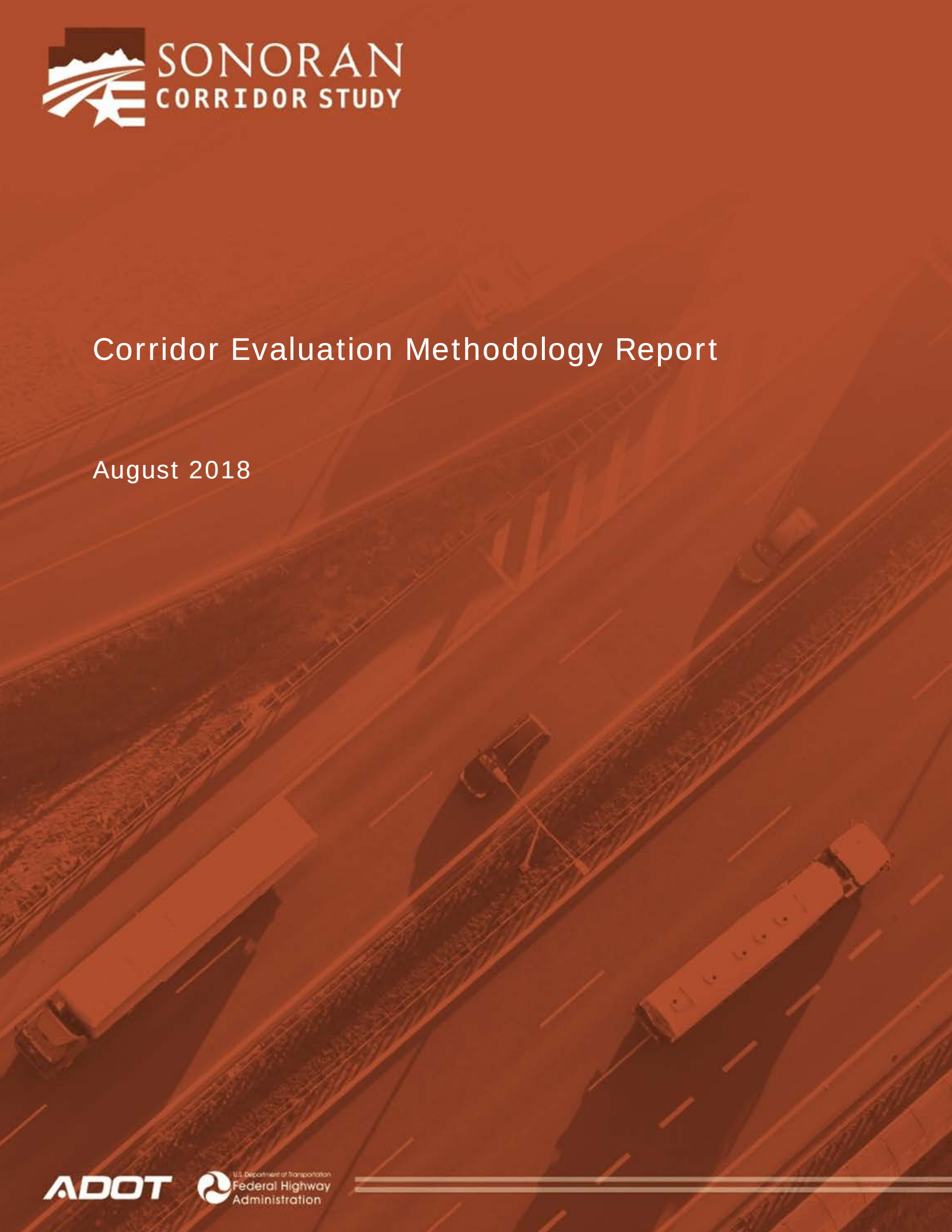
SONORAN CORRIDOR STUDY

Corridor Evaluation Methodology Report

August 2018



ADOT

U.S. Department of Transportation Federal Highway Administration

Corridor Evaluation Methodology Report

Submitted by:

Arizona Department of Transportation
Multimodal Planning Division
206 S. 17th Avenue, Mail Drop 310B
Phoenix, AZ 85007

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1 BACKGROUND AND PURPOSE

Section 1416 of the Fixing America's Surface Transportation (FAST) Act (Public Law 114-94), a 5-year legislation approved in December 2015 to improve the nation's surface transportation infrastructure, formally designated the Sonoran Corridor "along State Route [SR] 410 connecting Interstate Route 19 (I-10) and Interstate Route 10 (I-10) south of the Tucson International Airport (TUS)" as a High Priority Corridor on the National Highway System. Subsequently, the Federal Highway Administration (FHWA) and Arizona Department of Transportation (ADOT) are conducting the environmental review and preparing a Tier 1 Environmental Impact Statement (EIS) for the Sonoran Corridor in compliance with the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] 4371 et seq.). FHWA is the Lead Federal Agency and ADOT is the Local Project Sponsor under NEPA. Figure 1 shows the Study Area identified for the Sonoran Corridor Tier 1 EIS study.

An alternatives analysis is a required component of the overall NEPA process. FHWA and ADOT will generate a Corridor Selection Report (CSR) that documents the corridor alternative development and screening process, and summarizes the outcome of this phase. The CSR will assess a comprehensive set of corridor alternatives through an evaluation screening process that uses a combination of topographical, environmental, and engineering information, and as well as public and agency input.

The purpose of this *Corridor Evaluation Methodology Report* is to outline the evaluation methodology that will be used to identify, evaluate, and screen corridor alternatives for the Sonoran Corridor in the CSR phase. It documents agreed-upon evaluation categories and screening criteria to be used in comparing the identified corridor alternatives against each other using high-level quantitative and qualitative measures. Figure 2 is a graphical representation of the corridor alternative development and screening process described in this document.

Once a comprehensive set of alternatives has been identified, a refinement step will be applied to develop a Refined List of Corridor Alternatives that will be carried forward for a detailed screening. The alternatives will be evaluated using screening criteria based largely on the identified Need and Purpose to then establish which corridor alternatives are best able to meet the needs and purposes of the project. The result of the screening will be the Reasonable Range of Corridor Alternatives, including an option not to build the project (i.e., a No Build alternative), that will be analyzed in the Draft Tier 1 EIS, per Code of Federal Regulations Title 40 (40CFR) Chapter 5 §1502.14.

