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Prepared for

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

Prepared by

ENVIRONMENTAL PLANNING DIVISION

within the

LOCATION SECTION, HIGHWAY DEVELOPMENT GROUP

ARIZONA HIGHWAY DEPARTMENT
IN CONJUNCTION WITH THE
FEDERAL HIGHWAY ADMINISTRATION

* * *

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Administrative Action for

State Route 360
Superstition Freeway

Project F-028-1-201 JUNCTION I-10 - PINAL COUNTY LINE
MARICOPA COUNTY, ARIZONA

Project F-028-1-202 MARICOPA COUNTY LINE - JUNCTION U.S. 60
PINAL COUNTY, ARIZONA

* * *

THIS HIGHWAY IMPROVEMENT IS PROPOSED FOR FUNDING UNDER TITLE 23, UNITED STATES CODE. THIS STATEMENT FOR THE IMPROVEMENT WAS DEVELOPED IN CONSULTATION WITH THE FEDERAL HIGHWAY ADMINISTRATION AND IS SUBMITTED PURSUANT TO:

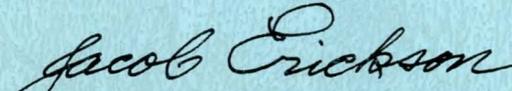
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July 24, 1973
Date


A. L. CHADWICK
Chief Deputy State Engineer
ARIZONA HIGHWAY DEPARTMENT

CLEARED BY FHWA FOR CIRCULATION AND COMMENTS

July 24, 1973
Date


for H. C. TILZEY, Division Engineer
FEDERAL HIGHWAY ADMINISTRATION

ES-10

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SUMMARY

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

PROJECTS

F-028-1-201
JUNCTION I-10 - PINAL COUNTY LINE

F-028-1-202
MARICOPA COUNTY LINE - JUNCTION U.S. 60

STATE ROUTE 360
SUPERSTITION FREEWAY

NOTE: For the purpose of this Environmental Impact Statement, the above referenced projects are combined. Where reference is made to "the project", it shall mean the combination of projects unless otherwise specified.

Description of Highway Project

The present routing of State Route 360 (Superstition Freeway) was established in 1962 as part of "A Major Street and Highway Plan for the Phoenix Urban Area and Maricopa County" and has been adopted by those agencies responsible for planning in the area traversed by the freeway. The roadway will be constructed to freeway standards from its present terminus at Rural Road in Tempe and will continue eastward for 20 miles in Maricopa County and five miles in Pinal County to a terminus with U.S. Highway 60-80-89 southeast of Apache Junction. When completed, Route 360 will be about 27 miles in length including the two-mile segment already completed in Tempe.

Initial construction of the project will provide two traffic lanes in each direction separated by a 46-foot-wide median to Power Road and an 84-foot median eastward to the project terminus. The flat terrain of the project area will allow construction of roadways near natural ground level. In the undeveloped corridor, existing desert vegetation along the roadway margins will be left intact. Landscaping in urban areas will be similar to that on the existing portion of Route 360.

Right of way width will vary from a base of 300 to 500 feet with some additional flaring at traffic interchanges.

Construction from Rural Road to Price Road may begin in late 1973. Construction will proceed eastward as funds become available.

Environmental Impact

Increased urbanization along the freeway corridor is inevitable. Construction of the project will accelerate this development. The

freeway will improve access to Tempe, Mesa, and Apache Junction. The overall economic effect should be beneficial.

Daily traffic volumes for 1995 are expected to range from 85,000 in Tempe to 14,000 in Pinal County. The design will allow for two additional lanes when needed. Much parallel arterial traffic will be diverted to the freeway.

Relocation of about ten residences, part of two trailer parks and possibly three businesses will be required. Approximately 850 acres of agricultural land and 415 acres of undeveloped desert will be required for right of way.

Loss of breeding habitat will result in a slight reduction in the populations of nesting birds and small animals. As urbanization proceeds, certain birds and animals adaptable to urban environments will supplant much of the existing wildlife.

There are no historic sites in the freeway right of way. However, the project route bisects at least six prehistoric Hohokam Indian canals and probable archaeological sites long concealed by farming activity. Construction of the freeway will provide a means whereby these remains, once thought lost, can be excavated.

Tempe has elected to construct five elementary schools and adjacent parks adjoining the freeway right of way, while Mesa has plans for one school along the corridor. These school locations will minimize cross-freeway bussing. Noise abating features will be applied to achieve acceptable noise levels. Mesa Community College was located adjacent to the planned freeway to benefit from its traffic service.

A large new hospital purposely constructed near the freeway to take advantage of improved access was built with provisions for mitigating adverse impacts of the highway.

The freeway is compatible with plans for development of bikeways, hiking, and riding trails.

Although the project will introduce increased noise levels at certain points along its length, noise abatement measures will reduce this noise to acceptable levels.

Air pollutant levels on the existing segment of this freeway are presently below allowable levels. Increases in traffic volumes should not cause an appreciable increase in pollutants since by the year 1995 vehicle emission rates will be reduced about 90 percent from those of 1972.

Alternatives

Generally, the effect of doing nothing would be the opposite of proceeding with the project. Over the short term the rural travel demand would

continue to increase with urban demand. Abrupt dismissal of the project would have a depressant effect upon land values and development along the freeway route as well as an undesirable effect upon residents and businesses which were located in anticipation of the project's completion.

Reducing the need for transportation could be a long-range alternative to automotive travel.

Although bicycles are not used for the same trip purposes which freeways serve, they can help reduce noise and air pollution levels on arterial streets. Transit buses are capable of reducing pollutant levels and resource usage; however, the majority of the bus service in the Phoenix Metropolitan Area is serving only transit-dependent persons. Fixed right of way transit facilities have attributes similar to transit buses, but on a larger scale. Institution of a fixed right of way transit system appears not to be imminent in the Phoenix area.

Improving the existing streets to handle increased traffic would have greater adverse impacts than would result from a freeway. Construction of a new street-like facility in the freeway right of way would be possible but only at a sacrifice of some of the favorable features of the freeway such as landscaping, noise abatement barriers, safety features, etc.

Although the project location is considered fixed in Maricopa County, four alternate routings are under study in Pinal County. All alternate routings would have similar social, economic and environmental impacts.

Roadways may be constructed at grade, depressed or elevated. All three types of constructions will be incorporated into the Route 360 Freeway.

Federal, State, and local agencies and other organizations
from which comments are being requested

U.S. Department of the Interior
U.S. Environmental Protection Agency
U.S. Office of Economic Opportunity
Department of Housing and Urban Development
U.S. Department of Health, Education and Welfare
Arizona State Parks Board
Arizona State Department of Health - Environmental Health Services
Arizona State Museum
Arizona Game and Fish Department
Department of Economic Planning and Development
Arizona Highway Department - District Engineer
Arizona State Department of Health
Maricopa County Board of Supervisors
Maricopa County Highway Department
Maricopa County Planning and Zoning Department
Maricopa County Engineer
Maricopa County Flood Control District

Superintendent of Maricopa County Schools
Maricopa County Parks and Recreation Department
Maricopa County Health Department
Maricopa Association of Governments
Mesa Community College - Dean
Pinal County Board of Supervisors
Pinal County Planning and Zoning Department
Pinal County Engineer
Pinal County Flood Control District
Pinal County School Superintendent
Pinal County Parks and Recreation Department
Pinal County Health Department
City of Tempe - Parks and Recreation Department
City of Tempe - Planning and Zoning Department
City of Tempe - City Manager
City of Tempe - City Engineer
City of Tempe - Traffic Engineering Department
City of Tempe - Mayor
Tempe Chamber of Commerce
Tempe Elementary School District No. 3 - Superintendent
City of Mesa - Parks and Recreation Department
City of Mesa - Planning and Zoning Director
City of Mesa - Engineer
City of Mesa - Traffic Engineering Department
City of Mesa - City Manager
City of Mesa - Mayor
Mesa Chamber of Commerce
Mesa School District No. 4 - Superintendent
City of Phoenix - Mayor
City of Phoenix - City Manager
City of Phoenix - Deputy Manager
Sky Harbor International Airport - Airport Manager
City of Chandler - Mayor
Chandler Chamber of Commerce
Town of Gilbert - Mayor
Gilbert Chamber of Commerce
Apache Junction Chamber of Commerce
Apache Junction School District - Superintendent
Williams Air Force Base
Sun Valley Bus Lines
Greyhound Bus Lines
Continental Trailways
Safeway Suburban Stages
Arizona Historical Society
Arizona Public Service
Central Arizona Project Association
Southern Pacific Transportation Company
Desert Samaritan Hospital
Citizens for Mass Transit and Against Freeways
General Motors Desert Proving Ground
Salt River Project
El Paso Natural Gas Company

PART ONE

LOCATION, DESCRIPTION, AND PURPOSE OF PROPOSED PROJECT

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Draft
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Administrative Action
for
State Route 360
Superstition Freeway

Project F-028-1-201
JUNCTION I-10 - PINAL COUNTY LINE
(In Maricopa County, Arizona)

Project F-028-1-202
MARICOPA COUNTY LINE - JUNCTION U.S. 60
(In Pinal County, Arizona)

NOTE: For the purpose of this Environmental Impact Statement, the above referenced projects are combined. Where reference is made to "the project", it shall mean the combination of projects unless otherwise specified.

1. Location, Description, and Purpose of Proposed Project

Location:

The proposed Route 360 Freeway will afford eastbound drivers a view of the westernmost escarpments of the Superstition Mountains. Accordingly, the common name by which the route is known is Superstition Freeway. Figure 1-1 on Page 1-2 shows the mountains as they could appear to motorists near the east end of the route.

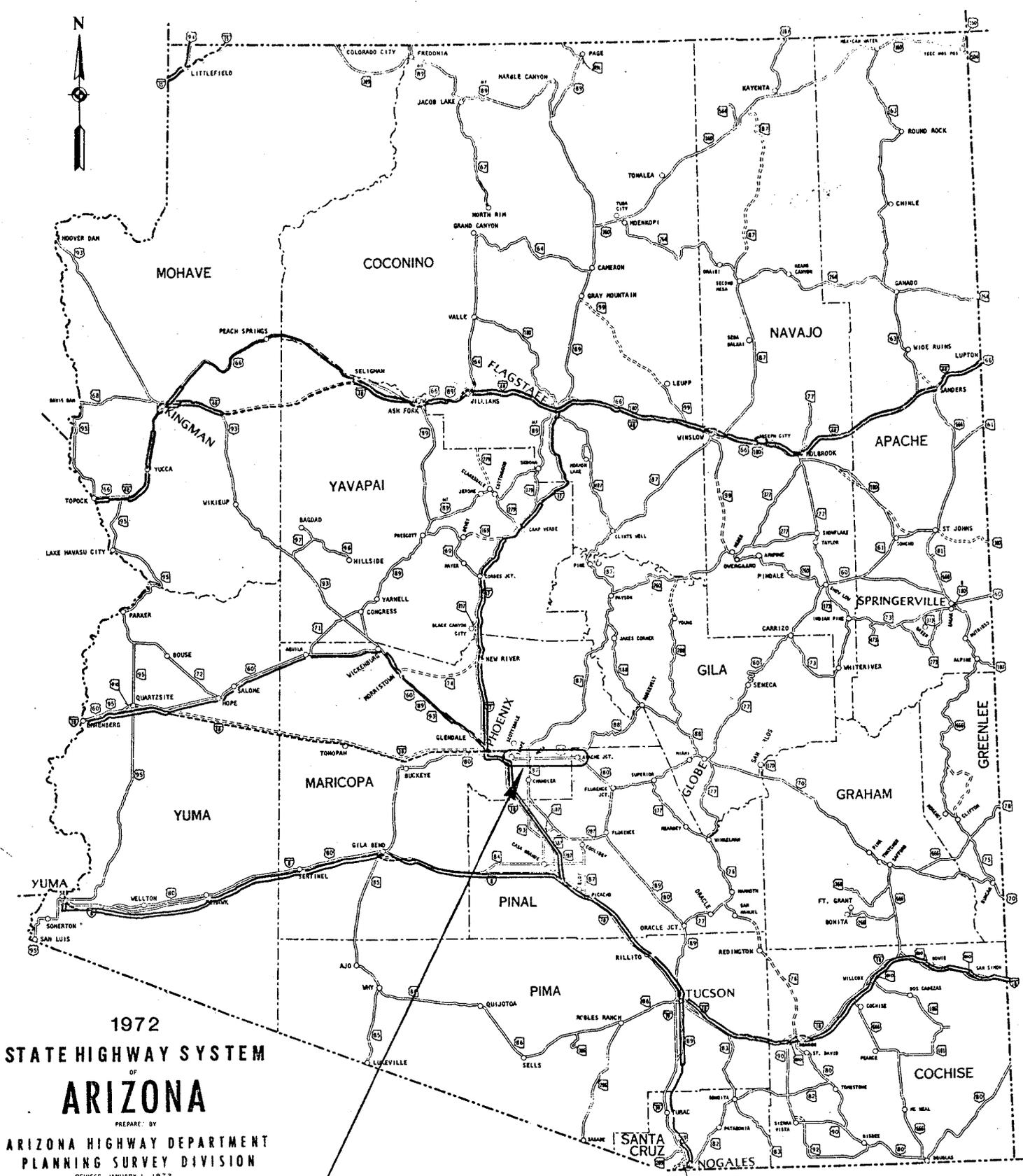
The Superstition Mountains lie generally within the confines of the Tonto National Forest in northern Pinal County, Arizona, east of the Phoenix Metropolitan Area. The mountains comprise a significant portion of the divide between the drainage areas of the Salt and Gila Rivers, southern Arizona's two most important watercourses. The highest peaks reach an elevation of over 4,500 feet, towering over the surrounding desert which lies approximately 1,500 feet above sea level. As may be seen in Figure 1-1, the western face of the mountains is composed of various sheer escarpments, some of which are several hundred feet in height.

The name "Superstition" derives from the locally well-known story of a German immigrant who is reported to have died in 1891 leaving behind a large cache of gold hidden in a mine in the mountains. The gold has never been found and is, consequently, the subject of speculation and superstitions.

It is proposed to construct the Route 360 Freeway for a distance of approximately 25 miles in Maricopa and Pinal Counties, Arizona. See maps, Figures 1-2, 1-3, 1-4a and 1-4b. In Maricopa County project will extend eastward twenty miles from the current terminus of the Route 360 Freeway near Rural Road in Tempe to the Pinal County line. The location of this section was approved by the Federal Highway Administration January 23, 1967. In Pinal County the project will traverse five miles, plus or minus one mile depending upon the final alignment choice, eastward from the Maricopa County line to a point on the existing divided U.S. 60-80-89 Highway southeast of the community of Apache Junction. Alternate routings in Pinal County which are subject to further consideration are shown on Figure 1-4b. A discussion of alternate routes is included in Part Four of this environmental impact statement. The finished Route 360 Freeway will be approximately 27 miles in length including the segment now open to traffic from I-10 to Rural Road within the City of Tempe.

Description:

The project will eventually be constructed to full freeway standards throughout the entire length. By definition a freeway is a divided highway having full control of access (ingress and egress only at designated points such as interchange ramps) and grade separation at



1972
STATE HIGHWAY SYSTEM
 OF
ARIZONA

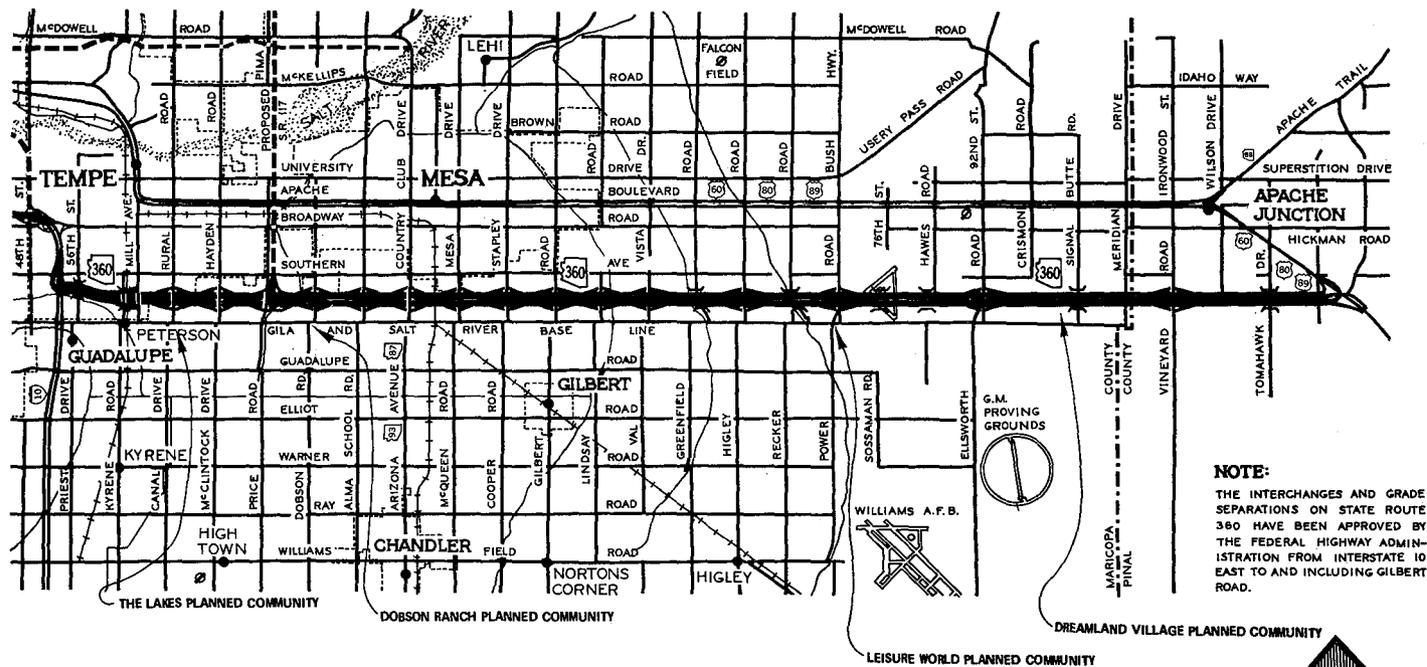
PREPARED BY
ARIZONA HIGHWAY DEPARTMENT
PLANNING SURVEY DIVISION

REVISED JANUARY 1, 1972
 SCALE - MILES
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Projects: F-028-1-201 Jct. I-10 - Pinal County Line
 F-028-1-202 Maricopa County Line - Jct. US 60
 Superstition Freeway (SR 360)
 Maricopa and Pinal Counties

FIGURE 1-2

Figure 1-3



NOTE:
 THE INTERCHANGES AND GRADE SEPARATIONS ON STATE ROUTE 360 HAVE BEEN APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION FROM INTERSTATE 10 EAST TO AND INCLUDING GILBERT ROAD.

LEGEND:

- EXISTING STREETS AND HIGHWAYS 
- PROPOSED HIGHWAYS 
- FUTURE S.R. 360 
- TRAFFIC INTERCHANGE 
- GRADE SEPARATION 

ARIZONA HIGHWAY DEPARTMENT
 URBAN - FREEWAY DIVISION

STATE ROUTE 360

INTERSTATE 10 TO U.S. HIGHWAY 60-80-89
 TEMPE/MARICOPA TO APACHE JCT./PINAL

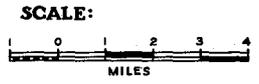




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SUPERSTITION FREEWAY CORRIDOR

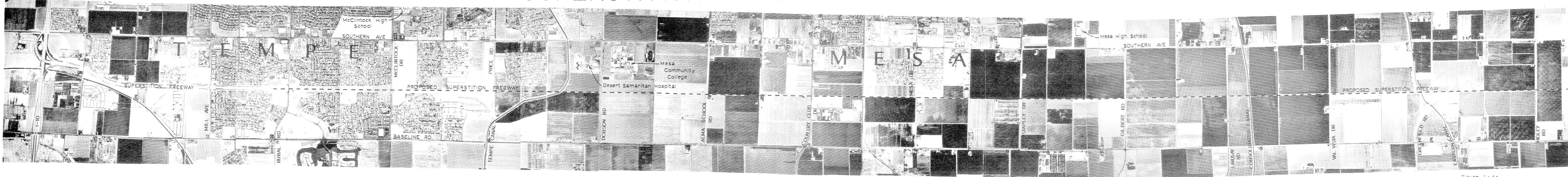


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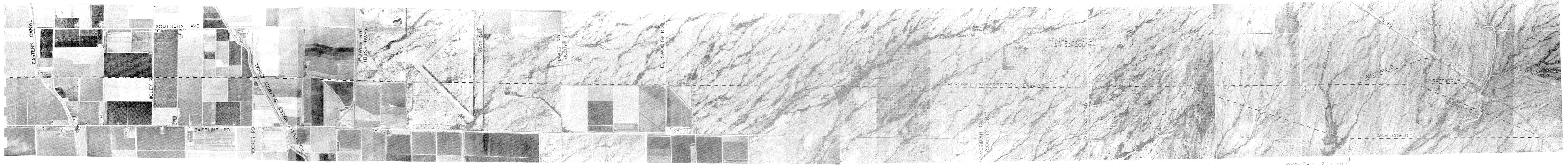


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SUPERSTITION FREEWAY CORRIDOR

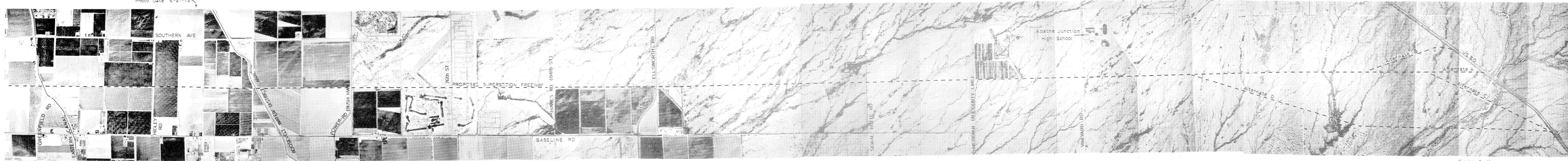


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all intersections with railroads and other roads and pedestrian ways where those facilities are carried across the freeway.

Roadways and Medians

Initial construction will provide two traffic lanes in each direction throughout the length of the project from Rural Road to U.S. 60-80-89. From Rural Road to a point near Power Road the traveled lanes will be separated by a median 46 feet in width. This median width is sufficient for the future inclusion of one more traffic lane in each direction plus full paved median shoulders and a barrier for the prevention of crossover head-on collisions. East of Power Road the traveled lanes will be separated by a median 84 feet in width. This median width is also sufficient for the future inclusion of additional traffic lanes, if needed. Current standards of the Arizona Highway Department provide for the inclusion of paved shoulders on both sides of all two-lane freeway roadways. These shoulders are four feet in width on the median side and ten feet in width on the outside. Whenever a third traveled lane is added in each direction, the new paved median shoulders will be ten feet in width.

The project will have full control of access throughout. Access to and from the freeway will be permitted only at specified points by means of on and off ramps.

Grade Separations and Traffic Interchanges

Although ground elevations along the corridor vary from approximately 1,175 feet to over 1,700 feet above sea level, the terrain immediately adjacent to the project is flat, essentially without relief, having a slight fall from east to west. Therefore, the freeway will be

constructed with roadways near the natural ground level except where elevation or depression is necessary to effect a grade separation at canals, railroads, and other roads. Where grade separations are located in close proximity, it is necessary to maintain continuous elevation or depression of the freeway.

Beginning at the western terminus of the project, one-quarter mile west of Rural Road, the freeway roadways are located at grade. The Route 360 Freeway is planned to underpass Rural Road, McClintock Road, and Price Road. Diamond interchange ramps will connect to Rural and McClintock Roads. At Price Road ramps will be constructed to the west only. Possible future construction of the Route 117 Freeway may in this vicinity be located immediately east of Price Road. Route 117 and Interstate and Defense Highway 10 are the only Freeways planned to intersect the Route 360 Freeway under the current Maricopa Association of Governments Transportation Plan. Proceeding easterly the Freeway is planned to overpass the Tempe Canal and canal service roads, Dobson Road, Alma School Road, Extension Road, State Route 87 (known alternately as Country Club Drive and Arizona Avenue) the Southern Pacific railroad tracks, Center Street, Mesa Drive, Horne Road, Stapley Drive and Gilbert Road. If storm drainage problems between the Tempe Canal and Gilbert Road can be adequately resolved, crossroads may be partially depressed except Dobson Road, State Route 87 and Center Street. Otherwise, all crossroads in this segment will remain near the natural ground level.

Diamond traffic interchanges are proposed to be located at one-mile intervals at Dobson Road, Alma School Road, State Route 87, Mesa Drive, Stapley Drive, and Gilbert Road. A grade separation with a partially

depressed crossroad may also be located at Longmore Street. East of Gilbert Road design is in a very preliminary stage and interchange features have not been fully determined. For environmental impact assessment purposes it may be assumed that grade separations will be located at one-mile intervals at Lindsay Road, Val Vista Drive, Greenfield Road, Higley Road, Recker Road, Power Road, Sossaman Road, Hawes Road, Ellsworth Road, Signal Butte Road, Vineyard Road, and Tomahawk Drive as well as at the junction with U.S. Highway 60-80-89. Grade separations will also be located at the Consolidated, Eastern, and Roosevelt Canals. Diamond-type traffic interchanges will be constructed at some, but not all, of the grade separated crossroads. Specific interchange locations have not been determined. However, it may be assumed that initial construction will include interchanges not more than four miles apart in most cases; hence, intraregional (local) traffic will be offered a degree of service. There will necessarily be an interchange at the U.S. 60-80-89 terminus.

Drainage Considerations

From an engineering viewpoint, the handling of overland water flows, particularly in the Mesa area, will be a difficult problem to solve. Several solutions to this problem are currently under study, although none of these tentative solutions are so outstanding as to merit adoption at present.

The problem of rainwater runoff in the Mesa area arises from the fact that the area traversed is irrigated. Irrigation of farmland requires that the land be graded to a uniform and very gentle slope with the resultant obliteration of all natural drainage courses. In

an undeveloped desert area it is a relatively simple matter to locate a bridge or pipe structure at each point where a new highway intercepts a drainage course, most commonly a dry wash. In an irrigated area, rainwater runoff does not concentrate itself in drainage courses, but instead flows uniformly across the evenly graded land, arriving at the highway right of way in the form of sheets of water spread over large areas. These sheet flows eventually form shallow ponds covering, in some cases, many acres at the points where their flows are obstructed by obstacles such as canal banks, railroad embankments, and highway embankments including, potentially, the Route 360 Freeway. This condition constitutes flooding, and in urbanized areas can cause substantial property damage.

All rights of way traversed by the proposed freeway in the City of Mesa are irrigated and therefore cause significant problems for the designers of drainage control facilities for the project.

It is the desire of the Arizona Highway Department and of the City of Mesa to partially depress most of the freeway's crossroads in the Mesa area so that the aesthetically undesirable characteristics of a fully elevated freeway may be avoided. Design efforts are being directed toward a design concept which will enable implementation of these desires.

The alternative is to fully elevate the freeway in the vicinity of the crossroads so that the crossroads may remain at the natural level of the terrain, thereby avoiding flooding of depressed roadways.

Safety Features

Safety features incorporated into new highway construction projects are changing rapidly and will probably continue to do so during the

period in which the Route 360 Freeway is under design. The current trend in safety features includes slope flattening and obstacle removal where possible so that errant vehicles may return to the roadway instead of overturning or colliding with some roadside object. It may be assumed that the freeway design will consider all applicable safety standards in effect at the time of final design of the project's individual segments.

Among the most effective safety features which the Route 360 Freeway will have are the basic design elements of a freeway. Traffic flows in opposite directions will be continuously separated by a median capable of elimination of almost all cross-median head-on collisions. Initial construction will provide a median width of 46 feet between traveled lanes of the opposing roadways, a width sufficient to prevent most cross-median accidents. Whenever median width is reduced by the addition of lanes in the median, a rigid median barrier will eliminate the possibility of such collisions. The grade separation of all railroads and crossroads will effectively eliminate all broadside, intersection-type collisions. Full control of access, as effected by a fence at or near the right of way limits, will prevent most pedestrians and large animals from straying onto the freeway and becoming involved with vehicular traffic. The increased traffic capacity of the freeway, in conjunction with the elimination of crossroad intersection signalization, will help to prevent most tailend collisions which occur when traffic flow is interrupted.

Directional signing, which will be designed in accordance with national standards, will be minimized to avoid driver confusion and clarified and standardized to permit most rapid assimilation by the motorist.

Landscaping

Beautification of the freeway through Tempe and Mesa urbanized areas will be effected through the installation and maintenance of complete irrigated landscaping similar to that now in existence along the already built section of freeway between I-10 and Rural Road. See Figure 1-5, Page 1-14. Such landscaping includes verdant native and adapted trees, shrubs, and grass arranged in patterns to blend with and complement the features of the roadway and of the adjacent development. Slopes of cuts and fills will generally be sufficiently flat to permit the installation of those types of landscape materials and plants which can be used on level ground so that the use of artificial slope coverings may be minimized.

Plants currently existing within the proposed corridor do not generally lend themselves to use in future landscaping. From Rural Road to Power Road the existing plant cover consists of agricultural crops and, in those fields and parcels which lie fallow, weeds. In areas east of Power Road where native desert plants still exist there are few, if any, plants suitable for transplanting within the freeway right of way. The freeway right of way in areas of native desert growth will not generally be cleared except in those areas specifically devoted to construction activity. Landscaping will resemble that shown in Figure 1-6, Page 1-15. Existing vegetation along the roadway margins will be left intact, where possible.

Noise Abatement Features

The project will, as a minimum, include provisions for the abatement of noise to legally acceptable levels, although legally acceptable levels will not be regarded as a satisfactory ultimate goal for noise abatement.

The project alignment was chosen for its lack of deleterious impacts upon the then existing urban development. Urbanization, which began well



Figure 1-5

TYPICAL VIEW OF SUPERSTITION FREEWAY IN URBAN AREAS
AZ 360 At Rural Road Shown

1-15

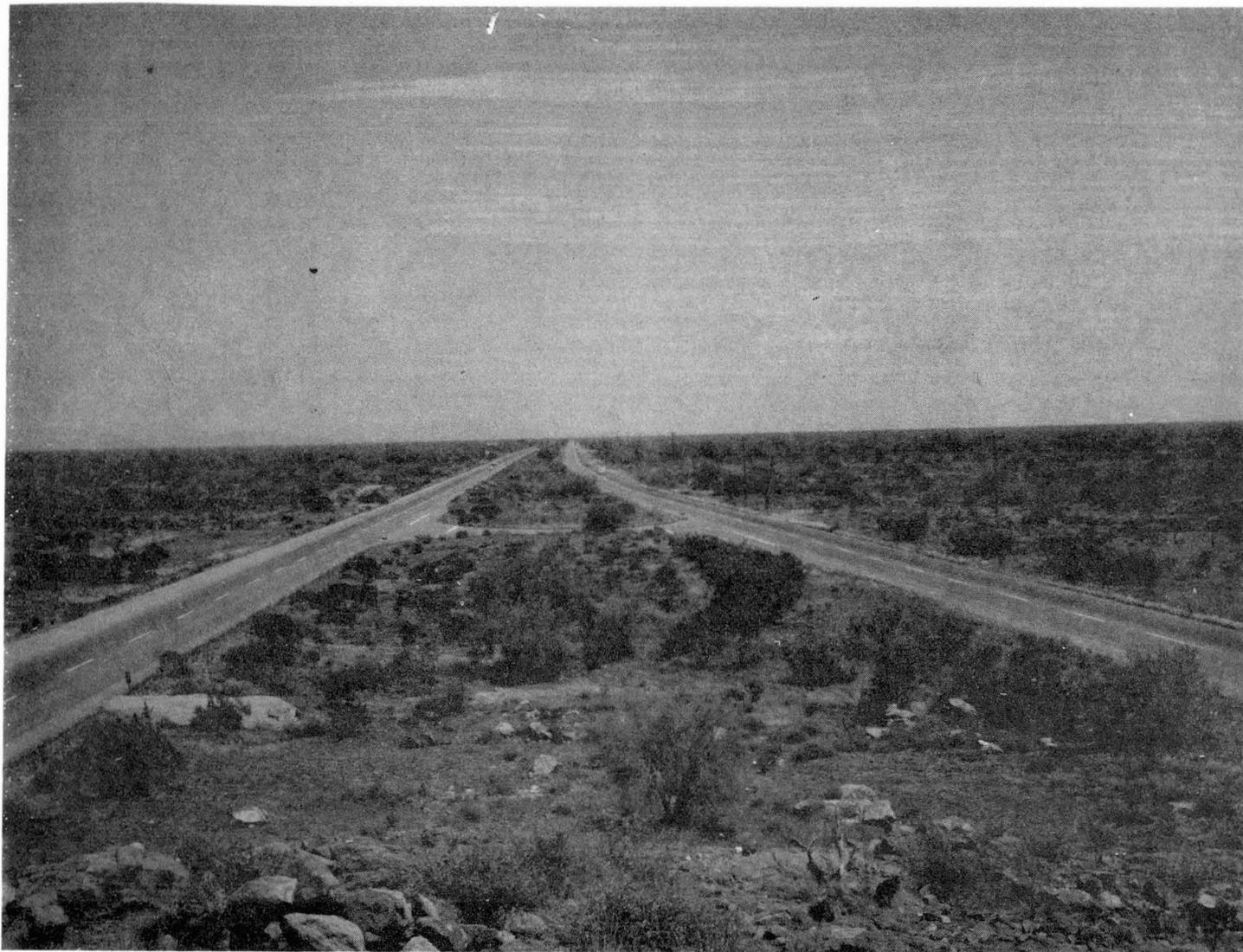


Figure 1-6

TYPICAL VIEW OF SUPERSTITION FREEWAY IN RURAL AREAS
US 60-80-89 Between Apache Junction and Florence Junction Shown

north of the proposed route in Tempe, is now present on both sides of the corridor. This urban residential development was planned around the existence of a freeway along the Route 360 Freeway corridor. Hence, most homeowners along the corridor bought with knowledge of the planned freeway. This does not relieve the Arizona Highway Department of its responsibility in ameliorating noise levels at adjacent properties. However, it does mean that residents adjacent to the corridor may be more tolerant of the anticipated noise levels.

Depression of the freeway in parts of Tempe and probable elevation of the freeway most of the way through Mesa will have a definitely beneficial effect on local noise levels. Along the at-grade portions of the project in Tempe and Mesa physical noise abatement devices will be utilized. These include earthen berms and masonry walls similar to those in place along the existing freeway segment. See typical cross sections in Figure 4-3 on Page 4-47. Research and testing of other types of noise shields are being carried on in several states including Arizona. It is possible that the results of this research will find application in the final design of the project.

Materials

Materials required for construction of the project will include all of the materials commonly associated with highway construction. These include earthen embankment material and aggregates of the various types required for pavement base courses, asphaltic concrete paving, and portland cement concrete for paving and structural purposes.

In some cases it may be necessary to remove excess earthen materials from the project. Such excess materials are received favorably by many property owners and developers who might otherwise have to pay for hauling of soils to their property. Agreement with landholders will be reached prior to deposition of materials on affected properties.

Aggregate, which composes the bulk of the asphalt and concrete, will be obtained from the Salt River bed. The Salt River, which once flowed by Tempe and Mesa but is now usually dry, provides a readily available source of aggregate for a wide variety of uses. Existing areas of excavation will provide all necessary aggregate and no new areas will need to be opened. Haul roads may need to be reconstructed for the distance from the pit to the nearest appropriate point on the Mesa or Tempe city street system. Most materials hauling in conjunction with the project will be over local streets and roads and will, therefore, be subject to legal load limits. Steel will not be obtained locally and will, therefore, have no effect on local resources.

Traffic Projections

Past and present traffic data for the portions of Route 360 discussed in this environmental impact statement are not available because Route 360 is a new highway on completely new alignment. However, traffic counts have been taken on the first segment of the freeway which was opened to traffic in 1970 from I-10 to Rural Road. Traffic counts for 1972 showed a daily average of 15,200 vehicles on the completed segment. As an aid in assessing the impacts which the Route 360 Freeway will have upon the corridor in which it is located, traffic volume projections are provided in Table 1-1. For the purposes of these projections, the optimistic assumption is made that the entire route will be open to traffic in 1983. Accordingly, two years after project completion would be 1985, twenty years after completion, 2003. Economic priorities do not permit design of highway projects for all expected traffic loadings. After widening to its ultimate six-lane width, the Route 360 Freeway will permit efficient handling of the majority of traffic loadings expected during the design goal period.

Right of Way

It is currently planned that right of way width will be approximately 300 feet east of Rural Road to Price Road and 400 feet from that point east to the project terminus. Additional right of way will be acquired

TABLE 1-1

EXPECTED DAILY TRAFFIC (VEHICLES)

<u>Freeway Segment After Project Completion</u>	<u>Time After Project Completion</u>		
	<u>2 Years</u>	<u>20 Years</u>	<u>Design Year</u>
Rural Road to McClintock Drive	61,000	94,000	71,000
Price Road to Dobson Road	55,000	87,000	64,000
Alma School Road to State Route 87	74,000	113,000	85,000
Mesa Drive to Stapley Drive	70,000	107,000	81,000
Gilbert Road to Lindsay Road	57,000	90,000	66,000
Val Vista Road to Higley Road	47,000	76,000	54,000
Power Road to Ellsworth Road	44,000	73,000	51,000
U.S. Highway 60-80-89	40,000	66,000	46,000
	35,000	58,000	40,000
	30,000	49,000	35,000
	28,000	44,000	32,000
	19,000	30,000	22,000
	16,000	24,000	18,000
	12,000	18,000	14,000

Note: Data furnished by Maricopa Association of Governments, March, 1973.

at traffic interchanges to provide for interchange ramp construction. The flaring required at crossroad interchanges is generally not more than 100 feet on each side. However, near Price Road right of way will be reserved for future construction of a major interchange at the junction of the Route 360 Freeway with the Route 117 Freeway. The acquisition of an additional 100 feet of right of way on the north side of the roadways from the Tempe Canal to the Roosevelt Water Conservation District Canal, a distance of approximately 10.5 miles, is planned for drainage control purposes. This area is subject to substantial overland flows after the infrequent heavy rainstorms.

Because the Route 360 Freeway is an ongoing project which will not be completed over its entire length for many years to come, it must be recognized that a discussion of major design features includes many elements which are subject to change. It is believed, however, that the description of major features will be sufficient to enable reasonable assessment of environmental impacts of the project.

Existing Facilities

The existing freeway segment from Interstate and Defense Highway 10 to Rural Road in Tempe has a right of way width of 300 feet except at interchange areas where some additional land is required for ramps. The freeway has two traffic lanes in each direction with exterior shoulders ten feet in width and median shoulders four feet in width. The median, measured from the edges of the traveled lanes, is 46 feet in width, allowing for the future construction of a third traveled lane in each direction as well as paved median shoulders and a barrier for the prevention of cross-median travel (head-on

collisions). The freeway presently overpasses and interchanges with I-10, overpasses Priest Road which is also known as 56th Street according to the Phoenix street numbering system, underpasses Hardy Drive which is also known as 60th Street, underpasses Kyrene Road, underpasses a branch line of the Southern Pacific railroad, underpasses and interchanges with Mill Avenue, and terminates at Rural Road without a grade separation structure. A pedestrian overcrossing is located between Mill Avenue and Rural Road at College Avenue. As a part of future construction it is proposed to underpass Rural Road and complete an interchange at that location. Landscaping of the existing segment is among the most complete highways in Arizona, including all types of plantings from grasses to trees. At points where the main roadway is located near the natural ground level, earthen berms or masonry walls are provided to ameliorate noise levels at adjacent properties.

Estimated Construction Dates

As of this writing design studies and designs are being prepared for the section of the Route 360 Freeway from the current terminus near Rural Road easterly to Gilbert Road, a distance of approximately eight miles. It is currently anticipated that construction from Rural Road to Price Road near the Tempe-Mesa city limits will begin in late 1973 with completion in early 1975. From that point easterly to State Route 87 the beginning of construction is expected in mid-1975 with estimated completion in late 1976. The State Route 87 to Gilbert Road section is projected for construction in early 1977 with completion to Gilbert Road expected in late 1978.

East of Gilbert Road the timetable is less definite. Alternate routings are still under study near the extreme east end of the projects. Design studies have not yet determined the specific locations of traffic interchanges with the arterial routes in that area. Problems with storm run-off in irrigated areas remain to be solved. Construction east of Gilbert Road is estimated for some time in the 1980's. It may be expected that traffic problems on parallel existing routes as well as problems incurred at the Gilbert Road temporary terminus will serve to advance construction to the early 1980's or shortly after the freeway reaches Gilbert Road from the west.

It should be understood, of course, that the estimated dates given above are dependent upon compliance with all environmental and other laws applicable to a project of this type. Funding availability will also greatly affect the construction dates for the project.

It is not possible to accurately estimate funding availability. Federal highway legislation is normally enacted biennially in even-numbered years. However, no such legislation was enacted by the Congress in 1972.

It is anticipated that the Route 360 Freeway will provide the needed high level of service for through traffic immediately upon completion of each section and for many years to come. Insofar as the state of the art of traffic volume projections has been refined, it is expected that the Route 360 Freeway will still be able to offer a high level of service to traffic in 1995 with only the addition of two more lanes in the median where necessary, as provided in the initial project design.

Parallel Streets

East-west traffic through the areas to be served by the Route 360 Freeway must currently use one or more of the parallel surface streets.

Parallel routes available to the motorists include the following:

U.S. 60-80-89: This route, known as Apache Boulevard in Tempe, Main Street in Mesa, and Apache Trail east of Mesa through Apache Junction, is a divided facility with four or six lanes throughout, lying two miles north of the Route 360 Freeway. Through Tempe and Mesa a narrow curbed and landscaped median and four traffic lanes are provided. East of Mesa a wider median and six lanes are present to the Pinal County line where the roadways reduce to four lanes. U.S. 60-80-89 is the state highway which will be most affected by traffic diversion to the Route 360 Freeway. Traffic volumes exceed 25,000 vehicles per day in Tempe and Mesa and produce undesirable congestion.

Broadway Road: Lying one and one-half miles north of the proposed freeway, this urban arterial has four lanes through Tempe and Mesa to Gilbert Road. East of that point, a narrow two-lane roadway is provided. Periodic construction projects will result in the widening and reconstruction of remaining two-lane segments of Broadway Road to four lanes or more.

Southern Avenue: Lying one-half mile north of the proposed freeway, this arterial has four lanes in Tempe from the west city limit to McClintock Drive. East of that point the facility has two lanes to the end of pavement at Power Road east of Mesa. Sections having four lanes are not severely congested. However, pending reconstruction with added lanes, some two-lane sections of Southern Avenue are carrying traffic in excess of design capacity.

Baseline Road: Lying one-half mile south of the proposed freeway, this two-lane arterial is under the jurisdiction of the Arizona Highway Department west of State Route 87. Baseline Road carries traffic volumes in excess of 10,000 vehicles per day in some areas and is experiencing increased congestion as traffic volumes continue to increase beyond roadway capacity. Paving on Baseline Road ends east of Mesa at Ellsworth Road.

All of the foregoing arterials described are at-grade facilities with no control of access. Consequently, the traffic carrying capacity of each facility is restricted by the presence of roadside residences, businesses, and industry as vehicles entering and leaving these places interrupt the flow of through traffic. A proliferation of local streets necessitates many signalized intersections at intervals of one mile or less, often only one-quarter mile apart.

The existing arterials in the vicinity of the proposed Route 360 Freeway, with the exception of U.S. Highway 60-80-89 have grown from the network of section line roads which were built to serve the needs of agriculture in the vicinity. As urbanization proceeded it became necessary to widen these arterials to serve traffic needs, particularly in Mesa and Tempe. Since these roads functioned as both local service facilities and as arterial highways prior to the advent of urban development, they necessarily continued to function as local service roads and are not compatible with the demands of through traffic.

The U.S. 60-80-89 Highway was intended as a through route initially. In the vicinity of Tempe, Mesa, and Apache Junction this facility is designated as the route for U.S. 60 from Norfolk, Virginia, to Los Angeles, California; the route for U.S. 80 from Savannah, Georgia, to San Diego, California; the route for U.S. 89 from Nogales, Arizona, to the Canadian border in Montana; and the route for Highway 93 which

also runs from Nogales, Arizona, to the Canadian border in Montana, but generally along different routings. As recently as 1970 this was also the route for U.S. 70 from the Atlantic Coast in North Carolina to Los Angeles, California.

U.S. 60-80-89 Highway was the site of strip commercial development with its associated traffic problems long before Tempe and Mesa expanded toward each other in toto. Because of these developmental factors which have affected the existing at-grade arterials along the Route 360 Freeway corridor, no route near the corridor is capable of providing a high level of service to through traffic between Phoenix and points east through Tempe, Mesa, and Apache Junction.

Early Planning

Interstate Highway 10, basically an east-west route, leaves Tempe on a southerly course and maintains a southeasterly tack until after passing Tucson more than 100 miles away. This routing of I-10 from Phoenix to Tucson was determined almost immediately upon implementation of the Federal Aid Highway Act of 1956. Public hearings were held in Phoenix on February 27, 1957, and in Casa Grande on May 28, 1959, at which the Phoenix-Casa Grande Interstate Freeway was presented in a form quite similar to that which was eventually constructed. Opposition was registered at these hearings by Mesa interests fearful of being bypassed. Prior to construction of I-10 all Phoenix-Tucson traffic was required to pass through Mesa. A proposal presented by the Mesa interests that an Interstate-type freeway be constructed from I-10 east via Mesa was received favorably by the Arizona Highway Department. This was the seed from which the Route 360 sprang.

The total mileage of Interstate and Defense Highways authorized by the Congress was limited at that time to 41,000 miles, most of which was allocated to specific congressionally mandated routes. Because of indefinite routings on mandated Interstate highways it was not possible to designate the Tempe-Mesa Freeway as an Interstate spur route.

In 1960 "A Major Street and Highway Plan for the Phoenix Urban Area and Maricopa County" was published, calling for construction of a county-wide highway system based on a network of freeways and expressways in a grid pattern in the Phoenix area. The 1960 plan was adopted by the affected governmental agencies as the basis for highway planning in Maricopa County. Although the 1960 plan continues to be subject to change, all freeways constructed to date are in full accord with the plan, including the already constructed portion of the Route 360 Freeway. However, the general corridor routing for the Tempe-Mesa Freeway as shown in the 1960 plan was from one-half to two miles north of the alignment planned for construction. As explained in greater depth in Part Four of this environmental impact statement, the chosen route was preferred over the routing shown in the 1960 Plan because of reduced traffic problems and reduced disruption of the existing urbanized area.

By 1962 the routing of the Tempe-Mesa Freeway was established, essentially in its present location. On May 24 of that year the route was taken into the state system by the Arizona Highway Commission and designated State Route 360. On August 31, 1962, it was accepted by the Bureau of Public Roads (now the Federal Highway Administration) as Federal-aid Primary Route 28.

The year 1963 saw negotiations between the Arizona Highway Department and residential developers in Tempe so that a corridor could be reserved for the freeway in the midst of newly burgeoning residential development. This farsighted course of action made possible the development of the Route 360 Freeway without the demolition of a single residence in Tempe, a city which now lies along both sides of the freeway corridor accommodating a population rapidly approaching 100,000 persons. Compare aerial photo maps, Figures 1-4a and b showing the Route 350 Freeway corridor in 1972 and 1964, respectively.

Full studies of the Route 360 Freeway, particularly of the section which is now open to traffic, began in August 1965. These led in sequence to a public hearing held February 19, 1966, in Tempe which resulted in a March 28, 1966 approval by the Federal Highway Administration of the route location from Interstate Highway 10 to Power Road, a distance of approximately 16.4 miles. Final design of the junction with I-10 and the segment from there east to Rural Road proceeded immediately. An offer of a design hearing for the section from Rural Road to Gilbert Road was advertised to the public in August 1969. Because no requests for a hearing were received, no public hearing was held. In Arizona it has not been uncommon for well-advertised offers of public hearings to meet with no response from the public.

Construction of the junction of the Route 360 Freeway with Interstate Highway 10, including a one-half mile segment of the freeway to Priest Road (56th Street) was begun in October 1967. This construction was completed in October 1968 but was not opened to

traffic because no ramps to connecting streets were available along this segment. Traffic service for the motoring public became available late in 1970 with the completion of a two-mile extension of the Route 360 Freeway from Priest Road to a connection with Rural Road in the City of Tempe. Construction of this segment included installation of complete landscaping and also included walls and earthen berms for noise abatement.

Description of Surrounding Land Area

The proposed corridor for the project traverses an area which is flat and open. The ground elevation of the corridor rises gradually from 1,175 feet above sea level to approximately 1,700 feet as one moves eastward toward the Superstition Mountains from about Interstate 10.

The project area is classified as Sonoran Desert. The natural plant life here varies from a few species at Power Road where native vegetation is first encountered to many more found at the east end nearer the mountain foothills. The right of way area between Rural Road and McClintock has been cleared and is mostly standing idle at this time but was farm land for many years. Urban development has rapidly progressed along this portion of the corridor right of way north to Southern Avenue and south to Baseline Road.

The land in the corridor right of way between McClintock Road and Price Road is for the most part lying fallow. Urban development has also progressed rapidly between this portion of right of way and Southern Avenue and Baseline Roads.

Productive agriculture is still being carried on over the proposed corridor right of way from Price Road easterly to Power Road. Some urbanization has developed primarily along Southern Avenue, between Price Road and Stapley Road, but north of the corridor right of way. The area between the right of way and Baseline Road is predominately agricultural as it is south of Baseline Road. The farm crops consist primarily of alfalfa, maize, cotton, wheat, and barley. The higher value per acre truck crops are not found here. Along this portion of the right of way one also finds a dairy business, scattered beef feed lots, and some citrus groves.

From Power Road eastward to the intersection with U.S. 60-80-89. the proposed corridor right of way passes through open and nearly flat desert land with the exception of a citrus grove near Power Road, a trailer park near 76th Street, and an agricultural development between Hawes Road and 92nd Street, south of the right of way. Irrigation water has not been provided to the major portion of this area of the corridor and farming has not been developed. The area west of Power Road has been provided with irrigation water resulting in agricultural production.

Climate

The warm, sunny, dry climate of the project area is reflected in weather data compiled for Phoenix in Table 1-2, Page 1-29. In an average year, Phoenix has an average maximum and minimum temperature of nearly 85 and 56 degrees Fahrenheit, respectively. Eighty-six percent of the daylight hours are sunny while only 7.2 inches of rain falls in an average year.

TABLE 1-2

CLIMATIC DATA FOR PHOENIX, ARIZONA

	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Avg</u>
Average Percentage of Possible Sunshine ^{1/}	77	80	83	88	93	94	84	85	89	88	84	77	86
Average Maximum Temperature ^{1/}	64.9	68.9	74.6	83.0	91.7	101.4	104.0	101.6	97.7	87.0	74.7	65.8	84.6
Average Minimum Temperature ^{1/}	38.0	41.7	46.1	52.5	59.8	68.5	77.1	75.8	69.0	56.3	44.9	38.8	55.7
Mean Monthly Temperature Average ^{2/}	47.9	53.5	59.0	67.2	75.0	83.6	89.8	87.5	82.8	70.7	58.1	51.6	69.0
Long Term Average Precipitation (inches) ^{2/}	.73	.85	.66	.32	.13	.09	.77	1.12	.73	.46	.49	.85	7.20

^{1/} Source: Valley National Bank. "The Arizona Statistical Review." 28th Edition. Phoenix. September, 1972.

^{2/} Source: Arizona Crop and Livestock Reporting Service. "Arizona Agricultural Statistics Bulletin, S-7." Phoenix. March, 1972.

The winter season occasionally brings a few snowflakes to this area, but snow is of no importance and does not remain on the ground. Hailstorms are experienced periodically and cause some damage to crops.

Wind speeds within the Maricopa County area are usually of such low magnitude that they do not constitute an important element of the average climate. Occasionally, due to unusual barometric conditions, wind gusts over 50 miles per hour have been recorded.

Soils

The Superstition Freeway proposed alignment lies on top of two soil types described in Technical Bulletin 171, February 1966, SOILS OF ARIZONA published by the University of Arizona Agricultural Experiment Station.

The portion between I-10 and a point approximately five miles west of the intersection with State Route 87 is located over a soil type classified as B 1: Deep soils of the thermic region, one of the soil classes in Class B, Deep Soils of the Alluvial Flood Plains.

Soils in the alluvial flood plains are not restricted in depth by cemented layers of bedrock. There are many areas, however, where rooting depth is inhibited by either sandy or clayey layers. Because the soil material is deposited by running water, random layering is to be expected in most of the soils in this unit. The topography is flat. Many of these flood plains are subject to flooding unless well protected by levees or control dams. These alluvial soils are further separated into two temperature subunits.

One of these subunits is B 1, which includes the deep alluvial soils in the areas of the state with mean annual soil temperatures above about 59° F. Much of the cotton produced in the state is grown in these soils. When considering the unit in its entirety, it must be said that textures are quite variable. However, within several large areas textures may be quite uniform.

The remaining portion of the proposed alignment, located between the point approximately five miles west of State Route 87 in Maricopa County and the termination at the intersection with U.S. 60-80-89 in Pinal County, is over a soil type classified as C 1: Developed soils from acid igneous alluvium on nearly level topography, one of the soil classes in Class C, Soils of the Thermic Region.

Soil Unit Class C is composed of soils that have been developed over several thousand years in areas where the mean annual soil temperature is above 59° F. In general, only the upper few inches of the soil profiles are leached of carbonate, and free carbonate is usually present within 30 inches of the surface.

Subunit C 1, in general, occupies the areas nearer the center of the intermountain valleys. In general, slopes are less than three percent and the smoother areas are quite often successfully irrigated. The soils in this area are low in organic matter, probably due to the sparsity of vegetation and to the high temperatures.

For the most part, these soils are developed in the intermountain basins in the southwestern and western part of the state. Much

diversity exists in these soils, depending primarily on the parent material from which they developed. In general, the soils near the base of the surrounding mountains contain coarser fragments, with textures tending to be finer near the middle of the valleys.

Clay has accumulated in the B horizon of most of these soils. The extent of the clay accumulation varies with the topography, i.e., the flatter the area, the higher the clay content in the B Horizon. The content of carbonate is quite unpredictable because of the uncertain origin of the parent material, but there is a tendency to find more carbonate in those areas immediately adjacent to mountain ranges with appreciable contents of limestone or calcareous sandstones.

Soils with cemented caliche layers form important inclusions in this unit. Also included in the unit are numerous small areas of soils belonging in the B 1 subunit.

Summary of Conditioning Factors

Erosion and sedimentation, although conditioned by climate and vegetative cover, are primarily influenced by geological and structural features. Likewise, general topography and slope are dependent mainly upon the types of rocks and their physical attitude.

Due to general aridity, weathering and erosion in the study area are predominantly mechanical rather than chemical. Great fluctuations of temperature are effective in the disintegration of rock surfaces. The principal erosive process is the headward downcutting by streams, especially in the areas of heavier rainfall. By these processes, materials graded from coarse to fine are moved and eventually deposited as a variety of soil types.

