FINAL REPORT

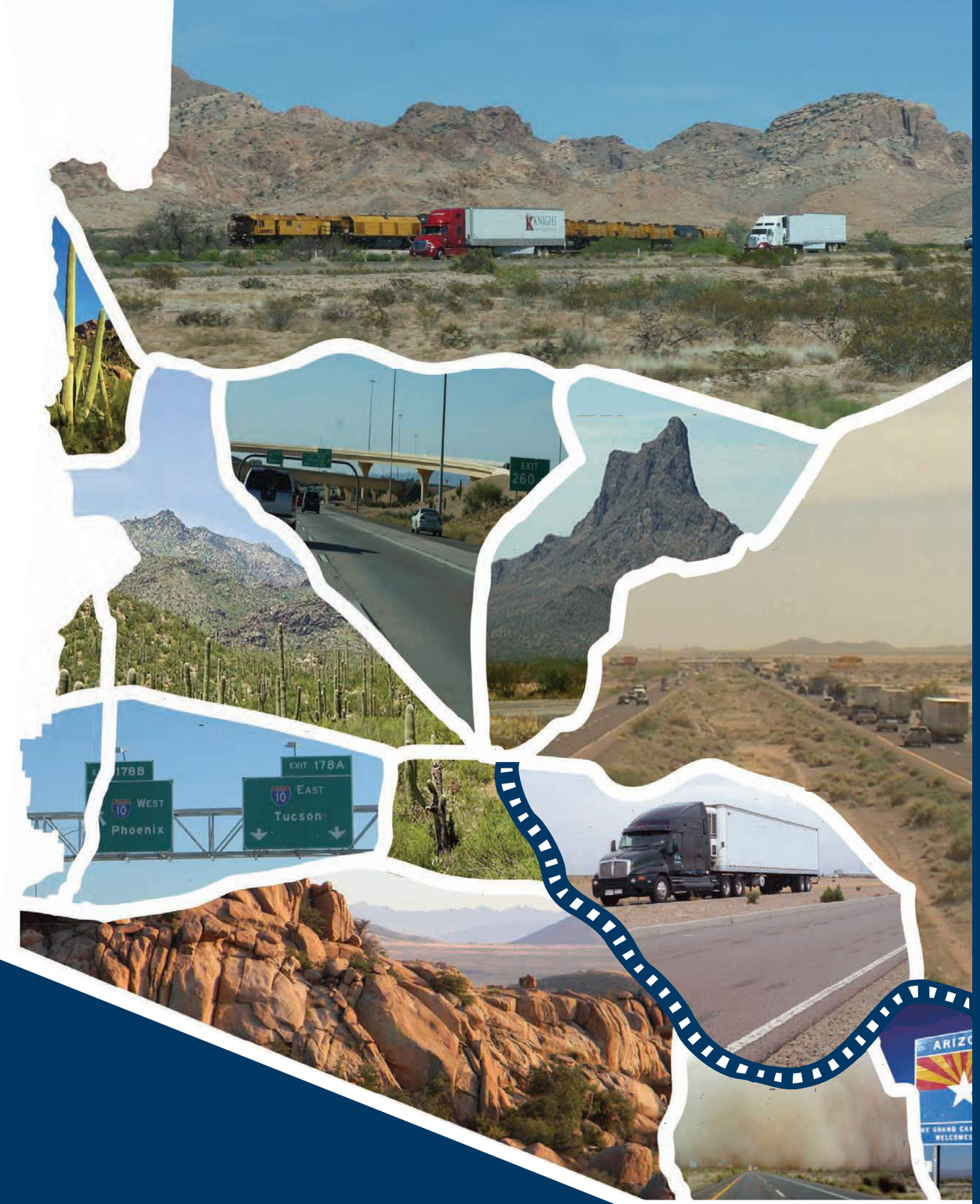
I-10 East Corridor Profile Study Update

State Route 202L to New Mexico State Line

PREPARED FOR ADOT APRIL 2023

ADOT WORK TASK NO.
MPD 0021-21

ADOT CONTRACT NO.
17-171963



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I-10 EAST CORRIDOR PROFILE STUDY

STATE ROUTE 202L TO NEW MEXICO STATE LINE

ADOT WORK TASK NO. MPD0021-21 H80

ADOT CONTRACT NO. 17-171963

FINAL REPORT

APRIL 2023

PREPARED FOR:

ARIZONA DEPARTMENT OF TRANSPORTATION

PREPARED BY:

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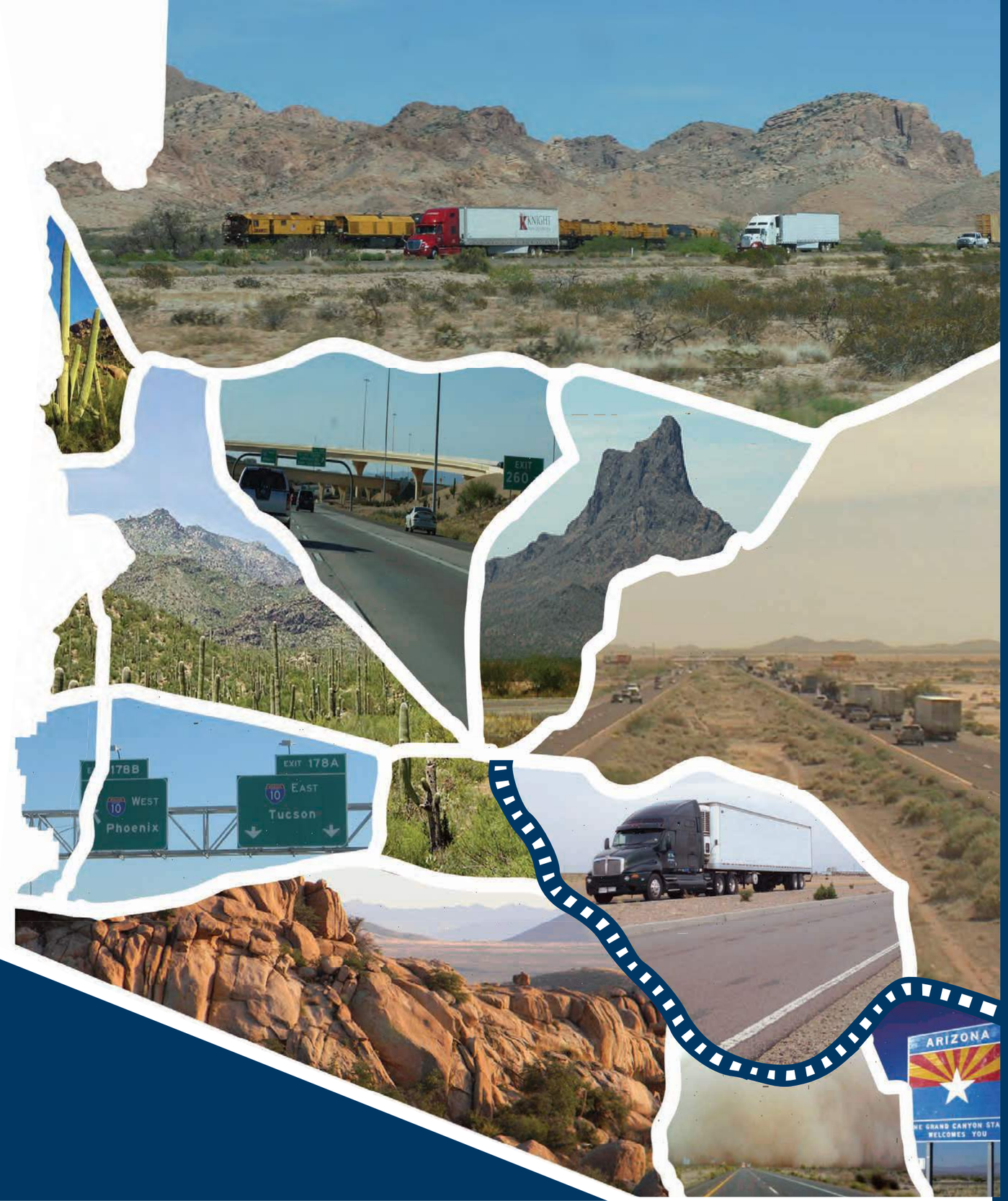
ACRONYMS & ABBREVIATIONS

AADT	Average Annual Daily Traffic
ADOT	Arizona Department of Transportation
ASLD	Arizona State Land Department
AZTDM	Arizona Travel Demand Model
BCA	Benefit-Cost Analysis
BLM	Bureau of Land Management
BQAZ	Building a Quality Arizona
CCTV	Closed Circuit Television
CDP	Census Designated Places
CR	Cracking Rating
CYMPO	Central Yavapai Metropolitan Planning Organization
DMS	Dynamic Message Sign
DCR	Design Concept Report
FMPO	Flagstaff Metropolitan Planning Organization
FY	Fiscal Year
HCRS	Highway Condition Reporting System
HPMS	Highway Performance Monitoring System
I-	Interstate
INRIX	Real-time traffic conditions database
IRI	International Roughness Index
ITS	Intelligent Transportation System
LCCA	Life-Cycle Cost Analysis
LOS	Level of Service
LOTTR	Level of Travel Time Reliability
LRTP	Long Range Transportation Plan
MAG	Maricopa Association of Governments
MAP 21	Moving Ahead for Progress in the 21st Century
MP	Milepost
MPD	Multimodal Planning Division
NACOG	Northern Arizona Council of Governments
NB	Northbound
NPV	Net Present Value
OP	Overpass
PES	Performance Effectiveness Score
P2P	Planning to Programming
PDI	Pavement Distress Index
PSR	Pavement Serviceability Rating
RTP	Regional Transportation Plan
SB	Southbound
STSP	Strategic Traffic Safety Plan
SR	State Route
TI	Traffic Interchange
TIP	Transportation Improvement Plan
TTTR	Truck Travel Time Reliability
UP	Underpass
USDOT	United States Department of Transportation
V/C	Volume to Capacity Ratio
VMT	Vehicle-Miles Traveled
WIM	Weigh-in-motion



Executive Summary

EXECUTIVE SUMMARY

INTRODUCTION

The Arizona Department of Transportation (ADOT) is the lead agency for this Corridor Profile Study (CPS) of Interstate 10 (I-10) between State Route (SR) 202L (Santan Freeway) and the New Mexico State Line (I-10 East). The CPS study examines key performance measures relative to the I-10 East Corridor, and the results of this performance evaluation are used to identify potential strategic improvements.

ADOT has completed 21 original CPS within four separate groupings or rounds. In 2020, ADOT separated the previously studied corridors into six groupings to be updated and reassessed: Northeast, Northcentral, Northwest, Southeast, Southcentral, and Southwest. The 13 corridor studies within the three northern groupings were updated in Summer 2022. The I-10 East Corridor, depicted in **ES-1** along with all CPS corridors, is one of the strategic statewide corridors identified and the subject of this CPS Update.

Corridor Study Purpose, Goals and Objectives

The purpose of the CPS is to measure corridor performance to inform the development of strategic solutions that are cost-effective and account for potential risks. This purpose can be accomplished by following the process described below:

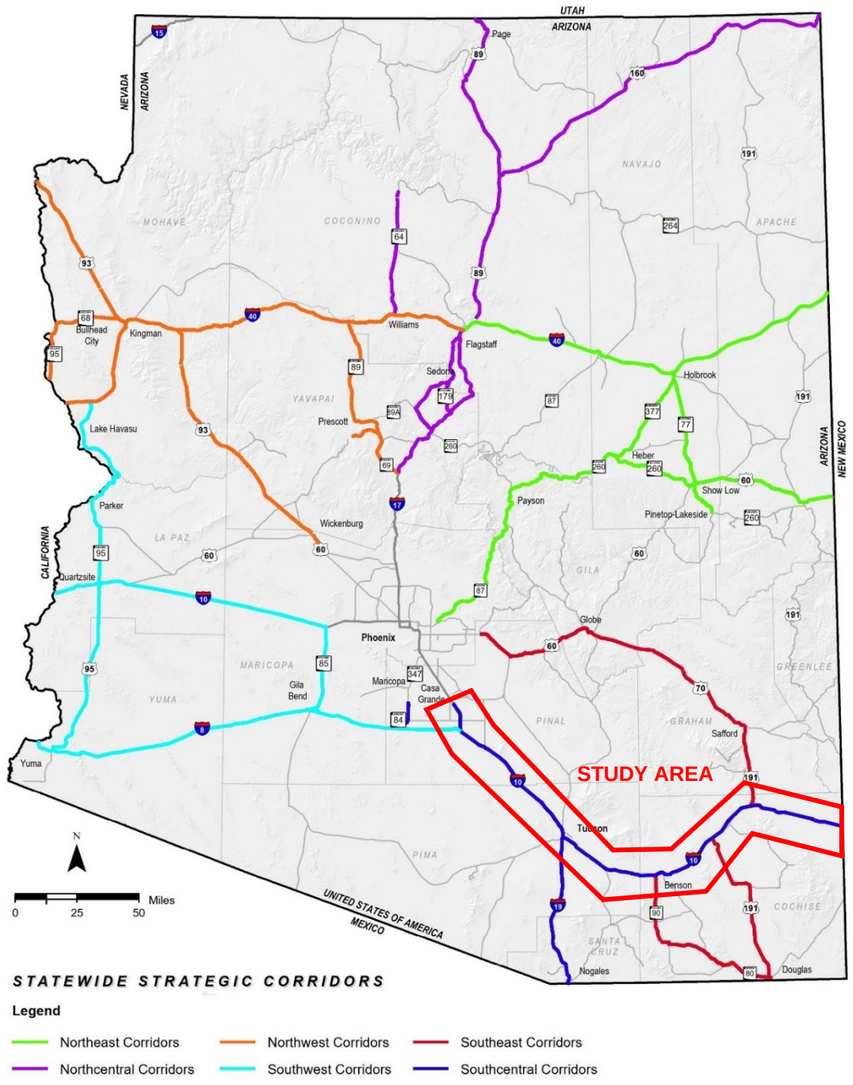
- Inventory past improvement recommendations
- Define corridor goals and objectives
- Assess existing performance based on quantifiable performance measures
- Propose various solutions to improve corridor performance
- Identify specific solutions that can provide quantifiable benefits relative to the performance measures
- Prioritize solutions for future implementation, accounting for performance effectiveness and risk analysis findings

The objective of this study is to identify a recommended set of prioritized potential solutions for consideration in future construction programs, derived from a transparent, defensible, logical, and replicable process. The I-10 East CPS defines solutions and improvements for the corridor that are evaluated and ranked to determine which investments offer the greatest benefit to the corridor in terms of enhancing performance.

The following goals are identified as the desired outcome of this study:

- Link project decision-making and investments on key corridors to strategic goals
- Develop solutions that address identified corridor needs based on measured performance
- Prioritize improvements that cost-effectively preserve, modernize, and expand transportation infrastructure

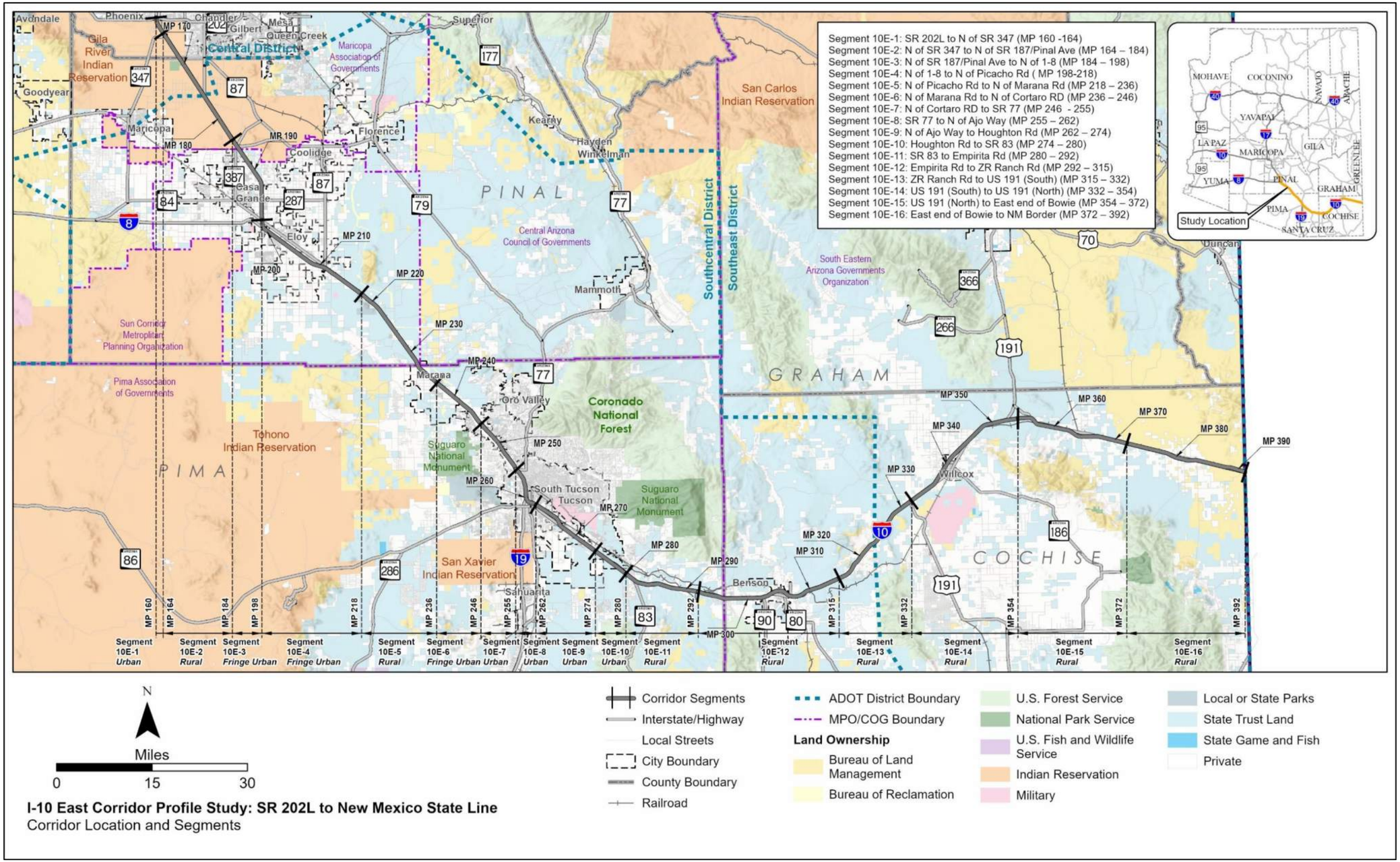
Figure ES-1: Corridor Study Area



Study Location and Corridor Segments

The I-10 East Corridor is divided into 16 planning segments for analysis and evaluation. The corridor is segmented at logical breaks where the context changes due to differences in characteristics such as terrain, daily traffic volumes, or roadway typical section. Corridor segments are shown in **Figure ES-2**.

Figure ES-2: Corridor Location and Segments



I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Corridor Location and Segments

CORRIDOR PERFORMANCE

A series of performance measures is used to assess the I-10 Corridor. The results of the performance evaluation are used to define corridor needs relative to the long-term goals and objectives for the corridor.

Corridor Performance Framework

This study uses a performance-based process to define baseline corridor performance, diagnose corridor needs, develop corridor solutions, and prioritize strategic corridor investments. In support of this objective, a framework for the performance-based process was developed through a collaborative process involving ADOT and the CPS consultant teams.

Figure ES-3 illustrates the performance framework, which includes a two-tiered system of performance measures (primary and secondary) to evaluate baseline performance.

Figure ES-3: Corridor Profile Performance Framework

The following five performance areas guide the performance-based corridor analyses:

- Pavement
- Bridge
- Mobility
- Safety
- Freight

The performance measures include five primary measures: Pavement Index, Bridge Index, Mobility Index, Safety Index, and Freight Index. Additionally, a set of secondary performance measures provides for a more detailed analysis of corridor performance. **Table ES-1** provides the complete list of primary and secondary performance measures for each of the five performance areas.

Table ES-1: Corridor Performance Measures

Performance Area	Primary Measure	Secondary Measures
Pavement	**Pavement Index** Based on a combination of International Roughness Index, cracking, and rutting	• Directional Pavement Serviceability • Pavement Failure • Pavement Hot Spots
Bridge	**Bridge Index** Based on lowest of deck, substructure, superstructure and structural evaluation rating	• Bridge Sufficiency • Bridge Rating • Bridge Hot Spots
Mobility	**Mobility Index** Based on combination of existing and future daily volume-to-capacity ratios	• Future Congestion • Peak Congestion • Travel Time Reliability • Multimodal Opportunities
Safety	**Safety Index** Based on frequency of fatal and suspected serious injury crashes	• Directional Safety Index • Strategic Traffic Safety Plan Emphasis Areas • Other Crash Unit Types • Safety Hot Spots
Freight	**Freight Index** Based on bi-directional truck travel time reliability	• Travel Time Reliability • Bridge Vertical Clearance • Bridge Vertical Clearance Hot Spots

Each of the primary and secondary performance measures identified in the table above is comprised of one or more quantifiable indicators. A three-level scale was developed to standardize the performance scale across the five performance areas, with numerical thresholds specific to each performance measure:

Good/Above Average Performance – Rating is above the identified desirable/average range

Fair/Average Performance – Rating is within the identified desirable/average range

Poor/Below Average Performance – Rating is below the identified desirable/average range

The terms “good”, “fair”, and “poor” apply to the Pavement, Bridge, Mobility, and Freight performance measures, which have defined thresholds. The terms “above average”, “average”, and “below average” apply to the Safety performance measures, which have thresholds referenced to statewide averages.

Corridor Performance Summary

Table ES-2 shows a summary of corridor performance for all primary measures and secondary measure indicators for the I-10 East Corridor. A weighted corridor average rating (based on the length of the segment) was calculated for each primary and secondary measure as shown in **Table ES-2**. The following general observations were made related to the performance of the I-10 East Corridor:

- The Pavement performance measures generally show “good” performance; the Bridge performance measures generally show “fair” performance; the Mobility performance measures generally show “good” or “fair” performance; the Safety performance measures show a mix of “above average”, “average”, and “below average” performance; and the Freight performance measures generally show “fair” performance
- The weighted average of the Pavement Index shows “good” overall performance for the I-10 East Corridor; Segments 10E-4 through 10E-10, 10E-12, and 10E-14 show “poor” performance in % Area Failure
- The weighted average of the Bridge Index shows “fair” overall performance for the I-10 East Corridor; Segments 10E-14 and 10E-16 have bridges showing “poor” performance in the Lowest Bridge Rating
- The weighted average of the Mobility Index shows “good” overall performance for the I-10 East Corridor; Segments 10E-7, 10E-8, and 10E-11 show “poor” performance for the Mobility Index and/or Future Daily V/C; Segments 10E-3 and 10E-8 show “poor” performance for Closure Extent in the EB direction while Segments 10E-15 and 10E-16 show “poor” performance for Closure Extent in the WB direction
- The weighted average of the Safety Index shows “average” overall performance for the I-10 East Corridor; for the Directional Safety Index, Segments 10E-5 and 10E-6 show “below average” performance in the EB direction while Segments 10E-4, 10E-12, 10E-13, and 10E-15 show “below average” performance in the WB direction; Segments 10E-3, 10E-4, 10E-6, 10E-10, 10E-11, 10E-13, 10E-14, and 10E-15 show “below average” performance for crashes involving lane departures; Segments 10E-3, 10E-4, 10E-5, 10E-9, 10E-12, 10E-14, 10E-15, and 10E-16 show “below average” performance for crashes involving trucks
- The weighted average of the Freight Index shows “fair” overall performance for the I-10 East Corridor; Segments 10E-7, 10E-8, and 10E-9 show “poor” performance for the Freight Index and Directional TTTR in both directions; Segment 10E-15 shows “poor” performance for Closure Duration in the EB direction; Segment 10E-6 shows “poor” performance for Closure Duration in the WB direction; Segments 10E-3, 10E-4, 10E-5, and 10E-14 show “poor” performance for Bridge Vertical Clearance

Table ES-2: Corridor Performance Summary by Segment and Performance Measure

Segment #	Segment Length (miles)	Pavement Performance Area				Bridge Performance Area			Mobility Performance Area									
		Pavement Index	Directional PSR		% Area Failure	Bridge Index	Sufficiency Rating	Lowest Bridge Rating	Mobility Index	Future Daily V/C	Existing Peak Hour V/C		Closure Extent (instances/ milepost/year/mile)		Directional LOTTR (all vehicles)		% Bicycle Accommodation	% Non-Single Occupancy Vehicle (SOV) Trips
			EB	WB							EB	WB	EB	WB	EB	WB		
10E-3[1]	11	4.38	4.28	4.25	5%	5.84	90.11	5.00	0.42	0.49	0.26	0.25	0.80	0.45	1.04	1.05	94%	10.1%
10E-4[1]	20	3.81	4.06	4.13	40%	6.87	91.40	5.00	0.41	0.47	0.25	0.24	0.17	0.30	1.05	1.05	96%	9.9%
10E-5[2]	18	3.93	4.17	3.84	22%	6.13	92.86	5.00	0.42	0.48	0.26	0.25	0.10	0.21	1.04	1.04	87%	8.1%
10E-6[1]	10	3.87	4.07	3.85	25%	6.79	95.23	5.00	0.56	0.63	0.39	0.36	0.18	0.55	1.03	1.03	100%	13.7%
10E-7[1]	9	3.76	3.72	3.66	48%	6.72	89.99	5.00	0.86	0.98	0.54	0.51	0.13	0.44	1.17	1.11	64%	13.7%
10E-8[1]	7	4.04	3.81	3.82	24%	6.62	93.51	6.00	1.09	1.19	0.71	0.70	0.89	0.57	1.04	1.05	89%	14.0%
10E-9[1]	12	3.89	3.81	3.79	28%	5.78	89.04	5.00	0.80	0.88	0.55	0.62	0.35	0.43	1.14	1.04	93%	13.3%
10E-10[1]	6	3.76	3.56	3.72	33%	6.54	95.47	5.00	0.52	0.58	0.35	0.36	0.20	0.17	1.03	1.03	98%	12.2%
10E-11[2]	12	4.35	4.15	4.20	8%	6.74	94.92	6.00	0.76	0.85	0.43	0.42	0.37	0.12	1.03	1.03	100%	9.0%
10E-12[2]	23	4.13	4.09	4.04	22%	6.20	93.57	5.00	0.60	0.69	0.38	0.33	0.39	0.10	1.04	1.03	97%	7.7%
10E-13[2]	17	3.98	3.83	4.02	9%	5.46	81.14	5.00	0.38	0.43	0.31	0.27	0.05	0.21	1.04	1.04	78%	9.2%
10E-14[2]	22	4.13	4.16	4.08	20%	5.73	86.82	4.00	0.35	0.39	0.25	0.19	0.11	0.23	1.03	1.03	100%	10.8%
10E-15[2]	18	4.22	3.97	4.22	14%	5.90	93.96	5.00	0.28	0.31	0.17	0.15	0.26	1.06	1.03	1.03	99%	8.3%
10E-16[2]	20	4.34	3.96	4.13	3%	5.42	84.96	4.00	0.43	0.48	0.24	0.21	0.21	1.05	1.06	1.04	99%	4.9%
Weighted Corridor Average		4.07	4.01	4.02	20%	6.21	91.23	5.02	0.51	0.58	0.33	0.31	0.26	0.42	1.06	1.04	93.4%	9.6%

SCALES

Performance Level	All			All			Urban and Fringe Urban	All	All	All	
Good/Above Average Performance	> 3.75	> 3.75	< 5%	> 6.5	> 80	> 6	< 0.71	< 0.22	< 1.15	> 90%	> 17%
Fair/Average Performance	3.00-3.75	3.40 - 3.75	5%- 20%	5.0 - 6.5	50 - 80	5 - 6	> 0.71 - 0.89	0.22 - 0.62	1.15 - 1.50	60% - 90%	11% - 17%
Poor/Below Average Performance	< 3.00	< 3.40	> 20%	< 5.0	< 50	< 5	> 0.89	>0.62	> 1.50	< 60%	< 11%

Performance Level	Rural
Good/Above Average Performance	< 0.56
Fair/Average Performance	> 0.56 - 0.76
Poor/Below Average Performance	> 0.76

[1]Urban Operating Environment
[2]Rural Operating Environment

Table ES-2: Corridor Performance Summary by Segment and Performance Measure (continued)

Segment #	Segment Length (miles)	Safety Performance Area								Freight Performance Area					
		Safety Index	Directional Safety Index		% of Fatal + Suspected Serious Injury Crashes at Intersections	% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures	% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians	% of Segment Fatal + Suspected Serious Injury Crashes Involving Trucks	% of Segment Fatal + Suspected Serious Injury Crashes Involving Bicycles	Freight Index	Directional TTTR		Closure Duration (minutes/milepost/year)		Bridge Vertical Clearance (feet)
			EB	WB							EB	WB	EB	WB	
10E-3[a]	11	0.98	1.13	0.83	Insufficient Data	67%	Insufficient Data	17%	Insufficient Data	1.09	1.08	1.10	74.69	40.20	15.76
10E-4[a]	20	1.24	0.86	1.61	Insufficient Data	68%	Insufficient Data	24%	Insufficient Data	1.09	1.12	1.10	22.21	55.16	15.90
10E-5[a]	18	1.43	1.95	0.92	Insufficient Data	61%	Insufficient Data	13%	Insufficient Data	1.11	1.08	1.08	9.48	16.92	15.84
10E-6[a]	10	1.09	1.38	0.80	Insufficient Data	63%	Insufficient Data	5%	Insufficient Data	1.08	1.06	1.06	20.86	233.15	17.51
10E-7[a]	9	0.96	1.22	0.69	Insufficient Data	56%	Insufficient Data	13%	Insufficient Data	1.63	1.60	1.65	32.13	47.71	16.50
10E-8[b]	7	0.44	0.30	0.58	Insufficient Data	35%	Insufficient Data	Insufficient Data	Insufficient Data	1.40	1.36	1.44	98.36	64.47	16.50
10E-9[c]	12	1.04	1.27	0.80	Insufficient Data	63%	Insufficient Data	20%	Insufficient Data	1.64	1.86	1.42	38.57	35.20	16.13
10E-10[c]	6	0.59	0.58	0.61	Insufficient Data	100%	Insufficient Data	Insufficient Data	Insufficient Data	1.09	1.06	1.13	12.00	14.00	16.15
10E-11[d]	12	0.77	0.99	0.55	Insufficient Data	84%	Insufficient Data	5%	Insufficient Data	1.11	1.08	1.15	48.10	15.44	16.22
10E-12[e]	23	1.22	1.02	1.42	Insufficient Data	59%	Insufficient Data	30%	Insufficient Data	1.09	1.10	1.09	47.31	11.98	16.20
10E-13[e]	17	1.02	0.87	1.18	Insufficient Data	81%	Insufficient Data	19%	Insufficient Data	1.15	1.18	1.12	3.54	38.82	16.40
10E-14[e]	22	0.74	0.57	0.91	Insufficient Data	80%	Insufficient Data	33%	Insufficient Data	1.08	1.07	1.08	21.52	32.85	15.96
10E-15[e]	18	1.18	0.87	1.49	Insufficient Data	80%	Insufficient Data	33%	Insufficient Data	1.07	1.07	1.06	145.45	71.37	16.31
10E-16[e]	20	0.59	0.42	0.76	Insufficient Data	56%	Insufficient Data	44%	Insufficient Data	1.17	1.17	1.17	117.98	70.16	16.00
Weighted Corridor Average		1.00	0.96	1.03	Insufficient Data	68%	Insufficient Data	24%	Insufficient Data	1.17	1.18	1.16	50.41	49.27	16.18
		SCALES													
Performance Level		**Urban or Rural 6 Lane Freeway**								**All**			**All**		
Good/Above Average Performance		> 0.65			< 0.00%	< 55.7%	< 4.0%	< 5.0%	< 0.0%	< 1.15			< 44.18		> 16.5
Fair/Average Performance		0.65 - 1.35			0.00%	55.7% - 62.9%	4.0% - 7.9%	5.0% - 12.9%	0.0% - 1.3%	1.15 - 1.35			44.18-124.86		16.0 - 16.5
Poor/Below Average Performance		> 1.35			> 0.00%	> 62.9%	> 7.9%	> 12.9%	> 1.3%	> 1.35			> 124.86		< 16.0
Performance Level		**Urban >6 Lane Freeway**													
Good/Above Average Performance		< 0.89			< 0.00%	< 40.4%	< 1.6%	< 1.9%	< 0.00%						
Fair/Average Performance		0.89 - 1.11			0.00%	40.4% - 43.2%	1.6% - 4.7%	1.9% - 5.1%	0.00%						
Poor/Below Average Performance		> 1.11			> 0.00%	> 43.2%	> 4.7%	> 5.1%	> 0.00%						
Performance Level		**Urban 4 Lane Freeway**													
Good/Above Average Performance		< 0.73			< 0.00%	< 60.6%	< 0.0%	< 6.9%	< 0.00%						
Fair/Average Performance		0.73 - 1.27			0.00%	60.6% - 78.1%	0.0% - 4.9%	6.9% - 12.4%	0.00%						
Poor/Below Average Performance		> 1.27			> 0.00%	> 78.1%	> 4.9%	> 12.4%	> 0.00%						
Performance Level		**Rural 4 Lane with Daily Volume > 25,000 (< 25,000)**													
Good/Above Average Performance		< 0.78 (< 0.84)			< 0.00% (< 0.00%)	< 69.0% (< 72.8%)	< 0.7% (< 1.0%)	< 8.5% (< 19%)	< 8.5% (< 19%)						
Fair/Average Performance		0.78 - 1.22 (0.84 - 1.16)			0.00% (0.00%)	69.0 - 77.5% (72.8% - 76.4%)	0.7% - 4.7% (1.0% - 3.3%)	8.5% - 18.0% (19% - 22.5%)	8.5% - 18.0% (19% - 22.5%)						
Poor/Below Average Performance		> 1.22 (> 1.16)			> 0.00% (> 0.00%)	> 77.5% (< 76.4%)	> 4.7% (> 3.3%)	> 18.0% (> 22.5%)	> 18.0% (> 22.5%)						

[a]Urban or Rural 6 Lane Freeway
[b]Urban > 6 Lane Freeway
[c]Urban 4 Lane Freeway
[d]Rural 4 Lane Freeway with Daily Volume > 25,000 vpd
[e]Rural 4 Lane Freeway with Daily Volume < 25,000 vpd

Note: "Insufficient Data" indicates there was not enough data available to generate reliable performance ratings

NEEDS ASSESSMENT

Corridor Description

The I-10 East Corridor is an important travel corridor in the central part of the state. The corridor functions as a route for recreational, tourist, and regional traffic and provides critical connections between the communities it serves and the rest of the regional and interstate network.

Corridor Objectives

Statewide goals and performance measures were established by the ADOT Long-Range Transportation Plan (LRTP) 2010-2035 goals and objectives that were updated in 2017. Statewide performance goals that are relevant to I-10 East performance areas were identified and corridor goals were then formulated for each of the five performance areas that aligned with the overall statewide goals established by the LRTP. Based on stakeholder input, corridor goals, corridor objectives, and performance results, three "Emphasis Areas" were identified for the I-10 East Corridor: Mobility, Safety, and Freight.

Taking into account the corridor goals and identified emphasis areas, performance objectives were developed for each quantifiable performance measure that identify the desired level of performance based on the performance scale levels for the overall corridor and for each segment of the corridor. For the performance emphasis areas, the corridor-wide weighted average performance objectives are identified with a higher standard than for the other performance areas.

Achieving corridor and segment performance objectives will help ensure that investments are targeted toward improvements that support the safe and efficient movement of travelers on the corridor. Addressing current and future congestion, thereby improving mobility on congested segments, will also help the corridor fulfill its potential as a significant contributor to the region's economy.

Needs Assessment Process

The performance-based needs assessment evaluates the difference between the baseline performance and the performance objectives for each of the five performance areas used to characterize the health of the corridor: Pavement, Bridge, Mobility, Safety, and Freight. The performance-based needs assessment process is illustrated in **Figure ES-4**.

The needs assessment compares baseline corridor performance with performance objectives to provide a starting point for the identification of performance needs. This mathematical comparison results in an initial need rating of None, Low, Medium, or High for each primary and secondary performance measure. An illustrative example of this process is shown in **Figure ES-5**.

The initial level of need for each segment is refined to account for hot spots and recently completed or under construction projects, resulting in a final level of need for each segment. The final levels of need for each primary and secondary performance measure are combined to produce a weighted final need rating for each segment. A detailed review of available data helps identify contributing factors to the need and if there is a high level of historical investment.

Figure ES-4: Needs Assessment Process

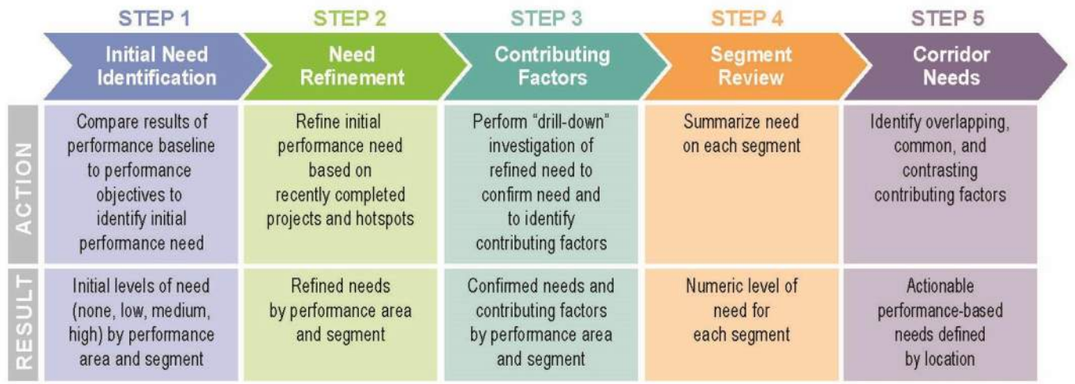


Figure ES-5: Initial Need Ratings in Relation to Baseline Performance (Bridge Example)

Performance Thresholds	Performance Level	Initial Level of Need	Description
6.5	Good	None*	All levels of Good and top 1/3 of Fair (>6.0)
	Good		
	Good		
	Fair		
	Fair	Low	Middle 1/3 of Fair (5.5-6.0)
5.0	Fair	Medium	Lower 1/3 of Fair and top 1/3 of Poor (4.5-5.5)
	Poor		
	Poor	High	Lower 2/3 of Poor (<4.5)
	Poor		

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Summary of Needs

Table ES-3 provides a summary of needs for each segment across all performance areas, with the average need score for each segment presented in the last row of the table. A weighting factor of 1.5 is applied to the need scores of the performance areas identified as emphasis areas (Mobility, Safety, and Freight for the I-10 East Corridor). There are twelve segments with a Medium overall average need and two segments with a Low overall average need.

Pavement Needs

- Overall, the corridor has a Low Pavement need for each of the segments from Segment 10E-3 to Segment 10E-16, except for Segment 10E-6, where a recently completed project addressed all Pavement hot spots
- Pavement hot spots were identified in each of the segments, with Segments 10E-4, 10E-5, 10E-6, 10E-7, 10E-9, 10E-12, 10E-13, and 10E-15 each containing at least two different ranges of hot spot locations
- The level of need for Segments 10E-3, 10E-11, 10E-13 and 10E-16 were raised to Low due to the presence of hot spots along the segments
- Segments 10E-12 and 10E-13 show a high level of historical investment, meaning that some previous projects have proven to provide only temporary improvements and require frequent attention
- Recently completed projects on Segments 10E-4, 10E-5, 10E-6, 10E-7, and 10E-12 partially addressed needs due to hot spots

Bridge Needs

- Final Bridge needs are generally Low, with Segments 10E-8 and 10E-11 having no need and Segments 10E-13 and 10E-16 having Medium need
- Bridge hot spots were identified in Segments 10E-5, 10E-12, 10E-13, 10E-14, and 10E-16
- Three hot spot bridges (Red Rock TI UP (#592), Cochise TI UP (#518), and Airport Rd UP (#1114)) have potential repetitive investment issues and are candidates for life-cycle cost analysis to evaluate alternative solutions
- Final design is programmed for the Red Rock TI UP (#592) in 2026

Mobility Needs

- The Mobility performance area is an emphasis area for the I-10 East Corridor
- Segments 10E-7 and 10E-8 have a High need and are located in the Tucson area and may been affected by ongoing construction projects in the segments. Segment 10E-11 also has a High need and is located just outside the Tucson area
- A Medium Mobility need was identified in Segment 10E-9, which is located in the Tucson area and may have been affected by ongoing construction projects in the area
- Low Mobility needs were identified in Segments 10E-3, 10E-6, 10E-12, 10E-13, 10E-15, and 10E-16
- A programmed project to widen MP 247.57-253.40 to eight lanes in 2023 in Segment 10E-7 is expected to address the Mobility need in that segment
- A programmed project to widen MP 264-267 to six lanes in 2026 and reconstruct the I-10/Country Club Road traffic TI in Segment 10E-9 is expected to partially address the Mobility need in that segment
- A programmed climbing lane at MP 302.95-303.40 in 2024 in Segment 10E-12 may address the Mobility need for part of the segment

Safety Needs

- The Safety performance area is an emphasis area for the I-10 East Corridor
- High Safety needs were identified in Segments 10E-4, 10E-5, 10E-12, and 10E-15
- Medium Safety needs were identified in Segments 10E-3, 10E-6, 10E-7, 10E-9, and 10E-13
- Safety hot spots were identified in Segments 10E-7, 10E-8, 10E-9, 10E-11 and 10E-13
- Hot spots in Segment 10E-8 altered the final need from None to Low
- The programmed projects listed under Mobility Needs are expected to address the Safety need in Segment 10E-7 but only partially address the Safety need in Segments 10E-9 and 10E-12

Freight Needs

- The Freight performance area is an emphasis area for the I-10 East Corridor
- Segments 10E-8 and 10E-9 were identified as having a High need
- Segment 10E-7 was downgraded from a High need to a Medium need as recently completed projects addressed some of the needs of the segment
- Segment 10E-10 was downgraded from a Low need to None as a recently completed project is believed to have addressed the need of the segment
- There are four bridges in Segment 10E-3, two bridges in Segment 10-4, and one bridge in Segment 10-14 that currently provide less than 16.25’ vertical clearance and cannot be bypassed by using ramps

Overlapping Needs

This section identifies overlapping performance needs on the I-10 East Corridor, which provides guidance to develop strategic solutions that address more than one performance area with elevated levels of need. Completing projects that address multiple needs presents the opportunity to more effectively improve overall performance. A summary of the overlapping needs that relate to locations with elevated levels of need is provided below:

- Segments 10E-7 and 10E-9, both of which have the highest average need score of all the segments of the corridor, have elevated needs in the Mobility, Safety, and Freight performance areas and Pavement hot spots
- Segments 10E-3 and 10E-4 have elevated needs in the Safety performance area and Pavement and Freight hot spots

Table ES-3: Summary of Needs by Segment

Performance Area	Segment Number and Mileposts (MP)													
	10E-3	10E-4	10E-5	10E-6	10E-7	10E-8	10E-9	10E-10	10E-11	10E-12	10E-13	10E-14	10E-15	10E-16
	MP 187-198	MP 198-218	MP 218-236	MP 236-246	MP 246-255	MP 255-262	MP 262-274	MP 274-280	MP 280-292	MP 292-315	MP 315-332	MP 332-354	MP 354-372	MP 372-392
Pavement	Low	Low	Low	None	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Bridge	Low	Low	Low	Low	Low	None	Low	Low	None	Low	Medium	Low	Low	Medium
Mobility*	Low	None	None	Low	High	High	Medium	None	High	Low	Low	None	Low	Low
Safety*	Medium	High	High	Medium	Medium	Low	Medium	Low	Low	High	Medium	Low	High	Low
Freight*	Low	Low	Low	Low	Medium	High	High	None	Low	Low	None	Low	Low	Low
Average Need	**1.23**	**1.23**	**1.23**	**1.08**	**1.92**	**1.77**	**1.92**	**0.54**	**1.31**	**1.46**	**1.15**	**0.77**	**1.46**	**1.15**

Level of Need	Average Need Range
None[+]	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

* Identified as Emphasis Area for I-10E Corridor
[#] N/A indicates insufficient or no data available to determine level of need
[+] A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study

STRATEGIC SOLUTIONS

The principal objective of the CPS is to identify strategic solutions (investments) that are performance-based to ensure that available funding resources are used to maximize the performance of the State's key transportation corridors. One of the first steps in the development of strategic solutions is to identify areas of elevated levels of need (i.e., Medium or High). Addressing areas of Medium or High need will have the greatest effect on corridor performance and are the focus of the strategic solutions. Segments with Medium or High needs and specific locations of hot spots are considered strategic investment areas for which strategic solutions should be developed. Segments with lower levels of need or without identified hot spots are not considered candidates for strategic investment and are expected to be addressed through other ADOT programming processes. The I-10 East strategic investment areas (resulting from the elevated needs) are shown in **Figure ES-6**.

Screening Process

This section examines qualifying strategic needs and determines if the needs in those locations require action. In some cases, needs that are identified do not advance to solutions development and are screened out from further consideration because they have been or will be addressed through other measures, including:

- A project is programmed to address this need
- The need is a result of a Pavement or Bridge hot spot that does not show historical investment or rating issues; these hot spots will likely be addressed through other ADOT programming means
- A bridge is not a hot spot but is located within a segment with a Medium or High level of need; this bridge will likely be addressed through current ADOT bridge maintenance and preservation programming processes
- The need is determined to be non-actionable (i.e., cannot be addressed through an ADOT project)
- The conditions/characteristics of the location have changed since the performance data was collected that was used to identify the need

Candidate Solutions

For each elevated need within a strategic investment area that is not screened out, a candidate solution is developed to address the identified need. Each candidate solution is assigned to one of the following three P2P investment categories based on the scope of the solution:

- Preservation
- Modernization
- Expansion

Documented performance needs serve as the foundation for developing candidate solutions for corridor preservation, modernization, and expansion. Candidate solutions are not intended to be a substitute or replacement for traditional ADOT project development processes where various ADOT technical groups and districts develop candidate projects for consideration in the performance-based programming in the P2P process. Rather, these candidate solutions are intended to complement ADOT's traditional project development processes through a performance-based process to address needs in one or more of the five performance areas of Pavement, Bridge, Mobility, Safety, and Freight. Candidate solutions developed for the I-10 Corridor will be considered along with other candidate projects in the ADOT statewide programming process.

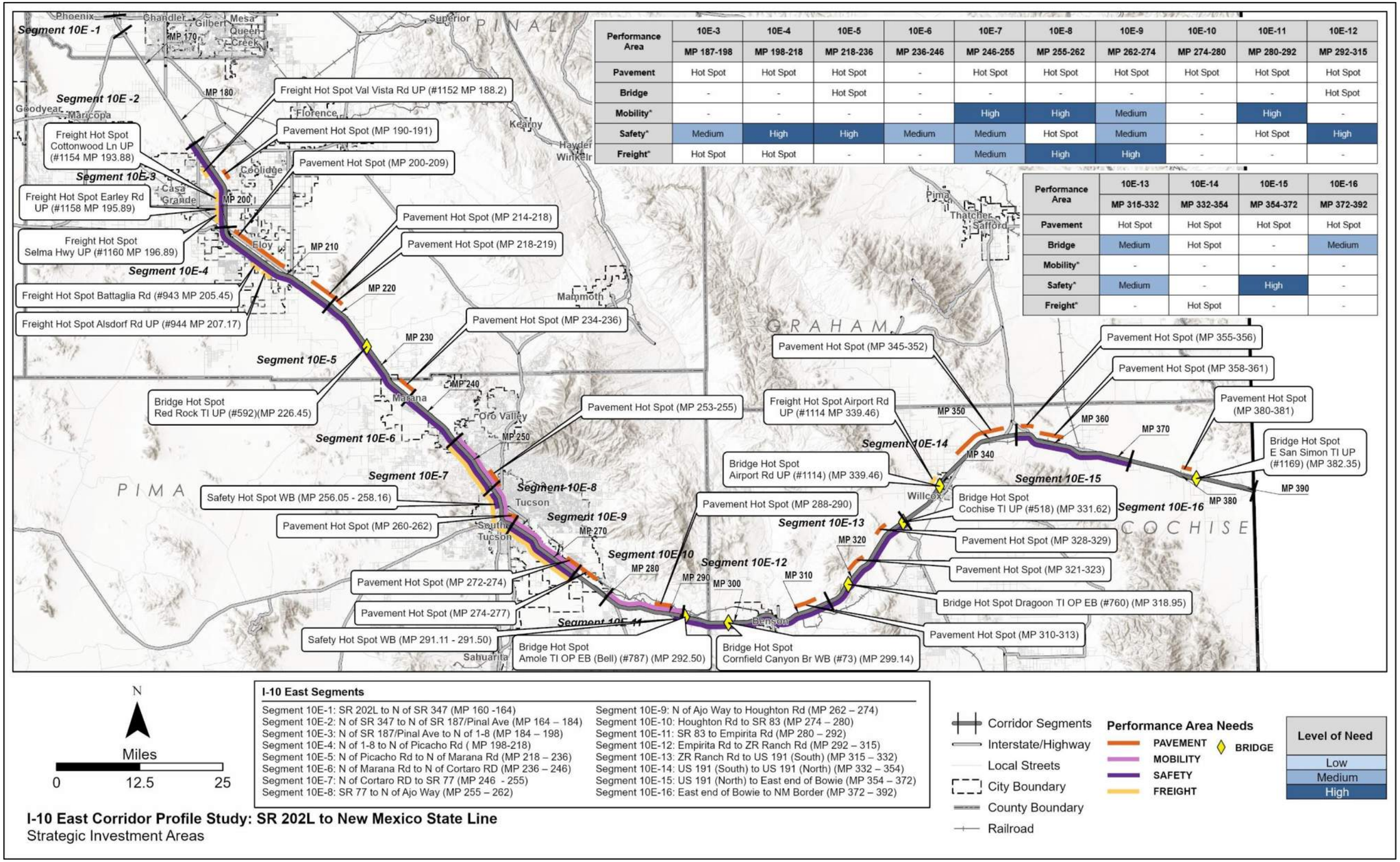
Candidate solutions should include some or all of the following characteristics:

- Do not recreate or replace results from normal programming processes
- May include programs or initiatives, areas for further study, and infrastructure projects
- Address elevated levels of need (High or Medium) and hot spots
- Focus on investments in modernization projects (to optimize current infrastructure)
- Address overlapping needs
- Reduce costly repetitive maintenance
- Extend operational life of system and delay expansion
- Leverage programmed projects that can be expanded to address other strategic elements
- Provide measurable benefit

Candidate solutions developed to address an elevated need in the Pavement or Bridge performance area will include two options: rehabilitation or full replacement. These solutions are initially evaluated through a Life-Cycle Cost Analysis (LCCA) to provide insights into the cost-effectiveness of these options so a recommended approach can be identified. Candidate solutions developed to address an elevated need in the Mobility, Safety, or Freight performance areas are advanced directly to the Performance Effectiveness Evaluation. In some cases, there may be multiple solutions identified to address the same area of need.

Candidate solutions that are recommended to expand or modify the scope of an already programmed project are noted and are not advanced to solution evaluation and prioritization. These solutions are directly recommended for programming.

Figure ES-6: Strategic Investment Areas



Performance Area	10E-3	10E-4	10E-5	10E-6	10E-7	10E-8	10E-9	10E-10	10E-11	10E-12
	MP 187-198	MP 198-218	MP 218-236	MP 236-246	MP 246-255	MP 255-262	MP 262-274	MP 274-280	MP 280-292	MP 292-315
Pavement	Hot Spot	Hot Spot	Hot Spot	-	Hot Spot	Hot Spot	Hot Spot	Hot Spot	Hot Spot	Hot Spot
Bridge	-	-	Hot Spot	-	-	-	-	-	-	Hot Spot
Mobility*	-	-	-	-	High	High	Medium	-	High	-
Safety*	Medium	High	High	Medium	Medium	Hot Spot	Medium	-	Hot Spot	High
Freight*	Hot Spot	Hot Spot	-	-	Medium	High	High	-	-	-

Performance Area	10E-13	10E-14	10E-15	10E-16
	MP 315-332	MP 332-354	MP 354-372	MP 372-392
Pavement	Hot Spot	Hot Spot	Hot Spot	Hot Spot
Bridge	Medium	Hot Spot	-	Medium
Mobility*	-	-	-	-
Safety*	Medium	-	High	-
Freight*	-	Hot Spot	-	-

I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Strategic Investment Areas

SOLUTION EVALUATION AND PRIORITIZATION

Candidate solutions are evaluated using the following steps: LCCA (where applicable), Performance Effectiveness Evaluation, Solution Risk Analysis, and Candidate Solution Prioritization. The methodology and approach to this evaluation are shown in **Figure ES-7** and described more fully below.

Life-Cycle Cost Analysis

All Pavement and Bridge candidate solutions have two options: rehabilitation/repair or reconstruction. These options are evaluated through an LCCA to determine the best approach for each location where a Pavement or Bridge solution is recommended. The LCCA can eliminate options from further consideration and identify which options should be carried forward for further evaluation.

When multiple independent candidate solutions are developed for Mobility, Safety, or Freight strategic investment areas, these candidate solution options advance directly to the Performance Effectiveness Evaluation without an LCCA.

Performance Effectiveness Evaluation

After completing the LCCA process, all remaining candidate solutions are evaluated based on their performance effectiveness. This process includes determining a Performance Effectiveness Score (PES) based on how much each solution impacts the existing performance and needs scores for each segment. This evaluation also includes a Performance Area Risk Analysis to help differentiate between similar solutions based on factors that are not directly addressed in the performance system.

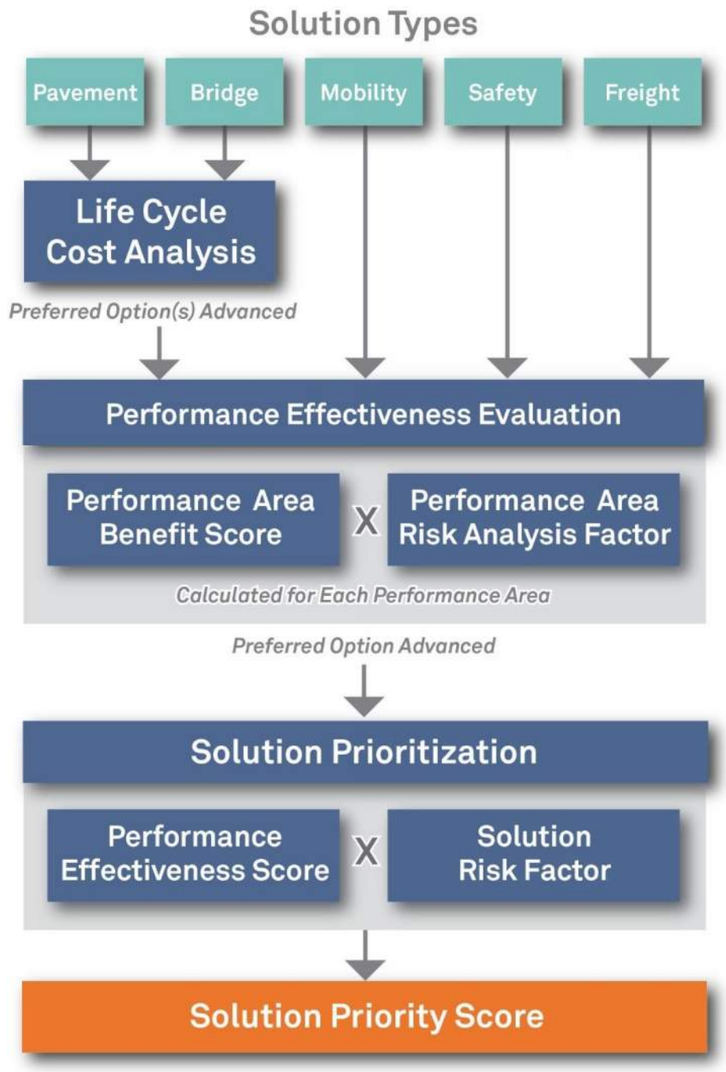
Solution Risk Analysis

All candidate solutions advanced through the Performance Effectiveness Evaluation are also evaluated through a Solution Risk Analysis process. A solution risk probability and consequence analysis is conducted to develop a solution-level risk weighting factor. This risk analysis is a numeric scoring system to help address the risk of not implementing a solution based on the likelihood and severity of performance failure.

Candidate Solution Prioritization

The PES, weighted risk factor, and segment average need score are combined to create a prioritization score. The candidate solutions are ranked by prioritization score from highest to lowest. The highest prioritization score indicates the candidate solution that is recommended as the highest priority. Solutions that address multiple performance areas tend to score higher in this process.

