-way information will depend upon local conditions and practices in each State. In any event, it must be the continuing purpose of advance planning, through coordination and cooperation with engineering and design agencies, to insure the earliest availability of sufficient information on right-of-way requirements to support advance acquisition.

*Federal authorization* — If Federal participation in right-of-way costs is contemplated eventually, it is important that advance planning insure that all Federal requirements and prerequisites are or will be satisfied. When these requirements must be fulfilled will vary, and will depend upon arrangements made locally with the Bureau of Public Roads. In California, for example, formal authorization is obtained when the highway department acquires the properties from the revolving fund. In Ohio, where a

type of financing other than a true revolving fund is used, the Bureau has tentatively stated that authorization is required prior to purchase by the holding agency, even though this may be several years before the highway department purchases the properties from the holding agency. There are also certain Federal requirements for right-of-way plan information which must be available before authorization is granted. This may frequently require that special arrangements be made with the design agencies to furnish the necessary information for submission to the Bureau. Whatever the local requirements, advance planning must determine these requirements and provide for them.

#### Coordination within the Highway Department

Planning involves many activities. It requires fact gathering, making analyses, estimating needs, evaluation of resources, developing schedules, making assumptions, predicting results, arriving at decisions, preparing instructions, programming, and many others. Seldom is it possible for one organization or subordinate element thereof to accomplish its planning without reference to other sections, divisions and departments. Thus, in all planning situations major emphasis must of necessity be placed on the task of coordination. This is particularly true of advance planning for acquisition for future use. The principal areas in which close coordination is required insofar as early right-of-way acquisition is concerned are as follows (functional designations are used, since organizational structures will vary):

*Programming* — In every highway department the functions of preparing and maintaining current and future highway construction programs, and corresponding financing allocations and projections are carried out. Coordination with programming must occur early in the planning stage of advance acquisition in connection with the initial selection of projects, with substitution of projects later if necessary, and correlation of the advance buying programs with current operating programs. To the extent that advance buying is supported from regular highway funds, there must be close coordination with the regular finance and budget planning elements of the department.

*Design* — Since acquisition for future use is greatly dependent upon the status of design and the availability of project right-of-way requirements, it is obvious that coordination with these divisions must be close and continuing on such matters as route determinations, public hearings, alignment approvals, and right-of-way limits. In coordination with these groups, the development of a procedure for obtaining required design information in advance of the normal schedule of operations, is the item of greatest importance in the context of advance planning.

*Right-of-Way* — Coordination within the right-of-way organization itself is also essential. Projects to be acquired, overall priorities, and buying schedules should be

thoroughly coordinated and checked for feasibility with the sections of right-of-way having primary interest therein. Financing arrangements and fund availability are matters for internal coordination during advance planning to insure efficient execution of the advance acquisition program. Actually, the planning task will usually be distributed among the various sections of the right-of-way organization and accomplished on a cooperative basis. In this situation mutual coordination among the sections concerned must be close, thorough, and continuing throughout.

#### Coordination with Other State, Federal, and Local Agencies

Today, the construction of highways is such a vast undertaking that many agencies of government at Federal, State, and local levels are frequently directly involved. Where this is so, there must be full coordination between these agencies and the highway department at the advance planning stage.

*Federal agencies* — The direct concern of the Bureau of Public Roads in the matter of right-of-way authorization to proceed in Federal-aid projects has been noted. The Bureau also controls the development of project design through various stage approvals such as alignment, grade, geometrics, and hearings which in turn affects directly the availability of right-of-way information. Recently a revision of the Federal Housing Act, establishing loans to small businesses being physically displaced by highway construction, develops a requirement for coordination with the Small Business Administration. On major roads where advance acquisition will be active, it can be expected that a number of such businesses will be affected. All such matters, involving any agency of the Federal Government, must be properly coordinated in connection with advance planning.

*Other State agencies* — Direct coordination is usually required with other State agencies in regard to financing and legal matters. State constitutions and legislative acts often place certain statutory responsibilities in the chief finance officer and the attorney general. Under normal conditions the required coordination is effected routinely in the development and execution of the highway program. Under a system of advance acquisition, special action must usually be taken to insure proper accomplishment. Advance acquisition frequently involves coordination with State planning agencies with respect to regional development plans. Various State agencies often own or control public lands required as right-of-way, and releases and transfers must be effected to convert this land to highway use.

*Local agencies* — Frequently, local agencies are participating in or sponsoring various highway improvement projects. Particularly is this true of cities in connection with urban projects. Local planning and zoning commissions also are often vitally

interested in changes in the highway and street networks, as these may affect development plans and land use locally. In some instances cities and counties may, by agreement or as a matter of law, be responsible for actually acquiring or furnishing rights-of-way. Advance planning must insure, through coordination, that all interested agencies are informed and all necessary cooperative arrangements are made.

#### Coordination with Utilities

Many States have established active liaison between the highway department and the public utility companies for the specific purpose of keeping each other informed of their respective future plans. Usually, however, actual adjustments of utility facilities does not occur until shortly before construction. Advance acquisition provides an opportunity for the utility companies to schedule necessary work early to the mutual benefit of both the companies and the highway department. Advance planning, through coordination with the companies, can facilitate early adjustment of utilities.

#### Public Relations

Favorable public reaction, and especially acceptance by property owners directly affected, is much to be desired whenever it is necessary to acquire rights-of-way for highway projects. The many special advantages of advance planning and future use acquisition can be a distinct asset when properly brought to the attention of owners and the local public. The problem of resettlement, which is often acute in urban areas, is aided by the early publication and dissemination of reliable information on advance acquisition plans.

#### Overlap Between Advance and Operational Planning

Planning is continuous at all levels from the inception of a project until the operation is complete. The pace will vary from time to time; emphasis placed in the various aspects of the program will change; and as planning proceeds, it will tend to become more detailed and more concerned with operating problems. However, operating problems must be anticipated very early, since their ultimate successful solution frequently depends upon basic arrangements made as a result of advance planning. Thus, it is difficult to draw a sharp line of demarcation between advance planning and operational planning. Considerable overlap will exist where one merges into the other, especially where the same sections and individuals are involved in both, as is usually the case. For this reason the reader should consider that the items discussed in this section on advance planning procedures will apply with equal force where appropriate to the later discussion on administration and operation of advanced acquisition programs.

### Requirement for Special Financing

Conventional highway department financing procedures are usually based on the principle of financing current highway programs from funds to the limit of their present availability. When construction programs must be expanded beyond the means currently available, States have provided their highway departments additional financial resources by such methods as special bond issues, to be retired from anticipated future revenue. All funds, regular and supplemental, are jealously husbanded by highway administrators and utilized almost exclusively to maximize current construction. Thus, any proposal to divert significant portions of available funds to defray expenses for future projects receives a cool reception. Investment of regular funds for advance acquisition falls in the latter category.

However, if an advance acquisition program is to be implemented, sizeable amounts of money must be made available from some source. An effective advance acquisition program could not ordinarily operate on the relatively small amounts which might be diverted from regular funds. The provision of supplemental funds for construction purposes serves as a precedent for seeking additional fund sources for advance right-of-way purchases. Some of the methods and devices used to obtain the capital required for acquisition for future use are outlined below.

### Regularly Budgeted Funds

As indicated, reliance upon regular funds to finance advance acquisition is not generally feasible. Frequently, however, certain portions of these funds may be made available under special conditions. To obtain maximum benefit from early acquisition, the program must be sufficiently flexible to permit spot-type buying where this is desirable. Frequently, a short time before acquisition is scheduled on a regularly programmed project, a situation will arise where it is highly desirable in order to forestall, for example, speculative development of certain properties, that these be acquired immediately. To avoid, for the relatively short time remaining until construction, the administrative burden of processing such purchases through special fund accounting, it is often more efficient to utilize regular funds. It is wise planning to provide for the use of regular funds for contingency purposes.

In some situations it may be feasible to program the right-of-way portion of project funds separately from the construction portion, and phase the right-of-way funds several years in advance. This technique has been used in California to support advance acquisition where sufficient regular highway funds were available. Sometimes, where a project is co-sponsored by another governmental agency, and the other agency has

funds earmarked, it may be possible to arrange that the agency's participation in the project cost be utilized primarily for early right-of-way acquisition.

### Appropriated Funds

The New York method is based upon the use of a portion of the funds appropriated annually for the Department of Public Works. Upon approval of the Governor, the Director of the Budget may set aside amounts up to \$20 million for the advance purchase of rights-of-way. This is not a fund, but rather an authorization for investment in rights-of-way which will be built up over a period of several years, utilizing appropriated funds.<sup>10</sup>

Washington in 1957 appropriated a \$10 million fund to be used within two years "for the advanced purchase of rights-of-way and access rights . . ." <sup>11</sup> This is a one-time appropriation for the specific purpose of buying highway rights-of-way. Additional similar appropriations would be necessary to continue the program after these funds were exhausted or the time limitation of two years had expired. Where the State financial situation is such that special appropriations can be obtained, this is a useful mechanism. Much of the bookkeeping and record-keeping associated with the operation of revolving funds and similar devices is avoided.

### Revolving Funds

One of the most useful and popular devices for providing the working capital needed for advance acquisition is the revolving fund. Such a fund was first established by California in 1952 and is still operating successfully.<sup>12</sup> This is a true revolving fund in that the fund is reimbursed from regular highway funds when the properties are required for construction. Initially, the fund was established at \$10 million and in 1953 increased by an additional \$20 million. New Mexico in 1956 created a variant of the California method by setting aside \$5 million from 1955 unused highway debentures to buy right-of-way for future projects.<sup>13</sup> This fund is not fully self-replenishing since it is set up to operate in connection with the Federal-aid program, and is dependent upon Federal reimbursements which never reach 100 per cent of State costs. Continuation of this mechanism would require periodic replenishment of the fund by some means.

### Bond Money

One of the traditional sources of additional funds for highway construction—issuance and sale of bonds—is also a useful source of funds for advance acquisition

10. Highway Research Board Special Report 27, p. 44.

11. *Ibid.*, p. 45.

12. *Ibid.*, p. 42.

13. *Ibid.*, p. 43.

purposes. In 1954 the Ohio legislature authorized a \$500 million nine-year highway program to be financed by money raised through the issuance of bonds. The first stage of this program earmarked \$8 million specifically for rights-of-way.<sup>14</sup> Of course, when bond money is exhausted, the program is at an end unless additional authorizations are forthcoming. Bonds have the disadvantage that a debt is created which must ultimately be retired. If retirement is required from future highway funds without augmenting these funds by providing increases in revenues, then future programs will suffer. The advantage is that ready cash is made available for current use.

#### Investment Funds

The tremendous savings which are achieved from an effectively administered program of acquisition for future use derive in part from the fact that real estate values generally have exhibited a continuing upward trend for a number of years, and that during the period the properties are held awaiting construction a net profit is usually realized from property management activities. These characteristics make advance acquisition attractive as an investment. The real estate provides security for the funds invested, and property management income is available to pay an interest or service charge on the money. In most States there are governmental or quasi-governmental agencies, such as a public employees retirement board, which manage and invest funds being held in trust. It is reasonable that such agencies looking for sound investment opportunities would find the financing of advance acquisition attractive.

In 1959 the Ohio General Assembly passed a measure authorizing the Director of Highways and several trust fund agencies, the Public Employees Retirement Board, the State Teachers Retirement Board, the School Employees Retirement Board and the Industrial Commission, to enter into agreements whereunder the highway director, as agent of the boards, could purchase property required for future highway right-of-way in the board's name in amounts up to 10 per cent of their assets. The Director of Highways must repurchase the properties from the boards prior to the letting of a construction contract requiring the properties, or within five years from the date of original purchase, for a price to include the original purchase price plus a holding charge based on a percentage of amounts involved. The highway department has custody of the property and the right to lease, rent and use the property until required as right-of-way.<sup>15</sup> Subsequently, when its legality was questioned in the courts, the Ohio Supreme Court ruled that the act was constitutional.<sup>16</sup> The court went further and praised the concept as being patently in the public interest in view of the economic and practical advantages of advance acquisition. The operation of this system has been quite successful.

14. *Ibid.*, p. 44.

15. Highway Research Correlation Service Circular 396, August 1959, (Memorandum 113).

16. Highway Research Correlation Service Circular 421, May 1960, (Memorandum 120).

Washington, in 1961, passed legislation authorizing the use of trust fund money for the early acquisition of right-of-way. The funds authorized to participate in the program are the Teachers and State Employees Retirement Boards, Medical Aid and Accident Funds, and certain excess funds available in the general treasury of the State. Limitations of 10 per cent of available assets apply to the boards, and 20% to the general treasury funds. The boards are reimbursed prior to the time a construction contract is let, or within four years, whichever is earlier. Interest is paid on the monies used. This system differs from the Ohio method, in that title to the property is taken by the highway department at the time of original purchase, and the financing is thus considered as a direct highway obligation, which avoids any allegation that the acquisition may not be for a legitimate highway purpose.<sup>17</sup>

#### Short Term Borrowing

Resembling somewhat the bond issue method in that the funds are obtained from the private money market, the technique of short term borrowing is especially useful as a means of augmenting advance acquisition working capital. In operation, the system may be administered in much the same manner as investment funds obtained from trust fund sources.

In July 1961, the Ohio General Assembly passed legislation<sup>18</sup> authorizing the issuance of certificates of obligation maturing at the end of the biennium for which issued for the purpose of paying the cost of real property required as highway right-of-way. The certificates are renewable for not to exceed three succeeding bienniums. Moneys received from the sale of each issue are paid into a separate "special highway acquisition fund" for that issue. The funds are administered by the commissioners of the State sinking fund "upon the direction and with the consent of the director of highways," who will purchase property in fee simple in the name of the commissioners of the sinking fund. The Director of Highways is required to repurchase the property prior to the letting of a highway contract utilizing such property, or upon expiration of the term of agreement. A holding charge is required to be paid to the commissioners. The highway department has full use and control of such property from the time of its original purchase.

#### Installment Plan

Although not implemented as yet in any State, an installment plan concept of financing that may at least add flexibility to an advance acquisition program has been proposed. Many owners may prefer to have the purchase price of their property paid

17. Highway Research Board Correlation Service Circular 450, Sept. 1961, (Memorandum 134).

18. Ohio Revised Code, Sections 129.41, 129.42, 5501.115, 5501.116 and 5501.117 (Amended Senate Bill No. 524).

to them over a period of time, for the tax advantages that may accrue or for other reasons. Arrangements would be made with such owners to schedule partial payments to fit the cycle of availability of regularly budgeted highway funds. Financing would thus be on a current basis. In effect, the owner would be providing the working capital. If such a method is found to be feasible, it should prove valuable as a special tool when its use would be appropriate.

#### Authorities

For years many States have used the procedure of establishing authorities to finance and operate, or finance and lease back to regular State agencies for operation, public works of all kinds. Perhaps the most familiar of these are the port authorities and turnpike authorities. In 1935, Pennsylvania created a General State Authority based on the lease-back concept. Other States adopted the authority concept rapidly, primarily as a useful means of avoiding debt limitation restrictions of State constitutions, although there are other advantages. In 1949, Pennsylvania established the State Highway and Bridge Authority to construct, improve, and maintain State highways, bridges, and other traffic facilities. The Authority does not construct toll projects; instead, it rents projects to the State highway department for operation as a part of the free road system of the State. When the enabling legislation is properly prepared, most authorities have been considered constitutional. Although the Pennsylvania State Highway and Bridge Authority specifically does not provide for the engineering and right-of-way costs of highway projects, there would appear to be no cogent reason why such activity could not be so financed. As another potentially useful means of financing advance right-of-way acquisition, the use of authorities might merit consideration.

#### Summary

A wide choice of means is available for providing the financing necessary to support an effective advance acquisition program where regular highway funds are not adequate. Without some type of supplemental financing, most States would probably not be able to implement advance buying on the scale required to maximize the benefits of such a program. These methods share, to a greater or lesser degree, the disadvantage of the extra administrative burden of maintaining accounts, creating special records, effecting transfers of property, etc. This disadvantage is outweighed by the many advantages of an advance acquisition program.

In the use of any financing method it is advisable, where Federal participation is expected, to coordinate the details in advance, including the provisions of any necessary legislation, with the Bureau of Public Roads. The date on which, under different circumstances, the title to property to be acquired will vest officially in the

highway department may determine eligibility. In most instances it will probably be necessary to follow approved appraisal and negotiating practices, and properly document each transaction at the time of original purchase to establish eligibility for reimbursement.

## ADMINISTRATION AND OPERATION

### General

The policies, procedures, and method of operation employed in accomplishing an advance acquisition program will depend primarily upon the constitutional and legal powers and limitations under which operations will be conducted, the methods of financing available and utilized, the general operating policies of the particular highway department, and the existing procedures and organization of the responsible right-of-way acquisition agency. Depending upon the legal situation, it may be necessary, for example, to base the program on voluntary purchase alone. The level of buying that can be maintained is, of course, dependent upon financial resources available, as well as the status of plan completion and availability of information on the right-of-way requirements of future projects. General policies and existing organization of the highway department may determine whether and to what extent advance acquisition activities are centralized or decentralized. As in all activities, there are perhaps as many different operating systems used in acquisition for future use as there are organizations engaged. There are, however, certain administrative and operating requirements more or less common to all systems upon which guidelines can be formulated.

### Policies

Before a new program such as acquisition for future use can be initiated, it is necessary, for purposes of continuing control and orientation of the program, to establish basic operational policies. Depending upon the objectives to be achieved by advance acquisition in relation to the overall highway program, the local financial and legal conditions, and other similar factors, certain administrative decisions must be made. The following policy areas are among those which will require such decisions.

*Level of program* — In consideration of the size and phasing of the overall highway program, the availability of finances and other factors, a determination must be made as to the portion of the total right-of-way program which will be undertaken on an advance basis. This will usually be expressed in terms of millions of dollars per month or per year. In some situations it may be desirable to indicate sub-levels for major categories, such as urban and rural, Federal-aid projects and non-Federal-aid projects. In practice these levels usually function as program goals rather than limitations subject, of course, to the availability of funds. Once program levels are

established, the single factor which most often prevents attainment of the desired buying rates is the difficulty of obtaining sufficient information from design to allow appraising and negotiating to proceed.

*Types of projects* — In theory, subject to suitable financial arrangements and the availability of project plans, there is no reason why all right-of-way could not be purchased on an advance basis, reimbursing the cost of the right-of-way with regular highway funds at the time of construction. This would certainly solve the lead time problems which perennially harass right-of-way operations. Actually, the Ohio right-of-way concept is exactly along these lines. With two large sources of funds available, retirement board trust funds and borrowing through certificates of obligation, Ohio hopes that progressively more of the right-of-way program can be shifted to an advance basis.

At present, however, and perhaps for a long time to come, advance acquisition in most States will account for only a portion of the total right-of-way purchased for highway purposes. It is thus necessary to determine which types of projects are most appropriate for advance buying and will result in the greatest returns. Local conditions will govern the exact policy in any State at any given time, but certain principles generally apply. Larger projects requiring the longest buying lead time, urban projects having extensive resettlement and demolition problems, relocation in areas where it is necessary to protect the future right-of-way from development by private interests, critical segments of projects (such as interchange locations), are types which normally would have high priority. In certain situations it may be desirable to limit advance acquisition to Federal-aid projects to reduce the burden of repayment of borrowed funds from regular construction money.

It will be found that all programs of advance acquisition should provide a capability for some "non-project" buying. There are always situations where significant savings in land costs can be realized by the purchase of individual properties or small groups of properties in widely scattered locations if advantage can be taken of the opportunity. Home sites and industrial sites are springing up rapidly in all types of unpredictable places along and near the highways. The purchase of such "spot" properties as required can protect a proposed future alignment, and result in considerable savings in right-of-way costs at the same time.

*Methods of acquisition* — Perhaps the most practical method of obtaining future right-of-way is by purchase in fee simple. There is always the element of unpredictability when dealing in futures, and if any property acquired should not be needed, having fee title will facilitate disposition. There are, however, other useful methods by which future right-of-way may be obtained or protected. Each has its special advantages and uses. Policies may be developed which integrate the use of these tools to the end that increased flexibility and effectiveness is given to the acquisition program.

- a. Excess condemnation, if the authority is available, has the advantage of avoiding high damages and/or uneconomical remnants.
- b. Land exchange authority provides a means of compensating an owner in kind when it is impracticable for the owner to accomplish the same result, and money alone will not make him whole.
- c. Options, reservation easements, conditional and development easements are valuable means of preventing at reasonable cost private improvements in areas to be purchased at some future time. Development easements are particularly useful in marginal areas where right-of-way limits are not too firm and it may be necessary to expand the taking.
- d. Police powers such as zoning, subdivision regulation, reservations and setbacks, and the official mapping statutes, although not often used in conjunction with State highway operations are nevertheless worthy of consideration on occasion. Their potential use should be reflected in the operating policies.

*Use of funds* — Where more than one source of funds is available, and this is frequently the case, it is necessary to establish rules governing the choice of funds to be used. Often there are special provisions associated with each source of funds which may limit the types of projects or types of properties for which it may be expended, or may best be expended. The sizes of the various funds and desirable balances to be retained in each may effect their use. These and other factors should be considered and a policy developed to guide the administration and use of both regular and supplemental funds.

*Minimum requisites for acquisition* — The required prerequisites for right-of-way acquisition will vary somewhat from State to State, between Federal-aid and non-Federal-aid projects, between purchase and condemnation, and in other ways. It may be necessary, where legally and administratively permissible, to modify the requirements somewhat for advance acquisition. The objective should be to prescribe only minimum requisites, since at the time advance acquisition will usually take place, detailed and specific project information will also be at a minimum. In all cases, proposed location should be known, and minimum right-of-way widths determined. If a Federal-aid project, a public hearing is usually mandatory.

#### Organization

From a management point of view, there are two ways of looking at the function of acquisition for future use. One view considers there is no basic difference between advance acquisition and normal acquisition, except that a different type of money is used to pay for the property, and the time required to accomplish the acquisition is not as critical. The other view recognizes significant differences between the two types of

buying at almost every step, from the planning stage until the property is ultimately incorporated in a highway project. The relative weights given to each of these views will have a significant effect upon the ultimate organization of this particular function.

If it is considered that little difference exists, about the only change in existing organization of the right-of-way activity may be the establishment of a special section to administer the funds used and maintain necessary accounting records. If a property management section does not already exist in the right-of-way organization, it may also be necessary to create a unit to manage acquired properties until their utilization at time of construction. The functions of advance planning, operational planning, and control would be accomplished within the existing organization. This method assures maximum integration with normal right-of-way activity, and minimum adjustment of operating procedures.

Another method of arrangement, designed to obtain increased program emphasis and provide better control, is to combine in a separate branch or bureau within the right-of-way organization those special functions that pertain particularly to advance acquisition. These special functions include advance planning, fund management, liaison and operation, and property management. Here, the actual operations of appraising and buying retain their existing organizational status, with coordination and scheduling of activity being effected by the liaison and operations section of advance acquisition. This method takes advantage of the economy of effort in utilizing the existing organization in the more or less standard operations, while recognizing the special nature of certain new activities and the organizational and program advantages of combining these.

Under certain conditions, the organizational setup for advance acquisition may also include a few appraisers and negotiators for the handling of special purchases either because of their special nature or because normal schedules do not provide sufficient flexibility under all circumstances. In the extreme case, advance acquisition could include a complete buying organization suitably manned to meet its program objectives. This would resemble the task-force type of organization, with its temporary advantages of program emphasis, control and speed, but with the disadvantages of a duplicate organization and problems of coordination.

In Ohio, the second type of organization has been found to be very effective. The activity has been given bureau status, coordinate with the appraisal, acquisition, legal and utilities functions, with all reporting directly to the Deputy Director of Right-of-Way. The organization includes the functions of advance planning, fund management, property management, and liaison. The latter maintains close coordination with the appraising and buying organizations of the twelve highway department field divisions, and of the cities and counties in the metropolitan areas.

## Criteria for Purchase

Perhaps one of the first decisions to be made in establishing an advance acquisition program is the determination of an order of preference in the purchase of various types of property. Such an order of preference is useful for both project buying and spot buying. Properties to be acquired should be selected in accordance with the overall objectives of the advance acquisition program. Usually, the order of preference will include the following or similar categories as listed:<sup>19</sup>

- a. Prevention of development of vacant land which will ultimately be acquired for highway purposes.
- b. Prevention of further improvements or expansion of existing developed property.
- c. Acquisition of developed property where a substantial part of the purchase price can be recouped through property management.
- d. Acquisition of developed property where significant lead time is required to permit orderly resettlement of occupants and/or physical clearance of right-of-way.
- e. Acquisition of certain properties which might be termed "distressed" because of the unusual position of the seller, i.e., where a property has been damaged by fire.

## Types of Buying Situations

The criteria for purchase of property must be applied according to the particular situation. Some of the different types of situations which individually or in combination may affect buying procedures are:

*Long-range acquisition* — When buying near the extreme range of futurity, "spot" buying will usually predominate over project buying due to the lack of detailed project information so far in advance. Emphasis will be on opportunistic savings to be realized, and on the protection of critical areas required for future use.

*Short-range acquisition* — Buying that occurs relatively late in the advance acquisition period will be largely conducted on a project basis. The emphasis here is on gaining the necessary lead time for acquisition and physical clearance of the right-of-way for construction purposes. The various criteria for purchase have minimum application since the entire project will be acquired.

*Urban and built-up areas* — In this situation total takes will predominate, and acquisition can proceed fairly rapidly. However, since such property is usually more

19. Adapted from Ohio Department of Highways, Directive D-96, "Procedure for Advance Procurement of Rights-of-Way."

expensive, partial takes in the marginal areas will normally await completed right-of-way plans. Emphasis in urban areas is on property management of improved properties, resettlement and physical clearance.

*Rural areas* — Partial takes will usually predominate over total takes in rural areas. However, since the land is less expensive generally, ample right-of-way widths can be acquired based on minimum plan information. Lease-back arrangements are frequently entered into which are advantageous both to the highway department and to the owners. Development or conservation easements are frequently used to protect marginal areas that may be required to meet future expansion needs.

*Existing location* — Acquisition on existing location can be extremely costly. Where minimum additional right-of-way is taken, damages to residues can run very high. Therefore, buying in this situation will be very selective, primarily to prevent improvement and development which would further increase the ultimate cost of the right-of-way. Property acquired should be purchased in fee, with the expectation of selling the excess of residue later. The latter method also solves the problem of access limitation.

*New location* — Buying on new location is primarily for the purpose of protecting a desired alignment. Acquisition can be selective to control development in the area of interest, and achieve savings in property costs.

### Procedures

To insure proper coordination and functioning of the various activities involved in advance acquisition, it is essential to develop administrative and operating procedures. These procedures should be written and published for the guidance of all concerned. Generally, emphasis will be placed on what is new and what is different from normal procedures, and will thus, to a large extent, be individual for each State. The following subjects will normally be covered:

- a. Organization and responsibilities of the advance acquisition function.
- b. Policies and criteria for purchase of properties in advance.
- c. Advance planning and procedures for coordination among agencies in determining projects and schedules.
- d. Utilization of funds, payment procedures, and income from property management.
- e. Liaison with operating agencies (appraisal, negotiations, etc.), levels of buying and reports of accomplishment.
- f. Negotiating and closing procedures.
- g. Property management (rental policy, maintenance policy, rate formula, etc.).
- h. Demolition and clearance procedures.
- i. Utility rearrangements.

## Negotiation

Basically, negotiation procedures used in advance acquisition are no different from normal negotiation practice. There are, however, certain differences in the relative positions of the owner as a seller and of the State as a buyer at this early stage which can greatly facilitate the task, and operate to the advantage of the State.

*Time to decide* — Contrary to the usual situation where acquisition must be pressed to conclusion under threat of eminent domain within a restricted period of time, it is possible under advance acquisition to enter into more deliberate discussions with the owner, and allow whatever time is necessary for him to make his decision. The entire negotiating atmosphere is greatly improved by the relaxation of the time element. The owner does not feel "pressed", and is hence usually more amenable. The negotiator, likewise, is more relaxed and tends to a better job of "selling" and representing the department's interest.

*Time to relocate* — If it is necessary for an owner to re-establish himself elsewhere, the problem of relocation will be a major factor in reaching his decision. Settlement of negotiations is expedited where it is possible to allow the owner to remain in possession of his property until he can buy or build elsewhere. Where the property is occupied by tenants, the assurance that they will be given time to locate other accommodations has the same beneficial effect on negotiations.

*Lease-back privilege* — Frequently, with construction several years away, a residential or business owner may prefer to remain in his present location for an extended period. In this situation, acquisition can be completed and arrangements made for the owner to lease or rent the premises from the State. From the property management standpoint there are advantages in the former owner remaining as a tenant. Lease-back is especially useful in rural areas in keeping the land in production until needed.

*Cash buyer* — Having cash in hand when he must go into the market to buy replacement property places the owner in a very favorable position. He can take advantage of the best opportunity the market offers, he can be more selective usually in his choice of property, and frequently he can negotiate better than average financing arrangements when a loan is involved.

*Restricted market* — When acquisition begins, the open market opportunities for an affected owner to dispose of his property to a private buyer become progressively more limited. As the market shrinks in his area, so do his chances of obtaining a fair price for his property from a private buyer. His best, and often his only potential buyer becomes the State, where fair value is always assured. Also, as acquisition proceeds, his opportunities to buy other nearby property often diminish, since other owners who sold to the State earlier have had first choice of properties available elsewhere.

*Normal turnover* — In recent years the average turnover of property has been very high. In some areas the turnover period has averaged as little as six years. Advance acquisition should capitalize on this continuing turnover wherever possible. To an owner who is ready to sell in any event, the availability of a ready buyer with cash in hand and the absence of any brokerage fee, are strong inducements.

### Hardship Buying

One of the categories listed for the purchase of property in advance is that of distressed property. For one reason or another, the condition of the property is such that it is not marketable without an unjustified additional investment in repairs, reconstruction, or modernization. In this situation there is, of course, usually an advantage to both the State and the owner in negotiating an immediate sale. However, since in this type of situation the owner is at a relative disadvantage, it is easy to extend the distressed category to include any case in which an owner may claim a disadvantage as a seller. The most usual disadvantage so claimed is that of hardship; and where hardship, as such, is recognized as a criterion for purchase, a new dimension is added to the advance acquisition program.

The purchase of true hardship cases is not necessarily undesirable, and when properly administered can reflect credit on the right-of-way activity of the highway department. However, it should be managed very carefully; otherwise, this type of buying can rapidly assume the proportions of a program within a program, causing disruption of buying schedules and creating a tremendous administrative workload in investigating and checking out hardship claims. The real danger of such a program is that it can generate a widespread charge of favoritism to the detriment of the advance acquisition program as a whole. This occurs when, under the pressure of work, invalid claims are recognized as valid. Property owners in a community usually know which hardship claims are valid and which are not. They react to an unjustified purchase first by submitting claims *en masse* and, when these are rejected, building up the charge of favoritism. In practice, it appears wise to deemphasize the hardship aspect, and avoid a publicly announced formal hardship program as long as this is possible. True hardship cases will usually be recognized in any event, and can be handled as the circumstances warrant.

### Control of Buying

Property to be acquired will be determined, especially that to be acquired on a project or segment of a project basis, by the planning element of advance acquisition when project lists and priorities are developed. "Spot" buying, however, will usually originate from field organizations of the highway department or from cooperating cities and counties. To control the latter type of buying, some system of approval is usually

required, whereby recommendations to buy will be initiated in the field, and forwarded for review to the central advance acquisition office together with a sketch or plan of the properties concerned. Upon approval, funds may be allocated and acquisition authorized and scheduled.

### Prenegotiation Activity

Upon authorization of advance purchase, the acquisition process itself begins. Title examinations and appraisals are obtained under the same procedures that normally apply to current acquisition. Review appraisers will determine fair market values, and negotiations will then begin. Normally, the cost of these activities are paid from regular highway funds, since most of this cost is salary expense of regular employees whose time had already been included in the department's budget.

## USE OF THE POLICE POWERS

### General

Many studies have been made and much has been written regarding the problem of land use and development at highway interchange locations.<sup>20</sup> This is but a localization of the larger problem of the coordination and integration of highway objectives and planning with land use controls generally. All of the devices suggested in relation to the interchange problem are equally worthy of consideration for application to the broader problem. Aside from outright purchase, these devices fall into one of two categories: other eminent domain measures (access controls, development easements, options, etc.), and the various police powers. The more important of the police powers that may assist in protecting the right-of-way required for future highways are: official mapping, reservation, zoning, and subdivision control. The increasing emphasis placed upon the development of procedures for the application of the various police powers stems from its usefulness in not only protecting the initial public investment in the highway plant, but also in possibly reducing the right-of-way expenditures for new highways.

All police power devices are based on the right of the sovereign to regulate, restrict, or destroy private property rights as may be reasonably necessary to protect and preserve the public order, health, safety, morals, or general welfare. In all cases constitutional limitations restrict unreasonable exercise of the power. Thus, the various regulatory devices share a common characteristic—some mechanism is provided for the taking of an appeal and the granting of exception where the application of the power to a particular property may result in undue hardship. To this extent the police power

20. Highway Research Board Bulletin 288, 1961. "Land Use and Development at Highway Interchanges — Symposium."

does not possess in all cases the finality and assurance of eminent domain, where the only remaining problem is that of determining the amount of compensation to be paid for the rights that are to be or have been taken.

Another point of significance in considering the police power is that regardless of the statutory provisions incorporated in specific enabling legislation, the courts will determine "reasonableness" under the particular circumstances involved in each case. There is thus considerable flexibility on the part of the courts in adapting the police power to changing concepts of what constitutes an appropriate balance between private and public needs. The result is that generally the trend has been toward judicial broadening of these powers and an enlargement of the areas to which the police power may be applied. For example, building and setback lines may be imposed under the police power, whereas in an earlier day eminent domain was required.<sup>21</sup> The use of the police power as a supplemental tool in protecting future right-of-way requirements should, therefore, be carefully examined and exploited wherever possible. The development of law is a history of the interaction of the traditional inertia of existing concepts and the dynamic momentum of new and demanding needs. Indications are that the public recognizes the seriousness of the overall highway transportation problem, and may now be ready to accept regulation heretofore deemed confiscatory.

One disadvantage of the use of the police power is the necessity for administrative machinery to implement and monitor its application. Generally, this machinery exists at the subordinate governmental level rather than at the State level. The extensive coordination thus required to achieve the purposes of the highway department often discourages police power use. For police power to come of age and take its proper place beside eminent domain in providing and protecting the right-of-way required for modern highway facilities, enabling laws are needed to establish standards and provide for regional or State agencies to cooperate with and assist local agencies on common problems. Such agencies would provide a convenient focal point for insuring appropriate consideration of highway requirements. A few States already have laws of this type.<sup>22</sup>

### Official Mapping

The official mapping device is both one of the oldest and simplest of methods for protecting future right-of-way.<sup>23</sup> It assures that the land needed will be available at bare land prices at the time the public body is in a position to effect acquisition. Another advantage of official mapping is that it permits orderly, planned community growth and development in relation to future routes of travel. All official mapping statutes operate by controlling the building of structures on land within the defined limits

21. Highway Research Board Bulletin 101, p. 77.

22. Highway Research Board Bulletin 55, 1952, p. 52, "Roadside Zoning."

23. Highway Research Board Bulletin 232, 1959, p. 90.

of the mapped location of proposed highways and streets. Control is effected by a permit system whereby a builder must obtain official authorization in advance. If he builds without a permit, he will not be entitled to any compensation for damage to such structure when the right-of-way is acquired. Typical of a police power, a relief mechanism is provided for hardship, primarily for the case where an owner could not otherwise realize a fair return on the mapped portion of his property.

A number of States have enabling legislation permitting the use of mapped street powers.<sup>24</sup> Among the objectives formally expressed in the Tennessee official map legislation that are of interest from the highway viewpoint are:

- a. Protect present and future street (highway) system;
- b. Reduce waste of excessive streets (highways);
- c. Avoid excess expenditure of public funds;
- d. Protect right-of-way from encroachments which could cause such rights-of-way to be changed or abandoned to the detriment of the community.

More recently several States, including Washington, Indiana, California, and Pennsylvania, have extended official map powers to permit State highway departments to use the device to protect future right-of-way.<sup>25</sup> Of particular note is the following quotation from the Tennessee act: "Upon adoption of an official map . . . the appropriate local, State and Federal authorities shall proceed as expeditiously as feasible with the advance acquisition of rights-of-way."<sup>26</sup>

The prerequisite, of course, to the use of the official map technique is a specific precisely mapped roadbed, which can be filed in the public records. Under present conditions of accelerated highway programs where construction is pacing engineering very closely, the requirement for confirmed detailed right-of-way plans is a distinct disadvantage. Perhaps the most advantageous use of official mapping in connection with current highway programs is to effect planned adjustments of streets and local thoroughfares required to accommodate future urban expressways, including the protection of the right-of-way for the expressways until acquisition can be scheduled. Official mapping is also useful where contract plans are well advanced and for some reason construction has been deferred to a later program year.

#### Reservations

As in official mapping, the reservation device operates through restricting and regulating the construction of buildings and other improvements in the reserved areas

24. See Highway Research Correlation Service Circular 389, April 1959, "The Official Map — A Rejuvenated Planning Tool."

25. Highway Research Board Bulletin 288, 1961, p. 42.

26. Highway Research Correlation Service Circular 398, August 1959.

which would enhance the value of the tract. The reservation of lands for highway purposes is quite similar to official mapping, but is more limited in scope and consequently somewhat less effective. An advantage is that reservation may usually be selective, in that particular areas or critical parcels may be reserved without the necessity of delineating and reserving an entire future right-of-way. Reservations are frequently administered in conjunction with subdivision regulations where it is desired to reserve certain areas for future highway use without requiring dedication.<sup>27</sup> Relief provisions common to police power devices are usually in the form of time limitations which require the public agency to acquire within a specified number of years or the reservation is void. In the case of Washington-Maryland Metropolitan District, a maximum of three years is allowed to complete acquisition.<sup>28</sup>

Special enabling legislation is required to define the reservation powers granted, and to establish a mechanism for administering the act. Although this power has not been used extensively to date,<sup>29</sup> it is a tool worthy of consideration for use, particularly in conjunction with other police powers and eminent domain procedures.

