



PASSENGER RAIL CORRIDOR STUDY
Tucson to Phoenix

Shaping the Vision

Public Participation Spring 2014



*Comments due
May 31,
2014*

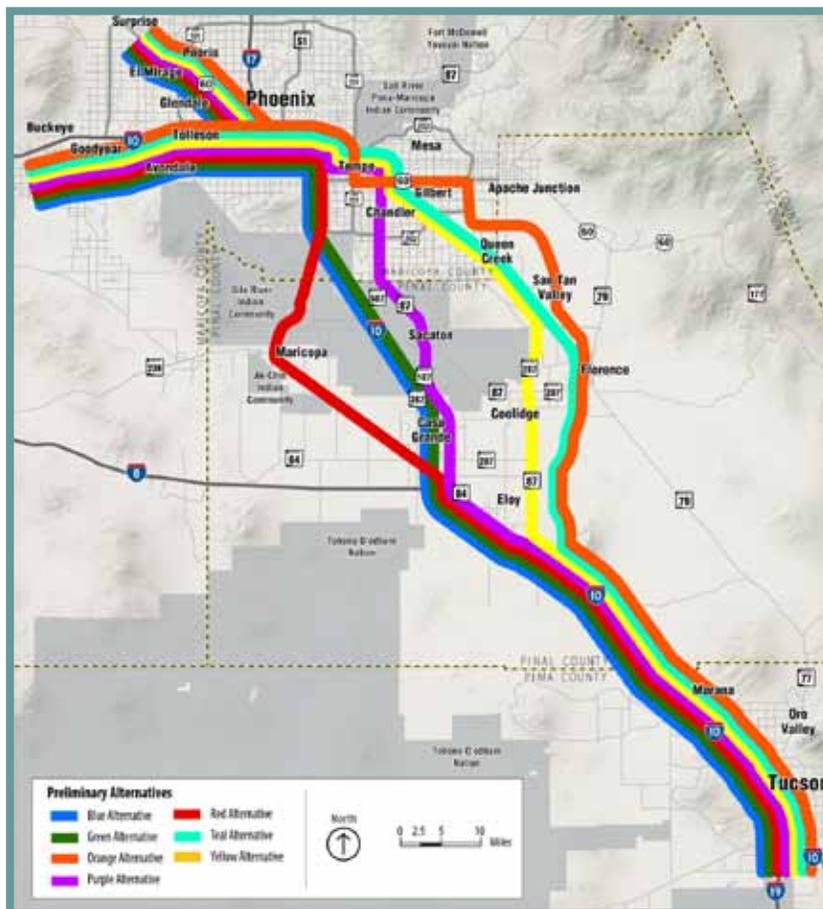


www.azdot.gov/passengerrail

Tucson and Phoenix are Arizona's largest metropolitan areas and they are connected by Interstate 10 (I-10). It is the most heavily traveled corridor in our state and it is reaching capacity. Previous studies have shown that I-10, even with additional lanes, is not sufficient to meet the future travel demand.

The Arizona Department of Transportation (ADOT) Passenger Rail Corridor Study; Tucson to Phoenix has narrowed down possible rail routes to three alternatives to potentially meet the need for future transportation options between Tucson and Phoenix.

Use this booklet for background information and then fill out a short survey to help Shape the Vision. See pages (10-15) to review and compare the three final alternatives.



In Fall 2012, you weighed in on seven potential alternative routes for the new passenger rail system, pictured to the left.

Arizona's Future:

**More People, More Jobs, More Travel.
Travel Options Move People.**

Arizona's population is projected to nearly double in the next 40 years. Rising from 6.2 million to 11.6 million, most of the increase will result from growth in the Sun Corridor, which encompasses Maricopa, Pinal, and Pima counties. The need for passenger rail is based on the anticipated travel patterns and growing congestion on the highway network. This is a result of population and job growth projections.

| County | 2010 Population (Employment) | 2050 Population (Employment) | % Change Population (% Change Employment) |
|-----------------|------------------------------|------------------------------|---|
| Pima | 956,000 (337,000) | 1.5 million (529,000) | 59% (57%) |
| Pinal | 350,000 (52,000) | 1.2 million (77,000) | 255% (49%) |
| Maricopa | 4 million (1.6 million) | 6.9 million (3.4 million) | 84% (115%) |

