Summary

BACKGROUND INFORMATION

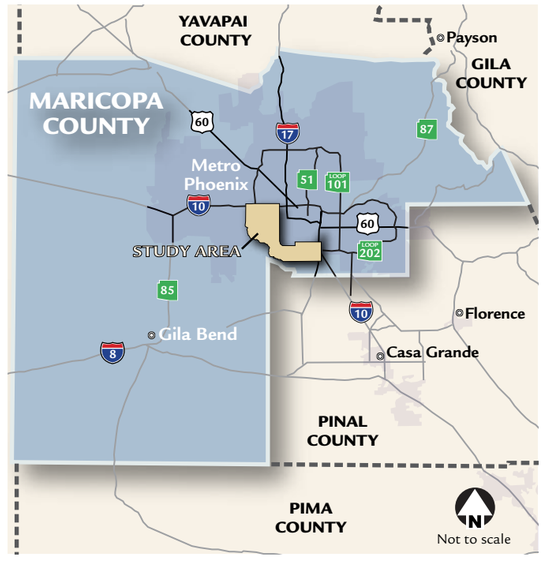
The Arizona Department of Transportation (ADOT) is the sponsor of a proposed action, the construction and operation of the South Mountain Freeway in Maricopa County, Arizona. The proposed freeway would constitute a section of the Regional Freeway and Highway System, the Loop 202 (referred to as State Route [SR] 202L in this document). The Federal Highway Administration (FHWA), the federal lead agency for the proposed action, in cooperation with the U.S. Army Corps of Engineers (USACE), the U.S. Bureau of Indian Affairs, and the Western Area Power Administration, has prepared this Final Environmental Impact Statement (FEIS)/ Section 4(f) Evaluation (referred to as FEIS in this document) in accordance with:

- the National Environmental Policy Act (NEPA) of 1969 [42 United States Code (U.S.C.) § 4332(2)(c)]
- Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S.C. § 303, as amended)
- Section 404 of the Clean Water Act of 1977 (33 U.S.C. § 1251)

The FEIS 1) satisfies FHWA and ADOT's environmental analysis requirements; 2) provides a comparison of the social, economic, and environmental impacts that may occur from implementation of the proposed action—operation and construction of a major transportation facility; and 3) identifies measures to avoid, reduce, or otherwise mitigate adverse impacts. The FEIS includes sufficient preliminary design information to compare alternatives.

The location of the Study Area for the proposed action is in the southwestern portion of the Phoenix metropolitan area in Maricopa County, Arizona (Figure S-1). Consideration of alternatives and project impacts was comprehensive and extended outside Study Area limits when appropriate. While the Gila River Indian Community (Community) is included in the Study Area, no alternatives have been studied in detail on Community land. The many years of ongoing outreach to gain permission to study an alternative in detail on Community land have been unsuccessful. Ultimately, the Community elected to not grant permission to study alternatives in detail on Community land and, therefore, FHWA and ADOT have determined that an alternative alignment on Community land is not feasible.

Figure S-1 Location of the Study Area, Maricopa County



The Study Area for the proposed freeway is in the central portion of Maricopa County, Arizona.

The proposed freeway would be constructed in phases ultimately leading to an eight-lane divided, access-controlled facility, with four travel lanes in each direction. Three lanes would be for general purpose use and one lane would be dedicated to high-occupancy vehicle use.

General background information about the proposed action includes:

- The proposed freeway would generally follow the southern and western edges of the city limits of Phoenix, Arizona, for a distance of between 22 and 24 miles.
- The proposed action would constitute a section of SR 202L (part of the Regional Freeway and Highway System). The Red Mountain, Santan, and South Mountain freeway corridors are the component parts of the ultimate SR 202L.
- The proposed freeway is integral to the region's adopted multimodal transportation plan as a key element of the plan's freeway system component and would be part of the National Highway System.
- The proposed freeway would begin at a connection to Interstate 10 (I-10) (Papago Freeway) between

What you will find in the Summary chapter

The *Summary* chapter provides an overview of the proposed action, specifically:

- **what is the historical context (page S-4)**
- **how it came to be needed (page S-5)**
- **what it would look like if it were constructed (page S-8)**
- **the impacts it would cause while being constructed and when open to the public for use (page S-10)**
- **what measures ADOT would implement to reduce those impacts (page S-18)**
- **what events led to identification of a Preferred Alternative (page S-35)**
- **what key issues and outstanding areas of concern are (page S-40)**
- **what communications have occurred in getting to the point of issuing an FEIS (page S-43)**

The *Summary* is not the "final word" about the proposed action; the reader is encouraged to refer to the main contents of the FEIS regarding proposed action-related topics and issues.

Acronyms, abbreviations, glossary, list of preparers, references, and an index can be can be found in the back of the FEIS.

115th Avenue/Avondale Boulevard (milepost 131.7) and 43rd Avenue (milepost 140.7) and end at or near the existing system-to-system freeway interchange connecting SR 202L (Santan Freeway) to I-10 (Maricopa Freeway) (milepost 161.3) (Figure S-2).

CONTENTS OF THE FEIS

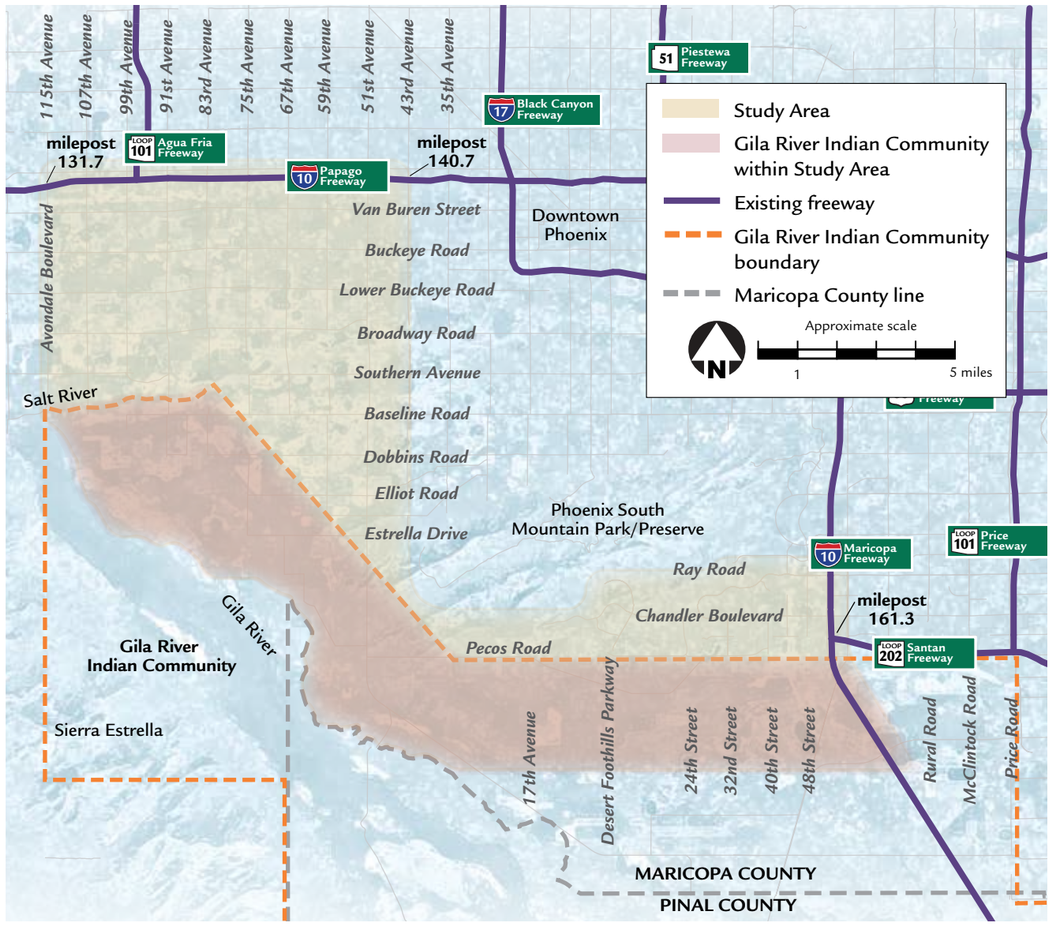
The contents of the FEIS (summarized in Table S-1) embody the first steps of a process through which each step led to refinement and narrowing of previous determinations until a final decision is made. A final decision will be documented in the record of decision (ROD) (see Figure S-3).

COMMENTS ABOUT THE ENVIRONMENTAL IMPACT STATEMENT PROCESS

The environmental impact statement (EIS) process provides information to assist FHWA and ADOT in making determinations regarding the proposed action to meet project objectives while taking into account sensitive social, economic, and environmental concerns. Basic purposes of the EIS process are to:

- engage the public and stakeholders throughout the process
- provide full and fair disclosure of environmental impacts
- inform decision makers and the public of reasonable alternatives and/or measures to reduce, minimize,

Figure S-2 Location, Phoenix Metropolitan Area



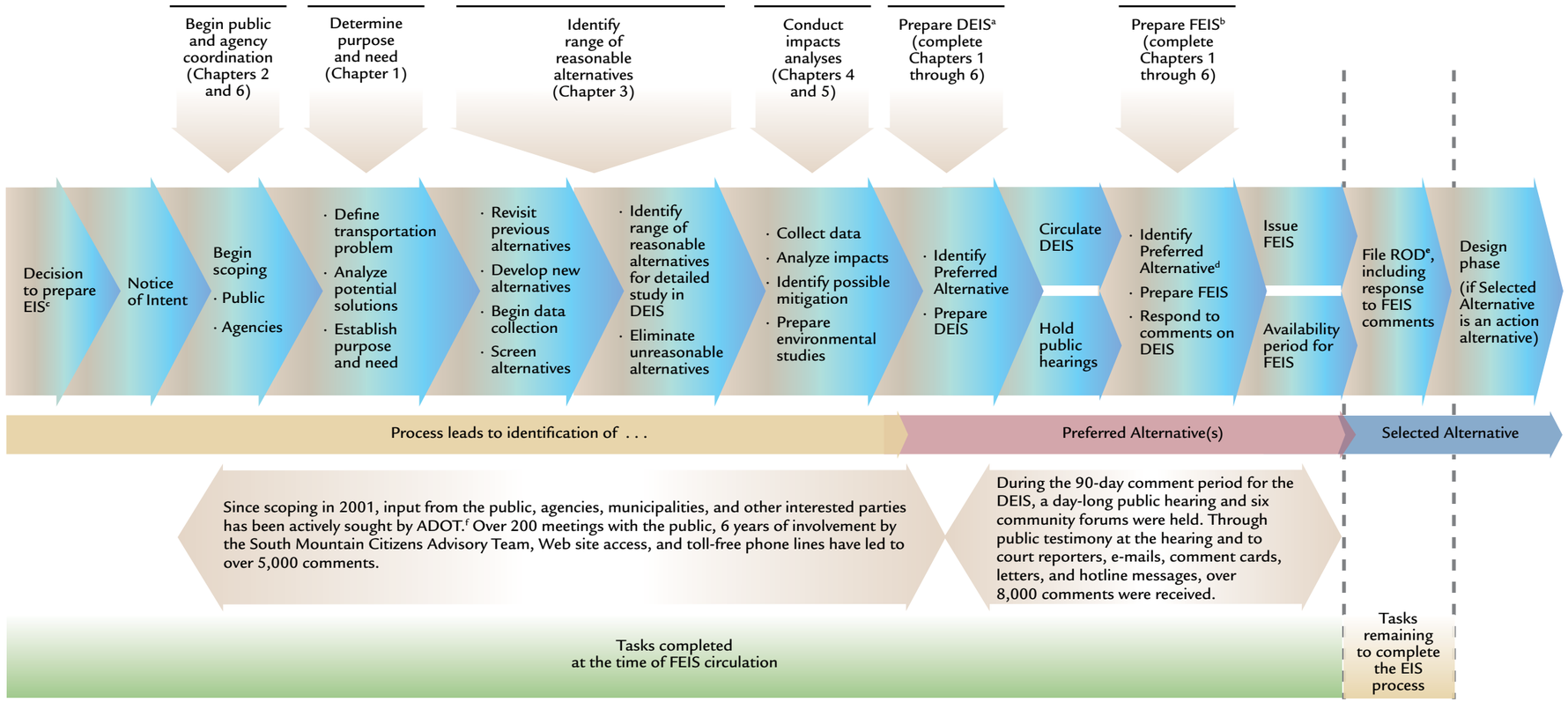
Located in the southwestern portion of the Phoenix metropolitan area, the study of alternative actions encompasses 156 square miles of natural, rural, and urban landscapes.

Table S-1 Final Environmental Impact Statement/Section 4(f) Evaluation Content Summary

Chapter	Highlights
Chapter 1 **Purpose and Need**	• Process used to determine whether there is a need for a major transportation facility in the Study Area • Need based on socioeconomic factors • Need based on regional transportation demand and existing and projected transportation system capacity deficiencies
Chapter 2 **Gila River Indian Community Coordination**	• Steps taken by FHWA,[a] ADOT,[b] and others to engage the Gila River Indian Community • Possible future actions that could be taken
Chapter 3 **Alternatives**	• How alternatives were developed and the process used to determine which alternatives should be studied in detail in the FEIS[c] and which should be eliminated from study • A description of the No-Action Alternative and why it is studied • Design features of each action alternative studied in detail, including alignment, profile, number of lanes, conceptual costs, construction sequencing, and how traffic would operate on each alternative in the future • Reasons for Preferred Alternative
Chapter 4 **Affected Environment, Environmental Consequences, and Mitigation**	• Identification of impacts that would result from the action alternatives and the No-Action Alternative • How alternatives may beneficially affect the environment • What measures would be taken to avoid, reduce, or otherwise mitigate adverse impacts
Chapter 5 **Section 4(f) Evaluation**	• The connection of NEPA[d] with Section 4(f) and Section 6(f) • What properties are protected under Section 4(f) and Section 6(f) • How the alternatives would affect resources afforded protection under Section 4(f)
Chapter 6 **Comments and Coordination**	• Awareness of the continuous and comprehensive efforts to engage the public, jurisdictions, agencies, and other stakeholders in the EIS[e] process • Trends in comments received depending on location and time in the EIS process • Future communication efforts that will be undertaken

[a] Federal Highway Administration [b] Arizona Department of Transportation [c] Final Environmental Impact Statement
[d] National Environmental Policy Act [e] environmental impact statement

Figure S-3 Environmental Impact Statement Process



[a] Draft Environmental Impact Statement [b] Final Environmental Impact Statement [c] environmental impact statement [d] See page S-35 for a discussion of the process for identifying a Preferred Alternative.
[e] record of decision [f] Arizona Department of Transportation

The environmental impact statement process is complete with the filing of a record of decision (ROD). The ROD includes the Selected Alternative, measures to mitigate impacts, and responses to comments received on the Final Environmental Impact Statement.

avoid, or otherwise mitigate adverse impacts or enhance the quality of the human environment to the extent practicable

- consider environmental, operational, fiscal, and engineering factors when making proposed action-related determinations

The FEIS provides planning-level design information to assist in comparing alternatives. The FEIS was prepared, in part, to elicit comments from interested citizens, organizations, and agencies regarding content of the document and the specific effects of the proposed freeway alternatives. ADOT and FHWA have completed the steps leading to the circulation of the FEIS (Figure S-3).

The Draft Environmental Impact Statement (DEIS) was released for public comment on April 26, 2013, and a public hearing was held on May 21, 2013. This FEIS was prepared and made available to the public to:

- document impacts of the proposed action and to reflect changes (where appropriate, in design, impact, and mitigation disclosure) based on comments received on the DEIS
- describe the process and considerations used to reach a Selected Alternative (to be recorded in a ROD)
- identify and commit to all reasonable mitigation measures that, to the extent practicable, reduce, minimize, or eliminate impacts (formal obligations to mitigation would be expressed in the ROD)
- include comments received during the DEIS comment period and responses to those comments

DESCRIPTION OF THE PROPOSED ACTION

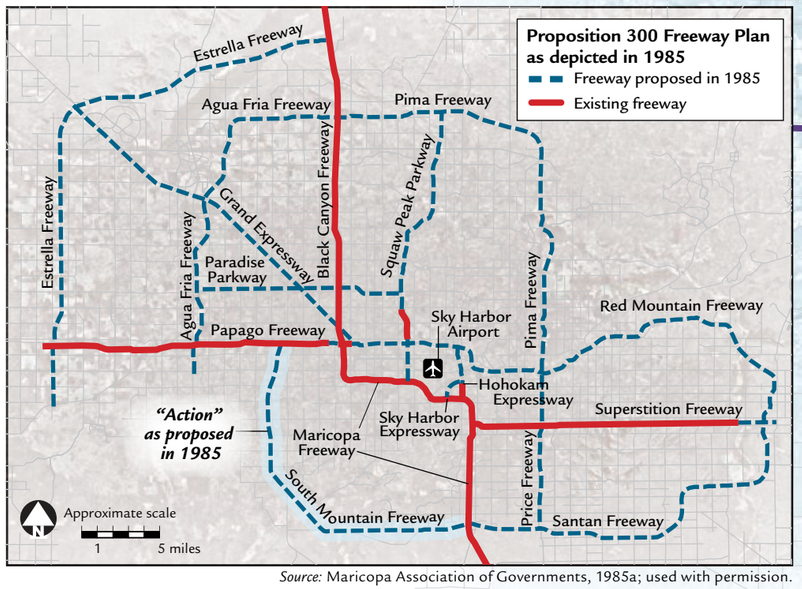
HISTORICAL CONTEXT

The South Mountain Freeway was originally included in the proposed 232-mile Maricopa Association of Governments (MAG) Regional Freeway System (now called the Regional Freeway and Highway System) as planned in 1985 (Figure S-4). At that time, it was added into the State Highway System by the State Transportation Board. The facility, designated as a portion of SR 202L, was designed as a high-speed, access-controlled freeway.

Since 1985, ADOT and MAG have sequenced construction of the Regional Freeway and Highway System to meet the most pressing regional transportation needs as funds became available. As other freeway segments were analyzed, designed, and constructed, further studies were prepared to examine proposed freeway alternatives. Versions of the proposed action have continued to be included in updates to MAG transportation planning documents,

Figure S-4 The Maricopa Association of Governments Regional Freeway and Highway System, 1985 and 2003

Note: The graphic below depicts the freeway plan as shown to voters in 1985.



Source: Maricopa Association of Governments, 1985a; used with permission.

[a] Maricopa Association of Governments [b] design concept report [c] environmental impact statement

Source: Maricopa Association of Governments, 2003; extrapolated analysis

The general location of the South Mountain Freeway has remained unchanged since first being introduced in the mid-1980s.

including the current adopted *Regional Transportation Plan* (RTP) (MAG 2003) (Figure S-4).

The 2003 RTP is a comprehensive regional plan addressing needs for all transportation modes and for planned transportation improvements in the MAG region through fiscal year 2026 (see text box on page 1-5 for more information regarding the RTP). Upon its inclusion in the Regional Freeway and Highway System in the mid-1980s, the proposed South Mountain Freeway also became an element of long-range planning efforts of local jurisdictions (e.g., City of Phoenix) throughout the Study Area.

Since the original planning for the freeway in 1985, changes have occurred in regional growth patterns and traffic movements, local land uses, State and federal environmental regulations, roadway design standards, and funding sources. Within this historical context ADOT is finalizing the planning effort for one of the "missing" Regional Freeway and Highway System segments, the South Mountain Freeway.

ADOT has opted to seek federal highway funds to assist in completing the proposed freeway. For this reason, FHWA is required to ensure that the proposed action complies with the provisions of NEPA and other federal environmental laws. Study of the proposed freeway in the FEIS is based on logical termini, sufficient length, independent utility, construction priorities associated with the Regional Freeway and Highway System, and projected traffic needs.

PURPOSE AND NEED

Over the past 40 years, Phoenix-area population, housing, and employment experienced some of the fastest growth in the nation (Figure S-5). For example, from the early 1950s to the mid-1990s, population in the MAG region grew by over 500 percent. (The population in the United States as a whole grew by approximately 70 percent during this time period.)

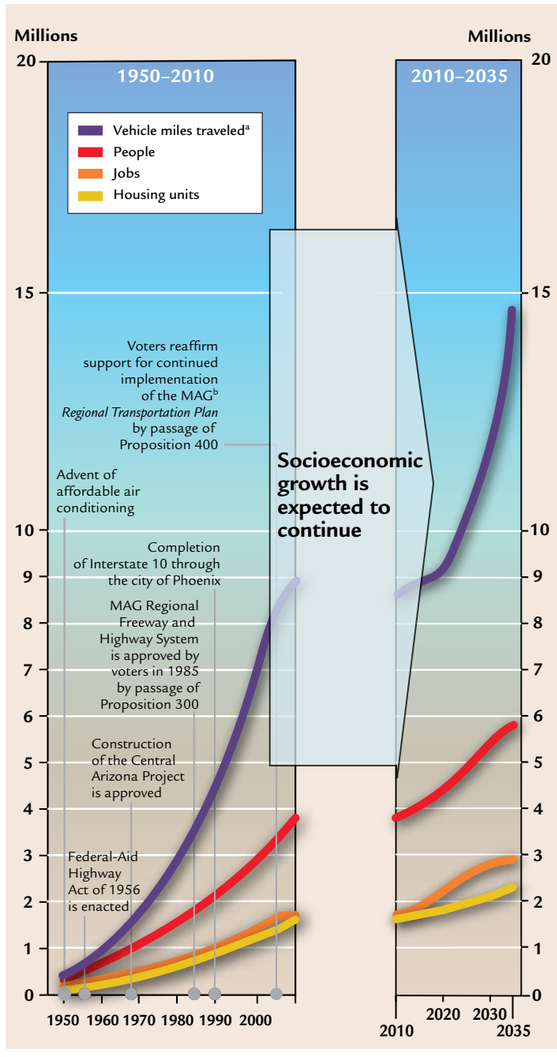
Several factors—desirable climate and desert setting, advantageous location as a distribution hub, popularity as a travel destination, year-round agricultural benefit, enhanced water supply (e.g., from the Central Arizona Project)—have substantially contributed to the greater Phoenix metropolitan area being a popular destination for people and industry. These factors are expected to continue to drive growth through 2035 and beyond; MAG projections indicate Maricopa County's population will add an average 800,000 people per decade from 2010 to 2035.

