ARIZONA PASSENGER RAIL CORRIDOR STUDY

Tucson to Phoenix

Record of Decision

December 2016

Submitted to:

U.S. Department of Transportation
Federal Railroad Administration

Submitted by:

Arizona Department of Transportation
Multimodal Planning Division

ARIZONA PASSENGER RAIL CORRIDOR STUDY: TUCSON TO PHOENIX

Final Tier 1 Environmental Impact Statement
Record of Decision

Submitted pursuant to the National Environmental Policy Act (42 USC 4321 et seq.); Federal Railroad Administration Procedures for Considering Environmental Impacts (64 FR 28545, May 26, 1999); Council on Environmental Quality's regulations implementing NEPA (40 CFR parts 1500-1508); Federal Transit Administration's Environmental Impact and Related Procedures (23 CFR Part 771).

by the
Federal Railroad Administration

Sponsoring Agency
Arizona Department of Transportation

Cooperating Agencies
Federal Transit Administration
Federal Highway Administration

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The Federal Railroad Administration (FRA) is issuing this Record of Decision (ROD) concurrently with the Final Tier 1 Environmental Impact Statement pursuant to Section 1311 of the Fixing America's Surface Transportation Act (Pub. L. 112-141). Through this ROD, FRA identifies the Yellow Corridor Alternative with corridor options (Orange Corridor) for further review in Tier 2 studies for intercity and commuter passenger rail service between Tucson and Phoenix. Passenger rail would reduce travel times and improve service reliability.

Record of Decision

ROD.1 Introduction to the Record of Decision

This is the Federal Railroad Administration's (FRA) Record of Decision (ROD) for the Arizona Passenger Rail Corridor Study: Tucson to Phoenix (APRCS) conducted by the Arizona Department of Transportation (ADOT). FRA is an operating administration of the U.S. Department of Transportation and is the federal Lead Agency for the Tier 1 Environmental Impact Statement (EIS) conducted under the National Environmental Policy Act (NEPA). Federal cooperating agencies for the process are the Federal Transit Administration (FTA) and Federal Highway Administration (FHWA).

FRA and ADOT used a tiered environmental process for the APRCS. Tiering is a phased environmental review process that is commonly used in the development of complex projects. With a tiered approach, the Tier 1 NEPA document evaluates impacts of a broad-scale project. Following a decision concluding the Tier 1 NEPA process, Tier 2 NEPA documents are developed to evaluate at a project level the environmental impacts within one or more specific logical sections or phases of a project, which will be developed through separate but related studies.

FRA approves the Yellow Corridor Alternative with routing options (Orange Alternative), as described below, for further review in Tier 2 studies for passenger rail service between Tucson and Phoenix, Arizona. The Yellow Corridor Alternative follows existing ADOT or Union Pacific Railroad (UP) right-of-way (ROW), including the UP Phoenix Subdivision's Southeast Branch. A passenger rail facility within the selected corridor alternative will meet the identified transportation need of providing an alternative mode to help address existing and future travel demand in the Pima, Pinal, and Maricopa tri-county area.

In selecting the Yellow Corridor Alternative, FRA considered the information and analysis contained in the Draft Tier 1 EIS dated September 2015 and the Final Tier 1 EIS dated December 2016. FRA also considered comments from agencies, tribes, and the public received during the scoping process and the public comment period for the Draft Tier 1 EIS.

Routing options will be considered at Tier 2 to address stakeholder input.

The Yellow Corridor Alternative follows existing ADOT and/or UP ROW including the UP Phoenix Subdivision's Southeast Branch. FRA considers a passenger rail system within the Yellow Corridor Alternative more cost efficient and better performing than a passenger rail system within the Orange Corridor Alternative.

Routing options will be evaluated at Tier 2 through Tempe using a portion of the Orange Corridor Alternative to avoid or minimize the potential use of Section 4(f) resources and/or potential adverse effects to historic properties that are known to exist within the Yellow Corridor. There will also be optional routing evaluated at Tier 2 within Pinal County utilizing a portion of what was the Orange Corridor Alternative, should an alignment avoiding known cultural resources along the existing UP ROW or elsewhere within the 1-mile-wide corridor alternative not be feasible.

FRA prepared this Final EIS/ROD in accordance with the Council on Environmental Quality's (CEQ) regulations implementing NEPA (40 CFR parts 1500–1508) and FRA's Procedures for Considering Environmental Impacts (64 Federal Register (FR) 28545, May 26, 1999). Specifically, this ROD:

- provides background on the NEPA process leading to the publication of the Final Tier 1 EIS, including a summary of public involvement and agency coordination;
- states and reaffirms the study's Purpose and Need;
- identifies the alternatives considered by FRA in making a decision at the Tier 1 level;
- identifies the Selected Corridor Alternative;
- summarizes the environmental benefits and adverse effects of constructing and operating a passenger rail facility within the Selected Corridor Alternative;
- summarizes the comments received on the Draft Tier 1 EIS;
- discusses the measures to minimize environmental harm, and the future evaluations required for Tier 2 studies; and
- presents the FRA decision, determination, and findings on the study and identifies and discusses the factors that were balanced by FRA in making its decision.

The APRCS builds on statewide and regional planning efforts and initiatives investigating alternative approaches to implementing passenger rail service between Tucson and Phoenix, Arizona's two largest cities.

ROD.2 NEPA Process

The Tier 1 NEPA process for the APRCS began formally in October 2011 when FRA published the Notice of Intent to prepare an EIS. Milestones for the EIS are shown in **Table ROD-1**.

Table ROD-1. Milestones in the NEPA Process for the APRCS

Milestone	Date
Notice of Intent published in the Federal Register	October 6, 2011
Public Scoping Meetings	October 7 through November 1, 2011
Public Scoping Comment Period	October 6 through November 14, 2011
Agency Scoping Meeting	October 11, 2011
Draft EIS (DEIS) Notice of Availability published in the Federal Register	September 11, 2015
Public Hearings on the DEIS	September 15, 16, and 17, 2015
DEIS Comment Period	September 11 through October 30, 2015
ROD/Final EIS (FEIS) Notice published in the Federal Register	Winter 2016/2017

The Draft Tier 1 EIS presented: the purpose and need for a passenger rail facility between Tucson and Phoenix; the range of corridor alternatives and the alternatives screening for these corridors; the existing environmental setting; potential adverse and beneficial effects from construction and operation of a passenger rail facility; and potential measures to avoid, minimize, or mitigate potential adverse environmental effects.

ADOT and FRA developed a range of corridor alternatives with the goals of serving key population and activity centers, maximizing potential ridership, minimizing environmental impacts, and being cost effective. An iterative planning and outreach process identified potential routes which are documented in an Alternatives Analysis (AA) report published October 7, 2014 and found in the *Alternatives Analysis Appendix*. Each alternative route underwent multidisciplinary consideration, leading to a set of corridor alternatives. FRA and ADOT examined two corridor alternatives, in addition to a No Build Alternative, in the Draft Tier 1 EIS.

The Tier 1 EIS examined the potential impacts on the environment that could reasonably be anticipated from construction and operation of a future passenger rail system within two 1-mile-wide corridor alternatives, as well as the effects of the No Build Alternative. The tiered analysis used existing, readily available data to establish baseline conditions, often reporting ranges of impacts that could prevail, without reference to a specific alignment or project. To

give the public a full view of the potential impacts of the alternatives, the EIS reported worst-case assessments in some cases.

The Final EIS and ROD identifies programmatic and policy-driven mitigation measures, including measures to avoid sensitive resources during project siting, comply with air and noise emission standards, commit to regulatory requirements such as the Uniform Relocation Assistance and Real Property Acquisition Policies Act, and implement Best Management Practices. More specific mitigation measures will be identified and refined during project-level analysis. This ROD identifies the general types of potential mitigation measures that ADOT and FRA will carry forward in Tier 2 analysis. If funds are available, a detailed analysis will take place and be reported in subsequent Tier 2 NEPA documents for the segments selected for advancement.

ROD.3 Purpose and Need

The purpose of implementing passenger rail transportation between Tucson and Phoenix is to help meet future travel demand in the Study Area (Pima, Pinal, and Maricopa counties). State and regional planning initiatives have recommended implementing passenger rail to add travel capacity to what is already offered by highways. Having an additional travel mode for the trip between Tucson and Phoenix could enhance highway safety and reduce air pollutant emissions by removing automobiles from already congested highways. ADOT's 2010 Statewide Rail Framework Study and subsequent State Rail Plan identify a passenger rail vision linking southern and northern Arizona. The APRCS is the first phase in the proposed implementation of the State Rail Plan, linking Arizona's largest metro areas of Tucson and Phoenix. Such a line could connect intermediate locations within the region and be the starting point for later rail connections to other regions of the Southwest and beyond.

The purpose of proposed passenger rail service in Arizona includes:

a) Providing transportation alternatives to the automobile and reduce the congestion growth rate

b) Increasing access to existing and planned employment and activity centers

c) Supporting reliable travel times and safe travel in an increasingly congested region that currently affords few transportation alternatives to the automobile

d) Connecting the suburban and rural areas between Tucson and Phoenix

e) Facilitating continued development of a comprehensive, multimodal, and interconnected regional and multi-regional transportation network that provides mobility choices for existing and future needs and allows connectivity to systems beyond the Tucson-Phoenix corridor

Need for Passenger Rail Service

The need for passenger rail service between Tucson and Phoenix is driven by increasing travel demand from population growth and changing demographics along the Study Corridor, as well as the need for alternative modes of travel. In recent decades, population and employment within the Study Area have increased. With only 17 percent of Arizona's land in private ownership, most of the state's developable land is located between the Tucson and Phoenix metropolitan areas and is projected to develop as a continuous urban corridor between these two cities.

The need for proposed passenger rail service (see Final Tier 1 EIS Section 1.1) in Arizona includes:

- Need for Commuter Travel (see Final Tier 1 EIS Section 1.1.1)
- Need for Intercity Travel (see Final Tier 1 EIS Section 1.1.2)
- Need for Improved Connectivity within the Region and Beyond (see Final Tier 1 EIS Section 1.1.3)

ROD.4 Alternatives

The AA report, developed as part of the APRCS, documents the assessment of transportation opportunities that led to the selection of the corridor alternatives evaluated in the Draft Tier 1 EIS. The AA identified all reasonable connections between Tucson and Phoenix and initially considered all available transportation modes. In keeping with the Purpose and Need, automobile travel was eliminated from further consideration because it is not projected to fully satisfy anticipated demand, and does not satisfy the identified need for this study. Expanding existing bus services was deemed to have the same limitations as autos and life cycle costs indicated a higher cost in operation and maintenance in the long term; consequently, this alternative was also eliminated from further consideration. FRA and ADOT determined that air travel was not competitive in terms of time or cost and could not effectively serve destinations between the Tucson and Phoenix hubs. This left passenger rail and dedicated bus rapid transit (BRT) as the primary modal choices to be refined through further analysis.