*based on locally adopted plans

*More People,
More Jobs*

| Origin and Destination (trip distance) | Travel Time (minutes) | | Percent Increase |
|---|-----------------------|-------------------|------------------|
| | 2010 ¹ | 2050 ² | |
| Apache Junction to Coolidge (45 miles) | 56 | 142 | 154% |
| Eloy to Phoenix-Mesa Gateway Airport (59 miles by way of I-10) | 63 | 167 | 165% |
| Phoenix to Marana (73 miles) | 64 | 220 | 244% |
| Marana to Tucson (24 miles) | 21 | 104 | 395% |
| Phoenix to Tucson (105 miles) | 95 | 324 | 241% |

¹ estimated driving time using Yahoo! Maps driving directions via I-10

² estimated using 2050 Arizona Statewide Travel Demand Model, including all planned improvements to I-10

*More Travel,
Longer Travel
Times*

Passenger Rail Service Comes into Focus

Arizonans want flexibility in use of a future passenger rail service – it's not just about getting between Tucson and Phoenix, but also moving from place to place along the way. The concept of a “blended service” would provide a **local and express service** that would operate on the same tracks but at different times of the day. Local service would be intended for moving around the corridor, while an express option would focus on providing more direct service with fewer stops and faster travel times.

Building Communities

Train stations are vibrant community gathering places. The study team met with several communities throughout the study area to talk about what it takes to build a successful station. Communities want a mix of commercial and residential development, the ability to walk and bike to and from the station, parking, and plenty of options for traveling to your final destination once you depart the train. The image below is a rendering of what a potential station could look like in local communities.



Station area rendering of passenger rail station with the ability to connect to other forms of transportation to final destination. Mixed use development would surround stations to support vibrant communities.

Building Ridership

Building rail infrastructure is only as valuable as the riders who use the system. As part of this study, ridership numbers are forecasted based on several inputs including anticipated population growth, development, and employment areas. The table below shows the anticipated ridership for rail between Tucson and Phoenix as well as other established services around the country.

Preliminary Annual Corridor Ridership Range

| System | Ridership per year | Length (in miles) | Riders per Mile |
|---|------------------------|-------------------|-----------------|
| Tucson to Phoenix Preliminary Ridership Range Intercity and Commuter (2035) | 3,000,000 to 5,000,000 | 120 | 41,667 |
| Existing Primarily Commuter Service | | | |
| Sound Transit Sounder (Everett - Lakewood) | 2,800,000 | 82 | 34,146 |
| DART - Trinity Railroad Express (Dallas - Ft. Worth) | 2,423,100 | 34 | 71,268 |
| UTA Frontrunner (Pleasant View - Provo) | 3,581,100 | 89 | 40,237 |
| San Diego Coaster (Oceanside - San Diego) | 1,600,000 | 41 | 39,024 |
| Existing Primarily Intercity Service | | | |
| NM Railrunner Express (Belen - Albuquerque - Santa Fe) | 1,191,654 | 97 | 12,285 |
| Amtrak - Capitol Corridor (San Jose - Oakland to Sacramento - Auburn) | 1,746,397 | 168 | 10,395 |
| Amtrak - Surf Line (San Diego - LA - San Luis Obispo) | 2,640,342 | 350 | 7,544 |
| Amtrak - Hiawatha (Milwaukee - Chicago) | 838,355 | 86 | 9,748 |

Note: Project ridership forecasts are still being refined. Comparative system data are for 2012 (latest year for which data are available).

Preliminary Relative Ridership by Alternative

| Alternative | Preliminary Relative Ridership Results |
|-------------|--|
| Green | ○ |
| Orange | ◐ |
| Yellow | ◑ |



UTA Frontrunner (Utah)



What You Have Told Us

ADOT has reached out to communities at dozens of events and festivals between Tucson and Phoenix. In 2011, ADOT asked Arizonans their general thoughts regarding rail and the use of rail in Arizona. In 2012, ADOT presented seven route alternatives and asked Arizonans to provide their opinions on each alternative. A total of 6,675 comments were received in the form of paper surveys, online surveys, and general emailed comments.

Overall, support for a rail system is overwhelming. Fewer than 5 percent of the comments have indicated opposition to the project.



What you said was most important when considering an alternative route:

- Fast travel time
- Service to and around the high activity centers within communities
- Connections between airports and universities
- Connections with population centers



What would be your preferred travel choice between Tucson and Phoenix?

The team wanted to understand people's preferences with regard to mode. This helped focus the study to be most responsive to Arizonans' transportation needs and expectations.