It is this growth that continues to drive the need for public infrastructure (e.g., transportation systems). The MAG 1985 *Long-Range Transportation Plan* (LRTP), which included the planned 232-mile Regional Freeway and Highway System, was a direct response to the growth occurring in the region. The multimodal 2003 RTP serves as the "next generation" of the LRTP. In preparing the RTP, MAG offered 150 public input opportunities and held 117 agency meetings and 173 stakeholder meetings. Opportunities for public input included expert panels, focus groups, special events and workshops, and public hearings (see the MAG Web site, <azmag.gov>, for additional information).

A major transportation facility (the South Mountain Freeway) has been included in the region's adopted transportation planning documents since 1985 and remains in the current RTP. At the beginning of the EIS process, the need for a major transportation facility in the Study Area was reexamined to determine whether it was still needed. Using state-of-the-practice methods and tools, the analysis conducted for the EIS revealed that a major transportation facility is needed to address:

- Socioeconomic factors:
  - Population, housing, and employment are projected to increase by approximately 50 percent between 2010 and 2035, increasing travel demand (see Figure S-5).
  - Growth in vehicle miles traveled is projected to meet or exceed these socioeconomic factors and to further burden the already-overtaxed regional transportation system.
  - Almost 50 percent of projected increases in population, housing, and employment from 2010 to 2035 for the entire MAG region are expected to occur in the southwestern and southeastern

Figure S-5 Historical and Projected Growth



[a] vehicle miles traveled reduced to one-tenth of their actual values to facilitate comparison of growth rates on the same axis
[b] Maricopa Association of Governments

Sources: 1950–2010 U.S. Census; Maricopa Association of Governments, 2013b and 2013c

Rapid growth trends in the region are projected to continue in the foreseeable future. These will continue to drive public infrastructure needs.

What is the Maricopa Association of Governments?

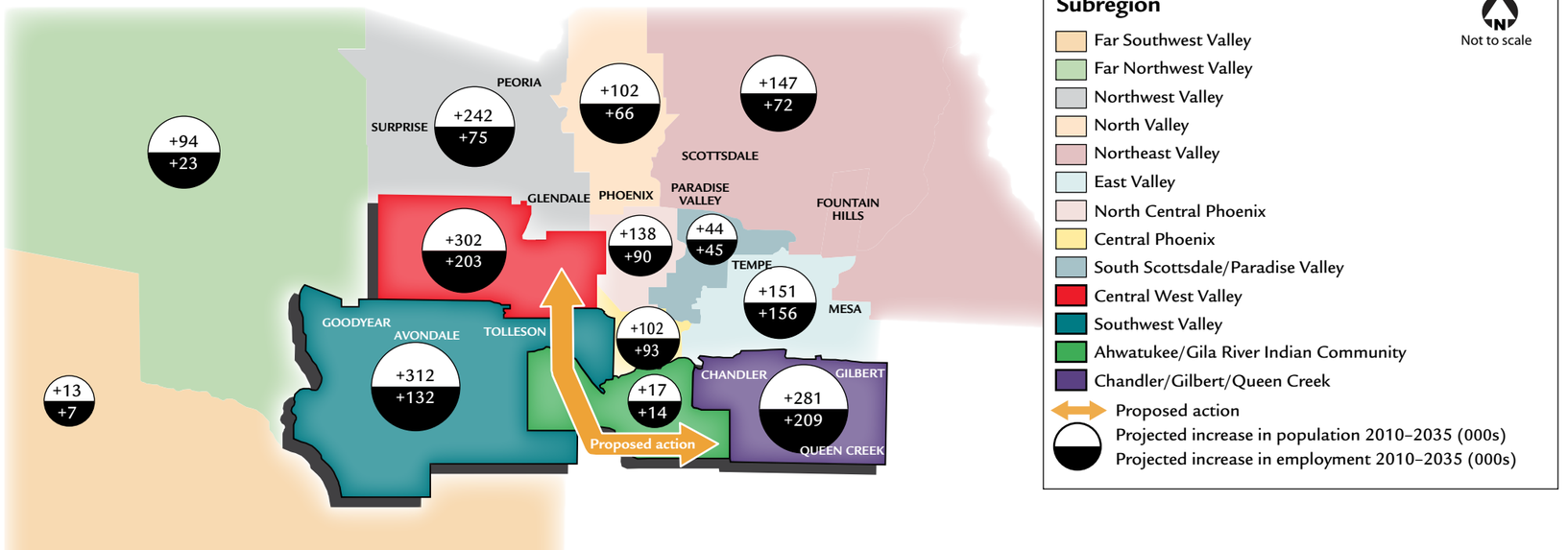
MAG was created in 1967 to foster regional cooperation and address regional challenges in the greater Phoenix metropolitan area. In 1973, MAG became the designated metropolitan planning organization for regional planning in the Maricopa County region. Its current membership includes the 27 incorporated cities and towns within Maricopa County and the contiguous urbanized area, 3 Native American Indian communities, and Maricopa and Pinal counties. ADOT and the Citizens Transportation Oversight Committee serve as ex-officio members for transportation-related issues.

MAG is at the service of its members. By fostering communication, planning, policymaking, coordination, advocacy, and technical assistance, MAG serves to facilitate and create an environment for its members to address issues and needs that cross city, town, county, and even state boundaries.

The Articles of Incorporation for MAG state that the association was formed to:

- **Provide a forum for discussion and study of regional problems of mutual interest to the governments in the region.**
- **Ensure, through cooperation and the pooling of common resources, maximum efficiency and economy in governmental operations, which will provide every citizen with the utmost value for every dollar.**
- **Identify and comprehensively plan for the solution of regional problems requiring multicity, town, and county cooperation.**
- **Facilitate agreements among the governmental units for specific projects or other interrelated developmental actions or for the adoption of common policies with respect to problems that are common to its members.**
- **Attain the greatest degree of intergovernmental cooperation possible in order to prepare for future growth and development of the region.**

Figure S-6 Growth Distribution



Activity Area	Population (000s)			Employment (000s)		
	2010	2035	Projected Increase	2010	2035	Projected Increase
Central West Valley	578	880	302	136	339	203
Southwest Valley	203	521	318	58	190	132
Ahwatukee/Gila River Indian Community	80	97	17	27	41	14
Chandler/Gilbert/Queen Creek	645	926	281	288	497	209
Total for the proposed action activity area	1,506	2,424	918	509	1,067	558
Total Maricopa County	3,824	5,776	1,952	1,707	2,892	1,185
Percentage contribution – proposed action corridor activity area	**39%**	**42%**	**47%**	**30%**	**37%**	**47%**

Source: Maricopa Association of Governments, 2013b; extrapolated analysis

Based on the needs analysis, a major transportation facility would be located in one of the region's (and nation's) fastest-growing areas in terms of population and employment.

portions of the Phoenix metropolitan area, which a major transportation facility in the Study Area would serve (see Figure S-6).

- Although the economic downturn that began in late 2007 has created a slow-growth development context, historic and projected long-term growth rates indicate the condition is temporary.

- Regional transportation demand and existing and projected transportation system capacity deficiencies:
  - **Transportation demand** – Average daily traffic volumes on freeways and arterial streets are projected to increase substantially in and adjacent to the Study Area between 2012 and 2035.
  - **Quality of traffic operations** – Level of service (LOS) is a measure of traffic congestion, with LOS A the least congested and LOS F the most congested. During peak commuting periods, the LOS on regional transportation facilities operating in the Study Area and its surroundings is poor, with much of the network congested for multiple hours. Even with planned improvements from implementation of the RTP (except the proposed action), travel conditions are projected to get worse.
  - **Transportation capacity** – The 2012 road network can serve only 84 percent of the total demand while operating at LOS D. Even with implementation of planned RTP improvements (except the proposed action), the 2035 road network would be able to serve only 69 percent of the total demand while operating at LOS D.
  - **Travel time** – Delays experienced daily by hundreds of thousands of drivers would continue to worsen over the course of the next 20-plus years, resulting in substantial lost time and related costs.

When considering the historical need for a major transportation facility; socioeconomic factors; and the analyses of the existing and projected transportation capacity and demand, quality of traffic operational performance, and travel time; the proposed action is a needed element of the transportation network in the MAG region. Therefore, a clear need exists for a major transportation facility in the Study Area. The purpose of the proposed action is to fulfill the multiple dimensions of this need.

ALTERNATIVES

Once purpose and need were established for the proposed action, the next step in the EIS process was to identify a range of reasonable alternatives to be studied in detail in the FEIS (see sidebar on the next page regarding the definition of a range of reasonable alternatives). This step identified reasonable alternatives for the proposed action to allow for a meaningful subsequent comparison of how the alternatives might affect the human and natural environments.

Screening Process

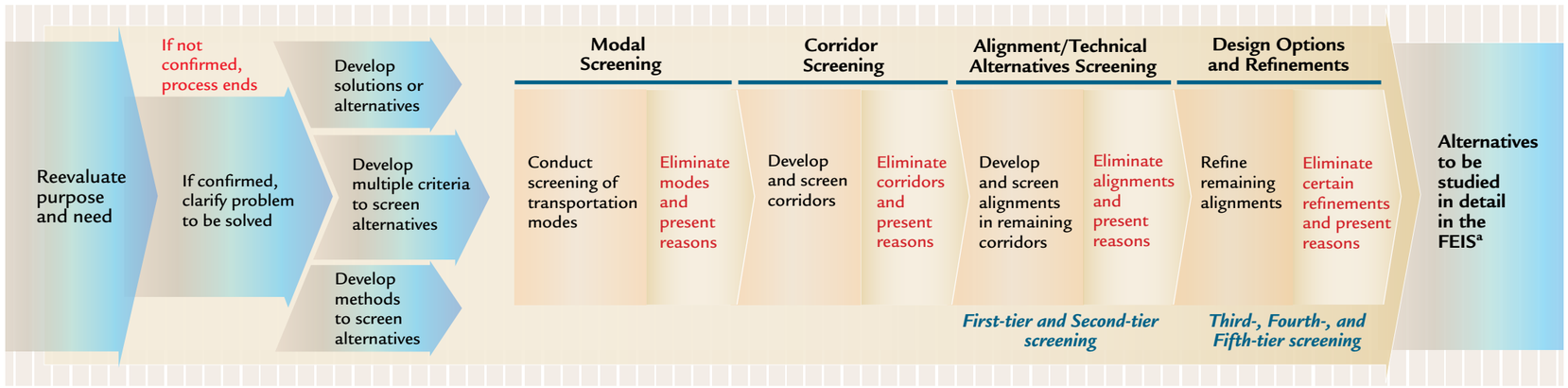
A process was undertaken to develop a broad range of alternatives, screen those alternatives using a multidisciplinary set of criteria, and identify the alternatives to be studied in detail in the DEIS. By conducting a multidisciplinary analysis, ADOT, FHWA, and other stakeholders participated in an integrated, methodical approach that led to outcomes in the consideration of the proposed action. Such outcomes included:

- a comprehensive set of alternatives to be considered at the start of the EIS process
- a comprehensive set of diverse viewpoints and expertise relevant to pertinent determinations associated with environmental concerns, design requirements, optimization of traffic conditions, ability to meet purpose and need criteria, minimization of project cost, and concerns of localized importance
- assurance that the comparative importance of criteria maintained an appropriate balance when considering the performance of alternatives under analysis
- reasons to eliminate alternatives from further study were rooted in sound judgment when considering diverse viewpoints in the context of multidisciplinary criteria
- assurance that the screening process was an open process; results of each step were shared in a timely manner with FEIS project team members, local jurisdictions, and the public

The screening process is illustrated schematically in Figure S-7. At each step in the process, alternatives were comparatively measured against multiple criteria, including ability to meet purpose and need criteria, cost effectiveness, minimization of environmental impacts, operational and design characteristics, constructibility, and public and agency acceptability. Alternatives were either eliminated from further study or carried forward to the next level of evaluations.

None of the action alternatives considered in the screening process would avoid environmental impacts entirely; the screening process, however, helped ensure the elimination from detailed study many of those

Figure S-7 Alternatives Development and Screening Process



[a] Final Environmental Impact Statement

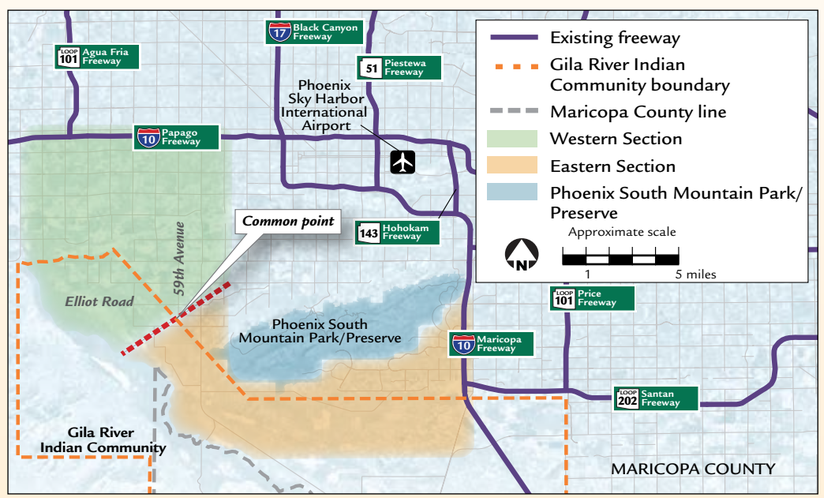
Identification of alternatives for detailed analysis followed logical steps, beginning with determination of the proposed action's purpose and need, followed by consideration of transportation modes and corridors and alignments. Specific multidisciplinary criteria were established prior to the screening process to guide determinations in the alternatives identification process.

Creation of Western and Eastern Sections

A common point is shared among the alignments of all action alternatives; it is located east of 59th Avenue and south of Elliot Road. To evaluate and compare action alternatives, the Study Area is presented in two geographical sections: a Western Section and an Eastern Section. The break between the Western and Eastern Sections is a line perpendicular to the Community boundary through the common point as illustrated in the figure.

The Study Area was divided into two sections because:

- Each section presents distinct issues. For example, in the Western Section, the rapid transition from predominantly agricultural uses to urban fringe is the prevalent trend. In the Eastern Section, issues are different: the Ahwatukee Foothills Village community is nearly built-out and Community land to the south limits proposed action options. These factors effectively limit comparative impact analysis among the alternatives.
- The common point permits combining action alternatives in the Western Section with action alternatives in the Eastern Section to best satisfy the purpose and need of the proposed action.



What is meant by a range of reasonable alternatives?

Federal regulations stipulate that an EIS shall "rigorously explore and objectively evaluate all reasonable alternatives" (40 Code of Federal Regulations [C.F.R.] § 1502.14[a]).

In 1983, the Council on Environmental Quality (CEQ) issued guidance stating "reasonable alternatives include those that are practical or feasible from a technical and economic standpoint" and "us[e] common sense." When a large number of alternatives may exist, "only a reasonable number . . . covering the full spectrum of alternatives, must be analyzed and compared in the EIS" (*Federal Register* 46:18026 [1981]).

Can impacts on the environment be avoided entirely?

All alternatives, including the No-Action Alternative, would generate impacts on the natural and human environment. Impacts from any of the action alternatives would be unavoidable given a public works project the size of the proposed action. Because other alternatives were eliminated from further study due, in part, to undesirable impacts on the natural and human environment, the action alternatives carried forward for detailed study in the FEIS, in essence, represent actions undertaken to avoid, reduce, or otherwise mitigate impacts on the environment. By this measure, the types and degree of impacts reported next in the section, *Impacts* (on page S-10), have already been, to some measure, reduced.

alternatives that would have generated substantially greater impacts than other alternatives (see sidebar on this page regarding environmental impacts).

Action Alternatives

The screening process led the project team to conclude:

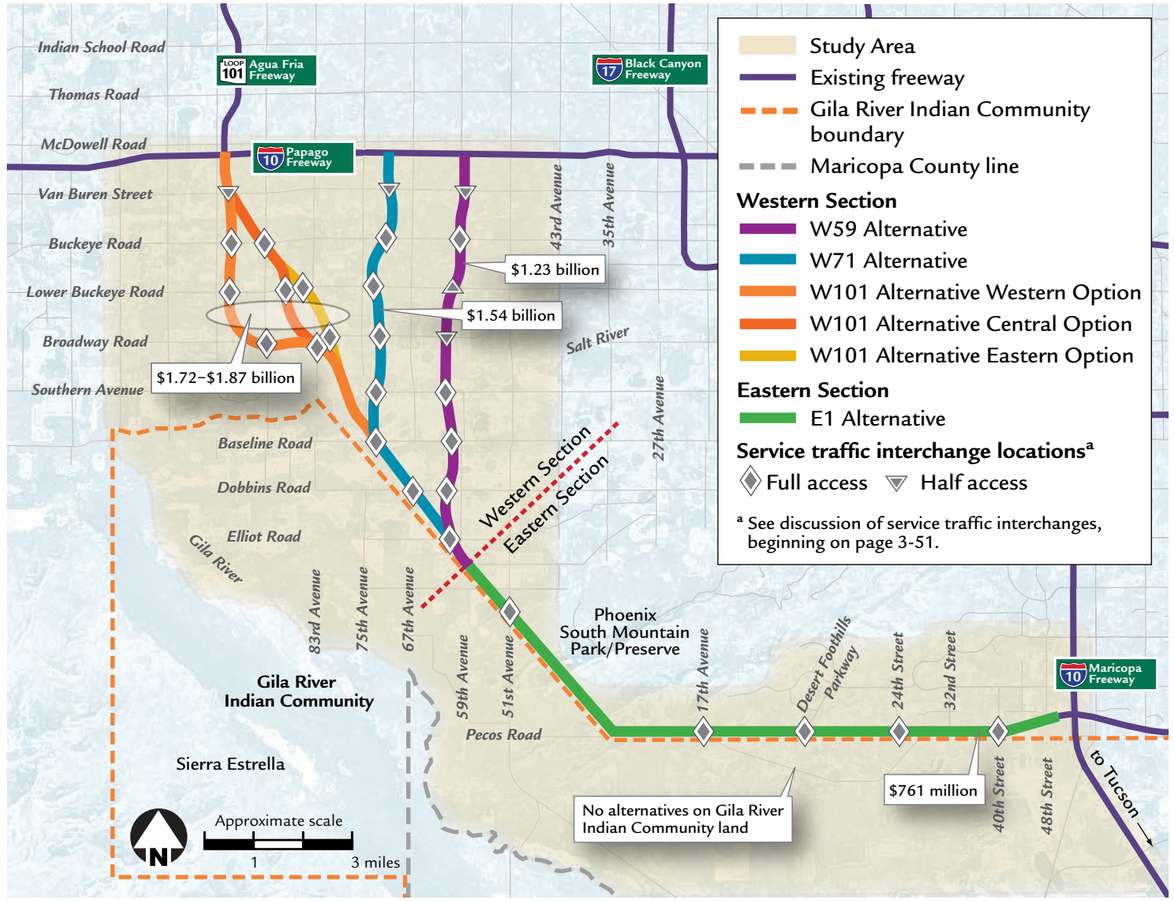
- Of the transportation modes considered, the freeway mode would best address regional transportation demand and transportation system capacity deficiencies.
- The freeway mode would bring added benefit to transportation system linkage by completing the Regional Freeway and Highway System as planned since the mid-1980s and to local and regional adopted long-range planning efforts through its consistency with the transportation elements of local and regional long-range land use plans (see Table S-2 for more information related to why the freeway mode was determined to be the most appropriate mode).
- For the freeway mode, three action alternatives in the Western Section of the Study Area, one action alternative in the Eastern Section of the Study Area, and the No-Action Alternative were determined to represent an adequate range of reasonable alternatives for detailed study in the FEIS.

The action alternatives are the W59 Alternative, the W71 Alternative, the W101 Alternative (with alignment options), and the E1 Alternative. Figure S-8 illustrates the locations of the four action alternatives (and options) studied in detail in the FEIS and some features common to the action alternatives: specifically, local traffic interchange locations and planning-level cost estimates (including right-of-way [R/W] and construction costs). Figure S-9 illustrates the typical section of the freeway. Chapter 3, *Alternatives*, has detailed descriptions of features of the alternatives.

No-Action Alternative

The No-Action Alternative is included for detailed study in accordance with NEPA requirements to compare beneficial and adverse impacts of the action alternatives with those benefits and adverse impacts of not proceeding with one of the action alternatives.

Figure S-8 Action Alternatives



Note: Cost estimates are in 2012 dollars. For more information on the planning-level cost estimates, see page 3-59.