### Zoning

Zoning is a well-established function of government under the police power and is in almost universal use at the municipal level in practically all States.<sup>30</sup> In many areas, with the growth of suburban development, the use of zoning has been extended to counties. Local administration of zoning, and the consequent necessity for highway departments to rely largely upon cooperation and coordination, is one disadvantage of the method at present. Although the power to zone comes from the State, the legislatures composed of local representatives have been reluctant to deviate from the concept of local control of the zoning power. To be more fully effective for highway protection purposes, provisions should be made for the mandatory zoning by local authority of areas adjacent to major traffic routes, and a review of all such zoning and subsequent changes in zoning by the State highway engineer.<sup>31</sup>

Despite deficiencies, zoning remains a potentially useful device for the protection of highways. Procedures are developed and generally understood, and administering bodies are in existence. One of the basic purposes of zoning is through the control of land use to provide for the proper future development of an area, and the enhancement of value and utility of properties affected. The adequacy of the highways serving these communities has a very direct bearing on the attainment of these objectives and

27. Highway Research Correlation Service Circular 449, August 1961.

28. Highway Research Board Bulletin 77, 1953, p. 55.

29. See Highway Research Board Bulletin 205, 1958, p. 22. (Five States: California, Indiana, Pennsylvania, Texas, Washington).

30. Highway Research Board Special Report 27, p. 50.

31. Highway Research Board Bulletin 288, p. 78.

hence are a matter of interest to zoning officials. Zoning controls most effective for highway purposes are setbacks, building lines and front yard requirements, driveway restrictions, and regulation of the functional use of land abutting the highways. The intelligent operation of these controls can greatly facilitate widening and future improvement of highway facilities, and assist in maintaining the design traffic capacities of these roads.

Unlike eminent domain, the zoning power in common with the other police powers (except for nuisance abatement), can only apply to the future. Existing non-conforming uses and conditions are not affected. Variances may be, and frequently are, granted and existing zoning is often changed upon petition by interested parties. For these and other reasons, until some type of State-wide authority is provided, zoning must remain largely in the category of a potentially useful power, except for the setback device.

#### Subdivision Regulation

Perhaps the most useful of the police powers from the highway standpoint is subdivision control or regulation. This device operates through the power to approve plats, and can be used to:

- a. Require permanent setbacks or planting strips;
- b. Provide for frontage roads;
- c. Limit connection of the street system to arterial highways;
- d. Require the dedication free of charge of highway right-of-way areas, including provision for future widening;
- e. Control functional use of lands through deed restrictions.

Perhaps the main advantage of subdivision control is that the developer will usually agree to most reasonable restrictions and requirements to obtain approval of his plat. Initial controversy, which is common with respect to the zoning of existing communities, is thus avoided and future problems are averted by the simple technique of restricting conveyances.

Here, as in zoning, a basic weakness generally is the lack of enforced coordination between State-level highway organizations and local administering agencies. Perhaps the type of coordination mechanism required could be centralized in a State-level planning agency which would establish standards and supervise and coordinate comprehensive community planning activities, including the related areas of zoning and subdivision control. The advantage of utilizing a planning agency in this manner is that highway needs are basic to comprehensive planning, and essential coordination could be thus directly assured.

## Summary

Police power devices used in conjunction with eminent domain to acquire and protect highway right-of-way required for future use, offer a number of important advantages. To be fully effective, however, some method of insuring necessary State-local cooperation must be provided. It appears the most feasible means of accomplishing this end is through the operation of a State-level planning body responsible for overall policy guidance, standards, and the general supervision of local activities concerned with the planning and the control of community development. In the absence of such State-wide coordination, direct communication and cooperation between the highway department and local agencies should be exploited to obtain maximum benefit of the police power. The advance acquisition activity, with its advance planning and liaison capabilities, would appear to be the logical unit to maintain contact with local agencies and assure the integration of the use of the police power with advance purchasing.

## JOINT PROGRAMS

### General

When programs are undertaken by other governmental agencies to renew, rehabilitate, or redevelop blighted or substandard areas, the routes of travel to be provided are usually vital to and inseparable from the ultimate plan. Where State highways are involved, it is essential that planning be on a joint basis to insure proper consideration of all factors involved. Perhaps the best example of a joint program is the urban renewal program of the Housing and Home Finance Agency of the Federal government. The manner in which this program operates will illustrate the right-of-way advantages of joint programs.

### Operation of Urban Renewal

The Federal act establishing the urban renewal program provides that Federal funds may be used to reimburse a portion of the net cost of such projects, and that such funds may participate specifically in the acquisition of land required, the demolition and removal of buildings and improvements, and the installation, construction, or reconstruction of streets and other improvements necessary for carrying out the urban renewal plan. With proper coordination, highway right-of-way requirements within the area of an urban renewal project can be identified in the urban renewal plan. The land may then be acquired and buildings removed from the proposed right-of-way in conjunction with urban renewal buying. The highway department may then purchase the right-of-way so acquired from the urban renewal agency at cost, or arrange for the cost of the right-of-way to be credited to the city's share of

the cost of the highway project. The connection with advance procurement is obvious, since urban renewal projects require extended periods of time to complete, and the purchase of land, therefore, must be accomplished well in advance.

#### Advantages of Advance Acquisition

A major advantage of integrating the acquisition of highway right-of-way with a renewal project is that experience has shown that land acquired from a redevelopment agency costs much less than if acquired directly.<sup>32</sup> Another advantage is the economy of time and effort realized by the highway right-of-way organization when the actual buying and demolition work is accomplished by others. A relatively minor investment of planning and coordinating effort on the part of advance acquisition can achieve major savings in time and money, and significantly contribute to the advancement of the highway improvement program.

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32. Highway Research Board Special Report 27, p. 52.

## CHAPTER 42

# Roadside Regulations and Controls

NICHOLAS M. MARGETIS

*Chief of Roadside Control*

*State Highway Commission of Wisconsin*

### THE EFFECT OF ZONING REGULATIONS, SUBDIVISION CONTROLS, ETC., ON RIGHT OF WAY VALUATION AND ACQUISITION

#### Zoning Regulations

It is generally considered axiomatic that land characteristics, including physical attributes, present and prospective economic base, and present and prospective population densities will in large part determine zoning. It follows, and is equally axiomatic, that zoning in large part determines land use potential and value.<sup>1</sup> The economy of a particular locality, considered together with its population distribution and the projected or desired economy and population concentration planned for the locality, will to a large extent dictate the direction which planning and zoning will take in the locale. This zoning will also reflect the amount of land which will be required or desired for different uses and will determine the most desirable pattern or relationship between the various economic areas and population concentration.

Just as fee title in a particular parcel of land has traditionally been considered as the "bundle of rights" or interests in and to the particular land, so too, land use has traditionally been considered in light of all its uses, that is, all the purposes to which land may be worth in the future.<sup>2</sup> It is present value in light of all reasonable future potential. is related directly to all these uses to which the land can be put. The test accordingly is not any particular value ascribed for any special purpose or use, but the fair market value of the land in view of all the purposes and use potential to which it is naturally adapted. The various individual uses or parts of the overall bundle of potential uses is indicative of the full extent of possible demand for such uses, and accordingly determines market value.

#### Present and Future

Fair market value or just compensation will therefore reflect all the uses to which the property may be put, i.e., the total "bundle of uses" and not in terms of value

for any particular use. This valuation will largely reflect legally permitted uses of the property as then zoned. However, inherent in this valuation is not only the effect of zoning restrictions at the time of valuation, but the probability of zoning change in the reasonably foreseeable future. This possibility of zoning changes is not inconsistent with present valuation. The present value is still the present worth of the land, considering, however, future probabilities and potential. It is not a valuation of what the land may be worth in the future.<sup>2</sup> It is present value in light of all reasonable future potential.

In acquiring private property for a public use, such as right of way for highway purposes, a State, or equivalent agency, is of course obligated to pay the fair market value of the property acquired, or its equivalent "just compensation" where the acquiring agency exercises its inherent power of eminent domain. The valuation of the property required will be in terms of the highest and most profitable use to which the property taken could be put. This relates to the future as well as to present use. It follows that in arriving at such valuation, either to establish a sale price for a negotiated purchase of the property or as the first step in condemnation proceedings, zoning ordinances regulating the use and hence value of the property taken will be considered.<sup>3</sup>

Zoning ordinances have been an integral part of valuation in acquisition of properties affected thereby at least since 1926.<sup>4</sup> Techniques and court proceedings to establish or disprove value because of ordinances have been refined through the years since that time to a point where the impact of such laws and code enforcement on value has become a dynamic force in property valuation. The stakes involving expenditures of public funds are very high, and properly the subject of considerable sifting and weighing in the earnest endeavor to arrive at a truly fair market value or just compensation.<sup>5</sup>

As these valuable tools in the process of evaluation have been developed and applied, a very considerable body of law relating to such use, effect, and its importance, has grown. This in turn has enlarged the frontiers of legal application by way of the position or role of the basic philosophies on the law of evidence.

### Evidence

In arriving at the often elusive fair market value or just compensation, it frequently becomes a question of law and artistic presentation by counsel in presenting evidence bearing on such value by way of zoning ordinances. The method of presentation, rulings of the court in condemnation cases, and open-mindedness of a jury will bear dramatically on the duty of a trial court to consider all factors affecting property valuation. It is generally considered settled law in the United States that these zoning ordinances affecting property values involved in the proceedings are admissible in evidence. These ordinances, however, relate to presently existing conditions. There

is, therefore, not much of a problem relative to admissibility of existing zoning ordinances.

In arriving at the full fair market value or just compensation, however, land use potential, based upon changing physical conditions, or probability of change or amendment of existing zoning ordinances to permit or legalize expanded and generally more profitable land use, creates a very considerable problem. This probability of change or future amendment of an existing zoning ordinance encounters substantially the same difficulties that are involved in attempting to show remote or speculative damages. Such future amendment or probable change must not be remote or speculative; rather, it must be shown that there is a reasonable degree of probability of success in the future amendment, which can of course be shown by the status of the amending process at the date of trial, change in physical conditions which has occurred, as further evidenced, for example, by master plans indicating that areas surrounding the parcel under consideration will in all probability be rezoned, and other media artistically presented. All this is required or helpful in getting to the problem and furnishing this additional and welcome light to a court, condemnation commissioners, or jury, to illuminate these otherwise dark areas in a frequently difficult field of property valuation.<sup>6</sup> Evidence or testimony of future change or proposed amendment of zoning ordinances then, to be truly helpful, must involve a degree of reasonable certainty, which is generally shown either by evidence of fraudulent suppression of land value or these changing conditions in areas surrounding a condemned property; the probability of future amendment cannot, of course, be remote or speculative.<sup>7</sup> These wide latitudes of evidentiary criteria allow a broad stage for counsel to perform a service in these difficult fields, guided by the precept which appears to be the general weight of authority that such changing conditions require that evidence of a reasonable probability of a change in zoning classification within a reasonable time may properly be admitted and its influence upon market value at the time of taking should be taken into account.<sup>8</sup>

Valuation of lands proposed for right of way acquisition assume these same burdens and should enjoy the same latitudes permitted by law as reflected in the appraisal process, whether acquisition is by negotiated settlement, or by condemnation.

#### Subdivision Planning Controls

A very able planning tool, in addition to the conventional zoning regulations and official mapping acts, is the subdivision control or platting law device. These subdivision controls, especially when accompanied by highway oriented or at least highway conscious zoning, can effectively aid in stabilizing thought and valuation processes when a taking of affected lands becomes necessary. Subdivision control laws although effective on a rather limited geographic scale, can, when so highway oriented

perpetuate a long range stability, particularly from points of view of restricting direct access to adjacent highways and by restricting location and proximity of roadside development. While reserving in large part the traditional local governmental prerogative and controls in subdivision control matters, effective cooperation has been experienced in those States adopting such laws. The basic control device incorporating a cooperative State-local action, has proved effective. A few States have already proceeded to implement these devices, and it is hoped that planning tools and various combinations thereof will become more common since the results in these fields can be rewarding, not only in exerting a stabilizing influence valuable to the community, but also in valuing lands required for public purposes. The State of Wisconsin is among the few States which have thus far adopted effective official mapping laws on the State level, and was the first State to adopt a firm highway oriented subdivision control law (1949), with Michigan adopting a similar law in 1957.<sup>9</sup>

Right-of-way valuation and acquisition in areas directly included within planned subdivision developments, and within adjacent or included areas comprising "potential" subdivision lands, has been facilitated by the very existence of these subdivision control laws. In the State of Wisconsin, for example, which enjoys the continued effect of these official mapping devices and subdivision control laws, it has proved highly effective in areas where highway improvements are proposed and land acquisition may be imminent. The land developers ordinarily will confer with the various State and local agencies involved in these planning and highway improvement programs, with the result that subdivision plats and "potential" subdivision lands are oriented to the proposed new highway improvement, and both the State program and the individual land developer's private program proceed simultaneously and compatibly. The gratifying result has often been that the lands subsequently acquired for public highway purposes were excluded from the subdivision development itself, and the subdivision, as completed in harmony with the planned highway improvement, has been left undisturbed through the free exchange of planning information. In these cases the problem of valuation of the lands acquired for the public purpose has been measurably minimized; nor was there any unnecessary aligning of opposing legal forces to determine the almost automatically resolved problem of valuation of these "potential" subdivision lands in areas undergoing a transition in land use and a marked transition in prospective land use. This practical coordinated approach has proved effective in those states utilizing these combined planning tools in highway matters.<sup>10</sup>

#### **Interchange Laws**

An additional planning device coordinated with the foregoing is the much talked of "interchange laws". These planning requirements on state and local levels are affecting the sensitive and highly important areas comprising a reasonable radius

surrounding the many interchanges of primary traffic arteries which are being produced as a result of the accelerated highway program on a national level. These interchange laws, and the sound thinking behind them, are gradually making inroads in traditional county zoning ordinances. The mutually complementary philosophies in this area will become more pronounced as the device becomes more widespread. In the State of Wisconsin, for example, a recent county zoning ordinance has incorporated an "interchange zone" which is in close harmony with the access and roadside protection phases of pertinent provisions of the Wisconsin Administrative Code Subdivision Controls. Within a radius of prescribed control this typical ordinance is effecting careful coordination in protection of these roadside areas, and is fostering planned development at these interchanges. These controls are desirable both from the local planning point of view in requiring and perpetuating orderly land development, as well as in fostering services required on highly traveled traffic arteries, while yet protecting the interchange itself for the primary function for which it was designed and constructed.<sup>11</sup>

THE EFFECT OF HEALTH REGULATIONS, BUILDING CODES, ETC.,  
ON RIGHT OF WAY VALUATION AND ACQUISITION

The Problem

Within recent years new tools and techniques in the fields of law and code enforcement have begun to exert a profound impact and all evidences in the field clearly indicate that ascribing the effect of these tools on value, and the proof thereof, is becoming a permanent part of the appraisal process. Consequently, these new tools and techniques are a continuing assistance to acquiring agencies, as well as to lenders and borrowers, and buyers and sellers, in the difficult problems of valuation of properties subject to these laws and codes. Summary proceedings against non-conforming land owners for violation of local zoning or code requirements, pursuant to enabling state legislation, can go far in posing clear-cut issues relative to a particular property operated (frequently at considerable profit) in violation of code requirements. These summary proceedings have been much used, for example, in urban renewal projects. Such proceedings obviate the legal niceties so often inherent in legal actions where too often the basic issues become obscured in a maze of evidentiary matters.

A 1959 amendment of the Illinois Eminent Domain Act, for example, provides in effect that in condemnation proceedings a court might instruct the jury to disregard such value as may have been obtained from income derived from operations in violation of city code requirements and law. In the alternative, the law provides that a jury might be instructed that it can take into consideration the amount of money

expenditures which would be required in order to put the property in minimum compliance with the code or legal requirements.<sup>12</sup>

### Valuation Pitfalls

In acquiring substandard properties or properties operated in violation of various zoning or code requirements, two very basic inequities result. The first inequity stems from the failure of the governmental unit to enforce the law or code requirements. An immediate and visible result of firm efforts, through negotiations or via the judicial process in case of condemnation where any governmental unit as an acquiring agency is guided by this valuation, is to decrease the cost of acquisition and thereby maintain the proper and required control over expenditure of essentially public funds. The other inequity in the acquisition stage relative to these substandard properties involves an impecunious buyer who with little or no cash down payment assumes very substantial mortgage or other financial obligations which too frequently exceed the full face value of the property.<sup>13</sup>

Examine this latter inequity—and it is inequitable both to the “purchaser” as a private individual who considers himself the “owner” of the property and, if the basic appraisal problem inherent in this type of situation has not been met, to the acquiring governmental agency. Assume a private purchaser who has \$10,000 in cash and buys a substandard property, which is operated at a substantial profit in violation of zoning and code requirements, for \$40,000, the buyer giving a purchase money mortgage to the seller, who accepts such arrangement, in the amount of \$30,000. Question arises as to whether this is actually a cash transaction. The purchaser here could probably obtain a \$30,000 mortgage from conventional sources only by the expenditure of perhaps an additional \$10,000 to bring the property up to code. If the property were brought up to code, its value would still be approximately \$40,000. Thus, the purchaser would have to invest an additional \$10,000 in order to obtain the \$30,000 mortgage from conventional sources, which he obtained outright from the seller of the substandard property. The purchaser would probably prefer to pay \$30,000 in cash and assume the hazard of not improving the property or correcting the code violations, assuming a continued lack of enforcement of the violations. Does it not therefore follow, when the purchaser buys the property for \$10,000 cash in a transaction in which the seller takes back a \$30,000 purchase money mortgage, that the buyer is really paying \$30,000 for the property and an additional \$10,000 for the benefit of financing not otherwise available from normal conventional sources? Does it not follow that the true value of the property is \$30,000? This points up the heavy obligation of the appraiser to be cautious in examining a comparable sale, for example, to differentiate monies paid for the property itself and the monies paid as a premium for financing a property illegally operated at a profit.<sup>14</sup>

## Valuation Problems

The next step, and an even more perplexing problem, is the *Mayme Riley* situation, a recent District of Columbia case relative to acquisition of substandard non-conforming properties operated at a profit in violation of code requirements.<sup>19</sup> The value of the property being acquired by a public agency was established at a level considerably less than the sum of several mortgages on the property. The owner's legal counsel claimed that value was represented by the sum of the mortgages—in effect the purchase price which Mayme Riley had paid for the property and including the value of some improvements made after the purchase. The court did not hold that the value of the property was the amount paid for purchase by Mayme Riley, but the court did feel that an inequity had resulted and sent the case back for a new price determination. The government appealed, and the appellate court sent the case down for a new trial.

In the *Mayme Riley* case the trial court had instructed the jury that the property at the time of taking was to be appraised at its fair market value, which meant what the property would sell for in cash or "terms equivalent to cash". The court on appeal held that the jury should also have been instructed that such terms would be "equivalent to cash" if deferred purchase money notes are such that under normal conditions the notes could be turned into cash at their face amount. The case itself was framed against a background of rather peculiar circumstances, which may also have led to the determination that the cost of reproduction method of valuation is a method usually resorted to where the character of the property is such that it is not susceptible to application of the doctrine of market value.

By either approach, or in fact by any recognized method of valuation, full appreciation must be given by the appraiser to the questionable status of these properties whose primary claim to a negativistic right to continue operations is based upon a positive failure to enforce legal mandate.

In the *Mayme Riley* situation, set aside for a moment the fact that the purchase may not have been a wise one where the sum of the mortgages exceeded the fair cash market value of the property. Nevertheless, *Mayme Riley* somehow may actually have established an equity position that was saleable—an equity position that would have a market value. In this case there were several individual persons occupying relative "positions" with respect to the property which in sum total were saleable for a higher price than the fair cash market value of the property itself. In this type of situation, there would appear to be an inequity in condemnation procedures which would award full value to some positions and would disregard others entirely. Since the appraiser is ordinarily retained to appraise the value of an unencumbered fee, that is precisely what he should value. If the land acquisition agencies want to be "more humane and equitable," perhaps the possibility might be examined as to con-

demning the interests of the holders of the prime obligations and put a reasonable value on a quitclaim deed from Mayme Riley, who from the beginning considered herself as "owner" of the property. The complete solution of the problem may, in part, combine the appraisal process with legislative and perhaps administrative assistance in predominantly slum or blighted areas in urban renewal programs, but would apply to a far lesser extent in routine acquisition for most public improvement projects, such as the highway program, where zoning laws and code requirements have not been enforced by the administering governmental units. No property wherever situated can have any guarantee of continuing immunity from enforcement of these laws and code requirements.<sup>16</sup>

In addition to the processes at the time of valuation or before the acquisition, these problems relative to the impact of law and code violations on value can affect the transaction after the fact of acquisition, particularly in the case of private relationships. This additional aspect of the problem, as it relates to the effect of public land use controls on marketability of title, was involved in a recent State of Wisconsin Supreme Court case with potentially far-reaching effect.<sup>17</sup> In the *Brunke* case, involving conveyance of real estate by a deed including terms that the premises were to be conveyed ". . . free and clear from all encumbrances . . .," it appears that prior to the sale the Industrial Commission of Wisconsin had issued a certificate of inspection concerning certain defects in the building and provided that the order be complied with by a date which was some months after the date of the sale. It was alleged that the violations in effect constituted encumbrances and were a breach of the defendant's warranty, and money was claimed for reimbursement of the amount required to extinguish the code violations. The Wisconsin State Supreme Court adopted the line of reasoning to the effect that a violation of a building code is an encumbrance when the agency charged with its enforcement has taken action prior to the conveyance which, if the normal administrative procedure is followed, would place the purchaser in the position of a violator of the law and thereby impose on him the "hazard of litigation." This reasoning in effect assumed an intermediate position between holding with those cases which find: First, that zoning violations as such are encumbrances and second, those which find that building code violations as such are not encumbrances.<sup>18</sup> It is considered by some authorities that in Wisconsin the courts are tending toward the position and will eventually decide that a building code violation is an encumbrance even though enforcement action has not begun. In any event, it would appear exceedingly wise and cautious to recognize the necessity in appropriate cases for inserting into offers to purchase, deeds, etc., provisions specifically dealing with a violation situation.<sup>19</sup>

Basically, the problem here involved, and the resolution thereof, whether occurring as part of the valuation or appraisal process prior to acquisition by deed or via the

condemnation process, or after the fact by recovery or allied actions, is the same whether arising before or after the fact.

## LAWS AND REGULATIONS RELATIVE TO OUTDOOR ADVERTISING

### The Policy

In the broad field of control of outdoor advertising there immediately appears the traditional alignment of police power versus eminent domain as means of accomplishing objectives established upon the firm foundations of public safety, convenience, and the general welfare and including a very basic concept embodying aesthetic considerations which are also claiming increasing recognition in law.<sup>20</sup> This recognition that it is as much within the power of government to determine that an area shall be beautiful as to determine that it is healthy,<sup>21</sup> together with the long recognized public safety aspect, have in effect combined to precipitate broad statements and declaration as national policy that outdoor advertising within 660 feet of the right of way edge of the National System of Interstate and Defense Highways shall be regulated under national standards developed by the Secretary of Commerce. This is a basic federal recognition of a problem which has long plagued the many States. This new policy relative to the Interstate Highway System was stated by the Congress in the 1958 Highway Act and establishes that it is in the public interest to encourage and assist the States to control the use of and to improve areas adjacent to the Interstate System by controlling outdoor advertising adjacent to this highway system. The avowed policy was established to promote the safety, convenience, and enjoyment of the traveling public and the free flow of Interstate Commerce, and to protect the public investment in the Interstate Highway System itself.<sup>22</sup>

The State of Wisconsin was one of the first States to implement this national policy in 1960<sup>23</sup> by enabling legislation under which administrative rules were subsequently adopted by the State of Wisconsin effective after April 5, 1960, which date was the effective date of the enabling law.<sup>24</sup>

These provisions in Wisconsin's statutes and administrative code are in compliance with the announced national policy on the subject and are in addition to the previously administered statutory and administrative code regulations relative to prohibition of signs and billboards under general State statutes. These State law and administrative code provisions deal not only with such encroaching advertising facilities as may have been located within highway right-of-way but also act to prohibit advertising signs beyond the right-of-way limits and located on private property, where such advertising facilities may be considered or proved to be potentially hazardous within the definitions contained in such prior legislation and code statements. Such statutory and code provisions are ordinarily within the purview of the general police power of the State in these

matters. Consideration of the objectives to be obtained are, of course, also assessable under eminent domain proceedings relative to restriction on land use or acquisition of certain of the many interests comprising total ownership in lands.

Methods by which the objectives stated in the announced National Policy can be realized will, of course, involve a thorough examination by each State of its existing laws and court decisions to determine the most appropriate and feasible means of accomplishing the required control. Except in the case of those few States, such as Wisconsin, which have adopted state legislation and code regulations to implement the announced national policy in this area of control, most States will require new laws to effect such policy. There has been, of course, and there will continue to be vigorous opposition to enactment of such legislation and regulations from outdoor advertising industries. Support for such programs, however, will be forthcoming from groups interested in the safety and aesthetic considerations in highway protection and in the preservation of landscape in its natural state.

### The Problem

The basic, and perhaps primary problem confronting the various States in this control, is whether outdoor advertising should be regulated through the exercise of the State's police powers or whether it must be regulated through exercise of the power of eminent domain. Nor will the designation of either means to achieve the desired result, either as an exercise of the police power or as an application of eminent domain processes, summarily solve the problem since in the last analysis the question must be passed upon by the courts in the event of opposition to administration of the procedures adopted under either approach. It is frequently difficult to draw a precise line. It has been contended that even a regulation administered under the police power of the State may, in fact, be a "taking" in the constitutional sense if the private individual has suffered any loss for the benefit or need of the public in administering the policy. Fortunately, this view is not predominant, at least insofar as it automatically requires payment for damage in any measure to the private landowner as a result of these police power regulations.<sup>25</sup>

### The Balance — Police Power

As an exercise of the police power inherent in the State, it is universally agreed that reasonable regulations may be imposed upon the use of private property, or private property may be taken without compensation as long as the regulation bears reasonable relationship to protection and preservation of the public health, safety, morals, and the general welfare. In the specific area contemplated by the National Policy relative to outdoor advertising, there must be a balance among considerations of policy relative to the extent that State legislation and actions should go or can go under

the wing of the police power; whether the answer may be more in the field of eminent domain by way of acquisition of easements, negative or otherwise; or whether the ultimate solution may be a combination of these various considerations. The extent to which private property may be regulated solely for aesthetic considerations is undergoing development, and although not conclusively settled, would indicate that the pattern of pronouncements in the public interest being made carry potentially far-reaching possibilities.<sup>26</sup> In implementing the desired control under police powers, there would, of course, be no question relative to such right to regulate and prohibit those billboards which would be considered as interfering with vision, sight distance, public safety, etc. However, it is obvious that every billboard could not be considered in itself as a traffic hazard. In accordance with the announced National Policy, any laws implementing controls which are based purely on the police power, will have to consider a number of factors, including population density, nature of surrounding areas and conditions there prevailing, and based upon all considerations, will ordinarily have to provide for a permit system with the reasonable regulation of advertising rather than its outright universal and uncompromising prohibition. This would also be in accord with the basic consideration that certain services necessary to the highway users must be designated and identified, or directions otherwise given to the traveler to satisfy the basic needs and requirements of safe and enjoyable travel. It is of course obvious that what may be considered reasonable in one area may not necessarily be reasonable in another area. If it is anticipated that a single set of substantially similar regulations will become prevalent or effective in all different types of areas, and under all conditions and circumstances, such regulations must allow sufficient latitude or variations in order that the intent may be adapted to conditions and requirements of the particular area, if the anticipated uniform support of the courts and the general public is to be achieved.

Considering the nature of the times, the impact of current accelerated highway programs throughout the entire country and the dramatic increase in motor vehicle traffic, would indicate that it can be reasonably anticipated that progressive far-sighted treatment will be given to the necessary controls to insure preservation of aesthetics, as well as preservation of the investment of the public in the physical highway facilities themselves.<sup>27</sup>

#### **Eminent Domain**

Approaching the subject from the point of eminent domain, the first consideration will be, of course, the general proposition that the taking of private property for public purposes is limited to that which is necessary for the public purpose to be accomplished. There would ordinarily be little difficulty in proving the existence of public necessity to support acquisition of property, or interests therein, by eminent

domain. Similarly, the courts have been ready to uphold statutes authorizing a taking of restrictive easements upon payment of compensation. For example, the right to control access, light, air, and view has been upheld in general, and by this same reasoning there should be no objection to laws authorizing prohibition or restrictions against advertising as being in the interest of public safety and welfare.

Many so-called negative easements are in current use and have been used through the years. It is, of course, basically still an easement "appurtenant to the land," for it places a burden on private property. In the case of such easements or burdens placed upon the land as in the case of a negative easement, the burden is a restriction or covenant to refrain or the right to prevent the owner from making a specific use of the land.

The right of eminent domain, as an attribute of sovereignty, is in general limited by both constitutional and statutory provisions. However, as the conditions and situations progressively change, the legislature may enlarge the power within constitutional limits by legislative enactment as the public necessity requires.

It is not a new concept in the law that various interests in lands may be acquired for public highway purposes in addition to the fee or other basic interest required to accommodate the highway improvement itself. These additional interests may relate to the remaining lands of the adjacent owner and may constitute restrictive easements going beyond the limit of the lands acquired and designated as right of way. For example, Wisconsin law<sup>28</sup> provides that lands *or interests therein* required for public highway purposes may be acquired. Under these provisions, various interests have been acquired, in addition to the much used acquisition of access rights, and have included conventional construction easements, drainage and channel change easements, and where required, development easements restricting certain designated areas or strips along the required right-of-way to preserve the areas adjacent to the improved highway facility. It may well be feasible, though in some situations perhaps costly, to expand the concept of highway development rights to include prohibition against advertising or placing of advertising structures within a described zone. This approach could, in effect, have a dual effect, by not only accomplishing the regulation of advertising, but also of maintaining the adjacent lands in substantially the present condition for possible future highway expansion. The reasonableness of the taking would, of course, be subject to scrutiny by the courts as to the extent of the restricted zone; but the general trend of thought which is becoming more crystalized in the direction of preservation of highway corridors, and particularly the emphasis being placed on aesthetics accompanying the physical attributes of the improved highway facility, would seem to indicate a readiness to accept the concept via the judicial process.

Special legislation, not necessarily related to the basic acquisition laws relative to lands required for highway purposes, also enters into this immediate area of study. Some States, such as Wisconsin, enjoy specific legislative authority for acquisition of scenic

easements<sup>29</sup> which are directly applicable and which achieve the desired result relative to advertising controls in the areas covered by these statutes.

In much of the foregoing procedures, acquisition of interests in land to effect advertising controls would involve an additional problem relative to valuation and the appraisal process. It would not appear, however, that this problem would be an obstacle any more than the appraisal problem involved in valuation of rights of access in conjunction with existing or improved highway facilities.

The over all problem in this field is not one solely for the Congress, State legislatures, or administrative agencies in acquisition processes relative to lands required for public highway purposes. The outdoor advertising industry may itself submit proposed legislation in these same fields. Both the State highway administrators and legislative bodies must consider not only the desirability of these controls, but also the cost. In considering the public interest, it is also necessary to consider all the public, including the effect of the proposed legislation and regulations on legitimate business and industry forming a well-established and necessary place in the economy of the States. The ultimate resolution may well be a striking of a satisfactory workable balance, recognizing, though limiting to a reasonable degree, the rights of advertisers, toward the end that the investment and preservation of the highway improvements will serve the public interest, safety, and welfare, and still permit reasonable recognition of business and industry.

#### LAW AND POLICY RELATIVE TO ENTRANCE CONTROL

"State control of both public and private access is fast becoming a maxim of modern highway programming. Such control is not only an important feature of the Interstate Highway Program, but of other state highway construction programs as well. Under such programs authorized by statute, it is no longer possible for the adjacent landowner to maintain highway access from any part of his property; no longer does every cross-road join the highway. This concept of control and limitation of access involves many legal problems of importance to the attorney. . . ." <sup>30</sup>

#### The Necessity

The impact of the accelerated highway program during recent years has focused attention on the concept of control of highway access from many vantage points. The desirability and necessity of access control is self-supporting, both economically and from the considerations of public safety, convenience, and the general welfare. It appears every day through dramatic alignment of figures, statistics, and reports. For example, from the safety-economy standpoint, in 1955 alone, more than 38,000 persons were killed in motor vehicle accidents; more than 1,300,000 were injured; and economic loss ran to over \$4.5 billion. It has been estimated, however, that the fatal accident rate on highways

with full control of access is one-fourth to one-half of the accident rate on comparable roads without access control. The necessity of safety and controls from the human and economic standpoints needs no support. Further, from the point of view of efficiency and traffic capacity, it is determined that an average six-lane controlled access road can carry 50,000 cars per day; whereas it would require 18 lanes for a nonlimited access road to carry a like number of cars per day. Similarly, a limited access road can carry up to three times the amount of traffic with no increase or widening of existing traffic lanes.<sup>31</sup>

Control of access has come into its own. It is not the intent of this brief section to trace the origins of the right of access, or the nature and extent of these rights, which has been treated earlier in this text in considerable detail, including the various limitations of such rights of access both with relation to new right-of-way, and with relation to established right-of-way. Nor is it intended to discuss the means or methods of access control which are available. The intensive research focused on the entire subject in recent years has produced treatises—monumental works as well as detailed articles by way of law review presentations, theses, etc., each of which not only expounds the nature of access control, but also serves as a collection or compilation of authorities and other source information, as well as discussions and analyses of cases tracing the development of the concept from early years to the present status. Reference briefly to these works relative to access controls and protection of roadside areas by such authors as Levin,<sup>32</sup> Beuscher,<sup>33</sup> Covey,<sup>34</sup> Netherton,<sup>35</sup> Stanhagen,<sup>36</sup> and Solberg<sup>37</sup> will give a keen insight into the many technical aspects of the problem and methods of treatment, covering the crucial, formative 15 years from 1947 to the present.

It is rather the intent of this section to indicate law and policy relative to entrance control in a jurisdiction typical of many States, and operating under substantially similar laws effecting control of access under the again traditional concepts of police power and eminent domain.

### The Precept

Access control means many different things to various segments of the public who are involved in or who may be affected by highway improvement and construction programs and highway use. To the highway engineer, access control means protection of the traffic capacity of a highway facility throughout the built-in operational life of the highway and continued protection in the event further reconstruction may become feasible after the operational life of the facility as originally constructed has been realized. The highway user sees savings in travel time, costs, and convenience. The land owner may take several views depending upon the highest and best use of his own land. It is not uncommon to confuse *access* with *accessibility*, the two often being equated. The increasing trend would appear to be that accessibility can perpetuate a uniformity and stability in efficient operation, planned use, and property values to the maximum. Conven-

tional considerations relating to various typical land uses, such as farmlands, suburban residential areas, urban multiple unit residential areas, commercial districts, industrial sites, institutional sites, and other roadside businesses show clearly that access directly between such land uses and the main traveled highway is neither necessary nor even desirable to afford successful operation of the land or enterprises in the highest and best use attributable thereto. Nor is such direct access safe, or in the ultimate approach, convenient. Accessibility on the other hand is desirable and necessary, and in this area the planner sees access controls as a challenge in maximum utilization of land use and planning for future use. Administration of public policy by governmental agencies in accordance with statutory mandate must consider the various viewpoints together and in balanced perspective when policy determinations are made. Policy and administrative decisions, compatible with the law, to be sound must reflect the best possible and feasible accommodation and reconciliation of the various interests involved, within the framework of the traditional public safety, convenience, and general welfare.<sup>38</sup>

### The Methods

In implementing the concept of access control there appear at least five basic categories or means available, although only the first two, or various combinations thereof, have gained widespread familiarity to any substantial degree, the latter three comprising in effect subtle variations or combinations of authorities inherent in the first two. There would be *first*, the power to regulate private use of property referred to as the police power; *second*, the power to appropriate private property for a public use upon just compensation, referred to as eminent domain; *third*, the power to spend public monies in aid of public purposes, or the power to make contracts; *fourth*, the power to tax and license; and *fifth*, the planning function of public agencies.

Inherent in the basic police power doctrine in this field is the hitherto little noted availability of an action of nuisance as an additional tool in implementing control of access in the modern highway era. This doctrine, though little applied thus far in recognizing private access as a form of nuisance to a public highway, would appear to be a potential tool available for such purpose just as this doctrine is available relative to controlling other roadside activity deemed detrimental, such as certain types of roadside advertising. In general, judicial review of these statutory declarations would appear able to withstand challenges of constitutionality under concepts of due process.<sup>39</sup>

The body of regulatory legislation relative to highway use and access thereto may conveniently be placed in three categories according to objectives desired to be obtained by the particular legislation: First, those regulations intended to protect the integrity of access control as it is established and constructed in the original design of the highway; second, those regulations intended to introduce access control into the design and operation of highways which were originally designed as land service roads but subsequently

become unable to accommodate increased traffic demands in a safe and orderly manner; and third, those regulations which are intended to exercise control over the adjacent traffic generators or traffic generating capacity of the roadside land, thus forestalling the development of conditions which would jeopardize the safety, efficiency, and convenience of the adjacent highway.<sup>40</sup>

The past 15 or 20 years would appear to indicate that the basic coordinating thought and philosophy, in striking a balance between needs of all classes of land use, development and highway users, requires ". . . a reversion to the test of reasonableness and suitability of the access arrangement before and after control in the light of the landowner's use of his roadside site with emphasis on establishing a better understanding of the role of access in various land uses and reaffirmation of the premises on which the current public policy of access control rests."<sup>41</sup>

### The Administrative Problem

Effective administration of access control laws and regulations must recognize that both continuing and changing aspects of the overall picture combine to create a living concept; access control is not a static thing. In other words, if the concept of this all-important area in highway administration is to survive, and is to be a smoothly workable legal tool, wisely administered, the highway administrators must face the basic legal problem raised for counsel; namely, after access control has been established, when and how may it be modified to accommodate the changes which occur in the economy and as reflected in the use of the highway and roadside areas? And who should be permitted to institute these modifications? And what is the administrative vehicle for carrying such requests, consistent with public interest and compatible with the basic concept of access control, in effecting the desired results, and at the same time perpetuating the overall control consistent with public interest?

