

VISUAL RESOURCES

AFFECTED ENVIRONMENT

Pertinent Regulations and Guidance

Under NEPA, it is a policy goal for the federal government to:

use all practicable means . . . [to] . . . assure for all Americans safe, healthful, productive, and *aesthetically and culturally pleasing surroundings* . . . [and to] . . . preserve important historic, cultural, and natural aspects of our national heritage, and maintain, whenever possible, an environment which supports diversity, and variety of individual choice . . . [§ 101(b)(2) and (4); emphasis added]

To this end, federal agencies are directed to:

utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the *environmental design arts in planning and in decisionmaking* which may have an impact on man's environment . . . [§ 102(2)(A); emphasis added]

The process used to determine potential impacts of the proposed transportation corridor on existing visual resources generally followed FHWA Technical Advisory T 6640.8A (1987) and FHWA guidelines outlined in *Visual Impact Assessment for Highway Projects* (1988).

Local Setting

The Study Area lies within the Basin and Range Physiographic Province, characterized by rocky mountain ranges that alternate with desert basins as the primary landform organization. Dominant landforms visible in the Study Area are the Sierra Estrella, the South Mountains, and the Salt and Gila river valleys. Elevations along the various proposed action alternatives range from approximately 1,160 feet above mean sea level at Pecos Road (eastern end) to about 1,015 feet above mean sea level where 99th Avenue intersects I-10 (Papago Freeway). Numerous viewpoints in SMPP provide panoramic vistas and views of adjacent landforms, agriculture, and urban development in the Study Area.

The Study Area is located in the Sonoran Desert scrub vegetative community, characterized by saguaro, bursage, creosote bush, ocotillo, prickly pear/cholla, paloverde, and ironwood. Native plant communities have been substantially replaced by crops and ornamental plants in the agricultural and urban areas. Outstanding natural features in the viewshed include prominent off-site landforms and vistas across the lowlands of the Community land to the south. Lone Butte is an identifiable landmark just south of the Eastern Section of the Study Area. The Sierra Estrella defines the background to the majority of the westward views. The mountain range also provides distinct rugged landforms and skyline character.

The northwestern portion of the Study Area is level agricultural land that is rapidly transitioning to warehouse and distribution facilities, light industrial uses, and to medium-density housing. The South Mountains and the Sierra Estrella provide backdrops to many southerly and easterly views in this area. Throughout the Study Area, views of SMPP are available because of the steep rise in elevation of the South Mountains (see the text box on the next page for a typical view from the South Mountains). This fault-block desert mountain range provides a distinctive backdrop to the north along Pecos Road in the Eastern Section of the Study Area and is visible from most anywhere in the Study Area.

Visual Quality, Visual Character, and Viewer Sensitivity

The Study Area was evaluated in terms of the existing visual conditions and landscape character. The visual conditions analysis consisted of identifying distinct features, areas of preservation and disturbance, and key landmarks, and of locating major viewpoints. Distinct features comprise landscape elements and patterns that make a memorable visual impression. Major viewpoints offer distant views of distant landforms/landmarks that attract attention away from the foreground area (the area within 0.25 mile of the viewer's position).

The Study Area was subdivided into Visual Assessment Units (VAUs) based on landform, land use, length,

and the presence of special features in the foreground, middleground, and background. In particular, these units were defined by observable changes in the primary biotic community as marked by vegetation, land use and visual character, and viewpoint (to or from the action alternatives) as well as by the presence of special features in the landscape. For the action alternatives in the Western Section of the Study Area, 32 VAUs were developed along the proposed alignments. Twelve additional VAUs were identified and analyzed along the existing I-10 (Papago Freeway) and SR 101L freeways in the northern portion of the Western Section. The action alternative in the Eastern Section was divided into 6 VAUs. The proposed action alternatives were not anticipated to affect the 12 additional VAUs' visual resources in the Western Section because the existing freeway corridors are well-established and any changes in visual quality would be low. Therefore, the project team did not include these units in its assessment because they would tend to artificially lower (dilute) the values of the impact assessments without providing any corresponding ability to distinguish visually preferable alternatives or options. Any potential impacts at system traffic interchange locations would be captured in the terminal VAU along a given alternative's corridor.