***If an action alternative were identified as the Selected Alternative at the end of the environmental impact statement process, it would be a combination of an action alternative from the Western and Eastern Sections. Funding for the proposed freeway in the amount of $1.9 billion is included in the current* Regional Transportation Plan, *and early elements of the design, right-of-way, and construction are programmed in the next 5 years in the regional and state* Transportation Improvement Programs.**

The No-Action Alternative would not construct any type of major transportation facility, like the extension of SR 202L (Santan Freeway) west of I-10 (Maricopa Freeway); it would, however, include all other projects described in the RTP. Traffic on the existing segment of SR 202L (Santan Freeway), as well as along I-10 (Papago Freeway), would be required to use existing Interstate and Regional Freeway and Highway System facilities or the local street network. The No-Action Alternative would not alleviate projected increases in traffic volumes and congestion on the Interstate and regional freeway systems or on the local street network by the design year 2035. It would instead, lead to worsening traffic congestion and substantial related impacts, resulting in:

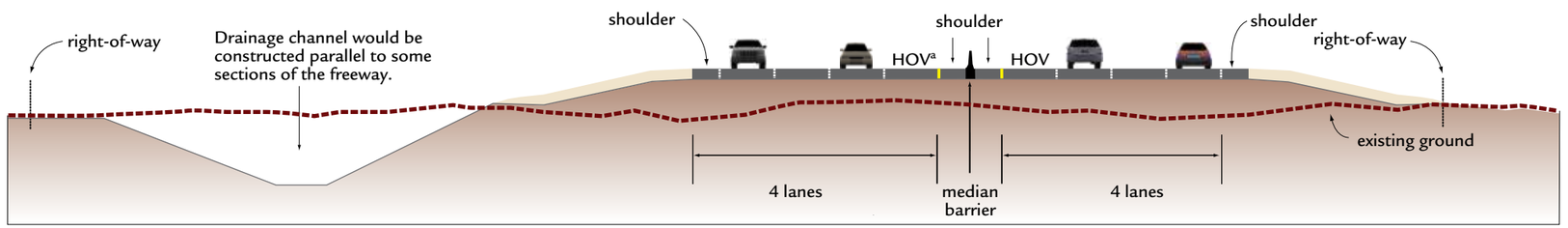
- increased difficulty in gaining access to adjacent land uses
- increased difficulty in gaining access to the Interstate and regional freeway systems from the local arterial street network

Table S-2 Implementation of the Proposed Freeway as the Appropriate Modal Alternative to Satisfy Purpose and Need Criteria, 2035

Criterion	With the Proposed Freeway	Without the Proposed Freeway
Who would use the proposed freeway?	• 75 percent of drivers using the proposed freeway would be coming from or traveling to the area surrounding the proposed freeway; this area is projected to experience almost 50 percent of the growth in Maricopa County by 2035	• Travelers would continue to use existing routes such as I-10[a] and Baseline Road, which would become more and more congested • Increased congestion and travel time would occur because no other high-capacity facilities (e.g., freeways) are planned in the area
How would the proposed freeway affect the average traveler?	• By reducing congestion, travel times would improve within the region, resulting in an estimated $200 million annual savings in travel time	• Trip times and traffic congestion would worsen without the proposed freeway
What effects would the proposed freeway have on the regional freeway system?	• Would improve the regional transportation network as planned for during the past 25 years, increasing the efficiency of other existing and planned freeways • Would remove traffic from congested freeways and arterial streets • Would optimize use of adjacent freeways such as SR 202L[b] (Santan Freeway) and the proposed SR 30[c]	• Freeways would not experience congestion relief provided by proposed freeway • If the connections were not provided, the need for other planned freeways would have to be reassessed and reanalyzed in terms of traffic performance • Segments of the regional freeway system, such as SR 202L (Santan Freeway) and SR 30, would be underused
What effects would the proposed freeway have on the area's arterial street network?	• Proposed freeway would reduce traffic on arterial streets by 274,000 vpd[d], which equates to 33 arterial street-lanes of traffic being removed from the system	• Street widening and intersection improvements would be needed to address increased congestion, but these improvements are not planned or funded and obtaining the right-of-way for these improvements would be difficult
What effects would the proposed freeway have on areawide continuity and connectivity?	• Would complete the freeway loop system (as part of SR 202L) • Would increase mobility and access by connecting freeways such as SR 202L (Santan Freeway) in the east to SR 30, SR 101L[e], and SR 303L[f] in the west	• Freeway loop system would be incomplete; SR 202L would be incomplete and underused • An alternative connection between the eastern and western portions of the Phoenix metropolitan area would not be provided • Motorists on the local arterial street network would have to drive longer distances on these congested streets before being able to gain access to Interstate and regional freeways
What effects would the proposed freeway have on the area's overall transportation capacity deficiency?	• 20 percent of the travel demand in 2035 would remain unmet (see Figure 3-14, on page 3-31); 11 percent less than without the proposed freeway, which would make a substantial difference for the areas's overall transportation network	• 31 percent of the travel demand in 2035 would remain unmet (see Figure 3-14, on page 3-31)
Would the proposed freeway affect traffic in the Broadway Curve[g] area of I-10?	• Proposed freeway would reduce daily traffic volumes by 32,000 vpd on this portion of I-10 and to the south on I-10 between Baseline and Elliot roads, more than any other segments of the region's freeways • During the morning commute, the Broadway Curve would experience shorter duration of LOS[h] E or F conditions	• Would carry approximately 11 percent more traffic without the proposed freeway and would experience a greater degradation of traffic performance • During the morning commute, the Broadway Curve would experience longer duration of LOS E and F conditions
What effects would the proposed freeway have on SR 202L (Santan Freeway)?	• Would increase use on the segment near the proposed freeway by 42,000 vpd • Would optimize operation of the remainder of the SR 202L system	• SR 202L near the proposed freeway would remain underused
Would the proposed freeway affect traffic using 51st Avenue through Community[i] land?	• Would reduce traffic from 9,200 vpd in 2012 to 8,100 vpd in 2035, preventing an increase in unwanted traffic cutting through the Community	• Traffic volumes would increase to 11,800 vpd in 2035 • 51st Avenue would continue to be used by unwanted traffic cutting through the Community
What other general transportation effects would the proposed freeway have?	• Would reduce projected traffic volumes on the remaining regional freeway system, Interstate freeways, and local road network • Would provide opportunities for freeway-dependent transit services • Would provide additional opportunities for transportation system management and transportation demand management	• No improvement in performance of the region's freeways, Interstate freeways, and arterial streets would occur • Additional opportunities for regional freeway-dependent transit services, transportation system management, and transportation demand management would not occur
What effects would the proposed freeway have on the area's transportation planning efforts?	• Would fulfill the planning efforts of numerous governmental entities • Would be an integral element and enhance operation of other planned improvements in the *Regional Transportation Plan* • Would fulfill a need first formally acknowledged in 1985	• Lack of the proposed freeway would be inconsistent with the planning efforts of numerous governmental entities • Would not complete the planned improvements in the *Regional Transportation Plan*

[a] Interstate 10 [b] State Route 202L (Loop 202) [c] State Route 30 [d] vehicles per day [e] State Route 101L (Loop 101) [f] State Route 303L (Loop 303) [g] The Broadway Curve is the area of Interstate 10 between 48th Street and Broadway Road; it is the most congested stretch of freeway in the Phoenix metropolitan area. [h] level of service [i] Gila River Indian Community

Figure S-9 Typical Eight-lane Freeway Section



[a] high-occupancy vehicle

Note: The drainage channel would be located north or east of the proposed freeway.

The freeway cross section would be typical of those found throughout the region's freeways. Regional consistency in lane geometry improves driver expectancy and safety and can contribute to enhanced traffic operation as a result. Right-of-way width varies at specific locations depending on the need for noise walls, drainage basins or channels, retaining walls, etc.

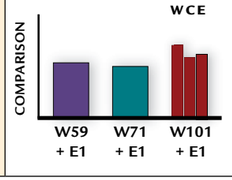
- increased levels of congestion-related impacts
- reduced performance of regional freeway-dependent transit services
- noticeably longer trip times and higher user costs

Identifying the No-Action Alternative as the Selected Alternative would be inconsistent with MAG's and local jurisdictions' land use and transportation plans and would not adequately serve transit opportunities. Identifying the No-Action Alternative would not preclude proposal of a project similar to the proposed action from occurring in the future.

IMPACTS

Table S-3 summarizes potential impacts from the construction and operation of the proposed action. A full discussion of environmental consequences is presented in Chapter 4, *Affected Environment, Environmental Consequences, and Mitigation*. Measures available to ADOT to avoid, reduce, or otherwise mitigate impacts are described in Table S-4, beginning on page S-18. In the FEIS, Table S-3, total impacts (combining the Western and Eastern Sections) are presented to allow reviewers to compare the action alternatives' performance and the No-Action Alternative through the entire Study Area. Because the E1 Alternative would connect with each action alternative in the Western Section, the difference in impacts among the action alternatives is based on impacts in the Western Section of the Study Area. Many impacts from the action alternatives in the Western Section would be similar in type and magnitude. For example, impacts on air quality, surface water, or utilities would be relatively the same among the three action alternatives in the Western Section. For some other elements of the environment, impacts would vary measurably depending on the action alternative analyzed. Table S-3 reveals major differences among the action alternatives in the following areas: conversion of residential, open space/undeveloped, and total land uses; consistency with local and regional plans; residential and business displacements; loss of tax revenues; noise impacts and costs of their mitigation; and impacts to wells.

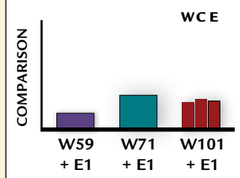
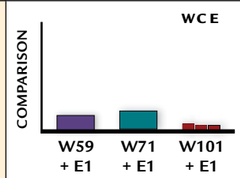
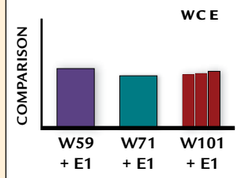
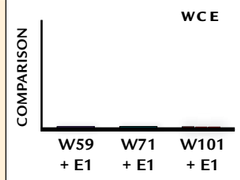
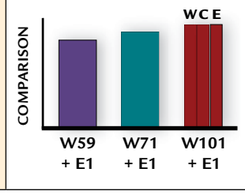
Table S-3 Environmental Impact Summary Matrix, Proposed Action

Type of Impact	No-Action Alternative	Action Alternatives				
		W59 Alternative + E1 Alternative	W71 Alternative + E1 Alternative	W101 Alternative and Options[a] + E1 Alternative	Quick View of Action Alternatives	Context and Intensity of Impacts for all Action Alternatives
Land Use						
Agricultural converted to Transportation (estimated acreage)	No immediate conversion would occur, other than what could occur from other planned transportation projects. Because of planned development, it is likely that land uses would be converted to transportation-related urban uses.	708	650	836–969		Of the action alternatives, the W101/E1 Alternative and Options would have the greatest impact. The No-Action Alternative would have no immediate effect. Regardless, loss of agricultural land attributable to any action alternative would be negligible relative to the amount of land in the region and to other land development trends that are contributing to the loss of agricultural land (as would continue to occur under the No-Action Alternative).

Notes: Table footnotes can be found at the end of this table, on page S-17. W, C, and E refer to Western, Central, and Eastern Options for the W101/E1 Alternative; see Figure S-8.

(continued on next page)

Table S-3 Environmental Impact Summary Matrix, Proposed Action (continued)

Type of Impact	No-Action Alternative	Action Alternatives				
		W59 Alternative + E1 Alternative	W71 Alternative + E1 Alternative	W101 Alternative and Options[a] + E1 Alternative	Quick View of Action Alternatives	Context and Intensity of Impacts for all Action Alternatives
Residential converted to Transportation (estimated acreage)	No immediate conversion would occur, other than what could occur from other planned transportation projects. Because of planned development, it is likely that land uses would be converted to transportation-related urban uses.	164	395	282–348		The W71/E1 Alternative and Options would result in the greatest conversion of residential to transportation, followed by the W101/E1 Alternative, and then the W59/E1 Alternative. Regardless, conversion of residential land caused by any action alternative would have a negligible effect on residential land availability relative to the amount of land in the region designated for residential use. The No-Action Alternative would not immediately convert residential land to a transportation use.
Commercial/ Industrial converted to Transportation (estimated acreage)	No immediate conversion would occur, other than what could occur from other planned transportation projects. Because of planned development, it is likely that land uses would be converted to transportation-related urban uses.	177	220	186–218		The W71/E1 Alternative would result in the greatest acreage conversion of commercial/industrial use. Regardless, conversion of commercial/industrial land caused by any action alternative would have a negligible effect on commercial/industrial land use availability relative to the amount of land in the region designated for such use. The No-Action Alternative would not immediately convert commercial/industrial land to a transportation use.
Open Space/ Undeveloped converted to Transportation (estimated acreage)	Planned development will inevitably cause rural-to-urban land conversion, but no immediate conversions would occur other than from other planned transportation projects.	712	617	630–711		The W59/E1 Alternative would convert the most open space/ undeveloped land of all the action alternatives. Regardless, loss of open space/undeveloped land attributable to any action alternative would be negligible relative to other land development trends that are contributing to the loss of open space/undeveloped land.
Public/Quasi-public converted to Transportation (estimated acreage)	No immediate conversion would occur, other than what could occur from other planned transportation projects.	13	17	20		Any of the action alternatives would have a negligible effect on the availability of public/quasi-public land in the region. The No-Action Alternative would have the least impact.
Total land use conversion (estimated acreage)	No immediate conversion would occur, other than what could occur from other planned transportation projects.	1,813	1,938	2,161–2,191		The W101/E1 Alternative and Options would result in the greatest impact of any of the action alternatives. However, land conversion attributable to any action alternative would be negligible relative to the amount of land in the region and to other land development trends that are contributing to land conversion. The No-Action Alternative would have no immediate impact.

Notes: Table footnotes can be found at the end of this table, on page S-17. W, C, and E refer to Western, Central, and Eastern Options for the W101/E1 Alternative; see Figure S-8.

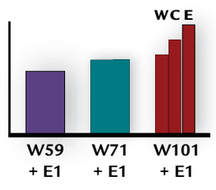
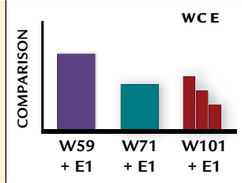
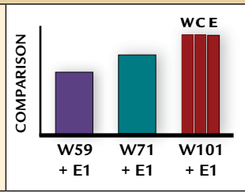
(continued on next page)

Table S-3 Environmental Impact Summary Matrix, Proposed Action (continued)

Type of Impact	No-Action Alternative	Action Alternatives				
		W59 Alternative + E1 Alternative	W71 Alternative + E1 Alternative	W101 Alternative and Options[a] + E1 Alternative	Quick View of Action Alternatives	Context and Intensity of Impacts for all Action Alternatives
Social Conditions						
Consistent with local and regional plans (provide a freeway in the Study Area in a planned corridor meeting goals and objectives of the long-range plans)	This alternative would not be consistent with the intent of the local and regional plans to provide a freeway in the Study Area and to promote growth along the corridor.	Yes	Yes, but inconsistent in location.		Not applicable	The No-Action Alternative would have the highest potential for lack of consistency with local and regional plans. The W71/E1 and W101/E1 Alternatives would be consistent with local and regional plans, but not in location. The W59/E1 Alternative is most consistent with local and regional plans.
Community character and cohesion	No immediate substantial impacts on community character and cohesion; planned development within communities would have an effect.	Visual and noise intrusions to existing neighborhoods in Laveen and Estrella villages. The freeway would bisect developed properties and disrupt cohesion and existing internal site circulation. Visual and noise intrusions would affect rural, natural areas and recreational areas adjacent to the E1 Alternative.		Visual and noise intrusions to rural and industrial areas in western Estrella Village and the city of Tolleson. Options would interrupt the cohesion both of dairy operations and farmsteads. Visual and noise intrusions would affect rural, natural areas and recreational areas adjacent to the E1 Alternative.	Not applicable	The action alternatives would introduce an intensive land use adjacent to less-intensive, less-compatible uses in some areas. The impact of any action alternative would intensify as community character would transition from agricultural to residential, as has been ongoing and planned for several years.
Environmental Justice and Title VI[b]						
Disproportionately high adverse effects on minority, low-income, female head-of-household, elderly, and disabled populations	As congestion on surface streets increases, all neighborhoods would be affected equally. Travel times for local buses would increase, affecting low-income and minority populations. The No-Action Alternative would result in no property acquisitions and no household relocations. Therefore, environmental justice populations would not be affected by right-of-way acquisitions.	The W59/E1 Alternative would displace the fewest residential properties. Minority, elderly, female head-of-household, low-income, and disabled populations would be adversely affected by the proposed action; however, no disproportionately high adverse effects on these populations would occur.	Minority, elderly, female head-of-household, and disabled populations would be adversely affected by the proposed action; however, no disproportionately high adverse effects on these populations would occur.	Minority, elderly, female head-of-household, and disabled populations would be adversely affected by the proposed action; however, no disproportionately high adverse effects on these populations would occur.	Not applicable	All action alternatives would adversely affect protected populations, but impacts would not be disproportionately high after comparing projected impacts or benefits with those experienced by all populations in the Study Area.

(continued on next page)

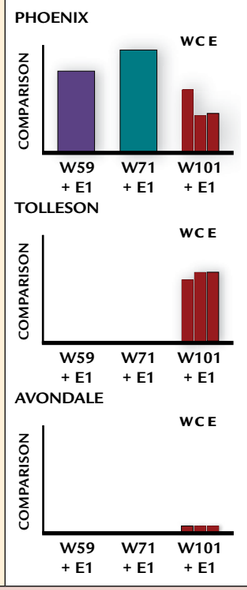
Table S-3 Environmental Impact Summary Matrix, Proposed Action (continued)

Type of Impact	No-Action Alternative	Action Alternatives				
		W59 Alternative + E1 Alternative	**W71 Alternative + E1 Alternative**	**W101 Alternative and Options[a] + E1 Alternative**	**Quick View of Action Alternatives**	**Context and Intensity of Impacts for all Action Alternatives**
Disparate impacts to minority populations protected by Title VI	Not applicable	The W59/E1 Alternative would displace the fewest residential properties. Minority populations protected by Title VI would be adversely affected by the proposed action; however, no disparate impacts to these populations would occur.	Minority populations protected by Title VI would be adversely affected by the proposed action; however, no disparate impacts to these populations would occur.	Minority populations protected by Title VI would be adversely affected by the proposed action; however, no disparate impacts to these populations would occur.	Not applicable	All action alternatives would adversely affect minority populations protected by Title VI; however, no disparate impacts to these populations would occur after comparing projected impacts or benefits with those experienced by all populations in the Study Area.
Displacements and Relocations						
Residential displacements (as of 2013, approximate number)	0	168 houses 680 apartments	960 houses 0 apartments	1,061–1,439 houses 0 apartments		The W59/E1 Alternative would displace fewer residential properties than would the W71/E1 or W101/E1 Alternative, in part because local jurisdictions have planned for the proposed action along an alignment on 55th Avenue (most similar to the W59 Alternative) and among the commercial and industrial development along the W59 Alternative. The displacement projections are consistent with a project of this magnitude located in a growing region. The No-Action Alternative would result in no residential displacements.
Business displacements (approximate number)	0	42	26	14–30		The W59/E1 Alternative would displace more businesses than would the W71/E1 Alternative or the W101/E1 Alternative and Options. The displacement projections are consistent with a project of this magnitude located in a growing region. The No-Action Alternative would result in no displacements of businesses.
Effects on homeland security	No impacts on security-sensitive sites would occur.	The W59/E1 Alternative would be near a fuel tank farm.	No impacts on security-sensitive sites would occur.	No impacts on security-sensitive sites would occur.	Not applicable	While the W59/E1 Alternative would be located near the fuel tank farm, the Arizona Office of Homeland Security and the City of Phoenix have concurred that the W59/E1 Alternative and the fuel tank farm could coexist (an earlier version of the alternative was located closer to the tank farm).
Economic Resources						
Existing taxable land base conversion to nontaxable use (estimated acreage)	0	1,609	1,748	1,934–1,965		The W101/E1 Alternative and Options would convert the most taxable land base of any action alternative, primarily because the alternative and its options are the longest alignments considered. Regardless, the conversion would be consistent with other projects of this magnitude. The No-Action Alternative would not convert land to a nontaxable use.

Notes: Table footnotes can be found at the end of this table, on page S-17. W, C, and E refer to Western, Central, and Eastern Options for the W101/E1 Alternative; see Figure S-8.