The key will of course in large part lie within the field of judicial review of administrative decisions. This concept is familiar; it has proved workable in the field of legislative actions and would appear particularly adaptable to the field of access control inasmuch as the record of the administrative decisions will form the framework, supported by the governmental administrative agency and its engineering-legal-planning staffs for the presentation of the case of the landowner-applicant or the planner-developer. Implicit in some current State access control laws is the right of appeal from determinations made and published by the administering State agency, either as such appeal is provided in the basic controlled access law or by the existence of compatible legislation governing administrative procedures. This administrative-judicial review procedure will be necessary to provide a mechanism for access control determinations, and arrangements of controlled highways, to be in effect adaptable and self-adjusting; for as the patterns of land use and highway use change, this need for adjustment and

modification will become increasingly manifest. The law and administrative procedures applicable thereto must provide a firm but understanding procedure for resolving those claims made that the prevailing arrangement of controlled access as it involves a particular area or land use development may have become obsolete and unrealistic, and thus may border on a "taking" of property without due process of law in the constitutional sense. This approach will not only become necessary as a device to protect access control itself, but also will be required if, as the proponents of access control claim, the control itself is one of many tools available for wise administration in the planning and developmental processes to safeguard the public safety, convenience, and general welfare in the increasingly broad areas of land use and highway use.<sup>42</sup>

In the State of Wisconsin, for example, the applicable statutory provisions of the controlled access law, and the provisions of the Administrative Procedure Act are in effect combining to form a workable means to perpetuate these desired access controls and an administrative process in harmony with the recognition of the controlled access highway as a living, perpetual concept in these changing times.<sup>43</sup>

#### Typical Administrative Application of the Laws and Code

In 1949 the State of Wisconsin Legislature declared:

. . . that the effective control of traffic entering upon or leaving intensively traveled highways is necessary in the interest of public safety, convenience and the general welfare . . . For the purposes of this section a controlled access highway is a highway on which the traffic is such that the Highway Commission has found, determined and declared it to be necessary, in the interest of the public safety, convenience and the general welfare to prohibit entrance upon and departure from the highway or street except at places specially designated and provided for such purposes, and to exercise special controls over traffic on such highway or street.

. . . [The] Commission may use an existing highway or provide new and additional facilities for a controlled access highway and so design the same and its appurtenances, and so regulate, restrict or prohibit access to or departure from it as the Commission may deem necessary or desirable. The Commission may eliminate intersections at grade of controlled access highways with existing highways or streets, by grade separation or service road, or by closing all such roads and streets at the right of way boundary line of such controlled access highway and may divide and separate any controlled access highway into separate roadways or lanes by raised curbing, dividing sections or other physical separation or by signs, markers, stripes or other suitable devices, and may execute any construction necessary in the development of a controlled access highway including service roads or separation of grade structures.

The traditional provisions, relative to public hearing after appropriate publication, and the ultimate Finding, Determination, and Declaration to effect a particular con-

trolled access highway are included, and the statute continues and provides further that:

. . . no person shall have any right of entrance upon or departure from or travel across any controlled access highway, or to or from abutting lands except at places designated and provided for such purposes, and on such terms and conditions as may be specified from time to time by the Commission. . . . After the designation of a controlled access highway, the owners or occupants of abutting lands shall have no right or easement of access, by reason of the fact that their property abuts on the controlled access highway or for other reason, except only the controlled right of access and of light, air or view.<sup>44</sup>

Upon completion of the controlled access project or designation of an existing highway facility as a controlled access highway, the legislation further provides that

. . . after the establishment of any controlled access highway, no street or highway or private driveway, shall be opened into or connected with any controlled access highway without the previous consent and approval of the Commission in writing, which shall be given only if the public interest shall be served thereby and shall specify the terms and conditions on which such consent and approval is given.

If new right-of-way is required for additional facilities for a controlled access highway, either in conjunction with or in lieu of designating an existing highway as a controlled access highway, the legislation provides further that ". . . any lands or other private or public property or interest in such property needed to carry out the purposes of this section may be acquired by the Highway Commission in the manner provided in Section 84.09."<sup>45</sup>

Under the procedures effective in the State of Wisconsin a public hearing, as required by law, is held after due publication of a notice of public hearing to be held. This notice will indicate the highway proposed for control, and the route or alignment thereof. The properties affected or to be affected thereby are identified for information of the landowners. After the public hearing is held, and the matter considered by the State Highway Commission, if determined to be in the public interest, a Finding, Determination and Declaration is adopted, published as required by law, and ultimately recorded with the Register of Deeds in the appropriate county wherein the project is located. The Finding, Determination and Declaration of the highway commission will designate the properties affected thereby, and accordingly the effect of the order of the commission will be posted to each property so affected by the recording process in the office of the County Register of Deeds. Subsequent to adoption by the commission of the control order, an official map is prepared by the highway commission indicating the precise alignment of the highway in relation to the adjacent properties affected, and for each property so affected, the map will indicate the access, and any restrictions applicable. This official map is available to the public upon request, and is filed with various local offices including the office of the County Register of Deeds, as well as

the offices of county, city, town, village and other governmental offices for viewing by the public upon request. The map is also available at a nominal cost to any landowner or other person interested. This map is explicit in the information showing the commencement, alignment and termination of the project and designating each property affected and the access, if any, authorized for each such property. Any subsequent revision or amendment of the original Finding, Determination and Declaration, or the official map relating thereto, are treated in a similar manner.

After the controlled access project becomes effective, formal "Authorizations for Access to or Across a Controlled Access Highway," or "Denial of Access," are issued and mailed to each landowner affected by the project.

Subsequent to the establishment of a controlled access highway facility, in accordance with laws and regulations relative thereto, any additional access which may be granted after full consideration by the highway commission and its specialized staff must be in accordance with the statutory requirement that no street or highway or private driveway shall be opened into or connected with the controlled access highway without prior consent and approval of the commission in writing, *which shall be given only if the public interest shall be served thereby*. Although it has been somewhat rare that any additional private use openings furnishing access to the controlled access highway facility have been allowed, it is not at all uncommon that an "adjustment" or "re-classification" of existing access, or access authorized under the commission's Finding, Determination and Declaration, has been considered and granted by the highway commission. These latter situations will in general relate to planned land development, systems of frontage roads, shopping centers, subdivision plats, and similar indices of orderly land use development. In such cases an existing or previously authorized point of access for private use may be authorized for public use as a plat street or a frontage road connection with the controlled access highway. In these cases it has frequently resulted that other authorized points of private access will be rescinded and removed in view of the fact that the planned frontage roads or plat streets developed with the land use proposed have made obsolete the continued necessity for all or some of such prior points of private access. The negotiation aspect and cooperative interplay of traffic engineering, planning, and land development projects, as the sum total of the administrative processes, has proved remarkably workable in the state of Wisconsin. These very sensitive areas of administration in a field of regulation which, although admittedly clearly in the field of public interest, safety and convenience, and public necessity, have and will continue to meet some localized objection from landowners, particularly those who may want to commercialize "islands" of enterprises or "ribbon development" to the maximum momentary and monetary advantage of the landowner. These "islands" and "ribbon development" have not always proved to be in the best interest of long-range planning, development, and perpetuation of planned land use

consistent and compatible with the controlled access highway facility and compatible with the general public interest.

In properly assessing the over-all concept of controlled access, particularly from a police power point of view, it is of course mandatory that the effect of legislation of this type be considered also in relation to requirements satisfying the equal protection and due process clauses of state and federal constitutions. There must also be assessed the nature of review as required by the particular statute, or by other legislation compatible with and bearing upon the subject, as well as under common law. This is particularly necessary in the case of the controlled access law presently under consideration, as administered by the state of Wisconsin, inasmuch as necessary rights and interests required to carry out the intent of the statute may also be acquired by eminent domain, as noted above.<sup>46</sup>

It is generally agreed, although particular statutes may vary in their terms, that the scope of review of administrative decisions made pursuant to the statute will be substantially similar regardless of the specific wording of a particular access control statute. The Wisconsin Administrative Procedure Act provides in effect that administrative decisions which directly affect the legal rights, duties or privileges of any person, whether affirmative or negative in form, shall be subject to judicial review as provided in the law. The statute provides that generally the review be conducted by the court without a jury, and the scope of review relates to the basic question of determining whether the administrative findings or decisions may have prejudiced the substantial rights of the particular claimant in that they were: *a.* contrary to constitutional rights or privileges; *b.* in excess of the statutory authority or jurisdiction of the agency, or affected by other error of law; *c.* made or promulgated upon unlawful procedures; *d.* unsupported by substantial evidence in view of the entire record as submitted; or *e.* arbitrary or capricious.<sup>47</sup>

The problem on review may become particularly complex especially in those statutes, such as that of the state of Wisconsin, which incorporates aspects both of police power and the use of eminent domain to accomplish controlled access highways.

It is the general consensus of opinion in the administration of the Wisconsin controlled access law that the scope of review would be substantially as outlined in the State Administrative Procedure Act. Under Wisconsin law, therefore, there are two basic yet distinct determinations that the State Highway Commission will make in these matters. First, is the determination by the commission finding that the designation of the highway as a controlled access highway is necessary in the interest of public safety, convenience and the general welfare. Second, the commission will make a decision as to how individual properties will be affected. Under the applicable provisions of the Administrative Procedure Act such decisions must be appealed within thirty days after service of notice of the order or decision.

At the time of the Finding, Determination and Declaration of the Commission establishing a controlled access highway, the highway commission makes studies to determine the access to be allowed to individual properties, and public access which will be authorized under the project. If it is determined in the interest of public safety, convenience and the general welfare that certain parcels be landlocked, with no direct access to the highway, the commission may elect to proceed under provisions of the controlled access law authorizing acquisition of the required lands or interests therein under eminent domain procedures, especially in cases where no other existing indirect access is available to the landlocked parcel.<sup>48</sup>

If a particular tract of land is entirely landlocked by the controlled access law, it would appear that a "taking" may have occurred in the public interest, and acquisition by eminent domain procedures would be required. On the other hand, if there is reasonable access to the controlled access highway (either direct or indirect), no "taking" would occur in the constitutional sense which would require compensation or a resort to eminent domain proceedings.<sup>49</sup> Here again the concept of *access* as against *accessibility* would appear to be paramount.

The studies made by the commission and its specialized staff relative to determination of the degree of restrictions necessary in the public interest to adequately protect the highway for the use for which it was intended, will result in designations as to the extent, type, location of private and public access to be allowed to connect with the controlled access highway facility. After these studies and upon publication of the official map indicating the results of these studies, the property owner is notified by mail of the determination of the commission as to how the Finding, Determination and Declaration relative to the controlled access project affects the individual property. The "Authorization" or "Denial" of access is specific relative to the land affected, in that the extent, nature, description, use limitation, etc., of such access as may be authorized, is explicitly spelled out. Again, request for a rehearing must be made within thirty days upon receipt of notice of such determination in accordance with provisions of the Administrative Procedure Act. At this time all questions involving the Finding, Determination and Declaration, or Order of the Commission as it affects the particular property of the specific landowner, must be resolved.

Subsequent to this time, any requests for an additional point or points of access, either public or private, or requests relative to reclassification or change in the permitted use of authorized access, raises a single issue before the highway commission, i.e., the question of whether such request would be in the public interest, in accordance with the controlled access law itself.<sup>50</sup>

Ordinarily, any subsequent division or subdivision of larger tracts of land existing at the time the controlled access order became effective need not be considered by the State Highway Commission in its deliberations relative to determination as to whether

a particular request is in the public interest. Planned land developments would ordinarily result in a reclassification or authorized expanded use of existing access provided the development is compatible with the nature and operation of the controlled access facility, is serving the public interest, and is consistent with the intent of the legislature<sup>51</sup> and the Highway Commission.<sup>52</sup>

The changing economy, as reflected in land use development would therefore in general be considered in the public interest, where compatible with the basic necessity of the controlled access project itself, and compatible with other legislative and code requirements in the public interest relative to access controls.

In conformity with constitutional and common law requirements, administrative procedures relative to determinations by the commission upon applications submitted subsequent to the highway commission's original Finding, Determination and Declaration establishing a controlled access highway, may not require a hearing as being necessary to satisfy the requirements of due process, or as a prerequisite to judicial review. The commission may make its decision upon its own investigation in these cases, and its determination will be based upon full investigation and documentation, which need not necessarily consist of sworn testimony. Rather, it will ordinarily consist of engineering and other staff studies made relative to the specific problem, and such other information available to the commission bearing upon the particular problem or application. In making its determination, findings of fact and conclusions will ordinarily be prepared, consisting of concise separate statements and the ultimate conclusions reached upon each issue. This decision of the commission is transmitted to the property owner who thereupon may either ask for a judicial review or may request an administrative hearing on the decision. Should the further request for an administrative hearing be timely made, it will ordinarily be granted. It may be administratively desirable to have pleadings in support of the application for this type of hearing before the commission. Such pleadings would be additionally desirable in that it may permit a determination by the commission denying a hearing, should the pleadings show reasons that the applicant would not be entitled to one.

In the absence of specific statutory provisions providing for a hearing in the controlled access law itself,<sup>53</sup> it is felt that the opportunity to be heard or the opportunity to present written materials before the Commission, and to present arguments thereto, would be in compliance with the constitutional and common law requirements. Ordinarily, the facts are not in dispute in the great majority of the cases involving access control; rather, it involves only the application of the law itself, and administrative policy and procedures to these undisputed facts.

The Supreme Court of Wisconsin has held that judicial review of an administrative decision is the exclusive way to review controlled access decisions, and therefore the questions of administrative policies and procedures and the scope of judicial review be-

come a matter of paramount importance in the administration of the controlled access laws.<sup>54</sup>

### Looking to the Future

Just as the authority of the state to exercise its inherent police powers to effect access control in accordance with legislative grant, is an accepted attribute of sovereignty, so too the authority of the state to use powers of eminent domain to implement access control is no longer challenged. However, two areas of possible controversy are apparent: *first*, the basic question as to when eminent domain proceedings must be used in preference to the procedures under the police power; and *second*, the problem of valuation of access rights when they are acquired or condemned for highway purposes.

One of the difficult problems at the outset, relative to the determination of whether to use the police power or the power of eminent domain to effect access control, is the original determination as to when the right of access of an abutting landowner is restricted, limited or otherwise reduced below the point where such access is deemed reasonable and adaptable for his land use. The matter of acquisition of the requisite rights of access via eminent domain, would appear to be a discretionary matter within the prerogative of the administering state agencies relative to effecting a controlled access highway, considering the requisite basic determination as to method, against the legislative-engineering background of the statutes. In the state of Wisconsin, for example, the laws state that such requisite interests ". . . may be acquired. . ." under statutes governing procedures for acquisition of lands and interests therein for highway purposes. Such statutes permitting acquisition of the required interests likewise state that if the required lands or interests cannot be purchased expeditiously for a price deemed reasonable, the administering agency ". . . may acquire the same by condemnation. . ." <sup>55</sup>

The other area of possible controversy relative to the standards for valuation of access rights when acquired for highway purposes, involves inherent relationships of access and accessibility and land use. Various land uses have traditionally been considered as requiring rather stereotyped methods or means of access. However, all land uses actually enjoy a great deal of flexibility relative to the arrangement of access necessary to adequately serve the particular land use development. The number or arrangements of these various patterns of access, any one of which can be equally efficient, desirable and fully capable of handling the traffic volumes generated by the particular land use development, are limited only by the imagination of land use planners and developers in carrying through their particular projects. Further consideration by the planners would normally be given to the coordination of their access requirements with the larger requirements of other areas developed by private or public planning agencies, and to achieving a compatibility with the design of the particular highway facilities adjacent thereto in the interest of public safety, convenience, and the general welfare. This too,

is a changing thing; it is an essentially perpetual process of land use and development reflecting the changing economy. Recognition of the overall situation as a fluid concept dictates that control of access via the eminent domain procedures, be not static or related strictly in time and condition to a set or established pattern or degree of land development then existing at the time of acquisition.

#### FOOTNOTES

1. See Stanhagen, *HIGHWAY TRANSPORTATION CRITERIA IN ZONING LAW*, Bureau of Public Roads, U.S. Government Printing Office, Washington 1960; Stanhagen and Mullins, *POLICE POWER AND PLANNING CONTROLS FOR ARTERIAL STREETS*, Bureau of Public Roads, U.S. Government Printing Office, Washington 1960; Ratcliff, *URBAN LAND ECONOMICS*, McGraw-Hill, New York 1949, pp. 406-415; Orgel, *VALUATION UNDER EMINENT DOMAIN* (2d Edition), Michie Company, Charlottesville, Va. 1953, Vol. 1, Sections 28-36.
2. *CONDEMNATION APPRAISAL PRACTICE*, American Institute of Real Estate Appraisers, Chicago 1961, pp. 38-45.
3. *LOCAL PLANNING ADMINISTRATION* (2d Edition), International City Manager's Association, Chicago 1948, pp. 218-247; 12 *Syracuse Law Review* 352-361 (1959); U.S. Constitution Amendment V; Wisconsin Constitution Article I, Section 13.
4. *Village of Euclid v. Ambler Realty Co.*, 272 U.S. 365 (1926). There have, of course, been written into the laws of some States statutory provisions accomplishing admissibility of these code requirements.
5. Levi, "Impact of Law and Code Enforcement on Value," *The Appraisal Journal*, January 1961, pp. 78-82.
6. 12 *Syracuse Law Review* 352, 355 *et seq.* (1959); and see 72 *Harvard Law Review* 523-525 (1959).
7. 12 *Syracuse Law Review* 352, 358 (1959).
8. *Id.* at 358, citing *State Roads Commission v. Warriner*, to the effect that ". . . Evidence of a reasonable probability of a change in zoning classification within a reasonable time may properly be admitted and its influence upon market value at the time of the taking may be taken into account."
9. See Chapter 236, Wisconsin Statutes, and Chapter Hy 33, Wisconsin Administrative Code; Covey, *ROADSIDE PROTECTION THROUGH ACCESS CONTROL*, Automotive Safety Foundation, Washington 1960, pp. 39-46; Ratcliff, *op. cit.* footnote 1, pp. 415-420; *LOCAL PLANNING ADMINISTRATION*, *supra* footnote 3, pp. 248-267; Lathrop, *Wisconsin's 1955 Platting Law*, 1956 *Wisconsin Law Review* 385.
10. The problem of valuation against this background should not, however, lose sight of the amount of platted lots which a current market will support. In this connection, see *LOCAL PLANNING ADMINISTRATION*, *supra* footnote 3, p. 262, indicating several studies which have been made relative to excessive platting; and see Kucirik and Beuscher, *Wisconsin's Official Map Law*, 1957 *Wisconsin Law Review* 176.
11. Covey, *Freeway Interchanges: A Case Study and an Overview*, 45 *Marquette Law Review* 21-58 (1961). The State of Wisconsin, Department of Resource Development, is currently engaged in studies pertaining to proposed legislation in this broad and increasingly important field of protection of interchange areas. See *THE PROTECTION AND DEVELOPMENT OF INTERCHANGES ON WISCONSIN'S STATE HIGHWAY SYSTEM*, Department of Resource Development, State of Wisconsin (mimeo 1961).

Also, progressive County Zoning Ordinances are beginning to include sections pertaining to "Interchange Zoning," exercising what promises to be realistic control guidance in these sensitive areas. Columbia County, Wisconsin, was one of the first counties to institute this type of provision in the traditional county zoning ordinance. Note the striking similarity of these provisions with Chapter Hy 33, Wisconsin Administrative Code, the State subdivision control regulations, per footnotes 9, *supra*, and 52, *infra*. The Columbia County, Wisconsin, Zoning Ordinance provides in pertinent part as follows:

Highway Setback Lines. There shall be setback lines along abutting highways as required by the provisions of Section XVI, and the following special regulations shall also apply:

- (a) Frontage roads not less than 50 feet wide shall be provided across the entire width or length of any lot that abuts on any intersecting highway, and there shall be not more than one access in each 1,000 feet from any such frontage road to the intersecting highway, but in no case less than two such points of access in each quadrant of an intersection of two or more highways. The location of such points of access shall be further restricted as follows:
    - (1) No such access shall be located on either side of the intersecting highway within 1000 feet of the most remote end of taper of any entrance to or exit from a controlled access highway.
    - (2) Such access shall be located directly opposite cross-overs in median strips where the highway serving the Highway Interchange District is divided for directional control of traffic flow.
  - (b) Each building or group of contiguous buildings shall have not more than two entrances to the abutting frontage road, and no such entrance shall exceed 30 feet in width. Wherever practicable, buildings or groups of buildings shall use entrances in common, in order to reduce the number of such entrances and promote the safety of travel upon the abutting frontage road.
  - (c) The intervals between permitted entrances to a frontage road shall be closed against vehicular access by a curb, planting strip, or other effective barrier.
12. Levi, *loc. cit.* footnote 5, pp. 78-82. Mr. Levi's incisive article sets forth a number of powerful, informative and illustrative examples of a highly successful application of modern streamlined legislation in this field, on acquisitions by governmental agencies in full recognition of the various properties as illegal, nonconforming uses which were operated, frequently at considerable monetary profit, in violation of Code Regulations. And see generally Orgel, *op. cit.* footnote 1, Vol. 1, Section 3.
  13. Slayton, "Appraisers' Role in Urban Renewal," *The Appraisal Journal*, January 1962, pp. 16-20; and see 72 Harvard Law Review 523-525 (1959).
  14. Nelson, "Commentary on Appraiser's Role in Urban Renewal," *The Appraisal Journal*, January 1962, pp. 20-26. This excellent brief commentary poses the problem with dramatic realism. And see Comment, *The Elimination of Nonconforming Uses*, 1951 Wisconsin Law Review 685.
  15. *Mayme J. Riley v. D.C. Redevelopment Land Agency*, 100 App. D.C. 360, 246 F.2d 641 (1957).
  16. See Nelson, *loc. cit.* footnote 14; 72 Harvard Law Review 523-525 (1959).
  17. *Brunke v. Pharo*, 3 Wis.2d 628, 89 N.W.2d 221 (1958); and see discussion of this case, Stephan, *Marketability of Title: Violation of Building Code as an Encumbrance*, 1958 Wisconsin Law Review 641-652.
  18. Stephan, *op. cit.* footnote 17, 641, 647.
  19. 1958 Wisconsin Law Review 641, 651-652.
  20. See Powers, *Control of Outdoor Advertising*, 38 Nebraska Law Review 541-551 (1959); Levin, *Federal Aspects of the Interstate Highway Program*, 38 Nebraska Law Review 377-406 (1959); see generally, Orgel, *op. cit.* footnote 5, Vol. 1, Section 107.
  21. *Berman v. Parker*, 348 U.S. 26 (1954); and see State *ex rel.* Slaveland Park Holding Corp. v. Wieland, 269 Wis. 262, 69 N.W.2d 217 (1955). The Wisconsin Supreme Court has gone as far as any State court in the land on this subject.
  22. 72 Stat. 95, Sec. 12 (1958); see Levin, *op. cit.* footnote 20, 377, 390.
  23. Chapter 639, Laws of 1959 (State of Wisconsin), published February 5, 1960, was effective April 5, 1960. See Sec. 84-30, Wisconsin Statutes.
  24. Sec. 84.30(4) authorized the State Highway Commission of Wisconsin to "... establish rules relative to the size, type, spacing, location and color of permitted signs, among other things, which are otherwise consistent with this Section and the National Policy and which are necessary to carry out the purposes of this section. Such rules shall provide for, among other things, the prohibition of signs which endanger safety, are obsolete, untidy, or are maintained or erected upon trees, rocks or other natural objects." These administrative rules were promulgated and published as Chapter Hy 19, Wisconsin Administrative Code, Secs. Hy 19.001 to Hy 19.05, inclusive. (Several of these administrative rules are currently undergoing court test.)

25. See Covey, *op. cit.* footnote 9, pp. 14-15; 38 *Nebraska Law Review* 542-543 (1959).
26. See *Berman v. Parker*, and *State ex. rel. Slaveland Park Holding Corp. v. Wieland*, *supra* footnote 21.
27. See Barrett and Netherton, *Issues and Problems of Proof in Judicial Review of Roadside Advertising Controls*, paper prepared for presentation to Special Committee on Highway Laws, 41st Annual Meeting of Highway Research Board, Washington, January 1962; Armstrong, *The Wisconsin Billboard Case*, paper prepared for presentation to the Committee on Legal Affairs, 47th Annual Meeting, American Association of State Highway Officials, Denver, October 1961—a documentary on current legal action relative to the Wisconsin Billboard Law, and the Administrative Regulations published pursuant thereto.
28. Sec. 84.09(1), Wisconsin Statutes, provides that the State Highway Commission "... may acquire by gift, devise, purchase or condemnation any lands for establishing, laying out, widening, enlarging, extending, constructing, reconstructing, improving and maintaining highways, streets, roadside parks and weighing stations which it is empowered to improve or maintain, or interests in lands in and about and along and leading to any or all of the same. . . ." (Emphasis added.)
29. See sec. 84.105(6), Wisconsin Statutes, relative to scenic easements along national parkways located wholly or partially within the State of Wisconsin; and see Chapter 427, Laws of 1961 (State of Wisconsin), relative to scenic easements.
30. Editorial Note, 38 *Nebraska Law Review* 407 (1959). This editorial note introduces the control of highway access presentation of Frank M. Covey, Jr., in the March, 1959 issue, *Nebraska Law Review*, captioned "Interstate Highway Symposium."  
And see generally Orgel, *VALUATION UNDER EMINENT DOMAIN* (2d Edition), Michie Company, Charlottesville, Va. 1953, Vol. 1, Sections 64, 88, 92, 111.
31. See Shearer, "Built-in Safety," *Automotive Industries*, December 1, 1956, p. 71; ACCIDENT FACTS, National Safety Council, Chicago 1956, p. 43; Owen, *THE METROPOLITAN TRANSPORTATION PROBLEM*, The Brookings Institution, Washington 1956, pp. 43-45; Cunyngnam, *The Limited Access Highway from the Lawyer's Viewpoint*, 13 *Missouri Law Review* 19, 24 (1948).
32. Levin, *ROADSIDE PROTECTION*, Bureau of Public Roads (mimeo 1957); Levin, *Highway Zoning and Roadside Protection in Wisconsin*, 1951 *Wisconsin Law Review* 197; Levin, *PUBLIC CONTROL OF HIGHWAY ACCESS AND ROADSIDE DEVELOPMENT* (Rev. Edition), Public Roads Administration, U.S. Government Printing Office, Washington 1947; and see Levin, *Federal Aspects of the Highway Program*, 1959 *Nebraska Law Review* 377 (Interstate Highway Symposium); Levin, "The Highway Interchange Land-Use Problem," 288 *Highway Research Board Bulletin* 1 (1961); Levin, *Land Use Development and the Highway Interchange*, address to 46th Annual Road School, Purdue University, April 20, 1960.
33. Beuscher, "Protection of Highways and Feeder Streets Through Subdivision Controls," 101 *Highway Research Board Bulletin* 52 (1955); Beuscher, "Roadside Protection Through Nuisance and Property Law," 113 *Highway Research Board Bulletin* 66 (1956).
34. Covey, *Highway Protection Through Control of Access and Roadside Development*, 1959 *Wisconsin Law Review* 567; Covey, *Freeway Interchanges: A Case Study and an Overview*, 45 *Marquette Law Review* 21 (1961); Covey, *The Control of Highway Access*, 38 *Nebraska Law Review* 407 (1959); Covey, "Impact of Police Power Controls in Wisconsin," 232 *Highway Research Board Bulletin* 84 (1959); Covey, *ROADSIDE PROTECTION THROUGH ACCESS CONTROL*, Automotive Safety Foundation, Washington 1960.
35. Netherton, *A Summary and Reappraisal of Access Control*, paper prepared for presentation to the Special Committee on Highway Laws, 41st Annual Meeting of Highway Research Board, January 1962.  
And see particularly the forthcoming treatise, *CONTROL OF HIGHWAY ACCESS*, by Mr. Netherton, Counsel for Legal Research, Highway Research Board. This work is an intensive treatment of the subject, and comprises a penetrating analysis of the concept of access control.
36. Stanhagen, "Highway Interchanges and Land Use Controls," 288 *Highway Research Board Bulletin* 32 (1961); Stanhagen, *HIGHWAY TRANSPORTATION CRITERIA IN ZONING LAW*, Bureau of Public Roads, U.S. Government Printing Office, Washington 1960; Stanhagen and Mullins, *POLICE POWER AND PLANNING CONTROLS FOR ARTERIAL STREETS*, Bureau of Public Roads, U.S. Government Printing Office, Washington 1960.
37. Solberg, "Safe, Efficient, and Attractive Highways," 1958 *Land* 537; Solberg, "Roadside Zoning," 55 *Highway Research Board Bulletin* 49 (1952).

38. See forthcoming publication of Ross D. Netherton, *supra* footnote 35, particularly Parts III and IV, relating to Access Control Powers and Their Uses, and Valuation of Access Rights.
39. *Id.* at Part III; see Beuscher, "Roadside Protection Through Nuisance and Property Law," 113 *Highway Research Board Bulletin* (1956), pp. 66-77; Beuscher and Morrison, *Judicial Zoning Through Recent Nuisance Cases*, 1955 *Wisconsin Law Review* 440; Kurtz, "The Effect of Land Use Legislation in the Common Law of Nuisance in Urban Areas," 36 *Dicta* 414 (1959).
40. See Netherton, *CONTROL OF HIGHWAY ACCESS*, *supra* footnote 35, Part III.
41. *Id.* at Parts II-III.
42. See Sec. 84.25, Wisconsin Statutes, The Controlled-Access Law; Chapter 227, Wisconsin Statutes, The Administrative Procedure Act; Chapter 588, Laws of 1961 (State of Wisconsin), The Freeway Law; and see *supra* footnote 35.
43. See *Nick v. State Highway Commission*, 13 Wis.2d 511, 109 N.W.2d 71 (1961); *supra* footnote 42; Feifarek, *Judicial Review of Administrative Decisions in Highway Access Control*, paper prepared for presentation to 41st Annual Meeting of Highway Research Board, January 1962; *Carazella v. State*, 269 Wis. 593, 71 N.W.2d 276 (1956); Sec. 84.29, Wisconsin Statutes, The Interstate Highway Law; Sec. 84.295, Wisconsin Statutes, The Freeway Law, created by Chapter 588, Laws of 1961, published October 25, 1961.
44. Sec. 84.25(1)-(6), Wisconsin Statutes.
45. Sec. 84.25(8), Wisconsin Statutes; and see Sec. 84.09(1), Wisconsin Statutes.
46. See Sec. 48.25(8), Wisconsin Statutes.
47. Chapter 227, Wisconsin Statutes, The Administrative Procedure Act, particularly Secs. 227.14-227.15, 227.20.
48. Sec. 84.25(8), Wisconsin Statutes; and see Chapter 32, Wisconsin Statutes.
49. *Nick v. State Highway Commission*, *supra* footnote 43.
50. Sec. 84.25(4), Wisconsin Statutes.
51. Chapter 236, Wisconsin Statutes, The Platting Law.
52. Chapter Hy 33, Wisconsin Administrative Code, State Highway Commission of Wisconsin Rules and Regulations Governing Land Subdivision Plats Abutting State Trunk Highways and Connecting Streets.
53. Sec. 84.25, Wisconsin Statutes.
54. *Nick v. State Highway Commission*, *supra* footnote 43.
55. See the excellent treatment of these all-important facets of access control in the forthcoming publication *CONTROL OF HIGHWAY ACCESS*, by Ross D. Netherton, particularly Part III, Chapters 14 and 15, *supra* footnote 35.

## Property Management and the Disposal of Improvements

MARION MARKHAM

*Supervising Right-of-Way Specialist  
Bureau of Public Roads*

*and*

CHARLES M. FORNACI

*Right-of-Way Specialist  
Bureau of Public Roads*

An acceptable definition of property management would be the administrative care of real property with the objective of maximum net return to the owner over the longest period of time. Rent collecting and bill paying, although components of property management, are mechanical practices and are not necessarily the controlling ones. The forces and trends affecting income and expenses are the major elements which control the ultimate welfare of real estate.

By definition, therefore, commercial property management is unalterably associated with income properties and the production of the maximum income therefrom. Property management usually entails, among other things:

1. The determination of proper rent schedules.
2. The securing of desirable tenants.
3. The collection of rentals.
4. Provisions for maintenance and repairs.
5. The keeping of adequate records.
6. The ultimate sale or disposition of the property.

Every one of these generalized concepts applies in a marked degree to the present activities of property management in the highway right-of-way field, for one of the emerging problems generated by the accelerated highway programs has been the management and disposal of improvements located on lands acquired for highway rights-of-way. For many years, very little attention had been given to this phase of the right-of-way acquisition function, mainly because relatively few structures were in fact being acquired in most States. With the advent of the accelerated programs and

the large increase in the number of improved parcels which had to be acquired, particularly in urban areas, most States were not equipped with either the knowledge or the expert personnel to efficiently handle the disposition of these improvements either by clearance or by retention for rental purposes.

### **Administrative Organization for Property Management**

It appears essential and basic that the efficient performance of an effective right-of-way program requires a properly organized and coordinated property management section. At the present time there are 24 States with property management units, and 2 other States are in the process of establishing such departments. As a general rule, these sections have been organized as a part of the right-of-way division. In the majority of jurisdictions having property management sections, their functions encompass not only the interim management of improvements acquired by the highway departments, but also the final clearance of the right-of-way area prior to actual construction.

The functions involved in the field of property management require a personnel force with a thorough knowledge not only of real estate transactions and prevailing market conditions, but also the very specialized skills needed in the appraisal of buildings for removal or demolition, the conduct of sales, and the leasing and maintenance of properties.

Irrespective of the particular type of administrative organization developed for property management or the functions assigned thereto, it is important that those duties that are so delegated be clearly understood by the members of the section, the right-of-way division, and all pertinent segments of the highway department. Responsibility for management and clearance functions should properly be delegated to one official; but if it is determined to divide these duties through two separate units, the persons delegated these tasks should be completely aware of their areas of responsibility and those of their counterpart. As in all administrative fields, proper delineation and definition of functions will result in a coordinated and productive organization.

### **Lead Time and Advanced Acquisitions**

Although universally accepted as one of the prime requisites for an efficiently operating right-of-way program, the matter of lead time, or rather the lack of it, attains particular significance in the problem area under discussion. The vast majority of States have been seriously hampered at one time or another because of this condition. In this specific context, the absence of adequate lead time not only contributes to hasty and sometimes unsound appraisal and negotiation techniques, but in a negative sense, actually deprives a State of a readily available source of revenue that exists in the proper and efficient disposal of structures.

In this connection, the advantages of a sufficiently far-sighted acquisition program cannot be overemphasized. Such a program not only enables a State to acquire rights-of-way and dispose of property in an orderly, efficient manner but permits the rental of improved properties in the interim period prior to actual construction. Very real possibilities exist in this area for a return to the States of a substantial portion of the original capital investment expended for improved properties. While there is some feeling that the strict business of a highway department is to build highways and not competitively engage in the real estate business, the sizable amounts invested and the possibility of substantial recapture make a balanced program of this nature operate in the general public interest.

It is significant that all of the States are attempting to make the necessary time allowances in their construction and program scheduling to permit the proper acquisition and clearance of the required right-of-way areas. The considerations and flexibility which, by definition, must exist for the attainment of this objective call for a high degree of coordination between the various divisions of the highway organization. Even a rudimentary and partial achievement of this goal would go a long way towards the elimination of many of the problems presently confronting the right-of-way departments.

#### Inventory of Improvements Acquired by the States

An essential requirement for the proper operation of a property management section is the maintenance of a complete and current inventory of all improvements acquired and/or held by the State.

In the maintenance of adequate inventory records, the following general types of data should be collected on each improved property acquired by the State: Percent and amount of the total purchase price attributable to the improvements, estimated salvage value, method of disposition, sale price, and the amount paid or returned in demolition, whether by a special demolition contractor or the general highway construction contractor. Such a record could also be used to include pertinent data on rentals, including length of time and amount of income realized, repairs and personnel costs, etc. The maintenance of this record system on an active and current basis provides in a relatively short time a bank of data indicating the amounts and percentages of recapture realized, and the most advantageous methods of disposal available in the particular regions of the State.

With the desirability of this function accepted, it would be a simple mechanical problem to establish either a ledger method or a card punch system, or some combination of the two, to maintain the required data. The elaborateness and detail of the system utilized depends upon the individual State, but the important point is that it include, at least, the above noted information.

## Determination of Salvage Value

Salvage value refers to the amount of investment recapturable by the State from the ultimate disposal of improvements, irrespective of whether the buildings are to be relocated or demolished. The salvage value of improvements located within the right-of-way area is, by definition, something less than the market value of these same buildings on their permanent sites because of the obvious necessity for physical removal. The determination of salvage values is a highly complex and technical function, requiring the consideration of such factors as the costs of moving and restoration of the improvements, the effects of local restrictions and codes, the reaction and demand of the local market for used improvements, and the construction and design characteristics of the particular building which may determine the feasibility and economy of relocation.

If possible, estimates of probable salvage values should not, as a rule, be delegated to the appraiser who made the original real estate valuation on the property of the specialized knowledge required. While it is undoubtedly true that many professional appraisers possess the necessary background, too often the appraiser may be selected to establish the salvage values simply because of the lack of more adequately trained personnel. With the limiting qualification for the particularized skills and knowledge, the employees of the property management section are perhaps in the best position to estimate these values.

Market value for the properties involved may be self-established by the action of public bids and auctions. Some restraint is, of course, exercised in this technique by the ability of the vending authority to reject offers and readvertise for sale if the proffered offers appear too low. While not possessing the sophistication of the more formalized techniques, this method probably works on an operational level about as well as any other.

When the previous owner wishes to retain the improvements, the agreed-upon settlement usually reflects the actual cost of moving with an amount allowed for alleged depreciation accruing to the property by reason of relocation. If the sale of the improvements is to be made to the general public for removal or demolition, the salvage value estimated is predicated upon the prevailing market prices paid for similar properties under similar conditions. The worth of these latter estimates would, of course, be directly dependent upon the availability of sufficient historical data to make the ultimate value conclusions reliable.

If the body of information necessary to make valid estimates in this area is not available due to lack of experience, the maintenance of an adequate record system, as previously noted, would provide within a short period the necessary supporting data to make well-founded estimates of probable salvage values. The investment of time

and effort required for this record system would be more than compensated for by the availability of this reliable market data.

#### DISPOSITION OF IMPROVEMENTS

In the disposition of improvements located within the right-of-way areas, the owner is generally given the opportunity to retain and relocate the improvements. If this cannot be accomplished and there is some worth to the structures, the State may attempt to sell the buildings through sealed bids or public auction. As a final recourse, especially in those cases where the improvements are of low value or the right-of-way area is immediately required for construction, the State arranges for their removal either through a separate demolition contract or by inclusion in the general highway construction contract.

#### Retention by Owner

Given the fact of owner retention, financial settlements may fall into two major categories. Under the first classification, the estimated salvage value of the structure is deducted from the appraised property value, with the owner receiving the balance as net payment. In the second set of circumstances, the estimated moving costs are added to the appraised land value, with the owner receiving this totaled figure. Under both sets of settlements, the owner bears the cost and responsibility for the moving and rehabilitation of his structures.

There appears to be a substantial monetary difference in end result depending upon which of the two techniques is employed. As illustrative of this point, a hypothetical case is outlined below with the following set of assumed figures:

Total property value \$8,000; land value \$3,000; building value \$5,000; moving costs \$2,500; estimated salvage value \$500.