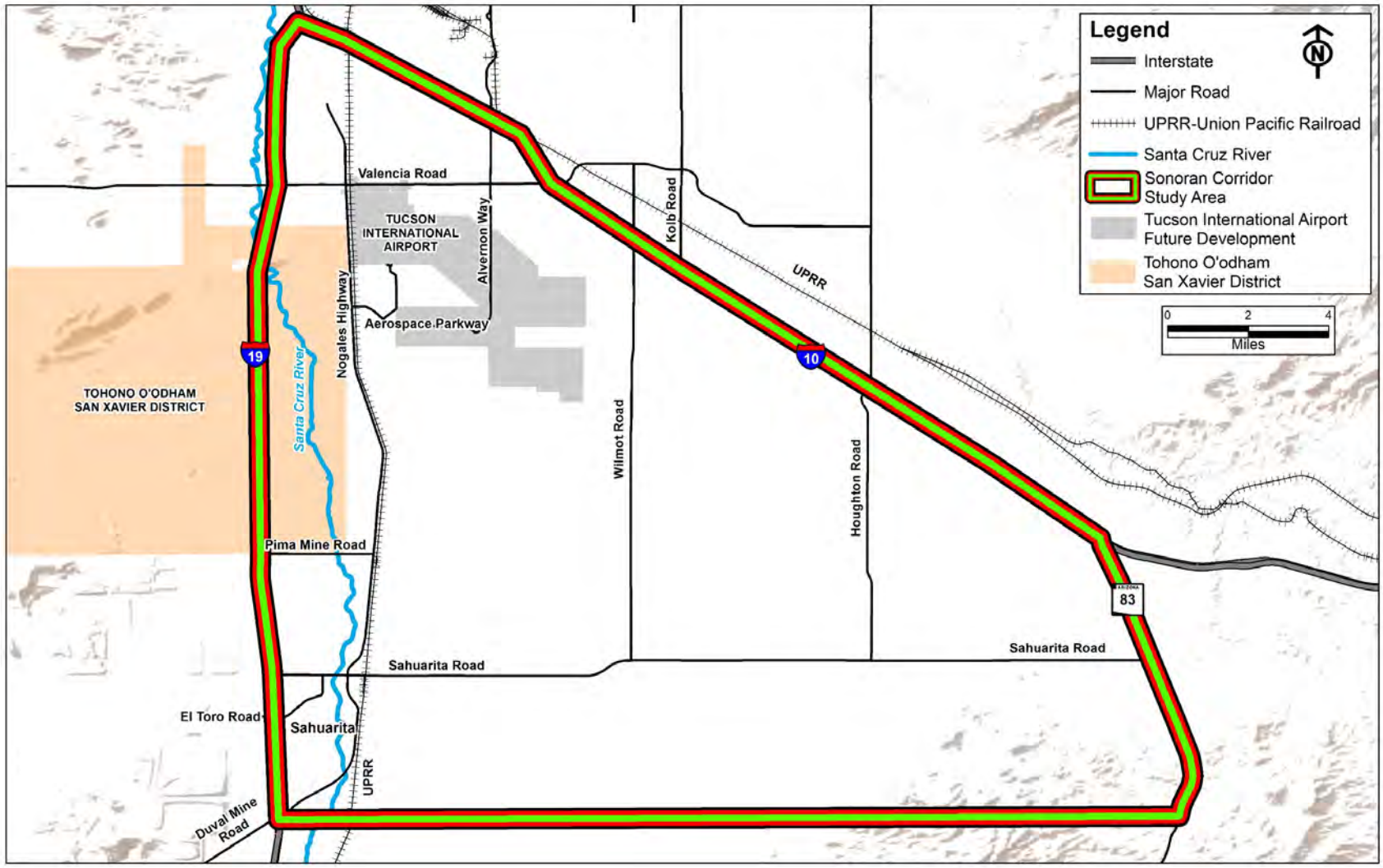


Figure 1. Sonoran Corridor Study Area

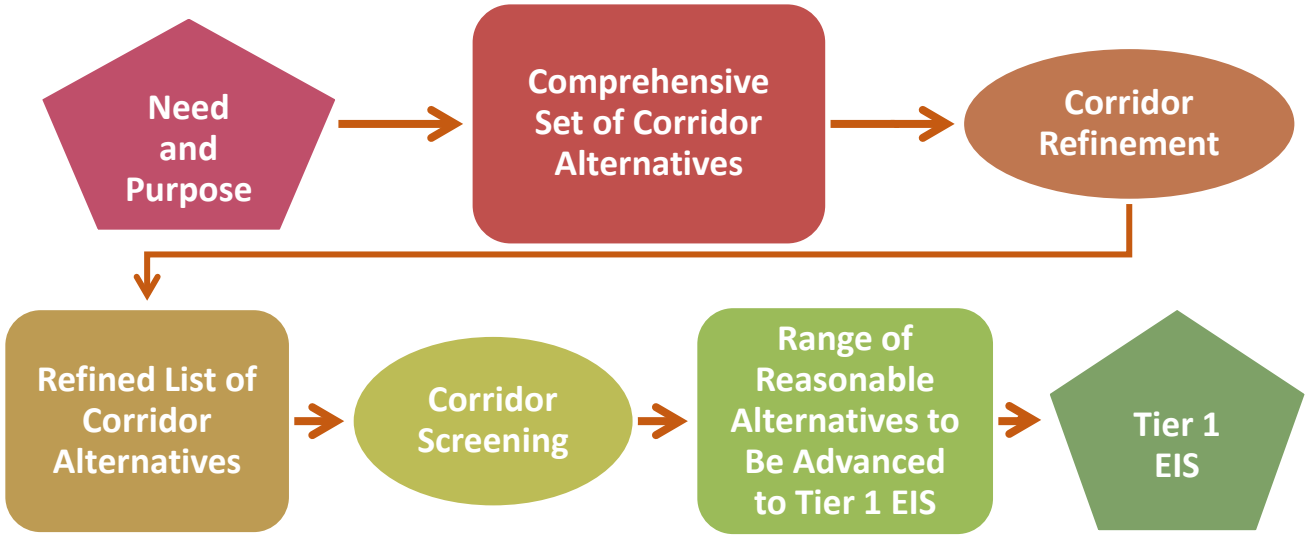


Figure 2. Alternative Refinement and Selection Process

2 DEFINITION OF CORRIDOR ALTERNATIVES

2.1 Comprehensive Set of Corridor Alternatives

A first step is defining a Comprehensive Set of Corridor Alternatives based on four primary sources:

- Previous Sonoran Corridor Area Studies
- Agency Scoping Input
- Public Scoping Input
- Technical Analysis

To promote thorough coverage of the Sonoran Corridor Study Area (Figure 1), the information and suggestions derived from these inputs will be used to identify a set of prospective corridor alternatives. This Comprehensive Set of Corridor Alternatives will be shaped and advanced as a Refined List of Corridor Alternatives following a detailed evaluation in the CSR. Specific information regarding these inputs is discussed in the following sections.

2.1.1 Previous Sonoran Corridor Area Studies

In 2015, Pima County completed an assessment of the Sonoran Corridor in response to ongoing and potential employment changes in the study area. The purpose of this Sonoran Corridor

Study was to determine if there was justification for a new transportation corridor and, if so, to establish the likely potential routes that would link I-19 and I-10 south of TUS. The study compiled technical data relevant to the ADOT Sonoran Corridor study. Pima County engaged stakeholders throughout the study of the corridor.

Other planning studies that have been consulted in developing alternatives for the Sonoran Corridor Tier 1 EIS are: the ADOT Interstate 11 (I-11) Tier 1 EIS, the ongoing I-10/SR 210 project immediately north of the Sonoran Corridor area, the Pima Association of Governments (PAG) Regional Mobility and Accessibility Plan (RMAP) from 2016, the Sonoran Corridor Economic and Revenue Impact Analysis done by Pima County in 2015, and the Sahuarita/El Toro Road Corridor Study completed in 2013 by the Town of Sahuarita. These studies and reports, as well as legislative action by some stakeholder agencies provide additional insight into potential corridor alternatives to be considered in the Sonoran Corridor analyses.