ENVIRONMENTAL CONSEQUENCES

Potential impacts of the proposed action were assessed against the current visual setting. The impact analysis sought to evaluate the effects on the scenic quality and cohesiveness that each of the proposed alignments would have on the area's visual conditions. The Study Area landscapes are in the state's major metropolitan area. Most VAUs have only low-to-moderately low visual quality and offer only relatively modest visual quality when considered on a statewide basis. For a major urban area, however, the Study Area contains high-to-moderately high-quality views of the region's mountains. For the most part, implementation of any of the action alternatives would not adversely affect these views. The analysis was able to discriminate among action alternatives in terms of the degree of change in visual quality between the pre- and postproject conditions.

Components Used in Assessing Impacts on Visual Resources

Visual quality or attractiveness is a combination of attributes based on landforms, water characteristics, vegetation patterns, and architectural/cultural elements. For each VAU, the relative distinctiveness/vividness, intactness, and unity of the landscape were determined. Visual quality was rated in seven rankings, from “very low” to “very high,” depending on the distinctiveness, unity, and intactness of the patterns and attributes of the VAU. Unity is the visual coherence and harmony of the landscape when considered as a whole. Visual intactness relates to the integrity of the visual order in the natural and built landscapes and the extent to which landscape elements and the patterns that they create cohere. The level of visual intactness was expressed as “low,” “medium,” or “high.”

Using this process, the existing visual quality of the Study Area was determined to be generally in the moderate-to-low range for most VAUs. Several VAUs, primarily associated with

industrial and warehouse activities, scored in the low range. The VAUs nearest the western end of SMPP are relatively undisturbed or have lower levels of disturbance that could reduce visual quality; these scored in the moderately high range.

Visual character, or landscape character, is the physical appearance of the landscape, including the natural, physical, and architectural/cultural features that give it an identity and “sense of place.” It is the order and composition of the elements of form, line, color, and texture that make up the visual landscape. It is a value-free measure in that changes in visual character are neither “good” nor “bad.” There are few highly distinctive features in the Study Area except for SMPP and the Salt River channel. Land use is a patchwork of residential, industrial, and agricultural, creating heterogeneous settings of forms, colors, and textures. Most individual Study

Area land uses, however, lack diversity and have few dominant elements.

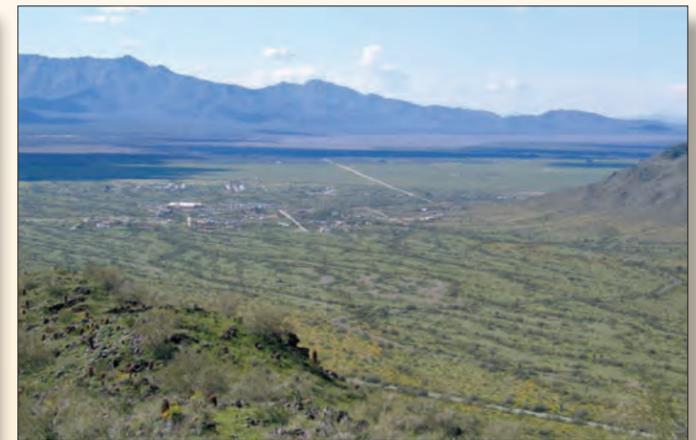
Visual sensitivity is a relative measure of viewer response to changes in the landscape. The primary viewer types in the Study Area include local residents (the majority of existing viewers), businesspersons, SMPP visitors, and daily commuters to destinations in the Study Area and in the Phoenix metropolitan area. Residents would likely respond to changes in the scenic quality of the landscape as viewed from their homes. Scenic viewing for these residents would also occur from local streets and parks. Views from SMPP would include vantage points from dispersed recreational activities such as hiking and mountain biking. Most viewers from areas of warehouse or industrial use (e.g., the Salt River channel, near I-10) would be assumed to have lower sensitivity to landscape changes.



This residential landscape is unified, intact, and harmonious—well representing the visual quality component.



This agricultural scene exhibits strong elements of form, line, color, and texture—well representing the visual character component.



Hikers in the far western end of SMPP would likely notice any adverse visual changes in views toward the Sierra Estrella. Such landscapes well represent the visual sensitivity component.

Action Alternatives, Western and Eastern Sections

Determination of the visual impacts of the proposed freeway were qualitatively made based on an evaluation of the changes in visual quality, on an assessment of the overall change in visual character, and on the likely sensitivity of the most likely frequent Study Area viewers to changes in the visual landscape. Appendixes B and C in the technical report, *Visual Resources Report*, describe the process the project team employed to evaluate visual impacts and display the details of the results. The setting, especially in

the Western Section of the Study Area, is somewhat similar for each action alternative. Therefore, a quantitative method that took into account small changes within each proposed corridor was developed to determine the magnitude of visual change. The approach considered the distribution of landscape features and land use in each action alternative to compare the alternatives’ visual impacts.