Natural Vegetation

The natural vegetation in the proposed freeway corridor and in the adjacent area is generally classified as Sonoran Desert type vegetation. The vegetative cover found in the Superstition Freeway study area consists of a relatively wide range of plant genera and species. The area is lightly dotted with Yellow Paloverde, Catclaw Acacia, Mesquite, Ironwood. The shorter shrubby growth is more dominant consisting of Creosotebush, Wolfberry, Bursage, Brittlebush, and Broom Baccharis.

The herbaceous plant life varies each year with the amount and time of rainfall. The herbaceous plants that provide much of the color consist of Globe Mallow, Fiddleneck, Mustard, Desert Bailey, Filaree, Phacelia, Woolly Lotus, Lupine, Cheeseweed, and Ragweed. During seasons of abundant moisture, Mediterranean grass and Indianwheat provide a short duration ground cover.

Along the desert washes which are dry most of the year, additional plant species are found including Tamarisk, Tree Tobacco, Ironwood, Clematis, a few Desertwillows, and Spiny Hackberry.

The eastern portion of the corridor, located in Pinal County, supports a sprinkling of Ocotillo, Pricklypear Cactus, Saguaro, Buckhorn Cholla, and Teddybear Cholla.

Table 1-3 on page 1-34 gives the botanical names of the common names cited herein.

TABLE 1-3

THE MOST COMMON
PLANTS INDIGENOUS TO THE PROJECT AREA

Acacia greggi	Catclaw Acacia
Ambrosia sp.	Ragweed
Amsinckia spp.	Fiddleneck
Asclepias sp.	Milkweed
Astragalus nuttallianus	Locoweed
Baccharis sarothroides	Broom Baccharis
Baileya multiradiata	Desert Bailey
Celtis pallida	Spiny Hackberry
Cercidium floridum	Blue Paloverde
Cercidium microphylla	Littleleaf Paloverde
Cereus giganteus	Saguaro
Chilopsis linearis	Desertwillow
Clematis drummondii	Drummond Clematis
Encelia farinosa	White Brittlebush
Eriogonum fasciculatum	California Buckwheat
Erodium cicutarium	Filaree
Fouquieria splendens	Ocotillo
Franseria ambrosioides	Ambrosia Bursage
Franseria deltoidea	Triangle Bursage
Larrea tridentata	Coville Creosotebush
Lotus tomentellus	Desert Deervetch
Lupinus spp.	Lupine
Lycium andersonii	Anderson Wolfberry
Malva parviflora	Little Mallow
Nicotiana glauca	Tree Tobacco
Olneya tesota	Tesota (Ironwood)
Opuntia spp.	Chollas, Pricklypears
Phacelia spp.	Phacelia
Plantago insularis	Desert Indianwheat
Plantago purshi	Wooly Indianwheat
Prosopis spp.	Mesquite
Schismus barbatus	Mediterranean grass
Sphaeralcea spp.	Globe Mallow
Tamarix pentandra	Fivestamen Tamarix

Inventory of Economic Factors: Tempe

General

The Tempe-Mesa area must be considered one of the most dynamic growth areas in the nation. Over the past decade virtually every economic indicator has recorded a continuous and substantial growth for the City of Tempe and its environs. A glance at Figure 1-7 on Page 1-36 shows Tempe's strategic location in the burgeoning Phoenix Metropolitan Area, a location that assures continued economic growth if adequate transportation for its workers and residents is provided.

Tempe is no longer a free-standing, self-contained community. Its recent growth and future potentials largely reflect the continued ability of the Phoenix region and the State to attract people and industries from elsewhere in the nation. It houses people who work and shop all over the Valley. Its street system is but a part of the total regional transportation system. Its business potential is expanded by the vast purchasing power of the entire region. The metropolitan influence on Tempe is pervasive.

Alfred Marshall, the great English economist, once said that the dominant factor in the development of the western world was transportation. Adequate transportation will insure the continued economic development of the Tempe-Mesa area and the area east to Apache Junction. Inadequate transportation facilities could hinder or completely stymie this growth.

The importance of the location of a major thoroughfare, like a freeway, cannot be overemphasized. Systems of roadways form a rigid framework which very permanently mold the economic and social development and pattern of an area or community.

The economic growth of Tempe since its inception has been greatly influenced by the Salt River. The river has been an obstacle to growth

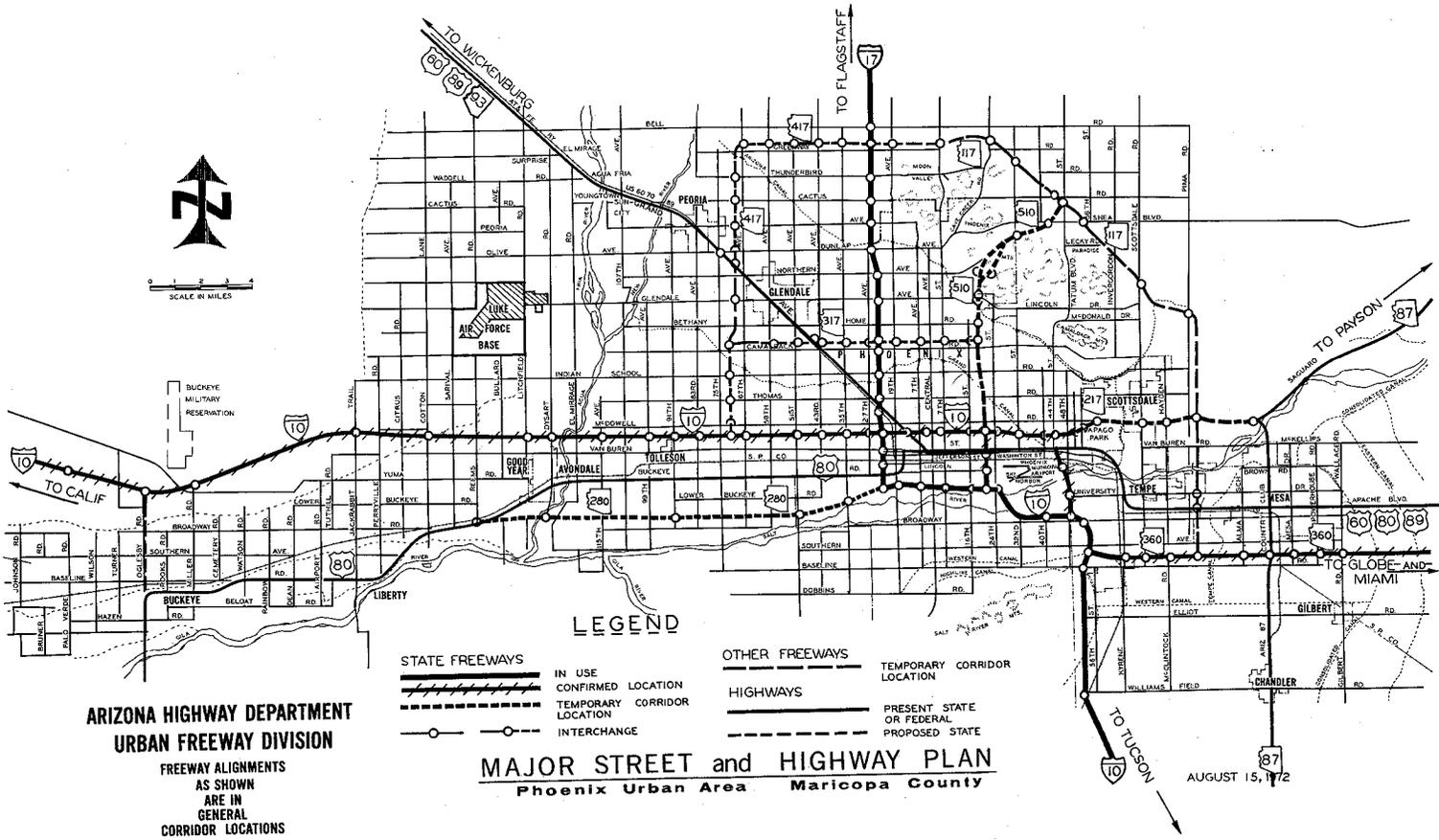


Figure 1-7

into the Tempe-Mesa-Chandler area. It has created a broad wasteland through the center of the Valley which has been uneconomic for uses other than the extraction of sand and gravel.

In periods when the Salt River Project must release water from its diversion dams, the Salt River can overflow all of the roadways connecting the Phoenix area to the Tempe-Mesa area except the Maricopa Freeway and the Tempe Bridge. (See Tempe Map in Back Pocket.) This snarls peak-hour traffic and causes considerable economic loss to business by employees arriving late to their jobs and delaying normal economic intercourse between both sides of the Salt River.

The river will remain an economic hindrance until such time as adequate all-weather crossings are erected across it to handle future traffic needs.

The City of Tempe's basic structure has been influenced by the railroad (See Tempe Area Photographic Map in Back Pocket) which, in the past, has affected development south of the railroad tracks. Although since World War II substantial growth has occurred in this southern area the completion of the underpass on McClintock Road in 1971 has aided north-south traffic circulation

and has provided better access to residential and commercial sites south of the railroad even further quickening the pace of development.

U.S. 60-80-89 runs along Mill Avenue and Apache Boulevard as it crosses the Tempe area and presently carries the great bulk of through traffic in the area. (See Tempe Area Photographic Map in Back Pocket.) Because of this, Mill Avenue and Apache Boulevard had considerable historical importance throughout the post World War II period of Tempe's growth. Although the character of traffic along Mill Avenue and Apache Boulevard will change with the elimination of much of the through traffic if the Superstition Freeway is completed along its proposed alignment east to Apache Junction, these streets will continue to function as major arteries and principal commercial streets in the Tempe area.

Unquestionably, the extension and improvement of the regional transportation network by construction of the proposed Superstition Freeway will encourage the extension of urban growth along transportation corridors, particularly the Superstition Freeway corridor.

If the Superstition Freeway is completed along its presently proposed alignment, great impetus will be given to the development of outlying urban concentrations.

Tempe's future general pattern of urban expansion toward the south will be determined by the availability of undeveloped land and on the west, north and south by the boundaries of other jurisdictions. Tempe's growth to the south should be constrained only by an adequate water supply and by the necessary sewage disposal facilities.

It is the policy of the City of Tempe to encourage contiguous development in an orderly fashion. This will facilitate efficiency and economy in planning, financing and construction of sewer and water lines, streets, school, parks and other community facilities.

Population

The State of Arizona in general and the Phoenix urban region in particular, are magnets attracting migration from all areas of the nation. The population increase for Arizona of 9.7 percent from April 1, 1970 to July 1, 1972 was more than three times the U.S. Rate for the same period. The population of Maricopa County was estimated to be 1,060,000 on July 1, 1972, an increase of 9.3 percent from the 1970 census. It is anticipated that 1973 will be another year of outstanding population growth for Maricopa County.

The major portion of the gain in Arizona's population was due to net migration into the State, 109,800 out of 171,600 or 64 percent. A decline in Arizona's birth rate during 1971 and 1972 reduced the natural increase gain to only 36 percent during this period.

In its early years, Tempe experienced slow, steady growth. Between 1910 and 1940 Tempe functioned primarily as an agricultural service center and it grew more slowly than other areas of the Valley.

Tempe has consistently enlarged its share of Maricopa County population since World War II. Between 1940 and 1960 Tempe grew at a faster rate than the State, County and the City of Phoenix. Its accelerated growth during the 1950s was due to industrial expansion, rising college enrollment and migration to the region.

Tempe emerged in the 1960s as one of the focal points of residential development in the Salt River Valley. Since 1965 Tempe has been Arizona's fastest growing major city. It is presently growing at an estimated rate of 1,000 new residents each month. Based on the present estimated rate of growth Tempe's population will be approximately 100,000 by the year 1975 according to projections made by planning consultants. These population figures and estimates include full-time students residing on the Campus of Arizona State University.

Continued economic diversification, increased local employment, and desirable housing at favorable prices are essential to Tempe's continued growth by in-migration. The abundance of land favorable to the construction of residential sites will also be a very important factor in the attraction of new residents.

The Superstition Freeway, if constructed along its proposed alignment, will be an indispensable transportation component in providing access to residential and employment sites in accommodating Tempe's projected population growth. The section of the Superstition Freeway already constructed has been a vital transportation element in serving the area it traverses.

Employment

Tempe's strategic location in the Phoenix Metropolitan Area gives it the capability of drawing on a large labor base of skilled and

unskilled labor in whatever combination is needed for commerce and industry. In addition, Tempe has its own rapidly growing labor force of skilled and unskilled labor. The Superstition Freeway, if completed to its Apache Junction terminal, would aid in providing convenient transportation access for this labor supply.

Total employment in the Phoenix area as of January, 1973 was 447,900. This figure represents a gain of 38,300 since January 1972 or a growth rate of 9.4 percent.

Unemployment recorded a seasonal increase of 1,100 from December, 1972 to January, 1973 and the January, 1973 figure of 15,400 is 1,100 less than January, 1972. The January seasonally adjusted unemployment ratio was 3.3 percent compared to 3.4 percent the previous month and 3.8 percent a year before. This is an excellent indicator of the strengthening position of the Phoenix Metropolitan Area economy.

In Maricopa County 1971 statistics indicate wholesale and retail trade ranking first in number of employees with 84,700, manufacturing second with 68,200 and government third with 63,100.

Population growth has been the major stimulus to the growth of the government sector since many of the state and local employees are involved in education, a field that has a direct correlation to population.

Agricultural employment is expected to continue its slow, steady decline due to technological advances and the conversion of agricultural land to nonagricultural use. Employment in transportation, trade and the finance sectors in the Phoenix Metropolitan Area should continue the strong, steady growth exhibited in recent years.

With the increasing emphasis on services--medical, recreational, environmental--and the booming tourist industry in the Phoenix area, the service sector should provide good employment opportunities.

The expanding development in the Tempe area has provided excellent opportunity for skilled construction workers. Although some economic researchers are predicting a slight decline in the Phoenix Metropolitan Area's home building trade in the coming year, the home construction underway, and planned, in the Tempe area should ensure a continued demand for skilled construction workers in this area for the foreseeable future.

The 1970 Census indicates that the workers in the Phoenix Metropolitan Area are a highly mobile lot. The City of Tempe is shown to have a net labor surplus, that is, it has more resident workers than job sites. Resident workers from Tempe will commute to job sites all over the Phoenix Metropolitan Area. An adequate regional transportation system is mandatory to maintain this mobility of the Phoenix Metropolitan Area labor force. The proposed Superstition Freeway route from Rural Road to Apache Junction is a key link in the regional transportation system.

Property Values

The value of property is directly contingent upon its use or anticipated use. If the proposed freeway makes it possible to devote the adjacent land, or land within the freeway's influence, to a more profitable use, the land value will be increased. Since the assessed valuation of land for tax purposes is directly related to the market value of land, any increase in land value abutting the freeway or within the freeway's influence, will reflect in an increase in the amount collected for property taxes.

Perhaps the basic problem in discussing the effects of highways on land values and uses is that of divorcing the effects of economic growth

from those resulting from highway improvement. These two forces are probably incapable of being entirely separated because, while the highway influences land values through location benefits, it is itself the result of economic expansion. In other words, the highway is both a cause and an effect of economic growth.

Economic studies made by the Arizona Highway Department along Interstate 17 north of Phoenix show that property values of commercial and large residential subdivision sites abutting the freeway showed increase in comparison to property values of similar-type properties in a selected control area. Dramatic increases in values were observed in interchange areas in this study as in most freeway economic impact studies in urban areas.

There appears to be indisputable evidence that property values along the area the proposed Superstition Freeway is expected to traverse have increased measurably more in the last few years than in areas in Tempe and Mesa not affected by the freeway. The anticipation of construction of the proposed freeway can logically be inferred to have caused this increase. The irony arises of the State Highway Department having to pay more for right of way acquisition for the freeway simply because of value enhancement due to anticipated benefits believed to be reaped by the construction of the same freeway.

The access the freeway provides to properties that are adjacent to it, or in the vicinity of it, is a very specific reason for land value increases occurring to these properties. This improved access afforded by freeways often changes the most profitable use of the land, as from agricultural usage to residential subdivisions. This type of change can translate into considerable land value increases.

There also seems to be an economic psychological effect of freeways in urban areas that results in self-fulfilling prophecies. If enough people with the necessary purchasing power believe that land values will increase as a result of proximity to freeways, land values will increase.

The average land value in the part of the proposed Superstition Freeway that traverses the Tempe area (that is, from Rural Road to the Tempe Canal) is as follows:

<u>Section</u>	<u>Estimated Land Value Per Acre, April 1973</u>
Rural Road to McClintock Road	\$15,000
McClintock Road to Price Road	\$20,000
Price Road to Tempe Canal	\$15,000

The total right of way acquisition needed for the part of the proposed Superstition Freeway crossing the City of Tempe area (that is, from Rural Road to the Tempe Canal) is approximately 130 acres. The total estimated right of way acquisition cost for this acreage is approximately \$2,170,000.

There are no buildings, structures or improvements of any sort presently lying within the proposed Superstition Freeway right of way path as it crosses the Tempe area.

Tax Base

The Tempe area crossed by the proposed Superstition Freeway lies in the Tempe Union High School District and Tempe Elementary School District Number Three. A breakdown of the tax rate per one hundred dollars of assessed valuation for the years 1967 through 1972 is shown on the following page.

TAX RATE PER \$100.00 ASSESSED VALUATION

SCHOOL DISTRICT	ELEMENTARY	HIGH	COMMUNITY COLLEGE	STATE	COUNTY	TOTAL OUTSIDE CITY	CITY OR FIRE DISTRICT	TOTAL
<u>Tempe No. 3</u>			<u>Tempe Union</u>				<u>Tempe</u>	
1967	\$5.09	\$2.54	\$.37	\$1.70	\$1.85	\$11.55	\$1.00	\$12.55
1968	3.83	1.68	.49	2.16	1.97	10.13	1.25	11.38
1969	4.29	3.41	.62	2.20	2.13	12.65	1.25	13.90
1970	4.64	2.85	.66	1.65	2.13	11.93	1.25	13.18
1971	4.93	3.15	.69	1.90	2.13	12.80	1.25	14.05
1972	4.85	3.18	.62	1.55	2.10	12.30	1.25	13.55

Source: Arizona Property Tax Rates and Assessed Valuation, 1972 Supplement, The Arizona Tax Research Association

The State Tax Rate is fixed by the State Tax Commission; the other rates are fixed by the county, city, and school districts, as applicable. The total rate is applied to assessed valuation to obtain the amount of tax assessed.

By statute the assessed valuation of real estate is determined by a fixed percentage of the market value of the real estate. Market value is generally considered to be the full cash value the real estate would bring if it were exposed on the market for an adequate period of time in a voluntary sale, without undue pressure on either the buyer or seller, and both parties having adequate knowledge of the real estate's potential.

The fixed percentage is 18 percent of market value for vacant or residential classified properties, 25 percent of market value for commercial properties, 40 percent for utilities, and 60 percent for mining, railroads, and timber properties.

The total assessed valuation for real estate for the City of Tempe for the years 1967 through 1972 is:

1967	\$56,103,629	1970	\$69,893,700
1968	\$59,579,305	1971	\$80,936,880
1969	\$62,528,959	1972	\$97,297,049

Source: Arizona Property Tax Rates and Assessed Valuation, 1972 supplement.
The Arizona Tax Research Association.

Although some of the increase in assessed valuation has been due to inflationary pressures over this period, the lion's share can be attributed to accelerated land development in the Tempe area.

Property taxes have historically been the major source of elementary and high school funding. Increases in total assessed valuation within a school district should impose a lighter tax load on the real estate of that district. Conversely, a reduction of total assessed valuation within a district can reflect in a higher tax rate for the real estate within its boundaries.

The 1972 total tax rate of 13.55 per one hundred dollars of assessed valuation for Tempe Number 3 is about average for school districts in the eastern section of the Phoenix Metropolitan Area.

Arizona State University

Arizona State University is situated on a 300-acre campus just to the east of downtown Tempe. (See Tempe Map in Back Pocket.) The University has an all-pervasive effect on every phase of Tempe's life including the economic.

Founded in 1885 as the Territorial Normal School, the institution progressed through teachers' college and liberal arts college development

to its present status as a multipurpose university with nine colleges, a Graduate School of Social Service Administration, Divisions of Agricultural and Industrial Design and Technology, and 63 academic departments.

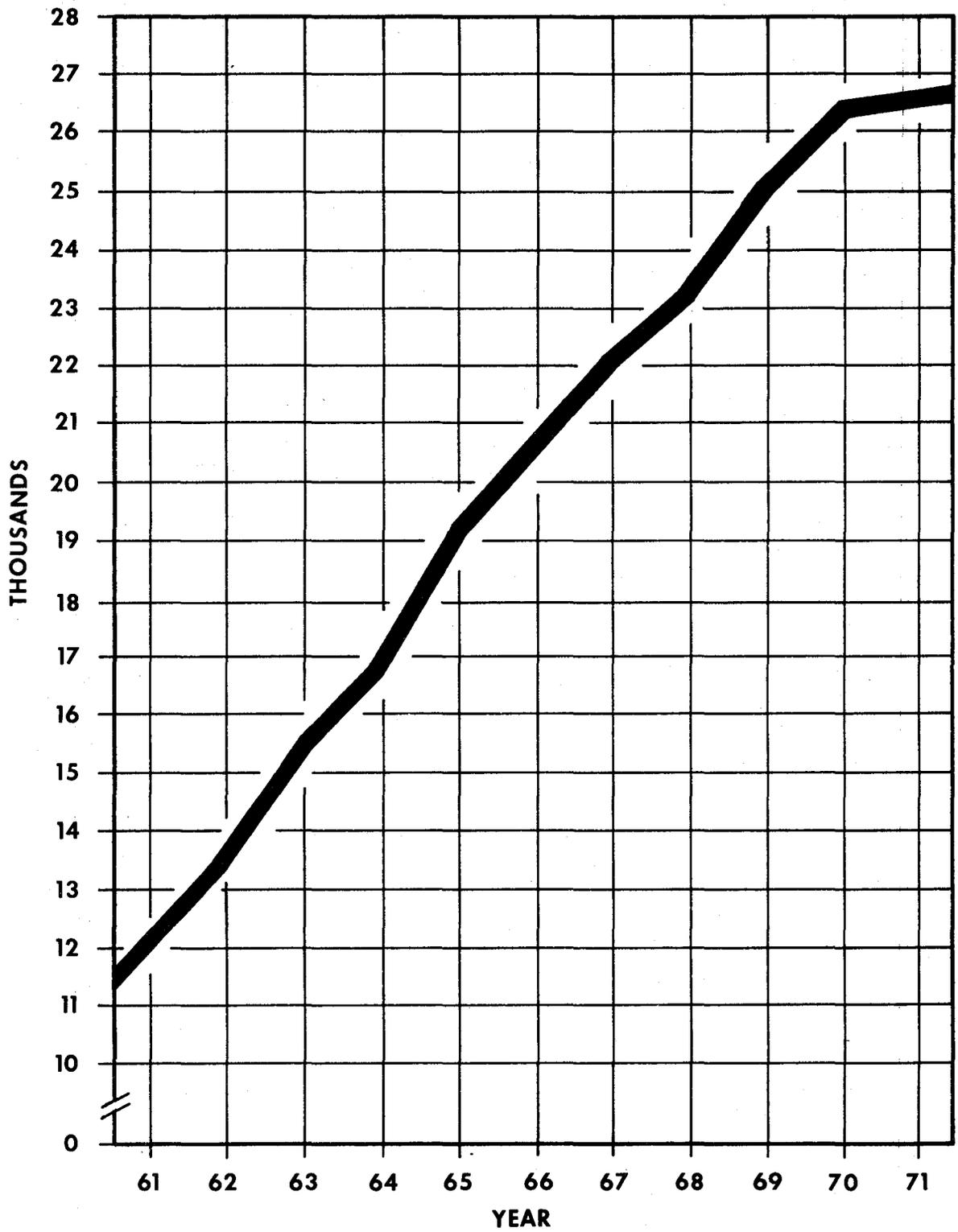
Colleges are Liberal Arts, Education, Business Administration, Engineering Sciences, Architecture, Nursing, Fine Arts, Law, and Graduate College. The Summer Sessions and the Extension Division serve students around the clock and around the calendar.

The main campus has many new architecturally harmonious buildings necessary to accommodate the large enrollment. The Grady Gammage Memorial Auditorium, designed by Frank Lloyd Wright is one of the showplaces of the Valley and a major cultural center of the Phoenix Metropolitan Area.

Arizona State University athletic teams are among the nation's finest. The ASU football team, playing in the new 50,000-seat Sun Devil Stadium, has received excellent support from residents of the Phoenix Metropolitan Area. ASU serves the people of Arizona in teaching, research, and services with an Architecture Library, Audio-Visual Film Library, Music Research Center and Arizona Historical Foundation.

Arizona State University's 1971-72 enrollment shows 82.5 percent of the students from Arizona, 16 percent from out of state and 1.5 percent from foreign countries. The total enrollment of 30,995, one-fourth of which is in the graduate college, comes from all 50 states and more than 62 nations. Of 19,487 students enrolled in the University from Maricopa County, 8,822 are from Phoenix, 5,302 from Tempe, 2,653 from Scottsdale and 1,667 from Mesa. The balance is from locations all over the County. Figure 1-8 on Page charts the impressive growth of ASU from 1961 to 1971.

ON CAMPUS STUDENT ENROLLMENT Arizona State University



Based Upon Total Enrollment in Residence

SOURCE: Registrar, Arizona State University, Tempe, Arizona

Arizona State University has proven a major stimulus to Tempe's growth. Its future influence on Tempe's physical development will stem largely from demands on the city's street system and its need for expansion room.

The University is the City of Tempe's largest employer with 2,831 on the payroll in the 1971-1972 academic year. It makes a major contribution to the economy of Tempe and the Phoenix Metropolitan Area. Direct impacts of university spending for construction, operation, and maintenance of the physical plant are widely dispersed throughout the region and state. Local merchants receive a significant proportion of off-campus spending by students, faculty, and staff. In addition, campus visitors attending meetings, conferences, cultural and athletic events exert an economic impact.

In 1971-1972 ASU expended in excess of 38 million dollars for personal services, other operating expenditures and capital outlay for equipment. In addition, \$6,976,000 was expended on construction. The indirect and multiplier effects of the business, payrolls, and secondary purchasing power created by the University are major economic benefits in which Tempe and the Phoenix Metropolitan Area share.

Tempe derives extremely important intangible benefits from the presence of Arizona State University. The University permeates the city's social and cultural environment. The cultural and social advantages it affords are important magnets to immigration. Its readiness to assist new types of industry has been instrumental in attracting electronic and related industries to the Valley. Its importance to the economy of Tempe and the Phoenix Metropolitan Area is difficult to measure and to overemphasize.

Central Business District

Mill Avenue, from the Tempe Bridge to Grady Gammage Auditorium, is the core street of the Central Business District of Tempe. The Tempe map in the back pocket shows the Central Business District in proper perspective with the rest of the Tempe area.

The Hayden Flour Mills on the far north end of Mill Avenue, next to the Tempe Bridge crossing of the Salt River, is one of the City's original landmarks. The area on Mill Avenue south of the Hayden Flour Mills is devoted to automobile sales and automobile related businesses. Some of the older structures along Mill Avenue have been converted into campus oriented and tourist oriented businesses. The Tempe Shopping Center at Mill Avenue and University Drive is the major retail outlet in the downtown Tempe area.

Many of the Valley's financial institutions have branch offices in the downtown Tempe area. Tempe's new civic center is located just to the east of the heart of the downtown area.

It is the policy of the City of Tempe that downtown Tempe should be redeveloped to commercial and other uses gaining special benefits from its strategic regional location, core area character, and proximity to Arizona State University.

The Tempe General Plan recommends that downtown Tempe should be redeveloped as a diversified business district without special orientation to retail trade. (See Tempe General Plan Land Use Map, Figure 2-2 on Page 2-5.) The General Plan states that various types of the following land uses should be considered: (1) regional, branch, and local offices; (2) hotels and downtown motor lodges; (3) recreation and entertainment establishments oriented to regional-local-campus trade; service establishments supporting the foregoing activities.

The proposed Superstition Freeway if completed to the Apache Junction terminal would considerably alleviate traffic congestion along Mill Avenue thus acting as an ameliorative influence toward the implementation of the Tempe General Plan's recommendations.

Tourism

A 1970 survey of motels, resorts and guest ranches in the Phoenix Metropolitan Area revealed 286 such establishments with a total of 14,562 rooms. Since that time a sizable number of rooms has been added from new development and expansion of existing accommodations. The Valley has excellent convention facilities and draws convention guests from all over the nation. An estimated 600 million dollars was expended in Arizona in 1972. Of this amount over half (approximately 320 million dollars) was spent in the Phoenix Metropolitan Area.

For years Tempe failed to take full advantage of its position on a main transcontinental route by not having modern tourist facilities available for travelers. Most of its facilities have been small and did not offer the conveniences of the larger motels in the Phoenix area. In recent years two international motel chains have placed large, full-service facilities along Route 60-80-89 near Arizona State University; this has helped provide better accommodations for tourists in the Tempe area and for year-round visitors to Arizona State University.

Recently a rash of modern restaurants, some of them attached to regional chains, has opened for business along or near Apache Boulevard (Route 60-80-89). These restaurants cater to the growing local population as well as to the tourist trade.

Arizona State University offers many cultural attractions for the tourist. Grady Gammage Auditorium schedules a variety of activities of the performing arts throughout the tourist season.

Tempe has a year-round recreation program including supervised play in designated park areas, athletic and game equipment, arts, and hobby programs. These programs have appeal for many of the winter visitors. Park areas within the City provide facilities for picnics, games, swimming, and a nine-hole golf course and driving range.

Tempe's propinquity to downtown Phoenix and its favorable location within the Phoenix Metropolitan Area make it an excellent site for tourists. Improvement of the Phoenix Area's regional transportation system through construction of the Superstition Freeway along its presently proposed route to Apache Junction, would enhance Tempe's tourism potential.

Development

a. Zoning

Zoning is a function of the police power which authorizes properly constituted jurisdictions to regulate land use for the purpose of the health, safety and general welfare of the public. Zoning can be adjusted and expanded to meet new and changing conditions through legislative action and judicial decisions.

Zoning can prohibit property development that would be detrimental to neighboring properties or injurious to the health and safety of the general public. The owner whose land is limited by zoning is compensated by benefits accruing to him from similar limitations imposed on his neighbors. By its very nature zoning

confers economic benefits on some properties while withholding it from others. Although the market is the prime factor determining when land will be developed, through its prohibition of certain uses, zoning determines the framework of a community.

It is one of the principal objectives of the Tempe General Plan to employ zoning as part of an integrated process to encourage orderly community growth.

In the City of Tempe zoning is administered by the City Planning Director who recommends zoning action to the seven-member Planning and Zoning Commission and the seven-member Board of Adjustments, the organizations responsible for all zoning matters within the City of Tempe.

The zoning map shown as Figure 1-9 on Page 1-54 indicates the land use permitted in the area penetrated by the proposed Superstition Freeway. It shows that most of the area adjacent to the proposed route is zoned for residential usage. A notable exception is the large area on the southeast corner of the Superstition Freeway route and Rural Road which is zoned for a Planned Shopping Center. The zoning map indicates that there is no industrial usage authorized along the route crossed by the proposed Superstition Freeway from Rural Road east to the Tempe Canal.

Zoning throughout this area was predicated on the assumption that the Superstition Freeway would be constructed along its presently proposed route as illustrated on the zoning map.

b. Residential

Residential construction in the Phoenix Metropolitan Area continued its healthy pace in 1972 registering an 11 percent

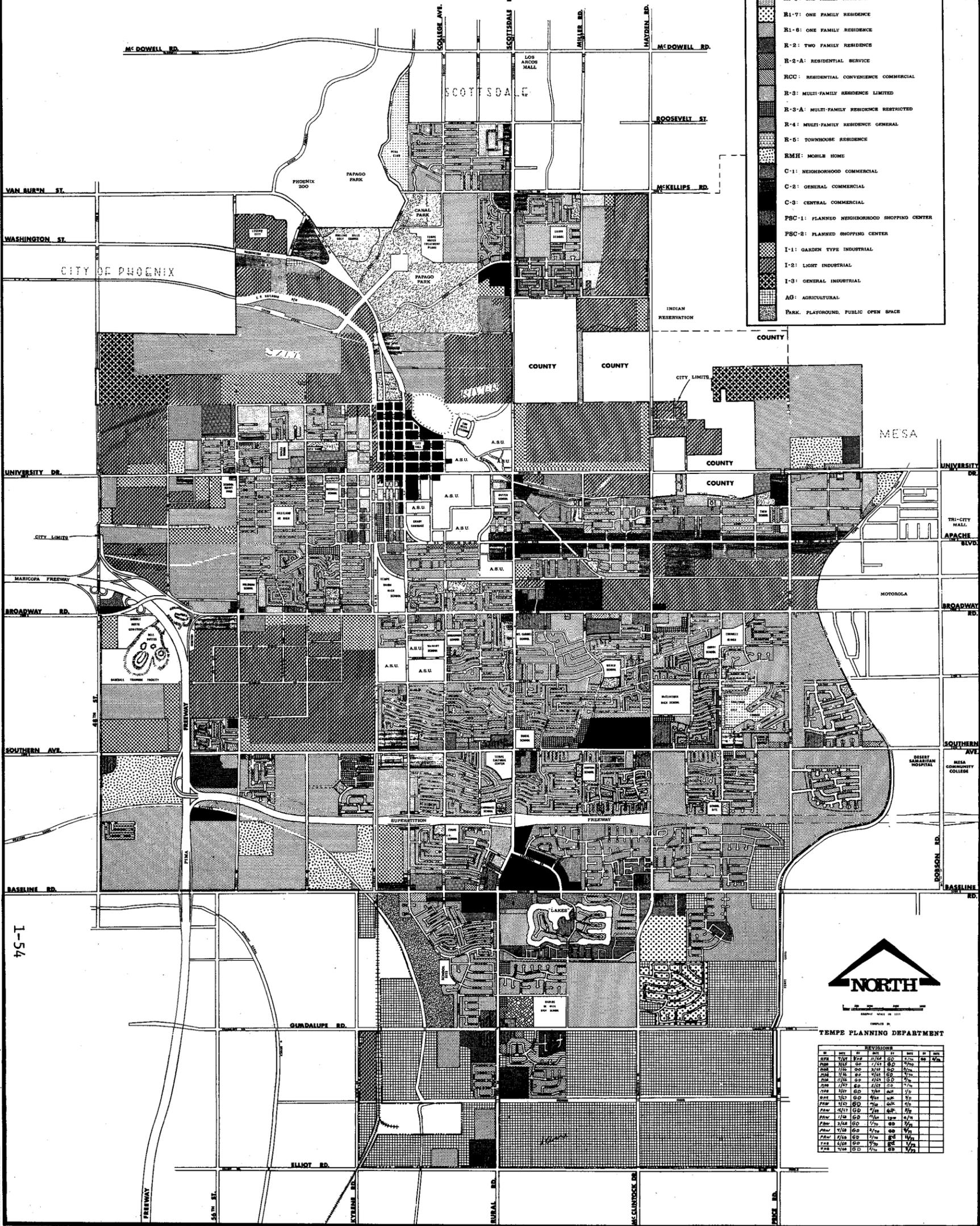
Figure 1-9

ZONING MAP

CITY OF TEMPE

LEGEND

- R1-15: ONE FAMILY RESIDENCE
- R1-10: ONE FAMILY RESIDENCE
- R1-8: ONE FAMILY RESIDENCE
- R1-7: ONE FAMILY RESIDENCE
- R1-6: ONE FAMILY RESIDENCE
- R-2: TWO FAMILY RESIDENCE
- R-2-A: RESIDENTIAL SERVICE
- RCC: RESIDENTIAL CONVENIENCE COMMERCIAL
- R-3: MULTI-FAMILY RESIDENCE LIMITED
- R-3-A: MULTI-FAMILY RESIDENCE RESTRICTED
- R-4: MULTI-FAMILY RESIDENCE GENERAL
- R-5: TOWNHOUSE RESIDENCE
- RMH: MOBILE HOME
- C-1: NEIGHBORHOOD COMMERCIAL
- C-2: GENERAL COMMERCIAL
- C-3: CENTRAL COMMERCIAL
- PBC-1: PLANNED NEIGHBORHOOD SHOPPING CENTER
- PBC-2: PLANNED SHOPPING CENTER
- I-1: GARDEN TYPE INDUSTRIAL
- I-2: LIGHT INDUSTRIAL
- I-3: GENERAL INDUSTRIAL
- AG: AGRICULTURAL
- PARK: PLAYGROUND, PUBLIC OPEN SPACE



TEMPLE PLANNING DEPARTMENT

REVISIONS	
NO.	DATE
1	1/15/78
2	2/15/78
3	3/15/78
4	4/15/78
5	5/15/78
6	6/15/78
7	7/15/78
8	8/15/78
9	9/15/78
10	10/15/78
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90	6/15/85
91	7/15/85
92	8/15/85
93	9/15/85
94	10/15/85
95	11/15/85
96	12/15/85
97	1/15/86
98	2/15/86
99	3/15/86
100	4/15/86

increase in the value of construction and a 12 percent increase in the number of units over 1971. Reflecting the growth in residential units was the 37,005 units connected to electricity for the first time.

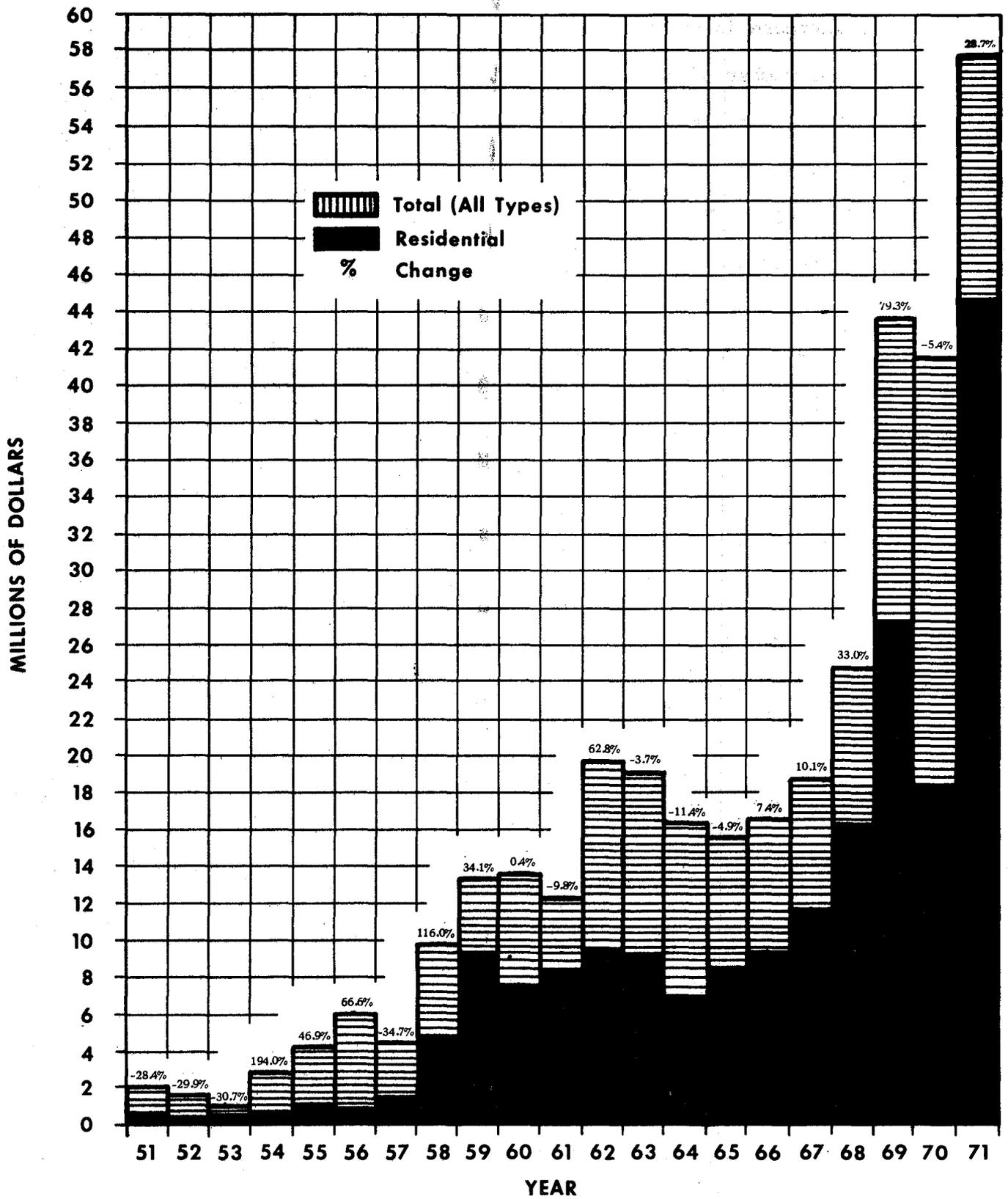
Although 1973 may not continue the rate of growth that 1972 witnessed in the residential construction area, it should still be a very solid year. One possible inhibiting factor is construction costs which are predicted to continue climbing, especially after labor contracts are signed at midyear. For 1973 close to 30,000 housing units are forecast to be constructed in the Phoenix Metropolitan Area. Approximately 17,000 are predicted to be single family, 4,000 townhouses and 9,000 multiple units.

As an integral part of the Phoenix Metropolitan Area, Tempe's residential construction reflects in the area as a whole.

Tempe's residential areas are relatively free of land use conflicts. New residential areas south of the railroad are largely single family with concentrations of townhouses occurring near major street intersections. In the growth area south of the proposed Superstition Freeway route new residential districts are generally developing in fairly contiguous fashion without extensive skip distances between subdivisions.

The Building Permits Chart (Figure 1-10 on Page 1-56) indicates the growth of all types of construction within the City of Tempe for the years 1951 through 1971. The Chart graphically illustrates the large dollar-volume increase in construction in the decade of the 1960s.

BUILDING PERMITS



SOURCE: Office of Building Inspector, City of Tempe, Tempe, Arizona

In 1971 an all-time record of 2,100 building permits for single-family residences was issued in Tempe for a monetary value of \$28,739,000. This amount is double the \$14,192,000 monetary value issued in 1970. In 1971, 2,333 building permits for a value of \$44,766,000 for residential permits of all kinds were recorded. This compares with \$18,194,000 for 2,585 permits for residences of all kinds in 1970.

As indicated by the building permits graph (Figure 1-10 on Page 1-62), Tempe was affected as the rest of the Phoenix Metropolitan Area was with the tight money situation that inhibited construction activities in the mid-1960s.

The 1972 median single-family home value in the Tempe area is \$28,365 compared to the Phoenix Metropolitan Area's median single-family home value of \$23,394.

As the aerial photograph for Tempe in the back pocket reveals, the area on both sides of the proposed Superstition Freeway route is predominantly residential in character. The major residential developers in the Tempe region place great emphasis on access to all sections of the Phoenix Metropolitan Area as a factor in selection of residential subdivision sites. The burgeoning residential construction in the area to the south of the proposed Superstition Freeway is based on no small degree on the anticipated construction of this Freeway along the proposed route.

c. Commercial

Before World War II, Tempe was a typical small, college oriented community. Local residents tended to patronize retail and service establishments in the Phoenix vicinity to secure an adequate selection

of goods and better services. In recent years the blossoming of new retail centers in the area on both sides of the existing Superstition Freeway and the proposed future Superstition Freeway alignment has aided in stemming this tide. Corrections of previous imbalances in retail composition in the Tempe growth area between Broadway and Baseline Roads are being remedied by these new centers.

Present Tempe zoning policy dictates that the size, location, and retail composition of each shopping center will be determined by and limited to the needs and potentials of its intended trade area. Neighborhood shopping centers and small convenience outlets are to be located and arranged to minimize adverse effects on adjacent residential property. Recent shopping center development has complied with Tempe's provisions for improved appearance, protection of adjacent property, preservation of street function, and provision for adequate off-street parking.

The photographic map of Tempe in the back pocket indicates the location of the chief shopping centers in the Tempe area that will be influenced by the construction of the proposed Superstition Freeway.

An attempt has been made in these new shopping center developments to group complementary, compatible, and similar establishments in integrated concentrations in so far as it is possible to do this, to increase sales volumes. Existing zoning discourages strip commercial development with its traffic conflicts, customer inconvenience, and design disunity to establishments which are relatively independent of others and which do not benefit from location in business conformations.

Recently constructed shopping centers in the developing area in southern Tempe have been the result of observing trends in shopping habits and retail sales that point out the advantages of locating a business in an organized grouping of commercial establishments. Concentrations of complementary, compatible and similar establishments develop cumulative drawing power, attract a larger clientele, make more efficient use of land, and afford greater customer convenience than establishments in isolated locations or arterial strips.

With few exceptions, all future retail businesses in Tempe are planned to be situated in organized regional, community, or neighborhood shopping centers.

Tempe's 1960 median family income was \$5,933 which was below the average reported for the Phoenix Urban Area. Consumer surveys in 1965 indicated that the local median had increased to \$7,638 placing it above the urban area average. The 1970 Census reported Tempe's median family income to be \$11,092, second in the State only to Scottsdale's \$12,726 and well ahead of Phoenix's \$9,956.

This increase can be partially attributed to the number of relatively well-paid faculty members who reside in Tempe and an influx into Tempe of comparatively affluent families.

It is this increase in median family income, along with population growth, that has been a major factor in encouraging the development of the new modern shopping centers on both sides of the existing Superstition Freeway and proposed Superstition Freeway alignment. It is an economic axiom that population forms the backbone of demand but demand must be buttressed by purchasing power to be effective.

Shopping Center and Retail Outlets

Pertinent information on the major shopping center and retail outlets in the Tempe Area is given below. Building cost figures have been supplied by the City of Tempe Department of Public Works. They constitute improvement costs only and do not include land costs.

Danelle Plaza

Southwest corner of Mill Avenue and Southern Avenue

Established 1964

Type: Neighborhood shopping center

Total number of businesses: 26

Total gross building area (square feet): 66,100

Parking spaces: 1,000

Average 24-hour vehicular traffic:

Southern Avenue (1969)	5,600
Mill Avenue (1969)	3,900

Fed Mart

Northwest corner of Broadway Road and McClintock Drive, Tempe

Established 1969

Type: Discount department store

Total number of departments: 24

Total gross building area (square feet): 35,000

Parking spaces: 500

Average 24-hour vehicular travel:

Broadway Road (1969)	19,100
McClintock Drive (1969)	12,000

Cost from building permit (excludes land cost): \$593,000

Grant Plaza

Northwest corner of Rural Road and Southern Avenue

Established 1970

Type: Discount department store

Total number of departments: 32

Total gross building area (square feet): 106,000

Parking spaces: 777

Average 24-hour vehicular traffic:

Rural Road (1969)	10,500
Southern Avenue (1969)	3,500

Cost: \$1,000,000

Hayden Plaza East

Southwest corner of Scottsdale Road and Curry Road

Established 1963

Total number of businesses: 38

Total gross building area (square feet): 265,000

Parking spaces: 3,500

Average 24-hour vehicular traffic:

Scottsdale Road (1969)	22,000
------------------------	--------

Cost: \$670,000

Smitty's Shopping Center

Northwest corner of McClintock Drive and Baseline Road

Established 1972

Total gross building area (square feet): 83,935

Parking spaces: 600

Average 24-hour vehicular traffic:

McClintock Drive	Not given
Baseline Road	Not given

Cost: \$1,000,000

Tempe Center

Southeast corner of Mill Avenue and University Drive

Established 1956

Total number of businesses: 31

Total gross building area (square feet): 98,564

Parking spaces: 663

Average 24-hour vehicular traffic:

Mill Avenue (1969) 27,300

University Drive (1969) 25,100

Cost: Accurate cost figure not available

Valley Fair

Southeast coner of Mill Avenue and Southern Avenue

Established 1963

Total number of businesses: 21

Total gross building area (square feet): 74,370

Parking spaces: 500

Average 24-hour vehicular traffic:

Mill Avenue (1969) 3,900

Southern Avenue (1969) 3,500

Cost: \$450,000

Valley Plaza

Northeast corner of McClintock Drive and Southern Avenue

Established 1971

Type: Neighborhood shopping center

Total number of businesses: 12

Total gross building area (square feet): 111,500

Parking spaces: 589

Average 24-hour vehicular traffic:

McClintock Drive 7,000

Southern Avenue 3,700

Cost: \$1,980,000

A \$22,000,000 double-decked, enclosed mall, regional shopping center is planned for opening on the northwest corner of Southern Avenue and McClintock Drive in the Spring of 1975. The total gross building area is anticipated to be 1,000,000 square feet with 5,000 parking spaces on the 70 acre site. Montgomery Ward and the Boston Department Store will anchor the center's anticipated 100 stores.

A new shopping center, Basha's Plaza, located on the southwest corner of Southern Avenue and McClintock Drive, was established in 1972. Information available reveals its estimated building cost to be \$945,000. It is presently comprised of eight businesses with ample parking space available.

All of the major shopping centers constructed in recent years have been built in relatively close proximity to the proposed Superstition Freeway. The proposed location of the freeway has undoubtedly been a major factor in the selection of these shopping center sites because of the number of residential subdivisions developing in the area populated by relatively high-income families. The location of many of these subdivision sites have been predicated on the construction of the Freeway along the proposed route.

d. Industrial

The Tempe General Plan recognizes the need for additional industry in the Tempe Area. Industry is needed for diversification and expansion of its tax base.

It is city policy to develop a social, physical and economic climate attractive to industry. Among the key factors emphasized are cooperative attitudes, responsible government, a progressive administration, comprehensive planning, equitable zoning, adequate transportation, utilities and services, and stable tax rates. Over concentration of industry in any part of the city is to be prevented in order to avoid excessive traffic congestion.

The City of Tempe recognizes the importance of evaluating each industry development proposal carefully, giving full consideration to such factors as potential revenue production, service and facility needs, performance and site development characteristics, compatibility with adjacent uses and geographic location in the community.

It is also recognized that the reservation of prime industrial land can prove an important community asset providing that the integrity and economic potential of such lands are preserved by releasing reserves only when market demand is strong, adequate utilities and transportation facilities are provided and orderly development is assured.

The Tempe Zoning Map indicates a provision for garden-type industries at the southeast corner of the grade separation of Kyrene Road and the Superstition Freeway. (This portion of the freeway has already been constructed. Along the portion of the freeway in the Tempe area yet to be constructed, zoning prohibits industrial use of any sort.)

Light industrial and garden-type industrial uses are permitted in the area bordered by Southern Avenue on the south, Interstate 10 on the west, Broadway Road on the north, and Kyrene Road on the east. Easy access to Interstate 10 and to the segment of the Superstition Freeway now completed makes this a prime industrial site.

Much of this area is presently built up with commercial headquarters, light industrial uses and warehousing.

It is Tempe Planning and Zoning policy to reserve the land adjacent to Maricopa Freeway (I-10) and 48th Street in west and northwest Tempe for organized industrial districts. Strict appearance and performance controls are to be imposed on all industrial development abutting freeways. The performance of all industrial establishments should be restricted to the extent necessary to avoid nuisance, hazard and other adverse conditions affecting adjacent residential districts.

The outlook for local industrial expansion is greatly increased by three major factors: (1) increasing university specialization in scientific research, (2) directional trends in lateral expansion of the metropolitan area, and (3) improved regional access promised by the freeway system.

Public Utilities

It is the policy of the City of Tempe that the long-range planning, financing, and construction of water, sewage disposal and storm drainage facilities should be fully coordinated with community growth plans to insure availability of adequate utility services when needed. Existing public utility facilities are adequate to meet the needs of the immediate future in the Tempe area.

Electricity:

The State's two largest purveyors of electricity, the Arizona Public Service Company and the Salt River Project, serve the Tempe Area with electric power. Generally, Arizona Public Service serves the area north of Broadway Road and the Salt River Project serves the area to the south of Broadway.

Gas:

Arizona Public Service, supplied by El Paso Natural Gas Company from their transcontinental pipe lines, serves gas to the Tempe area.

Telephone:

Mountain States Telephone and Telegraph Company provides telephone service to Tempe and the whole Phoenix Metropolitan area.

Domestic Water:

Water is delivered to Tempe residents by the City of Tempe Water Company. A treatment plant permits usage of water from the Salt and Verde Rivers.

Irrigation:

The Salt River Project provides irrigation water for agricultural use in the Tempe area. City irrigation is available in limited areas of Tempe and is supplied by the City.

Sewage:

Tempe sewage is disposed of by the "trickling filter" process at a Phoenix plant completed in 1964. The Five-City Interceptor Sewer System, which provided the connecting mains to this plant, was completed in 1966 and is shared by Phoenix, Glendale, Scottsdale, Mesa, and Tempe.

Refuse:

The City of Tempe provides a twice weekly refuse collection service for its residents.

Inventory of Economic Factors: Mesa

General

The economy of Mesa, as that of Tempe, is inextricably entwined with the economy of the Phoenix Metropolitan Area as a whole. Mesa is located on the eastern periphery of the Phoenix Metropolitan Area and borders on the agricultural area to the east. Cropland, citrus groves, beef and dairy lots in the Mesa area make a major agricultural contribution to Maricopa County's \$329 million annual gross farm income. Principal crops are cotton, alfalfa, cereal grains, citrus fruit and sugar beets. Sugar is processed at a new sugar mill within a few miles of Mesa.

Table crop production of lettuce, onions, potatoes and other vegetables is also a major industry. Loading of produce in Mesa often totals more than 2,500 freight cars annually, plus hundreds of truck trailer loadings. Feedlots for beef cattle and the dairy business are also economically important to the Mesa area.

There are several agriculturally oriented research facilities in the Mesa area including a University of Arizona Agricultural Experiment Station. Within a 15-mile radius of Mesa lie the Arizona Cotton Research Center, the University of Arizona Citrus Experiment Station, the U.S. Water Research Conservation Laboratory, as well as feed consultants, seed laboratories, and other agricultural testing services. The agricultural business is extremely important to the Mesa area.

Mesa industry is diversified including such manufacturing firms as electrical components, metal fabrication, aircraft, machine tools, propulsion systems, citrus packing and food processing.

The Mesa area is a dynamic growth area. Anticipation of construction of the Superstition Freeway has intensified the urbanization pattern of the outlying areas, particularly along the proposed freeway route.

Main Street is the major business artery cutting through the heart of Mesa. It carries both through traffic as U.S. Route 60-80-89 and local traffic. The construction of the Superstition Freeway approximately two miles to the south of Main Street and parallel to it should not change the business or historical character of the street.

The four heaviest traveled streets in Mesa are Main Street, University Drive, Broadway and Country Club Drive. Country Club Drive is the only one of these streets with a north-south alignment. While Main Street carries more traffic than any other Mesa Street, it is forced to perform two conflicting traffic roles--principal business street and principal through artery. The construction of the Superstition Freeway would relieve the latter function by taking much of the through traffic off Main Street.

Population

Mesa's growth since World War II has rivaled that of Tempe and the Phoenix Metropolitan Area as a whole. Table 1-4 on Page 1-69 indicates this steady growth. Three of the ten-year periods show population increases of more than 100 percent over the previous ten-year span. These increases reflect a sound and balanced growth based on a good economic and sociological foundation. Existing conditions would indicate that Mesa's growth will exceed 90,000 by 1975 and probably be in the neighborhood of 220,000 by 1990.