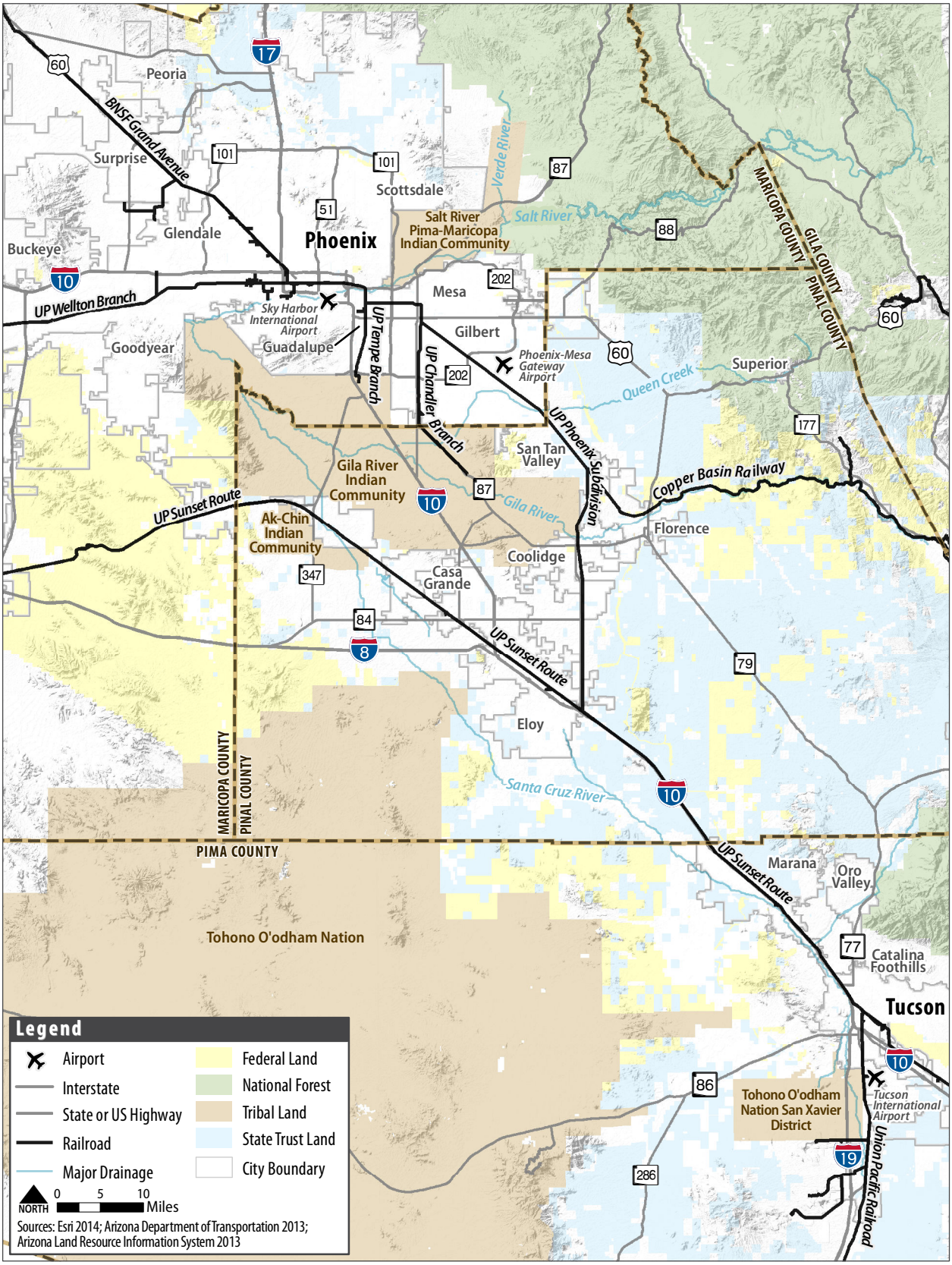
The potential alignment and routing options between Tucson and Phoenix were screened based on broad assessments of land use compatibility, effect on the environment, travel markets, and estimated cost. The Level 1 screening criteria established a tiered ranking of these performance measurements and included input from the public, agencies, and professionals with pertinent expertise.

Within the selected alternative, optional routings will be considered in Tier 2 studies as potential solutions to address stakeholder input based on a high-level viability assessment. A routing option through Tempe using a portion of the Orange Corridor Alternative could be used to avoid or minimize the potential use of Section 4(f) resources and/or potential adverse effects to historic properties. An optional routing in Pinal County could use a portion of what was the Orange Corridor Alternative should an alignment along existing UP ROW or elsewhere within the 1-mile-wide corridor alternative not be feasible.

Alternatives deemed most viable by the initial analysis served population centers between the Tucson and Phoenix hub locations with a relatively direct route (i.e., minimal or no reverse direction travel). The initial screening analysis showed that from over 150 possible route alternatives, seven conceptual alternatives were most effective in terms of service, travel time, generalized cost (based on distance), accessibility, stakeholder and public input, and potential environmental effects. All seven conceptual alternatives follow either existing transportation corridors or the planned North-South Corridor in Pinal County to allow opportunities for construction on previously developed land. **Figure ROD-1** shows existing railroads within the study corridor. The seven conceptual alternatives are briefly described below:

- **Blue –** BRT alternative along I-10 in dedicated lanes. The BRT Alternative was eliminated during second-level screening as it did not meet the Purpose and Need, being subject to the same external factors on I-10 as automobile traffic (i.e., temporary shutdowns due to weather and accidents), despite having dedicated lanes. In addition, the Blue Alternative was least popular among the public based on submitted comments and survey results. High-level operating cost estimates also indicated that operation and maintenance costs for bus service will be much greater in the long term than for a rail alternative, while having substantially lower passenger capacity.
- **Green –** A rail alternative connecting Tucson and Phoenix along I-10 and the UP Tempe Branch. This alternative initially emerged from the Level 2 screening as a final alternative; however, it was eliminated from further consideration in a third round of screening. While this alternative was the shortest in distance and projected travel time, it had less potential ridership and would serve fewer population centers compared with other alternatives. The Green Alternative also assumed future widening of the existing I-10 roadway, and would require additional ADOT easements through tribal land. Further development of the alternative and coordination during the course of the AA process raised uncertainties about the widening and its effect on tribal resources.

Figure ROD-1. Existing Railroads within the Study Corridor



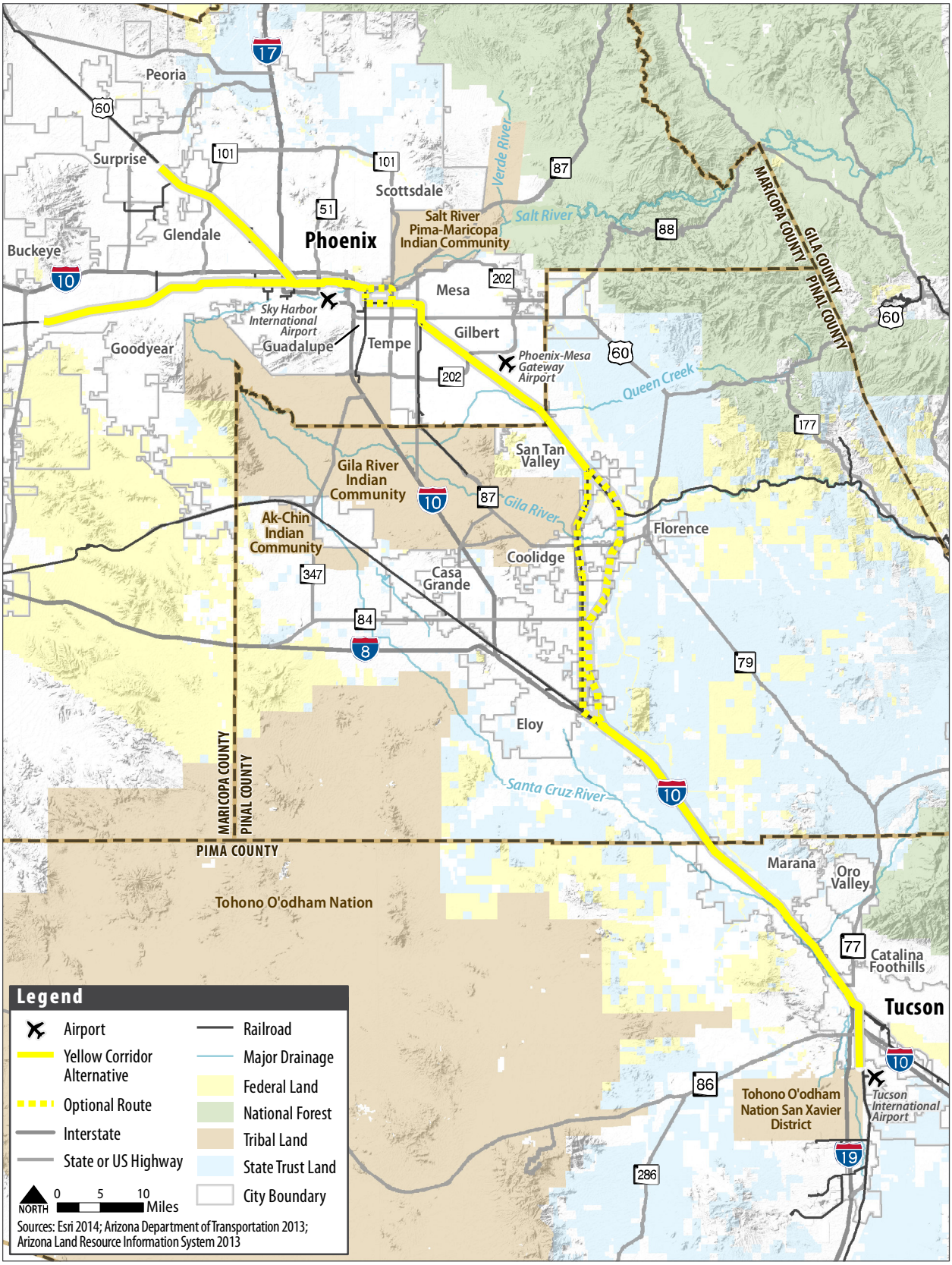
Through coordination with the Gila River Indian Community (GRIC), complementary transit connections to the tribal community would be included with any selected APRCS corridor alternative.