Construction and operation of the proposed freeway would facilitate access to views of the Gila River Valley between the Sierra Estrella and the South Mountains. More people would be exposed to views of these fault-

block mountains so close to central Phoenix. For some people, the freeway might provide a superior driving experience, visually, compared with driving through downtown Phoenix using I-10.

Action Alternatives, Western Section

Table 4-51 displays the visual impacts projected to be caused by the action alternatives in the Western Section. The greater the number, the greater the visual impact that would be experienced with construction and operation of the given action alternative.

In the Western Section, residential areas, expanses of agricultural fields, and natural areas such as the Salt River channel drive higher visual impact scores. Warehouses and light and heavy industry generate the least visual impact changes because of their low sensitivity to visual change. The degree to which specific corridors would avoid directly conflicting with the most visually sensitive land uses largely determined overall visual impacts. In the relatively flat landscape of the Western Section action alternatives, distances of even a half mile would provide substantial buffering from much of the adverse visual impacts of the proposed project.

W59 (Preferred) Alternative

Largely because of the buffering provided by the land use controls undertaken over the years since the South Mountain Freeway was first proposed in the 1980s, reduced viewer sensitivity and exposure meant low visual impacts for this alternative, particularly along its southern portion. Land uses that would conflict with a freeway have been somewhat constrained along this alignment, despite its proximity to Phoenix’s urban growth. Construction of a system traffic interchange at I-10 (Papago Freeway) would entail substantial visual impact, but it would be in an area of existing freeway impacts and of warehouse and light industrial activity. The W59 Alternative would cross Dobbins Road near 62nd Avenue, thereby avoiding direct and adverse impacts on nearby historic properties [see Chapter 5, Section 4(f) Evaluation, for more information]. Blending colors, lines, textures, and forms of the freeway with the surrounding environment would reduce its visual impact on the historic resources. Because the freeway would be elevated over Dobbins Road, aesthetic treatment of the overpasses would help diminish any visual impacts and could, over time, help unify what may become a visually complex landscape. Ideas illustrated in the text box on page 4-159 would help protect the visual integrity of the historic properties and the visual unity of the proposed freeway in its increasingly urbanizing context.

W71 Alternative

While the W71 Alternative would create the most visual impact of all the Western Section action alternatives,

the impacts would not be substantially different from that of the other action alternatives. It ranked highest (most impact) in terms of visual sensitivity, the visual element that caused it to have the highest overall impact. The W71 Alternative would cross or be near numerous residential areas. Using a length-weighted approach (VAU score divided by VAU linear feet), three of the eight highest-rated (most adversely affected) VAUs are in the W71 Alternative corridor and W101 Alternative Eastern Option.

W101 Alternative

Because of their location farther west than the other alternatives, the options under the W101 Alternative scored in the middle to low range in terms of visual change. This is largely attributable to having retained much agricultural land use because the land is farther from Phoenix and because of the existence of warehouses and light industry along I-10. Relative to the W71 Alternative, there is less residential development that would be disrupted, and industrial activities would experience little change in viewer sensitivity by having a transportation facility nearby. Because of the greater height and mass, increased number of travel lanes, and likely perceived complexity, construction of a system traffic interchange at I-10 (Papago Freeway) and SR 101L would create a visual impact substantially greater than that from a system traffic interchange at either of the other two action alternatives’ intersections with I-10 (Papago Freeway).

Action Alternative, Eastern Section

E1 (Preferred) Alternative

The evaluation of visual impacts for the Eastern Section VAUs and the E1 Alternative followed the same analytical steps as used for the Western Section action alternatives. The results are summarized in Table 4-51. The overall visual impacts would be substantially higher than for any of the Western Section action alternatives. This is chiefly attributable to the severe visual impacts that would accompany the road cuts at the western end of the South Mountains, altering views from the Community north to the mountains and altering views from the mountains to the Community to the south and