Figure ES-7: Candidate Solution Evaluation Process



SUMMARY OF CORRIDOR RECOMMENDATIONS

Prioritized Candidate Solution Recommendations

Table ES-4 and **Figure ES-8** show the prioritized candidate solutions recommended for the I-10 East Corridor in ranked order of priority. The highest prioritization score indicates the candidate solution that is recommended as the highest priority. Implementation of these solutions is anticipated to improve performance of the I-10 East Corridor. The following observations were noted about the prioritized solutions:

- Most of the anticipated improvements in performance are in the Mobility, Safety, and Freight performance areas
- The highest-ranking solutions tend to have overlapping benefits in the Mobility, Safety, and Freight performance areas
- The highest-priority solution addresses needs in the Tucson area (MP 255-274)

Other Corridor Recommendations

As part of the investigation of strategic investment areas and candidate solutions, other corridor recommendations can also be identified. These recommendations could include modifications to the existing Statewide Construction Program, areas for further study, or other corridor-specific recommendations that are not related to construction or policy. The list below identifies other corridor recommendations for the I-10 East Corridor:

- When recommending future projects along the I-10 East Corridor, review historical ratings and levels of investment. According to data used for this study, the following pavement and bridge locations have exhibited high historical investment (pavement) or rating fluctuation (bridge) issues:
  - Red Rock TI UP Bridge (#592, MP 226.45)
  - Cochise TI UP Bridge (#518, MP 331.62)
  - Airport Rd UP Bridge (#1114, MP 339.46)
  - Pavement MP 292-315 (Segment 10E-12)
  - Pavement MP 315-332 (Segment 10E-13)
- Continue to support and implement the recommendations of the DCR for the I-10 Wild Horse Pass Corridor (Loop 202 to SR 387)

Policy and Initiative Recommendations

In addition to location-specific needs, general corridor and system-wide needs have also been identified through the CPS process. While these needs are more overarching and cannot be individually evaluated through this process, it is important to document them. A list of recommended policies and initiatives was developed for consideration when programming future projects not only on the I-10 Corridor, but across the entire state highway system where the conditions are applicable. The following list, which is in no particular order of priority, was derived from the initial four CPS rounds:

- Install Intelligent Transportation System (ITS) conduit with all new infrastructure projects
- Prepare strategic plans for Closed Circuit Television (CCTV) camera and Road Weather Information System (RWIS) locations statewide
- Leverage power and communication at existing weigh-in-motion (WIM), dynamic message signs (DMS), and call box locations to expand ITS applications across the state
- Consider solar power for lighting and ITS where applicable
- Investigate ice formation prediction technology where applicable
- Conduct highway safety manual evaluation for all future programmed projects
- Develop infrastructure maintenance and preservation plans (including schedule and funding) for all pavement and bridge infrastructure replacement or expansion projects
- Develop standardized bridge maintenance procedures so districts can do routine maintenance work
- Review historical ratings and level of previous investment during scoping of pavement and bridge projects. In pavement locations that warrant further investigation, conduct subsurface investigations during project scoping to determine if full replacement is warranted
- For pavement rehabilitation projects, enhance the amount/level of geotechnical investigations to address issues specific to the varying conditions along the project
- Expand programmed and future pavement projects as necessary to include shoulders
- Expand median cable barrier guidelines to account for safety performance
- Install CCTV cameras with all DMS
- In locations with limited communications, use CCTV cameras to provide still images rather than streaming video
- Develop statewide program for pavement replacement
- Install additional continuous permanent count stations along strategic corridors to enhance traffic count data
- When reconstruction or rehabilitation activities will affect existing bridge vertical clearance, the dimension of the new bridge vertical clearance should be a minimum of 16.25 feet where feasible
- All new or reconstructed roadway/shoulder edges adjacent to an unpaved surface should be constructed with a Safety Edge
- Collision data on tribal lands may be incomplete or inconsistent; additional coordination for data on tribal lands is required to ensure adequate reflection of safety issues
- Expand data collection devices statewide to measure freight delay
- Evaluate and accommodate potential changes in freight and goods movement trends that may result from improvements and expansions to the state roadway network
- At traffic interchanges with existing communication connectivity to the ADOT TOC, consideration should be given to adding thermal detection cameras for vehicle detection with the capability for wrong-way vehicle detection
- Improved vehicle detection systems, as recommended by ADOT Systems Technology group, should be deployed at traffic interchanges for improved traffic control

Next Steps

The candidate solutions recommended in this study are not intended to be a substitute or replacement for traditional ADOT project development processes where various ADOT technical groups and districts develop candidate projects for consideration in the performance-based programming in the P2P process. Rather, these candidate solutions are intended to complement ADOT's traditional project development processes through a performance-based process to address needs in one or more of the five performance areas of Pavement, Bridge, Mobility, Safety, and Freight. Candidate solutions developed for the I-10 East Corridor will be considered along with other candidate projects in the ADOT statewide programming process.

It is important to note that the candidate solutions are intended to represent strategic solutions to address existing performance needs related to the Pavement, Bridge, Mobility, Safety, and Freight performance areas. Therefore, the strategic solutions are not intended to preclude recommendations related to the ultimate vision for the corridor that may have been defined in the context of prior planning studies and/or design concept reports. Recommendations from such studies are still relevant to addressing the ultimate corridor objectives.

These results will be incorporated into a summary document comparing all corridors that is expected to provide a performance-based review of statewide needs and candidate solutions.

This CPS assessment is an update to the original CPS assessments conducted between 2017 and 2019. Due to changes in state and federal reporting standards as well as data availability, the original methodology has been adapted to produce comparable and relatable performance, need, and evaluation results. The methodology has changed as follows:

- Pavement performance now includes the addition of rutting as a component of the Pavement Distress measure
- Bridge performance no longer includes the % Functionally Obsolete secondary measure
- Safety performance includes updated secondary measure categories and is evaluated against updated statewide averages
- Mobility and Freight performance are evaluated using updated reliability measures based on Level of Travel Time Reliability and Truck Travel Time Reliability, which are new federal standard measures adapted from the previous Travel Time Index and Planning Time Index measures

Table ES-4: Prioritized Recommended Solutions

Rank	Candidate Solution #	Option	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
1	CS10E.15	C	East Tucson Mobility, Safety, and Freight Improvements (MP 265-274)	-Implement ramp metering on all on-ramps where warranted at the ten TIs within project limits -Widen left shoulder in both directions -Consider installing speed feedback signs (MP 268) -Install EB DMS sign (MP 266)	$29.27	M	**97**
2	CS10E.14	B	Tucson Mobility, Safety, and Freight Improvements (MP 255-262)	-Implement ramp metering on all on-ramps where warranted at the nine TIs within project limits	$6.53	M	**48**
3	CS10E.3	B	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation (MP 188.2)	-Reprofile mainline	$7.17	M	**47**
4	CS10E.9	B	Red Rock TI UP (#592) Bridge Project (MP 226.45)	-Replace bridge	$2.39	M	**45**
5	CS10E.2	-	Casa Grande Safety Improvements (MP 187-190)	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) -Install DMS signs (EB MP 190 and WB MP 190)	$4.49	M	**35**
6	CS10E.29	-	Bowie Area Safety Improvements (MP 354-372)	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) -Install WB DMS sign (MP 356)	$18.39	M	**29**
7	CS10E.6	A	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation (MP 196.89)	-Replace bridge	$9.65	M	**25**
	CS10E.6	B	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation (MP 196.89)	-Reprofile mainline	$14.42	M	**11**

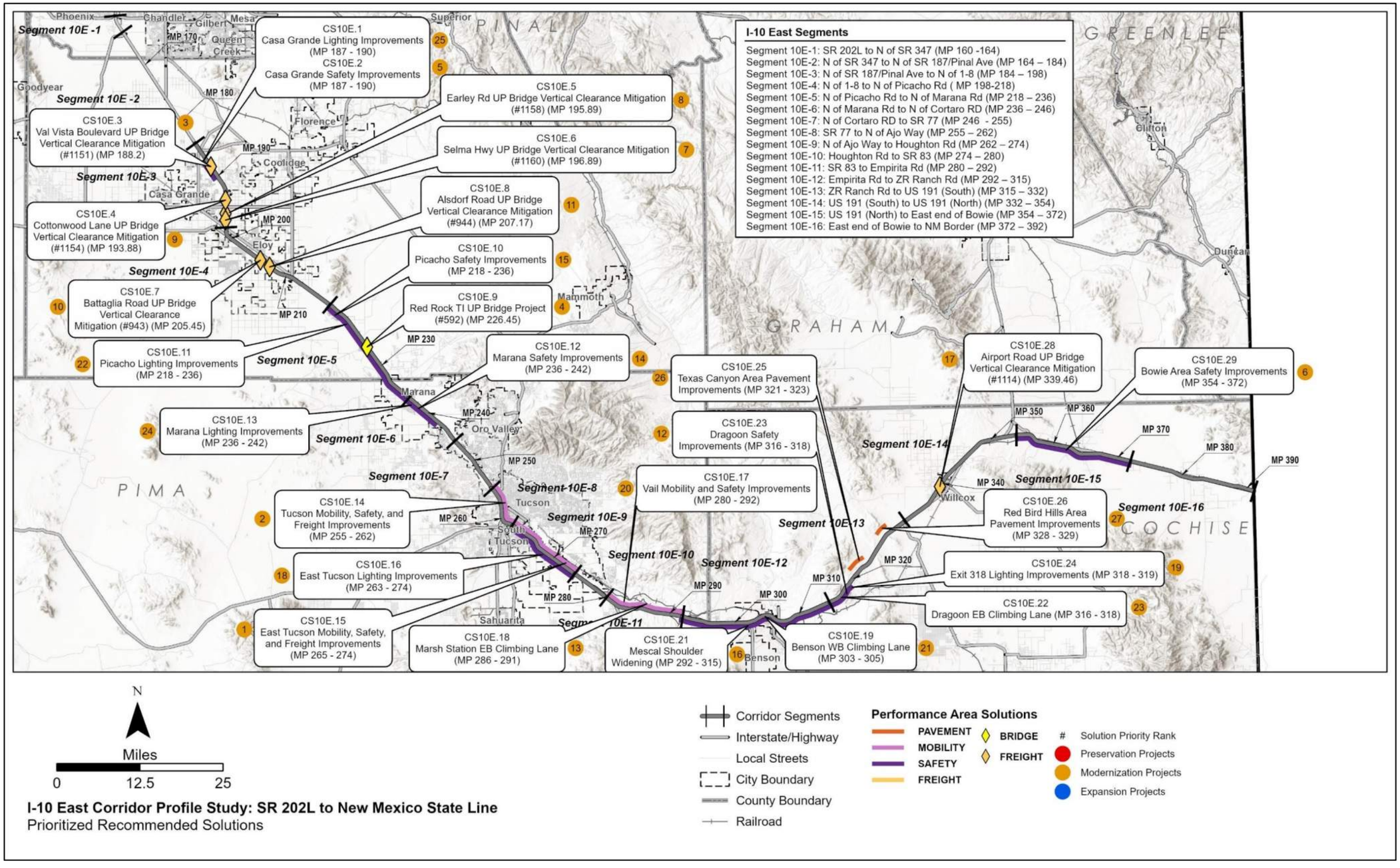
Table ES-4: Prioritized Recommended Solutions (continued)

Rank	Candidate Solution #	Option	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
8	CS10E.5	A	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation (MP 195.89)	-Replace bridge	$11.03	M	**24**
	CS10E.5	B	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation (MP 195.89)	-Reprofile mainline	$13.32	M	**11**
9	CS10E.4	A	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation (MP 193.88)	-Replace bridge	$10.53	M	**24**
	CS10E.4	B	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation (MP 193.88)	-Reprofile mainline	$14.42	M	**3**
10	CS10E.7	A	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation (MP 205.45)	-Replace bridge	$7.75	M	**23**
	CS10E.7	B	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation (MP 205.45)	-Reprofile mainline	$13.32	M	**8**
11	CS10E.8	A	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation (MP 207.17)	-Replace bridge	$8.27	M	**21**
	CS10E.8	B	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation (MP 207.17)	-Reprofile mainline	$14.42	M	**6**
12	CS10E.23	-	Dragoon Safety Improvements (MP 316-318)	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) (MP 316-318) -Consider installing speed feedback signs (MP 317) -Install DMS sign (MP 317)	$3.67	M	**21**
13	CS10E.18	-	Marsh Station EB Climbing Lane (MP EB 286-291)	-Construct climbing lane	$32.44	M	**15**
14	CS10E.12	-	Marana Safety Improvements (MP 236-242)	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders)	$9.76	M	**15**
15	CS10E.10	-	Picacho Safety Improvements (MP 218-236)	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders)	$29.29	M	**14**

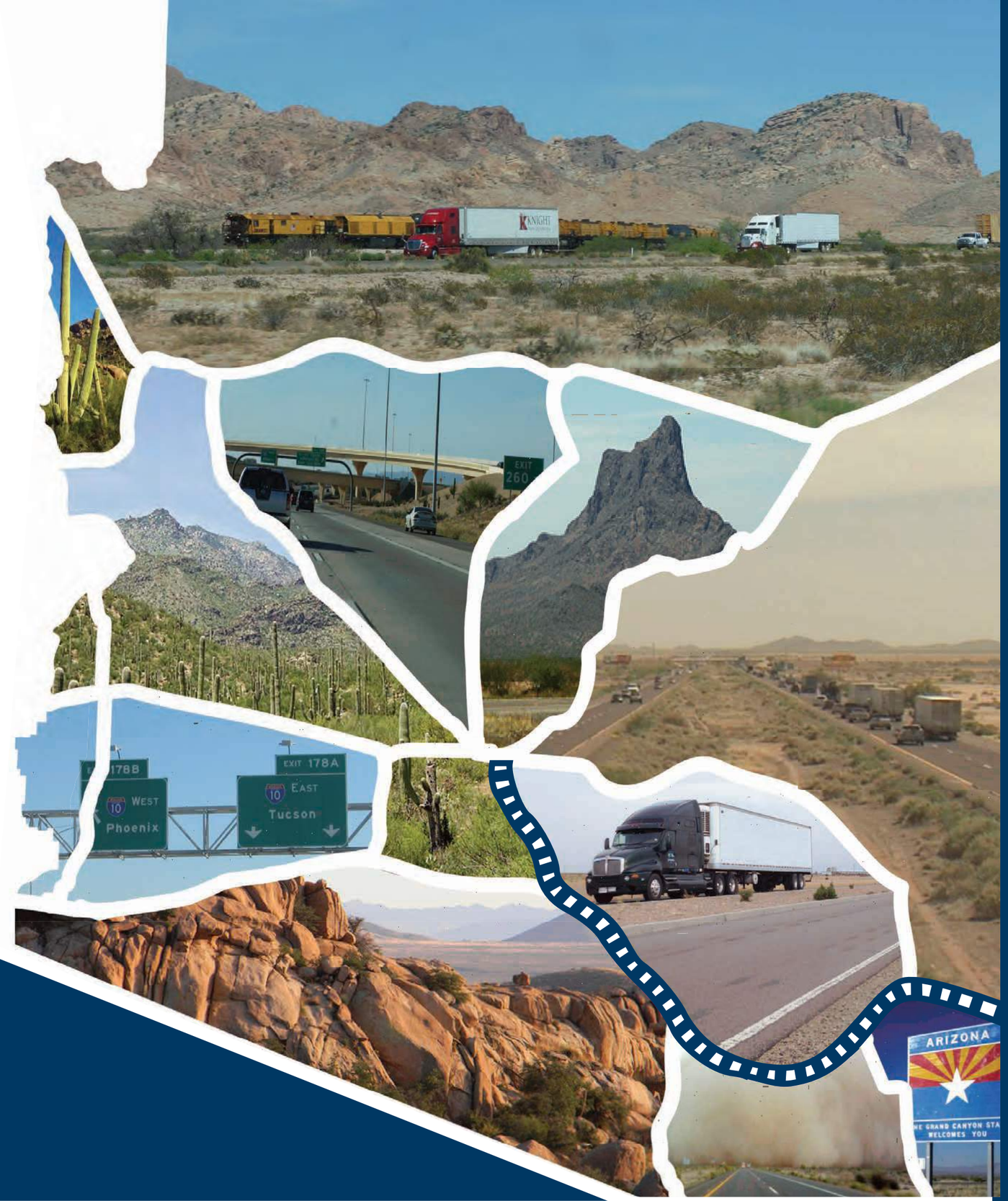
Table ES-4: Prioritized Recommended Solutions (continued)

Rank	Candidate Solution #	Option	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
16	CS10E.21	-	Mescal Shoulder Widening (MP 292-315)	-Widen left shoulder to 10 feet in both directions (striping, delineators, RPMs, safety edge, and rumble strips)	$84.78	M	**9**
17	CS10E.28	A	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation (MP 339.46)	-Replace bridge	$7.50	M	**9**
	CS10E.28	B	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation (MP 339.46)	-Rehabilitate bridge and reprofile mainline	$11.50	M	**3**
18	CS10E.16	-	East Tucson Lighting Improvements (MP 263-274)	-Install lighting (both directions)	$25.71	M	**9**
19	CS10E.24	-	Exit 318 Lighting Improvements (MP 318)	-Install lighting at exit	$1.17	M	**7**
20	CS10E.17	-	Vail Mobility and Safety Improvements (MP 280-292)	-Widen left shoulder to 10 feet in both directions (striping, delineators, RPMs, safety edge, and rumble strips) -Rehabilitate right shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips)	$44.23	M	**6**
21	CS10E.19	-	Benson WB Climbing Lane (MP WB 303-305)	-Construct climbing lane -Widen 3 bridges within the project limits	$16.58	M	**5**
22	CS10E.11	-	Picacho Lighting Improvements (MP 218-236)	-Install lighting (both directions)	$42.06	M	**3**
23	CS10E.22	-	Dragoon EB Climbing Lane (MP 316-318)	-Construct climbing lane	$19.47	M	**3**
24	CS10E.13	-	Marana Lighting Improvements (MP 236-242)	-Install lighting (both directions)	$14.02	M	**2**
25	CS10E.1	-	Casa Grande Lighting Improvements (MP 187-190)	-Install lighting (both directions)	$7.01	M	**1**
26	CS10E.25	B	Texas Canyon Area Pavement Improvements (MP 321-323)	-Replace pavement	$15.03	M	**1**
27	CS10E.26	B	Red Bird Hills Area Pavement Improvements (MP 328-329)	-Replace pavement	$7.51	M	**1**

Figure ES-8: Prioritized Recommended Solutions



Final Report



Final Report

1.0 INTRODUCTION

The Arizona Department of Transportation (ADOT) is the lead agency for this Corridor Profile Study (CPS) of Interstate 10 (I-10) between State Route (SR) 202L (Santan Freeway) and the New Mexico State Line (I-10 East). Only the portion of I-10 between Casa Grande (milepost [MP] 187) and the New Mexico State Line is the focus of this CPS update as the portion between SR 202L and Casa Grande is currently being evaluated in the I-10: SR 202L to SR 387 Design Concept Report prepared by ADOT.

The CPS study examines key performance measures relative to the I-10 East Corridor, and the results of this performance evaluation are used to identify potential strategic improvements.

The intent of the corridor profile program, and of ADOT's Planning to Programming (P2P) process, is to conduct performance-based planning to identify areas of need and make the most efficient use of available funding to provide an efficient transportation network.

ADOT has completed 21 original CPS within four separate groupings or rounds. In 2020, ADOT separated the previously studied corridors into six groupings to be updated and reassessed: Northeast, Northcentral, Northwest, Southeast, Southcentral, and Southwest. The 13 corridor studies within the three northern groupings were updated in Summer 2022. The 8 corridor studies within the three southern groupings began in Spring 2022 and include:

Southeast

- US 60: Meridian Road to US 70; US 70: US 60 to US 191; and US 191: US 70 to SR 80
- SR 90: I-10 to SR 80 and SR 80: SR 90 to US 191

Southcentral

- I-19: Nogales to I-10
- I-10: Casa Grande to the New Mexico State Line
- SR 347: Peters and Nall Road to SR 84 and SR 84: SR 347 to I-8

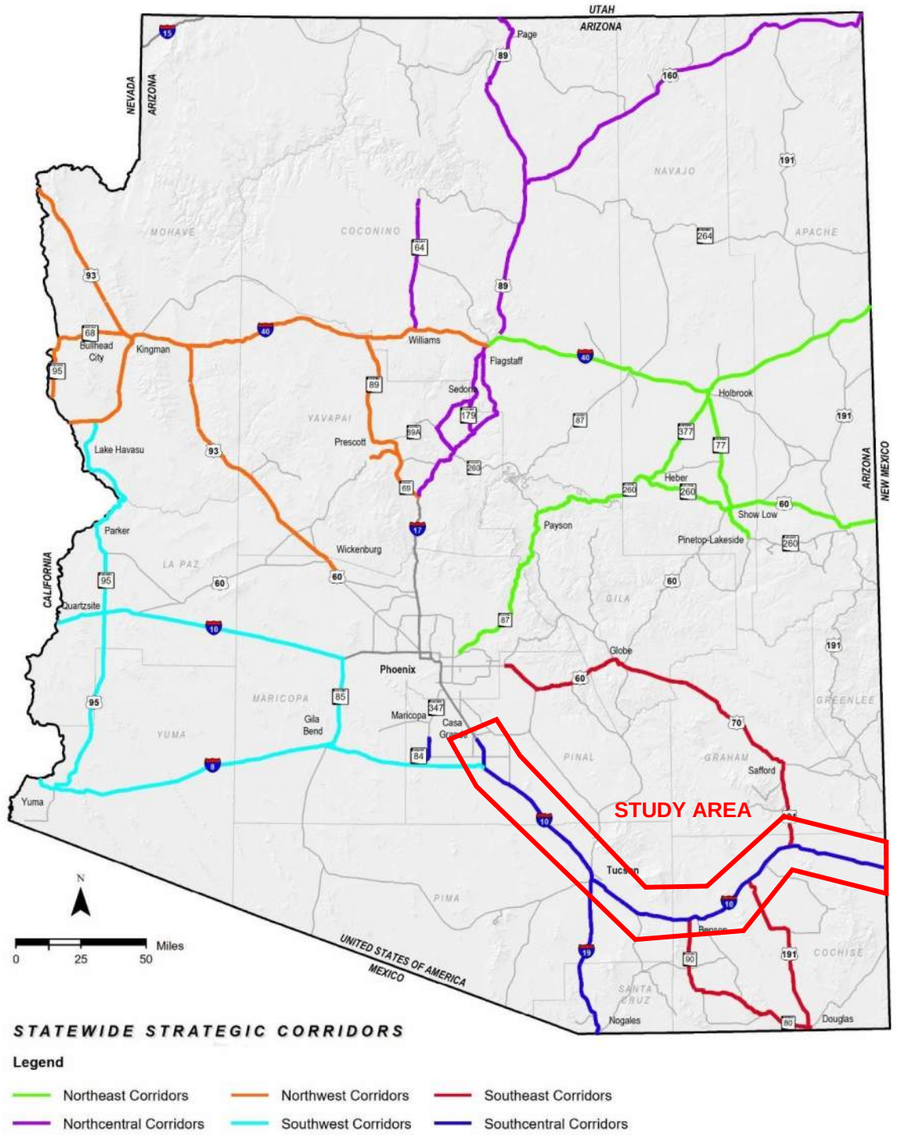
Southwest

- US/SR 95: I-8 to I-40
- I-10: California State Line to SR 85 and SR 85: I-10 to I-8
- I-8: California State Line to I-10

The studies under this program assess the overall health, or performance, of the state's strategic highways. The CPS will identify candidate solutions for consideration in the Multimodal Planning Division's (MPD) P2P project prioritization process, providing information to guide corridor-specific project selection and programming decisions.

The I-10 East Corridor, depicted in **Figure 1** along with all CPS corridors, is one of the strategic statewide corridors identified and the subject of this CPS Update.

Figure 1: Corridor Study Area



1.1 Corridor Study Purpose

The purpose of the CPS is to measure corridor performance to inform the development of strategic solutions that are cost-effective and account for potential risks. This purpose can be accomplished by following the process described below:

- Inventory past improvement recommendations
- Define corridor goals and objectives
- Assess existing performance based on quantifiable performance measures
- Propose various solutions to improve corridor performance
- Identify specific solutions that can provide quantifiable benefits relative to the performance measures
- Prioritize solutions for future implementation, accounting for performance effectiveness and risk analysis findings

1.2 Study Goals and Objectives

The objective of this study is to identify a recommended set of prioritized potential solutions for consideration in future construction programs, derived from a transparent, defensible, logical, and replicable process. The I-10 East CPS defined solutions and improvements for the corridor that were evaluated and ranked to determine which investments offer the greatest benefit to the corridor in terms of enhancing performance. Corridor benefits will be categorized by the following three investment types:

- Preservation: Activities that protect transportation infrastructure by sustaining asset condition or extending asset service life.
- Modernization: Highway improvements that upgrade efficiency, functionality, and safety without adding capacity.
- Expansion: Improvements that add transportation capacity through the addition of new facilities and/or services.

This study identifies potential actions to improve the performance of the I-10 East Corridor. Proposed actions are compared based on their likelihood of achieving desired performance levels, life-cycle costs, cost-effectiveness, and risk analysis to produce a prioritized list of solutions that help achieve corridor goals.

The following goals are identified as the desired outcome of this study:

- Link project decision-making and investments on key corridors to strategic goals.
- Develop solutions that address identified corridor needs based on measured performance.
- Prioritize improvements that cost-effectively preserve, modernize, and expand transportation infrastructure.

1.3 Corridor Overview and Location

The I-10 East Corridor is a major east-to-west all-weather transcontinental highway that connects California (Santa Monica) with Florida (Jacksonville). I-10 is a major transportation artery route for freight and passenger vehicular traffic, connecting major metropolitan cities throughout the southern part of the United States. I-10 plays a key role in the transportation infrastructure of southern Arizona, contributing to its economic success.

I-10 provides the most direct link between the greater Phoenix and Tucson metropolitan areas in Arizona and Los Angeles, California, to the west, and major Texas and Florida cities to the east. I-10 provides a principal road link for freight traffic from the ports of California. This study builds on earlier planning efforts in developing and applying a performance-based process for prioritizing improvements to meet the corridor's present and future needs

1.4 Corridor Segments

The I-10 Corridor is being studied in two separate efforts. The I-10 West CPS extends from the California State Line to SR 85. The I-10 East CPS extends from SR 202L to the New Mexico State Line and is referred to as I-10 East.

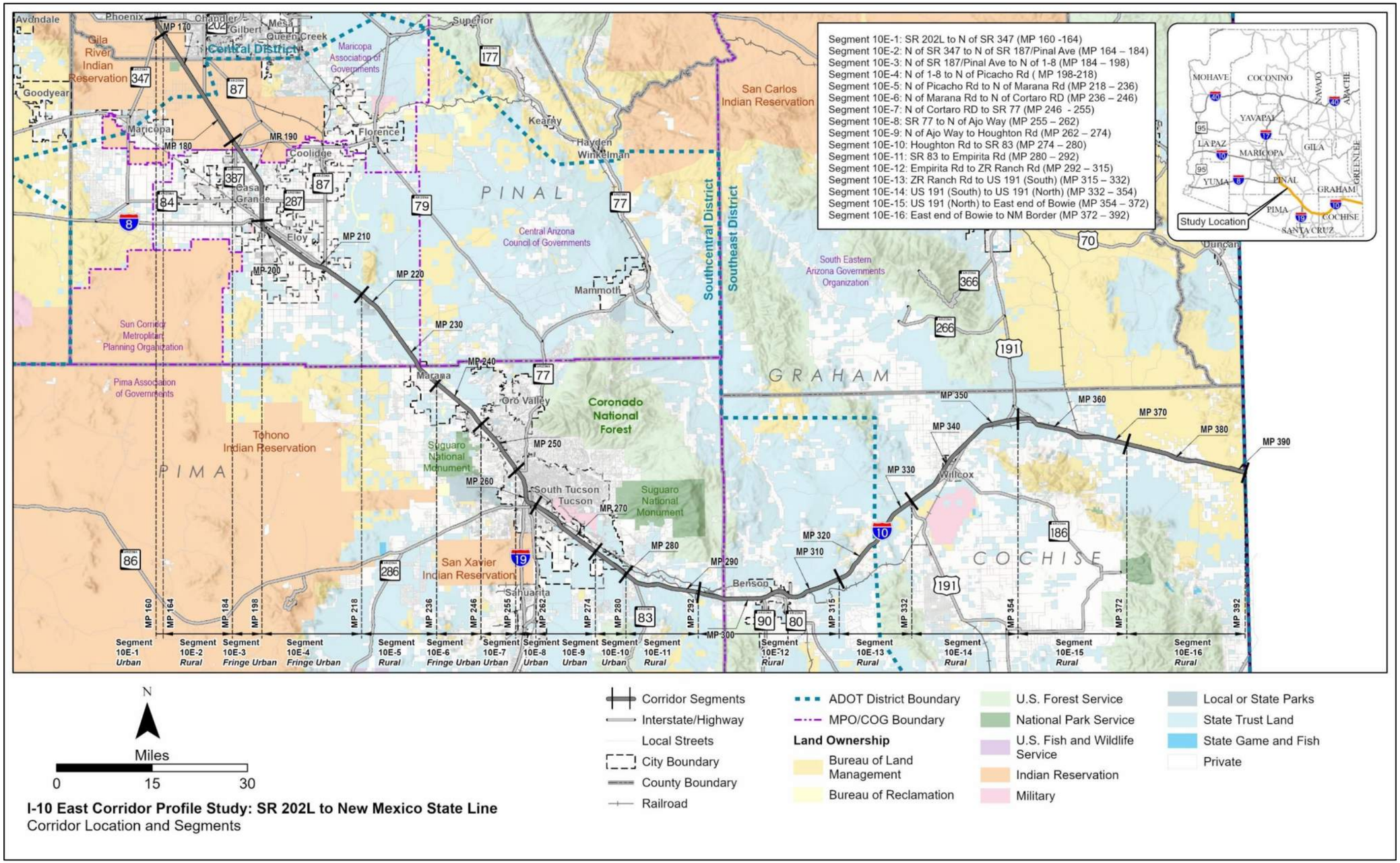
The I-10 East Corridor is 232 miles long, from SR 202L (MP 160) to the Arizona-New Mexico State Line (MP 392). The I-10 East Corridor is located in three ADOT Districts (Central, Southcentral, and Southeast), four planning areas (Maricopa Association of Governments [MAG], Sun Corridor Metropolitan Planning Organization [SCMPO], Pima Association of Governments [PAG], and Southeastern Arizona Governments Organization [SEAGO]), and four counties (Maricopa, Pinal, Pima, and Cochise).

The I-10 East Corridor is divided into 16 planning segments to allow for an appropriate level of detailed needs analysis, performance evaluation, and comparison between different segments of the corridor. Corridor segments are described in **Table 1** and shown in **Figure 2.** Segments 10E-1 and 10E-2 are shown in this and all subsequent figures for context but omitted from this and all subsequent tables as they are not the focus of this CPS update.

Table 1: I-10 East Corridor Segments

Segment #	Begin	End	Approx. Begin Milepost	Approx. End Milepost	Approx. Length (miles)	Typical Through Lanes (EB, WB)	2020/2040 Average Annual Daily Traffic Volume (vpd)	Character Description
10E-3	Casa Grande (MP 187)	North of I-8	187	198	11	3,3	42,700 / 56,800	Characterized as “Urban or Rural 6-Lane Freeway”; three lanes in each direction; posted speed limit of 75 mph. Adjacent to Gila River Indian Community and urbanizing area of Casa Grande.
10E-4	North of I-8	North of Picacho Road	198	218	20	3,3	40,800 / 52,500	Characterized as “Urban or Rural 6-Lane Freeway”; three lanes in each direction; posted speed limit of 75 mph. The I-8 system TI is at MP 199. Adjacent to Eloy.
10E-5	North of Picacho Road	North of Marana Road	218	236	18	3,3	42,500 / 54,700	Characterized as “Urban or Rural 6-Lane Freeway”; three lanes in each direction; posted speed limit of 75 mph. Area is largely rural, undeveloped desert; Union Pacific Railroad (UPRR) runs parallel on northern side of this segment, continuing to Tucson.
10E-6	North of Marana Road	North of Cortaro Road	236	246	10	3,3	57,500 / 73,500	Characterized as “Urban or Rural 6-Lane Freeway”; three lanes in each direction; posted speed limit of 75 mph. Traverses Marana as freeway enters the Tucson urbanized area.
10E-7	North of Cortaro Road	SR 77	246	255	9	3-4,3-4	104,000 / 132,600	Characterized as “Urban or Rural 6-Lane Freeway” or “Urban >6-Lane Freeway”; four lanes in each direction at Ina Rd TI (MP 248-249) and southeast of Ruthrauff Rd TI (MP 252-255) with three lanes each direction north of Ina Rd TI and between Ina Rd TI and Ruthrauff Rd TI; posted speed decreases at MP 246 to 65 mph through Tucson.
10E-8	SR 77	North of Ajo Way	255	262	7	3-4,3-4	144,400 / 170,900	Characterized as “Urban >6-Lane Freeway” or “Urban or Rural 6-Lane Freeway”; four lanes in each direction MP 255-259 before dropping a lane at the I-19 system interchange. This segment serves the urbanized Tucson area.
10E-9	North of Ajo Way	Houghton Road	262	274	12	2-3,2-3	58,900 / 70,300	Characterized as “Urban 4-Lane Freeway”; drops to two lanes in each direction at MP 262-263; posted speed limit increases to 75 mph at MP 271. The segment ends at Houghton Road, which is considered the eastern extent of the Tucson urbanized area; generally rural to the east.
10E-10	Houghton Road	SR 83	274	280	6	2,2	36,300 / 44,400	Characterized as “Urban 4-Lane Freeway.” The area is largely rural, with the exception of Vail (unincorporated place) at the SR 83 junction.
10E-11	SR 83	Empirita Road	280	292	12	2,2	27,500 / 34,300	Characterized as “Rural 4-Lane Freeway >25K”; posted speed limit remains at 75 mph. Exit 292 (Empirita Road) has an unconventional “folded diamond” interchange type.
10E-12	Empirita Road	ZR Ranch Road	292	315	23	2,2	21,100 / 27,500	Characterized as “Rural 4-Lane Freeway <25K.” This segment traverses Benson.
10E-13	ZR Ranch Road	US 191 (South)	315	332	17	2,2	17,900 / 22,300	Characterized as “Rural 4-Lane Freeway <25K.” This segment has steep grades EB (as high as 6 percent) and WB (as high as 4 percent), causing considerable truck slowing; highest point on I-10 is at MP 321 (4,937 feet).
10E-14	US 191 (South)	US 191 (North)	332	354	22	2,2	16,900 / 21,000	Characterized as a “Rural 4-Lane Freeway <25K”; traverses Willcox. US 191 is coincident with this segment.
10E-15	US 191 (North)	Eastern end of Bowie	354	372	18	2,2	13,500 / 16,700	Characterized as “Rural 4-Lane Freeway <25K.” At MP 362, the freeway makes a wide sweeping curve around Bowie, an unincorporated census-designated place.
10E-16	Eastern end of Bowie	New Mexico State Line	372	392	20	2,2	12,600 / 15,600	Characterized as a “Rural 4-Lane Freeway <25K.” At MP 378, the freeway makes a wide sweeping curve around San Simon, an unincorporated census-designated place. The San Simon commercial vehicle port of entry (POE) is at MP 383, and a rest area is at MP 388.

Figure 2: Corridor Location and Segments



I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Corridor Location and Segments

1.5 Corridor Characteristics

Arizona is connected with the rest of the country through two major east-to-west transcontinental Interstate corridors, namely I-10 and I-40. I-10 connects Southern Arizona to California on the west coast and Florida on the east coast. The I-10 East Corridor provides a significant freight and travel route to the eastern portion of the United States and a connection to I-8 and I-19, providing a link to international commerce.

National Context

I-10 is part of the National Highway System, traversing 2,460 miles, making it the fourth-longest highway in the country. Its western terminus is in California (SR 1 in Santa Monica) and its eastern terminus is I-95 (in Jacksonville, Florida). I-10 intersects with eight of the nation's ten north-to-south Interstates and provides access to eight states and many major U.S. cities including Tallahassee, Florida, Mobile, Alabama, New Orleans, Louisiana, Baton Rouge, Louisiana, Houston, Texas, San Antonio, Texas, and Los Angeles, California. UPRR runs along I-10 from Los Angeles to New Orleans. Mexico, one the of the largest trading partners with the United States, is connected with I-10 by way of I-19 and SR 189 through Nogales, Arizona.

The portion of I-10 between Phoenix and Tucson is also a major element of the CANAMEX Trade Corridor, a High Priority Corridor, as defined by Congress in the 1995 National Highway Systems Designation Act. Through Arizona this route is defined as generally following I-19 from Nogales to Tucson, I-10 from Tucson to Phoenix, and US 93 in the vicinity of Phoenix to the Nevada Border.

Regional Connectivity

I-10 is Arizona's southernmost continuous east-to-west transportation corridor, stretching beyond Arizona's border with California and New Mexico. I-10 is identified as a Key Commerce Corridor within Arizona. I-10 attracts commercial truck, intercity, commuter, recreational, and out-of-state through traffic. The I-10 East corridor provides connections to State and U.S. highways including SR 202L, SR 347, SR 587, SR 287, I-8, SR 87, SR 77, I-19, SR 83, SR 90, SR 80, US 191, and SR 186. These highways provide access to tourist attractions, national parks and monuments, and many Arizona cities. In addition to linking Phoenix and Tucson (Arizona's two largest cities), Arizona communities that are linked by the I-10 East corridor include Chandler, Casa Grande, Eloy, Marana, Benson, and Willcox. I-10 plays a vital role in transporting fresh produce and agricultural goods from Mexico to Arizona and other states because it is connected to the busiest Arizona land POE (Mariposa) by way of I-19 and SR 189.

Commercial Truck Traffic

Arizona is a pass-through state for much of the freight originating at the ports of Los Angeles and Long Beach and traveling east to Texas and the central United States for distribution. As a result, I-10 is experiencing increasing freight flows from both domestic and international sources. The average daily truck traffic volumes on I-10 range from approximately 5,500 (eastern part of I-10 corridor near the New Mexico State Line) to 13,500 (Tucson area) trucks per day. The high truck volumes equate to 10 to 45 percent of the total daily traffic volume throughout the corridor. The I-10 segments within Phoenix and Tucson experience particularly high commercial truck activity. A steady truck volume through the I-10 corridor results in as much as 45 percent truck traffic in the rural section of I-10 near the New Mexico State Line where daily traffic volumes decrease. Phoenix and Tucson are identified as key regional trade, service, and distribution centers in Arizona with their strategic location in relation to Los Angeles, San Diego, and Mexico.

I-10 is one of the Key Commerce Corridors, recognizing the significance of this route to Arizona's economy. Key Commerce Corridors represent a strategic statewide approach to leverage infrastructure improvements to enhance Arizona's competitive economic position.

Under the Fixing America's Surface Transportation Act (FAST Act), I-10 is identified as a National Highway Freight Network to strategically direct federal resources and policies toward improved freight performance. As the primary connections for east-to-west goods movement arriving from Mexico (via SR 189 and I-19), truck traffic along I-10 carries a significant volume of high-value imported commercial goods and agricultural products.

The I-10 San Simon POE facility is approximately 2 miles west of the New Mexico State Line. The facility performs inspections and other duties to enforce state and federal laws for commercial vehicles.

Commuter Traffic

Most commuter traffic along I-10 East occurs within the urbanized areas of greater Phoenix and Tucson. According to the most recent traffic volume data maintained by ADOT (2020), traffic volumes range from approximately 12,600 vehicles (east of Bowie) per day in rural areas to 144,000 vehicles per day through Tucson. The section between Tucson and Phoenix also has a significant number of commuters, adding to the volume with approximately 50,000 vehicles per day (ADOT Traffic Division, 2014).

According to 2020 American Community Survey data from the U.S. Census Bureau, 79 percent of the workforce in Casa Grande, 73 percent of the workforce in Phoenix, and 73 percent of the workforce in Tucson relies on a private vehicle to get to work. The smaller communities along I-10 East have a high percentage of workers commuting long distances (presumably to the metropolitan areas of Tucson or Phoenix).

Recreation and Tourism

I-10 East provides access to recreational opportunities in southeastern Arizona and southern New Mexico. Many recreational users travel on I-10 East to access Picacho Peak State Park, Catalina State Park, Saguaro National Park, and Chiricahua National Monument. Motorists also use I-10 East to access I-8 when travelling west to San Diego or to access I-19 when travelling south to Nogales, Mexico. Tucson and Phoenix are also major recreational tourist destinations for motorists.

Multimodal Uses

Freight Rail

UPRR is one of the top transporters of intermodal freight in North America, and its Sunset Route runs parallel to the I-10 East corridor from the junction with I-8 to the New Mexico State Line. The Sunset Line carries large amounts of freight from the coast to the Midwest and Texas. Currently, the line experiences bottlenecks because of large stretches where the route is not double-tracked. UPRR also operates two branch routes that connect the Sunset Route to Phoenix from Picacho and Nogales from Tucson. UPRR is planning to turn the Sunset Route into a high-capacity route by double tracking the line throughout Arizona.[1]

Passenger Rail

Amtrak operates the Sunset Limited rail service, which runs along portions of I-10 East from north of Casa Grande to New Mexico with stops in Maricopa, Tucson, and Benson. In 2015, ADOT conducted a feasibility study for a high-speed passenger rail line between Phoenix and Tucson. A preliminary alignment was chosen, though no funding has been identified.

Bicycles/Pedestrians

Bicycles are prohibited from using I-10 East from the start of the corridor through Tucson to Kolb Road (MP 270). Bicycles are permitted to use the shoulders for the rest of the corridor, which generally are 10-feet-wide or wider. Pedestrians are prohibited on the entire route.

Bus/Transit

The largest regional public transportation service providers along the I-10 East corridor are Valley Metro in the Phoenix area and Sun Tran in Tucson. Multiple private companies provide bus service between Phoenix and Tucson. Greyhound operates a bus that has stops all along the I-10 East corridor from Phoenix to New Mexico.

Aviation

Airports in the vicinity of the I-10 East corridor are Gila River Memorial, Casa Grande Municipal, Eloy Municipal, Pinal Airpark, Marana Regional, Tucson International, Benson Municipal, and Cochise County. Most of these airports are small regional airports with very few daily flights. Tucson International Airport is the only airport along the corridor with scheduled passenger service on commercial airlines. It provides flights throughout the country and to Mexico.

Land Ownership, Land Uses, and Jurisdictions

As shown previously in **Figure 2**, the I-10 East corridor traverses multiple jurisdictions and land owned or managed by various entities in four Arizona counties: Maricopa, Pinal, Pima, and Cochise. The northern section of the corridor traverses the Gila River Indian Community (GRIC). Most of the remaining land along the corridor is owned by the Bureau of Land Management and the Arizona State Land Trust.

Population Centers

Major population centers along the I-10 East corridor are within the urbanized areas of Phoenix, Casa Grande, and Tucson. The modest growth anticipated by 2040 in Cochise County at the eastern portion of the corridor is countered by the significant population growth expected in the western portion (encompassing Maricopa and Pinal counties), and modest growth in the Tucson area. The Tucson area growth is largely forecast to the north (Marana) and east (Vail) along the I-10 corridor. Growth throughout the corridor and the lack of alternate routes results in projections for higher traffic volumes throughout the corridor. **Table 2** summarizes the populations for communities along the fourteen eastern segments of the corridor. Moderate population growth is projected between 2010 and 2040 in the major population centers along the corridor, according to the Arizona State Demographer's Office.

Table 2: Current and Future Population

Community	2010 Population	2020 Population	2040 Population	% Change 2010–2040	Total Growth
Pinal County	**376,369**	**466,175**	**820,887**	**118%**	**444,518**
Casa Grande	48,571	57,518	92,880	91%	44,309
Florence	25,537	29,130	64,667	153%	39,130
Coolidge	11,825	13,154	66,274	460%	54,449
Eloy	16,631	19,528	71,918	332%	55,287
Pima County	**980,263**	**1,050,906**	**1,195,142**	**22%**	**214,879**
Marana	34,961	49,910	82,287	135%	47,326
Tucson	520,116	550,878	601,587	16%	81,471
Oro Valley	40,984	46,446	54,508	33%	13,524
Cochise County	**131,346**	**134,166**	**155,200**	**18%**	**23,854**
Mescal	1,812	1,796	1,850	2%	38
Sierra Vista	45,047	45,592	44,662	-1%	-385
Benson	5,105	5,137	5,698	12%	593
Willcox	3,757	3,634	3,319	-12%	-438

Source: U.S. Census, Arizona Commerce Authority

Major Traffic Generators

Within the Phoenix and Tucson areas, the major traffic generator is local traffic, from both commuters and other daily travelers. Within Phoenix, Tucson, and Casa Grande, traffic is also generated by freight, including agricultural and industrial traffic. Outside of the study area, major traffic generators are the southern California ports and the Nogales border crossing (Mariposa), which generate significant freight traffic that uses I-10 East to access the central and eastern markets of the United States. Furthermore, recreational amenities around Tucson generate additional traffic on I-10 East. The Port of Tucson is just off I-10; it is a full-service inland port and

[1] Arizona State Rail Plan (2011), Appendix A

rail yard. The Port of Tucson is a federally designated, activated Foreign Trade Zone and a State of Arizona Enterprise Zone, generating additional foreign and domestic freight traffic through Tucson.[2]

Tribes

The GRIC is a semiautonomous Native American-governed territory covering 584 square miles adjacent to Phoenix within Maricopa and Pinal Counties. It is home to members of both the Akimel O'odham and Pee-Posh tribes. The population of the reservation is 11,257, within seven districts along the Gila River.[3]

Wildlife Linkages

The Arizona State Wildlife Action Plan (SWAP) provides a 10-year vision for the entire state, identifying wildlife and habitats in need of conservation, insight regarding the stressors to those resources, and actions that can be taken to alleviate those stressors. Using the Habimap Tool that creates an interactive database of information included in the SWAP. This database and other environmental resources should be conducted early on during all future project-related activities to ensure appropriate environmental compliance. The following wildlife and habitat considerations affecting rights-of-way along the I-10 East corridor were identified (these should not be considered a comprehensive listing of affected resources):

- Wildlife waters are northeast of Picacho, southwest of I-10 from Ina Road to Grant Road, and northwest of I-10 from Dragoon Road to US 191.
- I-10 bisects allotments/pastures from southeast of Picacho to the Pima-Pinal County line, and more infrequently from Colossal Cave Road to the Arizona-New Mexico border. These areas correspond primarily to State Land holdings, with areas closer to the Arizona-New Mexico border controlled by the Bureau of Land Management.
- Areas of AZ Missing Linkages lie in and around areas of Potential Wildlife Linkages along I-10 from east of Picacho to Tucson, from east of Vail to west of Benson, and from east of Benson to the Arizona-New Mexico border.
- The Species and Habitat Conservation Guide indicates moderately sensitive habitats along I-10 from Casa Grande into Tucson and highly sensitive habitats east of Tucson to the Arizona-New Mexico border.
- Moderate to high levels of Species of Economic and Recreational Importance are identified along I-10 throughout Casa Grande and spanning east toward the Arizona-New Mexico border.
- Species of Greatest Conservation need are identified along the I-10 corridor from Phoenix at SR 202L to the Arizona-New Mexico border.

Corridor Assets

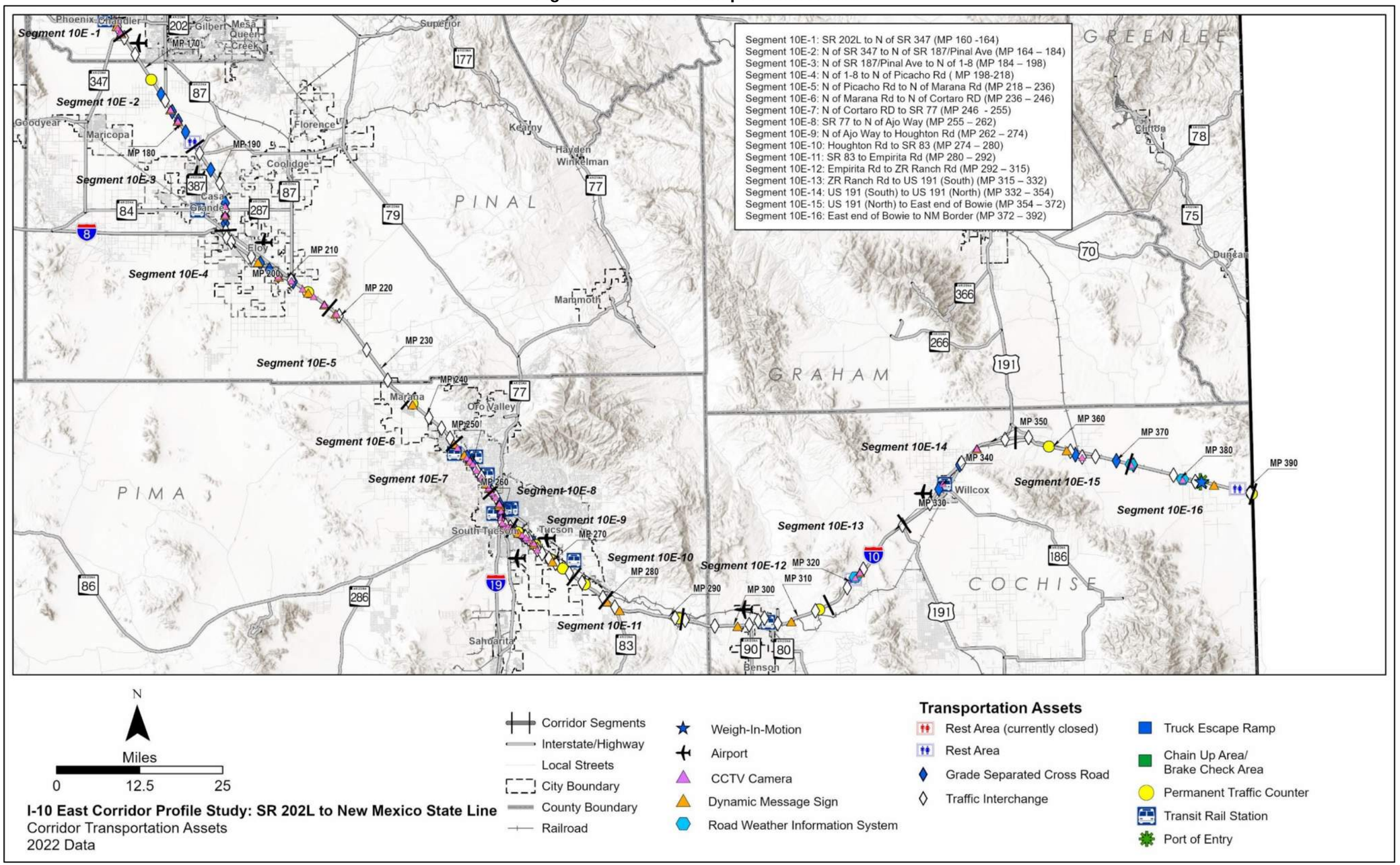
Corridor transportation assets are summarized in **Figure 3**. Most assets are in the more densely populated portions of the corridor, specifically through Tucson. Many bus stops are in Tucson near the I-10 corridor. There is also at Amtrak station and an airport. A freight weigh station is near the New Mexico border in San Simon, Arizona. There are dynamic message signs (DMS) and closed-circuit television (CCTV) cameras throughout the corridor. Also, 12 permanent traffic count stations are spaced intermittently throughout the I-10 East corridor.

Within the I-10 East corridor, ADOT operates three rest areas (which serve both directions of I-10) and a weigh station. The Texas Canyon Rest Area is at MP 320 and the San Simon Rest Area is at MP 388. The Texas Canyon and San Simon Rest Areas were renovated in 2015. The Sacaton Rest Area was renovated in 2017. The San Simon weigh station is at MP 383.

There are 33 DMSs throughout the corridor, with most between Phoenix and Tucson and just east of Tucson.

[2] https://www.linkedin.com/company/port-of-tucson
[3] http://www.gilariver.org/index.php/about

Figure 3: Corridor Transportation Assets



1.6 Corridor Stakeholders and Input Process

A Technical Advisory Committee (TAC) was created that was comprised of representatives from key stakeholders. TAC meetings will be held at key milestones to present results and obtain feedback. In addition, several meetings will be conducted with key stakeholders to present the results and obtain feedback.

Key stakeholders identified for this study included:

- ADOT Southeast District
- ADOT Southcentral District
- ADOT Central District
- ADOT Technical Groups
- SEAGO
- MAG
- SCMPO
- PAG
- AGFD
- ASLD
- Federal Highway Administration (FHWA)

Several Working Papers were developed during the course of the CPS. The Working Papers were provided to the TAC for review and comment.

1.7 Prior Studies and Recommendations

This study identified recommendations from previous studies, plans, and preliminary design documents. Studies, plans, and programs pertinent to the I-10 East Corridor were reviewed to understand the full context of future planning and design efforts within and around the study area. These studies are organized below into four categories: Framework and Statewide Studies, Regional Planning Studies, Planning Assistance for Rural Areas (PARAs) and Small Area Transportation Studies (SATS), and Design Concept Reports (DCRs) and Project Assessments (PAs).

Framework and Statewide Studies

- ADOT Bicycle and Pedestrian Plan Update (2013)
- ADOT Pedestrian Safety Action Plan (2017)
- ADOT Five-Year Transportation Facilities Construction Program (2023 – 2027)
- ADOT Climbing and Passing Lane Prioritization Study (2015)
- ADOT Arizona Key Commerce Corridors (2014)
- ADOT Arizona Multimodal Freight Analysis Study (2009)
- ADOT Arizona Ports of Entry Study (2021)
- ADOT Arizona State Airport Systems Plan (2018)
- ADOT Arizona State Freight Plan (2017)
- ADOT Arizona State Rail Plan (2011)
- AGFD Arizona State Wildlife Action Plan (2012)
- AGFD Arizona Wildlife Linkages Assessment (2006)
- ADOT Arizona Statewide Dynamic Message Sign Master Plan (2011)
- ADOT Arizona Statewide Intelligent Transportation System (ITS) Architecture (2018)
- ADOT Arizona Statewide Rail Framework Study (2010)
- ADOT Arizona Statewide Rest Area Study (2011)
- ADOT Arizona Statewide Shoulders Study (2015)
- ADOT Arizona Strategic Traffic Safety Plan (2019)
- ADOT Arizona Roadway Departure Safety Implementation Plan (RDSIP) (2014)
- ADOT AASHTO U.S. Bicycle Route System (2015)
- ADOT Low Volume State Routes Study (2017)
- ADOT Statewide Stormwater & Erosion Control Study (2020)
- ADOT Statewide Transportation Planning Framework – Building a Quality Arizona (BQAZ) (2009)
- ADOT Transportation Asset Management Plan (2021)
- ADOT What Moves You Arizona? Long-Range Transportation Plan (2016-2040)

Regional Planning Studies

- Arizona Passenger Rail Corridor Study, Tucson to Phoenix
- I-10 Phoenix-Tucson Bypass Study
- I-11 Tier 1 Environmental Impact Statement
- MAG 2050 Regional Transportation Plan (RTP)
- PAG 2040 RTP
- PAG 2040 RTP Update
- PAG 2017–2021 5-year Regional Transportation Improvement Program
- PAG Regionally Significant Corridors
- PAG State Transportation System Mobility and Regional Circulation Needs Feasibility Study
- PAG Southeast Area Arterial Study
- PAG Short-Range Transit Program Implementation Plan: FY 2015–2019
- PAG High Capacity Transit System Plan
- Regional Transportation Authority Our Mobility Plan
- Pima County Comprehensive Plan
- Sonoran Desert Conservation Plan
- Sonoran Corridor Alternatives Analysis
- Southwest Infrastructure Plan
- Pinal County Regionally Significant Routes for Safety and Mobility
- Pinal County Transit Feasibility Study

Planning Assistance for Rural Areas and Small Area Transportation Studies

- Northwest Cochise County Long-Range Transportation Plan
- City of Benson General Development Plan
- City of Eloy General Plan
- Pinal County Small Area Transportation Study
- Southern Pinal County Regional Corridor Study
- Plan Tucson, City of Tucson General and Sustainability Plan
- City of Willcox General Plan
- Plan Tucson, City of Tucson General and Sustainability Plan
- City of Willcox General Plan

Design Concept Reports and Project Assessments

- Interstate 10 Corridor Study, Junction I-8 to Tangerine Road DCR (2014)
- I-10/Replacement Tangerine Traffic Interchange – Marana, Arizona, Final Design Concept Report (2008)
- Interstate 10 Corridor Study, Ina Road TI to Ruthrauff TI Final Design Concept Report (2021)
- Feasibility Report: Interstate 10: Junction Interstate 19 to State Route 83, State Route 210: Golf Links Road to I-10 (2012, updated 2015)
- I-10 – Texas Canyon, MP 315 to Johnson Road TI, Final Design Concept Report (2014)
- Interstate 10 Corridor Study, Tangerine Road to Ina Road Final Design Concept Report (2014)
- I-10 Val Vista to I-8 Final Project Assessment (2009)
- North-South Corridor Study and Tier 1 Environmental Impact Statement (2021)

Summary of Prior Recommendations

Various studies and plans, including several DCRs, have recommended improvements to the I-10 East Corridor as shown in **Table 3** and **Figure 4**. They include, but are not limited to:

- Widening of numerous sections of I-10 East, some of which will require right-of-way acquisition. Many other proposed improvements are associated with the recommended widening:
  - Widen to four lanes in each direction from MP 161 to 255
  - Widen to five lanes in each direction from MP 199 to 252
  - Widen to four lanes in each direction from MP 259 to 263
  - Widen to three lanes in each direction from MP 265 to 392
- Climbing and passing lanes have been recommended in the eastern portion of the I-10 East corridor based on the Climbing and Passing Lane Prioritization Study.
- Many TI improvements have been recommended throughout the corridor.