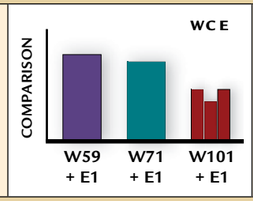
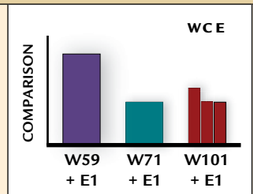
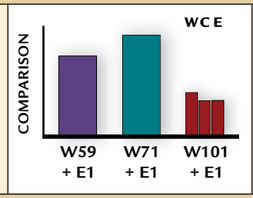
(continued on next page)

Table S-3 Environmental Impact Summary Matrix, Proposed Action (continued)

Type of Impact	No-Action Alternative	Action Alternatives				
		W59 Alternative + E1 Alternative	W71 Alternative + E1 Alternative	W101 Alternative and Options[a] + E1 Alternative	Quick View of Action Alternatives	Context and Intensity of Impacts for all Action Alternatives
Estimated annual loss of tax revenues for existing land uses (property and sales tax/general fund)	No immediate reduction would occur. Continued planned development within the Study Area and future transportation projects would affect property and sales tax/general fund revenues in the area.	Phoenix: $4,576,900 No effect on Tolleson or Avondale property and sales tax/general fund revenues would occur.	Phoenix: $5,594,900 No effect on Tolleson or Avondale property and sales tax/general fund revenues would occur.	**W101 Western Option** Phoenix: as much as $3,567,100 Tolleson: as much as $3,632,500 Avondale: as much as $387,600 **W101 Central Option** Phoenix: as much as $2,286,900 Tolleson: as much as $4,114,800 Avondale: as much as $387,600 **W101 Eastern Option** Phoenix: as much as $2,335,400 Tolleson: as much as $4,114,800 Avondale: as much as $387,600		The Cities of Avondale, Phoenix, and Tolleson would experience reductions in sales and property tax revenues (Avondale and Tolleson would not be directly affected by the W59/E1 or W71/E1 Alternative). For Phoenix and Avondale, reductions would be inconsequential, regardless of which action alternative were implemented. However, under the W101/E1 Alternative and Options, tax revenue losses for Tolleson would be substantial; the City would experience a 20 to 24 percent annual reduction. The No-Action Alternative would not reduce the amount of property and sales tax/general fund revenues for the Study Area municipalities.
Travel time (impacts in $/year)	No savings would result under this alternative.	Any of the action alternatives would result in over $200 million (in 2013 dollars) per year savings after construction of the entire facility.				
Air Quality						
Failure to meet CO[c] 8-hour and 1-hour standards	Congestion on the local arterial street network and regional freeway system would increase, leading to increased travel times and increased CO emissions.	All action alternatives would increase 1-hour and 8-hour CO concentrations near the proposed action; however, these increases would not cause exceedances of the health-based NAAQS[d] in 2035. The action alternatives are anticipated to reduce congestion and travel times within the region, resulting in reduced regional CO emissions.				
Failure to meet particulate matter standards (PM_{10} and $PM_{2.5}$)[e]	Increased traffic congestion on the transportation network would lead to increased travel times and increased PM_{10} and $PM_{2.5}$ emissions.	All action alternatives would result in short-term increases in PM_{10} and $PM_{2.5}$ concentrations during construction. All action alternatives would increase particulate emissions near the proposed action; however, these increases would not cause exceedances of the health-based NAAQS in 2035. The action alternatives are anticipated to reduce congestion and travel times within the region, resulting in reduced regional PM_{10} and $PM_{2.5}$ emissions.				
MSATs[f]	MSAT levels would decline from existing levels because of compliance with strategies identified by EPA's[g] national control programs.	For all action alternatives, increased traffic volumes would produce elevated MSATs emissions near the proposed action. The action alternatives would reduce congestion and improve regional traffic conditions, which would reduce regional MSATs emissions. Additionally, overall MSATs levels would decline from existing levels because of compliance with strategies identified by EPA's national control programs.				
Transportation conformity	Not consistent with the RTP[h] and TIP[i]	The action alternatives would be consistent with the RTP and TIP because they would provide a planned transportation facility needed to improve traffic in the Phoenix metropolitan area.				

(continued on next page)

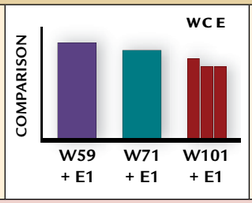
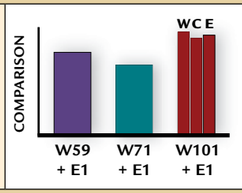
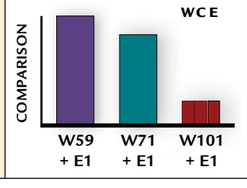
Table S-3 Environmental Impact Summary Matrix, Proposed Action (continued)

Type of Impact	No-Action Alternative	Action Alternatives				
		W59 Alternative + E1 Alternative	W71 Alternative + E1 Alternative	W101 Alternative and Options[a] + E1 Alternative	Quick View of Action Alternatives	Context and Intensity of Impacts for all Action Alternatives
Noise						
Number of receivers (e.g., groups of residences) eligible for noise mitigation	Activities associated with planned development would affect noise levels but would not be mitigated by the proposed action.	114	109	53–68		Any of the action alternatives would introduce traffic noise where it currently does not exist or produce it at higher levels than now experienced. The W59/E1 and W71/E1 Alternatives would affect the greatest number of noise receivers. The No-Action Alternative would result in continued noise impacts on receivers from local traffic.
Water Resources						
Loss of water resources (wells potentially affected)	0	121	57	57–75		The W59/E1 Alternative would affect the most groundwater wells. The number of wells potentially affected is consistent with a project of the magnitude of the proposed action. The well replacement program as outlined by State law is followed by the Arizona Department of Transportation on its projects throughout the region. The No-Action Alternative would not affect any wells.
Floodplains						
Conversion of floodplains (estimated total acreage)	The No-Action Alternative would have no impact on floodplains. Any future projects to provide access across the Salt River would have potential floodplain impacts.	94	127	48–52		The W71/E1 Alternative would have a substantially greater impact on floodplain acreage than would either the W59/E1 Alternative or W101/E1 Alternative and Options. However, regardless of action alternative, the impact on the overall natural and beneficial values of the floodplain would be negligible. The No-Action Alternative would not affect floodplains.
Waters of the United States						
Loss of jurisdictional waters (estimated acreage)	0	In the Western Section, the W59 (Preferred) Alternative is anticipated to affect less than 0.5 acre of jurisdictional waters (the Salt River) and would be permitted under a nationwide permit. In the Eastern Section, the E1 (Preferred) Alternative would cross several jurisdictional waters. The E1 Alternative is anticipated to permanently affect between 1 and 2 total acres of jurisdictional waters (ephemeral washes), including potential disturbances of greater than 0.5 acre at individual wash crossings; CWA permitting would be determined during the project design phase.				
Topography, Geology, and Soils						
Change to topography, geology, and soil conditions	No direct effects.	In the Western Section, shallow groundwater conditions might influence both the design and method of construction of bridge foundations; however, such conditions are common and construction technologies to overcome these conditions are readily available. In the Eastern Section, bedrock units would likely be encountered, resulting in difficult excavation conditions in cut sections that would require blasting to facilitate removal.				
Biological Resources						
Loss of habitat	No direct effects.	All action alternatives would result in the conversion of cover, nesting areas, and food resources for wildlife habitat provided by the natural plant communities found in the Study Area. No critical habitat is designated in or adjacent to the Study Area for any threatened or endangered species. Much of the land through which the proposed action would pass has already been converted to urban, agricultural, and transportation uses (see Secondary and Cumulative section in this table).				
Loss of wildlife of special concern	No direct effects.	The action alternatives in the Western Section may affect foraging behavior along the Salt River of individuals of the Sonoran Desert population of bald eagles that have nested west of the Study Area, but there would be no take of bald or golden eagles under the Bald and Golden Eagle Protection Act.				

Notes: Table footnotes can be found at the end of this table, on page S-17. W, C, and E refer to Western, Central, and Eastern Options for the W101/E1 Alternative; see Figure S-8.

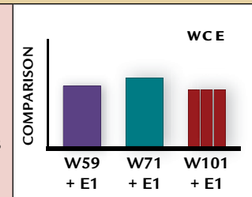
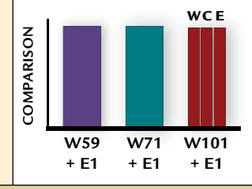
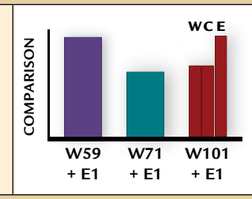
(continued on next page)

Table S-3 Environmental Impact Summary Matrix, Proposed Action (continued)

Type of Impact	No-Action Alternative	Action Alternatives				
		W59 Alternative + E1 Alternative	W71 Alternative + E1 Alternative	W101 Alternative and Options[a] + E1 Alternative	Quick View of Action Alternatives	Context and Intensity of Impacts for all Action Alternatives
Loss of threatened and endangered species	No direct effects.	The Sonoran desert tortoise and the Tucson shovel-nosed snake are both Candidate species and are scheduled for consideration for listing under the Endangered Species Act, but neither species is listed at this time. In the Eastern Section, the action alternatives may affect the Sonoran desert tortoise. Direct effects could include mortality from equipment and activities during construction and by vehicle traffic after completion. Individuals may be displaced by construction activities and the removal of food sources and cover habitat. Indirect effects could include the degradation of habitat caused by the introduction of invasive species. The proposed project may affect, but is not likely to adversely affect, the Tucson shovel-nosed snake.				
Loss of habitat connectivity	The No-Action Alternative would have no immediate effect. Planned and existing development could eventually cause impacts.	Some wildlife movement in the Western Section might be restricted because of the barrier that would be created. Wildlife movement has already been substantially affected by ongoing development. In the Eastern Section, the action alternatives would create a physical barrier that could, depending on design, decrease movement of wildlife to and from the South Mountains and Sierra Estrella.				
Cultural Resources						
Archaeological sites (NRHP[j]-eligible sites affected)	0	12	11	9–10		All action alternatives would affect large prehistoric villages sites. The extent of these impacts would be determined by subsequent testing. Therefore, it appears that all action alternatives have similar potential for affecting archaeological resources.
Historic sites (NRHP-eligible sites affected)	0	The W59/E1 and W71/E1 Alternatives would cross the Roosevelt Canal and historic Southern Pacific Railroad, but neither would affect the eligibility of the sites. The W101/E1 Alternative would also cross the railroad with similar outcomes. All of the action alternatives would affect Phoenix South Mountain Park/Preserve.				
TCPs[k] (NRHP-eligible sites affected)	0	All of the action alternatives would affect the South Mountains TCP.				
Prime and Unique Farmlands						
Conversion of prime and unique farmlands (estimated acreage)	No immediate loss would occur, but because of planned development, loss of farmland to urban uses would occur.	723	636	870–923		The W101/E1 Alternative and Options would have the greatest prime and unique farmlands impacts, followed by the W59/E1 Alternative, and then the W71/E1 Alternative. The No-Action Alternative would not immediately affect prime and unique farmlands. The conversion of farmland would be inconsequential because farmland in the Study Area would eventually be converted to urban uses, although some remnants of farmland would likely remain.
Hazardous Materials						
Disturbance of hazardous materials (number of high-priority sites)	0	5	4	1		The W59/E1 Alternative would potentially interact with the greatest number of hazardous materials sites. Implementation of the W101/E1 Alternative and Options would involve one high-priority site. The No-Action Alternative would have no impact on hazardous materials sites.

(continued on next page)

Table S-3 Environmental Impact Summary Matrix, Proposed Action (continued)

Type of Impact	No-Action Alternative	Action Alternatives				
		W59 Alternative + E1 Alternative	W71 Alternative + E1 Alternative	W101 Alternative and Options[a] + E1 Alternative	Quick View of Action Alternatives	Context and Intensity of Impacts for all Action Alternatives
Visual Resources						
Alteration of visual resources	No immediate impacts would occur; planned development would result in the ultimate appearance of urban use.	Impacts on views from residential and rural uses would include construction impacts, new traffic interchanges, and visibility of the new facility. Impacts would not change the low-to-moderate visual quality of views along the W101/E1 and W59/E1 Alternatives. The W71/E1 Alternative would have a higher level of visual sensitivity because of more planned residential development than the other action alternatives; this would create a slightly greater magnitude of impacts. Visual impacts from severe road cuts through ridgelines of the South Mountains would alter views of the natural setting.				All action alternatives would introduce a substantial human-made feature into the environment. The W71/E1 Alternative would create a slightly greater magnitude of impacts, followed by the W59/E1 and W101/E1 Alternatives. The No-Action Alternative would have no immediate impacts.
Energy						
Regional energy consumption in 2035 (millions of gallons/year)	2,874	2,848	2,853	2,850		Fuel consumption would vary because of differences in vehicle miles traveled, vehicle mix, and fuel economies. The action alternatives would provide benefits. The No-Action Alternative would result in the greatest energy consumption.
Temporary Construction						
Temporary construction impacts	No impacts would occur.	Temporary negative effects on air quality, noise levels, water resources, residential and business access, pedestrian and vehicular traffic, and utilities would be comparable among action alternatives.				
Material Sources and Waste Materials						
Estimated deficit (amount of fill material needed, in millions of cubic yards)	No materials would be required.	10.00	6.45	7.20–10.20		The W71/E1 Alternative would have the smallest deficit, while the W101/E1 Alternative Eastern Option would have the largest deficit. These amounts are not considered excessive for a project of this size. No materials would be required under the No-Action Alternative.
Secondary and Cumulative						
Secondary impacts	Growth in traffic, population, and related effects would occur with or without the proposed action, resulting in increased congestion. The action alternatives would also result in secondary impacts on biological resources, water resources, air quality, cultural resources, land uses, community character, and economic conditions.					
Cumulative impacts	All alternatives would occur in an already urbanizing area (most noticeably in the Western Section of the Study Area), an area planned for urban growth as established in local jurisdictions' land use planning activities for as many as the last 25 years. The purpose of the proposed action is not to promote economic development but to respond to a growing need for additional transportation capacity as a result of regional growth occurring now and as projected. Therefore, the action alternatives are not expected to contribute to induced growth in the region. For the action alternatives, the minimal contribution to overall traffic use is expected to have both positive and negative consequences. Cumulative impacts may occur on biological resources, water resources, cultural resources, land uses, visual resources, recreational land, noise, and air quality.					
Section 4(f) Resources						
Section 4(f) resources affected	No use of Section 4(f) resources would occur.	All action alternatives would result in the direct use of Section 4(f) resources in the South Mountains; avoidance would not be prudent and feasible.				

[a] W101/E1 Alternative includes ranges because of design and alignment options. [b] Title VI of the Civil Rights Act of 1964 [c] carbon monoxide [d] National Ambient Air Quality Standards [e] PM_{10} = coarse particulate matter, $PM_{2.5}$ = fine particulate matter [f] mobile source air toxics [g] U.S. Environmental Protection Agency [h] *Regional Transportation Plan* [i] *Transportation Improvement Program* [j] National Register of Historic Places [k] traditional cultural property

Are these mitigation measures final?

Mitigation measures presented in the FEIS represent a range of activities to reduce impacts during construction and operation of the proposed freeway. Some measures are action-specific and some are procedural. If an action alternative were the Selected Alternative, measures would be committed to through the ROD and specific actions would be resolved during design and construction stages.

MEASURES TO MITIGATE ADVERSE EFFECTS

Table S-4 presents measures to avoid, reduce, or otherwise mitigate environmental impacts of the proposed action. Presentation in the FEIS represents a commitment by ADOT to implement the measures. The commitment by ADOT to the measures was made in cooperation with FHWA and will be reinforced at the time of the ROD. ADOT anticipates the measures (as applicable to ADOT) would be made part of the ROD.

Measures committed to will be implemented as part of project development, including R/W acquisition, construction, operation, and maintenance phases of the Selected Alternative, as appropriate. Other permitting actions and permissions required for proposed action approval are presented later in this chapter.

It is possible that mitigation measures proposed for one element would also provide benefits to a secondary element. Other agencies or groups, such as MAG or the City of Phoenix, may take further actions to augment the proposed mitigation measures, but such actions would be independent and not monitored by FHWA or ADOT.

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Land use	For the W59 and E1 Alternatives, ADOT and FHWA would coordinate with public land holding agencies (BLM and ASLD) managing affected public land and the various leaseholders to accommodate the proposed action.	Impacts on public land uses and leaseholders	4-19			■				
Social conditions	ADOT would consider methods of reducing the amount of R/W needed; providing alternative access to the local road network to satisfy emergency services access requirements; and using noise barriers, aesthetic treatments of structures, and landscaping to reduce neighborhood intrusions.	Neighborhood intrusions and impacts on the character of surrounding neighborhoods	4-23			■				
	The ADOT Right-of-Way Group would coordinate during the design phase to designate necessary utility corridors for relocations where appropriate.	Utility relocations					■			
	ADOT would coordinate with all local agencies and private facility owners to minimize the effects of utility relocations and adjustments. Coordination would include, when possible, developing construction schedules to coincide with scheduled maintenance periods and off-peak loads.	Disruptions to service from utility relocations or damage during construction							■	
	ADOT would coordinate with appropriate City of Phoenix officials during the final design process to consider and identify, if appropriate, enhancements such as a pedestrian overpass to reduce possible pedestrian related impacts.	Impacts to pedestrians				■				
	ADOT would coordinate with municipalities and affected communities to address and resolve impacts on internal road networks.	Impacts to local traffic network				■				
	ADOT would develop and implement a public involvement plan for the design and construction phases of the proposed action. Objectives of continued public involvement may include, but would not be limited to, a level of involvement in: • architectural design treatment of structures • measures to minimize harm to Section 4(f) resources • the acquisition and relocation process • modification to the local roadway network • construction activity monitoring	Potential discontinued ADOT and public interaction				■			■	
	ADOT would coordinate with all appropriate emergency services and efforts would be made to minimize effects on response routes and times for all service areas.	Emergency response times during construction				■			■	

Notes: Abbreviations and acronyms are provided at the end of this table, on page S-34. The purple-colored bars designate the entity(ies) responsible for implementing the mitigation measure.

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department: Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Displacements and relocations	An acquisition and relocation assistance program would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (49 C.F.R. § 24), which identifies the process, procedures, and time frame for R/W acquisition and relocation of affected residents or businesses.	Residents and business owners displaced by the proposed action	4-51				■			
	Relocation resources would be available to all residential and business relocatees, without discrimination. All replacement housing would be decent, safe, and sanitary. Replacement housing is available in the general area; last-resort housing would, however, be provided if it were found that sufficient, comparable housing were not available within monetary limits of owners and tenants. If necessary, specific relocation plans would be developed to assist displaced residents of mobile homes in finding new locations for their mobile homes. All acquisitions and relocations resulting from the proposed freeway would comply with Title VI of the Civil Rights Act of 1964 and with 49 C.F.R. § 24.	Residents and business owners displaced by the proposed action					■			
	Private property owners would be compensated at fair market value for land and may be eligible for additional benefits. As for renters, HUD considers anything under a 6 percent rental vacancy rate as a "tight" rental market. The Rental Supplement is based on a calculation between the current rental plus utilities and the determined available comparable rental unit plus utilities times 42 months. This payment would be made available to assist with the difference in rent if the cost of replacement housing were to exceed the rental cost at that time (with conditions).	Land acquired from residents and business					■			
	ADOT would provide, where possible, alternative access to properties losing access to the local road network. In the event that alternative access could not be provided, ADOT would compensate affected property owners in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.	Loss of access to the local road network				■	■			
	Prior to the ROD, ADOT would consider protective and hardship acquisition on a case-by-case basis in accordance with criteria outlined in the ADOT *Right-of-Way Procedures Manual* (2011a).	Residents and business owners displaced by the proposed action				■				
	ADOT would coordinate with the local jurisdictions, MAG, and Valley Metro to identify opportunities to use excess R/W, whenever possible, for future park-and-ride lots and related public facilities.	Potential discontinued ADOT and local jurisdiction interaction				■				
Economic impacts	During construction, ADOT would coordinate with local businesses to ensure reasonable access to businesses would be maintained during regular operating hours.	Disruptions to businesses during construction	4-67						■	
Air quality	The following mitigation measures would be followed, when applicable, in accordance with the most recently accepted version of the ADOT *Standard Specifications for Road and Bridge Construction* (2008). Site preparation • Minimize land disturbance. • Use watering trucks to minimize dust. • Stabilize the surface of dirt piles if not removed immediately. • Use windbreaks to prevent accidental dust pollution. • Limit vehicular paths and stabilize temporary roads. • To prevent dirt from tracking or washing onto paved roads, 50-foot-long track-out pads consisting of 12-inch-deep aggregate of 3 to 6 inches in diameter would be placed over geotextile fabric adjacent to paved roads.	Particulate matter released into the air during construction	4-85						■	■

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department: Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Air quality (continued)	Construction • Use dust suppressants on unpaved traveled paths. • Minimize unnecessary vehicular and machinery activities. • To prevent dirt from tracking or washing onto paved roads, 50-foot-long track-out pads consisting of 12-inch-deep aggregate of 3 to 6 inches in diameter would be placed over geotextile fabric adjacent to paved roads. • To the extent practicable, construction equipment that meets EPA's Tier 4 emission standards shall be used. • Where feasible, construction equipment powered by alternative fuels (e.g., biodiesel, compressed natural gas, electricity) shall be used. • ADOT would provide training to contractor's personnel regarding air quality impacts from construction activities, potential health risks to nearby receptors, and methods to reduce emissions.	Particulate matter released into the air during construction	4-85						■	■
	Postconstruction • Revegetate or use decomposed granite on all disturbed land. • Remove dirt piles and unused materials. • Revegetate all vehicular paths created during construction to avoid future off-road vehicular activities.								■	■
	A traffic control plan would be developed and implemented to help reduce impacts of traffic congestion and associated emissions during construction.	Pollutants released into the air from slowed and idling vehicles				■			■	
	An approved dust permit would be obtained prior to construction from the Maricopa County Air Quality Department for all phases of the proposed action. The permit would describe measures to control and regulate air pollutant emissions during construction.	Particulate matter released into the air during construction							■	■
Noise	General locations of noise barriers have been identified, but these locations and general noise wall design would be reevaluated as design progresses. Where feasible, noise barriers would be constructed as early as possible in the construction phasing to shield adjacent properties from construction-related noise impacts.	Noise generated by construction and operation of the proposed action	4-91	■		■			■	
Water resources	The proposed freeway would have properly designed roadway channels to resist erosion, energy-dissipating structures at all culverts where discharge velocity may cause downstream erosion, and sediment-trapping basins strategically located to maximize sediment removal and to function as chemical-spill containment structures.	Pollutants reaching the Gila and Salt rivers	4-106			■				
	Vegetative or mechanical means would be used to minimize erosion from cut and fill slopes. Vegetation would slow surface runoff, help bind soils, reduce raindrop impact, and break up flow patterns. Mechanical means include retaining walls, rock slope protection, and geotextiles such as matting. Where appropriate, retaining walls would decrease cut and fill slopes, which, in turn, would reduce runoff velocities and erosion potential. Rock slope protection, where placed, would armor the slope, thereby preventing soil movement. Geotextiles would prevent extensive contact between surface runoff and soil, keeping the soil intact.	Erosion from cut and fill slopes and from ground disturbing activities				■				
	Runoff discharge from the roadway to the irrigation district canals and conveyance ditches would be minimized by roadway design and the use of BMPs.	Pollutants reaching irrigation district canals and conveyance ditches				■				

Notes: Abbreviations and acronyms are provided at the end of this table, on page S-34. The purple-colored bars designate the entity(ies) responsible for implementing the mitigation measure.