<i>METHOD A</i>		<i>METHOD B</i>	
Total property value	\$8,000	Land value	\$3,000
Less salvage value	— 500	Plus moving costs	+ 2,500
Net payment to owner	<u>\$7,500</u>	Net payment	<u>\$5,500</u>

It appears obvious that while the property owner is being treated fairly and advantageously under both sets of circumstances, the difference in methods represents an absolute and substantial dollar loss to the highway department under the first technique. The second method appears to be the more favorable to the acquiring authority.

Irrespective of the particular method utilized, the owner's retention of structures is to the State's advantage as to time, monetary payment, and good will. However,

it is desirable, if the owner is to retain the improvements, that definite arrangements be concluded at the time of acquisition rather than permit the owner to sell his property to the State at full market value and then at a later date have the same owner repurchase the property at a low figure either at public sale or from the demolition or construction contractor.

### **Public Sale**

As a secondary step, attempts are generally made to dispose of improvements through public sale when the owner does not wish or cannot be persuaded to retain. The method of sale is usually through sealed bids or public auction sales; or if the circumstances of the particular case dictate, both methods may be used. Sealed bids are generally used when the individual structure is of low value or located in a somewhat remote area, whereas auctions are more generally utilized where properties are located in urbanized areas with an active local real estate market. The use of sealed bids is sometimes preferred because it provides a more systematized control with less expenditure of personnel. In general, however, both methods appear to offer satisfactory and relatively equal results.

In this context, sales on a "pay or be paid" basis may be resorted to, requiring, of course, the use of sealed bids. It is felt the advantage of this technique lies in the reduction of personnel time expended, with the probability of securing somewhat more favorable bids on borderline improvements.

Although at first glance stipulations as to a minimum acceptable bid may appear desirable when conducting a public sale, there is some feeling that a fixed minimum bid may have the effect of scaring off potential bidders. This can be obviated to some extent by not advising the bidders of the amount fixed, or as an alternative, the State can reserve the right to reject unsatisfactory offers, thus maintaining an effective safeguard against a decidedly disadvantageous bid.

### **Right-of-Way Clearance by Demolition or Construction Contracts**

There is a tendency to resort to the practice of letting demolition contracts or including improvement removal provisions within highway construction contracts when structures cannot be disposed of or when the right-of-way area is immediately required for construction. This situation usually arises because particular properties are unsaleable, or because of the lack of an adequate lead time to arrange for their public sale. As noted previously, the development of this adequate lead time is a primary requisite for an efficient disposal program; and given this adequate interval, resort to public sale will generally produce the greater return to the State and eliminate the necessity for destruction of otherwise valuable structures. Those buildings which are capable of

being relocated or dismantled for salvageable materials will be sold under the most advantageous competitive market conditions.

However, even with an adequate time element for public sale, there will occasionally be buildings that either have little salvage value or cannot be economically relocated, and therefore will fail to develop any interest from prospective bidders. As a result, the State bears the responsibility for the removal of these unsaleable properties from the right-of-way limits, and must choose between a separate demolition contract or as a last resort, inclusion of this item in the highway construction contract. In essence, there appears little to overwhelmingly recommend the use of one method in preference to the other. A demolition contract might be chosen to eliminate a potentially unsafe structure or a neighborhood nuisance when the anticipated period of construction is somewhat in the future. Again, it might be feasible to let this type of immediate contract to be able to realize whatever limited salvageable materials are available in the structures before vandals completely remove all items of any value.

When, in the final instance, it might become necessary to dispose of improvements through either a demolition or construction contract, every effort should still be made by the State to realize any value that may exist in the structures. Conceivably, this could be accomplished by setting up bid forms on a "pay or be paid" basis. Although there is a tendency to look upon demolition as a liability item for which payment to the contractor must be made, there are occasions where structures represent an absolute asset for which the State should receive payment. The most competitive situation might be brought about by advertising for bids on a "pay or be paid" basis. The State would ultimately realize full benefit from the structures to be demolished even though they are of supposed marginal value. In any event, the State should be in a position to make a valid prebid determination of the salvage values of the improvements in order to effectively judge the bid prices submitted.

The practice of including all disposal items in either a demolition or highway construction contract, may possibly have the particular advantages of a uniformity of procedure plus an absolute savings in time expended for right-of-way clearance. While these factors may be considered of paramount importance in certain States, the question is still open as to whether such a procedure overlooks a potentially rich source of recapture for at least a part of the investment made in the acquired improvements. In any event, it cannot be recommended that a State engage in the wholesale use of demolition contracts for right-of-way clearance until it has demonstrated that this particular technique will effect the greatest economy, both in terms of time and money.

Included in disposal contracts may be provisions to the effect that all of the improvements must be demolished and that none may be relocated to other sites either by the contractor or by sale to members of the general public. The inclusion of

these stipulations effectively limits the practice of prior owners repurchasing their former dwellings from the contractor at a low price, removing them to another plot, and in essence reaping a "windfall" from their dealings with the public authority.

### Vandalism

One of the more conspicuous and wasteful aspects of the acquisition of improved properties for right-of-way purposes relates to the problem of vandalism of structures so acquired. This specific problem has been advanced as the main reason for the letting of separate demolition contracts far in advance of actual construction dates. In addition, vandalism of structures often occurs to such a severe degree that it is necessary to destroy buildings which might otherwise have substantial values for relocation or as a source of salvageable materials. Quite obviously, any loss sustained to these structures because of vandalism represents an absolute loss of a potential revenue source. While the minimizing of vandalism is in many respects a mechanical function for solution at the local level, certain factors are self-evident in this area and certain suggestions can be presented as to possible desirable practices.

*Structure occupancy* — Experience has shown that vandalism does not occur while structures are occupied, either by tenants or former owners. It seems desirable therefore to allow improvements to be occupied as long as possible prior to the time of public sale or the award of a demolition or construction contract. The successful operation of this synchronized program naturally requires a high degree of centralized responsibility by a property management director or other persons with appropriate authority to coordinate the removal of occupants and the immediate surrender of the improvements to the successful purchaser or contractor.

*Awareness of resource* — Granted that these improvements do actually represent a resource, and that vandalism causes a loss in value from this potential, one of the first steps in the reduction of this problem appears to be to make every employee, particularly those in the right-of-way and construction divisions, feel personally responsible for the development of procedures and the prevention on a day-to-day basis of any acts of vandalism that might reduce this revenue source. This is not to say that highway personnel should assume policing duties, but yet the operational employees working on a particular project every day are in the best position to observe and keep close check on vacant properties. However, this particular phase can only be as effective as the administrative intent and purpose ultimately transmitted to these employees.

On an operational level, certain jurisdictions have developed relatively satisfactory and unique methods of coping with vandalism. It is accepted that all methods will

not have universal applicability, but the following examples are presented as some of the current practices being used in this field.

California is generally recognized as having smoothly-functioning management and disposal procedures. Yet, at one time California was likewise beset by large-scale vandalism, especially in urban areas, and the highway department was unable to secure what it felt was adequate police protection for vacant properties awaiting disposal. Therefore, a procedure was developed whereby in those areas where there are a sufficient number of properties to justify the expense, the highway department secures the loan of regular State police personnel who devote full time to the protection of the improvements. At the present time, there are approximately 35 State policemen assigned to the right-of-way department, with the department bearing the full cost of their salaries and vehicle operation. The State estimates that even with this expense involved, the ultimate result is a very substantial saving to the highway department.

Georgia has adopted a procedure whereby buildings are offered for public sale as soon as right-of-way acquisitions begin on a project. The offers for sale are made with the understanding that the buildings will be delivered to the successful purchasers if and when they are acquired by the State. Through the operation of this method the purchaser is ready to take possession immediately after the premises are vacated, and thus vandalism is sharply reduced. Florida used a similar approach on one project, except that every structure on the whole contract was included in one mass bid. The successful bidder was able to secure possession as each improvement was vacated, and the damages usually inflicted by vandalism were eliminated.

Adopting another approach, the Port of New York Authority developed a unique system for curbing vandalism in a high density urban area acquired for new approaches to the George Washington Bridge. By means of a cash contribution to the local YMCA, they were able to have a special project office opened with counselors and sport facilities available. With the establishment of a meeting and recreational headquarters for the neighborhood youth, they were successful in keeping them away from the structures, thereby sharply curbing vandalism.

In the final analysis, there are no quick and foolproof methods for solving this problem. Rather it involves an administrative recognition of the loss of a revenue source, with an accompanying intent to reduce this waste of a public resource. Starting from the base of this intent, it is necessary to strive for a proper organizational structure with a centralized authority to properly program building possession and surrender to successful purchasers or contractors. And as a final step, highway employees, local police authorities, and the general public must be made to realize the public interest in these structures and to assume the ultimate responsibility to prevent the dissipation of this community investment.

## Retention of Improvements for Rental Purposes

In recent years, most of the States have initiated the practice of leasing acquired structures when they are located in right-of-way areas not required for immediate construction. However, because of the recent inception of this practice in many States, there is no general national consensus yet available as to the monetary effectiveness of this program. The lack of property management experience combined with a lack of adequate lead time for sufficient leasing periods have contributed in many areas to relatively ineffective and marginal rental programs.

From a positive position, two States have experienced rather startling results with a farsighted acquisition and management program. At the present time, California has under lease agreement approximately 7,500 improvements, realizing a present annual gross income of over \$6 million. Maryland's experience has been that its program recaptures up to 50 percent of the acquisition cost of structures when a lead time of 5 to 6 years is provided. In both cases, an effective property management section and an adequate lead time period have been recognized as the major necessities for an efficiently operating and economic program.

Although there is a tendency among some States to dismiss possible recapture through rentals as being too small for serious considerations, all evidence indicates that if this program is effectively utilized, a greater amount of the monies invested could be realized than is being done at the present time. The rapidly increasing acquisition costs demand that all States examine very carefully every available means of recouping at least part of the money expended for improvement acquisition.

*Terms of rental agreement* — Because of the short time available for renting structures in many instances, the terms of leases entered into are generally on a month-to-month basis, with a 30-day termination clause included, usually available to either party. Where advance right-of-way acquisition programs are in effect, leases may be on a yearly basis, or possibly on some other set period depending upon the scheduled construction date. The possibilities of recapturing a substantial percentage of the purchase price of the improvement are naturally much greater where an advance acquisition program is being carried on. A combination of the two types of lease agreements may be used; i.e., the month-to-month rental agreement may be entered into when construction is not too far off, and a year-to-year lease or other specific periods for properties acquired some years in advance of construction.

Actual amounts charged for rent vary generally between 5 and 8 percent of the purchase price of the structures involved, or may be based on the prevailing rate in the area. The somewhat lower rents are compensated for by the fact that maintenance of the properties involved is generally the responsibility of the renter.

## CHAPTER 44

### Utility Relocations and Accommodations\*

Public highways are of major importance to our social and economic life; consequently, certain regulations relative to highway design and highway location have been publicly accepted as vital necessities. Publicly, privately, and cooperatively-owned utilities have also been accepted as vital parts of the essentials required to provide for general welfare. They too have certain design features which must be observed in order for the utility lines to function properly.

For economic and/or physical reasons highways and utility lines at times must of necessity jointly occupy the same right-of-way. It is the responsibility of the State highway department to accomplish the location, design, construction, and maintenance of the State highways, and to provide adequate safeguards in the expenditure of public highway funds. The Federal and State highway agencies cannot, however, confine their interest and attention to only those situations involving the expenditure of public highway funds. Rather, in all instances where utility facilities are encountered, every effort should be made to accomplish the most economical and best engineered adjustments and relocations possible. In order that utility facilities may properly function in the best interest of the utility consumer without becoming a hazard to the traveling public's use and safety or hampering the proper construction and maintenance of the highways, it is advisable that the general outline of policies and procedures contained herein be adhered to by those in the State organization responsible for coordinating utility-highway matters.

#### Classification of Utilities

For general purposes, all utility physical plants and operating facilities of both public and private nature may be considered as either pipe lines, communication lines, or electric power lines. Each one of these groups will present their individual type of problems, methods of relocation and administration thereof.

1. Pipe lines may be further divided according to the products they carry: (a)  
The gas lines may be considered as high, medium, and low pressure transmission

\* This chapter represents a report and compilation of various State utility operational procedures, prepared by the Office of Right-of-Way and Location, Bureau of Public Roads. It has been written for informational purposes, and is not intended to furnish specific policies, or to replace existing procedures with respect to Federal-aid reimbursement provisions.

lines, distribution lines, vacuum lines, gathering lines, and service lines; (b) oil and gasoline lines may be divided into crude lines and refined-products lines, gathering lines, and sludge waste lines; (c) water lines may be either of concrete, cast iron, or steel pipe; and (d) miscellaneous pipe lines may be those used for sewers and/or municipal wastes.

2. Communication lines may be either micro-wave facilities laid underground or aerial conductors on pole lines or a combination of both. They may be either local service lines or toll lines.
3. Electric power lines, in general, may be high voltage transmission lines or lower voltage distribution lines; either or both lines may be in combination as well as being installed above or below ground.

### Design and Functional Requirements

Utilities must be located and designed to be clear of or protected from the highway construction operations. It is therefore necessary to consider the minimum maneuvering area and space required, and a minimum limit of subsurface penetration of heavy machinery used in the earth excavation and embankment work. Final location of the relocated utility should also be clear of or protected from possible damage resulting from the operation of maintenance machinery and impact from highway traffic.

For controlled access freeways, such as Interstate freeways,<sup>1</sup> no utility installations should be made within the access control limits, except under extraordinary conditions or for the purpose of crossing the right-of-way, and then such utility must be so designed, constructed and protected that its operation or functioning may be maintained by the utility company from outside the controlled right-of-way limits without interfering in any way with the traveling public using the highway and ramps.

In all instances, overhead and underground facilities must provide the minimum required clearances and be designed to afford maximum safety for the traveling public. The design and types of materials shall conform with appropriate governmental codes, regulations, and specifications.

There are certain functional requirements that must be considered in the installation of the utilities. Installations should be constructed so that they will be accessible for their own servicing and will not obstruct the area for future highway use and maintenance. Pipe lines should be designed and constructed free of any sharp or acute angles, which would prevent their interior cleaning or swabbing. Pole lines should be so located that their anchors may be installed without encroaching on the backslopes of highway

1. For Interstate highways, see "A Policy on the Accommodation of Utilities of the National System of Interstate and Defense Highways," published by the American Association of State Highway Officials; approved June 10, 1959, adopted July 30, 1959.

drainage ditches. Valves, tees, drips, etc., placed on pipe lines should be located so that they are clear of the highway roadway, drainage ditches, ramps and fences. Conductors for communication lines and electric power lines should be properly spaced and elevated above the ground to meet the standards prescribed by the respective construction codes.

### Relocation Costs

State participation in the cost of a utility relocation required by a highway project will be governed by State law. Normally each relocation will fall in one of the following categories:

1. Where the utility company or owner has a vested property interest in the land being acquired for highway purposes, the relocation costs will be normally borne by either the State or local interests.
2. Where the utility facility occupies a public highway right-of-way through a permit, franchise, or license issued by the responsible authority, the responsibility for bearing the cost of relocation will be normally set forth under the terms of occupancy. Such will prevail except where overriding state laws provide otherwise.
3. Where the utility facility occupies a public highway right-of-way, or land acquired for highway right-of-way, through sufferance, without documented easement in favor of the utility owner, or by actual encroachment, being located outside the described limits of its easement, then the cost of relocation will normally be borne by the utility company.
4. Where there is a combination of the above conditions covering a utility's facility involved in a particular highway project, then the costs of relocation will be prorated between the State and the utility company.

Where the State has requested Federal-aid funds to defray the costs of utility relocations, project approvals, authorizations, scheduling of the work and the handling of the details involved must be in accordance with Federal regulations prescribed by the Bureau of Public Roads (reference is made to the Bureau of Public Roads Policy and Procedure Memorandum No. 30-4, and subsequent related memoranda).

### Project Operating Procedure

Upon completion of planning or highway location surveys the State should immediately notify the owners of affected utility facilities that such surveys have been made and that plans are being considered for a highway improvement. A map showing the approximate alignment of the survey should be forwarded with this notification, together with a request that the owner list all of his utility facilities in the vicinity

of the survey. By an early exchange of such information, both the State and utility company establish a line of communication with each other and can effectuate the most economical and practical solution to their conflicts in the highway location or utility relocation. It is advisable for both the State and the utility to designate one particular person in each organization to act as contact man in all phases of the relocation procedure.

Such an early exchange of information is commonly referred to as "liaison," which is a necessary process for the orderly planning of ways to meet common highway-utility problems. If highway-utility activities are to remain in harmony during the critical and extended period during which many highway-utility conflicts will need to be resolved, liaison can not begin too early in the life of a highway project. It is for this reason that States should attempt to advise the utility and furnish it with the necessary highway construction plan details as soon as they are developed in order that it may be prepared to initiate negotiations or suggestions for making necessary adjustments to its utility facilities in the construction of the highway project. This information can have a decided influence on right-of-way acquisition, as well as road design details.

Such liaison will result in substantial monetary savings in land exchanges as well as special construction details designed to lower relocation costs. Much time, money and effort can be saved where the overall responsibility and authority for coordinating such matters is placed with one individual or unit in the utility and State organization.

After these early State-utility discussions have been held, the State should provide written notice to the utility requesting it to:

1. Proceed with preliminary design for the utility relocation in connection with the State's construction, and
2. Advise the State when such design is sufficiently advanced in order that a field conference may be held.

The utility company should proceed to design its facility and the highway department to design the highway in a manner that will assure that adequate protection is being provided for the highway and that the utility's productive capacity and function is restored to a like condition which existed prior to the proposed highway construction.

Considerable time is saved when an early job site conference is held, attended by the State's resident engineer, the State utilities engineer, and the utility company's engineer. On complicated Federal-aid projects, the Bureau of Public Roads area or district engineer may be requested to attend the conference.

From this conference the utility company obtains the information necessary to formulate its proposal, discuss and be informed of special requirements, reimbursable items, nonreimbursement items, betterments for which it must pay, and other pertinent information that will permit it to submit a proposal that is acceptable with the first

submission. All engineering decisions agreed upon during the site conference should be documented in the proposal submitted by the company, so that these decisions will become a part of the agreement assembly and serve as guiding information to all echelons through which the agreement must pass until final reimbursement is made.

If the utility company is not adequately staffed to prepare the necessary plans and estimates, and desires to use a consulting engineer, permission should be requested in writing from the State. This request must be accompanied by an estimate for such services. Utility companies are sometimes reluctant to start their preliminary engineering work until they have been provided with definite lines and grades of the proposed highway facility. This is not necessarily the most effective approach to the ensuing problem, for here is where the utility company can make a material contribution to the ultimate design of the proposed highway. By providing the State with the benefit of their experience and knowledge of past or related relocations, the utility could initiate certain designs which possibly might result in a monetary saving to both the highway department and utility company, or possibly recommend ways to alleviate the need of making the entire relocation. Likewise, the utility's early participation in design of a relocation also provides essential lead time necessary to procure the utility's own material needs as well as improving possible timing and coordination of problems that would otherwise arise between the utility and highway contractor during the physical highway construction.

The utility will prepare a cost estimate for the relocation in conformity with current requirements. The basis of this estimate will be supported by suitable plans or drawings. This estimate and drawings will become a part of a formal agreement to be executed by the utility and the State. The agreement, estimate and drawings, together with the necessary supporting documents, should be submitted by the utility to the State for its review and recommendations. Any betterments to be installed for the benefit of the company should be so indicated in the estimate, plans and statement of work.

The agreement will set out the contractual relationships between the State and the utility. The utility will agree to provide all necessary supporting affidavits of its rights, title, easements or any other documents that indicate its interest in the land occupied by the affected facilities, in order that appropriate determinations may be made of the proportionate shares of the eligible costs to be borne by the State and the utility. In addition, the agreement must set forth the determined percentages of the total eligible costs to be borne respectively by the State and the utility. The utility must also agree to perform the work as indicated by the accompanying estimate, plans or drawings, subject to the State's and the Bureau of Public Road's (on Federal-aid projects) inspections and approvals during and subsequent to completion of the utility work. The State will agree to participate in the cost of the utility

relocation to the extent prescribed by State laws and policies, and on Federal-aid projects, in conformity with the eligibility requirements for Federal participation. At any time after the execution of the agreement, but before the utility relocations are completed, if it is determined that the cost of the relocation has been underestimated, or substantial change has been made in the plans, the utility should immediately tender a revised estimate, together with a request for approval of any revision in cost.

The utility plans and cost estimates prepared should be sufficiently informative, definitive and complete to provide a clear picture of the work to be done. They form the basis for the State-utility agreement and are made a part thereof as an exhibit. The plans should, at least, include the following data:

1. Related highway alignment (with cross roads and streets) showing project identification, stationing, structures, and profile.
2. Legend, plan scale, plan date, color coded (old and proposed) utilities.
3. Location, length, profile, type, size, class, protective devices, and major component parts of the existing utility facilities with the utility's name shown.
4. Temporary changes to utility facilities (if applicable), showing horizontal and vertical alignment.
5. Permanent changes to utility facilities, showing horizontal and vertical alignment and minimum clearances.
6. Work to be performed at the expense of the owner.
7. Existing and new highway right-of-way lines, with access control shown, if applicable (limits of the utility company's title, easement or permit are desirable also).

The cost estimate is considered acceptable if it meets the following minimum requirements:

1. It should show the utility company name, highway project number, and be identified by number and/or date of estimate.
2. The estimate should set forth the items of work to be performed by groupings, indicating the costs of preliminary engineering, labor, construction overhead, materials and supplies (temporary and permanent), transportation, equipment, etc., broken down by work phases in sufficient detail to provide a reasonable basis for analysis and give a clear understanding of the work involved.
3. It should show all credits to the project, such as salvable material, betterments, and extended service life credit.
4. The estimate should be in sufficient detail so that the State personnel, upon completion of the work, can readily relate the costs accumulated for the work accomplished to the work required in the agreement with no doubt as

to whether any work phases were added or deleted or any betterments were involved.

Some items should properly be left for final review and audit, such as final salvage credits, actual quantities, hours, rates, prices, etc. There are other items, however, such as the general scope of the work, credit for extended service life, overhead or underground design, the economics of the proposed adjustments, need for cathodic protection, thickened wall pipe, spare conduit or duct, coating and wrapping, additional height of pole lines and similar engineering items, which should not be left for decision at the final review and audit time. These decisions should be made and properly documented after adequate review of the proposed utility adjustment by appropriate engineering, right-of-way and audit personnel before the agreement is approved.

No physical construction work toward the accomplishment of the utility relocation may be done prior to written authorization by the State to proceed. In other words, the existing facility is to remain undisturbed, and no expenses of any nature toward the physical construction of a replacement facility or the removal of the present facility may be incurred by the utility until such authorization is given. After joint reviews by all parties concerned, the State will advise the utility company as to the status of its proposed agreement, indicating any missing papers or other information needed to complete the submission, and setting forth any particular stipulations and/or considerations required to make the agreement fully acceptable for final execution.

#### Construction Procedures

Once agreement has been reached on the essential elements by all parties, the utility will be authorized, by written notice from the State, to proceed with the necessary relocation. Upon receipt of the State's authorization the utility will take the necessary steps to bring about the physical relocation of its facilities as soon as possible. If it is necessary for any of the work to be contracted, that is, to be done by other than the utility's own forces, and such fact was not stated in the supporting papers of the executed agreement, the utility must at once advise the State, indicating that it is not adequately staffed or equipped to perform the work with its own forces, or otherwise show that it will be in the public interest to contract the work. Upon the utility's receipt of an approval to proceed by contract method, it will solicit bids from reputable contractors for performing the work.

The utility company will advise the State of the date that they propose to begin the relocation work. If the underlying highway project is advertised for the receipt of construction bids during this interim, the State should so advise the utility. The utility should also be notified of the award date and the highway contractor as soon as possible

following the official award of the highway contract. The State will then conduct a preconstruction meeting prior to the start of physical work in order to review and discuss the proposed construction schedules, sequence of operations, safety measures, and general coordination of work by all affected utility companies and highway contractors who have State agreements or awarded contracts on the related highway project. This meeting is for the benefit of both the highway contractor and utility company and each should send a responsible representative who is in a position to speak for his respective organization. Arrangements are also made at the meeting for immediate notification of specific persons in each organization in case the agreed operational plan is to be adjusted or special safety or protective measures are needed during the construction period.

Where the utility must rent equipment to accomplish the work, an appropriate solicitation for quotations of rental rates from suppliers of the required kind or type of equipment should be made to establish that the lowest available rate is paid. Existing continuing contracts for rental of transportation and other equipment, which the utility has determined to be the most economical for its operations, may, upon approval of the State, be considered as complying with the requirements.

To assure equitable reimbursement for its cost, it is extremely important that the utility keep a careful record of the field operations. Such records should include dates between which particular field operations were performed, the number of men used on the job to accomplish those operations, the number, kind, and capacity of the required pieces of equipment and machinery, dates used, the actual quantities of all materials used and quantities and conditions of those received and returned shall be recorded.

The State should at all times during the physical re-arrangement of the facilities keep a record of materials being placed in the new installation, materials being removed from the present facility, the number of employees working, the number of man-hours worked, supervision provided and equipment used.

It is advisable that the State's construction supervision of utility relocations be in the hands of one man, a project inspector, with necessary assistance from other field and staff members. Such assignments are made in the same manner and purpose as those made for other items of construction. This procedure also gives a more uniform interpretation and treatment of State and Federal requirements. By the same token, utility companies are urged to follow the same practice. The project inspector should keep a detailed record, by date, to include the work force and equipment used, the disposition of salvaged or removed materials, and the amount of new materials going into the work. Complete records should be kept by the project inspector, showing quantities involved in credits for betterments and salvage, completely supported by appropriate, documented notes. The inspector should develop records of the actual work

adequate for use in auditing procedures and development of as-built plans at a later date. Such records will require submission of the regular notices for the start of work on a project and completion of utility work as are required on all highway construction contracts. Weekly progress reports, covering such utility operations, will also be prepared and routed in the same manner as weekly reports covering highway construction operations.

The utility company should carry out the relocation and record the related actual costs in accordance with the provisions of the approved agreement and all other provisions prescribed by State laws and policies of the State. The utility company should be required to keep, and make available to the project engineer, and to other authorized representatives of the State, copies of detailed payrolls for office and field personnel, equipment use records, materials used, and salvage records, including the condition and disposition of the removed and salvaged materials, as well as the payment to any subcontractor, if the work is performed in that manner.

#### Payment for Relocation Costs

Upon satisfactory completion of the work covered by a relocation agreement, the utility must make a complete billing covering all costs incurred, with complete "as-built" plans, and submit same to the State for review and approval. The billing should show the description of the work and give the site of the project, the project number, and the date on which the first work started. Where preliminary engineering and/or right-of-way items are involved, the date should be given on which the earliest item of billed expense was incurred, and the location should be noted where the records and accounts billed can be audited. The billing should be prepared in a statement form accompanying State claim forms properly executed in the required number. Adequate references must be made in the statement to properly correlate the billing with the company's accounts, records and relevant documents.

Unless the agreement was approved on a lump sum basis, the statement setting out the accumulated costs shall follow as closely as possible the form and order of the items set out in the estimate supporting the approved agreement. The totals for material and supplies, material handling costs, labor, overhead, travel expense, transportation, equipment costs, miscellaneous construction costs and/or other services will be shown in such a manner as will readily permit a comparison with the approved plans and estimates.

All principal items of material should be detailed to show actual quantities, sizes, description, unit price and extensions, following the pattern set up in the approved estimate as closely as possible. Salvage credits for recovered permanent materials will be shown on the statement following the charges for materials incorporated in the

permanent facility, and salvage credits for temporary materials used or returned from the job should follow the charges for materials charged to temporary construction.

Cost records and accounts are subject to audit by a representative of the State and (on Federal-aid projects) the Bureau of Public Roads. During the progress of construction and until the audit of the utility records and final payment of relocation costs has been completed, the records and the accounts pertaining to the construction of the project, and accounting therefor, will be available for inspection by the representatives of the State and (on Federal-aid projects) the Bureau of Public Roads.

### Conclusion

The American Association of State Highway Officials and the American Right of Way Association have viewed with professional concern the implications of the increased volume and magnitude of highway and utility right-of-way relocations which will be required over the years ahead as a result of the tremendous construction program of a nationwide system of highways to be built under the provision of the Federal-Aid Highway Act. Both associations, representing national components of highways, utilities, and other agencies, recognize that these respective organizations would be seriously affected by the required relocations or possible disruption of many portions of their respective highway and service networks.

During the past several years, the AASHO/ARWA Liaison Committees have been engaged in the stimulation, encouragement and sponsorship of mutual advance planning procedures between highway departments, utilities, and other agencies. This form of liaison does not include discussions concerning the geometric design of highways, design of utility facilities, or questions of reimbursement to the utilities for relocation costs. However, the joint committees have found that where *bona fide* cooperation and collaboration of the parties have been established, there are many tangible benefits resulting to the participating agencies. Likewise, these objectives also are consistent with the principles of the Bureau of Public Roads' policy and procedures, which provide for the encouragement at State levels of the advance planning needed to resolve utility adjustments and relocations.

## CHAPTER 45

### The Research Function in Right-of-Way Acquisition

DAVID R. LEVIN

*Deputy Director, Office of Right-of-Way and Location,  
Bureau of Public Roads*

Certain kinds of research studies can be of inestimable value in land acquisition for highway purposes. Because increasingly large amounts of public funds are being spent for highway rights-of-way, attention today is being focused on all elements of right-of-way cost. The general principle which both Federal and State highway officials seek to follow is not to underpay any particular property owner, but not to overpay either. To assist this objective, more and more States are finding that research on particular right-of-way problems can pay handsome dividends.

Accordingly, the right-of-way professional should know something about the kinds of research studies which are being undertaken in this field today, and some possibilities for the future. The kinds of research referred to involve economic impact research, severance damage studies of several kinds, control of access analysis, and other varieties. These are discussed in some depth in the following paragraphs.

#### ECONOMIC IMPACT RESEARCH

As a point of orientation, it might be profitable to here review the standards that governed the selection of routes for the National System of Interstate and Defense Highways. The selection of this system was no hit-or-miss proposition, as some erroneously believe, but was based on sound engineering and economic criteria, as follows:

1. *Service to cities of various population groups* — The routes selected should connect as directly as possible the maximum number of cities of various population groups.
2. *Service to principal metropolitan areas* — The routes selected should provide maximum service to principal metropolitan areas as well as to specific cities.
3. *Density of rural population* — Routes should traverse the country's most populous bands of rural territory.

4. *Distribution of the whole population* — Routes should have their principal termini in the larger cities and also pass enroute between these termini through or very close to the denser clusters of population in small towns and populous rural areas.
5. *Relation to manufacturing activity* — The routes selected should provide transportation facilities for as much as possible of the manufacturing industry of the country. Locations where manufacturing activity exists in greatest volume are the points of origin and destination of large volumes of motor truck traffic for which service should be provided, as well as for passenger car traffic.
6. *Relation to agricultural production* — Interstate System routes should traverse to the maximum extent possible the areas of high per acre value in marketed crop production.
7. *Relation to concentrations of motor vehicle ownership* — Interstate System routes should be selected to traverse to the maximum extent possible areas having a high density of motor vehicle ownership.
8. *Relation to routes of strategic importance from the standpoint of national defense* — The Interstate System should be designated to include the principal traffic routes of military importance.
9. *Relation to military and naval establishments and war industry* — Routes of the Interstate System should be selected to serve the highway movement to and from military and naval establishments and potential war industries.
10. *Relation to routes of highest traffic volume* — Interstate System routes should be selected in accord with the highest traffic volumes in the areas traversed, serving a share of the total highway movement greatly exceeding the proportion of the total highway mileage involved.
11. *Relation to principal topographic features* — Consideration of major topographic features is important in the selection of some Interstate System routes. Conformation of the land and the courses of principal rivers may influence to some extent the location of certain routes.
12. *Cooperation with the Department of Defense* — One of the primary functions of the National System of Interstate Highways is to serve the national defense. Under the provisions of the Federal-aid Highway Act of 1948 the Commissioner of Public Roads was directed, among other things, to invite the cooperation and suggestions of the Secretary of Defense.

The measurement of the effects of this route selection process, and in fact, almost every kind of activity involved in the right-of-way function can benefit from the

increasingly significant findings of economic impact research. This kind of study seeks to ascertain the nature and magnitude of the economic and sociological effects of highway improvements on urban and rural communities, on residences, on industry and business, on recreation, on natural resource exploitation, and all other sectors of the economic life of the nation.

Obviously, if the right-of-way official is fully informed on the findings of this research, he can more competently acquire the lands needed for highway purposes at the lowest price to the public and the fairest price to the property owners involved. The data derived from economic impact research can be very revealing in distinguishing between real and fancied damages. If there is actual damage involved in a particular taking of property for highway purposes, the right-of-way official will be the first to recognize it and want to compensate the landowner for it, to the extent that compensation for such damage is authorized by law. If there is no damage in fact, economic impact research could reassure the property owner and he will be the more willing to settle for a fair price.

Aside from its more specific applications in the right-of-way appraisal and negotiation processes, economic impact research will provide a broad and general background for the right-of-way official which can be obtained in no other way. Accordingly, it is suggested that the right-of-way agent obtain, at the earliest possible time, copies of any economic impact research which has been conducted in his own State. From that point on, he may want to investigate the best of such similar studies in other States. A selected list of a few of the latest completed economic impact studies, as of the date of this writing, is found at the end of this chapter. (*Attachment A*)

Recently, an excellent summary of about 100 of these studies has been prepared for the use of the Congress of the United States. Hundreds of thousands of dollars of research money are represented by these studies, yet the summary can be obtained for a mere twenty-five cents, by writing to the U.S. Government Printing Office, Superintendent of Documents, Washington 25, D.C. and asking for *House Document 72, 87th Congress, 1st Session*. The State highway departments probably have extra copies available for the use of their right-of-way personnel; otherwise it is well worth the small expenditure for the individual to purchase his own copy, for this report will place the right-of-way professional in possession of solid factual data on matters and areas of his work about which he had previously only had a general or intuitive knowledge.

An extensive manual is now available for the conduct of economic impact research, issued by the Bureau of Public Roads, entitled *Guide for Highway Impact Studies*, December 1959. It is available from the State highway departments or from the Bureau of Public Roads.

A particular kind of economic impact research which has just been described involves severance damage or land economic studies. In general, severance damage or partial-taking studies are case history analyses of all or a selection of parcels along a given highway route that has been improved. The facts that constituted the basis for the appraisal of and payment for severance damages in the first instance are the starting point. To these are added such facts as the condition of access, proximity to an urbanized area, type of highway, size of the parcel remaining, land use status, distance to ramp or interchange, and other related factors. Additionally, any sales of the remainder or portions of the remainder are analyzed in terms of similar elements. From all of these facts, it should be quite obvious whether a proper or improper basis was used in the first instance in ascertaining the kind and amount of severance damage that existed, if any.

Traditionally, highway departments have been seeking to ascertain and measure the extent of severance damages, based upon the generally accepted legal and appraisal principles that govern such situations in the particular State involved. A few highway departments have, in the past several years, noted that at least in some instances allegations of damage to remainders have not materialized in fact, after the highway improvement was completed and opened to traffic. Quite to the contrary, they have been aware that in many instances substantial benefits to the owners of remainders have resulted instead of fancied damage.

Suspicion of benefit, however, is an insufficient basis upon which to mount an appraisal that will stand up under the scrutiny of either the experts for the property owner or the courts that seek to arbitrate disputes between public or quasi-public officials and property owners. Moreover, such officials themselves want to be fair to both the public that must finance the bill and the property owners; they want to neither overpay nor underpay.

The answer to this vexing problem is scientifically derived data, in the form of case histories of properties that have been subjected to partial taking for highway purposes, over a sequence of time. For the sake of easy identification, these have been called severance damage or partial taking studies.

#### Savings Resulting from Use of Studies

Actually, these studies cost very little to undertake. Yet the potential savings that could result from the application of the data developed in these studies could be enormous. In this connection, a recent litigated case in Mississippi should be noted, where the owners sought total compensation from the State highway department, including a large severance damage item, amounting to \$404,270. At the trial in the

Mississippi Chancery Court, the highway department brought in technicians who had produced some of the economic impact studies in Texas, since they had not yet developed similar data of their own. It is believed that a great deal of weight was given to this testimony, and the Chancellor awarded the property owners the sum of \$29,312. On appeal, the Mississippi Supreme Court reduced the award to \$6,812.

It is quite apparent that the difference between \$404,270 and the final award of \$6,812 can buy a lot of economic impact research or severance damage studies in Mississippi, and the State would still be money ahead.

#### Extent of Severance Damage Research

Severance damage studies are now actively being carried on in 30 States.<sup>1</sup> Twelve additional States are planning to undertake severance damage research.<sup>2</sup>

The nature of the work completed to date and of studies in progress is outlined in *Attachment B*, attached to this chapter.

In most of these States, the actual research or investigation is being carried on by the highway department personnel; in a few cases by university groups or others. In all of these instances, Federal-aid highway planning survey funds are used, the so-called 1½ percent funds.

#### Suggested Form of Case Study

The earliest of these severance damage studies were undertaken in California. Based upon the California experience and later studies in Washington, Oregon, Ohio, and other States, a suggested form has been evolved for assembling data for each partial taking involving severance damage. It is included as *Attachment C*.

At first blush, one may note that this form is rather extensive. Just a word about that: If only half of the facts are obtained, the study might just as well be forgotten entirely. One can assume that these data will be scrutinized closely by the appraisers for the property owner (and they should) and by the courts. If a complete job has been done, the data will stand up; otherwise, they will be discredited.

The form suggested is designed with that end in view. In fact, it utilizes much, if not all, of the data contained in the original California forms and it is also a re-arrangement designed to facilitate easy coding and analysis. Extensive use is made of check boxes; and while this extends the physical size of the form, it makes for easier analysis at a later date.

#### Analytical Punch Cards

If this general form and approach is followed by a particular State, it will obtain a respectable amount of sound data on each of a selected number of partial takes. The

next step is to package these data in usable and easily accessible form. Punch cards have already been designed which will serve this purpose.

If the suggested standard form and punch cards are used by the States, every State highway department or other agency will be enabled to use the data derived by every other State. If a group of States, such as for example, Wisconsin, Indiana, Illinois, Iowa, etc., wants to interchange punch cards, they can do so with the confidence that, if any of them punch code 15 or 16 or 25 on any of the cards, exactly the same data will be represented.