Table 3: Corridor Recommendations from Previous Studies

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization [M], Expansion [E]}			Status of Recommendation			Name of Study
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)?	
1	170	210	40	Bridge Preservation	√			N/A	N/A	N	FY22-26 ADOT Bridge P2P
2	191	191		New DMS at MP 191		√		N/A	N/A	N	Statewide Dynamic Message Sign Masterplan (2011)
3	192.85	192.95		Widen bridge as well as add general purpose lane			√	N/A	N/A	N	FY22-26 ADOT Expansion P2P
4	197	197		Jimmie Kerr Boulevard, remove TI; Selma Highway, add new TI		√		2030	N/A	Y	Interstate 10 Corridor Study, Junction I-8 to Tangerine Road Design Concept Report (2014)
5	199	199		I-10/I-8, reconstruct system TI		√		2030	N/A	N	Arizona's Key Commerce Corridors (March 2014)
6	199	240	40	Widen to 5 lanes in each direction			√	2030	N/A	Y	Interstate 10 Corridor Study, Junction I-8 to Tangerine Road Design Concept Report (2014)
7	199	247	48	Between I-8 and Cortaro Road, widen to 8 lanes			√	2030	N/A	N	Arizona's Key Commerce Corridors (March 2014)
8	200	200		Sunland Gin Road TI relocated ¼ mile east of existing location		√		2030	N/A	Y	Interstate 10 Corridor Study, Junction I-8 to Tangerine Road Design Concept Report (2014)
9	210	213	3	I 10 realignment through the community of Picacho		√		2030	N/A	Y	Interstate 10 Corridor Study, Junction I-8 to Tangerine Road Design Concept Report (2014)
10	217	217		New DMS at MP 217		√		N/A	N/A	N	Statewide Dynamic Message Sign Masterplan (2011)
11	218	248	30	Fiber optic installation				FY 2022	N/A	N	ADOT Design List Fiscal Year 2022
12	222	231.71	10	Pavement preservation (AR-ACFC)		√		N/A	N/A	N	ADOT Advertisement
13	222	231.71	10	Pavement preservation RR(5"TL, 3"PL) + FR	√			N/A	N/A	N	FY22-26 ADOT Pavement Preservation List
14	224	224		New DMS at MP 224		√		N/A	N/A	N	Statewide Dynamic Message Sign Masterplan (2011)
15	226	227	1	Bridge rehabilitation		√		N/A	N/A	N	FY22-26 ADOT Bridge P2P
16	226.42	227.42	1	Bridge rehabilitation, widen to three lanes in each direction		√	√	N/A	N/A	N	ADOT 5-Year Program CYMPO 2045 Regional Transportation Plan Update (2020)
17	231.71	242		Pavement preservation RR(5"TL, 3"PL) + FR	√			N/A	N/A	N	FY22-26 ADOT Pavement Preservation List
18	232	232		Bridge replacement		√		N/A	N/A	N	FY22-26 ADOT Modernization P2P
19	236	248	12	Pavement preservation	√			N/A	N/A	N	AZBEX 02/18/2022
20	236	260	24	Bridge preservation	√			N/A	N/A	N	FY22-26 ADOT Bridge P2P
21	240	240		Tangerine Road reconstruct TI		√	√	N/A	N/A	N	I-10/Replacement Tangerine Traffic Interchange – Marana, Arizona Final Design Concept Report (2008)
22	240	248		Pavement preservation RR(5"TL, 3"PL) + FR	√			N/A	N/A	N	FY22-26 ADOT Pavement Preservation List
23	243	243		New DMS at MP 243		√		N/A	N/A	N	Statewide Dynamic Message Sign Masterplan (2011)
24	245	248		New DMS at MPs 245, 247.2, 247.9, and 248		√		N/A	N/A	N	Statewide Dynamic Message Sign Masterplan (2011)

Table 3: Corridor Recommendations from Previous Studies (continued)

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization [M], Expansion [E]}			Status of Recommendation			Name of Study
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)?	
25	247.57	253.4	6	Widening to 8 lanes			√	N/A	N/A	N	ADOT 5-Year Program
26	248	252	4	Ina Road to Ruthrauff Road, widen to 8 lanes			√	2016-2035	N/A	N	Draft PAG 2045 Regional Transportation Plan (RTP) Update (January 2014)
27	248.03	251.85	4	Construct 4 GP lanes each direction			√	N/A	N/A	N	ADOT Advertisement
28	250	250		Orange Grove Road, reconstruct TI		√	√	2025-2035	N/A	N	Draft PAG 2045 Regional Transportation Plan (RTP) Update (January 2014)
29	251	251		Sunset Road, reconstruct TI		√	√	2025-2035	N/A	N	Draft PAG 2045 Regional Transportation Plan (RTP) Update (January 2014)
30	251	251		New DMS at MP 251		√		N/A	N/A	N	Statewide Dynamic Message Sign Masterplan (2011)
31	254	254		New DMS at MP 254		√		N/A	N/A	N	Statewide Dynamic Message Sign Masterplan (2011)
32	259	263	4	I-19 to Kino Parkway, widen to 8 lanes			√	2025-2035	N/A	N	Draft PAG 2045 Regional Transportation Plan (RTP) Update (January 2014)
33	260	265	5	I-19 to SR 210, widen to 8 lanes			√	N/A	N/A	N	Feasibility Report Interstate 10: Junction Interstate 19 to State Route 83; State Route 210: Golf Links Road to I 10 (2015)
34	260	291	31	I-19 to New Mexico border, widen to 6 lanes			√	2035	N/A	N	Arizona's Key Commerce Corridors (March 2014)
35	260	274	14	Tucson area I-10 widening project			√	N/A	N/A	N	FY22-26 ADOT Expansion P2P
36	262	262		Park Avenue, reconstruct TI		√	√	2020	N/A	N	PAG 2016–2020 5-Year Regional Transportation Improvement Program
37	262	262		Park Avenue, reconstruct TI		√	√	2016-2025	N/A	N	Draft PAG 2045 Regional Transportation Plan (RTP) Update (January 2014)
38	262.4	272	10	Pavement/bridge rehabilitation		√		N/A	N/A	N	ADOT Advertisement
39	263	263		Kino Parkway, reconstruct TI			√	2035-2045	N/A	N	Draft PAG 2045 Regional Transportation Plan (RTP) Update (January 2014)
40	264	267	3	Widening to three lanes as well as construction of ramps in connection to future SR 210 to I-10			√	N/A	N/A	N	ADOT 5-Year Program
41	264	264		Reconstruction of TI located at Country Club Road, 3 GP lanes in each direction			√	N/A	N/A	N	ADOT 5-Year Program, Draft PAG 2045 Regional Transportation Plan (RTP) Update (January 2014), PAG 2016–2020 5-Year Regional Transportation Improvement Program
42	265	270	5	SR 210 to Kolb Road, widen to 12 lanes			√	N/A	N/A	N	Feasibility Report Interstate 10: Junction Interstate 19 to State Route 83; State Route 210: Golf Links Road to I 10 (2015)

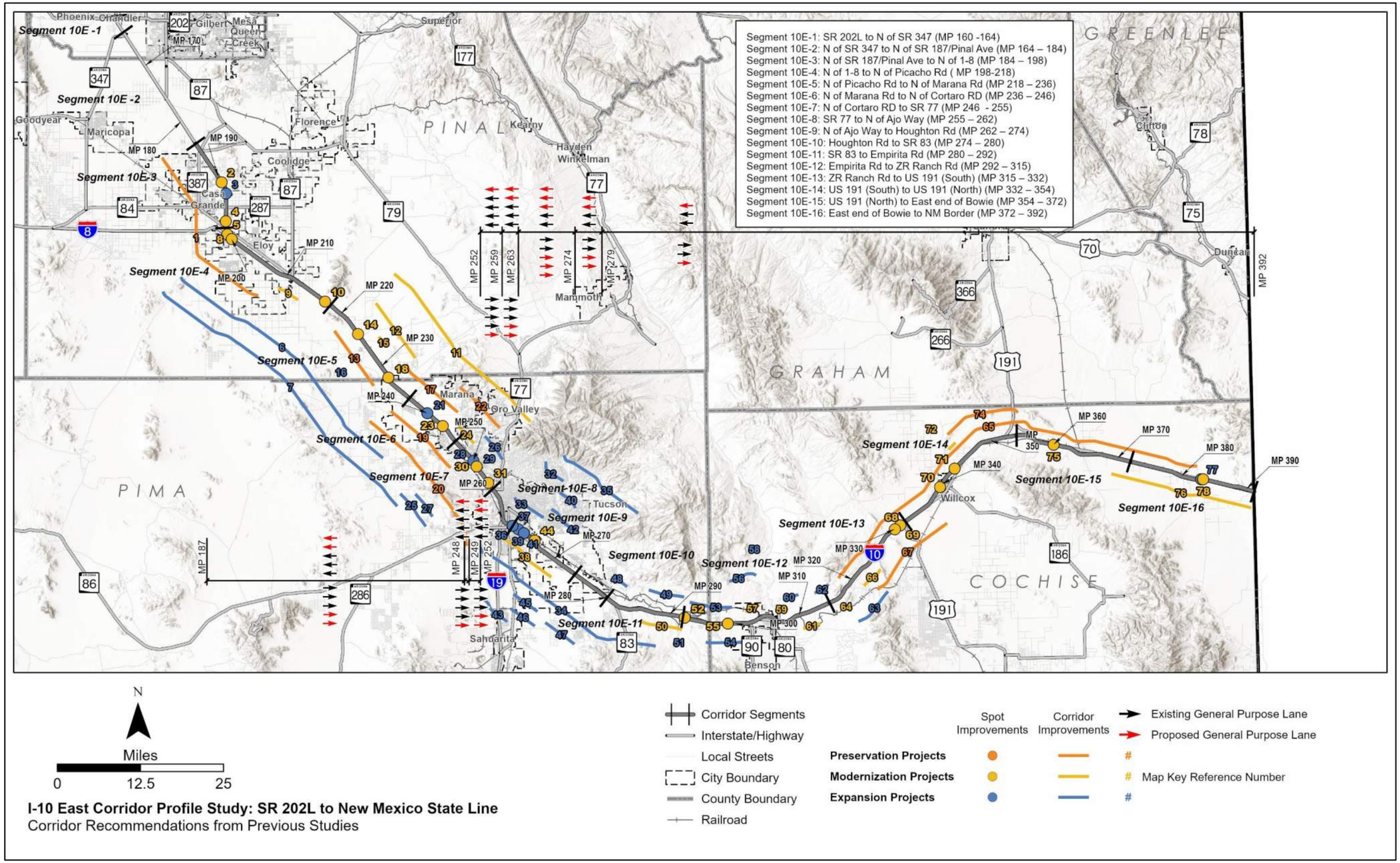
Table 3: Corridor Recommendations from Previous Studies (continued)

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization [M], Expansion [E]}			Status of Recommendation			Name of Study
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)?	
43	265	270	5	Alvernon Road to Kolb Road, widen to 8 lanes			√	2025-2045	N/A	N	Draft PAG 2045 Regional Transportation Plan (RTP) Update (January 2014)
44	266	266		New DMS at MP 266		√		N/A	N/A	N	Statewide Dynamic Message Sign Masterplan (2011)
45	270	274	4	Kolb Road to Houghton Road, widen to 6 lanes			√	2025-2035	N/A	N	Draft PAG 2045 Regional Transportation Plan (RTP) Update (January 2014)
46	270	274	4	Kolb Road to Houghton Road, widen to 10 lanes			√	N/A	N/A	N	Feasibility Report Interstate 10: Junction Interstate 19 to State Route 83; State Route 210: Golf Links Road to I 10 (2015)
47	274	279	4	Houghton Road to Wentworth Road, widen to 8 lanes			√	N/A	N/A	N	Feasibility Report Interstate 10: Junction Interstate 19 to State Route 83; State Route 210: Golf Links Road to I 10 (2015)
48	279	281	2	Wentworth Road to SR 83, widen to 6 lanes			√	N/A	N/A	N	Feasibility Report Interstate 10: Junction Interstate 19 to State Route 83; State Route 210: Golf Links Road to I 10 (2015)
49	286	291	5	Additional EB climbing lane			√	N/A	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
50	286.82	292.53		Additional EB climbing lane		√		N/A	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
51	292.35	293.35	10	Bridge rehabilitation/replacement, new system TI connection to new Chino Valley Area Freeway corridor		√	√	N/A	N/A	N	ADOT 5-Year Program AZ Statewide Transportation Planning Framework Study (2010)
52	292.35	292.35		Bridge rehabilitation		√		FY 2021	N/A	N	ADOT Design List Fiscal Year 2021
53	293	299	6	Mescal EB climbing lane			√	N/A	N/A	N	FY22-26 ADOT Modernization P2P
54	296	303	7	Cochise/Pinal County line to B-10/ 4th Street Exit, widen to 6 lanes			√	2040	N/A	N	Northwest Cochise County Long-Range Transportation Plan (2010)
55	299	299		Skyline Road, new TI		√		2040	N/A	N	Northwest Cochise County Long-Range Transportation Plan (2010)
56	302	306	4	Additional WB climbing lane			√	N/A	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
57	302.8	304.71		Additional WB climbing lane		√		N/A	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
58	302.95	303.4	.45	Climbing lane			√	N/A	N/A	N	ADOT 5 -Year Program
59	307	308	1	Bridge rehabilitation		√		N/A	N/A	N	FY22-26 ADOT Bridge P2P

Table 3: Corridor Recommendations from Previous Studies (continued)

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization [M], Expansion [E]}			Status of Recommendation			Name of Study
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)?	
60	309	311	2	Additional EB climbing lane			√	N/A	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
61	309.8	312		Additional EB climbing lane		√		N/A	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
62	315	317	2	Additional EB climbing lane			√	N/A	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
63	315	321	7	Addition of EB climbing lane and safety improvements			√	N/A	N/A	N	I-10 – Texas Canyon, MP 315 to Johnson Road TI Final Design Concept Report (2014)
64	316.01	317.26		Additional EB climbing lane		√		N/A	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
65	318	383	65	Bridge deck preservation	√			N/A	N/A	N	FY22-26 ADOT Bridge P2P
66	320.86	323.96		Additional WB climbing lane		√		N/A	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
67	322	336.25		Pavement preservation RR(5"TL, 3"PL) + FR	√			N/A	N/A	N	FY22-26 ADOT Pavement Preservation List
68	330	330		New DMS at MP 330		√		FY 2017	N/A	N	Statewide Dynamic Message Sign Masterplan (2011)
69	331	331	2	Cochise TI, construct improvements		√		N/A	N/A	N	ADOT 5-Year Program 2016–2020
70	339.46	339.46		Bridge mitigation		√		N/A	N/A	N	FY22-26 ADOT Modernization P2P
71	343	343		New DMS at MP 343		√		N/A	N/A	N	Statewide Dynamic Message Sign Masterplan (2011)
72	344	345	1	Bridge deck rehabilitation		√		FY2021-2025	N/A	N	FY22-26 ADOT Bridge P2P
73	344.51	345.51	1	Bridge rehabilitation		√		N/A	N/A	N	ADOT 5_Year Program
74	345.05	356.49		Pavement preservation RR(5"TL, 3"PL) + FR	√			N/A	N/A	N	FY22-26 ADOT Pavement Preservation List
75	360	360		New DMS at MP 360		√		N/A	N/A	N	Statewide Dynamic Message Sign Masterplan (2011)
76	370	392	22	Road – Other Improvement		√		FY 2021	N/A	N	ADOT Design List Fiscal Year 2021
77	383	383		San Simon port of entry improvements to ramps, truck access, facilities, and miscellaneous.			√	N/A	N/A	N	ADOT Ports of Entry Final Report 2021
78	383.35	383.35		Bridge replacement		√		N/A	N/A	N	FY22-26 ADOT Modernization P2P

Figure 4: Corridor Recommendations from Previous Studies



I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Corridor Recommendations from Previous Studies

2.0 CORRIDOR PERFORMANCE

This chapter describes the evaluation of the existing performance of the I-10 East Corridor. A series of performance measures is used to assess the corridor. The results of the performance evaluation are used to define corridor needs relative to the long-term goals and objectives for the corridor.

2.1 Corridor Performance Framework

This study uses a performance-based process to define baseline corridor performance, diagnose corridor needs, develop corridor solutions, and prioritize strategic corridor investments. In support of this objective, a framework for the performance-based process was developed through a collaborative process involving ADOT and the CPS consultant teams.

Figure 5 illustrates the performance framework, which includes a two-tiered system of performance measures (primary and secondary) to evaluate baseline performance. The primary measures in each of five performance areas are used to define the overall health of the corridor, while the secondary measures identify locations that warrant further diagnostic investigation to delineate needs. Needs are defined as the difference between baseline corridor performance and established performance objectives.

Figure 5: Corridor Profile Performance Framework

The following five performance areas guide the performance-based corridor analyses:

- Pavement
- Bridge
- Mobility
- Safety
- Freight

These performance areas reflect national performance goals stated in *Moving Ahead for Progress in the 21st Century* (MAP-21):

- Safety: To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
- Infrastructure Condition: To maintain the highway infrastructure asset system in a state of good repair
- Congestion Reduction: To achieve a significant reduction in congestion on the National Highway System
- System Reliability: To improve the efficiency of the surface transportation system
- Freight Movement and Economic Vitality: To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
- Environmental Sustainability: To enhance the performance of the transportation system while protecting and enhancing the natural environment
- Reduced Project Delivery Delays: To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion

In 2015, the *Fixing America's Surface Transportation Act* (FAST Act) was passed. The FAST Act continued to emphasize the performance management approach identified in MAP-21 but included additional provisions for meeting established performance targets.

The MAP-21 and FAST Act performance areas were considered in the development of ADOT's P2P process, which integrates transportation planning with capital improvement programming and project delivery. Because the P2P program requires the preparation of annual transportation system performance reports using the five performance areas, consistency is achieved among various ADOT processes by using these same performance areas.

While these performance areas were established prior to the earlier rounds of the CPS program, several related federal and ADOT reporting measures and targets were not yet in place at that time. These measures and targets have since been established (subsequent to completion of the prior CPS rounds). As such, it became necessary to revisit and revise the CPS performance measures to be more consistent with the latest federal and ADOT reporting measures and targets.

The performance measures include five primary measures: Pavement Index, Bridge Index, Mobility Index, Safety Index, and Freight Index. Additionally, a set of secondary performance measures provides for a more detailed analysis of corridor performance.

Each of the primary and secondary performance measures is comprised of one or more quantifiable indicators. A three-level scale was developed to standardize the performance scale across the five performance areas, with numerical thresholds specific to each performance measure:

Good/Above Average Performance – Rating is above the identified desirable/average range

Fair/Average Performance – Rating is within the identified desirable/average range

Poor/Below Average Performance – Rating is below the identified desirable/average range

Table 4 provides the complete list of primary and secondary performance measures for each of the five performance areas.

Table 4: Corridor Performance Measures

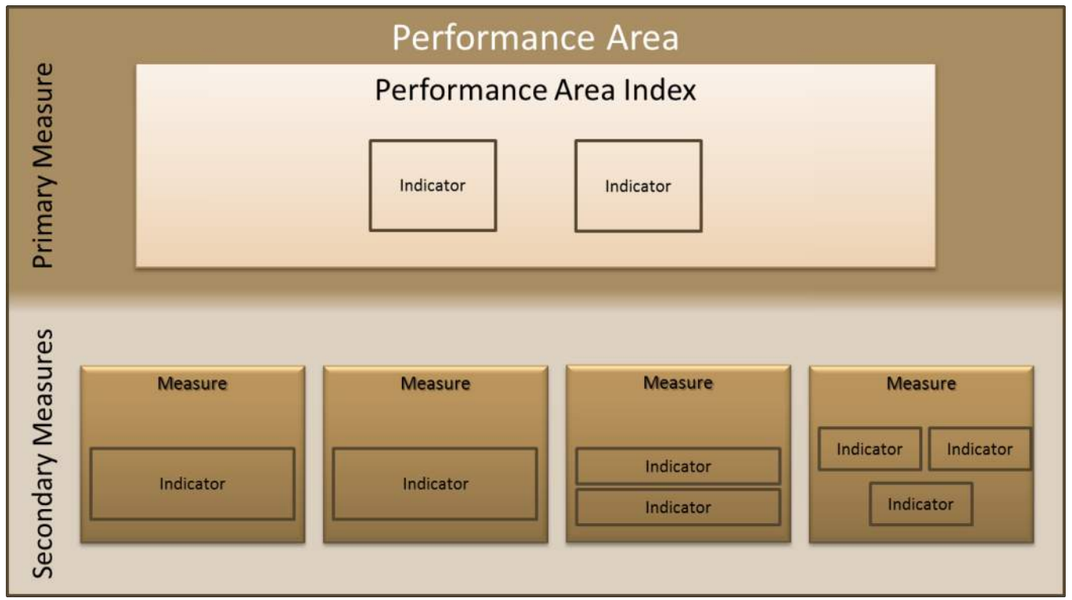
Performance Area	Primary Measure	Secondary Measures
Pavement	**Pavement Index** Based on a combination of International Roughness Index, cracking, and rutting	• Directional Pavement Serviceability • Pavement Failure • Pavement Hot Spots
Bridge	**Bridge Index** Based on lowest of deck, substructure, superstructure and structural evaluation rating	• Bridge Sufficiency • Bridge Rating • Bridge Hot Spots
Mobility	**Mobility Index** Based on combination of existing and future daily volume-to-capacity ratios	• Future Congestion • Peak Congestion • Travel Time Reliability • Multimodal Opportunities
Safety	**Safety Index** Based on frequency of fatal and suspected serious injury crashes	• Directional Safety Index • Strategic Traffic Safety Plan Emphasis Areas • Other Crash Unit Types • Safety Hot Spots
Freight	**Freight Index** Based on bi-directional truck travel time reliability	• Travel Time Reliability • Bridge Vertical Clearance • Bridge Vertical Clearance Hot Spots

The general template for each performance area is illustrated in **Figure 6**.

The guidelines for performance measure development are:

- Indicators and performance measures for each performance area should be developed for relatively homogeneous corridor segments
- Performance measures for each performance area should be tiered, consisting of primary measure(s) and secondary measure(s)
- Primary and secondary measures should assist in identifying those corridor segments that warrant in-depth diagnostic analyses to identify performance-based needs and a range of corrective actions known as solution sets
- One or more primary performance measures should be used to develop a Performance Index to communicate the overall health of a corridor and its segments for each performance area; the Performance Index should be a single numerical index that is quantifiable, repeatable, scalable, and capable of being mapped; primary performance measures should be transformed into a Performance Index using mathematical or statistical methods to combine one or more data fields from an available ADOT database
- One or more secondary performance measure indicators should be used to provide additional details to define corridor locations that warrant further diagnostic analysis; secondary performance measures may include the individual indicators used to calculate the Performance Index and/or “hot spot” features

Figure 6: Performance Area Template

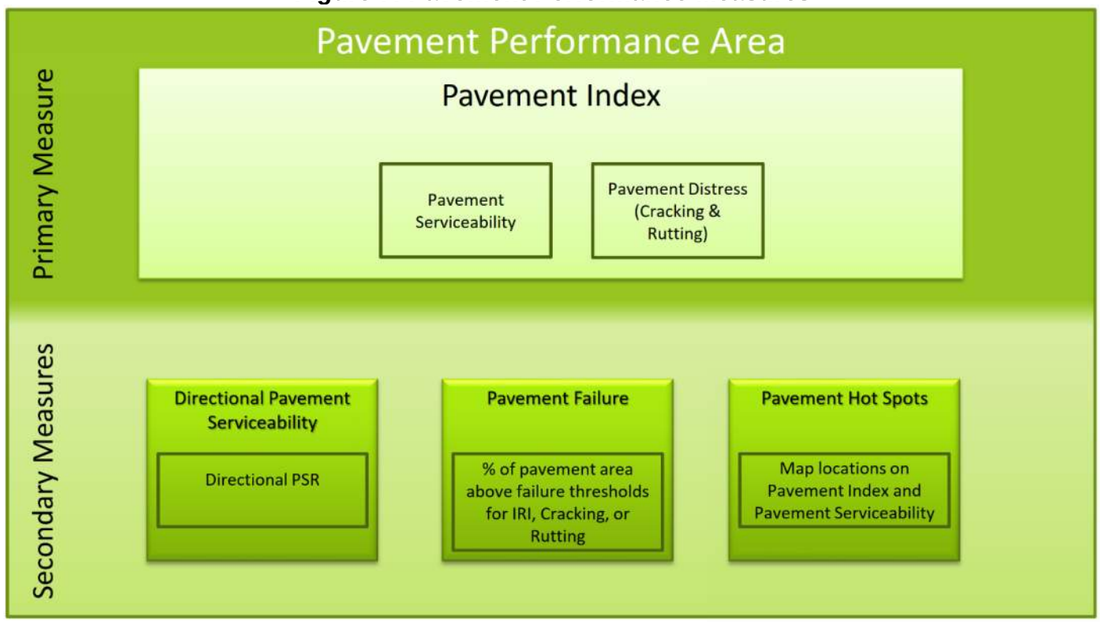


2.2 Pavement Performance Area

The Pavement Performance Area consists of a primary measure (Pavement Index) and three secondary measures, as shown in **Figure 7**. These measures assess the condition of the existing pavement along the I-10 East Corridor. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C.**

This CPS is an update to a previously completed report. The performance measures and performance thresholds have been revised from the previous version. For the Pavement performance area, the new methodology includes the use of Rutting data and the performance thresholds have been slightly modified.

Figure 7: Pavement Performance Measures



Primary Pavement Index

The Pavement Index is calculated using two pavement condition ratings: the Pavement Serviceability Rating (PSR) and the Pavement Distress Index (PDI).

The PSR is extracted from the International Roughness Index (IRI), a measurement of pavement roughness based on field-measured longitudinal roadway profiles. The PDI is extracted from the Cracking Rating (CR) and Rutting Rating, field-measured samples from each mile of highway.

Both the PSR and PDI use a 0 to 5 scale with 0 representing the lowest performance and 5 representing the highest. The Pavement Index for each segment is a weighted average of the directional ratings based on the number of travel lanes. Therefore, the condition of a section with more travel lanes will have a greater influence on the resulting segment Pavement Index than the condition of a section with fewer travel lanes.

Each corridor segment is rated on a scale with other segments in similar operating environments. Within the Pavement performance area, the relevant operating environments are designated as interstate and non-interstate segments. For the I-10 East Corridor, the following operating environments were identified:

- Interstate: all segments

Secondary Pavement Measures

Three secondary measures provide an in-depth evaluation of the different characteristics of pavement performance.

Directional Pavement Serviceability

- Weighted average (based on number of lanes) of the PSR for the pavement in each direction of travel

Pavement Failure

- Percentage of pavement area rated above failure thresholds for IRI, Cracking, or Rutting

Pavement Hot Spots

- A Pavement “hot spot” exists where a given one-mile section of roadway rates as being in “poor” condition
- Highlights problem areas that may be under-represented in a segment average. This measure is recorded and mapped, but not included in the Pavement performance area rating calculations

Pavement Performance Results

The Pavement Index provides a high-level assessment of the pavement condition for the corridor and for each segment. The three secondary measures provide more detailed information to assess pavement performance.

Based on the results of this analysis, the following observations were made:

- The weighted average of the Pavement Index shows “good” overall performance for the I-10 East Corridor
- Segments 10E-4, 10E-5, 10E-6, 10E-7, 10E-8, 10E-9, 10E-10, 10E-12, and 10E-14 have “poor” % Area Failure ratings
- Pavement hot spots along the corridor include:
  - Segment 10E-2, MP 190-191
  - Segment 10E-4, MP 200-209, MP 211-212, and MP 213-218
  - Segment 10E-5, MP 218-219, MP 222-223, MP 225-227, MP 229-230, and MP 234-236
  - Segment 10E-6, MP 240-241 and MP 244-246

- Segment 10E-7, MP 246-249 and MP 250-252
- Segment 10E-8, MP 260-262
- Segment 10E-9, MP 262-263, MP 266-267, and MP 272-274
- Segment 10E-10, MP 274- 277
- Segment 10E-11, MP 288-290
- Segment 10E-12, MP 303-308 and MP 310-313
- Segment 10E-13, MP 321-323 and MP 328-329
- Segment 10E-14, MP 345-352
- Segment 10E-15, MP 355-356 and MP 358-361
- Segment 10E-16, MP 380-381

Table 5 summarizes the Pavement performance results for the I-10 East Corridor. **Figure 8** illustrates the primary Pavement Index performance and locations of Pavement hot spots along the I-10 East Corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 5: Pavement Performance

Segment	Segment Length (miles)	Pavement Index	Directional PSR		% Area Failure
			EB	WB	
10E-3	11	4.38	4.28	4.25	5%
10E-4	20	3.82	4.06	4.13	40%
10E-5	18	3.93	4.17	3.84	22%
10E-6	10	3.87	4.07	3.85	25%
10E-7	9	3.76	3.72	3.66	48%
10E-8	7	4.04	3.81	3.82	24%
10E-9	12	3.89	3.81	3.79	28%
10E-10	6	3.76	3.56	3.72	33%
10E-11	12	4.35	4.15	4.20	8%
10E-12	23	4.13	4.09	4.04	22%
10E-13	17	3.98	3.83	4.02	9%
10E-14	22	4.13	4.16	4.08	20%
10E-15	18	4.22	3.97	4.22	14%
10E-16	20	4.34	3.96	4.13	3%
SCALES					
Performance Level		**Interstate**			
Good		> 3.75	> 3.75		< 5%
Fair		3.00 - 3.75	3.40 - 3.75		5% - 20%
Poor		< 3.00	< 3.40		> 20%

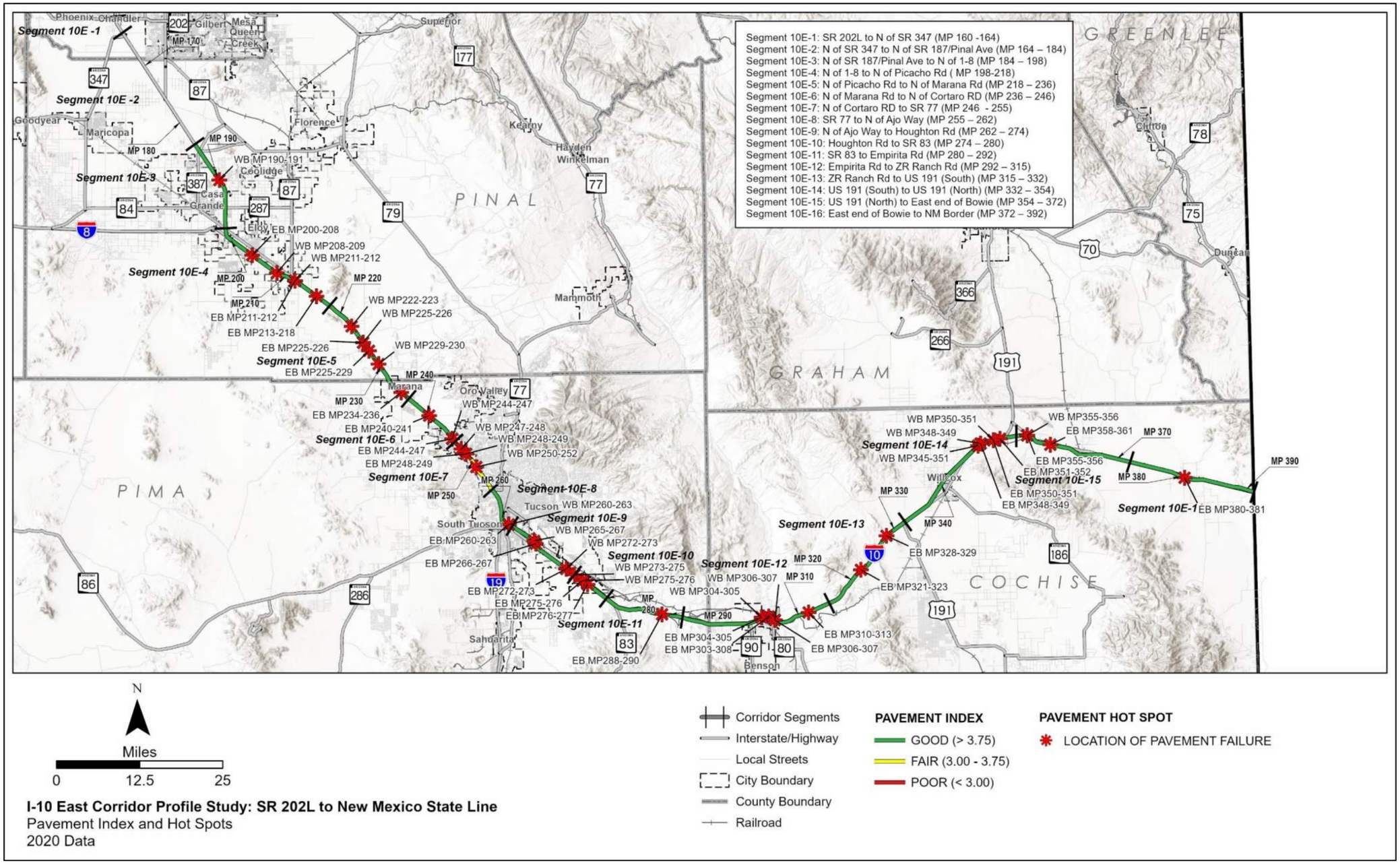
Statewide Transportation Asset Management Plan

Moving Ahead for Progress in the 21st Century Act of 2012 (MAP-21), identified national transportation system goals. The transportation asset management regulations associated with the infrastructure condition goals required the development of a Transportation Asset Management Plan (TAMP) covering National Highway System (NHS) bridges and pavements. As part of the statewide TAMP, ADOT developed pavement performance metrics and thresholds in compliance with federal tracking and reporting requirements, as shown in **Table 6**. The thresholds shown in **Table 6** are the basis for the TAMP and ADOT's federal reporting and are different than those used in this CPS, which are based on ADOT's Pavement Management System, as shown in **Table 5**. The TAMP reports asset condition information in the aggregate at the statewide level and applying the thresholds shown in **Table 6** would result in different segment-level performance than shown in **Table 5**.

Table 6: Statewide TAMP Metrics

Metric	Good	Fair	Poor
IRI (in./mile)	< 95	95-170	> 170
Cracking (%)	< 5	5-20 (asphalt) 5-15 (jointed concrete) 5-10 (cont. reinforced concrete)	> 20 > 15 > 10
Rutting (in.)	< 0.20	0.20–0.40	> 0.40
Faulting (in.)	< 0.10	0.10-0.15	> 0.15

Figure 8: Pavement Performance



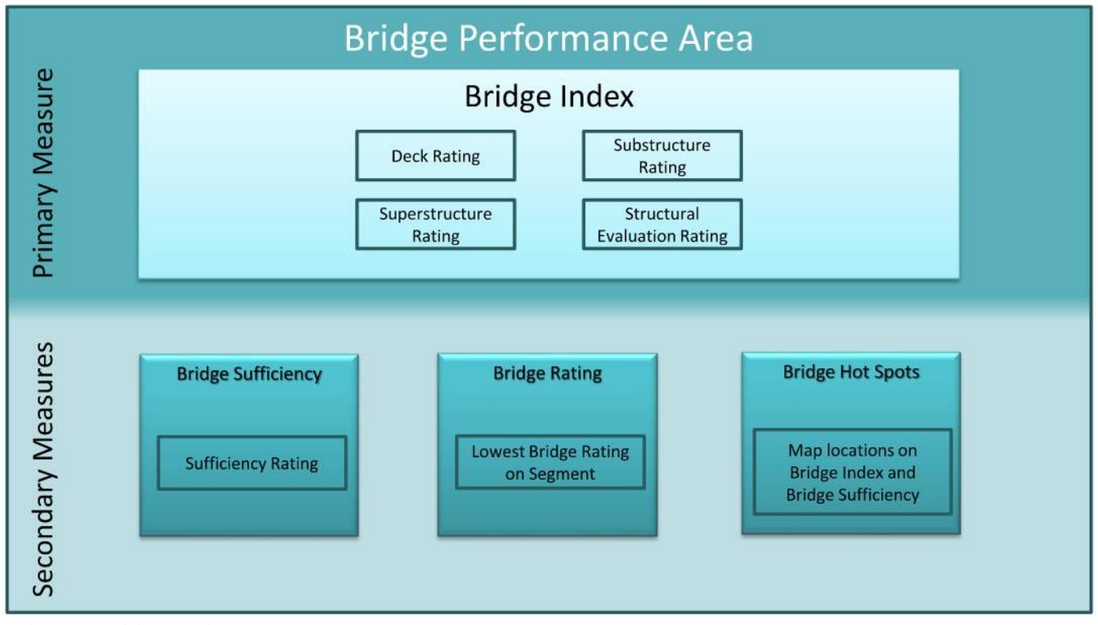
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Pavement Index and Hot Spots
2020 Data

2.3 Bridge Performance Area

The Bridge Performance Area consists of a primary measure (Bridge Index) and three secondary measures, as shown in **Figure 9**. These measures assess the condition of the existing bridges along the I-10 East Corridor. Only bridges that carry mainline traffic or bridges that cross the mainline are included in the calculation. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C.**

This CPS is an update to a previously completed report. The performance measures and performance thresholds have been revised from the previous version. For the Bridge performance area, the new methodology does not include the performance metric related to Functionally Obsolete bridges, which was used in the previous methodology.

Figure 9: Bridge Performance Measures



Primary Bridge Index

The Bridge Index is calculated based on the use of four different bridge condition ratings from the ADOT Bridge Database, also known as the Arizona Bridge Information and Storage System (ABISS). The four ratings are the Deck Rating, Substructure Rating, Superstructure Rating, and Structural Evaluation Rating. These ratings are based on inspection reports and establish the structural adequacy of each bridge. The performance of each individual bridge is established by using the lowest of these four ratings. The use of these ratings, and the use of the lowest rating, is consistent with the approach used by the ADOT Bridge Group to assess the need for bridge rehabilitation. The Bridge Index is calculated as a weighted average for each segment based on deck area.

Secondary Bridge Measures

Three secondary measures provide an in-depth evaluation of the characteristics of each bridge:

Bridge Sufficiency

- Multipart rating includes structural adequacy and safety factors as well as functional aspects such as traffic volume and length of detour
- Rates the structural and functional sufficiency of each bridge on a 100-point scale

Bridge Rating

- The lowest rating of the four bridge condition ratings (substructure, superstructure, deck, and structural evaluation) on each segment
- Identifies lowest performing evaluation factor on each bridge

Bridge Hot Spots

- A Bridge “hot spot” is identified where a given bridge has a bridge rating of 4 or lower or multiple ratings of 5 between the deck, superstructure, and substructure ratings
- Identifies particularly low-performing bridges or those that may decline to low performance in the immediate future

Bridge Performance Results

The Bridge Index provides a high-level assessment of the structural condition of bridges for the corridor and for each segment. The four secondary measures provide more detailed information to assess bridge performance.

Based on the results of this analysis, the following observations were made:

- The weighted average of the Bridge Index shows “fair” overall performance for the I-10 East Corridor
- Bridge hot spots along the corridor include:
  - Segment 10E-5, Red Rock TI UP at MP 226.45
  - Segment 10E-12, Amole TI OP EB (Bell) at MP 292.50
  - Segment 10E-12, Cornfield Canyon Br WB at MP 299.14
  - Segment 10E-13, Dragoon TI OP EB at MP 318.95
  - Segment 10E-13, Cochise TI UP at MP 331.62
  - Segment 10E-14, Airport Rd UP at MP 339.46
  - Segment 10E-16, E San Simon TI UP at MP 382.35

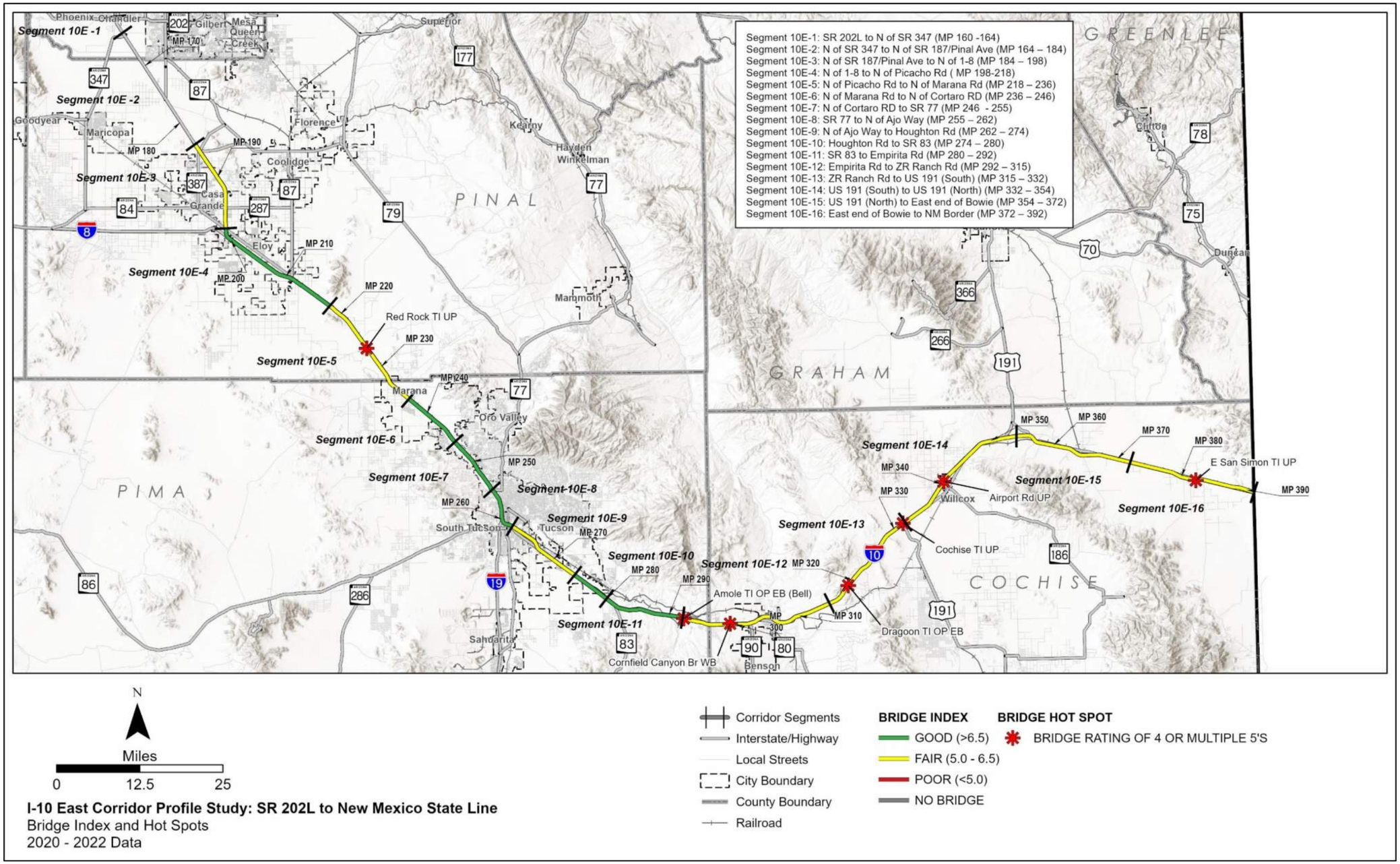
Table 7 summarizes the Bridge performance results for the I-10 East Corridor. **Figure 10** illustrates the primary Bridge Index performance and locations of Bridge hot spots along the I-10 East Corridor. Maps for each secondary measure can be found in **Appendix A.**

Table 7: Bridge Performance

Segment #	Segment Length (miles)	# of Bridges	Bridge Index	Sufficiency Rating	Lowest Bridge Rating
10E-3	11	6	5.84	90.11	5
10E-4	20	13	6.87	91.40	5
10E-5	18	4	6.13	92.86	5
10E-6	10	11	6.79	95.23	5
10E-7	9	14	6.72	89.99	5
10E-8	7	15	6.62	93.51	6
10E-9	12	26	5.78	89.04	5
10E-10	6	5	6.54	95.47	5
10E-11	12	6	6.74	94.92	6
10E-12	23	22	6.20	93.57	5
10E-13	17	4	5.46	81.14	5
10E-14	22	6	5.73	86.82	4
10E-15	18	15	5.90	93.96	5
10E-16	20	12	5.42	84.96	4
Weighted Corridor Average			6.21	91.23	5.02

SCALES			
Performance Level		**All**	
Good	> 6.5	> 80	> 6
Fair	5.0 – 6.5	50 – 80	5 – 6
Poor	< 5.0	< 50	< 5

Figure 10: Bridge Performance

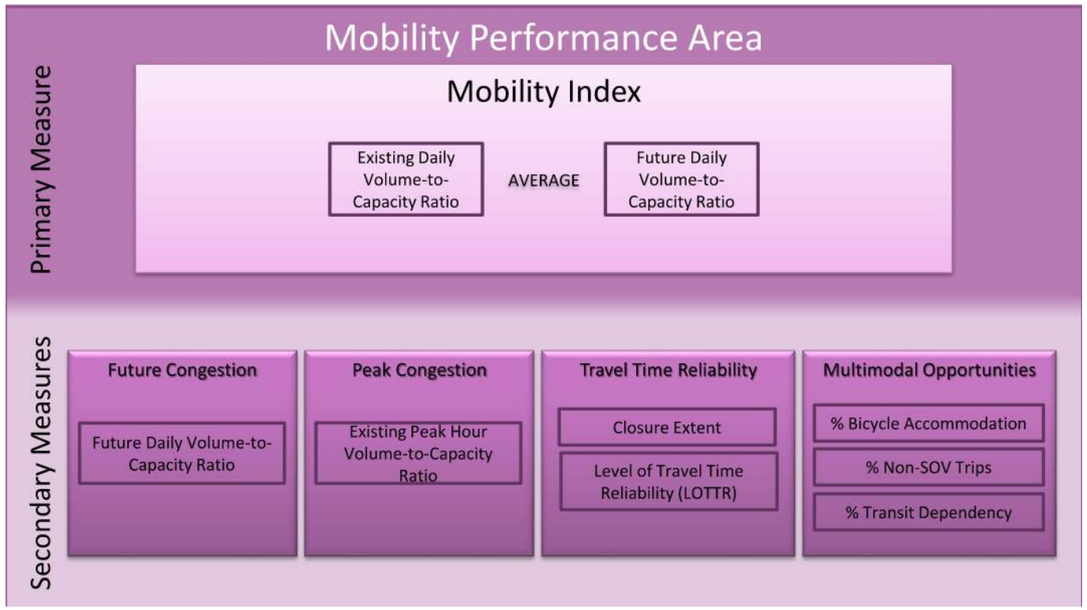


I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Bridge Index and Hot Spots
2020 - 2022 Data

2.4 Mobility Performance Area

The Mobility performance area consists of a primary measure (Mobility Index) and four secondary measures, as shown in **Figure 11**. These measures assess the condition of existing mobility along the I-10 East Corridor. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C**.

Figure 11: Mobility Performance Measures



Primary Mobility Index

The Mobility Index is an average of the existing (2020) daily volume-to-capacity (V/C) ratio and the future (2040 AZTDM) daily V/C ratio for each segment of the corridor. The V/C ratio is an indicator of the level of congestion. This measure compares the average annual daily traffic (AADT) volume to the capacity of the corridor segment as defined by the service volume for level of service (LOS) E. By using the average of the existing and future year daily volumes, this index measures the level of daily congestion projected to occur in approximately ten years (2030) if no capacity improvements are made to the corridor.

Each corridor segment is rated on a scale with other segments in similar operating environments. Within the Mobility performance area, the relevant operating environments are urban vs. rural setting. For the I-10 East Corridor, the following operating environments were identified:

- Rural Flow: Segments 10E-5, 10E-11, 10E-12, 10E-13, 10E-14, 10E-15, and 10E-16
- Fringe Urban: Segments 10E-3, 10E-4, and 10E-6
- Urban: Segments 10E-7, 10E-8, 10E-9, and 10E-10

Secondary Mobility Measures

Four secondary measures provide an in-depth evaluation of operational characteristics of the corridor:

Future Congestion – Future Daily V/C

- The future (2040 AZTDM) daily V/C ratio. This measure is the same value used in the calculation of the Mobility Index
- Provides a measure of future congestion if no capacity improvements are made to the corridor

Peak Congestion – Existing Peak Hour V/C

- The peak hour V/C ratio for each direction of travel
- Provides a measure of existing peak hour congestion during typical weekdays

Travel Time Reliability – Three separate travel time reliability indicators together provide a comprehensive picture of how much time may be required to travel within the corridor:

- Closure Extent:
  - The average number of instances a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel; a weighted average was applied to each closure that takes into account the distance over which the closure occurs
  - Closures related to crashes, weather, or other incidents are a significant contributor to non-recurring delays; construction-related closures were excluded from the analysis
- Level of Travel Time Reliability (LOTTR):
  - The ratio of the 80th percentile travel time to average (50th percentile) travel time for a given corridor segment in a specific direction; as corridor segments were often comprised of multiple roadway sections for which LOTTR was reported, a weighted average was applied to each section based on the section length in order to arrive at the segment LOTTR
  - The LOTTR reflects how consistent or dependable the travel might be from day to day or during different times of day

Multimodal Opportunities – Three multimodal opportunity indicators reflect the characteristics of the corridor that promote alternate modes to the single occupancy vehicle (SOV) for trips along the corridor:

- % Bicycle Accommodation:
  - Percentage of the segment that accommodates bicycle travel; bicycle accommodation on the roadway or on shoulders varies depending on traffic volumes, speed limits, and surface type

  - Encouraging bicycle travel has the potential to reduce automobile travel, especially on non-interstate highways
- % Non-SOV Trips:
  - The percentage of trips (less than 50 miles in length) by non-SOVs
  - The percentage of non-SOV trips in a corridor gives an indication of travel patterns along a section of roadway that could benefit from additional multimodal options
- % Transit Dependency:
  - The percentage of households that have zero or one automobile and households where the total income level is below the federally defined poverty level
  - Used to track the level of need among those who are considered transit dependent and more likely to utilize transit if it is available

Mobility Performance Results

The Mobility Index provides a high-level assessment of mobility conditions for the corridor and for each segment. The four secondary measures provide more detailed information to assess mobility performance.

Based on the results of this analysis, the following observations were made:

- The weighted average of the Mobility Index shows “good” overall performance for the I-10 East Corridor, though Segment 10E-8 shows “poor” overall performance and Segments 10E-7, 10E-9, 10E-11, and 10E-12 show “fair” overall performance
- During the existing peak hour, traffic operations are “good” for all segments
- Segments 10E-7, 10E-8, and 10E-11 are anticipated to have “poor” performance in the future, according to the Future Daily V/C performance indicator. All other segments are anticipated to have “good” performance in the future except Segments 10E-9 and 10E-12, which are anticipated to have “fair” performance in the future
- Segments 10E-3 and 10E-8 in the eastbound direction and Segments 10E-15 and 10E-16 in the westbound direction show “poor” performance according to the Closure Extent parameter, with all other segments showing “good” or “fair” performance
- The LOTTR performance indicator shows “good” or “fair” performance for all segments
- All segments show “good” or “fair” performance for % Bicycle Accommodations
- All segments show “poor” or “fair” performance for % Non-SOV Trips

Table 8 summarizes the Mobility performance results for the I-10 East Corridor. **Figure 12** illustrates the primary Mobility Index performance along the I-10 East Corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 8: Mobility Performance

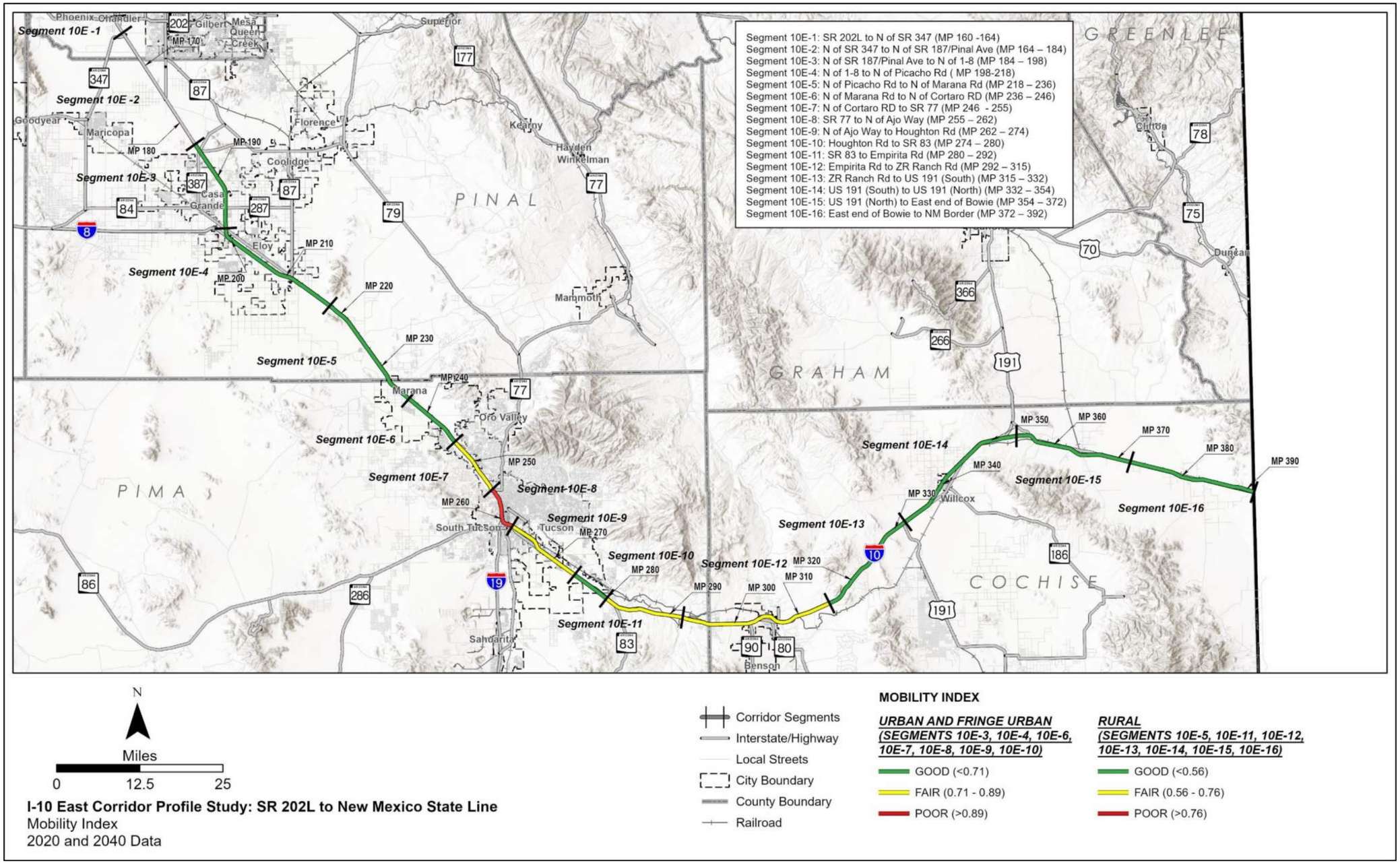
Segment	Segment Length (miles)	Mobility Index	Future Daily V/C	Existing Peak Hour V/C		Closure Extent (instances/ milepost/year/mile)		Directional LOTTR (all vehicles)		% Bicycle Accommodation	% Non-Single Occupancy Vehicle (SOV) Trips
				EB	WB	EB	WB	EB	WB		
10E-3[1]	11	0.42	0.49	0.26	0.25	0.80	0.45	1.04	1.05	94%	10.1%
10E-4[1]	20	0.41	0.47	0.25	0.24	0.17	0.30	1.05	1.05	96%	9.9%
10E-5[2]	18	0.42	0.48	0.26	0.25	0.10	0.21	1.04	1.04	87%	8.1%
10E-6[1]	10	0.56	0.63	0.39	0.36	0.18	0.55	1.03	1.03	100%	13.7%
10E-7[1]	9	0.86	0.98	0.54	0.51	0.13	0.44	1.17	1.11	64%	13.7%
10E-8[1]	7	1.09	1.19	0.71	0.70	0.89	0.57	1.04	1.05	89%	14.0%
10E-9[1]	12	0.80	0.88	0.55	0.62	0.35	0.43	1.14	1.04	93%	13.3%
10E-10[1]	6	0.52	0.58	0.35	0.36	0.20	0.17	1.03	1.03	98%	12.2%
10E-11[2]	12	0.76	0.85	0.43	0.42	0.37	0.12	1.03	1.03	100%	9.0%
10E-12[2]	23	0.60	0.69	0.38	0.33	0.39	0.10	1.04	1.03	97%	7.7%
10E-13[2]	17	0.38	0.43	0.31	0.27	0.05	0.21	1.04	1.04	78%	9.2%
10E-14[2]	22	0.35	0.39	0.25	0.19	0.11	0.23	1.03	1.03	100%	10.8%
10E-15[2]	18	0.28	0.31	0.17	0.15	0.26	1.06	1.03	1.03	99%	8.3%
10E-16[2]	20	0.43	0.48	0.24	0.21	0.21	1.05	1.06	1.04	99%	4.9%
Weighted Corridor Average		0.51	0.58	0.33	0.31	0.26	0.42	1.05	1.04	93.4%	9.6%

SCALES					
Performance Level	**Urban and Fringe Urban**	**All**	**All**	**All**	
Good/Above Average Performance	< 0.71	< 0.22	< 1.15	> 90%	> 17%
Fair/Average Performance	> 0.71 - 0.89	0.22 - 0.62	1.15 - 1.50	60% - 90%	11% - 17%
Poor/Below Average Performance	> 0.89	> 0.62	> 1.50	< 60%	< 11%

Performance Level	Rural
Good/Above Average Performance	< 0.56
Fair/Average Performance	> 0.56 - 0.76
Poor/Below Average Performance	> 0.76

[1]Urban Operating Environment
[2]Rural Operating Environment

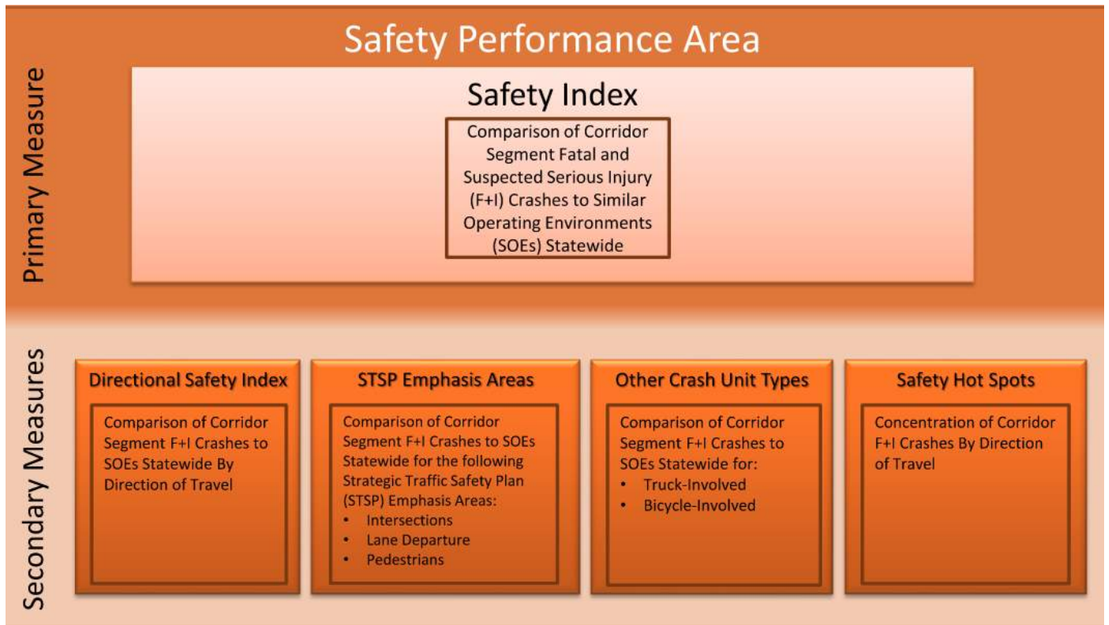
Figure 12: Mobility Performance



2.5 Safety Performance Area

The Safety performance area consists of a primary measure (Safety Index) and four secondary measures, as illustrated in **Figure 13**. All measures relate to crashes that result in fatal and suspected serious injuries, as these types of crashes are the emphasis of the ADOT Strategic Traffic Safety Plan (STSP), FHWA, and MAP-21. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C.**

Figure 13: Safety Performance Measures



Primary Safety Index

The Safety Index is based on the bi-directional frequency and rate of fatal and suspected serious injury crashes, the relative cost of those types of crashes, and crash occurrences on similar roadways in Arizona. According to ADOT's 2018 Highway Safety Improvement Program Application, fatal crashes have an estimated cost that is 17.3 times the estimated cost of suspected serious injury crashes ($9.5 million compared to $555,000).