2.1.2 Agency Scoping Input

An approximate 60-day scoping period was conducted for the Sonoran Corridor Tier 1 EIS environmental review process, beginning on May 12, 2017 and ending on July 15, 2017. FHWA and ADOT invited agencies, tribal communities, and organizations by letter to participate in the scoping process and attend an agency scoping meeting that was held at the PAG offices on June 7, 2017. The written and oral comments received from the agencies and tribal communities during scoping involve common themes on potential corridor alternatives, environmental resources, considerations, and/or constraint areas (See Figure 3) and proposed corridor alternatives identified in prior studies or by local legislative action (See Figure 4). Following is a list of these common themes:

- Make rail freight infrastructure part of the project
- Focus study on movement of commerce
- Consider a route that will provide access to TUS from the south
- Reduce travel times by getting regional motorists to I-19 faster
- Consider a route that connects to I-19 at El Toro Road
- Consider a route that connects I-19 near Pima Mine Road

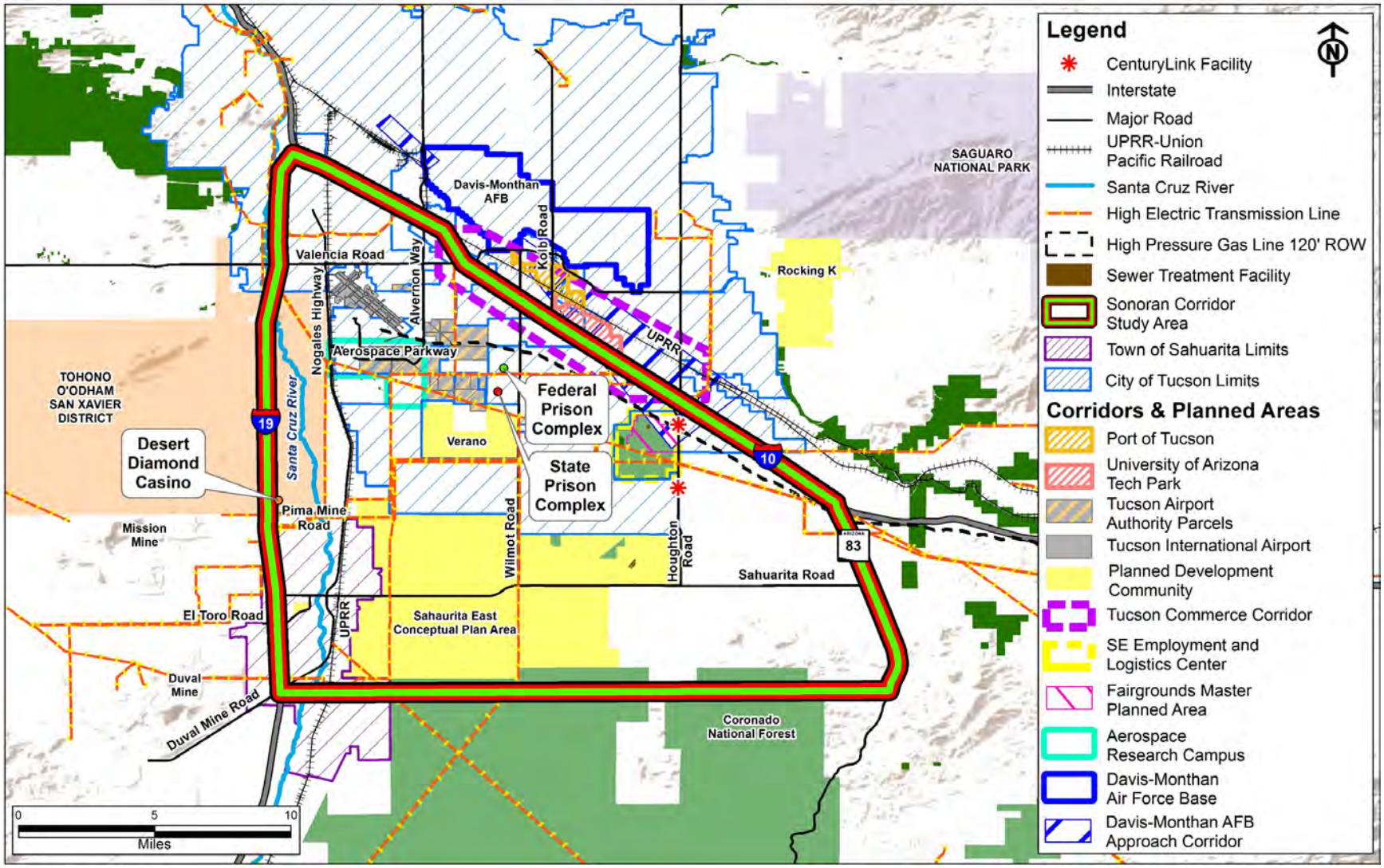


Figure 3. Areas of Interest Considered in the Screening Process

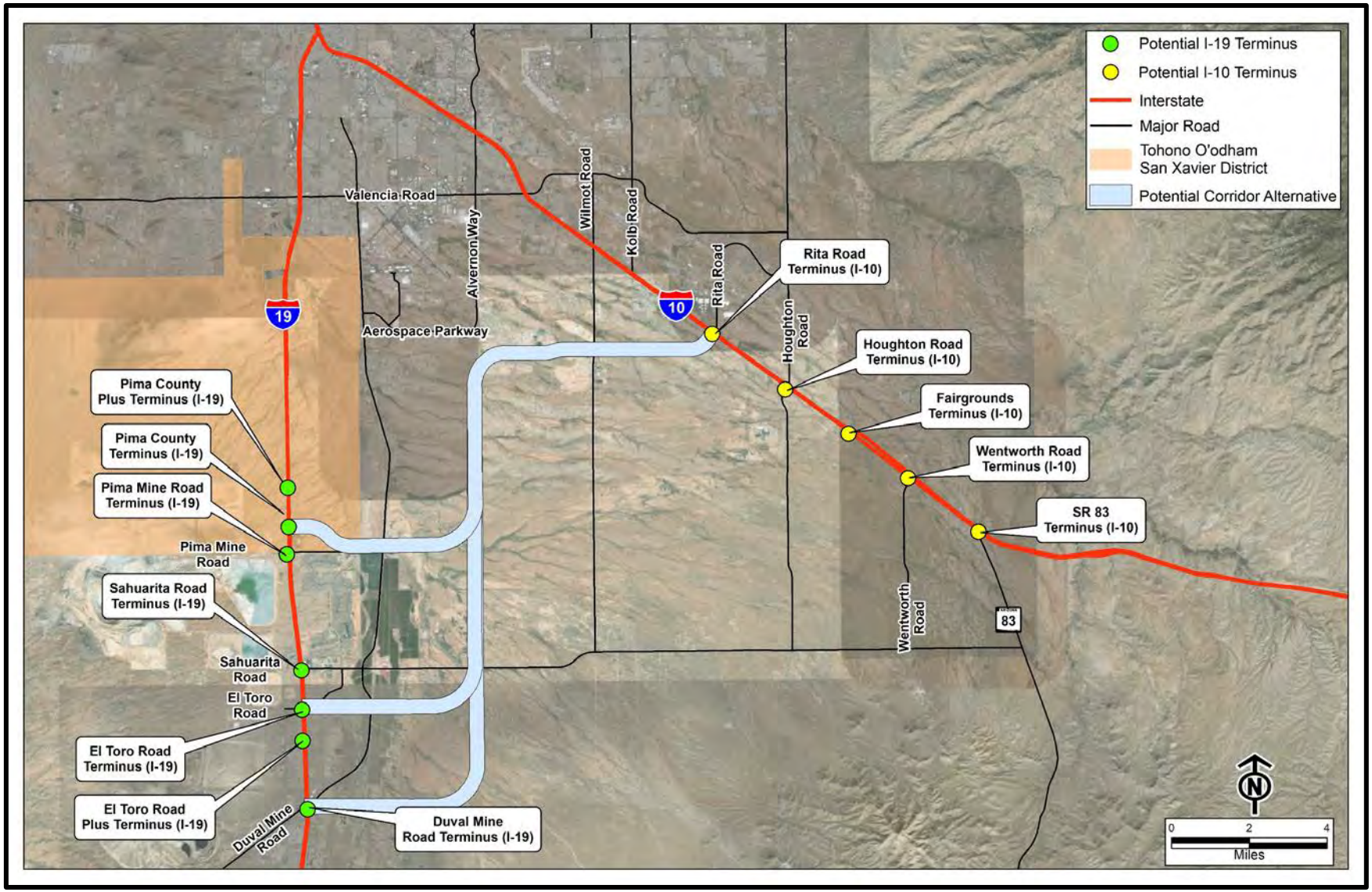


Figure 4. Agency Alternative Concepts

- Area south of I-10 is a major growth corridor. Consider commuter needs for workers in Vail and Tucson
- Be mindful of Tohono O'odham Nation processes and work with leadership and allottees as well as Bureau of Indian Affairs
- Consider effects of a new highway on air quality in the area
- Avoid impacts to existing electrical transmission lines
- Plan for a new highway connection to SR 210 (Barraza-Aviation Parkway)
- Keep routes that would potentially accommodate trucks carrying hazardous materials away from existing schools and population centers
- Mitigate potential negative effects on habitat and wildlife corridors