78.9%
Train



19.4%
Personal Vehicle



0.8%
Air



0.6%
Bus



0.2%
Bike



What do you need to have available at the rail station to arrive at your final destination?

Transportation upon arrival at the destination location is an important component to use of a rail system. ADOT asked respondents how they would get around once they reach their destination.

Respondents were allowed to choose more than one mode of transportation.



Bike Rentals

Tucson Modern Streetcar

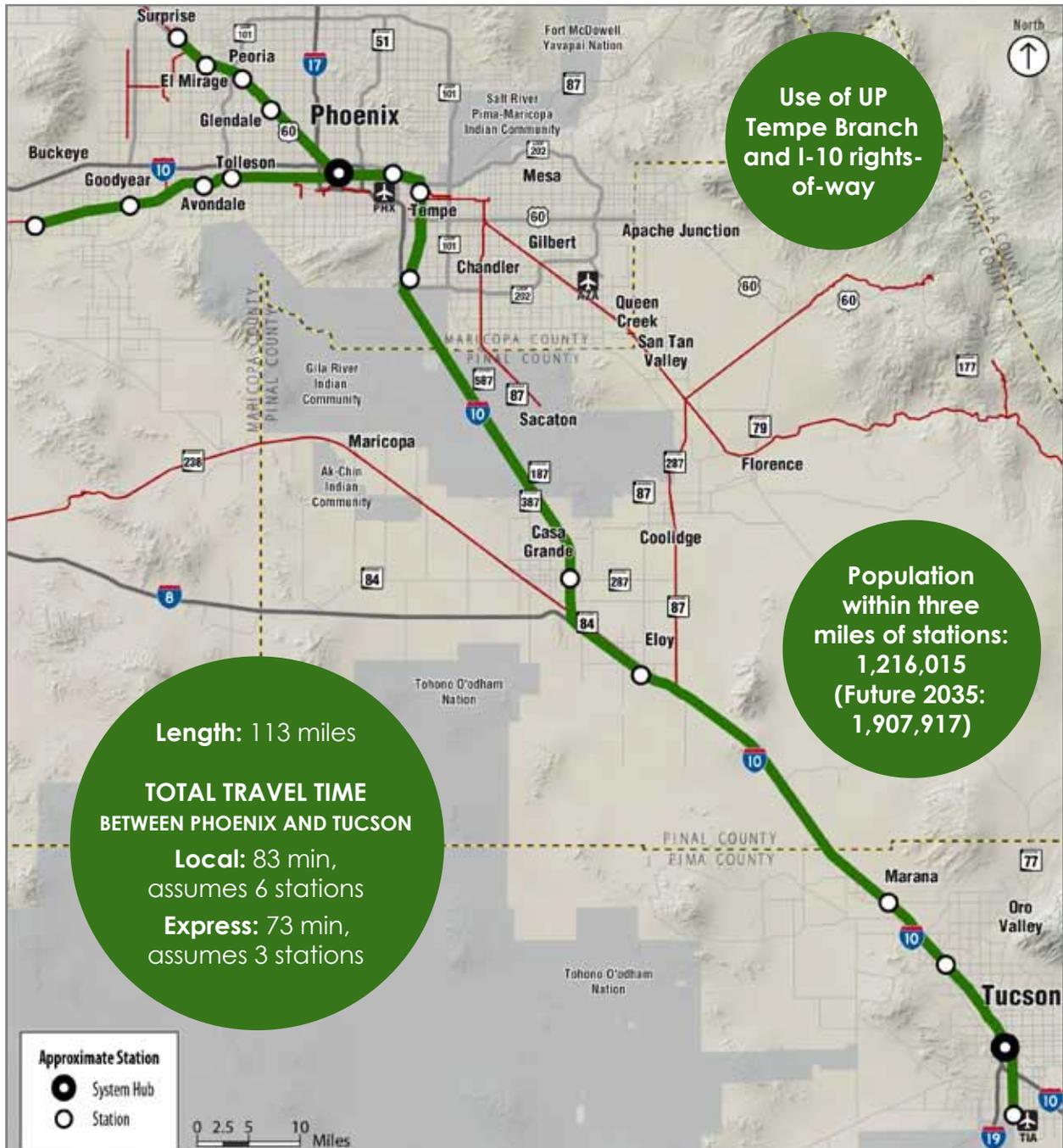


Alternatives

Seven route alternatives were developed and evaluated. Three of those seven alternatives will continue to be studied and evaluated. ADOT took into consideration comments received from Arizonans, environmental concerns, financial feasibility, community acceptance and accessibility, operating characteristics, mobility, and safety of the system.