- **Orange –** A rail alternative along I-10, the planned North-South Corridor, a designated transit corridor in the proposed Superstition Vistas master-planned community, and the US 60 Superstition Freeway. This alternative was advanced as one of the corridor alternatives analyzed in the Draft Tier 1 EIS.
- **Teal –** A rail alternative along I-10, the planned North-South Corridor, the UP Phoenix Subdivision's Southeast Branch, and Rittenhouse Road. Essentially a hybrid of the Yellow and Orange Alternatives, the Teal Alternative could serve as an option should conflicts arise with the selected corridor alternative. Analyses of the Teal Alternative in the Tier 1 EIS were covered under the evaluation of the Yellow and Orange corridor alternatives.
- **Yellow –** A rail alternative initially planned to follow UP ROW, including the Phoenix Subdivision's Southeast Branch. The alternative was later redefined as running within ADOT ROW where I-10 parallels the UP Sunset Route. This alternative was advanced as one of the corridor alternatives analyzed in the Draft Tier 1 EIS. ADOT recommended this alternative for locating passenger rail between Tucson and Phoenix, and FRA has approved the recommendation of this alternative.
- **Purple –** A rail alternative along I-10 from Tucson, turning north through the GRIC north of Casa Grande to join the UP Chandler Branch into Phoenix. The portion of the alternative through GRIC would require a new easement and presented potential impacts to Tribal land and cultural and historic resources, so this alternative was eliminated from further consideration in a third round of screening.
- **Red –** A rail alternative along I-10 from Tucson continuing along the Maricopa-Casa Grande Highway into the City of Maricopa, then following State Route (SR) 347 to the UP Tempe Branch into Phoenix, this alternative traveled over a longer distance than other alternatives, served fewer population centers, and had potential impacts on the GRIC similar to the Purple Alternative. Also, the public preference for this alternative was very low. It was therefore eliminated from further consideration.

The Tier 1 Draft EIS evaluated the alternatives at a corridor level, with the intent of providing a basis for identifying high-level impacts and understanding system performance. The Orange and Yellow alternatives were treated as 1-mile-wide corridor alternatives in the Draft Tier 1 EIS, reserving environmental evaluation of specific alignments within the corridors for future study phases. **Figure ROD-2** shows the selected Yellow Corridor Alternative with corridor options described in Section 7.3 of the Final Tier 1 Environmental Impact Statement.

The No Build Alternative assumes that existing, planned, and programmed projects within the study corridor would occur. There are no state funded planned initiatives for Intercity

Figure ROD-2. Selected Corridor Alternative



Passenger Rail, Commuter Rail or Bus Rapid Transit to connect the three-county Study area. This alternative also includes all transportation facilities and services programmed for implementation within the three-county Study Area, including transit, roadway, and highway improvements identified in the Transportation Improvement Programs (TIPs) of Maricopa Association of Governments (MAG), Central Arizona Governments (CAG), the Sun Corridor Metropolitan Planning Organization (SCMPO), and the Pima Association of Governments (PAG), as well as other significant improvements in various stages of planning, design, or construction.

ROD.5 Selection of the Preferred Alternative

Based on the analysis conducted and findings reported in the Tier 1 EIS regarding environmental impacts, overall estimated costs, projected ridership, and agency and public input, FRA has selected the Yellow Corridor Alternative recommended by ADOT, with routing options, as the location of further study to implement a future Tucson-to-Phoenix passenger rail system.

Environmentally Preferred Alternative

The selected preferred alternative also is the environmentally preferred alternative, pursuant to CEQ 1505.2(b), for implementation of a future Tucson-to-Phoenix passenger rail system. The Yellow Corridor Alternative is environmentally preferred because it has lower impacts to wildlife corridors and wildlife linkages; fewer visual, aesthetic and scenic resource impacts; and fewer water resources including floodplains, rivers, washes, arroyos and potential wetlands. FRA also considers a passenger rail system within the Yellow Corridor Alternative more cost efficient and better performing than a passenger rail system within the Orange Corridor Alternative.

Table ROD-2 compares potential environmental impacts of the two corridor alternatives analyzed with the No Build Alternative.

Table ROD-2. Comparison of Environmental Criteria

Criterion	Yellow Corridor	Orange Corridor	No Build
Potential need for conversion of non-transportation land uses	Moderate	Moderate to High	N/A
Compatibility with local plans	Compatible	Moderately Incompatible	Compatible
Compatibility with underlying property ownership	Moderately Incompatible	Compatible	Compatible
Compatibility of station areas[a]	Compatible	Moderately Incompatible	N/A

Table ROD-2. Comparison of Environmental Criteria

Criterion	Yellow Corridor	Orange Corridor	No Build
Existing population within station area district[b]	851,713	717,329	N/A
Existing employment within station area district[b]	796,426	726,212	N/A
Future population within station area district[b]	1,188,103	1,027,518	N/A
Future employment within station area district[b]	1,036,490	939,520	N/A
Existing minority population within station area district[b]	481,916	404,114	N/A
Existing low-income population within station area district[b]	296,018	265,145	N/A
Parks[c] (200-foot ROW corridor)	151 (21)	146[d] (20)	N/A
Daily reduction in NO_X emissions (STOPS)[d] (kg.)	516	519	[e]
Daily reduction in CO emissions (STOPS) (kg.)	9,507	9,563	[e]
Daily reduction in VOC emissions (STOPS) (kg.)	340	342	[e]
Daily reduction in PM_{10} emissions (STOPS) (kg.)	6	6	[e]
Daily reduction in CO_2 emissions (STOPS) (kg.)	242,072	243,504	
Daily reduction in SO_2 emissions (STOPS) (kg.)	2.39	2.40	
Potential noise receptors[c] (within 1,800-foot sensitivity distance)	51,260 (39,450)	50,094 (34,155)	N/A
Potential vibration impact receptors	4,925	2,325	N/A
Hazardous materials sites	1,511	1,142	[f]
Rivers, washes, or arroyos (linear feet)	1,480,187	1,910,872	[f]
Potential wetlands (acres)	1,032	1,476	[f]
100-year Floodplain (acres)	9,330	9,876	[f]
Wildlife corridors	20	26	[f]
Wildlife linkage zones crossed (miles)	20.3	32.93	[f]
Annual reduction in gasoline usage (gallons)	3,037,000	3,058,000	[e]
Visual, aesthetic, and scenic resource impacts	Minimal to Moderate	Moderate to High	Minimal
Known archaeological resources	372	418	[f]
Historic resources listed on the National Register of Historic Places	158	126[d]	[f]

[a] Conceptual station areas at major intersections or activity centers; not specific sites
[b] A 3-mile radius surrounding each conceptual station area
[c] Potentially affected parks and noise receptors were estimated for narrower corridors in addition to the mile-wide corridor numbers; the estimated number in the narrower corridor appears in parentheses directly beneath the quantity for the mile-wide corridor.
[d] Routing options using segments of the Orange Corridor Alternative could avoid impacts to specific resources.
[e] Likely increases in pollutant emissions and gasoline usage from increased vehicular congestion not calculated for this Tier 1 analysis
[f] Potential impacts from other reasonably foreseeable projects are not calculated for this Tier 1 analysis

CO = Carbon Monoxide kg. = kilograms VOC = Volatile Organic Compounds

ROD.6 Public and Agency Coordination

Public involvement efforts for the study began with project kickoff in March 2011. Agencies, nongovernmental groups, and the public were engaged throughout the federal environmental review process for the APRCS.

To comply with Executive Order 12898, community demographics and socioeconomic impacts were considered in analyzing the alternatives, and the public participation process was designed to ensure "full and fair participation by potentially affected communities" throughout the duration of the study. Public outreach to minority and low-income populations was accommodated by hosting multiple public meetings in diverse locations and advertising the meetings in locations and through media that targets these populations. In addition, ADOT and FRA took numerous proactive steps to meet with and coordinate with the tribes and hold outreach activities at tribal fairs and public events.

All meetings were held in accessible facilities in compliance with the Americans with Disabilities Act (ADA). Every effort was made to respond to members of the public who require a sign language interpreter, an assistive learning system, a translator, or any other accommodations to facilitate participation in the planning process.

Opportunities for public comment and information sharing have been ongoing using ADOT's project website and through a network of agencies and public contacts established for this study.

Lead, Cooperating, and Participating Agencies

FRA was the lead federal agency for the EIS. ADOT is the local sponsoring agency and in 2009 received $2 million – $1 million plus a $1 million state match – through FRA's Capital Assistance to States – Intercity Passenger Rail Service Program, to prepare a Service Development Plan and the required environmental study. In addition to funding for these two studies, ADOT received $4,331,250 in 2011 through FTA's New Starts program funds ($3,465,000 federal in an 80%-20% state match), to conduct an Alternatives Analysis under FTA guidelines. No FRA funding is committed to final design or construction activities.

FTA and FHWA are cooperating agencies on this study because of the project's potential effects on urban transit services, interstate and state highway ROWs, and planned transportation facilities. No other cooperating agencies were designated during the development of the Draft EIS; however, other federal agencies, including the National Park Service and Arizona State Land Department, have indicated an interest in becoming cooperating agencies in Tier 2 NEPA studies if alternatives are proposed on or near land administered by these agencies.

Public Outreach Techniques

Because of the 120-mile length of the study corridor, major emphasis was placed on electronic communication and scheduled public participation events to maximize participation. Information on ADOT website and distributed at public events (including county fairs, festivals, on college campuses, etc.) has included meeting announcements, brochures, media releases, fact sheets, and surveys that helped indicate public preferences throughout AA and Tier 1 EIS development. ADOT held corridor-wide community status updates with the public and with federal, state, and local agencies as alternatives were refined and as ADOT and FRA removed alternatives from further study.

Government and Other Stakeholder Coordination

Sixty-two federal, state, regional, and local government agencies interested in the project were invited to serve as participating agencies, in addition to the Ak-Chin, Gila River, and Salt River Pima-Maricopa Indian Communities. Agencies that accepted this role provided input to scoping, purpose and need development, and identification of potential effects.

Government agencies throughout the corridor were actively engaged in the APRCS, including opportunities to be participating or cooperating agencies in the study process. FRA and ADOT solicited stakeholder feedback through direct contact with elected officials, government agencies and stakeholders, interested organizations, and community groups.

Public Scoping

FRA published the Notice of Intent for this study in the Federal Register on October 6, 2011. ADOT and FRA also relied on media releases, social media communication, and e-mail distribution, social media distribution, and media coverage to encourage interested stakeholders and the public to participate in the scoping process.

Seven legal and display advertisements announced scoping open houses and events in local and regional newspapers between September and October 2011. Video and print media formed a primary element of public participation. A two-minute video, booklet, and 12-question survey were made available in DVD and hard copy, as well as online.

ADOT held 12 scoping events (four in each study county) between October 7 and November 1, 2011. A total of 141 people registered attendance at the 12 scoping events, and hundreds more stopped by ADOT booths at community events and spoke with study team members. The public comment period for scoping ended on November 14, 2011.