The reasons for the population growth of Mesa and the Salt River Valley are manifold and difficult to specifically isolate. The area's

mild winter climate has always been a magnet for tourists. The increased mobility of the American public since World War II has given the Valley more exposure. The advent of home air conditioning in these years has made extreme heat of the summer tolerable. Veterans who were stationed at the air fields that dotted the Valley in World War II have been excellent goodwill ambassadors for the Valley's climate. These air field induced aeronautic and later space and electronic related industries have contributed in varying degrees to Mesa and the Salt River Valley's growth.

TABLE 1-4

MESA POPULATION AND AREA GROWTH

Year	Population ^{1/}	Area (Square Miles)
1900	722	
1910	1,692	1.00
1920	3,036	1.00
1930	3,711	1.00
1940	7,224	1.77
1950	16,770	5.72
1960	33,722	13.50
1962	39,670 (estimated)	16.30
1963	41,300 (estimated)	17.00
1964	46,000 (estimated)	17.40
1965	50,529 (special census)	17.80
1966	53,800 (estimated)	18.03
1967	57,300 (estimated)	18.60
1968	60,300 (estimated)	19.07
1969	61,800 (estimated)	20.00
1970	62,853 (national census)	24.05
1971	74,555 (estimated)	24.43

^{1/}Source: City of Mesa

The City of Mesa's growth, even more than Tempe's, is dependent upon the construction of the Superstition Freeway along its proposed alignment. The Freeway will provide needed access to the Phoenix Metropolitan area

lying to the west of Mesa. It is the transportation linchpin in providing access for Mesa's growing population to the rest of the Phoenix area. A major portion of the presently built up or urbanized land is concentrated in the western sector of Mesa contiguous with the eastern edge of development in Tempe. Mesa has ample room to grow to the east if adequate regional transportation is provided.

Employment

The continuing influx of newcomers into the Mesa area has provided an adequate labor pool of both skilled and unskilled labor to meet the commercial and industrial needs of the community. Available labor runs the gamut from the professional, semi-professional and managerial level through clerical sales and service skills to unskilled workers. Wages and salaries in the Mesa area are generally lower than those paid on the West Coast but are competitive with those paid in other sections of the Phoenix Metropolitan Area.

U.S. Bureau of the Census statistics reveal that Mesa, like Tempe, has a net labor surplus, i.e., it has more resident workers than job sites. These statistics show that as of April 1970, Mesa had a total of 23,259 resident workers. Of this number, 12,253 worked within the City of Mesa, 4,491 worked in Phoenix, 2,101 in Tempe, 1,030 in Scottsdale, and the remainder in other sections of the Valley and the State. These figures are indicative of a highly mobile labor force dependent on an adequate regional transportation system.

The Tempe Employment, Part One, discusses the general employment situation in the Phoenix Metropolitan Area. As an integral part of this area, this discussion is applicable to employment conditions in the City of Mesa.

Property Values

An investigation of property value changes in the approximate 7.65 mile stretch from the Tempe Canal to Val Vista Road through the Mesa area indicates that anticipation of the construction of the proposed Superstition Freeway has had a positive effect on sales prices along this route. As in the Tempe area, real estate interest has been most intense in the vicinity of the intersection of the proposed Freeway with the major intersecting north-south crossroads where interchanges are anticipated to be constructed.

The general discussion of freeway effect on adjacent and neighboring properties that was made in Part One of the Tempe Economic Property Value Segment is applicable to the Mesa area. Freeways are only part of the myriad economic factors that influence land prices, but they are major influences.

The degree of certainty of construction of the freeway and the distance in time before the anticipated construction date are elements that are considered by buyers and sellers in the market place when assessing the possible construction of the freeway on land value along the proposed freeway route. Since the anticipated construction of the proposed Superstition Freeway in the Mesa area is further removed in time than its anticipated construction in the Tempe area, and the certainty of construction in the Mesa area is possibly considered to be a little less than the certainty of construction in the Tempe area, the overall freeway impact on property values in the Mesa area could be inferred to be a little less than in the Tempe area. Because of these certainty and time factors, the economic impact caused by the anticipated construction of the Superstition Freeway on property values can be concluded to diminish gradually as it runs eastward toward Apache Junction.

The average land value for April 1973 for the part of the proposed Superstition Freeway that traverses the Mesa area (from Price Road to Val Vista Road) is as follows:

<u>Section</u>	<u>Estimated Land Value Per Acre</u>
Price Road to Dobson Road	\$15,000
Dobson Road to Alma School Road	23,000
Alma School Road to Country Club Drive	20,000
Country Club Drive to Mesa Drive	14,320
Mesa Drive to Stapley Drive	8,500
Stapley Drive to Gilbert Road	8,000
Gilbert Road to Lindsey Road	8,500
Lindsey Road to Val Vista Drive	8,000

The total right of way needed for the proposed Superstition Freeway from the Tempe Canal to Val Vista Road through the Mesa area is approximately 430 acres. The total estimated cost of acquiring this right of way, including land and improvements is approximately six million dollars.

Tax Base

The Mesa area crossed by the Superstition Freeway lies in the Mesa Union High School District and Mesa Elementary School District No. 4. A breakdown of the tax rate per \$100 of assessed valuation for the years 1967 through 1972 is shown on the following page.

Maricopa County

Tax Rate Per \$100.00 Assessed Valuation

<u>Mesa School District No. 4</u>	<u>Elem.</u>	<u>Mesa High</u>	<u>Community College</u>	<u>State</u>	<u>County</u>	<u>Total Outside City</u>	<u>Mesa City or Fire Dist.</u>	<u>Total</u>
1967	4.75	3.82	.37	1.70	1.85	12.49	0	12.49
1968	2.89	2.49	.49	2.16	1.97	10.00	0	10.00
1969	2.97	2.39	.62	2.20	2.13	10.31	0	10.31
1970	3.57	2.96	.66	1.65	2.13	10.97	0	10.97
1971	4.77	3.34	.69	1.90	2.13	12.83	0	12.83
1972	4.36	3.40	.62	1.55	2.10	12.03	0	12.03

Source: Arizona Property Tax Rates and Assessed Valuation, 1972 Supplement,
The Arizona Tax Research Association.

The total assessed valuation for real estate in the City of Mesa for the years 1967 through 1972 is:

1967	48,612,847	1970	62,607,386
1968	53,412,357	1971	71,178,423
1969	55,575,444	1972	81,677,280

Source: Arizona Property Tax Rates and Assessed Valuation, 1972 Supplement.
The Arizona Tax Research Association.

The 1972 total tax rate of \$12.03 per one hundred dollars of assessed valuation for Mesa No. 4 is a little below average for school districts in the eastern section of the Phoenix Metropolitan Area.

A discussion of tax rate determination and tax rate classification is made in the Tempe Economic Tax Base Section, Part One.

Central Business District

The Mesa central business district is hampered by the same problems facing other cities of similar age and size. Particularly noted are inadequate parking, an uncontrolled mixture of pedestrians and automobiles and major store entrances facing through arterials. The central business district has strong competition from new regional centers and is losing major shopper goods stores. The new centers have more modern facilities and more abundant parking areas with easier ingress and egress. For these reasons, the Mesa central business district is losing its economic position as the major retail complex in the Mesa area.

The Mesa central business district can loosely be described as being within the confines of Country Club Drive on the west, Mesa Drive on the east, University Drive on the north, and Broadway Road on the south (See Mesa map in back pocket). The city municipal building complex and many of the financial institutions, public buildings, shoppers' goods facilities, and professional offices are located in this one-mile square area. Nevertheless, Mesa does not have a well defined central business district. For example, Tri-City Mall, a large regional shopping center approximately two miles to the west of the central business district has preempted shoppers' goods sales from the central business district. Tri-City Mall is examined in the ensuing section on Mesa Commercial Development.

It is Mesa policy as expressed in Mesa 1990, the General Plan, that a "major activity corridor" should be encouraged in an east-west direction between University Drive and Broadway. This corridor would contain major shopping, hotel-motel, office and governmental facilities, major concentrations of higher density housing and several major public open space and recreation facilities.

Development

a. Zoning:

A discussion of general zoning effects was made in the Tempe Economic Segment under "Development". The zoning map of the Mesa area is shown as Figure 1-11 on Page 1-76.

It is City of Mesa's policy to work closely with Maricopa County in discouraging "leap frog" techniques. It is also its policy to control location and quality of future subdivisions by denying zoning variances and not to extend city controlled utilities into areas where development is deemed unwise.

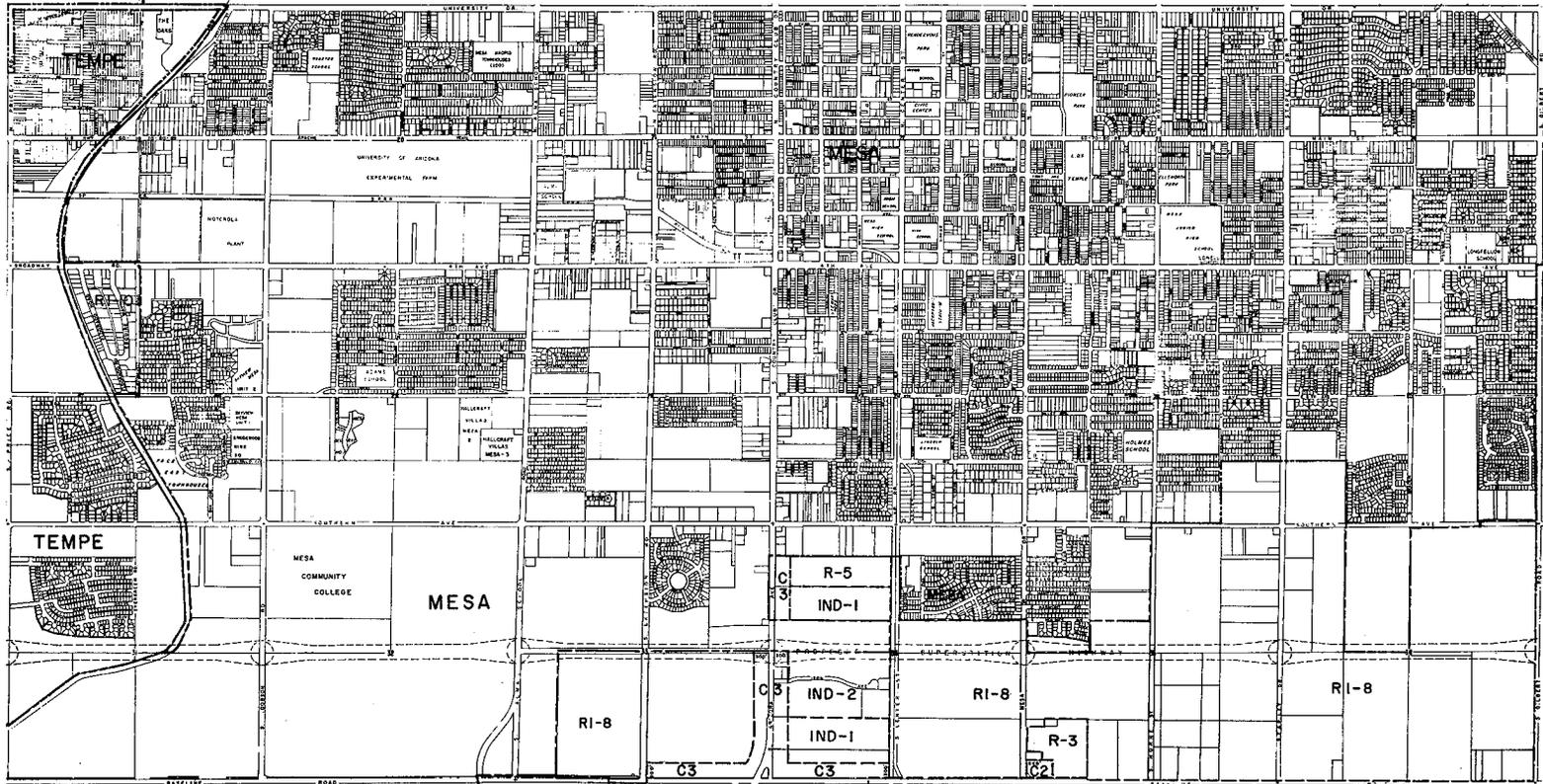
b. Residential

In recent years economic conditions in the Mesa area have been excellent for residential growth. Building permits data in Table 1-5, Page 1-78 reflect this growth. Investor confidence has been high due to confidence gained from the continuing population growth. Residential construction has been active to the east and northeast of the built-up area. Anticipation of the proposed Superstition Freeway has generated great interest in residential subdivision sites, where zoning allows, along the freeway's proposed route in the Mesa area. Residential developers are extremely concerned about access to the Phoenix area from their potential development sites.

c. Commercial

The existing central commercial area is capable of retaining its central location in relationship to Mesa's ecumene if the population growth is directed to the northeast and southeast more or less proportionately and if good access to the central area is provided

Figure 1-11



- CORPORATE LIMITS
- ZONING DISTRICT BOUNDARY
- BOUNDARY DELINEATING SPECIAL USES OR UNIT PLANS OF DEVELOPMENT

ZONING MAP

MAY 18 1973

TOWNSHIP 1 NORTH-RANGE 5 EAST, G. & S.R.B.M.
SOUTH HALF

MARICOPA COUNTY PLANNING AND ZONING COMMISSION

GRAPHIC SCALE IN FEET



ABBREVIATED KEY TO MARICOPA COUNTY ZONING

R1-6	Single Family Residential
R1-8	Single Family Residential
R-3	Multi-Family Residential
R-4	Multi-Family Residential
C-2	Intermediate Commercial
C-3	General Commercial
C-5	Planned Shopping Center
Ind-1	Planned Industrial
Ind-2	Light Industrial
Rural 43	Rural Zoning
R.U.P.	Residential Unit Plan
S.U.	Special-Use District

For specific zoning allowances see the 1969 Amended Zoning Ordinance for the Unincorporated Area of Maricopa County. Published by the City of Phoenix, Department of Planning and Zoning.

TABLE 1-5

CITY OF MESA BUILDING PERMIT INFORMATION

Year	<u>Single Family</u>		<u>Multi-Units & Apartments</u>		<u>Commercial & Industrial</u>		<u>Total (Includes Alterations)</u>	
	<u>Number of Units</u>	<u>Value</u>	<u>Number of Units</u>	<u>Value</u>	<u>Number of Units</u>	<u>Value</u>	<u>Number of Units</u>	<u>Value</u>
1972	1,792	\$24,059,675	140 - 1,295	\$12,234,068	88	\$14,495,677	5,459	\$59,175,536
1971	1,144	16,521,306	171 - 1,433	12,690,488	53	8,650,714	4,457	51,578,932
1970	1,272	15,522,075	113 - 800	5,526,210	68	20,218,796	4,814	49,144,628
1969	875	9,340,560	63 - 383	2,435,186	52	4,575,373	3,934	24,774,855
1968	476	4,915,695	51 - 304	2,248,960	52	5,469,093	2,946	20,928,214
1967	369	4,023,839	20 - 100	822,565	64	5,836,452	2,549	16,074,716
1966	272	2,894,073	12 - 79	739,020	73	7,390,295	2,279	14,359,869
1965	216	2,422,691	17 - NG	452,500	79	3,802,938	2,068	8,587,108
1964	333	3,458,619	48 - NG	2,106,294	69	3,526,033	2,549	11,628,603

by the major arterials feeding it. The construction of the Superstition Freeway along its proposed route would aid in directing population growth to the southeast to balance the northeasterly growth.

The establishment of Tri-City Mall on the corner of Main Street and Dobson Road in Mesa in 1969 was a major commercial turning point for the Mesa-Tempe area. This modern regional shopping center draws its clientele not only from Mesa and Tempe but from all sectors of the Eastern Phoenix Metropolitan area, as well as Chandler, Gilbert and Apache Junction. The vital statistics of this major retail outlet are given below:

Gross square footage	564,572
Number of tenants	44
Parking spaces	3,500
Average 24-hour Vehicular Traffic:	
Main Street	22,000
Dobson Road	21,000
Median Income of Customer Households	\$ 11,300

The key stores in the Tri-City shopping center are Diamond's, a major department store in the Phoenix Metropolitan area, and J. C. Penneys branch store of the national chain. Penney's Tri-City Mall store is visited monthly by an estimated 46,000 households and Diamond's Tri-City Mall store has an estimated monthly visitation by 35,000 households. These statistics are strong evidence of the emerging commercial importance of this area.

There are many other retail outlets that have been established in recent years in the area influenced by the proposed Superstition

Freeway. Among these are the large Woolco Department Store Center on the southwest corner of Southern Avenue and Country Club Drive that is presently being developed and the K Mart Shopping Center at the northeast corner of Broadway and Dobson. The Sears, Roebuck and Company's planned metro-center development on the southwest corner of Southern Avenue and Alma School Road is of particular significance. This shopping center will comprise 1,228,000 square feet in a double-decked, enclosed mall area and have 6,484 parking spaces on the 120 acre site. Two major department stores, along with Sears, will be located in the multi-store development. The first phase of construction is anticipated to be completed by Christmas of 1974.

d. Industrial

It is City of Mesa's policy to encourage the continued development of a stable, diverse industrial base within the planning area to make Mesa a more economically independent community to supply diverse job opportunities to its citizens.

Most of the existing industrial use is concentrated along and near the Southern Pacific Railroad right of way and around Falcon Field Airport in the northeast part of the Mesa area. Motorola has a large industrial plant in Mesa at Broadway and Dobson Road. There has been a continuing number of firms locating or expanding in Mesa. Among Mesa's major industrial firms are Dickson Electronic Corporation, Rosarita Mexican Foods and Staggs Bilt products representing such diversified industries as electronics, food and building.

The Mesa Comprehensive Land Use Plan - 1990 (Figure 2-5 on page 2-25) indicates that land abutting the proposed Superstition Freeway on the south from the Tempe Canal to east of Mesa Drive will be available for Industrial Park usage.

Mesa's continued industrial development is contingent upon an adequate regional transportation system providing the Mesa area with good access to other parts of the Phoenix Metropolitan area. The construction of the proposed Superstition Freeway to Apache Junction is an integral part of this transportation system.

Public Utilities

Water and Irrigation:

The present and future potential of the Mesa Municipal Water System is adequate for foreseeable needs. Deep wells provide the

water supply for the city. Mesa is now participating with Phoenix to provide a supply of treated river water to supplement the wells.

The Salt River Project provides water for irrigation to farms in the Mesa area. The City of Mesa has negotiated a water contract with the Salt River Project so that additional water can be provided for domestic industrial and municipal purposes.

Electricity:

Mesa's city owned utility purchases power from the U.S. Bureau of Reclamation and supplies power to most of the area within the city limits. The Salt River Project, a multi-purpose reclamation project, furnishes electricity to the Mesa area located outside the city limits. There appears to be sufficient electric power available to accommodate Mesa's growth needs for the predictable future, although periodic deficits could occur because of regional crises.

Natural Gas:

The City of Mesa purchases natural gas from the El Paso Natural Gas Company which supplies gas to the Phoenix Metropolitan area. Any gas shortage would probably reflect in the Phoenix Metropolitan area as a whole and not be isolated in the Mesa area. There could be periodic, temporary shortages in the future but the gas supply should be sufficient for the long run.

Telephone:

The Mesa area telephone service is provided by Mountain Bell which supplies the Phoenix Metropolitan area.

Inventory of Economic Factors: Eastern Maricopa County and Apache Junction
General

The economy of the area from Val Vista Road east to Apache Junction is dependent to a large degree on the economy of the Phoenix Metropolitan Area to the west. The economic base within this area is a combination of agriculture, manufacturing, trade and services, and tourism. The area is not self-sufficient economically, nor does it provide significant jobs or services to persons outside the study area.

Maricopa County is the most productive agricultural area in the State of Arizona. However, agricultural employment has been decreasing every year as agricultural lands on the urban fringe are converted to urban purposes. The portion of the agricultural base within the area has remained relatively stable because the full thrust of urban growth has not yet impacted this region.

The existing residential character of the area is primarily one of retired persons and persons who commute to jobs outside of the area. As the area grows, jobs in trades and services, attendant with population growth, will increase. Significant industrial growth could occur in the area if the Superstition Freeway is constructed along its proposed route from Rural Road in Tempe to its Apache Junction terminus. If this is the case, the area will create more of its own economy and become less of a commuter community.

The most important economic assets of the area are: agriculture, an abundant supply of land suitable for urban development, proximity to the Phoenix Metropolitan Area, industrial suitability which would be enhanced by construction of the freeway, scenic values caused principally by the

Superstition Mountains which would encourage residential development, and proximity to the recreational areas of the Salt and Verde River basins.

The mobile home is estimated to account for approximately 40 percent of the total dwelling units in the area between Val Vista Road and Apache Junction. This unusually high concentration of mobile homes exerts significant influence on the general economy and character of the region. If the Superstition Freeway is constructed, it is believed that more permanent types of residential development will occur in the lands adjacent to the freeway and will lower the percentage of mobile homes to total dwelling units.

Lineal east-west development is located along U.S. Highway 60-80-89 (an extension of Main Street in Mesa). This major route forms the backbone to which most of the existing development is attached. Some development also centers on Power Road which, north of U.S. 60-80-89, becomes Bush Highway. A large block of agricultural land surrounds the major canals in the area. Some commercial and residential development has occurred within these agricultural lands.

Agricultural uses, which occupy a good part of the area, are divided between citrus lands of primarily grapefruit and oranges and crop lands mostly in sorghum, alfalfa and cotton. Most of this acreage lies within the Salt River Project and the Roosevelt Water Conservation District.

A significant factor is the relative recent nature of the existing development in the area, the vast majority of it since World War II.

Apache Junction, near the eastern terminus of the proposed Superstition Freeway, is located at the foot of the Superstition Mountains in Pinal County, approximately 25 miles east of Phoenix. Because of Apache Junction's geographical location adjacent to the Pinal-Maricopa County line, Pinal County

economic statistics are not truly representative of the economic activity in the community. The town's proximity to the Metropolitan Phoenix Area provides a more realistic clue to the area's economy. The economy of Apache Junction is based almost exclusively on recreation and retirement.

Construction of a major hotel and shopping center at the junction of S.R. 88 and U.S. 60-80-89 in the mid-1950's gave Apache Junction its first focal point.

Land development in the Apache Junction area has been exhibiting more stability in recent years through more non-highway oriented development than in previous years. Although the winter population far exceeds the summer population, there is an increasing ratio of year-round residents.

Population

The population in the corridor one mile on each side of Highway 60-80-89 between Val Vista Road and Apache Junction was roughly estimated to be 16,000 in 1967. Population has concentrated where land has been subdivided and mobile home parks have developed. The projected 1980 population for this area is 64,000 and 83,000 for 1990 including future inhabitants of Leisure World and Dreamland Village which are described under the Residential Development Section of Part Two of this report. Population density determines the extent of physical facilities needed such as utilities, streets and highways, schools and parks and other public facilities.

The 1970 population for the unincorporated area of Apache Junction proper was 2,390. The growth of Apache Junction is tied to the area to the west and is highly dependent upon an adequate transportation system linking Apache Junction to the Mesa-Tempe-Phoenix area. The proposed Superstition Freeway is the necessary link for the area to reach its growth potential.

Employment

The economy of the eastern Maricopa County-Apache Junction area is based heavily on retirement-recreational type development and many of the inhabitants are engaged in employment in the service trades that are demanded by this type of economic activity. Worker residents of this area also commute to work sites in the Mesa-Tempe-Phoenix area and the mines in the Superior area.

Generally, employment rates tie to employment conditions in the Phoenix Metropolitan Area. However, because of the large influx of winter visitors into the area, the summer seasonal adjustment is heavier in this area than in the larger, more stable Phoenix Metropolitan Area.

Employment conditions in the eastern Maricopa County-Apache Junction area are greatly dependent upon an adequate transportation system. High worker mobility is essential for a good employment situation in the area. U.S. Highway 60-80-89 presently is the backbone of the transportation system used by the area's worker-residents.

Property Values

Property values along the 15-mile stretch from Val Vista Road to its junction with Highway 60-80-89 through the eastern Maricopa County-Apache Junction area have not experienced the increase to the degree noticeable in the Mesa and Tempe area. The degree of certainty of construction in this area is not as great as in the Mesa area and particularly the Tempe area. There is considerable interest manifested particularly in properties adjacent to the major north-south arteries where they intersect the proposed freeway.

An estimated average land value per acre for properties along the proposed Superstition Freeway in the eastern Maricopa County-Apache Junction area for April of 1973 is listed below:

Val Vista Road to Greenfield Road	\$ 8,000
Greenfield Road to Higley Road	8,000
Higley Road to Recker Road	8,000
Recker Road to Power Road	7,000
Power Road to Sossaman Road	6,000
Sossaman Road to Hawes Road	4,000
Hawes Road to Ellsworth Road	4,000
Ellsworth Road to Crismon Road	4,000
Crismon Road to Signal Butte	4,000
Signal Butte to County Line	3,500
County Line to Vineyard Road	2,000
Vineyard Road to Wilson Drive	3,000
Wilson Drive to Tomahawk Drive	2,000
Tomahawk Drive to Goldfield Road	2,000
Goldfield Road to Junction Highway 60-80-89	2,000

The total right of way acquisition needed for the part of the proposed Superstition Freeway crossing the eastern Maricopa County-Apache Junction area is approximately 637 acres. The total estimated right of way acquisition cost for this acreage is approximately \$3,020,000.

Tax Base

A discussion of tax rate determination and tax rate classification is made in the Tempe, Tax Base Section, Part One. The proposed Superstition Freeway route across eastern Maricopa County and the Apache Junction area in Pinal County goes through no incorporated areas.

Development

a. Zoning

Zoning in the area along the proposed freeway route is principally for residential usage. Zoning is administered by Maricopa County to the Pinal County line and by Pinal County to the east of that line. It is the policy of these counties to gradually adjust zoning to conform with land use planning.

Zoning maps including the freeway corridor in Maricopa County are shown in Figures 1-12 and 1-13 on Pages 1-88 and 1-89 respectively. A zoning map including the freeway corridor in Pinal County is shown in Figure 1-14 on Page 1-91.

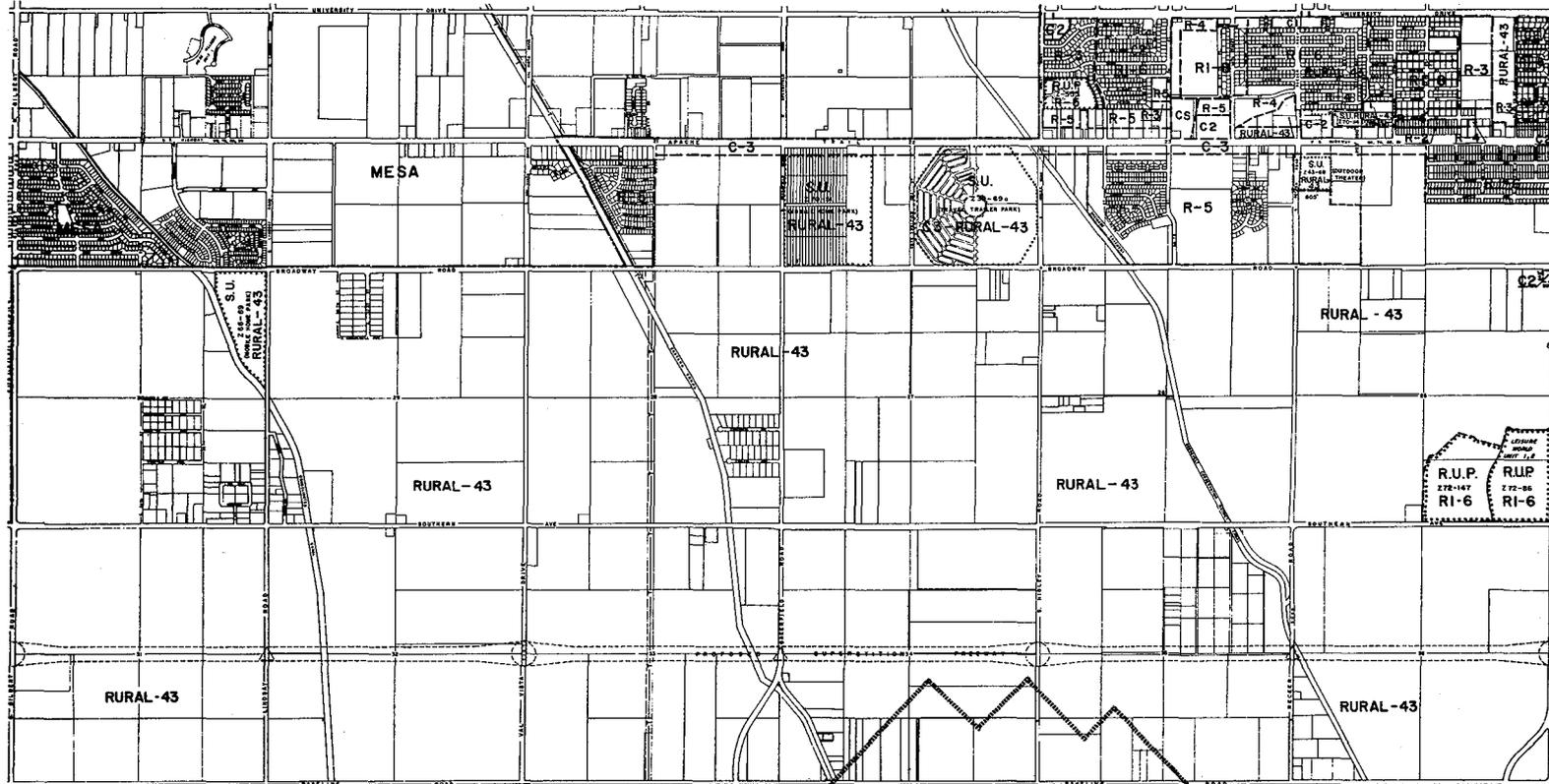
b. Residential

The land in the vicinity of the proposed Superstition Freeway through the eastern Maricopa County-Apache Junction area is mostly agricultural and in the vacant category. Zoning through this area permits residential usage including mobile homes. As mentioned earlier, the mobile homes make an unusually high contribution in meeting existing residential needs.

There is little of the nature of single family residences in the immediate vicinity of the proposed freeway through the eastern Maricopa County-Apache Junction area.

c. Commercial

Most of the commercial activity along Highway 60-80-89 is of small highway oriented businesses that have emerged as the area has grown. Recently, some larger, modern commercial facilities have been constructed at the intersection of the major



- CORPORATE LIMITS
- - - ZONING DISTRICT BOUNDARY
- BOUNDARY DELINEATING SPECIAL USES OR UNIT PLANS OF DEVELOPMENT
- 150' HORIZONTAL SURFACE BOUNDARY - WILLIAMS A.F.B.

ZONING MAP

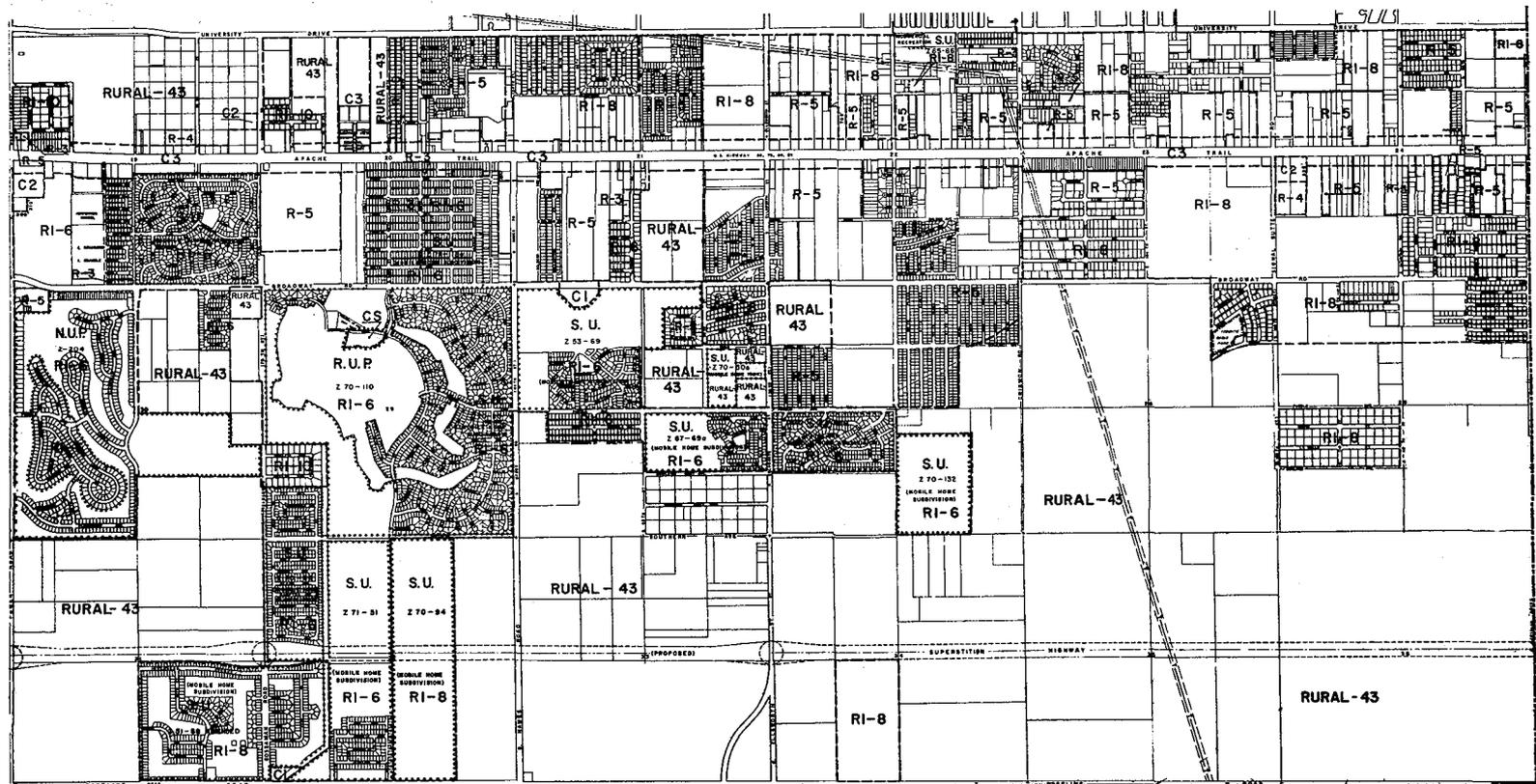
MAY 18 1973

TOWNSHIP 1 NORTH - RANGE 6 EAST, G.B.S.R.B.M.
SOUTH HALF

MARICOPA COUNTY PLANNING AND ZONING COMMISSION
GRAPHIC SCALE IN FEET



Figure 1-12



_____ CORPORATE LIMITS
 - - - - - ZONING DISTRICT BOUNDARY
 BOUNDARY DELINEATING SPECIAL USES OR UNIT PLANS OF DEVELOPMENT

ZONING MAP

MAY 18 1973

TOWNSHIP 1 NORTH - RANGE 7 EAST, 6&S.R.B.M.
SOUTH HALF

MINNEAPOLIS COUNTY PLANNERS AND ZONING ENGINEERS
GRAPHIC SCALE IN FEET

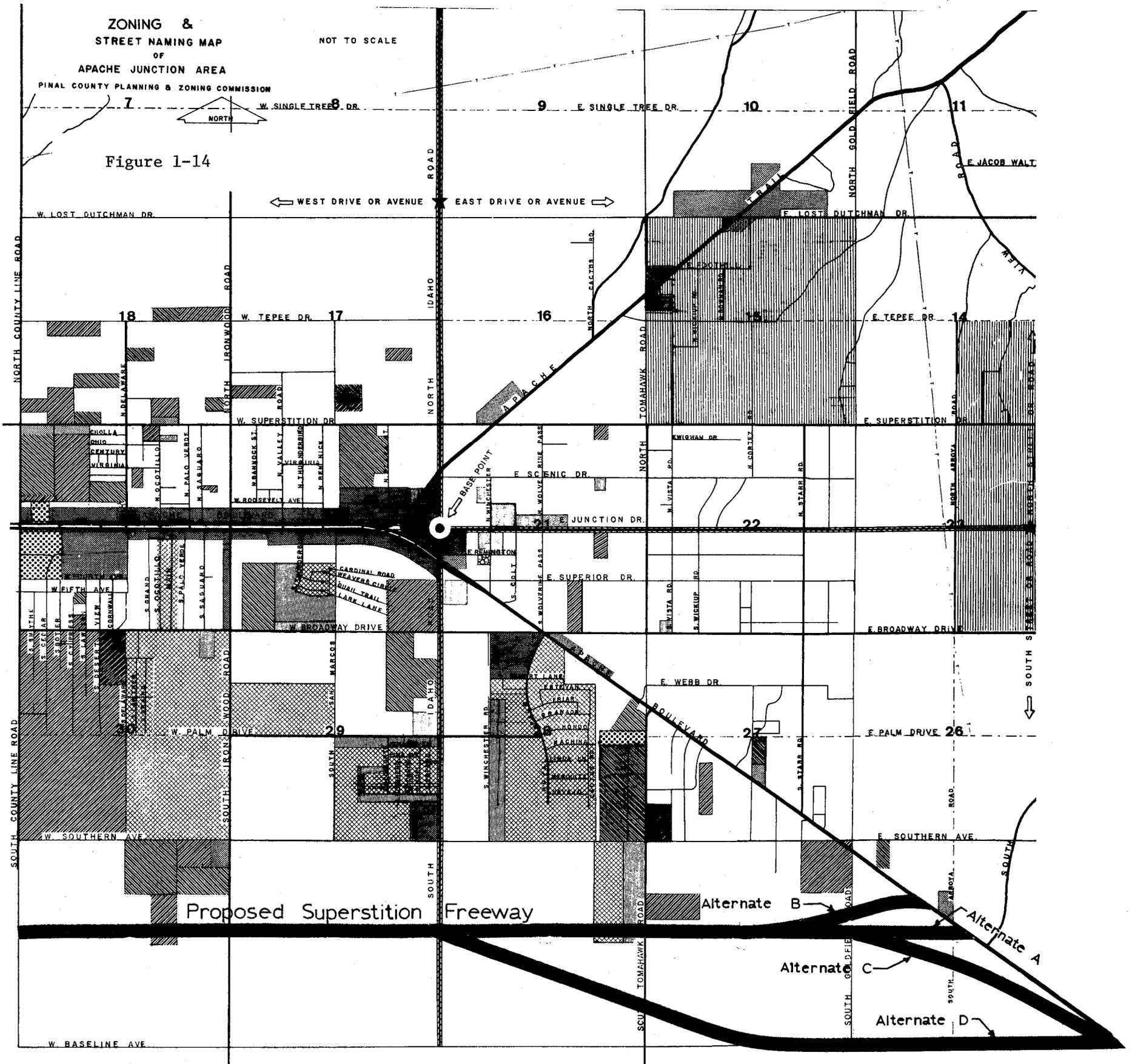
Figure 1-13

ABBREVIATED KEY TO MARICOPA COUNTY ZONING

R1-6	Single Family Residential
R1-8	Single Family Residential
R-3	Multi-Family Residential
R-4	Multi-Family Residential
R-5	Multi-Family Residential
C-2	Intermediate Commercial
C-3	General Commercial
C-5	Planned Shopping Center
Ind-1	Planned Industrial
Ind-2	Light Industrial
Rural 43	Rural Zoning
R.U.P.	Residential Unit Plan
S.U.	Special-Use District

For specific zoning allowances see the 1969 Amended Zoning Ordinance for the Unincorporated Area of Maricopa County. Published by the City of Phoenix, Department of Planning and Zoning.

Legend	Zone	Uses Permitted
	SR Suburb. Ranch Sec.601	1-family dwelling. Agriculture, recreational uses.
	SH Suburb. Homestead Sec.701	1-family dwelling, duplexes, not more than 2 trailers
	GR General Rural Sec.801	1-family dwelling unit-1 trailer per lot. Commercial agriculture
	CR-1 Single Res. Sec.901	1-family residences and home occupations.
	CR-2 Single Res. Sec.1001	CR-1 uses, one family residence, home occupations.
	CR-3 Single Res. Sec.1101	1-family residences and home occupations.
	CR-4 Mult. Res. Sec.1201	CR-3 uses, duplexes, Multiple dwellings (no more than 4 units in 1 bldg.)
	CR-5 Mult. Res. Sec.1301	CR-3 & CR-4 uses, multiple dwellings boarding & rooming houses.
	TR Transitional Sec.1401	CR-3, CR-4, CR-5 uses, tourist court or hotels, prof. offices & trailer crts
	CB-1 Local Bus. Sec.1501	Retail business, any residences, tourist courts, trailer courts.
	CB-2 Gen. Bus. Sec.1601	CB-1 uses, light manufacturing, wholesale.
	CI-1 Light Indust. & Warehouse Sec.1701	CB-1, CB-2 uses Warehouse & Industrial uses.
	CI-2 Heavy Indust. Sec.1801	CB-1, CB-2, CI-1 uses, other uses subject to conditional permit.
	TH Trailer Homesite Sec.2001	CR-3 uses Trailer Court. Trailer or Mobile Homes



north-south highways with Highway 60-80-89 in the western section of the area near Mesa.

The Mesa influence is pervasive throughout the western section of the area. As the area grows, the linear, or strip commercial development, should give way to the large, modern, well designed facilities with adequate off-street parking.

In Apache Junction, the large centrally located shopping center across from the Superstition Inn is the focal point of commercial activity in the vicinity.

d. Industrial

Generally, there is little presently in the nature of major industry in the eastern Maricopa County-Apache Junction area. There is more than ample industrial zoning in the area to take care of the existing demand for industrial land use. There are no provisions for industrial zoning in land areas adjacent to the proposed Superstition Freeway.

Public Utilities

Water:

Water supply within the eastern Maricopa County-Apache Junction area is obtained from two sources: the Salt River Project storage facilities and underground water from wells.

A good dependable water supply is mandatory for the future development of the area. The Central Arizona Project should supply the area with sufficient water to meet its growth needs.

Sewage:

All of the sewage for the area is handled by use of cesspools and septic tanks except for two of the larger subdivisions which have individual sewer systems. The deep water table and relatively low density of the area make the individual septic tank and cesspool system adequate for the present. Sanitary sewers should be used in the future, however, when the population growth will make the present system inadequate.

Electricity:

Electricity is supplied to the area by the Salt River Project.

Natural Gas:

Arizona Public Service supplies the area with natural gas.

Telephone:

Telephone system is operated by Mountain Bell.

Inventory of Economic Factors: Chandler and Williams Air Force Base

General

The City of Chandler is a light manufacturing, agricultural and tourist oriented community with a 1970 population of 14,250. Located approximately four and one-half miles to the south of the proposed Superstition Freeway's intersection with Country Club Road, Chandler is not intrinsically part of the Phoenix Metropolitan Area but its geographical location ties its economy to the Phoenix area.

Spreckel's has a \$20,000,000 sugar processing plant south of Chandler. In recent years, mobile home manufacturing has become an important factor in the Chandler economy. Williams Air Force Base, east of Chandler, serves as a major source of employment to Chandler residents and contributes to the local economy.

Construction of the proposed Superstition Freeway through to its Highway 60-80-89 terminus would aid in providing market access for Chandler's agricultural and manufacturing industries. Chandler's tourist trade would benefit by making travel quicker and more convenient to the tourist facilities in the Phoenix Metropolitan Area and supplying better access to the Superstition Mountain area.

Personnel working at Williams Air Force Base would benefit from the proposed freeway by gaining a larger radius of residence selection and by lessening the commuting time for those living in the Phoenix Metropolitan Area. Delivery of goods to Williams Air Force Base would be made easier through better access from the manufacturing, warehouse and marketing sources.

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Purpose:

The purpose of constructing the Superstition Freeway has been discussed as it relates to meeting the special needs of Tempe, Mesa, Apache Junction, and Chandler. However, the entire Metropolitan Phoenix Area and outlying towns such as Gilbert, Higley, and Queen Creek will also benefit, at least indirectly, from the freeway.

As already shown, that part of the Metropolitan Phoenix Area in the general area of the proposed freeway project has been changing in recent years from agricultural to residential, commercial, and industrial land use, thereby changing the social, economic and environmental character of the area. The entire Phoenix Metropolitan Area has grown from a resident population of 331,770 in 1950 to 1,105,000 in 1973. This growth, forecast to reach 1,720,000 persons by 1985, will insure the Phoenix Metropolitan Area's position as the population and economic center of the entire state.

It is to the dedication of meeting the existing and future transportation route needs of this rapidly growing area that the responsible local, regional and state planning agencies and elected officials have adopted the Major Street and Highway Plan for the Phoenix Urban Area of which the proposed Superstition Freeway is a vital part. A copy of the plan appears as Figure 1-7 on Page 1-36.

PART TWO

PROBABLE IMPACT OF THE PROPOSED PROJECT ON THE ENVIRONMENT

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PART TWO

2. Probable Impact of the Proposed Project on the Environment

NOTE: The probable impact to the areas through which the proposed Superstition Freeway, S.R. 360, traverses will, for the purpose of this Environmental Impact Statement, be separately evaluated and discussed in the following three segments identified as the Tempe Area, the Mesa Area, and the Apache Junction Area. A discussion of impacts pertinent to the entire freeway corridor follows these three segments at the end of Part Two.

THE TEMPE AREA (See Figure 2-1 on Page 2-2)

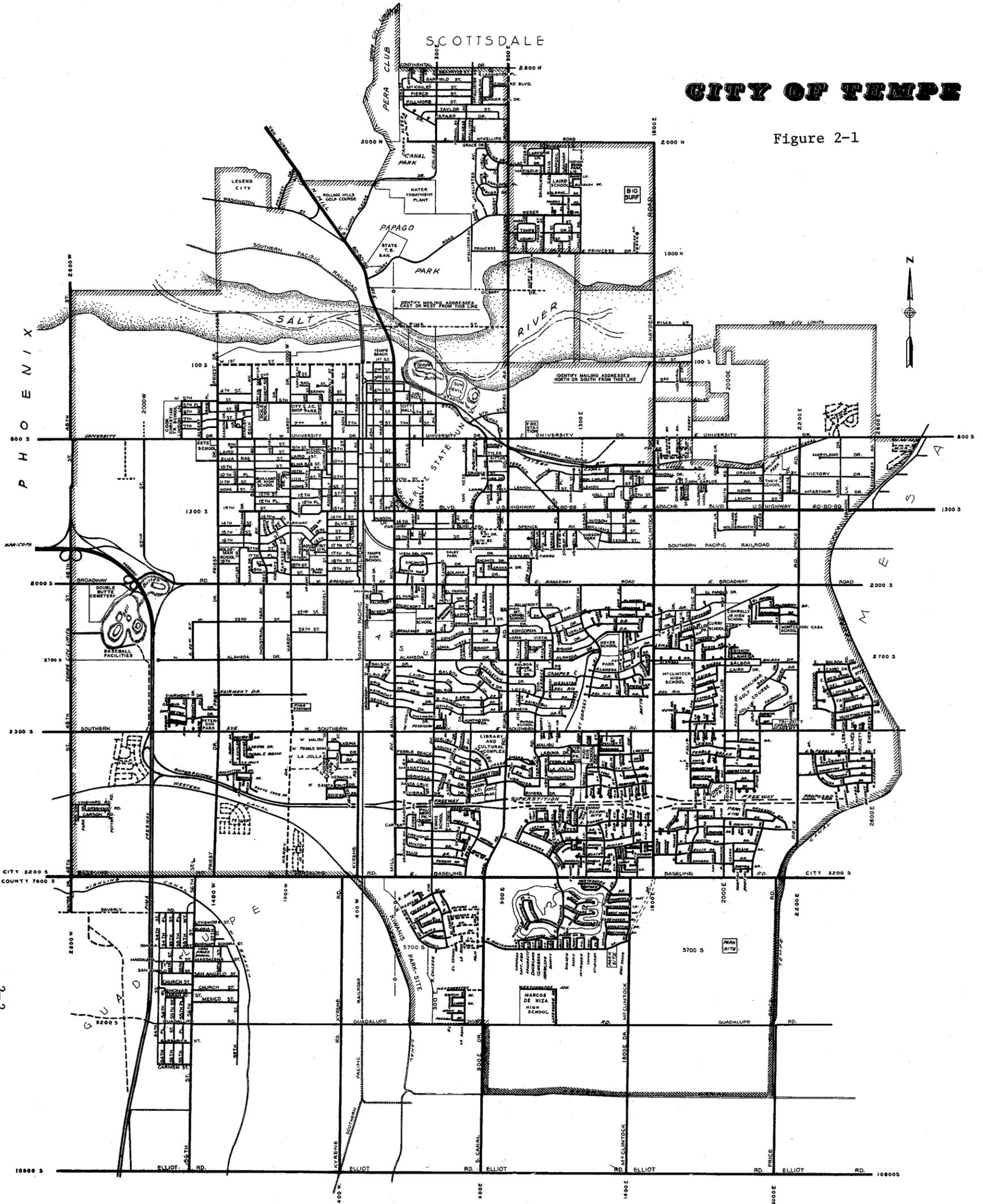
Community Development and Growth

The City of Tempe, originally known as Hayden's Ferry, emerged over a century ago on the south bank of the Salt River some nine miles southeast of Phoenix. Its early name honored Charles Hayden, the community's founder and owner of a cable ferry across the then-flowing Salt River.

In 1885 Tempe Normal College, the progenitor of Arizona State University, was founded. From its humble beginning, A.S.U. became a major influence in the development of Tempe, as well as Arizona, and today supports a student-faculty population of over 30,000.

CITY OF TEMPE

Figure 2-1



P H O E N I X

2-2

The heart of the early-day Tempe business district was developed near the bank of the Salt River and has over the years expanded in a southerly direction along Mill Avenue encompassing about one city block on either side of this main north-south thoroughfare comprised of commercial and travel-oriented service establishments.

About one mile south of the Salt River, Mill Avenue makes a sweeping curve to the east, at which point the road changes identification and becomes Apache Boulevard. From this curve, eastward to the east city limits of Tempe, a distance of about three miles, the route has for many years been lined with commercial and travel-oriented business enterprises. This busy route through Tempe is also designated as U.S. Highways 60-80-89 and State Route 93. These are major highways which afford access routes to, from, and through the central Arizona region for local, state, and interstate travelers.

Until the 1940's Tempe was generally known as a small college town having an economic structure based primarily on agriculture, the college, and related commercial business and tourism.

During the 1940's and 1950's the small college town began a growth and development pattern that was to result in Tempe becoming one of the fastest growing cities in the southwestern United States.

This growth trend has increased the population from 2,906 in 1940, to 63,550 in 1970. Since 1965 Tempe has been the fastest growing major city in Arizona with a population increase of 1,000 new residents each month. Based on the present rate of growth, Tempe's population is projected to reach 100,000 by the year 1975.

The change in population and the accompanying community and regional changes occurring as a result of this rapid growth trend, have significantly influenced and altered the overall character of the Tempe area. Land uses and zoning, both existing, as well as future projections as indicated in Figures 2-2 and 1-9, respectively, on Pages 2-5 and 1-54 are indicative of some of these changes.

As evidenced by the aerial photo maps, Figures 1-4a and 1-4b, Part One, the growth trend of Tempe has included expansion generally in all four major directions from the former localized business district of several decades past with the greatest proportion of expansion occurring to the south, the southwest, and the southeast. The Salt River on the north has somewhat acted as a retardant for large-scale development, however, over the years the north city limits boundary has been expanded to include areas now developed with residences and some commercial enterprises.

The local street grid pattern in the Tempe area generally provides for major streets at one-mile intervals, with lesser streets at one-half-mile intervals. The grid is completed with streets generally one block apart in the residential areas of the city. Service streets in commercial areas have been provided in patterns of less frequent intervals.

Discussed later in Part Two herein are changes and impacts relating to sociological and environmental factors, land uses, economic structure, commercial and industrial development, and other considerations pertinent to Tempe.

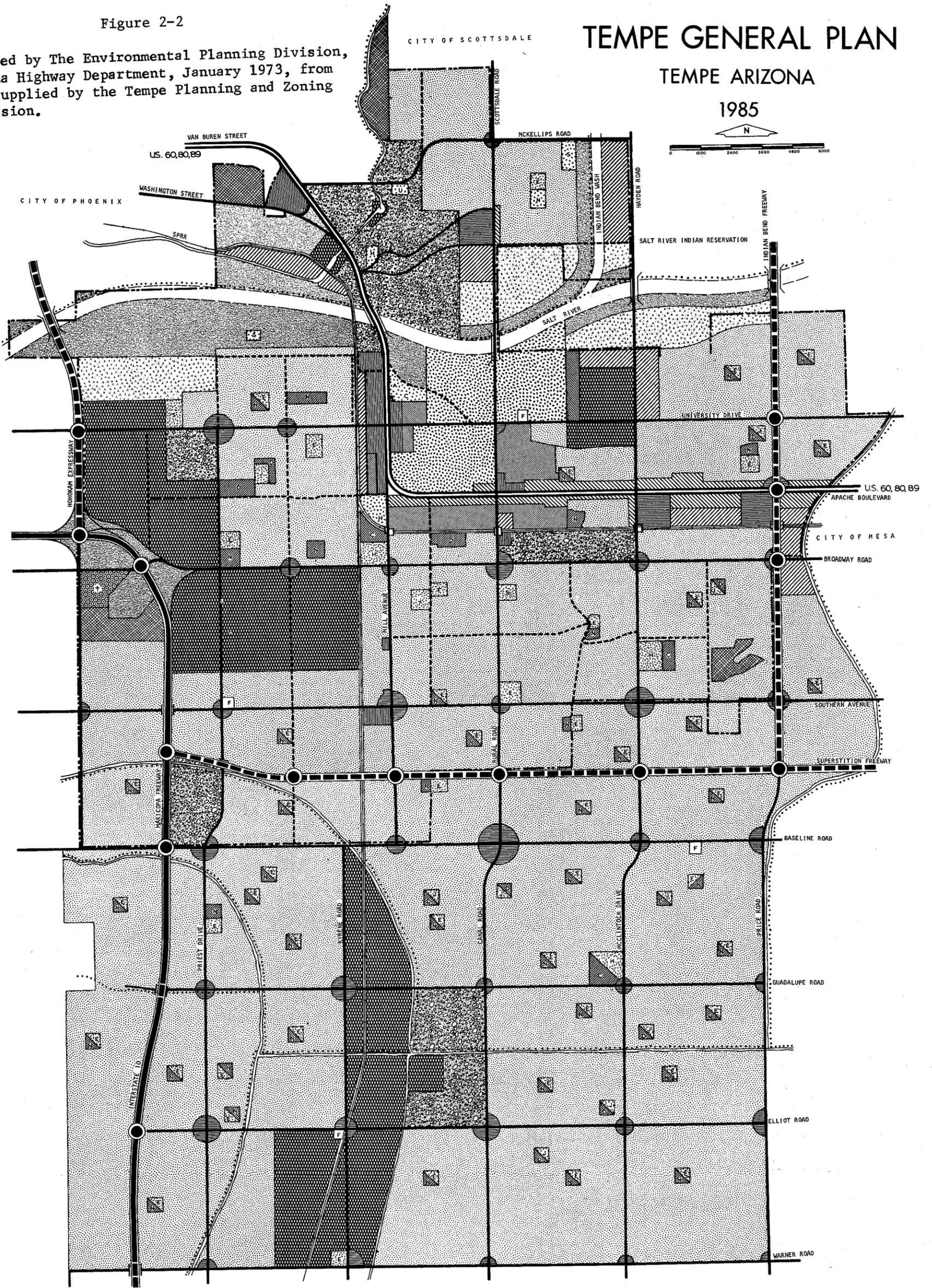
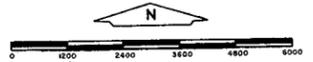
Figure 2-2

Prepared by The Environmental Planning Division,
 Arizona Highway Department, January 1973, from
 data supplied by the Tempe Planning and Zoning
 Commission.