Green



Characteristics:

- Substantial impact to sensitive historic and cultural resources
- Requirement for acquisition of sovereign Gila River Indian Community lands and Tribal allotments
- Serves smallest corridor population
- Predicted to attract the lowest ridership of the alternatives under consideration

Sample Estimated Travel Times

GREEN ALTERNATIVE

Local Travel Time - From Surprise (minutes)

| | Surprise | Peoria | Phoenix | Sky Harbor Airport | Tempe | Chandler | Casa Grande | Eloy | Marana | Tucson | Tucson Airport |
|----------------|----------|--------|---------|--------------------|-------|----------|-------------|------|--------|--------|----------------|
| Surprise | | 12 | 28 | 39 | 45 | 54 | 74 | 86 | 110 | 119 | 125 |
| Peoria | 12 | | 16 | 27 | 33 | 42 | 62 | 74 | 98 | 107 | 113 |
| Phoenix | 28 | 16 | | 10 | 16 | 25 | 46 | 58 | 82 | 90 | 96 |
| Sky Harbor | 39 | 27 | 10 | | 6 | 15 | 36 | 47 | 72 | 80 | 86 |
| Tempe | 45 | 33 | 16 | 6 | | 9 | 30 | 42 | 66 | 74 | 80 |
| Chandler | 54 | 42 | 25 | 15 | 9 | | 21 | 33 | 57 | 65 | 71 |
| Casa Grande | 74 | 62 | 46 | 36 | 30 | 21 | | 12 | 36 | 44 | 50 |
| Eloy | 86 | 74 | 58 | 47 | 42 | 33 | 12 | | 24 | 33 | 38 |
| Marana | 110 | 98 | 82 | 72 | 66 | 57 | 36 | 24 | | 8 | 14 |
| Tucson | 119 | 107 | 90 | 80 | 74 | 65 | 44 | 33 | 8 | | 6 |
| Tucson Airport | 125 | 113 | 96 | 86 | 80 | 71 | 50 | 38 | 14 | 6 | |

GREEN ALTERNATIVE

Local Travel Time - From Buckeye (minutes)

| | Buckeye | Avondale | Phoenix | Sky Harbor Airport | Tempe | Chandler | Casa Grande | Eloy | Marana | Tucson | Tucson Airport |
|----------------|---------|----------|---------|--------------------|-------|----------|-------------|------|--------|--------|----------------|
| Buckeye | | 19 | 35 | 46 | 51 | 60 | 81 | 93 | 117 | 126 | 131 |
| Avondale | 19 | | 16 | 26 | 32 | 41 | 62 | 74 | 98 | 107 | 112 |
| Phoenix | 35 | 16 | | 10 | 16 | 25 | 46 | 58 | 82 | 90 | 96 |
| Sky Harbor | 46 | 26 | 10 | | 6 | 15 | 36 | 47 | 72 | 80 | 86 |
| Tempe | 51 | 32 | 16 | 6 | | 9 | 30 | 42 | 66 | 74 | 80 |
| Chandler | 60 | 41 | 25 | 15 | 9 | | 21 | 33 | 57 | 65 | 71 |
| Casa Grande | 81 | 62 | 46 | 36 | 30 | 21 | | 12 | 36 | 44 | 50 |
| Eloy | 93 | 74 | 58 | 47 | 42 | 33 | 12 | | 24 | 33 | 38 |
| Marana | 117 | 98 | 82 | 72 | 66 | 57 | 36 | 24 | | 8 | 14 |
| Tucson | 126 | 107 | 90 | 80 | 74 | 65 | 44 | 33 | 8 | | 6 |
| Tucson Airport | 131 | 112 | 96 | 86 | 80 | 71 | 50 | 38 | 14 | 6 | |

GREEN ALTERNATIVE

Express Travel Time Table (minutes)

| | Phoenix | Sky Harbor | Casa Grande | Tucson |
|-------------|---------|------------|-------------|--------|
| Phoenix | | 11 | 40 | 76 |
| Sky Harbor | 11 | | 29 | 65 |
| Casa Grande | 40 | 29 | | 36 |
| Tucson | 76 | 65 | 36 | |