Not only does this make sense from a State's point of view, but doing it this way will mean that a "bank" of severance damage data will have become available for the first time, so that trends on a Statewide, regional, or even national basis can be formulated. This in itself will be invaluable to all the State highway departments.

#### Standards for Classification of Cases

If this research program gains momentum—and there is every promise that it will—then it is possible that a number of States will accumulate 200 or 300 or 400 case histories within the very near future. In this connection, it becomes most important to evolve a logical system of classification of these severance damage cases. When a new one of any particular type arises the three or four or five outstanding characteristics can be identified, and, through the use of punch cards, cases with similar characteristics can be quickly separated out from the "bank" by use of machine operations. For example, some of these characteristics may concern type of land use, distance from the nearest urban center, nature of the severance, total area of the parcel, kind of highway to which it is adjacent, type of access to that highway, and many other related elements. This would save the countless man-hours of work that would be required in going through 300 or 400 cases manually.

What is suggested here is a procedure similar to that which has been used for many years in connection with origin and destination studies.

#### Severance Damage Manual

A study outline is now available for severance damage analysis. It is entitled, *Manual for Highway Severance Damage Studies*, Bureau of Public Roads, 1961. It is available from the State highway departments or from the Bureau of Public Roads.

This manual outlines the essential features involved in the assembly, analysis and evaluation of severance damage data, resulting from partial takings of land for highway purposes. The manual includes the standard collection form which most State highway departments are using, a punch card processing procedure geared to the collection form, and suggested analytical formats.

It is the analysis approach that will, of course, provide the real "pay-off," one might say, in these severance damage studies. Case history data is not being assembled for their own sake. The information must be put to productive use in the acquisition and appraisal process, and unless it is, the effort will have been largely wasted. The manual, accordingly, develops these elements quite extensively.

#### Court Use of Severance Damage Data

Severance damage data, derived under the program just described, can be used, first and primarily, in the acquisition process by appraisers for both the public or quasi-public agencies and the property owners. Since approximately 85 percent of the acquisitions, for highway purposes at least, are settled by amicable negotiation, it can be used effectively in this large area of negotiation in the acquisition process.

It can also be used, in varying degrees depending upon the rules of evidence of the particular jurisdiction involved, in the remaining 15 percent of the cases that are litigated. It can be put into evidence directly or only upon cross-examination, as the rule of the particular court may dictate. The general standard in California, for example, is as follows:<sup>3</sup>

Sales in general, to be admissible as evidence, must be sufficiently near in time and location to the land to be valued, and must be sufficiently alike in respect to character, situation, usability and improvements, to render the two properties comparable in value.<sup>4</sup>

A scholar of this particular aspect of the law has recently summarized two general rules governing this subject matter in connection with the use of severance damage data:

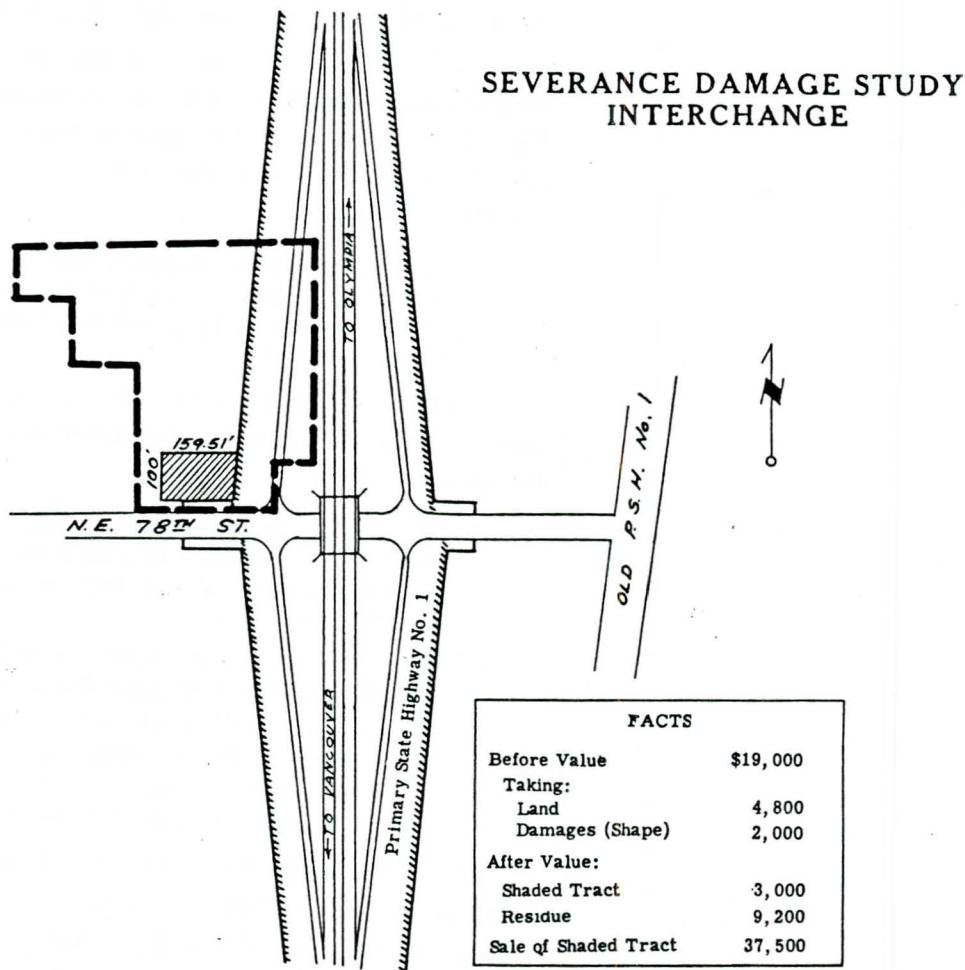
- (1) In general, sales prices of similar properties in the vicinity are admissible on direct as well as cross-examination, provided a sufficient foundation is laid to show comparability. If not remote in time, a prior sale of the subject property is likewise admissible.
- (2) Sales prices of similar properties to bodies possessing the power to condemn may, in a given case, be admissible on direct as well as cross-examination, but only when a showing is made that the transaction was voluntary, not influenced by the threat of condemnation, and not the result of a compromise. If admitted on cross-examination (and perhaps even on direct), a party is entitled to have the court give the cautionary instructions.<sup>5</sup>

An extensive analysis of the court use of severance damage studies and other types of economic surveys has recently been completed by the Bureau of Public Roads. It is entitled *Economic Evidence in Right-of-Way Litigation*.<sup>6</sup> This analysis is certainly worthy of careful study and is available from the State highway departments or the Bureau of Public Roads.

Illustrative Case History Studies

In order to show more precisely the nature and value of severance damage studies, a selection of case histories has been made from California, Michigan, Oregon and Washington. No particular significance attaches to these several States, except that the data were readily available and these studies are perhaps as far along as any. The findings of some of these parcel studies are deserving of close attention.

Figure 1 represents an interchange area along Primary State Highway No. 1 in the State of Washington. Note the entirety outlined with dashed lines, containing over 7 acres of unimproved lands. Note, also, the portion taken in February 1957, for highway right-of-way purposes. The highest and best use of the property at the time



SOURCE: Land Economic Study, No. 5, Washington State Highway Commission SD 1

Figure 1

of taking was considered to be commercial for a depth of 100 feet fronting on Northeast 78th Street, and residential for the balance of the entirety.

The "before" value was \$19,000. The right-of-way taking compensated the owner to the extent of \$6,800, as indicated, leaving an "after" value of the remainder of \$12,200. The small, cross-hatched parcel of 100 x 160 feet was sold in January 1958, eleven months later, for \$37,500. The owner still has the rest of his remainder.

Confronted with the facts in this case, one is almost compelled to conclude that specific benefits were largely ignored in this instance, or the appraisal basis for the valuation of the remainder was unrealistic in the first instance.

Figure 2 presents a different interchange area along the same highway in Washington. The entirety, as outlined by the dashed border, contains almost 36 acres of land, on which were a 7-room house, cabin, barn and shed in salvage condition as of October 1954, when the indicated right-of-way was taken, right through the middle of the parcel. The improved highway is now approximately 5 to 10 feet below the grade of the remaining lands. The east portion is landlocked.

The entirety was valued, at the time of the right-of-way taking, for \$27,575. The highway department paid \$11,000 for the land taken for right-of-way purposes, leaving an "after" value of the remainders on both sides of the highway of \$16,575.

Parcels 1 and 2, as indicated, sold for \$30,000 and \$20,000 respectively, and the owner still has almost 8 acres left on the east side of the freeway.

Figure 3 involves property in a single-family residential use on 11,120 square feet of land, as indicated. The State of Washington acquired 2,615 square feet of this total in February 1954 and paid the owner \$5,000 therefor; the entirety was valued then at \$10,800.

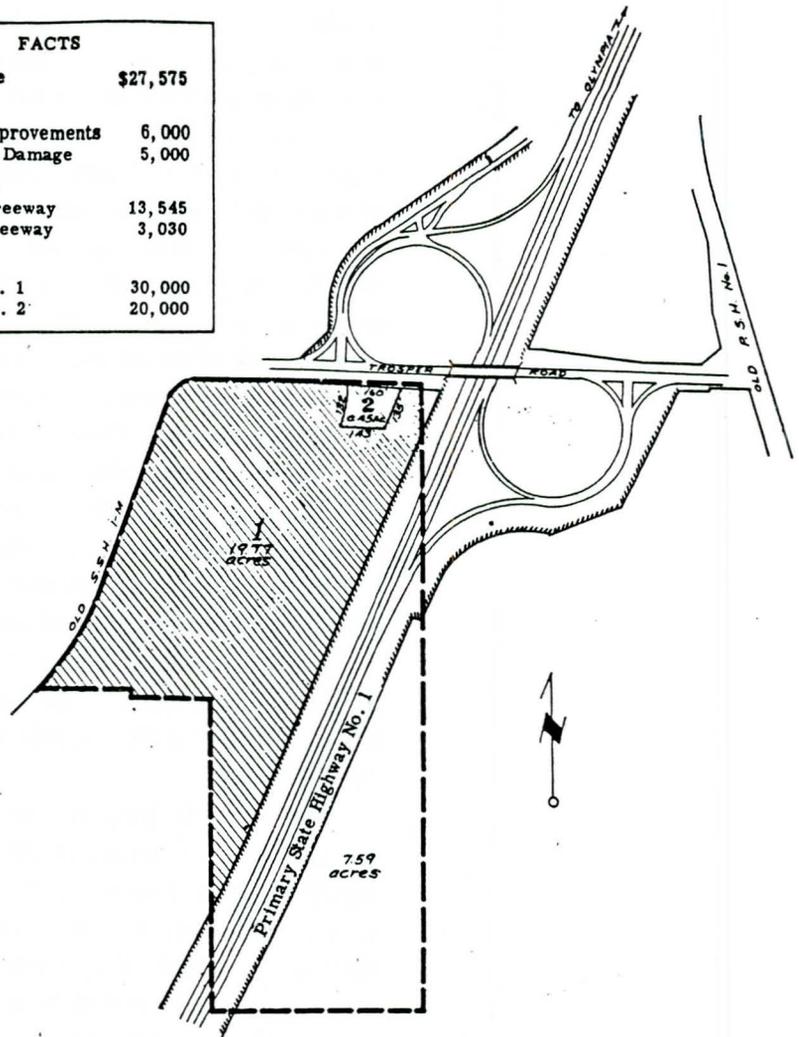
The remainder property, with the residence on it, sold thereafter in April 1954 and then again in September 1954. The first sale was for \$10,800; the second for \$10,750, each of these being almost double what the remainder value was at the time of the right-of-way acquisition and the basis of the payment to the owner by the highway department. Here again, it is obvious that the basic rules of appraising, as promulgated by the profession and as sustained by the courts, need an overhauling, in view of findings of this kind.

Incidentally, not all of the case histories studied are as dramatic as the three just illustrated. For example, an interesting situation occurs in Figure 4, a single-family frame dwelling on a parcel containing almost 10,000 square feet of land. The State of Washington acquired 88 square feet of land plus access rights to the westerly end of the property, in October 1957. The surface of the highway is 13 feet above the grade of the remainder lands.

The "before" value, in October 1957, was estimated at \$15,700, and the State paid approximately \$5,900 for the small portion it took for right-of-way purposes.

## SEVERANCE DAMAGE STUDY INTERCHANGE

FACTS	
Before Value	\$27,575
Taking:	
Land & Improvements	6,000
Severance Damage	5,000
After Value:	
West of Freeway	13,545
East of Freeway	3,030
Sales:	
Portion No. 1	30,000
Portion No. 2	20,000



SOURCE: Land Economic Study, No. 2, Washington State Highway Commission SD 2

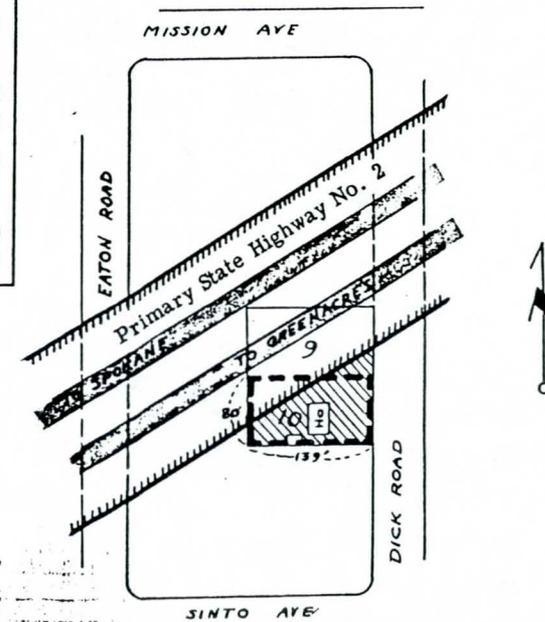
Figure 2

The "after" value of the remainder was, accordingly, deemed to have been \$9,800. The property was sold in January 1959 for \$11,500. It will be noted that there was some increase, substantial but not a fantastic one.

These studies of severance damages are objective research, of course. The attempt is not to deliberately isolate the sales involving great increases and ignore the others, just to make a point. For example, in Figure 5, is an illustration of a sale at a loss, in

## SEVERANCE DAMAGE STUDY URBAN

FACTS	
Before Value	\$10,800
Taking:	
Land	400
Damages (Proximity & Shape)	4,600
After Value	5,800
Sales:	
First	10,800
Second	10,750



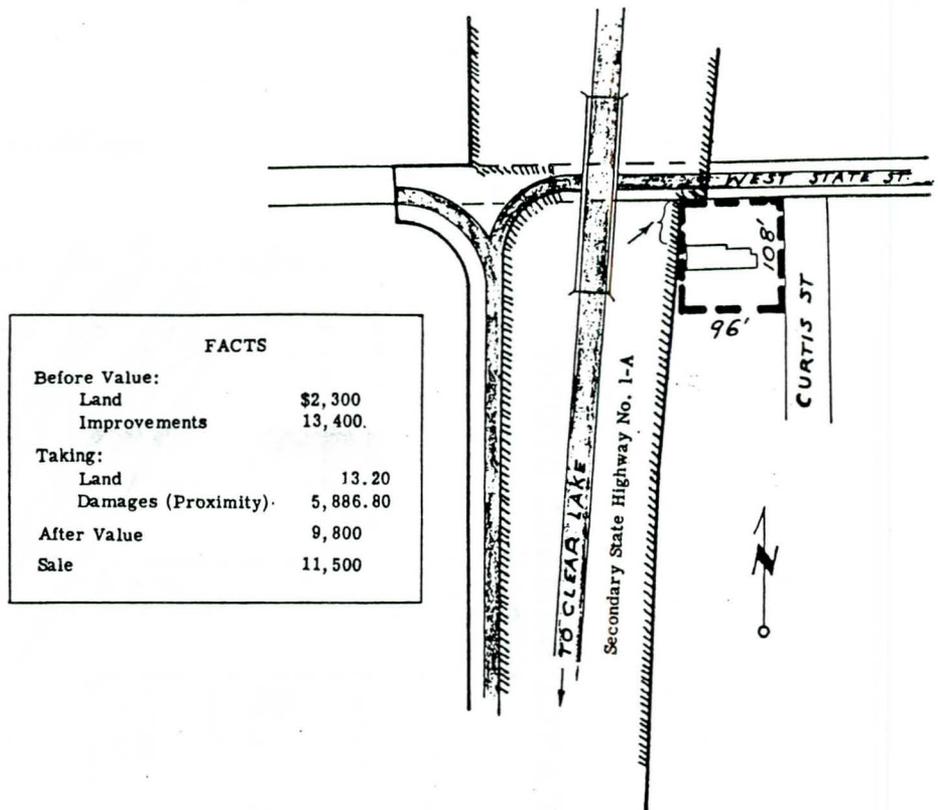
661

SOURCE: Land Economic Study No. 26, Washington State Highway Commission

SD 3

Figure 3

# SEVERANCE DAMAGE STUDY URBAN



SOURCE: Land Economic Study, No. 7., Washington State Highway Commission SD 4

Figure 4

terms of the "after" value, which might indicate that it was underestimated, rather than overestimated, in terms of the market.

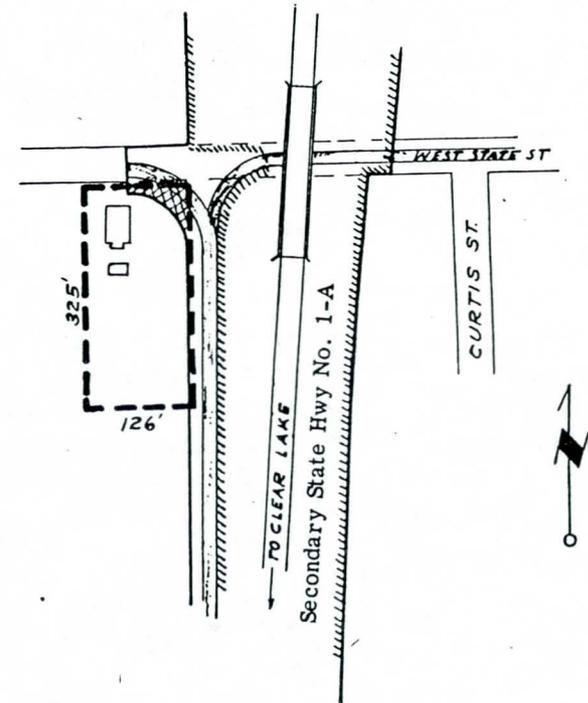
The subject property originally contained almost 30,000 square feet of land, with a single-family frame dwelling on it, together with an old frame shed. The State acquired 1,725 square feet in October 1957. A frontage road is at grade with the remainder lands. The "before" value was estimated at approximately \$7,000, and the State paid \$665 for the land taken for highway purposes, leaving a value of \$6,335 attributable to the remainder. The remainder was sold for only \$5,600, just 7 days after the acquisition by the State.

The next illustration, Figure 6, is one of a series formulated by the Oregon State Highway Department, and involves the Baldock Freeway. The subject entirety was a 70-acre farm, classed as semi-marginal. The nearest access to the freeway lies 7 miles

## SEVERANCE DAMAGE STUDY URBAN

FACTS	
Before Value:	
Land	\$1,300
Improvements	5,700
Taking:	
Land	100
Damage (Proximity)	565
After Value	6,335
Sale	5,600

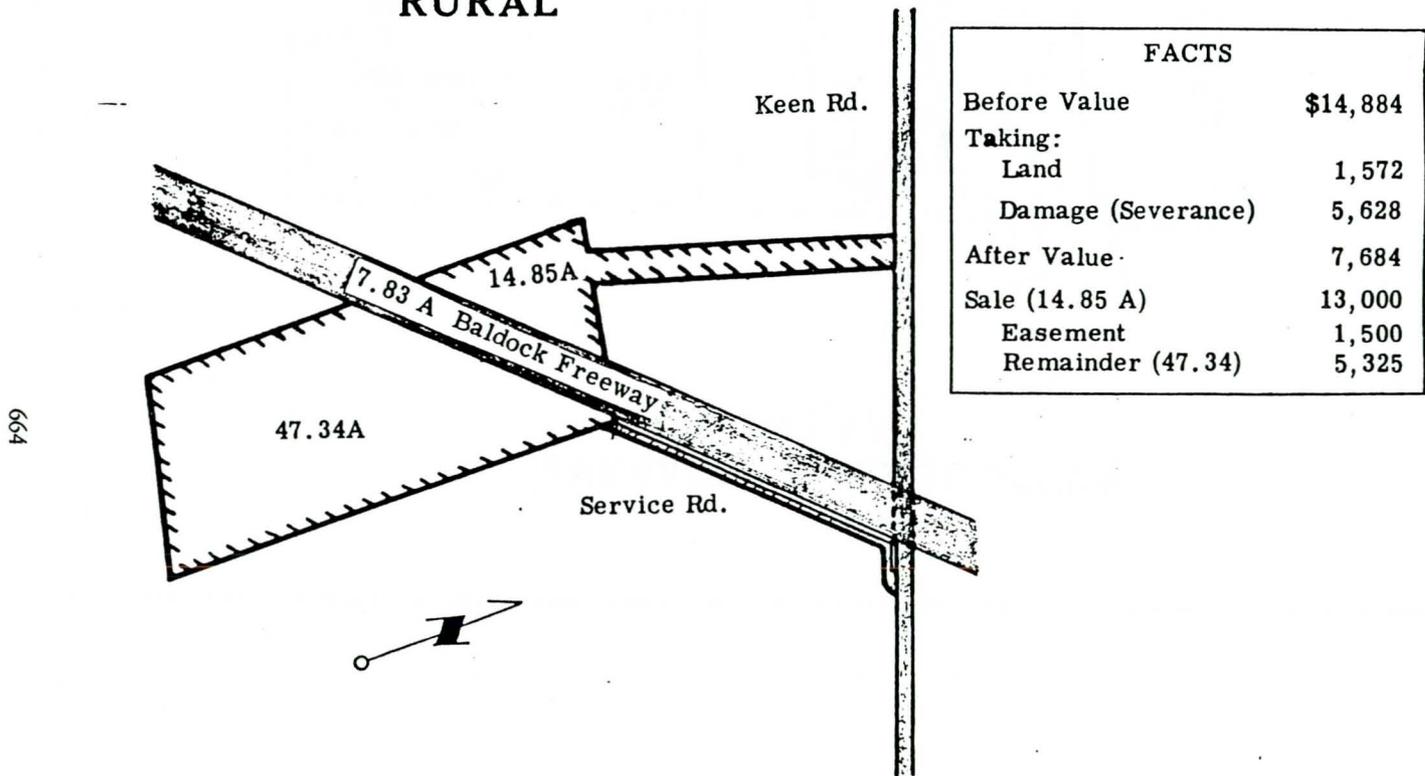
663



SOURCE: Land Economic Study, No. 9, Washington State Highway Commission SD 5

Figure 5

# SEVERANCE DAMAGE STUDY RURAL



SOURCE: Land Economics Studies, Properties Abutting Baldock Freeway,  
Oregon Highway Department, Salem, Case No. 7

Figure 6

away. The State, at its own expense, built a service road providing good and adequate access to the 47-acre remainder. The other remainder consisted of approximately 15 acres. The distance between the two severed parcels, via the frontage road, is approximately three-quarters of a mile.

The "before" value of the entirety was deemed to be approximately \$15,000. The State paid approximately \$7,200 for the right-of-way taking. The "after" value was a little less than \$7,700. Yet the smaller remainder of 15 acres sold for \$13,000, almost double the value of both remainders combined as set at the time of the highway taking. Additionally, the 47-acre still remains with the original owner.

Figure 7 portrays a diamond interchange area, including the subject property originally consisting of approximately 45 acres of idle farm land, zoned residential and located a quarter of a mile south of the City of Kalamazoo, Michigan. The area is bordered by a luxury home type of development and has all of the usual urban improvements. The tract had 1,246 feet of frontage on Oakland Drive. The owner purchased this tract on June 9, 1958, for \$45,000.

In May 1959, the State acquired approximately 13 acres outright and an easement of almost half of an acre for the widening of Oakland Drive. The court determined that the "before" value of the entirety was \$54,200, and awarded the owner \$40,780 for the land taken by the highway department and damages to the remainder. This was based on an "after" value of \$13,420.

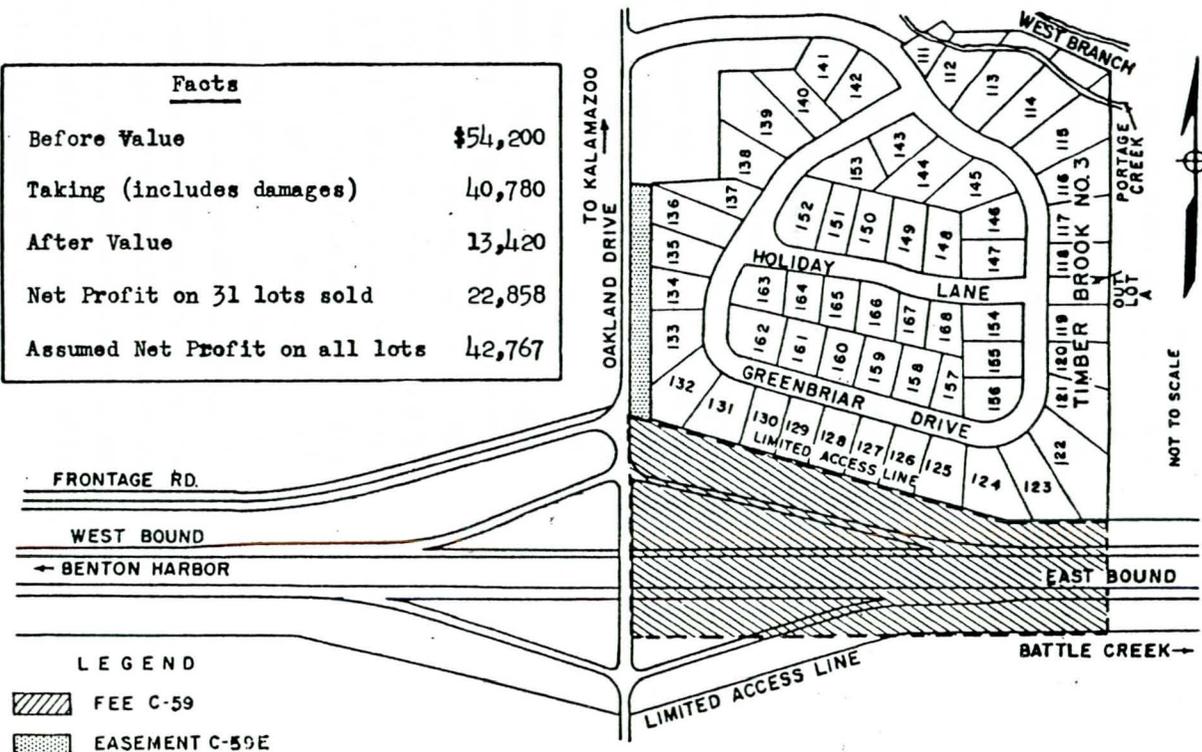
Subsequently, the owner subdivided his remainder property into 58 luxury-type residential building lots, with all improvements installed. Within a year, 31 of these were sold for prices ranging from \$3,000 to \$5,000, with an average of \$3,875 per lot. Allowing for the development costs involved, the net profit on the 31 lots amounted to \$22,858. If the same profit margin is projected to the remaining lots, the aggregate net profit will amount to \$42,767. It is quite obvious that this later development renders invalid the appraisal concepts on which the court made its award at the time of the highway right-of-way taking.

Figure 8 depicts a highway improvement and the subject property, consisting of a 151-acre farm, with the usual, but modernized, farm structures. The State appraised the entirety in June 1958 for \$25,800. The State settled with the owner for a total compensation of \$11,600 in November of that year. Parcel B was landlocked completely and a 90-percent damage item was assigned to it accordingly. The remainders in the aggregate were assigned an "after" value then of \$14,200.

Parcel A sold in September 1959 for \$9,500. In December of that year, Parcel B sold for \$5,000, and Parcel C can readily sell for \$6,000 or more. Here again, it is quite obvious that severance damage was over-estimated in this case, when the results are measured by realistic appraisal principles, which some appraisers for

SEVERANCE DAMAGE STUDY  
Interchange (Residential)

Facts	
Before Value	\$54,200
Taking (includes damages)	40,780
After Value	13,420
Net Profit on 31 lots sold	22,858
Assumed Net Profit on all lots	42,767

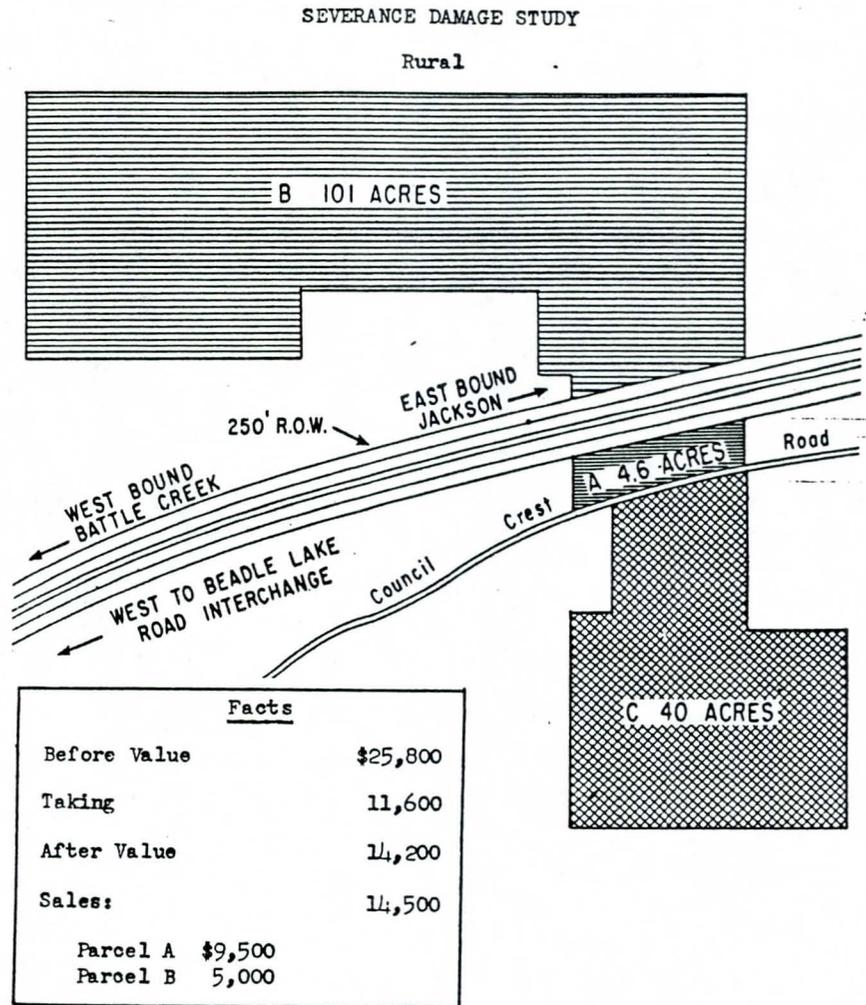


999

SOURCE: Land Economic Study No. 2, Michigan State Highway Commission. SD-7.  
Figure 7

property owners and the courts often refuse to recognize. It is the expectation that these studies will help to convince them of the truth in the matter.

The next few cases come from California. The subject property, adjacent to the highway improvement, as indicated in Figure 9, consisted of a 9-acre orange grove valued at \$18,000, and improved with a single-family residence and garage valued at \$2,877, for a total "before" value of \$20,877. In September 1950, the State acquired

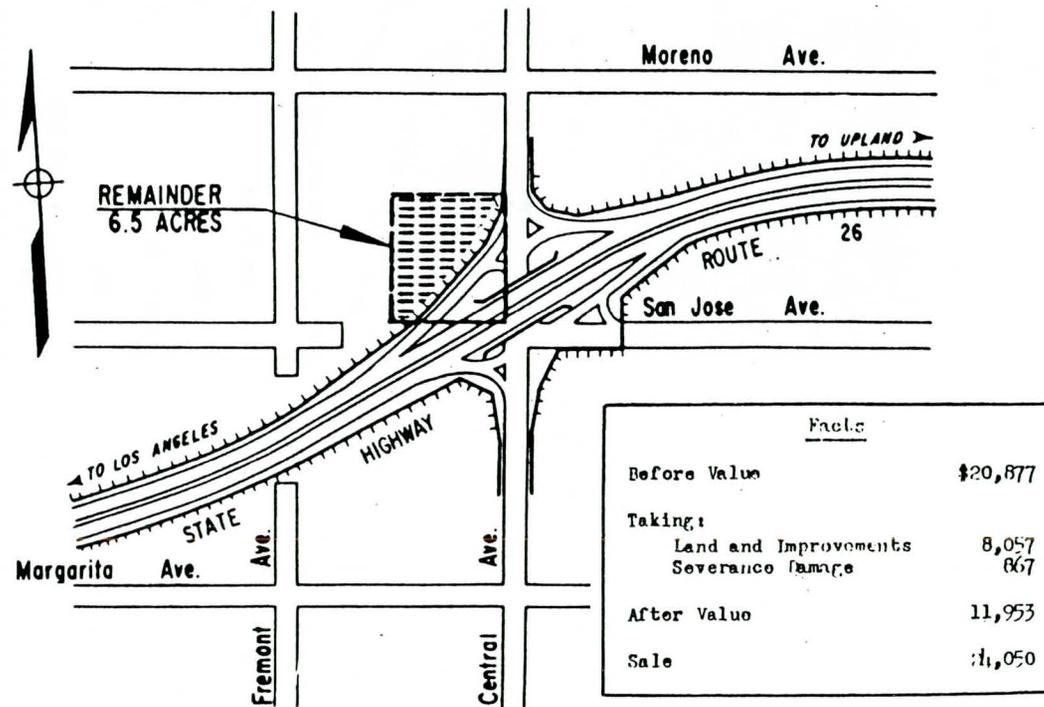


SOURCE: Land Economic Study No. 3, Michigan State Highway Department. SD-9.

Figure 8

SEVERANCE DAMAGE STUDY

Interchange



899

SOURCE: Land Economic Studies, Remainder Parcel Analysis, California Division of Highways, Case No. C-VIII-2-87. SD-10.

Figure 9

about 2.6 acres of this entirety and paid the owner \$8,924 for it. Accordingly, the "after" value was set at \$11,953.

Less than 5 years later, in April 1955, the remainder was sold for \$24,050, or a gain of 101 percent over "after" value, according to the California analysis. During the same period, properties in a similar (control) area increased approximately 75 percent. Hence, the subject property had a net gain of 26 percent due to the highway influence.

Another California study involves Figure 10. The property in question consisted of a 15,000-square-foot vacant lot valued at \$2,000. In September 1953, the State acquired 2,358 square feet and paid approximately \$800 for that amount of land. The "after" value, accordingly, was \$1,200. The remainder sold in April 1956 for \$1,000. Obviously, this involved a loss to the owner of \$200. It can be seen that, in this severance damage program, the researchers are just as much interested in the minuses as in the pluses. The objective is to develop a much more scientific and realistic approach to remainder valuation than is available at the present time.

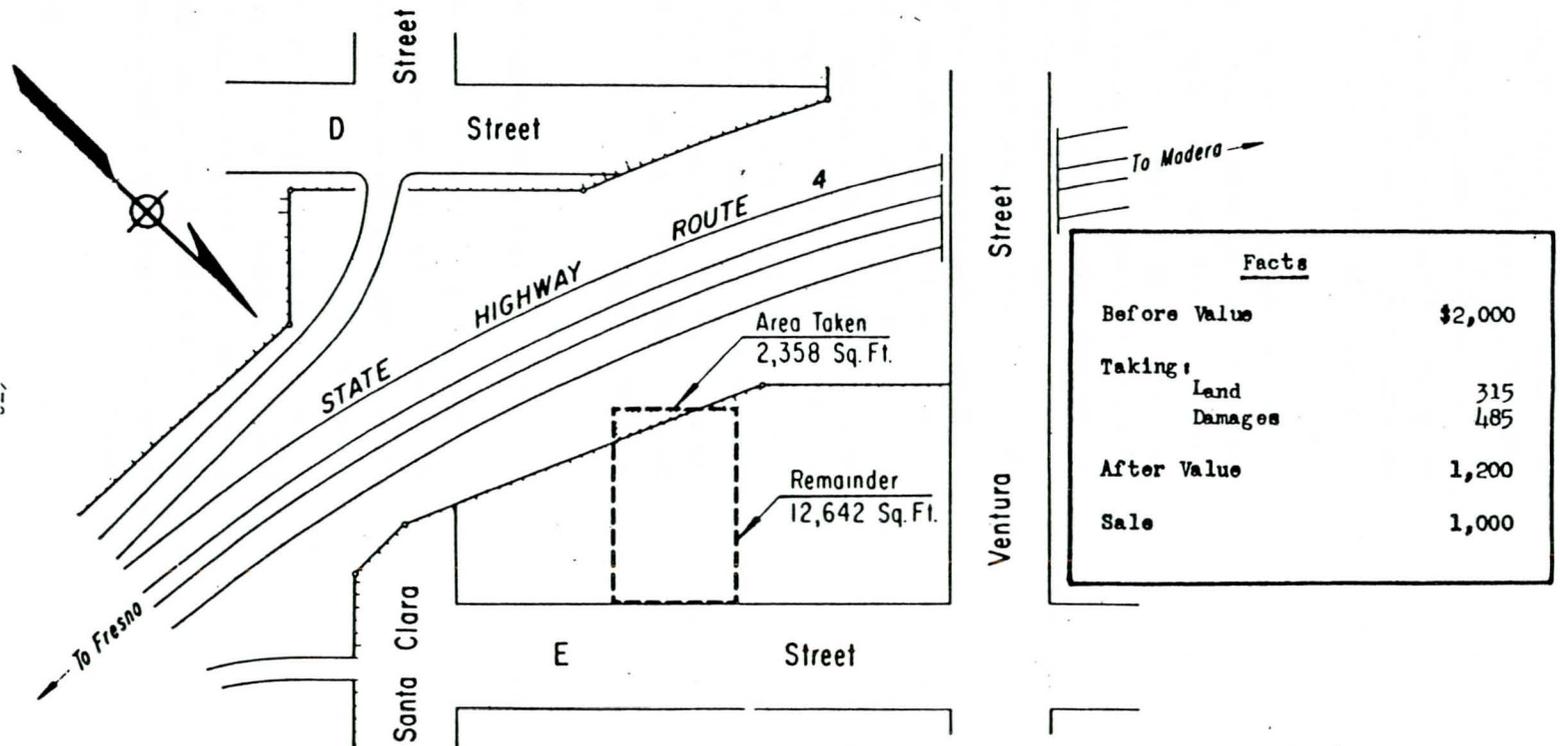
Severance damage studies, of a kind just described, make good sense from many different points of view. Data derived from these studies will enable the operating right-of-way official to determine, with far greater precision than ever before, the nature and extent of severance damages, which is a substantial part of the total right-of-way bill. Instead of a speculative approach, which most appraisers have had to take in such matters in the past, a much more scientific approach is now possible. Additionally, it will enable the judiciary to render fairer decisions, to both the condemner and the condemnee, when partial takings are involved. It will save the taxpayers untold sums of money and will benefit the property owner, for he, too, is due just treatment.