TEMPE GENERAL PLAN

TEMPE ARIZONA

1985



L E G E N D

- | | | | |
|--|---|---|--|
| <p>RESIDENTIAL</p> <ul style="list-style-type: none"> LOW & MEDIUM DENSITY (1-20 DWELLING UNITS/ACRE) HIGH DENSITY (OVER 20 DWELLING UNITS/ACRE) <p>COMMERCIAL</p> <ul style="list-style-type: none"> PLANNED GENERAL ARTERIAL <p>INDUSTRIAL</p> <ul style="list-style-type: none"> PLANNED LIGHT HEAVY | <p>SCHOOLS</p> <ul style="list-style-type: none"> ELEMENTARY INTERMEDIATE HIGH SPECIAL PARK-SCHOOL <p>GOVERNMENTAL & INSTITUTIONAL</p> <ul style="list-style-type: none"> ADMINISTRATIVE CULTURAL UTILITIES SERVICE FIRE STATION CEMETERY UNIVERSITY HOSPITAL | <p>RECREATION</p> <ul style="list-style-type: none"> NEIGHBORHOOD DISTRICT COMMUNITY CITY NON-PUBLIC <p>TRANSPORTATION</p> <ul style="list-style-type: none"> INTERSTATE HIGHWAY WITH INTERCHANGE REGIONAL FREEWAY WITH GRADE SEPARATION HIKING & RIDING TRAILS | <p>SPECIAL USES</p> <ul style="list-style-type: none"> OPEN SPACE RECLAMATION LANDS CANALS & FLOOD CHANNELS |
|--|---|---|--|

Building a New Highway Into and Through the Area

The rapid growth and development of Tempe has exerted great demands on the planning groups and agencies responsible for providing adequate public service facilities and roads, streets, and highways.

Proper planning of these public service and transportation facilities require interdisciplinary coordination by all of the involved agencies and the public which the facilities will serve.

The Arizona Highway Department, together with the City of Tempe, Maricopa County, and other responsible groups and agencies have for many years coordinated their long-range planning efforts for providing major highway and road facilities in the Tempe Area.

The Interstate and Defense Highway 10 traversing west Tempe, and that portion of the S.R. 360 Superstition Freeway already completed in south Tempe are two examples of such facilities resulting from comprehensive, continuing, and coordinated long-range planning.

Planning for the proposed freeway project began during the 1950's. In 1960 a Major Street and Highway Plan for the Phoenix Urban Area was adopted by the involved cities, the State, and Maricopa County. The plan identified highway and freeway routes proposed to meet present and long-range traffic needs of the Phoenix Urban Area. The Superstition Freeway, S.R. 360, is a part of that adopted plan, which was approved by the City of Tempe. A copy of the latest edition of the plan is shown in Figure 1-7 on Page 1-36.

The City of Tempe has, through application of good land use and land zoning principles, and in concerted coordination with the Arizona Highway Department and the public, kept the right of way corridor for the proposed S.R. 360 Superstition Freeway totally clear of

encroachments. As a result, there is no relocation involvement of people, businesses or homes on the proposed highway corridor in the Tempe Area.

The intense residential, commercial, and public development presently occurring as well as that which is planned for the future, along and in close proximity to the S.R. 360 corridor through Tempe is directly related to the plan that the proposed freeway facility will be constructed as and where planned.

Construction of a freeway facility through such an area in many instances serves as a catalyst to crystalize community growth and development. In the case of the S.R. 360 Superstition Freeway, much of the land development and building construction has been and is being accomplished well in advance of the highway construction phase.

Because the proposed freeway is an integral part of the overall community growth and development plan, and because the land use and zoning ideals of that plan are being followed by the city planners, it is not necessarily important whether the freeway or the community development is achieved concurrently or separately since one will complement the other.

In the instance of the proposed freeway, however, a direct early benefit will be realized in that construction of the facility will alleviate the rapidly mounting traffic buildup on the local streets in the vicinity of the freeway which has resulted from accelerated residential, commercial, and industrial growth in the area, thus relieving those streets for neighborhood traffic.

When the entire S.R. 360 Route is completed, most of the through traffic now utilizing Apache Boulevard and Mill Avenue (U.S. 60-80-89 and S.R. 93) in the downtown business district of Tempe will probably shift to the freeway route thereby relieving traffic congestion presently experienced in that and other related areas.

Population

The proposed Superstition Freeway is an important ingredient in serving the transportation needs of Tempe's projected population growth (estimated to be approximately 100,000 by the year 1975). The proposed freeway will provide a necessary transportation link to all parts of the Phoenix Metropolitan Area and to eastern Maricopa County and the Apache Junction area for future residents inhabiting the developing residential subdivisions just south of the proposed freeway route.

Interviews with real estate developers familiar with economic conditions in the Tempe and Mesa areas indicate that not constructing the freeway in this area would probably have an inhibiting effect on the area's population growth and residential developers could be deterred from entering into new construction activity to supply the necessary homesites for a growing population. The existing transportation system in the Tempe area does not adequately provide for the anticipated population growth rate. The proposed Superstition Freeway is an important transportation link to accommodate the Tempe area's expanding population.

Employment

The major impact that construction of the proposed Superstition Freeway in the Tempe area will have on employment is to provide improved access for workers living in the Tempe area to work anywhere in the Phoenix Metropolitan Area, eastern Maricopa County or Apache

Junction area. Conversely, it will enable workers from these various areas to labor in the Tempe area. By providing this transportation link, the Superstition Freeway enhances the entire region's labor interchangeability. This factor allows workers to live where they desire and still employ their talents to optimum use. It is a distinct advantage of a highly mobile society. It makes the whole Phoenix Metropolitan Area, to a certain degree, one vast labor pool. This tends to minimize pockets of unemployment and increase employment opportunities.

Workers more and more tend to measure the distance from their work by the time it takes to commute rather than the number of miles they must travel. If the Superstition Freeway is not constructed along the proposed route, employment sites available to Tempe workers will be to some degree curtailed because of the longer travel time necessary to reach employment sites in other areas. For the same reason, workers in some areas of the Salt River Valley will be deterred from accepting employment in the Tempe area. The increased traffic forecast along the major arteries will exacerbate the existing condition. Mere congestion will increase rush-hour commuting times.

Construction of the Superstition Freeway along the proposed route should aid the employment situation through a beneficial effect on the labor interchangeability factor. The non-construction of the Freeway will constitute an adverse effect on this factor.

Property Values

The actual construction of the Superstition Freeway along the proposed route in the Tempe area should not result in any unusual land value changes because the freeway has been anticipated in this area for

several years. Property values should increase if the anticipated freeway becomes reality, but the dramatic increases have probably already occurred in the Tempe area to be traversed by the proposed freeway. A discussion of this was made under Property Values in Part One.

Property values are, of course, tied to development and planned development. A discussion of the existing development was made in Part One, and the planned development is discussed below.

If the freeway is not constructed along the proposed route in the Tempe area, it would likely result in depressing land values. The degree of land value depression would depend on what alternate transportation plan was adopted to meet the area's pressing needs.

Tax Base

It is estimated that the tax base will be reduced by the following amount by virtue of the necessary right of way acquisition for the proposed Superstition Freeway through Tempe.

<u>Freeway Section</u>	<u>Estimated Annual Tax Reduction by Acquisition of Right of Way</u>
Rural Road to McClintock Drive	\$2650
McClintock Drive to Price Road	\$1825
Price Road to Tempe Canal	\$2200
Estimated Total Tax Reduction	\$6675

It is believed that the estimated \$6,675 lost to the tax rolls by virtue of the right of way acquisition will be overwhelmingly compensated for by the increase in the tax base of properties influenced by the construction of the freeway in this area. The conversion of

agricultural and vacant lands to residential usage in the Tempe area south of the proposed Superstition Freeway route, at least partially caused by the anticipation of improved transportation facilities, will considerably increase assessed valuations and raise the tax base.

An Arizona Highway Department Right of Way Division Study covering the period between 1968 and 1971 evidenced a considerable increase in assessed valuation of properties near the Black Canyon Freeway in the City of Phoenix. This increase was more than enough to easily offset the amount lost to the tax rolls due to right of way acquisition for that freeway.

The ratio of tax base increase to tax base loss should be markedly greater in the case of the proposed Superstition Freeway because of the relatively light erosion of the tax base due to acquiring the necessary right of way.

Tourism

A discussion of the tourist situation of the Phoenix Metropolitan Area and Tempe was made in Part One under Tourism.

Rerouting of the through traffic that would be caused by the construction of the Superstition Freeway along the route proposed and its impact on the tourist facilities is discussed under traffic circulation in the following pages.

It is generally believed that improvement of the Phoenix Metropolitan Area's regional transportation system will aid the tourist industry in every region of the Valley. The mobility afforded by a good transportation system is a major factor in drawing tourists to the area. As a necessary link in the Phoenix Metropolitan Area's overall transportation

network, construction of the Superstition Freeway along the proposed route should benefit the tourist industry in Tempe and the Phoenix Metropolitan Area as a whole.

Traffic Circulation

Preliminary estimates of vehicular travel to be carried by the proposed Superstition Freeway after its completion to Apache Junction range upwards of 80,000 average daily traffic in the Tempe area. This should have the effect of diminishing rather considerably the traffic flow along Baseline Road, the major artery paralleling freeway corridor approximately one-half mile to the south. Proposed freeway traffic should slightly lessen the future traffic along Southern Avenue, the major artery paralleling the freeway one-half mile to the north. This slight diminution of traffic should not adversely affect the retail centers and outlets currently operating or planned along Southern Avenue.

It is anticipated that traffic along Broadway Road (one mile north of Southern Avenue) will continue to increase even with the construction of the Superstition Freeway but not to the degree it would if the freeway were not built. The construction of the freeway in the Tempe area should not adversely influence the businesses and retail outlets along Broadway Road.

Apache Boulevard (Route 60-80-89, see Figure 1-3, Page 1-5) is presently a major transcontinental route which carries the bulk of all traffic between Apache Junction and Tempe. The completion of the proposed Superstition Freeway from Tempe to Apache Junction would relieve this route of much of its through traffic. Local traffic, however, would increase, even with the construction of the freeway.

Some of the smaller motels and service stations along this route in the Tempe and Mesa area would probably be adversely affected by the preponderance of through traffic using the freeway route to intercept Interstate 10. The larger tourist accommodations and particularly the full-service national motel affiliates should not be adversely influenced.

The non-highway oriented businesses along Apache Boulevard in the Tempe area should be able to redirect their businesses toward local patronage to offset any possible loss from the rerouting of tourist traffic along the proposed Superstition Freeway route. Further, the traffic relief afforded by the freeway should aid these businesses by alleviating congestion. Studies made in other areas of the country have shown that business streets bypassed have generally benefited through relief of traffic congestion. Trucks and other heavy commercial vehicles with destinations outside the Tempe area will tend to use the freeway, cutting down on noise and air pollution along Apache Boulevard.

The overall economic effect of the construction of the Superstition Freeway to the businesses along Apache Boulevard should be beneficial. Without relief of some kind, traffic along this major route could reach strangulation proportions in the near future.

Zoning along the proposed Superstition Freeway route in the Tempe area is mostly for residential properties. There is provision for a shopping center at the southeast corner of the proposed freeway and Rural Road. There are no zoning allowances for major industrial or commercial rush hour traffic generators along the proposed route.

According to statistics received from the Arizona State University Police Department over 10,000 vehicles will enter and leave the campus area on a typical academic day making the University Tempe's largest

traffic generator. Access to and from various parts of Tempe and the Phoenix Metropolitan Area in general is extremely important to the University. If completed to Apache Junction, the Superstition Freeway will aid in serving campus-destined and campus-generated traffic without undue disruption of the city's normal traffic circulation.

Coordination With Master Plans

The construction of the Superstition Freeway along the proposed route figures prominently in Tempe's General Plan. The General Plan articulates the premise that the street system creates as well as serves land use; consequently, street planning must be closely coordinated with land use planning. The Tempe General Plan recognizes that the street system should be designed to enhance the economic development and use of the land.

Land use planning for the City of Tempe from Broadway Road south is to a very large measure predicated on the construction of the proposed Superstition Freeway. If the Superstition Freeway is not constructed as proposed, growth in this area would be stymied and orderly land use planning as proposed by the Tempe General Plan would have to be re-analyzed.

Relocation

That segment of the proposed Superstition Freeway route that crosses the Tempe area is free from any improvement on the necessary right of way. Consequently, the Superstition Freeway will necessitate no relocation of people or improvements in the Tempe area. The photographic map of Tempe in back pocket shows the clear path available for construction along the proposed Freeway route from Rural Road to the Tempe Canal.

Temporary Economic Effect of Construction

The estimated expenditure for the necessary construction costs, drainage, landscaping and right of way to complete the two miles of Superstition Freeway from Rural Road to the Tempe Canal in the Tempe area is \$11,300,000. This amount would probably be mostly expended in the Phoenix Metropolitan Area; much of it would be felt through a beneficial economic impact on the Tempe region itself. Because of the highly diversified economy of the Phoenix Metropolitan Area, there is a relatively slow leakage of funds expended in the Valley to outside areas. This \$11,300,000 amount could be considered to give an economic boost to the Phoenix Metropolitan Area as a whole as it is impossible to totally economically segregate the different sub-regions of the area.

Eating establishments in the vicinity of the construction area should receive a mild boost in trade for the noon meal from some of the workers in the construction project. There should be little disturbance of business in the area by the necessary interruption of traffic along Rural Road, McClintock Drive and Price Road by the construction of the Freeway.

In overall balance, the immediate economic benefits accruing to the area as a result of the construction of the Superstition Freeway would far outweigh the minimal temporary economic disbenefits which would be principally caused by traffic inconvenience along the crossroads as a result of freeway construction activity.

Development

a. Zoning

A discussion of the zoning in the Tempe area is made in Part One.

b. Residential

A discussion of residential development along the proposed Superstition Freeway route was made in Part One. The primary impact of the construction of the Superstition Freeway in this area would be to continue this development by providing the needed access to other sections of the Phoenix Metropolitan Area. The Lakes, a major residential construction project along the Superstition corridor that is presently being developed, is deemed worthy of discussion in this section because of its impact on the area and its dependence upon the completion of the proposed Superstition Freeway for its traffic circulation needs.

The Lakes is a master planned, water oriented community. The project involves 322 acres of former farm land and is located along the south side of Baseline Road between Rural Road and McClintock Drive, within the city limits of the City of Tempe. When fully developed, the Lakes will provide housing and recreational amenities for 2,152 families. The development will include approximately 1,052 homes, 1,100 apartments, shops, a restaurant, a boating marina, and a resort hotel all surrounding a 50-acre man-made lake.

Accessibility to the property is from three major section line arterial roads: Baseline Road, Rural Road, and McClintock Drive. The Lakes is also accessible from anywhere in the Phoenix Metropolitan Area via Interstate Freeway 10. The Superstition Freeway will border the commercial portion (Lake Country) of The Lakes project to the north. The Lakes is situated three miles south of Arizona State University and the business center of Tempe and is less than

one mile from the new Tempe Cultural and Library Center. (See Tempe map in back pocket.) Downtown Phoenix, Scottsdale, and the Phoenix Sky Harbor International Airport are only minutes away by car.

Elementary and junior high schools are proposed for the property adjacent to The Lakes on the south. The new Marcos De Niza High School, one-quarter mile south is now available.

According to interviews with real estate developers familiar with economic conditions in the Tempe and Mesa areas, if the Superstition Freeway is not constructed along the proposed route in the Tempe Area it could have the effect of constraining residential development from its full growth potential. Access to various sections of the Valley provided by the proposed Superstition Freeway has been a factor in the developers' of subdivision sites in this area.

c. Commercial

A discussion of the existing commercial enterprises affected by the proposed Superstition Freeway was made in Part One. As mentioned, many of these outlets were built anticipating the construction of the freeway along the proposed route in this area. Additional commercial enterprises that are understood to be contemplating development in the area and are including the proposed Superstition Freeway in their traffic circulation plans are:

1. A southern California organization is designing a six to seven-million dollar development consisting of a department store and professional offices at the northeast corner of Baseline and Rural Roads.
2. A new car dealership is planning on locating on a 20-acre site on the southwest corner of Baseline and Rural Roads.

3. One of the nation's largest grocery chains is contemplating a commercial outlet on the southeast corner of McClintock Drive and Baseline Road.

4. Another new car dealership employing 200 people is planning to occupy the southwest corner of McClintock Drive and Baseline Road.

5. One of the Phoenix Metropolitan Area's largest grocery chains and a 50,000-square-foot department store is designing a development on the northeast corner of McClintock Drive and Baseline Road.

The anticipated developments on the locations cited are in various stages of planning. Information given on these proposed developments is considered general knowledge by persons cognizant of commercial real estate activity in the Tempe area. This information has not been corroborated by any of the principals in the planned developments. It is presented merely to indicate the intensity of interest in commercial sites in the area crossed by the proposed Superstition Freeway. It is the judgment of real estate developers in the area that anticipation of construction of the freeway has played a major part in this interest. If the Superstition Freeway were not to be built, many of these planned commercial sites developments might not take place.

d. Industrial

A discussion of industrial development in the Tempe area is presented in Part One. As mentioned, the zoning map indicates

that there is no industrial use authorized along the route crossed by the proposed Superstition Freeway from Rural Road east to the Tempe Canal.

The primary benefit afforded industrial sites in the Tempe area is the access to the east that the completion of the Superstition Freeway will provide. This should lower marketing transportation costs and reflect in slightly lower prices to the ultimate consumer. If the Superstition Freeway is not constructed, the normal traffic increase along Route 60-80-89 to the east will cause more congestion and result in increased product transportation costs for products originating from the manufacturing sites and warehouses in the Tempe area.

THE MESA AREA
(See Figure 2-3 on Page 2-21)

Community Development and Growth

The City of Mesa was originally founded in 1878 by a group of Mormons who came to Arizona from Bear Lake County, Idaho, and Salt Lake County, Utah. Among this early pioneer group were four men who were destined to become not only founders but leaders and planners of the new community as well. These four men, Charles Crismon, George W. Serrine, Francis M. Pomeroy and Charles I. Robson, soon after arriving in the area, developed and led in the construction of a new irrigation system which permitted water to flow from the Salt River through a series of canals and ditches to provide the irrigation necessary to make the area farmable, a venture which proved highly successful.

The original community was located on a flat table-mesa near the south bank of the Salt River some 16 miles southeast of Phoenix and about seven miles east of the then small community known as Hayden's Ferry (which later became Tempe).

The community was first incorporated in 1883 as the Village of Mesa, was changed in 1897 to the Town of Mesa, and finally in 1929 was changed to the city of Mesa. Prior to being called Mesa, the settlement was also known as Hayden, in honor of Charles Trumbull Hayden the founder of nearby Hayden's Ferry, and Zenos, after a prophet in the Book of Mormon.

The primary enterprise of the new community was agriculture. Many early-day irrigation canals and ditches were constructed which made ground farming possible. After 1911, additional irrigation facilities were made available to the area by the newly formed Salt River Project which constructed a series of storage dams upstream on the Salt River.

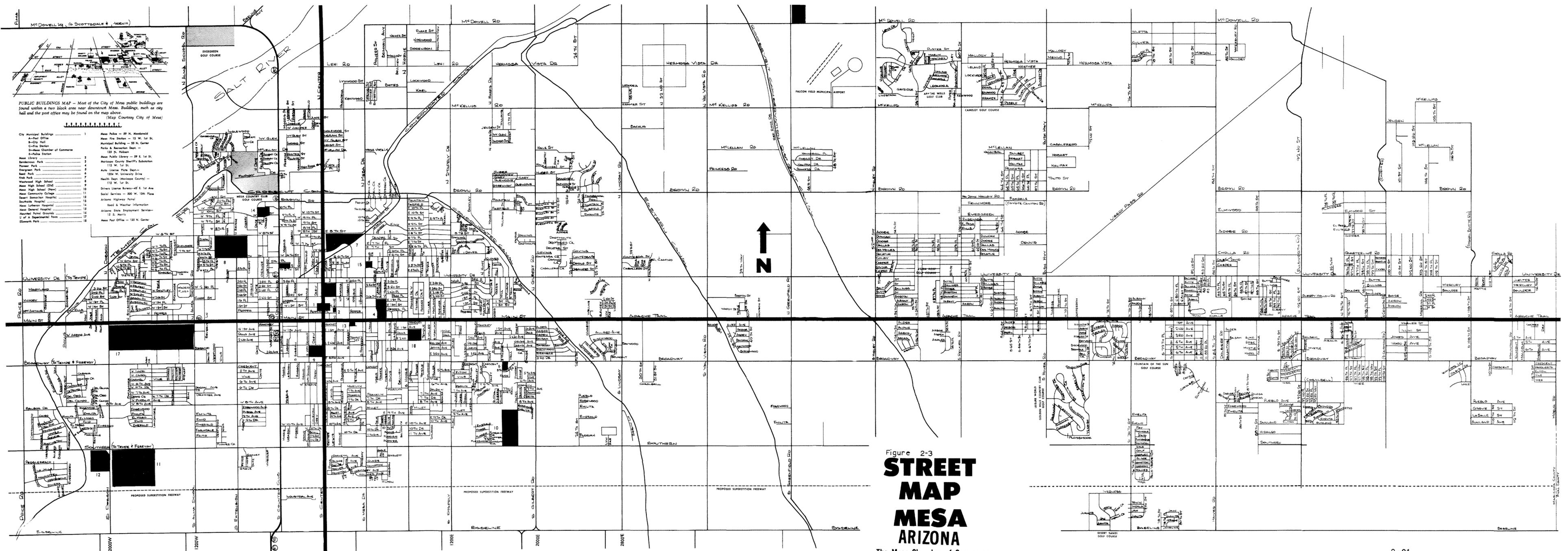


Figure 2-3
STREET MAP MESA ARIZONA
 The Mesa Chamber of Commerce
 10 W. 1st St. Mesa, Arizona 85201

A few years later the Roosevelt Water Conservation District was organized to bring still more acreage under cultivation easterly from Mesa. It was during this period that agriculture in the Mesa area reached a high plateau of productivity.

During the 1920's, reliable automobile transportation made it possible for many travelers to come to the warm, dry, winter climate of Arizona. Mesa thus became, and is today, a favorite winter resort area for tourists and visitors, a business which has been a major contribution and favorable influence upon the economic and growth structure of the local area and the state.

The population of Mesa increased from the few pioneer families of 1878 to 722 persons in 1900, 3,036 persons in 1920, 16,790 in 1950, 62,853 in 1970 and is projected to 130,000 by the year 1980.

During these several decades of growth, the physical structure of the area has enlarged many times from the original community center of 1878. Development has occurred generally in a south and easterly direction from the early-day location, with some expansion to the north and the west.

Businesses in downtown Mesa are concentrated in an area bounded by First Street on the north, First Avenue on the south, Country Club Drive (S.R. 87) on the west, and Hibbert Road on the east.

Land use in the immediate areas beyond these boundaries is devoted to semi-commercial-industrial-residential, and includes city and federal government entities.

Extending farther from the boundaries the use pattern changes to residential, schools, hospitals, and recreational, and includes some neighborhood commercial enterprises.

Agricultural, commercial, industrial and residential uses comprise the land-use pattern of the outer perimeter of Mesa. (See Figures 2-4 and 2-5 on the following pages for existing and future land use.)

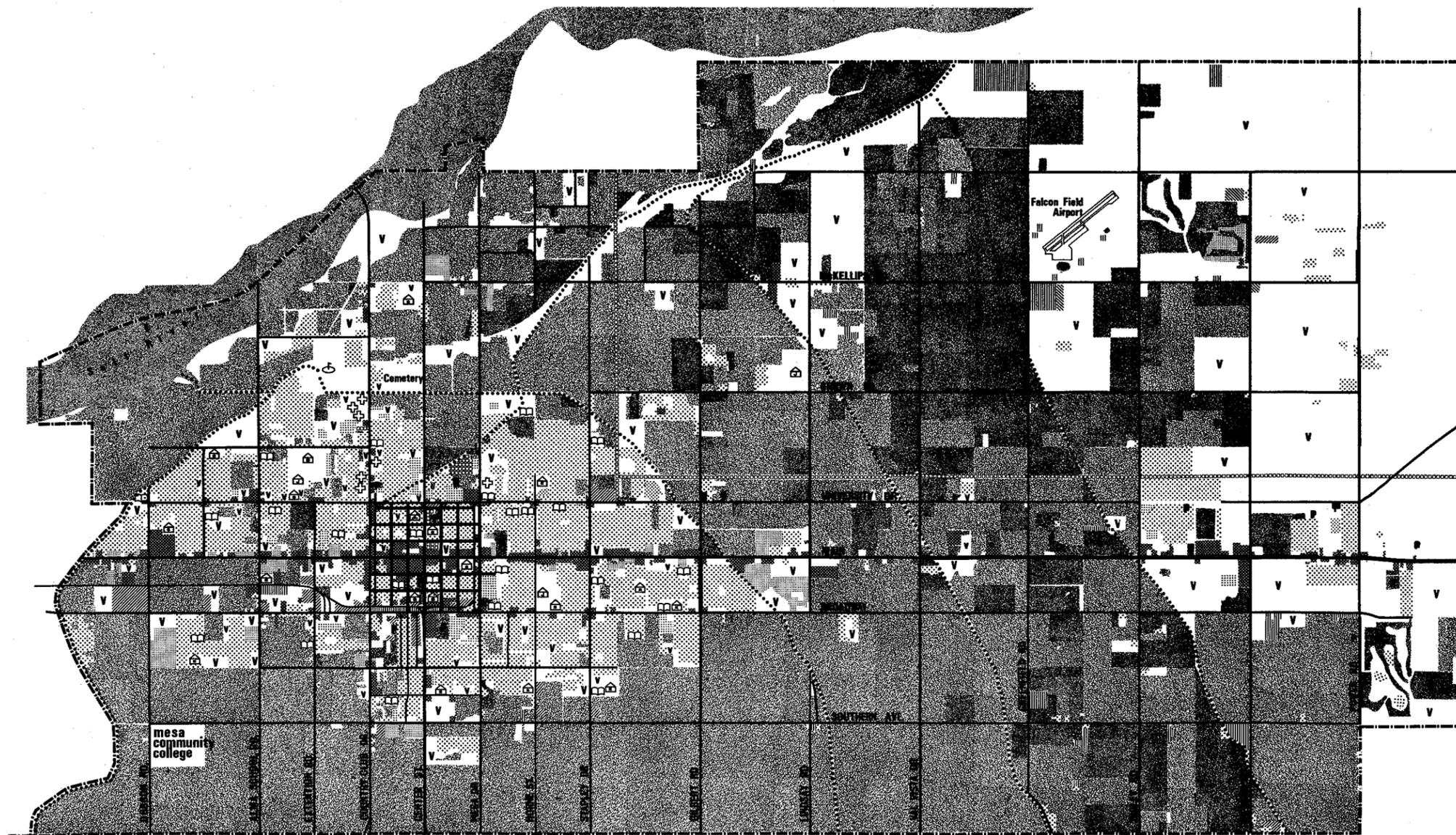
The major arterial highway facility through the Mesa area is U.S. Highways 60-80-89 (Main Street within the city limits) traversing east-west through the center of the downtown business district. This route is virtually lined with business establishments and service facilities oriented to both local and through traffic.

This major thoroughfare has been widened and divided in an effort to accommodate the heavy flow of vehicular traffic (both local and through traffic) on the downtown streets and to provide safety to the visiting and resident pedestrian shoppers and bicyclists patronizing the downtown business establishments.

Notwithstanding these recent improvements, traffic congestion is still a very serious problem, resulting in a reciprocal delay for through-traffic motorists and the shopper-motorists-pedestrians desiring to park and shop in the downtown area.

The concentration of congestion is most critical within the downtown business district. However, because of the high density of businesses located along or in close proximity to the main thoroughfare, vehicular congestion occurs generally on the entire main traffic corridor (U.S. Highways 60-80-89) between the east and west city limits of Mesa.

The proposed S.R. 360 Superstition Freeway, to be located about 2.0 miles south of and parallel to the downtown main traffic thoroughfare, will doubtless cause a shift of through traffic from the existing highway to the new freeway, which will result in a significant improvement of the downtown traffic congestion problem as it exists presently. This matter



RESIDENTIAL
 [Pattern] SINGLE FAMILY
 [Pattern] MULTI-FAMILY
 [Pattern] MOBILE HOMES
 [Pattern] COMMERCIAL & OFFICES

PUBLIC & SEMI-PUBLIC
 [Pattern] GOVERNMENT
 [Pattern] SCHOOL - ELEMENTARY, JUNIOR HIGH, SENIOR HIGH
 [Pattern] PUBLIC RECREATION
 [Pattern] CHURCH
 [Pattern] GOLF COURSE
 [Pattern] HOSPITAL

INDUSTRIAL, WAREHOUSING, WHOLESALING
 [Pattern] LIGHT INDUSTRY, WAREHOUSING & WHOLESALING
 [Pattern] HEAVY INDUSTRY

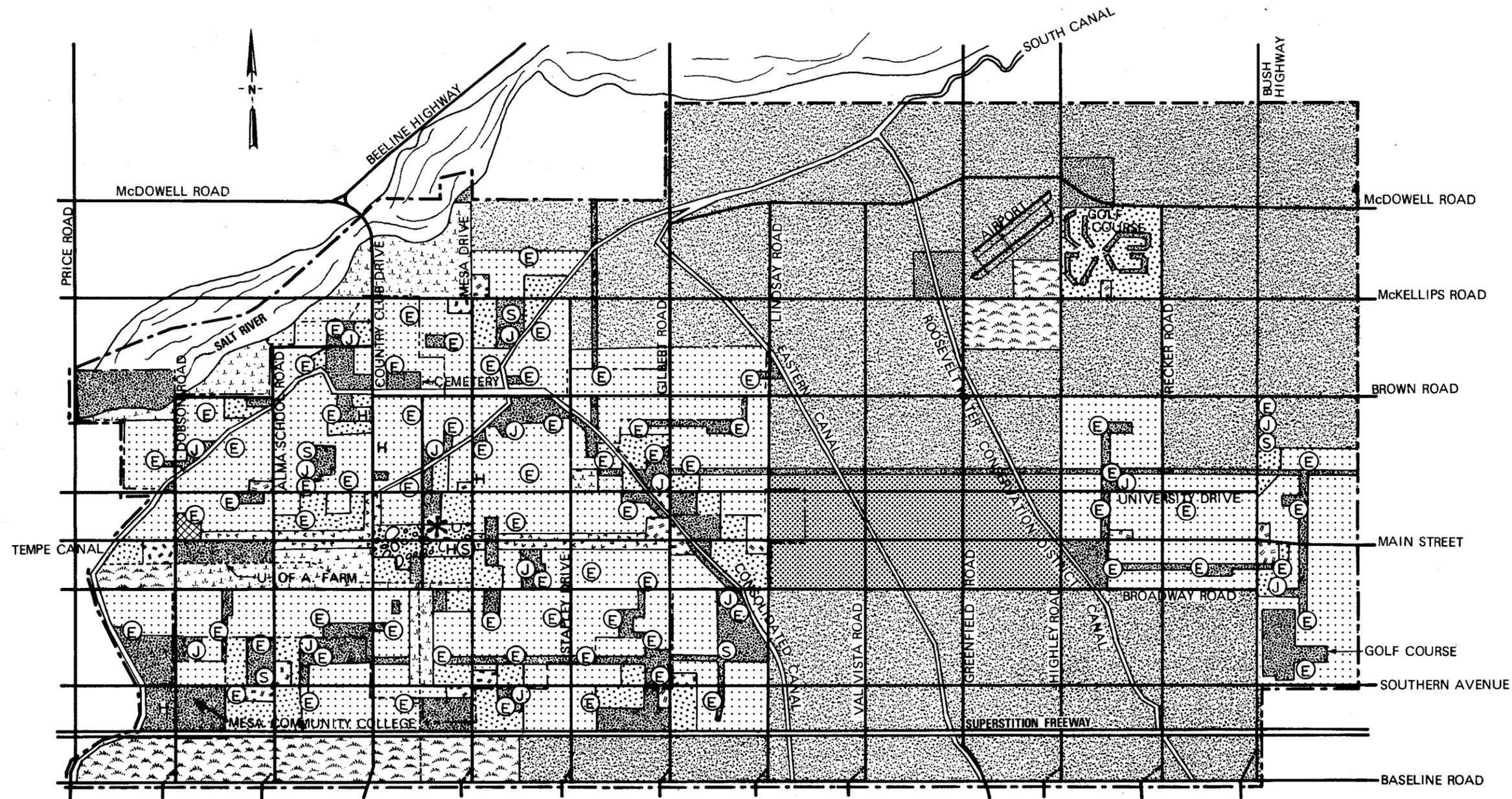
AGRICULTURE
 [Pattern] CROP
 [Pattern] CITRUS

[Symbol] VACANT
 [Symbol] STUDY AREA BOUNDARY

Figure 2-4
 GENERALIZED EXISTING LAND USE

THE MESA COMPREHENSIVE PLAN





- RESIDENTIAL**
- LOW DENSITY (UP TO 8 DWELLINGS/ACRE)
 - MEDIUM DENSITY (9 TO 15 DWELLINGS/ACRE)
 - HIGH DENSITY (15 OR MORE DWELLINGS/ACRE)
- COMMERCIAL**
- CITY CENTER
 - REGIONAL CENTER
 - HIGHWAY COMMERCIAL SERVICES
 - NEIGHBORHOOD COMMERCIAL

- INDUSTRIAL**
- LIGHT INDUSTRY
 - INDUSTRIAL PARK
- OPEN SPACE**
- PUBLIC RECREATION
 - AGRICULTURE AND VACANT
- CITY OF MESA BOUNDARY
 - - - PLANNING AREA BOUNDARY

- SCHOOLS**
- ELEMENTARY
 - JUNIOR HIGH
 - SENIOR HIGH
- PUBLIC - SEMI PUBLIC**
- CIVIC AND GOVERNMENT CENTER
 - HOSPITAL
 - RAILROAD
 - CANAL

LAND USE PLAN - 1990

THE MESA COMPREHENSIVE PLAN

Figure 2-5

Open space will be maintained adjacent to canals in urban areas.

is considered in more detail in the discussion of economic impact evaluations found further in this part of the impact statement.

Building a New Highway Into and Through the Area

The extensive, rapid growth and development of Mesa, especially that occurring during the past three decades, as well as that which is projected for the next 17 years (through 1990) has been and will be guided through the continuous, cooperative and comprehensive long-range planning applied by the City of Mesa in conjunction with other responsible planning agencies including the Arizona Highway Department, Maricopa County, neighboring municipalities, and others.

The proposed S.R. 360 Superstition Freeway is a direct and desired result of such long-range planning in a concerted effort by the involved planning agencies to provide adequate highway and road facilities, on a long-range planning basis, to the Mesa area. The freeway is an integral part of the adopted Major Street and Highway Plan for the Phoenix Urban Area which was approved by the City of Mesa. (See Figure 1-7 on Page 1-36.)

The S.R. 360 Superstition Freeway plan has served as a control and a major influence for existing and future proposed land-use planning and zoning by Mesa officials. As a result, the right of way corridor required for the proposed freeway has been kept clear of encroachments.

Development of the area, both existing and future, along and in general proximity of the freeway corridor is based on the premise that the freeway will be constructed as planned.

In Mesa it is evident that the freeway plan is directly influencing, and is serving as a catalyst to hasten, the development of the area well in advance of the actual highway construction.

Should this anticipated development progress as rapidly as that experienced in neighboring Tempe immediately to the west, exaggerated traffic build-up in Mesa will be a reality and a problem well ahead of the relief expected when the freeway facility is constructed and placed in service. This places the construction of this desired and urgently needed transportation facility in a high priority status in meeting the needs of the public.

Opening this new facility to local and through traffic will result in a shifting of traffic from the overcrowded and highly congested downtown streets onto the freeway, thus relieving a very serious existing and worsening traffic problem in the downtown business district and other related areas of Mesa.

Population

As is the case with Tempe, the proposed Superstition Freeway is basic to meeting the transportation needs of Mesa's projected population growth which is expected to exceed 90,000 by 1975 and could be around 220,000 by 1990. The proposed freeway will provide a necessary transportation link to all parts of the Phoenix Metropolitan Area and to eastern Maricopa County and the Apache Junction area for future residents inhabiting the developing subdivisions along the proposed freeway route and for residents within the general vicinity of the proposed freeway.

Also like Tempe, not constructing the freeway through this area would have a restricting effect on the area's population growth. The existing transportation system is not adequate for the projected population growth of the area. The Superstition Freeway would aid in meeting the area's transportation demands.

Employment

The major impact the Superstition Freeway in the Mesa area will have on employment is similar to the effect on the Tempe area. It will work toward increasing the labor interchangeability factor. A discussion of this has been made under the Tempe Employment Segment, Part Two. Construction of the freeway in the Mesa area would allow Mesa worker residents to broaden their radius of employment sites, particularly further into the Phoenix area.

Construction of the Superstition Freeway along the proposed route should aid the employment situation through increasing this labor interchangeability factor. Without the freeway, Mesa's worker residents in the future will find their radius of employment sites diminished because of increased traffic congestion along the major arteries, particularly in the rush-hour traffic.

Property Values

Although property values in the Mesa area along the path of the proposed Superstition Freeway have increased considerably over the last few years in anticipation of its construction, values would probably go somewhat higher if the construction becomes a certainty. As long as an element of doubt remains about the freeway's completion, land investors will hold off paying top dollars for developable land.

If the freeway is not constructed along the proposed route in the Mesa area, it would likely result in depressing land values to a degree. The amount of land value depression would depend on what alternate transportation plan was adopted to meet the Mesa area's urgent transportation needs.

Tax Base

The anticipated annual loss to the tax base due to acquisition of right of way for the construction of the proposed Superstition Freeway through the Mesa area is estimated to be approximately \$13,000. It is believed that the enhancement of the tax base by the increase in property values caused by the construction of the freeway would more than compensate for this tax base diminution.

The urbanization of vacant and agricultural lands along the path of the proposed freeway through this area will considerably increase assessed valuation of properties and raise the tax base more than enough to overcome the tax erosion caused by the right of way acquisition. This tax base increase could quite properly be attributed to the land value increases due to the anticipated construction of the proposed Superstition Freeway.

Tourism

A discussion of Tourism in the Phoenix Metropolitan Area is made under Tourism Section, Tempe Economic Segment, Part One. As part of the Phoenix Metropolitan Area, Mesa has a share in the area's booming tourist industry estimated to be \$320 million in 1972. A greater Phoenix Hotel-Motel Industry Survey conducted in 1970 showed Mesa to have a total of 40 establishments with an aggregate of 988 rooms available for occupancy. There has been considerable construction of tourist accommodations since that time. Most of the available tourist accommodations are located along Main Street.

Although the construction of the Superstition Freeway along the proposed route in the Mesa area might adversely affect the smaller motels and tourist oriented commercial activities, the overall tourist industry in the Mesa area should benefit considerably from its construction. There is a good possibility of the proposed Superstition Freeway changing the central place relationship for many tourists. Travelers from the west would be more likely to continue around the Phoenix area into the Mesa area if freeway conditions would be available all the way.

The construction of this proposed freeway would also give tourists and winter visitors residing in Mesa better access to the vast array of tourist facilities in the Phoenix and Tempe areas.

Considering all factors, the economic benefits accruing to the Mesa area as a result of the construction of the Superstition Freeway from Rural Road to Apache Junction would result in more economic benefits to the tourist industry than economic disbenefits. The economic advantages would be greater than not constructing the Freeway since the traffic congestion that the area would experience without the relief afforded by the freeway would act as a deterrent to an expanding tourist industry.

Traffic Circulation

Preliminary estimates of the traffic the Superstition Freeway will carry through the Mesa area range close to 74,000 through the Dobson Street vicinity to approximately 30,000 in the Val Vista Road area. This would have the effect of diminishing much of the traffic along Main Street through the Mesa district. Through traffic would be channeled largely onto the Superstition Freeway. Local traffic would also use the freeway to a considerable degree in preference to one of the major arteries when trip destinations found this travel path convenient.

Even with the construction of the Superstition Freeway through the Mesa area, the traffic along Main Street may well increase slightly due to projected traffic growth in the area. The proposed Superstition Freeway would have the effect of draining sufficient traffic from Main Street to prevent an absolutely intolerable traffic burden.

As in the Tempe area, the small motels, service stations, and tourist directed facilities along Main Street (an extension of Apache Boulevard into the Mesa area) should be able to reorient much of their businesses toward local patronage. The non-highway oriented businesses along Main Street in the Mesa area should benefit from the construction of the proposed Superstition Freeway.

Traffic relief afforded by the freeway should aid the parking situation for the non-highway oriented businesses. As in the case of Tempe, much of the truck and other heavy commercial vehicle traffic would tend to use the Superstition Freeway through the Mesa area, thereby cutting down on noise, dust and fumes along Main Street. Also as in the case of Tempe, the overall economic effect of the construction of the Superstition

Freeway to the businesses along Main Street should be beneficial. Without the relief of the proposed Superstition Freeway, the projected traffic along Main Street could be intolerable.

Coordination With Master Plans

The construction of the proposed Superstition Freeway in the Mesa area has been considered in Mesa 1990, The General Plan. Although the proposed freeway is located two miles to the south of the City's central area, the freeway will have some impact on future traffic circulation plans. Failure to construct the freeway along this proposed route would dictate a re-analysis of the Mesa area general plan.

Relocation

Preliminary relocation studies have identified five residences and a portion of one cattle feedlot in the path of the Superstition Freeway through the Mesa area (Tempe Canal to Val Vista Road). No non-farm related business is in the Mesa area freeway corridor. A final relocation survey will be made to determine the exact numbers of people, residences, etc. that will be relocated when freeway right of way is acquired. All relocations will be accomplished under provisions of the FHWA Policy and Procedure Memorandum 81-1 which, in part, dictates that the Arizona Highway Department will provide necessary assistance to relocatees in securing adequate replacement housing in an ample amount of time. Information obtained from the Mesa-Chandler-Tempe Multiple Listing Exchange reveals that as of June 27, 1973, 82 one and two bedroom, 198 three bedroom, and 100 four or more bedroom residences were listed for sale with the Exchange in the Mesa, East Mesa and Apache Junction Area. The prices on these residences range from \$9,900 to \$74,000 with the majority falling toward the lower end of the price scale (\$20,000 to \$30,000). There are, of course, other homes for sale in these areas not listed with the Multiple Listing Exchange. The home sales market is a dynamic market and housing available at this time is not necessarily indicative of housing available in one, two or three years at a similar price.

Any business displaced by the freeway would receive assistance from Highway Department personnel similar to that given housing relocatees.

Temporary Economic Effect of Construction

The estimated expenditure for the necessary construction costs, drainage, landscaping and right of way to complete the approximately 7.65 miles of Superstition Freeway from the Tempe Canal to Val Vista Road is \$23,000,000. This amount would be mostly expended in the Phoenix Metropolitan Area with much of the economic impact felt in the Mesa and Tempe areas.

There should be little disturbance of business in the area by the necessary interruption of traffic along the major arteries in the Mesa area that cross the path of the proposed Superstition Freeway.

Some residential developments near the southern part of the Mesa area crossed by the proposed Superstition Freeway will be bothered by the noise and dust factor attendant with freeway construction. Most of the area crossed by the proposed freeway has no development within the affected vicinity of its path.

As in the case of the Tempe area, the immediate economic benefits accruing to the Mesa area as a result of the construction of the Superstition Freeway would outweigh the economic disbenefits which would be principally caused by traffic inconvenience along the major crossroads.

Development

a. Zoning

A discussion of the zoning in the Mesa area is made in Part One.

b. Residential

The construction of the proposed Superstition Freeway in the Mesa area will have a strong influence on residential development on land within the vicinity of the proposed freeway. Interviews with

knowledgeable real estate brokers and developers have revealed an intense interest in available land near the proposed Superstition Freeway. Access to Tempe and Phoenix is extremely important to these developers. If the freeway is constructed through to Apache Junction along the proposed route, this will constitute a large boost for residential construction in the area. The demand for residences is substantial in the area traversed by the freeway corridor and investor confidence appears to be high.

One particular residential project that should be noted because of its size is the Dobson-Continental Homes project planned to be constructed near the proposed Superstition Freeway in the southwest Mesa area. The focal point of the project is located at the intersection of Baseline Road and Dobson Road. The Dobson Ranch property (2,195 acres) consists of nine parcels of land, and one 160-acre parcel at the northwest corner of Baseline Road and Price Road. The major portion of the project lies between Southern Road to the north, Guadalupe Road to the south, Alma School Road to the east and Price Road to the west.

This project is planned to accommodate a future population of 30,000 for the Dobson-Continental Homes property covering 2,195 acres. The plan sets forth the required amounts of residential, commercial and supporting public and quasi-public land uses, in compatible arrangements. The plan is based on an overall density of about 13 persons per gross acre, and four and one-half housing units per gross acre. The 30,000 people will be housed within 5,582 single-family dwelling units (including patio and townhouse types), 2,565 multi-family dwelling units (two-story garden and townhouse), and 2,610 multi-family apartments.

The plan concurs in general with the 1980 Master Plan for Tempe and Mesa and meets their design standards for schools, parks and streets. The proposed land uses for the subject property include 1,703 acres reserved for residential, 229 acres for commercial and 441 acres for public and quasi-public land uses. The property is strategically located in the path of present urban growth which should be accelerated because of excellent access to the proposed Superstition Freeway.

c. Commercial

Construction of the Superstition Freeway along the proposed route would act as a catalyst for shopping centers and retail outlets to be constructed in the area where zoning permits.

In the judgment of real estate developers many shopping center developments are awaiting the certainty of construction of the freeway in the Mesa area to implement commercial development plans. The rationale behind the commercial development plans seems to be that residential growth will follow the freeway route. Conversely, if the freeway is not constructed, commercial development in this area will not proceed as quickly, or to the degree that it would if the freeway were constructed.

d. Industrial

The construction of the Superstition Freeway along the proposed route in the Mesa area would open up excellent industrial sites along the freeway where zoning permits. (See the Mesa Zoning Map on Page 1-76). The Superstition Freeway would in turn provide excellent access to Interstate 10 and the route to the West Coast markets.

Like the Tempe area, the Mesa area would also be afforded better access to the east if the Superstition Freeway is completed to the Apache Junction area as proposed.

THE APACHE JUNCTION AREA

Community Development and Growth

Apache Junction is a youngster among Arizona communities. Although some settlement began after completion of the Apache Trail (State Highway 88) to Roosevelt Dam site in 1904, Apache Junction did not achieve community status for many years thereafter. A post office, for example, was not established until 1950, and the community was still unincorporated through early 1973.

Apache Junction was named for its location at the crossroads of the Apache Trail and U.S. Highway 60-80-89. Its early growth, which centered around highway-oriented businesses, was later spurred by winter visitors attracted by the area's picturesque desert setting below the slopes of the Superstition Mountains. For many years Apache Junction's summer population was negligible.

Land development eventually became less highway-oriented. Of almost 2,000 residential lots platted in the Apache Junction area of Pinal County from 1950 to 1962, half were built upon. Residential development, especially involving mobile homes, has continued at an accelerated rate and has been joined with development of community-oriented businesses.

Although the 1970 census listed the Apache Junction population as only 2,390, this figure is misleading. Extensive developments west of the community add several thousand persons to the total. Increasing numbers of these people in and around Apache Junction are year-round residents employed in the Mesa area or in the adjacent mining towns of Pinal County.

While these factors are combining to increase community stability, the population of Apache Junction remains highly seasonal with the winter population perhaps doubling that of summer months. The economy of Apache Junction is based on retirement and recreation. Commercial services cater largely to tourists and recreationalists traveling to the Salt River chain of lakes and Arizona's northern forests.

Building a New Highway Into and Through the Area

U.S. Highway 60-80-89 through Apache Junction offers the only logical route to most of the popular recreational areas mentioned above. It also serves as the major route of travel through Apache Junction for local residents and is lined with practically all the community's businesses. These factors, combined with many slow-driving retirees and tourists, generate heavy and often hazardous traffic. Construction of the Superstition Freeway will prompt a shift of through traffic from Highway 60-80-89 and afford reduced traffic congestion for local residents patronizing Apache Junction's business community.

Early development in the Apache Junction area and west toward Mesa was confined mostly to a narrow band on either side of U.S. 60-80-89. Growth has since expanded the developed boundaries both north and south and continues to do so; however, development has not yet reached the Superstition Freeway corridor. Proper planning and zoning by Maricopa and Pinal County officials have insured the freeway corridor will remain in its present open state. Zoning maps in Figures 1-12, 1-13 and 1-14 show consideration for the Superstition Freeway corridor.

Population

The construction of the Superstition Freeway along the proposed route from Val Vista Road to Apache Junction would act as a catalyst in

developing this area. The diminution of the time difference between this area and the Phoenix Metropolitan Area would be a major factor in attracting population by providing an incentive for residential developers to build homes for residents working in the Phoenix Metropolitan Area. Although the projected population growth figures in Part One could possibly be met without construction of the freeway, the freeway would contribute much toward insuring the area's growth potential.

Employment

Construction of the Superstition Freeway in the eastern Maricopa County-Apache Junction area will have a beneficial effect on employment conditions in the area by allowing worker residents to find employment sites much further into the Phoenix Metropolitan Area, thus providing them with greater employment options.

The Superstition Freeway in the Apache Junction area should also present more employment opportunities by catalyzing residential, commercial and industrial development in the area.

Failure to complete the Superstition Freeway along the proposed route through the eastern Maricopa County-Apache Junction area may result in constraining the area's employment growth potential by restricting possible employment opportunities offered by the freeway's construction.

Property Values

The full impact of construction of the Superstition Freeway on property values in the eastern Maricopa County-Apache Junction area is difficult to evaluate. This area is presently in a growth state, and the freeway could well be the catalyst that would accelerate this growth and increase property values considerably.

Property values are contingent upon development. Much of the development in the eastern Maricopa County-Apache Junction area is awaiting the certitude and scheduling of freeway construction through the area. Realization that the freeway is to be built through this area in the foreseeable future undoubtedly has caused land values to rise considerably.

Tax Base

It is estimated that the tax base will be reduced in the following amounts by virtue of the necessary right of way acquisition for the proposed Superstition Freeway in the eastern Maricopa County-Apache Junction area.

	<u>Estimated Annual Tax Reduction by Right of Way Acquisition</u>
Val Vista Road to Greenfield Road	\$1,364
Greenfield Road to Higley Road	605
Higley Road to Recker Road	598
Recker Road to Power Road	541
Power Road to Sossaman Road	618
Sossaman Road to Hawes Road	355
Hawes Road to Ellsworth Road	349
Ellsworth Road to Crismon Road	334
Crismon Road to Signal Butte Road	296
Signal Butte Road to County Line	-0-
County Line to Vineyard Road	359
Vineyard Road to Idaho Road	-0-
Idaho Road to Tomahawk Drive	498
Tomahawk Drive to Goldfield Road	596
Goldfield Road to Highway 60-80-89	<u>496</u>
Total Estimated Tax Reduction by Right of Way Acquisition	\$7,009

The approximate \$7,000 estimated to be lost to the tax rolls by right of way acquisition for the proposed freeway in the eastern Maricopa County-Apache Junction area will be more than compensated for by an enhancement of the tax base caused by freeway construction. The gradual urbanization of the land in this area will be accelerated as freeway construction proceeds. The conversion of agricultural and vacant lands to urban usage, which usually accompanies freeway construction, also should increase property assessed valuations and raise the tax base.

Tourism

The majority of the motels and mobile home parks within the eastern Maricopa County-Apache Junction area are oriented toward winter visitors and the tourist trade with some of the larger tourist accommodations such as the Superstition Inn at Apache Junction gaining national reputation as winter resorts. The area has a great tourist potential and tourism will generate an even greater contribution to the future of the area's economy.

On the other hand, the Superstition Freeway could reduce tourist patronage of businesses along Route 60-80-89 by diverting through traffic to the freeway. Operations that are marginal in nature and receive residual trade from the larger facilities might have difficulty in reorienting their businesses to local trade. Construction of the freeway would lessen the time necessary to get to this area and provide freeway conditions through the Phoenix area.

The impact of the Superstition Freeway upon the tourist facilities of eastern Maricopa County-Apache Junction will be favorable overall.

Traffic Circulation

The average daily traffic ranging from 18,000 in the western section of the study area to approximately 5,000 in the eastern section, is not

presently an intolerable burden for Highway 60-80-89, although the traffic along the route is predicted to increase significantly over the next few years. Some of the smaller highway oriented businesses along Route 60-80-89 might have difficulty re-orienting their facilities toward local trade but the overall business atmosphere in the Apache Junction area should improve with the construction of the Superstition Freeway and the accompanying reduction of congestion, noise, fumes and dust along the Route 60-80-89.

Coordination with Master Plans

The proposed Superstition Freeway route through the eastern Maricopa County-Apache Junction area has been coordinated with the political subdivisions involved. Planning and zoning have been formulated with the anticipated future construction of the freeway in mind. Failure to construct the freeway would entail re-analyzing and revising the area's planning.

Relocation

A preliminary relocation investigation has shown that the Superstition Freeway corridor between Val Vista Road and the project terminus contains one business and part of another, five or six homes, and small parts of two mobile home parks. The two businesses include a small dairy west of Greenfield Road which is completely in the corridor and about 25 acres of a turf farm bounded on the west by Meridian Drive. A final survey will identify exact numbers of people and residences requiring relocation.

All relocation will be accomplished under provisions of the FHWA Policy and Memorandum 81-1 discussed on Page 2-32. PPM 81-1 directs the Arizona Highway Department "to insure to the maximum extent possible the

prompt and equitable relocation and reestablishment of persons, businesses, farmers . . . displaced as a result of Federal and Federal-aid highway construction." Availability of housing in the area is discussed under Mesa Area Relocation on page 2-32.

Development

a. Zoning:

A discussion of area zoning is presented in Part One of the eastern Maricopa County-Apache Junction Economic Section.

b. Residential:

The construction of the proposed Superstition Freeway through the eastern Maricopa County-Apache Junction area should act as a catalyst for residential development in the area, particularly along the freeway route. Intensive development in the area will depend on general economic conditions and utility availability, particularly water; however, the great savings in time that the freeway will give this area in traveling to various parts of the Phoenix Metropolitan Area should stimulate residential development interest.

There are two residential projects in the process of development in the western section of the area that are of such size, scope and significance to merit special attention. They are Leisure World and Dreamland Village. The proposed Superstition Freeway plays an important part in the transportation planning of both these residential communities. Each will have developed areas on both sides of the freeway.

Leisure World is being developed on approximately 2,150 acres between Apache Boulevard and Baseline Road on both sides of Power Road. The community is planned in two sections: a self-contained

adult community and an all family development that together will eventually support approximately 26,700 people.