Table 4-51 Visual Impacts, Action Alternatives

Action Alternative	Magnitude of Change			Overall Impact on Visual Resources
	Visual Quality	Visual Character	Visual Sensitivity	
Western Section				
W59	1.79	1.65	1.68	1.70
W71	1.75	2.29	2.33	2.12
W101 Western Option	1.97	2.03	1.29	1.76
W101 Central Option	1.90	1.90	1.63	1.81
W101 Eastern Option	1.71	1.98	1.52	1.74
Eastern Section				
E1	1.99	2.86	2.72	2.52

Note: Valuations derive from analytical procedures described in the *Visual Resources Report*. “Magnitude of Change” refers to the difference in the evaluations of the three visual resource assessment components (see page 4-156), before and after the proposed freeway’s construction, i.e., the visual impact. Using the state’s landscapes as the basis of comparison, impacts to visual resources from the action alternatives were evaluated on a scale of 1 to 3, with 3 representing the most severe impact. In general, areas of low to moderately low initial visual quality would tend to experience only moderate or low visual impact with construction and operation of a freeway. This conclusion is generally applicable across all action alternatives, except for those in areas with the highest initial visual quality (e.g., near Phoenix South Mountain Park/Preserve) or with the most sensitive viewers (e.g., close to recreation areas or residential communities). Higher numbers mean greater visual impact. “Overall Impact on Visual Resources” is the average of these three components’ impacts, standardized by each respective action alternative’s length.

southwest. Also, the proximity of numerous residences along Pecos Road creates high viewer sensitivity to disturbances in these views.

Attention was given to the sensitive views along the E1 Alternative, including views from SMPP, views from residential areas in Ahwatukee Foothills Village, views from the Community, and views of the major road cuts at the western end of SMPP. Hikers and other users of SMPP would have distant, elevated, open views of the proposed action, with the closest views being from some of the most popular trails in the park. Sketches of these views, with the proposed project, are in the *Visual Resources Report* (also, see simulations in Figure 5-9, on page 5-16). The proposed freeway would be readily visible from houses directly fronting Pecos Road on its northern side and from Community land on its southern side. During the design phase, the sizes and locations of any noise barriers or retaining walls that might become part of the proposed action (see the text box on page 4-159 and the section,

Noise, beginning on page 4-80, for additional information regarding noise barriers) would be determined. Farther north, the proposed freeway would be less visible because of intervening houses, vegetation, and, in many cases, topography. It is only with an increase in elevation, along the side slopes of the South Mountains, that the freeway would become visible; at these distances (1–1.5 mile or more) from the proposed freeway, its visibility and any change in visual quality would be minimal, given that Pecos Road is already a four-lane, divided road. Service traffic interchanges would be only moderately elevated and would result in only moderate visual impacts beyond those existing with the divided, four-lane Pecos Road.

No-Action Alternative

The No-Action Alternative would result in no direct change in visual character or quality because it would not involve freeway construction. Over time, the visual character and quality of the Study Area would be expected to change because of the Phoenix metropolitan area's continued urban development. Urban expansion would inevitably replace rural or undeveloped portions of the Study Area. The loss of rural or natural areas would potentially reduce the visual quality of the Study Area. If low-visual-quality development were to occur, there would be an additional reduction of overall visual quality. If future development, however, were harmonious with existing Study Area visual elements and patterns in terms of scale, color, line, and form, beneficial effects may be realized.

MITIGATION

ADOT Design Responsibilities

The following list describes measures that ADOT might employ to avoid creating visual impacts, reduce such impacts, or otherwise mitigate visual impacts associated with the proposed project. Upon review of these measures, ADOT, along with FHWA, may choose to modify or delete measures or may choose to add new measures to avoid, reduce, or mitigate impacts. 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

The use of treatments and patterning on noise barriers and screen walls, piers, concrete barriers, retaining walls, and highly visible headwalls is an opportunity for exercising community aesthetic preferences. ADOT maintains a palette of treatments that it is willing to incorporate into such structures. If a community through which the proposed freeway would pass were to request other treatments, 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 community may wish to cover the additional expenses to secure the desired treatment.

The extensive and high road cuts proposed for the western end of 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.

CONCLUSIONS

Implementation of any of the action alternatives would introduce a substantial human-made feature (the proposed action) into the environment. In the Western Section, any of the action alternatives would be visually consistent with the development occurring and projected to continue to occur; differences in visual impacts among the action alternatives would be negligible.