Between October 7 and November 14, 2011, the study team received 2,784 scoping survey responses along with 291 additional comments submitted that did not follow the survey

format. In general, comments reflected a need for an additional transportation option between Tucson and Phoenix and a preference for rail. Respondents indicated that if they had a viable alternative to traveling by automobile via I-10, they would likely make the trip more frequently.

The primary themes identified from the responses, listed in **Table ROD-3**, helped the project team analyze the data.

Table ROD-3. Public Scoping Comment Themes

Comment Category	# Unique Comments	% of Total Unique Comments
Financial Feasibility	1,199	8%
Operational Characteristics	1,841	13%
Safety and Security	1,720	12%
Mobility	6,858	48%
Environment	1,858	13%
Economy	742	5%

Slightly over 6 percent of the comments received indicated opposition to the concept of passenger rail between Tucson and Phoenix. The majority of the opposed comments cited:

- The perceived need for higher taxes to fund the project;
- The existence of better uses for taxpayer dollars; and
- The need to fix problems on I-10 before building something that the commenters believed is not an absolute necessity.

Agency Scoping

In addition to public scoping, ADOT and FRA also directly engaged federal, state, and local agencies. ADOT distributed 111 invitations to state and local agencies as well as to Tribes on October 4, 2011 for an agency scoping meeting on October 11, 2011. Attached to the meeting invitations was a meeting agenda, study segment map, description of the segment areas, schedule of study milestones, comment form, and a state map showing the three-county Study Area.

A total of 66 agency representatives attended the meeting in person, and 34 participated via webinar.

Additional Outreach

Public and stakeholder involvement extended beyond scoping and continued throughout the study. Two additional phases of extensive stakeholder and public outreach occurred while ADOT and FRA prepared the AA. This outreach occurred in fall of 2012 and spring of 2014 at public venues in conjunction with scheduled events in communities within the corridor. Input from these efforts helped to narrow the range of alternatives considered during the evaluation process from the approximately 150 possible original routes to seven, and eventually to the final two corridor alternatives evaluated in the Draft Tier 1 EIS. Having over 10,000 project preference surveys completed by members of the public during the development of the AA led to a better understanding of what individuals believe is important and which alternatives best meet those expectations.

Draft EIS Public Hearings

As part of the NEPA process, FRA and ADOT circulated the Draft Tier 1 EIS for a 50-day public review and comment period. During this period, the document was made available to interested and concerned parties, including residents, property owners, community groups, the business community, elected officials, and public agencies.

FRA and ADOT also held a series of formal public hearings during this 50-day period, with one hearing in each county of the study corridor. The purpose of the hearings was to give interested parties an opportunity to formally comment on the study and the Draft Tier 1 EIS analysis. Attendance at the hearings did not require participant to comment in-person. Responses to comments are incorporated in an appendix to the attached Final Tier 1 EIS.

ROD.7 Transportation Impacts

ADOT coordinated with local agencies to obtain readily available long-range transportation plans within the study corridor. Major existing and planned transportation facilities for each transportation mode were identified, including locations with substantial existing levels of congestion.

The concept for rail service within the Yellow Corridor Alternative assumes train operation at speeds between 80 and 125 mph and a blend of intercity and commuter operations. Service assumptions were developed to estimate ridership as well as the effect of resulting changes in vehicle miles traveled (VMT) on safety, energy use, and air quality. Ridership approximations were based on a passenger rail system built on hypothetical alignments used in the AA. A future alignment along one of the corridor options included in the selected Yellow Corridor Alternative may have different impacts and will need to be reevaluated in Tier 2 studies.

Modeling software developed by FTA was used to estimate ridership for each corridor alternative. Travel times and service frequencies were developed for each corridor alternative. Operating in an intercity pattern (i.e., stopping only at hub and regional stations), a passenger rail system in either corridor alternative was estimated to complete a Tucson-to-Phoenix trip in approximately 1 hour and 23 minutes. In a commuter pattern (stopping at every station), a passenger rail system within the corridor alternatives could complete the Tucson-to-Phoenix run in an estimated 2 hours and 10 minutes.

Projected automobile trip times between Tucson and Phoenix estimated for the No Build Alternative are compared to estimated passenger rail travel times for each corridor alternative in **Table ROD-4** below.

Table ROD-4. Estimated Rail and Auto Travel Times between Tucson and Phoenix

	Yellow Corridor Rail Alternative (Hrs:Min)	Orange Corridor Rail Alternative (Hrs:Min)	No Build Alternative (Auto Travel) (Hrs:Min)
2010			1:53
2035	1:23 (Intercity)	1:30 (Intercity)	2:22
2050	1:23 (Intercity)	1:30 (Intercity)	2:59

Ridership was estimated using a new FTA forecasting model called STOPS (Simplified Trips-on-Project Software). “Unlinked” trips are all the component segments of a transit trip identified separately (i.e., a transfer from one bus route to another represents two unlinked trips), while “linked” trips count the entire trip from beginning to end as a single trip. This information is shown quantitatively in **Table ROD-5**.

Table ROD-5.Year 2035 Tucson-Phoenix Commuter and Intercity Trip Demand

	Yellow Corridor Alternative	Orange Corridor Alternative	No Build Alternative
Unlinked transit trips	476,000	475,000	451,000
Linked transit trips	343,000	343,000	324,000
Total Daily Rail Ridership	**20,060**	**18,080**	N/A
Intercity trips (>40 miles)	3,360	4,140	N/A
Commute trips (<40 miles)	16,700	13,940	N/A
Total by Service Type	**20,060**	**18,080**	
Daily VMT reduction	566,914	570,268	N/A
Daily VHT reduction	17,522	17,655	N/A

With a rail system in either corridor alternative, overall safety in the corridor could improve because passenger rail service will divert some automobile trips to an alternate mode of travel. The safety risk to travelers will decrease, as rail travel is statistically safer per passenger mile than auto travel, resulting in the improvements shown in **Table ROD-6**.

Specific station locations have not yet been determined for this Tier 1 analysis. As ridership forecasts are refined, station area concept plans will be developed to allow the determination of required parking, transit amenities, and vehicular circulation.

Table ROD-6.Safety Improvement (per 1,000,000 VMT in 2035)

	Yellow Corridor Alternative	Orange Corridor Alternative	No Build Alternative[a]
Annual fatality reduction	2.2	2.2	N/A
Annual injury reduction	33.2	33.4	N/A

Note: Assumes trains run 300 days a year.
[a] Potential increases in fatalities and injuries under the No Build Alternative were not estimated for this Tier 1 analysis.

Any impacts to adjacent properties resulting from station placement or configuration will be addressed during Tier 2 analysis.

Station Locations

The Tier 1 EIS does not identify specific station locations. Conceptual locations were included in the AA to provide a basis for corridor definition and ridership forecasting. Various station typologies were developed to provide context for station decision-making and local commitments; however, exact station locations will require more analysis and further agency and community input. Passenger stations and maintenance facilities will require their own NEPA evaluation during Tier 2 project development.

ROD.8 Summary of Potential Environmental Impacts

This section summarizes the potential impacts of implementing a passenger rail system in the Yellow Corridor Alternative based on the detailed analysis of the social, economic, and environmental resources documented in **Chapter 5** of the Final Tier 1 EIS. The potential impacts associated with each resource are listed in **Table ROD-7**.

ADOT and FRA conducted analysis for this Study for one-mile wide corridors; however, future construction activities will occur within a railroad ROW ranging from 66 to 400 feet wide. While alignment boundaries developed for Tier 2 analysis will initially address an area wider than the ultimate ROW required, to allow flexibility for avoiding environmentally sensitive areas, reducing costs, and addressing engineering constraints, the Tier 2 analysis will analyze an area less than the one-mile wide corridor. More in-depth environmental analysis, as well as coordination and consultation with state and federal agencies (e.g., State Historic Preservation Office, US Fish and Wildlife Service (USFWS)) on specific resource areas will be undertaken once alignment boundaries are more firmly established and funding has been allotted. During Tier 2, FRA and ADOT will develop a specific project alignment utilizing input from engineers, transit demand planners, and government agencies, as well as environmental data.

Resources Not Analyzed in the Tier 1 EIS

The following environmental resources are usually examined in an EIS but were not analyzed in this Tier 1 EIS because they are not found within the study corridor.

- Wild and Scenic Rivers
- Navigable Rivers
- Outstanding Arizona Waters
- Landmarks

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Land Use	• Impacts on land use, primarily on residential and agricultural	• Minor impacts, compared to the Yellow Corridor Alternative
Potential Mitigation	• The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and the Civil Rights Act of 1964 govern displacements and relocations. • Further engagement with local government entities and the public in the process of selecting specific locations for rail facilities such as rail stations to minimize the potential for land use conflicts.	
Socioeconomics	• Potential loss of jobs due to displacement • Potential adverse impacts to established neighborhoods and protected populations • Economic benefits provided through job creation, improved accessibility, and increased economic activity	• Impacts to socioeconomic conditions associated with anticipated increases in highway congestion • Economic benefits provided through jobs associated with planned and programmed projects not associated with passenger rail service
Potential Mitigation	• Coordination with local job placement agencies will help mitigate the impacts of potential job loss associated with displacement. • Adverse impacts on the elderly and people with disabilities will be mitigated by compliance with the Americans with Disabilities Act (ADA). • Further strategies to avoid, minimize, or mitigate potential impacts on socioeconomic conditions (neighborhoods, community facilities, businesses, employment) will be considered in the design process.	
Environmental Justice	• Beneficial economic and mobility impacts • Potential impacts on protected populations in areas with concentrations of minority, low-income, and elderly residents	• No disproportionately high and adverse impacts

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Potential Mitigation	• Actively involving Environmental Justice (EJ) populations in the decision-making process during Tier 2 could help avoid, minimize, or mitigate disproportionately high and adverse health or environmental effects of the rail system on protected populations. • Public engagement will aid planners in preventing the denial of, reduction in, or significant delay in the receipt of benefits by EJ populations in accordance with Executive Order 12898.	
Public Health and Safety	• Potential construction-related injuries • Potential noise and air quality impacts associated with construction activities • Potential conflicts with vehicular and pedestrian traffic where rail traffic is increased or newly introduced • Potential improvements to grade crossings and signals if aligned near UP • Potential reduction in highway injuries	• No improvements to public health and safety that will be associated with passenger rail service
Potential Mitigation	• FRA's High Speed Passenger Rail Safety Strategy (FRA 2009) offers best management practice (BMP) guidance for the design and construction of a passenger rail system and should be considered for implementation, as necessary and practicable such as: • Prior to the start of construction, develop a Health, Safety, Security, and Environment Plan to address health and safety risks and requirements, safe work practices, worker training, dust control, use and storage of potentially hazardous materials, emergency response, implementation of safety procedures, incident investigation and reporting, and related topics. • Where practical, consolidate public and private grade crossings along the route. Eliminate redundant and/or unsafe crossings (due to proximity of exiting road intersections, skewed geometry, etc.) where alternate access can be reasonably provided. • For at-grade crossings, especially within and on the fringe of populated areas, install the most sophisticated traffic control/warning device appropriate for the location, such as median barriers, special signage, flashing lights, four-quadrant gates, etc. In general, private crossings should be treated the same as public crossings.	