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Water resources (continued)	To reduce the potential impact of contaminants such as oil, grease, soil, and trash, settling basins would be used to collect water and allow materials to settle. The basins could also serve to contain chemical spills resulting from vehicle accidents. Each basin would be designed to contain a certain rainfall runoff volume before allowing discharge. If an accident were to occur, and the basins were dry at the time of the accident, the spill volume, in most cases, could be accommodated. These settling basins would require periodic cleaning and would be accredited as part of the Statewide Stormwater Management Program.	Runoff containing pollutants from ground-disturbing activities entering waters of the United States	4-106			■				
	A construction AZPDES permit, for ground-disturbing activities exceeding 1 acre, would be obtained from ADEQ for the Selected Alternative (if an action alternative) in accordance with the provisions set forth in Section 402 of the CWA. The AZPDES permit must be consistent with discharge limitations and water quality standards established for the receiving water.					■			■	
	A SWPPP would be prepared by the contractor that would use ADOT's project erosion and sediment control plans, details, and specifications for controlling construction-related pollution discharges to waters of the United States as defined in the CWA. BMPs set forth in the project erosion and sediment control plans, details, and specifications would be included in the contractor's SWPPP. BMPs may include: • Silt barriers (silt fences, compost-filled socks, or straw barriers) would be constructed to restrict and filter sediment flowing to off-site channels. • Trapped silt and debris would be removed to an off-site location before removing barriers. • Contamination from leaking equipment would be reduced or prevented through frequent construction equipment inspections. Faulty equipment would be repaired when discovered. • Construction equipment would be cleaned on a regular basis to minimize potential runoff contamination from petroleum products. • Sediment basins would be constructed to treat sediment-rich runoff before discharge to off-site drainage channels. • Equipment would be fueled and serviced at designated locations to minimize work site contamination. These fueling locations would be located away from nearby channels, swales, or other features that would quickly facilitate movement in the event of a spill. • Upon construction completion, all contaminated material (e.g., concrete wash water) would be removed and disposed of in accordance with local, regional, and federal regulations.					■				■
	ADOT would coordinate with appropriate governmental bodies such as flood control districts and the Community when designing drainage features for the proposed action.	Potential discontinued ADOT, local jurisdiction, and tribal interaction				■				
	ADOT would replace water lost through well acquisitions. This would be done through full well replacement or well abandonment and compensation (if requested by the owner).	Loss of wells					■			
	Existing irrigation canals affected by the freeway may be relocated to allow for conveyance of irrigation water (through installation of pipe, conduit, or extension) from one side of the freeway to the other.	Impacts to irrigation canals					■			
	The contractor would file a Notice of Intent and a Notice of Termination with ADEQ in accordance with Section 402 of the CWA and provide copies to ADOT.	Runoff containing pollutants from ground-disturbing activities entering waters of the United States							■	■

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Water resources (continued)	The contractor, in association with the District, would send a copy of the certificate authorizing permit coverage and a copy of the Notice of Termination acknowledgement letter to the ADOT Environmental Services Water and Air Quality Group, Glendale, Phoenix, Chandler, Goodyear, Tolleson, and Avondale, as appropriate, based on the location of project activities.	Runoff containing pollutants from ground-disturbing activities entering waters of the United States	4-106						■	■
	ADOT would comply with the State of Arizona Surface Water Quality Standard Rules (18 A.A.C. § 11). Other measures that ADOT would undertake include: • improving surface water quality when the freeway would be open to operation by proper maintenance of the retention, detention, and stormwater runoff facilities • mitigating, as previously outlined, for wells that may be adversely affected during construction • conveying affected irrigation ditches through pipe under the roadway • securing CWA Section 401 certification by ADEQ • relocating existing irrigation district canals that may be affected by the proposed action to allow for conveyance of irrigation water (through installation of pipe, conduit, or extension)	Impacts to the area's water resources							■	■
Floodplains	Bridge structures for all action alternatives would be designed to cross floodplains in such a way that their support piers and abutments would not contribute to a rise in floodwater elevation of more than a foot.	Impacts to floodplains	4-114			■				
	Floodplain impacts would be minimized by implementing transverse crossings of the floodplain and avoiding longitudinal encroachments.					■				
	The Maricopa County Floodplain Manager would be given an opportunity to review and comment on the design plans.					■				
	Design criteria for on-site drainage would be based on ADOT's *Roadway Design Guidelines* (2012a) and *Highway Drainage Design Manual – Hydrology* (1993) and on FHWA's *Urban Drainage Design Manual* (2001a).					■				
	ADOT's *Roadway Design Guidelines* (2012a) provides criteria to be used for off-site flows affected by the proposed action: • Culverts would be sized based on the design discharge of a 100-year storm. • Increases in water surface elevations as a result of the new facilities would be contained within the existing and proposed R/W or as noted in accordance with Section 611.3.C. • Culverts would be designed to be self-cleaning, Section 611.3.E. • Reinforced concrete box culvert and reinforced concrete pipe would be provided with adequate cover.					■				
	The Selected Alternative (if an action alternative) would require comprehensive hydrologic, hydraulic, sediment transport, and erosion-related assessments regarding potential 100-year flood effects associated with ephemeral washes. Results would provide information necessary to make a determination regarding what mitigation measures would need to be implemented. Measures may include physical structures associated with the freeway such as culverts. These measures would be determined during the design phase.					■				
Waters of the United States	ADOT would prepare and submit an application to USACE for a CWA Section 404 permit as appropriate, dictated by impacts on jurisdictional waters. The permit conditions would be developed according to the current Memorandum of Agreement between USACE, ADOT, and FHWA. No work would occur within jurisdictional waters until the appropriate CWA Sections 401 and 404 permits were obtained.	Unauthorized activities in waters of the United States	4-118			■				

Notes: Abbreviations and acronyms are provided at the end of this table, on page S-34. The purple-colored bars designate the entity(ies) responsible for implementing the mitigation measure.

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Waters of the United States (continued)	If more time were to be required to complete the proposed action than authorized by the Section 404 of the CWA permit, ADOT would submit a request for a time extension to USACE at least 1 month prior to reaching the authorized date.	Unauthorized activities in waters of the United States	4-118	■		■				
	If previously unidentified cultural resources were to be encountered in or adjacent to waters of the United States during the proposed undertaking, ADOT would notify FHWA and USACE immediately to make arrangements for the proper treatment of those resources.	Impacts to cultural resources within waters of the United States				■				
	If ADOT were to sell the freeway, ADOT would obtain the signature of the new owner in the applicable space provided in the permit and forward a copy of the permit to USACE to validate the transfer of the authorization.	Unauthorized activities in waters of the United States					■			
	The CWA Section 401 water quality certification would certify only the activities and construction of the Selected Alternative and would be valid for the same period as the CWA Section 404 permits. If project construction were not started by the USACE deadline, the applicant would notify ADEQ.								■	
	ADOT would provide a copy of the Section 401 water quality certification conditions to all appropriate contractors and subcontractors. ADOT would post a copy of these conditions in a water-resistant location at the construction site where it may be seen by workers.	Pollutants reaching waters of the United States							■	
	ADOT would maintain the project authorized by the permit in good condition and in conformance with the terms and conditions of the permit. ADOT would not be relieved of this condition even if ADOT were to abandon the project. Should ADOT cease to maintain the freeway or abandon the freeway without a good faith transfer, ADOT would obtain a modification of the permit from USACE.	Unauthorized activities in waters of the United States						■	■	
	If a substantive change/modification to the project were necessary, ADOT would provide notice and supporting information to ADEQ and USACE for review. ADEQ and USACE would then modify the certification to include the change/modifications, provided that water quality standards for surface waters (18 A.A.C. § 11, Article 1) would be achieved.	Pollutants reaching waters of the United States							■	
	When construction were to begin, ADOT would notify ADEQ and USACE prior to the start date. When notification were made, ADOT would provide the start date and the name and phone number of the primary contractor and a contact person. When the activities were completed, ADOT would notify ADEQ and USACE as soon as practicable after project completion.	Unauthorized activities in waters of the United States							■	
	Water used for dust suppression would not contain contaminants that could violate ADEQ water quality standards for surface waters or aquifers and would not be discharged off site. ADOT would obtain the necessary permits for such activities.	Pollutants reaching waters of the United States							■	
	ADOT would comply with all conditions set forth in the Section 401 water quality certification made as part of the project.								■	
	ADOT would allow USACE and ADEQ representatives to inspect the project at any time as determined to be necessary to ensure that it was being accomplished in accordance with the terms and conditions of the permit.	Unauthorized activities in waters of the United States							■	
	ADOT would prepare written instruction for all supervisory construction personnel on the protection of cultural and ecological resources, including all agreed-to environmental stipulations for the project and all conditions required by the permit. The instructions would address federal and State laws regarding antiquities, plants, and wildlife, including collection, removal, and the importance of these resources and the purpose and necessity of their protection.	Impacts to cultural and ecological resources within waters of the United States							■	

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Waters of the United States (continued)	Prior to initiating construction activities under the permit, ADOT would ensure that the contractor(s) would have been provided with a copy of the Section 404 authorization. This would be intended to confirm that the contractor(s) would comply with the terms and conditions of the Section 404 authorization.	Unauthorized activities in waters of the United States	4-118						■	
	Debris (such as soil, silt, sand, rubbish, cement, asphalt, oil or petroleum products, organic materials, tires, or batteries) derived from construction or demolition activities would not be deposited at any site where it may be washed into waters of the United States. After completion of the proposed project, the washes would be left in an environmentally acceptable condition, with all temporary construction and nonnative materials removed from the watercourse.	Pollutants reaching waters of the United States								■
	Pollution from the operation of equipment in the floodplain would be cleaned up and removed before it could be washed into a watercourse. Spills would be promptly cleaned and properly disposed.									■
	Temporary erosion and sediment control measures would be installed, at a minimum, according to ADOT's *Standard Specifications for Road and Bridge Construction* (2008) and *Erosion and Pollution Control Manual* (2012c), prior to construction and would be maintained as necessary during construction and would be maintained as necessary during construction and would not be installed in a manner that causes noncompliance with the Section 404 permit.									■
	If permanent erosion and sediment control measures were required, they would be installed as soon as practicable, preferably prior to construction activities, and would be maintained throughout the life of the project. Permanent erosion and sediment control measures would be located to protect downstream entities from construction impacts when there would be a flow in watercourses within the project boundary.									■
	Access roadways and staging areas would be designed to allow normal storm flows to pass unimpeded. There would be no significant change to the hydraulic conditions of the upstream waters as a result of the temporary constructed features.	Impacts to ecological resources within waters of the United States								■
	No petroleum products would be stored within the 25-year flood boundary of the Salt River, the Gila River, or unnamed tributary washes. Any soil contaminated as a result of contractors' operations would be disposed of in an appropriate, approved disposal facility.	Pollutants reaching waters of the United States								■
	No excavation, fill, or leveling would be permitted in the watercourses, outside the boundaries of the permitted work area.									■
	No fill would be taken from any watercourse outside the boundaries of the permitted work area. Fill would come from an area outside the OHWM of any watercourses and would be free of any contaminants or pollutants.									■
	Heavy equipment traffic would be restricted from entering the watercourses outside the boundaries of the permitted work area. Appropriate barricades would be installed to preclude this activity.									■
	During construction, the work sites would be maintained such that no construction debris or material spillover would be allowed in the watercourses. Upon completion of the work, all construction debris and excess material would be removed from the job sites and disposed of appropriately outside the USACE jurisdictional areas.	Pollutants reaching waters of the United States								■
	During construction, appropriate measures would be taken to accommodate flows within the watercourses, such that waters would not be diverted outside the OHWM.	Impacts to ecological resources within waters of the United States								■
	Prior to construction, the contractor would review and sign the *Checklist for Environmental Compliance*. ADOT would also sign the checklist and return it to ADOT EPG 7 calendar days prior to construction.	Unauthorized activities in waters of the United States								■

Notes: Abbreviations and acronyms are provided at the end of this table, on page S-34. The purple-colored bars designate the entity(ies) responsible for implementing the mitigation measure.

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Waters of the United States (continued)	The contractor should comply with all terms, general conditions, and special conditions of the Section 404 permit, as established by USACE and the Section 401 Water Quality Certification certified by ADEQ.	Unauthorized activities in waters of the United States	4-118							■
	No work would occur within jurisdictional waters until the appropriate CWA Sections 401 and 404 permits were obtained.									■
Topography, geology, and soils	According to the ADOT *Standard Specifications for Road and Bridge Construction* (2008), the contractor would be required to perform in-depth pre- and postconstruction surveys for all structures located within one-half mile in the event any blasting and/or heavy ripping were planned for construction purposes. This documentation should include photographic and video documentation.	Damage to structures resulting from blasting or other heavy construction methods	4-124							■
	Geotechnical-related construction effects would be mitigated through use of appropriate design, including excavations and slopes in soil and rock with an accepted degree of safety, placement of fills with an accepted degree of safety, protection of excavation and fill slopes against erosion, and design of roadway subgrade and foundations in accordance with accepted practices.	Potential mass failures of excavated and/or constructed rock faces				■				
	An acquisition and relocation assistance program would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (49 C.F.R. § 24), which identifies the process, procedures, and time frame for R/W acquisition and relocation of affected businesses.	Displacements of sand and gravel operations within Salt River riverbed					■			
	Relocation resources would be available to all business relocatees, without discrimination. All acquisitions and relocations resulting from the proposed freeway would comply with Title VI of the Civil Rights Act of 1964 and with 49 C.F.R. § 24. Private property owners would be compensated at fair market value for land and may be eligible for additional benefits. In the final determination of potential relocation impacts during the acquisition process, ADOT would provide, where possible, alternative access to properties losing access to the local road network. In the event that alternative access could not be provided, ADOT would compensate affected property owners in accordance with 49 C.F.R. § 24.						■			
	ADOT would consider protective and hardship acquisition on a case-by-case basis in accordance with criteria outlined in the ADOT *Right-of-Way Procedures Manual* (2011a).						■			
Biological resources	During the design phase, ADOT EPG would coordinate with USFWS, AGFD, and the Community's Department of Environmental Quality to determine whether any additional species-specific mitigation measures would be required.	Potential discontinued ADOT and USFWS interaction	4-138	■						
	Protected native plants within the project limits would be affected by this project; therefore, the ADOT Roadside Development Section would determine whether ADA notification would be needed. If notification were needed, the ADOT Roadside Development Section would send the notification at least 60 calendar days prior to the start of construction.	Loss of protected native plants		■	■	■				
	The proposed action would be designed to protect and maintain opportunities for wildlife movement between the South Mountains, the Gila River, and the Sierra Estrella. These opportunities would be located in the region where the E1 Alternative would intersect the southwestern portion of the South Mountains. Some drainage structures incorporated into the roadway plans would be designed to accommodate multifunctional crossings in appropriate locations that would allow limited use by the Community and also serve wildlife. These crossing structures and associated fences would be designed to reduce the incidence of vehicle-wildlife collisions and reduce the impact of the proposed action on wildlife connectivity between the South Mountains, the Gila River, and the Sierra Estrella. ADOT would coordinate with USFWS, AGFD, and the Community's Department of Environmental Quality during the design phase regarding the potential for locating and designing wildlife-sensitive roadway structures.	Obstacles to wildlife movements and wildlife-vehicle collisions		■	■	■				

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Biological resources (continued)	For drainage structures such as culverts located in potential wildlife movement corridors, wildlife friendly design would be considered during final design. ADOT would coordinate with USFWS, AGFD, and the Community's DEQ during the design phase regarding the potential for locating and designing wildlife-sensitive roadway structures.	Obstacles to wildlife movements and wildlife-vehicle collisions	4-138							
	All disturbed soils not paved that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity.	Loss of vegetation		■	■	■				
	Prior to signing the ROD for the project, the status of species and critical habitat proposed, listed, or designated under the ESA would be reviewed. If new species have been proposed or listed following completion of the Biological Evaluation, an update to the Biological Evaluation would be prepared and any required consultation with USFWS would be completed.	Impacts to newly listed threatened and endangered species		■	■	■				
	During final design of the project and within 90 days of approval to begin construction of each phase of the project, the status of species and critical habitat proposed, listed, or designated under the ESA would be reviewed. If new species or critical habitat have been proposed, listed, or designated following completion of the Biological Evaluation, or if the potential effects on species or critical habitat from the project have changed from those described in the Biological Evaluation, an update to the Biological Evaluation would be prepared and any required consultation with USFWS would be completed.	Impacts to newly listed threatened and endangered species		■	■	■				
	Prior to construction, ADOT EPG would arrange for surveys to be completed for the Sonoran desert tortoise, Tucson shovel-nosed snake, bats, and other species as determined by ADOT or FHWA to be necessary.	Potential impacts to reptiles and amphibians		■						
	During the design phase, ADOT would coordinate with USFWS, AGFD, and the Community's Department of Environmental Quality and determine whether any additional species-specific mitigation measures would be required.	Potential impacts to specific species		■						
	During the design phase, ADOT EPG would review and update biological requirements for the project, completing bird surveys as necessary, and developing species-specific mitigation measures to minimize potential impacts to birds protected under the MBTA.	Potential impacts to birds protected under the MBTA		■	■	■				
	ADOT would coordinate for the contractor's personnel to receive training regarding procedures for interactions with sensitive species that may be encountered during construction.	Potential impacts to specific species		■	■	■				
	If clearing, grubbing, or pruning of trees, shrubs, or cacti would occur between March 1 and August 31, a qualified biologist would conduct a bird nest search of all vegetation that would be cleared or pruned within 5 calendar days prior to vegetation clearing/pruning. If an active nest or nest cavity/hole of birds protected by the MBTA were observed, the vegetation clearing/pruning would be delayed in the immediate vicinity until the nest is no longer active or ADOT would obtain required permits from USFWS.	Interference with wildlife reproduction		■	■	■			■	■
	To prevent the introduction of invasive species seeds, the contractor would inspect all earthmoving and hauling equipment at the equipment storage facility and the equipment would be washed prior to entering the construction site.	Introduction of invasive species to the construction area							■	■
	To prevent invasive species seeds from leaving the site, the contractor would inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.	Spread of invasive species from the construction area							■	■
	Habitat impacts would be minimized by restricting construction activities to the minimum area necessary to perform the activities and by maintaining natural vegetation where possible.	Loss of wildlife habitat							■	■

Notes: Abbreviations and acronyms are provided at the end of this table, on page S-34. The purple-colored bars designate the entity(ies) responsible for implementing the mitigation measure.

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department: Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Biological resources (continued)	If any Sonoran desert tortoises were encountered during construction, the contractor would adhere to the most current guidelines regarding encounters with Sonoran desert tortoises.	Loss of Sonoran desert tortoises	4-138						■	■
	The contractor would adhere to the procedures for encounters with sensitive species that would include allowing the animal to leave of its own accord or contacting a trained person if the animal needed to be removed from the work area.	Potential impacts to specific species							■	■
	A biologist would be employed to complete a preconstruction survey for burrowing owls 96 hours prior to construction in all suitable habitat that would be disturbed. The biologist shall possess a burrowing owl survey protocol training certificate issued by AGFD. Upon completion of surveys, the survey results would be reviewed with the ADOT biologist and a course of action would be identified.	Loss of burrowing owls or their habitat							■	■
	If any burrowing owls are located in the work area, the contractor would immediately stop work at that location and notify the Engineer. The Engineer would contact the ADOT biologist to determine whether the owls could be avoided or must be relocated. The contractor would not work within 100 feet of any active burrow until the situation had been evaluated by the ADOT biologist. If the ADOT biologist determined that the owl must be relocated, a biologist holding a rehabilitation permit from USFWS would relocate burrowing owls from the project area.	Loss of burrowing owls							■	■
Cultural resources	Strategies for prehistoric sites would include: • A preconstruction testing plan would be developed and implemented for the sites by ADOT EPG's Historic Preservation Team. The testing plan would define locations of test excavations within sites to determine whether important archaeological deposits exist within the area of potential effects. The Historic Preservation Team would consult with SHPO and other consulting parties as required. Depending on the results of the testing program, follow-up data recovery excavations might also be required.	Loss of NRHP-eligible properties	4-158	■						
	Strategies for prehistoric sites would include: • A burial agreement with the ASM and concerned Native American tribes would be developed to outline procedures for proper removal, treatment, and reburial of any human remains and associated funerary objects that might be encountered. Impacts on the Roosevelt Canal and historic Southern Pacific Railroad would be avoided through the use of bridges to span the resources.	Loss of NRHP-eligible properties		■		■				
	ADOT, on behalf of FHWA and in conjunction with tribal and local authorities, Western, and BIA, developed a PA for the proposed action. A PA is a document that spells out the terms of a formal, legally binding agreement between lead agencies and other interested parties for the proper treatment and management of affected cultural resources. A PA establishes a process for consultation, review, and compliance with federal and State preservation laws as the effects of a project on historic properties were to become known. ADOT would follow the terms and conditions of the Section 106 PA developed for the proposed action. No ground-disturbing activities would be conducted until ADOT EPG has notified the District Engineer that the terms and stipulations of the PA have been fulfilled.			■						
	ADOT and FHWA would fund an eligibility report for the South Mountains TCP to be prepared by the Community. Consultation is continuing with the Community and other tribes regarding other appropriate mitigation strategies; selected, limited disclosure of locations of cultural resources sites; and other cultural resources issues related to the proposed action.	Harm to South Mountains TCP		■						

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Cultural resources (continued)	Although pedestrian access to traditional cultural places would be modified extensively by the proposed action, access would be provided by proposed crossings under the freeway. These multifunctional crossings are proposed near the cultural resources sites and would facilitate pedestrian access to these sites.	Isolation of the Community from culturally important places	4-158			■				
	Gaps in the cultural resources inventory would be investigated by ADOT in the design phase, prior to any construction or other ground-disturbing activities.	Loss of NRHP-eligible properties				■				
	If previously unidentified cultural resources were to be encountered during activity related to the construction of the proposed freeway, the contractor would stop work immediately at that location and would take all reasonable steps to secure the preservation of those resources and notify the ADOT Engineer. The ADOT Engineer would contact the ADOT EPG Historic Preservation Team immediately and make arrangements for the proper treatment of those resources. ADOT would, in turn, notify the appropriate agency(ies) to evaluate the significance of those resources.	Loss of discovered properties that may be NRHP-eligible		■					■	■
Prime and unique farmlands	During the design phase, ADOT would implement a R/W acquisition program in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (49 C.F.R. § 24).	Loss of prime or unique farmlands through segmenting of parcels	4-162				■			
	During the design phase of the proposed action, ADOT would coordinate with affected property owners as part of the R/W acquisition process to provide access, if possible, for farm equipment between divided agricultural parcels or to purchase remaining farm parcels considered too small to be farmed either economically or functionally.	Loss of prime or unique farmlands through segmenting of parcels					■			
	Provision would be made for access to farmland otherwise made functionally inaccessible by the project. Additional mitigation measures might be considered based on NRCS guidance.								■	
Hazardous materials	A site-specific Phase I assessment would be performed prior to site acquisition for each of the high-priority sites.	Disturbance of hazardous material sites	4-165			■				
	ADOT would review the status of open regulatory cases relating to hazardous materials releases during the design phase. Responsible parties associated with any open regulatory cases would be determined at that time. ADOT would coordinate with responsible parties to determine the status of any required cleanup actions.					■				
	ADOT would conduct asbestos and lead-paint inspections of structures to be demolished and require abatement measures during demolition.	Releases of asbestos or lead during demolition of acquired structures				■				
	The ADOT project manager would contact the ADOT EPG hazardous materials coordinator to determine the need for additional site assessment.	Disturbance of hazardous material sites		■		■				
	Staging for construction activities near wells or dry wells would be located in areas where accidental releases of potential contaminants would be minimized and any accompanying threat to groundwater resources minimized.	Hazardous materials reaching groundwater							■	■
	In cooperation with the contractor, ADOT's Construction District would develop and coordinate emergency response plans with local fire authorities, local hospitals, and certified emergency responders for hazardous materials releases or chemical spills.	Hazardous materials reaching groundwater or surface waters or affecting human health							■	■
	If suspected hazardous materials were to be encountered during construction, work would cease at that location and the ADOT Engineer would arrange for proper assessment, treatment, or disposal of those materials.	Disturbance of previously unknown hazardous material sites							■	■

Notes: Abbreviations and acronyms are provided at the end of this table, on page S-34. The purple-colored bars designate the entity(ies) responsible for implementing the mitigation measure.