A complete list of individual agency and tribal community scoping comments can be found here: http://www.azdot.gov/docs/default-source/transportation-studies/sonoran-corridor-scoping-summary.pdf?sfvrsn=2

2.1.3 Public Scoping Input

The public was also notified about the scoping process and public scoping meetings via newspaper advertisements, website, email blasts, social media, news releases, media interviews, and blog posts. Two public scoping meetings were held within the Sonoran Corridor Study Area, one each in Tucson and Sahuarita. During scoping, the public also provided feedback on potential corridor alternative preferences, considerations, and/or constraint areas, including potential locations for a transportation facility or areas to avoid. Figure 5 shows alternatives proposed for consideration by the public during Scoping. A full compilation of all public comments is provided in the Scoping Summary Report (ADOT 2017), available at the website listed in the paragraph above. A summary of the public scoping issue priorities is listed below:

- Traffic congestion and delays
- Sharing highways with commercial truck traffic
- Lack of connectivity
- Impact on neighborhoods, residences, and diverse communities
- Air quality
- Visual and aesthetic resources

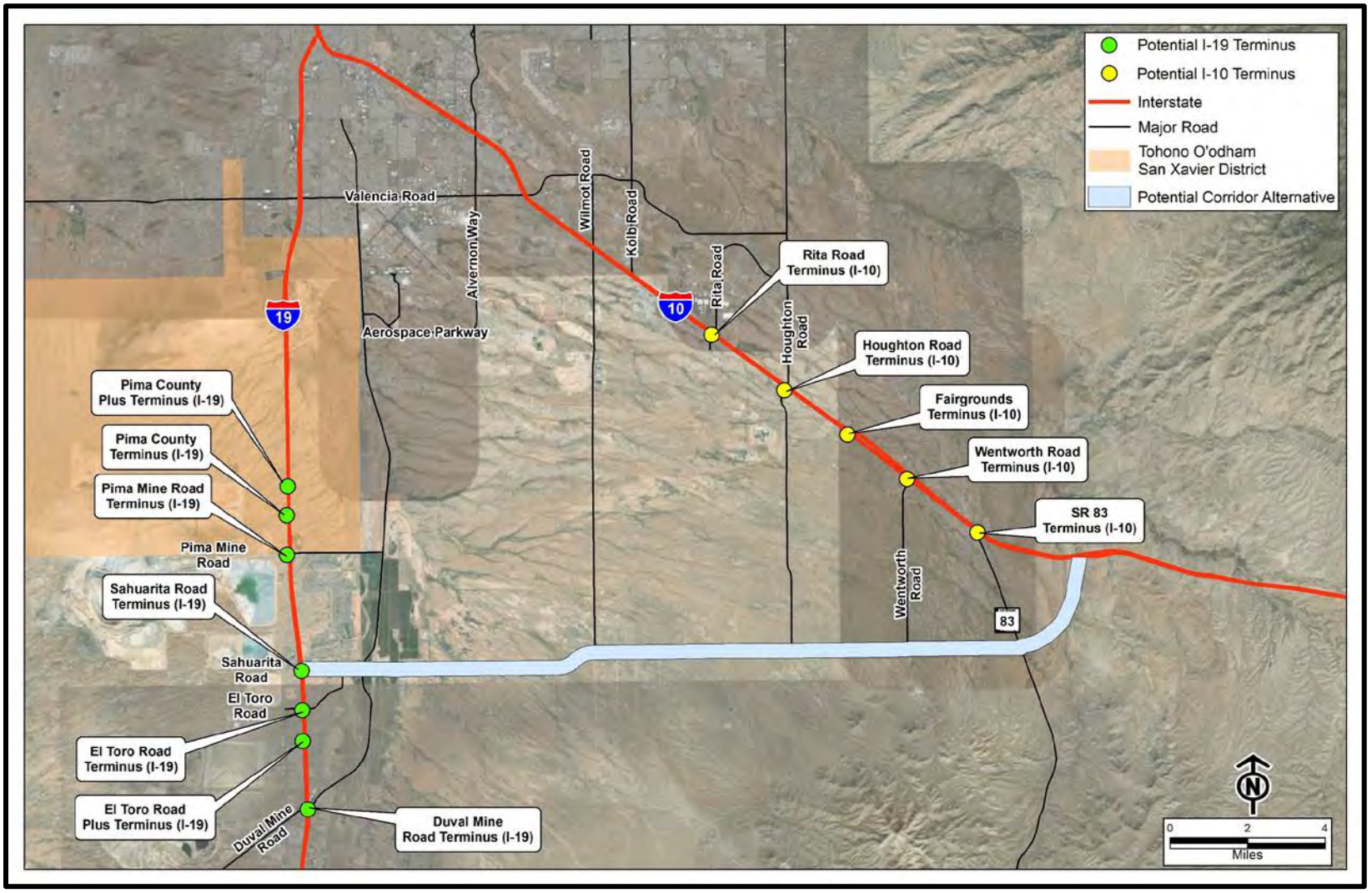


Figure 5. Corridor Alternative Suggested by the Public (Sahuarita Road)

- Alternative modes of transportation (rail, bicycle routes, etc.)
- Geology, soils, and farmland
- Preserving existing land use
- Protection of cultural sites

2.1.4 Technical Analysis

The understanding of the physical needs of the corridor and the most effective way to negotiate the terrain and features within the study area is an essential element of identifying the possible corridors for analysis. For this project, a computer-based model was used to generate multiple corridors, providing a comprehensive set of corridors from which to identify effective choices for analysis.

2.1.4.1 Quantm

Quantm is a computer model that facilitates the identification of corridor alignments by considering engineering and environmental factors encountered between specified termini. In this case, the termini are the connections to I-10 and I-19. Quantm maps potential routes for a proposed transportation facility based on engineering design criteria as well as sensitive environmental and cultural resources, land uses, and topographical constraints based on the impact a transportation corridor would have on them. This approach will identify a broad complement of corridors that can be narrowed, through engineering and planning analysis, to those that are most likely to be productive in terms of the Need and Purpose for the project.

Quantm can also be used to validate or optimize potential corridor alternatives (routes proposed during scoping, those from prior studies, and technical analysis outputs) by refining these potential corridors to ensure they meet the minimum engineering and environmental design criteria. For example, corridor alternatives may be moved slightly to overlay existing roadways/rights-of-way, avoid defined constraints, or better respond to engineering requirements.