Estimated cost of construction:
\$5.2 - \$7.9 Billion

Orange



Characteristics:

- Serves high activity population centers and Phoenix-Mesa Gateway Airport
- Minimal conflict with existing freight rail corridors
- Proposed elevated rail system has high construction costs
- Potential impacts to undisturbed land for lengthy segments

Sample Estimated Travel Times

ORANGE ALTERNATIVE

Local Travel Time - From Surprise (minutes)

| | Surprise | Peoria | Phoenix | Sky Harbor Airport | Tempe | Mesa | Florence | Coolidge/Florence | Eloy | Marana | Tucson | Tucson Airport |
|--------------------|----------|--------|---------|--------------------|-------|------|----------|-------------------|------|--------|--------|----------------|
| Surprise | | 12 | 28 | 37 | 44 | 70 | 88 | 95 | 109 | 135 | 143 | 149 |
| Peoria | 12 | | 16 | 25 | 32 | 58 | 76 | 83 | 97 | 123 | 131 | 137 |
| Phoenix | 28 | 16 | | 9 | 16 | 41 | 59 | 67 | 80 | 107 | 115 | 121 |
| Sky Harbor Airport | 37 | 25 | 9 | | 7 | 33 | 51 | 58 | 72 | 98 | 106 | 112 |
| Tempe | 44 | 32 | 16 | 7 | | 25 | 43 | 51 | 64 | 91 | 99 | 105 |
| Mesa | 70 | 58 | 41 | 33 | 25 | | 18 | 26 | 39 | 65 | 73 | 79 |
| Florence | 88 | 76 | 59 | 51 | 43 | 18 | | 8 | 21 | 48 | 56 | 61 |
| Coolidge/Florence | 95 | 83 | 67 | 58 | 51 | 26 | 8 | | 13 | 40 | 48 | 54 |
| Eloy | 109 | 97 | 80 | 72 | 64 | 39 | 21 | 13 | | 26 | 34 | 40 |
| Marana | 135 | 123 | 107 | 98 | 91 | 65 | 48 | 40 | 26 | | 8 | 14 |
| Tucson | 143 | 131 | 115 | 106 | 99 | 73 | 56 | 48 | 34 | 8 | | 6 |
| Tucson Airport | 149 | 137 | 121 | 112 | 105 | 79 | 61 | 54 | 40 | 14 | 6 | |

ORANGE ALTERNATIVE

Local Travel Time - From Buckeye (minutes)

| | Buck-eye | Avon-dale | Phoenix | Sky Harbor Airport | Tempe | Mesa | Florence | Coolidge/Florence | Eloy | Marana | Tucson | Tucson Airport |
|--------------------|----------|-----------|---------|--------------------|-------|------|----------|-------------------|------|--------|--------|----------------|
| Buckeye | | 19 | 35 | 44 | 51 | 77 | 94 | 102 | 116 | 142 | 150 | 156 |
| Avondale | 19 | | 16 | 25 | 32 | 58 | 75 | 83 | 96 | 123 | 131 | 137 |
| Phoenix | 35 | 16 | | 9 | 16 | 41 | 59 | 67 | 80 | 107 | 115 | 121 |
| Sky Harbor Airport | 44 | 25 | 9 | | 7 | 33 | 51 | 58 | 72 | 98 | 106 | 112 |
| Tempe | 51 | 32 | 16 | 7 | | 25 | 43 | 51 | 64 | 91 | 99 | 105 |
| Mesa | 77 | 58 | 41 | 33 | 25 | | 18 | 26 | 39 | 65 | 73 | 79 |
| Florence | 94 | 75 | 59 | 51 | 43 | 18 | | 8 | 21 | 48 | 56 | 61 |
| Coolidge/Florence | 102 | 83 | 67 | 58 | 51 | 26 | 8 | | 13 | 40 | 48 | 54 |
| Eloy | 116 | 96 | 80 | 72 | 64 | 39 | 21 | 13 | | 26 | 34 | 40 |
| Marana | 142 | 123 | 107 | 98 | 91 | 65 | 48 | 40 | 26 | | 8 | 14 |
| Tucson | 150 | 131 | 115 | 106 | 99 | 73 | 56 | 48 | 34 | 8 | | 6 |
| Tucson Airport | 156 | 137 | 121 | 112 | 105 | 79 | 61 | 54 | 40 | 14 | 6 | |