In the Eastern Section, the E1 (Preferred) Alternative would be visually inconsistent with the natural setting in and around the South Mountains. The E1 Alternative would cut through a series of three ridgelines; the severe cuts and the freeway would be visually inconsistent with the natural setting of the surrounding area. In the easternmost portion of the Eastern Section, the proposed action would replace an existing four-lane, east–west arterial street along the southern edge of a primarily built-out community; at this location, the proposed action would be more intensive than the visual effect created by the arterial street. Some Study Area residents with distant views of the surrounding agricultural land and mountains may find such views adversely affected by implementation of the proposed action.

Noise barriers would offset some adverse impact on foreground viewsheds created by the freeway, but the noise barriers themselves could cause viewshed impacts. Most single-family residences are, however, bounded by cinder-block walls that serve to obstruct foreground and

Aesthetic Treatment of Freeway Structures

Portions of the proposed freeway would require structures, including noise barriers (some in the form of walls). ADOT has received public input requesting additional information on how structures are aesthetically treated and how the public could be directly involved in developing aesthetic treatments. The requests stem in part from the different appearances of freeway structures throughout the region.

Decorative or aesthetic treatments are sometimes applied to noise barriers and other freeway structures to help them blend into the surroundings and/or fit in with the tone of the community. The ADOT Roadside Development Section is responsible for assigning a wide range of standard treatment applications and wall materials, including color, to noise barriers. Typically the community where the wall will be constructed will work closely with its City Architect or planning department to decide on a theme for the wall. Most times this can be accomplished from ADOT's standard applications. ADOT has expanded its selection of acceptable wall treatments to include thematic emblems or symbols and, in some cases, more than one color.

As an example, for SR 101L (Pima Freeway) in Scottsdale, the City of Scottsdale chose to add public art to the sound barriers. The City's intent went above and beyond ADOT's guidelines of reasonable aesthetics and, therefore, ADOT did not fund the aesthetic portion of the project. ADOT and the City of Scottsdale entered into an intergovernmental

agreement (IGA) for the purposes of allowing Scottsdale rights to design and construct artistic embellishment on the ADOT-supplied noise barrier. ADOT provided the funds for construction of the noise barriers themselves, but the City of Scottsdale provided the funds to cover the aesthetic portion of the walls. In the end, the City of Scottsdale contributed funds considerably greater than those initially estimated for the aesthetic treatment.

Like the above example, a municipality can be entirely responsible for the aesthetic treatment, although ADOT's Roadside Development Section is normally responsible for these functions. An IGA entered into between ADOT and the municipality would typically establish lines of responsibility. In one instance, the municipality maintained artistic control of the design throughout the process while ADOT provided suggestions in relation to aesthetics, directed issues centered around traffic speeds correlated to the size of the imagery, and maintained final approval of design plans and had the authority to request design changes if the proposed imagery was in any way offensive or otherwise distasteful.

Below are examples of the process that could occur to determine aesthetic treatment of structures:

- As general practice, ADOT's Roadside Development Section would work with the local jurisdiction to develop a theme for the noise walls from the standard, approved ADOT wall applications. Once a theme is decided on, the

Roadside Development staff would design the aesthetic treatment.

- ADOT and the local jurisdiction would collaborate to develop a theme for the noise walls and design the aesthetic treatments. In this instance, a different design outside of standard ADOT applications could be applied while still having ADOT fully involved in the process. This option may require the local jurisdiction to contribute a portion of the funds necessary for the aesthetic treatment.
- ADOT and the local jurisdiction could engage the public in either of the above scenarios. The public would be provided the opportunity to comment on and make suggestions for the aesthetic treatments. When conducted this way, often a citizens committee is formed to contribute to the design process.
- In the unusual circumstance that none of the above options are adequate, an option exists for the local jurisdiction to initiate an IGA with ADOT. This would allow the local jurisdiction to have primary artistic control over the aesthetic treatment of structures. In this scenario the local jurisdiction would be solely responsible for all design costs and any added construction costs of the advanced aesthetic treatments. Using more than one color for the aesthetic treatments is acceptable if the local jurisdiction commits to maintenance.



Examples of aesthetic treatments on freeway-related structures in the Phoenix metropolitan area

long-range views. Further, ADOT would work with municipalities' staff to incorporate aesthetically pleasing features into the project to offset impacts. Regardless, some views would remain adversely altered.

Under the No-Action Alternative, no project-related visual impacts would occur; however, continuing urban development—primarily in the Western Section—would transform views of remaining agrarian landscapes

to views of homogeneous suburban residential and commercial landscapes.