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Hazardous materials (continued)	Asbestos- and lead-paint-containing materials identified in structures to be demolished would be properly removed and disposed of prior to demolition.	Releases of asbestos or lead during demolition of acquired structures	4-165				■			
	Any existing aboveground storage tanks or underground storage tanks would be removed or relocated.	Hazardous materials reaching groundwater or surface waters or affecting human health					■			
	The contractor would develop an on-site health and safety plan for construction activities.	Impacts to human health and safety								■
	If relocation or removal of an aboveground storage tank or underground storage tank were necessary, the removal/relocation activities would be addressed in accordance with applicable laws and regulations of the State of Arizona.	Hazardous materials reaching groundwater or surface waters or affecting human health								■
	A hazardous waste management plan should be prepared for the handling of hazardous materials during construction.	Impacts to human health and safety								■
	Use of asbestos-containing materials would be avoided during construction.	Releases of asbestos during construction or afterward								■
Visual resources	During the design phase, ADOT would evaluate: • leaving in place rock outcrops—if stable and not a hazard to the traveling public—not interfering with construction or looking out-of-place in the natural landscape • using vegetative buffers to screen views both of the road and from the road • transplanting larger saguaro cacti, mature trees, and large shrubs likely to survive the transplanting and setting-in period to visually sensitive or critical roadway areas • blending retention basins and their landscape treatments into their natural surroundings • placing landscape treatment on the periphery of R/W areas at overpass locations as well as at other areas adjacent to residential development • clustering or grouping plant material in an informal pattern to break up the linear form of the freeway • using strategic gaps in plantings to frame positive views from the road • using earth colors for overpasses, retaining and screen walls, and noise barriers • using natural-tone metals with a noncontrasting, nonglare finish for guardrails and handrails • using riprap that blends with the surrounding rocks and exposed soil color • using shotcrete that matches the color and texture of adjacent rocks • using bridges and overpass structural systems that help unify a visually complex landscape • minimizing structural sizes and/or recessing the face of structural members from the edge of the roadway to reduce real or apparent breadth of structures	Disruption of natural landscape views or views of scenic value and incompatible views of proposed action from adjacent land	4-170			■				
	If a jurisdiction through which the proposed freeway would pass were to request treatments other than ADOT's standard palette of treatments to noise barriers, screen walls, piers, concrete barriers, retaining walls, or highly visible headwalls, such efforts may be negotiated with ADOT. (Treatments beyond the ADOT standard palette may be more expensive to construct and/or maintain. In such cases, a given jurisdiction may wish to cover the additional expenses to secure the desired treatment.)	General public concerns over aesthetic treatments				■				

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department: Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Visual resources (continued)	Road cuts proposed for the South Mountains would incorporate the newly exposed rock faces characteristic of the adjacent natural rock features, including scale, shape, slope, and fracturing to the extent that could be practicable and feasible as identified through geotechnical testing and constructibility reviews. ADOT would require the contractor to round and blend new slopes to mimic the existing contours to highlight natural formations. ADOT would evaluate having the contractor adjust and warp slopes at intersections of cuts and natural grades to flow into each other or transition with the natural ground surfaces without noticeable breaks.	Disruption of natural landscape views or views of scenic value	4-170			■				
Temporary construction impacts	A traffic control plan would be developed and implemented to help reduce impacts of traffic congestion and associated emissions during construction.	Pollutants released into the air from slowed and idling vehicles	4-173						■	
	The following mitigation measures would be followed, when applicable, in accordance with the most recently accepted version of the ADOT *Standard Specifications for Road and Bridge Construction* (2008). Site preparation • Minimize land disturbance. • Use watering trucks to minimize dust. • Stabilize the surface of dirt piles if not removed immediately. • Use windbreaks to prevent accidental dust pollution. • Limit vehicular paths and stabilize temporary roads. • To prevent dirt from tracking or washing onto paved roads, 50-foot-long track-out pads consisting of 12-inch-deep aggregate of 3 to 6 inches in diameter would be placed over geotextile fabric adjacent to paved roads. Construction • Use dust suppressants on unpaved traveled paths. • Minimize unnecessary vehicular and machinery activities. • To prevent dirt from tracking or washing onto paved roads, 50-foot-long track-out pads consisting of 12-inch-deep aggregate of 3 to 6 inches in diameter would be placed over geotextile fabric adjacent to paved roads. • To the extent practicable, construction equipment that meets EPA's Tier 4 emission standards shall be used. • Where feasible, construction equipment powered by alternative fuels (e.g., biodiesel, compressed natural gas, electricity) shall be used. • ADOT would provide training to contractor's personnel regarding air quality impacts from construction activities, potential health risks to nearby receptors, and methods to reduce emissions. Postconstruction • Revegetate or use decomposed granite on all disturbed land. • Remove dirt piles and unused materials. • Revegetate all vehicular paths created during construction to avoid future off-road vehicular activities.	Particulate matter released into the air during construction						■	■
	An approved "Application for Earth Moving Permit, Demolition, and Dust Control Plan" would be obtained prior to construction from the Maricopa County Air Quality Department for all phases of the proposed action. The permit would describe measures to control and regulate air pollutant emissions during construction.								■	■

Notes: Abbreviations and acronyms are provided at the end of this table, on page S-34. The purple-colored bars designate the entity(ies) responsible for implementing the mitigation measure.

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Temporary construction impacts (continued)	The following measures would be implemented for the Selected Alternative: • All equipment exhaust systems would be in good working order. Properly designed engine enclosures and intake silencers would be used. • Equipment would be maintained on a regular basis.	Particulate matter released into the air during construction	4-173							
	• New equipment would be subject to new product emission standards. • Stationary equipment would be located as far away from sensitive receivers as possible. • Construction-related noise generators would be shielded from noise receivers (e.g., use temporary enclosures to shield generators or crushers, take advantage of site conditions to provide topographic separation). • Construction alerts would be distributed to keep the public informed of construction activities, and a toll-free number for construction-related complaints would be provided. • During the design phase, hours of operation would be evaluated to minimize disruptions during construction.	Nuisance noise during construction								■
	Congestion from construction-related traffic would create temporary impacts in the project vicinity. The magnitude of these impacts would vary depending on the location of the sources of the fill material and of the disposition sites for surplus material, the land uses along the routes, the duration of hauling operations, staging locations, and the construction phasing. To identify acceptable routes and times of operation, ADOT, or its representative, would prepare an agreement with local agencies regarding hauling of construction materials on public streets.	Traffic congestion related to construction hauling operations				■			■	
	Traffic would be managed by detailed traffic control plans, including coordination with potentially affected public services. Access would be maintained during construction, and construction activities that might substantially disrupt traffic would not be performed during peak travel periods. To minimize disruption, ADOT would coordinate with local jurisdictions regarding traffic control and construction activities during special events. Requirements for the use of construction notices and bulletins would be identified as needed. The effectiveness of the traffic control measures would be monitored during construction and any necessary adjustments would be made.	Interference with normal traffic patterns on area roads				■			■	■
	ADOT would coordinate with the responsible local entities regarding the relocation of utilities, as appropriate. ADOT coordination with affected utilities would be ongoing and would continue through the design phase. Utilities with prior rights would be relocated at ADOT cost according to the requirements of the utility.	Disruptions to service from utility relocations or damage during construction				■				
	Disruptions to utility services, if necessary, would be restricted to being short-term and localized. ADOT and project contractors would continue to coordinate with utility providers during the design phase and project construction to identify potential problems and/or conflicts and to provide opportunities for their resolution prior to proposed actions. Replacement and/or relocation of utilities would be coordinated with ADOT construction activities and other projects in the area. Planning would include scheduling of disruptions and prior notification of adjacent property owners who would be affected by temporary service cut-offs. Emergency response procedures would be outlined by ADOT in consultation with local utility providers to ensure quick and effective repair of any inadvertent or accidental disruptions in service.	Disruptions to utility service and traffic from utility relocations or damage during construction				■			■	■
	Pedestrian access to the TCPs would not be precluded during construction, but might temporarily involve out-of-direction travel. It is understood that Community use of the TCPs is not seasonal, so avoidance of impacts would not be possible through construction scheduling. All TCPs would be appropriately protected (e.g., temporary fencing) during construction.	Restriction of access to TCPs and potential harm to TCPs							■	

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department: Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Material sources	The contractor would use material sources from the ADOT *Contractor-Furnished Materials Sources List*. If the source that the contractor prefers to use is not on the ADOT list, then the contractor would complete ADOT EPG's Material Source Environmental Analysis Application in accordance with ADOT's *Standard Specifications for Road and Bridge Construction*, Section 104 Material Sources (2008 Edition) (Stored Specification 104.12 General) prior to using material from that source.	Acquisition of unapproved material for project construction to address the deficit of material needed (material not generated by project construction)	4-176							■
	Contractor-furnished material sources must go through a process to obtain environmental clearance for use on ADOT projects. The material source owner or operator must submit a Material Source Environmental Analysis Application, with cultural survey and reports, to ADOT EPG. After receiving the completed application, ADOT EPG would initiate a cultural consultation process. Upon successful completion of this process, the material source would receive a tracking number and may be included on the ADOT *Contractor-Furnished Materials Sources List*.									■
Section 4(f)	Where the proposed action would cross NRHP-eligible properties (specifically, the Grand Canal, Roosevelt Canal, and the historic Southern Pacific Railroad [Wellton-Phoenix-Eloy Main Line]), the proposed action would be constructed as an elevated span to clear the properties.	Potential harm to NRHP-eligible historic properties	5-7			■				
	Because existing access to some of the NRHP-eligible properties afforded protection under Section 4(f) may be affected, alternative access would be provided. In those instances, access would not be restricted and utility of the resources would not be altered.	Potential restriction of access to NRHP-eligible historic properties				■			■	
	Where the proposed action would cross over trail segments (specifically, Segments Seven, Fifty-six, Sixty-eight, and Sixty-nine of the Maricopa County Regional Trails System, and Segment One of the Sun Circle Trail), the proposed action would be constructed as an elevated span to clear the trail segments.	Potential harm to trail segments	5-9			■				
	ADOT would engage Maricopa County in the design phase to coordinate the design of the proposed action with relevant segments of the County's trail system and to identify beneficial opportunities to locate trail segments along the proposed action.	Potential lack of coordination regarding trail design				■				
	During the design phase, ADOT would consult directly with the Phoenix City Manager's office to identify and implement other design measures, when possible, to further reduce land needed for the proposed action. The City Manager's office represents its constituents, including the Sonoran Preserve Advisory Committee, Phoenix Mountains Preservation Council, Mountain Bike Association of America, Phoenix Parks and Recreation Board, and Arizona Horsemen's Association.	Harm to SMPP (loss of land)	5-23			■	■			
	During the design phase, ADOT would consult directly with the Phoenix City Manager's office in representing City of Phoenix interests to enter into an IGA to identify and purchase replacement land. Replacement land would not exceed a 1:1 ratio (minus previously purchased replacement land) unless ADOT and the City of Phoenix determine jointly that exceeding the 1:1 ratio would be in the best interests of both parties. Pursuant to State law, ADOT cannot purchase land for the sole purpose of transferring it to other ownership. Therefore, under provisions set forth in the IGA entered into by both ADOT and the City of Phoenix, the City would be responsible for identification of replacement land. Once agreed upon under the terms of the IGA, ADOT would issue payment to the City of Phoenix for the acquisition of replacement land. Provisions of the IGA would ensure commitment of the transaction would be solely for the purposes of timely acquisition of parkland for public use within Phoenix.					■	■			

Notes: Abbreviations and acronyms are provided at the end of this table, on page S-34. The purple-colored bars designate the entity(ies) responsible for implementing the mitigation measure.

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Section 4(f) (continued)	ADOT would undertake the condemnation process to obtain the land for the proposed action. Because replacement land would be provided as a measure to minimize harm, ADOT would request City of Phoenix-written and published support prior to beginning the condemnation process.	Harm to SMPP (loss of land)	5-23			■	■			
	Design measures would be implemented to blend the appearance of the cuts with the surrounding natural environment, as feasible. The degree of slope treatment would depend on the interaction of two primary factors: the angle of the cut slope and the receptivity of the cut rock to rock sculpting and rounding to mimic existing contours and allow for staining, revegetation, and other related measures to blend the slope with the South Mountains' natural setting.	Harm to SMPP (visual impacts)				■				
	ADOT would undertake additional geotechnical investigations during the design phase to determine, in part, how receptive the proposed slope angles would be to slope treatments. During this period, ADOT would consult directly with the Phoenix City Manager's office in representing City of Phoenix interests and on behalf of the Sonoran Preserve Advisory Committee, Phoenix Parks and Recreation Board, and Phoenix Mountains Preservation Council in establishing a slope treatment plan for cut slopes through the ridgelines, with the clear intent to blend as well as would be possible the cut slopes with the South Mountains' natural setting.	Harm to SMPP (visual impacts)				■				
	Barriers proposed to mitigate noise impacts on neighboring residential developments (near the Foothills Reserve residential development and the Dusty Lane residential area), while not specifically intended to mitigate noise intrusion into SMPP, would provide incidental noise mitigation.	Harm to SMPP (noise intrusions)				■				
	Where appropriate, visual intrusions would be reduced by a number of measures: • Vegetation buffers would be used to screen views of the freeway from SMPP. • Larger saguaros, mature trees, and larger shrubs likely to survive the transplanting and setting-in period would be transplanted in relatively natural areas near the proposed action to blend with the existing landscape. • Clustering or grouping plant material in an informal pattern to break up the linear form of the freeway would be undertaken where appropriate to "naturalize" areas within the R/W. • Landscape treatments using native plants on the periphery of R/W areas at overpass locations and areas near residential developments would be installed where appropriate. • Aesthetic treatments and patterning would be applied to noise barriers and other structures (lighting standards, overpasses, abutments, retaining and screening walls).	Harm to SMPP (visual impacts)				■				
	ADOT would consult directly with the Phoenix City Manager's office in representing City of Phoenix interests and on behalf of the Sonoran Preserve Advisory Committee, Phoenix Parks and Recreation Board, and the Phoenix Mountains Preservation Council in establishing a slope treatment plan for cut slopes through the ridgelines, with the clear intent to blend as well as would be possible the cut slopes with the South Mountains' natural setting.				■	■				
	To set clear parameters defining the scope of the mitigation measures to be implemented and for making environmental determinations, an IGA would be created between ADOT and the City of Phoenix. For the proposed action through SMPP, ADOT would consult directly with the Phoenix City Manager's office in representing City of Phoenix interests and on behalf of the Sonoran Preserve Advisory Committee, Phoenix Parks and Recreation Board, and the Phoenix Mountains Preservation Council and with Community representatives to develop the aesthetic treatment of landscaping and structures through the park/preserve.					■				

(continued on next page)

Table S-4 Mitigation Measures, Arizona Department of Transportation, Action Alternatives (continued)

Element	Mitigation Measure	Impact(s) to be Mitigated	Beginning Page Reference(s)	Responsible ADOT Department						
				Environmental Planning Group	Roadside	Design	Right-of-Way	Maintenance District	Construction District	Selected Contractor
Section 4(f) (continued)	Based on locations, likelihood/effectiveness as multifunctional crossings, and on preliminary cost estimates, preliminary designs of some crossings would be enhanced to accommodate the movement of wildlife and provide access to SMPP for hiking, equestrian, Community, and bicycling use. Some of the crossings would provide direct access to SMPP; all would permit wildlife to move unimpeded in and out of the park preserve at the crossing locations.	Harm to SMPP (access and habitat connectivity)	5-23			■				
	During the design phase, ADOT would consult directly with the Phoenix City Manager's office (which represents its constituents, including the Sonoran Preserve Advisory Committee, Phoenix Mountains Preservation Council, Mountain Bike Association of America, Phoenix Parks and Recreation Board, and Arizona Horsemen's Association), Maricopa County, Arizona Department of Public Safety, USFWS, AGFD, and the Community's Department of Environmental Quality to finalize design features and locations of the crossings designed to provide access to SMPP.	Harm to SMPP (habitat connectivity and visual impacts)				■				
	During the design phase, ADOT would consult directly with the Community to identify and implement other design measures, when feasible, to further reduce land requirements for the proposed action. The consultation would likely include the City of Phoenix.	Harm to the South Mountains as a TCP (loss of land)	5-27			■				
	The E1 Alternative was designed to avoid a site that is a contributing element to the TCP, resulting in no direct use of this TCP element. A R/W fence would limit access to the site by freeway users, but Community members would continue to gain access to the site as they currently do.	Harm to the South Mountains as a TCP (destruction of a contributing element and access)				■				
	As a measure to minimize harm to the TCP, ADOT and FHWA would provide funds for the Community to conduct the TCP evaluation.	Harm to the South Mountains as a TCP (documentation of the TCP)				■				
	ADOT would invite the Community to participate in direct consultation with the City of Phoenix in establishing a slope treatment plan for cut slopes through the ridgelines, with the clear intent to blend the cut slope with the South Mountains' natural setting.	Harm to the South Mountains as a TCP (visual impacts)				■				
	ADOT would invite the Community to participate in direct consultation with the City of Phoenix to develop the aesthetic treatment of landscaping and structures (e.g., noise barriers) through the TCP.					■				
	The multipurpose crossings proposed as a measure to minimize harm to SMPP would provide access from the Community to the mountains.	Harm to the South Mountains as a TCP (access and habitat connectivity)				■				
	During the design phase, ADOT would invite the Community to participate in direct consultation with the City of Phoenix, Maricopa County, and assigned staff from the Arizona Department of Public Safety and AGFD to finalize design features and locations of the crossings.					■				
	The E1 Alternative was designed to avoid site AZ T:12:112 (ASM), resulting in no direct use of this TCP element. A R/W fence would limit access to the site by freeway users, but Community members would continue to gain access to the site as they currently do.	Harm to AZ T:12:112 (ASM) as a TCP (destruction and access)				■				

A.A.C. – Arizona Administrative Code
ADA – Arizona Department of Agriculture
ADEQ – Arizona Department of Environmental Quality
ADOT – Arizona Department of Transportation
AGFD – Arizona Game and Fish Department
ASLD – Arizona State Land Department
ASM – Arizona State Museum
AZPDES – Arizona Pollutant Discharge Elimination System
BIA – U.S. Bureau of Indian Affairs
BLM – Bureau of Land Management
BMPs – best management practices
C.F.R. – Code of Federal Regulations
Community - Gila River Indian Community
CWA – Clean Water Act
EPA – U.S. Environmental Protection Agency
EPG – ADOT Environmental Planning Group
FHWA – Federal Highway Administration
HUD – U.S. Department of Housing and Urban Development
IGA – intergovernmental agreement
MAG – Maricopa Association of Governments
MBTA – Migratory Bird Treaty Act
NRCS – Natural Resources Conservation Service
NRHP – National Register of Historic Places
OHWM – ordinary high-water mark
PA – programmatic agreement
ROD – record of decision
R/W – right-of-way
SHPO – State Historic Preservation Office
SMPP – Phoenix South Mountain Park/Preserve
SWPPP – Stormwater Pollution Prevention Plan
TCP – traditional cultural property
USACE – U.S. Army Corps of Engineers
USFWS – U.S. Fish and Wildlife Service
Western – Western Area Power Administration

IDENTIFICATION OF A PREFERRED ALTERNATIVE

A preferred action alternative in the Western and Eastern Sections has been identified.