Dreamland Village, one mile west of the Maricopa-Pinal County line, extends north and south from Apache Boulevard to Baseline Road, and east and west from Signal Butte Road to Crismon Road. It will be a self-contained, 1,063-acre retirement community, designed to eventually accommodate some 8,200 middle-income retirees. The community will include a variety of types of dwelling units, recreation centers, and a medical center with hospital. The plan for the community has been adjusted to provide for right of way requirements of the Superstition Freeway.

c. Commercial

The construction of the proposed Superstition Freeway through the eastern Maricopa County-Apache Junction area should enhance rather than detract from overall commercial activity throughout the area influenced by the freeway, and commercial outlets along U.S. 60-80-89 will benefit from the increased residential growth in the area induced by the freeway.

d. Industrial

It is general policy of both the Maricopa County and Pinal County Planning and Zoning authorities to be flexible in considering land uses. There is little demand for industrial lands adjacent to the proposed Superstition Freeway at the present time. If the freeway is constructed throughout the eastern Maricopa County-Apache Junction area to its terminal junction with Route 60-80-89, increased interest in industrial sites away from the freeway, but with good access to it,

could be stimulated. The freeway will give industrial sites in this area good access to markets on the West Coast by providing freeway facilities through its connection with Interstate 10 in the Tempe area.

e. The Superstition Freeway alignment crosses an abandoned airstrip in the vicinity of Sossaman Road (76th Street) east of Mesa. This is shown on the aerial strip photograph in Part One of this report.

Information furnished by the Arizona State Department of Aeronautics Director indicates this airstrip was an Army Air Corps auxiliary airport used by Williams Air Force Base during World War II. It was later abandoned by the Federal Government and the land was returned to its owners. It has been removed from aeronautical charts and is no longer recognized as an airport.

At the present time, a resident of the adjacent trailer court uses the airstrip and has a tie down for his airplane at his trailer. This trailer is presently located in the path of the proposed Superstition Freeway and relocation assistance will be provided as mentioned earlier in this report.

The airstrip is also used as an emergency field for disabled aircraft and as a base for spraying operations. Facilities are not available at the airstrip.

THE ENTIRE FREEWAY CORRIDOR

The discussions contained in the following paragraphs are relative to those impacts, influences and conditions which generally apply to the overall project corridor rather than to a specific segment and therefore are best considered on a total corridor basis.

Wildlife Considerations

Description of Wildlife

Wildlife appears along the Superstition Freeway corridor to an appreciable degree only from about the Tempe Canal to its terminus approximately 20 miles to the east. This section, comprising about four-fifths of the project, runs through farmland and undeveloped desert. The section from I-10 to the Tempe canal supports little wildlife habitat and, consequently, little wildlife.

Farm areas are important mostly in providing sources of food to wildlife species, especially birds. Concentrations of a few gregarious species are particularly evident. Thus, depending upon the season, large flocks of pigeons, Brewer's blackbirds, cowbirds, and mourning doves are common sights at feedlots. In late summer, feeding flights of mourning doves are joined by white-winged doves in grain and stubble fields.

Two predacious species, marsh hawks and sparrow hawks, also use farm fields for feeding. While not nearly as numerous as the gregarious species, the foraging habits of both hawk species make them somewhat conspicuous.

Citrus groves found along the east end of the cultivated portion of the corridor provide nesting and roosting habitat for mourning and

white-winged doves. Other species find similar habitat in the few trees and in brush bordering canals and farm residences. Birds common to these areas include common ground doves, roadrunners, house finches, white-crowned sparrows, and the ubiquitous starlings and English sparrows.

The sparseness and lack of vegetative types in the undeveloped desert zone reflects the low wildlife population levels found there. Creosotebush, which dominates the freeway desert corridor, is essentially monotypic over much of the route. Only an occasional wash supporting riparian trees and a scattering of cacti detracts from the monotonous landscape. When summer heat and low-rain years desiccate low-growing annual plants, only Creosotebush remains to provide an attraction for occasional wildlife.

Most species shun Creosotebush flats during such times, finding little food or shelter there. The verdin and black-tailed gnatcatcher, both resident birds of the area, are two of the few wildlife species which feed in Creosotebush.

Most of the wildlife in the project areas is there because of the numerous small washes which incise the corridor. The washes support a greater diversity of vegetation including tree-form species which attract nesting birds and plants which provide food. A few Saguaro and Cholla cacti also provide nesting sites for certain species.

Table 2-1 lists birds which probably occur either year round or seasonally in or near the desert portion of the freeway corridor. Many other species occur briefly in the corridor as transients during migration.

Mammals and other animal forms along the freeway corridor are much less conspicuous than bird life. Numerous species of small

mammals, reptiles, and amphibians are present in the project area, but their habits make them appear less abundant than they are.

Among larger mammal species, only the black-tailed jackrabbit is encountered to any degree of regularity in the project area. Other conspicuous mammal species are largely transient. The wide-ranging coyote is probably the most common of the group, while an occasional bobcat may also wander into the area. Less likely to be encountered are mule deer and javelina which are much more abundant east of the project terminus.

TABLE 2-1

BIRD SPECIES THAT MAY BE EXPECTED TO OCCUR IN OR ADJACENT TO THE DESERT PORTION OF THE SUPERSTITION FREEWAY CORRIDOR

Species	Year Round Resident	Summer Resident	Winter Resident
Turkey vulture		X	
Red-tailed hawk	X		
Marsh hawk			X
Harris' hawk	X		
Sparrow hawk	X		
Gambel's quail	X		
White-winged dove		X	
Mourning dove	X		
Roadrunner	X		
Common screech owl	X		
Great horned owl	X		
Elf Owl	X		
Burrowing owl		X	
Lesser nighthawk		X	
Costa's hummingbird	X ?		
Gila woodpecker	X		
Arizona crested-flycatcher		X	
Ash-throated flycatcher		X	
Purple martin		X	
Verdin	X		
Cactus wren	X		
Mockingbird		X	
Curve-billed thrasher	X		
Black-tailed gnatcatcher	X		
Starling	X		
Meadowlark	X ?		
House finch		X	
Black-throated sparrow		X	

Impact of Freeway on Wildlife

The major impact new highways have on wildlife is usually created indirectly. Highways through unurbanized areas traditionally breed land development which in turn forces wildlife from the land. To a degree this will occur with the Superstition Freeway. Developers are planning for the freeway and are selling homes and lots to a public expecting a freeway. However, urbanization is occurring so rapidly along the project corridor that by the time the Superstition Freeway is completed, it is likely that urbanization will have driven much of wildlife from the corridor independent of the freeway action.

Nevertheless, even were the freeway finished before extensive urbanization, its impact on wildlife would not be great. There are no known rare or endangered animals on the freeway corridor, and those species that are present are generally few in number or are not inexorably bound to the project area. For purposes of illustration, however, freeway impact on wildlife will be discussed as if urban development were not imminent.

Perhaps the major impact on wildlife will occur where the freeway will penetrate into agricultural land. Feeding and foraging areas will be lost to pigeons, Brewer's blackbirds, cowbirds, mourning doves, white-winged doves, sparrow hawks, and marsh hawks.

Also to be lost will be about 45 acres of mature citrus trees within the 500-foot right of way between Greenfield and Recker Roads. Since citrus groves in the Mesa area are used heavily by both mourning and white-winged doves for nesting, the freeway would eliminate some valuable nesting habitat. However, the lost acreage would amount to

less than one percent of the total citrus acreage in the Mesa area used by nesting doves. Data supplied by the Arizona Game and Fish Department indicate that elimination of this acreage could result in loss of production of about 250 whitewings and 500 mourning doves annually, providing displaced adult birds did not utilize adjacent citrus groves for nesting.

Additional breeding habitat around residences and along canal banks will be lost to passerines (perching birds), and their populations will be proportionally reduced. However, birds which utilize the farm areas only for food will find feeding areas in adjacent fields and feedlots and their population will show no appreciable decline.

Resident birds breeding in the desert portion of the freeway corridor (Table 2-1) may find adjacent areas occupied to carrying capacity. Unable to locate suitable breeding and nesting sites, their populations would be reduced by numbers equal to their population in the corridor. Seasonal residents will likewise find increased competition for space but will likely adapt to adjacent desert vegetation as will transients.

The limited home ranges of small mammals, reptiles, and amphibians living in the corridor will not allow them to expand their territories into adjacent desert areas and they will be eliminated. The greater mobility and fewer numbers of larger mammals, however, will combine to allow them to expand their ranges into new territories.

A few predatory birds which use the corridor for foraging grounds will find their food sources in shorter supply once the freeway is built. A subsequent slight reduction in the populations of

Harris' hawks, red-tailed hawks, sparrow hawks, screech owls, and great horned owls may result.

Materials Pits and Haul Roads

The effect upon the environment caused by extraction of materials to be used in the project will be minimal. It is anticipated the fill material needed for embankments will come from excavation work all within the highway right of way. Surplus material will be used to construct berms, to replace material previously removed from borrow pits in local landfills or in other designated areas to be agreed upon by the contractor and the engineer in charge.

Aggregate for the asphalt and concrete will come primarily from existing commercial pits located in the Salt River. These pits have been in use and will continue to remain in use after completion of this project.

The State has designated an existing Materials Pit Serial Number 6083, located 0.3 mile east of Country Club Drive in the usually dry Salt River, as a possible source. This pit is situated on the Salt River Indian Reservation and negotiations are still being carried on. If an agreement can't be reached, another site will be selected. This pit would be used for borrow (special backfill), select material, aggregate base and mineral aggregate. Only light clearing of weeds would be necessary over the unused portions of the pit area. The pit contains stratified deposits of sand and gravel to undetermined depth and the quantity estimated for use is 100,000 cubic yards. Light blade work would be required to reshape 1,200 feet of haul road in the pit area. The average haul distance from the pit is approximately six miles.

The pit areas in the normally dry river will return to natural condition through natural water movement and revegetation created by storm runoffs and controlled storage lake releases.

During the construction period there will be additional noise, air pollution and traffic inconvenience and the odor of construction

materials. To ameliorate these impacts, trucks hauling premixed concrete and other trucks will be licensed to meet Federal, State and local standards for air and noise pollution control and will be held to legal load limits. Dust will be mitigated by appropriate sprinkling technique.

Impact of Freeway on Agriculture

Agriculture has been a major use of land in the area of the proposed Superstition Freeway. The deep alluvial soil has been excellent for production of general farm crops such as alfalfa, maize, cotton, wheat, barley, and sugar beets. It has also been utilized for citrus fruit production, however no orchards have been started in recent years. Cattle feed lot production has been carried on and one dairy has been operating in the area. Water has been provided by means of the Salt River Project and deep wells. Farming has not been carried on extensively east of Power Road resulting in prevailing Sonoran Desert conditions.

The Superstition Freeway project will hasten the removal of land from agriculture and conversion to urban development, a movement which has already begun. Information available in the planning offices in the Cities of Tempe, Mesa, Chandler, Gilbert, the town of Apache Junction and the Counties of Maricopa and Pinal indicates the area in the proposed freeway corridor will be removed from agriculture with or without the freeway development. Development of the freeway will probably serve to decrease leapfrogging, resulting in continuous development along the corridor.

Large land holdings are being converted from farming to planned communities, such as the Dobson Ranch (2,373-acre Dobson Ranch-

Continental Homes property near Dobson Road), the Farnsworth property (1,063-acre Dreamland Village between Signal Butte Road and Crismon Road) and the Turner Ranch (2,156-acre Leisure World - Golden Hills Community near Power Road).

The larger developments are able to provide their own sewerage and water systems. Urban development on smaller parcels of land is being delayed by lack of sewerage and water lines from nearby cities.

Land developers have either purchased the land or have expressed interest in purchasing most of the land located along the Superstition Freeway corridor and between Southern and Baseline Roads extending from the junction between I-10 in Maricopa County and U.S. 60-80-89 in Pinal County.

The farmers have shown an intent to sell based upon a variety of factors, such as settling estates and rising land evaluation accompanied by rising taxes. This trend is evident along many of the major roads in the Phoenix area of influence.

The present major agricultural development is approximately eight miles to the south of the study area in the Queen Creek area. Several thousands of acres are being devoted to stone fruits, pecan groves and more recently, pistachio nut groves. A private airport is being constructed near Chandler to provide expeditious movement of the fresh fruit to the markets in this country and abroad.

Impact of Freeway on Plant Life

The freeway construction is not expected to cause significant adverse impact upon the plant life in the area. The specific corridor does not contain rare plants and the species found there cover a broad area in the valley. The construction will cut across

some dry washes, disrupting some plant growth that requires more moisture, but this will take place in much greater extent as housing and commercial construction continues. No natural streams cross the corridor so there will be no involvement with water quality, quantity, or plant and animal life normally associated with moving water.

The contractor will be in touch with the Arizona Department of Agriculture and Horticulture, and in the event a few large cacti are removed they will be reused on the site where practicable. Every effort will be made to disturb natural vegetation as little as possible.

The freeway right of way will be treated as an open space and will be shaped and landscaped in keeping with the surrounding area. The soil surface will be left in a slightly roughened condition to trap and hold moisture and native plant seeds.

The landscaping technique of using suitable native or introduced plants with appropriate irrigation as introduced on the already completed portion of the Superstition Freeway will be continued where practicable and appropriate along the remainder to be constructed. Seeding with native plant species, including wild flowers, desert wheat and grasses will be accomplished where practicable.

Aesthetics

Design engineers and landscape architects have given unusual attention to the aesthetics of the Superstition Freeway. Their efforts have resulted in considerable praise by the local mass media of the freeway's design and landscaped features. In addition, a pedestrian bridge at College Avenue has won a national design award for structures of its kind.

Landscaping and design features incorporated in the completed section of freeway will be repeated, at least through Tempe. Here, the freeway will be depressed to lessen noise and visual pollution; earthen berms and slump block walls will aid in this regard while enhancing the aesthetical appeal of the freeway. Extensive use of native and cultivated plants will harmonize with the existing freeway landscaping scheme.

Design plans for the freeway through Mesa are incomplete. However, this section will traverse mostly farmland where developed sources of irrigation water will permit landscaping with varied plant types. Beyond Mesa, the freeway corridor penetrates open desert land devoid of developed water. This section will probably be landscaped only sparingly, if at all, with native plant species and will generally be left in its native state.

While the freeway will intrude into eight miles of unspoiled desert landscape, that land is not high in scenic value. This project area is extremely flat and supports a rather uninteresting plant community visually dominated by Creosotebush. The more varied vegetation that has inspired descriptive terms like "lush" and "arborescent" for much of the Sonoran Desert barely begins to appear at the corridor's terminus.

Historic Places

The Superstition Freeway S.R. 360 corridor has been researched for potential impact to historic places and entities. The National Register of Historic Places was reviewed and a letter of inquiry was submitted to the State Liaison Officer at the Arizona State Parks Department. It is determined that there are no historic places in the proposed corridor.

(See letter from Arizona State Parks Department on Page 2-57.)

JACK WILLIAMS
Governor



STATE
PARKS

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April 17, 1973

Mr. Mason J. Toles
Division Manager
Environmental Planning
Division
Arizona Highway Department
1739 West Jackson Street
Mobile Unit #10
Phoenix, Arizona 85007

Re: Project F-028-1-201
Project F-028-1-202

Dear Mr. Toles:

In response to your letter of March 8, 1973 regarding your request for comments on the effect of the project on National Register of Historic Places; there are no National Register sites within the right-of-way. There are two potential nominations in the near vicinity. These are the Niels Peterson House at Priest and Southern Avenue and the Town of Guadalupe bounded by Baseline Road, Highline Canal, Interstate 10 and Saunders Aviation. However, these sites are located near the completed portion of Route 360.

Sincerely,


DENNIS McCARTHY
State Parks Director
State Liaison Officer
National Historic Preservation
Act of 1966

DM:DH:ag

RECEIVED

APR 18 1973

ARIZONA HIGHWAY DEPARTMENT
ENVIRONMENTAL PLANNING DIVISION

Social Factors

While the development of Phoenix was expanding, mostly northward, in the 1950's, Tempe and Mesa were experiencing only moderate growth. These cities were able to witness the uncontrolled expansion in the Salt River Valley's major growth area without being adversely affected. When the population growth trend began to move eastward, Tempe and Mesa were waiting to direct more orderly growth.

Benefits of this slower, more orderly growth were apparent when the Superstition Freeway was first proposed. Tempe and Mesa found they had open space for the freeway that would permit its construction without upsetting the social structure and institutions of each community. City planners took the cue and began planning much of their communities' future expansion around the proposed freeway corridor.

Educational Institutions

Description

Planning for schools has been given priority treatment. City and school officials for both Tempe and Mesa have chosen to build small elementary schools serving individual neighborhoods. They feel that children just out of a confined family environment adjust better to and are less intimidated by small schools. Thus, their self-identities and responses to teachers and peers alike are apt to be enhanced. In addition, schools located in individual neighborhoods enable children to walk to school and eliminate the need for extensive bussing.

Tempe officials have elected, where neighborhoods dictate, to construct elementary schools adjoining the Superstition Freeway right of way. Two such schools, Carminati and Evans, have been built along the existing freeway between Mill Avenue and Rural Road. Another, Arredondo Elementary

School, abuts the freeway right of way between Rural and McClintock Road while still two others are nearing completion next to the freeway corridor between McClintock and Price Road. See Figure 2-6 for school locations.

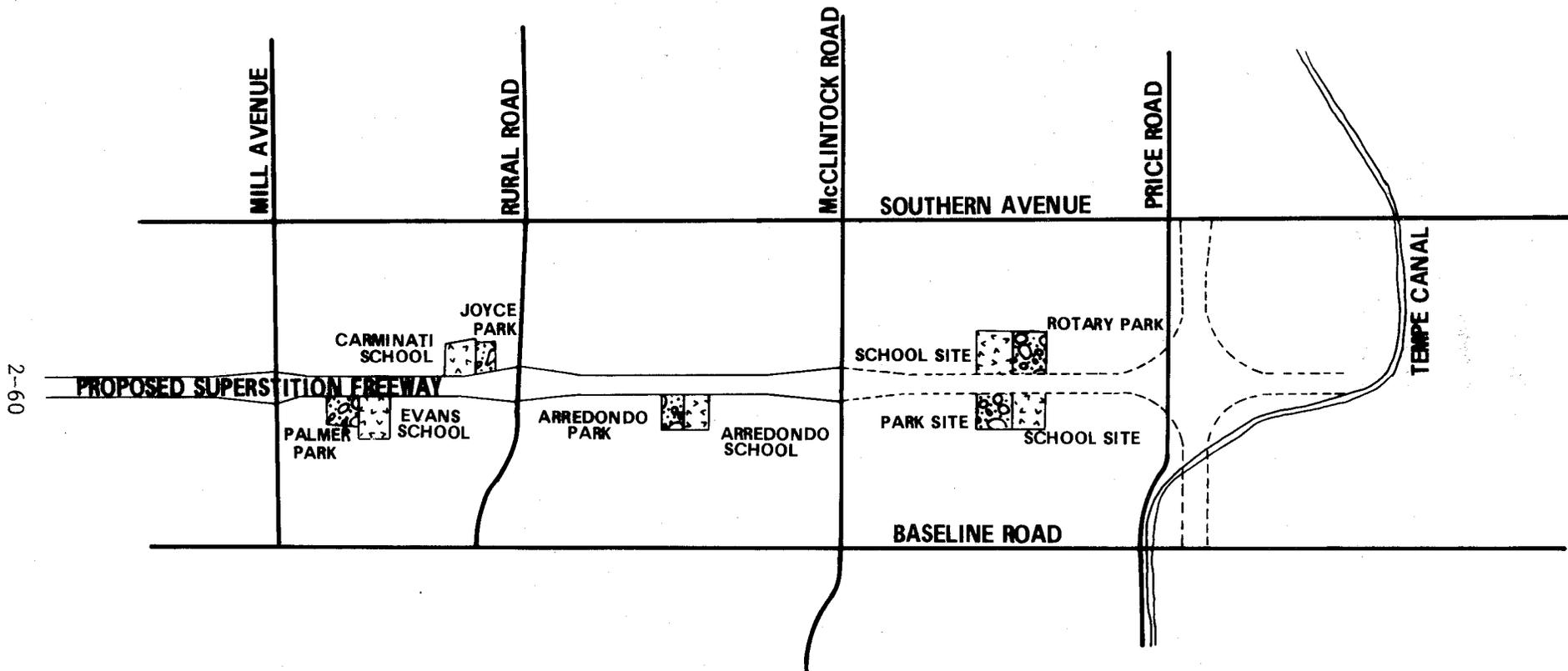
In Mesa, at least one elementary school is planned for construction next to the freeway corridor (and east of the Tempe Canal). Other public schools will be placed outside the zone of freeway influence. Mesa Community College, on the other hand, joins the Superstition Freeway right of way at Dobson Road.

The Apache Junction High School is the only other school along the Superstition Freeway corridor considered near enough to the right of way to be influenced by traffic. The high school property does not presently join the proposed freeway right of way, but the Apache Junction School District is negotiating for purchase of land that probably would abut the corridor.

Impact of Freeway on Educational Institutions

The fact that five public schools in Tempe will eventually abut the Superstition Freeway indicates that school officials do not view the freeway as undesirable to the welfare of students. On the contrary, the freeway is aiding plans of Tempe School administrators for building small neighborhood-oriented elementary schools. By following mid-section lines, the freeway is actually encouraging development of two small neighborhoods per land section (one on each side of the freeway). Without the freeway, larger neighborhoods would develop and in turn would require larger schools to serve them.

Where schools are being placed next to the freeway right of way, an added measure of safety for students is being provided. One side of each school ground will be completely closed to all traffic by a chain-link



Schools and parks abutting the Superstition Freeway corridor in Tempe

-  ELEMENTARY SCHOOL
-  CITY PARK

FIGURE 2-6

fence. The lower right hand corner of Figure 1-5 shows a portion of Evans School grounds separated from the freeway by such a fence. In most cases these schools will be served by only local and collector streets where traffic is minimal and students walking to school can avoid hazardous through traffic.

Earthen berms and the depressed design of the freeway in Tempe are effective in abating traffic noise near schools. A berm is shown in Figure 1-5 where the freeway passes in front of Evans School. School officials have reported there is no noise problem at the three elementary schools along the existing portion of the freeway.

Mesa school officials view the freeway as part of the exploding growth in Mesa and are planning schools to keep pace. Plans call for construction of at least one public school adjoining the freeway right of way. Furthermore, the Mesa School District would like to purchase property in a section of state land bounded by Baseline Road on the south and the Maricopa-Pinal County line on the east. Since the freeway route is planned through the center of this section, Mesa school officials apparently anticipate no conflict between the freeway and schools which may eventually be built here.

Perhaps the major adverse impact of the freeway on the public school systems will occur where students will have to be bussed across the freeway. However, schools are planned on both sides of the freeway so eventually students will not be required to cross. Bussing across the freeway is viewed as only a temporary problem.

Mesa Community College, which is a commuter college, will be more influenced by the Superstition Freeway than any other educational institution along the freeway route. Because of potential problems generated by

large numbers of commuting students, Mesa Community College was located in part to take advantage of the Superstition Freeway. It will relieve considerable traffic through Tempe and Mesa which students are increasingly adding to each year. In 1972, enrollment at Mesa Community College was 7,100; by 1980, it is projected to increase to 15,000. Access to the College will be enhanced by the freeway for most of these students, including many commuting from Mesa. About 40 percent of the student body resides in Mesa.

The impact the Superstition Freeway will have on Apache Junction schools is more difficult to predict. Although the student population of Apache Junction is increasing at about 18 percent per year, that school system is in its infancy compared to Tempe and Mesa. As such, Apache Junction officials should be able to plan locations for schools that would intelligently utilize the Superstition Freeway to best advantage.

The freeway will have little immediate effect upon Apache Junction Schools. Along the last eight-mile leg of the freeway corridor, practically all of the land between Southern Avenue and Baseline is undeveloped desert. Only the Apache Junction High School, located immediately north of the corridor at Vineyard Road, may be considered to be in the zone of freeway influence. However, its southern boundary is one-fourth mile from the freeway so that a major annoyance of some freeways, i.e., noise, will not be a problem here.

Recreational Facilities

Description

Tempe city planners are pursuing the currently popular approach of combining small neighborhood parks with school grounds. The advantages of such an approach are obvious: More economical use of land, shared facilities, mutual cooperation in maintenance, etc.

Three small city parks abutting the Superstition Freeway currently serve the Tempe public. These three, Palmer, Joyce and Arrendondo Parks, join Evans, Carminati and Arrendondo Elementary Schools, respectively. Potary Park, located between McClintock and Price Roads, also abuts the freeway right of way. A fifth park to be located next to the right of way will be developed in combination with a school across the freeway from Rotary Park. Park officials established the location of each park with full knowledge of the freeway location, and the existing parks were developed subsequent to establishment of the corridor. See Figure 2-6 for location of parks.

No other parks or recreational facilities are in such proximity to the Superstition Freeway. However, many parks of varying type and size will be served by the freeway to a degree dependent upon their locations. The same is true of nearby popular recreational areas east and northeast of the Salt River Valley. Included in this group are the Salt River chain of lakes (served by the scenic Apache Trail), Tonto National Forest, and the Superstition Wilderness Area, the closest wilderness to any major city in the continental United States.

Impact of Freeway on Recreation

No parks will be physically encroached upon by the freeway right of way. The combination parks-school grounds in Tempe will be closed to access on one side where they abut the freeway. With noise abating berms being used along the Superstition and proper landscaping with abundant trees, shrubs, etc., these parks may actually be given a small degree of isolation in an urban setting. The closed access will also provide an added safety factor.

The Superstition Freeway will provide an important link between the outdoor recreationists of metropolitan Phoenix and their points of recreational interest. Much of Arizona's prime recreational land is located in the eastern half of the state and is accessible to most Salt

River Valley residents through Tempe, Mesa, and Apache Junction via U.S. 60-80-89. That route is congested with traffic throughout much of the year, especially in the winter months when out-of-state visitors flock to the Apache Junction area.

For persons having only a weekend to spend away from the Valley, time is of essence. The thought of traveling through Mesa and Apache Junction on Friday evening after work en route to northeastern Arizona probably forces many people to seek the only alternate route, State Route 87 via Payson. The availability of the Superstition Freeway will provide much greater access to those wishing to get to the ski slopes in winter, the camping grounds and fishing waters in summer, and the hunting areas in fall.

For those traveling south and southeast, the logical route is Interstate 10. However, if one is contemplating a more leisurely trip south, such as to Tucson or Nogales, U.S. 80-89 through the Pinal Pioneer Parkway offers considerably more picturesque scenery on a low-traffic volume but well-maintained highway. The Superstition Freeway will provide better access to this highway section and will encourage more people to use it, especially those interested in viewing one of the best examples of lush Sonoran Desert vegetation in the state.

As the human population expands along the freeway corridor, increasing pressure will be applied to outdoor facilities available in the nearby Tonto National Forest and at the Salt River lakes. Increased use of the Superstition Wilderness Area (administered by the Tonto National Forest) will also likely occur, at least to a finite level. Should recreational use reach a level incompatible with the wilderness concept, entrance permits will in all likelihood be issued by the Tonto Forest to control

the numbers of people entering the area.^{1/} Thus, although the Superstition Freeway may indirectly contribute to increased use of the Superstition Wilderness Area (by accelerating nearby urbanization), proper management will insure maintenance of the wilderness in its intended state.

The Superstition Freeway will eliminate some opportunity to hunt small game along and near the project roadway. In the cultivated portion of the corridor, shooters seeking doves flying from citrus groves to grain fields will find their shooting zones more restricted and eventually eliminated as urbanization progresses. Limited hunting for doves, jack-rabbits, and in wet years, Gambel's quail, will also be reduced in the desert portion of the freeway corridor.

Religious Organizations and Facilities

Description

The Tempe First Church of the Nazarene is the only church structure in the zone of freeway influence. Its southern property line falls a few feet within right of way needed for the west-bound off ramp at the Rural Road Traffic Interchange. At the time of construction three years ago, church officials were aware that the Superstition Freeway would abut the southern property line of the church. Architects considered noise impact from the freeway and designed the church to ameliorate any annoying noise that may be generated by traffic.

The Church of Jesus Christ of Latter-Day Saints owns farmland in the freeway corridor. As part of its Permanent Welfare Fund, the church farms 79 acres of land near the project area between Stapley Drive and Gilbert Road. Crops grown here are used primarily to feed a church-owned dairy cattle herd.

^{1/} Personal communication from Fred J. Wirth, Supervisor of the Tonto National Forest

Impact of Freeway on Religious Facilities

The Superstition Freeway is not expected to have any significant impact on the Tempe First Church of the Nazarene. The few feet of church property that will be acquired will remove a small amount of parking space and will necessitate relocation of one church sign. Placement of the church with its back to freeway traffic and noise-abatement features of the depressed freeway should attenuate any serious noise problem. Access to the church via the Rural Road Traffic Interchange will be enhanced.

A 300-foot right of way north of the freeway centerline will remove about nine acres of farmland from the Church of Jesus Christ of Latter-Day Saints' welfare rolls. However, the church has farmland in sufficient quantity elsewhere so that this amount is not considered significant.

Hospitals

Description

Among health facilities, only the new 274-bed Desert Samaritan Hospital will be significantly affected by the Superstition Freeway. The hospital, dedicated on March 25, 1973 is located west of Dobson Road and north of the freeway corridor.

Impact of Freeway on Hospitals

The Desert Samaritan Hospital was located next to the proposed freeway purposely. The traffic interchange at Dobson Road will make the hospital much more accessible and will prove particularly vital in emergency cases. As the hospital realizes its expansion capabilities to one thousand beds, ready access will become even more important.

Distance between the freeway and the hospital (about one thousand feet from the main building) is sufficiently great to mollify any excessive noise levels which could be a potential problem with a facility as sensitive as a hospital. Another potential problem, exhaust fumes from traffic, will likewise be solved with a sophisticated air filtering system to be employed in the hospital.

Community Cohesion

Description

Until the 1950's, Tempe could still be identified as a free-standing independent community. Since then, however, the mushrooming population of the Phoenix urban area has made Tempe an integral part of the whole metropolitan region. Tempe alone experienced a population increase from nearly 24,000 in 1960 to over 63,000 in 1970.

The rapid growth of Tempe is reflected in mobility statistics of its citizenry. Of 18 geographical districts surveyed in the metropolitan Phoenix area in 1971, Tempe experienced the greatest percentage (75%) of residential changes for the previous five years of any district.^{2/} Most of the household changes involved people moving into Tempe from other areas.

With this continued immigration and ever increasing absorption into the stream of affairs of metropolitan Phoenix, it is probably inevitable that Tempe's community cohesiveness will be diminished. The large numbers of new residents may not have a particularly strong identity with the community. Certainly the days when Tempe was a sleepy little college town where the lives of everyone were intertwined are long gone.

Nevertheless, Arizona State University is still the focal point of Tempe. More than any one factor, the University is the binding force of

^{2/} Phoenix Newspaper, Inc., "Inside Phoenix '72," Phoenix, Arizona - 1972.

the community, and it will continue to be so, especially for those associated with the University and living in Tempe.

Many other people living in Tempe are there because it is a pleasant, clean, well-ordered community devoid of many problems associated with bigger city living. The Superstition and Maricopa Freeways provide easy and fast access into Phoenix where jobs await many of them. According to statistics compiled by the Arizona Employment Security Commission, almost 38 percent of Tempe workers in 1970 had jobs in Phoenix. For these people, involvement with the socio-political life of Tempe is probably not as great as with many others in the city.

The recent growth and early image of Mesa are much the same as for Tempe. Mesa still retains vestiges of a once small, farming community, yet finds itself in the midst of a population boom. Although Mesa's population increased from nearly 34,000 to 63,000 during the 1960's, farming remains an important part of Mesa's economy.

The influence of agriculture on Mesa is fast disappearing, however, with accelerating conversion of farmland to urban land uses. This transition from an agricultural to urban setting symbolizes the diminution of cohesive community bonds inherent in large urban areas.

The major thrust of urban expansion in Mesa is eastward along a corridor north of the Superstition Freeway right of way. Most of the people moving into this new growth area are newcomers to Mesa. Statistics show that 73 percent of Mesa's households moved there in the five years prior to 1971.^{3/} Thus, as in Tempe, most of Mesa's new residents probably have not had sufficient time to develop strong identity with the community.

The socio-political rather than the physical structure of Mesa probably asserts the greater dominance over the community cohesiveness. Of particular importance is the influence of the highly organized,

^{3/} Phoenix Newspapers, Inc., "Inside Phoenix '72", Phoenix, Arizona, 1972

family-oriented Mormon Church. Although only 23 percent of Mesa's households belong to the Mormon Church, its influence on the community is pervasive and accounts largely for Mesa's still stable, cohesive image.

Apache Junction has had too brief a history and lack of a stable population to have developed a strong sense of community identity. The first post office was not established until 1950, and the town was still unincorporated through early 1973. Perhaps as much as anything, the failure of Apache Junction residents to reach an early accord on incorporation indicates the independent nature of its citizenry.

The economy of Apache Junction, based almost exclusively on recreation and retirement, is sustained largely by retirees and winter visitors. Their ties with Apache Junction are expectably more tenuous than other residents. On the other hand, Apache Junction's businessmen and some year-round retirees provide a stabilizing influence on the town's affairs and form a nucleus interested in developing a more cohesive, economically diversified community.

Impact of Freeway on Community Cohesion

Although the Superstition Freeway is essentially an urban freeway, its routing through an unobstructed corridor precludes the necessity of disrupting established neighborhoods. Residential developments have formed on both sides of the freeway corridor in Tempe independent of one another. Typical neighborhood bonds have thus been prevented from forming between subdivision units facing one another across the freeway.

The feelings of identity with the community are probably not well developed yet in the new neighborhoods. The chance that they will be are probably better for those north of the freeway. Tempeans living south of the freeway are apt to experience some feeling of detachment from the

main body and nerve center of Tempe. For many of them the Superstition Freeway may well serve as a psychological barrier merely contributing to their choice of uninvolvement in community affairs. This trend will continue with increasing population, especially in Tempe's major growth area south of the freeway.

Unlike Tempe, the major growth area in Mesa is north of the Superstition Freeway. As such, the freeway will not present a psychological barrier to community involvement for most Mesans. Rather, its major impact on community cohesion will be its accelerating influence on growth, which, in itself, contributes to diminished feelings of community identity.

It is unlikely the Superstition Freeway will have much effect on the cohesiveness of Apache Junction, at least not as it now exists. The town's present life style and population composition do not dictate an environment conducive to a closely-knit citizenry.

Impact of Freeway on Public Emergency Services

The Superstition Freeway should cause little or no disruption of services provided by police and fire departments and ambulance companies. They will find access to accidents, fires, etc. assured through the continuation over or under the freeway of all existing cross streets, at least from Rural Road to Gilbert Road. Federally approved plans for this eight-mile segment call for grade separations at every section line street and at three mid-section streets.

Beyond Gilbert Road, plans are incomplete but probably will provide for grade separations at mile intervals to Ellsworth Road, a distance of nine miles. In the last eight-mile segment, three grade separations are currently planned.

Increasing urbanization along the freeway corridor make it imperative that public emergency services have ready access across it. Arterial and collector streets crossing the freeway a maximum of one mile apart should adequately provide that access. In the last eight-mile segment, grade separations will probably be incorporated into final design plans as urbanization there proceeds and existing desert "trails" are upgraded into arterial and collector streets.

Perhaps the only negative impact of the freeway on public emergency services will occur during the construction. During that stage, detours and construction activity may at times impede policemen, firemen, and ambulances in reaching their emergency destinations. On the other hand, the completed freeway will aid emergency hospital cases because of the proximity of the Desert Samaritan Hospital to the freeway.

ARCHAEOLOGICAL RESOURCES REPORT
ARIZONA HIGHWAY DEPARTMENT PROJECT
F-028-1 SUPERSTITION FREEWAY

The following report has been prepared by the Arizona State Museum, University of Arizona, Tucson, at the request of the Environmental Planning Division of the Arizona Highway Department as an aid in identifying the impact of the proposed improvement on the archaeological resources of the region. Data presented have been gathered from two primary sources:

- a) archaeological survey of all areas to be utilized in construction, and
- b) archival and published material pertaining to the prehistory of the Salt River Valley and the Superstition Mountains region. Included as an appendix to this report is an inventory of all sites directly affected by construction.

Archaeological Background Information

The Superstition Freeway (State Route 360) spans a distance of approximately 27 miles from Interstate 10 east to a junction with U.S. 60-80-89 just east of the community of Apache Junction. The first section of this highway, from I-10 to Rural Road, has already been constructed. This report is therefore concerned with the remaining 25 miles of the freeway from Rural Road east. The following construction and right-of-way projects are involved:

- F-028-1 (2) Rural Rd.-Dobson Rd. (C)
- F-028-1 (6) Dobson Rd.-Jct. S.R. 87 (C)
- F-028-1 (3) Jct. S.R. 87-Gilbert Rd. (C)
- F-028-1-603 Gilbert Rd.-East (RW)

To put this archaeological resources report into its proper context, the following brief synopsis of Hohokam archaeology has been included.

The Salt River Valley, in the vicinity of Phoenix, Tempe, and Mesa, is today the fastest growing and most densely populated area in the state.

Homes, shopping centers, roads, airfields, and farms rest upon the remains of what was by prehistoric standards an equally important and densely populated part of Arizona. Known to many as the Hohokam, these people lived in the Salt River Valley for some 1500 years, developing a highly organized and complex culture.

Arriving in the valley about the time of Christ, the Hohokam lived in villages along the Salt and Gila rivers. They were an agricultural people who made their living by gathering what they could from the natural vegetation and by farming the rich lands bordering the rivers. For the first 1000 years of their occupation of the Salt River Valley, the Hohokam lived in villages of various sizes made up of pithouses. Sometime around A.D. 1100 a change, possibly brought about by the arrival of a different group of people in the area, began to occur. Houses were constructed in blocks of rooms surrounded by large compound walls, and pithouses changed to surface rooms with joined walls. Large artificial mounds of earth, constructed in some cases over superstructures of adobe-walled rooms, began to appear in numbers. Sites became large, approaching city-like proportions, and were found in great density all over the valley. Irrigation systems were enlarged and expanded, bringing more land under cultivation. Then suddenly these great sites were abandoned, and by the middle of the 15th century the population had diminished greatly - the cities and canals fell into disuse and ruin.

Anglo settlers arriving in the 19th century were amazed by the great ruins found all over the valley. As their interests were largely agricultural, they began to farm the same land once farmed by the Hohokam. In some cases the old canals were cleaned out and reused to water the modern fields. The cities of Phoenix, Tempe, and Mesa were founded and

began to grow. As they did, and as more land around them came under cultivation, the Hohokam sites began to disappear under fields and houses. When the growth of the cities accelerated in the 1920's and 1930's, so did the destruction of the sites. Fortunately for today's archaeologists, two Phoenix resident O. A. Turney and Frank Midvale, had the foresight to map and name the more prominent ruins and canal systems in the Salt River Valley as they were visible in the 1920's. Although the sites are now covered by houses and farms, we do know their locations, and can help judge whether or not future developments will affect them.

Unfortunately, at that time, there were few archaeologists in the area who could take on the problems of excavating, salvaging, or preserving the sites, and they continued to be lost to urban and rural expansion. This process continues today, although at last archaeologists are in a better position to help minimize the effects of this expansion.

Despite this great wealth of sites, there have been few major excavations in the Salt River Valley. The Hemenway Expedition of 1888 explored Los Muertos, a large village northwest of Chandler, as well as several smaller sites--results of this work were finally published in 1945. In the 1930's excavations were conducted at Pueblo Grande in Phoenix. While this site was preserved as a city park, there has been almost no published material on the work there. Recently, Highway Salvage excavations have been carried out on Mound 8 at Las Colinas, and a preliminary report has appeared in print. In recent years, Arizona State University has done small-scale work at a number of sites in the metropolitan area, although publications have not yet been released on most of this research.

It is interesting to note the fates or present condition of the three sites mentioned above, for they perhaps typify the story of most of the ruins which lie in the Salt River Valley. Los Muertos has fallen victim to expanding land cultivation, and now lies under cotton fields. Pueblo Grande, at least a small part of the site, has been preserved as a city park; outside the park the remainder of the site rests under houses, roads, and businesses, or has been leveled for other purposes. Mound 8 at Las Colinas is probably the sole survivor of an original group of 10 mounds comprising a single site--the rest were long ago leveled or built upon.

Another large site where only minor archaeological work was accomplished was La Ciudad. This site, in the heart of Phoenix, covered an area of approximately one square mile. It is now completely built over--the center of the site lies under St. Luke's Hospital. However, though the site has been leveled and built upon, at least part of it remains below the present ground surface. During the construction of the hospital archaeological remains were encountered at depths of up to eight feet. This is important to bear in mind, and will be more fully discussed in the following section.

Archaeological Survey Report

Intensive archaeological survey of the proposed right-of-way of the Superstition Freeway was carried out to determine whether or not archaeological remains would be affected by the freeway construction. This survey is documented in Highway Salvage records 1973-1 and 1973-4. Beginning at Rural Road in Tempe, the entire 25-mile long right-of-way was surveyed on foot. A total of six areas which contained evidence of prehistoric occupation were encountered--these have not been given Arizona State Museum site numbers as yet. The reasons for this are detailed

below, along with the particular problems presented in dealing with the impact of the Superstition Freeway on these prehistoric remains.

Of the 25 miles from Rural Road to the junction of the proposed freeway with U.S. 60-80-89, all but approximately nine miles have been or are still under cultivation. This farming has created a twofold problem with regard to the archaeology present in the area. First the destruction of the original land surface through leveling, plowing, harrowing, and other activities has made recognition of sites almost impossible. The sherds, flakes, and stone tools which are commonly used as surface indicators of sites have been buried, broken, and scattered, making identification of the site areas difficult. Since the actual size of a site, its chronological position, and possible content or nature were all impossible to assess, Arizona State Museum site numbers have not been assigned. Rather, those areas where some amount of artifactual material was found have been designated as "localities" and numbered sequentially.

A second problem encountered in cultivated areas was the fact that in several places crops were obscuring the ground surface. Fields in fallow or clover, cotton, or alfalfa and, in some cases, mature citrus groves, made survey impossible. Even if sites were present, they would be virtually invisible in these situations.

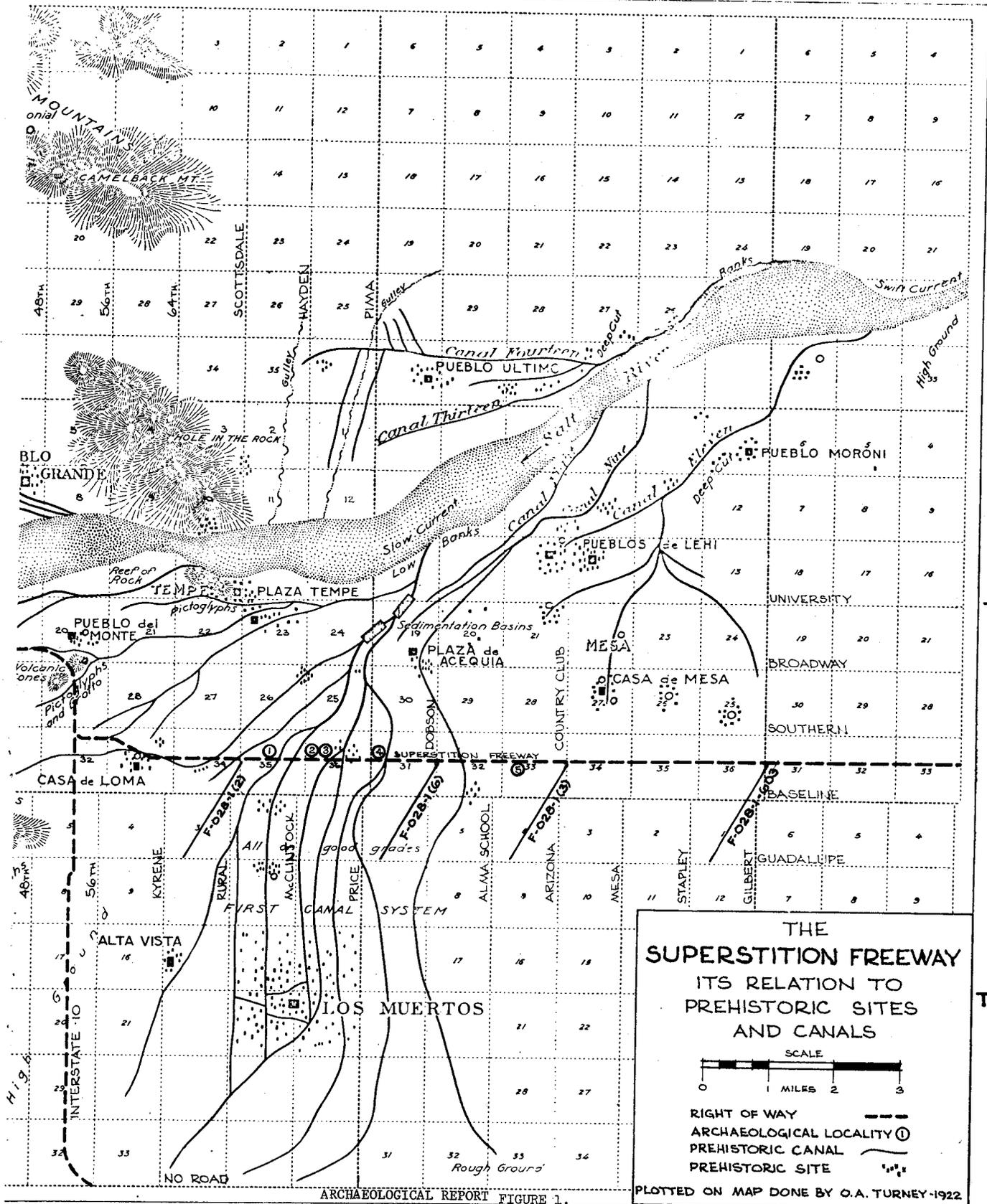
The six localities which have been defined are listed in the appendix at the end of this report. All were found in areas which have been or still are under cultivation, so all of them have suffered at least some damage. The first three localities, between Rural Road and Price Road may have undergone some additional disturbance due to construction-related activities. This section is no longer farmed, and parts of the right-of-way

have been used by local contractors as material sources and material dumps. Thus, some additional damage has been done to these sites, but its actual extent is unknown--it may be only superficial, or it may be total.

The remaining three identified localities are on land disturbed only by cultivation. In considering their archaeological value, two points must be kept in mind: first, at least part of a site disturbed by plowing should still be present below the "plow zone" (the depth to which the soil has been broken by plowing) if it had some depth to begin with. So while the surface and upper 12-18 inches of the site may have been broken up and scattered, features below this depth (houses, cremations, hearths, etc.) may survive intact. A second important point to consider is that archaeological remains may exist within the right-of-way which have not been recognized. In other words, sites may be present in certain areas but be completely unrecognizable due either to plowing or the presence of crops. We know for a certainty that this situation will occur in regard to a number of prehistoric canals. Figure 2-7 is an adaptation of a map done by O. A. Turney in 1922, on which has been added the right-of-way for the Superstition Freeway. Between Rural Road and Alma School Road at least six major canals cross the right-of-way--no evidence of any of these was found on the survey. However, simple plowing should do no more than obscure the surface indications of them, and there is every reason to believe that they could be found below the plow zone. It should also be noted that a small unnamed village is present in Section 36, T 1 N, R 4 E, between McClintock and Price. The right-of-way should cut the southern edge of this village. Unfortunately there has been additional disturbance in this section in the form of material dumping and borrowing by private contractors, so it is uncertain how much of this site is still

R-4E

R-5E



T-2N

T-1N

T-1S

intact. Scattered prehistoric trash was encountered here (see Localities 2 and 3, on page 2-81), but seemed to be in badly disturbed soil.

Summary and Recommendations

The proposed route of the Superstition Freeway from Rural Road to the junction with U.S. 60-80-89 bisects at least six prehistoric canals and six probable site localities. The location of this highway offers an opportunity to study portions of the Hohokam irrigation system and associated site areas in and near Tempe. This is quite important, for this city's rapid growth has rendered excavations of these once extensive remains all but impossible in the foreseeable future.

In order to properly assess the impact of the proposed construction on these archaeological resources, three alternatives or options must be considered:

- a) Relocation of the road to avoid these remains and preserve them intact for future study.
- b) Thoroughly investigate the remains through an intensive archaeological field program now.
- c) Permit construction to proceed without excavation.

The first alternative would be an illogical course of action for a number of reasons. The first section of the freeway from I-10 to Rural Road has already been constructed; moving the right-of-way of the section from Rural Road east would generate numerous problems and alterations. In addition, a "corridor" for the right-of-way has already been left in certain areas where housing developments have been constructed in the last two to three years. Relocation of the right-of-way would create major difficulties for homeowners and is totally unwarranted in regards to the archaeology present. In addition, the archaeological resources

remaining within the right-of-way have already suffered sufficient damage so as to make the desirability or value of preserving them "intact" questionable.

The third alternative is also undesirable. The continuing acceleration of man's desire to modify the surface of the land, whether it be housing developments, shopping centers, pipelines, golf courses, or freeways, has assured almost total destruction of the archaeological resources in a given region. This is especially true in the urban expansion of the metropolitan Phoenix area. To allow construction of this road to proceed without attempting to retrieve whatever information remains is inexcusable, especially since the mechanisms necessary to salvage these dwindling resources do exist.

To provide a means for scientific study of these archaeological resources before construction is the obvious alternative. The Arizona Highway Department has most adequately provided for this alternative in the past and will continue to do so. Due to the nature of the remains located within the right-of-way of the Superstition Freeway, a series of test excavations is recommended for the localities listed in the Appendix. These tests should determine the extent of the prehistoric remains and whether additional excavations on a large scale will be necessary.

The impact of the Superstition Freeway on the archaeological resources of the Salt River Valley cannot, at this time, be considered great. The paucity of cultural material located during the survey and the extensive damage already done indicate that construction of the road can be considered as essentially beneficial. It will provide the only means whereby these remains, once thought lost, can be used to augment our knowledge of the "First Masters of the American Desert."

APPENDIX A

Locality	Approx. Station	Description	Evaluation
1	154	Isolated remains centered around a cattle guard on the centerline west of McClintock Ave. by .5 mile. It appears that cutting and filling operations within the right-of-way prior to the survey largely if not completely destroyed the site.	Test excavation w/ backhoe 15 hrs.
2	190	Scattered remains located within the right-of-way between McClintock and Price, approximately 75-100 yards east of McClintock. Probably already partially destroyed by prior cutting, borrowing, and a drainage ditch. Part of the site may extend north into a field which was in fallow at the time of the survey	Test excavation w/ backhoe 15 hrs.
3	195-200	Scattered artifacts located on the centerline roughly 1/4 mile east of McClintock. Site badly disturbed by cutting, dumping, and filling on the right-of-way--site may be totally destroyed.	Test excavation w/ backhoe
4	232-245	Scatter of artifacts located in plowed field as yet undisturbed by construction activities. Site area is basically in western 1/4 of section between Prince and Dobson. Plowing has scattered and buried the artifacts, but may have left a good portion of the site undamaged.	Test excavation w/ backhoe 20 hrs.
5	360-365	Fairly concentrated remains located between Alma School Road and S.R. 87. Artifacts are situated on the southern edge of a huge excavation (flood control, borrow pit?); this undoubtedly destroyed part of the site. The southern or remaining part shows only superficial damage from cultivation.	Test excavation w/ backhoe 15 hrs.
6	775-778	Scatter of historic and prehistoric artifacts located in orange grove approximately .4 mile west of Recker Road in eastbound lane. Area disturbed only by cultivation at present.	Test excavation w/ backhoe 10 hrs.

Noise Considerations

The Route 360 Freeway will introduce noise levels above those which now exist at most points along the route's corridor.

Table 2-2 sets forth the maximum noise levels expected at the edge of the freeway right of way during the period 1990-1995. It should be noted that these projections indicate the L_{10} (the noise level which is not exceeded more than ten percent of the time during the noisiest hour of the day) which will be experienced at the noisiest point along each segment of the freeway. In some sections these L_{10} levels are of very limited geographic occurrence because of the geometrics of the proposed freeway. It should also be noted that noise from heavy trucks is the controlling factor at ALL points where unabated noise levels exceed federal standards. However, it is reasonable to assume that truck noise levels will eventually be restricted through legislative action. Whenever this occurs, overall noise levels resulting from traffic on the Route 360 freeway will be noticeably reduced.

Where noise reduction is attributed to the use of noise abatement barriers, a barrier height of ten feet is assumed. This is approximately the height of the barriers (walls and earthen berms) which are currently serving along the existing segment of freeway west of Rural Road. These barriers were designed and installed prior to promulgation of the current federal highway noise standards. At all points a ten-foot barrier can bring about at least marginal compliance with the standards. However, a very slight increase in barrier height (for example, to twelve or fifteen feet) can produce a substantial noise reduction at these points of marginal compliance.

Table 2-2
Noise Levels Adjacent to the
Superstition Freeway

	Average Daily Traffic (Vehicles)	Maximum L ₁₀ Noise Level at R/W line without barrier	Noise Level with 10' barrier See Note C	Federal Standard
Rural Road				
	71,000	76 dBA	65 dBA	70 dBA
McClintock Drive				
	64,000	75 dBA	64 dBA	70 dBA
Price Road				
	85,000	74 dBA	70 dBA	70 dBA
Dobson Road				
	81,000	74 dBA	68 dBA	70 dBA
Alma School Road				
	66,000	73 dBA	70 dBA	70 dBA
State Route 87				
	54,000	67 dBA	See Note A	70 dBA
Mesa Drive				
	51,000	73 dBA	70 dBA	70 dBA
Stapley Drive				
	46,000	72 dBA	69 dBA	70 dBA
Gilbert Road				
	40,000	71 dBA	65 dBA	70 dBA
Lindsay Road				
	35,000	71 dBA	65 dBA	70 dBA
ValVista Road				
	32,000	70 dBA	65 dBA	70 dBA
Higley Road				
	22,000	69 dBA	See Note A	See Note B
Power Road				
	18,000	68 dBA	See Note A	70 dBA
Ellsworth Road				
	14,000	67 dBA	See Note A	70 dBA
US Highway 60				

L₁₀ is the noise level which is exceeded only 10% of the time during the peak traffic hour.

Note A: Noise levels in compliance with federal standards are achieved at all points in this section without noise-abating barriers.

Note B: In this area no activities requiring reduced noise levels occur.

Note C: The use of earthen berm noise barriers is assumed. Because wall barriers can be placed on the right-of-way line, they offer somewhat more noise reduction in some cases.

No tracts of land requiring particular serenity will be affected by the freeway. It will, however, be necessary for local governmental agencies to prevent the occurrence of such areas adjacent to the freeway through use of their planning and zoning powers.

Local governmental agencies should also prohibit the construction of elevated exterior activity areas adjacent to and facing the freeway because such areas cannot be easily shielded from the freeway noise. Such areas would include second-story (or higher) balconies on homes, apartments, motels, etc.

The City of Tempe, on February 8, 1973, passed and adopted Arizona's first local noise limitation ordinance. As currently written, this ordinance would not affect the Route 360 Freeway except to prohibit the use of noisy construction implements and processes between the hours of 7:00 p.m and 7:00 a.m. This means that the normal practice of starting construction shortly after sunrise during the hot summer months would not be permitted. The present ordinance deals only with the noise of individual vehicles and would not apply to the noise levels generated by high freeway traffic volumes. However, because the City of Tempe regards the whole ordinance as essentially unenforceable, it may be expected that a new noise ordinance will follow in due course.

Air Pollutant Emissions

An investigation was made to determine air pollutant emissions from vehicle sources and the impact of these emissions on the air quality along the freeway corridor and arterial streets.