#### OTHER TYPES OF SEVERANCE DAMAGE RESEARCH

Once having set up the necessary research machinery, other types of analysis can be easily derived from the basic data, which could be most useful in every-day appraisal and negotiation problems. An example of this type of use may be one found in Ohio recently.

As a result of building highways of modern design, that State found it had landlocked a considerable number of parcels, over an extended period of time. On many of these, it had used a so-called "90-percent damage" rule, by which it was assumed that landlocked parcels were damaged 90 percent of their current market values. There seemed to be no factual basis for the rule, except the judgment of its makers.

SEVERANCE DAMAGE STUDY  
Vacant



SOURCE: Land Economic Studies, Remainder Parcel Analysis, California Division of Highways, Case No. C-VI-1-52. SD-12.

Figure 10

After the passage of time, considerable activity in the sale and disposal of these landlocked parcels was noted, and it was decided to study the magnitude of recoveries upon such sales. A most significant fact was observed: The extent of the recoveries varied with the number of abutters of the landlocked pieces. See Figure 11.

It will be noted from the figure that where there was only one abutter, the amount of recovery was approximately 20 percent. This meant that the 90-percent rule was off by about 10 percent, which is fairly creditable under the circumstances. But where there were two or more abutters, the percent of recoveries shot up to from 80 to 85 percent. This obviously indicated that the 90-percent rule was grossly unrealistic. (The Ohio people have now revised this rule, to be more in keeping with the facts. But it took a little bit of research to reveal the facts.)

In other words, once a State develops a bank of severance damage comparables, it can filter out of that bank countless combinations of variables or characteristics. This was done in the Ohio case.

Several States are currently bothered by so-called "proximity" damage cases. No very definitive rules now are available to measure this type of damage, at least, in highway cases. If a State had a fairly adequate bank of severance damage cases, it

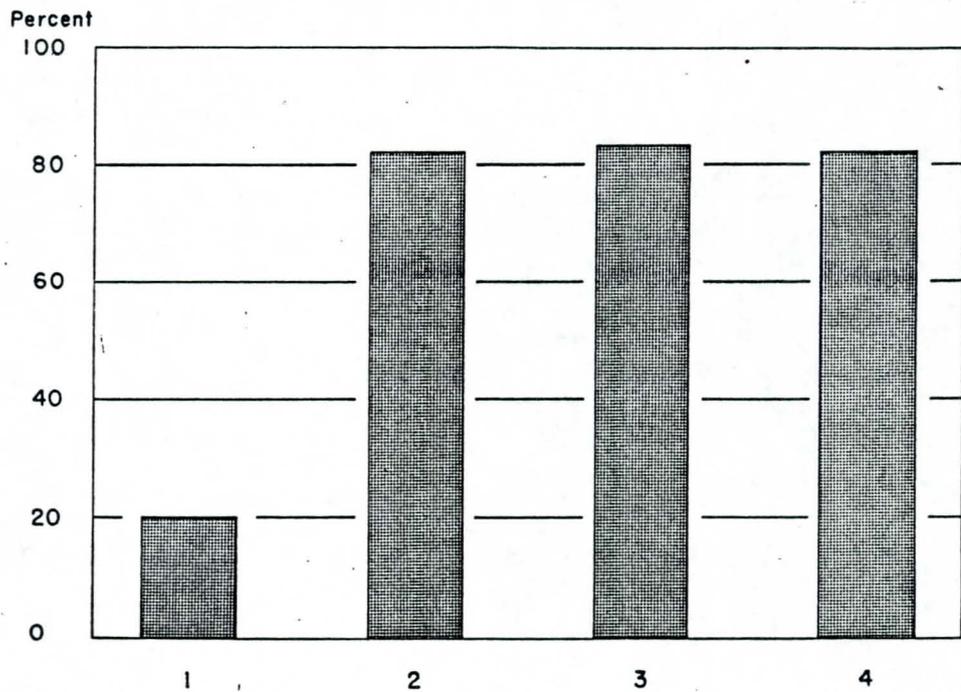


Fig.11 Percent of Recovery for Landlocked Acreage Sold, Classified by Number of Abutting Owners.

could filter out the proximity damage cases in short order. The practical uses of these data in the day-to-day appraisal and acquisition processes are countless.

### Research on Land Value and Land Use Changes

Land value determination is, of course, basic to the land acquisition process. Here again, research can be invaluable in seeking to gauge the temper of the market, in terms at least, of the "after" impact the highway improvement is likely to have on a given parcel or a given area.

The economic effects of highway improvements impinge in many instances on land and its improvements, in whole or in part. The market value of such land and property responds accordingly. A series of studies has been made comparing land values adjacent to a highway improvement with land values of similar property removed from the influence of the improvement; or comparing land values before and after a given highway betterment has been completed. These are summarized in *Attachment D*.

Investigation of the land uses involved in these land-value changes reveals this fact: The amount of the value influence depends primarily on the type of land use of the property prior to highway construction, and the proximity of the property to the highway. Most spectacular increases seem to occur when the improved facility has been responsible for a conversion in the land use of the property under study, or an acceleration in such conversion. A conversion from agriculture or vacant land to residential, commercial or industrial use produces a high percentage increase in land values. Vacant lands adjacent to improved highways develop faster than others, obviously.

It is quite evident, accordingly, that land value and land use analyses must go hand-in-hand, if any true insight is sought into the nature and extent of highway impact.

1. Alabama, Arizona, California, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New York, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Texas, Vermont, Virginia, Washington, Wisconsin.
2. Arkansas, Hawaii, Louisiana, Maine, Montana, Nebraska, New Mexico, North Carolina, North Dakota, Oklahoma, Tennessee, Wyoming.
3. JOURNAL OF THE STATE BAR OF CALIFORNIA, p. 145, "Recent Developments in Eminent Domain Law," by Benjamin King, March 1960.
4. County of Los Angeles v. Faus (1957), 48 Cal. 2d 672.
5. JOURNAL OF THE STATE BAR OF CALIFORNIA, op. cit., p. 155.
6. U.S. Department of Commerce, Bureau of Public Roads (1961); *The Georgetown Law Journal*, Vol. L, No. 2, 205-233, Winter 1961.

## Selected Bibliography on Recent Economic Impact Research

## GENERAL REFERENCES

- Agricultural Research Service. *A Report on the Economic Impact of Highway Improvement—Parts One to Three*. U.S. Department of Agriculture, 1959.
- Agricultural Research Service. *Economic and Legal Aspects of Land Use at Freeway Interchanges*. U.S. Department of Agriculture, 1960.
- Agricultural Research Service. *The Effects on Farm Operating Units of Partial Taking for Controlled-Access Highways*. U.S. Department of Agriculture, 1960.
- Allen, J. K. and McElyea, Richard. *Impact of Improved Highways on the Economy of the United States*. Stanford Research Institute, 1958.
- Boyce, R. R. and Horwood, E. M. *Studies of the Central Business District and Urban Freeway Development*. University of Washington, 1959.
- Garrison, W. L., et al. *Studies of Highway Development and Geographic Change*. University of Washington Press, 1959.
- Huhtanen, R. J., et al. *A Study of the Effects of Freeways on Central Business Districts*. Clark University, 1961.
- Real Estate Research Corporation. *Highway Networks as a Factor in the Selection of Commercial and Industrial Locations*. Chicago, 1958.
- Real Estate Research Corporation. *The Influence of Highway Improvements on Urban Land Use Patterns*. Chicago, 1958.

## AREA STUDIES

*California*

- Smith, J. R. "Motels—How Essential Are Accessibility and Visibility to Business Success?" Reprint from *California Highways and Public Works*. May-June, 1960.

*Connecticut*

- University of Connecticut. *The Economic and Social Effects of the Connecticut Turnpike on Eastern Connecticut*, Progress Report No. 28. Storrs, 1959. Prepared in cooperation with the Connecticut State Highway Department and the Bureau of Public Roads.

*Kansas*

- Hovey, R. M. and Pine, W. H. *Impacts of Interstate Highway 70 on Farmers in Trego County, Kansas*. Kansas State University, 1961.
- Wagner, Hulse. *The Economic Effects of Bypass Highways on Selected Kansas Communities*. University of Kansas, 1960. Prepared in cooperation with the State Highway Commission of Kansas and the Bureau of Public Roads.

*Kentucky*

- University of Kentucky. *Some Economic Effects of the Lexington Northern Belt Line*. Lexington, 1960.
- University of Kentucky. *The Effect of the Louisville Watterson Expressway on Land Use and Land Values*. Lexington, 1960.

*Maryland*

- Maryland State Roads Commission. *3 Economic Impact Studies on a Portion of the Baltimore Parkway*. Baltimore, 1960.

*Massachusetts*

- Massachusetts Department of Public Works. "Population of Interstate Route 495 'Wedge.'" *Social and Economic Impact of Highways*. Boston, 1960.

*Michigan*

- Faville, Hugh and Goldschmidt, Carl. "Effects on Businesses of Bypass Highways." *Economic and Social Effects of Highway Improvements*. East Lansing, 1960. Joint Research by Michigan State University and Michigan State Highway Department in cooperation with the Bureau of Public Roads.

- Larson, Ronald and Schenker, Eric. "Land and Property Values in Relation to Dort Highway Improvements." *Economic and Social Effects of Highway Improvement*. East Lansing, 1960. Joint Research by Michigan State University and Michigan State Highway Department in cooperation with the Bureau of Public Roads.
- Philbrick, A. K. "Analyses of the Geographical Patterns of Gross Land Uses and Changes in Numbers of Structures in Relation to Major Highways in the Lower Half of the Lower Peninsula of Michigan." *Economic and Social Effects of Highway Improvements*. East Lansing, 1961. Joint Research by Michigan State University and Michigan State Highway Department in cooperation with the Bureau of Public Roads.
- Schenker, Eric. "An Inventory of the Economic Factors Influenced by a Highway Development Program." *Economic and Social Effects of Highway Improvements*. East Lansing, 1960. Joint Research by Michigan State University and Michigan State Highway Department in cooperation with the Bureau of Public Roads.
- Vargha, L. A. "Agricultural Land Values and Distance from Hard Surface Roads, Ingham County, Michigan." *Effects of Highway Development on Rural Lands—Study V*. East Lansing, 1959. Joint Research by Michigan State University and Michigan State Highway Department in cooperation with the Bureau of Public Roads.

#### Minnesota

- Gensurowsky, Walter and Smith, Jr., E. G. *How Farmers Adjusted to an Interstate Highway in Minnesota*. University of Minnesota, 1960.
- Gustafson, D. O. and Smith, Jr., E. G. *The Economic Effects of a Highway Change on Faribault, Minnesota*. University of Minnesota, 1959. Prepared in cooperation with the Bureau of Public Roads.
- University of Minnesota. *Beltline—Commercial Industrial Development (A case study in the Minneapolis-St. Paul Metropolitan Area)* Minneapolis-St. Paul, 1960. Prepared in cooperation with Minnesota Highway Department and the Bureau of Public Roads.

#### Mississippi

- University of Mississippi. *A Planned Interchange in a Residential Area—Some Interim Influence*. Jackson, 1961. Prepared in cooperation with the Bureau of Public Roads.

#### Missouri

- Missouri State Highway Department. *Economic Effects of an Interstate Highway Bypass, Lebanon, Missouri*. Jefferson City, 1961.

#### New Mexico

- Zickefoose, P. W. *Highway Economic Impact Studies in Urban Communities of New Mexico: Problems and Methods*. New Mexico State University, 1960. Prepared in cooperation with New Mexico State Highway Department and the Bureau of Public Roads.

#### Rhode Island

- Blair Associates, Planning Consultants. *Downtown Pawtucket and the Freeway*. Providence, 1960. Prepared for the State of Rhode Island Department of Public Works in cooperation with the Bureau of Public Roads.
- Blair Associates, Planning Consultants. *Downtown Pawtucket and the Freeway—Part I: Physical Inventory, Part II: Economic Framework, and Part III: Traffic and Parking*. Providence, 1960. Prepared for the State of Rhode Island Department of Public Works in cooperation with the Bureau of Public Roads.

#### Texas

- Adkins, W. G., et al. *Farm Land Value and Rural Roads Service in Ellis County, Texas—1955-1958*. Texas Transportation Institute. College Station, 1960.
- Adkins, W. G. *Studies of Land Development at Interchanges*. Texas Transportation Institute. College Station, 1962.
- Thompson, R. H., et al. *A Preliminary Study of the Economic Impact of Stemmons Freeway—A Section of Interstate 35 E, Dallas, Texas*. Texas Transportation Institute, College Station, 1960.
- Thompson, R. H. and Adkins, W. G. *Some Economic Effects of the Suburban Portion of North Central Expressway, Dallas, Texas*. Texas Transportation Institute, College Station, 1961.
- Wootan, C. V. and Haning, C. R. *Changes in Land Values, Land Use, and Business Activity Along a Section of the Interstate Highway System in Austin, Texas*. Texas Transportation Institute, College Station, 1960.

Wootan, C. V. and Meuth, H. G. *Changes in Land Value, Land Use, and Business Activity Along a Section of the Interstate Highway System in Temple, Texas*. Texas Transportation Institute, College Station, 1960.

*Washington*

Garrison, W. L. and Marts, M. E. *Geographic Impact of Highway Improvement*. University of Washington, 1958.

Garrison, W. L. and Marts, M. E. *Influence of Highway Improvements on Urban Land—A Graphic Summary*. University of Washington, 1958.

Seyfried, W. R. *Determination of Special Benefits Resulting from Highway Location*. University of Washington, 1958.

ATTACHMENT B  
 Status of Severance Damage Studies  
 (As of September 1, 1962)

State	Research Agency	Nature of Study in Progress	Studies Completed
Alabama	Alabama State Highway Department	Case studies of severance damages.	<i>Land Economic Studies</i> Nos. 1, 2, 3, and 8.
Arizona	Arizona Highway Department	Analysis of cost data in connection with the acquisition of right-of-way for highway improvements.	<i>Arizona Land Economic Studies</i> FN-1-61 and FN-2-61.
Arkansas*			
California	California Division of Highways	Continuing case studies of severance damages to remainder properties after partial takings for right-of-way.	<i>Land Economic Studies, Remainder Parcel Analysis No. 1</i> —summarizes 10 remainder parcel sales in Vallejo, California.  <i>Land Economic Studies</i> —a progress report on remainder parcel study, including 20 case histories.  <i>California Land Economic Studies—Techniques</i> . Includes techniques and methodology for conducting land economic studies and remainder parcel analysis.  <i>Remainder Parcels</i> , a report of the Land Economics Study Section. 227 individual case studies.
Colorado	Colorado Department of Highways	Continuing case studies of severance damages to remainder properties after partial takings for right-of-way.  Severance damages, right-of-way acquisition, and partial takings, including case studies of same.	<i>Case Studies of Damage Payments</i> . Nos. 1 through 21.  <i>Land Economic Study—Interstate 25, Southeast of Denver</i> .
Connecticut*			

Florida	Florida State Road Department	Compilation and analysis of data pertaining to parcels for which severance damage has been paid.	
Georgia	Georgia State Highway Department	Analysis of factual evidence with respect to values fixed, payments made, disposition of remainder properties, and use of remainder properties.	<i>Land Economic Studies</i> Nos. 1, 2, 3, 4, 5, 6, 9, 10, 11, and 14.
Idaho	Idaho Department of Highways	Analysis of actual damage as compared with damage awards in connection with right-of-way takings.	<i>Partial Takings of Service Stations.</i>
Illinois	University of Illinois	Guidelines for appraisals in rural highway right-of-way acquisition.	
Indiana	Indiana State Highway Department and Purdue University	Evaluation of right-of-way appraisal values and determination of a series of basic uniform rules and guides to be used in land appraisals.	<i>Land Economic Studies</i> Nos. 1-11. <i>A Study of Partial Takings for a Portion of Interstate 65</i> , Progress Report No. 3 of <i>Studies of Highway Impact in Indiana.</i>
Iowa	Iowa State Highway Commission	Effects of farm unit severance resulting from right-of-way purchase.	
Kansas	State Highway Commission of Kansas and Kansas State University	Severance damage studies as part of a larger economic impact study.	<i>Impacts of Interstate 70 on Farmers in Trego County, Kansas.</i>
Kentucky	Kentucky Department of Highways	Investigation and evaluation of damage effects in terms of market value of a highway building program on remainders of partial takings in urban and rural areas.	
Louisiana*			
Maine	Maine State Highway Commission	Case study of partial taking and severance damage.	
Maryland	Maryland State Roads Commission	Case studies of remainder properties after purchase for right-of-way.	<i>Severance Study</i> Nos. 1 and 2, <i>Interchange Study</i> No. 1, and <i>Proximity Study</i> Nos. 1 and 3.
Michigan	Michigan State Highway Department	Guide for right-of-way appraisers in estimating costs for property acquired for highway right-of-way.	<i>Land Economic Studies</i> Nos. 1-10. 47 individual case studies.

State	Research Agency	Nature of Study in Progress	Studies Completed
Minnesota	University of Minnesota	Relationships between compensation payments and the extent of the property taken plus damages as a direct consequence of the highway.	<i>How Farmers Adjusted to an Interstate Highway in Minnesota.</i>
	Minnesota Department of Highways	Analysis of severance damages as part of an economic impact study being made on a segment of I-094-3(15) in St. Paul.	
Mississippi	University of Mississippi	Analysis of effects on land use, land value, and fragmentation.	<i>The Division of Rural Land by a Limited-Access Highway, Panola County, Mississippi.</i>
		Case studies of partial takings of rural properties.	
Missouri	Missouri State Highway Commission	Severance damage studies being conducted as part of a larger economic impact study.	<i>Land Economic Study of a Portion of Interstate 70.</i>
Montana*			
Nebraska*			
New Jersey	New Jersey State Highway Department	Develop data in order to provide a more reliable basis for estimating severance and consequential damage.	<i>Severance Study Manual, Severance Studies 6-15 and Severance Studies 16-25.</i>
New Mexico	New Mexico State Highway Commission	Severance damage studies.	
New York	New York Department of Public Works	Severance damage studies being conducted as part of the Northway economic impact study.	
North Carolina*			
North Dakota*	North Dakota State Highway Department	Case studies of several sections of highway.	
Ohio	Ohio Department of Highways	Studies of land values and relationship of subsequent sales prices of remainder parcels to "before" value, by type of remainder parcels.	<i>Manual of Procedure for Land Economic Studies. Preliminary Report of Land Economics Studies in the State of Ohio.</i>

	Oklahoma	Oklahoma State Highway Department	Collection and interpretation of sales data on severed parcels of land previously acquired. These data are expected to provide a basis for right-of-way appraisers to substantiate "after" values in the "before and after" appraisals for highway right-of-way.	
	Oregon	Oregon State Highway Department	Case studies of land values and severance damages to remainder properties after partial takings for right-of-way.	<i>Land Economic Studies Properties Abutting Baldock Freeway.</i> 22 case studies.  <i>Oregon Land Economic Studies</i> , Nos. 30-35
	Pennsylvania	Pennsylvania State University	Collection and analysis of partial takings along U.S. 111.	
	South Carolina*	University of South Carolina	Severance damage studies being conducted as part of a larger economic impact study.	<i>Remainder Parcel No. 1</i>
679	South Dakota	South Dakota Department of Highways	Parcel-by-parcel analysis of remainder properties adjacent to completed segments of the Interstate System to determine effects of the facility on (1) the market value of remaining land, and (2) the development of the remaining land.	<i>Case Studies</i> , Nos. 1-19
	Tennessee	University of Tennessee	Severance damage studies being conducted as part of a larger economic impact study.	
	Texas	Texas Highway Department and Texas Transportation Institute, Texas A and M College	Various aspects connected with the acquisition of right-of-way for highway use, including studies of case histories of remainder parcels and effects of displacement of persons and investments resulting from right-of-way acquisitions.	<i>A Study of Eighteen Remainder Parcels Along Houston's Gulf Freeway.</i>  <i>Case Studies of Twenty-five Remainder Parcels Along Interstate Loop 820.</i>  20 individual remainder parcel reports.
	Utah	Utah State Highway Department	An abbreviated severance damage study—one man is assigned on a part-time basis.	

State	Research Agency	Nature of Study in Progress	Studies Completed
Vermont	Vermont Department of Highways	Provide a more reliable basis for estimating severance and consequential damage.	<i>Case Studies</i> , Nos. 1-16
Virginia	Virginia Department of Highways		A number of case histories have been completed. <i>Report on Remainder Parcel Analysis.</i>
Washington	Washington Department of Highways	Analyze value of remainder properties after purchase of portion for highway use; case studies.	Individual land economic studies, Nos. 1-41, 43-51.
Wisconsin	Wisconsin State Highway Commission		<i>Land Economic Studies</i> , Nos. 1-10. 25 individual case studies.
Wyoming*	Wyoming State Highway Commission	Wyoming will study severance damages when situations present themselves for proper study.	
Nationwide	Agricultural Research Service, U.S. Department of Agriculture		<i>The Effects on Farm Operating Units of Partial Taking for Controlled-Access Highways.</i>

\*In planning stage and/or approved.

NOTE: In most cases, these severance damage studies are being conducted by researchers within the State highway departments, although in a few instances the work is being done under contract. For additional information concerning any study, it is suggested that inquiry be made to the appropriate State highway department.

ATTACHMENT C

Budget Bureau No. 41-R203; Approval Expires April 30, 1962

FORM PR-1000 (12-60)		CASE STUDY OF SEVERANCE DAMAGE				U.S. DEPARTMENT OF COMMERCE BUREAU OF PUBLIC ROADS	
ITEM	MAKE ENTRIES IN THIS COLUMN	USE FOR CODING ONLY	ITEM	MAKE ENTRIES IN THIS COLUMN	USE FOR CODING ONLY		
<b>A. GENERAL INFORMATION</b>			<b>D. ZONING OF ENTIRE TRACT BEFORE TAKING AND OF REMAINING PARCEL AFTER TAKING (Check one or more in each column)</b>				
A-1 Physical Location of Parcel		<input type="checkbox"/> *	URBAN:	BEFORE	AFTER	B	A
1.1 STATE		<input type="checkbox"/> *	1 RESIDENTIAL-OCCUPIED	<input type="checkbox"/> 01	<input type="checkbox"/> 01	<input type="checkbox"/> *	<input type="checkbox"/> *
1.2 COUNTY		<input type="checkbox"/> *	2 RESIDENTIAL-VACANT	<input type="checkbox"/> 02	<input type="checkbox"/> 02		
1.3 CITY		<input type="checkbox"/> *	3 COMMERCIAL-OCCUPIED	<input type="checkbox"/> 03	<input type="checkbox"/> 03		
1.4 STREET			4 COMMERCIAL-VACANT	<input type="checkbox"/> 04	<input type="checkbox"/> 04		
1.5 IDENTIFICATION NO.		<input type="checkbox"/> *	5 INDUSTRIAL-OCCUPIED	<input type="checkbox"/> 05	<input type="checkbox"/> 05		
A-2 Nearest Urban Place			6 INDUSTRIAL-VACANT	<input type="checkbox"/> 06	<input type="checkbox"/> 06		
2.1 NAME			RURAL:				
2.2 POPULATION		<input type="checkbox"/> *	7 FARM-OCCUPIED	<input type="checkbox"/> 11	<input type="checkbox"/> 11		
2.3 POPULATION AS OF:	1960 <input type="checkbox"/> 1 1950 <input type="checkbox"/> 2 OTHER <input type="checkbox"/> 3	<input type="checkbox"/>	8 FARM-VACANT	<input type="checkbox"/> 12	<input type="checkbox"/> 12		
<b>B. HIGHWAY DESCRIPTION</b>			9 NONFARM-RESIDENTIAL	<input type="checkbox"/> 13	<input type="checkbox"/> 13		
B-1 Highway Delineation (Enter month and year)	DATE HIGHWAY COMPLETED	<input type="checkbox"/> *	10 NONFARM-COMMERCIAL	<input type="checkbox"/> 14	<input type="checkbox"/> 14		
	DATE OF INVESTIGATION	<input type="checkbox"/> *	11 NONFARM-INDUSTRIAL	<input type="checkbox"/> 15	<input type="checkbox"/> 15		
B-2 Identification		<input type="checkbox"/> *	12 NONFARM-VACANT	<input type="checkbox"/> 16	<input type="checkbox"/> 16		
2.1 INTERSTATE ROUTE NUMBER			13 OTHER (Specify under Remarks - Item R)	<input type="checkbox"/> 17	<input type="checkbox"/> 17		
2.2 U.S. ROUTE NUMBER			<b>E. LAND USE STATUS (Check one or more in each column)</b>				
2.3 STATE ROUTE NUMBER			1 VACANT	BEFORE	AFTER	B	A
2.4 OTHER (Specify under Remarks - Item R)			<input type="checkbox"/> 01	<input type="checkbox"/> 01	<input type="checkbox"/> 01	<input type="checkbox"/> *	<input type="checkbox"/> *
2.5 HIGHWAY NAME, IF ANY			2 AGRICULTURE, FORESTRY, FISHING	<input type="checkbox"/> 02	<input type="checkbox"/> 02		
B-3 Type of Highway System (Check one or more)		<input type="checkbox"/> *	3 MANUFACTURING, CONSTRUCTION, MINING	<input type="checkbox"/> 03	<input type="checkbox"/> 03		
3.1 INTERSTATE RURAL	<input type="checkbox"/> 11		4 TRANSPORTATION, COMMUNICATION, ELECTRIC, ETC.	<input type="checkbox"/> 04	<input type="checkbox"/> 04		
3.2 INTERSTATE URBAN	<input type="checkbox"/> 12		5 WHOLESALE AND RETAIL TRADE	<input type="checkbox"/> 05	<input type="checkbox"/> 05		
3.3 FAP RURAL	<input type="checkbox"/> 21		6 SERVICES (Service station, motels, etc.)	<input type="checkbox"/> 06	<input type="checkbox"/> 06		
3.4 FAP URBAN	<input type="checkbox"/> 22		7 GOVERNMENT	<input type="checkbox"/> 07	<input type="checkbox"/> 07		
3.5 FAS RURAL	<input type="checkbox"/> 31		8 RESIDENTIAL	<input type="checkbox"/> 08	<input type="checkbox"/> 08		
3.6 FAS URBAN	<input type="checkbox"/> 32		<b>DESCRIBE LAND USE STATUS BRIEFLY:</b>				
3.7 OTHER STATE	<input type="checkbox"/> 43		BEFORE TAKING				
3.8 LOCAL RURAL	<input type="checkbox"/> 51						
3.9 LOCAL URBAN	<input type="checkbox"/> 52		AFTER TAKING				
3.10 NONCLASSIFIED FEDERAL	<input type="checkbox"/> 63						
3.11 TOLL FACILITY	<input type="checkbox"/> 73						

B-4 Type of Highway Facility, By Access (Check one or more)				ITEM		MAKE ENTRIES IN THIS COLUMN	USE FOR CODING ONLY	
4.1 MATERIAL HIGHWAY		<input type="checkbox"/> 1		*  <i>(If only one box is checked, enter its number above; otherwise, obtain code number from manual.)</i>		F-ACCESS BEFORE AND AFTER TAKING		
4.2 EXPRESSWAY-FULL CONTROL		<input type="checkbox"/> 2				F-1 Access to Principal Highway Before Taking (Check one box)		*  <i>(Enter code of box checked)</i>
4.3 EXPRESSWAY-PARTIAL CONTROL		<input type="checkbox"/> 3				2-WAY 1-WAY		
4.4 BELT HIGHWAY, CIRCUMFERENTIAL, OR BYPASS		<input type="checkbox"/> 4				1.1 UNRESTRICTED <input type="checkbox"/> 2 <input type="checkbox"/> 1		
4.5 ARTERIAL HIGHWAY <i>(If frontage road, indicate (Check one or more))</i>		1-WAY 2-WAY <input type="checkbox"/> 1 <input type="checkbox"/> 2		1.2 NO ACCESS <input type="checkbox"/> 3				
4.6 EXPRESSWAY-FULL CONTROL		<input type="checkbox"/> 1 <input type="checkbox"/> 2		*  <i>(If only one box is checked, enter its number above; otherwise, obtain code number from manual.)</i>		1.3 DIRECT ACCESS RESTRICTED TO DESIGNATED POINT <input type="checkbox"/> 4 <input type="checkbox"/> 5		
4.7 EXPRESSWAY-PARTIAL CONTROL		<input type="checkbox"/> 1 <input type="checkbox"/> 2				1.4 DIRECT ACCESS RESTRICTED TO DESIGNATED POINTS <input type="checkbox"/> 6 <input type="checkbox"/> 7		
4.8 BELT HIGHWAY, CIRCUMFERENTIAL, OR BYPASS		<input type="checkbox"/> 1 <input type="checkbox"/> 2				1.5 DISTANCE TO NEAREST TOWN OR TRADING CENTER TO NEAREST 1/2 MI. <input type="checkbox"/> 8 <input type="checkbox"/> 9		
C. DESCRIPTION OF TRACT, PARCEL TAKEN, AND REMAINING TRACT				F-2 Access to New Highway Improvement (Check one)				
C-1 Date State Acquired Property (Enter month, day, and year)		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		2.1 UNRESTRICTED		2-WAY 1-WAY <input type="checkbox"/> 2 <input type="checkbox"/> 1		
C-2 Size of Parcel		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		2.2 NO ACCESS		<input type="checkbox"/> 3		
2.1 ENTIRE TRACT:		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		2.3 DIRECT ACCESS RESTRICTED TO DESIGNATED POINT		<input type="checkbox"/> 4 <input type="checkbox"/> 5		
2.1.1 FRONTAGE (ft.)		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		2.4 DIRECT ACCESS RESTRICTED TO DESIGNATED POINTS		<input type="checkbox"/> 6 <input type="checkbox"/> 7		
2.1.2 ENTIRE AREA		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		2.5 DIRECT ACCESS RESTRICTED TO FRONTAGE ROAD		<input type="checkbox"/> 8 <input type="checkbox"/> 9		
2.1.3 TYPE OF MEASUREMENT (Check one)		ACRE <input type="checkbox"/> 1 SQ. FT. <input type="checkbox"/> 2		2.6 ENTRANCE TO MAIN HIGHWAY IS:		ON RAMP <input type="checkbox"/> 1 OFF RAMP <input type="checkbox"/> 2 INTERCHANGE <input type="checkbox"/> 3 OTHER <input type="checkbox"/> 4		
2.2 PARCEL TAKEN:		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		2.7 TRAVEL DISTANCE TO MAIN HIGHWAY TO NEAREST TENTH MI.		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		
2.2.1 FRONTAGE (ft.)		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		2.8 DISTANCE TO NEAREST TOWN OR TRADING CENTER TO NEAREST 1/2 MI.		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		
2.2.2 AREA TAKEN		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		F-3 Other Access		YES <input type="checkbox"/> 1 NO <input type="checkbox"/> 2 <i>(If yes, complete 3.2 &amp; 3.3)</i>		
2.2.3 TYPE OF MEASUREMENT (Check one)		ACRE <input type="checkbox"/> 1 SQ. FT. <input type="checkbox"/> 2		3.1 DIRECT ACCESS TO ROAD OTHER THAN PRINCIPAL HIGHWAY		YES <input type="checkbox"/> 1 NO <input type="checkbox"/> 2		
2.3 REMAINING TRACT:		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		3.2 DOES THIS ROAD INTERSECT NEW HIGHWAY?		YES <input type="checkbox"/> 1 NO <input type="checkbox"/> 2		
2.3.1 FRONTAGE (ft.)		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		3.3 DISTANCE TO NEAREST TOWN OR TRADING CENTER TO NEAREST 1/2 MI.		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9		
2.3.2 AREA REMAINING		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9						
2.3.3 TYPE OF MEASUREMENT (Check one)		ACRE <input type="checkbox"/> 1 SQ. FT. <input type="checkbox"/> 2						
2.4 SUBSEQUENT SALE OF REMAINING TRACT:		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9						
2.4.1 FRONTAGE (ft.)		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9						
2.4.2 AREA SOLD		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9						
2.4.3 TYPE OF MEASUREMENT (Check one)		ACRE <input type="checkbox"/> 1 SQ. FT. <input type="checkbox"/> 2						
Area as percentage of former tract		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9						
2.5 (ITEM 2.2.2 + 2.1.2)		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9						
2.6 (ITEM 2.2.3 + 2.1.2)		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9						
2.7 (ITEM 2.4.2 + 2.5.2)		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9						
2.8 NUMBER OF SALES OF ENTIRE REMAINING PARCEL		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9						
2.9 NUMBER OF SALES OF PORTIONS OF REMAINING PARCEL		<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9						
				G. ELEVATION, VISIBILITY, AND DESCRIPTION OF REMAINDER				
G-1 Elevation of Roadside of Highway		(Check one in each column)		BEFORE AFTER		B A		
1.1 AT GRADE LEVEL		<input type="checkbox"/> 1 <input type="checkbox"/> 2		<input type="checkbox"/> 1 <input type="checkbox"/> 2		<input type="checkbox"/> 1 <input type="checkbox"/> 2		
1.2 FEET ABOVE GRADE		<input type="checkbox"/> 3 (ft.) <input type="checkbox"/> 4 (ft.)		<input type="checkbox"/> 3 (ft.) <input type="checkbox"/> 4 (ft.)		<input type="checkbox"/> 3 <input type="checkbox"/> 4		
1.3 FEET BELOW GRADE		<input type="checkbox"/> 5 (ft.) <input type="checkbox"/> 6 (ft.)		<input type="checkbox"/> 5 (ft.) <input type="checkbox"/> 6 (ft.)		<input type="checkbox"/> 5 <input type="checkbox"/> 6		
G-2 Visibility of Highway From Roadside		(Check one in each column)		BEFORE AFTER		B A		
2.1 FULLY		<input type="checkbox"/> 1 <input type="checkbox"/> 2		<input type="checkbox"/> 1 <input type="checkbox"/> 2		<input type="checkbox"/> 1 <input type="checkbox"/> 2		
2.2 PARTIALLY		<input type="checkbox"/> 3 <input type="checkbox"/> 4		<input type="checkbox"/> 3 <input type="checkbox"/> 4		<input type="checkbox"/> 3 <input type="checkbox"/> 4		
2.3 NOT VISIBLE		<input type="checkbox"/> 5 <input type="checkbox"/> 6		<input type="checkbox"/> 5 <input type="checkbox"/> 6		<input type="checkbox"/> 5 <input type="checkbox"/> 6		
G-3 Description		(Check one or more)						
3.1 SEPARATED		<input type="checkbox"/> 1						
3.2 ISOLATED		<input type="checkbox"/> 2						
3.3 LANDLOCKED		<input type="checkbox"/> 3						
3.4 ON DEAD END		<input type="checkbox"/> 4						

USCensus-DC 4864-L-98

ITEM	MAKE ENTRIES IN THIS COLUMN	USE FOR CODING ONLY	ITEM	MAKE ENTRIES IN THIS COLUMN	USE FOR CODING ONLY
<b>H. APPRAISAL AND PAYMENTS</b>			<b>I. SALES PRICE OF REMAINING PARCELS</b>		
H-1 Compensation (Indicate by case of highest numbered award)		<input type="checkbox"/>	1. FIRST SALE: 1.1 DATE (Month, day, and year)		<input type="checkbox"/>
1.1 NEGOTIATED SETTLEMENT (CODE 1) 1.1.1 AMOUNT	\$	<input type="checkbox"/>	1.2 TOTAL PRICE	\$	<input type="checkbox"/>
1.1.2 DATE (Month & year)		<input type="checkbox"/>	1.3 VALUE OF IMPROVEMENTS	\$	<input type="checkbox"/>
1.2 ADMINISTRATIVE OR QUASI-JUDICIAL BODY (CODE 2) 1.2.1 AMOUNT	\$	(Use trailer code) <input type="checkbox"/>	1.4 VALUE OF LAND	\$	<input type="checkbox"/>
1.2.2 DATE (Month & year)		<input type="checkbox"/>	1.5 AREA OF LAND SOLD		<input type="checkbox"/>
1.3 TRIAL COURT (CODE 3) 1.3.1 AMOUNT	\$	<input type="checkbox"/>	1.6 TYPE OF MEASUREMENT (Check one) ACRE <input type="checkbox"/> 1 SQ. FT. <input type="checkbox"/> 2		<input type="checkbox"/>
1.3.2 DATE (Month & year)		<input type="checkbox"/>	1.7 UNIT PRICE	\$	<input type="checkbox"/>
1.4 APPELLATE COURT (CODE 4) 1.4.1 AMOUNT	\$	<input type="checkbox"/>	1.8 USE OF PARCEL		<input type="checkbox"/> *
1.4.2 DATE (Month & year)		<input type="checkbox"/>	2. SECOND SALE: 2.1 DATE (Month, day, and year)		<input type="checkbox"/>
H-2 Dollar Payments for Taking Right-of-Way 2.1 PAYT. - LAND & IMP.	\$	<input type="checkbox"/>	2.2 TOTAL PRICE	\$	<input type="checkbox"/>
2.2 AREA OF LAND TAKEN		<input type="checkbox"/>	2.3 VALUE OF IMPROVEMENTS	\$	<input type="checkbox"/>
2.3 TYPE OF MEASUREMENT (Check one) ACRE <input type="checkbox"/> 1 SQ. FT. <input type="checkbox"/> 2		<input type="checkbox"/>	2.4 VALUE OF LAND	\$	<input type="checkbox"/>
2.4 PRICE PER UNIT OF LAND TAKEN	\$	<input type="checkbox"/>	2.5 AREA OF LAND SOLD		<input type="checkbox"/>
2.5 DOLLAR PAYMENT FOR LAND TAKEN, IF AVAILABLE	\$	<input type="checkbox"/>	2.6 TYPE OF MEASUREMENT (Check one) ACRE <input type="checkbox"/> 1 SQ. FT. <input type="checkbox"/> 2		<input type="checkbox"/>
2.6 DOLLAR PAYMENT FOR IMPROVEMENTS TAKEN, IF AVAILABLE	\$	<input type="checkbox"/>	2.7 UNIT PRICE	\$	<input type="checkbox"/>
2.7 DOLLAR PAYMENT FOR DAMAGES RESULTING FROM TAKING	\$	<input type="checkbox"/>	2.8 USE OF PARCEL		<input type="checkbox"/>
Elements considered in establishing damages to remainder (Check one or more)		<input type="checkbox"/> *	3. THIRD SALE: 3.1 DATE (Month, day, and year)		(Use trailer code) <input type="checkbox"/>
2.8 PROXIMITY <input type="checkbox"/> 01		(If only one box is checked, enter its number above; otherwise obtain code number from "Manual")	3.2 TOTAL PRICE	\$	<input type="checkbox"/>
2.9 REDUCTION IN SIZE <input type="checkbox"/> 02			3.3 VALUE OF IMPROVEMENTS	\$	<input type="checkbox"/>
2.10 SHAPE <input type="checkbox"/> 03			3.4 VALUE OF LAND	\$	<input type="checkbox"/>
2.11 ACCESS RESTRICTED <input type="checkbox"/> 04			3.5 AREA OF LAND SOLD		<input type="checkbox"/>
2.12 DIVIDED PROPERTY <input type="checkbox"/> 05			3.6 TYPE OF MEASUREMENT (Check one) ACRE <input type="checkbox"/> 1 SQ. FT. <input type="checkbox"/> 2		<input type="checkbox"/>
2.13 OTHER (Specify) <input type="checkbox"/> 06		3.7 UNIT PRICE	\$	<input type="checkbox"/>	
2.14 ESTIMATED TOTAL BENEFITS RESULTING FROM TAKING	\$	<input type="checkbox"/>	3.8 USE OF PARCEL		<input type="checkbox"/>
2.15 GENERAL BENEFITS RESULTING FROM TAKING	\$	<input type="checkbox"/>	4. ADDITIONAL SALES LISTED IN ITEM K (Enter Yes or No)		<input type="checkbox"/> YES <input type="checkbox"/> NO
2.16 SPECIAL BENEFITS RESULTING FROM TAKING	\$	<input type="checkbox"/>			
2.17 (2.17a) + 2.7 - 2.16 Total dollar payments for taking right-of-way	\$				