Identification of a Preferred Alternative in the Western Section (W59 Alternative)

This section summarizes the alternatives screening process and factors considered for the identification of a Preferred Alternative in the Western Section. It begins with the identification of a preliminary preferred alternative, the W55 Alternative, and then discusses the shift to the W59 Alternative. The concluding discussion focuses on the reasons that ADOT and FHWA identified the W59 Alternative, and not the W71 or W101 Alternative, as the Preferred Alternative in the Western Section. A side-by-side comparison of the factors used in the alternatives screening process for each action alternative is presented in Figure S-10. Additional detail regarding the impacts associated with each action alternative is presented in Chapter 4, *Affected Environment, Environmental Consequences, and Mitigation*, and is summarized in Table S-3, beginning on page S-10.

In the summer of 2006, ADOT, with FHWA concurrence, identified the W55 Alternative as the preliminary preferred alternative in the Western Section. The public announcement in 2006 of the W55 Alternative as the preliminary preferred alternative prior to issuance of the DEIS was in response to increasing requests by officials of affected municipalities and land developers to allow better land planning in the rapidly developing Western Section. The announcement was grounded in the following context:

- Identification of the preliminary preferred alternative applied only to the Western Section of the proposed action corridor.
- Identification of the W55 Alternative as the preliminary preferred alternative in the Western Section was independent of a similar identification to be made regarding a Preferred Alternative in the Eastern Section.
- Because of outstanding issues at the time (2006) regarding Community coordination and the South Mountains, ADOT and FHWA elected to postpone a similar identification of a preliminary preferred alternative in the Eastern Section to continue Community coordination efforts.
- ADOT and FHWA have sought permission to develop alternatives on Community land. Coordination among ADOT, FHWA, and the Community regarding permission has occurred since project inception; however, despite those efforts, ADOT and FHWA have determined that an alternative alignment on Community land is not feasible. (Issues relevant to Community coordination are presented in Chapter 2, *Gila River Indian Community Coordination*.)
- Identification of the W55 Alternative as the preliminary preferred alternative in the Western Section of the corridor would not preclude the No-Action Alternative from being the Selected Alternative later in the EIS process.
- Identification of the W55 Alternative as the preliminary preferred alternative would not represent a final determination by ADOT and FHWA.

In identifying the preliminary preferred alternative, ADOT concluded the W55 Alternative would best balance fiscal responsibility, regional mobility needs, community sensitivity, and additional considerations such as consistency with long-range planning goals, economic and environmental impacts, and public and agency input. The SMCAT, formed specifically to evaluate the proposed action, was empowered to consider many of the same parameters as ADOT examined and, in doing so, to recommend a preliminary preferred alternative to ADOT for its consideration. As presented in Chapter 6, *Comments and Coordination*, the SMCAT evaluation resulted in its recommending the W101 Alternative. In doing so, the SMCAT emphasized the importance of addressing long-term regional mobility issues, but also expressed concern regarding possible impacts on community character and cohesion. ADOT shared SMCAT concerns about both long-term regional mobility and community sensitivity. These concerns, when combined with ADOT's concern for potential reduction in community services, in Tolleson in particular, ultimately contributed to ADOT's 2006 identification of the W55 Alternative—and not the W101 Alternative—as the preliminary preferred alternative. ADOT's determination was reached after:

- consideration of overall transportation needs in the region as identified in the RTP as adopted by Maricopa County voters
- consideration of consistency with clearly established long-range regional planning goals
- comparison of environmental and societal impacts expected from each of the alternatives and assessment of the ability to mitigate impacts
- a comparative examination of operational performance among the three action alternatives in the Western Section
- estimation of project costs in the context of fiscal responsibility to overall regional transportation infrastructure costs
- consideration of more than 4 years of public and agency input, including comments received at more than 200 formal and informal information exchanges with the public (through public meetings, the project Web site, and project telephone log, as well as recognition of resolutions passed by local communities and the SMCAT recommendation)

In 2009, MAG suggested that a portion of the W55 Alternative could be shifted west onto 59th Avenue to take advantage of the existing R/W and reduce cost and business displacements. This shifted alignment (called the W59 Alternative) would connect to I-10 (Papago Freeway) at an existing service traffic interchange. After further analysis was conducted related to alignment, traffic operations, construction impacts, and environmental considerations, the following advantages and disadvantages were identified:

- would enable better I-10 traffic performance than would be achievable with the W55 Alternative
- would offer certain design advantages over the W55 Alternative
- would be preferred from a security perspective because it would be farther from the petroleum storage facilities at 51st Avenue and Van Buren Street
- would not reconstruct the 51st Avenue Bridge at I-10
- would require the relocation of fewer businesses

- would require the relocation of utilities along 59th Avenue
- would cause increased disruption of traffic during construction along 59th Avenue
- would eliminate direct access from I-10 to 59th Avenue and vice versa (indirect access would be provided by a system of access roads connecting to 51st and 67th avenues)
- would require the relocation of more single-family residences and two apartment complexes

Believing that the advantages outweighed the disadvantages, ADOT and FHWA identified the W59 Alternative as the preliminary preferred alternative in the Western Section. The process and factors leading to identification of the W59 Alternative as the preliminary preferred alternative in the Western Section mirror those considered by ADOT and FHWA in 2006 to identify the W55 Alternative as the preliminary preferred alternative.

In preparing the FEIS for the proposed action, ADOT and FHWA identified the W59 Alternative as the Preferred Alternative in the Western Section and reconfirmed the following:

- Identification of the W59 Alternative as the Preferred Alternative in the Western Section does not preclude the No-Action Alternative from being the Selected Alternative later in the EIS process.
- The issues and factors leading ADOT and FHWA to identify the W59 Alternative as the Preferred Alternative remain applicable and well-founded. (However, identification of the Preferred Alternative in the FEIS does not represent a final determination by ADOT and FHWA; identification of a Preferred Alternative could change.)

In undertaking the process leading to this identification, ADOT and FHWA compared performance between the W59, W71, and W101 Alternatives. This process is described below.

When comparing action alternatives in the Western Section, the W71 Alternative was considered the least desirable of the three action alternatives because:

- The duration and extent of congested conditions on I-10 would be the least desirable of the alternatives considered.
- Residential impacts and relocations would be high (up to 839 properties affected).
- Regional and public support is lacking.
- The presence of an alignment is not consistent with local land use plans dating back to the mid-1980s.

ADOT continued the evaluation of the Western Section action alternatives by conducting a comparative analysis of the W59 and W101 Alternatives, as summarized below.

Overall Transportation Needs

- The W59 Alternative would better link the southern areas of the region with the central metropolitan area and would provide an alternative route to I-10 for regional connectivity.
- The W59 Alternative would be more consistent with local and regional transportation plans, including the RTP.
- Northbound and southbound motorists using the W101 Alternative would have a direct connection to SR 101L (Agua Fria Freeway) and would not have to travel on I-10 (Papago Freeway). This would complete a true loop around the Phoenix metropolitan area.
- The W101 Alternative would need additional widening improvements to SR 101L (Agua Fria Freeway).
- The W59 Alternative would need additional widening improvements to I-10 (Papago Freeway).

Consistency with Regional and Long-range Planning Goals

- The W59 Alternative would result in less land being converted to freeway use, thereby optimizing opportunities for planned development.
- Since the mid-1980s, City of Phoenix land use planning has progressed in recognition of the planned location of the proposed freeway near the W59 Alternative. Related land use planning for the Phoenix Villages of Estrella and Laveen has been consistent with the City's long-range land use planning.
- The location of the Salt River crossing of the W59 Alternative would be consistent with the Rio Salado Oeste joint use project planned by the City of Phoenix, USACE, and FCDMC.
- The W59 Alternative would avoid impacts on the planned expansion of the City of Tolleson wastewater treatment facility.

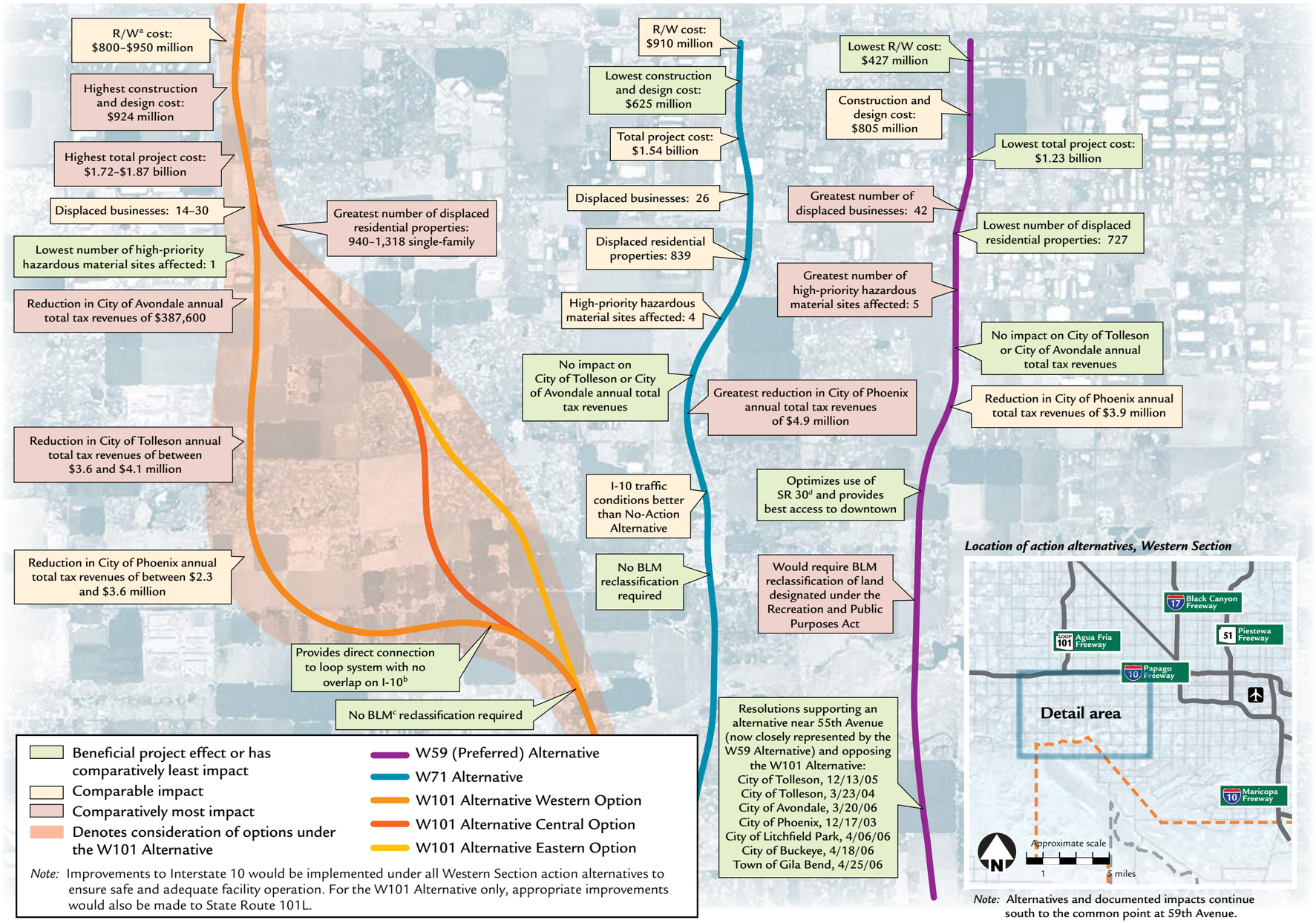
Environmental and Societal Impacts

- The W59 Alternative would result in fewer residential displacements.
- The W59 Alternative would have a nominal effect on the local tax base in Phoenix. It would result in less impact on the local tax bases in Tolleson and Avondale.
- Conversely, the W101 Alternative would have a severe impact on the City of Tolleson's tax base and would lead to a reduction in City-provided services.
- R/W for the W101 Alternative would eliminate a substantial portion of the remaining developable land in Tolleson. Tolleson is landlocked by Phoenix and Avondale, with no opportunity for future expansion of its city limits.

Operational Differences

- The W101 Alternative would provide a direct connection to SR 101L (Agua Fria Freeway), thus completing the loop system without any overlap on I-10.
- The W59 Alternative would provide more direct access to downtown Phoenix.
- The W101 Alternative would provide better access to destinations west and north of downtown Phoenix.
- The W59 Alternative would optimize the long-term system of freeways planned in the southwestern portion of metropolitan Phoenix. However, these benefits would not be realized until SR 30 and SR 303L, south of I-10, are completed.
- The W59 Alternative would avoid the skewed arterial street interchange configurations that would be needed for the W101 Alternative to connect with the planned SR 30, Avenida Rio Salado (ARS), and several arterial streets.

Figure S-10 Comparative Analysis, Action Alternatives, Western Section



Note: Improvements to Interstate 10 would be implemented under all Western Section action alternatives to ensure safe and adequate facility operation. For the W101 Alternative only, appropriate improvements would also be made to State Route 101L.

Note: Alternatives and documented impacts continue south to the common point at 59th Avenue.

[a] right-of-way [b] Interstate 10 [c] Bureau of Land Management [d] State Route 30

A comprehensive, multidisciplinary approach to identifying a Preferred Alternative in the Western Section led the Arizona Department of Transportation and the Federal Highway Administration to an alternative identification that balanced overall transportation needs; consistency with regional and long-range planning goals; environmental, economic, and societal impacts; operational differences; estimated costs; regional support; and public input.

Estimated Costs

- The total cost of the W59 Alternative would be $490 million to $640 million less than the W101 Alternative (see the section, *Planning-level Cost Estimates*, beginning on page 3-59).

Regional Support and Public Input

- Resolutions passed by the City/Town Councils of Avondale, Buckeye, Gila Bend, Goodyear, Litchfield Park, Phoenix, and Tolleson supported an alternative near 55th Avenue (now closely represented by the W59 Alternative) and opposed the W101 Alternative.
- Public input was split in support of either the W55 (now closely represented by the W59 Alternative) or W101 Alternative. The SMCAT supported the W101 Alternative, but expressed concern about its impacts on the communities surrounding the proposed freeway.

After considering the above points, ADOT, with concurrence from FHWA, identified the W59 Alternative as its Preferred Alternative in the Western Section.

Identification of a Preferred Alternative in the Eastern Section (E1 Alternative)

The E1 Alternative is the only action alternative developed for the Eastern Section. ADOT and FHWA sought permission to study alternatives in detail on Community land, but the Community decided such alternatives would not be in the Community's best interest (see Chapter 2, *Gila River Indian Community Coordination*). Therefore, ADOT, with concurrence from FHWA, identified the E1 Alternative as its Preferred Alternative in the Eastern Section. In reaching its determination, ADOT sought to balance its responsibilities to address regional mobility needs while being fiscally responsible and sensitive to local communities.

STATUS OF GILA RIVER INDIAN COMMUNITY ALTERNATIVES – AT THE FEIS STAGE

At the time of FEIS issuance, only one action alternative in the Eastern Section had been studied in detail. Other alternatives, not located on Community land, were subjected to the alternatives development and screening process (see text beginning on page 3-7). Another way to increase the number of action alternatives for detailed study in the Eastern Section would be to examine action alternatives on Community land.

A primary concern from the start of the EIS process for the proposed action has been whether ADOT and FHWA would be able to study an alternative in detail on Community land. Both agencies have worked to engage the Community throughout the study process. In response to a January 2010 letter from the Community Governor, ADOT developed an environmental and engineering overview document that outlined the freeway characteristics and potential impacts of an alignment on Community land. The Community Council considered this document and extensive Community member comments and authorized a referendum of Community members to favor or oppose the construction of the proposed South Mountain Freeway on Community land or to support a no-build option. The Community coordinated referendum occurred in February 2012 and Community members voted in favor of the no-build option; therefore, the on-Community alignment was eliminated from further study.

As a sovereign nation, the Community must grant permission to the State before any alternatives that would cross Community land can be planned and studied in detail. Under federal law, an Act of Congress is required before a state may condemn tribal land. The Secretary of the Interior retains the statutory authority to grant different types of easements across tribal land.

While outreach efforts to the Community have been ongoing for many years, efforts to obtain permission to develop an alternative on Community land were unsuccessful (see Chapter 2, *Gila River Indian Community Coordination*). Therefore, FHWA and ADOT have determined that an alternative alignment on Community land is not feasible.

Should the Community grant permission to develop alternatives on its land, ADOT and FHWA—in cooperation with the Community—would determine R/W needs for the alternative(s), conduct the appropriate analyses, and report findings in a NEPA document released to the public as part of this EIS study process (the specific document type would depend on progress made to that point through the EIS process). If an alternative(s) through Community land were determined to be a reasonable alternative(s), impacts of the alternative(s) would be disclosed in the appropriate NEPA document and would be compared with impacts of the other alternatives carried forward for detailed study in this EIS study process. Regardless of the document type, a Notice of Availability would be published in the *Federal Register* and a new public comment period would be opened following document publication.

If permission were granted, should an action alternative (after being studied) on Community land be subsequently identified as the Selected Alternative, the Community would need to grant additional permission to ADOT and FHWA to construct the alternative.

To conclude, no action alternatives on Community land are studied in detail in the FEIS. The Community has not granted permission to plan or study such alternatives in detail.

TREATMENT OF RESOURCES AFFORDED PROTECTION UNDER SECTION 4(f) – AT THE FEIS STAGE

Section 4(f) of the Department of Transportation Act provides the Secretary of Transportation with a means to protect land that may be affected by construction and operation of a transportation project. The protection extends only to significant publicly owned public parks, recreation areas, and wildlife and waterfowl refuges, as well as significant historic sites, whether they are publicly or privately owned. This protection stipulates that those facilities can be used for transportation projects only if

- there is no prudent and feasible alternative to using the land
- the project includes all possible planning to minimize harm to the land [see Chapter 5, *Section 4(f) Evaluation*]

Approximately 16,600 acres of Phoenix South Mountain Park/Preserve (SMPP) (see Figure S-11) are afforded protection under Section 4(f) as a publicly owned recreation area and a historic property. Land area used for the proposed freeway would be approximately 31.3 acres, which represents less than 0.2 percent of the total parkland.

The South Mountains are also considered a traditional cultural property (TCP) and are afforded protection under Section 4(f). Defining a meaningful boundary for the entire TCP would require detailed study of the traditional uses and cultural significance of the South Mountains. ADOT, FHWA, and the Community agree that any of the action alternatives would adversely affect the TCP, regardless of its precise boundary.

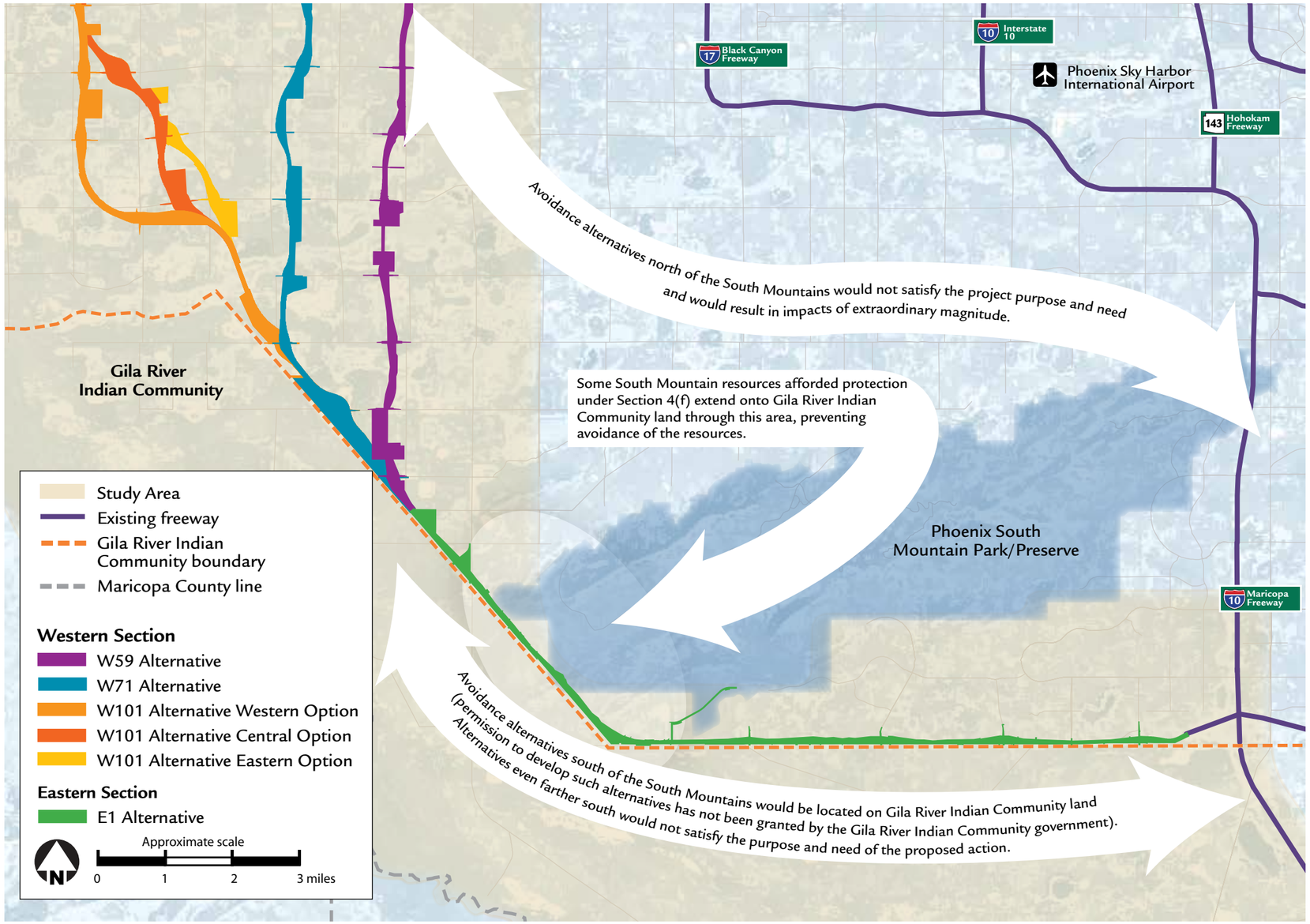
The South Mountains are highly valued by area residents:

- SMPP is arguably the largest city park in the United States and is considered a centerpiece of the Phoenix Mountain Preserve system.
- As a property eligible for listing in the National Register of Historic Places (NRHP), SMPP's origins are rooted in President Franklin D. Roosevelt's New Deal programs. SMPP is a symbol of Phoenix's parks program origins.
- As a TCP and a resource directly associated with other TCPs, the mountains are considered sacred—playing a role in tribal cultures, identities, histories, and oral traditions—and appear in many creation stories. Many traditional religious and ceremonial activities continue on the mountains.