ORANGE ALTERNATIVE

Express Travel Time Table (minutes)

| | Phoenix | Sky Harbor Airport | Mesa | Florence | Tucson |
|--------------------|---------|--------------------|------|----------|--------|
| Phoenix | | 9 | 33 | 47 | 90 |
| Sky Harbor Airport | 9 | | 24 | 38 | 81 |
| Mesa | 33 | 24 | | 14 | 57 |
| Florence | 47 | 38 | 14 | | 43 |
| Tucson | 90 | 81 | 57 | 43 | |



Estimated cost of construction:
\$6.5 - \$9.8 Billion

Yellow



Characteristics:

- Requires coordination with Union Pacific; a private freight railroad
- Serves high activity population centers and Phoenix-Mesa Gateway Airport
- Lower construction and operation costs
- Requires need to safely negotiate several at-grade railroad and roadway crossings
- Greater impacts to residential and business properties within established communities

Sample Estimated Travel Times

YELLOW ALTERNATIVE

Local Travel Time - From Surprise (minutes)

| | Surprise | Peoria | Sky Harbor Airport | Tempe | Mesa | Gilbert | Queen Creek | San Tan Valley | Coolidge | Eloy | Marana | Tucson | Tucson Airport |
|--------------------|----------|--------|--------------------|-------|------|---------|-------------|----------------|----------|------|--------|--------|----------------|
| Surprise | | 12 | 37 | 44 | 55 | 62 | 75 | 84 | 96 | 108 | 135 | 143 | 148 |
| Peoria | 12 | | 25 | 32 | 43 | 50 | 63 | 72 | 84 | 96 | 123 | 131 | 136 |
| Phoenix | 28 | 16 | 9 | 15 | 27 | 34 | 47 | 55 | 67 | 79 | 106 | 114 | 120 |
| Sky Harbor Airport | 37 | 25 | | 7 | 18 | 25 | 38 | 47 | 59 | 71 | 97 | 105 | 111 |
| Tempe | 44 | 32 | 7 | | 11 | 18 | 31 | 40 | 52 | 64 | 91 | 99 | 105 |
| Mesa | 55 | 43 | 18 | 11 | | 7 | 20 | 29 | 41 | 53 | 79 | 87 | 93 |
| Gilbert | 62 | 50 | 25 | 18 | 7 | | 13 | 22 | 34 | 46 | 73 | 81 | 86 |
| Queen Creek | 75 | 63 | 38 | 31 | 20 | 13 | | 9 | 20 | 32 | 59 | 67 | 73 |
| San Tan Valley | 84 | 72 | 47 | 40 | 29 | 22 | 9 | | 12 | 24 | 51 | 59 | 65 |
| Coolidge | 96 | 84 | 59 | 52 | 41 | 34 | 20 | 12 | | 12 | 39 | 47 | 53 |
| Eloy | 108 | 96 | 71 | 64 | 53 | 46 | 32 | 24 | 12 | | 27 | 35 | 41 |
| Marana | 135 | 123 | 97 | 91 | 79 | 73 | 59 | 51 | 39 | 27 | | 8 | 14 |
| Tucson | 143 | 131 | 105 | 99 | 87 | 81 | 67 | 59 | 47 | 35 | 8 | | 6 |
| Tucson Airport | 148 | 136 | 111 | 105 | 93 | 86 | 73 | 65 | 53 | 41 | 14 | 6 | |

YELLOW ALTERNATIVE

Local Travel Time - From Buckeye (minutes)