ITEM	MAKE ENTRIES IN THIS COLUMN	USE FOR CODING ONLY	ITEM	MAKE ENTRIES IN THIS COLUMN	USE FOR CODING ONLY
<b>H-3 Appraised Values</b> <b>I.1 TOTAL:</b> <b>I.1.1 ENTIRE TRACT AT TAKING</b>			<b>E. ADDITIONAL INFORMATION (Please indicate the item for which information is being modified)</b>		
	\$	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	ITEM	COMMENTS	
<b>I.1.2 PARCEL TAKEN</b>	\$	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
<b>I.1.3 DAMAGES</b>	\$	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
<b>I.1.4 REMAINDER</b>	\$	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
<b>I.2 LAND:</b> <b>I.2.1 ENTIRE TRACT AT TAKING</b>					
<b>I.2.2 PARCEL TAKEN</b>	\$	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
<b>I.2.3 DAMAGES</b>	\$	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
<b>I.2.4 REMAINDER</b>	\$	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
<b>I.3 IMPROVEMENTS:</b> <b>I.3.1 ENTIRE IMPROVEMENTS AT TAKING</b>					
<b>I.3.2 IMPROVEMENTS TAKEN</b>	\$	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
<b>I.3.3 DAMAGES</b>	\$	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
<b>I.3.4 REMAINDER</b>	\$	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			
<b>J. SKETCH</b>					
BEFORE			AFTER		
<b>J. PHOTOGRAPH</b>					
BEFORE			AFTER		
REPORTER'S SIGNATURE AND TITLE				DATE	

FORM PB-1000 (12-68)

SEC000-0C 0001-1-00

ATTACHMENT D

Changes in Value of Land Near Selected Highway Facilities

State	Place and facility	Time period	Unit of measure	Percentage of original value		Ratio of percentages, study area to control area
				Study area	Control area	
California <sup>1</sup>	Oakland and San Leandro—Eastshore Parkway	1941-53	Assessed value	8,700	5,200	1.67
	Ventura Boulevard (U. S. Highway 101)	1951-55	Price per front ft.	210	(2)	—
	Fresno (U. S. Highway 99)	1946-49	Value per acre	(3)	(3)	—
	Orange Avenue Freeway (U. S. Highway 99)	1946-49	do.	438	(2)	—
	Los Angeles—Santa Ana Freeway	1949-54	Assessed value			
	A	—	—	168	154	1.09
	B	—	—	705	460	1.53
C	—	—	412	390	1.06	
Georgia <sup>1</sup>	Atlanta Expressway:	1941-46 & 1952-56	Weighted average price per sq. ft.	—	234	—
	East side:					
	Proximity Band A	—	—	234	(2)	—
	Proximity Band B	—	—	207	(2)	—
	Proximity Band C	—	—	101	(2)	—
	West side:					
	Proximity Band A	—	—	260	(2)	—
Proximity Band B	—	—	68	(2)	—	
Proximity Band C	—	—	76	(2)	—	
Illinois <sup>6</sup>	Edens Expressway	1940-57	Assessed value	(5)	(2)	—
	Calumet-Kingery Expressway	do.	do.	(5)	(2)	—
Massachusetts <sup>6</sup>	Needham residential	1945-57	Sales value	231	247	0.94
	Lexington residential	1945-57	Assessed value	264	242	1.09
	Influenced band	do.	do.	388	—	—
	Rest of town	do.	do.	—	239	—

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State	Place and facility	Time period	Unit of measure	Percentage of original value Study area	Control area	Ratio of percentages, study area to control area
New York <sup>1</sup>	Bronx River Parkway	1910-32	do.	1,278	493	2.59
	do.	1939-51	do.	254	219	1.16
	Shore Parkway	1939-53	do.	176	119	1.48
	Henry Hudson Parkway:	1935-53	do.			
	Bronx study area	—	—	202	77	2.62
	Manhattan study area	—	—	105	92	1.14
	Grand Central Parkway Queens	1925-53 do.	do. do.	2,138 —	601 332	3.56 —
Texas	Gulf Freeway, Houston: <sup>8</sup>	1939-41 & 1954-56	Value per sq. ft. <sup>9</sup>			
	Proximity Group 1	—	—	667	—	—
	Proximity Group 2	—	—	242	—	—
	Proximity Group 3	—	—	—	80	—
	Proximity Group 4	—	—	—	203	—
	Dallas Expressway: <sup>10</sup>	1941-45 & 1951-55	do.			
	Proximity Band A <sup>11</sup>	—	—	723	240	3.01
	Proximity Band B	—	—	223	223	1.00
	Proximity Band C	—	—	285	227	1.26
	Interstate Highway System <sup>12</sup>					
	Austin	1941-48 & 1954-57	(Average price per acre (Nonsubdivided land	460 622	389 322	1.18 1.93
	Temple	1941-48	Average price per acre	1,417	140	10.12
	Rockwall County:	1944-48 & 1952-57	do.			
First section, Highway 67, Dallas County line to Rockwall	—	—	198	142	1.39	
Section section, Highway 67, Rock- wall interchange to Royse City interchange.	—	—	99	142	0.70	

	Both sections	—	—	151	142	1.06
	San Antonio Expressway <sup>13</sup>	1941-45 & 1952-56	Price per sq. ft.	(12)	(12)	—
Virginia	Lexington Bypass <sup>14, 15</sup>	1948-57	Value per sq. ft.			
	Buena Vista	—	—	—	175	—
	Greater Lexington (including suburbs)	—	—	183	—	—
	Lexington, less Main Street	—	—	—	180	—
	Main Street	—	—	243	—	—
	Central, less bypass	—	—	—	135	—
	Bypass	—	—	277	—	—

1. *California Land Studies*, Division of Highways, California Department of Public Works; *Camarillo Study* (Ventura Boulevard), by John F. Kelly, 1955; *Fresno*, by Robert L. Bangs, 1954. See *Influence of Highway Improvements on Urban Land; A Graphic Summary*, William L. Garrison and Marion E. Marts, University of Washington, Seattle, 1958, Section II. pp. 18, 21, 41, for data on Eastshore Freeway and Santa Ana Freeway.

2. Not available.

3. An analysis of 15 individual parcels vacant before construction of the Fresno Freeway indicated a value impact greater than twice on most parcels. Only one of these parcels had a larger gain before the freeway development than after that construction. In addition, 18 parcels of land adjacent to the Fresno Freeway and 23 parcels not abutting the freeway were analyzed. These were all the sales in the area. The Orange Avenue percentage gain is illustrative.

4. *Expressway Influence on Land Use and Value, Atlanta, 1941-1956*, James H. Lemly, Georgia State College of Business Administration, Atlanta, 1958, table A-2, p. 106.

5. *Highways and Their Meaning to Illinois Citizens*, George W. Barton and Associates, Evanston, Illinois, 1958, p. 22. Land values within various distances of the Edens Expressway and Calumet-Kingery Expressway were charted from Olcott's Bluebook of Land Values. Increases in the overall values were generally higher in the middle section through which the highways run. 1957 land value increases along the Edens Expressway ranged from 2.3 to 5.8 times 1940 values, and those along the Calumet-Kingery Expressway ranged from 2.5 to 3.5 times 1940 values.

6. *Economic Impact Study of Massachusetts Route 128*, A. J. Bone, et al., Massachusetts Institute of Technology, Cambridge, interim report, 1958.

7. Garrison and Marts, *op. cit.*, pp. 8-14.

8. *A 15-Year Study of Land Values and Land Use Along the Gulf Freeway, Houston, Texas, 1956*, Norris and Elder, Consulting Engineers, pp. 146-149.

9. Value of improvements omitted after adjustment for construction cost changes. Table includes only land annexed to city before 1941; figures for land annexed since 1946 are even more striking. The proximity groups in the Houston study are defined as follows: Group 1 is the primary area immediately adjacent to the facility; Group 2 is a secondary band on each side of Group 1; Group 3 consists of properties in the same quadrant as the freeway, with good roads and access to the freeway, but farther away; Group 4 consists of ten acres widely distributed over all areas of the city except the southeast quadrant, through which the Gulf Freeway passes. The effort was made to select properties as closely similar as practicable to areas in Groups 1 and 2.

10. *Effects of the Dallas Central Expressway on Land Values and Land Use*, William G. Adkins, Texas Transportation Institute, College Station, 1957, p. 24.

11. Bands were designated by distance from the expressway for study areas; control areas were selected with similar characteristics but out of the influence of the expressway.

12. *Changes in Land Value and Land Use Along Three Sections of the Interstate Highway System of Texas*, C. L. Haning, et al., Texas Transportation Institute, College Station, 1958, pp. 14, 17, 42, 58.

13. *Economic Impact of San Antonio Expressway*, William G. Adkins, Texas Transportation Institute, College Station, 1958, p. 11. Value of improvements omitted after adjustment for construction cost changes. Study shows only the differences between percentage changes of control and study areas, amounting to 133 percent.

14. *The Influence of Limited Access Highway on Land Value and Land Use; The Lexington, Virginia, Bypass: Progress Report No. 1*, Virginia Council of Highway Investigation and Research, 1958, Appendix III.

15. Value of improvements omitted.

## The Writing of Reports

HOMER T. ROSENBERGER

*Chief, Training Branch; Office of Administration  
Bureau of Public Roads*

A report provides a permanent resumé of a problem together with conclusions. Various kinds of reports are written in different ways. However, regardless of whether reporting to one's immediate chief, or to the Chief Engineer of a State highway department, or to a legislative committee, it may be necessary to include the following:

1. *A statement of the problem or activity.* In the report tell what period of time is covered, what was done, and what is planned.
2. *A statement of the method of studying the problem or conducting the activity.*
3. *A statement of findings or observations.* Be sure that the report tells what, why, when, where, how, and who.
4. *Conclusions.*

Frequently, the statement of the problem can be made in one concise paragraph and the methods of study in several, whereas the findings themselves may be lengthy and detailed. The major conclusions can be stated rather briefly, and should be in agreement with the findings or observations.

Reports which are built upon logically constructed, structural outlines are likely to save the reader's time. Center and sideheads quickly tell their story and cause the report to flow from start to finish in logical sequence.

Generally a report is valueless unless read by the persons for whom it was prepared. Thousands of reports receive only superficial scanning. How does one increase the probability that his report will be studied thoroughly by those for whom it is written? Here are eight suggestions:

1. State the technical matters in a way that will be understandable to those for whom the report is being written.
2. Exclude all of the irrelevant and include only the most pertinent facts and ideas. This screening will sharpen the focus.

3. Maintain a businesslike tone. A report that is perfunctory may attract little attention. One that is castigating is apt to arouse hostility toward itself and toward the person who wrote it.
4. State the recommendations in such a way that the reader will know exactly what each means.
5. Put interest into the center and sideheadings. Why not say—

*Cattle Pass Reduces Damage* — instead of "An evaluation of construction features in mitigation of damages shows saving in project costs."

*House Moving Saves Money* — instead of "The amount payable if the State acquires the improvement is more than the amount payable if the improvement is removed and reestablished for the owner."

*Access Denial* — instead of "Severance damages occasioned by the imposition of complete denial of access, leaving a parcel severed and landlocked."

*Low Severance Damages* — instead of "Construction of the new highway facility results in special benefits to the adjoining property which reduces or mitigates damages which might otherwise be payable."

6. Rewrite and condense the report. Never be satisfied with a first draft. Careful revision or rewriting will produce a more precise and more useful report than the original. Watch for incorrect spelling and faulty grammar. They often lead the reader to believe that the substance, too, may be poor. The deletion of unnecessary words, and the substituting of colorful and highly expressive words for the prosaic, will give life and additional meaning to the report. Verbosity can be squeezed out by rereading critically and crossing out unnecessary words. Then read again to see if the respective sentences actually say what they are meant to say. When time permits, it may be better to rewrite the draft of a report several days or longer after first writing it. Rereading at once may not permit the author to view the report objectively in overall or in detail.

The writer probably did a very careful job of fact gathering and evaluating. But does his report do justice to his right-of-way work? The report is the part of his work that is directly seen and scrutinized by his chief, the landowner, and the court. Therefore, the report should be concise, yet it should contain every bit of necessary information, and in such logical order that the reader can quickly find the facts in one place, and in another, his conclusions clearly stated.

7. Use visuals. Insert a few simple graphs and several pertinent photographs together with explanatory captions *if* they are helpful, but *not* merely to act as window dressing.

8. Summarize the report on a cover sheet and indicate that the details are attached. Even a busy executive cannot afford to pass lightly over a well prepared 1-page capsule of an extensive report on a matter about which he must make a decision. The report itself can frequently be made easier to comprehend by placing its detailed information in an appendix.

Decide whether the particular report should be in first person: "I interviewed the owner at his home, 2562 Dryden Road, Broad City," or should be impersonal, "The owner was interviewed at his home, 2562 Dryden Road, Broad City."

Readability is a commendable quality in any report, but levity should be avoided.

It is important that the report be submitted when needed. A report that reaches someone after the matter to which it relates has been solved, can scarcely avoid being discarded. Likewise, a report presented too far in advance of the time when the right-of-way problem on which it is based is current, may be laid aside. For example, if the right-of-way agent knows a case is to be tried before a jury in a condemnation trial, it may not be advisable or necessary to present each and every minute detail about the property to the attorney when the case is filed. It is probably only necessary to give those facts sufficient for the attorney to prepare his petitions or other filings. However, when the trial date has been set, it is essential that every detail of the taking be analyzed with him either through a written report or in a pretrial conference. Far too many adverse awards are received by the acquiring agencies simply because the right-of-way agent or engineer fails to give the attorney who is to try the case a thorough briefing on the essential facts *at the appropriate time*. One cannot assume that simply because the agent is thoroughly familiar with all the engineering and appraising techniques, that the attorney should also be as intimately familiar with them. The right-of-way agent must convey to him, either by written or oral reports, all pertinent knowledge that bears on the case.

Today a large bulk of right-of-way activities is put into writing so that findings, recommendations, and decisions will be available for references. Every highway right-of-way officer is faced with the task of report writing. His effectiveness is judged to a large extent by the preciseness and clarity of his reports. Those who master the art of report writing simplify for themselves and others, the task of providing this necessary permanent record.

## *Appendix A*

### DEFINITIONS

This section is devoted to the definitions of the words and phrases that are normally used in the process of acquiring right-of-way.

Those words or phrases for which definitions have been adopted by the American Association of State Highway Officials are indicated by (AASHO) after the definition. In some cases an additional definition has been given for a particular word or phrase where it is believed that this definition is also in general usage in the highway or appraisal fields.

Some phrases will be listed in their commonly accepted form and then cross-referenced to a key word in the phrase, both listings being in the proper alphabetical order.

#### A

**Abandonment** — Cessation of use of right-of-way or activity thereon with no intention to reclaim or use again for highway purposes. (sometimes called Vacation.) (AASHO)

**Abstract of Title** — A document showing the condensed history of the title to property, containing portions of all conveyances or other pertinent instruments relating to the estate or interest in the property, and all liens, charges, encumbrances and releases. (AASHO)

**Access Connection** — Any roadway facility by means of which vehicles can enter or leave an arterial highway. Included are intersections at grade, private driveways and ramps, or separate lanes connecting with cross streets or frontage roads.

**Accretion** — The increase of riparian land by the gradual deposit, by water, of solid material, whether mud, sand, or sediment, so as to cause that to become dry land which was before covered with water. The owner of the riparian land acquires title to all additions by means of accretion.

**Acquisition or Taking** — The process of obtaining right-of-way. (AASHO)

**Ad Valorem Tax** — A tax varying with the value of goods or property.

**Adverse Possession** — The act of an occupant of land in acquiring title against the real owner where possession has been actual, continuous, hostile, visible and distinct for the statutory period.

The possession must be actual and exclusive, open and notorious. It must be continuous for the period provided by the statute. The possession of one adverse claimant may be tacked to the possession of successive adverse claimants, provided there is privity of estate as between such claimants.

In some States, a shorter statutory period is provided where there is color of title and where the adverse claimant has paid taxes.

**Agreement of Sale** — A written contract whereby the purchaser agrees to buy certain real estate and the seller agrees to sell upon terms and conditions set forth therein.

**Amortization** — (1) The process of recovery, over a stated period of time, of the cost of an asset by appropriate periodical charges to current operations. It is similar to depreciation, but also applicable to intangible costs such as financing or refinancing costs, development cost and so on, (2) ~~Provision for gradual liquidation~~ of an obligation either by meeting serial principal payments periodically due thereon or by periodical allocations to a sinking fund.

✓ **Annuity** — (1) An annual income, (2) the return from an investment of capital in a series of periodic payments which comprise both interest and a partial return of capital, (3) the annual return may be in equal amounts called a level annuity or in increasing or decreasing annual amounts called an increasing or decreasing annuity, (4) a series of periodical payments, usually, although not necessarily, equal in amount and made at equal intervals of time; such as annually or semi-annually. In the appraisal process of the today market value of the annuity, it becomes necessary to translate these future payments, which are merely reflections of value, into their present worth. This is accomplished by means of a discounting process wherein the future amounts receivable are discounted for interest.

**Appraisal** — (1) An estimate and opinion of value, (2) Usually a written statement of the market value or value as defined by the appraiser of an adequately described parcel of property as of a specific date. A conclusion that results from an analysis of facts.

**Appraisal Report** — A written document in which is stated (1) the value conclusion, (2) the date as of which the value is estimated, (3) an adequate description of the property valued, (4) the reasoning in reaching the value conclusion, (5) the qualifying conditions, (6) market data, other factual data and processing by one or more of the three different approaches and (7) the signature of the appraiser.

**Appreciation** — The increase in cost, price or value that is due to improved economic conditions, increasing price levels, reversal of depreciating environmental trends, improved transportation facilities, direction of community or area growth and many other factors.

**Approach Nose** — An end of an island, or neutral area between roadways, which faces approaching traffic that passes either on one or both sides. (AASHO)

✓ **Appurtenance** — An item of property accessory to, or an adjunct of, a more important property, title to which usually passes with title to the principal property. Something which passes as an incident to land, such as a right-of-way.

**Arterial Highway** — A general term denoting a highway primarily for through traffic, usually on a continuous route. (AASHO)

✓ **Assessment** — (1) The valuation of property for taxation; also the value so assigned. (2) Nonrecurring charges levied against property to meet some specific purpose.

**Assignee** — The person to whom an agreement or contract is assigned.

✓ **Assignment** — The method or manner by which a right, a specialty or contract is transferred from one person to another.

**At Grade Intersection** — An intersection where all roadways join or cross at the same level. (AASHO)

**Auxiliary Lane** — The portion of the roadway adjoining the traveled way for parking, speed-change, or for other purposes supplementary to through traffic movement. (AASHO)

**Average Daily Traffic** — The average 24 hour volume, being the total volume during a stated period divided by the number of days in that period. Unless otherwise stated, the period is a year. The term is commonly abbreviated as ADT. (AASHO)

**Azimuth** — The angle between true (meridian) north and an object. In surveying it is measured clockwise from the north.

## B

**Backfill** — Material used to replace or the act of replacing material removed during construction; also may denote material placed or the act of placing material adjacent to structures. (AASHO)

**Backslope** — That portion of the roadway between the side drainage ditch and the top of cut, usually measured as a ratio of horizontal distance versus each foot of increase in elevation, i.e.—4 to 1 slope.

**Bargain and Sale Deed** — A deed in which the grantor does not warrant the title in any respect.

**Basic Capacity** — The maximum number of passenger cars that can pass a given point on a lane or roadway during one hour under the most nearly ideal roadway and traffic conditions that can be attained. (AASHO)

**Belt Highway** — An arterial highway for carrying traffic partially or entirely around an urban area or portion thereof. (Also called Circumferential highway.) (AASHO)

✓ **Bench Mark** — A point of known elevation, usually a mark of some durable material as stone or concrete posts; a bronze plate to serve as a reference point in running a line of levels for the determination of the elevations.

**Berm** — A horizontal ledge or bench part way up a slope. A longitudinal mound of earth used to deflect water; a dike-like earthen structure formed by materials excavated from a shallow ditch which parallels and adjoins it, used to control surface drainage.

**Binder** — An agreement to cover a down payment for the purchase of real estate as evidence of good faith on the part of the purchaser.

✓ **Board-Foot** — A unit of measure represented by a board one foot long, one foot wide and one inch thick.

**Bonus Value** — The value of any rental in excess of the rent reserved in the lease, which the tenant could obtain if he sublet the premises on the open rental market. It is the difference between the lease rent (contract rent) and the rent being paid by other tenants for comparable space in the vicinity of the subject lease (economic rent).

✓ **Borrow** — Suitable material from sources outside the roadway prism, used primarily for embankments. (AASHO)

**Bridge** — A structure of over 20 foot span. (Batteries of pipe culverts regardless of their length are not bridges.)

**Broker** — One employed by another, for a fee, to carry on any of the activities, especially in the sale of real estate, listed in the license law definition of the word.

**Building Code** — The ordinances, rules, and regulations of a municipality relating to the construction and maintenance of buildings.

✓ **Building Line** — A line established by ordinance or statute between which line and the street a structure is not permitted.

**Building Residual Technique** — A term designating a technique in which the land is valued independently of the building. The fair annual net return on the land value is deducted from the estimated net annual income to the property (land and building) and the residual amount is said to be attributable to the building, including depreciation, and is capitalized to indicate the building value.

C

- Capital** — Accumulation of wealth used to further the production process. Capital goods represent such wealth when invested in specialized means of production. Liquid or unspecialized capital may be shifted between various types of capital investments. In many respects land and capital goods are similar in that they represent fixed investments for relatively long periods of time.
- Capitalization** — The process of converting into present value a series of anticipated future annual installments of income.
- Capitalization Rate** — An anticipated rate of return for an investment. A rate at which income is processed to indicate the probable capital value. The rate is usually commensurate to risk. The capitalization rate is generally considered to be composed of a pure interest rate plus the recapture rate.
- ✓ **Cattle Guard** — An opening in a fence which is not closed by a gate, but having a ground grill that cattle will not cross.
- Causeway** — Elevated construction over marshy land or water. It may be either an earth fill or bridge type structure.
- Certificate of Title** — A document based on a title search stating that the title or interest in property is vested in a designated person and showing outstanding liens, charges, or other encumbrances. (AASHO)
- Chain** — A unit of land measurement—66 feet, the length of a surveyor's chain.
- Channelized Intersection** — An at-grade intersection in which traffic is directed into definite paths by islands. (AASHO)
- Chattel** — Personal property such as household goods or removable fixtures.
- Cloud on Title** — An outstanding claim or encumbrance which if valid will affect or impair the owner's title; a judgment or dower interest.
- Cloverleaf** — A four leg interchange with loops for left turns and outer connections for right turns or two way ramps for these turns. A full cloverleaf has ramps for two turning movements in each quadrant. (AASHO)
- Community Property** — All property acquired by either husband or wife or both during the marriage, except for that acquired by gift, descent and devise, belongs to both as a community and not as an individual.  
The death of either the husband or wife dissolves the community and the survivor's interest becomes absolute. Where the decedent dies intestate leaving no descendants or ascendants, such decedent's interest goes to the surviving spouse. In some States, when it is the wife who has died, title to the entire property passes to the husband.
- ✓ **Condemnation** — (1) The process by which property is acquired for highway purposes through legal proceedings under the power of eminent domain. (AASHO)  
(2) The act of a Federal, State, County or City government or district or public utility corporation vested with the right of eminent domain to take private property for public use when a public necessity exists. It is the act of a sovereign in substituting itself in the place of the owner and/or the act of taking all or part of the rights of the owner.  
(3) The term *condemnation* denotes the acquisition of property by the exercise of the right or power of eminent domain. Pursuant to this right or power, the sovereign, whether it is the Federal or State government, or an agency to whom there has been delegated this right or power, may, upon payment of just compensation, acquire property for the benefit of the public.
- ✓ **Consequential Damages** — Loss in value of a parcel, no portion of which is acquired, resulting from a highway improvement. (AASHO)

- Constructive Eviction** — Breach of covenant of warranty or quiet enjoyment; for example, the inability of a purchaser, or lessee, to obtain possession by reason of a paramount outstanding title.
- Constructive Notice** — Notice given by the public records. The law presumes that everyone has the same knowledge of all instruments properly recorded as if he were actually acquainted with them.
- ✓ **Contour** — A line connecting the points on a land surface which have the same elevation. The edge of the water of a lake forms a contour line.
- Contract** — An agreement between two or more persons, upon a sufficient consideration, to do or not to do a particular thing.
- ✓ **Contract Rent** — The amount of rent provided for under the terms of the lease; the actual rent that is agreed to be paid. In the written lease it is specifically set forth as one of the terms, and under an oral rental agreement, if the amount can be proven, it likewise is considered contract rent.
- Control of Access** — The condition where the right of owners or occupants of abutting land or other persons to access, light, air or view in connection with a highway is fully or partially controlled by public authority.  
*Full control of access means that the authority to control access is exercised to give preference to through traffic by providing access connections with selected public roads only and by prohibiting crossings at grade or direct private driveway connections.*  
*Partial control of access means that the authority to control access is exercised to give preference to through traffic to a degree that, in addition to access connections with selected public roads, there may be some crossings at grade and some private driveway connections. (AASHO)*
- ✓ **Conveyances** — A written instrument by which a title, estate or interest in property is transferred. (AASHO)
- Corner Influence** — The value effect of location at, or in proximity to, the intersection of two streets. The increment of value resulting from such location or proximity.
- ✓ **Cost of Replacement** — (1) The cost that would be incurred in acquiring an equally desirable substitute property. (2) The cost of reproduction new, on the basis of current prices, of a property having the utility equivalent to the one under appraisal. It may or may not be the cost of a replica of the property. (3) The cost of replacing unit parts of the structure to maintain it in the highest economic operating condition.
- Cost of Replacement Less Depreciation** — The cost of replacement new at current prices less a deduction for depreciation. The deduction for depreciation is a total loss in value arising from physical, functional and economic causes.
- Cost of Reproduction** — The cost of construction new of an exact duplicate or replica using the same materials, construction standards, design, layout, and quality of workmanship.
- Covenant** — An agreement between two or more persons, by deed, whereby one of the parties promises the performance or nonperformance of certain acts, or that a given state of things does or does not exist.
- Cross Connection** — A connecting roadway between two nearby and generally parallel roadways. (AASHO)
- Cross Section** — A view cutting through the roadway at right angles to the centerline showing the relationship of the various components of the roadway.
- Cubage** — Front or width of building multiplied by depth of building and by height.

- Cul-de-sac Street** — A local street open at one end only and with special provisions for turning around. (AASHO)
- Culvert** — Any structure not classified as a bridge which provides an opening under any roadway.
- Curb Loading Zone** — Roadway space adjacent to a curb and reserved for the exclusive use of vehicles during loading or unloading passengers or property. (AASHO)
- Curtesy** — The right which a husband has in his wife's estate at her death. The estate to which by common law a man is entitled, on the death of his wife, in the lands or tenements of which she is seised in possession in fee-simple or in tail during her coverture, provided they have had lawful issue born alive which might have been capable of inheriting the estate. It is a freehold estate for the term of his natural life.

## D

- Dead-End Street** — A local street open at one end only without special provisions for turning around. (AASHO)
- Dedication** — The setting apart by the owner and acceptance by the public of property for highway use, in accordance with statutory or common law provisions. (AASHO)
- Deed** — A duly attested written instrument, under seal, conveying real property or interest therein. (AASHO)
- Deficiency Judgment** — The difference between the indebtedness sued upon and the sale price or market value of the real estate at the foreclosure sale.
- Demise** — A transfer; a lease; a transfer to another of an estate for years, for life or at will.
- Depreciation** — A loss in value brought about by deterioration through ordinary wear and tear, action of the elements or functional or economic obsolescence.
- Depth Factor** — A factor (percentage) which represents the relative value of a given depth of a lot with respect to the value of the lot having an adopted standard or unit depth.
- Descent** — Hereditary succession. Succession to the ownership of an estate by inheritance, or by any act of law, as distinguished from "purchase." Title by descent is the title by which one person, upon the death of another, acquires the real estate of the latter as his heir at law.
- Design Capacity** — The practical capacity or lesser value determined for use in designing the highway to accommodate the design volume. (AASHO)
- Design Hourly Volume** — A volume determined for use in design, representing vehicular traffic expected to use the highway. The design hourly volume, abbreviated as DHV, should be the 30th highest hourly volume (30HV) of the future year chosen for design. Exception may be made on roads with high seasonal fluctuation, where a higher design hour volume may be required.
- Design Speed** — A speed determined for design and correlation of the physical features of a highway that influence vehicle operation. It is the maximum safe speed that can be maintained over a specified section of highway when conditions are so favorable that the design feature of the highway govern. (AASHO)
- Design Volume** — A volume determined for use in design, representing traffic expected to use the highway. Unless otherwise stated, it is an hourly volume. (AASHO)

- Devise** — A testamentary disposition of land or realty; a gift of real property by the last will and testament of the donor.
- Diamond Interchange** — A four leg interchange with a single one-way ramp in each quadrant. All left turns are made directly on the minor highway. (AASHO)
- Direct Compensation** — Payment for land or interest in land and improvements actually acquired for highway purposes. (Sometimes called direct damages.) (AASHO)
- Directional Interchange** — An interchange, generally having more than one highway grade separation, with direct connections for the major left turning movements. (AASHO)
- Dispossess** — To oust from land by legal proceedings; to eject, to exclude from realty.
- Divided Highway** — A highway with separate roadways for traffic in opposite directions. (AASHO)
- Donation** — The voluntary conveyance of private property to public ownership and use, without compensation to the owner. (AASHO)
- Dower** — The right which a wife has in her husband's estate at his death. A species of life estate which a woman is, by law, entitled to claim on the death of her husband, in the lands and tenements of which he is seised in fee during the marriage, and which her issue, if any, might by possibility have inherited.
- Drainage Area** — The area that will drain to any given selected point.
- Drainage Ditch** — Any open water course other than gutters, constructed beyond the limits of cut or fill slopes. The depressed area within the roadway given over to the collection and handling of surface drainage within the right-of-way.
- Drainage Easement** — An easement for directing the flow of water. (AASHO)

## E

- ✓ **Easement** — A right acquired by public authority to use or control property for a designated highway purpose. (AASHO)  
An interest in land consisting of the right to do an act, otherwise unprivileged, on the land of another. Where the easement is restricted to the use of land, it is appurtenant to the designated land and will pass with a transfer of the land. To create this type of easement, such as a right-of-way, the same formalities as those necessary in a conveyance are usually required. (AASHO)
- Easement, Avigation** — A right to fly over lands of another, usually within prescribed horizontal limits, which prohibits the use of the land above a specific level or series of levels, the height being determined by the lower limit of the "glide angle" required for safe approach to, and take off from, airport runways.
- Easement, Line-of-Sight** — See "Sight line easement."
- Easement, Planting** — See "Planting easement."
- Easement, Slope** — See "Slope easement."
- Economic Life** — The estimated period over which it is anticipated that a property may be profitably utilized.  
The period over which a property will yield a return "on" and "of" the investment over and above the economic rent due to the land. This period can never exceed the physical life of the property and most generally is short.
- Economic Obsolescence** — Impairment of desirability or useful life arising from economic forces, change in optimum land use, legislative enactments which restrict or impair property rights, and changes in the supply—demand relationships. Loss in the use and value of property arising from factors of economic obsolescence is

to be distinguished from loss in value from physical deterioration and functional obsolescence.

- ✓ **Economic Rent** — The amount of rent that could be reasonably expected if the property were available for rent. It is a fair, proper, and reasonable rental which would result from informed, intelligent, and prudent bargaining in the usual course of business.
- Effective Age** — The number of years of age indicated by the condition of a building. If a building has been maintained better than average, its effective age is less than the actual age; if there has been inadequate maintenance, it is greater.
- Effective Income** — The estimated gross income less allowances for vacancies and rent losses.
- ✓ **Eminent Domain** — The power to take property for public use with just compensation therefor. (AASHO)  
The right of the people or government to take private property for public use upon payment of just compensation.
- ✓ **Encroachment** — A building, a part of a building, or obstruction which intrudes upon or invades a highway or a sidewalk or trespasses upon the property of another.
- ✓ **Equity** — The interest or value which an owner has in real estate over and above the mortgage against it.
- Equity of Redemption** — The right of the original owner to reclaim property sold through foreclosure proceedings, by payment of debt, interest, and cost.
- ✓ **Escheat** — A preferable right of the State to an estate left vacant and where there is no one in existence able to make a claim thereto. The estate does not escheat to the State until after a certain period of time has elapsed after the death of the owner of the property. The period of time is governed by State law.
- Escrow** — A written instrument which, is deposited by the grantor with a stranger or third party to be kept until the performance of a condition or the happening of a certain event, and then to be delivered over to the grantee.  
The usual type of escrow transaction is where the grantor delivers the deed to a third party, who in turn delivers the deed to the grantee as provided in the escrow agreement.
- ✓ **Estate** — A right in property. An estate in land is the degree, nature, or extent of interest which a person has in it.
- ✓ **Estate for Years** — An estate, the duration of which is definitely fixed by the instrument of conveyance, or can be definitely computed, in the units of a year, a month, a week, or a day, or multiples or fractions thereof. This type of estate is generally referred to or called a leasehold.
- Estate in Reversion** — Residue of an estate left in the grantor, to commence in possession after the termination of some particular estate granted by him. In a lease, the lessor has the estate in reversion after the lease is terminated.
- Estimate** — An opinion developed from analysis of an adequate data program by one qualified to develop such an opinion; hence the opinion of an informed person.  
A preliminary opinion, the approximate cost of doing certain work.
- Eviction** — A violation of some covenant in a lease by the landlord, usually the covenant for quiet enjoyment; also refers to the process instituted to oust a person from the possession of real estate.
- Excess Condemnation** — The policy on the part of the condemner of taking, by right of eminent domain, more property than is actually necessary for the improvement.

**Execution, Writ of** — An order, issued by a court, directing the sale of property to satisfy a debt.

**Execution Sale** — A remedy afforded by law for the enforcement of a judgment. It is the usual process for the enforcement of a judgment for the payment of a sum of money, and it is generally the appropriate remedy for the subjection of tangible property to the satisfaction of the judgment. The writ of execution is followed by a levy, or taking property into the possession of the officer, usually the sheriff, and then by a sale by the sheriff of the property. The sale is completed upon there being executed a deed of conveyance by the sheriff (usually called a sheriff's deed) and delivered to the purchaser.

**Executor** — A person named in a will to carry out its provisions.

**Expense of Operation** — The sum total of all cost of operation of a property which are necessary to the production of gross income, usually estimated and reported on a periodic (such as annual) basis; not to be included as debt service or other capital charges.

**Expressway** — A divided arterial highway for through traffic with full or partial control of access and generally with grade separation at intersection. (AASHO)

## F

✓ **Fair Market Value** — The highest price estimated in terms of money which a property will bring if exposed for sale in the open market allowing a reasonable time to find a purchaser who buys with knowledge of all the uses to which it is adapted and for which it is capable of being used.  
The highest price which a buyer, willing but not compelled to buy, would pay; the lowest a seller, willing but not compelled to sell, would accept.  
*See also, "Market Value."*

**Fair Rental Value** — The monetary amount reasonably expected for the right to the agreed use of real estate. It may be expressed as an amount per month or other period of time, or per room, per front foot, per square foot, or other unit of property. Usually, it is established by competitive conditions. It is synonymous with economic rent.

✓ **Fee Simple** — An absolute estate or ownership in property including unlimited power of alienation. (AASHO)

The largest estate or ownership in real property; free from all manner of conditions or encumbrances. It may be subdivided into numerous lesser estates, but the sum total of all existing estates in any piece of land is equivalent to a fee simple absolute. Any fee simple estate is potentially of perpetual duration. It will continue in the successive heirs and assigns, including the heirs of the assigns, until such time as the current title holder shall die without heirs. At that time, the estate will cease and the property will escheat to the State.

✓ **Fill** — Use of material, or material used to equalize or to raise topography to a certain grade; to build up with fill; to fill low ground with sand, gravel or earth, etc.

**Fill Slope** — The portion of the roadway between the outside of the shoulder and the toe of the slope.

✓ **Fixture** — A movable chattel (such as a machine, heating plant, etc.) which by reason of its annexation to real property and adaptation to continuing use in connection with the realty, is considered a part of the realty.

**Flared Intersection** — An unchanneled intersection, or a divided highway intersection without islands other than medians, where the traveled way of any intersection leg is widened or an auxiliary lane is added. (AASHO)

**Flat or Ungraded Lease** — The fixed rental, flat or ungraded type of lease, provides that the lessee pay a fixed monthly, semi-annual or annual rental for the entire term of the lease.