Figure 6 outlines the major technical analysis steps undertaken to develop potential corridors that comprise the Comprehensive Set of Corridor Alternatives. A summary of those steps is provided below, followed by a more detailed discussion in Sections1.1.4.1 through 1.1.4.6):

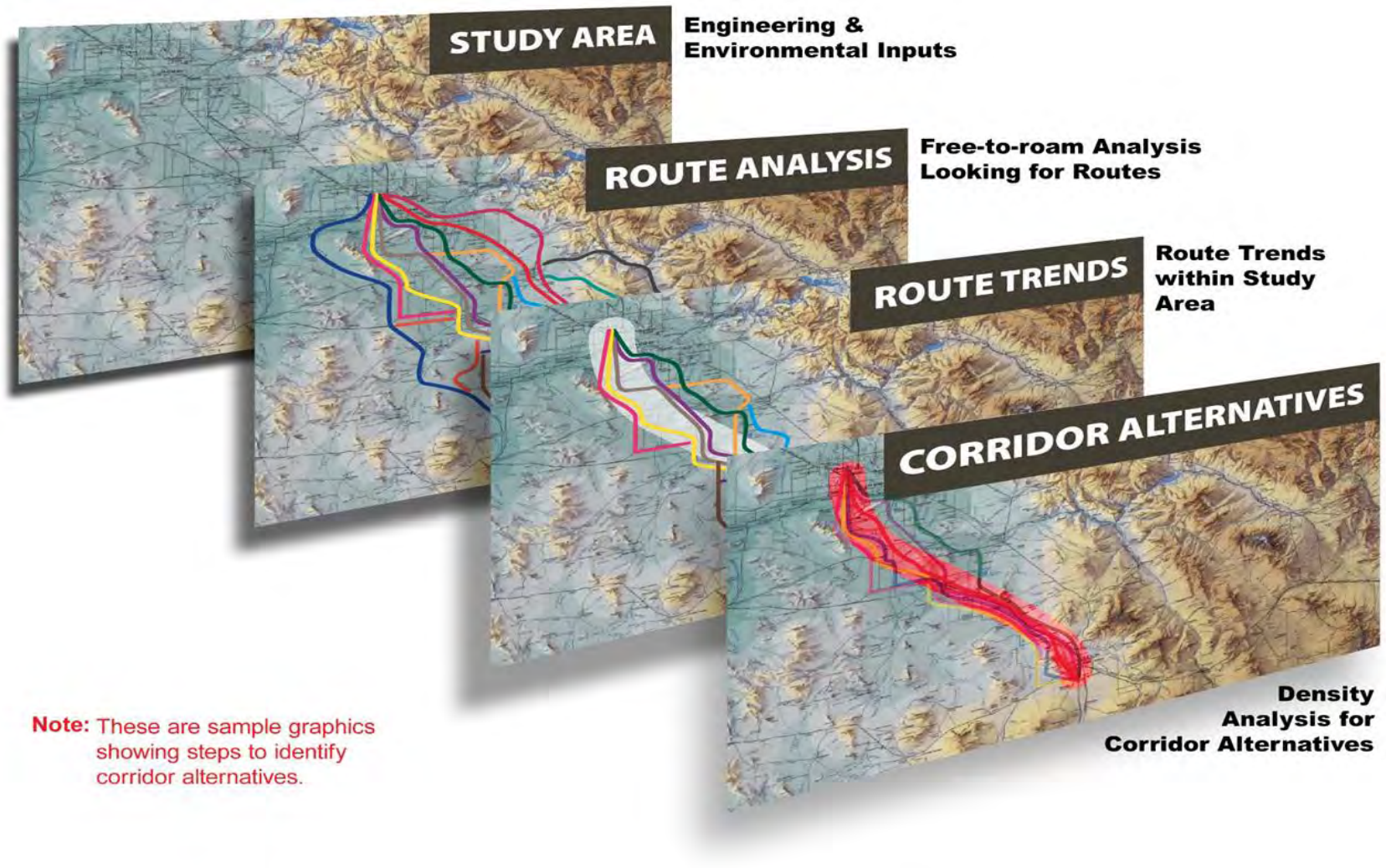


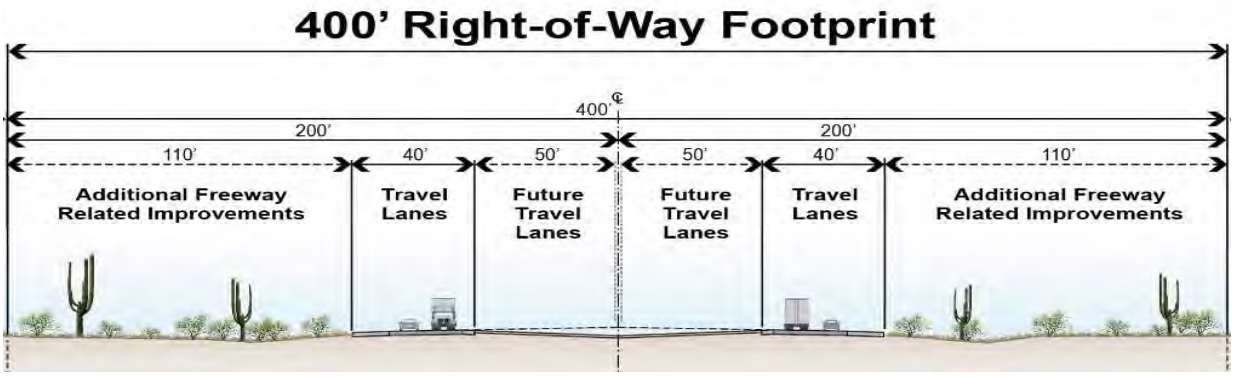
Figure 6. Technical Analysis Steps

- Collect and enter engineering and environmental inputs
- Run model for a free-to-roam (i.e., not geographically constrained) analysis, looking for all potential routes between termini identified on I-10 and I-19.
- Evaluate model outputs to identify route trends within the Sonoran Corridor Study Area
- Conduct density analysis of route trends (i.e., observe areas where modeled routes tend to converge and/or overlap) to identify potential corridor alternatives.

2.1.4.2 Inputs

The initial step of the technical analysis involves collecting and entering engineering and environmental inputs into the model. The engineering inputs are based on the design criteria for a proposed interstate freeway facility, with considerations for future multimodal elements (e.g., ability to maintain appropriate grades for rail). Environmental inputs can include identified protected resources, sensitive land uses, and topographical information.

The cross-section used to reflect these inputs and features is shown in Figure 7. This is an example of the typical cross-section of a proposed interstate freeway facility. The engineering input assumptions also address minimum turning radii/curves, grade/slope requirements, right-of-way (ROW) needs, etc. for a 4-lane interstate freeway. At this stage of the technical analysis, a 400-foot ROW footprint is used to account for the maximum horizontal width required for a



Note: 400-foot right-of-way footprint for the Sonoran Corridor could be located anywhere within the 2000-foot corridor alternative. Additionally, in areas collocated with existing facilities with lower anticipated traffic volumes or parallel constraints, the footprint may be less than 400 feet wide. Widths on either side of freeway corridor may vary. Engineering inputs for grade would allow the alternative to integrate other parallel transportation or linear uses in the future, such as freight rail, passenger rail, and/or a utility corridor.

Figure 7. Typical Cross Section for a Proposed Interstate Freeway Facility

proposed interstate freeway facility. In areas of constrained ROW or where a wider footprint may not be needed because of topography or other restrictions, a determination will be made as to the appropriate treatment of the corridor. The illustrative cross-section shown in Figure 7 is estimated for planning purposes only during the CSR phase. The inputs for a proposed interstate freeway facility would not preclude a multimodal transportation or other linear facility (i.e., rail and/or utility) within the corridor, if needed.

Figure 8 illustrates some of the environmental inputs for this stage of the analysis that were collected from various sources. These sensitive areas are considered potential avoidance areas in the technical analysis. Initial information for sensitive environmental resources and land use was gathered from prior data studies and a high-level survey of resources in the study area. Additional information was provided by agencies, the San Xavier District of the Tohono O'odham Nation, and the public during the scoping period.

Logical Termini

Another key input is where the corridor connects to the existing transportation system. The Sonoran Corridor is intended to connect I-19 and I-10 south of TUS. Connection points on either interstate would most likely be placed at locations that address specific preferences by the agencies and public, or where the interchange avoids significant resources, population centers, or technical challenges. The focus for this effort to date has been on assigning interchange locations that have been identified by public agencies and the public or which can accommodate a system interchange and effectively address local access needs, if the location is an existing service interchange. The termini should meet certain basic engineering guidelines to ensure long-term, effective operations for the new corridor as well as existing highways.