Each corridor segment is rated on a scale by comparing the segment score with the average statewide score for similar operating environments. Because crash frequencies and rates vary depending on the operating environment of a particular roadway, statewide values were developed for similar operating environments defined by functional classification, urban vs. rural setting, number of travel lanes, and traffic volumes. For the I-10 East Corridor, the following operating environments were identified:

- Urban or Rural 6 Lane Freeway: Segment 10E-3, 10E-4, 10E-5, 10E-6, and 10E-7
- Urban >6 Lane Freeway: Segment 10E-8
- Urban 4 Lane Freeway: Segment 10E-9 and 10E-10
- Rural 4 Lane Freeway with Daily Volume > 25,000: Segment 10E-11
- Rural 4 Lane Freeway with Daily Volume < 25,000: Segment 10E-12, 10E-13, 10E-14, 10E-15, and 10E-16

Secondary Safety Measures

Four secondary measures provide an in-depth evaluation of the different characteristics of safety performance:

Directional Safety Index

- This measure is based on the directional frequency and rate of fatal and suspected serious injury crashes

STSP Emphasis Areas

ADOT's 2019 STSP identified several emphasis areas for reducing fatal and suspected serious injury crashes. This measure compared rates of crashes in three STSP emphasis areas to other corridors with a similar operating environment. The three STSP emphasis areas related to crashes involving:

- Intersections
- Lane departures
- Pedestrians

Other Crash Unit Types

- The percentage of total fatal and suspected serious injury crashes that involves crash unit types of trucks and bicycles is compared to the statewide average on roads with similar operating environments

Safety Hot Spots

- The hot spot analysis identifies abnormally high concentrations of fatal and suspected serious injury crashes along the study corridor by direction of travel

For the Safety Index and the secondary safety measures, any segment that has too small of a sample size to generate statistically reliable performance ratings for a particular performance measure is considered to have "insufficient data" and is excluded from the safety performance evaluation for that particular performance measure.

Safety Performance Results

The Safety Index provides a high-level assessment of safety performance for the corridor and for each segment. The four secondary measures provide more detailed information to assess safety performance.

Based on the results of this analysis, the following observations were made:

- A total of 258 fatal and suspected serious injury crashes occurred along the I-10 East Corridor in 2016-2020; of these crashes, 90 were fatal and 168 involved suspected serious injuries
- The crash unit type performance measures for crashes at intersections and for crashes involving pedestrians and bicyclists have insufficient data to generate reliable performance ratings for the I-10 East Corridor
- The weighted average of the Safety Index shows “average” performance for the I-10 East Corridor compared to other segments statewide that have similar operating environments, meaning the corridor generally has a similar number of crashes as is typical statewide
- The overall Safety Index value for Segments 10E-5, 10E-12, and 10E-15 show “below average” performance, meaning these segments generally have a higher number of crashes than is typical statewide
- The Directional Safety Index value for Segments 10E-4, 10E-12, 10E-13, and 10E-15 in the WB direction and Segments 10E-5 and 10E-6 in the EB direction show “below average” performance
- Safety hot spots include:
    - WB MP 251-253 (Segment 10E-7)
    - WB MP 256-258.2 (Segment 10E-8)
    - EB MP 263-265.5 (Segment 10E-9)
    - WB MP 291.1-291.7 (Segment 10E-11)
    - EB MP 316-318.25 (Segment 10E-13)

Table 9 summarizes the Safety performance results for the I-10 East Corridor. **Figure 14** illustrates the primary Safety Index performance and locations of Safety hot spots along the I-10 East Corridor. Maps for each secondary measure can be found in **Appendix A**.

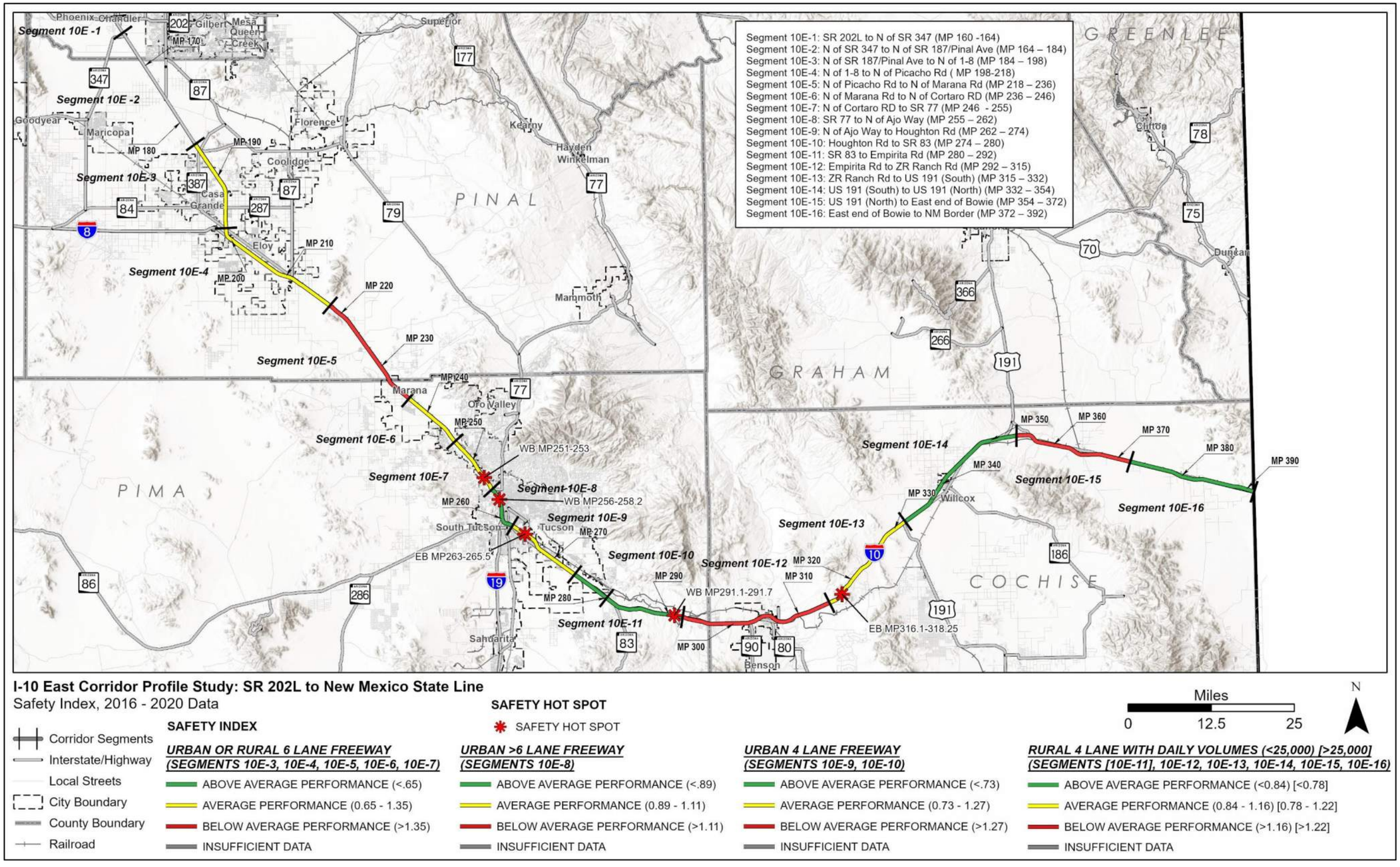
Table 9: Safety Performance

Segment	Segment Length (miles)	Safety Index	Directional Safety Index		% of Fatal + Suspected Serious Injury Crashes at Intersections	% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures	% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians	% of Segment Fatal + Suspected Serious Injury Crashes Involving Trucks	% of Segment Fatal + Suspected Serious Injury Crashes Involving Bicycles
			EB	WB					
10E-3[a]	11	0.98	1.13	0.83	Insufficient Data	67%	Insufficient Data	17%	Insufficient Data
10E-4[a]	20	1.24	0.86	1.61	Insufficient Data	68%	Insufficient Data	24%	Insufficient Data
10E-5[a]	18	1.43	1.95	0.92	Insufficient Data	61%	Insufficient Data	13%	Insufficient Data
10E-6[a]	10	1.09	1.38	0.80	Insufficient Data	63%	Insufficient Data	5%	Insufficient Data
10E-7[a]	9	0.96	1.22	0.69	Insufficient Data	56%	Insufficient Data	13%	Insufficient Data
10E-8[b]	7	0.44	0.30	0.58	Insufficient Data	35%	Insufficient Data	Insufficient Data	Insufficient Data
10E-9[c]	12	1.04	1.27	0.80	Insufficient Data	63%	Insufficient Data	20%	Insufficient Data
10E-10[c]	6	0.59	0.58	0.61	Insufficient Data	100%	Insufficient Data	Insufficient Data	Insufficient Data
10E-11[d]	12	0.77	0.99	0.55	Insufficient Data	84%	Insufficient Data	5%	Insufficient Data
10E-12[e]	23	1.22	1.02	1.42	Insufficient Data	59%	Insufficient Data	30%	Insufficient Data
10E-13[e]	17	1.02	0.87	1.18	Insufficient Data	81%	Insufficient Data	19%	Insufficient Data
10E-14[e]	22	0.74	0.57	0.91	Insufficient Data	80%	Insufficient Data	33%	Insufficient Data
10E-15[e]	18	1.18	0.87	1.49	Insufficient Data	80%	Insufficient Data	33%	Insufficient Data
10E-16[e]	20	0.59	0.42	0.76	Insufficient Data	56%	Insufficient Data	44%	Insufficient Data
Weighted Corridor Average		1.00	0.96	1.03	Insufficient Data	68%	Insufficient Data	24%	Insufficient Data
SCALES									
Performance Level	**Urban or Rural 6 Lane Freeway**								
Above Average Performance	> 0.65		< 0.00%		< 55.7%	< 4.0%		< 5.0%	< 0.0%
Average Performance	0.65 - 1.35		0.00%		55.7% - 62.9%	4.0% - 7.9%		5.0% - 12.9%	0.0% - 1.3%
Below Average Performance	> 1.35		> 0.00%		> 62.9%	> 7.9%		> 12.9%	> 1.3%
Performance Level	**Urban > 6 Lane Freeway**								
Above Average Performance	< 0.89		< 0.00%		< 40.4%	< 1.6%		< 1.9%	< 0.00%
Average Performance	0.89 - 1.11		0.00%		40.4% - 43.2%	1.6% - 4.7%		1.9% - 5.1%	0.00%
Below Average Performance	> 1.11		> 0.00%		> 43.2%	> 4.7%		> 5.1%	> 0.00%
Performance Level	**Urban 4 Lane Freeway**								
Above Average Performance	< 0.73		< 0.00%		< 60.6%	< 0.0%		< 6.9%	< 0.00%
Average Performance	0.73 - 1.27		0.00%		60.6% - 78.1%	0.0% - 4.9%		6.9% - 12.4%	0.00%
Below Average Performance	> 1.27		> 0.00%		> 78.1%	> 4.9%		> 12.4%	> 0.00%
Performance Level	**Rural 4 Lane with Daily Volume > 25,000 (< 25,000)**								
Above Average Performance	< 0.78 (< 0.84)		< 0.00% (< 0.00%)		< 69.0% (< 72.8%)	< 0.7% (< 1.0%)		< 8.5% (< 19%)	< 0.0% (< 0.0%)
Average Performance	0.78 - 1.22 (0.84 - 1.16)		0.00% (0.00%)		69.0 - 77.5% (72.8% - 76.4%)	0.7% - 4.7% (1.0% - 3.3%)		8.5% - 18.0% (19% - 22.5%)	0.0% - 0.0% (0.0% - 0.9%)
Below Average Performance	> 1.22 (> 1.16)		> 0.00% (> 0.00%)		> 77.5% (> 76.4%)	> 4.7% (> 3.3%)		> 18.0% (> 22.5%)	> 0.0% (>0.9%)

[a] Urban or Rural 6 Lane Freeway
[b] Urban > 6 Lane Freeway
[c] Urban 4 Lane Freeway
[d] Rural 4 Lane Freeway with Daily Volume > 25,000 vpd
[e] Rural 4 Lane Freeway with Daily Volume < 25,000 vpd

Note: "Insufficient Data" indicates there was not enough data available to generate reliable performance ratings

Figure 14: Safety Performance



2.6 Freight Performance Area

The Freight performance area consists of a single primary measure (Freight Index) and three secondary measures, as illustrated in **Figure 15**. All measures related to the reliability of truck travel are measured by observed truck travel time speed and delays to truck travel from road closures or physical restrictions to truck travel. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C**.

Figure 15: Freight Performance Measures

Primary Freight Index

The Freight Index is a reliability performance measure based on the travel time reliability for truck travel. The Truck Travel Time Reliability (TTTR) is the ratio of the 95th percentile truck travel time to average (50th percentile) truck travel time. The TTTR reflects the extra buffer time needed for on-time delivery while accounting for delay resulting from circumstances such as recurring congestion, crashes, inclement weather, and construction activities.

Each corridor segment is rated on a scale with other segments in similar operating environments. Within the Freight performance area, the relevant operating environments are interrupted flow (e.g., signalized at-grade intersections are present) and uninterrupted flow (e.g., controlled access grade-separated conditions such as a freeway or interstate highway).

For the I-10 East Corridor, all segments have Uninterrupted Flow operating environments.

Secondary Freight Measures

The Freight performance area includes three secondary measures that provide an in-depth evaluation of the different characteristics of freight performance:

Travel Time Reliability – Two separate travel time reliability indicators together provide a comprehensive picture of how much time may be required to travel within the corridor:

- Directional Truck Travel Time Reliability (TTTR):
  - The ratio of the 95th percentile truck travel time to average (50th percentile) truck travel time for a given corridor segment in a specific direction; as corridor segments were often comprised of multiple roadway sections for which TTTR was reported, a weighted average was applied to each section based on the section length in order to arrive at the segment TTTR
- Directional Closure Duration
  - The average time (in minutes) a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel; a weighted average is applied to each closure that takes into account the distance over which the closure occurs

Bridge Vertical Clearance

- The minimum vertical clearance (in feet) over the travel lanes for underpass structures on each segment

Bridge Vertical Clearance Hot Spots

- A Bridge vertical clearance "hot spot" exists where the underpass vertical clearance over the mainline travel lanes is less than 16.25 feet and no exit/entrance ramps exist to allow vehicles to bypass the low clearance location
- If a location with a vertical clearance less than 16.25 feet can be avoided by using immediately adjacent exit/entrance ramps rather than the mainline, it is not considered a hot spot

Freight Performance Results

The Freight Index provides a high-level assessment of freight mobility for the corridor and for each segment. The three secondary measures provide more detailed information to assess freight performance.

Based on the results of this analysis, the following observations were made:

- The weighted average of the Freight Index shows "fair" overall performance for the I-10 East Corridor, though Segments 10E-7, 10E-8, and 10E-9 show "poor" overall performance and Segment 10E-16 shows "fair" overall performance
- Segments 10E-7, 10E-8, and 10E-9 have "poor" performance in the Directional TTTR in both directions

- Segment 10E-6 has “poor” performance in Closure Duration in the WB direction and Segment 10E-15 has “poor” performance in Closure Duration in the EB direction
- The following hot spot bridges with vertical clearance less than 16.25 feet and no ramp were identified:
    - Segment 10E-3: Val Vista Rd UP MP 188.2
    - Segment 10E-3: Cottonwood Ln UP MP 193.88
    - Segment 10E-3: Earley Rd UP MP 195.89
    - Segment 10E-3: Selma Hwy UP MP 196.89
    - Segment 10E-4: Battaglia Rd UP MP 205.45
    - Segment 10E-4: Alsdorf Rd UP MP 207.17
    - Segment 10E-14: Airport Rd UP MP 339.46

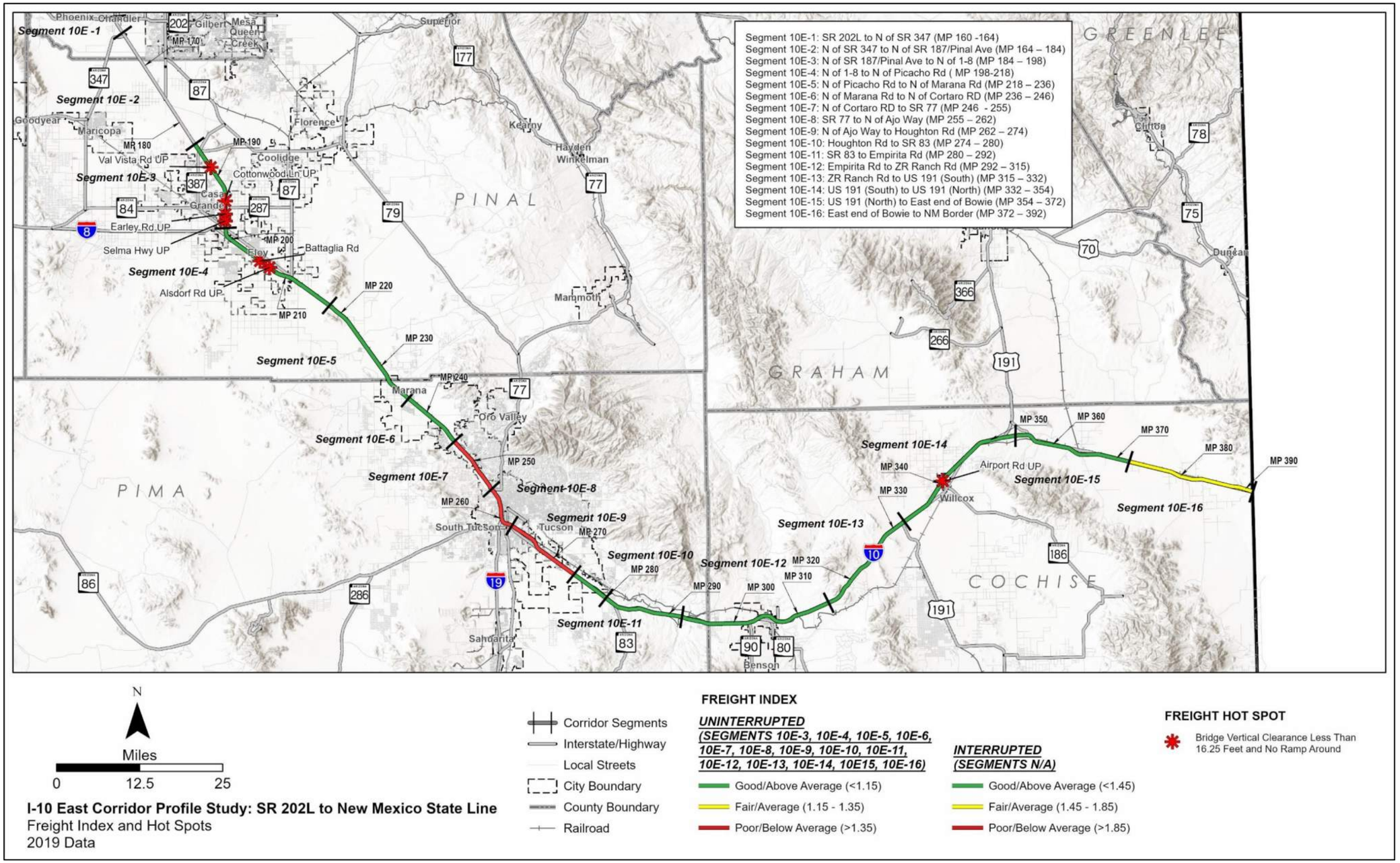
Table 10 summarizes the Freight performance results for the I-10 East Corridor. **Figure 16** illustrates the primary Freight Index performance and locations of freight hot spots along the I-10 East Corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 10: Freight Performance

Segment	Segment Length (miles)	Freight Index	Directional TTTR		Closure Duration (minutes/milepost/year)		Bridge Vertical Clearance (feet)
			EB	WB	EB	WB	
10E-3	11	1.09	1.08	1.10	74.69	40.20	15.76
10E-4	20	1.09	1.12	1.10	22.21	55.16	15.90
10E-5	18	1.11	1.08	1.08	9.48	16.92	15.84
10E-6	10	1.08	1.06	1.06	20.86	233.15	17.51
10E-7	9	1.63	1.60	1.65	32.13	47.71	16.50
10E-8	7	1.40	1.36	1.44	98.36	64.47	16.50
10E-9	12	1.64	1.86	1.42	38.57	35.20	16.13
10E-10	6	1.09	1.06	1.13	12.00	14.00	16.15
10E-11	12	1.11	1.08	1.15	48.10	15.44	16.22
10E-12	23	1.09	1.10	1.09	47.31	11.98	16.20
10E-13	17	1.15	1.18	1.12	3.54	38.82	16.40
10E-14	22	1.08	1.07	1.08	21.52	32.85	15.96
10E-15	18	1.07	1.07	1.06	145.45	71.37	16.31
10E-16	20	1.17	1.17	1.17	117.98	70.16	16.00
Weighted Corridor Average		1.17	1.18	1.16	50.41	49.27	16.18

SCALES			
Performance Level	**All**	**All**	
Good/Above Average Performance	< 1.15	< 44.18	> 16.5
Fair/Average Performance	1.15 - 1.35	44.18-124.86	16.0 - 16.5
Poor/Below Average Performance	> 1.35	> 124.86	< 16.0

Figure 16: Freight Performance



2.7 Corridor Performance Summary

Based on the results presented in the preceding sections, the following general observations were made related to the performance of the I-10 East Corridor:

- The Pavement performance measures generally show “good” performance; the Bridge performance measures generally show “fair” performance; the Mobility performance measures generally show “good” or “fair” performance; the Safety performance measures show a mix of “above average”, “average”, and “below average” performance; and the Freight performance measures generally show “fair” performance
- The weighted average of the Pavement Index shows “good” overall performance for the I-10 East Corridor; Segments 10E-4 through 10E-10, 10E-12, and 10E-14 show “poor” performance in % Area Failure
- The weighted average of the Bridge Index shows “fair” overall performance for the I-10 East Corridor; Segments 10E-14 and 10E-16 have bridges showing “poor” performance in the Lowest Bridge Rating
- The weighted average of the Mobility Index shows “good” overall performance for the I-10 East Corridor; Segments 10E-7, 10E-8, and 10E-11 show “poor” performance for the Mobility Index and/or Future Daily V/C; Segments 10E-3 and 10E-8 show “poor” performance for Closure Extent in the EB direction while Segments 10E-15 and 10E-16 show “poor” performance for Closure Extent in the WB direction
- The weighted average of the Safety Index shows “average” overall performance for the I-10 East Corridor; for the Directional Safety Index, Segments 10E-5 and 10E-6 show “below average” performance in the EB direction while Segments 10E-4, 10E-12, 10E-13, and 10E-15 show “below average” performance in the WB direction; Segments 10E-3, 10E-4, 10E-6, 10E-10, 10E-11, 10E-13, 10E-14, and 10E-15 show “below average” performance for crashes involving lane departures; Segments 10E-3, 10E-4, 10E-5, 10E-9, 10E-12, 10E-14, 10E-15, and 10E-16 show “below average” performance for crashes involving trucks
- The weighted average of the Freight Index shows “fair” overall performance for the I-10 East Corridor; Segments 10E-7, 10E-8, and 10E-9 show “poor” performance for the Freight Index and Directional TTTR in both directions; Segment 10E-15 shows “poor” performance for Closure Duration in the EB direction; Segment 10E-6 shows “poor” performance for Closure Duration in the WB direction; Segments 10E-3, 10E-4, 10E-5, and 10E-14 show “poor” performance for Bridge Vertical Clearance

Figure 17 shows the percentage of the I-10 East Corridor that rates as “good/above average” performance, “fair/average” performance, or “poor/below average” performance for each primary measure. Pavement is the highest performing area along the I-10 East Corridor, with 96% of the corridor in “good” condition as it relates to the primary measure. Bridge and Safety both show “fair/average” performance for more than half the corridor length.

Table 11 shows a summary of corridor performance for all primary measures and secondary measure indicators for the I-10 East Corridor. A weighted corridor average rating (based on the length of the segment) was calculated for each primary and secondary measure. The weighted average ratings are summarized in **Figure 18**, which also provides a brief description of each performance measure. **Figure 18** represents the average for the entire corridor and any given segment or location could have a higher or lower rating than the corridor average.

Figure 17: Performance Summary by Primary Measure

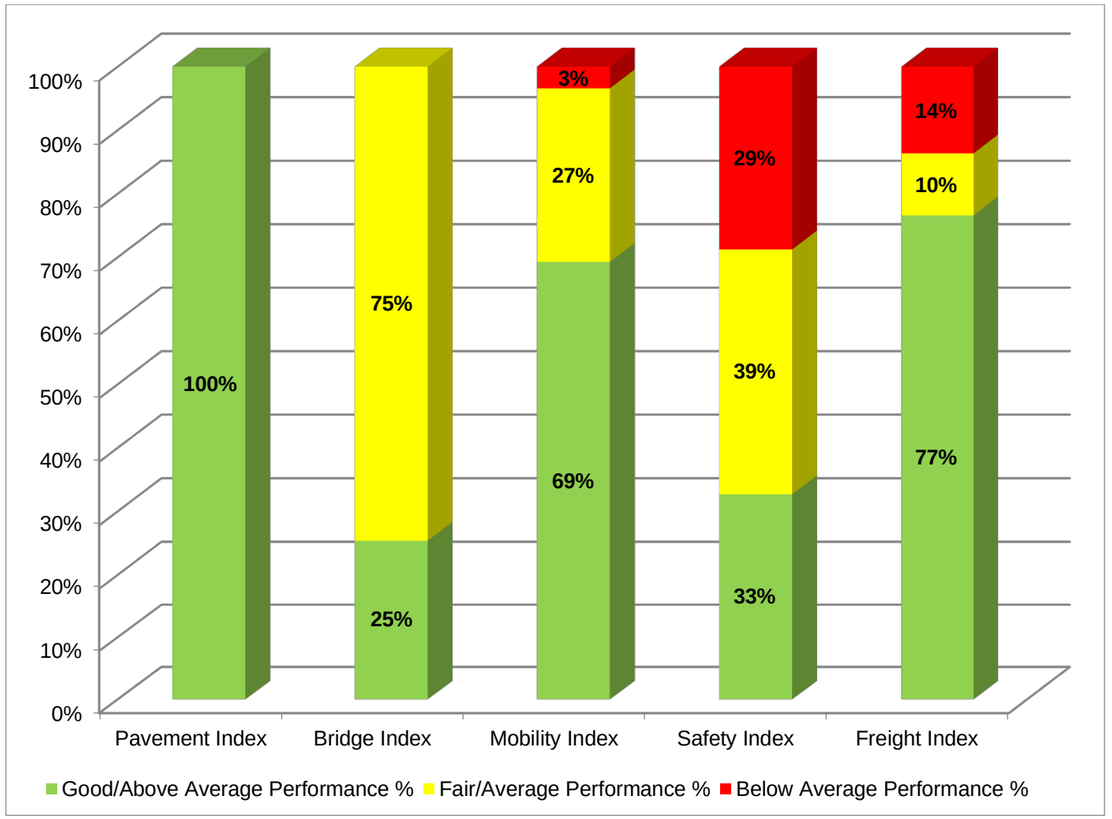


Figure 18: Corridor Performance Summary by Performance Measure

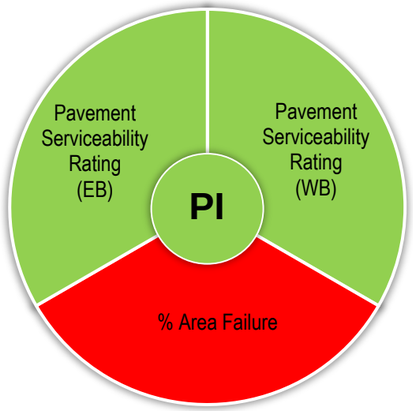
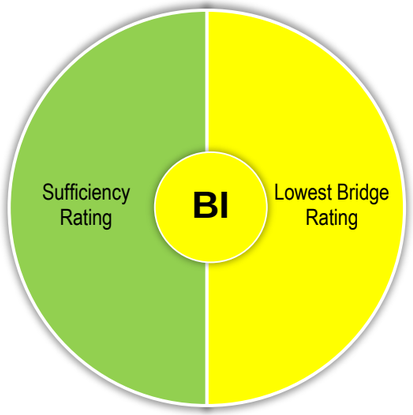
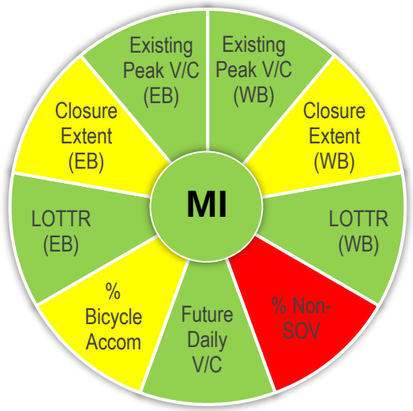
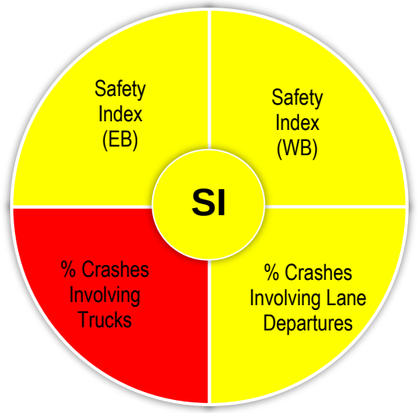
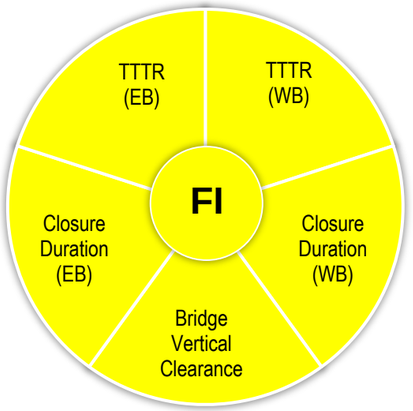
Pavement	Bridge	Mobility	Safety	Freight
				
Pavement Index (PI): based on three pavement condition ratings from the ADOT Pavement Database; the three ratings are the International Roughness Index (IRI), the Cracking Rating, and the Rutting Rating	**Bridge Index (BI):** based on four bridge condition ratings from the ADOT Bridge Database; the four ratings are the Deck Rating, Substructure Rating, Superstructure Rating, and Structural Evaluation Rating	**Mobility Index (MI):** an average of the existing daily volume-to-capacity (V/C) ratio and the projected long-term future daily V/C ratio	**Safety Index (SI):** combines the bi-directional frequency and rate of fatal and suspected serious injury crashes, compared to crash occurrences on roads with similar operating environments in Arizona	**Freight Index (FI):** a reliability performance measure based on the bi-directional Truck Travel Time Reliability (TTTR) for truck travel
➢ **Directional Pavement Serviceability Rating (PSR)** – the weighted average (based on number of lanes) of the PSR for the pavement in each direction of travel ➢ **% Area Failure** – the percentage of pavement area rated above failure thresholds for IRI, Cracking, or Rutting	➢ **Sufficiency Rating**– multipart rating includes structural adequacy and safety factors as well as functional aspects such as traffic volume and length of detour ➢ **Lowest Bridge Rating** –the lowest rating of the four bridge condition ratings on each segment	➢ **Future Daily V/C** – the future daily V/C ratio provides a measure of future congestion if no capacity improvements are made to the corridor ➢ **Existing Peak Hour V/C** – the existing peak hour V/C ratio for each direction of travel provides a measure of existing peak hour congestion during typical weekdays ➢ **Closure Extent** – the average number of instances a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel ➢ **Directional Level of Travel Time Reliability (LOTTR)** – the ratio of the 80th percentile peak period travel time to the 50th percentile peak period travel time for all vehicles ➢ **% Bicycle Accommodation** – the percentage of a segment that accommodates bicycle travel ➢ **% Non-Single Occupancy Vehicle (Non-SOV) Trips** –the percentage of trips that are taken by vehicles carrying more than one occupant	➢ **Directional Safety Index** – the combination of the directional frequency and rate of fatal and suspected serious injury crashes, compared to crash occurrences on roads with similar operating environments in Arizona ➢ **% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures** – the percentage of total fatal and suspected serious injury crashes involving lane departures compared to the statewide average percentage on roads with similar operating environments ➢ **% of Fatal + Suspected Serious Injury Crashes Involving Trucks** – the percentage of total fatal and suspected serious injury crashes involving trucks compared to the statewide average percentage on roads with similar operating environments	➢ **Directional TTTR** – the ratio of the 95th percentile peak period travel time to the 50th percentile peak period travel time for trucks ➢ **Closure Duration** – the average time a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel ➢ **Bridge Vertical Clearance** – the minimum vertical clearance over the travel lanes for underpass structures on each segment.

Table 11: Corridor Performance Summary by Segment and Performance Measure

Segment #	Segment Length (miles)	Pavement Performance Area				Bridge Performance Area			Mobility Performance Area									
		Pavement Index	Directional PSR		% Area Failure	Bridge Index	Sufficiency Rating	Lowest Bridge Rating	Mobility Index	Future Daily V/C	Existing Peak Hour V/C		Closure Extent (instances/ milepost/year/mile)		Directional LOTTR (all vehicles)		% Bicycle Accommodation	% Non-Single Occupancy Vehicle (SOV) Trips
			EB	WB							EB	WB	EB	WB	EB	WB		
10E-3[1]	11	4.38	4.28	4.25	5%	5.84	90.11	5.00	0.42	0.49	0.26	0.25	0.80	0.45	1.04	1.05	94%	10.1%
10E-4[1]	20	3.81	4.06	4.13	40%	6.87	91.40	5.00	0.41	0.47	0.25	0.24	0.17	0.30	1.05	1.05	96%	9.9%
10E-5[2]	18	3.93	4.17	3.84	22%	6.13	92.86	5.00	0.42	0.48	0.26	0.25	0.10	0.21	1.04	1.04	87%	8.1%
10E-6[1]	10	3.87	4.07	3.85	25%	6.79	95.23	5.00	0.56	0.63	0.39	0.36	0.18	0.55	1.03	1.03	100%	13.7%
10E-7[1]	9	3.76	3.72	3.66	48%	6.72	89.99	5.00	0.86	0.98	0.54	0.51	0.13	0.44	1.17	1.11	64%	13.7%
10E-8[1]	7	4.04	3.81	3.82	24%	6.62	93.51	6.00	1.09	1.19	0.71	0.70	0.89	0.57	1.04	1.05	89%	14.0%
10E-9[1]	12	3.89	3.81	3.79	28%	5.78	89.04	5.00	0.80	0.88	0.55	0.62	0.35	0.43	1.14	1.04	93%	13.3%
10E-10[1]	6	3.76	3.56	3.72	33%	6.54	95.47	5.00	0.52	0.58	0.35	0.36	0.20	0.17	1.03	1.03	98%	12.2%
10E-11[2]	12	4.35	4.15	4.20	8%	6.74	94.92	6.00	0.76	0.85	0.43	0.42	0.37	0.12	1.03	1.03	100%	9.0%
10E-12[2]	23	4.13	4.09	4.04	22%	6.20	93.57	5.00	0.60	0.69	0.38	0.33	0.39	0.10	1.04	1.03	97%	7.7%
10E-13[2]	17	3.98	3.83	4.02	9%	5.46	81.14	5.00	0.38	0.43	0.31	0.27	0.05	0.21	1.04	1.04	78%	9.2%
10E-14[2]	22	4.13	4.16	4.08	20%	5.73	86.82	4.00	0.35	0.39	0.25	0.19	0.11	0.23	1.03	1.03	100%	10.8%
10E-15[2]	18	4.22	3.97	4.22	14%	5.90	93.96	5.00	0.28	0.31	0.17	0.15	0.26	1.06	1.03	1.03	99%	8.3%
10E-16[2]	20	4.34	3.96	4.13	3%	5.42	84.96	4.00	0.43	0.48	0.24	0.21	0.21	1.05	1.06	1.04	99%	4.9%
Weighted Corridor Average		4.07	4.01	4.02	20%	6.21	91.23	5.02	0.51	0.58	0.33	0.31	0.26	0.42	1.06	1.04	93.4%	9.6%

SCALES											
Performance Level	**All**			**All**			**Urban and Fringe Urban**	**All**	**All**	**All**	
Good/Above Average Performance	> 3.75	> 3.75	< 5%	> 6.5	> 80	> 6	< 0.71	< 0.22	< 1.15	> 90%	> 17%
Fair/Average Performance	3.00-3.75	3.40 - 3.75	5%- 20%	5.0 - 6.5	50 - 80	5 - 6	> 0.71 - 0.89	0.22 - 0.62	1.15 - 1.50	60% - 90%	11% - 17%
Poor/Below Average Performance	< 3.00	< 3.40	> 20%	< 5.0	< 50	< 5	> 0.89	>0.62	> 1.50	< 60%	< 11%
Performance Level							**Rural**				
Good/Above Average Performance							< 0.56				
Fair/Average Performance							> 0.56 - 0.76				
Poor/Below Average Performance							> 0.76				

[1]Urban Operating Environment
[2]Rural Operating Environment

Table 11: Corridor Performance Summary by Segment and Performance Measure (continued)

Segment #	Segment Length (miles)	Safety Performance Area								Freight Performance Area					
		Safety Index	Directional Safety Index		% of Fatal + Suspected Serious Injury Crashes at Intersections	% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures	% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians	% of Segment Fatal + Suspected Serious Injury Crashes Involving Trucks	% of Segment Fatal + Suspected Serious Injury Crashes Involving Bicycles	Freight Index	Directional TTTR		Closure Duration (minutes/milepost/year)		Bridge Vertical Clearance (feet)
			EB	WB							EB	WB	EB	WB	
10E-3[a]	11	0.98	1.13	0.83	Insufficient Data	67%	Insufficient Data	17%	Insufficient Data	1.09	1.08	1.10	74.69	40.20	15.76
10E-4[a]	20	1.24	0.86	1.61	Insufficient Data	68%	Insufficient Data	24%	Insufficient Data	1.09	1.12	1.10	22.21	55.16	15.90
10E-5[a]	18	1.43	1.95	0.92	Insufficient Data	61%	Insufficient Data	13%	Insufficient Data	1.11	1.08	1.08	9.48	16.92	15.84
10E-6[a]	10	1.09	1.38	0.80	Insufficient Data	63%	Insufficient Data	5%	Insufficient Data	1.08	1.06	1.06	20.86	233.15	17.51
10E-7[a]	9	0.96	1.22	0.69	Insufficient Data	56%	Insufficient Data	13%	Insufficient Data	1.63	1.60	1.65	32.13	47.71	16.50
10E-8[b]	7	0.44	0.30	0.58	Insufficient Data	35%	Insufficient Data	Insufficient Data	Insufficient Data	1.40	1.36	1.44	98.36	64.47	16.50
10E-9[c]	12	1.04	1.27	0.80	Insufficient Data	63%	Insufficient Data	20%	Insufficient Data	1.64	1.86	1.42	38.57	35.20	16.13
10E-10[c]	6	0.59	0.58	0.61	Insufficient Data	100%	Insufficient Data	Insufficient Data	Insufficient Data	1.09	1.06	1.13	12.00	14.00	16.15
10E-11[d]	12	0.77	0.99	0.55	Insufficient Data	84%	Insufficient Data	5%	Insufficient Data	1.11	1.08	1.15	48.10	15.44	16.22
10E-12[e]	23	1.22	1.02	1.42	Insufficient Data	59%	Insufficient Data	30%	Insufficient Data	1.09	1.10	1.09	47.31	11.98	16.20
10E-13[e]	17	1.02	0.87	1.18	Insufficient Data	81%	Insufficient Data	19%	Insufficient Data	1.15	1.18	1.12	3.54	38.82	16.40
10E-14[e]	22	0.74	0.57	0.91	Insufficient Data	80%	Insufficient Data	33%	Insufficient Data	1.08	1.07	1.08	21.52	32.85	15.96
10E-15[e]	18	1.18	0.87	1.49	Insufficient Data	80%	Insufficient Data	33%	Insufficient Data	1.07	1.07	1.06	145.45	71.37	16.31
10E-16[e]	20	0.59	0.42	0.76	Insufficient Data	56%	Insufficient Data	44%	Insufficient Data	1.17	1.17	1.17	117.98	70.16	16.00
Weighted Corridor Average		1.00	0.96	1.03	Insufficient Data	68%	Insufficient Data	24%	Insufficient Data	1.17	1.18	1.16	50.41	49.27	16.18
		SCALES													
Performance Level		**Urban or Rural 6 Lane Freeway**								**All**			**All**		
Good/Above Average Performance		> 0.65			< 0.00%	< 55.7%	< 4.0%	< 5.0%	< 0.0%	< 1.15			< 44.18		> 16.5
Fair/Average Performance		0.65 - 1.35			0.00%	55.7% - 62.9%	4.0% - 7.9%	5.0% - 12.9%	0.0% - 1.3%	1.15 - 1.35			44.18-124.86		16.0 - 16.5
Poor/Below Average Performance		> 1.35			> 0.00%	> 62.9%	> 7.9%	> 12.9%	> 1.3%	> 1.35			> 124.86		< 16.0
Performance Level		**Urban >6 Lane Freeway**													
Good/Above Average Performance		< 0.89			< 0.00%	< 40.4%	< 1.6%	< 1.9%	< 0.00%						
Fair/Average Performance		0.89 - 1.11			0.00%	40.4% - 43.2%	1.6% - 4.7%	1.9% - 5.1%	0.00%						
Poor/Below Average Performance		> 1.11			> 0.00%	> 43.2%	> 4.7%	> 5.1%	> 0.00%						
Performance Level		**Urban 4 Lane Freeway**													
Good/Above Average Performance		< 0.73			< 0.00%	< 60.6%	< 0.0%	< 6.9%	< 0.00%						
Fair/Average Performance		0.73 - 1.27			0.00%	60.6% - 78.1%	0.0% - 4.9%	6.9% - 12.4%	0.00%						
Poor/Below Average Performance		> 1.27			> 0.00%	> 78.1%	> 4.9%	> 12.4%	> 0.00%						
Performance Level		**Rural 4 Lane with Daily Volume > 25,000 (< 25,000)**													
Good/Above Average Performance		< 0.78 (< 0.84)			< 0.00% (< 0.00%)	< 69.0% (< 72.8%)	< 0.7% (< 1.0%)	< 8.5% (< 19%)	< 8.5% (< 19%)						
Fair/Average Performance		0.78 - 1.22 (0.84 - 1.16)			0.00% (0.00%)	69.0 - 77.5% (72.8% - 76.4%)	0.7% - 4.7% (1.0% - 3.3%)	8.5% - 18.0% (19% - 22.5%)	8.5% - 18.0% (19% - 22.5%)						
Poor/Below Average Performance		> 1.22 (> 1.16)			> 0.00% (> 0.00%)	> 77.5% (< 76.4%)	> 4.7% (> 3.3%)	> 18.0% (> 22.5%)	> 18.0% (> 22.5%)						

[a]Urban or Rural 6 Lane Freeway
[b]Urban > 6 Lane Freeway
[c]Urban 4 Lane Freeway
[d]Rural 4 Lane Freeway with Daily Volume > 25,000 vpd
[e]Rural 4 Lane Freeway with Daily Volume < 25,000 vpd

Note: "Insufficient Data" indicates there was not enough data available to generate reliable performance ratings

3.0 NEEDS ASSESSMENT

3.1 Corridor Objectives

Statewide goals and performance measures were established by the ADOT Long-Range Transportation Plan (LRTP) 2010-2035 goals and objectives that were updated in 2017. Statewide performance goals that are relevant to I-10 East performance areas were identified and corridor goals were then formulated for each of the five performance areas that aligned with the overall statewide goals established by the LRTP. Based on stakeholder input, corridor goals, corridor objectives, and performance results, three "Emphasis Areas" were identified for the I-10 East Corridor: Mobility, Safety, and Freight.

Taking into account the corridor goals and identified emphasis areas, performance objectives were developed for each quantifiable performance measure that identify the desired level of performance based on the performance scale levels for the overall corridor and for each segment of the corridor. For the performance emphasis areas, the corridor-wide weighted average performance objectives are identified with a higher standard than for the other performance areas. **Table 12** shows the I-10 East Corridor goals, corridor objectives, and performance objectives, and how they align with the statewide goals.

It is not reasonable within a financially constrained environment to expect that every performance measure will always be at the highest levels on every corridor segment. Therefore, individual corridor segment objectives have been set as "fair/average" or better and should not fall below that standard.

Achieving corridor and segment performance objectives will help ensure that investments are targeted toward improvements that support the safe and efficient movement of travelers on the corridor. Addressing current and future congestion, thereby improving mobility on congested segments, will also help the corridor fulfill its potential as a significant contributor to the region's economy.

Corridor performance is measured against corridor and segment objectives to determine needs – the gap between observed performance and performance objectives.

Goal achievement will improve or reduce current and future congestion, increase travel time reliability, and reduce fatalities and suspected serious injuries resulting from vehicle crashes. Where performance is currently rated "good", the goal is always to maintain that standard, regardless of whether or not the performance is in an emphasis area.

Table 12: Corridor Performance Goals and Objectives

ADOT Statewide LRTP Goals	I-10 East Corridor Goals	I-10 East Corridor Objectives	Performance Area	Performance Measure	Performance Objective	
				Secondary Measure Indicators	Corridor Average	Segment
Preserve & Maintain the State Transportation System	Maintain, preserve, extend service life, and modernize State Transportation System infrastructure	Improve pavement ride quality for all corridor users Reduce long-term pavement maintenance costs	Pavement	Pavement Index	Fair or better	Fair or better
				Direction Pavement Serviceability Rating		
				% Area Failure		
		Maintain structural integrity of bridges	Bridge	Bridge Index	Fair or better	Fair or better
				Sufficiency Rating		
				Lowest Bridge Rating		
Improve Mobility, Reliability, and Accessibility **Make Cost-Effective Investment Decisions and Support Economic Vitality**	Improve mobility through additional capacity and improved roadway geometry Provide a safe and reliable route for general commuting, commerce, recreational, and tourist travel Provide a safe, reliable, and efficient connection to all communities along the corridor to permit efficient regional travel Implement critical/cost-effective investments to improve access to multimodal transportation	Reduce current congestion and plan to facilitate future congestion that accounts for anticipated growth and land use changes Reduce delays from recurring and non-recurring events to improve reliability Better accommodate bicycle and pedestrian use on the state system Emphasize the deployment of technology to optimize existing system capacity and performance	Mobility *(Emphasis Area)*	Mobility Index	Good	Fair or better
				Future Daily V/C		
				Existing Peak Hour V/C		
				Closure Extent		
				Directional Level of Travel Time Reliability		
				% Bicycle Accommodation		
				% Non-SOV Trips		
Enhance Safety	Provide a safe and reliable route for general commuting, commerce, recreational, and tourist travel Provide a safe, reliable, and efficient connection for the communities, major activity, and business hubs along the corridor Promote safety by implementing appropriate countermeasures, education, and awareness	Reduce the number and rate of fatal and suspected serious injury crashes for all roadway users	Safety *(Emphasis Area)*	Safety Index	Above Average	Average or better
				Directional Safety Index		
				% of Fatal + Suspected Serious Injury Crashes at Intersections		
				% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures		
				% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians		
				% of Fatal + Suspected Serious Injury Crashes Involving Trucks		
				% of Fatal + Suspected Serious Injury Crashes Involving Bicycles		
Improve Mobility, Reliability, and Accessibility **Make Cost-Effective Investment Decisions and Support Economic Vitality**	Support goals identified in the regional studies such as *What Moves You Arizona* Long-Range Transportation Plan as well as Arizona's *Key Commerce Corridors*	Implement the most cost-effective transportation solutions Reduce delays and restrictions to freight movement to improve reliability Improve travel time reliability (including impacts to motorists due to freight traffic)	Freight *(Emphasis Area)*	Freight Index	Good	Fair or better
				Truck Travel Time Reliability		
				Closure Duration		
				Bridge Vertical Clearance		

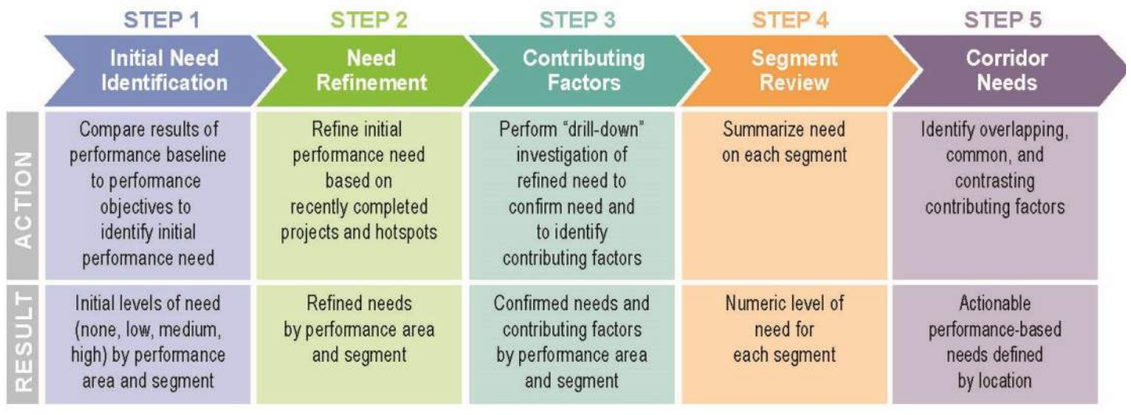
3.2 Needs Assessment Process

The following guiding principles were used as an initial step in developing a framework for the performance-based needs assessment process:

- Corridor needs are defined as the difference between the corridor performance and the performance objectives
- The needs assessment process should be systematic, progressive, and repeatable, but also allow for engineering judgment where needed
- The process should consider all primary and secondary performance measures developed for the study
- The process should develop multiple need levels including programmatic needs for the entire length of the corridor, performance area-specific needs, segment-specific needs, and location-specific needs (defined by MP limits)
- The process should produce actionable needs that can be addressed through strategic investments in corridor preservation, modernization, and expansion

The performance-based needs assessment process is illustrated in **Figure 19** and described in the following sections.

Figure 19: Needs Assessment Process



Step 1: Initial Needs Identification

The first step in the needs assessment process links baseline (existing) corridor performance with performance objectives. In this step, the baseline corridor performance is compared to the performance objectives to provide a starting point for the identification of performance needs. This mathematical comparison results in an initial need rating of None, Low, Medium, or High for each primary and secondary performance measure. An illustrative example of this process is shown in **Figure 20**.

Figure 20: Initial Need Ratings in Relation to Baseline Performance (Bridge Example)

Performance Thresholds	Performance Level	Initial Level of Need	Description
6.5	Good	None*	All levels of Good and top 1/3 of Fair (>6.0)
	Good		
	Good		
	Fair		
	Fair	Low	Middle 1/3 of Fair (5.5-6.0)
5.0	Fair	Medium	Lower 1/3 of Fair and top 1/3 of Poor (4.5-5.5)
	Poor		
	Poor	High	Lower 2/3 of Poor (<4.5)
	Poor		

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

The initial level of need for each segment is refined to account for hot spots and recently completed or under construction projects, resulting in a final level of need for each segment. The final levels of need for each primary and secondary performance measure are combined to produce a weighted final need rating for each segment. Values of 0, 1, 2, and 3 are assigned to the initial need levels of None, Low, Medium, and High, respectively. A weight of 1.0 is applied to the Performance Index need and equal weights of 0.20 are applied to each need for each secondary performance measure. For directional secondary performance measures, each direction of travel receives a weight of 0.10.

Step 2: Need Refinement

In Step 2, the initial level of need for each segment is refined using the following information and engineering judgment:

- For segments with an initial need of None that contain hot spots, the level of need should be increased from None to Low
- For segments with an initial level of need where recently completed projects or projects under construction are anticipated to partially or fully address the identified need, the level of need should be reduced or eliminated as appropriate
- Programmed projects that are expected to partially or fully address an identified need are not justification to lower the initial need because the programmed projects may not be implemented as planned; in addition, further investigations may suggest that changes in the scope of a programmed project may be warranted

The resulting final needs are carried forward for further evaluation in Step 3.

Step 3: Contributing Factors

In Step 3, a more detailed review of the condition and performance data available from ADOT is conducted to identify contributing factors to the need. Typically, the same databases used to develop the baseline performance serve as the principal sources for the more detailed analysis. However, other supplemental databases may also be useful sources of information. The databases used for diagnostic analysis are listed below:

Pavement Performance Area

- Pavement Rating Database

Bridge Performance Area

- ABISS

Mobility Performance Area

- Highway Performance Monitoring System (HPMS) Database
- AZTDM
- Real-time traffic conditions data produced by INRIX Database
- Highway Conditions Reporting System (HCRS) Database

Safety Performance Area

- Crash Database

Freight Performance Area

- INRIX Database
- HCRS Database

In addition, other sources considered helpful in identifying contributing factors are:

- Maintenance history (from ADOT PeCoS database for pavement), the level of past investments, or trends in historical data that provide context for pavement and bridge history
- Field observations from ADOT district personnel can be used to provide additional information regarding a need that has been identified
- Previous studies can provide additional information regarding a need that has been identified

Step 3 results in the identification of performance-based needs and contributing factors by segment (and MP locations, if appropriate) that can be addressed through investments in preservation, modernization, and expansion projects to improve corridor performance. See **Appendix D** for more information.

Step 4: Segment Review

In this step, the needs identified in Step 1 and refined in Step 2 are quantified for each segment to numerically estimate the level of need for each segment. Values of 0 to 3 are assigned to the final need levels (from Step 3) of None, Low, Medium, and High, respectively. A weighting factor is applied to the performance areas identified as emphasis areas and a weighted average need is calculated for each segment. The resulting average need score can be used to compare levels of need between segments within a corridor and between segments in different corridors.

Step 5: Corridor Needs

In this step, the needs and contributing factors for each performance area are reviewed on a segment-by-segment basis to identify actionable needs and to facilitate the formation of solution sets that address multiple performance areas and contributing factors. The intent of this process is to identify overlapping, common, and contrasting needs to help develop strategic solutions. This step results in the identification of corridor needs by specific location.

3.3 Corridor Needs Assessment

This section documents the results of the needs assessment process described in the prior section. The needs in each performance area were classified as either None, Low, Medium, or High based on how well each segment performed in the existing performance analysis. The needs for each segment were numerically combined to estimate the average level of need for each segment of the corridor

The final needs assessments for each performance measure, along with the scales used in analysis, are shown in **Table 13** through **Table 17**.