**Flexible Pavement** — See "Pavement, Flexible."

**Flood Plane** — The areas along the courses of streams which are subject to overflow.

**Flow Line** — The profile of the low point on the inside of a drainage structure or channel.

**Foreclosure** — A court process instituted by a mortgagee or a lien creditor to defeat any interest or redemption which the debtor-owner may have in the property.

**Four Leg Intersection** — An intersection with four legs, as where two highways cross. (AASHO)

**Four-3-2-1 Rule** — An empirical rule which ascribes 40% of the value of the lot to the quarter (in depth) of the lot fronting on the street, 30% to the next quarter, 20% to the third quarter, and 10% to the rear quarter.

**Freehold** — (1) An estate of inheritance, an estate for life, or an estate during the life of a third person.

(2) The unencumbered fee simple property, free of any division of interests.

**Freeway** — An expressway with full control of access. (AASHO)

**Frontage Street or Frontage Road** — A local street or road auxiliary to and located on the side of an arterial highway for service to abutting property and adjacent areas and for control of access. (AASHO)

**Front Foot** — A standard of measure, one foot wide, extending from the street line for a depth generally conceded to be 100 feet.

✓ **Functional Obsolescence** — The impairment of functional capacity or efficiency. Functional obsolescence reflects the loss in value brought about by such factors as overcapacity, inadequacy, and changes in the art, that affect the property item itself or its relation with other items comprising a larger property.

**Functional Utility** — The ability to provide usefulness, service, or profitableness. The combined effects on marketability of the usefulness and desirability of the property. The functional utility of a house is said to be good if the marketability of that house is not affected adversely by functional deficiencies.

## G

**General Benefits** — The advantage accruing from a given highway improvement to the community as a whole, applying to all property similarly situated. (AASHO)

✓ **General Warranty Deed** — A deed in which the grantor warrants the title against defects arising at any time, either before or after the grantor became connected with the land.

**Geometric Design** — Design of the visible dimensions and elements of a highway, street or road.

**Geometric Layout** — A preliminary plan showing all the general geometric features to be included in the proposed project without indicating detailed design information.

✓ **Grade** — (1) The slope of a surface, such as a lot or road, with a vertical rise or fall expressed as a percentage of the horizontal distance; e.g., a 3% upgrade means a rise of 3 feet per 100 feet of horizontal distance.

(2) Sometimes used in a sense of "on or at the same level"; e.g., a crossing at street grade; a lot at street grade.

- Grade Line** — The slope in the longitudinal direction of the roadbed, usually expressed in percent which is the number of units of change in elevation per 100 units horizontal distance. Also has a "general" use to mean the "highway profile."
- Graded or Step-up Lease** — Type of lease providing that the rental shall be increased or stepped up at the end of various stipulated periods in the future. Primarily, this type of lease is brought about by the insistence of the lessor to participate in expected future increased earning power of the property. However, this type of lease may be entered into in order to provide a lower rental during the early life of the lease to enable the lessee to build up his business, become established and lessen the possibility of failure. Although seldom used, there is a reverse or "step-down" type of the step-up lease, which provides for higher rents during the first periods of the lease and lower rents during the latter periods.
- Grade Separation** — A crossing of two highways, or a highway and a railroad, at different levels. (AASHO)
- Grant Deed** — The word grant, when used in a conveyance, conveys fee title and any after-acquired title of the grantor, unless a different intent is expressed in the deed.
- Grantee** — A person to whom real estate is conveyed; the buyer.
- Grantor** — A person who conveys real estate by deed; the seller.
- Gross Income** — The scheduled income from the operation of the business or the management of the property, customarily stated on the annual basis. The total periodic income collectible from the operation of a property on the basis of existing rent schedules.
- Gross Lease** — A lease of property whereby lessor is to meet all property charges regularly incurred through ownership. A lease under which the lessor pays all the expenses of operation of the property as well as capital charges.
- Gross Sales** — The total amount of sales as shown by invoices, before deducting returns, allowances, etc.
- Ground Lease or Ground Rent (Leases)** — (1) The payment made for use of unimproved land, usually, though not necessarily always, on a basis which is completely "net" to the owner.  
(2) The net rent paid for the right of use and occupancy of a parcel of unimproved land; or that portion of the total rental paid that is considered to represent a return upon the land only.
- Guarantee Title** — A title, the validity of which is insured by an abstract, title or indemnity company. (Sometimes called an Insured Title.) (AASHO)
- Gutter** — Any prepared open water course, whether paved or not, constructed inside of the shoulder line.

## H

- Habendum Clause** — The "to have and to hold" clause which usually follows the granting part of the deed, defining or limiting the quantity of the estate granted.
- Headway** — The time interval between passages of consecutive vehicles moving in the same direction by a given point. (AASHO)
- Hereditaments** — The largest classification of property; includes lands, tenements, and incorporeal property such as rights-of-way. Anything capable of being inherited.
- Highest and Best Use** — The most productive use, reasonable but not speculative or conjectural, to which property may be put in the near future. (AASHO)

A use of land which may reasonably be expected to produce the greatest net return to land over a given period of time. That legal use of land which will yield to land the highest present value. Sometimes called optimum use.

**Highway Capacity** — A measure of the ability of a roadway to accommodate traffic. Capacity of a roadway is affected by the composition of traffic, roadway alignment, profile, number and width of traffic lanes, adjacent development, vehicular speed and weather.

**Highway Development Right** — The right of owners to make changes in abutting property uses which, if exercised, would be inconsistent with present and future highway needs. (AASHO)

**Highway—Street or Road** — A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way. (AASHO)

**Historical Cost** — The total cost of a project on the basis of prices at the time of construction.

**Holdover Tenant** — A tenant who remains in possession of leased property after the expiration of the lease term.

**Horizontal Curve** — A curve joining two straight portions of alignment.

## I

**Income Capitalization** — A procedure in the appraisal process by which the value of real property can be estimated from the quantity, quality, and duration of its net income expectancy. It is the process of determining the value through the use of a rate which is believed to represent the proper relationship between the value of the property and the net income it will produce.

**Income, Gross** — See "Gross Income."

**Income, Net** — See "Net Income."

**Increasing Annuity** — An income stream characterized by periodic, fixed increases per period.

**Incumbrance** — A claim, lien, charge, or liability attached to and binding upon real property, such as a judgment, unpaid taxes, or a right-of-way; defined in law as any right to, or interest in, land which may subsist in another to the diminution to its value, but consistent with the passing of the fee.

**Incurable Depreciation** — The loss from cost now which is impossible to offset or which would involve an expenditure substantially in excess of the value increment resulting therefrom; e.g., loss due to detrimental neighborhood influences, loss due to over—and undersized rooms, excessive ceiling heights, poor design and/or layout, and loss caused by gradual deterioration of the bone structure, i.e., skeletal or structural members of a building which are rarely replaced unless they happen to be exposed, such as uncovered floor joists.

**Indenture** — A deed to which two or more persons are parties, and in which these enter into reciprocal and corresponding grants or obligations towards each other.

**Installment Contract** — Purchase of property with the debt payable at different successive periods as agreed; upon default, payments are forfeited.

**Interchange** — A grade separated intersection with one or more turning roadways for travel between intersection legs. (AASHO)

A system of interconnecting roadways in conjunction with a grade separation or grade separations providing for the interchange of traffic between two or more intersecting highways.

**Interchange Ramp** — A turning roadway at an interchange for travel between intersection legs. (AASHO)

**Interest** — A sum paid or calculated for the use of capital. The sum is usually expressed in terms of a rate or percentage of the capital involved, called the "interest rate."

**Intersection** — The general area where two or more highways join or cross, within which are included the roadway and roadside facilities for traffic movements in that area. (AASHO)

**Intersection Angle** — The angle between two intersection legs. (AASHO)

**Intersection at Grade** — See "At-grade Intersection."

**Intersection Entrance** — That part of an intersection leg for traffic entering the intersection. (AASHO)

**Intersection Exit** — That part of an intersection leg for traffic leaving the intersection. (AASHO)

**Interstate Highway System** — The Interstate System shall be designated within the United States, including the District of Columbia, and it shall not exceed forty-one thousand miles in total extent. It shall be so located as to connect by routes, as directly as practicable, the principal metropolitan areas, cities, and industrial centers, to serve the national defense and to the greatest extent possible, to connect at suitable border points with routes of continental importance in the Dominion of Canada and the Republic of Mexico. (Title 23, U.S.C.)

**Intrinsic Value** — A cost concept in that value is claimed to be inherent in the object itself, as opposed to the subjective theory of value which holds that goods or services have value because people will forego the use and enjoyment of goods and/or other services for the right of possession and use of them.

**Inverse Condemnation** — The legal process by which a property owner may claim and receive compensation for the taking of, or payment for damages to, his property as a result of a highway improvement. (AASHO)

**Island** — A defined area between traffic lanes for control of vehicle movements or for pedestrian refuge. Within an intersection a median or an outer separation is considered an island. (AASHO)

## J

**Joint Estates** — Two or more persons having concurrent and simultaneous estates or interests in the same parcel of land whether or not the estate in land is fee simple, a life estate, or an estate for years. Such cases of co-ownership are called tenancy by the entirety, joint tenancy, tenancy in common and community property.

**Joint Tenancy** — An estate in fee simple, for life, for years, or at will, arising by purchase or grant to two or more persons. Joint tenants have one and the same interest, accruing by one and the same conveyance, commencing at one and the same time, and held by one and the same undivided possession. The distinct character of joint tenancy is survivorship, by which the entire tenancy on the decease of any joint tenant remains to the survivors, and at length to the last survivor.

**Judgment** — Decree of court declaring that one individual is indebted to another and fixing the amount of such indebtedness.

**Just Compensation** — A full and fair equivalent for the loss sustained by the owner as a result of taking or damaging of private property for highway purposes. (AASHO)

## K

L

- ✓ **Laches** — Neglect to do a thing at a proper time, especially such delay as will bar a party from bringing a legal proceeding.
- ✓ **Land Residual Techniques** — A term designating a technique in which the building is valued independently of the land. The fair annual net return on the building value (interest and provision for depreciation) is deducted from the estimated net annual income to the property (land and building) and the residual amount is said to be attributable to the land and is capitalized to indicate the land value.
- ✓ **Lane** — A portion of the traveled way for the movement of a single line of vehicles.
- ✓ **Lease** — A contract, written or oral, for the possession of lands and tenements, on the one hand, and a recompense of rent or other income, on the other hand. It is a contract by which one person divests himself of real property and another person takes possession thereof for a determinable and limited time, though not necessarily a definite period of time.
- ✓ **Lease Assignment** — In a lease assignment, the lessee assigns and the new lessee assumes all of the terms of the original lease. The original lessee is relieved of further responsibility and the rent is paid by the new lessee direct to the original lessor.
- ✓ **Leased Fee** — (1) The title to a real estate subject to a lease. (2) A property held in fee with the right of use and occupancy conveyed under lease to another. A property with the right to receive ground rentals over a period of time and an ultimate repossession.
- ✓ **Leasehold** — Property held under tenure of lease. A property consisting of the right of use; occupancy of real property by virtue of lease agreement. The right of the lessee to use and enjoy real estate for a stated time under certain conditions, such as the payment of rent.
- ✓ **Legal Access** — A right which an owner of land that abuts a highway has to use the highway for ingress and egress.
- ✓ **Lessee** — One who acquires the right of use of the property of another. He is the one to whom the lease is granted or the property is rented under the lease. The lessee's interest is known as the leasehold.
- ✓ **Lessor** — One who rents real property to another or one who conveys or leases the right of use of real estate to another. He is the landlord. He usually is the fee owner; however, this is not always so, as in the case of a lessee who subleases to another party. The original lessee then also becomes a lessor and the owner of a sandwich lease interest. The lessor's interest is known as the leased fee.
- ✓ **Lien** — A hold or claim which one person has upon the property of another as a security for a debt or a charge, judgment, mortgage, taxes, etc.
- ✓ **Lienee** — A person who possesses a right of lien on the property of another.
- ✓ **Lienor** — A person on whose property the right of lien exists.
- ✓ **Life Estate** — An estate which is not terminable at any fixed or computable period of time, and cannot last longer than the life or lives of one or more persons. A life estate may arise by operation of law, or may be created by act or agreement of parties. A life estate created by the acts of the parties arises when the conveyance limits the duration of the created estate by the life or lives of one or more identified and existent persons, or when the conveyance, viewed as a whole, manifests the intent of the transferor to create an estate measured by the life or lives of one or more existent persons. A life estate can be conveyed but the life tenant cannot convey a greater estate than his own.

**Local Street or Local Road** — A street or road primarily for access to residence, business or other abutting property. (AASHO)

**Location** — The fixed position of the highway on the ground, including curves and tangents.

**Loop** — A one-way turning roadway that curves about 270° to the right to accommodate a left turning movement. It may include provisions for a left turn at a terminal to accommodate another turning movement. (AASHO)

## M

✓ **Market Value** — The highest price for which property can be sold in the open market by a willing seller to a willing purchaser, neither acting under compulsion and both exercising reasonable judgment. (AASHO)

**Marketable Title** — A title not subject to such reasonable doubt as would create a just apprehension of invalidity in the mind of a reasonable, prudent and intelligent person; one that a person of reasonable prudence and intelligence, guided by competent legal advice, would be willing to take and pay fair value for.

**Mechanic's Lien** — A species of lien created by statute which exists in favor of persons who have performed work or furnished materials in the erection or repair of a building.

**Median** — The portion of a divided highway separating the traveled ways for traffic in opposite directions. (AASHO)

**Median Lane** — A speed-change lane within the median to accommodate left turning vehicles. (AASHO)

**Median Opening** — A gap in a median provided for crossing and turning traffic. (AASHO)

**Merging** — The converging of separate streams of traffic into a single stream. (AASHO)

**Merging End** — An end of an island, or neutral area between roadways, beyond which traffic merges. (AASHO)

**Metes and Bounds Description** — A description of a parcel of land by reference to the courses (bearings, that is, the angles east or west of due north or due south) and distances (usually in feet or chains) of each straight line which forms its boundary, with one of the corners tied to an established point, that is, the bearing and distances to an established point, such as a section corner, or to the intersection of center lines of two roads. If one part of the boundary is on a curve, this part is described by showing the number of degrees of the central angle subtended by the curve arc, the length of the radius, and the length along the curve.

**Modernization** — Alteration of internal plan and/or facilities or of external detail of property or equipment to conform to present usage, style, form, method or taste.

✓ **Mortgage** — A conditional transfer of real property as security for the payment of a debt or the fulfillment of some obligation. A conveyance of an estate or interest of land as security of a debt with the right of redemption.

**Mortgage Deed** — A deed by way of mortgage which has the effect of the mortgage on the property conveyed and imposes a lien on the granted estates.

**Mortgagee** — A person to whom property is conveyed as security for a loan. One who takes a mortgage, or one who loans money secured by a mortgage.

**Mortgagee in Possession** — A mortgagee creditor who takes over the income from the mortgaged property upon default on the mortgage by the debtor.

**Mortgagor** — An owner who conveys his property as security for a loan (the debtor). One who gives a mortgage or one whose property is mortgaged.

**Multileg Intersection** — An intersection with five or more legs. (AASHO)

## N

**Negotiation** — The process by which property is sought to be acquired for highway purposes through discussion, conference, and final agreement upon the terms of a voluntary transfer of such property. (AASHO)

**Neighborhood** — An urban or suburban residential (or commercial) area exhibiting a fairly high degree of homogeneity as to housing, tenancy, income and population characteristics. They are often outlined by physical barriers such as railroad tracks, streams, commercial or industrial developments, hills, ravines, and by lines created by subdivision developments, difference in zoning ordinances, deed restrictions, or type or age of building development.

**Net Ground Lease** — A lease of unimproved land which provides that the lessee assume all property charges, including charges against land and improvements to be constructed by the lessee.

**Net Income** — The difference between the effective gross income and the expenses, including taxes and insurance. Usually the term is qualified as net income before depreciation.

**Net Lease** — A lease under which the lessee assumes complete responsibility for the operation of a property, including the obligation of operating expenses and all charges, including taxes, insurance, replacements, and any special assessments.

**Net Profit** — The term "net profits", without qualifying expression, is used to describe only the profits remaining after including all earnings and other income or profit and after deducting all expenses and charges of every character, including interest, depreciation and taxes. Net profits should represent the amount available for dividends and surplus.

— **Nonconforming Use** — A use which was lawfully established and maintained but which, because of the application of a zoning ordinance to it, no longer conforms to the use regulations of the zone in which it is located.

— **Nuisance Value** — The price an abutter or a nearby owner would pay to get rid of an objectionable condition or occupancy.

## O

**Observed Depreciation** — The loss from cost new which can be observed upon an inspection of the property under appraisal; in this restricted sense, ordinarily limited to physical deterioration or wear-out and functional obsolescence.

The loss from cost new which can be estimated from observation of the property itself and also from observation of environmental influencing factors, all as developed from competent analysis of an adequate market data program; in this broader usage, it is ordinarily limited to physical deterioration or wear out, functional obsolescence or environmental or economic obsolescence.

**Obsolescence** — The condition of being out of date. Obsolescence is caused by new inventions and improved processes for production or a change in the demand for the things produced. It is not the result of mere age or wear (physical depreciations).

— **Open End Mortgage** — A mortgage which permits the mortgagee to make additional advances, to be added to the principal balance and to be secured by the mortgage, without prejudice to the position of the mortgagee as a senior lienor or encumbrancer.

- Operating Expenses** — Generally speaking, all expenses, occurring periodically, which are necessary to produce net income before depreciation. Under some conditions, these expenses are placed in two categories; namely, operating expenses and fixed charges.
- Operating Statement** — An account in writing of the income, expense and profits of an enterprise during a specific period. A section of the profit-and-loss account of an enterprise whose main source of revenue is the performance of a service.
- Operational Delay** — The delay caused by interference between components of traffic. (AASHO)
- Option** — A written agreement granting a privilege to acquire property or an interest therein at a fixed price within a specified period. (AASHO)  
The right to purchase or lease a property at a certain price for a certain designated period, for which right a consideration is paid.
- Outer Connection** — A one-way turning roadway primarily for a right-turning movement. It may include provisions for a left turn at a terminal to accommodate another turning movement. (AASHO)
- Outer Separation** — The portion of an arterial highway between the traveled ways of a roadway for through traffic and a frontage street or road. (AASHO)
- Overall Rate** — A capitalization rate used in the processing (capitalizing) of the income to the property, that is, one rate for the total net income regardless of the amount attributable to any fractional part of the property.
- Overimprovement** — An improvement which is not the highest and best use for the site on which it is placed by reason of excessive size or cost.
- Overpass** — A grade separation where the subject highway passes over an intersecting highway or railroad. (Also called Overcrossing.) (AASHO)

## P

- Parcel Plat** — A map of a single parcel of property or a portion thereof needed for highway purposes, showing the boundaries, areas, the remainder, improvements, access, ownership and other pertinent information. (AASHO)
- Parkway** — An arterial highway for non-commercial traffic, with full or partial control of access, and usually located within a park or a ribbon of park-like development. (AASHO)
- Partial Taking** — The acquisition of a portion of a parcel of property. (AASHO)
- Party Wall** — A wall erected upon and over a line which separates two properties and in which the respective owners have common rights of use.
- Pass** — A land service facility for private use which separates the highway lanes from the cross movement of persons, animals (stockpass), vehicles and/or machines (equipment pass).
- Passing Sight Distance** — The minimum sight distance that must be available to enable the driver of one vehicle to pass another vehicle traveling 10 MPH slower than design speed, safely and comfortably, without interfering with the speed of an on-coming vehicle traveling at the design speed should it come into view after the overtaking maneuver is started.
- Patent** — A grant of some privilege, property, or authority made by the government or sovereign of a country to one or more individuals.  
A muniment of title issued by a government or state for the conveyance of some portion of the public domain. The instrument by which a state or government grants public lands to an individual.

- Pavement, Flexible** — A pavement structure which maintains intimate contact with and distributes loads to the subgrade and depends upon aggregate interlock, particle friction, and cohesion for stability. (AASHO)
- Pavement, Rigid** — A pavement structure which distributes loads to the subgrade having as one course a portland cement concrete slab of relatively high bending resistance. (AASHO)
- Pedestrian Overpass** — A grade separation designed to carry only pedestrian traffic over the highway.
- Pedestrian Underpass** — A grade separation designed to carry only pedestrian traffic under the highway.
- Percentage Lease** — A lease which provides that a rental shall be based on a percentage of the volume of business done on the premises, usually with a guaranteed minimum and occasionally a maximum rental regardless of business volume.
- Perch** — A unit of land measurement of 16.5 feet, the same length as a rod. There are four perches to a chain.
- Perpetuity** — A state of being continued forever; for example, an annuity which extends into the future without termination. Generally applied to an amount which accrues periodically for an indefinite number of installments, that is, without known or expected limitations.
- Physical Depreciation** — The physical wearing out. Decay, impairment, wasting away, wear and tear through the actions of the elements, age and use.
- Planting Easement** — An easement for reshaping roadside areas and establishing, maintaining and controlling plant growth thereon. (AASHO)
- Plat** — A map or plan of measurement. A representation on paper of a piece of land. A subdivision of land marked upon the earth and represented on paper.
- Plottage** — The increment resulting from the combination of two or more parcels into a larger whole so as to develop one site having a greater utility than the aggregate of each when separately considered.
- Police Power** — The inherent right of a government to pass such legislation as may be necessary to protect the public health and safety and/or to promote the general welfare. The control by the State, under which public welfare is served and to which property rights are subject.
- Possible Capacity** — The maximum number of vehicles that can pass a given point on a lane or roadway during one hour under the prevailing roadway and traffic conditions regardless of their effect in delaying drivers and restricting their freedom to maneuver. (AASHO)
- Practical Capacity** — The maximum number of vehicles that can pass a given point on a lane or roadway during one hour under the prevailing roadway and traffic conditions, without unreasonable delay or restrictions to the driver's freedom to maneuver. (AASHO)
- Prescription** — The acquisition of incorporeal hereditaments by an adverse user.
- Profile Grade** — The trace of a vertical plane intersecting the top surface of the proposed wearing surface, usually along the longitudinal center line of the road-bed. Profile grade means either elevation or gradient of such trace according to the context.
- Profile—Ground** — A line indicating ground elevations of a vertical section along a survey line.
- Property** — The right or interest which an individual has in lands and chattels to the exclusion of all others. Although technically the term means a right or interest in things rather than the things themselves, common usage makes it applicable to things rather than to the right or interest.

**Property Line** — The division between two parcels of land, or between a parcel of land and the street.

**Property—Personal** — In broad and general sense, everything that is the subject of ownership, not coming under the denomination of real estate. A right or interest in things personal, or right or interest less than a freehold in realty, or any right or interest which one has in things movable.

**Property—Real** — The bundle of rights which arise by reason of the ownership of physical real estate. The rights and interests possessed in land and those things affixed to the land.

Land, and generally whatever is erected or growing upon or affixed to land.

**Property Residual Technique** — A method of processing an indication of property value, i.e., land and buildings treated as a unit, by the capitalization of net income before depreciation. Provision for the recapture of capital value of the entire property is included, together with pure interest, in the overall rate employed.

**Proximity Damage** — A damage to a property arising as a consequence of the nearness or proximity of a highway, or other type of construction, to the improvements on the property. The diminution of the market value of a property as a result of the encroachment and proximity of a highway or other type of construction.

**Purchase and Lease Back** — A real estate transaction wherein an investor acquires title by purchase and gives contract possession by leasehold to the grantor.

**Purchase Money Mortgage** — A mortgage given by a grantee to the grantor in part payment of the purchase price of real estate.

## Q

**Quantity Survey Method** — A method of estimating costs, that is, in its strictest application, a repetition of the contractor's original procedure of determining the quantity and grade of each type of material used in the structure, estimating labor hours required, and applying unit costs to the material and labor quantities, with additional allowances for such items as overhead costs, labor insurance and contractor's profits.

**Quasi** — As if; of a similar nature.

**Quiet Enjoyment** — A covenant that the tenant or grantee of an estate shall enjoy the possession of the premises in peace and without disturbance by hostile claimants.

**Quitclaim Deed** — A deed conveying, without warranty, any title, interest or claim the grantor may have in the estate conveyed. (AASHO)

## R

**Radial Highway** — An arterial highway leading to or from an urban center. (AASHO)

**Railroad Grade Crossing** — The general area where a highway and a railroad cross at the same level, within which are included the railroad, roadway, and roadside facilities for traffic traversing that area. (AASHO)

**Rainfall Intensity** — Amount of rainfall in inches per hour in some select unit of time.

**Ramp** — See "Interchange Ramp."

**Real Property** — See "Property-Real".

- Reconditioning** — Restoration to sound condition by readjustment and replacement of worn parts; renovation.
- Reconstructed Statement** — A statement setting forth certain facts concerning a property or a business wherein certain items or figures appearing on an accounting statement are eliminated, transposed or changed for the purpose of reflecting a more complete or accurate statement under a variance of conditions for particular consideration.
- Remainder** — The portion of a parcel retained by the owner after a part of such parcel has been acquired. (AASHO)
- **Remainder Estate** — An estate in property created at the same time and by the same instrument as another estate and limited to arise immediately upon the termination of the other estate.
- Remaining Economic Life** — The period of time (years) from the date of appraisal to the date when the improvements become valueless.
- Remnant** — A remainder so small or irregular that it usually has little or no economic value to the owner. (AASHO)
- Remodeling** — Reconstruction of a property to adapt it to new and improved use.
- Rent** — The agreed upon payment for the right of use and/or occupancy of property, usually reduced to the form of a written lease.
- Residual Process** — A term applied to a method of estimating the value of the land or the building, as indicated by the capitalization of the residual net income attributable to it.
- Retaining Walls** — Vertical concrete walls, usually constructed adjacent to the roadbed, normally emplaced where restrictive right-of-way or design will not permit the use of normal slopes in embankment or cut sections.
- Revaluation Lease** — A type of lease providing for a flat rental during a stated initial period, with the property revalued and a new rental schedule developed therefrom at stated subsequent periods of time.
- Reversion** — The right to repossess and resume the full and sole use and proprietorship of real property which temporarily has been alienated by lease, easement or otherwise. The reversion right becomes effective at a stated time or under certain conditions such as the termination of a leasehold, etc., according to the terms of the controlling instrument.
- Right of Access** — The right of ingress to a highway from abutting land and egress from a highway to abutting land. (AASHO)  
See "Control of Access."
- Right of Immediate Possession** — The right to occupy property for highway purposes, after preliminary steps for acquisition have been taken and before final settlement. (AASHO)
- Right of Survey Entry** — The right to enter property temporarily to make surveys and investigations for proposed highway improvements. (AASHO)
- **Right-of-Way** — A general term denoting land, property or interest therein, usually in a strip, acquired for or devoted to a highway. (AASHO)
- Right-of-Way Appraisal** — The determination of the market value of property including damages, if any, as of a specified date, resulting from an analysis of facts. (AASHO)
- Right-of-Way Estimate** — An approximation of the market value of property including damages, if any, in advance of an appraisal. (AASHO)
- Right-of-Way Strip Map** — A plan of a highway improvement showing its relation to adjacent property, the parcels or portions thereof needed for highway purposes, and other pertinent information. (AASHO)

Rigid Pavement — See "Pavement, Rigid"

Rip Rap — Slope protection emplaced on steep cut banks or embankments to eliminate the occurrence of erosion, consisting of a thin concrete slab, grouted rock, wire fabric or stone blankets.

Riparian Rights — The rights of an owner of water-fronting lands in the bed, banks, accretions, water, access, moorage and related items. (AASHO)

2 Roadbed — The graded portion of a highway, usually considered as the area between the intersections of top and side slopes, upon which the base course, surface course, shoulders and median are constructed. (AASHO)

Roadside — A general term denoting the area adjoining the outer edge of the roadway. Extensive areas between the roadways of a divided highway may also be considered roadside. (AASHO)

Roadside Control — The public regulation of the roadside to improve highway safety, expedite the free flow of traffic, safeguard present and future highway investment, conserve abutting property values, or preserve the attractiveness of the landscape. (AASHO)

Roadside Zoning — The application of zoning for roadside control. (AASHO)

Roadway — The portion of a highway, including shoulders, for vehicular use. A divided highway has two or more roadways. The portion of the highway within the limits of construction. (AASHO)

Rotary — A channelized intersection in which traffic moves counter-clockwise around a center island desirably of sufficient size to induce weaving movements in lieu of direct crossing (AASHO)

Rotary Interchange — A multileg interchange where one highway is grade separated from a rotary on which all turning movements and through movements of all other highways are accommodated. (AASHO)

Route — The general position of a highway relative to major features of topography such as centers of population or important terrain features.

## S

Sandwich Lease — A lease in which the "sandwiched party" is the lessee of one party and the lessor to another. Usually the owner of the sandwich lease is neither the fee owner nor the user of the property.

Scenic Easement — An easement for conservation and development of roadside views and natural features. (AASHO)

Schematic Layout — A preliminary layout showing generally the proposed method of providing for the various traffic movements, not necessarily to scale.

Seizin — *Seisen*—Possession of real estate by one entitled thereto.

Setback Line — A line outside the right-of-way, established by public authority, on the highway side of which the erection of buildings or other permanent improvement is controlled. (AASHO)

A line established by law, deed restrictions or custom, fixing the minimum distance of the exterior face of the building, walls, and any other construction from a street or highway right-of-way line.

See also "Building Line."

6 Severance Damages — Loss in value of the remainder of a parcel resulting from an acquisition. (Sometimes called Indirect Damages.) (AASHO)

Any element of value arising out of the relation of the condemned portion to the tract of which it was a part. More specifically, in a partial taking, the diminution of the market value of the remainder area as a result of the severance of the part taken.

- Shoulder** — The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses. (AASHO)
- Side Ditch** — A prepared open water course, paved or not, contiguous to both the shoulder line and the base of the cut slope.
- Sideslope** — That portion of the roadway between the outside edge of shoulder and the adjacent drainage ditch, usually measured as a ratio of horizontal distance versus each foot of decrease in elevation.
- Sight Distance** — The length of roadway visible to the driver of a passenger vehicle at any given point on the roadway when the view is unobstructed.
- Sight Line Easement** — An easement for maintaining or improving the sight distance.
- Slope** — The inclined graded area beyond the shoulder and extending from the shoulder to the natural and undisturbed surface of the ground.
- Slope Easement** — An easement for cuts or fills. (AASHO)
- Special Benefits** — Advantage accruing from a given highway improvement to a specific property and not to others generally. (AASHO)
- Special Provisions** — Special directions, provisions or requirements peculiar to the project under consideration and not otherwise thoroughly or satisfactorily detailed or set forth in the specifications.
- Special Warranty Deed** — A special warranty deed is a deed in which the grantor warrants the title against defects arising after he acquired the land but not against defects arising before that time.  
A deed wherein the grantor limits his liability to the grantee to anyone claiming by, from, through or under him, the grantor.
- Specifications** — A general term comprising all directions, provisions and requirements contained within a specifications book together with such as may be added or adopted as supplemental specifications.
- Specific Performance** — A remedy in a court of equity compelling the defendant to carry out the terms of the agreement or contract which was executed.
- Speed-Change Lane** — An auxiliary lane, including tapered areas, primarily for the acceleration or deceleration of vehicles entering or leaving the through traffic lanes. (AASHO)
- Spot Zoning** — A provision in a zoning plan, or modification in such a plan, which affects only the use of a particular piece of property or a small group of adjoining properties and is not related to the general plan for the community as a whole.
- Standard Depth** — The depth of a typical lot in a neighborhood or community, usually applied to lots of a particular use category, such as central business lots, outlying commercial lots, and lots of different price residential neighborhoods.
- Stopping Sight Distance** — The distance required by a driver of a vehicle, traveling at a given speed, to bring his vehicle to a stop after an object on the roadway becomes visible. The distances used in design are calculated based on the driver's ability to see a 6-inch object in the road ahead when his eye level is  $3\frac{3}{4}$  feet above the roadway surface.
- Storm Sewer** — An underground conduit for drainage of surface water. An enclosed conduit that carries off the surface drainage through a series of surface inlets.
- Structural Layout** — The bridge layout that is prepared on a structural plan and profile sheet showing the plan of the proposed structure and a profile along the centerline of the proposed structure.
- Subbase** — The layer or layers of specified or selected material of designed thickness placed on a subgrade to support a base course. (AASHO)

- Subdivision** — A tract of land divided into lots suitable for home building purposes.
- Subgrade** — The top surface of a roadbed upon which the pavement structure and shoulders are constructed. (AASHO)
- Sublease** — Usually considered synonymous with sandwich lease, except that often a sublease involves the subletting of but a portion of the premises included in the prime lease.
- Substitution** — The principle of substitution affirms that the maximum value of a property tends to be set by the cost of acquisition of an equally desirable and valuable substitute property, assuming no costly delay is encountered in making the substitution.
- Substructure** — All of that part of the structure below the bottoms of the bearings supporting the superstructures, together with the backwalls and wingwalls.
- Summation Appraisal** — The market value indication derived through the addition of the value of the land, considered to be vacant and available, and the depreciated replacement cost of the improvement.
- Surface Runoff** — That part of the rainfall on an area that flows off as free surface water.
- Surplus Income** — The excess rent which a landlord or lessor enjoys over and above fair rental value when contract rent exceeds economic rent.  
Surplus income may arise because of temporary shortage of similar properties, excellent management, a monopoly, or a rapidly increasing rent.

## T

- Taking** — See "Acquisition or Taking."
- Tenancy at Sufferance** — A tenancy at sufferance is a possessory interest in land which exists when a person who had an estate in land wrongfully continues in possession of the land after the termination of such estate. Notice to terminate is not essential, unless specifically required by statute.
- Tenancy at Will** — An estate which is terminable at the will of either the landlord or tenant and has no specific duration. The relationship between the landlord and tenant at will is personal in its nature and, therefore, such tenancy is terminated by the death of either party.
- Tenancy by Dower** — A life estate to which a widow is entitled on the death of her husband in a third of the lands of which he was seized in fee simple, at any time during the marriage.
- Tenancy by the Curtesy** — A life estate to which, at common law, the husband is entitled in all the lands and tenements of which he and his wife were seized, in the right of the wife, in fee simple during the marriage, providing that there was issue born alive capable of inheriting the estate.
- Tenancy by the Entirety** — Created by a conveyance to husband and wife, whereupon each becomes seized and possessed of the entire estate and after the death of one the survivor takes the whole.
- Tenancy from Period to Period** — This type of tenancy arises in a case where the tenancy is automatically renewed at the end of each period unless, prior to the end of any given period, appropriate notice to terminate has been given.
- Tenancy in Common** — Tenants in common exist where two or more persons have distinct but undivided shares in an estate or interest in property. Each share is several and distinct from the share of the cotenants.
- Tenant** — In the broadest sense, one who holds or possesses lands or tenements by any kind of right or title, whether in fee, for life, for years, at will, or otherwise.

- **Tenement** — Everything of a permanent nature which may be held.
- **Terre Tenant** — One who has actual possession of land.
- ↙ **Three Approaches** — The basic methods or techniques by which market data are processed into an indication of value, designated as:
  - (1) *Comparative Sales Approach* variously referred to as *Comparison Approach*, *Sales Comparison Approach*, *Market Data Approach*.
  - (2) *Cost Approach*, sometimes referred to as *Summation Approach*.
  - (3) *Net Income Capitalization Approach*, sometimes referred to as *Capitalization Approach* and *Income Capitalization Approach*.
- Through Street or Through Highway** — Every highway or portion thereof on which vehicular traffic is given preferential right-of-way, and at the entrances to which vehicular traffic from intersecting highways is required by law to yield right of way to vehicles on such through highway in obedience to either a stop sign or a yield sign, when such signs are erected as provided in this act. (Uniform Vehicle Code—1956.) (AASHO)
- Time of Concentration** — The time required for water to flow from the most distant part of the drainage area to the point under consideration.
- Title** — The evidence of a person's right to property or the right itself. (AASHO)
- Title Insurance** — A policy of insurance which indemnifies the holder for any loss sustained by reason of defects in the title.
- Title Opinion** — An analysis and interpretation of a title search concerning present ownership, encumbrances, clouds on title and other infirmities. (AASHO)
- Title Search** — An investigation of public records and documents to ascertain the history and present status of title to property, including ownership, liens, encumbrances, charges and other interests. (AASHO)
- Toll Road** — A highway, bridge, or tunnel open to traffic only upon payment of a direct toll or fee. (AASHO)
- Torrens Title** — A certificate of title issued by a public authority under a system wherein all deeds and documents affecting real property are registered. (AASHO)
- Traveled Way** — The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes. (AASHO)
- Tunnel—Vehicular** — A subterranean passageway designed for the accommodation of vehicular traffic.
- Turning Movement** — The traffic making a designated turn at an intersection. (AASHO)
- Two-Way Ramp** — A ramp for travel in two directions. At a cloverleaf, it serves as both an outer connection and a loop. (AASHO)

## U

- Unchannelized Intersection** — An at-grade intersection without islands for directing traffic into definite paths. (AASHO)
- Underpass** — A grade separation where the subject highway passes under an intersecting highway or railroad. (Also called Undercrossing.) (AASHO)

## V

- Valuation** — The act or process of estimating value. The amount of estimated value.
- Vendee** — The purchaser of real estate under an agreement.

Vendor — The seller of real estate, usually referred to as the party of the first part in an agreement of sale.

✓ Vertical Curve — A curve drawn tangent to two intersecting grade lines to provide a smooth transition from one grade to another.

Volume, Traffic — The number of vehicles passing a given point during a specified time period. (AASHO)

## W

Waiver — The renunciation, abandonment or surrender of some claim, right or privilege.

✓ Warranty Deed — A deed containing covenants by the grantor, for himself and his heirs, to the grantee and his heirs, to warrant and defend the title and possession of the estate conveyed. (AASHO)

Wasting Assets — Those assets that are subject to depletion, such as timber, mineral, or oil lands.

Water Table — The upper limit of that part of the soil (or underlying material) wholly saturated with water.

Weighted Average — An average where each item in a series is adjusted by a judgment factor which reflects its relative importance. It is obtained by multiplying each item by its assigned weight (degree of importance or reliability), adding each product and then dividing the sum of the product by the sum of the weights.

Writ of Execution — A writ which authorizes and directs the proper officer of the court (usually the sheriff) to carry into effect the judgment or decree of the court.

## X

## Y

## Z

Zoning — The division of an area into districts and the public regulation of the character and intensity of use of the land and improvements thereon. (AASHO)

Zoning Ordinance — The exercise of police powers within the municipality in regulating and controlling the use of property.