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
	• When feasible, close private crossings within industrial developments and rural areas with a prevalence of heavy trucks and farm equipment. If private crossings cannot be closed, consider provision of a locking device when not in use. • Upgrade existing train traffic control systems to ensure safe interactions between existing rail facilities and traffic and between new rail facilities and traffic. • Clear trees and brush, as needed, to provide necessary sight distances for safe operation of the rail system. • Implement measures to suppress fugitive dust during construction. • Whenever possible, take measures to minimize noise related to construction. • Use active warning systems for pedestrians where rail lines cross existing sidewalks, trails, and bike routes, particularly when crossings are near parks, schools, and other activity centers. • Prepare road users for the challenges inherent at future crossings through educational and public outreach programs. Inform the public that passenger trains travel at significantly higher speeds than the freight trains currently operating in portions of the corridor alternatives and that relying exclusively on visual and/or audible cues to judge the arrival of trains can be extremely dangerous. • Evaluate if Quiet Zones applicable to UP freight operations should be extended to passenger rail operations where the Yellow Corridor Alternative intersects the Tempe Quiet Zone and where both corridor alternatives pass through the existing Phoenix Downtown Quiet Zone. • Evaluate the need for and, where warranted, install additional security improvements such as extra lighting, surveillance cameras, and other security measures at train stations. • Ensure that any future construction, operations, and maintenance of a passenger rail system meet the Occupational Health and Safety Act of 1970, FRA safety requirements, the ADA, the Resource Conservation and Recovery Act requirements, and other requirements to help protect the safety and health of workers and the public. • Tier 2 NEPA studies will address safety measures and strategies to protect the health and safety of passengers, motorists, and pedestrians at grade crossings.	

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Parklands and Recreation Areas	• Corridor intersects and has potential impacts to: ▪ 99 parks ▪ 45 public recreation areas ▪ 7 private parks and recreation areas	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned.
Potential Mitigation	• Mitigation measures will be developed in consultation with the official with jurisdiction over the resource and might include avoiding Section 4(f) and 6(f) resources or minimizing the acreage of a physical take of these properties during alignment planning and design, selecting rail station locations that avoid public parks; Moving equipment and facilities to another location within existing parkland, Purchase of similar properties; Planting vegetation to offset removed vegetation and/or establish visual and auditory screening.	
Section 4(f) and Section 6(f) Properties[1]	• Corridor intersects and has potential impacts to Section 4(f) properties[1] that include: ▪ 144 parks and recreation areas ▪ 165 historic properties ▪ 66 schools[2] ▪ 11 refuges ▪ 29 Section 6(f) Resources	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned.

[1] Resources include those within a 0.25-mile buffer around each corridor alternative to account for Section 4(f) resources that could be subject to potential constructive use impacts (e.g., noise and visual impacts) that may extend beyond the corridor boundaries.

[2] Athletic fields or other recreational facilities at schools must be publicly available to qualify for Section 4(f) protection. Availability of school recreational facilities will be determined during Tier 2.

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Potential Mitigation	• In conjunction with the Tier 2 NEPA documents, Section 4(f) resources will be confirmed within 0.25 mile of the project footprint. Additionally, the project team will evaluate the design to determine where it is possible and practical to avoid or minimize impacts. • Unless exceptions for de minimis Section 4(f) impact findings are applicable, a feasible and prudent alternative that avoids resources protected under Section 4(f) must be selected. If two or more alternatives affect Section 4(f) lands, the one causing the least relative harm to Section 4(f) resources must be selected. • Where impacts on Section 4(f) resources cannot be avoided, all possible planning must be completed to minimize impacts. • Mitigation measures for direct or constructive use of Section 4(f) resources will be determined, to the extent required, in consultation with the agency owning or administering the resource. • Minimization of harm could include alternative designs and/or mitigation measures that compensate for residual impacts. • Section 6(f) lands will be avoided to the extent practicable. • Impacts on Section 6(f) Land and Water Conservation Fund lands could include replacement property of equal fair market value and of reasonably equivalent usefulness for recreation purposes.	
Air Quality	• Potential air quality impacts associated with construction activities • Expected reduction in Vehicle Miles Traveled (VMT) and air pollutant emissions	• Expected increase in VMT and air pollutant emissions compared to Yellow Corridor Alternative because no passenger rail system would be built
Potential Mitigation	• Short-term construction-related impacts can be mitigated using construction Best Management Practices (BMPs) such as providing clearly marked detour routes for vehicles and pedestrians such that access to adjacent land use is maintained during construction. Other construction BMPs include minimizing fugitive dust; reducing idling of construction vehicles and equipment; and communicating the construction schedule to public officials, emergency service providers, and other affected stakeholders.	

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
	• In Tier 2, mitigation will be investigated to reduce emissions of criteria pollutants (particulate matter, ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead) to include using cleaner alternative fuels and implementing idling restrictions for construction equipment and locomotives. Conformity analysis modeling may be required to verify these findings. • FRA-funded projects follow the Environmental Protection Agency's (EPA) General Conformity Regulation; FTA-funded projects follow EPA's Transportation Conformity Regulation.	
Noise and Vibration	• Potential noise impacts associated with construction activities • Estimated 51,260 sensitive residential land uses were identified at Tier 1. Actual number of sensitive receptors will be identified and evaluated for potential noise and vibration effects in Tier 2 once an alignment within the corridor is established. • Greatest potential for noise will be at grade crossings where train horn is sounded for safety • Potential for vibration impacts associated with passage through developed landscape	• No impacts related to a passenger rail system, but ongoing and increasing noise within I-10 corridor from volume of automobile traffic
Potential Mitigation	• During Tier 2, measures to mitigate noise and ground-borne vibration will be evaluated. • Evaluate if future Quiet Zone implementations are applicable to UP freight operations, that should be extended to passenger rail operations where the Yellow Corridor Alternative intersects the Tempe Quiet Zone and where both corridor alternatives pass through the existing Phoenix Downtown Quiet Zone.	

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
	• Adhere to established design specifications for rail vehicles and infrastructure because the specifications were developed to minimize the potential for added noise from project implementation. • Noise mitigation measures at Tier 2 may include and are not limited to: vehicle and equipment design standards, use of resilient or damped wheels, track turning radii greater than 1,000 feet, rail lubrication, sound barriers, acquisition of buffer zones, ballast on at-grade aerial guideways. Additional measures can be and are not limited to: sound-damping devices on vehicles and equipment, regular maintenance such as wheel truing and rail grinding, minimum turning radii, sound barriers, buffer zones, acquisition of affected properties, and insulation. • Other noise mitigation options include design and location of track turnouts and crossovers, modifications to track support systems and affected buildings, adjustments to vibration transmission paths such as barrier trenches, reduced train speeds, and minimizing train operations at night. • Options to further reduce ground borne vibration at Tier 2 include: vehicle modifications to provide a soft primary suspension, minimum metal-to-metal contact of moving parts, and perfectly round smooth wheels; track support system modifications that soften the connection between tracks and their support structure. • Operational changes during Project implementation may include reduced train speeds, use of lowest vibration equipment and minimizing train operations at night.	
Hazardous Materials	• Corridor intersects with and potentially impacts or will be affected by 1,511 hazardous material facilities	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned. • Added highway congestion could increase traffic accidents and related fuel and other spills
Potential Mitigation	• Potential impacts on or from National Priority List (NPL) Superfund and other sites will be further evaluated in Tier 2 to determine level of risk and potential mitigation procedures.	

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
	These include safety procedures and protection of human health and the environment to help ensure no further contamination of adjacent sites and to provide a safe working environment during construction. • Solid waste materials generated during construction could be recycled or will be disposed of properly. • During individual Tier 2 NEPA studies, a site management plan will be prepared before construction to address known or potential hazardous material issues, including but not limited to: Measures to identify and address potentially contaminated soil and groundwater, as necessary or required; measures to identify and address lead-based paint and asbestos-containing materials including handling and disposal, as necessary or required. • A site-specific health and safety plan will be developed for Tier 2 NEPA studies, prior to construction including measures to protect construction workers and general public and procedures to protect workers and the general public in the event that unknown contamination or buried hazards are encountered.	
Geology, Topography, Soils, and Prime and Unique Farmland	• Corridor intersects with and potentially impacts: ▪ 17,000 acres in subsidence areas ▪ 235 fissures ▪ 77,000 acres of prime and unique farmlands	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned.

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Potential Mitigation	• During Tier 2, coordination will take place with the Natural Resources Conservation Service (NRCS). Form NRCS-CPA-106, Farmland Conversion Impact Rating for Corridor Type Projects, will be required at project level, to determine if farmland impacts warrant consideration of farmland protection measures. • Conservation measures and potential mitigation will be identified based on the Project assessment conducted during Tier 2 analysis; however, a number of BMPs and other measures to mitigate for effects can be anticipated. These include and are not limited to at Tier 2: Avoid steep slopes and known bedrock outcrops; minimize areas of new ground disturbance for access to construction areas by using existing roads where possible; avoid areas of known ground subsidence and fissures, when feasible develop and implement dust control and erosion control strategies; stockpile topsoil for use in reclamation; and develop and implement a reclamation and revegetation plan to minimize soil losses.	
Biological Resources	• Potential noise, habitat loss, and connectivity impacts on protected species and suitable habitat within corridor alternative • Medium impact to habitats and wildlife estimated by Arizona Game and Fish Department (AGFD)	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned.
Potential Mitigation	• Avoid impacts, when possible, particularly to protected and sensitive species and their associated habitat, and to wildlife corridors. • Coordinate with USFWS and AGFD during Tier 2 Section 7 consultation with USFWS will take place to determine a project's potential to affect a federally listed species and, if so, to what extent. Mitigation measures will also be determined as part of the consultation. • Assess impacts on state-listed species during Tier 2. If these should occur, ADOT and FRA will coordinate with AGFD in determining potential mitigation measures. • Standard ADOT environmental commitments will be implemented during Tier 2 to address and minimize edge effects through: the use of existing infrastructure; monitoring of adjacent habitats for change; and the development of adaptive management	