Seasonal variations of meteorology and air quality for the Phoenix Metropolitan area 1972 are presented in Tables 2-3, 2-4, 2-5, and 2-6.

TABLE 2-3
SUMMARY OF METEOROLOGICAL AND
AIR QUALITY FOR WINTER, 1972

HOUR	WIND DIRECTION DEGREES FROM NORTH	WIND SPEED METERS/SECOND	HC	HC	CO	CO	NO ₂	NO ₂
			WEEKDAY MICROGRAMS/ CUBIC METER	WEEKEND MICROGRAMS/ CUBIC METER	WEEKDAY MICROGRAMS/ CUBIC METER	WEEKEND MICROGRAMS/ CUBIC METER	WEEKDAY MICROGRAMS/ CUBIC METER	WEEKEND MICROGRAMS/ CUBIC METER
0100	112.5	2.72	3936	3805	11,227	7790	75	56
0200	112.5	2.51	3739	3411	6644	5499	56	56
0300	112.5	2.92	2362	2558	5499	3437	56	56
0400	112.5	2.77	2362	2755	3551	2864	56	56
0500	112.5	2.72	1706	2821	2406	2979	56	56
0600	112.5	2.67	1837	2558	3780	2749	38	56
0700	112.5	2.67	2624	2624	8707	3895	38	38
0800	112.5	2.56	2558	2558	10,310	4468	56	56
0900	112.5	2.87	1771	1181	5499	1146	75	38
1000	112.5	2.77	1115	459	3093	458	75	38
1100	112.5	2.87	656	197	1833	115	75	38
1200	112.5	2.62	394	131	1489	0	56	19
1300	135	2.67	328	66	1031	0	56	19
1400	180	2.72	328	66	1146	115	56	19
1500	292.5	2.36	262	66	1260	229	38	19
1600	292.5	2.46	328	66	1833	458	56	19
1700	247.5	2.88	918	328	5499	2406	75	38
1800	292.5	2.57	1902	918	9165	5041	94	75
1900	292.5	2.06	3346	1706	13,289	7332	94	94
2000	247.5	1.79	4920	3018	15,695	9279	113	94
2100	112.5	1.75	5576	3214	18,444	11,341	113	94
2200	112.5	2.10	5970	3542	19,132	12,602	113	94
2300	112.5	2.41	5051	3805	15,351	10,310	94	94
2400	112.5	2.62	3936	3608	13,633	9852	75	75

TABLE 2-4
SUMMARY OF METEOROLOGICAL AND
AIR QUALITY FOR SPRING, 1972

HOUR	WIND DIRECTION DEGREES FROM NORTH	WIND SPEED METERS/SECOND	HC	HC	CO	CO	NO ₂	NO ₂
			WEEKDAY MICROGRAMS/CUBIC METER	WEEKEND MICROGRAMS/CUBIC METER	WEEKDAY MICROGRAMS/CUBIC METER	WEEKEND MICROGRAMS/CUBIC METER	WEEKDAY MICROGRAMS/CUBIC METER	WEEKEND MICROGRAMS/CUBIC METER
0100	112.5	3.44	1181	1246	3208	4926	75	113
0200	112.5	3.60	1050	918	2062	3551	75	94
0300	112.5	3.44	984	853	1489	2520	56	94
0400	112.5	3.65	722	918	916	2291	56	75
0500	112.5	3.75	722	525	916	1146	56	56
0600	112.5	3.75	787	459	2406	1031	56	56
0700	112.5	3.70	722	328	3437	687	75	56
0800	112.5	4.42	459	131	2749	687	94	38
0900	135	3.70	197	66	1604	573	56	19
1000	135	3.34	66	66	916	802	38	19
1100	135	3.34	66	66	573	344	19	19
1200	157.5	3.75	66	66	458	344	19	0
1300	247.5	4.06	0	0	229	115	0	0
1400	247.5	3.90	0	0	687	115	0	0
1500	247.5	4.72	0	0	458	229	0	0
1600	247.5	4.68	66	0	458	458	0	0
1700	292.5	4.47	66	0	687	229	19	0
1800	292.5	4.93	131	66	916	1031	19	19
1900	292.5	4.47	525	918	3208	5041	56	94
2000	247.5	3.49	1115	2230	5041	10,769	75	132
2100	247.5	2.82	1443	2821	6186	14,091	75	151
2200	67.5	2.93	1509	2886	6186	14,205	75	151
2300	67.5	3.24	1443	3018	6186	12,143	75	132
2400	67.5	2.98	722	2034	5270	9279	75	132

TABLE 2-5
SUMMARY OF METEOROLOGICAL AND
AIR QUALITY FOR SUMMER, 1972

HOUR	WIND DIRECTION DEGREES FROM NORTH	WIND SPEED METERS/SECOND	HC	HC	CO	CO	NO ₂	NO ₂
			WEEKDAY MICROGRAMS/ CUBIC METER	WEEKEND MICROGRAMS/ CUBIC METER	WEEKDAY MICROGRAMS/ CUBIC METER	WEEKEND MICROGRAMS/ CUBIC METER	WEEKDAY MICROGRAMS/ CUBIC METER	WEEKEND MICROGRAMS/ CUBIC METER
0100	67.5	3.75	1050	918	2291	2635	94	75
0200	67.5	3.54	1050	918	2062	2062	94	56
0300	112.5	3.59	853	656	1375	1604	75	56
0400	112.5	3.39	787	394	1031	1146	75	94
0500	112.5	3.39	787	459	802	916	75	38
0600	112.5	3.08	722	525	1375	573	75	56
0700	112.5	3.18	525	328	2291	687	75	56
0800	112.5	3.34	262	199	1948	458	94	56
0900	112.5	3.18	199	66	1031	115	56	56
1000	135	3.13	66	66	687	0	38	38
1100	157.5	2.98	66	66	573	115	38	19
1200	225	3.24	0	0	687	0	19	19
1300	247.5	3.59	0	0	802	115	19	19
1400	247.5	3.95	0	0	687	115	19	19
1500	292.5	4.05	0	0	687	344	19	19
1600	292.5	4.11	0	66	229	573	19	19
1700	292.5	4.78	0	66	229	344	38	19
1800	292.5	4.57	66	66	344	573	38	19
1900	247.5	4.57	131	262	1146	1604	56	38
2000	247.5	3.85	656	394	2291	2864	94	75
2100	247.5	3.59	984	722	3895	3551	113	75
2200	247.5	3.80	918	918	3895	4010	94	75
2300	247.5	4.11	853	918	2979	2864	94	75
2400	292.5	3.54	984	984	3437	3093	94	75

TABLE 2-6
SUMMARY OF METEOROLOGICAL AND
AIR QUALITY FOR FALL, 1972

HOUR	WIND DIRECTION DEGREES FROM NORTH	WIND SPEED METERS/ SECOND	HC	HC	CO	CO	NO ₂	NO ₂
			WEEKDAY MICROGRAMS/ CUBIC METER	WEEKEND MICROGRAMS/ CUBIC METER	WEEKDAY MICROGRAMS/ CUBIC METER	WEEKEND MICROGRAMS/ CUBIC METER	WEEKDAY MICROGRAMS/ CUBIC METER	WEEKEND MICROGRAMS/ CUBIC METER
0100	112.5	2.46	1706	2099	6874	11,341	94	113
0200	112.5	2.56	1574	1837	5613	11,227	94	113
0300	112.5	2.36	1378	1902	4010	7332	75	94
0400	112.5	2.67	1574	2165	3208	7446	75	94
0500	112.5	2.67	1181	1902	2291	5728	75	94
0600	112.5	2.77	1509	1902	3895	5728	75	75
0700	112.5	2.88	1574	1050	7332	3666	75	75
0800	112.5	3.24	984	656	5384	2406	94	94
0900	112.5	3.59	394	197	2864	1260	94	56
1000	135	3.54	262	131	1375	458	75	38
1100	112.5	3.24	197	66	458	0	56	38
1200	135	3.29	131	0	458	0	38	38
1300	157.5	3.29	131	66	458	0	38	19
1400	157.5	3.49	131	66	573	0	38	19
1500	247.5	3.44	197	66	1031	115	38	19
1600	247.5	3.49	262	66	2291	573	56	38
1700	292.5	3.80	394	262	3780	2062	94	94
1800	292.5	3.44	722	787	5499	5613	113	132
1900	292.5	3.29	1246	1574	7676	8592	132	188
2000	247.5	2.46	1443	2034	7676	11,341	113	188
2100	292.5	2.56	1771	2296	8248	12,029	113	188
2200	247.5	2.77	1968	1902	8936	12,029	113	151
2300	247.5	2.41	2034	2558	8477	13,976	113	132
2400	112.5	2.46	1968	2690	7676	9623	94	132

Though not included in the above tables, atmospheric conditions range from stable overnight to moderately unstable during the day for winter months and moderately stable overnight to strongly unstable during the day for summer months.

The following procedures and data sources were used in computing air quality data and compiling information presented in the above referenced tables:

1. Annual average daily traffic forecasts for the study area were prepared by the Maricopa Association of Governments Transportation Planning Program. Traffic was then pro-rated on an hourly basis for both weekday and weekend and by season. Weekday peak hour traffic at 8 a.m. ranged from 9.99 percent of the average daily traffic in the fall to 9.3 percent in the summer. Weekend peak-hour traffic ranged from about 6.5 percent in the fall to 5.5 percent in the summer for the afternoon and evening hours (4 to 8 p.m.). Minimum traffic occurred between 2 and 4 a.m. on weekdays (less than 0.5 percent ADT) and 4 and 5 a.m. on weekends (approximately one percent ADT).
2. Vehicle speeds for freeway and city street traffic were adjusted for peak and off-peak periods. Average speeds ranged from 15 to 30 MPH for city streets and arterials and 45 to 60 MPH for the freeway.
3. Vehicle emission rates were obtained from the Federal Highway Administration R & D Report 72-34, "Motor Vehicle Emission Factors for Estimates of Highway Impact on Air Quality". This research was performed by the California Division of Highways using emission rates of California vehicles. Since the State of California has required vehicle emission controls for a longer period than Arizona, results of modeling for 1972 air pollutant concentrations (presented later) may not reflect the slightly higher emission rates of the average Arizona vehicle. These early controls on California vehicles will not affect computations for the 1995 air quality estimations.
4. The weather information, wind speed and wind direction, is a seasonal adjustment from information compiled by the U.S. Weather Station at Sky Harbor Airport, Phoenix, Arizona. Hourly stability classes were provided by the Arizona State Health Department and were adjusted on a seasonal basis also. It was assumed this meteorological data would apply to the year 1995 for the purposes of air quality estimations.

5. The ambient air quality information was furnished by the Maricopa County Health Department from analysis of air samples at their Roosevelt Street sampling site in Phoenix. These data reflect the air quality of the Phoenix area and contain an accumulation of all air pollutants.

Emission inventory data presented in the State of Arizona Air Pollution Control Implementation Plan of May 1972, (Revision No. 1) indicate that approximately 96 percent of the carbon monoxide in Maricopa County is from vehicle exhaust emissions. Seventy-one percent of the nitrogen dioxide and 42 percent of the hydrocarbons were also said to be related to vehicle exhaust emissions.

Since ambient air quality levels in the area of this project were not available at this time, the pollutant concentrations presented in the following tables, as the result of modeling, will reflect only emissions from the motor vehicles using the route under study and will not contain a correction for ambient air quality levels.

The applicable air quality standards are contained in Table 2-7 on Page 2-91. Air quality calculations using atmospheric dispersion formulae from the "Workbook of Atmospheric Dispersion Estimates", EPA Office of Air Programs, Publication No. AP-26, were made on the existing Route 360, Superstition Freeway, for 1972 and 1995 year traffic contributions. Result of these calculations are reported in Table 2-8 on Page 2-92.

The low initial traffic volumes and long distances from roadway to observer allows for good mixing of the air and dispersion of pollutants for the 1972 vehicle population mix.

By the year 1995 the vehicle emission rates will be reduced approximately 90 percent over the 1970 emission rates and would tend to negate an increase in air pollutants because of simple increases in traffic volumes.

Air quality calculations were also made for University Drive, Apache Boulevard, Broadway Road, Southern Avenue and Baseline Road.

TABLE 2-7^{1/}APPLICABLE AMBIENT AIR QUALITY STANDARDS^(a)

National Air Quality Standards			Present Arizona State Regulations				
Pollutant	Standard	Sample Basis ^(e)	Allowable Concentration		Sample Basis	Allowable Concentration	
			ug/m ³	ppm ^(d)		ug/m ³	ppm ^(d)
Particulates	Primary	Ann. Geom. Mean	75	--			
		Max. 24-hr. ^(b)	260	--			
	Secondary	Ann. Geom. Mean	60	--	Ann. Geom. Mean	60	--
		Max. 24-hr. ^(b)	150	--	Max. 24-hr.	100	--
SO ₂	Primary	Ann. Arith. Mean	80	0.031			
		Max. 24-hr. ^(b)	365	0.140			
		Ann. Arith. Mean	60	0.023	Ann. Arith. Mean	50	0.019
	Secondary	Max. 24-hr. ^(b)	260	0.10	Max. 24-hr.	260	0.10
		Max. 3-hr. ^(b)	1300	0.5	Max. 3-hr.	1300	0.5
CO	Primary & Secondary	Max. 8-hr. ^(b)	10000	9	Max. 8-hr.	7000	8.0
		Max. 1-hr. ^(b)	40000	35	Max. 1-hr.	40000	35.0
					Max. 7-day ave.	6000	6.9
Hydrocarbons	Primary & Secondary	Max. 3-hr: 6 AM-9 AM ^(b)	160	0.24	Max. conc.	80	0.12
NO ₂	Primary & Secondary	Ann. Arith. Mean	100	0.05	Ann. Arith. Mean	100	0.05
Photochemical Oxidants	Primary & Secondary	Max. 1-hr. ^(b)	160	0.08	Max. 1-hr. Peak Value	80	0.04
						150	0.075

Notes: (a) Standards marked with asterisk used for control strategy.

(b) Not to be exceeded more than once per year.

(c) Maximum 1-hr.

(d) At 25° C.

(e) Averages at the denoted time interval.

^{1/} Source: The State of Arizona Air Pollution Control Implementation Plan, May 1972 (Revision No. 1)

TABLE 2-8
AIR POLLUTANT EMISSIONS FROM MOTOR VEHICLES

TIME OF DAY	1972 WINTER SUPERSTITION (I-10 TO RURAL) SUPERSTITION TO RURAL ONLY			1995 WINTER SUPERSTITION (I-10 TO MILL) SUPERSTITION TO RURAL ONLY			1995 WINTER SUPERSTITION (I-10 TO McCLINTOCK) SUPERSTITION COMPLETED			1995 SUMMER SUPERSTITION (I-10 TO McCLINTOCK) SUPERSTITION COMPLETED		
	EMISSIONS 60 METERS FROM ϕ OF ROADWAY			EMISSIONS 60 METERS FROM ϕ OF ROADWAY			EMISSIONS 60 METERS FROM ϕ OF ROADWAY			EMISSIONS 60 METERS FROM ϕ OF ROADWAY		
	HC ug/m ³	CO ug/m ³	NO ₂ ug/m ³	HC ug/m ³	CO ug/m ³	NO ₂ ug/m ³	HC ug/m ³	CO ug/m ³	NO ₂ ug/m ³	HC ug/m ³	CO ug/m ³	NO ₂ ug/m ³
0100	9	59	5	6	46	3	7	57	3	4	32	2
0200	5	32	3	3	25	1	4	31	2	2	19	1
0300	3	19	2	2	15	1	2	18	1	2	13	1
0400	3	18	1	2	14	1	2	17	1	2	15	1
0500	4	23	2	2	18	1	3	22	1	3	21	1
0600	5	33	3	3	19	2	4	23	2	6	38	3
0700	19	126	11	11	73	6	14	89	8	7	47	4
0800	28	187	17	17	108	10	20	132	12	9	62	5
0900	14	91	8	8	52	5	10	64	6	6	42	4
1000	9	59	5	5	34	3	6	42	4	8	52	5
1100	8	54	5	5	37	3	6	46	3	11	82	6
1200	9	59	5	6	41	3	7	50	3	5	39	3
1300	12	79	7	7	55	4	9	67	5	2	16	1
1400	26	170	15	16	118	8	20	144	10	3	19	1
1500	12	78	7	7	54	4	9	66	5	4	28	2
1600	14	95	9	8	55	5	10	67	6	5	30	3
1700	18	121	11	11	70	6	13	86	8	5	33	3
1800	26	170	15	15	99	9	18	120	11	6	36	3
1900	27	178	16	16	103	9	19	126	11	4	25	2
2000	39	248	21	25	196	12	30	240	14	7	54	3
2100	28	180	15	18	142	8	22	174	10	8	65	4
2200	31	202	17	20	159	9	25	194	11	7	57	3
2300	25	158	13	16	125	7	19	153	9	6	49	3
2400	18	118	10	12	93	6	15	114	7	6	49	3

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Results of the Southern and Baseline air quality studies are shown in Table 2-9 on Page 2-94. These values are much below the air quality standards given in Table 2-7 on Page 2-91. Therefore, further investigation of air quality will not be made unless the parameters change. Low traffic volumes and speeds higher than the other arterials under investigation resulted in the lower concentration of air pollutants.

Results of the University, Apache and Broadway air quality studies are shown in Table 2-10 on Page 2-95. Carbon monoxide and nitrogen dioxide were below the standards and were not included in this table. The hydrocarbon standard is primarily an upper limit to prevent the formation of smog. The national standard limits hydrocarbons to a three-hour average (6 a.m. to 9 a.m.) of 160 ug/m^3 . This is the approximate threshold value for the production of smog later in the day (sunlight is an essential part of the process). The Arizona standard for hydrocarbons is 80 ug/m^3 . Pollutant concentrations for various distances from the centerline of the roadway to the observer at various times of day were computed and compared to the State standard for hydrocarbons. The results show that emissions from the present-day mix of motor vehicles exceeds the standard but that the concentrations will decrease by the year 1995.

Although nitrogen dioxide was over 100 ug/m^3 for some hourly readings, the annual arithmetic mean of 100 ug/m^3 would not be exceeded. The State of Arizona Air Pollution Control Implementation Plan, "Transportation Control Strategies," April 1973, indicates an annual average of 59 ug/m^3 for nitrogen dioxide in the Phoenix area.

The FHWA R & D Report 72-34 also indicated that by the year 1986, the vehicle population will not contain significant number of vehicles older than 1975 models; thus, the overall lowering of emissions.

TABLE 2-9
AIR POLLUTANT EMISSIONS FROM MOTOR VEHICLES

TIME OF DAY	1972 WINTER SOUTHERN-BASELINE (I-10 TO DOBSON) SUPERSTITION TO RURAL ONLY		
	EMISSIONS 30 METERS FROM $\frac{1}{2}$ OF ROADWAY		
	HC ug/m ³	CO ug/m ³	NO ₂ ug/m ³
0100	22	146	10
0200	12	79	5
0300	7	45	3
0400	7	43	3
0500	9	58	4
0600	13	94	6
0700	51	359	23
0800	80	558	36
0900	40	283	18
1000	27	186	12
1100	24	163	11
1200	26	177	12
1300	37	250	16
1400	76	511	33
1500	35	233	15
1600	43	301	20
1700	54	375	24
1800	73	507	33
1900	73	508	33
2000	94	614	40
2100	69	447	29
2200	74	483	32
2300	58	378	25
2400	43	281	18

	1995 WINTER SOUTHERN-BASELINE (I-10 TO DOBSON) SUPERSTITION TO RURAL ONLY		
	EMISSIONS 30 METERS FROM $\frac{1}{2}$ OF ROADWAY		
	HC ug/m ³	CO ug/m ³	NO ₂ ug/m ³
	7	57	2
	4	31	1
	2	18	1
	2	17	1
	3	22	1
	3	27	2
	12	102	6
	19	159	9
	10	80	5
	6	53	3
	6	55	3
	7	60	3
	10	84	4
	21	174	9
	9	79	4
	10	85	5
	13	107	6
	17	144	9
	17	144	9
	28	238	11
	20	173	8
	22	186	8
	17	146	6
	13	110	5

	1995 WINTER SOUTHERN-BASELINE (I-10 TO McCLINTOCK) SUPERSTITION COMPLETED		
	EMISSIONS 30 METERS FROM $\frac{1}{2}$ OF ROADWAY		
	HC ug/m ³	CO ug/m ³	NO ₂ ug/m ³
	5	41	2
	3	23	1
	1	13	1
	1	13	1
	2	16	1
	3	25	1
	12	96	6
	14	116	7
	7	59	4
	5	39	2
	5	40	2
	5	44	2
	7	62	3
	15	128	6
	7	58	3
	8	63	4
	9	78	5
	13	106	6
	13	105	6
	20	174	8
	15	126	6
	16	137	6
	12	107	5
	9	81	4

TABLE 2-10
AIR POLLUTANT EMISSIONS FROM MOTOR VEHICLES

TIME OF DAY	1972 WINTER		1972 WINTER		APACHE TRAIL (MILL TO McCLINTOCK)			APACHE TRAIL (MILL TO McCLINTOCK)			UNIVERSITY (MILL TO McCLINTOCK)			UNIVERSITY (MILL TO McCLINTOCK)		
	APACHE TRAIL (MILL-McCLINTOCK)		APACHE TRAIL (MILL-McCLINTOCK)		WINTER 1972 SUPERSTITIION TO RURAL ONLY	WINTER 1996 SUPERSTITIION TO RURAL ONLY	WINTER 1996 SUPERSTITIION COMPLETED	WINTER 1972 SUPERSTITIION TO RURAL ONLY	WINTER 1996 SUPERSTITIION TO RURAL ONLY	WINTER 1996 SUPERSTITIION COMPLETED	WINTER 1972 SUPERSTITIION TO RURAL ONLY	WINTER 1996 SUPERSTITIION TO RURAL ONLY	WINTER 1996 SUPERSTITIION COMPLETED	WINTER 1972 SUPERSTITIION TO RURAL ONLY	WINTER 1996 SUPERSTITIION TO RURAL ONLY	WINTER 1996 SUPERSTITIION COMPLETED
	BROADWAY (PRIEST-McCLINTOCK)		BROADWAY (PRIEST-McCLINTOCK)													
	WEEKDAY	WEEKEND	WEEKDAY	WEEKEND	WEEKDAY	WEEKDAY	WEEKDAY									
	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³	HC ug/m ³
0100	52	114		305												
0200	28	87		233												
0300																
0400																
0500																
0600																
0700					119	9	11	340	27	32	131	16	10	375	45	28
0800					185	15	17	565	45	53	175	24	15	534	74	47
0900					93	7	9	305	24	29	103	12	8	338	40	25
1000																
1100																
1200																
1300																
1400																
1500																
1600																
1700																
1800		151		461												
1900	199	225	569	727												
2000	223	354	593	944												
2100	161	276	430	736												
2200	174	258	438	650												
2300	136	201	342	505												
2400	103	170	258	428												

Air pollutants emitted during construction activities will be controlled by the applicable Arizona Highway Department Standard Specifications Section 215-1 which allows for the control of dust. Section 107 binds the contractor to comply with all rules and regulations of the State of Arizona and any other governmental agency which may have jurisdiction. Chapter 6, Article 8, Section 36-789 of the Arizona Revised Statutes regulates open burning and Regulation 7-1 of the Revised Arizona Rules and Regulations for Air Pollution Control contains regulations for fugitive dust.

Water

Water is a valuable resource in the area occupied by the Superstition Freeway corridor. In fact, water is named the most valuable resource in portions of Pinal County in the study entitled "Impact of Declining Water Levels on Rural Communities in Pinal County, Arizona", by Dunlap and Associates, 1969. This study reveals water is being depleted and long-range plans should be implemented as soon as possible to conserve and replenish this valuable resource.

The Superstition Freeway will not directly affect water quality or quantity. However, the development of commercial, industrial, recreation and residential activities currently underway and projected for future development along the length of the freeway will constitute a continuous demand for water. The degree of this impact will depend upon the land usage and the sources of water used.

The area between Rural Road and Power Road has been, in general, agricultural requiring extensive irrigation. Of this, the land between Rural Road and Recker Road has been irrigated by surface water from the

Salt River Project furnished through irrigation canals. The area between Recker Road and Power Road has been irrigated from deep wells as has limited agricultural developments between Power Road and Ellsworth Road. The balance of the area to the Pinal County Line and on out to the junction with U.S. 60-80-89, southeast of Apache Junction, has not been in agricultural production partly because of water quantity and quality deficiency.

It is anticipated the new land use will consume less water than agriculture did where agriculture has been carried on. In this region deep wells have been the chief source of water for domestic use and in the areas not supplied by surface irrigation also have been the source for irrigation water. The Cities of Tempe and Mesa have been furnishing municipal water to limited portions of this Superstition Freeway corridor and this coverage will expand as the additional territory is annexed.

Major land developers constructing planned communities in the vicinity of this corridor feel they can provide adequate living accommodations, green spaces, golf courses and lake systems, all using less water than has been used in the past for agriculture. Irrigation of green spaces, golf courses, and replenishment of lake water will be provided in part by sewage effluent from sewage disposal systems being developed for immediate needs. Deep wells that produce water quality unsuitable for human consumption will also be used for irrigation and the lakes. These developments include the Lakes, a 463-acre community for 5,000 people; Dobson Ranch, a 2,195-acre community for 30,000 people in 10,000 dwelling units; Leisure World Golden Hills, a 2,150-acre community for 26,121 people in 13,465 dwelling units; and Dreamland

Village, a 1,063-acre community to accommodate 8,000 to 9,000 people in 4,200 dwelling units. Three of these developments are primarily for adults over 40 years of age who will consume less water than members of young families.

Underground water is obtained from wells with water level ranging from 250 to 500 feet. The level of underground water is dropping 7.4 feet a year in the entire Mesa Basin as water withdrawal exceeds replenishment from surface sources.

The Leisure World Golden Hills General Development Plan states the present water consumption for irrigation of crops in this area has been approximately six acre-feet/year. Considering the total property of 2,200 acres, the yearly water use would be 12,000 acre feet. All irrigation water comes from the existing wells on the property. The in-house water use, based on similar development at Laguna Hills, California, is estimated to be between 130 and 150 gallons per day per dwelling, or a total of 1,680 acre-feet/year for 10,000 dwelling units. One acre-foot is the equivalent of 326,700 gallons. Of the 2,200 acres included in the project, approximately 40 percent will be landscaped open space. The irrigation demand for the green areas will be six acre-feet/year or a total of 4,800 acre-feet/year.

The estimated water consumption for the total Leisure World Golden Hills project is as follows:

Present crop irrigation	+12,000 acre-feet/year
After proposed development	
Lakes, Seepage & Evaporation	350 acre-feet/year
Irrigation Use	4,800 acre-feet/year
Domestic Use	1,680 acre-feet/year
Reclaimed Waste Water	- 1,680 acre-feet/year
TOTAL	5,150 acre-feet/year ^{4/}

^{4/}General development Plan, Leisure World Golden Hills Environmental Planned Community - January 1972.

The Lakes developer estimates the water available, based upon past consumption by agriculture and considered available, 1,206,315,840 gallons, would be an amount more than eight to ten times the annual need for the residential development.

"The Comprehensive Plan, Water and Sewer Development, Pinal County, Arizona", submitted in December 1969 by the Ken R. White Company provides noteworthy data on the water situation in Pinal County. It quotes much information from a study entitled "Impact of Declining Water Levels on Rural Communities in Pinal County, Arizona", by Dunlap and Associates, 1969. Portions of these documents that are pertinent to the western Pinal County vicinity of the Superstition Freeway are referenced in the next few paragraphs.

The agricultural, mining, and population growth of Pinal County depends upon the availability of good water. The number of acres cultivated each year depends upon the amount of water available for irrigation.

Estimated water requirements for crops are as follows:

cotton	5.0 acre-feet/acre
sorghum grain	3.5 acre-feet/acre
barley	3.0 acre-feet/acre

Cumulative average change in water levels in feet in the Queen Creek Higley-Gilbert area has been as follows:

1940 = 0					
<u>1944</u>	<u>1949</u>	<u>1954</u>	<u>1959</u>	<u>1964</u>	<u>1968</u>
-11	-36	-76	-112	-142	-147 feet

The break-even pumping lifts for specific crops are as follows:

<u>Crop</u>	<u>With Government Supports</u>	<u>Without Supports</u>
Cotton	1,300 feet	378 feet
Grain Sorghum	267 feet	143 feet
Barley	259 feet	168 feet
Alfalfa	Not Applicable	252 feet

As the ground water level approaches the depths shown in this table, the land will be put out of production. Due to the declining water levels, the maximum agricultural potential has not been realized. It is expected that ground water depletion will continue and that the agricultural economy in Pinal County will continue to decline. Until an outside source of water is made available, water conservation practices are rigidly enforced and water rehabilitation for reuse is provided, the agricultural economy will not be stabilized.

Precipitation in Pinal County is a minor source of water. During the summer, the rain that falls on the desert usually is lost to evaporation. It is estimated that only 1.0 percent of the annual precipitation in the desert areas enters the ground water reserve. However, locally heavy rainfall amounts produced by high intensity thunderstorms will often cause flooding which can affect a large area.

"The Pinal County, Arizona Comprehensive Plan for Water and Sewer Development", December 1969 states: "Most of Apache Junction is served by franchised water companies. The wells, storage and distribution are adequate in the central Apache Junction area. Of the ten wells in the area, eight produce water with excess fluoride concentration. The wells, storage and distribution system in the eastern part of the community, Sections 12, 13, 24 and 25 are inadequate. There are many private water

systems throughout the area and many of the people must haul their own domestic water." In addition to the fluorides, many of the existing water wells around Apache Junction area exhibit excess concentrations of hardness (such as sodium carbonate), chlorides, nitrates and sulfate.

In the past 15 years the population growth has been accelerating and most of the growth is attributed to the retirement-type facilities. There are many low-cost home and mobile home developments. The major portion of the population is concentrated between the west Pinal County Line and the junction of the highway SR 88 (Apache Trail) and U.S. 60-80-89. Residential and commercial developments extend a mile north and south of Apache Trail.

As the area expands, the cost of providing water from the central area of Apache Junction could be prohibitive. New sources of water are needed which will meet the water quality standards of the Arizona Department of Health. The Apache Junction area is included in the Phoenix Junction area and is included in the Phoenix-Mesa Metropolitan District for water from the Central Arizona Project.

A lowering water table has been a limiting factor in availability of well water in the section of the Superstition Freeway corridor between Power Road and the junction with U.S. Highway 60-80-89. This drop in the water table has caused some wells to go dry and the water quality to deteriorate in others. New wells have been attempted but have not been drilled deep enough to be productive. Some residents, especially those in mobile homes, have resorted to hauling water for domestic use.

The Arizona Water Company which holds a franchise to supply water to Apache Junction and vicinity has found that good quality water is available at 450 feet below the surface along Southern Avenue. A spokesman for this

company stated they have one well located two miles east of Maricopa County line along Southern Avenue, which is 800 feet deep and is capable of pumping 1600 gallons per minute. The well is currently being held down to 450 gallons per minute to meet present user needs. The Arizona Water Company has requested water allotment from the proposed Central Arizona Project to meet the water needs in this area. The total water requirement along this portion of the Superstition Freeway corridor will increase as urban development takes place. However, the decreased distance between residence on business units will make the installation of utility lines much less expensive per unit than experienced now with widely scattered users.

Due to water limitations, farming has not taken over much of the desert land along the Superstition Freeway corridor in eastern Maricopa County and western Pinal County. As the freeway is completed, land developers will seek to construct residential and commercial facilities in this desert area and will be searching for water supplies which have not been used in the past. The Central Arizona Project will be looked at as a prime source for the needed water; however, "The Pinal County Arizona Comprehensive Water and Sewer Development Plan" states: "In the event that Central Arizona Project water is not available, an alternate source of approved domestic water for the Apache Junction area is from ground water in the Florence Junction area."

Bikeways, Hiking Trails and Equestrian Trails

General Discussion

Throughout the State of Arizona there is a desire on the part of residents and visitors to lead an active adventurous life and enjoy the out-of-doors. This is certainly true in the vicinity of Phoenix and will be much in evidence in the cities and communities situated along the Superstition Freeway. Here the sunny climate, relatively level terrain, and points of interest such as the Sonoran-type desert, parks, nearby mountains, commercial flower farms, diversified crop farm land and canals are conducive to enjoying the open air on a bicycle, by walking or on horseback for exercise. There is also a growing trend to use bicycles as an alternate means of transportation to school and to work.

Significant studies are now available to aid planners at State, county, and local community levels, in design, coordinating details and providing facilities that will give consideration to bicycling, hiking, and horseback riding. As the Superstition Freeway is designed and built the rest of the way between the present completed segment at Rural Road and its termination at U.S. Route 60 in Pinal County, coordination is already taking place and will continue as planning for this portion of S.R. 360 progresses.

Consultation with the planning departments of Maricopa County, Pinal County, Tempe and Mesa, and the Chamber of Commerce in Apache Junction, reveals the Superstition Freeway should present no adverse impact upon present or future plans for development of bikeways, equestrian trails or hiking trails. The canal system in Maricopa County will be prominent in planning the circulation system of trails and paths, especially for the equestrian activity. In the area of the Superstition Freeway, trails will

follow the maintenance roads along the Tempe Canal and the Consolidated Canal, and will therefore pass under the freeway structures bridging the canals. Some bikeways will parallel concrete walks along certain selected roads crossing over or under the freeway at the intersections.

After crossing the freeway corridor, these paths and trails will then tie in to collector streets and into major county and state bikeways, and the equestrian and hiking trails.

The City of Tempe has asked the State Highway Department to extend proposed five-foot-wide sidewalks to ten-foot-wide where Rural Road, McClintock and Price Roads cross the freeway. One bike path will proceed south on College Road to Southern Avenue and east to Rural Road and cross the freeway on Rural Road. This will be an improvement over the present route which requires bicycle riders to cross the freeway on the inclined overpass at College Avenue, a very attractive route for hikers but steep for bicycle riders. This is included in design consideration for the freeway. Consideration is also being given to the Tempe request for an additional 100-foot length of structure over the Tempe Canal which will provide ample space for trails along the east side of the canal. A bicycle path has been started along Baseline Road, east of McClintock.

The City of Tempe is asking developers to include bikeways along arterial roads. Major developers building along the Superstition Freeway corridor are making provisions for facilities to accommodate recreational use of bicycles, walking, and in some cases, horseback riding. The larger developments include, at this time, Rossmoor Leisure World - Golden Hills, Dreamland Village, Continental Homes Dobson Ranch, and The Lakes. Much of this activity in the larger projects will be carried on within their own areas but access to the larger network of bikeways, hiking and equestrian trails will be provided.

Canal parks have been proposed at intervals along the Maricopa County canal system which will include restrooms, food facilities and parking for bicycles. The Maricopa County Sun Circle Trail crosses under the Superstition Freeway along the maintenance road adjacent to the Consolidated Canal providing hiking and riding trails. An equestrian park is planned between Baseline and Guadalupe Roads along the east side of Tempe Canal. The Maricopa County Parks Department planners are coordinating with the State Highway District Engineer's Office to get a provision made for a bikeway, equestrian trail and a hiking trail along the Consolidated Canal where it will pass under the Superstition Freeway. The Maricopa County Parks Department is also working with the Central Arizona Project planners in an attempt to get a series of hiking and riding trails along the C.A.P. canals suggesting a fence between the canal maintenance roads and the trails in the interest of safety. Much work is yet to be done involving agreements, easements, dimensions, materials, etc. It is recognized that horses and bicycles should not be ridden near unguarded water in the canals, and that different surfaces are required for the two. A more firm surface is needed for the bicycles which may be provided by chemically stabilizing the soil surface or using other hard surfacing techniques. The horses and hikers prefer a more resilient or natural surface. Property rights are also involved.

The City of Mesa is coordinating with the City of Tempe in the planning for bikeways and trails. They are also coordinating with State and county agencies. They would like to see the extra one hundred feet right of way, proposed for flood and drainage control on the north side of the freeway going through Mesa, be used for a bikeway and trails. The City of Mesa planners have coordinated with Salt River Project to obtain

permission to route trails along the Salt River Project canal banks and even use some water for small parks.

Final planning has not been done and the City of Mesa is now in the process of possible annexation of additional area extending from Mesa's present eastern limits at Higley Road to Sossaman Road, and south from Main Street (Apache Boulevard) to Baseline. This would include a canal crossing near Recker Road under the proposed freeway (the Roosevelt Conservation District Canal).

The community of Apache Junction has not presented plans for trails but activity will increase if the community becomes incorporated, a move currently being petitioned. Pinal County has no plans in the making that would involve bikeways, equestrian or hiking trails in the vicinity of the Superstition Freeway. The Pinal County 1985 Development Plan provides for the establishment of a Parks and Recreation Commission and then provides for recreation in land-use planning.

The Pinal County Department of Parks and Recreation has prepared an "Appraisal of Potentials for Outdoor Recreational Development in Pinal County, Arizona," January, 1970. In this they point out there is a high interest in horseback riding and foresee associating it particularly with vacation ranches and hunting areas.

Guidelines

1. U.S. Department of Transportation PPM 21-23, "Bicycle Routes Along or Crossing Federal-aid Highways", dated March 14, 1973, states:

"This memorandum sets forth the policies and procedures of the Federal Highway Administration relating to the provision or inclusion of facilities for bicycle operation on Federal-aid highways and Federal fund participation in the cost of providing such facilities. Provision is also made for consideration of trails for equestrians, hikers and other nonmotorized transportation modes."

It is the policy of the FHWA to encourage the provision of bicycle trails as part of Federal-aid highway projects wherever conditions are favorable and a public need will be served. One of the several provisions to be met specifies the trail must be within the right of way of the Federal-aid highway. They recognize the bicycle as increasing in popularity as a means of recreation and a mode of transportation.

2. "The Comprehensive Plan - 1990, for Phoenix, Arizona", prepared by the City of Phoenix Planning Department, November 1969:

This plan recognizes recreation as a form of leisure behavior and points out the provision of park and recreation facilities is accepted as a public responsibility as only the government has the resources to acquire and allocate recreation resources and services sufficiently over the entire city. The facilities to meet these needs include user-oriented facilities such as miniparks, neighborhood recreation centers, community recreation centers, and special facilities such as local open spaces and park malls. Intermediate facilities would combine natural landscape features with man-made improvements for day-long or weekend outings, including district parks such as Papago and Encanto Parks and several multiple use areas. Resource-based facilities, like South Mountain Park, are selected for natural beauty and remoteness and will encompass complete resource areas including regional and semiregional parks, hiking and riding trails, the driving for pleasure system, historic areas and landmarks.

3. "A Parks Recreation and Open Space Study - Maricopa County, Arizona", prepared by the Maricopa County Planning and Zoning Department, September 1970:

This study points out there are 700 lineal miles of hiking and riding trails presently proposed in Maricopa County, 65 miles of which had been

developed by September 1970. On the basis of the recommended standard of 25 miles per 50,000 population, a total of 1,000 miles would be needed by 1990. Right of way acquisition and trail facility development still need considerable study. The incorporation of trails within a greater variety of multiple-use corridors appears to be a necessity. Figure 2-8 , Page 2-108, shows the hiking and riding trail plan. The main feature of these trails is the Sun Circle Trail encompassing a 110-mile loop in the Valley of the Sun. More than half of this trail utilizes the banks of the modern canal system by virtue of agreement with the Salt River Project. Radiating out from the circle are proposed primary and secondary trails which are designed to form connecting links with many city and county parks, thereby complementing the trails system within these parks.

This Circle Trail Route crosses under the proposed Superstition Freeway along the bank of the Consolidated Canal near Lindsay Road. It runs south of and parallel to Guadalupe Road, two miles south of the Superstition Freeway.

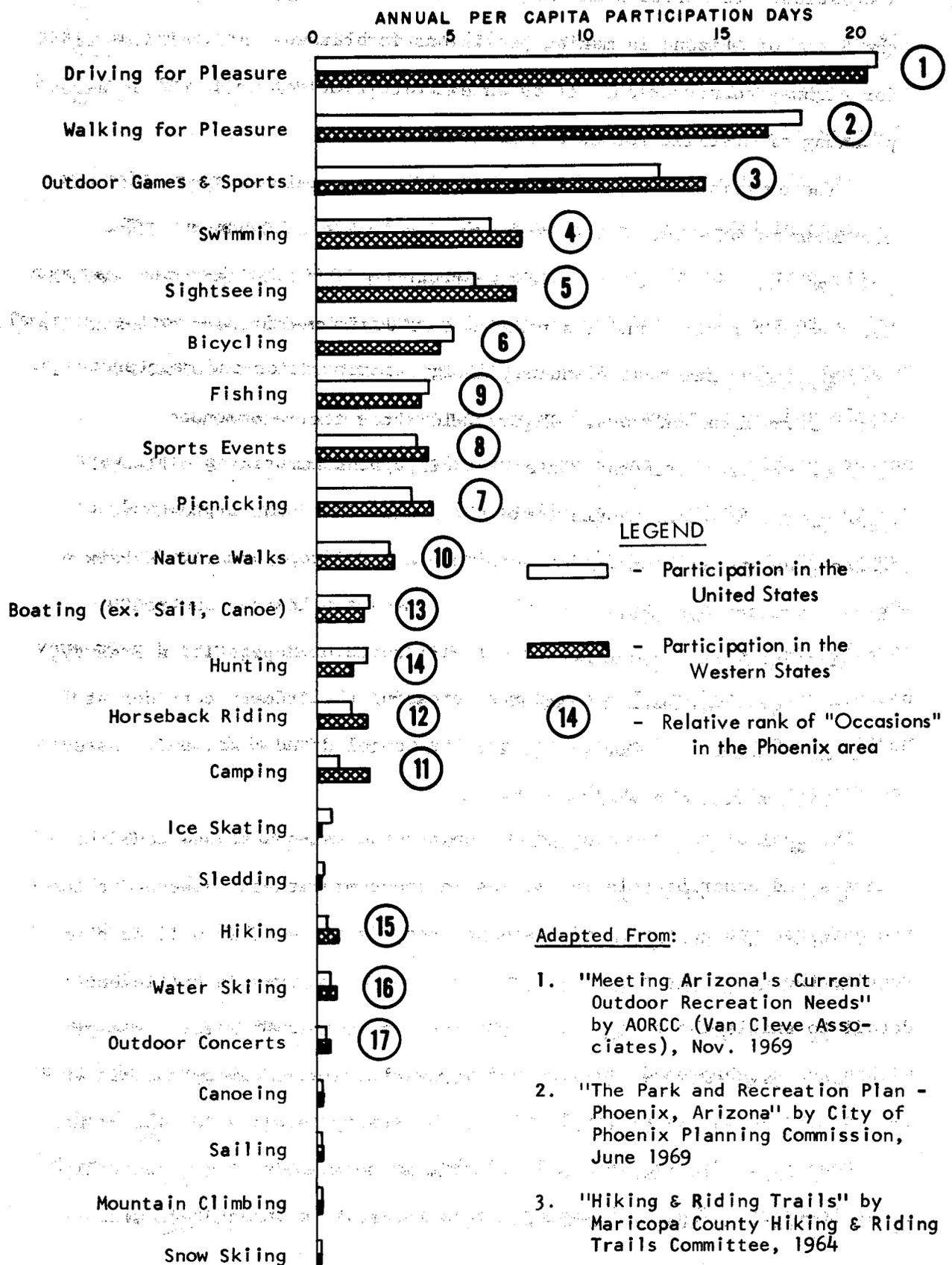
Figure 2-9, Page 2-109 reflects the annual per capita participation days of recreational pursuits carried on by people in the nation, in the West, and in Phoenix. In Phoenix, driving for pleasure ranks first, walking for pleasure is second, outdoor games and sports is third, sight-seeing is fifth, bicycling is sixth, and horseback riding is twelfth in seventeen categories.

4. "Arizona Bikeways", a study developed for the Arizona Highway Department by Bivens and Associates, Inc., Planning Consultants, February 1973:

This study was made in cooperation with the Federal Highway Administration, Arizona Outdoor Recreation Coordinating Commission, Bureau of Outdoor

WHAT AMERICANS DO MOST.....

In the Nation and in the West



Recreation. It reflects the high interest of the Highway Department and the State of Arizona in making provisions for bikeways in developing plans for highway construction. It is an excellent foundation for the detailed planning of specific routes and urban networks.

The objective is to implement a positive statewide program for the provision of bikeways where needed relative to State highways. The primary purpose of the study is to develop specific findings and recommendations to the State and its political subdivisions for the most economical, aesthetic and practical planning, design, construction and maintenance of bicycle and foot pathways. Figure 2-10 shows the recommended network of bike lanes and routes and bike paths comprising a bikeways system. Much of this route follows the Sun Circle Route proposed for equestrian and walking trails outlined in the Maricopa County, "A Park Recreation and Open Space Study". It provides a bike lane and route paralleling Southern Avenue, one-half mile north of Superstition Freeway, between Rural Road and Lindsay Roads, crossing the Freeway corridor at McClintock Road. A bike path follows the Consolidated Canal and crosses the freeway corridor with the Canal.

The goal of the recommended action program is to plan and construct bikeways and other bicycle facilities in the communities of the State for the safe use and enjoyment of residents and visitors. This will further require the development of local community bikeway plans in sufficient detail to enable the people of the State to be served by safer bikeways within the neighborhoods for community wide service. Funding sources at Federal, State and local levels will be necessary to carry out the plans.

Research indicates over half of Arizona households report ownership of at least one bike. Bike ownership is heaviest in urban areas with

2-111

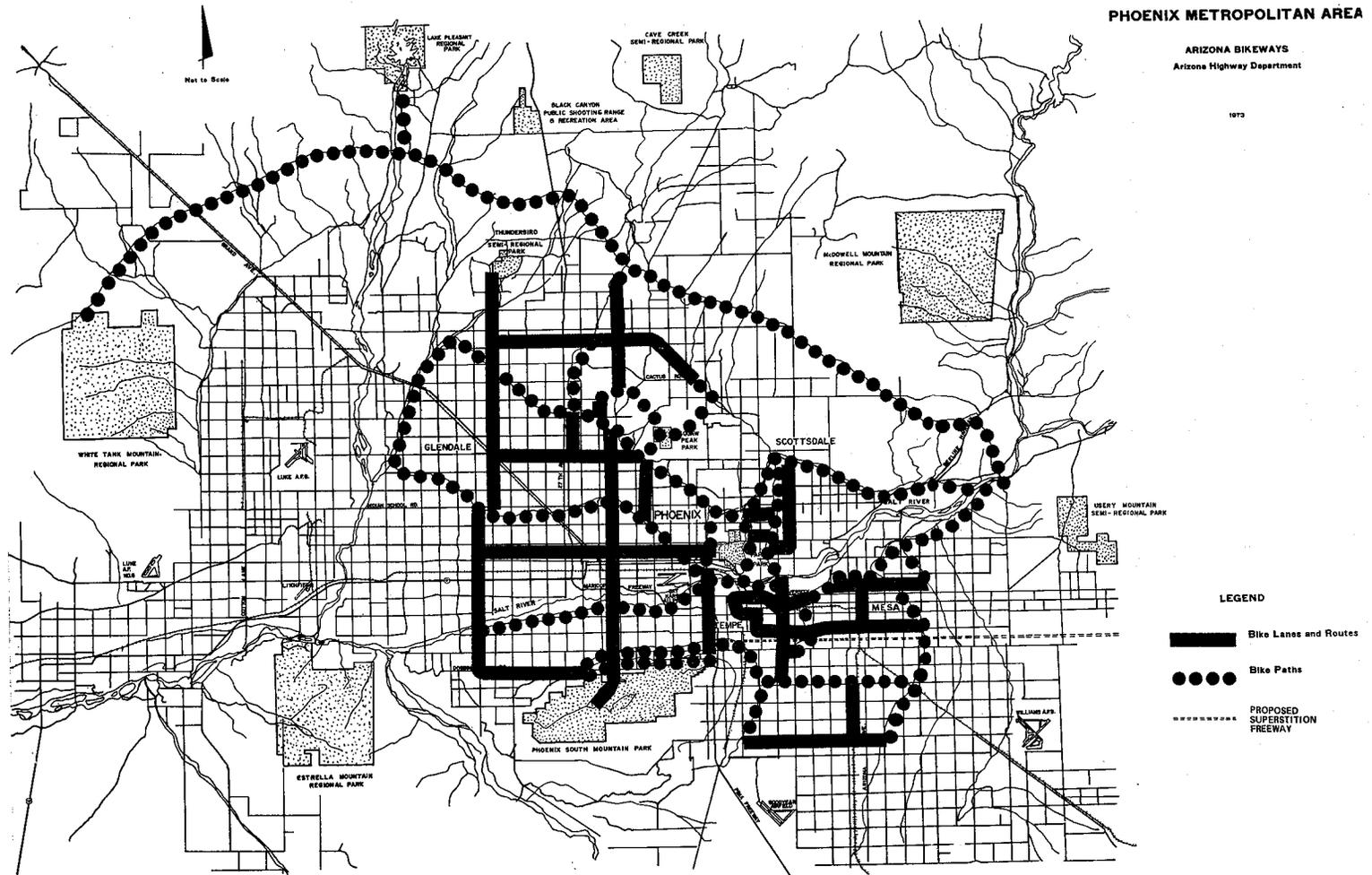


Figure 2-10

rural areas not far behind. Households which report riding bikes regularly comprise 90 percent of the bike owning households. The average bike owner spends 145.6 hours per year riding his bike. There are approximately 601,000 bikes owned by residents of this State.

Analysis made of trip functions as they related to age of the rider follows below:

Trip Function and Age - Statewide

<u>Function</u>	<u>Age 5-17</u>	<u>Age 18-64</u>	<u>Age 65+</u>	<u>All Ages</u>
Recreation	57 %	50 %	57%	55 %
School	26 %	16 %	0%	21 %
Shopping	12 %	9 %	21%	11 %
Exercise	2 %	31 %	36%	11 %
Visit Friends	8 %	2 %	50%	6 %
To Work	2 %	5 %	0%	6 %
Paper Route	4 %	0.3%	0%	6 %
Touring	<u>0.2%</u>	<u>0 %</u>	<u>0%</u>	<u>0.1%</u>
	*111.2%	113.3%	164%	116.1%

*Totals exceed 100% due to multiple responses.

5. "Tempe Bikeway Study: Background", prepared by the Tempe Planning Department, September 1972 :

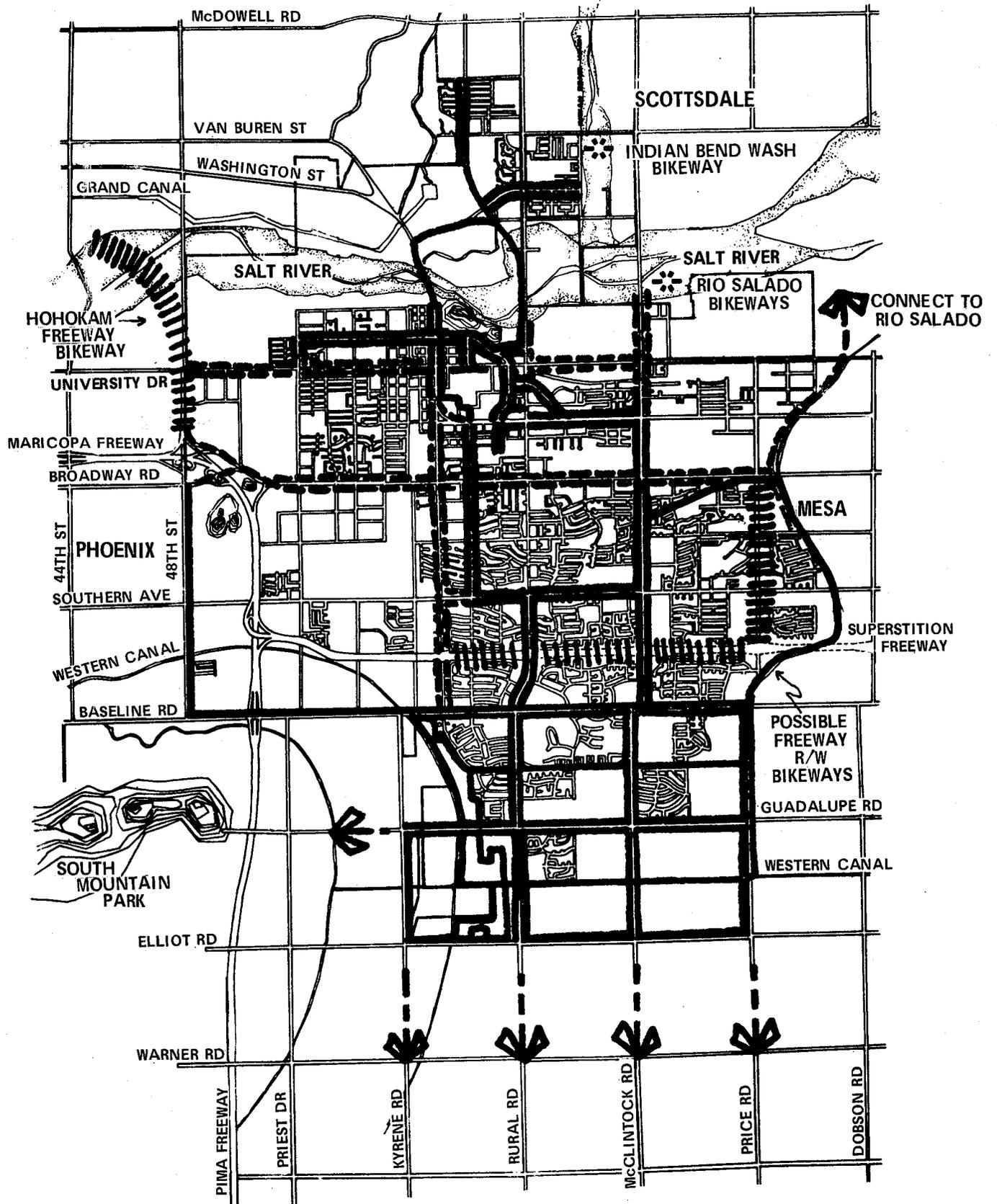
In 1971, College Avenue in Tempe was designated as a trial bicycle route and bikeways were included in Tempe's new general plan. The Tempe Bikeway Study was initiated to study the matter of bikeways in more detail and to propose specific bikeway designs and routes.

Tempe has a two-mile trial bicycle route along College Avenue from Arizona State University to the Superstition Freeway. Bicycle paths,

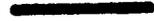
separate from the roadway, are now required on arterials in all new developments in the south part of Tempe. They will very likely be required on collectors as well in the near future. The City is preparing a "Bikeways Master Plan". Bikeways are also included in Arizona State University's Master Plan.

The City of Mesa has contacted the Tempe Planning Department with regard to bikeway plans. Interest in bikeways is growing in Mesa and the City is exploring bikeway feasibility.

The attached bikeway plan, Figure 2-11, shows the network of bikeways, hiking and riding trails that have been proposed for the Valley. The proposed Arizona State University bikeway follows the Tempe Canal across the Superstition Freeway corridor east of Price Road.



LONG-TERM BIKEWAY PROPOSALS

-  PHASE 1-5 BIKEWAYS
-  ASU/NEW DEVELOPMENT BIKEWAYS
-  FUTURE BIKEWAY PROPOSALS

PART THREE

PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

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PART THREE

3. Probable Adverse Environmental Effects Which Cannot Be Avoided

Effect on Residential Relocation

Inherent in the growth plans of Tempe and Mesa is completion of the Superstition Freeway. The general plans for both cities provide for the freeway corridor, and both have been successful in preventing residential and commercial development within the freeway corridor. The Pinal County Planning and Zoning Commission has likewise prevented development in the corridor south of Apache Junction.