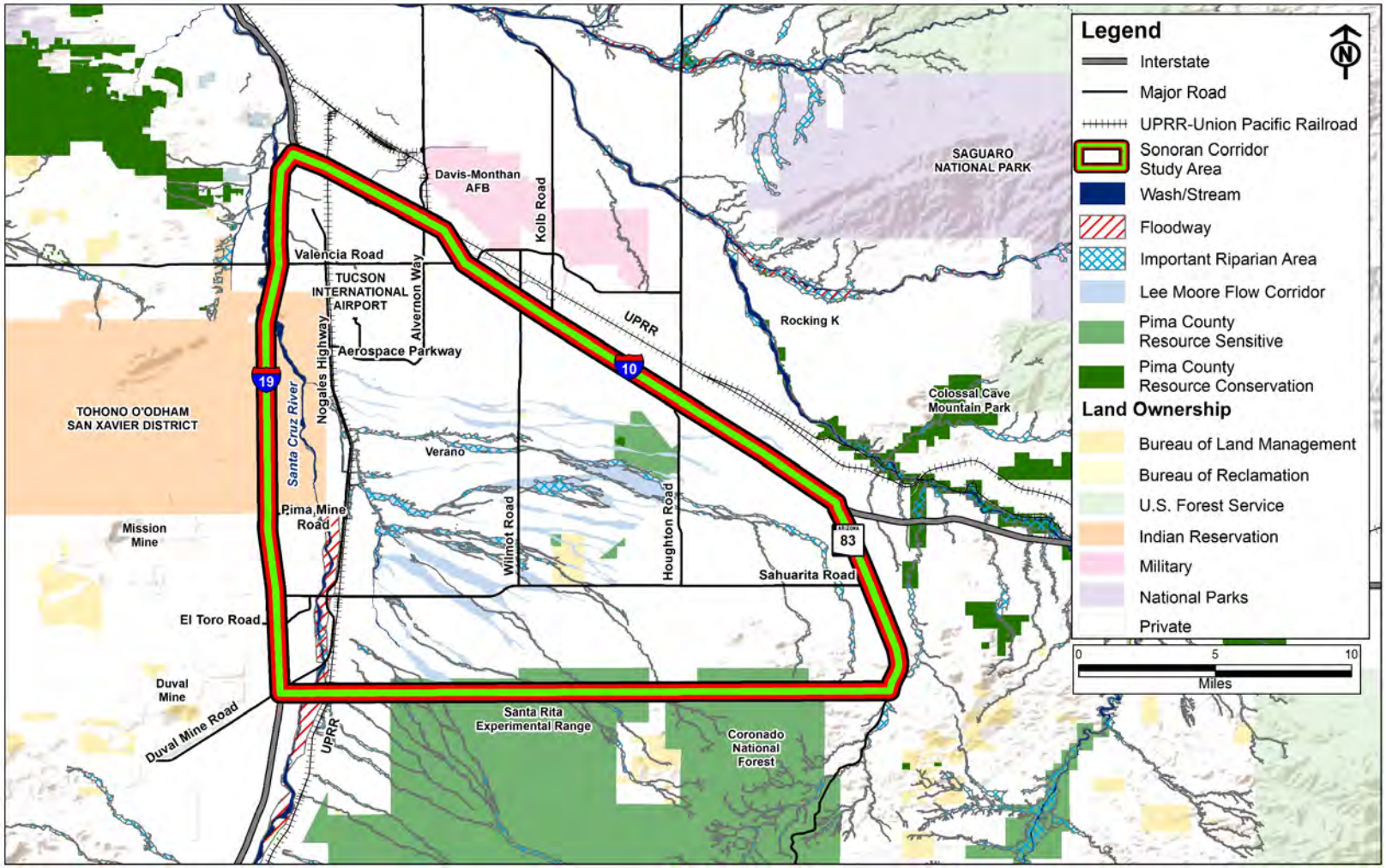


Figure 8. Environmentally Sensitive Areas

2.1.4.3 Free-to-Roam Analysis - Looking for Corridors

With the engineering design criteria, termini and environmental avoidance areas established, the model is allowed to "roam" freely, i.e., not constrained by geographical boundaries, as it generates potential corridor routing that responds to the inputs. The model considers engineering inputs such as slope and curvature requirements when traversing the existing topographic terrain layers. It generates 2,000-foot wide corridors within which a specific alignment that meets the prescribed design criteria for the Sonoran Corridor, a potential interstate freeway facility, can later be accommodated. Simultaneously, also based on inputs, the model avoids or minimizes effects on environmentally sensitive resources, such as historic and archeological sites or habitat areas, when mapping out potential corridors. Figure 8 shows some of the considerations to be included in the analysis. Using these input parameters, this technical analysis filters out corridors with potentially serious physical and environmental constraints, while also maximizing possible corridor alternatives.

2.1.4.4 Corridor Trends within the Study Area

As programmed, the free-to-roam analysis will generate 25 potential corridors for each connection pair between I-10 and I-19. From those, the most reasonable options based on the engineering and environmental inputs can be selected for further analysis. The next step is to identify potential corridor trends, or groupings of corridor routes, that generally follow a common or similar path. These common-path options will be used to identify potential corridor alternatives that can be included in the Comprehensive Set of Alternatives.

2.1.4.5 Density Analysis for Potential Corridor Alternatives

To assist in determining the most dominant route trends or groupings, the modeled corridors will be imported from Quantm into a Geographic Information Systems (GIS) software platform to undergo a density analysis that will more clearly distinguish the most common paths traced by the corridors. The results of this process will be used to map the prevalent routing trends from Quantm and add them to the set of corridor alternatives drawn from previous studies and agency and public input gathered during Scoping.

2.1.5 Refinement of Corridor Options

Starting from a very broad range of corridors, the Comprehensive Set of Alternatives is defined based on the corridors proposed by the public and the agencies and the corridors developed by technical analysis through Quantm. However, only some of the corridor alternatives identified by agencies or the public, or through the application of Quantm, conform to standard requirements for design, access, or operational safety. The Comprehensive Set is reduced through a Refinement step that incorporates engineering criteria and local considerations related to access impacts at proposed Interstate connection points. The viability of the connections to the existing Interstate system (system interchanges) is an essential element of successful Sonoran Corridor alternatives. This Refinement step will advance a Refined Set of Corridor Alternatives that will be subjected to detailed screening.

The Refinement step will apply the engineering and local access criteria to each Interstate connection point to identify the Refined List of Corridor Alternatives. The fundamental considerations in developing the Refined Alternatives are based on the following factors:

- Severe local mobility impact caused by location of the corridor terminus on I-10 or I-19. Introducing a system interchange at an existing service interchange has significant implications for how local access dependent on that interchange would be maintained or reestablished. Local traffic can sometimes be rerouted to avoid the new system interchange, but in many cases, the effect on existing travel would be severe enough to constitute a fatal flaw regarding maintenance of local circulation. In some cases, the presence of a system interchange could also have a major effect on the viability of the established local community if the new roadway impedes the community's primary functions. This can include:
    - the impact on institutions such as local government offices and facilities, schools, places of worship, critical access to residential or employment centers, etc., and
    - the inability to effectively replace local connections to destinations that depend on the existing interchange for access.
- Adherence to ADOT interchange separation requirements per Roadway Design Guidelines (RDG). ADOT RDG sets forth guidance for the placement of interchanges on the freeway system. In the case of system interchanges, a separation of two miles from neighboring service interchanges is recommended for safe and efficient operation. Many of the proposed termini along I-19 may not meet that guideline, and could pose challenges for operational effectiveness and safety if they do not comply with design requirements.

2.1.6 Optimization

The Refined Set of Corridor Alternatives will be optimized to take advantage of existing and/or future designated transportation links in regional or local plans to ensure the proposed corridors not only provide a major transportation connection between I-10 and I-19, but also effectively support a future transportation network in the Sonoran Corridor study area. Once optimized to a reasonable routing plan, the Refined Set of Corridor Alternatives will be screened using the detailed criteria discussed in Section 3 as the means of establishing the Reasonable Range of Alternatives for analysis in the Tier 1 EIS.