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
	strategies for toxins, invasive species, and habitat conversion. • Methods to minimize loss of habitat that will be considered during Tier 2include providing construction workers with environmental awareness training; maximizing the use of disturbed lands and minimizing habitat fragmentation; minimizing construction impacts by limiting the disturbance zone as much as possible; using previously disturbed areas for staging and equipment storage; flagging or fencing sensitive habitats such as riparian areas or wetlands to prevent construction impacts from occurring within the area; and transplanting displaced vegetation to adjacent lands, when feasible. • Methods to minimize impacts to plant and animal species that will be considered during Tier 2 include notifying the Arizona Department of Agriculture of the removal of protected native plants so plants may be salvaged; implementing seasonal restrictions on the removal of vegetation to protect nesting birds; implementing seasonal restrictions on the disturbance of sensitive wildlife areas; conducting preconstruction surveys for nesting birds prior to the removal of vegetation if ground clearing occurs during the nesting season; conducting preconstruction surveys for removal and translocation of Sonoran desert tortoise and western burrowing owl; providing wildlife escape options in open trenches and inspect trenches to remove wildlife prior to filling; checking under vehicles for wildlife seeking shade (especially reptiles, including the desert tortoise) before driving. • Methods to minimize impacts to wildlife movement corridors that will be considered during Tier 2 include refining identified wildlife linkage corridors, movement corridors, and habitat blocks to reflect current state of knowledge; supporting studies to better understand the movement of mule deer and bighorn sheep in association with a passenger rail system within the corridor alternatives; supporting studies to better understand the movement and habitat use of Sonoran desert tortoise and Tucson shovel-nosed snake in association with a passenger rail system within the corridor alternatives; Not compromising the function of existing wildlife movement corridors or large habitat blocks; Design sufficient wildlife crossing structures to facilitate movement of large and small species of wildlife across the landscape, including appropriate funnel fencing associated with crossing areas, and appropriate ROW fencing to allow for, or restrict as necessary, wildlife movement; Locate crossing structures to enhance wildlife crossing of the existing transportation corridors associated with a passenger rail system; Provide for follow-through studies to assess the effectiveness of the wildlife crossing structures. • For Tier 2 projects, suggested ways to control the spread of nonnative and invasive species is to: Develop a Habitat Restoration Plan for all temporary impacts to native vegetation and provide it to land management/resource agencies for review prior to project construction; Address and minimize edge effects through: the use of existing infrastructure; monitoring of adjacent habitats for change; and the development of adaptive management strategies for toxins, invasive species, and habitat conversion; Prepare a site restoration plan identifying techniques, timing, and success criteria; Wash vehicles and equipment	

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
	to avoid potential transport of nonnative seed to construction areas; Rehabilitate disturbed ground as soon as possible following construction activities to minimize exposure of bare ground susceptible to colonization by nonnative plants; Use chemical or mechanical treatments on existing infestation areas within construction zones to prevent additional spread; Restore sites with native seed mixes certified as "weed free."	
Waters of the United States	• Impacts to four major crossings of Waters of the US • Likely to require Clean Water Act permitting	• Highway runoff pollutants could increase from increased traffic • No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned.
Potential Mitigation	• Impacts on waterways and waterbodies will be addressed in more detail during Tier 2. • During design, coordination will take place with the US Army Corps of Engineers (Corps) and appropriate state agencies to develop mitigation strategies including: A jurisdictional delineation will be undertaken during Tier 2 to identify which washes will be recommended as Waters of the US and thus subject to Section 404 permitting and Section 401 certification. Quantification of new, permanent impacts to Waters of the US and permit materials will be completed based on final design of the rail line, major structures, utility work, and other associated construction. Any mitigation measures included by the Corps in their permit verification letter(s) must be included in the construction documents. • Mitigation identified at Tier 2 in consultation with the appropriate permitting agencies could include in-lieu fees, and vegetation or habitat restoration.	
Wetlands	• Corridor intersects with and potentially will likely affect 1,030 wetland acres, 550 of these acres are likely jurisdictional wetlands	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned.

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Potential Mitigation	• During Tier 2, wetlands will be reviewed to determine where it is possible and practical to avoid or minimize impacts, using pilings or bridges or through other measures. If a Section 404 Individual Permit is required, the permit application must include documentation of an alternatives selection process and efforts to avoid and minimize impacts to wetlands. Mitigation options for unavoidable impacts will be discussed in more detail and could include in-lieu fees and onsite or offsite permittee-responsible mitigation. • During design, ADOT and FRA will coordinate with the Corps and appropriate state resource agencies to develop mitigation strategies.	
Water Quality	• Upper Santa Cruz & Avra Basin Sole Source Aquifer, 1 wastewater treatment plant, 24 named washes, 1,030 wetland acres, 1,791 well sites potentially affected • Arizona Pollutant Discharge Elimination System (AZPDES) permit and Storm Water Pollution Prevention Plan (SWPPP) required	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned. • Highway runoff pollutants could increase from increased traffic

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
• **Potential Mitigation**	• Construction General Permits will be obtained prior to construction and will be addressed as required mitigation as part of the Tier 2 analysis to verify that stormwater discharges associated with construction of a future passenger rail system are authorized. • Best Management Practices (BMPs) for the SWPPPs will be confirmed in Tier 2. • The required Water Quality Certifications will be addressed prior to any work in jurisdictional waters. Mitigation for impacts on mapped or unmapped wells, including proper abandonment (such as plugging and sealing) to prevent groundwater pollution will also be addressed. No work shall occur within jurisdictional Waters of the US until the appropriate Clean Water Act Section 401 certification and 404 permits are obtained. • For Tier 2 projects, consideration of secondary containment at rail maintenance yards where petroleum-based products may be stored or used and at rail station parking lots to control stormwater runoff to minimize the risk of contaminating surface and groundwater, particularly within the boundaries of the sole source aquifer. • The following standard specifications also may be included as mitigation measures: ADOT's Standard Specifications for Road and Bridge Construction, Section 104 Scope of Work, Subsection 09 Prevention of Landscape Defacement; Protection of Streams, Lakes, and Reservoirs (2008 Edition) • During construction, the construction contractor shall take sufficient precautions, considering various conditions, to prevent pollution of streams, lakes, and reservoirs with fuels, oils, bitumens, calcium chloride, fresh Portland cement, fresh Portland cement concrete, raw sewage, muddy water, chemicals or other harmful materials. None of these materials shall be discharged into any channels leading to such streams, lakes, or reservoirs. The contractor shall give special attention to the effect of its operations upon the landscape and shall take special care to maintain natural surroundings undamaged.	

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Floodplains	• 9,330 acres of the mile-wide corridor are within the 100-year floodplain	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned.
Potential Mitigation	• At Tier 2 during the design phase flood control districts with jurisdiction will be provided the opportunity to review and comment on the design plans to ensure flood district requirements are met and that structures will not cause flood-related erosion hazards or aggravate existing flood hazards. • After construction at Tier 2, all work sites and fills will be removed and the affected areas returned to former elevations. • Floodplain modifications may require a Letter of Map Revision (LOMR) to account for changes to areas that may be subject to floods. • Other mitigation measures could include restoring natural floodplain values by seeding with native vegetation and proper design of bridges and culverts to prevent flood flow restriction. • Specific mitigation measures will be identified during Tier 2 and implemented prior to construction.	
Energy Use and Climate Change	Annually: • 142 million fewer VMT • 66,710 fewer tons of carbon dioxide (CO_2) emissions • 3.04 million fewer gallons of fuel consumption	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned. • VMT in the three-county Study Area expected to increase substantially with population growth and the 142 million VMT savings projected with the Yellow Corridor Alternative would not occur

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Potential Mitigation	• Mitigation may not be required for energy and climate change because diverting trips from other modes of transportation will be beneficial, lowering the overall generation of CO_2 emissions. Further reduction of GHG emissions could be expected by employing BMPs associated with construction (e.g., conserving fuel and reducing GHG emissions during construction activities) and/or operations (e.g., improving fuel efficiency of locomotives, fueling with low-carbon footprint sources, etc.). Any efforts to increase displacement of riders from light vehicles (private automobiles/trucks) to rail (e.g., advertising, incentives) could be developed into project design or set up as additional mitigation. • Specific measures that can be incorporated into project design or developed at Tier 2 as mitigation measures during operation include identifying state-of-the-art locomotives to maximize fuel efficiency; target-marketing to drivers of single-occupancy vehicles to maximize the effects of rail modal use on energy conservation and reduction of GHG emissions; concentrating bus-service routes to feed passengers to train stations; and bringing dispersed riders to train stations through other methods (e.g., demand response systems [paratransit, taxi, shuttle, call-and-ride]). • Specific measures that can be incorporated into project design or developed at Tier 2 as mitigation measures during construction include limiting construction and operational equipment idling; encouraging workers to carpool; locating staging areas near work sites; and scheduling material deliveries during off-peak hours to minimize highway congestion.	
Visual and Aesthetic Scenic Resources	• Southern hub to Eloy: Minimal to moderate physical visual impacts Eloy to northern hub: Variable physical visual impacts, depending on location	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned.

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Potential Mitigation	• Through continued public involvement during Tier 2, residents' concerns about potential views will be identified. The mitigation at Tier 2 will not only address adverse visual impacts identified from the design but will also address concerns from the viewing audience identified during the public involvement process. • Mitigation considered at Tier 2 will include restoring vegetation on areas disturbed during project construction; screening objectionable views of railroad facilities next to sensitive viewers such as residents or next to landmarks, cultural resources, or recreation areas; applying context-sensitive design to new or reconstructed rail stations that respects scenic resources in adjacent urban or natural surroundings; developing structure aesthetics to soften adverse visual changes for adjacent residents and other sensitive viewers; where appropriate, applying landscape design to blend new rail facilities into their surroundings; where the project would change the visual quality of existing landforms, shaping cut-and-fill slopes and revegetate to blend into the surrounding landscape; designing new lighting to direct light to focus on where it is needed, minimize light intruding onto adjacent properties, and reduce light pollution of the night sky; where appropriate, providing light screening to shield adjacent sensitive viewers from the headlights of passing trains and rail facility lighting; minimizing nighttime construction lighting next to residents and other sensitive viewers; and screening staging areas where construction equipment and materials are stored.	
Cultural Resources	• Potential to impact cultural resources based on the following inventory within the mile-wide corridor ▪ 372 known archaeological resources ▪ 158 resources listed on the National Register of Historic Places ▪ Casa Grande National Monument (further environmental studies required)	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned.