Pavement Needs

- Overall, the corridor has a Low Pavement need for each of the segments from Segment 10E-3 to Segment 10E-16, except for Segment 10E-6, where a recently completed project addressed all Pavement hot spots
- Pavement hot spots were identified in each of the segments, with Segments 10E-4, 10E-5, 10E-6, 10E-7, 10E-9, 10E-12, 10E-13, and 10E-15 each containing at least two different ranges of hot spot locations
- The level of need for Segments 10E-3, 10E-11, 10E-13 and 10E-16 were raised to Low due to the presence of hot spots along the segments
- Segments 10E-12 and 10E-13 show a high level of historical investment, meaning that some previous projects have proven to provide only temporary improvements and require frequent attention
- Recently completed projects on Segments 10E-4, 10E-5, 10E-6, 10E-7, and 10E-12 partially addressed needs due to hot spots
- See **Appendix D** for detailed information on contributing factors

Table 13: Final Pavement Needs

Segment #	Performance Score and Level of Need				Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Pavement Index	Directional PSR		% Area Failure				
		NB	SB					
10E-3	4.38	4.28	4.25	5%	0.00	MP 190-191	None	Low
10E-4	3.82	4.06	4.13	40%	0.60	MP 200-209, MP 211-212, and MP 213-218	Widen to 6 lanes MP 209.6-213.8 (2020)	Low
10E-5	3.93	4.17	3.84	22%	0.40	MP 218-219, MP 222-223, MP 225-227, and MP 234-236	Pavement rehab MP 222-231.71 (2022)	Low
10E-6	3.87	4.07	3.85	25%	0.60	MP 240-241 and MP 244-246	Pavement rehab MP 237.47-246 (2022)	None
10E-7	3.76	3.72	3.66	48%	0.60	MP 246-249 and MP 250-255	Ina Rd TI Reconstruct MP 247.8-249.8 (2019) and Ruthrauff Rd TI Reconstruct MP 252-253.1 (2021)	Low
10E-8	4.04	3.81	3.82	24%	0.40	MP 260-262	None	Low
10E-9	3.89	3.81	3.79	28%	0.60	MP 262-263, MP 266-267, and MP 272-274	None	Low
10E-10	3.76	3.56	3.72	33%	0.70	MP 274-277	None	Low
10E-11	4.35	4.15	4.20	8%	0.00	MP 288-290	None	Low
10E-12	4.13	4.09	4.04	22%	0.40	MP 303-308 and MP 310-313	Pavement Rehab MP 303-308 (2021)	Low
10E-13	3.98	3.83	4.02	9%	0.00	MP 321-323 and MP 328-329	None	Low
10E-14	4.13	4.16	4.08	20%	0.40	MP 345-352	None	Low
10E-15	4.22	3.97	4.22	14%	0.20	MP 355-356 and MP 358-361	None	Low
10E-16	4.34	3.96	4.13	3%	0.00	MP 380-381	None	Low

Level of Need (Score)	Performance Score Need Scale			Segment Level Need Scale
None* (0)	> 3.5	> 3.63	< 10%	0
Low (1)	3.25 - 3.5	3.63 - 3.52	10% - 15%	< 1.5
Medium (2)	2.75 - 3.25	3.52 - 3.38	15% - 25%	1.5 - 2.5
High (3)	< 2.75	< 3.38	> 25%	> 2.5

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Bridge Needs

- Final Bridge needs are generally Low, with Segments 10E-8 and 10E-11 having no need and Segments 10E-13 and 10E-16 having Medium need
- Bridge hot spots were identified in Segments 10E-5, 10E-12, 10E-13, 10E-14, and 10E-16
- Three hot spot bridges (Red Rock TI UP (#592), Cochise TI UP (#518), and Airport Rd UP (#1114)) have potential repetitive investment issues and are candidates for life-cycle cost analysis to evaluate alternative solutions
- Final design is programmed for the Red Rock TI UP (#592) in 2026
- See **Appendix D** for detailed information on contributing factors

Table 14: Final Bridge Needs

Segment #	Performance Score and Level of Need			Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Bridge Index	Sufficiency Rating	Lowest Bridge Rating				
10E-3	5.84	90.11	5.00	1.2	None	None	Low
10E-4	6.87	91.40	5.00	0.2	None	None	Low
10E-5	6.13	92.86	5.00	0.2	Red Rock TI UP (#592) (MP 226.45)	None	Low
10E-6	6.79	95.23	5.00	0.2	None	None	Low
10E-7	6.72	89.99	5.00	0.2	None	None	Low
10E-8	6.62	93.51	6.00	0.0	None	None	None
10E-9	5.78	89.04	5.00	1.2	None	None	Low
10E-10	6.54	95.47	5.00	0.2	None	None	Low
10E-11	6.74	94.92	6.00	0.0	None	None	None
10E-12	6.20	93.57	5.00	0.2	Amole TI OP EB (Bell) (#787) (MP 292.50) Cornfield Canyon Br WB (#73) (MP 299.14)	None	Low
10E-13	5.46	81.14	5.00	2.2	Dragoon TI OP EB (#760) (MP 318.95) Cochise TI UP (#518) (MP 331.62)	None	Medium
10E-14	5.73	86.82	4.00	1.4	Airport Rd UP (#1114) (MP339.46)	None	Low
10E-15	5.90	93.96	5.00	1.2	None	None	Low
10E-16	5.42	84.96	4.00	2.4	E San Simon TI UP (#1169) (MP 382.35)	None	Medium

Level of Need (Score)	Performance Score Need Scale			Segment Level Need Scale
None (0)	≥ 6.0	≥ 70	> 5	0
Low (1)	5.5 - 6.0	60 - 70	5	< 1.5
Medium (2)	4.5 - 5.5	40 - 60	4	1.5 - 2.5
High (3)	≤ 4.5	≤ 40	< 4	> 2.5

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicated that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Mobility Needs

- The Mobility performance area is an emphasis area for the I-10 East Corridor
- Segments 10E-7 and 10E-8 have a High need and are located in the Tucson area and may been affected by ongoing construction projects in the segments. Segment 10E-11 also has a High need and is located just outside the Tucson area
- A Medium Mobility need was identified in Segment 10E-9, which is located in the Tucson area and may have been affected by ongoing construction projects in the area
- Low Mobility needs were identified in Segments 10E-3, 10E-6, 10E-12, 10E-13, 10E-15, and 10E-16
- A programmed project to widen MP 247.57-253.40 to eight lanes in 2023 in Segment 10E-7 is expected to address the Mobility need in that segment
- A programmed project to widen MP 264-267 to six lanes in 2026 and reconstruct the I-10/Country Club Road traffic TI in Segment 10E-9 is expected to partially address the Mobility need in that segment
- A programmed climbing lane at MP 302.95-303.40 in 2024 in Segment 10E-12 may address the Mobility need for part of the segment
- See **Appendix D** for detailed information on contributing factors

Table 15: Final Mobility Needs

Segment #	Performance Score and Level of Need									Initial Segment Need	Recently Completed Projects	Final Segment Need
	Mobility Index	Future Daily V/C	Existing Peak Hour V/C		Closure Extent		Directional LOTTR		% Bicycle Accommodation			
			NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB				
10E-3[1a]	0.42	0.49	0.26	0.25	0.80	0.45	1.04	1.05	94%	0.4	None	Low
10E-4[1a]	0.41	0.47	0.25	0.24	0.17	0.30	1.05	1.05	96%	0.0	None	None
10E-5[2a]	0.42	0.48	0.26	0.25	0.10	0.21	1.04	1.04	87%	0.0	None	None
10E-6[1a]	0.56	0.63	0.39	0.36	0.18	0.55	1.03	1.03	100%	0.2	None	Low
10E-7[1a]	0.86	0.98	0.54	0.51	0.13	0.44	1.17	1.11	64%	3.1	None	High
10E-8[1a]	1.09	1.19	0.71	0.70	0.89	0.57	1.04	1.05	89%	4.1	None	High
10E-9[1a]	0.80	0.88	0.55	0.62	0.35	0.43	1.14	1.04	93%	1.5	None	Medium
10E-10[1a]	0.52	0.58	0.35	0.36	0.20	0.17	1.03	1.03	98%	0.0	Houghton Rd TI Reconstruct MP 274.8-274.9 (2021)	None
10E-11[2a]	0.76	0.85	0.43	0.42	0.37	0.12	1.03	1.03	100%	2.7	None	High
10E-12[2a]	0.60	0.69	0.38	0.33	0.39	0.10	1.04	1.03	97%	0.3	None	Low
10E-13[2a]	0.38	0.43	0.31	0.27	0.05	0.21	1.04	1.04	78%	0.2	None	Low
10E-14[2a]	0.35	0.39	0.25	0.19	0.11	0.23	1.03	1.03	100%	0.0	None	None
10E-15[2a]	0.28	0.31	0.17	0.15	0.26	1.06	1.03	1.03	99%	0.3	None	Low
10E-16[2a]	0.43	0.48	0.24	0.21	0.21	1.05	1.06	1.04	99%	0.3	None	Low

Level of Need (Score)	Performance Score Need Scale				Segment Level Need Scale
None* (0)	≤ 0.77 (Urban) ≤ 0.63 (Rural)	< 0.35	< 1.27[a] < 1.27[b]	> 80%	0
Low (1)	0.77 - 0.83 (Urban) 0.63 - 0.69 (Rural)	0.35 - 0.49	1.27 - 1.38[a] 1.27 - 1.38[b]	70% - 80%	< 1.5
Medium (2)	0.83 - 0.95 (Urban) 0.69 - 0.83 (Rural)	0.49 - 0.75	1.38 - 1.62[a] 1.38 - 1.62[b]	50% - 70%	1.5 - 2.5
High (3)	≥ 0.95 (Urban) ≥ 0.83 (Rural)	> 0.75	> 1.62[a] > 1.62[b]	< 50%	> 2.5

1: Urban or Fringe Urban
2: Rural

a: Uninterrupted Flow Facility
b: Interrupted Flow Facility

** A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Safety Needs

- The Safety performance area is an emphasis area for the I-10 East Corridor
- High Safety needs were identified in Segments 10E-4, 10E-5, 10E-12, and 10E-15
- Medium Safety needs were identified in Segments 10E-3, 10E-6, 10E-7, 10E-9, and 10E-13
- Safety hot spots were identified in Segments 10E-7, 10E-8, 10E-9, 10E-11 and 10E-13
- Hot spots in Segment 10E-8 altered the final need from None to Low
- The programmed projects listed under Mobility Needs are expected to address the Safety need in Segment 10E-7 but only partially address the Safety need in Segments 10E-9 and 10E-12
- See **Appendix D** for detailed information on contributing factors

Table 16: Final Safety Needs

Segment #	Performance Score and Level of Need								Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Safety Index	Directional Safety Index		% of Fatal + Suspected Serious Injury Crashes at Intersections	% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures	% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians	% of Fatal + Suspected Serious Injury Crashes Involving Trucks	% of Fatal + Suspected Serious Injury Crashes Involving Bicycles				
		NB/ EB	SB/ WB									
10E-3[c]	0.98	1.13	0.83	Insufficient Data	67%	Insufficient Data	17%	Insufficient Data	2.4	None	Widen to 6 lanes MP 196.4-218.6 (2020)	Medium
10E-4[c]	1.24	0.86	1.61	Insufficient Data	68%	Insufficient Data	24%	Insufficient Data	3.5	None	Widen to 6 lanes MP 196.4-218.6 (2020), SR 87 TI Reconstruct MP 210-212 (2019)	High
10E-5[c]	1.43	1.95	0.92	Insufficient Data	61%	Insufficient Data	13%	Insufficient Data	3.2	None	Pavement Rehab MP 222-231.71 (2022)	High
10E-6[c]	1.09	1.38	0.80	Insufficient Data	63%	Insufficient Data	5%	Insufficient Data	1.6	None	Pavement Rehab MP 237.47-247.89 (2022)	Medium
10E-7[c]	0.96	1.22	0.69	Insufficient Data	56%	Insufficient Data	13%	Insufficient Data	1.6	EB MP 247.67- 248.00, WB MP 252.5 - 253.75	Pavement Rehab MP 237.47-247.89 (2022), Ina Rd TI Reconstruct MP 247.8-249.8 (2019), Ruthrauff Rd TI Reconstruct MP 252-253.1 (2021)	Medium
10E-8[d]	0.44	0.30	0.58	Insufficient Data	35%	Insufficient Data	Insufficient Data	Insufficient Data	0.0	WB MP 256.05 - 258.16	None	Low

Level of Need (Score)		Performance Score Needs Scale						Segment Level Need Scale
None* (0)	a	≤ 0.95	0%	≤ 74%	≤ 2%	≤ 20%	0%	0
	b	≤ 0.91	0%	≤ 66%	≤ 2%	≤ 9%	0%	
	c	≤ 0.88	0%	< 58%	≤ 5%	≤ 8%	0%	
	d	≤ 0.96	0%	≤ 41%	≤ 3%	≤ 3%	0%	
Low (1)	a	0.96 - 1.06	0%	74% - 75%	3%	21%	0%	≤ 1.5
	b	0.92 - 1.09	0%	67% - 72%	3% - 4%	10% - 11%	0%	
	c	0.89 - 1.11	0%	59% - 60%	6%	10% - 11%	0%	
	d	0.97 - 1.03	0%	42% - 42%	4%	4%	0%	
Medium (2)	a	1.07-1.26	0%	75% - 77%	3%	22% - 23%	0%	1.5 - 2.5
	b	1.10-1.44	0%	73% - 83%	4%-6%	11% - 14%	0%	
	c	1.12-1.57	0%	61% - 64%	7%-8%	11% - 15%	0%	
	d	1.04-1.17	0%	43% - 43%	5%	5%	0%	
High (3)	a	≥ 1.27	0%	≥ 78%	≥ 4%	≥ 24%	≥ 1%	≥ 2.5
	b	≥ 1.45	0%	>84%	≥7%	≥15%	0%	
	c	≥ 1.58	0%	≥ 65%	≥ 9%	≥ 16%	≥ 1%	
	d	≥ 1.18	0%	≥ 44%	≥ 6%	≥ 6%	0%	

a: Rural 4 Lane Freeway with Daily Volume < 25,000
b: Urban 4 Lane Freeway
c: Urban or Rural 6 Lane Freeway
d: Urban > 6 Lane Freeway

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Table 16: Final Safety Needs (continued)

Segment #	Performance Score and Level of Need								Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Safety Index	Directional Safety Index		% of Fatal + Suspected Serious Injury Crashes at Intersections	% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures	% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians	% of Fatal + Suspected Serious Injury Crashes Involving Trucks	% of Fatal + Suspected Serious Injury Crashes Involving Bicycles				
		NB/ EB	SB/ WB									
10E-9[b]	1.04	1.27	0.80	Insufficient Data	63%	Insufficient Data	20%	Insufficient Data	1.8	EB MP 262.92 - 265.72	Pavement Rehab MP 262.4-272 (2022	Medium
10E-10[b]	0.59	0.58	0.61	Insufficient Data	100%	Insufficient Data	Insufficient Data	Insufficient Data	0.6	None	Houghton Rd TI Reconstruct MP 274.8-274.9 (2021)	Low
10E-11[a]	0.77	0.99	0.55	Insufficient Data	84%	Insufficient Data	5%	Insufficient Data	0.7	WB MP 291.11 - 291.50	Superelevation Improvements MP 281.3-288.12 (2016)	Low
10E-12[a]	1.22	1.02	1.42	Insufficient Data	59%	Insufficient Data	30%	Insufficient Data	3.0	None	Superelevation Improvements MP 291.7-297.7 (2016), Pavement Rehab MP 296-301 (2016), Pavement Rehab MP 303-308 (2021)	High
10E-13[a]	1.02	0.87	1.18	Insufficient Data	81%	Insufficient Data	19%	Insufficient Data	1.8	EB MP 316.27- 318.25	Safety Improvements MP 316 (2018), Rockfall Mitigation MP 316-322 (2016), Rest Area Rehab MP 320.5 (2016)	Medium
10E-14[a]	0.74	0.57	0.91	Insufficient Data	80%	Insufficient Data	33%	Insufficient Data	1.2	None	-	Low
10E-15[a]	1.18	0.87	1.49	Insufficient Data	80%	Insufficient Data	33%	Insufficient Data	3.5	None	Pavement Rehab MP 362.2-367.7 (2017), Tree Removal MP 368-390 (2022)	High
10E-16[a]	0.59	0.42	0.76	Insufficient Data	56%	Insufficient Data	44%	Insufficient Data	0.6	None	Tree Removal MP 368-390 (2022), Rest Area Rehab MP 388 (2016)	Low

Level of Need (Score)		Performance Score Needs Scale						Segment Level Need Scale
None* (0)	a	≤ 0.95	0%	≤ 74%	≤ 2%	≤ 20%	0%	0
	b	≤ 0.91	0%	≤ 66%	≤ 2%	≤ 9%	0%	
	c	≤ 0.88	0%	< 58%	≤ 5%	≤ 8%	0%	
	d	≤ 0.96	0%	≤ 41%	≤ 3%	≤ 3%	0%	
Low (1)	a	0.96 - 1.06	0%	74% - 75%	3%	21%	0%	≤ 1.5
	b	0.92 - 1.09	0%	67% - 72%	3% - 4%	10% - 11%	0%	
	c	0.89 - 1.11	0%	59% - 60%	6%	10% - 11%	0%	
	d	0.97 - 1.03	0%	42% - 42%	4%	4%	0%	
Medium (2)	a	1.07-1.26	0%	75% - 77%	3%	22% - 23%	0%	1.5 - 2.5
	b	1.10-1.44	0%	73% - 83%	4%-6%	11% - 14%	0%	
	c	1.12-1.57	0%	61% - 64%	7%-8%	11% - 15%	0%	
	d	1.04-1.17	0%	43% - 43%	5%	5%	0%	
High (3)	a	≥ 1.27	0%	≥ 78%	≥ 4%	≥ 24%	≥ 1%	≥ 2.5
	b	≥ 1.45	0%	>84%	≥7%	≥15%	0%	
	c	≥ 1.58	0%	≥ 65%	≥ 9%	≥ 16%	≥ 1%	
	d	≥ 1.18	0%	≥ 44%	≥ 6%	≥ 6%	0%	

a: Rural 4 Lane Freeway with Daily Volume < 25,000
b: Urban 4 Lane Freeway
c: Urban or Rural 6 Lane Freeway
d: Urban > 6 Lane Freeway

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Freight Needs

- The Freight performance area is an emphasis area for the I-10 East Corridor
- Segments 10E-8 and 10E-9 were identified as having a High need
- Segment 10E-7 was downgraded from a High need to a Medium need as recently completed projects addressed some of the needs of the segment
- Segment 10E-10 was downgraded from a Low need to None as a recently completed project is believed to have addressed the need of the segment
- There are four bridges in Segment 10E-3, two bridges in Segment 10-4, and one bridge in Segment 10-14 that currently provide less than 16.25' vertical clearance and cannot be bypassed by using ramps
- See **Appendix D** for detailed information on contributing factors

Table 17: Final Freight Needs

Segment #	Performance Score and Level of Need						Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Freight Index	Directional TTTR		Closure Duration		Bridge Vertical Clearance				
		NB/ EB	SB/ WB	NB/ EB	SB/ WB					
10E-3[a]	1.09	1.08	1.10	74.69	40.20	15.76	0.7	Val Vista Rd UP (#1152 MP 188.20), Cottonwood Ln UP (#1154 MP 193.88), Earley Rd UP (#1158 MP 195.89), Selma Hwy UP (#1160 MP 196.89)	Widen to 6 lanes MP 196.4-198 (2020)	Low
10E-4[a]	1.11	1.12	1.10	22.21	55.16	15.90	0.4	Battaglia Rd (#943 MP 205.45), Alsdorf Rd UP (#944 MP 207.17)	SR 87 TI Reconstruct MP 210-212 (2019) Widen to 6 lanes MP 198-218 (2020)	Low
10E-5[a]	1.08	1.08	1.08	9.48	16.92	15.84	0.4	None	Widen to 6 lanes MP 218-218.6 (2020)	Low
10E-6[a]	1.06	1.06	1.06	20.86	233.15	17.51	0.3	None	None	Low
10E-7[a]	1.63	1.60	1.65	32.13	47.71	16.50	3.6	None	Ina Rd TI Reconstruct MP 247.8-249.8 (2019) Ruthrauff Rd TI Reconstruct MP 252-253.1 (2021)	Medium
10E-8[a]	1.40	1.36	1.44	98.36	64.47	16.50	2.7	None	None	High
10E-9[a]	1.64	1.86	1.42	38.57	35.20	16.13	4.0	None	None	High
10E-10[a]	1.09	1.06	1.13	12.00	14.00	16.15	0.4	None	Houghton Rd TI Reconstruct MP 274.8-274.9 (2021)	None
10E-11[a]	1.11	1.08	1.15	48.10	15.44	16.22	0.2	None	None	Low
10E-12[a]	1.09	1.10	1.09	47.31	11.98	16.20	0.2	None	None	Low
10E-13[a]	1.15	1.18	1.12	3.54	38.82	16.40	0.0	None	None	None
10E-14[a]	1.08	1.07	1.08	21.52	32.85	15.96	0.4	Airport Rd UP (#1114 MP 339.46)	None	Low
10E-15[a]	1.07	1.07	1.06	145.45	71.37	16.31	0.5	None	None	Low
10E-16[a]	1.17	1.17	1.17	117.98	70.16	16.00	0.6	None	None	Low

Level of Need (Score)		Performance Score Need Scale				Segment Level Need Scale
None* (0)	a	≤ 1.22	≤ 1.22	≤ 71.07	≥ 16.33	0
	b	≤ 1.58	≤ 1.58			
Low (1)	a	1.22-1.28	1.22-1.28	71.07 - 97.97	16.17 - 16.33	≤ 1.5
	b	1.58-1.72	1.58-1.72			
Medium (2)	a	1.28-1.42	1.28-1.42	97.97 - 151.75	15.83 - 16.17	1.5 - 2.5
	b	1.72-1.98	1.72-1.98			
High (3)	a	≥ 1.42	≥ 1.42	≥ 151.75	≤ 15.83	≥ 2.5
	b	≥ 1.98	≥ 1.98			

a: Uninterrupted Flow Facility
b: Interrupted Flow Facility

** A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Segment Review

The needs for each segment were combined to numerically estimate the average level of need for each segment of the corridor. **Table 18** provides a summary of needs for each segment across all performance areas, with the average need score for each segment presented in the last row of the table. A weighting factor of 1.5 is applied to the need scores of the performance areas identified as emphasis areas (Mobility, Safety, and Freight for the I-10 East Corridor). There are twelve segments with a Medium overall average need and two segments with a Low overall average need.

Table 18: Summary of Needs by Segment

Performance Area	Segment Number and Mileposts (MP)													
	10E-3	10E-4	10E-5	10E-6	10E-7	10E-8	10E-9	10E-10	10E-11	10E-12	10E-13	10E-14	10E-15	10E-16
	MP 187-198	MP 198-218	MP 218-236	MP 236-246	MP 246-255	MP 255-262	MP 262-274	MP 274-280	MP 280-292	MP 292-315	MP 315-332	MP 332-354	MP 354-372	MP 372-392
Pavement	Low	Low	Low	None	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Bridge	Low	Low	Low	Low	Low	None	Low	Low	None	Low	Medium	Low	Low	Medium
Mobility*	Low	None	None	Low	High	High	Medium	None	High	Low	Low	None	Low	Low
Safety*	Medium	High	High	Medium	Medium	Low	Medium	Low	Low	High	Medium	Low	High	Low
Freight*	Low	Low	Low	Low	Medium	High	High	None	Low	Low	None	Low	Low	Low
Average Need	**1.23**	**1.23**	**1.23**	**1.08**	**1.92**	**1.77**	**1.92**	**0.54**	**1.31**	**1.46**	**1.15**	**0.77**	**1.46**	**1.15**

Level of Need	Average Need Range
None[+]	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

* Identified as Emphasis Area for I-10E Corridor
[#] N/A indicates insufficient or no data available to determine level of need
[+] A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study

Summary of Corridor Needs

The needs in each performance area are shown in **Figure 21** and summarized below:

Pavement Needs

- Overall, the corridor has a Low Pavement need for each of the segments from Segment 10E-3 to Segment 10E-16, except for Segment 10E-6, where a recently completed project addressed all Pavement hot spots
- Pavement hot spots were identified in each of the segments, with Segments 10E-4, 10E-5, 10E-6, 10E-7, 10E-9, 10E-12, 10E-13, and 10E-15 each containing at least two different ranges of hot spot locations
- The level of need for Segments 10E-3, 10E-11, 10E-13 and 10E-16 were raised to Low due to the presence of hot spots along the segments
- Segments 10E-12 and 10E-13 show a high level of historical investment, meaning that some previous projects have proven to provide only temporary improvements and require frequent attention
- Recently completed projects on Segments 10E-4, 10E-5, 10E-6, 10E-7, and 10E-12 partially addressed needs due to hot spots

Bridge Needs

- Final Bridge needs are generally Low, with Segments 10E-8 and 10E-11 having no need and Segments 10E-13 and 10E-16 having Medium need
- Bridge hot spots were identified in Segments 10E-5, 10E-12, 10E-13, 10E-14, and 10E-16
- Three hot spot bridges (Red Rock TI UP (#592), Cochise TI UP (#518), and Airport Rd UP (#1114)) have potential repetitive investment issues and are candidates for life-cycle cost analysis to evaluate alternative solutions
- Final design is programmed for the Red Rock TI UP (#592) in 2026

Mobility Needs

- The Mobility performance area is an emphasis area for the I-10 East Corridor
- Segments 10E-7 and 10E-8 have a High need and are located in the Tucson area and may been affected by ongoing construction projects in the segments. Segment 10E-11 also has a High need and is located just outside the Tucson area
- A Medium Mobility need was identified in Segment 10E-9, which is located in the Tucson area and may have been affected by ongoing construction projects in the area
- Low Mobility needs were identified in Segments 10E-3, 10E-6, 10E-12, 10E-13, 10E-15, and 10E-16
- A programmed project to widen MP 247.57-253.40 to eight lanes in 2023 in Segment 10E-7 is expected to address the Mobility need in that segment
- A programmed project to widen MP 264-267 to six lanes in 2026 and reconstruct the I-10/Country Club Road traffic TI in Segment 10E-9 is expected to partially address the Mobility need in that segment
- A programmed climbing lane at MP 302.95-303.40 in 2024 in Segment 10E-12 may address the Mobility need for part of the segment

Safety Needs

- The Safety performance area is an emphasis area for the I-10 East Corridor
- High Safety needs were identified in Segments 10E-4, 10E-5, 10E-12, and 10E-15
- Medium Safety needs were identified in Segments 10E-3, 10E-6, 10E-7, 10E-9, and 10E-13
- Safety hot spots were identified in Segments 10E-7, 10E-8, 10E-9, 10E-11 and 10E-13
- Hot spots in Segment 10E-8 altered the final need from None to Low
- The programmed projects listed under Mobility Needs are expected to address the Safety need in Segment 10E-7 but only partially address the Safety need in Segments 10E-9 and 10E-12

Freight Needs

- The Freight performance area is an emphasis area for the I-10 East Corridor
- Segments 10E-8 and 10E-9 were identified as having a High need
- Segment 10E-7 was downgraded from a High need to a Medium need as recently completed projects addressed some of the needs of the segment
- Segment 10E-10 was downgraded from a Low need to None as a recently completed project is believed to have addressed the need of the segment
- There are four bridges in Segment 10E-3, two bridges in Segment 10-4, and one bridge in Segment 10-14 that currently provide less than 16.25’ vertical clearance and cannot be bypassed by using ramps

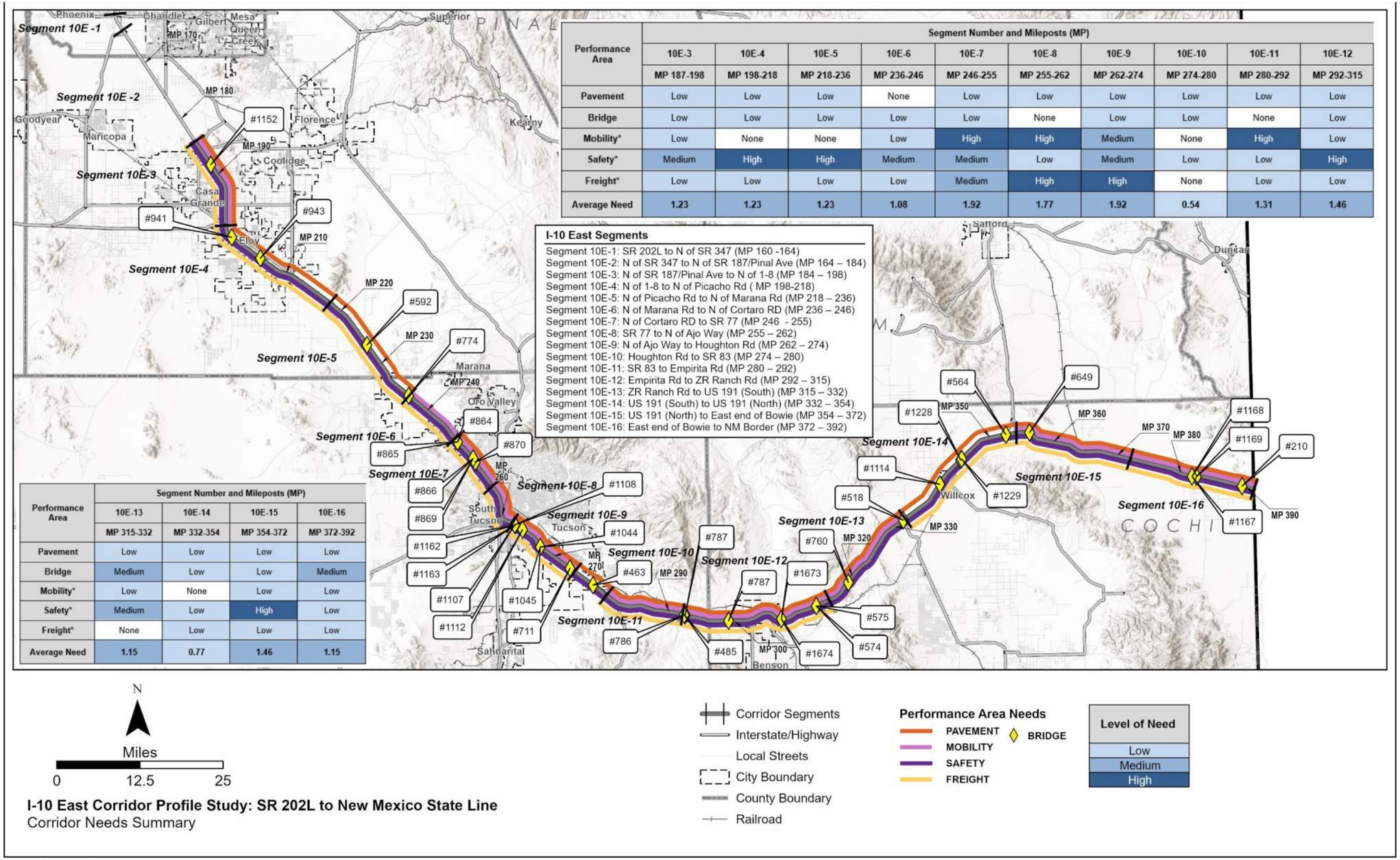
Overlapping Needs

This section identifies overlapping performance needs on the I-10 East Corridor, which provides guidance to develop strategic solutions that address more than one performance area with elevated levels of need. Completing projects that address multiple needs presents the opportunity to more effectively improve overall performance. A summary of the overlapping needs that relate to locations with elevated levels of need is provided below:

- Segments 10E-7 and 10E-9, both of which have the highest average need score of all the segments of the corridor, have elevated needs in the Mobility, Safety, and Freight performance areas and Pavement hot spots
- Segments 10E-3 and 10E-4 have elevated needs in the Safety performance area and Pavement and Freight hot spots

- Segments 10E-5 and 10E-12 have elevated needs in the Safety performance area and Pavement and Bridge hot spots
- Segment 10E-6 has elevated needs in the Safety performance area
- Segment 10E-8 has elevated needs in the Mobility and Freight performance areas and Pavement and Safety hot spots
- Segment 10E-10 has no elevated needs but does have Pavement hot spots
- Segment 10E-11 has elevated needs in the Mobility performance area and Pavement and Safety hot spots
- Segment 10E-13 has elevated needs in the Bridge and Safety performance areas and Pavement hot spots
- Segment 10E-14 has no elevated needs but does have Pavement, Bridge, and Freight hot spots
- Segment 10E-15 has elevated needs in the Safety performance area and Pavement hot spots
- Segment 10E-16 has elevated needs in the Bridge performance area and Pavement hot spots

Figure 21: Corridor Needs Summary



Performance Area	Segment Number and Mileposts (MP)									
	10E-3	10E-4	10E-5	10E-6	10E-7	10E-8	10E-9	10E-10	10E-11	10E-12
	MP 187-198	MP 198-218	MP 218-236	MP 236-246	MP 246-255	MP 255-262	MP 262-274	MP 274-280	MP 280-292	MP 292-315
Pavement	Low	Low	Low	None	Low	Low	Low	Low	Low	Low
Bridge	Low	Low	Low	Low	Low	None	Low	Low	None	Low
Mobility*	Low	None	None	Low	High	High	Medium	None	High	Low
Safety*	Medium	High	High	Medium	Medium	Low	Medium	Low	Low	High
Freight*	Low	Low	Low	Low	Medium	High	High	None	Low	Low
Average Need	1.23	1.23	1.23	1.08	1.92	1.77	1.92	0.54	1.31	1.46

Performance Area	Segment Number and Mileposts (MP)			
	10E-13	10E-14	10E-15	10E-16
	MP 315-332	MP 332-354	MP 354-372	MP 372-392
Pavement	Low	Low	Low	Low
Bridge	Medium	Low	Low	Medium
Mobility*	Low	None	Low	Low
Safety*	Medium	Low	High	Low
Freight*	None	Low	Low	Low
Average Need	1.15	0.77	1.46	1.15

*Identified as an Emphasis Area

*A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.

4.0 STRATEGIC SOLUTIONS

The principal objective of the CPS is to identify strategic solutions (investments) that are performance-based to ensure that available funding resources are used to maximize the performance of the State's key transportation corridors. One of the first steps in the development of strategic solutions is to identify areas of elevated levels of need (i.e., Medium or High). Addressing areas of Medium or High need will have the greatest effect on corridor performance and are the focus of the strategic solutions. Segments with Medium or High needs and specific locations of hot spots are considered strategic investment areas for which strategic solutions should be developed. Segments with lower levels of need or without identified hot spots are not considered candidates for strategic investment and are expected to be addressed through other ADOT programming processes. The I-10 East strategic investment areas (resulting from the elevated needs) are shown in **Figure 22**.

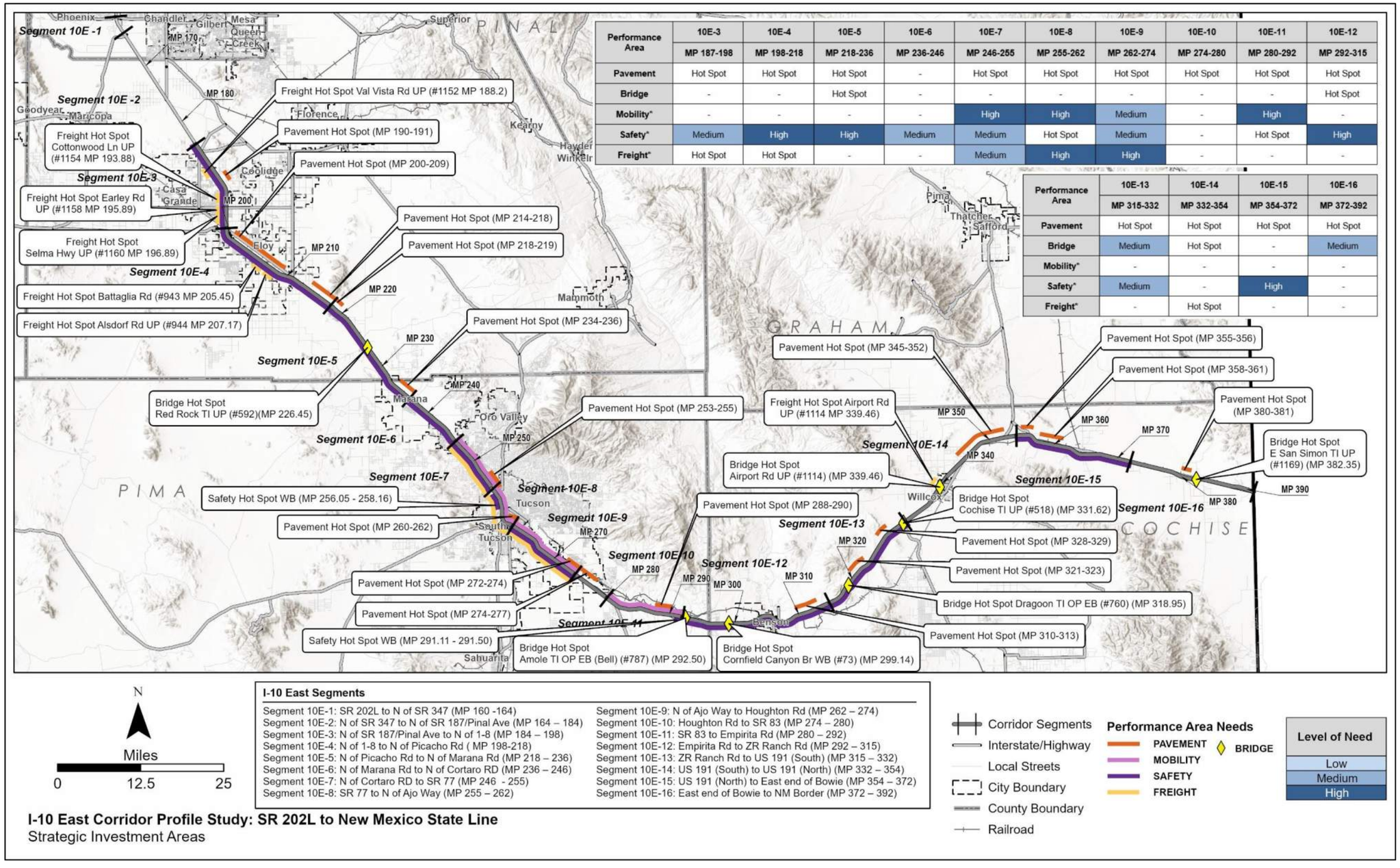
4.1 Screening Process

This section examines qualifying strategic needs and determines if the needs in those locations require action. In some cases, needs that are identified do not advance to solutions development and are screened out from further consideration because they have been or will be addressed through other measures, including:

- A project is programmed to address this need
- The need is a result of a Pavement or Bridge hot spot that does not show historical investment or rating issues; these hot spots will likely be addressed through other ADOT programming means
- A bridge is not a hot spot but is located within a segment with a Medium or High level of need; this bridge will likely be addressed through current ADOT bridge maintenance and preservation programming processes
- The need is determined to be non-actionable (i.e., cannot be addressed through an ADOT project)
- The conditions/characteristics of the location have changed since the performance data was collected that was used to identify the need

Table 19 notes if each potential strategic need advanced to solution development, and if not, the reason for screening the potential strategic need out of the process. Locations advancing to solutions development are marked with Yes (Y); locations not advancing are marked with No (N) and highlighted. This screening table provides specific information about the needs in each segment that will be considered for strategic investment. The table identifies the level of need – either Medium or High segment needs, or segments without Medium or High level of need that have a hot spot. Each area of need is assigned a location number in the screening table to help document and track locations considered for strategic investment.

Figure 22: Strategic Investment Areas



Performance Area	10E-3	10E-4	10E-5	10E-6	10E-7	10E-8	10E-9	10E-10	10E-11	10E-12
	MP 187-198	MP 198-218	MP 218-236	MP 236-246	MP 246-255	MP 255-262	MP 262-274	MP 274-280	MP 280-292	MP 292-315
Pavement	Hot Spot	Hot Spot	Hot Spot	-	Hot Spot	Hot Spot	Hot Spot	Hot Spot	Hot Spot	Hot Spot
Bridge	-	-	Hot Spot	-	-	-	-	-	-	Hot Spot
Mobility*	-	-	-	-	High	High	Medium	-	High	-
Safety*	Medium	High	High	Medium	Medium	Hot Spot	Medium	-	Hot Spot	High
Freight*	Hot Spot	Hot Spot	-	-	Medium	High	High	-	-	-

Performance Area	10E-13	10E-14	10E-15	10E-16
	MP 315-332	MP 332-354	MP 354-372	MP 372-392
Pavement	Hot Spot	Hot Spot	Hot Spot	Hot Spot
Bridge	Medium	Hot Spot	-	Medium
Mobility*	-	-	-	-
Safety*	Medium	-	High	-
Freight*	-	Hot Spot	-	-

I-10 East Segments

Segment 10E-1: SR 202L to N of SR 347 (MP 160 -164)
Segment 10E-2: N of SR 347 to N of SR 187/Pinal Ave (MP 164 – 184)
Segment 10E-3: N of SR 187/Pinal Ave to N of 1-8 (MP 184 – 198)
Segment 10E-4: N of 1-8 to N of Picacho Rd (MP 198-218)
Segment 10E-5: N of Picacho Rd to N of Marana Rd (MP 218 – 236)
Segment 10E-6: N of Marana Rd to N of Cortaro RD (MP 236 – 246)
Segment 10E-7: N of Cortaro RD to SR 77 (MP 246 - 255)
Segment 10E-8: SR 77 to N of Ajo Way (MP 255 – 262)
Segment 10E-9: N of Ajo Way to Houghton Rd (MP 262 – 274)
Segment 10E-10: Houghton Rd to SR 83 (MP 274 – 280)
Segment 10E-11: SR 83 to Empirita Rd (MP 280 – 292)
Segment 10E-12: Empirita Rd to ZR Ranch Rd (MP 292 – 315)
Segment 10E-13: ZR Ranch Rd to US 191 (South) (MP 315 – 332)
Segment 10E-14: US 191 (South) to US 191 (North) (MP 332 – 354)
Segment 10E-15: US 191 (North) to East end of Bowie (MP 354 – 372)
Segment 10E-16: East end of Bowie to NM Border (MP 372 – 392)

Corridor Segments
Interstate/Highway
Local Streets
City Boundary
County Boundary
Railroad

Performance Area Needs
PAVEMENT
MOBILITY
SAFETY
FREIGHT
BRIDGE

Level of Need
Low
Medium
High

I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Strategic Investment Areas

*Identified as an Emphasis Area

Table 19: Strategic Investment Area Screening

Segment # and MP	Level of Strategic Need					Location #	Type	Need Description	Advance (Y/N)	Screening Description
	Pavement	Bridge	Mobility	Safety	Freight					
10E-3 (MP 187-198)	Hot Spot	-	-	Medium	Hot Spot	L1	Pavement	Hot spot WB MP 190-191	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes.
						L2	Safety	MP 187-198 has a Medium level of need based on the % fatal + suspected serious injury crashes involving trucks and % fatal + suspected serious injury crashes involving lane departures above the statewide average; the overall Safety Index and Directional Safety Indexes are average 5 fatal crashes and 7 suspected serious injury crashes in segment; crash data analysis indicates 33% involve collision with a fixed object, 50% involving a single vehicle, and 42% in dark-unlighted conditions	Y	No programmed project to address Safety need
						L3	Freight	Hot spot at Val Vista Rd UP (#1152) at MP 188.20	Y	No programmed project to address Freight need
						L4	Freight	Hot spot at Cottonwood UP (#1154) at MP 193.88	Y	No programmed project to address Freight need
						L5	Freight	Hot spot at Earley Rd UP (#1158) at MP 195.89	Y	No programmed project to address Freight need
						L6	Freight	Hot spot at Selma Hwy UP (#1160) at MP 196.89	Y	No programmed project to address Freight need
10E-4 (MP 198-218)	Hot Spot	-	-	High	Hot Spot	L7	Pavement	Hot spots at EB MP 200-208, WB MP 208-209, EB/WB 211-212, and EB 213-218	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes.
						L8	Safety	MP 198-218 has a High level of need based on the WB Directional Safety Index, % fatal + suspected serious injury crashes involving trucks and % fatal + suspected serious injury crashes involving lane departures above the statewide average; the overall Safety Index and EB Directional Safety Indexes are average 12 fatal crashes and 13 suspected serious injury crashes in segment; one crash involving a pedestrian; crash data analysis indicates 36% involve overturning, 40% involve a single vehicle, and 36% in dark-unlighted conditions	N	Widening project completed MP 198-218 in 2020 addressed Safety Need
						L9	Freight	Hot spot at Battaglia Rd UP (#943) at MP 205.45	Y	No programmed project to address Freight need
						L10	Freight	Hot spot at Alsdorf Rd UP (#944) at MP 207.17	Y	No programmed project to address Freight need

Legend: Strategic investment area screened out from further consideration.

Table 19: Strategic Investment Area Screening (continued)

Segment # and MP	Level of Strategic Need					Location #	Type	Need Description	Advance (Y/N)	Screening Description
	Pavement	Bridge	Mobility	Safety	Freight					
10E-5 (MP 218-236)	Hot Spot	Hot Spot	-	High	-	L11	Pavement	Hot spots MP 218-219, MP 222-223, MP 225-227, and MP 234-236	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes.
						L12	Bridge	Hot spot at Red Rock TI UP (#592) at MP 226.45 with deck rating 5, substructure rating 5	Y	High historical investment, considered a strategic investment; design programmed FY 2026
						L13	Safety	MP 218-236 has a High level of need based on the overall Safety Index, EB Directional Safety Index, and % fatal + suspected serious injury crashes involving trucks above the statewide average; the WB Directional Safety Index is average 13 fatal crashes and 10 suspected serious injury crashes in segment; two crashes involving a pedestrian; crash data analysis indicates 30% involve overturning, 13% involve a collision with a non-fixed object, and 30% under the influence of drugs or alcohol	Y	No programmed project to address Safety need
10E-6 (MP 236-246)	-	-	-	Medium	-	L14	Safety	MP 236-246 has a Medium level of need based on the EB Directional Safety Index and % fatal + suspected serious injury crashes involving lane departures above the statewide average; the overall Safety Index and WB Directional Safety Index are average 6 fatal crashes and 13 suspected serious injury crashes in segment; two crashes involving a pedestrian; crash data analysis indicates 42% involve single vehicle, 26% involve overturning, and 53% in dark-unlighted conditions	Y	No programmed project to address Safety need

Legend: Strategic investment area screened out from further consideration.

Table 19: Strategic Investment Area Screening (continued)

Segment # and MP	Level of Strategic Need					Location #	Type	Need Description	Advance (Y/N)	Screening Description
	Pavement	Bridge	Mobility	Safety	Freight					
10E-7 (MP 246-255)	Hot Spot	-	High	Medium	Medium	L15	Pavement	Hot spots MP 246-249 and MP 250-255	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes.
						L16	Mobility	MP 246-255 has a High level of need based on the Future V/C and overall Mobility Index	N	Programmed widening project MP 247.57-253.40 in 2024
						L17	Safety	Hot spots EB MP 247.67-248.0 and WB MP 252.5-253.75 MP 246-255 has a Medium level of need based on the % fatal + suspected serious injury crashes involving trucks above the statewide average; the overall Safety Index and both Directional Safety Indexes are average 6 fatal crashes and 10 suspected serious injury crashes in segment; one crash involving a pedestrian; crash data analysis indicates 38% involve rear end, 25% involve single vehicle, and 50% involve speed too fast for conditions	N	Programmed widening project MP 247.57-253.40 in 2024
						L18	Freight	MP 246-255 has a Medium level of need based on the Freight Index and Directional Truck Travel Time Reliability in both directions	N	Programmed widening project MP 247.57-253.40 in 2024
10E-8 (MP 255-262)	Hot Spot	-	High	Hot Spot	High	L19	Pavement	Hot spot MP 260-262.	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes.
						L20	Mobility	MP 255-262 has a High level of need based on the Future V/C, overall Mobility Index, and EB Closure Extent	Y	No programmed project to address Mobility need
						L21	Safety	Hot spot WB 256.05-258.16	Y	No programmed project to address Safety need
						L22	Freight	MP 255-262 has a High level of need based on the Freight Index and Directional Truck Travel Time Reliability in both directions	Y	No programmed project to address Freight need

Legend: Strategic investment area screened out from further consideration.

Table 19: Strategic Investment Area Screening (continued)

Segment # and MP	Level of Strategic Need					Location #	Type	Need Description	Advance (Y/N)	Screening Description
	Pavement	Bridge	Mobility	Safety	Freight					
10E-9 (MP 262-274)	Hot Spot	-	Medium	Medium	High	L23	Pavement	Hot spots MP 262-263, MP 266-267, and MP 272-274	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes.
						L24	Mobility	MP 262-274 has a Medium level of need based on the Future V/C and overall Mobility Index	Y	Programmed project to widen MP 264-267 to six lanes in 2026 and reconstruct the I-10/Country Club Road traffic TI in Segment 10E-9 is expected to partially address the Mobility need in that segment
						L25	Safety	Hot spot EB MP 262.92-265.72 MP 262-274 has a Medium level of need based on the % fatal + suspected serious injury crashes involving trucks above the statewide average; the overall Safety Index and both Directional Safety Indexes are average 8 fatal crashes and 22 suspected serious injury crashes in segment; crash data analysis indicates 33% involve rear end, 47% involve single vehicle, and 27% involve overturning	Y	No programmed project to address Safety need
						L26	Freight	MP 262-274 has a High level of need based on the Freight Index and Directional Truck Travel Time Reliability in both directions	Y	No programmed project to address Freight need
10E-10 (MP 274-280)	Hot Spot	-	-	-	-	L27	Pavement	Hot spot MP 274-277	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes.
10E-11 (MP 280-292)	Hot Spot	-	High	Hot Spot	-	L28	Pavement	Hot spot MP 288-290	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L29	Mobility	MP 280-292 has a High level of need based on the Future V/C and overall Mobility Index	Y	No programmed project to address Mobility need
						L30	Safety	Hot spot WB 291.11-291.50	Y	No programmed project to address Safety need

Legend: Strategic investment area screened out from further consideration.

Table 19: Strategic Investment Area Screening (continued)

Segment # and MP	Level of Strategic Need					Location #	Type	Need Description	Advance (Y/N)	Screening Description
	Pavement	Bridge	Mobility	Safety	Freight					
10E-12 (MP 292-315)	Hot Spot	Hot Spot	-	High	-	L31	Pavement	Hot spot MP 303-308 and MP 310-313	Y	High historical investment, considered a strategic investment. Recent project completed from MP 303-308
						L32	Bridge	Hot spot Amole TI OP EB (Bell) (#787) at MP 292.5 with deck rating 5, substructure rating 5	N	Bridge does not meet criteria for historical review, therefore not considered strategic.
						L33	Bridge	Hot spot Cornfield Canyon Br WB (#73) at MP 299.14 with deck rating 5, substructure rating 5, superstructure rating 5	N	Bridge does not meet criteria for historical review, therefore not considered strategic.
						L34	Safety	MP 292-315 has a High level of need based on the overall Safety Index, WB Directional Safety Index, and % fatal + suspected serious injury crashes involving trucks above the statewide average; the EB Directional Safety Index is average 10 fatal crashes and 17 suspected serious injury crashes in segment; two crashes involving pedestrians and one crash involving bicycles; crash data analysis indicates 19% involve rear end, 41% involve single vehicle, and 22% involve overturning	Y	No programmed project to address Safety need
10E-13 (MP 315-332)	Hot Spot	Medium	-	Medium	-	L35	Pavement	Hot spot MP 321-323 and MP 328-329	Y	High historical investment, considered a strategic investment
						L36	Bridge	Hot spot Dragoon TI OP EB (#760) at MP 318.85 with deck rating 5, substructure rating 5	N	Bridge does not meet criteria for historical review, therefore not considered strategic.
						L37	Bridge	Hot spot Cochise TI UP (#518) at MP 331.62 with deck rating 5, substructure rating 5	Y	Bridge does meet criteria for historical investment, considered strategic
						L38	Safety	Hot spot EB MP 316.1-318.25 MP 315-332 has a Medium level of need based on the WB Directional Safety Index and % fatal + suspected serious injury crashes involving lane departures above the statewide average; the overall Safety Index and EB Directional Safety Indexes are average 5 fatal crashes and 21 suspected serious injury crashes in segment; crash data analysis indicates 65% involve single vehicle, 31% involve overturning, and 31% involve collision with fixed object	Y	No programmed project to address Safety need

Legend: Strategic investment area screened out from further consideration.

Table 19: Strategic Investment Area Screening (continued)

Segment # and MP	Level of Strategic Need					Location #	Type	Need Description	Advance (Y/N)	Screening Description
	Pavement	Bridge	Mobility	Safety	Freight					
10E-14 (MP 332-354)	Hot Spot	Hot Spot	-	-	Hot Spot	L39	Pavement	Hot spot MP 345-352	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L40	Bridge	Airport Road UP (#1114) at MP 339.46 with deck rating 5, substructure rating 4	Y	Bridge does meet criteria for historical investment, considered strategic
						L41	Freight	Hot spot at Airport Road UP (#1114) at MP 339.46	Y	No programmed project to address Freight need
10E-15 (MP 354-372)	Hot Spot	-	-	High	-	L42	Pavement	Hot spot MP 355-356 and 358-361	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes.
						L43	Safety	MP 354-372 has a High level of need based on the overall Safety Index, WB Directional Safety Index, % fatal + suspected serious injury crashes involving lane departures, and % fatal + suspected serious injury crashes involving trucks above the statewide average; the overall Safety Index and EB Directional Safety Indexes are average 6 fatal crashes and 9 suspected serious injury crashes in segment; crash data analysis indicates 73% involve single vehicle, 40% involve overturning, and 33% involve collision with fixed object	Y	No programmed project to address Safety need
10E-16 (MP 372-392)	Hot Spot	Medium	-	-	-	L44	Pavement	Hot spot MP 380-381	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L45	Bridge	East San Simon TI UP (#1169) at MP 382.35 with substructure rating 4	N	Bridge does not meet criteria for historical review, therefore not considered strategic.

Legend: Strategic investment area screened out from further consideration.

4.2 Candidate Solutions

For each elevated need within a strategic investment area that is not screened out, a candidate solution is developed to address the identified need. Each candidate solution is assigned to one of the following three P2P investment categories based on the scope of the solution:

- Preservation
- Modernization
- Expansion

Documented performance needs serve as the foundation for developing candidate solutions for corridor preservation, modernization, and expansion. Candidate solutions are not intended to be a substitute or replacement for traditional ADOT project development processes where various ADOT technical groups and districts develop candidate projects for consideration in the performance-based programming in the P2P process. Rather, these candidate solutions are intended to complement ADOT's traditional project development processes through a performance-based process to address needs in one or more of the five performance areas of Pavement, Bridge, Mobility, Safety, and Freight. Candidate solutions developed for the I-10 East Corridor will be considered along with other candidate projects in the ADOT statewide programming process.

Characteristics of Strategic Solutions

Candidate solutions should include some or all of the following characteristics:

- Do not recreate or replace results from normal programming processes
- May include programs or initiatives, areas for further study, and infrastructure projects
- Address elevated levels of need (High or Medium) and hot spots
- Focus on investments in modernization projects (to optimize current infrastructure)
- Address overlapping needs
- Reduce costly repetitive maintenance
- Extend operational life of system and delay expansion
- Leverage programmed projects that can be expanded to address other strategic elements
- Provide measurable benefit

Candidate Solutions

A set of 29 candidate solutions are proposed to address the identified needs on the I-10 East Corridor.

Table 20 identifies each strategic location that has been assigned a candidate solution with a number (e.g., CS10E.1, 10E.2, etc.). Each candidate solution is comprised of one or more components to address the identified needs. The assigned candidate solution numbers are linked to the location number and provide tracking capability through the rest of the process. The locations of proposed solutions are shown on the map in **Figure 23**.

Candidate solutions developed to address an elevated need in the Pavement or Bridge performance area will include two options: rehabilitation or full replacement. These solutions are initially evaluated through a Life-Cycle Cost Analysis (LCCA) to provide insights into the cost-effectiveness of these options so a recommended approach can be identified. Candidate solutions developed to address an elevated need in the Mobility, Safety, or Freight performance areas are advanced directly to the Performance Effectiveness Evaluation. In some cases, there may be multiple solutions identified to address the same area of need.

Candidate solutions that are recommended to expand or modify the scope of an already programmed project are noted and are not advanced to solution evaluation and prioritization. These solutions are directly recommended for programming.

Table 20: Candidate Solutions

Candidate Solution #	Segment Ref #	Location #+	Beginning Milepost	Ending Milepost	Candidate Solution Name	Option*	Scope	Investment Category (Preservation [P], Modernization [M], Expansion [E])
CS10E.1	10E-3	L2	187	190	Casa Grande Lighting Improvements	-	-Install lighting (both directions)	M
CS10E.2	10E-3	L2	187	190	Casa Grande Safety Improvements	-	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) -Install DMS signs (EB MP 190 and WB MP 190)	M
CS10E.3	10E-3	L3	188.20	188.20	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	A	-Replace bridge	M
						B	-Reprofile mainline	M
CS10E.4	10E-3	L4	193.88	193.88	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	A	-Replace bridge	M
						B	-Reprofile mainline	M
CS10E.5	10E-3	L5	195.89	195.89	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	A	-Replace bridge	M
						B	-Reprofile mainline	M
CS10E.6	10E-3	L6	196.89	196.89	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	A	-Replace bridge	M
						B	-Reprofile mainline	M
CS10E.7	10E-4	L9	205.45	205.45	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	A	-Replace bridge	M
						B	-Reprofile mainline	M
CS10E.8	10E-4	L10	207.17	207.17	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	A	-Replace bridge	M
						B	-Reprofile mainline	M
CS10E.9	10E-5	L12	226.45	226.45	Red Rock TI UP (#592) Bridge Project	A	-Rehabilitate bridge	P
						B	-Replace bridge	M
CS10E.10	10E-5	L13	218	236	Picacho Safety Improvements	-	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders)	M
CS10E.11	10E-5	L13	218	236	Picacho Lighting Improvements	-	-Install lighting (both directions)	M
CS10E.12	10E-6	L14	236	242	Marana Safety Improvements	-	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders)	M
CS10E.13	10E-6	L14	236	242	Marana Lighting Improvements	-	-Install lighting (both directions)	M

* '-': Indicates only one solution is being proposed and no options are being considered

Table 20: Candidate Solutions (continued)

Candidate Solution #	Segment Ref #	Location #	Beginning Milepost	Ending Milepost	Candidate Solution Name	Option *	Scope	Investment Category (Preservation [P], Modernization [M], Expansion [E])
CS10E.14	10E-8	L20/L21/ L22	255	262	Tucson Mobility, Safety, and Freight Improvements	A	-Construct general purpose lane (MP 255-262) -Widen 13 bridges within project limits	E
						B	-Implement ramp metering on all on-ramps where warranted at the nine TIs within project limits	M
CS10E.15	10E-9	L24/L25/ L26	265	274	East Tucson Mobility, Safety, and Freight Improvements	A	-Construct general purpose lane (MP 265-274) -Widen 10 bridges within project limits	E
						B	-Construct auxiliary lane -Widen 2 bridges within project limits	E
						C	-Implement ramp metering on all on-ramps where warranted at the ten TIs within project limits -Widen left shoulder in both directions -Consider installing speed feedback signs (MP 268) -Install EB DMS sign (MP 266)	M
CS10E.16	10E-9	L25	263	274	East Tucson Lighting Improvements	-	-Install lighting (both directions)	M
CS10E.17	10E-11	L29/L30	280	292	Vail Mobility and Safety Improvements	-	-Widen left shoulder to 10 feet in both directions (striping, delineators, RPMs, safety edge, and rumble strips) -Rehabilitate right shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips)	M
CS10E.18	10E-11	L30	286	291	Marsh Station EB Climbing Lane	-	-Construct climbing lane	M
CS10E.19	10E-12	L34	303	305	Benson WB Climbing Lane	-	-Construct climbing lane -Widen 3 bridges within the project limits	M
CS10E.20	10E-12	L31	310	313	Benson Area Pavement Improvements	A	-Rehabilitate pavement	P
						B	-Replace pavement	M
CS10E.21	10E-12	L34	292	315	Mescal Shoulder Widening	-	-Widen left shoulder to 10 feet in both directions (striping, delineators, RPMs, safety edge, and rumble strips)	M

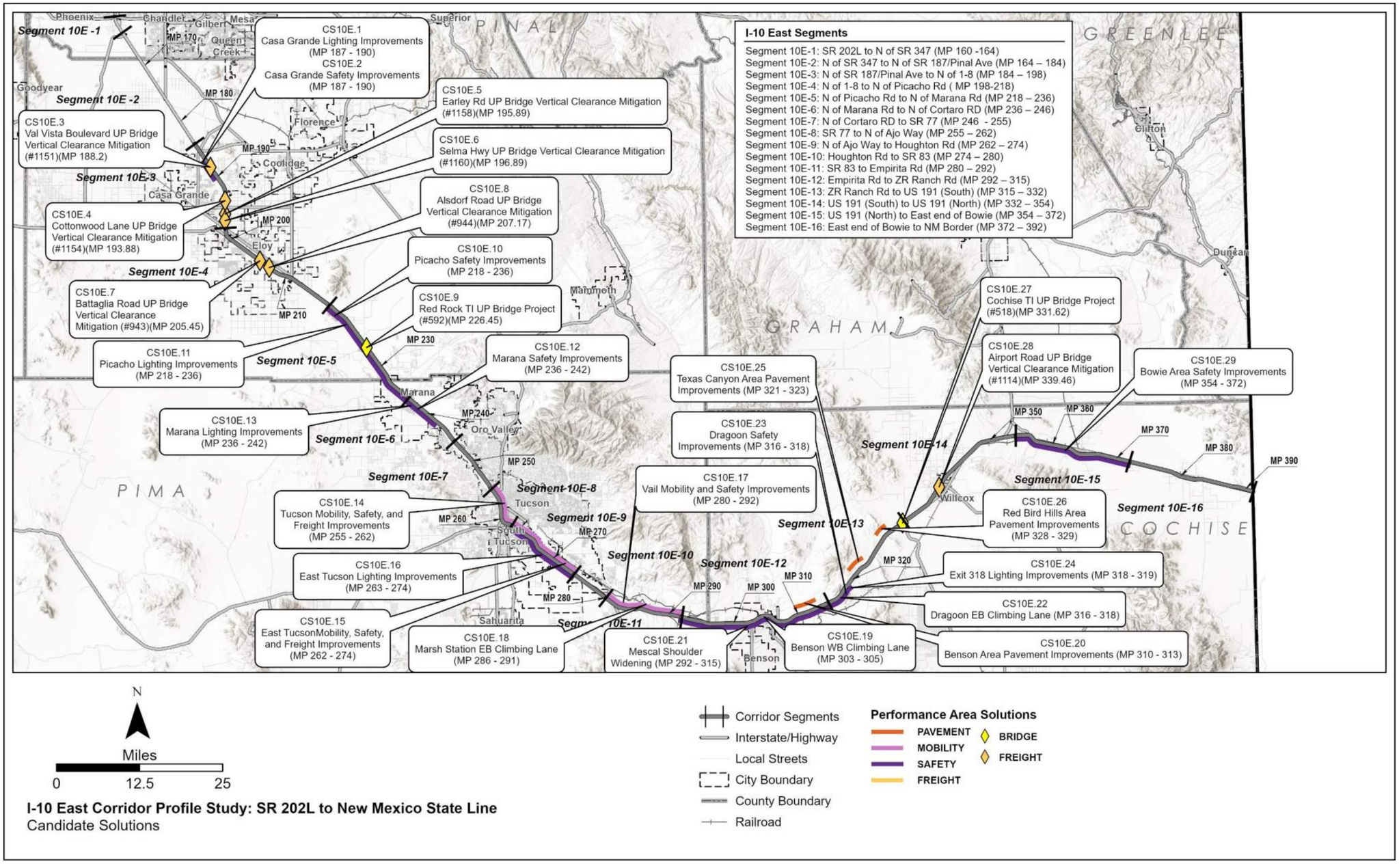
* '-': Indicates only one solution is being proposed and no options are being considered

Table 20: Candidate Solutions (continued)

Candidate Solution #	Segment Ref #	Location #+	Beginning Milepost	Ending Milepost	Candidate Solution Name	Option*	Scope	Investment Category (Preservation [P], Modernization [M], Expansion [E])
CS10E.22	10E-13	L38	316	318	Dragoon EB Climbing Lane	-	-Construct climbing lane	M
CS10E.23	10E-13	L38	316	318	Dragoon Safety Improvements	-	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) (MP 316-318) -Consider installing speed feedback signs (MP 317) -Install DMS sign (MP 317)	M
CS10E.24	10E-13	L38	318	318	Exit 318 Lighting Improvements	-	-Install lighting at exit	M
CS10E.25	10E-13	L35	321	323	Texas Canyon Area Pavement Improvements	A	-Rehabilitate pavement	P
						B	-Replace pavement	M
CS10E.26	10E-13	L35	328	329	Red Bird Hills Area Pavement Improvements	A	-Rehabilitate pavement	P
						B	-Replace pavement	M
CS10E.27	10E-13	L37	331.62	331.62	Cochise TI UP (#518) Bridge Project	A	-Rehabilitate bridge	P
						B	-Replace bridge	M
CS10E.28	10E-14	L40/L41	339.46	339.46	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	A	-Replace bridge	M
						B	-Rehabilitate bridge and reprofile mainline	M
CS10E.29	10E-15	L43	354	372	Bowie Area Safety Improvements	-	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) -Install WB DMS sign (MP 356)	M

* '-': Indicates only one solution is being proposed and no options are being considered

Figure 23: Candidate Solutions



I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Candidate Solutions

5.0 SOLUTION EVALUATION AND PRIORITIZATION

Candidate solutions are evaluated using the following steps: LCCA (where applicable), Performance Effectiveness Evaluation, Solution Risk Analysis, and Candidate Solution Prioritization. The methodology and approach to this evaluation are shown in **Figure 24** and described more fully below.