Each of the corridor alternatives in the Refined Set must comply with good design practices and conform to planned functionality within the Study Area. Each of these corridors will be optimized to provide the most appropriate routing and service consistent with their individual configurations emerging from the project analysis as well as the potential for supporting an underlying network of roadways. This may require minor realignment to fit local conditions to increase the corridors' compatibility with local and regional plans.

- Consideration of existing and planned corridors: The Refined Set of Corridor Alternatives will be adjusted to take advantage of current and future roadway corridors, where they exist or are proposed, to minimize encroachment on other land wherever possible.
- Consideration of potential future access points: In addition to the termini at I-10 and I-19, locations along the corridor will need to serve local access at major crossroads and must be positioned to readily accept connections to existing and proposed land uses.
- General engineering standards/requirements: Quantm identifies corridors based on engineering criteria, among other considerations, so the corridors conform to basic design principles. However, there is a need to verify and vet the viability of each corridor to ensure that it follows the appropriate standards and practices and will serve the operational objectives of the project.

The results of Optimization will determine the specific configuration and routing of the alternatives that will be subject to the screening criteria in the Selection Corridor Alternatives process.

3 SELECTION OF CORRIDOR ALTERNATIVES

For the Sonoran Corridor Tier 1 EIS study, the screening process will apply specific measures to the Refined List of Corridor Alternatives to ensure alternatives meet the established Need and Purpose while not precluding other modes of transportation. As documented in the Need and Purpose Statement, the overall purpose of the Sonoran Corridor is to provide a high-priority, high-capacity, access-controlled transportation corridor that will:

- Accommodate future travel demand due to forecasted growth by affording better access;
- Provide an alternative direct connection between I-19 and I-10 south of TUS that will reduce commercial and commuter travel times and cost; and
- Improve the 2045 LOS within the Study Area.

The problems and issues within the Sonoran Corridor Study Area include the following:

- Projected population and employment growth
- Lack of system linkages associated with regional, interstate, and international mobility
- Projected congestion and roadway capacity issues

Using the specified criteria will allow a comparative evaluation to understand how each corridor alternative performs relative to the criteria, as well as to the other corridor alternatives.

3.1 Corridor Evaluation Categories and Screening Criteria

The performance of each alternative will be assessed based on screening criteria that reflect the following evaluation categories. These categories were formulated based on input received during the Scoping process and previous planning studies, and are specifically designed to address the Need and Purpose as well as good planning and engineering practice:

1. Anticipated Growth – the alternative's ability to support planned or anticipated local development. This category responds to the Purpose objective of accommodating future travel demand due to the forecasted growth.
2. Mobility – contribution of the alternative to improving passenger and freight travel in the corridor. The criteria in this category address mobility for corridor residents, employees, visitors, manufacturers, growers, shippers, etc., consistent with the stated Purpose objective to reduce congestion and improve the LOS projected for 2045.

3. System Linkages – the alternative's ability to address the Purpose objective for a facility that improves transportation network connections to the two Interstates, to reduce travel times and cost.
4. Economic Benefit – contribution of the alternative to improving access to activity centers and jobs and fostering retention and expansion of commercial and industrial activity in the corridor.
5. Environment – effect of a project alternative on the environment, including the effect on sensitive species or habitats, cultural resources, and disadvantaged populations. This category constitutes an underlying precept of good planning, designed to measure the contribution of the alternative to reducing overall energy consumption (e.g., decreasing overall vehicle miles traveled, easing congestion, using less fuel), improving air quality, minimizing the effect on sensitive resources, etc.
6. Implementation Feasibility – relative ease of implementation based on property acquisition costs, number and complexity of structures, construction challenges, public support, and negotiations associated with constructing the corridor.

Each of these categories will be used throughout the CSR in evaluating alternatives.

3.1.1 Screening Criteria

The screening criteria used to assess the Refined List of Corridor Alternatives will eliminate those corridor alternatives that do not effectively meet the Need and Purpose, or that do not compete effectively against other corridor choices. Based on an independent assessment of each corridor alternative against each criterion, the sum of the ratings for all criteria will generate a total score for the corridor. This corridor score will be a significant factor in drawing comparisons among the proposed corridor alternatives, and in deciding which of them will be included in the Reasonable Range of Corridor Alternatives to be carried forward for further analysis in the Tier 1 EIS.

The criteria in the screening process will be applied to each refined corridor alternative assuming a width of approximately 2,000 feet for purposes of measuring relative conformity with design requirements and performance criteria. These criteria and corresponding measures for the screening evaluation are detailed in Table 1. In general, the evaluation criteria will

contrast measures using high, medium, and low performance ratings, represented by●, ◐, and ○, respectively. These are intended to indicate relative performance within each criterion and

provide a basis for presenting results that conforms to accepted practice[1]. Each "Harvey Ball" has a supporting numerical value that will be used in calculating a total for each alternative. That total will be the basis of comparing the alternative corridors against each other. The specific breakdown of the ●, ◐, and ○ ranges for each criterion will be determined once the empirical data have been collected or developed to ensure a fair and logical comparison among the three levels.

Given their absence in the geographical location of the Study Area, the proposed Sonoran Corridor would not affect the following environmental resource categories; therefore, they are not included as screening criteria:

- Coastal Zones
- Navigable Rivers
- National Natural Landmarks
- Outstanding Arizona Waters
- Wild and Scenic Rivers

[1] This approach was used effectively by ADOT in the "Passenger Rail Corridor Study: Tucson to Phoenix" Tier 1 EIS, completed in 2016. It has also been used on the I-11 Corridor Tier 1 EIS, currently in development.

Table 1. Evaluation Criteria

Category	Criteria	Measures	Scale	Source
G – Growth and Community Acceptance	**Criterion G-1: Compatibility with Local Plans** - Effect of the alternative on existing or proposed plans within the corridor	Compatibility with adopted local and regional plans	● Compatible (C): the corridor is identified in the local plans and the project is consistent with the intent of the plans ◐ Compatible with Difficulties (D): the corridor is not entirely reflected in local plans but may not create significant complications ○ Incompatible (I): the corridor impacts an already built condition and is not reflected in local plans	County, city and town General Plans and Zoning maps and other corridor-specific data when available
	Criterion G-2: Public and Agency Support – Preference of the alternative by stakeholder agencies and public	Statements of support by local agencies and the public	● Supported (S): the corridor has the support of the public and agencies ◐ Ambivalent (A): reaction to the corridor is evenly mixed or neutral ○ Opposed (O): the corridor is not supported or preferred by members of the public or agencies	Input and feedback from project meetings, project website, news sources, and social media

Table 1. Evaluation Criteria (continued)

Category	Criteria	Measures	Scale	Source
G – Growth and Community Acceptance	**Criterion G-3: Compatibility of Corridor with Underlying Property Ownership** – Level of negotiation required with independent agencies/ nations/companies	Compatibility with underlying land ownership	● Compatible (C): the corridor is compatible with existing property ownership ◐ Compatible with Encumbrances (E): portions of the corridor are incompatible with existing property ownership and/or all or part of the corridor is partially compatible with existing property ownership (e.g., allotted lands, operating uses, etc.) ○ Incompatible (I): the corridor is incompatible with existing property ownership (e.g., National Park, protected Tribal lands or wildlife areas, etc.)	General Plans and Zoning and Areas of Influence maps.
	Criterion G-4: Employment Served – Existing and future employment	Employment growth within 2 miles of corridor centerline	● Most employment ◐ Medium employment ○ Least employment	Data from adopted plans and local plans such as the Sonoran Corridor TAC information