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Potential Mitigation	• Municipalities or counties north of Eloy may require avoidance of certain archaeological sites because of established conservation or land use plans (e.g., Historic Homes of Phoenix: An Architecture & Preservation Guide, Pinal County Comprehensive Land Use Plan). • Casa Grande Ruins National Monument is one of the most prominent cultural resources within the state. The monument should be avoided and close coordination with tribal communities and National Park Service should occur with regard to proximity of the passenger rail system and monument boundaries. • If the alignment of a future passenger rail system resulted in an adverse effect to a property that is listed or eligible for listing on the National Register of Historic Places, potential mitigation measures could include additional research to recover data or exhaust the information potential of a site, changes in project design, development of a Programmatic Agreement (PA), Memorandum of Agreement (MOA), or other options that may result from Section 106 consultation. • Specific mitigation measures could include a PA or an MOA with a public involvement component, archaeological data recovery, archaeological treatment plans, historic buildings surveys, and historic engineering record documentation. • Consultation with all consulting parties over potentially affected properties will be key to developing a passenger rail system during Tier 2. As the study proceeds to a Tier 2 project-level NEPA process, avoidance of these properties and mitigation of potential visual and audible impacts will be considered.	

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Unavoidable Adverse Impacts / Irreversible and Irretrievable Commitment of Resources	• ROW may require conversion of substantial amounts of prime and unique farmland • Substantial commitments of construction materials, financial resources, and energy consumption • Financial resources will be committed for Tier 2 NEPA documentation, project design, construction, operation, and maintenance. These financial resources would no longer be available for other projects. • During Tier 2 analyses, a more complete review of the design and the specific alignment for a passenger rail system will be conducted, which may further refine the nature of or potential quantity of resources that may be irreversibly and irretrievably committed for implementation of a passenger rail system.	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned. • Expected increase in VMT and air pollutant emissions because no passenger rail system would be built • Energy consumption could be higher as VMT continues to increase
Short-Term Uses vs. Long-Term Productivity	• Short-term construction impacts, including benefit of construction employment and economic activity • Long-term benefits and productivity of passenger rail transportation and regional socioeconomic systems, reduced energy use, and reduction in air pollutant emissions	• No impacts related to a passenger rail system, as there are no such infrastructure programs currently planned. • Minimal improvement in transportation network • Less efficient transportation system • Increased highway congestion • Longer travel times

Table ROD-7. Potential Environmental Impacts Analyzed In the Tier 1 EIS and Potential Mitigation

Resource Topic	Yellow Corridor Alternative	No Build Alternative
Indirect and Cumulative Impacts	• Reduced traffic congestion and pollutant emissions • Reduced ridership of existing transportation modes • Increased chance of hazardous material incidents and water pollution • Transit-oriented development near stations	• Expected increase in vehicular traffic congestion and energy consumption, and decrease in air quality
Potential Mitigation	• Specific mitigation measures for unavoidable adverse impacts, irreversible/irretrievable commitment of resources, short-term use of resources, and indirect and cumulative impacts, to the extent required, will be discussed in Tier 2 NEPA documents as specific impacts are identified.	

Environmental Impacts

Table ROD-7 summarizes the potential for impacts, assessed at a Tier 1 level, of constructing and operating a passenger rail system in the Yellow Corridor Alternative based on existing conditions corridor-wide, as compared to the potential impacts of the No Build Alternative.

Project Commitments

The Final Tier 1 EIS identifies potential mitigation measures for each relevant environmental resource that could be used in Tier 2, and future funded planning and construction phases, in **Chapter 5, Existing Conditions and Environmental Consequences**. During Tier 1, the project sponsor has committed to continue consultation with the public, public jurisdictions, regulatory agencies, and tribes to identify the need for specific mitigation measures to be developed during Tier 2 for implementation during construction and operation of a passenger rail system. As a result, all practicable means to avoid or minimize environmental harm from the selected alternative have not been adopted at this stage of project development.

Potential Mitigation

In the Tier 1 EIS, many of the mitigation measures represent commitments to further coordinate with the public, resource and regulatory agencies, and tribes during Tier 2 studies and project development. **Table ROD-7** introduces types of mitigation to address impacts to resources that will potentially result from implementation of a passenger rail system within the Yellow Corridor Alternative. Site-specific mitigation measures will be identified and discussed during Tier 2 analysis after design details are known, recorded in NEPA documents as specific impacts are identified, and implemented at the appropriate phase of project delivery.

Mitigation Planning

Because Tier 1 studies do not involve project implementation, most mitigation measures suggest the types of measures that will be more fully developed during Tier 2 studies. Some activities in Tier 1, such as public outreach, were conducted in accordance with the programmatic and policy-based mitigation that will be continued should funding become available to proceed with Tier 2 studies. The efforts to inventory the types of resources that occur within the mile-wide corridors provide data that will be used to established opportunities and constraints in the development of Tier 2 alternative alignments to avoid sensitive resources and minimize impacts.

Specific impact mitigation to be developed include wetland mitigation, construction timing restrictions, stormwater pollution and prevention plans, implementation of BMPs, and documentation of historic structures and other properties. Site-specific mitigation at Tier 2 will be identified in consultation with federal or state regulatory agencies with jurisdiction over a

given resource. As needed, formal consultation will occur with resource agencies to address obligations to minimize and mitigate impacts (e.g., formal consultation under Section 7 of the Endangered Species Act). Tier 2 environmental reviews will also require analysis under Section 4(f) of the Department of Transportation Act and Section 6(f) of the Land and Water Conservation Act and will include appropriate mitigation, if needed.

Comparison of Alternatives

As described above, ADOT and FRA completed a multidisciplinary evaluation of alternatives as part of the APRCS. The AA involved conceptual engineering of possible alternative alignments at a level appropriate for cost estimating, scheduling, operational analyses, and community involvement. The AA process resulted in a range of alternatives that were narrowed through multiple screenings to identify the alternatives evaluated in the FRA-led EIS for the Study. The findings of the AA are reported along with corridor-level analysis of potential environmental impacts to compare the potential performance and impacts of a passenger rail system within each corridor alternative with the No Build Alternative.

A passenger rail system within the Yellow Corridor Alternative will provide shorter trip times to a larger total number of riders, with reductions in injuries and fatalities over the No Build Alternative similar to those for a passenger rail system within the Orange Corridor Alternative.

The No Build Alternative will not incur any of these costs, but it will not meet the identified purpose and need for an alternate transportation mode between Tucson and Phoenix.

Of the corridor alternatives considered, a passenger rail system within the Yellow Corridor Alternative is more compatible with existing local plans; serves a larger population; and potentially affects slightly fewer natural resources, sensitive noise receptors, viewers, and known archaeological (prehistoric) resources. However, at the Tier 1 level of analysis, the potential to affect known historic resources, hazardous materials, and parks appears to be slightly greater with the Yellow Corridor Alternative compared to a passenger rail system with the Orange Corridor Alternative, because the Yellow Corridor passes through more developed urban areas. Also at the Tier 1 level of analysis, the potential to affect known water resources, wildlife corridors, and potential species habitat appears greater with the Orange Corridor Alternative.

Although serving a smaller existing population, a passenger rail system within the Orange Corridor Alternative has a slightly greater potential to reduce gasoline consumption and criteria pollutant emissions than a passenger rail system within the Yellow Corridor Alternative because of the denser future land use patterns that would result from transit service promoting shorter trips, walking and cycling, and reduced car use and ownership. Compared to the No Build

Alternative, a passenger rail system within either corridor alternative offers increased access to transit for protected populations and economic generators as well as improved air quality and energy consumption.

Comparison Summary and Preferred Alternative

Potential impacts to the community and other environmental resources; financial feasibility, ease of implementation, and operating characteristics; and mobility and safety are compared in **Table ROD-8.** Evaluating the overall estimated costs, projected ridership, and potential environmental impacts associated with implementing passenger rail within one of the corridor alternatives, FRA considers a passenger rail system within the Yellow Corridor Alternative more cost efficient and better performing than a passenger rail system within the Orange Corridor Alternative. FRA also finds that the potential impacts to the environment for each corridor alternative will likely be similar. Therefore, ADOT recommended and FRA has selected the Yellow Corridor Alternative with corridor options as the selected alternative.

Table ROD-8. Comparison of Community and Environmental Criteria

Criterion	Yellow Corridor	Orange Corridor	No Build
Potential need for conversion of non-transportation land uses	Moderate	Moderate to High	N/A
Compatibility with local plans	Compatible	Moderately Incompatible	Compatible
Compatibility with underlying property ownership	Moderately Incompatible	Compatible	Compatible
Compatibility of station areas[a]	Compatible	Moderately Incompatible	N/A
Existing population within station area district[b]	851,713	717,329	N/A
Existing employment within station area district[b]	796,426	726,212	N/A
Future population within station area district[b]	1,188,103	1,027,518	N/A
Future employment within station area district[b]	1,036,490	939,520	N/A
Existing minority population within station area district[b]	481,916	404,114	N/A
Existing low-income population within station area district[b]	296,018	265,145	N/A
Parks[c] (200-foot ROW corridor)	151 (21)	146 (20)	N/A
Daily reduction in NO_X emissions (STOPS)[d] (kg.)	516	519	[e]
Daily reduction in CO emissions (STOPS) (kg.)	9,507	9,563	[e]
Daily reduction in VOC emissions (STOPS) (kg.)	340	342	[e]
Daily reduction in PM_{10} emissions (STOPS) (kg.)	6	6	[e]
Daily reduction in CO_2 emissions (STOPS) (kg.)	242,072	243,504	
Daily reduction in SO_2 emissions (STOPS) (kg.)	2.39	2.40	

Table ROD-8. Comparison of Community and Environmental Criteria

Criterion	Yellow Corridor	Orange Corridor	No Build
Potential noise receptors[c] (within 1,800-foot sensitivity distance)	51,260 (39,450)	50,094 (34,155)	N/A
Potential vibration impact receptors	4,925	2,325	N/A
Hazardous materials sites	1,511	1,142	[f]
Rivers, washes, or arroyos (linear feet)	1,480,187	1,910,872	[f]
Potential wetlands (acres)	1,032	1,476	[f]
100-year Floodplain (acres)	9,330	9,876	[f]
Wildlife corridors	20	26	[f]
Wildlife linkage zones crossed (miles)	20.3	32.93	[f]
Annual reduction in gasoline usage (gallons)	3,037,000	3,058,000	[e]
Visual, aesthetic, and scenic resource impacts	Minimal to Moderate	Moderate to High	Minimal
Known archaeological resources	372	418	[f]
Historic resources listed on the National Register of Historic Places	158	126	[f]
Annual operating cost for commuter rail portion of service (2013 dollars)	$67.0 Million	$86.0 Million	$0
Capital cost (2013 dollars)	$4.5 Billion	$7.6 Billion	$0
Annual operating cost per commuter rail passenger (2013 dollars)	$10.37	$15.99	$0
Annual operating cost per intercity rail passenger (2013 dollars)	$14.73	$15.38	$0
Right-of-Way cost (2013 dollars)	$144.9 Million	$62.1 Million	$0
Ease of Implementation	Moderate	Low	N/A
Predictability and Dependability	Moderate	High	Low
Urban stations (conceptual)	14	12	0
Rural stations (conceptual)	1	3	0
Daily commuter ridership	16,700	13,940	0
Daily intercity ridership	3,360	4,140	0
Reduction in automobile VMT (STOPS)	566,914	570,268	0
Transit and pedestrian connectivity[g]	D	C	F
Tucson to Phoenix commuter rail travel time (hours:minutes)	1:35	1:45	N/A
Tucson to Phoenix intercity rail travel time (hours:minutes)	1:23	1:30	2:22[h]