Life-Cycle Cost Analysis

All Pavement and Bridge candidate solutions have two options: rehabilitation/repair or reconstruction. These options are evaluated through an LCCA to determine the best approach for each location where a Pavement or Bridge solution is recommended. The LCCA can eliminate options from further consideration and identify which options should be carried forward for further evaluation.

When multiple independent candidate solutions are developed for Mobility, Safety, or Freight strategic investment areas, these candidate solution options advance directly to the Performance Effectiveness Evaluation without an LCCA.

Performance Effectiveness Evaluation

After completing the LCCA process, all remaining candidate solutions are evaluated based on their performance effectiveness. This process includes determining a Performance Effectiveness Score (PES) based on how much each solution impacts the existing performance and needs scores for each segment. This evaluation also includes a Performance Area Risk Analysis to help differentiate between similar solutions based on factors that are not directly addressed in the performance system.

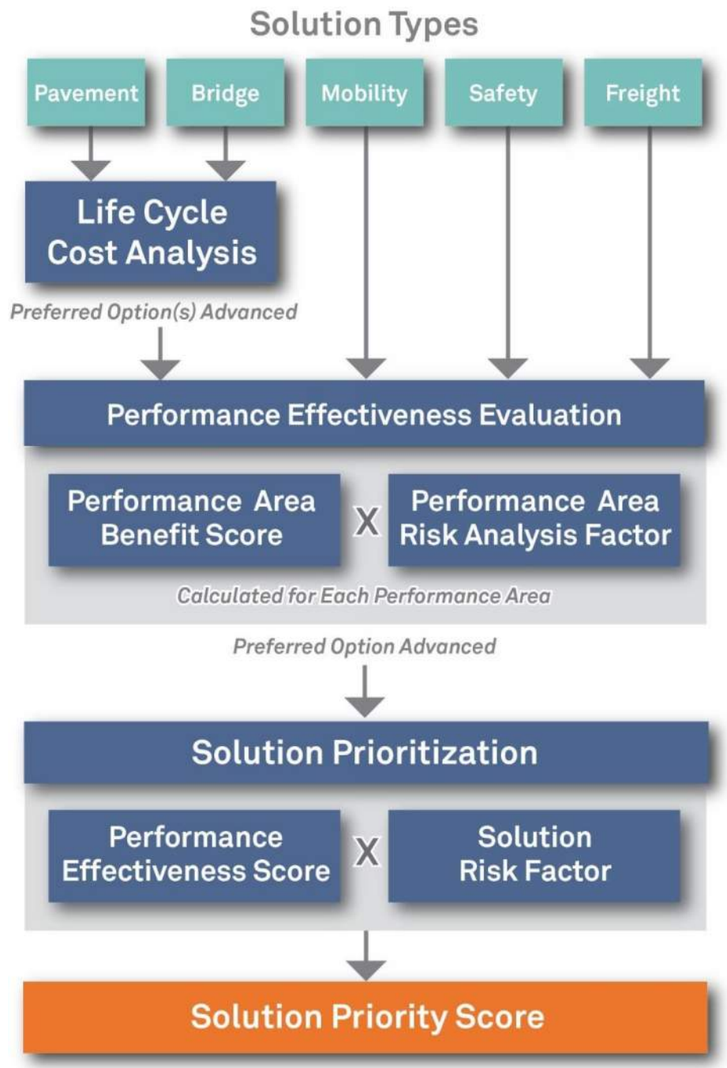
Solution Risk Analysis

All candidate solutions advanced through the Performance Effectiveness Evaluation are also evaluated through a Solution Risk Analysis process. A solution risk probability and consequence analysis is conducted to develop a solution-level risk weighting factor. This risk analysis is a numeric scoring system to help address the risk of not implementing a solution based on the likelihood and severity of performance failure.

Candidate Solution Prioritization

The PES, weighted risk factor, and segment average need score are combined to create a prioritization score. The candidate solutions are ranked by prioritization score from highest to lowest. The highest prioritization score indicates the candidate solution that is recommended as the highest priority. Solutions that address multiple performance areas tend to score higher in this process.

Figure 24: Candidate Solution Evaluation Process



5.1. Life-Cycle Cost Analysis

LCCA is conducted for any candidate solution that is developed as a result of a need in the Pavement or Bridge Performance Area. The intent of the LCCA is to determine which options warrant further investigation and eliminate options that would not be considered strategic.

LCCA is an economic analysis that compares cost streams over time and presents the results in a common measure, the present value of all future costs. The cost stream occurs over an analysis period that is long enough to provide a reasonably fair comparison among alternatives that may differ significantly in scale of improvement actions over shorter time periods. For both bridge and pavement LCCA, the costs are focused on agency (ADOT) costs for corrective actions to meet the objective of keeping the bridge or pavement serviceable over a long period of time.

LCCA is performed to provide a more complete holistic perspective on asset performance and agency costs over the life of an investment stream. This approach helps ADOT look beyond initial and short-term costs, which often dominate the considerations in transportation investment decision making and programming.

Bridge LCCA

For the bridge LCCA, three basic strategies are analyzed that differ in timing and scale of improvement actions to maintain the selected bridges, as described below:

- Bridge replacement (large upfront cost but small ongoing costs afterwards)
- Bridge rehabilitation until replacement (moderate upfront costs then small to moderate ongoing costs until replacement)
- On-going repairs until replacement (low upfront and ongoing costs until replacement)

The bridge LCCA model developed for the CPS reviews the characteristics of the candidate bridges including bridge ratings and deterioration rates to develop the three improvement strategies (full replacement, rehabilitation until replacement, and repair until replacement). Each strategy consists of a set of corrective actions that contribute to keeping the bridge serviceable over the analysis period. Cost and effect of these improvement actions on the bridge condition are essential parts of the model. Other considerations in the model include bridge age, elevation, pier height, length-to-span ratio, skew angle, and substandard characteristics such as shoulders and vehicle clearance. The following assumptions are included in the bridge LCCA model:

- The bridge LCCA only addresses the structural condition of the bridge and does not address other issues or costs
- The bridge will require replacement at the end of its 75-year service life regardless of current condition
- The bridge elevation, pier height, skew angle, and length-to-span ratio can affect the replacement and rehabilitation costs
- The current and historical ratings are used to estimate a rate of deterioration for each candidate bridge
- Following bridge replacement, repairs will be needed every 20 years
- Different bridge repair and rehabilitation strategies have different costs, expected service life, and benefit to the bridge rating
- The net present value of future costs is discounted at 3% and all dollar amounts are in 2022 dollars
- If the LCCA evaluation recommends rehabilitation or repair, the solution is not considered strategic and the rehabilitation or repair will be addressed by normal programming processes
- Because this LCCA is conducted at a planning level, and due to the variabilities in costs and improvement strategies, the LCCA net present value results that are within 15% should be considered equally; in such a case, the solution should be carried forward as a strategic replacement project – more detailed scoping will confirm if replacement or rehabilitation is needed

Based on the candidate solutions presented in **Table 20**, LCCA was conducted for three bridges on the I-10 East Corridor, as noted in **Table 21**. Additional information regarding the bridge LCCA is included in **Appendix E**.

Pavement LCCA

The LCCA approach to pavement is very similar to the process used for bridges. For the pavement LCCA, three basic strategies are analyzed that differ in timing and scale of improvement actions to maintain the selected pavement, as described below:

- Pavement replacement (large upfront cost but small ongoing costs afterwards – could be replacement with asphalt or concrete pavement)
- Pavement major rehabilitation until replacement (moderate upfront costs then small to moderate ongoing costs until replacement)
- Pavement minor rehabilitation until replacement (low upfront and ongoing costs until replacement)

The pavement LCCA model developed for the CPS reviews the characteristics of the candidate paving locations including the historical rehabilitation frequency to develop potential improvement strategies (full replacement, major rehabilitation until replacement, and minor rehabilitation until replacement, for either concrete or asphalt, as applicable). Each strategy consists of a set of corrective actions that contribute to keeping the pavement serviceable over the analysis period. The following assumptions are included in the pavement LCCA model:

- The pavement LCCA only addresses the condition of the pavement and does not address other issues or costs
- The historical pavement rehabilitation frequencies at each location are used to estimate future rehabilitation frequencies

- Different pavement replacement and rehabilitation strategies have different costs and expected service life
- The net present value of future costs is discounted at 3% and all dollar amounts are in 2022 dollars
- If the LCCA evaluation recommends rehabilitation or repair, the solution is not considered strategic and the rehabilitation will be addressed by normal programming processes
- Because this LCCA is conducted at a planning level, and due to the variabilities in costs and improvement strategies, the LCCA net present value results that are within 15% should be considered equally; in such a case, the solution should be carried forward as a strategic replacement project – more detailed scoping will confirm if replacement or rehabilitation is needed

Based on the candidate solutions presented in **Table 20**, LCCA was conducted for three pavement solutions on the I-10 East Corridor, as noted in **Table 22**. Additional information regarding the pavement LCCA is contained in **Appendix E**.

As shown in **Table 21** and **Table 22**, the following conclusions were determined based on the LCCA:

- Bridge replacement was determined to be within 15% of the effective approach for Red Rock TI UP Bridge #592 (CS10E.9, MP 226.45). The replacement option of this solution was carried forward to the Performance Effectiveness Evaluation
- Rehabilitation or repair was determined to be the most effective approach for Cochise TI UP Bridge #518 (CS10E.27, MP 331.62). Therefore, it is assumed that the identified need with be addressed by normal programming processes and this candidate solution will be dropped from further consideration
- Repair was determined to be the most effective approach for Airport Road UP Bridge #1114 (CS10E.28, MP 339.46) and the identified bridge need is not considered strategic as a stand-alone solution. Both options of this solution, however, were carried forward to the Performance Effectiveness Evaluation due to other needs
- Rehabilitation or repair was determined to be the most effective approach for Benson Area Pavement Improvements (CS10E.20, MP 310-313). Therefore, it is assumed that the identified need with be addressed by normal programming processes and this candidate solution will be dropped from further consideration
- Concrete reconstruction was considered within 15% of the most effective approach for Texas Canyon Area Pavement Improvements (CS10E.25, MP 321-323). The replacement option of this solution was carried forward to the Performance Effectiveness Evaluation
- Concrete reconstruction was considered within 15% of the most effective approach for Red Bird Hills Area Pavement Improvements (CS10E.26, MP 328-329). The replacement option of this solution was carried forward to the Performance Effectiveness Evaluation

Table 21: Bridge Life-Cycle Cost Analysis Results

Candidate Solution	Present Value at 3% Discount Rate ($)			Ratio of Present Value Compared to Lowest Present Value			Other Needs	Results
	Replace	Rehab	Repair	Replace	Rehab	Repair		
Red Rock TI UP Bridge #592 (CS10E.9, MP 226.45)	$2,397,000	$2,700,000	$2,110,000	1.14	1.28	1.00	N	Strategic as a stand-alone solution; replacement is recommended to carry forward for evaluation.
Cochise TI UP Bridge #518 (CS10E.27, MP 331.62)	$5,268,000	$4,412,000	$4,412,000	1.19	1.00	1.00	N	Not strategic as a stand-alone solution as rehabilitation or repair appear to be the more effective approaches.
Airport Road UP Bridge #1114 Vertical Clearance Mitigation (CS10E.28, MP 339.46)	$6,599,000	$5,921,000	$4,693,000	1.41	1.26	1.00	Y	Not strategic as a stand-alone solution; carry forward for further evaluation with other needs.

Table 22: Pavement Life-Cycle Cost Analysis Results

Candidate Solution	Present Value at 3% Discount Rate ($)				Ratio of Present Value Compared to Lowest Present Value				Other Needs	Results
	Concrete Reconstruction	Asphalt Reconstruction	Asphalt Medium Rehabilitation	Asphalt Light Rehabilitation	Concrete Reconstruction	Asphalt Reconstruction	Asphalt Medium Rehabilitation	Asphalt Light Rehabilitation		
Benson Area Pavement Improvements (CS10E.20, MP 310-313)	$27,348,000	$28,649,000	$22,404,000	$25,404,000	1.22	1.28	1.00	1.13	N	Not strategic as a stand-alone solution as rehabilitation appears be to the most effective approach.
Texas Canyon Area Pavement Improvements (CS10E.25, MP 321-323)	$18,232,000	$19,099,000	$16,218,000	$18,364,000	1.12	1.18	1.00	1.13	N	Strategic as a stand-alone solution; concrete reconstruction is recommended to carry forward for evaluation.
Red Bird Hills Area Pavement Improvements (CS10E.26, MP 328-329)	$9,116,000	$9,550,000	$8,109,000	$9,182,000	1.12	1.18	1.00	1.13	N	Strategic as a stand-alone solution; concrete reconstruction is recommended to carry forward for evaluation.

5.2. Performance Effectiveness Evaluation

The results of the Performance Effectiveness Evaluation are combined with the results of a Performance Area Risk Analysis to determine a PES as defined in Section 5.0. The objectives of the Performance Effectiveness Evaluation include:

- Measure the benefit to the performance system versus the cost of the solution
- Include risk factors to help differentiate between similar solutions
- Apply to each performance area that is affected by the candidate solution
- Account for emphasis areas identified for the corridor

The Performance Effectiveness Evaluation includes the following steps:

- Estimate the post-solution performance for each of the five performance areas (Pavement, Bridge, Mobility, Safety, and Freight)
- Use the post-solution performance scores to calculate a post-solution level of need for each of the five performance areas
- Compare the pre-solution level of need to the post-solution level of need to determine the reduction in level of need (potential solution benefit) for each of the five performance areas
- Calculate performance area risk weighting factors for each of the five performance areas
- Use the reduction in level of need (benefit) and risk weighting factors to calculate the PES

Post-Solution Performance Estimation

For each performance area, a slightly different approach is used to estimate the post-solution performance. This process is based on the following assumptions:

- Pavement:
  - The IRI rating would decrease (to 30 for replacement or 45 for rehabilitation)
  - The Cracking rating would decrease (to 0 for replacement or rehabilitation)
  - The Rutting rating would decrease (to 0 for replacement or rehabilitation)
- Bridge:
  - The structural ratings would increase (+1 for repair, +2 for rehabilitation, or increase to 8 for replacement)
  - The Sufficiency Rating would increase (+10 for repair, +20 for rehabilitation, or increase to 98 for replacement)
- Mobility:
  - Additional lanes would increase the capacity and therefore affect the Mobility Index and associated secondary measures
  - Other improvements (e.g., ramp metering, parallel ramps, variable speed limits) would also increase the capacity (to a lesser extent than additional lanes) and therefore would affect the Mobility Index and associated secondary measures
  - Changes in the Mobility Index (due to increased capacity) and Safety Index (due to crash reductions) would have a direct effect on the LOTTR secondary measure
  - Changes in the Safety Index (due to crash reductions) would have a direct effect on the Closure Extent secondary measure
- Safety:
  - Crash modification factors were developed that would be applied to estimate the reduction in crashes (for additional information see **Appendix F**)
- Freight:
  - Changes in the Mobility Index (due to increased capacity) and Safety Index (due to crash reductions) would have a direct effect on the Freight Index and the TTTR secondary measure
  - Changes in the Safety Index (due to crash reductions) would have a direct effect on the Closure Duration secondary measure

Performance Area Risk Analysis

The Performance Area Risk Analysis is intended to develop a numeric risk weighting factor for each of the five performance areas (Pavement, Bridge, Mobility, Safety, and Freight). This risk analysis addresses other considerations for each performance area that are not directly included in the performance system. A risk weighting factor is calculated for each candidate solution based on the specific characteristics at the solution location. For example, the Pavement Risk Factor is based on factors such as the elevation, daily traffic volumes, and amount of truck traffic. Additional information regarding the Performance Area Risk Factors is included in **Appendix G**.

Following the calculation of the reduction in level of need (benefit) and the Performance Area Risk Factors, these values are used to calculate the PES. In addition, the reduction in level of need in each emphasis area is also included in the PES.

Net Present Value Factor

The benefit (reduction in need) is measured as a one-time benefit. However, different types of solutions will have varying service lives during which the benefits will be obtained. For example, a preservation solution would likely have a shorter stream of benefits over time when compared to a modernization or expansion solution. To address the varying lengths of benefit streams, each solution is classified as a 10-year, 20-year, 30-year, or 75-year benefit stream, or the net present value (NPV) factor (F_{NPV}). A 3% discount rate is used to calculate F_{NPV} for each classification of solution. The service lives and respective factors are described below:

- A 10-year service life is generally reflective of preservation solutions such as pavement and bridge preservation; these solutions would likely have a 10-year stream of benefits; for these solutions, a F_{NPV} of 8.8 is used in the PES calculation
- A 20-year service life is generally reflective of modernization solutions that do not include new infrastructure; these solutions would likely have a 20-year stream of benefits; for these solutions, a F_{NPV} of 15.3 is used in the PES calculation

- A 30-year service life is generally reflective of expansion solutions or modernization solutions that include new infrastructure; these solutions would likely have a 30-year stream of benefits; for these solutions, a F_{NPV} of 20.2 is used in the PES calculation
- A 75-year service life is used for bridge replacement solutions; these solutions would likely have a 75-year stream of benefits; for these solutions, a F_{NPV} of 30.6 is used in the PES calculation

Vehicle-Miles Travelled Factor

Another factor in assessing benefits is the number of travelers who would benefit from the implementation of the candidate solution. This factor varies between candidate solutions depending on the length of the solution and the magnitude of daily traffic volumes. Multiplying the solution length by the daily traffic volume results in vehicle-miles travelled (VMT), which provides a measure of the amount of traffic exposure that would receive the benefit of the proposed solution. The VMT is converted to a VMT factor (known as F_{VMT}), which is on a scale between 0 and 5, using the equation below:

$$F_{VMT} = 5 - (5 \times e^{VMT \times -0.0000139})$$

Performance Effectiveness Score

The PES is calculated using the following equation:

PES = (Sum of all Risk Factored Benefit Scores + Sum of all Risk Factored Emphasis Area Scores) / Cost) x F_{VMT} x F_{NPV}

Where:

Risk Factored Benefit Score = Reduction in Segment-Level Need (benefit) x Performance Area Risk Weighting Factor (calculated for each performance area)

Risk Factored Emphasis Area Score = Reduction in Corridor-Level Need x Performance Area Risk Factors x Emphasis Area Factor (calculated for each emphasis area)

*Cost = estimated cost of candidate solution in millions of dollars (see **Appendix H**)*

F_{VMT} = Factor between 0 and 5 to account for VMT at location of candidate solution based on existing daily volume and length of solution

F_{NPV} = Factor (ranging from 8.8 to 30.6 as previously described) to address anticipated longevity of service life (and duration of benefits) for each candidate solution

The resulting PES values are shown in **Table 23**. Additional information regarding the calculation of the PES is contained in **Appendix I**.

For candidate solutions with multiple options to address Mobility, Safety, or Freight needs, the PES should be compared to help identify the best performing option. If one option clearly performs better than the other options (e.g., more than twice the PES value and a difference in magnitude of at least 20 points), the other options can be eliminated from further consideration. If multiple options have similar PES values, or there are other factors not accounted for in the performance system that could significantly influence the ultimate selection of an option (e.g., potential environmental concerns, potential adverse economic impacts), those options should all be advanced to the prioritization process.

On the I-10 East Corridor, the following candidate solutions have options to address Mobility, Safety, or Freight needs:

- CS10E.3 (Options A and B) - Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation
- CS10E.4 (Options A and B) - Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation
- CS10E.5 (Options A and B) - Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation
- CS10E.6 (Options A and B) - Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation
- CS10E.7 (Options A and B) - Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation
- CS10E.8 (Options A and B) - Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation
- CS10E.14 (Options A and B) - Tucson Mobility, Safety, and Freight Improvements
- CS10E.15 (Options A, B and C) - East Tucson Mobility, Safety, and Freight Improvements
- CS10E.28 (Options A and B) - Airport Road UP (#1114) Bridge Vertical Clearance Mitigation

Based on a review of the PES values for the aforementioned solutions, CS10E.3 (Option B), CS10E.14 (Option A), and CS10E.15 (Options A and B) did not advance to the solution prioritization process because the remaining option has a PES more than twice that of the eliminated options and the difference is greater than 20 points. All other solutions with multiple options have PES scores close enough that all options were carried forward.

As was previously mentioned, rehabilitation or repair (Option A) was determined to be the most effective approach for the candidate solutions listed below that were subject to LCCA so these candidate solutions were eliminated from further consideration; no PES values were calculated for these solutions and they do not appear in **Table 23**:

- Cochise TI UP Bridge #518 (CS10E.27, MP 331.62)
- Benson Area Pavement Improvements (CS10E.20, MP 310-313)

Replacement or reconstruction (Option B) was determined to be the most effective approach for the candidate solutions listed below that were subject to LCCA so these candidate solutions were carried forward to the Performance Effectiveness Evaluation and PES values were calculated for these solutions as shown in **Table 23**:

- Red Rock TI UP Bridge #592 (CS10E.9, MP 226.45)
- Texas Canyon Area Pavement Improvements (CS10E.25, MP 321-323)
- Red Bird Hills Area Pavement Improvements (CS10E.26, MP 328-329)

Table 23: Performance Effectiveness Scores

Candidate Solution #	Segment #	Option	Candidate Solution Name	Milepost Location	Estimated Cost* (in millions)	Risk Factored Benefit Score					Risk Factored Emphasis Area Scores			Total Factored Benefit Score	F_{VMT}	F_{NPV}	Performance Effectiveness Score
						Pavement	Bridge	Mobility	Safety	Freight	Mobility	Safety	Freight				
CS10E.1	10E-3	-	Casa Grande Lighting Improvements	187-190	$7.01	0.02	0.00	0.00	0.03	0.02	0.00	0.00	0.01	0.07	4.16	15.3	0.6
CS10E.2	10E-3	-	Casa Grande Safety Improvements	187-190	$4.49	0.19	0.00	0.02	0.86	0.47	0.00	0.05	0.07	1.19	4.16	15.3	16.9
CS10E.3	10E-3	A	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	188.2	$7.17	2.76	2.17	0.00	0.00	2.76	0.00	0.00	0.00	4.93	1.28	30.6	27.0
		B	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	188.2	$14.42	2.06	0.00	0.00	0.00	2.06	0.00	0.00	0.00	2.06	2.24	15.3	4.9
CS10E.4	10E-3	A	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	193.88	$10.53	2.76	0.92	0.00	0.00	2.76	0.00	0.00	0.00	3.69	1.28	30.6	13.7
		B	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	193.88	$14.42	0.66	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.66	2.24	15.3	1.6
CS10E.5	10E-3	A	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	195.89	$11.03	2.76	1.15	0.00	0.00	2.76	0.00	0.00	0.00	3.91	1.28	30.6	13.9
		B	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	195.89	$13.32	2.62	0.00	0.00	0.00	2.62	0.00	0.00	0.00	2.62	2.24	15.3	6.7
CS10E.6	10E-3	A	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	196.89	$9.65	2.76	0.84	0.00	0.00	2.76	0.00	0.00	0.00	3.60	1.28	30.6	14.7
		B	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	196.89	$14.42	2.74	0.00	0.00	0.00	2.74	0.00	0.00	0.00	2.74	2.24	15.3	6.5
CS10E.7	10E-4	A	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	205.45	$7.75	2.63	0.17	0.00	0.00	2.63	0.00	0.00	0.00	2.79	1.23	30.6	13.6
		B	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	205.45	$13.32	1.90	0.00	0.00	0.00	1.90	0.00	0.00	0.00	1.90	2.16	15.3	4.7
CS10E.8	10E-4	A	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	207.17	$8.27	2.63	0.17	0.00	0.00	2.63	0.00	0.00	0.00	2.80	1.23	30.6	12.7
		B	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	207.17	$14.42	1.44	0.00	0.00	0.00	1.44	0.00	0.00	0.00	1.44	2.16	15.3	3.3

Table 23: Performance Effectiveness Scores (continued)

Candidate Solution #	Segment #	Option	Candidate Solution Name	Milepost Location	Estimated Cost* (in millions)	Risk Factored Benefit Score					Risk Factored Emphasis Area Scores			Total Factored Benefit Score	F_{VMT}	F_{NPV}	Performance Effectiveness Score
						Pavement	Bridge	Mobility	Safety	Freight	Mobility	Safety	Freight				
CS10E.9	10E-5	B	Red Rock TI UP (#592) Bridge Project	226.45	$2.39	0.00	1.47	0.00	0.00	0.00	0.00	0.00	0.00	1.47	1.28	30.6	24.0
CS10E.10	10E-5	-	Picacho Safety Improvements	218-236	$29.29	0.01	0.00	0.01	2.00	1.13	0.00	0.28	0.30	2.60	5.00	15.3	6.8
CS10E.11	10E-5	-	Picacho Lighting Improvements	218-236	$42.06	0.01	0.00	0.02	0.62	0.39	0.00	0.09	0.10	0.84	5.00	15.3	1.5
CS10E.12	10E-6	-	Marana Safety Improvements	236-242	$9.76	0.01	0.00	0.01	0.89	0.17	0.00	0.05	0.03	0.98	4.96	15.3	7.6
CS10E.13	10E-6	-	Marana Lighting Improvements	236-242	$14.02	0.00	0.00	0.10	0.11	0.00	0.00	0.01	0.00	0.22	4.96	15.3	1.2
CS10E.14	10E-8	A	Tucson Mobility, Safety, and Freight Improvements	255-262	$130.52	2.13	0.00	11.99	0.08	2.13	0.04	0.02	0.09	14.36	5.00	20.2	11.1
		B	Tucson Mobility, Safety, and Freight Improvements	255-262	$6.53	2.28	0.00	0.05	0.20	2.28	0.00	0.05	0.10	2.69	5.00	15.3	31.5
CS10E.15	10E-9	A	East Tucson Mobility, Safety, and Freight Improvements	265-274	$123.66	4.13	0.00	6.39	1.21	0.37	0.13	0.20	0.31	12.38	5.00	20.2	10.1
		B	East Tucson Mobility, Safety, and Freight Improvements	265-274	$87.85	4.49	0.00	5.85	1.68	0.40	0.07	0.26	0.33	12.68	5.00	20.2	14.6
		C	East Tucson Mobility, Safety, and Freight Improvements	265-274	$29.27	9.55	0.00	0.16	2.36	0.89	0.00	0.52	0.70	13.29	5.00	15.3	34.7
CS10E.16	10E-9	-	East Tucson Lighting Improvements	263-274	$25.71	0.28	0.00	0.03	0.43	0.03	0.00	0.16	0.03	0.93	5.00	15.3	2.8
CS10E.17	10E-11	-	Vail Mobility and Safety Improvements	280-292	$44.23	0.87	0.00	0.08	0.39	1.89	0.00	0.15	0.33	1.82	4.95	15.3	3.1
CS10E.18	10E-11	-	Marsh Station EB Climbing Lane	EB 286-291	$32.44	0.07	0.00	4.18	0.01	0.08	0.04	0.00	0.02	4.31	3.08	20.2	8.3
CS10E.19	10E-12	-	Benson WB Climbing Lane	WB 303-305	$16.58	0.00	0.00	0.81	0.25	0.02	0.01	0.03	0.01	1.14	1.59	20.2	2.2
CS10E.21	10E-12	-	Mescal Shoulder Widening	292-315	$84.78	0.27	0.00	0.67	2.58	1.16	0.00	0.25	0.38	4.16	4.99	15.3	3.7
CS10E.22	10E-13	-	Dragoon EB Climbing Lane	316-318	$19.47	0.13	0.00	0.06	0.89	0.12	0.01	0.04	0.04	1.17	1.10	20.2	1.3

Table 23: Performance Effectiveness Scores (continued)

Candidate Solution #	Segment #	Option	Candidate Solution Name	Milepost Location	Estimated Cost* (in millions)	Risk Factored Benefit Score					Risk Factored Emphasis Area Scores			Total Factored Benefit Score	F_{VMT}	F_{NPV}	Performance Effectiveness Score
						Pavement	Bridge	Mobility	Safety	Freight	Mobility	Safety	Freight				
CS10E.23	10E-13	-	Dragoon Safety Improvements	316-318	$3.67	0.22	0.00	0.00	0.99	0.18	0.00	0.04	0.05	1.30	1.96	15.3	10.6
CS10E.24	10E-13	-	Exit 318 Lighting Improvements	318	$1.17	0.02	0.00	0.00	0.19	0.02	0.00	0.01	0.01	0.23	1.10	15.3	3.3
CS10E.25	10E-13	B	Texas Canyon Area Pavement Improvements	321-323	$15.03	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.35	1.96	8.8	0.4
CS10E.26	10E-13	B	Red Bird Hills Area Pavement Improvements	328-329	$7.51	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.24	1.10	8.8	0.3
CS10E.28	10E-14	A	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	339.46	$7.50	2.24	1.35	0.00	0.00	2.24	0.00	0.00	0.00	3.59	0.55	30.6	8.1
		B	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	339.46	$11.50	1.05	1.02	0.00	0.00	1.05	0.00	0.00	0.00	2.08	1.05	15.3	2.9
CS10E.29	10E-15	-	Bowie Area Safety Improvements	354-372	$18.39	0.09	0.00	0.12	2.06	1.40	0.00	0.33	0.27	2.87	4.83	15.3	11.5

*: See **Table 25** for total construction costs

5.3. Solution Risk Analysis

Following the calculation of the PES, an additional step is taken to develop the prioritized list of solutions. A solution risk probability and consequence analysis is conducted to develop a solution-level risk weighting factor. This risk analysis is a numeric scoring system to help address the risk of not implementing a solution based on the likelihood and severity of performance failure. **Figure 25** shows the risk matrix used to develop the risk weighting factors.

Figure 25: Risk Matrix

		Severity/Consequence				
		Insignificant	Minor	Significant	Major	Catastrophic
Frequency/Likelihood	Very Rare	Low	Low	Low	Moderate	Major
	Rare	Low	Low	Moderate	Major	Major
	Seldom	Low	Moderate	Moderate	Major	Severe
	Common	Moderate	Moderate	Major	Severe	Severe
	Frequent	Moderate	Major	Severe	Severe	Severe

Using the risk matrix in **Figure 25**, numeric values were assigned to each category of frequency and severity. The higher the risk, the higher the numeric factor assigned. The risk weight for each area of the matrix was calculated by multiplying the severity factor times the frequency factor. These numeric factors are shown in **Figure 26**.

Figure 26: Numeric Risk Matrix

			Severity/Consequence				
			Insignificant	Minor	Significant	Major	Catastrophic
		Weight	1.00	1.10	1.20	1.30	1.40
Frequency/Likelihood	Very Rare	1.00	1.00	1.10	1.20	1.30	1.40
	Rare	1.10	1.10	1.21	1.32	1.43	1.54
	Seldom	1.20	1.20	1.32	1.44	1.56	1.68
	Common	1.30	1.30	1.43	1.56	1.69	1.82
	Frequent	1.40	1.40	1.54	1.68	1.82	1.96

Using the values in **Figure 26**, risk weighting factors were calculated for each of the four risk categories (low, moderate, major, and severe). These values are simply the average of the values in **Figure 26** that fall within each category. The resulting average risk weighting factors are:

Low	Moderate	Major	Severe
1.14	1.36	1.51	1.78

The risk weighting factors listed above are assigned to the five performance areas as follows:

- Safety = 1.78
  - The Safety performance area quantifies the likelihood of fatal or incapacitating injury crashes; therefore, it is assigned the Severe (1.78) risk weighting factor
- Bridge = 1.51
  - The Bridge performance area focuses on the structural adequacy of bridges; a bridge failure may result in crashes or traffic being detoured for long periods of time resulting in significant travel time increases; therefore, it is assigned the Major (1.51) risk weighting factor
- Mobility and Freight = 1.36
  - The Mobility and Freight performance areas focus on capacity and congestion; failure in either of these performance areas would result in increased travel times but would not have significant effect on safety (crashes) that would not already be addressed in the Safety performance area; therefore, they are assigned the Moderate (1.36) risk weighing factor
- Pavement = 1.14
  - The Pavement performance area focuses on the ride quality of the pavement; failure in this performance area would likely be a spot location that would not dramatically affect drivers beyond what is already captured in the Safety performance area; therefore, it is assigned the Low (1.14) risk weighting factor

The benefit in each performance area is calculated for each candidate solution as part of the Performance Effectiveness Evaluation. Using this information on benefits and the risk factors listed above, a weighted (based on benefit) solution-level numeric risk factor is calculated for each candidate solution. For example, a solution that has 50% of its benefit in Safety and 50% of its benefit in Mobility has a weighted risk factor of 1.57 (0.50 x 1.36 + 0.50 x 1.78 = 1.57).

5.4. Candidate Solution Prioritization

The PES, weighted risk factor, and segment average need score are combined to create a prioritization score as follows:

Prioritization Score = PES x Weighted Risk Factor x Segment Average Need Score

Where:

*PES = Performance Effectiveness Score as shown in **Table 23***

Weighted Risk Factor = Weighted factor to address risk of not implementing a solution based on the likelihood and severity of the performance failure

*Segment Average Need Score = Segment average need score as shown in **Table 18***

Table 24 shows the prioritization scores for the candidate solutions subjected to the solution evaluation and prioritization process. Solutions that address multiple performance areas tend to score higher in this process. A prioritized list of candidate solutions is provided in the subsequent section. See **Appendix J** for additional information on the prioritization process.

Table 24: Prioritization Scores

Candidate Solution #	Segment #	Option	Candidate Solution Name	Milepost Location	Estimated Cost* (in millions)	Performance Effectiveness Score	Weighted Risk Factor	Segment Average Need Score	Prioritization Score	Percentage by which Solution Reduces Performance Area Segment Needs				
										Pavement	Bridge	Mobility	Safety	Freight
CS10E.1	10E-3	-	Casa Grande Lighting Improvements	187-190	$7.01	0.6	1.57	1.23	**1**	0%	0%	0%	1%	1%
CS10E.2	10E-3	-	Casa Grande Safety Improvements	187-190	$4.49	16.9	1.68	1.23	**35**	0%	0%	0%	25%	5%
CS10E.3	10E-3	A	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	188.2	$7.17	27.0	1.43	1.23	**47**	0%	79%	0%	0%	72%
CS10E.4	10E-3	A	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	193.88	$10.53	13.7	1.40	1.23	**24**	0%	54%	0%	0%	72%
		B	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	193.88	$14.42	1.6	1.36	1.23	**3**	0%	0%	0%	0%	17%
CS10E.5	10E-3	A	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	195.89	$11.03	13.9	1.40	1.23	**24**	0%	54%	0%	0%	72%
		B	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	195.89	$13.32	6.7	1.36	1.23	**11**	0%	0%	0%	0%	68%
CS10E.6	10E-3	A	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	196.89	$9.65	14.7	1.40	1.23	**25**	0%	55%	0%	0%	72%
		B	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	196.89	$14.42	6.5	1.36	1.23	**11**	0%	0%	0%	0%	68%
CS10E.7	10E-4	A	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	205.45	$7.75	13.6	1.37	1.23	**23**	0%	100%	0%	0%	65%
		B	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	205.45	$13.32	4.7	1.36	1.23	**8**	0%	0%	0%	0%	47%
CS10E.8	10E-4	A	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	207.17	$8.27	12.7	1.37	1.23	**21**	0%	100%	0%	0%	65%
		B	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	207.17	$14.42	3.3	1.36	1.23	**6**	0%	0%	0%	0%	36%
CS10E.9	10E-5	B	Red Rock TI UP (#592) Bridge Project	226.45	$2.39	24.0	1.51	1.23	**45**	0%	100%	0%	0%	87%
CS10E.10	10E-5	-	Picacho Safety Improvements	218-236	$29.29	6.8	1.73	1.23	**14**	0%	0%	0%	38%	0%
CS10E.11	10E-5	-	Picacho Lighting Improvements	218-236	$42.06	1.5	1.72	1.23	**3**	0%	0%	0%	12%	0%
CS10E.12	10E-6	-	Marana Safety Improvements	236-242	$9.76	7.6	1.76	1.08	**15**	0%	0%	0%	25%	0%
CS10E.13	10E-6	-	Marana Lighting Improvements	236-242	$14.02	1.2	1.58	1.08	**2**	0%	0%	4%	3%	0%

Table 24: Prioritization Scores (continued)

Candidate Solution #	Segment #	Option	Candidate Solution Name	Milepost Location	Estimated Cost* (in millions)	Performance Effectiveness Score	Weighted Risk Factor	Segment Average Need Score	Prioritization Score	Percentage by which Solution Reduces Performance Area Segment Needs				
										Pavement	Bridge	Mobility	Safety	Freight
CS10E.14	10E-8	B	Tucson Mobility, Safety, and Freight Improvements	255-262	$6.53	31.5	1.40	1.08	**48**	0%	-	0%	36%	23%
CS10E.15	10E-9	C	East Tucson Mobility, Safety, and Freight Improvements	265-274	$29.27	34.7	1.45	1.92	**97**	0%	0%	1%	63%	28%
CS10E.16	10E-9	-	East Tucson Lighting Improvements	263-274	$25.71	2.8	1.63	1.92	**9**	0%	0%	0%	12%	1%
CS10E.17	10E-11	-	Vail Mobility and Safety Improvements	280-292	$44.23	3.1	1.49	1.31	**6**	0%	-	0%	27%	33%
CS10E.18	10E-11	-	Marsh Station EB Climbing Lane	286-291	$32.44	8.3	1.36	1.31	**15**	0%	-	25%	1%	3%
CS10E.19	10E-12	-	Benson WB Climbing Lane	303-305	$16.58	2.2	1.46	1.46	**5**	0%	0%	14%	6%	1%
CS10E.21	10E-12	-	Mescal Shoulder Widening	292-315	$84.78	3.7	1.65	1.46	**9**	0%	0%	9%	67%	13%
CS10E.22	10E-13	-	Dragoon EB Climbing Lane	316-318	$19.47	1.3	1.69	1.15	**3**	0%	0%	2%	23%	5%
CS10E.23	10E-13	-	Dragoon Safety Improvements	316-318	$3.67	10.6	1.69	1.15	**21**	0%	0%	0%	26%	9%
CS10E.24	10E-13	-	Exit 318 Lighting Improvements	318	$1.17	3.3	1.72	1.15	**7**	0%	0%	0%	4%	1%
CS10E.25	10E-13	B	Texas Canyon Area Pavement Improvements	321-323	$15.03	0.4	1.23	1.15	**1**	67%	0%	0%	2%	0%
CS10E.26	10E-13	B	Red Bird Hills Area Pavement Improvements	328-329	$7.51	0.3	1.41	1.15	**1**	33%	0%	0%	4%	1%
CS10E.28	10E-14	A	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	339.46	$7.50	8.1	1.42	0.77	**9**	0%	83%	0%	0%	81%
		B	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	339.46	$11.50	2.9	1.43	0.77	**3**	0%	63%	0%	0%	38%
CS10E.29	10E-15	-	Bowie Area Safety Improvements	354-372	$18.39	11.5	1.71	1.46	**29**	0%	0%	2%	65%	4%

6.0 SUMMARY OF CORRIDOR RECOMMENDATIONS

6.1 Prioritized Candidate Solution Recommendations

Table 25 and **Figure 27** show the prioritized candidate solutions recommended for the I-10 East Corridor in ranked order of priority. The highest prioritization score indicates the candidate solution that is recommended as the highest priority. Implementation of these solutions is anticipated to improve performance of the I-10 East Corridor. The following observations were noted about the prioritized solutions:

- Most of the anticipated improvements in performance are in the Mobility, Safety, and Freight performance areas
- The highest-ranking solutions tend to have overlapping benefits in the Mobility, Safety, and Freight performance areas
- The highest-priority solution addresses needs in the Tucson area (MP 255-274)

6.2 Other Corridor Recommendations

As part of the investigation of strategic investment areas and candidate solutions, other corridor recommendations can also be identified. These recommendations could include modifications to the existing Statewide Construction Program, areas for further study, or other corridor-specific recommendations that are not related to construction or policy. The list below identifies other corridor recommendations for the I-10 East Corridor:

- When recommending future projects along the I-10 East Corridor, review historical ratings and levels of investment. According to data used for this study, the following pavement and bridge locations have exhibited high historical investment (pavement) or rating fluctuation (bridge) issues:
  - Red Rock TI UP Bridge (#592, MP 226.45)
  - Cochise TI UP Bridge (#518, MP 331.62)
  - Airport Rd UP Bridge (#1114, MP 339.46)
  - Pavement MP 292-315 (Segment 10E-12)
  - Pavement MP 315-332 (Segment 10E-13)
- Continue to support and implement the recommendations of the DCR for the I-10 Wild Horse Pass Corridor (Loop 202 to SR 387)

6.3 Policy and Initiative Recommendations

In addition to location-specific needs, general corridor and system-wide needs have also been identified through the CPS process. While these needs are more overarching and cannot be individually evaluated through this process, it is important to document them. A list of recommended policies and initiatives was developed for consideration when programming future projects not only on the I-10 East Corridor, but across the entire state highway system where the conditions are applicable. The following list, which is in no particular order of priority, was derived from the initial four CPS rounds:

- Install Intelligent Transportation System (ITS) conduit with all new infrastructure projects
- Prepare strategic plans for Closed Circuit Television (CCTV) camera and Road Weather Information System (RWIS) locations statewide
- Leverage power and communication at existing weigh-in-motion (WIM), dynamic message signs (DMS), and call box locations to expand ITS applications across the state
- Consider solar power for lighting and ITS where applicable
- Investigate ice formation prediction technology where applicable
- Conduct highway safety manual evaluation for all future programmed projects
- Develop infrastructure maintenance and preservation plans (including schedule and funding) for all pavement and bridge infrastructure replacement or expansion projects
- Develop standardized bridge maintenance procedures so districts can do routine maintenance work
- Review historical ratings and level of previous investment during scoping of pavement and bridge projects. In pavement locations that warrant further investigation, conduct subsurface investigations during project scoping to determine if full replacement is warranted
- For pavement rehabilitation projects, enhance the amount/level of geotechnical investigations to address issues specific to the varying conditions along the project
- Expand programmed and future pavement projects as necessary to include shoulders
- Expand median cable barrier guidelines to account for safety performance
- Install CCTV cameras with all DMS
- In locations with limited communications, use CCTV cameras to provide still images rather than streaming video
- Develop statewide program for pavement replacement
- Install additional continuous permanent count stations along strategic corridors to enhance traffic count data
- When reconstruction or rehabilitation activities will affect existing bridge vertical clearance, the dimension of the new bridge vertical clearance should be a minimum of 16.25 feet where feasible
- All new or reconstructed roadway/shoulder edges adjacent to an unpaved surface should be constructed with a Safety Edge
- Collision data on tribal lands may be incomplete or inconsistent; additional coordination for data on tribal lands is required to ensure adequate reflection of safety issues

- Expand data collection devices statewide to measure freight delay
- Evaluate and accommodate potential changes in freight and goods movement trends that may result from improvements and expansions to the state roadway network
- At traffic interchanges with existing communication connectivity to the ADOT TOC, consideration should be given to adding thermal detection cameras for vehicle detection with the capability for wrong-way vehicle detection
- Improved vehicle detection systems, as recommended by ADOT Systems Technology group, should be deployed at traffic interchanges for improved traffic control

Table 25: Prioritized Recommended Solutions

Rank	Candidate Solution #	Option	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
1	CS10E.15	C	East Tucson Mobility, Safety, and Freight Improvements (MP 265-274)	-Implement ramp metering on all on-ramps where warranted at the ten TIs within project limits -Widen left shoulder in both directions -Consider installing speed feedback signs (MP 268) -Install EB DMS sign (MP 266)	$29.27	M	**97**
2	CS10E.14	B	Tucson Mobility, Safety, and Freight Improvements (MP 255-262)	-Implement ramp metering on all on-ramps where warranted at the nine TIs within project limits	$6.53	M	**48**
3	CS10E.3	B	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation (MP 188.2)	-Reprofile mainline	$7.17	M	**47**
4	CS10E.9	B	Red Rock TI UP (#592) Bridge Project (MP 226.45)	-Replace bridge	$2.39	M	**45**
5	CS10E.2	-	Casa Grande Safety Improvements (MP 187-190)	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) -Install DMS signs (EB MP 190 and WB MP 190)	$4.49	M	**35**
6	CS10E.29	-	Bowie Area Safety Improvements (MP 354-372)	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) -Install WB DMS sign (MP 356)	$18.39	M	**29**
7	CS10E.6	A	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation (MP 196.89)	-Replace bridge	$9.65	M	**25**
	CS10E.6	B	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation (MP 196.89)	-Reprofile mainline	$14.42	M	**11**

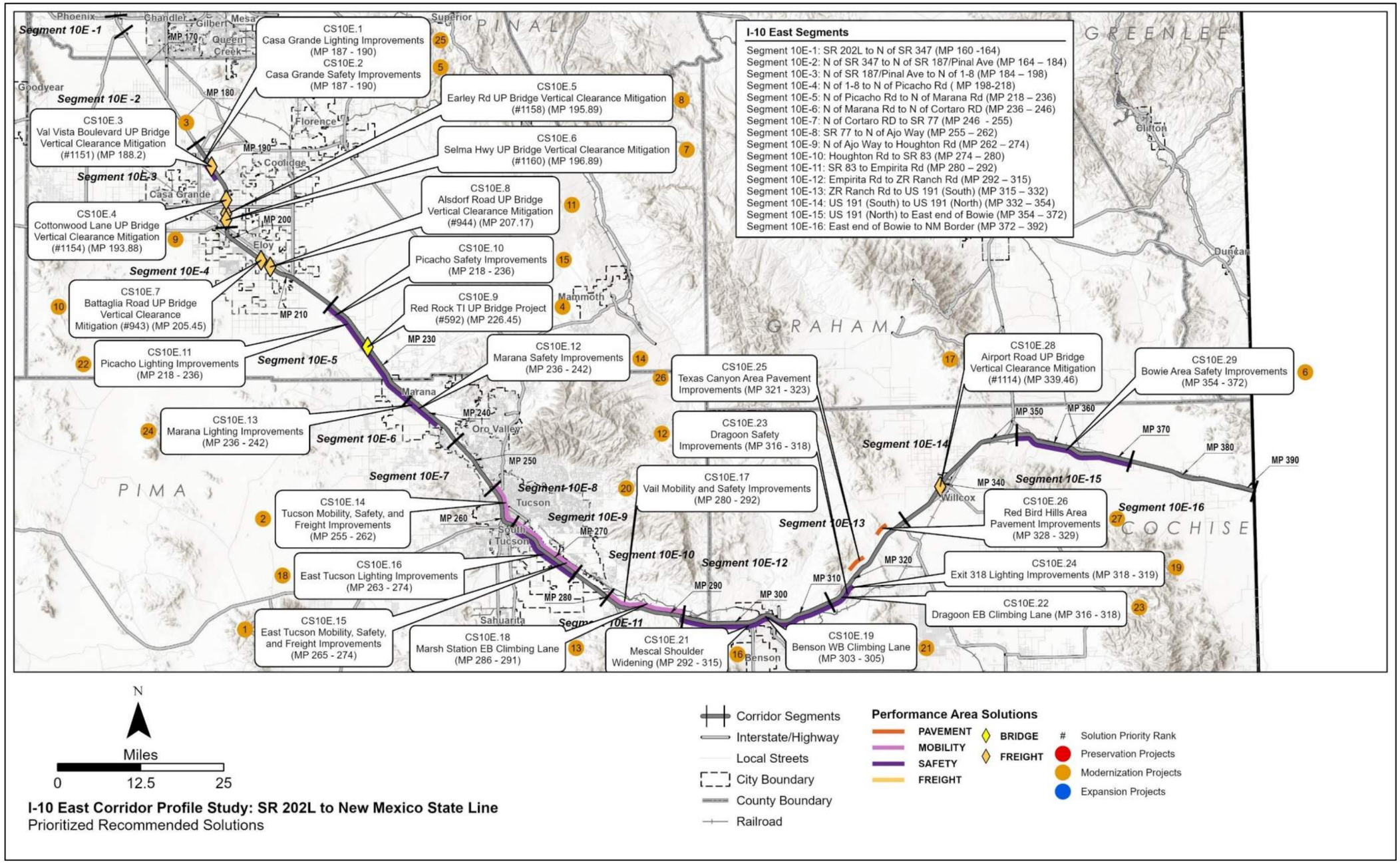
Table 25: Prioritized Recommended Solutions (continued)

Rank	Candidate Solution #	Option	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
8	CS10E.5	A	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation (MP 195.89)	-Replace bridge	$11.03	M	**24**
	CS10E.5	B	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation (MP 195.89)	-Reprofile mainline	$13.32	M	**11**
9	CS10E.4	A	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation (MP 193.88)	-Replace bridge	$10.53	M	**24**
	CS10E.4	B	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation (MP 193.88)	-Reprofile mainline	$14.42	M	**3**
10	CS10E.7	A	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation (MP 205.45)	-Replace bridge	$7.75	M	**23**
	CS10E.7	B	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation (MP 205.45)	-Reprofile mainline	$13.32	M	**8**
11	CS10E.8	A	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation (MP 207.17)	-Replace bridge	$8.27	M	**21**
	CS10E.8	B	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation (MP 207.17)	-Reprofile mainline	$14.42	M	**6**
12	CS10E.23	-	Dragoon Safety Improvements (MP 316-318)	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) (MP 316-318) -Consider installing speed feedback signs (MP 317) -Install DMS sign (MP 317)	$3.67	M	**21**
13	CS10E.18	-	Marsh Station EB Climbing Lane (MP EB 286-291)	-Construct climbing lane	$32.44	M	**15**
14	CS10E.12	-	Marana Safety Improvements (MP 236-242)	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders)	$9.76	M	**15**
15	CS10E.10	-	Picacho Safety Improvements (MP 218-236)	-Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders)	$29.29	M	**14**

Table 25: Prioritized Recommended Solutions (continued)

Rank	Candidate Solution #	Option	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
16	CS10E.21	-	Mescal Shoulder Widening (MP 292-315)	-Widen left shoulder to 10 feet in both directions (striping, delineators, RPMs, safety edge, and rumble strips)	$84.78	M	**9**
17	CS10E.28	A	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation (MP 339.46)	-Replace bridge	$7.50	M	**9**
	CS10E.28	B	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation (MP 339.46)	-Rehabilitate bridge and reprofile mainline	$11.50	M	**3**
18	CS10E.16	-	East Tucson Lighting Improvements (MP 263-274)	-Install lighting (both directions)	$25.71	M	**9**
19	CS10E.24	-	Exit 318 Lighting Improvements (MP 318)	-Install lighting at exit	$1.17	M	**7**
20	CS10E.17	-	Vail Mobility and Safety Improvements (MP 280-292)	-Widen left shoulder to 10 feet in both directions (striping, delineators, RPMs, safety edge, and rumble strips) -Rehabilitate right shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips)	$44.23	M	**6**
21	CS10E.19	-	Benson WB Climbing Lane (MP WB 303-305)	-Construct climbing lane -Widen 3 bridges within the project limits	$16.58	M	**5**
22	CS10E.11	-	Picacho Lighting Improvements (MP 218-236)	-Install lighting (both directions)	$42.06	M	**3**
23	CS10E.22	-	Dragoon EB Climbing Lane (MP 316-318)	-Construct climbing lane	$19.47	M	**3**
24	CS10E.13	-	Marana Lighting Improvements (MP 236-242)	-Install lighting (both directions)	$14.02	M	**2**
25	CS10E.1	-	Casa Grande Lighting Improvements (MP 187-190)	-Install lighting (both directions)	$7.01	M	**1**
26	CS10E.25	B	Texas Canyon Area Pavement Improvements (MP 321-323)	-Replace pavement	$15.03	M	**1**
27	CS10E.26	B	Red Bird Hills Area Pavement Improvements (MP 328-329)	-Replace pavement	$7.51	M	**1**

Figure 27: Prioritized Recommended Solutions



6.4 Next Steps

The candidate solutions recommended in this study are not intended to be a substitute or replacement for traditional ADOT project development processes where various ADOT technical groups and districts develop candidate projects for consideration in the performance-based programming in the P2P process. Rather, these candidate solutions are intended to complement ADOT's traditional project development processes through a performance-based process to address needs in one or more of the five performance areas of Pavement, Bridge, Mobility, Safety, and Freight. Candidate solutions developed for the I-10 East Corridor will be considered along with other candidate projects in the ADOT statewide programming process.

It is important to note that the candidate solutions are intended to represent strategic solutions to address existing performance needs related to the Pavement, Bridge, Mobility, Safety, and Freight performance areas. Therefore, the strategic solutions are not intended to preclude recommendations related to the ultimate vision for the corridor that may have been defined in the context of prior planning studies and/or design concept reports. Recommendations from such studies are still relevant to addressing the ultimate corridor objectives.

These results will be incorporated into a summary document comparing all corridors that is expected to provide a performance-based review of statewide needs and candidate solutions.