Avoidance of the South Mountains is not prudent and feasible because:

- Located south of downtown Phoenix and north of the Community, the mountain range serves as a physical barrier for regional transportation (see Figure S-11).

Figure S-11 Sovereign Nation and Section 4(f) Constraints, Action Alternatives



Section 4(f) affords protection to the South Mountains because of their status as a publicly owned public park, a National Register of Historic Places-eligible site, a traditional cultural property (TCP) itself, and a site geographically and culturally linked to other TCPs. Because of the sensitive nature of cultural resources, neither the boundary of the South Mountains TCP nor those of the associated TCPs are shown on the above map. The related TCPs are found within the South Mountains TCP, whose boundary generally extends beyond that of Phoenix South Mountain Park/Preserve.

- Alternatives located north of the mountains to avoid the protected resource would not meet the purpose and need of the proposed action and would create impacts of extraordinary magnitude (see Table 3-5 on page 3-12).
- Alternatives located south of the mountains would pass through Community land. Because the Community has not granted permission to develop alternatives on its land, there is no prudent and feasible alternative to avoid use of the mountains. Placing an alternative even farther south of the Community land would not satisfy the purpose and need of the proposed action. Therefore, using a portion of the mountains is the only build action available.

ADOT and FHWA would implement all possible measures to reduce impacts on the resource (see the section, *Measures to Minimize Harm*, in Chapter 5, *Section 4(f) Evaluation*, beginning on page 5-23). The continuing communications among ADOT, FHWA, and the Community to obtain permission to develop action alternatives on Community land could imply the following:

- If permission were granted, an alternative(s) on Community land could avoid use of the mountains but would not guarantee avoidance of other Section 4(f) resources on Community land.
- If avoidance of the South Mountains would occur, all other things being equal, other non-Community alternatives (or at least, the portion passing through SMPP and the TCPs) could be eliminated from further study.

As noted in the section, *Status of Gila River Indian Community Alternatives – At the FEIS Stage*, on page S-38, Community permission granting the development of alternatives on Community land would not directly mean such alternatives could be constructed. The Community would still maintain its right to not permit construction of the proposed action on its land. Therefore, while alternatives on Community land would be studied in detail (if Community permission were granted to do so), the determination as to whether such alternatives would be prudent and feasible, as defined in Section 4(f), could be made only if and when the Community were to grant permission to construct an alternative on its land.

Therefore, if the Community were to grant permission to develop an alternative(s) on its land at some future date, the E1 Alternative as presented in the FEIS would continue to be studied in detail.

OTHER GOVERNMENT ACTIONS

Several major transportation projects are under study, design, or construction in the region, including Valley Metro Regional Transit System projects, improvements to U.S. Route 60 (Grand Avenue), I-10 (Papago Freeway), SR 202L (Red Mountain and Santan freeways), and major studies for SR 303L, SR 30, ARS, SR 24 (Williams Gateway Freeway), I-10 (Maricopa Freeway), and Interstate 17 (Black Canyon Freeway). Impacts of the connection between the proposed action and SR 30 (under study) will be addressed in the environmental assessment conducted for SR 30.

These major projects and study efforts are subject to preparation of their own design reports and appropriate environmental documents and permits. ADOT has accounted for these projects in the analyses presented in the FEIS. They have been considered when evaluating and planning systemwide regional transportation performance and when considering impacts that would result from the proposed action. Improvements to the arterial and local street networks would occur during implementation of the proposed action. Local street improvements would be implemented by the Cities and County as appropriate.

PERMITS AND PERMISSIONS REQUIRED

Other permits and permissions applicable to the proposed action are listed in Table S-5. These would apply to all action alternatives.

AREAS OF CONCERN

It is not uncommon for specific technical and procedural aspects to be areas of continuous concern for a project of the magnitude of the proposed action; this is particularly so when considering the diversity of environments in which the proposed action would pass. Areas of known concern are:

- The EIS process requires that a full range of reasonable, yet distinct alternatives for the proposed action be considered. To achieve this, some action alternatives are on different alignments from the originally adopted alignment. Considering the extensive amount of public involvement that was undertaken by ADOT to establish the original alignment and by MAG to complete the RTP, and considering that the City of Phoenix has attempted to maintain the village core concept in the Western Section along the original alignment but has allowed residential development to occur in the Eastern Section along the original corridor, a substantial amount of public and agency concern has been expressed about the proposed action, specifically about introducing new alignment alternatives.
- A substantial amount of development has occurred and been planned in the area of the originally planned alignment. In some instances, development was located to avoid conflicts with the freeway location; in other instances, development (sometimes incompatible with a freeway) has been allowed to encroach in the area of the planned alignment. Impacts relative to air quality, noise levels, visual quality, and displacements that did not exist in the late 1980s now would exist in relation to the action alternatives.
- At least three studies have been undertaken addressing the location of the proposed action since the 1980s. Some public comments suggest this EIS process reflects "just one more study" that may result in relocation of the alignment but will not result in freeway construction. Study of the corridor for the proposed freeway for more than 20 years has created uncertainties for many long-term residents near the proposed action.
- The original version of the proposed action placed the freeway on relatively undeveloped land that lies immediately north of the Community boundary (on what is now Pecos Road). Land to the north of the

Table S-5 Major Permits and Permissions

Permit/Permission	Granting Agency(ies)	Applicant	Application Time	Granting Time	Application Portion of Project
Section 404 of the CWA[a] permit	USACE[b]	ADOT[c]	Concurrent with design in accordance with Memorandum of Agreement between USACE, ADOT, and FHWA	Concurrent with design	Portions of construction in waters of the United States
Section 401 of the CWA certification	ADEQ[d]	ADOT	Concurrent with design	Concurrent with design	Required for Section 404 permit issuance
Section 402 (AZPDES)[e] of the CWA permit	ADEQ	ADOT	Design and/or construction phases	Prior to construction of each phase	Stormwater quality during construction phase
Change of Access Report	FHWA[f]	ADOT	EIS[g] phase	Concurrent with ROD[h]	Interstate access changes
Application for earthmoving permit, demolition, and dust control plan	Maricopa County	ADOT	Design and/or construction phases	Prior to construction of each phase	Air quality during construction phase, including emissions from equipment
Federal land reappropriations	BLM[i]	FHWA	Design phase	Design phase	BLM-owned land directly affected by the Selected Alternative
Construction-related permits and clearances for all of the above (potentially)	Various	Contractor	Contractor	Prior to construction	Impacts associated with off-site activities such as construction staging, borrow areas, batch plant sites
Utility relocation or new location	Various	Various	Design and/or construction phases	Prior to construction	Major utility relocations
Intergovernmental agreements	Various	Various	Design phase	Design phase	Architectural treatments of structures, landscape plans, measures to minimize harm applicable to Section 4(f) as addressed in Chapter 5, *Section 4(f) Evaluation*

Note: Table S-4, *Mitigation Measures, Arizona Department of Transportation, Action Alternatives*, beginning on page S-18, and applicable sections in Chapter 4, *Affected Environment, Environmental Consequences, and Mitigation*, further elaborate permitting requirements.

[a] Clean Water Act [b] U.S. Army Corps of Engineers [c] Arizona Department of Transportation [d] Arizona Department of Environmental Quality [e] Arizona Pollutant Discharge Elimination System
[f] Federal Highway Administration [g] environmental impact statement [h] record of decision [i] Bureau of Land Management

original alignment was also primarily undeveloped. ADOT adopted the alignment because it avoided Community land but kept the alignment along the southern limits of the beginnings of the planned Ahwatukee Foothills Village community so as to minimize impacts. Since that time, Ahwatukee Foothills Village has developed extensively. By reopening the alternatives development and screening process, the public again inquired about possible use of Community land for the proposed freeway. Some have requested the proposed action be located primarily within the Community. The Community has not granted permission to develop such alternatives. Members of the general public, however, continue to ask ADOT to move a portion of the proposed freeway to Community land because other sections of the Regional Freeway and Highway System have been located on other tribal land.

- The location of the freeway was formally adopted by ADOT and MAG in 1988 and 1989 when ADOT prepared preliminary design and State-level environmental documents according to ADOT mandates. At the time when the original version of the proposed action was adopted in the late 1980s, ADOT undertook agency coordination and public involvement activities in anticipation that State funds would be sufficient to develop the project. The City of Phoenix has made land use planning decisions (i.e., general plan designations and zoning) in the context of the proposed freeway's general alignment.
- During the 1988 and 1989 planning process, primary public concerns focused on the freeway's potential effects on the quality of residential life, specifically the compatibility of a freeway with residential areas, air pollution and noise, visual impacts caused by spillover effects of freeway lighting and by the contrasts of hard and harsh surfaces associated with modern freeways, reductions in property values, and the obstruction of views to resources such as the South Mountains. Other comments identified concerns about protecting desert areas and associated wildlife habitat.

- The RTP included an alignment for the South Mountain Freeway that closely followed the W59 Alternative. A footnote to a figure indicated that the EIS and design concept report (DCR) study process are underway and are considering multiple location options. If any major modifications to the RTP are necessary, MAG would need to follow the process outlined in Arizona Revised Statutes § 28-6353.
- With the Study Area now developed, the proposed action would entail acquisition of properties within the proposed freeway R/W and relocation of affected residents. In an effort to retain their properties, several property owners have claimed that the City of Phoenix, the developers, and ADOT did not disclose the potential for a proposed freeway and, thus, they should not have to sell their property. Review of previously published ADOT, City of Phoenix, MAG, and developer documents shows that disclosure of the proposed freeway and alignments has occurred (seller disclosures, public announcements, several public meetings, frequent articles in print and broadcast media, etc.) since 1980.
- Several potentially affected property owners have requested consideration for advance or hardship acquisitions. The hardship acquisition process is similar to the regular acquisition process, except properties must meet strict criteria outlined in the ADOT *Right-of-Way Procedures Manual*, Project Management Section (2011a), to be eligible for hardship acquisitions.
- Some property owners who may reside adjacent to the proposed action if it were constructed are concerned about compensation for perceived damages. Claims for structural damages are evaluated on a case-by-case basis through the ADOT Risk Management Section. A formal process is established for damage claims.
- Near the South Mountains, bedrock may be encountered during construction of the proposed freeway. Cuts through ridgelines of the South Mountains are anticipated. As a result, blasting may be required to fragment the rock material for removal. Members of the public expressed concerns about potential damage to structures caused by blasting. ADOT's *Standard Specifications for Road and Bridge Construction* (2008) assigns responsibility for all damage resulting from the use of explosives to the contractor that uses the explosives. In the special provisions of the construction contract for the proposed action, ADOT would include a requirement for the contractor to perform in-depth pre- and postconstruction surveys for all structures located within ½ mile in the event any blasting and/or heavy ripping would be planned for construction purposes. This documentation would include before-and-after photographs and videos.
- Many public comments have been received suggesting the proposed freeway would function primarily as a bypass for trucks. Based on comments received, some people perceive the purpose of the proposed freeway to be the removal of trucks from I-10 through downtown Phoenix. It is not a goal of ADOT and FHWA for the proposed freeway to function as a truck bypass. The majority of trucks using I-10 to pass through Arizona would bypass the greater Phoenix metropolitan area using SR 85 and Interstate 8 (I-8). SR 85 and its connections to I-10 and I-8 are currently being rebuilt to freeway standards to improve this route. These improvements are projected to result in even greater use of the Phoenix bypass, such that by 2020, the segment of I-10 between I-8 and Tucson will be the most heavily used interstate segment by trucks in the state (ADOT 2007b). This is not intended to imply that commercial trucks would not use the proposed freeway. Truck traffic within Arizona is associated with the import, export, and internal distribution of freight. Maricopa County functions as a hub for freight entering the state for eventual distribution within the state. Most current commercial vehicle destinations are in the vicinity of Phoenix Sky Harbor International Airport and areas directly south and east. Commercial trucks would use the proposed freeway. But it is not expected that the entire volume of truck traffic using I-10 would divert from I-10 to use the proposed freeway if it were constructed. The most important factor in achieving the efficient and fast movement of freight—the lifeblood of the trucking industry—is finding ways to shorten travel times. Truckers conducting local commerce in or traveling to and from distribution centers in the Phoenix metropolitan area must necessarily enter congested areas. Through-truck traffic (those not having to stop in the metropolitan area) would continue to use the faster, designated, and posted existing bypass system of I-8 and SR 85.
- Public comments were received requesting the restriction of the transportation of hazardous materials if the proposed action were constructed. Questions were raised about how restrictions would be imposed and why some state routes are restricted from hazardous materials transport. To plan hazardous material transportation routes, carriers use lists of designated and restricted routes, by state, published in the *Federal Register*. Through federal delegation, ADOT is responsible for restricted route designations. Local governments may request that ADOT restrict hazardous material transport through a particular area, and it is ADOT's responsibility to analyze and adopt or reject that request. The agency's determination is based on a number of considerations, including, but not necessarily limited to, public safety and the presence of acceptable alternative routes. Consistent with the majority of freeway facilities within the Phoenix metropolitan area, it is not anticipated that hazardous materials carriers would be restricted from using the proposed freeway.
- Recent concerns have been expressed regarding mobile source air toxics (MSATs), which are part of a larger group of air pollutants labeled hazardous air pollutants (HAPs). HAPs refer to "a range of compounds that are known or suspected to have serious health or environmental impacts" (40 C.F.R. §§ 80 and 86). According to the U.S. Environmental Protection Agency (EPA), motor vehicles are major contributors to national emissions of several HAPs, and EPA has released a rule addressing emissions of HAPs from mobile sources. This rule identified the initial list of

21 compounds that are emitted from motor vehicles and are known or suspected to cause detrimental health effects. In the rulemaking, EPA noted that the methodology used to select the compounds for the list may be used in the future to add or remove compounds as new information becomes available. The health effects referenced earlier provide some information regarding the types of effects that could result from MSATs under some level of exposure. Although MSATs are expected to decline over time, an MSAT analysis has been included in the FEIS.

COMMUNICATIONS AND COORDINATION – INVOLVING THE PUBLIC AND AGENCIES IN THE EIS PROCESS

The federal government has established minimum requirements for public input during the EIS process. Since the start of the EIS process for the proposed action in 2001, ADOT, with the concurrence of FHWA, has exceeded the minimum requirements of NEPA; the efforts by ADOT and FHWA to engage the public, agencies, and other stakeholders represented open, frequent, diverse, and comprehensive opportunities for those providing information, those seeking information, or those wishing to otherwise influence the analytical and alternatives screening processes.

ADOT and FHWA developed an extensive public involvement plan, soliciting input into the process throughout all phases. Purposes of seeking public input were to:

- identify new data pertinent to the proposed action to assist in determining the full scope of the study
- gauge the general public's understanding of the proposed action and disseminate information to help further that understanding
- identify any preferences regarding the proposed action's location
- identify and address, to the extent practicable, public questions and concerns regarding the proposed action

To accomplish these goals, a variety of communication tools were used at major project milestones, including:

- A 2-day agency scoping meeting was held with 95 agency representatives at the beginning of the EIS process.
- Communication with local, regional, State, and federal agencies continued throughout the process with monthly coordination meetings.
- Both ADOT and FHWA have sought and encouraged the Community to allow study of alternatives on its land for the Eastern Section. The Community has not granted permission to study an alternative in detail within Community boundaries. Therefore, FHWA and ADOT have determined that an alternative alignment on Community land is not feasible.

The following items highlight the results of public outreach efforts undertaken leading up to publication of the DEIS in April 2013:

- Over 200 presentations were made to community groups, homeowners' associations, chambers of commerce, village planning committees, trade associations, and other interested parties.
- Twelve formal public meetings were held. Fifteen days prior to each meeting, display advertising was placed in *The Arizona Republic*, the *Ahwatukee Foothills News,* the *Gila River Indian News,* the *Tribune, La Voz,* and the *West Valley View*. Total distribution was approximately 260,000 newspapers per formal meeting.
- One meeting notice flier and four newsletters were distributed throughout the Study Area in the following quantities (per distribution per meeting): 28,500 door hangers, 5,000 inserts in the *Gila River Indian News*, and 28,000 inserts in the *Ahwatukee Foothills News*. In addition, newsletters and fliers were sent to over 4,500 individuals on the project mailing list.
- The November 2008 project newsletter was mailed to 78,700 businesses and residences in the Study Area and to 3,300 individuals on the project mailing list.
- The February 2010 project newsletter was mailed to 62,400 businesses and residences in the Study Area and to 3,600 individuals on the project mailing list.
- The February 2011 informational postcard was mailed to 5,000 businesses and residences on the project mailing list.

A project Web site was developed to provide the public with project information and an e-mail address (projects@azdot.gov) was provided to obtain feedback. Approximately half of comments received prior to publication of the DEIS in April 2013 were submitted electronically through the Web site's online survey or e-mail. Over 5,000 comments were received by the project team up to publication of the DEIS.

Since 2001 and up to publication of the DEIS, more than 800 news articles were published in the region's newspapers.

A project hotline number (602-712-7006) was established so that the public could provide feedback on the study. The hotline is monitored daily. Between 2006 and 2013, more than 500 calls were received.

The public outreach program for the DEIS phase (April 2013 to July 2013) was developed to maximize opportunities for the public to review and provide comments on the DEIS, maintaining compliance with NEPA requirements. The outreach program had four main components:

- awareness campaign – included a fact sheet, "how to participate" handout and video, events, and briefings of elected officials and key stakeholders
- public hearing – held on May 21, 2013, at the Phoenix Convention Center from 10 a.m. to 8 p.m., with an estimated 500 attendees, including 117 people who spoke before a panel of project team members

More to come . . .

The public and agencies will continue to be invited to participate through the completion of the EIS process. (See Chapter 6, *Comments and Coordination*, to learn more about agency and public involvement efforts for the proposed action.)

- online public hearing – went live at 10 a.m. on May 21, 2013, at <azdot.gov/southmountainfreeway> and linked to <smfonlinehearing.com>, with 1,864 people visiting the site
- community forums – held between June 4 and July 11, 2013, at six locations: in the Estrella, Laveen, and Ahwatukee Foothills villages of Phoenix; within the Community; and in Chandler and Avondale

Public involvement during the DEIS 90-day public comment period included participation by 1) attending the public hearing or community forums, 2) viewing the online public hearing, or 3) submitting a comment. Approximately 900 people attended one of the public events held during the comment period. Almost 1,900 unique visitors viewed information from the online hearing. The project team received 8,201 comments from federal, State, local, and tribal agencies; special interest groups; businesses; and members of the public. When combined, over 10,000 people participated in the DEIS phase through one or more of the public involvement methods available.

To advance project communication and coordination, a voluntary, advisory working group of 25–30 representatives was formed to provide a forum for ongoing communication among ADOT, FHWA, and the local and regional community regarding the development of the EIS. The SMCAT met regularly to review project status, serve as a conduit of information with community organizations, and define neighborhood and regional issues and concerns.

Public opinion regarding a project like the proposed action can change. Several factors can play a role in the ebb and flow of public opinion over the course of time. Seeking input into the process provides awareness of any changes. As an example, during the first half of the EIS process, comments from the public indicated a need for the proposed freeway, but opinions on location were divided. As action alternatives were identified for detailed study and their alignments presented to the general public, comments from the participating public revealed a change in the perception of the need for the proposed action. Further analysis of the comments revealed many people living adjacent to proposed alignments were the most likely to comment either that there is no purpose or need for the proposed freeway or to simply oppose the proposed action entirely. Conversely, the remainder of the comments received from residents throughout the region revealed continued support for the proposed action as an effective way to reduce traffic congestion in the region.

Public comments strongly suggested the need to clarify how much coordination has occurred with the Community regarding the proposed action and also a desire for ADOT and FHWA to exhaust efforts to study alternatives for the proposed action on Community land. In addition to written and verbal conversations, over 110 meetings have been held since 2001, at which Community representatives were invited to discuss issues pertaining to the proposed action.

INDEPENDENT EVALUATION OF THE FEIS

The lead and cooperating agencies have been integral in providing guidance regarding document content and format. The agencies have evaluated the document independently and provided further guidance for incorporation into the FEIS. Upon completion of the EIS process, the lead and cooperating agencies will adopt the document according to CEQ procedures.