However, about ten residences between Alma School Road and the project's terminus are in the path of the proposed freeway. Most of these homes are farm related and were built before S.R. 360 was conceived. A few mobile homes located between Power and Sossaman Roads and in the last two miles of the project may also be in the freeway right of way.

Those few people occupying permanent residences in the freeway's path have life styles which may be in conflict with urban living. Although they probably view urbanization of their land as inevitable (rising land evaluation is forcing taxes prohibitively high), nevertheless, relocation for them may well prove unpleasant and even traumatic.

People occupying mobile homes have been so located for a shorter period of time and should find a move to a new location less disruptive. A move for these people can probably be accomplished in the same mobile park through simple relocation of their mobile units. Relocation assistance will be provided in accordance with provisions of appropriate federal and state regulations.

Effect on Agriculture

About 12 miles of agricultural land between Price and Power Roads will be traversed by the Superstition Freeway. A 500-foot corridor of land planted variously to alfalfa, cotton, sugar beets, grain crops, and citrus will be removed from production in this segment as well as about 25 acres of a turf farm immediately east of the Maricopa-Pinal County line. Also to be lost to the freeway will be portions of a cattle feedlot and one small dairy between Mesa Drive and Greenfield Road.

Effect on Natural Environment

Vegetation

The freeway will bisect essentially undisturbed desert land from about Sossaman Road to the project's terminus, a distance of about ten miles. Creosote bush, which is the dominant plant type in the desert portion of the freeway corridor, will be eliminated in greatest number. A few Ironwood, Mesquite and Palo Verde trees growing along washes will also be destroyed. Plants more resistant to transplanting shock, e.g., Saguaro cacti, will be planted elsewhere in the right of way when feasible. In addition to vegetation loss resulting from actual plant removal, some loss may also occur in washes where disruption of natural drainage caused by the freeway may result in desiccation of riparian species.

Wildlife

Loss of breeding habitat in the freeway corridor will result in the loss of birds nesting there. Small mammals, amphibians, and reptiles inhabiting the corridor will also show reduction in their populations. Wildlife species utilizing the agricultural portion of the corridor for feeding should find their food needs met in adjacent farmland. However,

those species which forage in the desert portion of the corridor will be forced to compete for scantier food supplies in adjacent desert areas, and some probably will experience small population reductions. A more detailed discussion of adverse freeway effects on wildlife is presented in Part Two.

Effect on Hunting

The freeway's direct effect upon reducing wildlife populations will have a corresponding, but small, effect upon reducing hunting opportunity. Limited opportunity to hunt doves, jackrabbits, and quail in the desert portion of the freeway will become more limited. The project's major adverse impact on hunting will be removal of open areas in farmland where shooters now seek doves flying between citrus groves and grain fields. As shooting zones are removed by the freeway and further restricted by expanded urbanization, hunting opportunity here will eventually be eliminated.

Effect of Construction

During freeway construction, motorists using north-south roads between Southern Avenue and Baseline Road will be periodically inconvenienced. Construction activity will, at times, slow and even detour traffic crossing the freeway corridor. Competition for road space with haul trucks and other construction machinery will further impede traffic flow on the north-south crossroads as well as on Southern Avenue and Baseline Road.

Noise and dust pollution generated by construction activity will be a temporary annoyance to persons living and traveling near the work area. However, dust will be mitigated by sprinkling techniques. There will be a temporary adverse effect upon aesthetics caused by construction of haul roads, grading activities, etc.

Effect on Noise

The Route 360 Freeway will introduce noise levels above those which now exist at most points along the route's corridor. Anticipated noise levels resulting from freeway traffic are discussed in Part Two.

PART FOUR

ALTERNATIVES TO THE PROPOSED PROJECT

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PART FOUR

4. Alternatives to the Proposed Project

PURPOSE OF THE PROJECT

The purpose of constructing the Route 360 Freeway is:

"To aid in meeting and satisfying the transportation needs of the project's service area."

This statement of purpose correctly implies that no panacea exists which will fully satisfy all the transportation needs of a specific locale.

RURAL SERVICE ALTERNATIVES

Although the majority of trips using the Route 360 Freeway will be essentially urban in nature there will, nevertheless, be a large number of rural trips using the proposed facility.

The project, though proposed for construction to the standards of an Interstate and Defense Highway is not Interstate either by funding or by intent. The project is not intended to provide long distance service to other states, specifically New Mexico in this case. Traffic between central Arizona and southern New Mexico would logically use Interstate Highway 10, while commerce between central Arizona and northern New Mexico can use Interstate Highway 40. Instead, the project will serve to link the Phoenix metropolitan area with the rural areas and small cities of eastern Arizona served by U.S. Highways 60 and 70. These areas include northern Pinal County, eastern Gila County, the southern portions of Navajo and Apache Counties, and all of Graham and Greenlee Counties.

The following discussion will address the alternative rural transportation modes which are presently functioning or are proposed "to aid in meeting and satisfying the transportation needs of the project's service area."

The Do-Nothing Alternative

The do-nothing alternative is self-explanatory. The Arizona Highway Department may implement this alternative by failing to cause the construction of the Route 360 Freeway.

The effects of doing nothing are necessarily the opposite of the impacts of proceeding with implementation of the project as described more fully in Part Two of this environmental impact statement. Stated differently this means that, over the short term at least, currently observed trends would continue in effect. Over the short term the rural travel demand would continue to increase in consonance with increased urban traffic. Because the arterial through routes on the east side of the urban area are steadily becoming more congested, rural traffic entering the metropolitan area would experience gradually increasing travel times and would seek alternate routes instead of using U.S. Highway 60-80-89 through Apache Junction, Mesa, and Tempe. Depending upon individual trip destinations, alternate routes are presently available.

Traffic between points west of Tempe and points east of Pinal County may detour via Florence to Interstate 10 by way of State Routes 287 and 387. This route adds many miles to a trip into or out of the Phoenix urban area but can produce a time savings. The effect of this increased mileage is to increase the risk of accident for travelers (assuming a constant accident rate) and to gradually discourage trip-making because of the increased mileage required to accomplish each trip's purpose.

Along the general corridor of the Route 360 Freeway in the Tempe-Mesa area, Baseline Road (which for part of its length is designated Temporary State Route 69) offers a level of service such that many travelers detour to use it. The effect of increased usage of Baseline Road (or other

parallel alternative arterial routes) will be to increase congestion, thereby increasing the accident rate and discouraging further trip-making.

The effect of the do-nothing alternative upon rural traffic will generally be to discourage further trip-making to/from the Phoenix urban area even though the concentration of economic, social, and governmental activities in the urban area necessitates an interface with the rural areas of the state.

The Railroad Alternative

Mainline railroads parallel Interstate Highways 10 and 40 easterly from central Arizona to southern and northern New Mexico and points east. Lesser rail lines also serve the rural service areas which might benefit from construction of the Route 360 Freeway. These areas include Pinal, Gila, Graham, and Greenlee Counties where freight-only service is offered via branch lines of the Southern Pacific Company and by connecting secondary railroads.

However, no continuous rail route east from Phoenix through this area exists. For example, the present highway distance from Phoenix to the mining community of Globe, county seat of Gila County, is 88 miles. The distance between the same two points by rail is approximately 350 miles.

No rail passenger service is available in Gila, Graham, or Greenlee Counties at all.

The division of freight traffic by mode is presently such that railroads generally ship bulky, low-value items while smaller, higher value items travel by truck or by other means. A truck is itself a bulky item and is therefore subject to transport by rail. The shipment of trucks by rail offers the possibility of reducing the volume of trucks on major

highways where effective rail service is available. Such shipment of trucks would have few detrimental impacts upon the environment. Most rail lines have enough unused capacity to be able to bear additional traffic load without requiring new construction. Even where necessary, rail construction may have less impact than highway construction because of reduced roadway width requirements and the passage of fewer vehicles after completion.

No major proposal has been advanced to improve rail service in the rural service area of the Route 360 Freeway.

The Pipeline Alternative

Pipelines provide transportation for a few special items with the expenditure of a minimum of man hours because it is both unnecessary and impossible for a person to accompany a pipeline shipment to its destination.

A pipeline also offers, in most contexts, a minimum of disruption to the local ecosystems. (It should be noted here that a prime ecological consideration in opposition to the Alaska pipeline is that oil must be heated for pipeline shipment and that the radiant heat along the pipeline route might disrupt the tundra ecosystem. Such an objection would be without foundation in the hot desert and semi-desert areas of Arizona.)

The impact of a pipeline upon highway transportation is much like that of a railroad because both tend to transport shipments which would be too large and/or unwieldy to transport by truck on a highway. For this reason, highway transport tends to serve as the distributing element between pipeline termini and individual customers.

Long distance pipelines presently enter the Phoenix area along a variety of routes and can presently serve the purposes for which they are intended.

No major proposal has been advanced to improve pipeline service in the rural service area of the Route 360 Freeway.

Intercity Bus Alternative

Intercity bus service offers a real and present alternative to the use of the private automobile along many rural routes. A bus can contain as many persons and things as may be carried in dozens of automobiles. A bus consumes fewer resources than the autos it can substitute for and is to that extent less disruptive of the environment.

Greyhound Lines-West operates through service easterly from the Phoenix metropolitan area along U.S. Highway 60, offering four to five schedules each day in each direction. Greyhound is purely an intercity operator and is prohibited from accepting passengers locally in the parts of the Phoenix urban area where local transit service is available. Greyhound's share of person trips along U.S. Highway 60 is somewhat less than two percent, approximately the same proportion of person trips served by intercity bus service nationwide.

No major proposal has been advanced to improve intercity bus service in the rural service area of the Route 360 Freeway. But, it may reasonably be expected that completion of the proposed freeway would permit a reduction in scheduled travel time of several minutes for buses not stopping at intermediate points as they enter the Phoenix metropolitan area.

Air Travel Alternative

Commercial scheduled airlines do not serve any of the small non-metropolitan communities east of the Phoenix urban area in the rural service area of the Route 360 Freeway. Charter service is available to

the few points having sufficient airport facilities. The utility of air travel along this corridor is, accordingly, quite limited.

No major proposal has been advanced to improve air service in the rural service area of the Route 360 Freeway. But, it may reasonably be expected that completion of the proposed freeway would improve accessibility to Phoenix Sky Harbor International Airport for residents of rural areas to the east of Phoenix.

Summary of Rural Service Alternatives

It does not presently appear that rural transportation in the rural service area of the Route 360 Freeway will experience any significant trend changes in the foreseeable future. Rural transportation in Arizona has for many years been dependent upon motor vehicles and highways. Although this combination may not provide optimal utilization of available resources, it has been able to serve the majority of the area's transportation needs and is expected to continue to do so.

URBAN SERVICE ALTERNATIVES

The vast majority of vehicle trips using the Route 360 Freeway will have origins and destinations within the Phoenix metropolitan area. It is estimated that not more than ten percent of the vehicles using the freeway in Tempe will have an origin or destination outside the metropolitan area. The portion of trips passing through (i.e. having their origins and destinations outside the metropolitan area) may be less than one percent.

The following discussion will address the urban transportation alternatives which are presently functioning or are proposed "to aid in meeting and satisfying the transportation needs of the project's service area."

For the purpose of this discussion, the metropolitan area is defined to include the Maricopa Association of Governments planning area (which ends on the east side at the Pinal County line) and also the Pinal County community of Apache Junction which maintains extensive economic intercourse with the eastern areas of Maricopa County within the service area of the proposed Route 360 Freeway.

The Do-Nothing Alternative

The do-nothing alternative is self-explanatory. The Arizona Highway Department may implement this alternative by failing to cause the construction of the Route 360 Freeway. This specific alternative also assumes that no significant actions will be taken by other agencies to serve the purposes for which the freeway is intended.

Reference is made to Part Two of this environmental impact statement in which were reported the probable impacts of the proposed Route 360 Freeway. Generally, the effects of doing nothing would be the opposite of continuing with the project. It must be recognized, however, that an abrupt dismissal of the project would most probably have significant depressant effects upon urban development now taking place in the freeway's service area. This is because much development has taken place and much is planned for construction prior to construction of the freeway, but with full reliance upon the freeway as the transportation facility which would supply the greatest part of the development's transportation needs.

It is generally axiomatic that transportation is one of the most important if not the most important parameter in the determination of land value. Natural resources associated with the land cannot, for example, be well utilized in the very local economy which prevails without the

presence of transportation facilities to interconnect the local economy with the greater region of which it is a part.

Obviously, the Phoenix metropolitan area as a whole does not suffer from a severe lack of transportation connections to other parts of the United States. The tripling of metropolitan population in the last twenty years to a present level of over one million residents was necessarily predicated on an adequate external transportation system.

However, within the urbanized area the Phoenix situation is similar to that of many other cities in that even though an intensive network of urban transportation facilities exists, the level of usage of some of these facilities is so great that little or no reserve exists to handle the traffic generated by new development and the overall general increase of urban activity. Consequently, new development tends to favor corridors served by new transportation facilities. This tendency can be seen along almost all the major highways serving Phoenix. Indeed, most of the development now existing in the Tempe-Mesa-Apache Junction area is dependent upon the transportation corridor created by U.S. Highway 60-80-89 and various parallel arterial routes. Although most of these arterials now experience considerable congestion, the very rapid development of the Tempe-Mesa-Apache Junction area continues on the assumption that the Route 360 Freeway will be constructed to serve the created traffic demand.

The alternative of doing nothing would effectively negate this assumption and would therefore significantly impact upon developmental trends. Failure to construct the Route 360 Freeway would not greatly affect development and growth of the overall metropolitan area but would likely cause some new developments to seek alternate locations. For instance, home builders try to choose desirable locations convenient to

employment. Without the freeway various Tempe-Mesa-Apache Junction locales would lose part of their locational advantage in proportion to the increased time required to complete home-based trips. Commercial outlets choose to maximize their competitive advantage by locating near the greatest number of potential customers. Without the freeway, the number of customers within the distance defined by a specific driving time would be reduced. A similar effect would apply to employers who choose, among many other considerations, to locate their enterprise as near as possible to the largest potential labor pool for their business.

The effect of freeway-related development is greater in Mesa than in Tempe because the latter is already served by Interstate Highway 10. Consequently, the do-nothing alternative would impact most greatly upon Mesa.

Apache Junction is to a moderate degree an entity to itself in that the tourist-retired nature of the local economy does not require as much interaction with other parts of the metropolis. The primary effect on Apache Junction of not building the freeway would be to delay the arrival of a more fully integrated economic structure in that community by delaying the arrival of larger commercial enterprises.

Insofar as land values without the freeway would probably not increase as rapidly as otherwise, there would be relatively less tax income from the existing land, even though the right of way proposed for the freeway could remain as taxable land and be developed for other, nontransportation purposes. It is assumed that balanced new development, with or without the proposed freeway, would generally generate sufficient tax revenues to be basically self-supporting, i.e., not requiring more services than the new taxes can support.

Without the freeway, noise levels greatly above those now found adjacent to the freeway corridor would not be introduced. Autos on freeways produce more noise individually than when traveling at lesser speeds on surface streets. En masse they produce more noise than would be found on parallel surface streets because of their greater concentration. However, without the freeway a larger number of vehicles would be required to pass in closer proximity to residences and businesses. Sheer distance is very effective in ameliorating vehicle noise levels. A home facing a major arterial street at a distance of 40 feet from pavement's edge would experience 79 dBA under heavy traffic while all areas adjacent to the freeway can be held to 70 dBA or less by noise shielding. Provision of noise shielding along major streets would necessarily be ineffective because of the discontinuities required to allow street access for vehicles and pedestrians. Since noise shielding barriers are generally opaque, the usage of such barriers along main streets would prevent roadside enterprises from being seen by potential customers.

The effect on air quality if the proposed Route 360 Freeway is not constructed is discussed in Part Two of this environmental impact statement.

Concentrations of carbon monoxide and nitrogen dioxide along the arterial routes parallel to the proposed freeway would not exceed Arizona or Federal standards in 1972 or 1995 with or without the freeway. Because of meteorological conditions in the Phoenix area, the highest concentrations of air pollutants occur in the late evening and early morning hours and the present hydrocarbon emissions from vehicles would contribute to a level in excess of the Arizona standard of 80 micrograms per cubic meter. It should be noted, however, that only 42 percent of Maricopa County's hydrocarbons have been related to vehicle emissions.

By 1995, probably well before, air pollutant emissions from the vehicle population will be reduced sufficiently to meet applicable air quality standards.

An extra right of way width of approximately one hundred feet is proposed for acquisition along the north side of the freeway through the Mesa area for drainage control purposes. If the freeway is not constructed this land would not be available for flood control purposes unless otherwise acquired by some other agency. Hence, choice of the do-nothing alternative would constitute a rejection of the flood control benefits which can result from construction of the freeway.

Construction of new development in the proposed corridor of the freeway has been restricted pending further progress of the project. The real estate so preserved would remain, at least temporarily, if the do-nothing alternate were chosen. It is possible then that the freeway corridor might be acquired for public usage other than for highway purposes before property owners exercised rights of ownership.

If the freeway is not constructed, there will be no significant early effect upon the flora and fauna found along the proposed route. This may be insignificant, however, because urban and semi-urban development along the project corridor will be at least as effective in removing the undeveloped desert land from its natural state eventually in those diminishing areas where natural conditions still exist.

A course of inaction would also preclude the short-term effects of constructing the freeway such as materials usage, dust, disruption, and noise from construction activities.

The discussion of the do-nothing alternate is not academic. It is entirely conceivable that the Route 360 Freeway will

not ever be fully implemented as proposed in Part One of this environmental impact statement. A recent non-binding advisory vote in the City of Phoenix demonstrated opposition (58 percent of the votes cast) to a major freeway project which was planned to be the nucleus of the Phoenix area's freeway system. Such extensive opposition to the Route 360 Freeway by citizen groups and the local press has not crystallized and does not appear to be imminent. But, the long construction period envisioned for the project will encompass a time of great change in eastern Maricopa County. It is almost certain that the resident population will experience change, increasing by a large percentage. It is also possible that citizens' attitudes toward transportation and transportation facilities will change. It is beyond the scope of this environmental impact statement to assess or estimate the magnitude or effect of such sociological trends.

The Alternative of Reduced Transportation Need

It is theoretically possible to reduce the need for transportation facilities by reducing the overall need for transportation. The incentives for doing so are great. Transportation consumes approximately 20 percent of the entire American gross national product and yet is not useful of and within itself except for recreational purposes.

It is obvious that most individuals cannot live at the point where any, much less all, of their basic needs are produced. However, in urban areas the greatest amount of transportation delay results from the concentration of trips between the home and the place of employment. Commuting is a phenomenon peculiar to just the past century. Even at the beginning of the industrial age most workers lived within just a short walk of their place of employment and many maintained a small store or workshop in their own homes.

Zoning in the present day metropolitan Phoenix area generally tends to maximize the need for transportation, specifically automotive transportation. Developers are required, in conforming to zoning specifications, to create vast areas of whatever development they create: residential neighborhoods too big to walk across, shopping center parking lots too big and too formidable to venture into as a pedestrian, concentrated industrial areas far from potential employees' homes. Many new residential neighborhoods are even surrounded by block walls with infrequent openings for the use of automobiles. Although many design features are included in such developments to optimize the safety of vehicular and pedestrian traffic, the sheer increase of vehicular travel mandated by zoning procedures must result in increased traffic accidents despite a lower accident rate (per vehicle mileage traveled).

Different land use patterns allowing an intermingling of land uses can result in the need for less vehicular travel by coordinating, rather than separating, complementary functions. On a small scale this is being done in a few specific developments already. However, their effects will be small until and unless a significant portion of the urban area is developed in such a manner as to minimize the need for transportation.

The vicinity of the proposed Route 360 freeway still contains vast parcels of land not developed to urban uses and is, therefore, an ideal place to apply concepts in first development of the area which can reduce the need for automotive transportation.

Until the individual's need for transportation is reduced it is inevitable that our vast investment in transport facilities will continue to be inadequate as an overall solution to the present urban transportation problem.

The Non-Motorized Transportation Alternative

Non-motorized transportation is essentially limited to the bicycle. As discussed previously, pedestrian travel is precluded for most purposes by the present and developing patterns of land use. Horses are used in the Phoenix urban area, occasionally even for non-recreational purposes, but their utility is obviously not such as to make them a viable alternative to the automobile for many purposes.

Recent studies indicate that in the Phoenix urban area the bicycle is used primarily for recreation and exercise. However, a large and growing number of persons, particularly students, use the bicycle as a basic element in their transportation. In the area of the Route 360 Freeway there is a high degree of interest in bicycle usage. School communities in Tempe and Mesa produce a growing demand for bicycle transportation on and off campuses for students and some faculty and staff members. The negative factors of automobile parking problems and operating expenses as well as the positive desire to reduce pollution and resource usage has prompted many persons to request bicycle facilities.

Operation of bicycles on arterial streets is, at best, a hazardous endeavor insofar as most main routes are designed for and devoted to the exclusive use of automotive traffic. Although the law gives bicycles the same rights and responsibilities as automobiles in use of the streets, simple reality demonstrates that the bicyclist is an unprotected intruder into the realm of automotive traffic. The number of bikers killed or injured annually emphatically underscores this point.

Consequently, planners for the State of Arizona and the cities of Tempe and Mesa have directed their attention to the need for bikeways.

The State has received recommendations for the construction of an extensive bikeway system in and around each of the state's larger cities and is studying funding possibilities. The cities of Mesa and Tempe have planned more intensive bikeway networks within their own boundaries. Tempe has already constructed some bikeway mileage and is requiring developers to provide bikeways along arterial streets. Arizona State University expects to develop bikeways on its campus in 1973.

Federal highway funding is authorized for bikeway purposes under certain conditions as specified in Federal Highway Administration Policy and Procedure Memorandum 21-23, published in March 1973. Although the continuity of Tempe's bikeway system is hampered by the existing portion of the Route 360 freeway, the future structures which will enable Rural Road, McClintock Road, and possibly other arterials to cross the freeway will include provisions for bikeways.

In Mesa it is generally planned to utilize canals as corridors for bikeway, equestrian, and other recreational purposes. The Route 360 Freeway will not disrupt these canal corridors since each canal will be crossed by a bridge with sufficient clearance to permit passage of massive canal maintenance vehicles. Mesa's bikeway plans are coordinated with those of adjoining Tempe. It is possible that the additional right of way to be provided for drainage purposes in Mesa can also be the site of a bikeway.

Although bicycles are not generally used for the same trip purposes which freeways serve, they can help to alleviate vehicular traffic on arterial streets and so reduce the levels of air and noise pollution.

The Bus Transit Alternative

Transit buses now in operation in the Phoenix area seat 45 to 53 passengers and, therefore, have the potential of eliminating the need for 35 or more

automobiles at any one point which a bus passes. The environmental implications of this are obviously significant: reduced air pollution levels, reduced noise levels, reduced usage of resources (including roads), and reduced total cost for each individual patron.

That transit buses also have certain disadvantages is apparent from ridership statistics. In the Phoenix urban area transit buses accommodate less than one-half percent of all trips even though no other public transit exists.

Buses are subject to the same delays as other traffic plus the additional delay caused by stopping to receive and discharge passengers. Because of the necessity for these stops, no buses use the freeways and, accordingly, are at a further disadvantage in total travel time. Midday service is minimal - only five routes in the Phoenix urban area have half-hour service through the day while several routes have no midday service whatsoever. Most routes leave downtown Phoenix for the last time by 7:15 p.m. and no bus leaves after 9:20 p.m. The Tempe-Mesa line, privately operated, is the only route with any Sunday service.

The greatest portion of transit bus service in the Phoenix urban area is provided by the Phoenix Transit Corporation operating under contract to the City of Phoenix. Phoenix Transit operates 29 routes, all of which radiate from a terminal point in downtown Phoenix. All but three routes operate exclusively within the City of Phoenix while two routes serve the neighboring City of Scottsdale and one route serves neighboring Glendale at the expense of Phoenix taxpayers.

It is agreed by analysts of the system that service is minimal, sufficient only for transit dependent persons. No route operates more frequently than every half-hour, even during peak hours. Saturday service is minimal while Sunday and late evening service is nonexistent.

As the general per capita income and car ownership of Phoenix area residents has risen in consonance with national trends, the result has been seen in reduced ridership of Phoenix Transit buses. Ridership was 9.3 million persons in 1960 or about 30,500 persons per day when the urban area had a population of 650,000 persons. By 1972 annual ridership had declined to less than four million persons or about 13,100 persons per day even though metropolitan area population had increased by about 70 percent to 1.1 million residents. Transit bus ridership has declined nationwide but not as abruptly as in Phoenix.

Phoenix Transit does not presently serve any community along the Route 360 Freeway. However, various proposals for changes in Phoenix Transit's level of service envision routes to Tempe or Mesa and will be discussed under this heading.

Sun Valley Bus Lines is primarily an operator of charter bus service as well as intercity service to various Colorado River communities and Las Vegas, Nevada. However, Sun Valley operates one transit route in the Phoenix urban area between Phoenix, Tempe, and Mesa, providing service into the early evening hours as well as on Saturday and Sunday. Sun Valley and Phoenix Transit mutually offer free transfers and provide connecting services.

Ridership on the Tempe-Mesa route which primarily uses the present U.S. Highway 60-80-89 is also declining, but less rapidly than on Phoenix Transit's routes. Total 1972 ridership for Sun Valley's transit operation was approximately 200,000 persons, about 650 persons per day.

Safeway Suburban Stages operates one small bus on a route between Apache Junction and Mesa along U.S. Highway 60-80-89, then along Dobson Road in west Mesa to Mesa Community College. Until November 1972 another small bus was operated on Power Road across the Route 360 Freeway corridor

from Williams Air Force Base to U.S. Highway 60-80-89 from which point the routing of the other line was followed to Mesa Community College. This second route was discontinued because of insufficient patronage but may be resurrected in the foreseeable future to serve the Leisure World retirement community which is proposed to house several thousand persons when completed and have internal connecting bus service. The demographic factors of Leisure World, as planned, are expected to contribute to local bus ridership.

Safeway's ridership is not presently sufficient to assure profitability. However, the company expresses hope for the future because of projected population increases along its corridors of service.

The Tempe-Mesa-Apache Junction area is uniquely incompatible with bus transit or with any more intensive form of fixed right of way transit service. Bus service is confined, with one exception, to a single route over parts of which both Sun Valley Bus Lines and Safeway Suburban Stages operate. This one route, known variously as Mill Avenue and Apache Boulevard in Tempe, Main Street in Mesa, and Apache Trail east of Mesa, was for many years the hub of urban activity in eastern Maricopa County and is, consequently, located in close proximity to many of the older areas which now house and serve much of the area's transit dependent population.

Conversely, most of the locales away from the bus route are newer and are characterized by highway auto ownership rates and decreased transit usage. Usage of private automobiles in eastern Maricopa County is encouraged by the generally adequate and well developed street system.

Although peak period congestion occurs daily at many points, auto drivers in the area are not faced with the factors commonly found in large cities which discourage automobile usage.

DeLeuw, Cather and Company submitted to the Maricopa Association of Governments in 1971 the "Phoenix Urban Area Public Transportation Study" which recommended that Phoenix Transit's service be upgraded by intensification, by extending service into the evening hours, and by the addition of a few specific routes. It was also recommended that a transit authority should be established which would encompass the entire urban area and not be dependent upon the City of Phoenix.

Although the final recommendations of DeLeuw, Cather and Company did not involve the service of Sun Valley Bus Lines, some of the alternate plans which were discussed favorably included a plan in which Sun Valley's transit operation and various freeway express routes would have been incorporated into the Phoenix Transit network. No part of the Route 360 Freeway was open to traffic at the time the study began. But, it is possible that the freeway could be used for express bus service whenever the demand for such service arises.

DeLeuw, Cather also favorably discussed significant intensification and extension of transit bus service in the urban area but dismissed this option because of the great cost to local governments of operating such a system as contrasted with the minimal benefits expected. The operating expenses of a transit system are not generally eligible for federal assistance at present. However, capital grants are available from the

Urban Mass Transportation Administration of the Federal Government

Such funds are being used to acquire new buses for Phoenix Transit.

A variety of trends are converging which may encourage greatly increased expenditures for public transit in the Phoenix metropolitan area in the foreseeable future. Such trends include present fuel shortages, increased awareness of the need for transportation for families not owning automobiles, increased awareness of the environmental consequences of automobile usage, the cost of automobile anti-pollution measures, etc.

In its most recent session the Arizona legislature created a department of transportation for the state. It is likely that such a department will have a part in improving mass transportation in the state's urban areas.

The Fixed Right of Way Transit Alternative

Fixed right of way transit facilities involve the establishment of some sort of guideway which is used, sometimes exclusively, by vehicles which can carry passengers. In the traditional sense this includes the urban portions of long distance railways and also specifically urban railway systems which operate with subway-type vehicles, whether below the ground, on the ground, or above it. As an intermediary stage buses

may be operated without guideways on facilities devoted exclusively to their use. In recent years various "new" systems have been proposed and some have been implemented using new technologies. However, these technologies have essentially been applied to revamps of the types of mass transit facilities which have been in service in some cities for many years.

Fixed right of way transit facilities have essentially the same positive aspects which were attributed to buses previously, except that a fixed right of way transit facility is statistically more effective. For example, a bus can carry the passengers of 40 automobiles while a transit train can carry the passengers of almost that many buses. The environmental implications of this are obviously significant: the environmental benefits of buses are multiplied and also compounded because most fixed right of way transit facilities are powered by electricity which may be generated from clean sources such as hydroelectric or nuclear facilities or in areas remote from population concentrations.

That fixed transit facilities also have certain disadvantages is apparent from the present limited application of such facilities. Only six American metropolitan areas have such facilities although several more areas have systems in the planning stages. The cost of most fixed right of way transit facilities is great and must be borne largely by the taxpayers in the immediate vicinity of the system since federal assistance in constructing systems is minimal while operating expenses are very rarely eligible for federal funding support. (Many areas might assess urban freeways similarly but for the highway trust fund. If a transit trust fund is established it could have the effect of greatly lowering the threshold of financial feasibility for fixed right of way transit systems.)

These costs have usually been interpreted to mean that high potential ridership volumes are required to justify the expense of a system. High capacity transit systems are sometimes victims of their own high capacity during off-peak hours because operating costs are usually proportional to the number rather than size of the trains used. Hence, off-peak schedules are reduced and the system becomes less attractive because of the increased waiting times between vehicles. This points to the inherent demand of a fixed transit system to accommodate high volumes of passengers. Criteria have been established to define the amount of socio-economic activity which must occur within a given locale to establish the need for a fixed transit system. These criteria would apply to a system constructed and operated for profit. However, the advent of increased federal funding along with increased general awareness of the need to utilize the positive environmental features of such systems will tend to justify transit systems which were previously untenable.

No authoritative (i.e. governmental) study has ever recommended the early institution of a fixed right of way transit system in the Phoenix metropolitan area.

The "Phoenix Urban Area Public Transportation Study", a 1971 report to the Maricopa Association of Governments by DeLeuw, Cather and Company discussed rail transit as follows:

Rail rapid transit is generally applicable in corridors with high densities of development. A strong focal point with a major concentration of trip origins and destinations helps attract patronage to a rail rapid transit system. A rail rapid transit corridor requires a feeder system of buses and other forms of transportation in order to provide good service. The projections by the Valley Area Traffic and Transportation Study for an urban area population level of 1.6 million, expected early in the 1980's, indicate a continuation of the

present low density pattern of development and the attendant dispersed travel patterns. Since such a pattern of development lacks a major strong focal point, travel is along a large number of corridors rather than along a limited number of major corridors. We believe that if the growth of the urban area follows the projected patterns, rail rapid transit would not be a viable alternative for the foreseeable future.

However, urban form and the type of transportation facilities required to serve the associated travel demands are very closely interrelated. In fact, transportation facilities may be used as a tool to help shape the urban form. If the Phoenix Urban Area desires to alter the trend in the development patterns and adopt a policy of concentrated development, the entire transportation system must be reviewed, and appropriate steps should be taken to provide transportation alternatives commensurate with the goals of the community.

The concept of a transit authority for ownership and management (which is the recommended concept and is discussed elsewhere in this report) provides a governmental organization which is adapted to plan and implement rail and other high-level transit services in the Phoenix Urban Area, should future studies and policy decisions indicate the desirability of such action. Such an organization would have the authority and capacity to engage in transit planning with an agency, or agencies, having cognizance over the broad aspects of regional planning. Whatever policy decisions are made regarding the future of rapid transit, an investment in the modernization of the present bus fleet would be justified because, should rail rapid transit service be initiated during the useful life-period of the buses, they may be utilized on feeder routes. (End DeLeuw, Cather quote.)

The Maricopa Association of Governments produced in 1970 VATTSS (Valley Area Traffic and Transportation Study) Report Number 10 entitled "Transit and the Phoenix Metropolitan Area." This report deals with the historical evolution of Phoenix as compared with other urban areas and discusses in general terms the applicability and desirability of planning for the types of development which might be supported by different transit types. The report does not specifically advocate any form of transportation over another. However, the concluding portions of the report advise against fixed right of way transit systems (which had previously been defined to require high density concentrations of activity) in the following manner:

The advice for the Phoenix area (in the context of transportation demand) would be to avoid concentration and, thus, avoid backing into the situation faced by many large metropolitan areas today. Plans for tomorrow often reflect today's problems and are based on yesterday's traditions. It seems that every generation or era looks back on that preceding and identifies it as good and secure when, in reality, memory has dulled or history forgotten the troubles and tribulations which caused the people of that preceding era to move in different directions. Decision-makers must ask themselves whether concentration and dominant districts are really, functionally, what will be needed in the future or if they are carry-overs of the historic desire for monuments. More critically, are they an admission of the ability to provide only a small, limited area which can be a pride for the community and the inability to develop the community as a whole?
(End VATTs quote.)

"The Comprehensive Plan - 1990" prepared by the City of Phoenix Planning Department in 1969 reported the following findings:

The existing and projected low densities of land use development, anticipated high levels of automobile ownership and present trends in transit use do not suggest a greatly expanded role for public transit in the Phoenix Urban Area. In the future, as population densities increase, a higher demand for public transit may develop to serve the urban area. It should be noted that public transit and automobile transportation cannot be considered as simple alternatives, for each has its appropriate role in serving the travel requirements of the urban area.

There is currently discussion, both nationally and locally, on rail transit. A recent report by the U.S. Department of Transportation to Congress says: "Five U.S. cities now have rail transit systems in operation, a sixth has one under construction, and five others are seriously considering such systems for the future. In four of the five urban areas considering rail rapid transit systems, estimates are that such systems would serve about five percent of the urban area's total daily person trips, and ten percent of the area's peak-hour trips. (Estimates for the fifth area, Los Angeles, are about one-half of these values)."

The Phoenix Urban Area projected size, density and form would not support a rail transit system in the frame of present long range planning, through 1990. Rail rapid transit is primarily intended to serve centrally oriented commuter trips along dense travel corridors, a situation which is not foreseen for Phoenix. However, there should be periodic re-evaluation of the transportation system and its various modes with due consideration for the desires of the people. In the future,

if it appears that citizens attitudes change in favor of increasing density of living or as we approach 2,000,000 people, a broad base mass transit study to explore the potentials of all transportation modes should be undertaken. Thus Phoenix can take advantage of new technology and experience of other urban areas in the field of mass transit over the next decade. (End "Comprehensive Plan" quote.)

In 1971 the City of Phoenix prepared a report entitled "Central Phoenix Plan" which suggested general guidelines for a specified district of high-rise development along a corridor dominated by Central Avenue in the city's core area. This report considered that only buses and autos would be available to provide access to the Central Phoenix Plan area for the foreseeable future. Nevertheless, it is apparent that any fixed right of way transit system for the Phoenix urban area would focus on central Phoenix. The Central Phoenix Plan considered mass transportation as follows:

A modern public transportation system will play an increasingly important role in the development of the Central Phoenix area and must be integrated into a regional system. Remote parking, with high quality shuttle service and other innovative ideas, can contribute to the development of a flexible public transportation system. This system will help relieve traffic, provide service to those who want to use public transportation, as well as those who cannot afford private transportation. Studies leading to such a regional approach to public transportation should be developed. The Central Phoenix Plan is flexible and can adapt at any future time to a mass transit system. (End "Central Phoenix Plan" quote.)

The cities of Tempe and Mesa have both prepared planning guidelines for their respective areas. However, neither plan made reference to any proposals for early implementation of a fixed right of way transit system. Nor was reference made to the existing transit bus service in either city.

Because no governmental agency in the metropolitan area has found fixed right of way transit systems to be sufficiently applicable to the

needs of the urban area to justify a detailed study of a specific proposal, it becomes necessary to present the considered proposals of the individual citizens who have devoted their attention to the possible need for fixed transit systems in the Phoenix urban area.

Dr. Gerard F. Judd, a chemistry professor at Phoenix College and leader of Citizens for Mass Transit Against Freeways (a citizens' group opposed to urban freeway construction in the Phoenix area), was in 1969 a member of the Land Transportation Division of Phoenix Forward Task Force. He was the prime author of the minority report entitled "A Mass Transit System for Maricopa Valley Maricopa Valley Transit Corporation under Maricopa Valley Transit Authority" which was prepared as the result of Phoenix Forward's transportation study for the Phoenix urban area. (The majority report regarded fixed right of way mass transit as unfeasible and recommended earliest construction of the proposed freeway network.)

Dr. Judd's report envisions the construction of 400 miles of subways and surface railways to provide, in conjunction with various feeder services, a high-speed transit system which would serve virtually all points in the Phoenix urban area. The 400-mile fixed transit system would be constructed in several stages beginning with a 75-mile east-west line which would be located approximately 2.5 miles north of the Route 360 Freeway in the Tempe-Mesa-Apache Junction area. The other first stage line would be a north-south route 18 miles in length through the center of Phoenix.

Excerpts from "A Mass Transit System for Maricopa Valley, Maricopa Valley Transit Corporation under Maricopa Valley Transit Authority" follow:

Abstract: A mass transit system employing underground and surface railway is proposed as a Maricopa Valley Transit System to be operated under Maricopa Valley Transit Authority. It is to be supplemented with automobile, maxicab, commuter pools, computerized bus, bicycle, walking and other short distance portal-arrival modes, as well as giant parking lots adjacent to portals. This system when completed will cost about \$1.8 billion dollars and furnish much faster, more convenient, cheaper and cleaner transportation than the auto. A map with successive stages of the lines is presented with estimated times of travel, headways, portal separation distances, construction schedule and specific costs.

Automobile travel rates are down to a low average of 24 mph in the Valley, with downtown rush travel rates at 5-15 mph. Delay is common throughout the valley with 15 mph, 25 mph, and 35 mph speed limits prohibiting progress everywhere. It is estimated the average peak hour speed in 1980 will be 15 mph! Numerous people are without even the poor transportation of the auto due to poverty or untoward circumstances. Pollution of the air, 80-85% caused by the car, is intolerable and a great hazard to health.

It would seem that there should be an emphasis away from freeways in the city proper. Freeways have a purpose, but it would seem sensible to circumscribe the city, not ruin it.

What then, is an acceptable alternate to carapace transportation in terms of Mr. John Doe, the average citizen? It would appear that by looking at the inefficient method of the car, where one lane of a rail line could replace 21 lanes of freeway traffic would look attractive to him. Further, he should be impressed by huge economies already alluded to. There is little question that he would be singularly happy to be left in the pure air left by the demise of the auto and to leave to himself more space for living. A single car requires as much space to operate in a city as a family does to live in (2400 sq. ft.).

A 65 mph average rate should easily be attainable in a rail system using transit cars with the routes carefully planned through the entire valley. To negotiate small distances about 1,000 buses and minibuses in conjunction with the system should bring travel to within a few blocks of all citizens in the confines of Maricopa Valley. Computer systems should put average rates at 50 mph, better than twice our present average car rate, and 4-5 times the speeds in downtown Phoenix. Furthermore there would be no pollution with electric-powered cars.

There can be little doubt that people would leave the car for such an efficient system. Studies have proven people will gladly leave their cars home if a suitable transportation system is available. Last year in Toronto, which has a large auto traffic as well as probably the best transit system in the world for a moderately sized city, 11 million people rode the subway for the first time. Their 2200 vehicles move about 1 million people daily. Our system could be better than their system, because the stops necessary in the congested system create delay which lowers the average speed of their subways tremendously.

We used Toronto as sort of a model since they have a very successful system employing subways, streetcars, trolleys and buses. We also took cognizance that much of Maricopa Valley was still open land with large concentrations of population in between. We also went on the thesis that there was much available know-how in the way of cars, computerized transit systems, etc. in the general public and corporations to negotiate small distances quickly. We also went on the hypothesis that carapace transportation, i.e., 1 car, 1 person was untenable in the city, either for transporting large numbers of people or for eliminating air-pollution. It has been established that a single rail transit line is equivalent to 21 lanes of freeway traffic. It has also been shown that as soon as a freeway is completed, it is crowded past capacity, loads up arteries and side streets and creates a whole new series of problems and expenses. A mass transit system such as the one we envision could carry all possible loads far into the 21st century.

Our main object was to eliminate delay caused by the congestion of the car and short stops, and assure ourselves of a system with very high speed capability. A figure of 110-125 mph for top speed levels with 65 mph average can easily be achieved over the long stops in the lines planned.

The following steps are felt to be vital in organizing a successful transit system in Maricopa Valley:

- (1) Immediate and intensive education of the public.
- (2) Vote to ascertain whether citizens want mass transit in all cities.
- (3) Disband MAG and VATTS
The Mayor of Phoenix should disband MAG and VATTS, which were set up to get government funds for building streets and freeways. He should try to get cooperation from the other mayors and principals in the cities through a series of meetings for support of the mass transit principle. Decongesting the streets and solving the air pollution problem should draw those persons together in a common cause.

- (4) Maricopa Valley Transit Authority should be organized formally (by cities).
- (5) Maricopa Valley Transit Corporation should be organized with a group of about 3-5 men to conduct the operations of the lines.
- (6) There should be an operational division, a research division and a public relations division to keep balance in expansion vs present service.

It is the philosophy of the researcher that the system to serve the Maricopa Valley should be paid for by the carowners and the riders who do not own cars. It is believed that they both should be assessed the same. The reason for this philosophy is that the hidden costs of the auto to the city are about 3-5 times what the auto assessment tax is anyway, and therefore it is wise to consider that the subway transit system could be easily built out of these hidden costs. Consider a car, for example, which pays \$70 for registration. The total cost would therefore be \$210-350 to the city. It would therefore be easy for the owner to pay a mere \$100 annually to support the system construction.

Another feature of this problem is that the car owner is contaminating the atmosphere of the city with 7 pounds of carbon monoxide per day and he should either discontinue this practice by riding the mass transit, or pay the cost of reclaiming it, and returning pure oxygen and nitrogen to the atmosphere. It is estimated that this cost would be at least 1000 times the cost of oxygen, which is 7×0.264 or \$1.80 per day. Thus the cost to the car owner would be \$1800 per day.

The advantage of paying a fee on the car in return for high speed, cheap transportation is very evident to the normal citizen. Only freeway-builders stick to the silly concept that the car owner should only be charged for fees to construct streets, on which they travel. It would seem that the car owner, who requires as much room in the city to move his car as he does for his house, has just as much obligation to pay taxes for city affairs as the home owner. This is especially true when he is using the city sky for a garbage can, and the city streets to cause the city, state, county and property owners, and even the hospitals, police department, coroner and others tremendous expense.

It has been decided, then, to charge the car owner \$100 the first year and in turn, give him credit to ride the lines for a year. Perhaps there should be some limits set on the total number of trips that could be taken by each car owner, and a charge made on those trips above that, but in general, he should be permitted to travel freely on the lines with his card. (End quote of Dr. Judd.)

James W. Elmore, Dean of the College of Architecture of Arizona State University, published "A Study of Mass/Rapid Transit for Phoenix and the Salt River Valley" in 1970. In this study Elmore suggested planning for a basic 50-mile loop of fixed right of way transit to be built when needed. Also suggested were possible later extensions.

Professor Elmore's basic loop would not offer significant service to the Tempe-Mesa-Apache Junction area east of Arizona State University which would be one of the corners of the loop with lines west to central Phoenix and north to Scottsdale. However, one of the proposed extension loop routes would offer service to points in south Tempe and as far east as Lindsay Road in Mesa (3.5 miles east of downtown Mesa). Excerpts from the report follow:

In San Francisco, it is now expected that the first trains will roll in 1972. This will be 21 years after planning began in 1951. The enormous amount of lead time required for planning, design and construction of anything so complex is a critical factor in recognizing and meeting transportation needs. The effort must be begun at the earliest possible time.

Presently, it appears that Phoenix and the Valley of the Sun may never need or be able to support a system of public mass/rapid transit operating on exclusive, grade-separated rights-of-way. But if alternatives to present systems should ever prove to be required, they will best be provided if the need has been anticipated and the possible solutions considered both in advance planning and in the day-to-day decisions that would affect them.

Almost all growth in United States cities since World War II has responded to the possibilities opened by the private automobile. Arterials, freeways and the vehicles they carry have proved their worth in meeting the enormous and growing demands for ground transportation of people and things. But they have also combined to produce urban sprawl, air pollution, congestion, and deterioration or abandonment of the public transportation that might serve those unable to own or operate cars. Evidence is accumulating that any city that grows very large must provide a balanced transportation system--one that has freeways doing what they can do best and mass/rapid transit doing what it can do best--one that offers both a choice to the owner of the private auto and the only hope of essential mobility to one less advantaged.

Like many other cities, metropolitan Phoenix is rapidly approaching the point at which it must know the cost and potential of mass/rapid transit--and also the lack of it--if it is to continue to make fully considered determinations regarding its transportation needs and its future form. Developing a model from which this knowledge might be gained is the purpose of this study. It asks and suggests an answer to the question:

Given the present and predictable state of transit technology and the 1970 and expected future size and nature of the Phoenix urban area, HOW MIGHT MASS/RAPID TRANSIT SERVE AND HOW MIGHT IT LOOK?

A well conceived transit facility can provide both an effective service and a pleasant experience to those using it. And it can be inserted into the city in ways that will truly grace it.

Ultimately, the feasibility of mass/rapid transit will have to be demonstrated by exhaustive engineering and economic studies and whatever proposals might be made will have to be subjected to equally comprehensive studies to characterize costs and benefits and to propose responsible ways of financing both capital and operating needs. The present study is focused on the conceptualization of a system that might be worthy of investigation in more extensive detail.

In this country most cities that have a population of 1,000,000 or more or are even approaching it, are actively engaged in planning for mass/rapid transit to work with streets and freeways in a balanced transportation system. San Francisco has the Bay Area Rapid Transit system under construction, Los Angeles, Washington, D. C., Atlanta, and Seattle have completed detailed plans, and at least ten other cities have specific test plans under study.

It is expected that there will be substantial and probably dramatic advances in transit technology during the years of planning the Valley system. However, it is believed that with whatever modifications may be indicated, the routes and concepts described can be adjusted to take advantage of the best systems current at the time the critical decisions are made.

A 50-mile "figure eight" loop is the nucleus of the system. Automated, electrically driven vehicles operating either separately or coupled into trains on exclusive grade-separated rights-of-way provide a fast transit link, urban transit, connecting 23 stations that are served by local transit. The "Loop," or the "8," as it might be called for the sake of brevity and convenience, serves such traffic generators as uptown and downtown Phoenix, Sky Harbor Airport, Arizona State University, Tempe, Scottsdale, and Glendale.

Anticipated in this study are 50 miles of extensions that would replace local transit with urban transit service to other points. Using portions of the "Loop," additional lines would connect Mesa with Sun City, South Phoenix with Skunk Creek, and Litchfield Park with Paradise Valley. At the same time, all those points would be connected with stations on the "Loop."

Storage and maintenance yards would be located along the Santa Fe right-of-way and Grand Avenue between Indian School Road and the Paradise Freeway. Control would best be located where the "8" crosses itself at Central Avenue and Indian School Road. At this point a very substantial building might be provided to serve as headquarters for the "Valley Area Transit Authority" and to accommodate a variety of municipal and other functions.

In addition to the "Loop," express bus service might be provided to connect stations along the Black Canyon and Papago freeways. These would be planned to interface with both the "8" and its extensions and local transit systems.

The characteristics of the "Loop" can be summarized as follows:

Total route length (double track) (two way)	50.0 miles
Number of stations	23
Average station spacing--entire route	2.1 miles
Average station spacing--Central Avenue	1.0 mile
Average scheduled speed, including stops	42.0 MPH
Maximum speed	75.0 MPH
Minimum operating headways (under fully automated control)	90.0 sec.
Station dwell time	20.0 sec.
Vertical circulation at stations	Escalators
Fare collection	Fully automatic

Speeds and travel times are extrapolated from data given for the equipment and operation of BART, San Francisco.

Although estimating the cost of a mass/rapid transit concept is not one of the objectives of this study, it is readily possible, using data supplied by Westinghouse Electric Corporation to project the cost of the basic loop, the "8", if it were constructed as a Westinghouse Transit Expressway. The Westinghouse estimates are for "Typical Total Capital Costs per System Mile--Includes All Construction, Land, Stations and Rolling Stock" and they are further identified, in the publication Westinghouse Engineer for January, 1970, as "Construction and capital costs based on Transit Expressway Report--February 20, 1967. These basic costs have been inflated substantially over those reported in the Report to allow for increases in construction costs." The projection, then, in January 1970 was as follows:

<u>Type of Construction</u>	<u>Westinghouse Cost per Mile</u>	<u>No. of Miles</u>	<u>Total Cost</u>
Subway	17,000,000	6.5	\$110,500,000
Aerial	8,000,000	34.5	276,000,000
Surface	6,200,000	<u>9.0</u>	<u>55,800,000</u>
Total		50.0	\$442,300,000

(End Professor Elmore quote.)

Other transit types have been offered for use in the Phoenix urban area, primarily by commercial interests promoting a specific vehicle type. These promotions have not generally offered specific route proposals for a system which might offer service in the Tempe-Mesa-Apache Junction area.

The specific beneficial or detrimental impacts of any proposed fixed right of way mass transit system relative to air pollution, noise, socio-economic factors, etc. are not capable of analysis until such a system has passed through the route location stage to the preliminary design stage. No such system so far proposed for the Phoenix urban area has advanced to that stage of development.

HIGHWAY ALTERNATIVES

Of the alternatives discussed in the preceding sections the Arizona Highway Department has the legal prerogative to choose only one, the do-nothing alternative. Because of State and federal laws pertinent to the expenditure of highway user moneys, the Arizona Highway Department may not choose to implement any other mode of transportation to the exclusion of a highway project regardless of the potentially beneficial environmental impacts which may accrue from such a course of action.

This section discusses alternative highway types, locations, and designs and, therefore, provides the range of choices from which the Arizona Highway Department, as a specific individual agency, may choose.

Alternate Highway Facilities

Improve Existing Streets

A possible alternative to freeway construction is to improve the existing streets so that optimal utilization of existing facilities may be obtained. Within the more heavily urbanized portions of the Tempe-Mesa area this has already been done. U.S. Highway 60-80-89, the responsibility of the Arizona Highway Department, has been essentially fully developed for several years and cannot be expanded further without the acquisition of additional right of way. Most of the properties adjoining the highway in Tempe and Mesa are developed, many with such minimal setback from the roadway that building demolition would be required if additional right of way were needed. Such takings would be costly both from a monetary and social viewpoint. Various construction projects have improved U.S. Highway 60-80-89 in recent years without materially increasing highway capacity. Such projects improve the appearance, drainage, and safety of the highway through the provision of landscaped raised medians, curbing in developing areas, additional traffic signals, etc.

Other arterial roads parallel to the proposed freeway, such as Baseline Road, Southern Avenue, Broadway Road, and University Drive, are the responsibility of the city or county within which they are located. These arterials have been fully developed in the areas of greatest need and are subject to the same general right of way restrictions as U.S. Highway 60-80-89. These routes are still being improved by local agencies as rapidly as funds permit. That such arterial development is not sufficient is apparent from the traffic congestion levels which exist not only during commuting hours on weekdays but also on Saturdays and during the middle of the day.

One-way streets, applicable in areas where closely spaced streets form a well-defined grid, would require separations of up to one mile in the Tempe-Mesa-Apache Junction area in order to use existing roadways because subdivision developers have been encouraged to create non-continuous local streets. Through much of eastern Maricopa County there is no continuous network of non-arterial streets available for use. Large separations between paired one-way streets tend to require additional vehicle mileage (in reaching the street going the right way) and, therefore, partially, if not completely, negate the traffic capacity benefits of converting to one-way operation. The benefits of one-way streets are due primarily to the elimination of the conflicts encountered by left-turning vehicles. In cases where left-turn lanes were provided at intersections, it is possible to provide an extra through lane in converting to one-way operation with a resultant capacity increase.

The environmental consequences of increasing traffic flow on surface streets are generally negative except for the economic benefits deriving from the increased activity levels. Otherwise, increased traffic on an existing street leads to increased noise levels, increased air pollutant emissions, etc.

Build a New Street Instead of Freeway

It would be possible to utilize the right of way of the Route 360 Freeway for the construction of a Route 360 facility of street-like characteristics, no bridges or ramps at crossroad intersections. This would appear to cost less than a freeway but may in reality provide little, if any savings. To handle the traffic volumes for which the Route 360 Freeway is designed would require construction of a roadway of exceptional width since each lane of freeway has the traffic-carrying

capacity of two to four lanes of surface arterial street because of the effect on streets of signals and cross traffic. The Route 360 Freeway is designed to carry on six lanes as much traffic as can be handled by four four-lane surface arterial streets such as now exist in the Tempe-Mesa area. The width of such a facility could not easily be contained within the presently planned right of way and would not leave room for such beneficial items as landscaping, earthen berm noise abatement barriers, etc. The construction of an arterial street of more normal proportions would avoid these sacrifices at the expense of being unable to serve new and existing economic development in proportion to its reduced width and traffic capacity. Construction of a surface arterial would also result in a lesser increase in safety for those using the facility. Accident and fatality rates in Arizona and nationwide are generally reduced by one-half to two-thirds on freeways because of the virtual elimination of head-on and broadside-type collisions which may occur on arterial streets required to perform the same traffic functions.

The problems faced by designers in eliminating flood hazard in the vicinity of the Route 360 Freeway would still have to be faced by designers of a surface street. The cost of controlling rainstorm runoff water at the proposed freeway location will be a large and significant portion of the overall project cost regardless of whether a freeway or alternate roadway type is chosen for construction.

Alternate Freeway Locations

The Federal Highway Administration approved the location of the Maricopa County segment of the Route 360 Freeway on January 23, 1967. Since this location approval it has not been considered to materially change the location of the route within the county. Accordingly, the

following discussion of alternate locations in the Tempe-Mesa area is academic since the alternates discussed are not presently under consideration. The discussion should, however, illuminate the basic reasons why the discarded alternates were regarded as less desirable than the presently planned alignment.

The discussion of Pinal County alternate routings is not academic, however, because location approval has not been given by the Federal Highway Administration. Several variants are under consideration and it is not presently known which routing will be chosen.