This CPS assessment is an update to the original CPS assessments conducted between 2017 and 2019. Due to changes in state and federal reporting standards as well as data availability, the original methodology has been adapted to produce comparable and relatable performance, need, and evaluation results. The methodology has changed as follows:

- Pavement performance now includes the addition of rutting as a component of the Pavement Distress measure
- Bridge performance no longer includes the % Functionally Obsolete secondary measure
- Safety performance includes updated secondary measure categories and is evaluated against updated statewide averages
- Mobility and Freight performance are evaluated using updated reliability measures based on Level of Travel Time Reliability and Truck Travel Time Reliability, which are new federal standard measures adapted from the previous Travel Time Index and Planning Time Index measures

Appendices

Appendix A: Corridor Performance Maps

This appendix contains maps of each primary and secondary measure associated with the five performance areas for the I-10E corridor. The following are the areas and maps included:

Pavement Performance Area:

- Pavement Index and Hot Spots
- Pavement Serviceability and Hot Spots (directional)
- Percentage of Pavement Area Failure

Bridge Performance Area:

- Bridge Index and Hot Spots
- Bridge Sufficiency
- Lowest Bridge Rating

Mobility Performance Area:

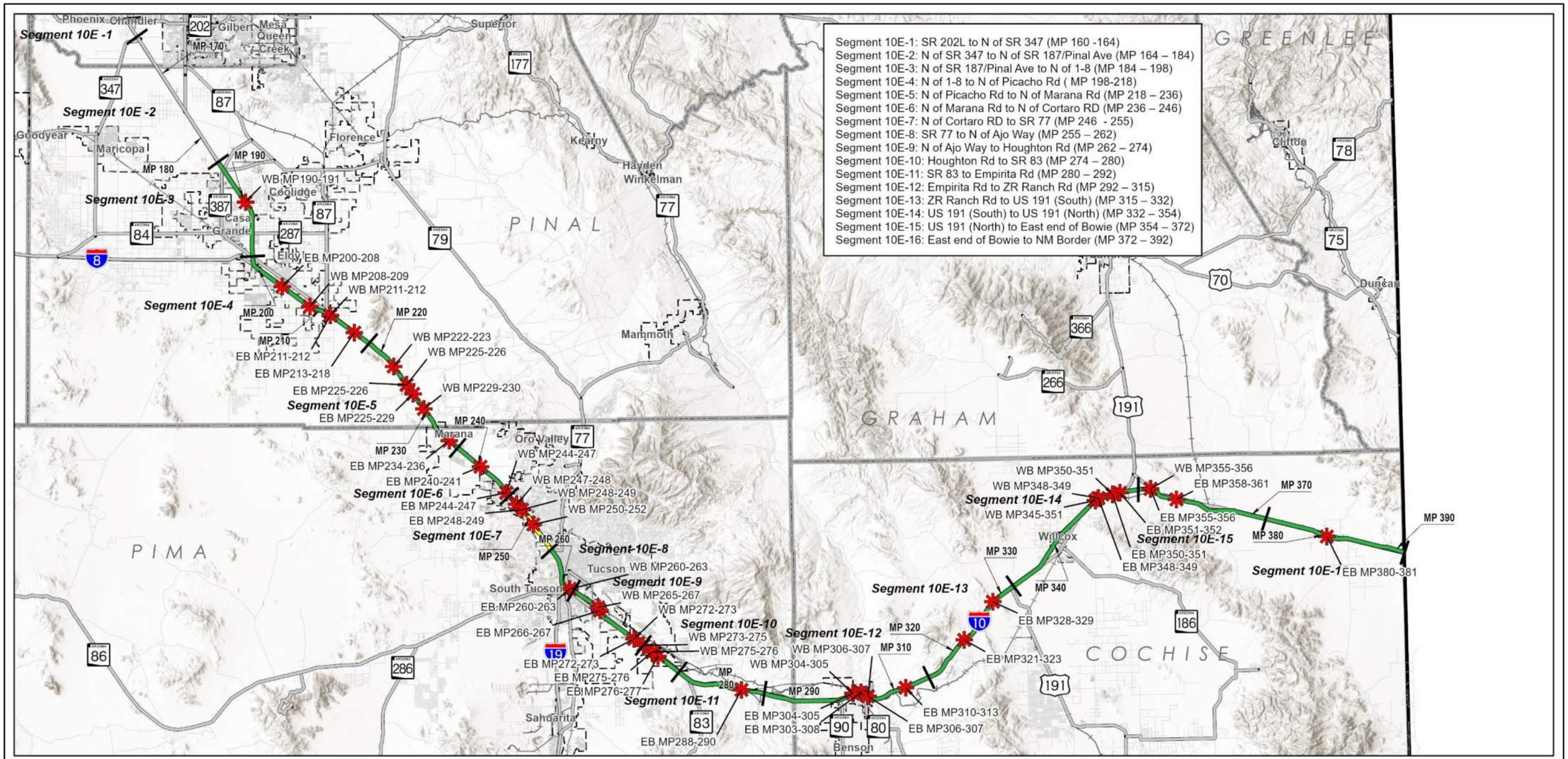
- Mobility Index
- Future Daily V/C Ratio
- Existing Peak Hour V/C Ratio (directional)
- Closure Frequency (directional)
- Level of Travel Time Reliability (directional)
- Multimodal Opportunities
- Percentage of Bicycle Accommodation

Safety Performance Area:

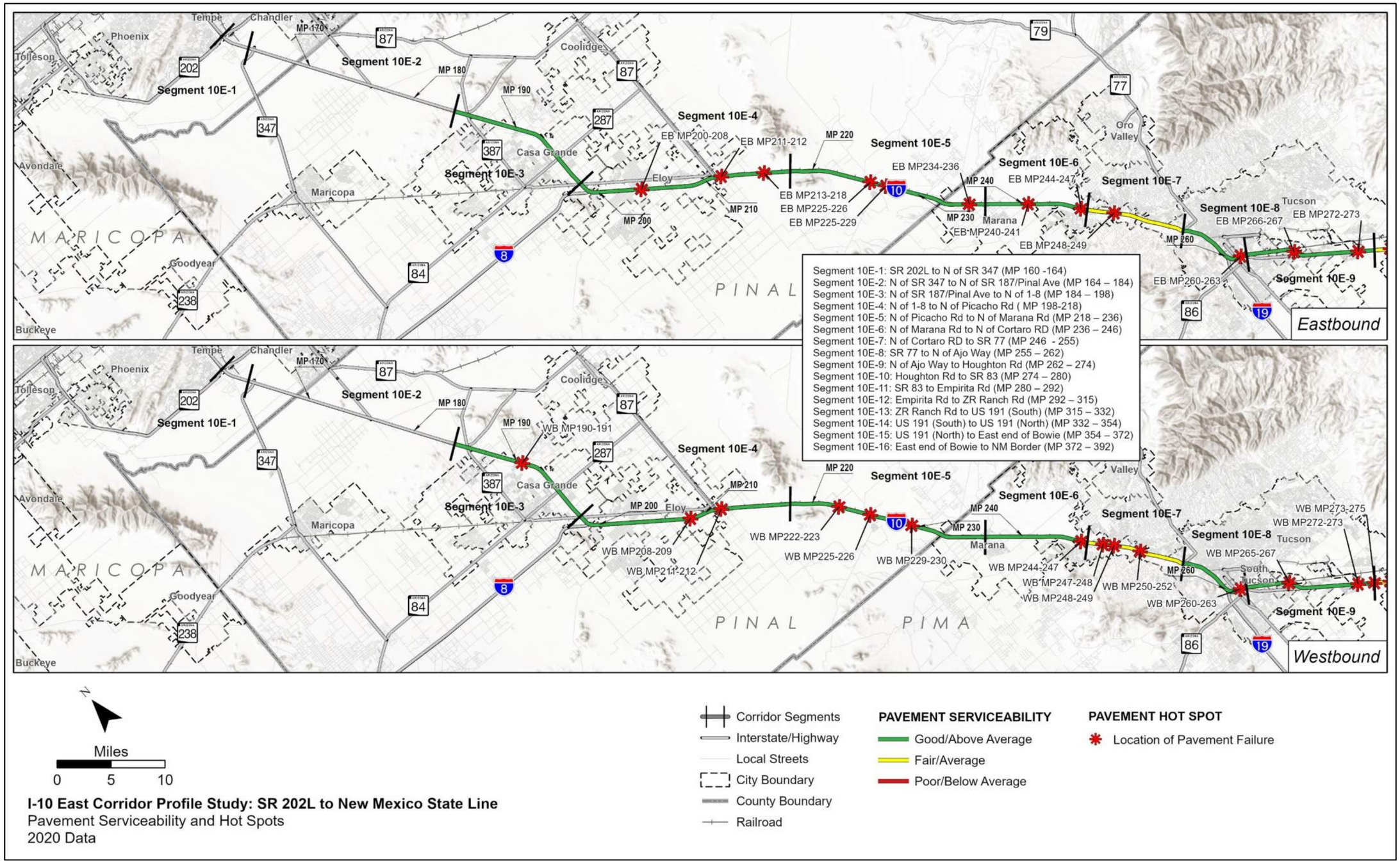
- Safety Index and Hot Spots
- Safety Index and Hot Spots (directional)
- Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Intersection Crashes Compared to the Statewide Average for Similar Segments (insufficient data – not included)
- Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Lane Departures Compared to the Statewide Average for Similar Segments
- Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Pedestrians Compared to the Statewide Average for Similar Segments
- Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Trucks Compared to the Statewide Average for Similar Segments
- Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Bicycles Compared to the Statewide Average for Similar Segments

Freight Performance Area:

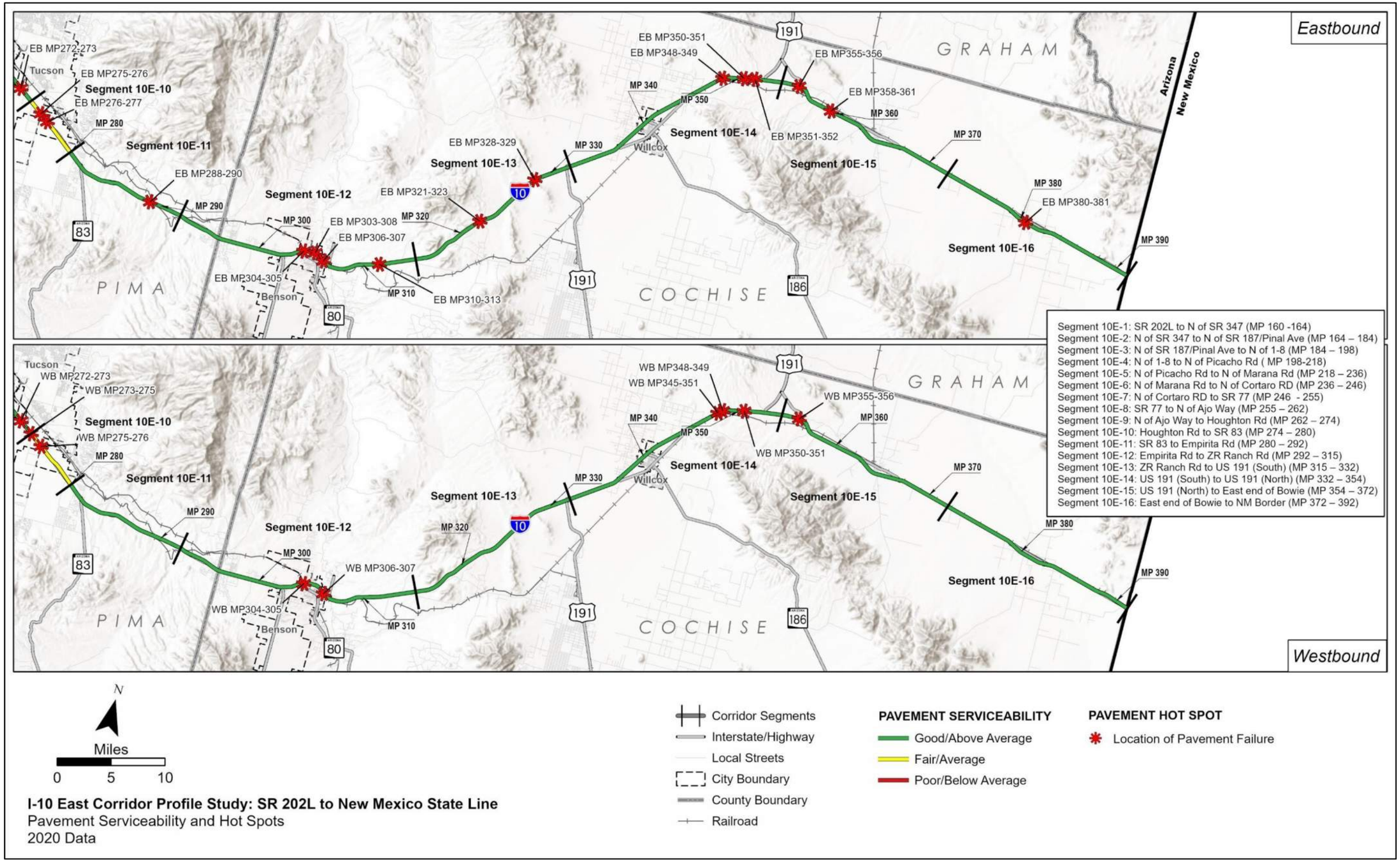
- Freight Index and Hot Spots
- Truck Travel Time Reliability (directional)
- Closure Duration (directional)
- Bridge Vertical Clearance



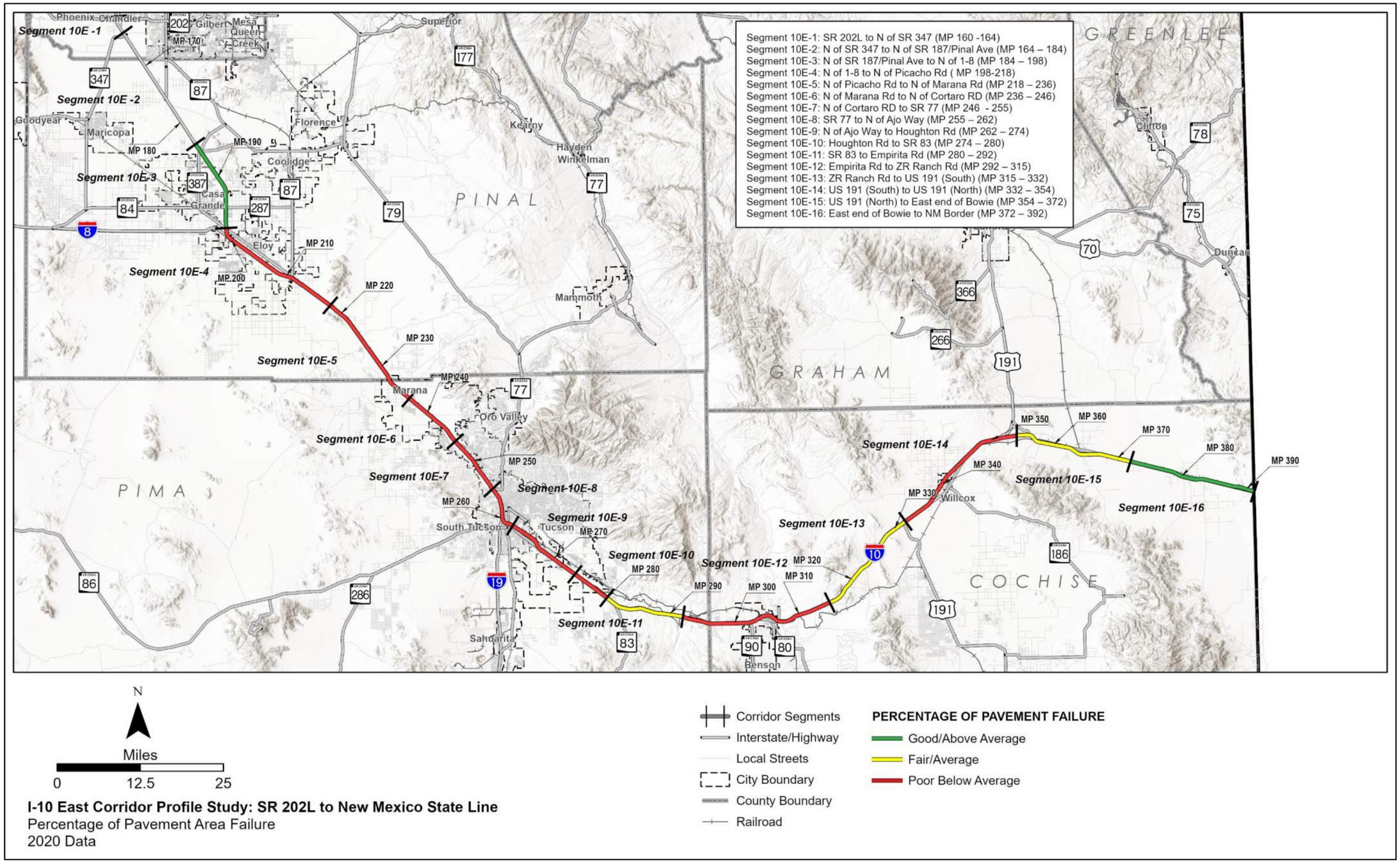
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Pavement Index and Hot Spots
2020 Data



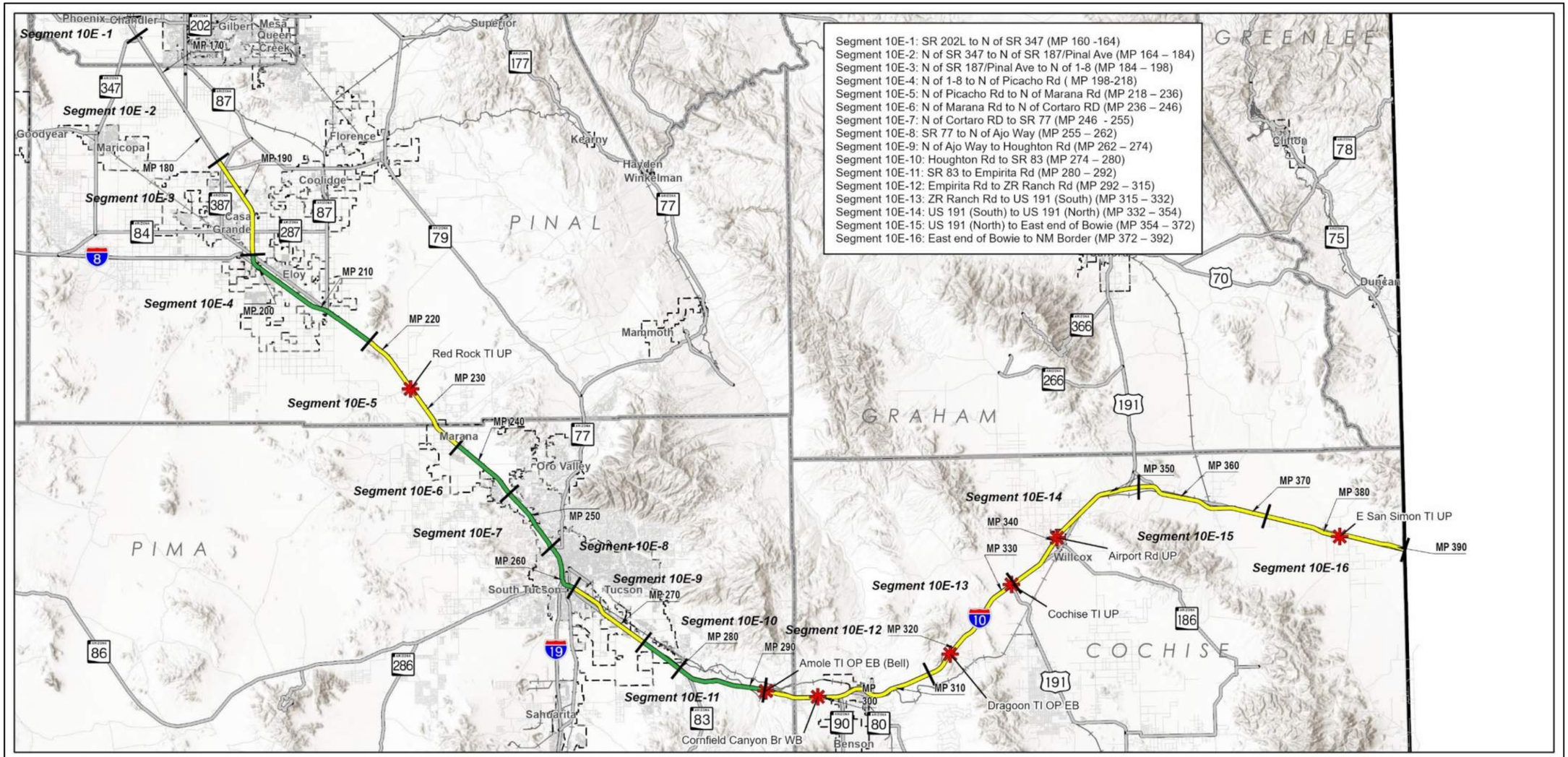
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Pavement Serviceability and Hot Spots
2020 Data



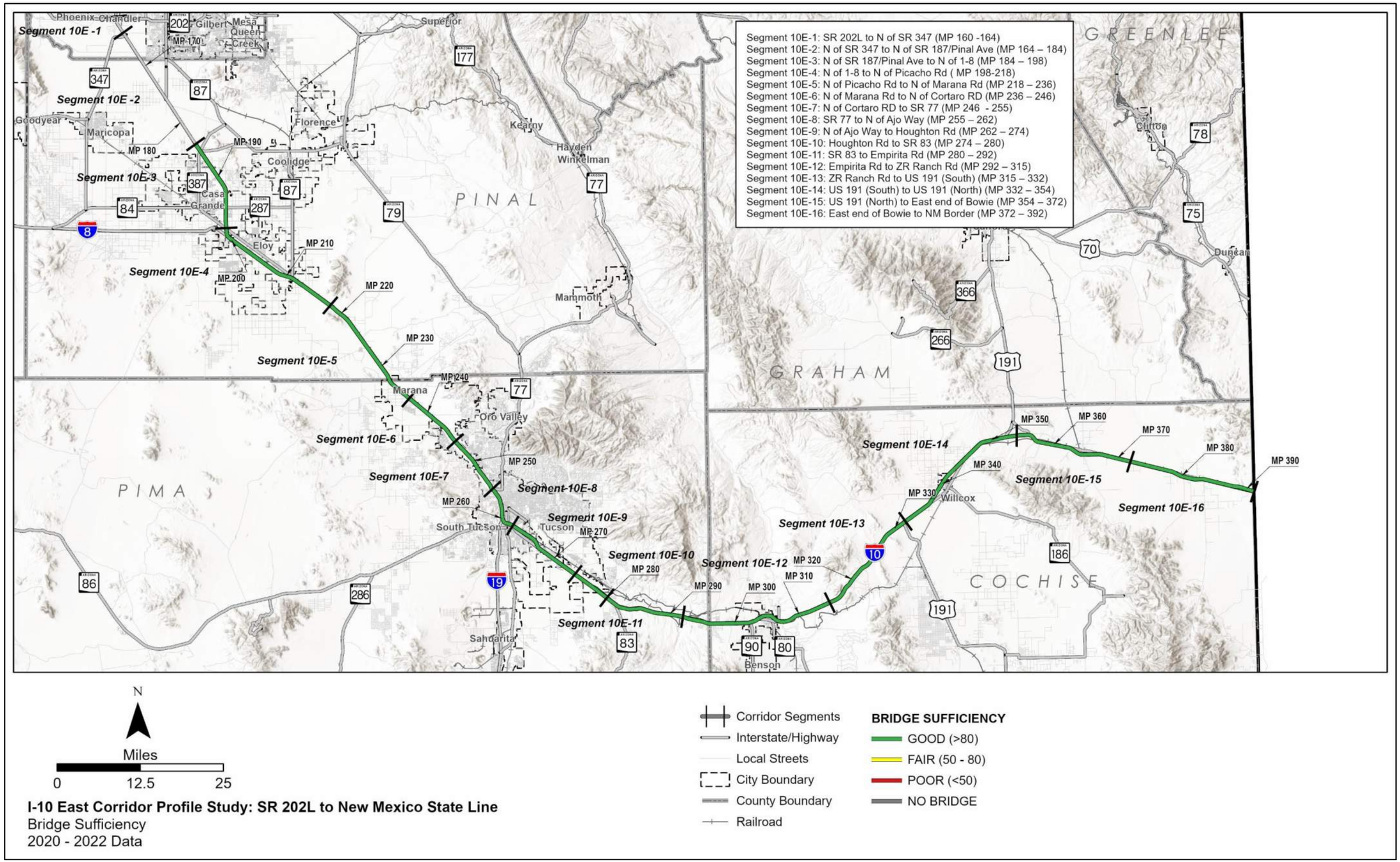
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Pavement Serviceability and Hot Spots
2020 Data



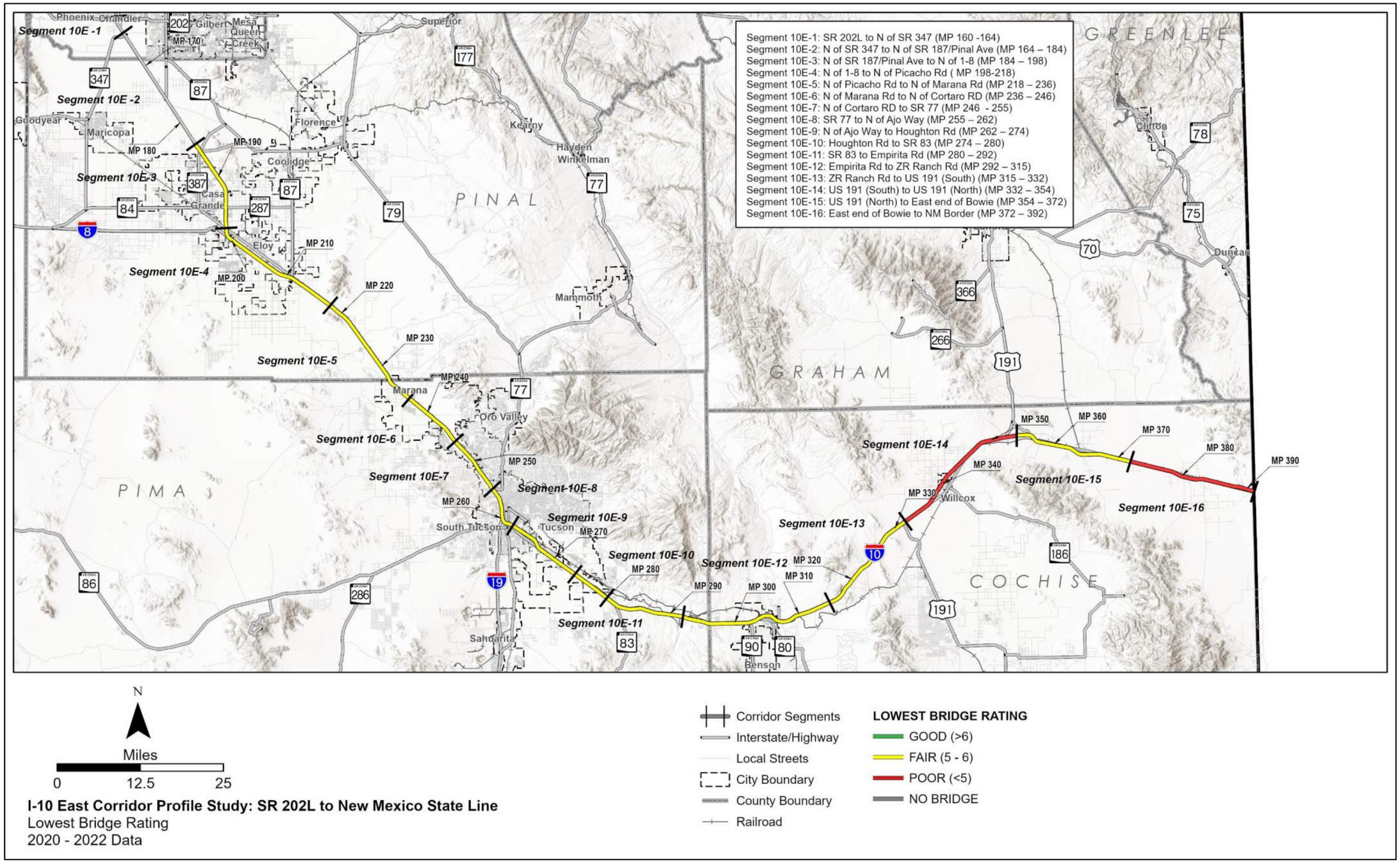
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Percentage of Pavement Area Failure
2020 Data



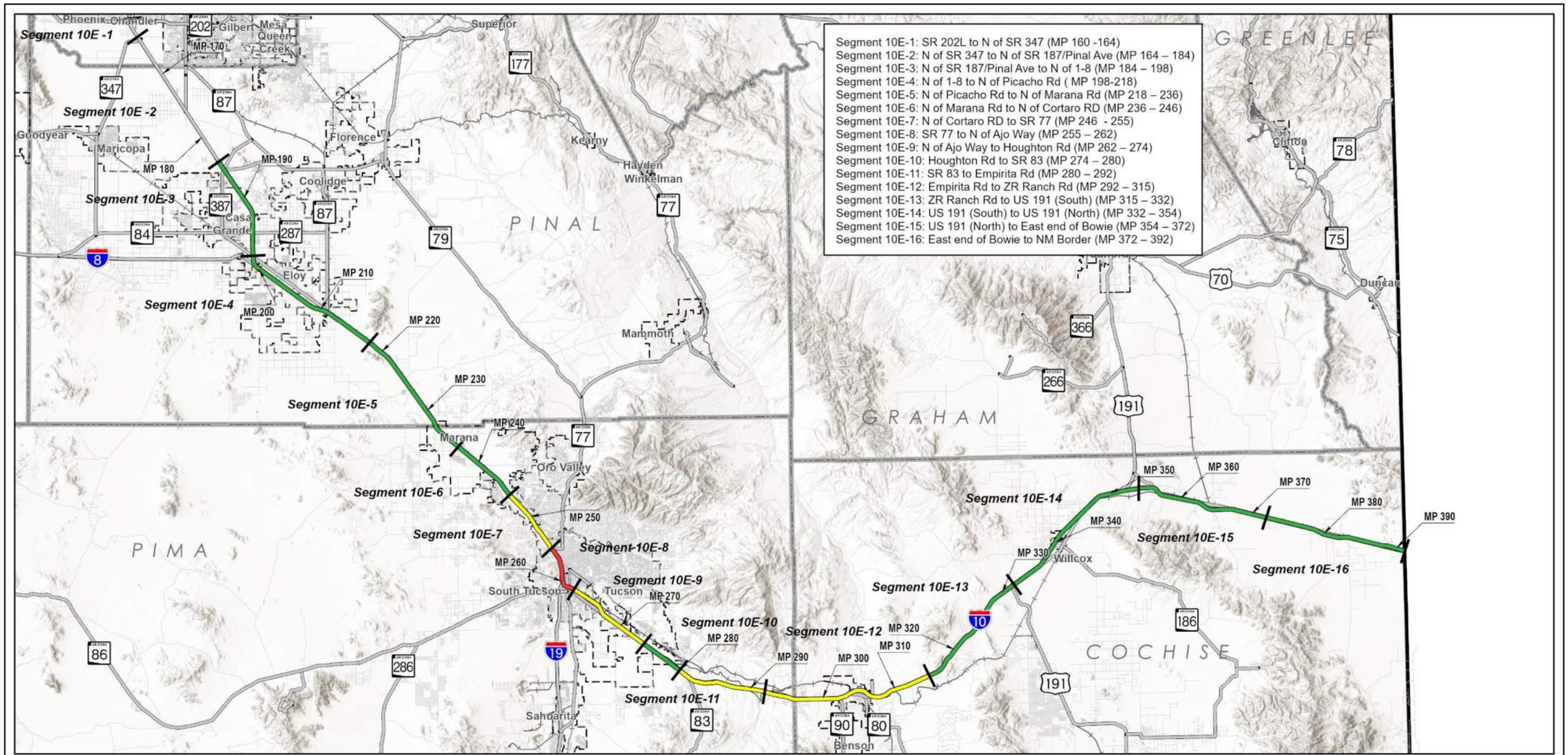
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Bridge Index and Hot Spots
2020 - 2022 Data



I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Bridge Sufficiency
2020 - 2022 Data



I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Lowest Bridge Rating
2020 - 2022 Data



N

Miles

0 12.5 25

I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Mobility Index
2020 and 2040 Data

Corridor Segments
Interstate/Highway
Local Streets
City Boundary
County Boundary
Railroad

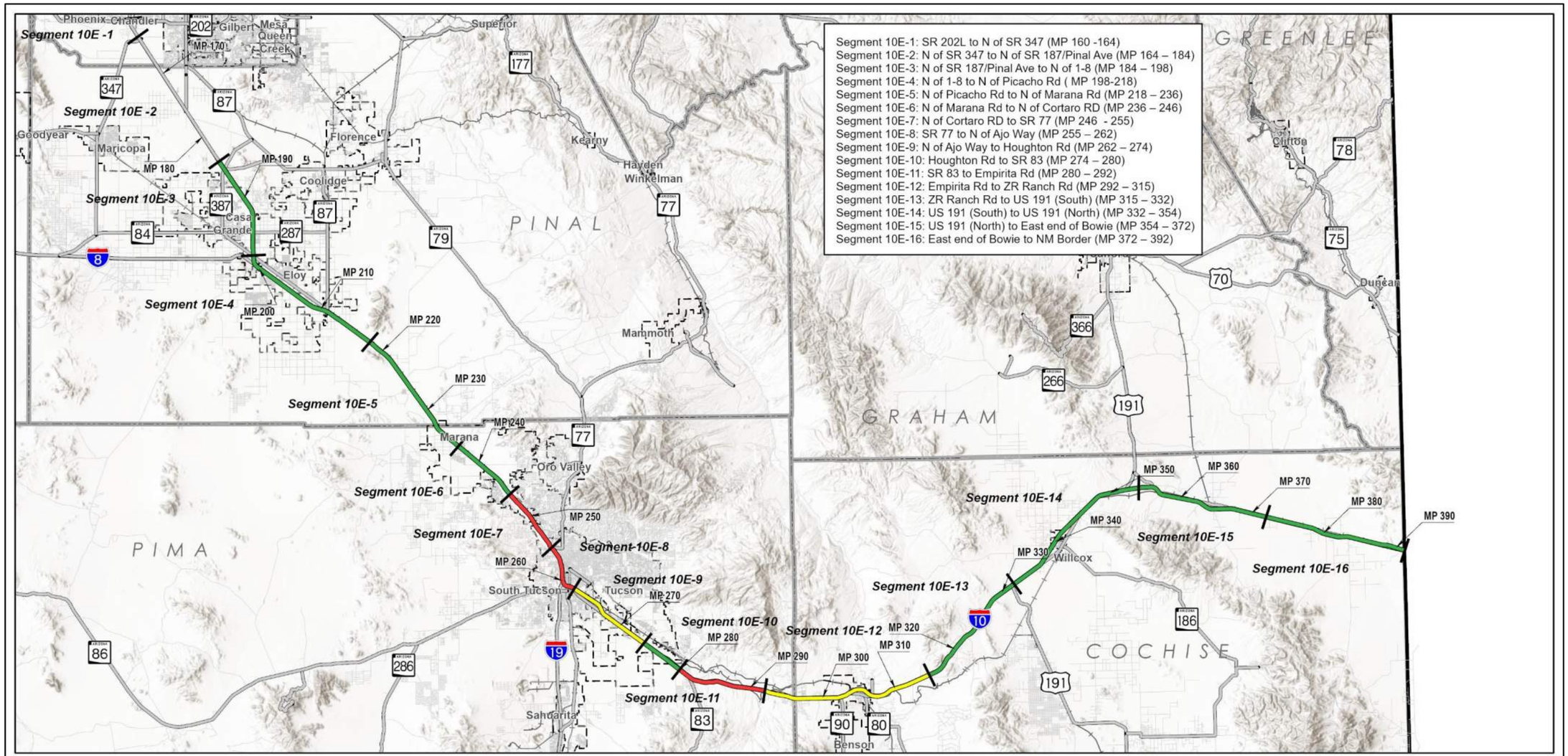
MOBILITY INDEX

URBAN AND FRINGE URBAN (SEGMENTS 10E-3, 10E-4, 10E-6, 10E-7, 10E-8, 10E-9, 10E-10)

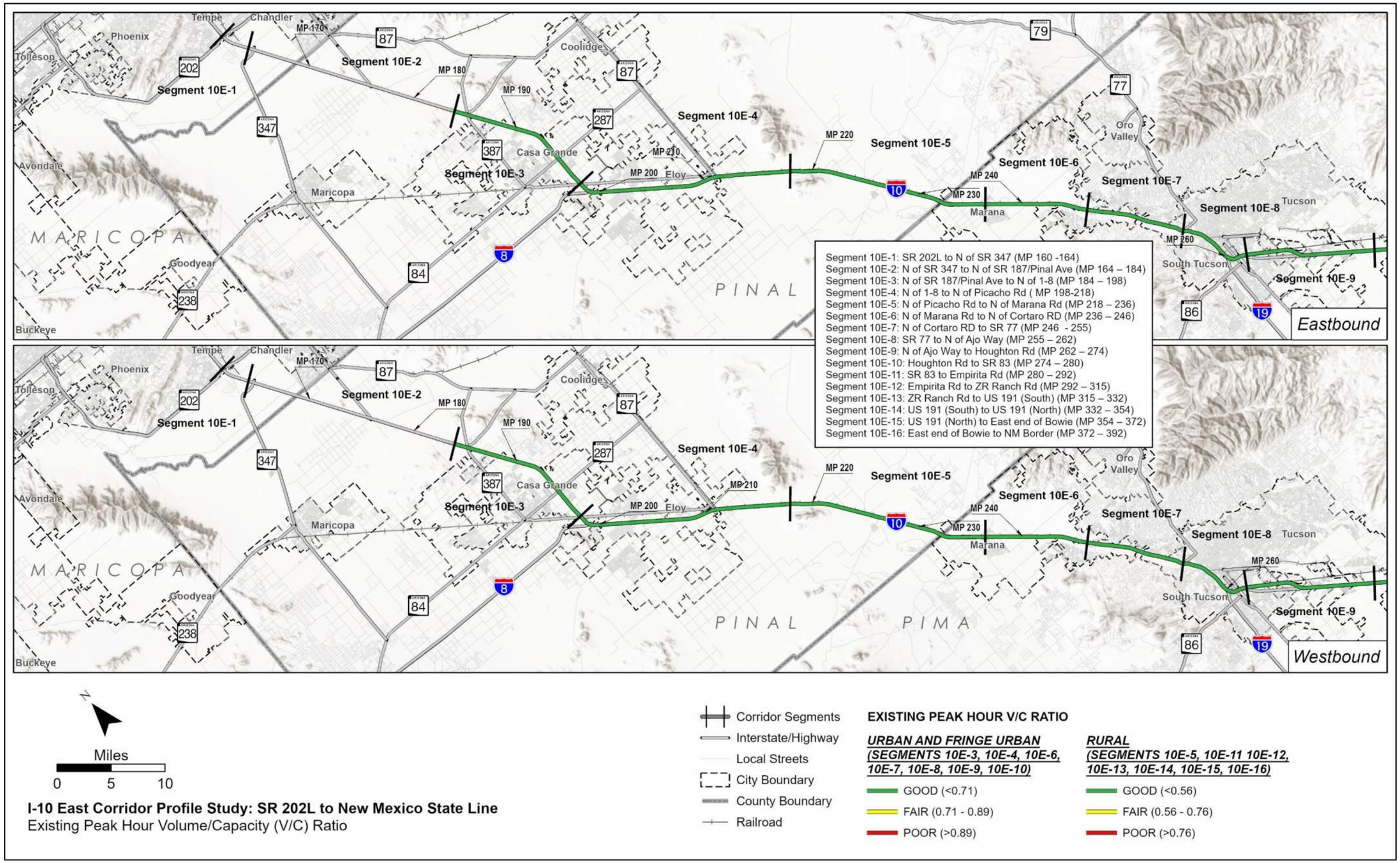
- GOOD (<0.71)
- FAIR (0.71 - 0.89)
- POOR (>0.89)

RURAL (SEGMENTS 10E-5, 10E-11, 10E-12, 10E-13, 10E-14, 10E-15, 10E-16)

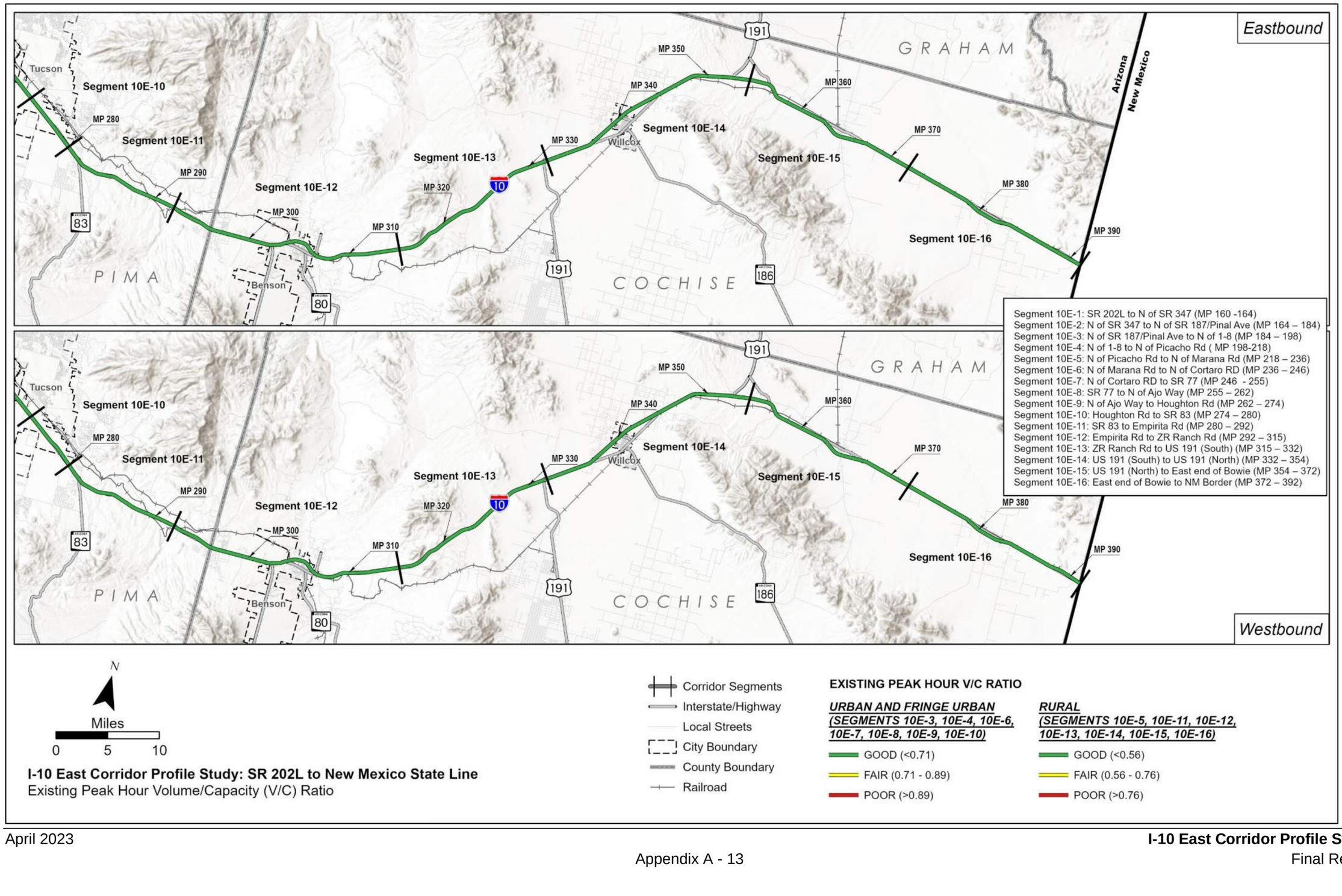
- GOOD (<0.56)
- FAIR (0.56 - 0.76)
- POOR (>0.76)



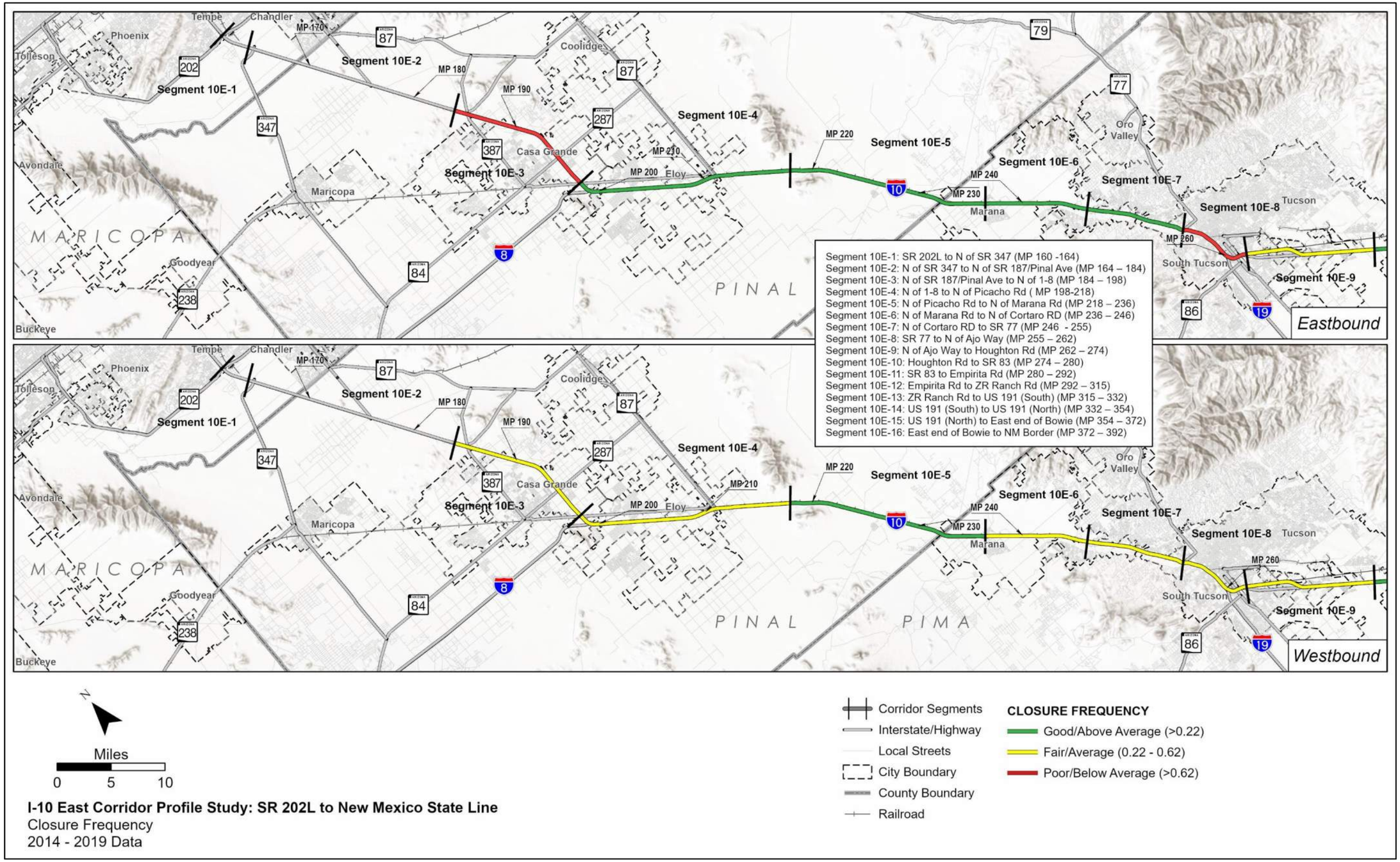
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Future Daily Volume/Capacity (V/C) Ratio
2040 Data



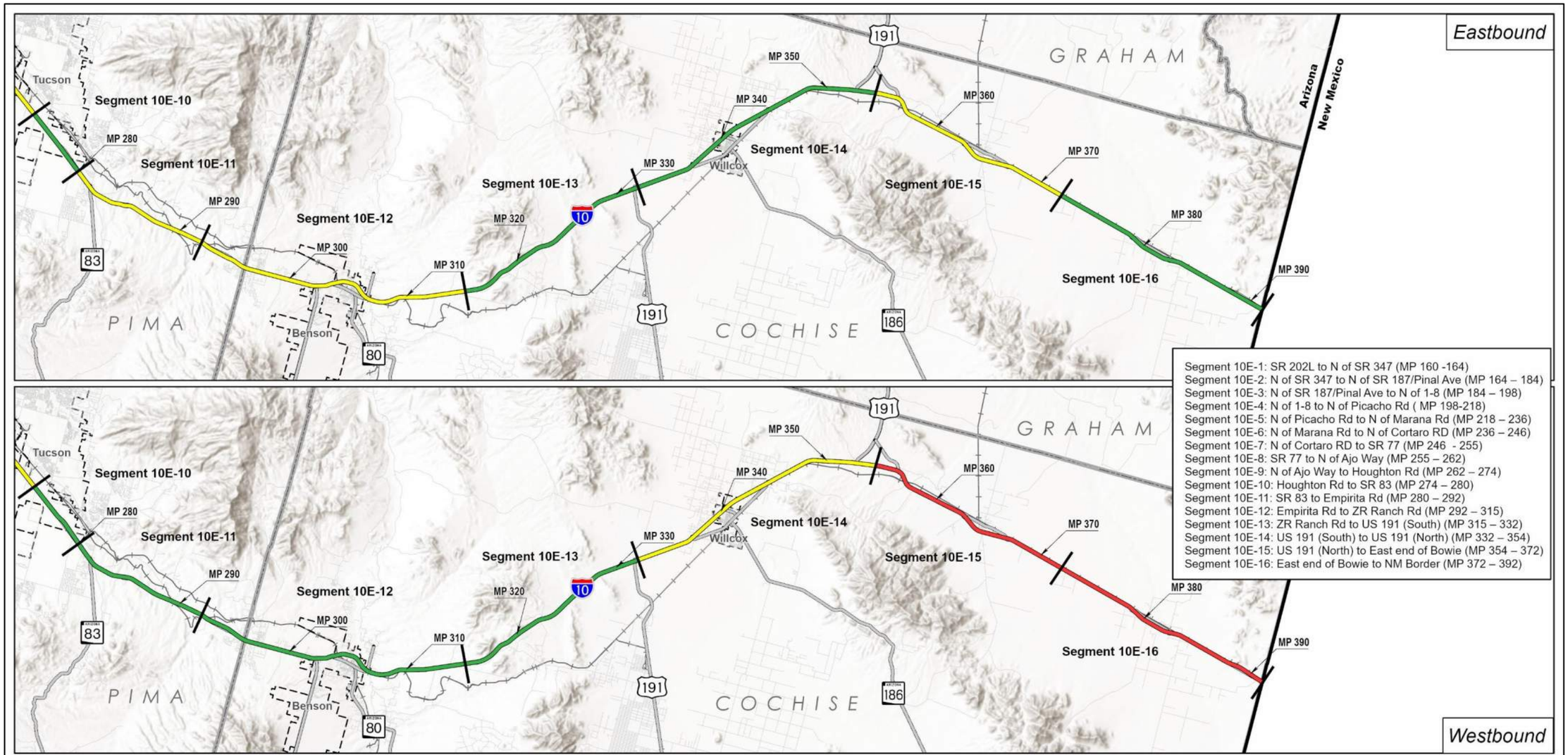
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Existing Peak Hour Volume/Capacity (V/C) Ratio



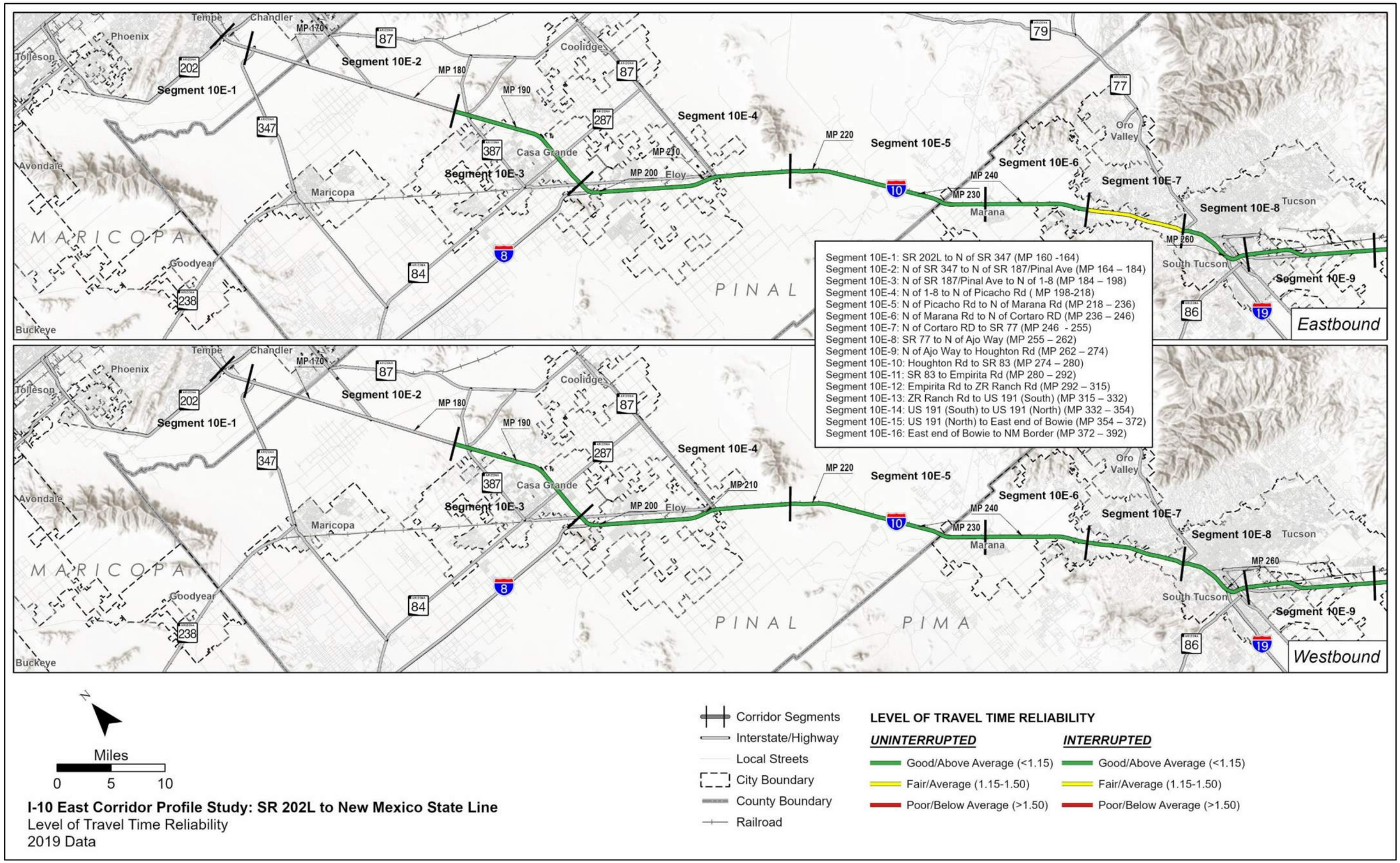
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Existing Peak Hour Volume/Capacity (V/C) Ratio



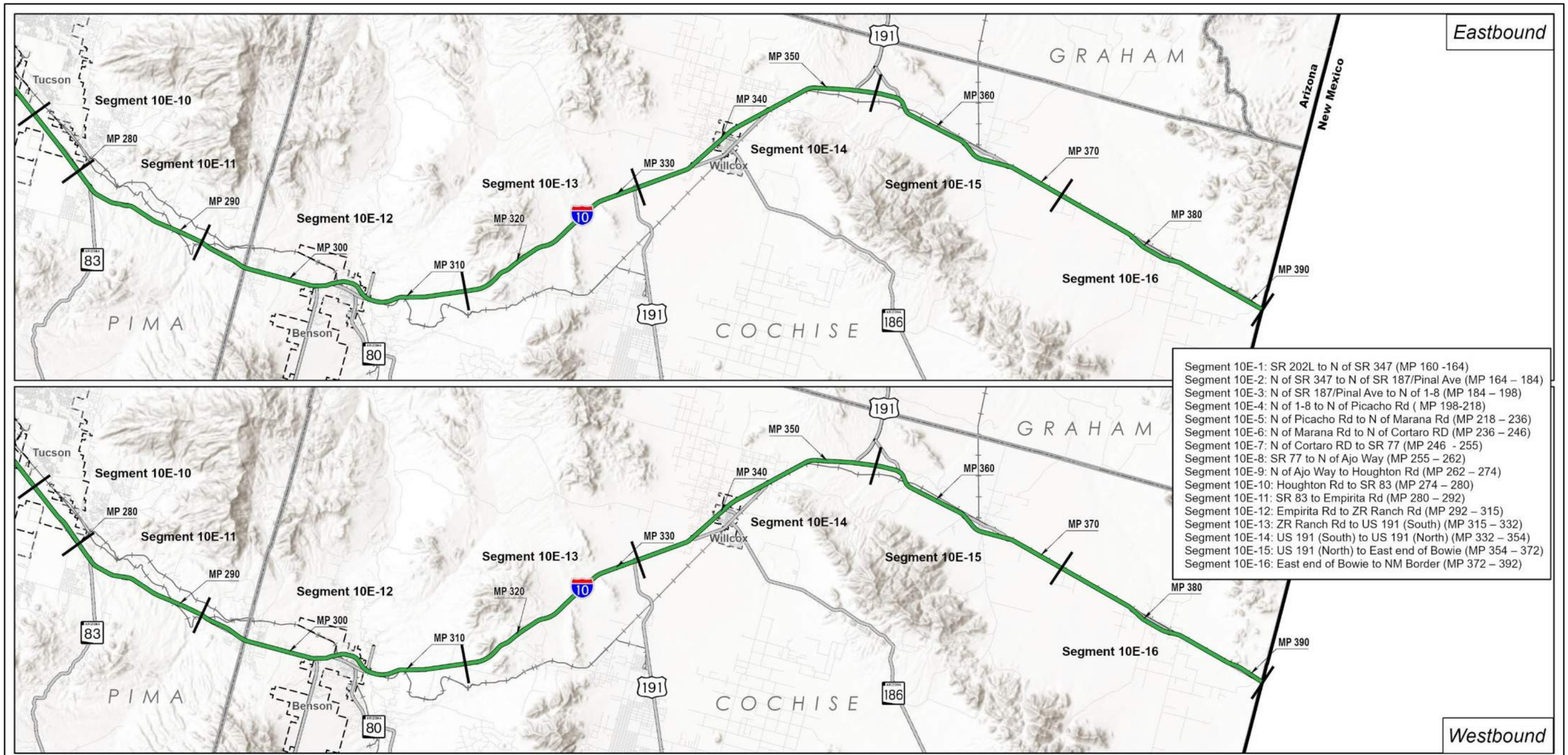
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Closure Frequency
2014 - 2019 Data