Table 1. Evaluation Criteria (continued)

Category	Criteria	Measures	Scale	Source
M – Mobility	**Criterion M-1: Travel Demand:** Annualized passenger trips	Travel demand forecast for corridor alternative	● Highest travel demand ◐ Medium travel demand ○ Lowest travel demand	Travel model
	Criterion M -2: Travel Demand – Annualized truck trips	Forecast percentage of truck travel in corridor	● Highest truck travel ◐ Medium track travel ○ Lowest truck travel	Truck forecast model
	Criterion M-3: Reduction of truck volume on Interstate facilities	Reduction of truck traffic at the I-19/I-10 interchange	● Highest reduction of trucks ◐ Medium reduction of trucks ○ Lowest reduction of trucks	Travel forecast for I-10 and I-19 from travel model

Table 1. Evaluation Criteria (continued)

Category	Criteria	Measures	Scale	Source
M—Mobility	**Criterion M-4: Travel Time**– Estimated travel time reductions.	Travel time in minutes between common corridor locations based on output from travel demand model	● Lowest travel time ◐ Medium travel time ○ Highest travel time	Travel Model calculation
	Criterion M-5: Congestion Reduction: How corridor improves traffic operations	Comparison of LOS on I-10, I-19, Valencia Rd, Nogales Highway and Sahuarita Rd with alternative and without	● Most congestion reduction ◐ Some congestion reduction ○ Least congestion reduction	Travel demand model and LOS calculations
	Criterion M-6: Improved access to TUS: estimated trips from new corridor	Forecast of future travel demand to TUS with new corridor compared to airport travel demand without corridor	● Highest airport access ◐ Some airport access ○ Least airport access	Travel Model, TUS forecast

Table 1. Evaluation Criteria (continued)

Category	Criteria	Measures	Scale	Source
M—Mobility	**Criterion M-7: Multimodal Connectivity:** promote bicycle, pedestrian and trail connectivity	Routes support locally adopted bicycle, pedestrian and trails plans and/or provide new multimodal transportation opportunities	● High level of multimodal connectivity ◐ No change in multimodal connectivity ○ Reduced multimodal connectivity	GIS maps or Google Earth and existing plans
SL – System Linkages	**Criterion SL-1:** Contribution to comprehensive transportation network and improved access	Sum of miles on existing or future roadway network from nearest point on Sonoran Corridor alternative to airport and major residential and employment centers.	● Shortest total miles ◐ Average mileage ○ Greatest mileage	GIS maps or Google Earth
EB - Economic Benefits	**Criterion EB- 1:** Access to jobs and revenue potential	• Number of activity centers (existing and proposed) within 2 miles of the corridor • Number of jobs within 2 miles of corridor centerline	● Most activity centers ◐ Average activity centers ○ Least activity centers	PAG travel modeling data

Table 1. Evaluation Criteria (continued)

Category	Criteria	Measures	Scale	Source
E – Environmental	**Criterion E-1:** Sensitive noise receptors	Number of second level sensitive noise receptors within 2,000 feet of corridor centerline	● Least receptors ◐ Average receptors ○ Most receptors	GIS analysis of maps from AGFD or National Park Service or another appropriate source
	Criterion E-2: residences potentially affected	Number of residences within the corridor	● Least residences ◐ Average residences ○ Most residences	GIS analysis of PAG modeling data
	Criterion E-3: historic/cultural/ archaeological resources	Acreage of documented sensitive historic/cultural/ archaeological resources within the corridor; percent of sites more than 50% percent covered by alternative	● Fewest resources ◐ Average resources ○ Most resources	GIS applications to AZ State Museum and other Archaeological Databases

Table 1. Evaluation Criteria (continued)

Category	Criteria	Measures	Scale	Source
E – Environmental	**Criterion E-4:** wetlands/floodplains/ rivers/ washes/arroyos	Wetlands/100-year floodplains (in acres) and rivers/washes/arroyos (in linear feet) within the corridor	● Lowest total impact ◐ Medium total impact ○ Maximum total impact	Aerial measurement
	Criterion E-5: wildlife corridors	Number of identified wildlife corridors crossed as shown in the Arizona Wildlife Linkages report prepared by Arizona Fish and Game Department	● Least affected corridors ◐ Some affected corridors ○ Most affected corridors	AGFD
	Criterion E-6: biological resources which may be affected	Quantify biological resources within the corridor based on six-point scale using the Arizona Game and Fish Department "Species and Habitat Conservation Guide"	● Fewest resources ◐ Middle resources ○ Most resources	AGFD HabiMap

Table 1. Evaluation Criteria (continued)

Category	Criteria	Measures	Scale	Source
E – Environmental	**Criterion E-7:** existing environmental justice populations	Minority and low-income population (number of people) within 1 mile of corridor centerline	● Lowest affected population ◐ Middle affected population ○ Highest affected population	Census data
	E-8: Greenfield sites – emphasis on use of existing corridors	Acreage of corridor on undeveloped land vs. existing infrastructure	● Least affected greenfield area ◐ Some affected greenfield area ○ Most affected greenfield area	GIS analysis and transportation and utility network analyses

Table 1. Evaluation Criteria (continued)

Category	Criteria	Measures	Scale	Source
IF - Implementation Feasibility	**Criterion IF-1:** ease of Implementation	Qualitative evaluation of the relative costs of building the corridor including property acquisition, structures, construction challenges, public support, and negotiations	● Low (L): lower costs for property acquisition and construction with public acceptance/support ◐ Moderate (M): moderate costs for property acquisition and construction with challenges related to public acceptance/ support ○ High (H): Significant costs for property acquisition and construction with challenges related to public acceptance/ support	Analysis of corridor character and special conditions

4 SUMMARY AND NEXT STEPS

The corridor alternatives will be developed and screened based on this CSR methodology. The process and outcomes will be documented in the CSR. The screening will enable FHWA and ADOT to eliminate less productive corridor alternatives from detailed analysis. For the Sonoran Corridor Tier 1 EIS, the detailed evaluation of the refined set of corridor alternatives in the Sonoran Corridor Study Area will determine which corridor alternatives best meet the Need and Purpose and warrant further analysis in the Tier 1 EIS.

Each option in the Refined List of Corridor Alternatives will be assessed on its own merits as a candidate to be included in the Reasonable Range of Corridor Alternatives studied in the Draft Tier 1 EIS. The most favorable corridor alternatives emerging from the screening process will comprise the Reasonable Range of Corridor Alternatives which, along with a No Build Alternative, will undergo detailed analysis in the Draft Tier 1 EIS and from which a Preferred Corridor Alternative, or the No Build Alternative, will be chosen. Prior to a final determination of the Reasonable Range of Corridor Alternatives, the results from the screening will be presented to public and agencies for additional input.

FHWA and ADOT will prepare a Draft Tier 1 EIS to more fully assess the Reasonable Range of Corridor Alternatives that emerge from the CSR, along with the No Build Alternative. The Draft Tier 1 EIS will:

- identify the Need and Purpose for the Sonoran Corridor;
- describe the screening process and each of the Corridor Alternatives;
- evaluate the affected environment and potential environmental impacts of each alternative based on agreed upon assessment methodologies for the environmental resource areas;
- select a Preferred Alternative; and
- provide opportunities for the public, agencies, and tribal communities to review and comment on the Sonoran Corridor Draft Tier 1 EIS.

The Draft Tier 1 EIS will be circulated for public and agency comment over a 45-day review period. During this time, public hearings will be held to share the subject matter of the Draft Tier 1 EIS, provide opportunities for public comment, and formally record all comments received. Comments and their responses will be incorporated into the Final Tier 1 EIS. FHWA

plans to issue a Record of Decision (ROD) concurrently with the Final Tier 1 EIS pursuant to Section 1311 of the FAST Act (Public Law 112-141).