| | Buckeye | Avondale | Sky Harbor Airport | Tempe | Mesa | Gilbert | Queen Creek | San Tan Valley | Coolidge | Eloy | Marana | Tucson | Tucson Airport |
|--------------------|---------|----------|--------------------|-------|------|---------|-------------|----------------|----------|------|--------|--------|----------------|
| Buckeye | | 19 | 44 | 51 | 62 | 69 | 82 | 91 | 102 | 114 | 141 | 149 | 155 |
| Goodyear | 10 | 9 | 33 | 40 | 51 | 58 | 72 | 80 | 92 | 104 | 131 | 139 | 145 |
| Avondale | 19 | | 25 | 32 | 43 | 50 | 63 | 72 | 83 | 95 | 122 | 130 | 136 |
| Phoenix | 35 | 16 | 9 | 15 | 27 | 34 | 47 | 55 | 67 | 79 | 106 | 114 | 120 |
| Sky Harbor Airport | 44 | 25 | | 7 | 18 | 25 | 38 | 47 | 59 | 71 | 97 | 105 | 111 |
| Tempe | 51 | 32 | 7 | | 11 | 18 | 31 | 40 | 52 | 64 | 91 | 99 | 105 |
| Mesa | 62 | 43 | 18 | 11 | | 7 | 20 | 29 | 41 | 53 | 79 | 87 | 93 |
| Gilbert | 69 | 50 | 25 | 18 | 7 | | 13 | 22 | 34 | 46 | 73 | 81 | 86 |
| Queen Creek | 82 | 63 | 38 | 31 | 20 | 13 | | 9 | 20 | 32 | 59 | 67 | 73 |
| San Tan Valley | 91 | 72 | 47 | 40 | 29 | 22 | 9 | | 12 | 24 | 51 | 59 | 65 |
| Coolidge | 102 | 83 | 59 | 52 | 41 | 34 | 20 | 12 | | 12 | 39 | 47 | 53 |
| Eloy | 114 | 95 | 71 | 64 | 53 | 46 | 32 | 24 | 12 | | 27 | 35 | 41 |
| Marana | 141 | 122 | 97 | 91 | 79 | 73 | 59 | 51 | 39 | 27 | | 8 | 14 |
| Tucson | 149 | 130 | 105 | 99 | 87 | 81 | 67 | 59 | 47 | 35 | 8 | | 6 |
| Tucson Airport | 155 | 136 | 111 | 105 | 93 | 86 | 73 | 65 | 53 | 41 | 14 | 6 | |

YELLOW ALTERNATIVE

Express Travel Time Table (minutes)

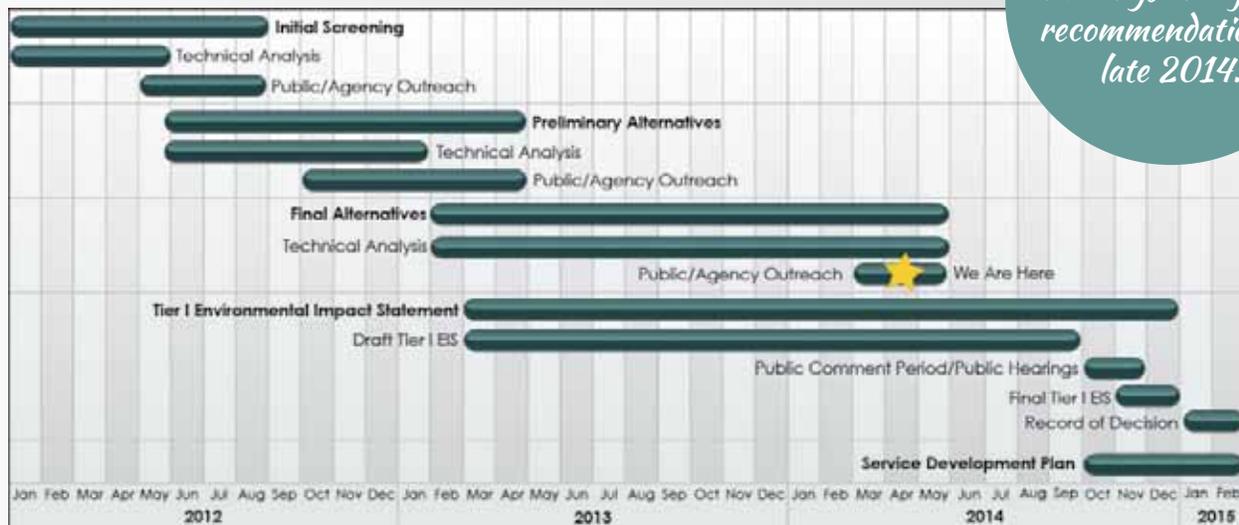
| | Coolidge | Phoenix | Queen Creek | Sky Harbor Airport | Tucson |
|--------------------|----------|---------|-------------|--------------------|--------|
| Coolidge | | 51 | 18 | 42 | 41 |
| Phoenix | 51 | | 33 | 9 | 92 |
| Queen Creek | 18 | 33 | | 24 | 58 |
| Sky Harbor Airport | 42 | 9 | 24 | | 82 |
| Tucson | 41 | 92 | 58 | 82 | |



Estimated cost of construction:
\$3.6 - \$5.4 Billion

Schedule and Next Steps

Watch for public hearings on a final recommendation in late 2014.



Contact Us

Please submit your comments through May 31, 2014.

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