Table ROD-8. Comparison of Community and Environmental Criteria

Criterion	Yellow Corridor	Orange Corridor	No Build
Estimated at-grade crossings[i]	112	55	0[j]
2035 reduction in fatalities per million VMT (STOPS)	2.2	2.2	0[k]
2035 reduction in injuries per million VMT (STOPS)	33.2	33.4	0[k]

[a] Conceptual station areas at major intersections or activity centers; not specific sites
[b] A 3-mile radius surrounding each conceptual station area
[c] Potentially affected parks and noise receptors were estimated for narrower corridors in addition to the mile-wide corridor numbers; the estimated number in the narrower corridor appears in parentheses directly beneath the quantity for the mile-wide corridor.
[d] Simplified Trips-on-Project Software (STOPS) is a ridership modeling program utilized by FTA
[e] Likely increases in pollutant emissions and gasoline usage from increased vehicular congestion not calculated for this Tier 1 analysis
[f] Potential impacts from other reasonably foreseeable projects are not calculated for this Tier 1 analysis
[g] Graded on an A-F scale with "A" offering the greatest number of transit and pedestrian connections, and "F" the lowest number of connections
[h] Year 2035 Baseline. Travel time by automobile using I-10
[i] At-grade crossings inferred based on ADOT rail crossing database and aerial photography review
[j] Via I-10
[k] Zero reduction in fatalities and injuries; potential increases from traffic congestion not calculated for this Tier 1 analysis
CO = Carbon Monoxide kg. = kilograms VOC = Volatile Organic Compounds

Airport Connections

Throughout the development of the Arizona Passenger Rail Corridor Study Draft Tier 1 EIS corridor analyses, the public and stakeholder agencies identified airport access as an important consideration among their preferences as a feature of future passenger rail service.

All three major airports in the study corridor – Tucson International Airport (TUS), Phoenix-Mesa Gateway Airport (AZA), and Sky Harbor International Airport (PHX) – could have connections to a future passenger rail line, but a detailed evaluation of specific alignments, impacts, or other implications of how these connections will be accomplished was not a part of this study. These analyses will be undertaken as part of future studies. ADOT and FRA recommend studying passenger rail connectivity to TUS for future Tier 2 studies. As noted in the Draft Tier 1 EIS, ADOT anticipates that a passenger rail system between the Tucson and Phoenix metro areas will be funded incrementally, and that construction and operations will be implemented in phases. The specific phasing of a future passenger rail system is not known at this time but will be determined as funding is allocated and as part of Tier 2 NEPA review.

ROD.10 Next Steps

Tier 2 studies and NEPA documentation will need to occur before design and construction of any federally funded passenger rail facility can be completed. The additional analysis required for Tier 2 studies, NEPA documentation, and design needed to advance to the project level are described in this section.

Phased Implementation

ADOT anticipates that a passenger rail system will be incrementally funded and that construction and operation will be implemented in phases. Within the approximately 20-year planning horizon, ADOT will consider initial and successive phases through the interim implementation phase, which is the last phase that will be implemented using information from the existing Service Development Plan.

For example, funding can be initially allocated for improving existing facilities to support higher speeds, or improve/construct particular stations and maintenance and layover facilities on existing freight railroads. Traditional and potential alternative funding sources include USDOT grant programs, federal loan programs, public-private partnerships, and 100 percent privatization. Service could initially start with fewer stations and with fewer round trips. As additional funding becomes available, further construction could take place to expand service. No individual section of a passenger rail system has been identified for implementation, but the following proposed corridor sections, or any other functional configurations deemed viable, could be evaluated as logical, independent sections subject to available funding and the source of that funding. These corridor sections could also be combined, modified, or revisited in the future based on available funding. Chapter 8 of the Final EIS describes potential phases and strategies for implementation of passenger rail service. ADOT may modify these phases as it continues to develop an approach to implementation and in response to factors such as the availability of funding.

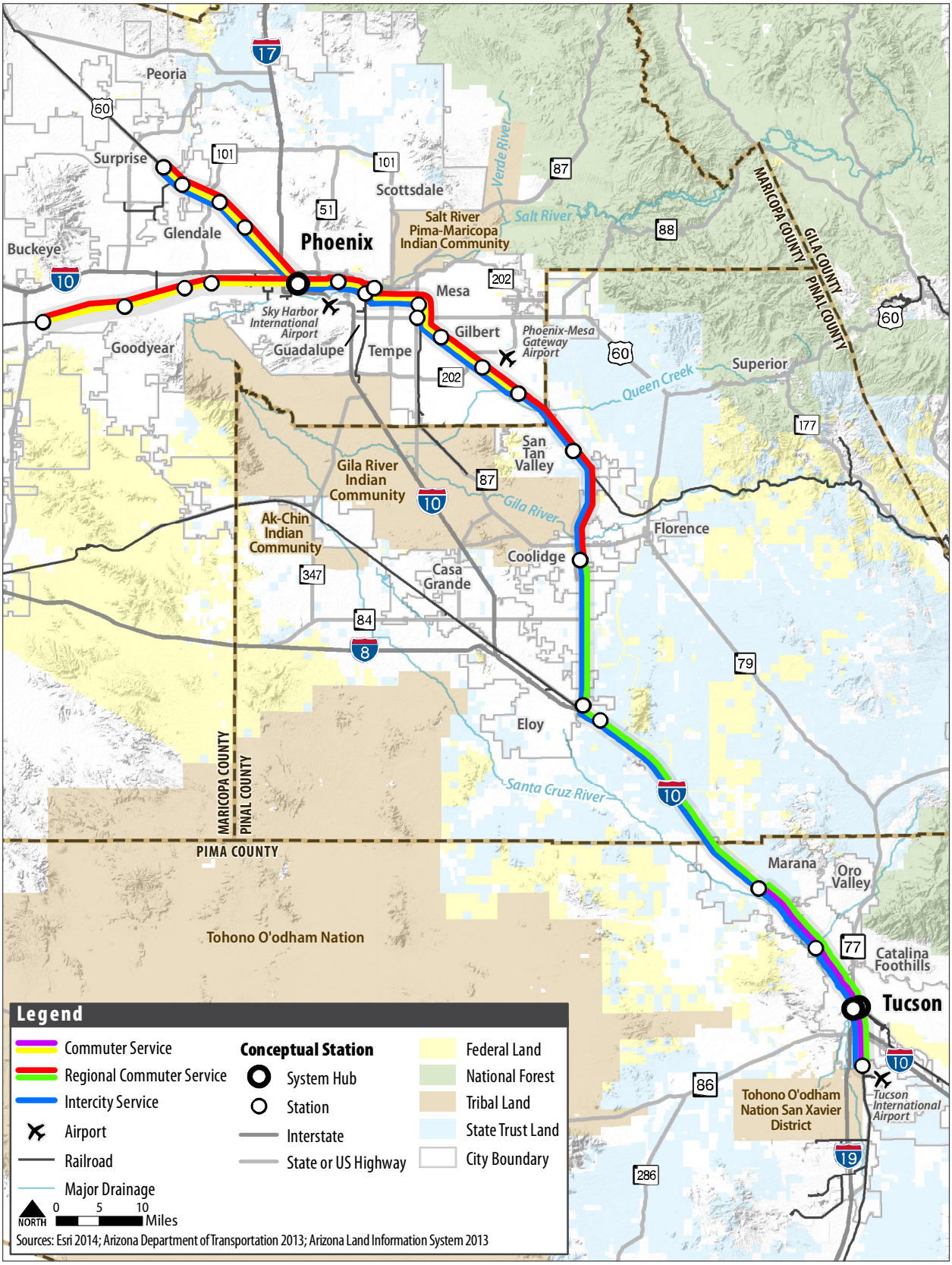
Tier 2 Operable Sections

If federal funding becomes available, Tier 2 studies and NEPA documentation will be advanced for logical operable sections of a passenger rail system. One or more operable sections of a future passenger rail system between Tucson and Phoenix could be developed as individual projects. A separate Tier 2 NEPA document will be prepared for each project identified; depending on the potential for impacts, this could be an EIS, an Environmental Assessment (EA), or a Categorical Exclusion (CE). Any such segment will be required to have independent utility, with or without construction of other segments. Preliminary design will be conducted to support Tier 2 studies and supply more detailed information necessary to identify specific resources affected by construction, and to what extent.

Coordination and outreach will occur during Tier 2 studies to engage the public more fully regarding a project's effects on individual properties and specific environmental resources, and issues such as the design of stations and other railroad facilities. Input from the outreach effort will be incorporated into the NEPA analysis and project design.

Figure ROD-3 shows the possible implementation phases.

Figure ROD-3. Possible Implementation Phases



Tier 2 Technical Studies

In addition to NEPA documentation, numerous technical studies will be completed as part of the Tier 2 process to acquire a more detailed understanding of the nature and magnitude of impacts. The analyses will consider avoidance of and minimization of impacts to sensitive environmental resources. For each Tier 2 section, the following studies and technical reports may be required:

- Detailed site-specific alternatives analyses
- Wetland delineations and identification of Clean Water Act Section 404 permitting requirements
- Cultural resource surveys and National Historic Preservation Act Section 106 consultation
- Threatened and endangered species or species of special status surveys
- Noise and vibration analysis
- Section 4(f) evaluation
- Section 6(f) evaluation
- Phase I Environmental Site Assessments
- Air emissions analysis in nonattainment areas
- Station-area traffic studies
- Engineering surveys

All final determinations on Section 4(f) resources, Section 106 consultation, Section 7 consultation, and wetlands and floodplains will be completed at the Tier 2 analysis stage.

Coordination with Other Studies

To ensure consistency in planning and provide alternative mode opportunities in future or expanding corridors being studied, the ongoing APRCS will continue to be developed as Tier 2, project-level documents in coordination with other transportation planning studies whenever possible and appropriate, including the Interstate 11 Tier 1 EIS between Nogales and Wickenburg, and the SR 410 Sonoran Corridor Tier 1 EIS between I-19 and I-10 south of TUS. In addition, AGFD has requested that ADOT coordinate the APRCS with their analysis of the North-South Corridor's potential impacts, and incorporate those results into the cumulative impacts analysis for this study.