Maricopa County Alternate Routes

In 1960 a study done by Wilbur Smith and Associates entitled "A Major Street and Highway Plan for the Phoenix Urban Area and Maricopa County" was published. Commonly referred to as the Wilbur Smith report, it called for construction of a county-wide highway system based on a network of freeways and expressways in a grid pattern in the Phoenix area. This report, accepted by most governmental agencies in Maricopa County including the Cities of Tempe and Mesa, showed a routing for a Tempe-Mesa freeway lying from one-half to two miles north of the currently proposed alignment. (See "Wilbur Smith Line," Figure 4-1 on Page 4-37. The Wilbur Smith Line was located between Broadway Road and Southern Avenue to a point east of Mesa where the route turned northerly to connect with the existing U.S. Highway 60. This route was closer to the centroids of activity and would have offered more service to traffic than any route proposed since. If constructed in 1960, the Wilbur Smith Line would have required very little relocation of residences or businesses except in the area just south of downtown Mesa. But, the

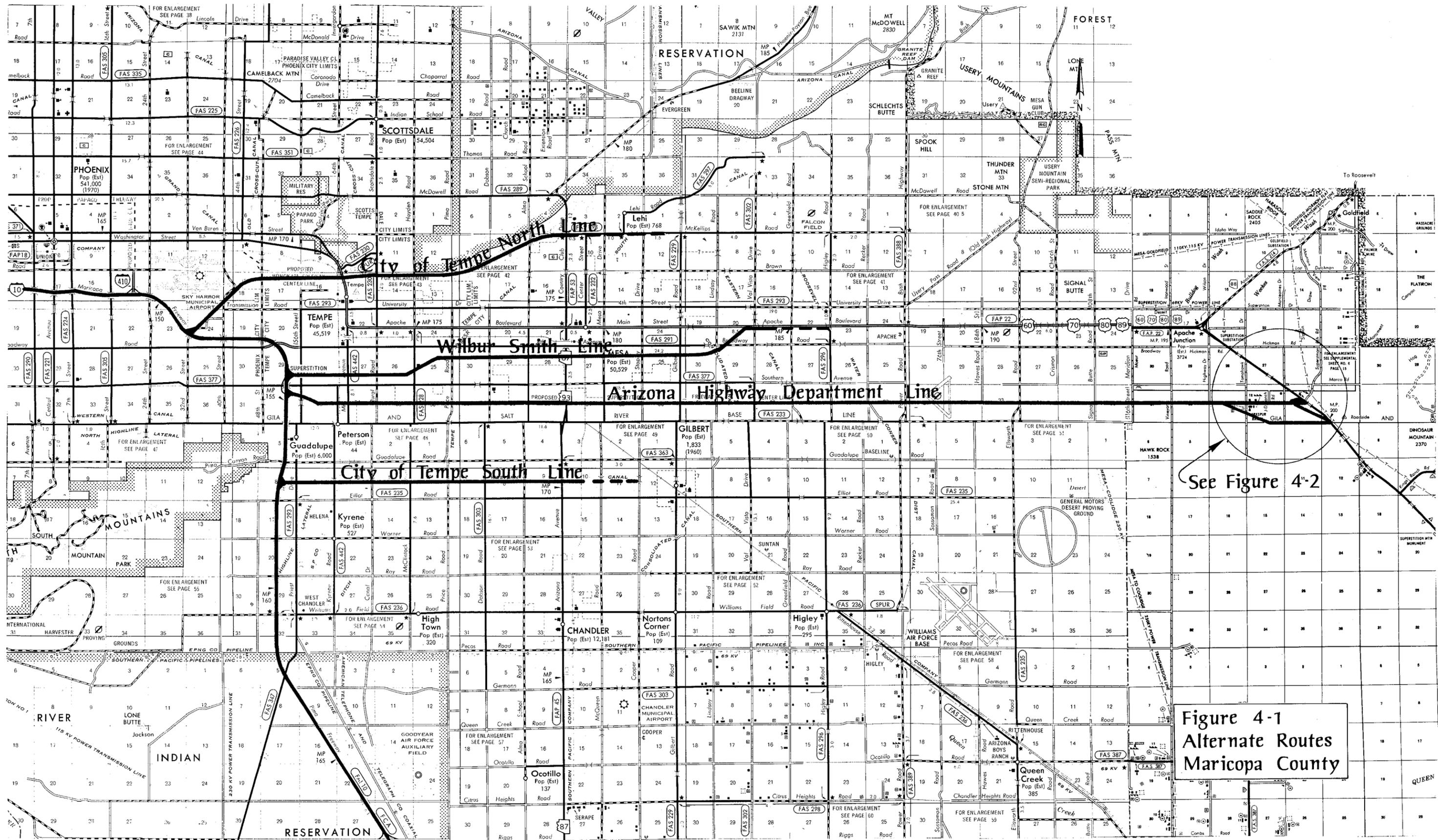


Figure 4-1
Alternate Routes
Maricopa County

urban growth in the Tempe-Mesa area was not given adequate consideration. Within a very few years, residential developments were constructed in the path of the Wilbur Smith Line in Tempe and, to a lesser extent, in Mesa, as well as east of Mesa along U.S. Highway 60, converting that highway into little more than an urban arterial.

By 1962 the problems of the Wilbur Smith routing were apparent so that, after extensive study, the Arizona Highway Department chose the approximate routing shown on Figure 4-1 and designated "Arizona Highway Department Line". This routing was located, except for a short section in Tempe, along the midsection line between Southern Avenue and Baseline Road. This alignment has received location approval from the Federal Highway Administration for the section from Interstate Highway 10 to the Pinal County Line. The segment from the county line easterly within Pinal County is still under study and will be discussed later in this section.

The Arizona Highway Department Line lies within the city limits of both Mesa and Tempe. Judicious planning has assured a right of way corridor for the freeway with almost no relocation of residences or businesses. The line is also parallel to and two miles from U.S. Highway 60, the current prime travel route for areas east of Mesa. Therefore, the route is able to serve all points along its corridor while effectively minimizing disruption of the existing communities.

The Arizona Highway Department line will, as a consequence of its decreased disruptive effect, not serve existing traffic as well as the Wilbur Smith Line. Until recently almost no developed portions of Tempe or Mesa lay to the south of the freeway. This means that most drivers today would have to go somewhat out of their way to benefit from the

convenience of the freeway. However, for many years the City of Tempe has foreseen that its growth was restricted on the west by Phoenix, on the north by Scottsdale, and on the east by Mesa so that the only option was southerly growth for which Tempe has planned. The accessibility provided by Interstate Highway 10 and more recently by State Route 360 has spurred this growth to the south.

Although Mesa's planning and growth are oriented predominantly in an easterly direction from the center of that city, extensive development to the southwest, south of the Route 360 Freeway is also planned. The development of both cities is effectively centralizing the proposed freeway route, making the freeway a more effective servant of the traffic demands of eastern Maricopa County.

Although the City of Tempe has been able, through advance planning, to effectively negate the potential divisive effect of the freeway, Tempe originally feared that the proposed routing would destroy its community cohesiveness. In September 1963 a resolution of the City Council was passed opposing the routing selected for the freeway. The Arizona Highway Department was requested by Tempe to change the routing so that the new freeway would be constructed along the south bank of the usually dry Salt River. See "City of Tempe North Line" on Figure 4-1. Tempe also recommended that a second route be constructed south of the city along the midsection line between Guadalupe and Elliot Roads. See "City of Tempe South Line" on Figure 4-1.

This proposal had the obvious disadvantage of requiring two freeways to serve the purpose for which one was intended, with the resultant increase in both cost and environmental effect. Most important in 1963

when environmental effects were of less concern than today was the fact that the proposed location of the Tempe North Line was not a feasible engineering project. With consideration given to the intermittent nature of flow in the Salt River's channel, it was difficult to provide sufficient right of way for traffic interchanges. One small mountain which projects into the river channel also effectively blocks a route along the south margin of the Salt River.

The Tempe South Line would have affected its surroundings in much the same way as does the Arizona Highway Department Line, except that being located two miles farther south, it would offer less service to most drivers. And, although the rural nature of the area would not preclude rerouting the Tempe South Line, the originally proposed location of this route could have caused the freeway to pass through the center of downtown Gilbert.

Pinal County Alternate Routes

The Federal Highway Administration concurs with the location of the Route 360 Freeway between I-10 and the Pinal County line. However, the freeway will traverse, more or less, five miles in Pinal County. The alignment of this section is currently under study with four variants given consideration to date. See Figure 4-2 on Page 4-41.

East of Vineyard Road in Pinal County all routes traverse virgin desert, undeveloped except for the presence of a few residences, including mobile homes near Tomahawk Drive and one house about one-sixth mile west of U.S. Highway 60 near the midsection line which, within Maricopa County, defines the alignment of the freeway. The following table compares the relative lengths and requirements of each of the four alternates.

T7-7

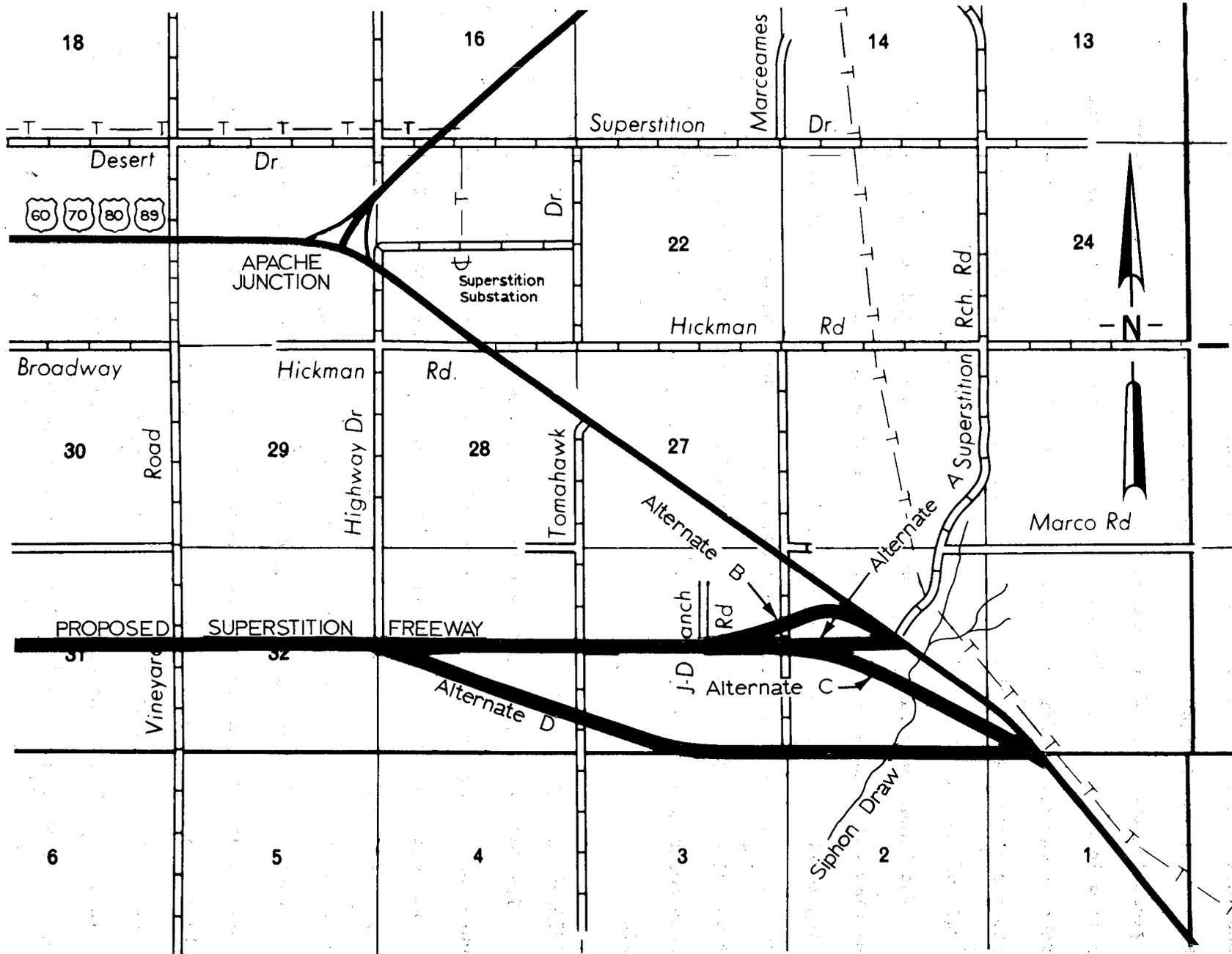


Figure 4-2 Alternate Routes (Pinal County)

Construction costs have not been estimated. But, it is reasonable to assume that the unit costs will be similar and that costs will depend primarily upon the length of new freeway to be constructed.

	<u>Alt. A</u>	<u>Alt. B</u>	<u>Alt. C</u>	<u>Alt. D</u>
Length of new construction required in Pinal County.	4.7 mi	4.6	5.4	5.4
Travel distance from county line to end of Alt. D.	5.5 mi	5.6	5.4	5.4
Relocation of residences or businesses required?	Yes	Yes	Yes	No

Alternate A consists of extending the midsection line routing of the Maricopa County segment of the freeway directly to a point of junction with U.S. Highway 60. This alternate would require the most relocation of residences and would involve the greatest difficulty in constructing an interchange with U.S. Highway 60 because Siphon Draw is located at the approximate junction point.

Alternate B consists of relocating the last mile of Alternate A slightly to the north to avoid the problems of locating an interchange at Siphon Draw. This alternate would require relocation of the same residences as Alternate A near Tomahawk Road but may avoid the residence near Highway 60, depending upon the final design of that junction. Although Alternate B would require the least amount of initial construction it would necessitate the greatest amount of travel and would, therefore, eventually require the greatest investment in improving U.S. Highway 60 to serve Route 360 Freeway traffic.

Alternates C and D diverge at different points from Alternate A to effect a junction with U.S. Highway 60 at a common point about one-half mile south of the general alignment of Alternate A. Alternate C would require relocation of the residences near Tomahawk Drive but would not

require relocation of the residence near Highway 60. Alternate D will require no relocation of existing residences. Both routes are the same length, requiring the most new highway construction, but the least vehicular travel.

Alternates A, B, C, and D would have essentially similar environmental impacts in areas other than relocation and initial cost as previously discussed. Traffic levels would not be affected by the choice of alternates. Consequently, air pollutant emissions and noise levels would be essentially identical for all alternates. Specific levels of noise and air pollution and other disruptions to the existing environment in Pinal County are discussed more fully in Part Two of this environmental impact statement.

Alternate Freeway Designs

At-Grade Design

The simplest way to construct a roadway of any type is to construct it as nearly as possible to the ground level of the surrounding terrain, at-grade. See Figure 4.3 on page 4-47. Roadways are, however, seldom at the exact level of the ground surface since it is usually necessary to allow for the passage of rainwater flows under the roadway. In areas of near-level terrain this requires a slight elevation of the roadway surface.

At-grade roadway construction, as compared with other types, has beneficial impacts upon the environment including minimal construction cost, minimal disruption of the narrow band within the right of way corridor, less intrusion into the visual environment than elevated roadways, and slightly greater traffic capacity than undulating roadways.

Detrimental impacts of at-grade freeway construction upon the local environment include maximum noise levels, high air pollutant concentrations

since the pollutants are emitted at the height at which most human activity occurs, and maximum interruption of cross traffic since crossroads must be either raised, lowered, or terminated.

It is proposed to construct the Route 360 Freeway as an at-grade facility for most of its length east of Gilbert Road and for short stretches between traffic interchanges in Tempe.

Elevated Design

At locations where crossroad and railroad traffic is required to cross a freeway at frequent intervals, it is possible to raise or lower the freeway roadways so that cross traffic may experience minimized disruption. See Figure 4-3 on page 4-47. In cases where right of way is insufficient for embankment side slopes it is possible to build an elevated freeway on continuous structure. This also may reduce objections to massive embankment side slopes raised on the basis of adverse social or aesthetic impact.

Elevated roadway construction, as compared with other types, has beneficial impacts upon the environment including less noise than at-grade roadways, optimal air pollutant dispersion, potentially reduced disruption to cross traffic and, therefore, to the social fabric of the community.

Detrimental impacts of elevated freeway construction upon the local environment include maximal visual intrusion, high construction costs, particularly for elevated structures, and greater disruption to the narrow band within the right of way corridor.

It is presently expected that the Route 360 Freeway will be partially or fully elevated on earthen embankment in Mesa between the Tempe Canal and Gilbert Road. However, final design of the freeway profile awaits further studies of the problems encountered in that area.

In areas where the amount of embankment material required for new roadway construction is greater than the amount of material available from roadway excavation, it is necessary to import or "borrow" the required embankment materials from nearby sources. Because much of the land adjacent to the proposed project is vacant (see aerial photo map it is expected that the required acreage for borrow pits will be reasonably attainable.

Depressed Design

A depressed freeway has the same basic capabilities of reducing disruption to movement across it as does an elevated route. (See Figure 4-3 on page 4-47.) Further, it is possible to fully cover a depressed route or to place it in tunnel so that, after construction, no intrusion upon the local environment is seen. However, these benefits are achieved at the expense of moving vast quantities of earthen materials away from the project while creating a sump for rainwater runoff. Consequently, drainage costs comprise a large expense for many depressed freeway projects.

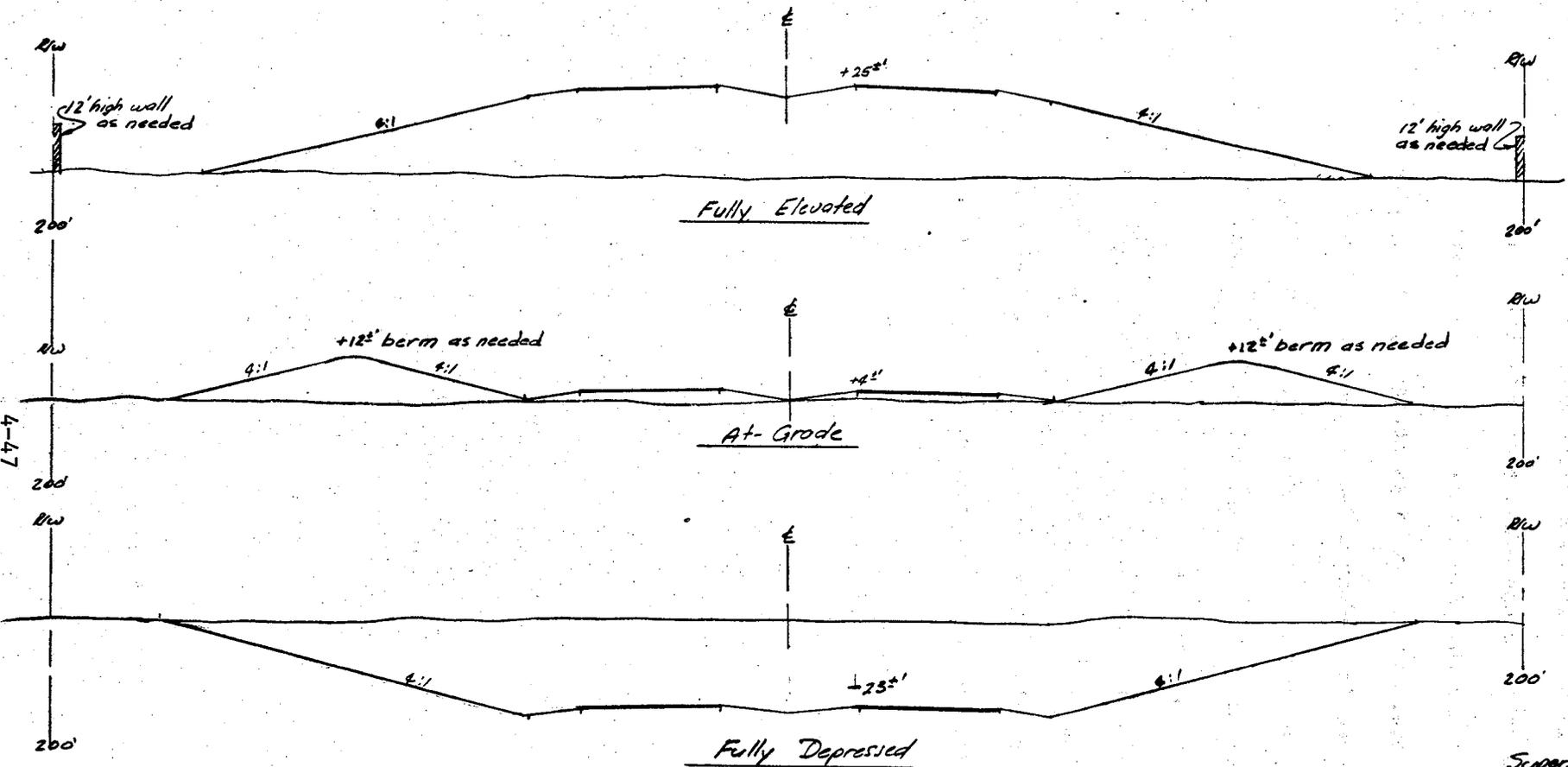
Depressed freeway construction, as compared with other types, has beneficial impacts upon the environment including minimal noise levels outside the freeway right of way, minimum visual intrusion upon the local environment, including the possibility of covering the road completely, potentially reduced disruption to cross traffic, and therefore, to the social fabric of the community.

Detrimental impacts of depressed freeway construction upon the local environment include high construction costs, maximum drainage problems, and maximum concentration of air pollutant emissions.

The Route 360 Freeway will, because of rainwater drainage problems have only three new short segments of mainline roadway depressed below

existing ground level. These will be at the points where the freeway underpasses Rural Road, McClintock Drive, and Price Road in Tempe.

In some cases it is possible to use excavation materials from depressed roadway sections at nearby points where elevated roadways are to be constructed. However, it is sometimes necessary to excavate more material than can be used in roadway construction and to dispose of the excess. Along the corridor of the proposed freeway much land is vacant (see aerial photo map 1-4), awaiting future development. Since much of this land is relatively low-lying it is necessary to haul in earthen materials to raise the level of the land. Consequently, it is often possible to reach agreement between the state or contractor and the various landowners so that excess excavation materials may be moved to private property for the mutual benefit of all concerned.



Superstition Fwy.
Suggested Typical Section
ADST

RnD 6-29-2

FIGURE 4-3

PART FIVE

THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE
ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT
OF LONG-TERM PRODUCTIVITY

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PART FIVE

5. The Relationship Between Local Short-Term Uses of the Environment and Maintenance and Enhancement of Long-Term Productivity

Short Term Uses:

Construction

During construction of the Superstition Freeway certain temporary conditions will exist. Essential utility service to area residents will be disrupted for short periods. Plans will be prepared to minimize these disruptions and preclude any possibility of a health hazard that might result from the absence of these services.

Dust and noise associated with the project will be regulated by standard specifications and special instructions in the construction contracts. General construction and the stockpiling of materials may have some detrimental effect upon the aesthetics of the area. However, this situation will be of short duration.

Changes in Traffic Patterns

An evolution of changes in traffic patterns will occur throughout the construction of this project. Detour routes and routes for hauling construction materials and equipment will change as the various phases of construction and the various contract segments are accomplished. Detour routing will be a part of the construction plans. Since these detours will be new construction midway between two established roads (Southern Avenue and Baseline Road), disruption of traffic will be much less than would otherwise be the case if existing roads were being reconstructed. Intersected streets will require construction of grade separations or traffic intersections according to the plans, and this will contribute to the need for traffic control during the construction period.

The opening of S.R. 360 will cause some changes in traffic patterns and traffic control systems. Travel patterns will be modified to accommodate the new facility. Certain streets will have their traffic load diminished as the Superstition Freeway will offer motorists an alternative route to their destinations. Others will have additional demands placed upon them as they supply routes of access to and from the new facility. Plans for improving these streets and modifying the traffic control systems are being coordinated with Tempe and Mesa. Coordination is also being maintained with Maricopa and Pinal Counties as well as with Apache Junction.

Taking of Natural Features

Efforts will be made to preserve existing shrubs, trees and major plants and leave portions of the freeway right of way in a natural condition, where practicable. This natural vegetation is confined to the eastern ten and one-quarter miles of the 25-mile corridor. Much of the vegetation that will be removed will be replaced in time by natural vegetative regeneration. New landscaping will be accomplished (where practicable) and where irrigation may be supplied in keeping with the already completed short segment of this expressway in Tempe. This is further discussed in Parts One and Two of this statement.

Taking of Man-Made Features

The short-term impact of displacement and demolition of man-made features is minimized because the State, City and County planners have discouraged erection of man-made features in the corridor and

land developers have cooperated in this effort. In addition, this corridor was selected at a time the area had experienced little development other than agriculture.

There are no churches, schools or hospitals in the freeway right of way. Since the corridor center line follows along the existing mid-section line between Baseline Road and Southern Avenue, a minimum disruption of individual farm spreads will occur as the actual construction of the freeway occurs. Agricultural irrigation ditches, located along this center line, will be removed. Replacement of these ditches will be accomplished in accordance with the Salt River Project plans to continue supplying irrigation water to the area as needed. The Salt River Project will handle details of design and construction and financial assistance will be provided by the State.

Part Three of this statement discusses the impact upon residences located in the right of way. Approximately ten residence dwellings located between Alma School Road and the eastern terminus of the project will be removed. A few mobile homes located between Power Road and Sossaman Road and near the project's terminus may encroach upon the right of way area and will require moving. A portion of a cattle feed lot and the main building of a small dairy located between Mesa Drive and Greenfield Road will be removed.

The removal of a very small number of dwellings will mean relocation for a comparably small number of people. The short-term impact for these people could be unpleasant or traumatic since they have been living in a rural setting normally associated with stability.

In the long-term approach, urbanization in this area appears to be inevitable and will result in greatly increased land evaluation accompanied by higher taxes which could also compel residents to change their life style or move. Relocation assistance will be provided in accordance with provisions of appropriate federal and state regulations.

It is not certain how many mobile homes will be involved at the time of the actual highway construction, but at this time the number appears to be small. As noted in Part Three of this study, the mobile home occupants have been located here a shorter period of time and should find a move less disruptive. New trailer spaces for these people can probably be found within the same mobile home parks. If this is not possible there are numerous other mobile home parks within the vicinity. Relocation assistance will also be provided as necessary.

Approximately 850 acres of irrigated farmland lying within the right of way will be removed from production. This will involve a few acres of older citrus trees but most acreage is in field crops. One deep well is located in the construction area. The El Paso Natural Gas pump station on the mid-section line at Center Street may require relocating.

Long Term Uses:

Foreseen Changes in Land Use Resulting From the Proposed Project

Urban development as described in Parts One and Two of this study is rapidly moving ahead throughout the Phoenix area of influence. The Department of Economic Planning and Development (DEPAD) has

prepared a study which shows enough land already is subdivided outside urban areas in Arizona to accommodate a million more persons than are expected here in the year 2000. In Maricopa County, the study lists 26 subdivisions covering 118,248 acres. For Pinal County, the study lists eight subdivisions covering 35,400 acres.

The area along the Superstition Freeway is one of the rapidly developing areas. It is also an area of well-planned communities. The large developments underway at this time are setting a trend of single and multiple residence dwellings placed around green spaces and provided with water features, and recreational facilities. Within these larger projects, which encompass both sides of the freeway, the plan is to construct housing away from the freeway and locate shopping centers, service centers and other commercial activities near the road and especially near interchanges.

Intensive development has taken place along both sides of the Superstition Freeway corridor between Mill Avenue and Price Road in Tempe and Mesa. Other urban development has been progressing on both sides of Southern Avenue between Alma School Road and Stapley Drive. Availability of large tracts of land near Dobson Road and near Price Road and Power Road (Bush Highway) has caused major developments to begin. These latter projects would probably have emerged without the proposed freeway. However, the developers are capitalizing upon the close proximity of this route to expedite movement of residents and service vehicles.

Smaller parcels of land have not been in demand for development due to lack of city sewage and water services. Now that the larger developments are starting and initially providing their own sewage

systems and using existing water sources, requests have been made to complete the extension of municipal services along the corridor. Annexation petitions which would put Mesa's eastern limits a mile east of Bush Highway have been circulated. The Mesa Planning and Zoning Director has stated the annexation move was the result of "tremendous pressure" by residents crowding into the fast developing pathway toward the Superstition Mountains. The proposed annexation area extends from Mesa's present eastern limits at Higley Road to Sossaman Road, and south from Main Street (Apache Boulevard) to Baseline Road. This area contains over 1,000 parcels of property including some large developments. The area is already being served by Mesa with domestic water. The Superstition Freeway corridor runs through the full length of the proposed expansion area. Community members of Apache Junction are actively seeking incorporation and are expecting growth to increase in their area and those areas in the vicinity of the Superstition Freeway.

Real estate agencies and planners for the cities and counties along the Superstition Freeway corridor report several land developers have started projects along the corridor and others have expressed interest in future land acquisition and development with the land nearer Phoenix, Tempe, and Mesa receiving the greatest interest for early development. This is land that has been in farm production and has had water rights established. However, the previously little used, or unused, land in eastern Maricopa County and western Pinal County has drawn greater interest as ultimate uses are recognized and accepted.

As previously stated such development along this study area could be expected to take place without the Superstition Freeway. However, the expectation of this route has already acted as a catalyst for activity in the area. Actual construction may be expected to further accelerate land development. The freeway will provide a rapid, convenient and safer route for nearby residents to commute from their homes to places of employment or other activities within the cities of Phoenix, Tempe and Mesa. This is being given consideration by residential developers.

It is anticipated that at some future time the State Route 360 designation may be changed to U.S. Route 60-80-89. This route number change is not expected to cause an increase in usage by interstate travelers since the proposed project is within an urban area and not of sufficient length to entice travelers from the established Interstate system. (See discussion in Part Four of this Environmental Impact Statement). However, the route number change would improve access for intrastate travelers into the various communities along the Superstition Freeway and would remove some through traffic from the present "Main Street" routing of U.S. 60-80-89.

While some short term impact on services along the existing U.S. Routes 60-80-89 may be incurred by a route number change, the impact should be minimal in view of the overall traffic densities. It is expected that by the time a route number change is initiated most intrastate travelers will be aware of both routes and will have already chosen that route which best serves their needs.

Shopping centers, commercial establishments and industry are expected to come into an area that offers reasonably priced land,

labor and accessibility. Under these circumstances, the main effects of the Superstition Freeway will consist of introducing some changes in the priorities and sequences of development of land already committed to a given general category of use. For example, substantial construction will replace random placement of trailers, mobile homes and small low-cost structures that have started to materialize along the corridor.

This routing, linking important transportation routes and activity centers would also lend itself well to mass transportation in future planning for a total transportation system in the Salt River Valley. (See Part Four)

Items Related to Foreseen Changes in Land Use Resulting from the Improvement that may Either Limit, Expand or Affect the Following

a. Land

The immediate and continuing effect of the Superstition Freeway will be to promote a greater intensity of land use in the Tempe, Mesa and Apache Junction area, and to hasten an inevitable trend in land development along its corridor. As this area, as well as the entire area in the Phoenix sphere of influence continues to grow, much of the land formerly in its natural desert state or used for agriculture will be occupied by housing, industry and other man-made features. Development along Baseline Road and on to the south may be expected to take place much sooner than it would without the freeway which will open up the area. Such development in the past has been progressing primarily along Southern Avenue to the north of the

freeway corridor. Indications of this trend of expansion already exist with properties in the vicinity of the proposed project.

Open land is being converted to various other uses. However, this project will preserve a bank of open space between the road surface and the right of way boundaries that would otherwise be built upon. This will help blend in with the view toward the Superstition Mountains and with the green belts and water features planned for the larger residential developments.

The immediate and continuing effect of the Superstition Freeway will be to promote a greater intensity of land use in this Tempe, Mesa and Apache Junction area, and to hasten the inevitable trend in land development along its corridor.

b. Water

The area surrounding this 25-mile corridor has been served by a number of water sources. Deep wells have furnished water for domestic use and irrigation. The cities of Tempe and Mesa have furnished some municipal water to their incorporated areas. The Salt River Project and the Roosevelt Conservation District, provide water along the portion of the corridor between Rural Road and Power Road. The area between Power Road and the Junction with U.S. 60-80-89 in Pinal County is served by water from deep wells. Some of these wells are private and some are operated under franchises supplying water to several users.

The plan is to furnish Central Arizona Project (CAP) water to the area between Power Road and the Junction with U.S. 60-80-89.

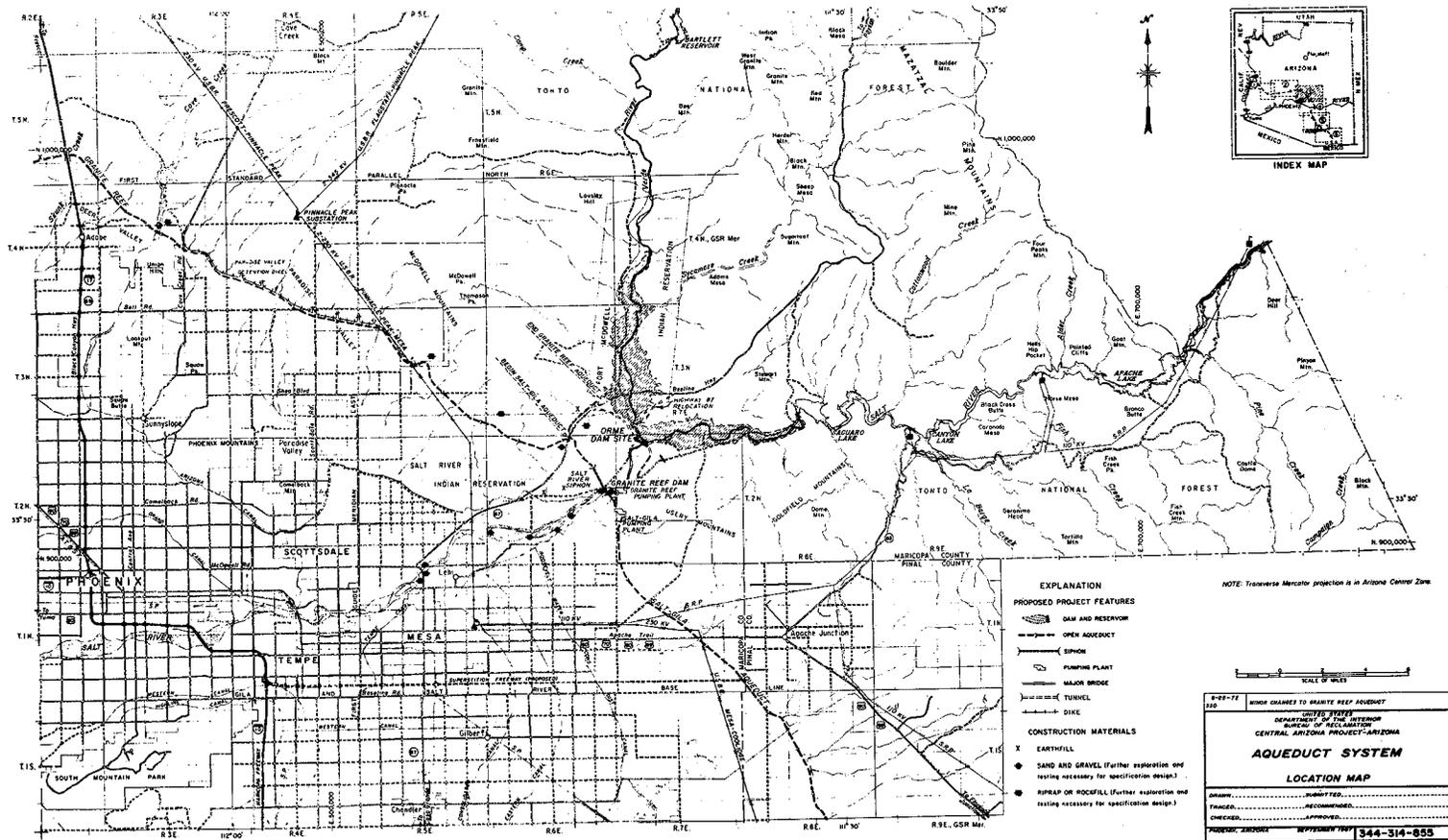
The water will be delivered from the Salt-Gila aqueduct running from the northwest to the southwest, crossing the Superstition Freeway just west of the Maricopa County line, near Signal Butte Drive (Figure 5-1, Page 5-11).

More intensive development or the future urbanization of this study area along the Superstition Freeway corridor represents a transfer of water from agricultural to municipal use. It is generally understood that residential, commercial and industrial activity will require less water than agriculture has required in this area.

Plans to use sewage treatment plant effluent for irrigation in green spaces should decrease the total demand for water from wells. This decrease in the pumping of underground water should slow down the lowering of the underground water level. Water has been available to this area in the past but the water level has been dropping and the quality of the water has been decreasing in some wells due to a greater concentration of salts.

The area surrounding the freeway corridor between Power Road and U.S. 60-80-89 southeast of Apache Junction has been slow to develop, partly because of water shortage caused by lowering of the water table and the poor quality of water in some wells. Since much of this area is still in its native desert state, future urban development here will require more water than has been used in the past, but less than agriculture uses. It is intended that Central Arizona Project water and local deep-well water will furnish necessary water in these areas.

Figure 5-1



It is hoped that CAP water and decreased water pumping will, by diminishing the lowering of the underground water level, curtail further development of existing ground fissures or depressed areas. One such depressed area along Power Road crosses Southern Avenue and ends about one-fourth mile from the Superstition Freeway alignment. The ground has reportedly dropped three to four feet during the past 20 years due to the removal of underground water.

c. Air

The proposed Superstition Freeway will promote higher vehicle speeds and more steady rates of travel than would streets parallel to the freeway. Figures 3-1 and 3-2 of AP-42, Compilation of Air Pollutant Emission Factors, show that higher average speeds of steady-state driving result in lower emission factors than lower average speeds or stop-and-go driving.

A discussion of the air quality is found in Part Two of this statement. This discussion predicts a 90-percent reduction in emission rates over the 1972 emission rates, even with a projected increase in traffic. By 1986 the vehicle population will not contain significant numbers of vehicles older than 1975, therefore accounting for lower emission rates.

d. Noise

A discussion of noise impact is found in Part Two of this study.

The Route 360 Freeway is expected to introduce noise levels above those which now exist at most points along the route's corridor. Noise of heavy trucks will be the controlling factor at all points along the freeway where unabated noise levels

might be expected to exceed federal standards. However, it is reasonable to assume that truck noise levels will eventually be restricted through legislative action. When this restriction occurs, overall noise levels resulting from traffic on this freeway will be noticeably reduced. Noise abatement barriers (walls and earthen berms) are currently in use along the existing segment of freeway west of Rural Road and similar methods will be considered for the new construction to help enhance the area's environment.

e. Wildlife

The land use trends will of necessity diminish the habitat and food sources of the small animals and birds currently using the agricultural fields and the desert area. As evidenced in other areas of the Valley, this change in land usage is an established pattern which the freeway will tend to hasten.

There will be some tradeoff, however. The larger developers are creating green belts; lakes and other water features; equestrian, hiking, and bike trails; recreational areas including golf courses; and are making extensive use of landscape materials. These newly created habitats, plus efforts by the residents to provide food, water and shelter, will encourage certain birds and other small animals adaptable to urban environments to inhabit or frequent the area.

PART SIX

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

PART SIX

6. Irreversible and Irretrievable Commitments of Resources

Although neither irreversible nor irretrievable, the commitment of approximately 1,265 acres of land for right of way will be necessary. If at some future date new modes of transportation obviate utilization of this highway alignment, the roadway could be obliterated and vegetated to its former natural state.

A portion of this right of way area would be committed to hard surfacing and public area even if the Superstition Freeway were never built. The Phoenix, Arizona Comprehensive Plan for 1990 shows 20.1 percent of the total developed land area in the Phoenix planning area would be allocated to expressways, streets and alleys. This is an increase above the 18.6 percent utilized for such use in 1965. The Phoenix plan shows a total of 38,000 acres in the Phoenix planning area's 252,900 acres would be devoted to streets and alleys, or 15.4 percent of the developed land area.

Using the 15.4 percent factor, 195 acres of the 1,265 acres of land programmed for the Superstition Freeway right of way would be required for streets and alleys if the area involved were entirely utilized by urban development.

The percentage of developed area devoted to streets and alleys by the major planned communities underway along the Superstition Freeway corridor ranges from 10 percent through 16.3 percent to a high of 30 percent.

The construction of this project will remove approximately 850 acres of agricultural land from production. This land is located between

north and south boundaries of Southern Avenue and Baseline Road and west and east boundaries of Rural Road and Power Road (Bush Highway). The portion of proposed right of way between Rural Road and Price Road has already been taken out of production and is fallow. The portion between Price Road and Power Road is primarily used for production of alfalfa, cotton, sorghum, wheat, barley, and some sugar beets and citrus.

Construction of this project will also consume approximately 415 acres of unimproved and undeveloped Sonoran Desert land. This land is located between Power Road (Bush Highway) on the west and the project terminus at U.S. 60-80-89. Within this area is a turf farm near Meridian Drive which will partly encroach upon the freeway right of way.

The change in land use along the freeway corridor will conform to the future land-use plans of the cities of Tempe and Mesa, the community of Apache Junction, and the counties of Maricopa and Pinal. The urbanizing influence of Tempe, Mesa, and Apache Junction is causing rapid urban development in this entire area occupied by and surrounding the proposed Superstition Freeway corridor.

A review of expansion taking place along nearly every paved street or road in and around the Phoenix sphere of influence, developments already started and other developing interest expressed in the area along the Superstition Freeway (S.R. 360), indicate this area will grow even without the freeway. Construction of the freeway could merely hasten the commitment of rural land to urban development.

This freeway will provide convenient access from developments and expedite movement of vehicles between major points of activity, a factor that could encourage industrial, commercial and residential development.

Major developments that have already started in the area include Rossmoor Leisure World (26,726 people on 1,520 acres), The Lakes (1,026 homes and 1,100 apartments on 300 acres), Dreamland Village (8,000 to 9,000 people on 1,063 acres), and Dobson Ranch (30,000 people on 2,373 acres). These larger planned communities are setting the trend toward medium to relatively low-density population, open space, and water-feature oriented type of western living. This will probably decrease the trend for establishing many small mobile home and trailer courts that have been developing in this area.

The right of way area not used for actual highway construction will be treated as an open space which will preserve a significant portion of the land that will be naturalized and will blend in with the Sonoran Desert in the vicinity of the Superstition Mountains.

The construction of S.R. 360 will require large quantities of fill and aggregates for use in asphalt and concrete paving and in the structures. It is anticipated the fill material will come from excavation work to be done in the corridor. The aggregate will come primarily from commercial pits in the Salt River bed near the project.

This area currently contains several commercial sand and gravel operations and therefore no new material sources should be necessary.

In the event the material to be excavated from depressed sections of the freeway should exceed requirements for fill on the project, this material will then be used for such purposes as land fills, filling a previously used materials pit, provided to local urban development projects or disposed of in other designated areas to be agreed upon by the contractor and the engineer in charge.

The Superstition Freeway will not directly affect water quality or quantity. However, the development of commercial, industrial, recreation and residential activities currently underway and projected for future development along the length of the freeway will constitute irreversible and irretrievable commitment of water resources. The degree of this impact will depend upon the land usage and the sources of water used.

Based upon past experience of land developers in building in the Phoenix sphere of influence, new land uses will require less water than agriculture required in the past. This should then require less water along the Superstition Freeway corridor between Rural Road and Power Road where intensive agriculture has been carried on over the past years. The area starting at Power Road and proceeding on past the county line to the junction with U.S. 60-80-89 in Pinal County has not been farmed, except for a few isolated projects. Agricultural development has been delayed in this area because of difficulty in obtaining water in sufficient quantity and quality. Salt River Project surface water has not been available here. Deep wells have been used as the water source, and many of these do not meet State health standards due to excessive concentrations of sodium carbonate, chlorides, fluorides, nitrates, and sulfates. As the water table has dropped, estimated seven or more feet per year, these mineral concentrations have increased. Some wells do contain potable water and are being used to supply water to the small trailer parks and mobile home parks dotting this development area in eastern Maricopa and western Pinal Counties.

In this area where agriculture has not flourished in the past, new land-use development, spurred partly by the Superstition Freeway, will require new water sources. The long awaited Central Arizona Project water is eagerly sought as a new water source to meet present needs and aid future development and improve the economy. It is hoped this additional water will decrease the drain upon existing underground water reserves and slow down the lowering of the water table, resulting in less deterioration of the water quality.

As is already planned by the large planned community developers, refined effluent from sewage systems will be used in green space irrigation and to replace evaporation loss in man-made lake systems. This will decrease the total gallonage of water that would otherwise be required to enable and sustain residential, industrial, and commercial activities in this area which is expected to undergo development in the future.

PART SEVEN

PROPOSED ACTION TO MINIMIZE HARM FROM UNAVOIDABLE
ADVERSE ENVIRONMENTAL EFFECTS

PART SEVEN

7. Proposed Action to Minimize Harm From Unavoidable Adverse Environmental Effects

As mentioned in previous parts of this report, when the Superstition Freeway is at-grade, earthen berms and masonry walls will help ameliorate potential noise problems from heavy traffic and provide pleasing aesthetics.

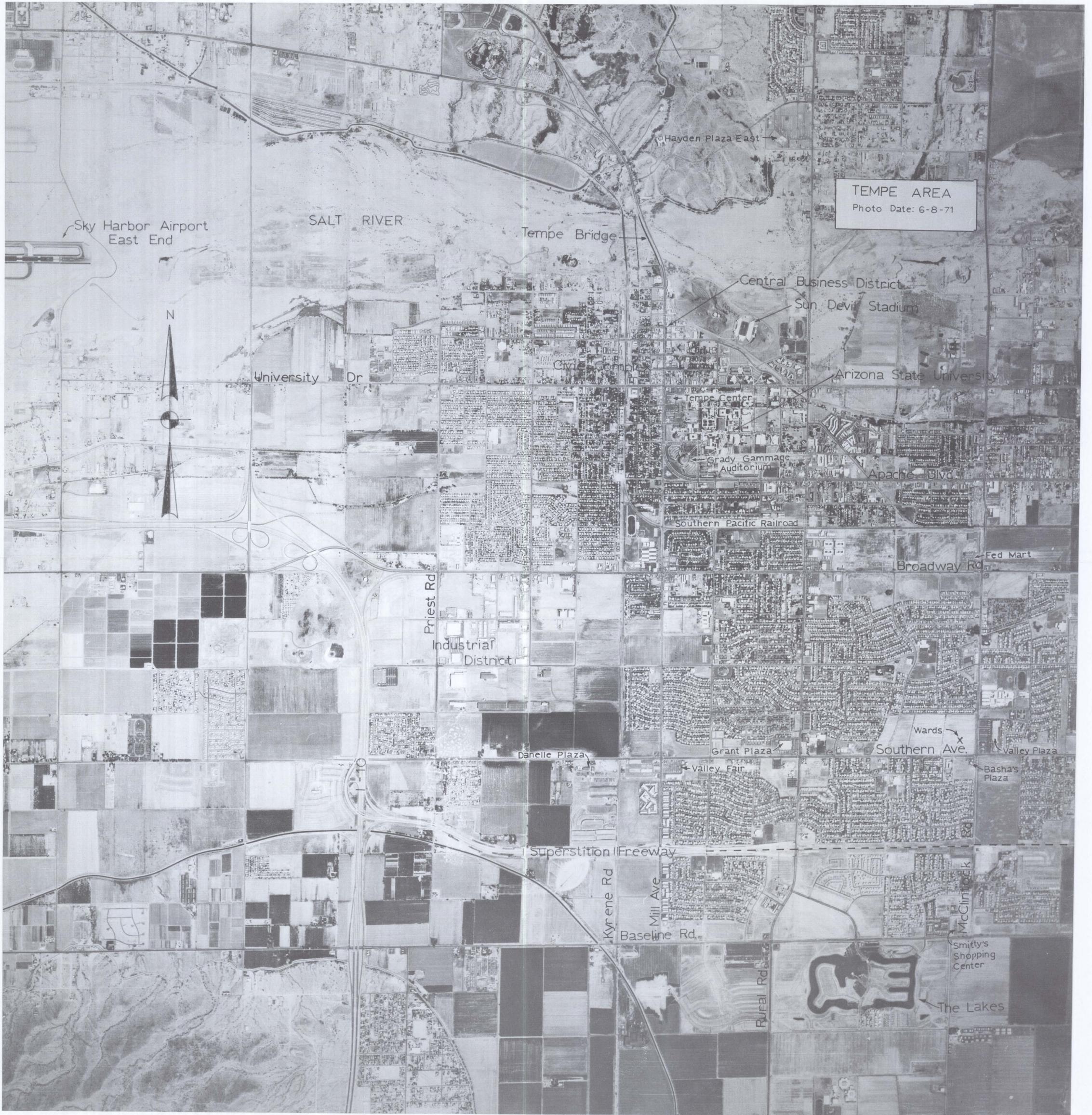
No sensitive areas are expected to be adversely affected by noise from freeway traffic. However, it will be necessary for local governmental agencies to prevent development of such areas adjacent to the freeway through use of their planning and zoning powers. Local agencies should also prohibit construction of elevated exterior activity areas (e.g., balconies on houses, apartments, motels, etc.) adjacent to and facing the freeway because they cannot be easily shielded from freeway noise.

The motorist will find S.R. 360 an aesthetically pleasing freeway. The sweeping slopes of the depressed segments will be landscaped with shrubs, trees, and grass to modify the harshness of highway concrete. Less landscaping will be employed where the freeway will be at grade level to maintain the open feeling of existing farmland and desert. In the desert portion of the freeway corridor, large salvageable plants will be transplanted in the median and roadside open areas.

Special provisions in construction contracts will require contractors to comply with Arizona Highway Department standard specifications during construction of the project. Such requirements pertain to minimizing the adverse environmental effects caused by excessive noise and dust production and use of borrow pits, disposal sites, haul roads, and detour routes.

The high availability of housing in the Phoenix metropolitan area insures an almost unlimited opportunity for relocating single family dwelling occupants. Highway Department experience has shown that replacement housing is almost always superior to that being replaced, at least in dollar value. Replacing older homes that long-time occupants may attach considerable sentiment to is not such an easy task.

Housing comparable to that in the Superstition Freeway corridor, i.e. surrounded by farmland or desert, may be difficult to find. However, relocation personnel of the Highway Department's Right of Way Section will aid residents in the freeway corridor in finding housing of their choice. As much as possible, attempts will be made to mitigate loss to relocatees of their familiar home environment.



TEMPE AREA
Photo Date: 6-8-71

Sky Harbor Airport
East End

SALT RIVER

Tempe Bridge

Hayden Plaza East

N

University Dr

Central Business District

Sun Devil Stadium

Civilian Complex

Arizona State University

Tempe Center

Grady Gammage Auditorium

Apache Blvd

Southern Pacific Railroad

Fed Mart

Broadway Rd

Priest Rd

Industrial District

Danelle Plaza

Grant Plaza

Wards

Southern Ave.

Valley Plaza

Basha's Plaza

Superstition Freeway

Kyrone Rd

Mill Ave

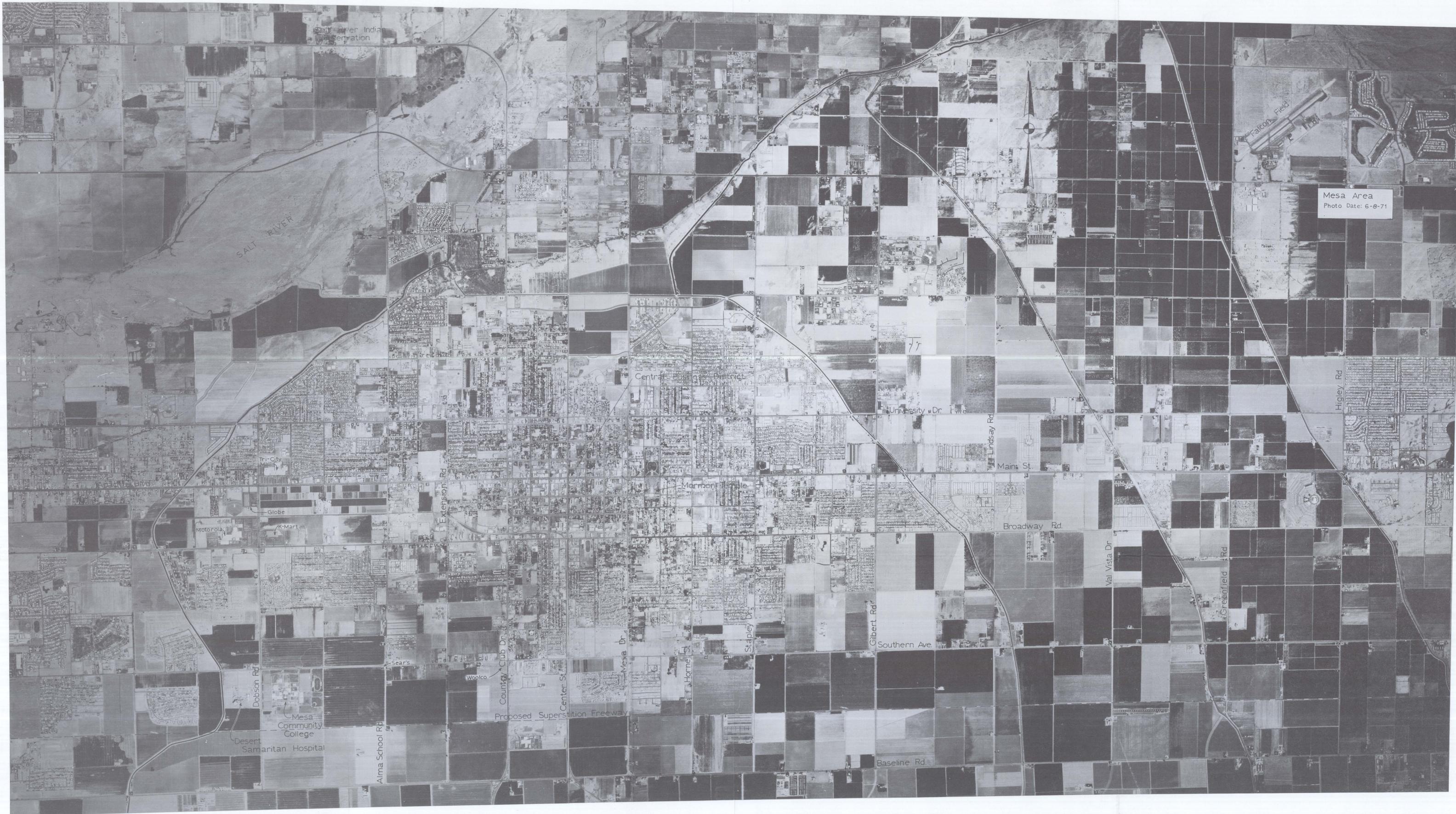
Baseline Rd

Smitty's Shopping Center

The Lakes

Rural Rd

McClintock Rd



Salt River Indian
Reservation

SALT RIVER

Mesa Area
Photo Date: 6-8-71

Central Business District

University Dr.

Higley Rd

Tri-City Mall

Extension Rd

Marmion Temple

Main St.

Motorola

Globe

K-Mart

Broadway Rd.

Dobson Rd

Mesa Community College

Desert Samaritan Hospital

Alma School Rd

Sear's

Woolco

Country Club Dr.

Proposed Superstition Freeway

Center St.

Mesa Dr.

Horne St.

Stapley Dr.

Southern Ave.

Baseline Rd.

Gilbert Rd.

Val Vista Dr

Greenfield Rd

Falcon Field