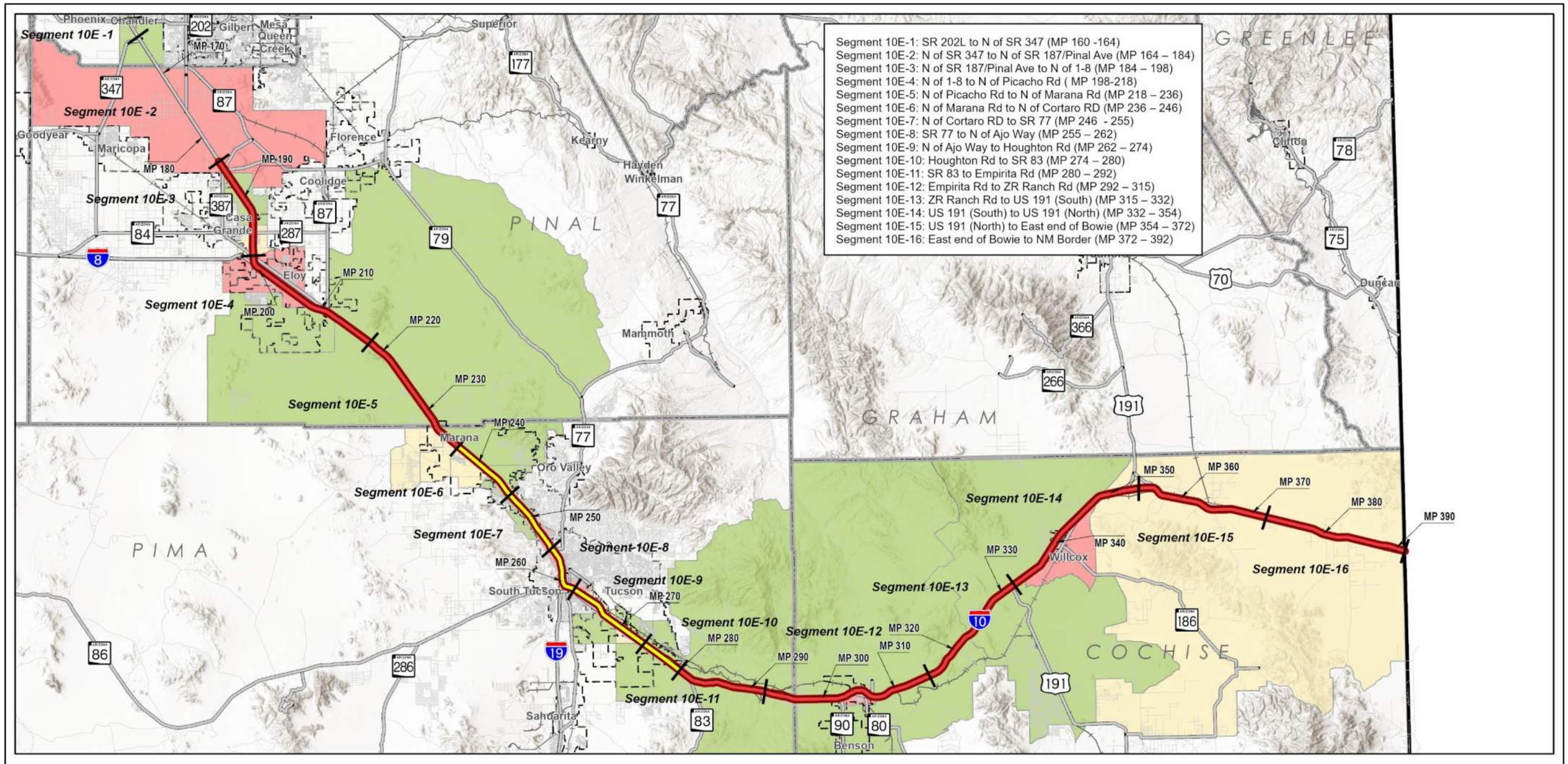
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Closure Frequency
2014 - 2019 Data



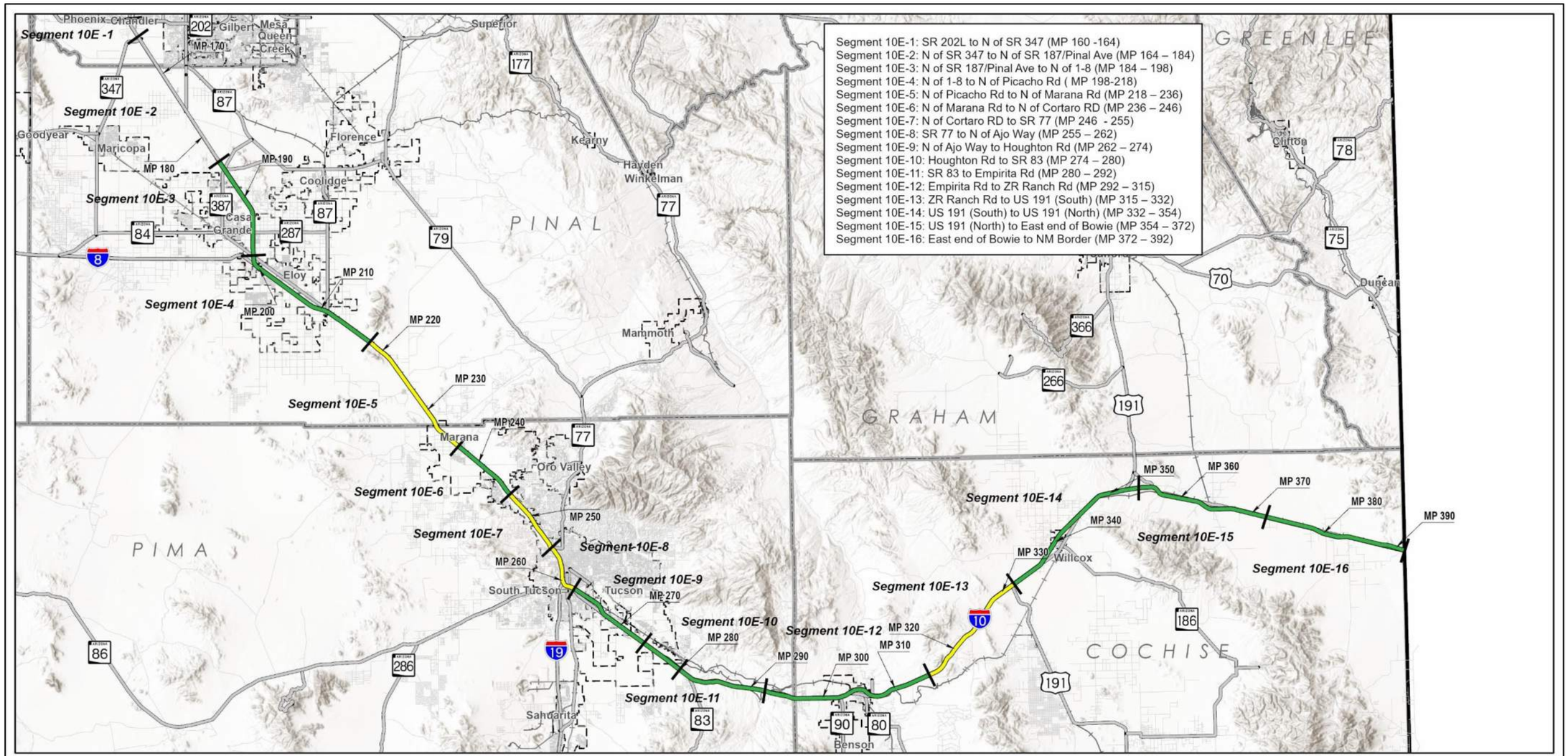
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Level of Travel Time Reliability
2019 Data



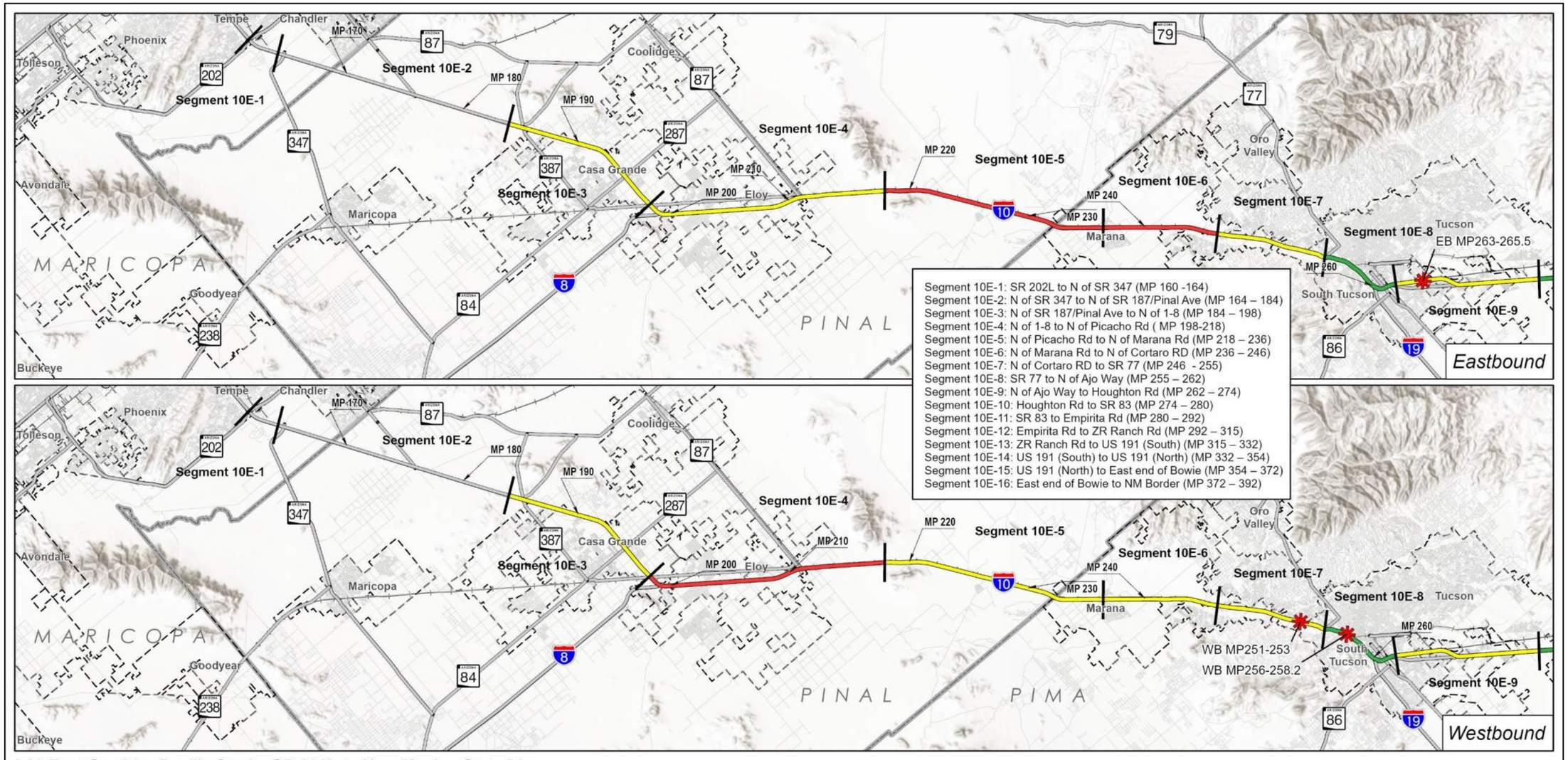
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Level of Travel Time Reliability
2019 Data

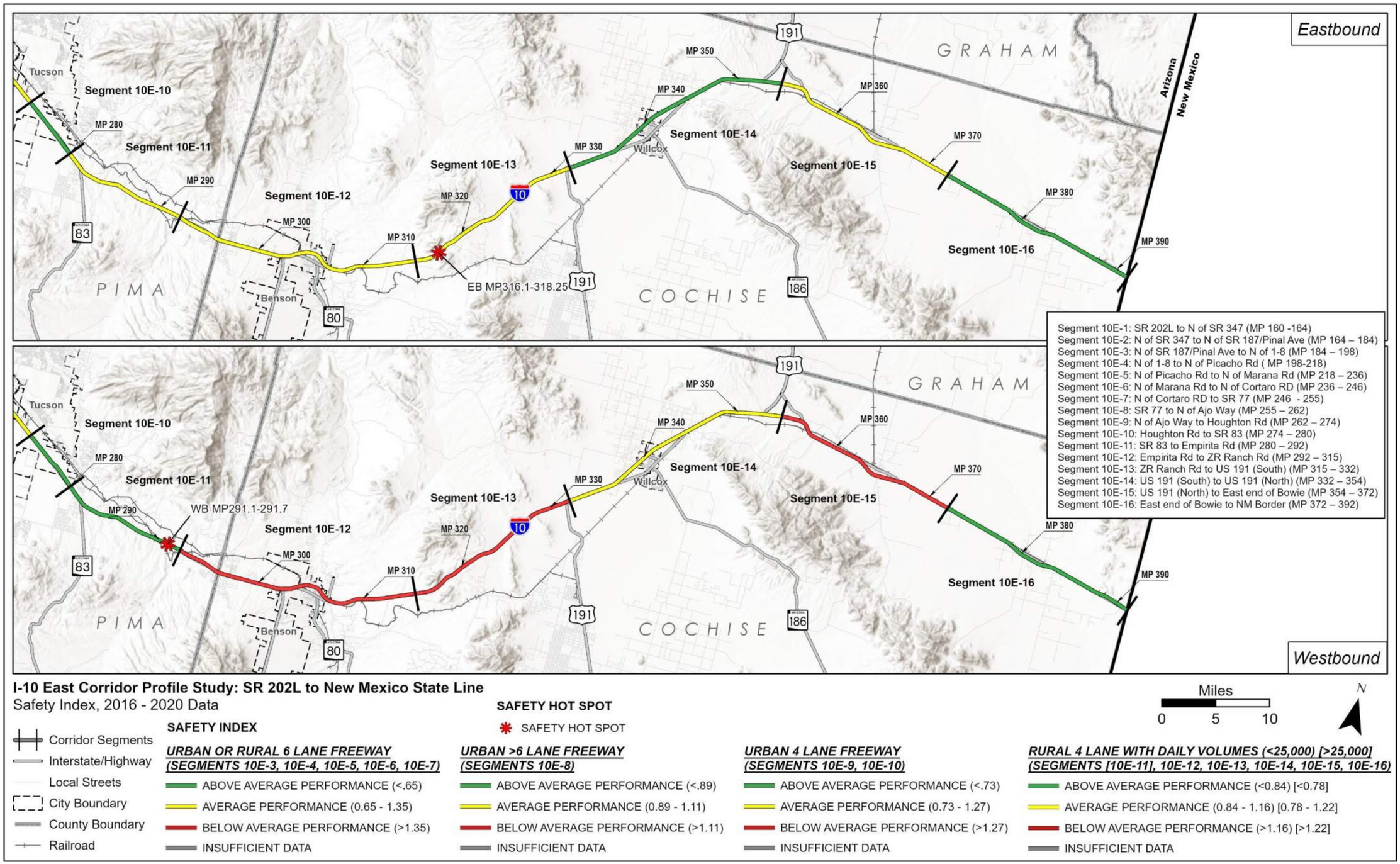


I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Multimodal Opportunities
2019 Data



I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Percentage of Bicycle Accommodation
2019 Data


Segment 10E-1: SR 202L to N of SR 347 (MP 160 -164)
Segment 10E-2: N of SR 347 to N of SR 187/Pinal Ave (MP 164 – 184)
Segment 10E-3: N of SR 187/Pinal Ave to N of 1-8 (MP 184 – 198)
Segment 10E-4: N of 1-8 to N of Picacho Rd (MP 198-218)
Segment 10E-5: N of Picacho Rd to N of Marana Rd (MP 218 – 236)
Segment 10E-6: N of Marana Rd to N of Cortaro RD (MP 236 – 246)
Segment 10E-7: N of Cortaro RD to SR 77 (MP 246 - 255)
Segment 10E-8: SR 77 to N of Ajo Way (MP 255 – 262)
Segment 10E-9: N of Ajo Way to Houghton Rd (MP 262 – 274)
Segment 10E-10: Houghton Rd to SR 83 (MP 274 – 280)
Segment 10E-11: SR 83 to Empirita Rd (MP 280 – 292)
Segment 10E-12: Empirita Rd to ZR Ranch Rd (MP 292 – 315)
Segment 10E-13: ZR Ranch Rd to US 191 (South) (MP 315 – 332)
Segment 10E-14: US 191 (South) to US 191 (North) (MP 332 – 354)
Segment 10E-15: US 191 (North) to East end of Bowie (MP 354 – 372)
Segment 10E-16: East end of Bowie to NM Border (MP 372 – 392)
Eastbound
Westbound
EB MP263-265.5
WB MP251-253
WB MP256-258.2
MARICOPA
PINAL
PIMA
Phoenix
Tempe
Chandler
Tolleson
Avondale
Goodyear
Buckeye
Maricopa
Coolidge
Casa Grande
Eloy
Marana
Oro Valley
South Tucson
Tucson
MP 170
MP 180
MP 190
MP 200
MP 210
MP 220
MP 230
MP 240
MP 260
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Safety Index, 2016 - 2020 Data
SAFETY HOT SPOT
SAFETY HOT SPOT
Miles
0 5 10
N
SAFETY INDEX
Corridor Segments
Interstate/Highway
Local Streets
City Boundary
County Boundary
Railroad
URBAN OR RURAL 6 LANE FREEWAY (SEGMENTS 10E-3, 10E-4, 10E-5, 10E-6, 10E-7)
ABOVE AVERAGE PERFORMANCE (<.65)
AVERAGE PERFORMANCE (0.65 - 1.35)
BELOW AVERAGE PERFORMANCE (>1.35)
INSUFFICIENT DATA
URBAN >6 LANE FREEWAY (SEGMENTS 10E-8)
ABOVE AVERAGE PERFORMANCE (<.89)
AVERAGE PERFORMANCE (0.89 - 1.11)
BELOW AVERAGE PERFORMANCE (>1.11)
INSUFFICIENT DATA
URBAN 4 LANE FREEWAY (SEGMENTS 10E-9, 10E-10)
ABOVE AVERAGE PERFORMANCE (<.73)
AVERAGE PERFORMANCE (0.73 - 1.27)
BELOW AVERAGE PERFORMANCE (>1.27)
INSUFFICIENT DATA
RURAL 4 LANE WITH DAILY VOLUMES (<25,000) [>25,000] (SEGMENTS [10E-11], 10E-12, 10E-13, 10E-14, 10E-15, 10E-16)
ABOVE AVERAGE PERFORMANCE (<0.84) [<0.78]
AVERAGE PERFORMANCE (0.84 - 1.16) [0.78 - 1.22]
BELOW AVERAGE PERFORMANCE (>1.16) [>1.22]
INSUFFICIENT DATA



I-10 East Corridor Profile Study: SR 202L to New Mexico State Line

Safety Index, 2016 - 2020 Data

Corridor Segments
Interstate/Highway
Local Streets
City Boundary
County Boundary
Railroad

SAFETY HOT SPOT

SAFETY HOT SPOT

SAFETY INDEX

URBAN OR RURAL 6 LANE FREEWAY (SEGMENTS 10E-3, 10E-4, 10E-5, 10E-6, 10E-7)

- ABOVE AVERAGE PERFORMANCE (<.65)
- AVERAGE PERFORMANCE (0.65 - 1.35)
- BELOW AVERAGE PERFORMANCE (>1.35)
- INSUFFICIENT DATA

URBAN >6 LANE FREEWAY (SEGMENTS 10E-8)

- ABOVE AVERAGE PERFORMANCE (<.89)
- AVERAGE PERFORMANCE (0.89 - 1.11)
- BELOW AVERAGE PERFORMANCE (>1.11)
- INSUFFICIENT DATA

URBAN 4 LANE FREEWAY (SEGMENTS 10E-9, 10E-10)

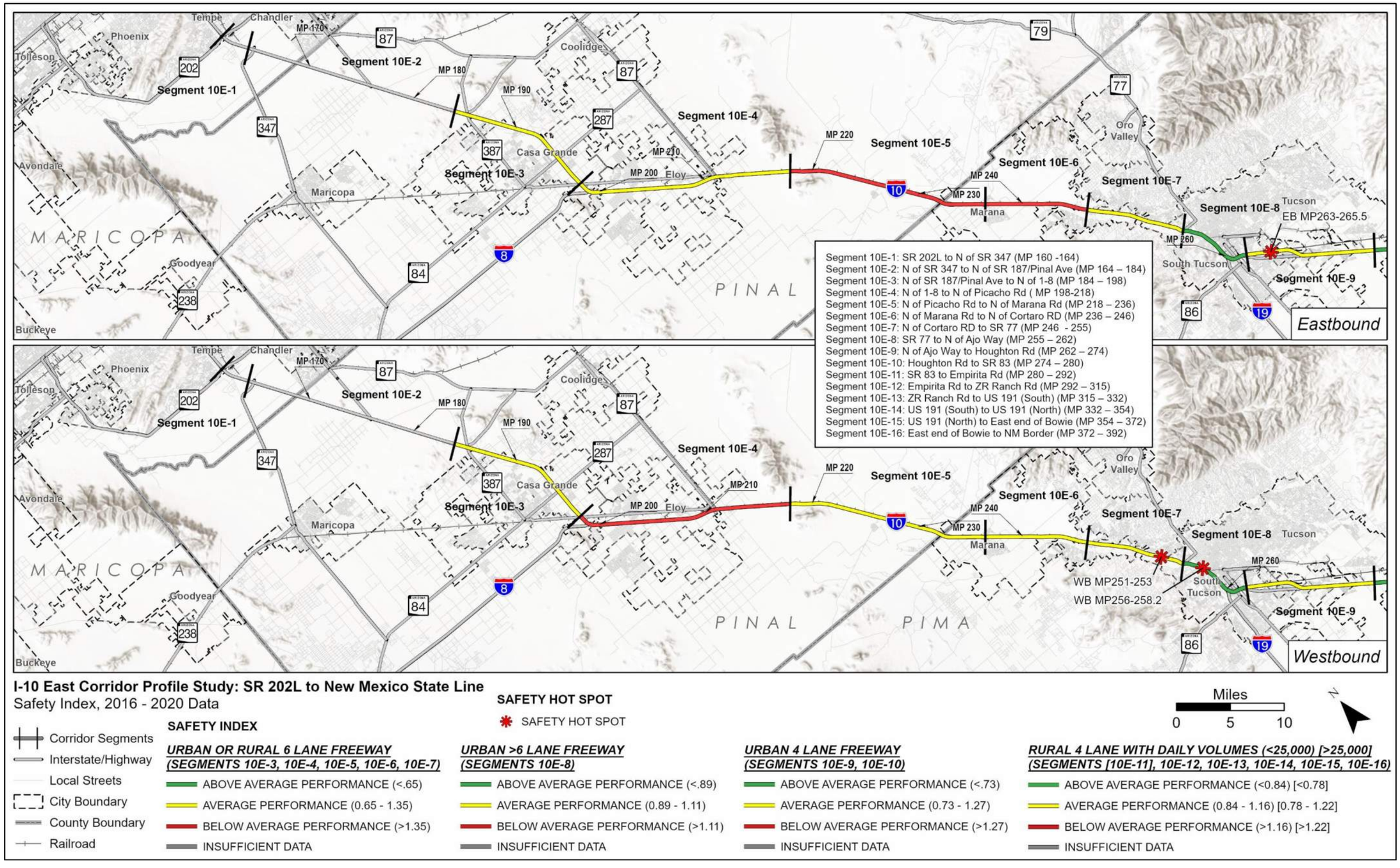
- ABOVE AVERAGE PERFORMANCE (<.73)
- AVERAGE PERFORMANCE (0.73 - 1.27)
- BELOW AVERAGE PERFORMANCE (>1.27)
- INSUFFICIENT DATA

RURAL 4 LANE WITH DAILY VOLUMES (<25,000) [>25,000] (SEGMENTS [10E-11], 10E-12, 10E-13, 10E-14, 10E-15, 10E-16)

- ABOVE AVERAGE PERFORMANCE (<0.84) [<0.78]
- AVERAGE PERFORMANCE (0.84 - 1.16) [0.78 - 1.22]
- BELOW AVERAGE PERFORMANCE (>1.16) [>1.22]
- INSUFFICIENT DATA

Miles 0 5 10

N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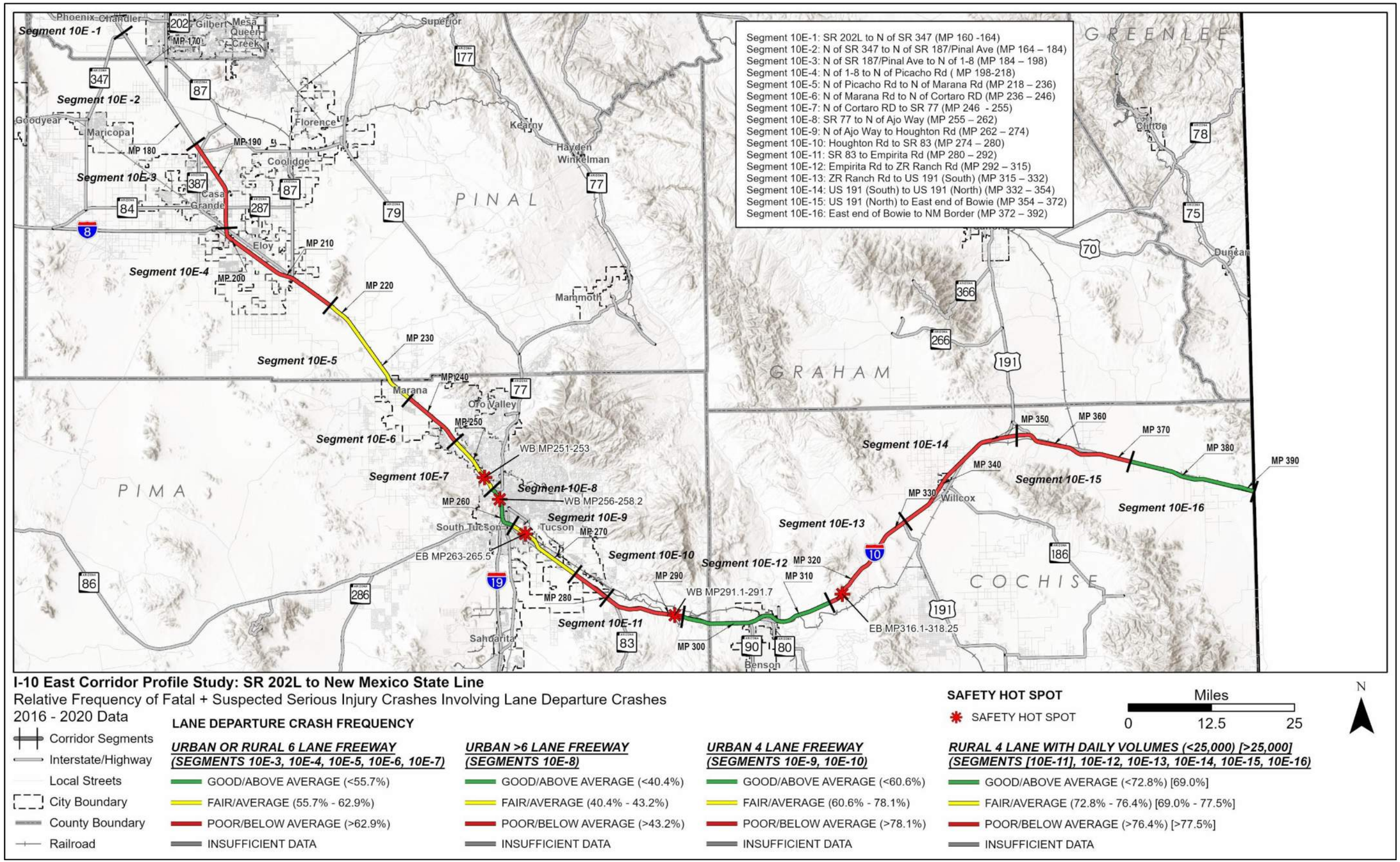
Segment 10E-5: N of Picacho Rd to N of Marana Rd (MP 218 – 236)
Segment 10E-6: N of Marana Rd to N of Cortaro RD (MP 236 – 246)
Segment 10E-7: N of Cortaro RD to SR 77 (MP 246 - 255)
Segment 10E-8: SR 77 to N of Ajo Way (MP 255 – 262)
Segment 10E-9: N of Ajo Way to Houghton Rd (MP 262 – 274)
Segment 10E-10: Houghton Rd to SR 83 (MP 274 – 280)
Segment 10E-11: SR 83 to Empirita Rd (MP 280 – 292)
Segment 10E-12: Empirita Rd to ZR Ranch Rd (MP 292 – 315)
Segment 10E-13: ZR Ranch Rd to US 191 (South) (MP 315 – 332)
Segment 10E-14: US 191 (South) to US 191 (North) (MP 332 – 354)
Segment 10E-15: US 191 (North) to East end of Bowie (MP 354 – 372)
Segment 10E-16: East end of Bowie to NM Border (MP 372 – 392)
Eastbound
Westbound
EB MP263-265.5
WB MP251-253
WB MP256-258.2
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Safety Index, 2016 - 2020 Data
SAFETY HOT SPOT
SAFETY HOT SPOT
SAFETY INDEX
Corridor Segments
Interstate/Highway
Local Streets
City Boundary
County Boundary
Railroad
URBAN OR RURAL 6 LANE FREEWAY (SEGMENTS 10E-3, 10E-4, 10E-5, 10E-6, 10E-7)
ABOVE AVERAGE PERFORMANCE (<.65)
AVERAGE PERFORMANCE (0.65 - 1.35)
BELOW AVERAGE PERFORMANCE (>1.35)
INSUFFICIENT DATA
URBAN >6 LANE FREEWAY (SEGMENTS 10E-8)
ABOVE AVERAGE PERFORMANCE (<.89)
AVERAGE PERFORMANCE (0.89 - 1.11)
BELOW AVERAGE PERFORMANCE (>1.11)
INSUFFICIENT DATA
URBAN 4 LANE FREEWAY (SEGMENTS 10E-9, 10E-10)
ABOVE AVERAGE PERFORMANCE (<.73)
AVERAGE PERFORMANCE (0.73 - 1.27)
BELOW AVERAGE PERFORMANCE (>1.27)
INSUFFICIENT DATA
RURAL 4 LANE WITH DAILY VOLUMES (<25,000) [>25,000] (SEGMENTS [10E-11], 10E-12, 10E-13, 10E-14, 10E-15, 10E-16)
ABOVE AVERAGE PERFORMANCE (<0.84) [<0.78]
AVERAGE PERFORMANCE (0.84 - 1.16) [0.78 - 1.22]
BELOW AVERAGE PERFORMANCE (>1.16) [>1.22]
INSUFFICIENT DATA
Miles
0 5 10
N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Segment 10E-8: SR 77 to N of Ajo Way (MP 255 – 262)
Segment 10E-9: N of Ajo Way to Houghton Rd (MP 262 – 274)
Segment 10E-10: Houghton Rd to SR 83 (MP 274 – 280)
Segment 10E-11: SR 83 to Empirita Rd (MP 280 – 292)
Segment 10E-12: Empirita Rd to ZR Ranch Rd (MP 292 – 315)
Segment 10E-13: ZR Ranch Rd to US 191 (South) (MP 315 – 332)
Segment 10E-14: US 191 (South) to US 191 (North) (MP 332 – 354)
Segment 10E-15: US 191 (North) to East end of Bowie (MP 354 – 372)
Segment 10E-16: East end of Bowie to NM Border (MP 372 – 392)
Segment 10E -1
Segment 10E -2
Segment 10E-3
Segment 10E-4
Segment 10E-5
Segment 10E-6
Segment 10E-7
Segment 10E-8
Segment 10E-9
Segment 10E-10
Segment 10E-11
Segment 10E-12
Segment 10E-13
Segment 10E-14
Segment 10E-15
Segment 10E-16
Phoenix-Chandler
Gilbert
Mesa
Queen Creek
Superior
Goodyear
Maricopa
Florence
Coolidge
Casa Grande
Eloy
Kearny
Hayden
Winkelman
Mammoth
Marana
Oro Valley
South Tucson
Tucson
Sahuarita
Willcox
Benson
Clifton
Duncan
PINAL
PIMA
GRAHAM
GREENLEE
COCHISE
MP 170
MP 180
MP 190
MP 200
MP 210
MP 220
MP 230
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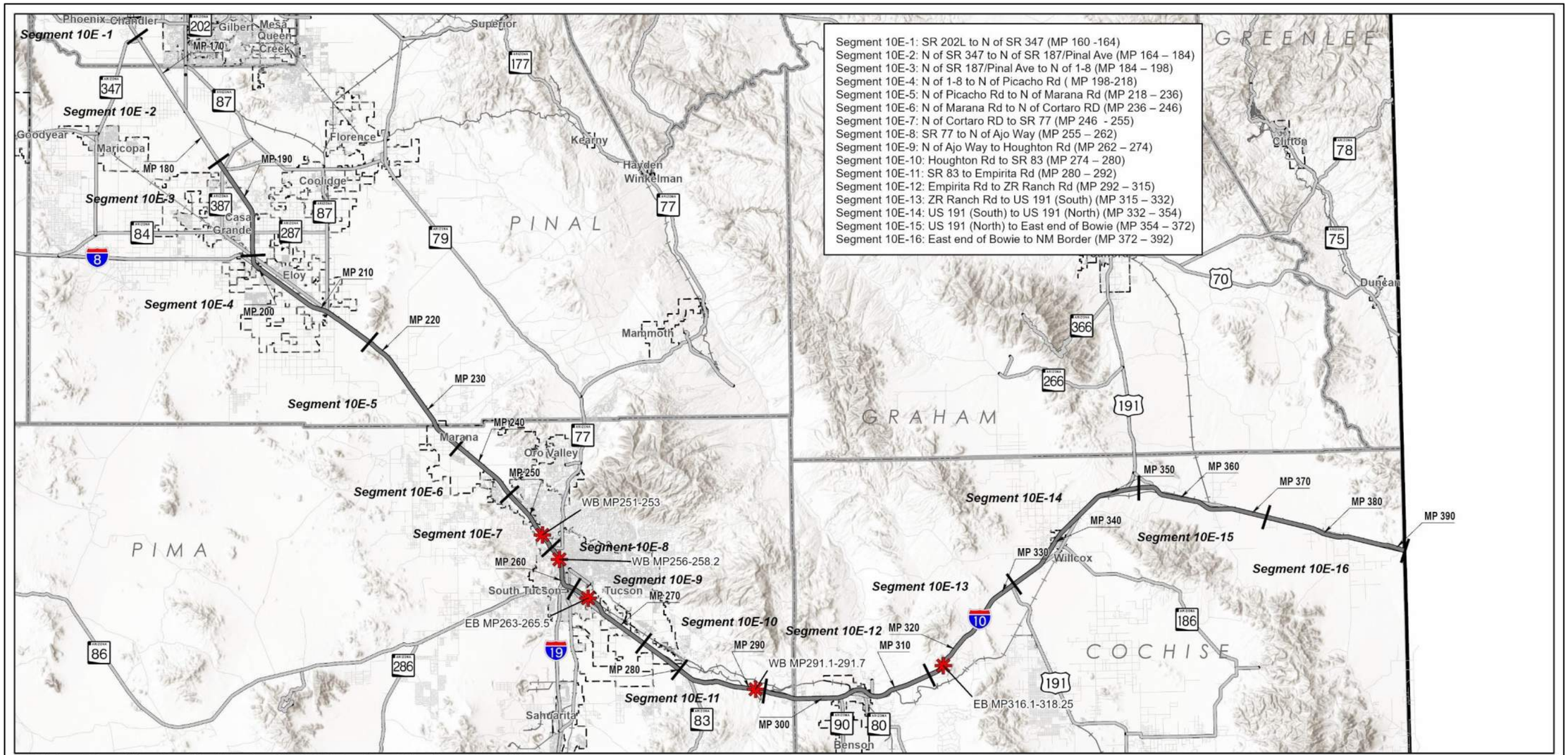
MP 300
MP 310
MP 320
MP 330
MP 340
MP 350
MP 360
MP 370
MP 380
MP 390
WB MP251-253
WB MP256-258.2
EB MP263-265.5
WB MP291.1-291.7
EB MP316.1-318.25
202
347
87
387
84
8
287
79
177
77
10
19
86
286
83
90
80
366
266
191
70
78
75
186
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Lane Departure Crashes
2016 - 2020 Data
Corridor Segments
Interstate/Highway
Local Streets
City Boundary
County Boundary
Railroad
LANE DEPARTURE CRASH FREQUENCY
URBAN OR RURAL 6 LANE FREEWAY (SEGMENTS 10E-3, 10E-4, 10E-5, 10E-6, 10E-7)
GOOD/ABOVE AVERAGE (<55.7%)
FAIR/AVERAGE (55.7% - 62.9%)
POOR/BELOW AVERAGE (>62.9%)
INSUFFICIENT DATA
URBAN >6 LANE FREEWAY (SEGMENTS 10E-8)
GOOD/ABOVE AVERAGE (<40.4%)
FAIR/AVERAGE (40.4% - 43.2%)
POOR/BELOW AVERAGE (>43.2%)
INSUFFICIENT DATA
URBAN 4 LANE FREEWAY (SEGMENTS 10E-9, 10E-10)
GOOD/ABOVE AVERAGE (<60.6%)
FAIR/AVERAGE (60.6% - 78.1%)
POOR/BELOW AVERAGE (>78.1%)
INSUFFICIENT DATA
RURAL 4 LANE WITH DAILY VOLUMES (<25,000) [>25,000] (SEGMENTS [10E-11], 10E-12, 10E-13, 10E-14, 10E-15, 10E-16)
GOOD/ABOVE AVERAGE (<72.8%) [69.0%]
FAIR/AVERAGE (72.8% - 76.4%) [69.0% - 77.5%]
POOR/BELOW AVERAGE (>76.4%) [>77.5%]
INSUFFICIENT DATA
SAFETY HOT SPOT
SAFETY HOT SPOT
Miles
0
12.5
25
N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Segment 10E-15: US 191 (North) to East end of Bowie (MP 354 – 372)
Segment 10E-16: East end of Bowie to NM Border (MP 372 – 392)
Phoenix-Chandler
Gilbert
Mesa
Queen Creek
Superior
Goodyear
Maricopa
Florence
Kearny
Hayden
Winkelman
Coolidge
Casa Grande
Eloy
Mammoth
Marana
Oro Valley
South Tucson
Tucson
Sahuarita
Willcox
Benson
Clifton
Duncan
PINAL
PIMA
GRAHAM
GREENLEE
COCHISE
WB MP251-253
WB MP256-258.2
EB MP263-265.5
WB MP291.1-291.7
EB MP316.1-318.25
MP 170
MP 180
MP 190
MP 200
MP 210
MP 220
MP 230
MP 240
MP 250
MP 260
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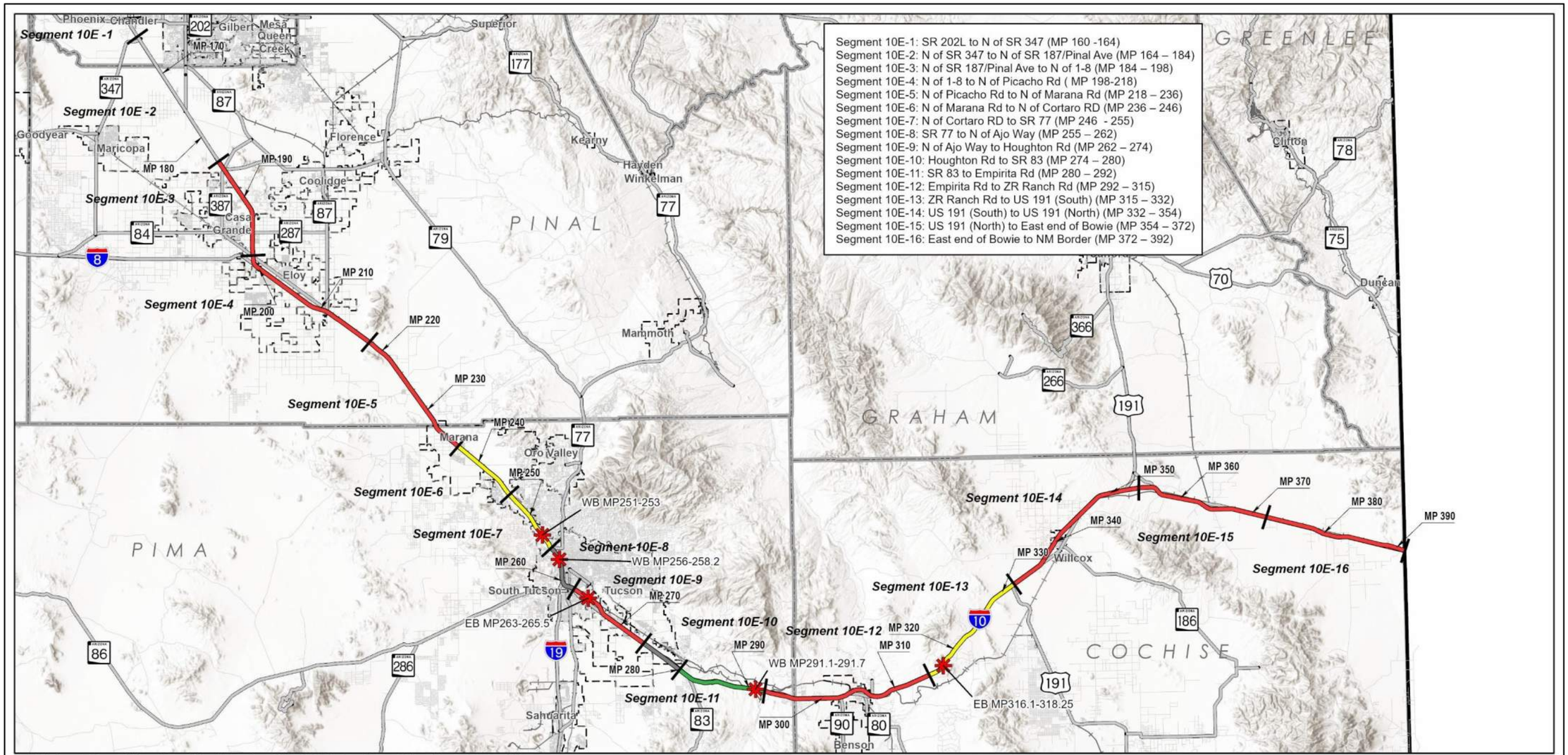
MP 310
MP 320
MP 330
MP 340
MP 350
MP 360
MP 370
MP 380
MP 390
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Pedestrian Crashes
2016 - 2020 Data
PEDESTRIAN CRASH FREQUENCY
Corridor Segments
Interstate/Highway
Local Streets
City Boundary
County Boundary
Railroad
URBAN OR RURAL 6 LANE FREEWAY (SEGMENTS 10E-3, 10E-4, 10E-5, 10E-6, 10E-7)
GOOD/ABOVE AVERAGE (<4.0%)
FAIR/AVERAGE (4.0% - 7.9%)
POOR/BELOW AVERAGE (>7.9%)
INSUFFICIENT DATA
URBAN >6 LANE FREEWAY (SEGMENTS 10E-8)
GOOD/ABOVE AVERAGE (<1.6%)
FAIR/AVERAGE (1.6% - 4.7%)
POOR/BELOW AVERAGE (>4.7%)
INSUFFICIENT DATA
URBAN 4 LANE FREEWAY (SEGMENTS 10E-9, 10E-10)
GOOD/ABOVE AVERAGE (<0.0%)
FAIR/AVERAGE (0.0% - 4.9%)
POOR/BELOW AVERAGE (>4.9%)
INSUFFICIENT DATA
RURAL 4 LANE WITH DAILY VOLUMES (<25,000) [>25,000] (SEGMENTS [10E-11], 10E-12, 10E-13, 10E-14, 10E-15, 10E-16)
GOOD/ABOVE AVERAGE (<1.0%) [<0.7%]
FAIR/AVERAGE (1.0% - 3.3%) [0.7% - 4.7%]
POOR/BELOW AVERAGE (>3.3%) [>4.7%]
INSUFFICIENT DATA
SAFETY HOT SPOT
SAFETY HOT SPOT
Miles
0
12.5
25
N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Segment 10E-16: East end of Bowie to NM Border (MP 372 – 392)
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Queen Creek
Superior
Florence
Kearny
Hayden
Winkelman
Coolidge
Casa Grande
Eloy
Maricopa
Goodyear
Mammoth
Marana
Oro Valley
South Tucson
Tucson
Sahuarita
Willcox
Benson
Clifton
Duncan
Safford
PINAL
PIMA
GRAHAM
GREENLEE
COCHISE
MP 180
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MP 370
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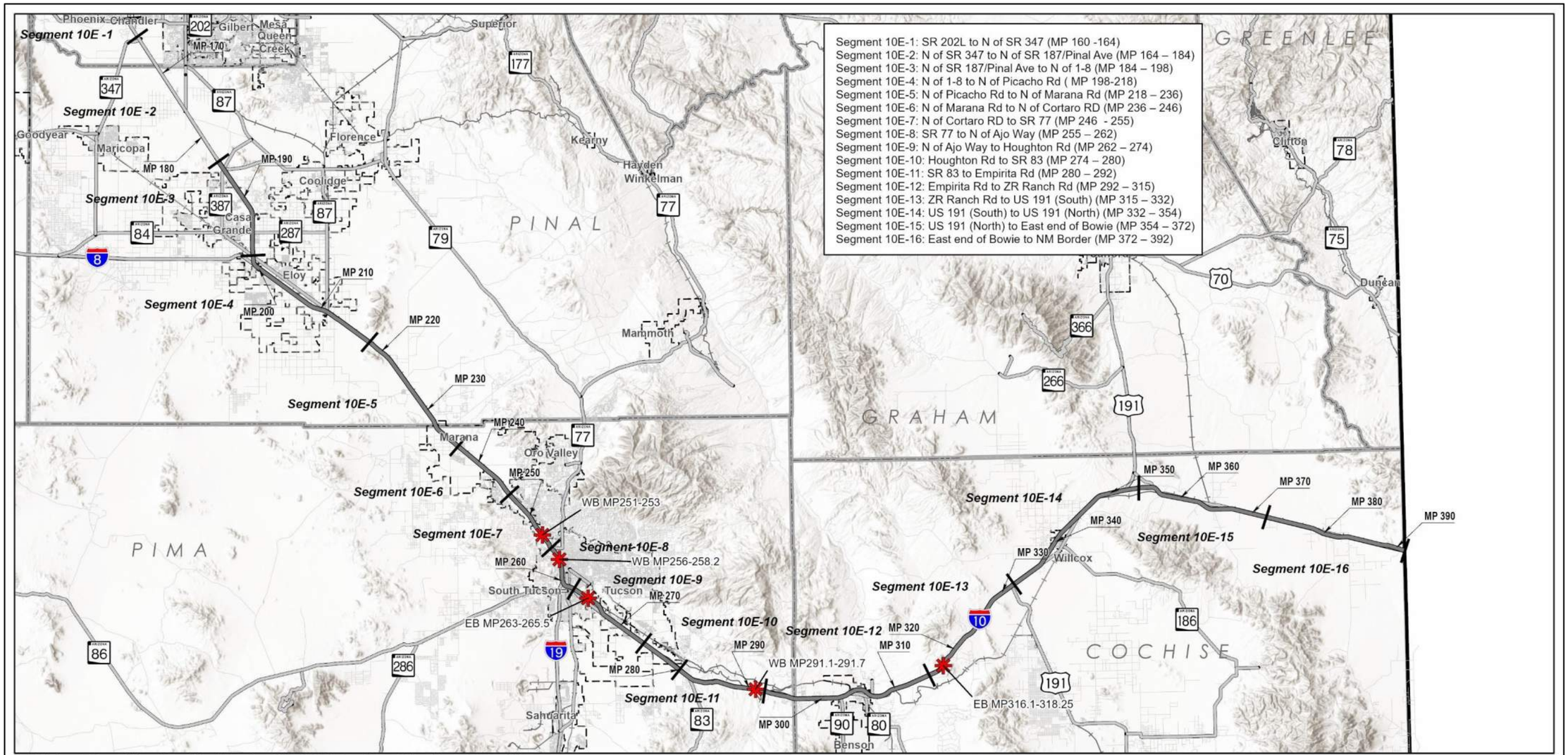
MP 390
WB MP251-253
WB MP256-258.2
EB MP263-265.5
WB MP291.1-291.7
EB MP316.1-318.25
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Truck Crashes
2016 - 2020 Data
SAFETY HOT SPOT
SAFETY HOT SPOT
Miles
0
12.5
25
N
TRUCK CRASH FREQUENCY
Corridor Segments
Interstate/Highway
Local Streets
City Boundary
County Boundary
Railroad
URBAN OR RURAL 6 LANE FREEWAY (SEGMENTS 10E-3, 10E-4, 10E-5, 10E-6, 10E-7)
GOOD/ABOVE AVERAGE (<5.0%)
FAIR/AVERAGE (5.0% - 12.9%)
POOR/BELOW AVERAGE (>12.9%)
INSUFFICIENT DATA
URBAN >6 LANE FREEWAY (SEGMENTS 10E-8)
GOOD/ABOVE AVERAGE (<1.9%)
FAIR/AVERAGE (1.9% - 5.1%)
POOR/BELOW AVERAGE (>5.1%)
INSUFFICIENT DATA
URBAN 4 LANE FREEWAY (SEGMENTS 10E-9, 10E-10)
GOOD/ABOVE AVERAGE (<6.9%)
FAIR/AVERAGE (6.9% - 12.4%)
POOR/BELOW AVERAGE (>12.4%)
INSUFFICIENT DATA
RURAL 4 LANE WITH DAILY VOLUMES (<25,000) [>25,000] (SEGMENTS [10E-11], 10E-12, 10E-13, 10E-14, 10E-15, 10E-16)
GOOD/ABOVE AVERAGE (<19.0%) [<8.5%]
FAIR/AVERAGE (19.0% - 22.5%) [8.5% - 18.0%]
POOR/BELOW AVERAGE (>22.5%) [18.0%]
INSUFFICIENT DATA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Segment 10E-16: East end of Bowie to NM Border (MP 372 – 392)
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Gilbert
Mesa
Queen Creek
Superior
Florence
Kearny
Hayden
Winkelman
Coolidge
Casa Grande
Eloy
Mammoth
Marana
Oro Valley
South Tucson
Tucson
Sahuarita
Willcox
Benson
Clifton
Duncan
Goodyear
Maricopa
PINAL
PIMA
GRAHAM
GREENLEE
COCHISE
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MP 190
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MP 280
MP 290
MP 300
MP 310
MP 320
MP 330
MP 340
MP 350
MP 360
MP 370
MP 380
MP 390
WB MP251-253
WB MP256-258.2
EB MP263-265.5
WB MP291.1-291.7
EB MP316.1-318.25
202
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387
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287
8
79
177
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78
75
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366
266
191
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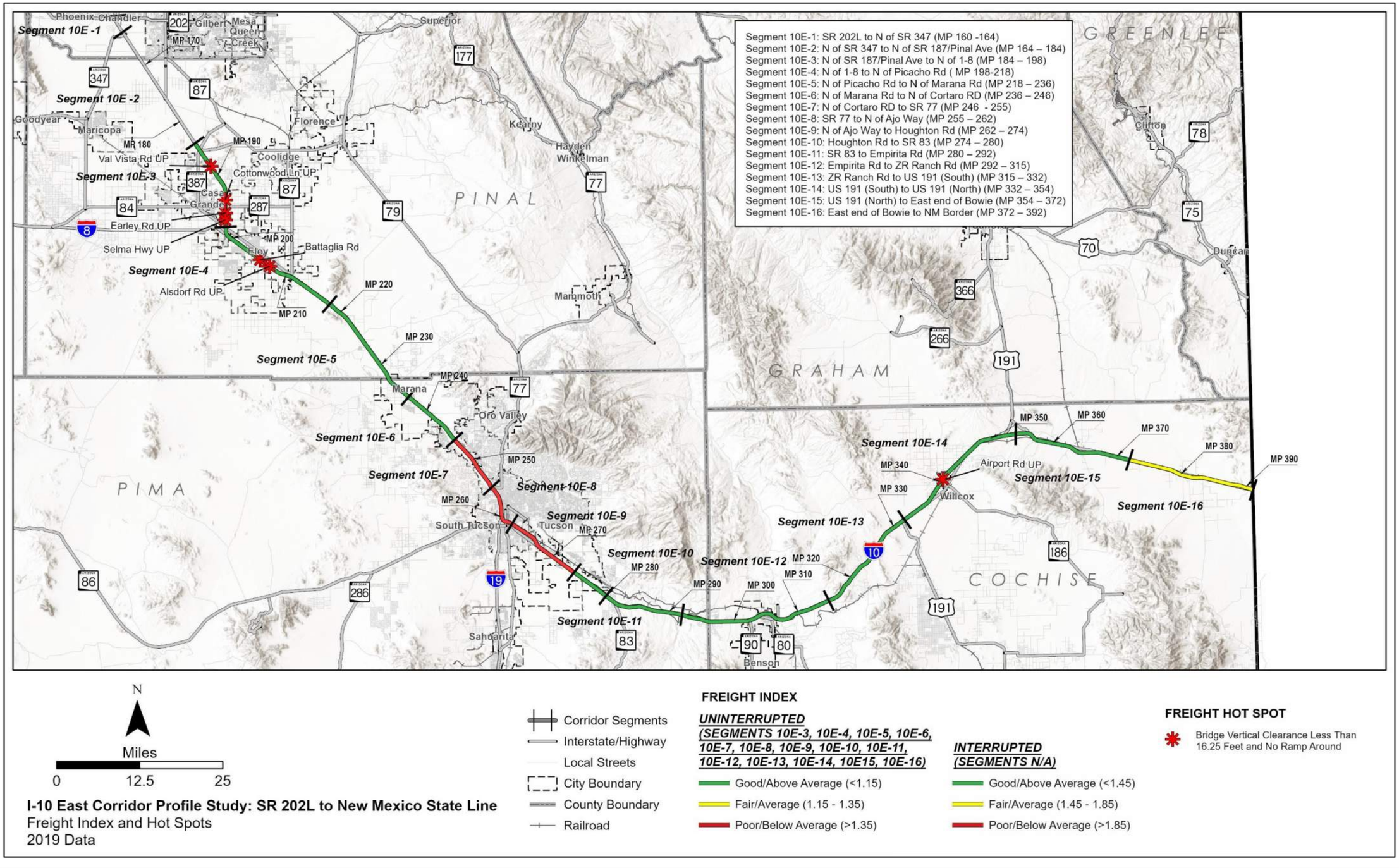
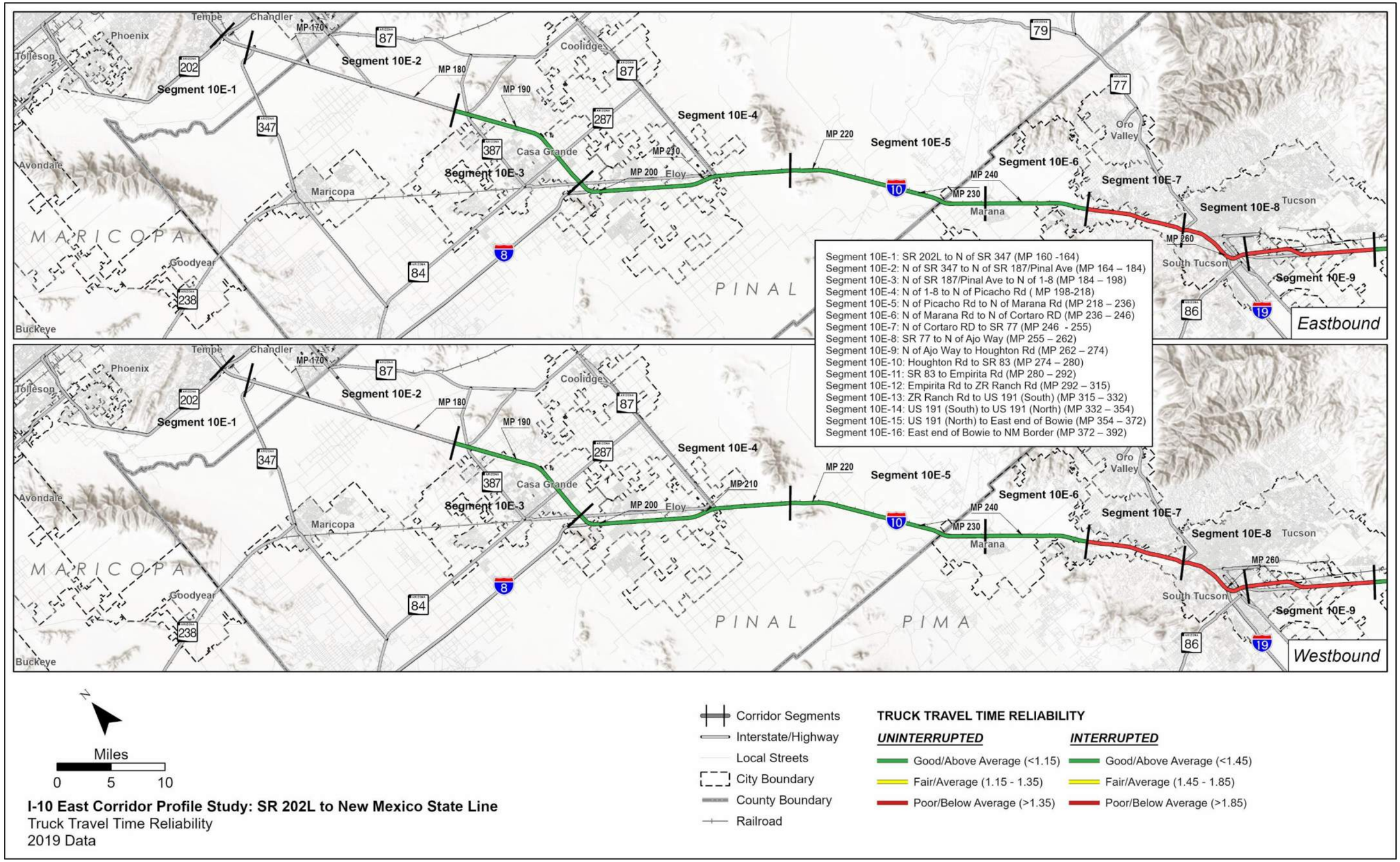
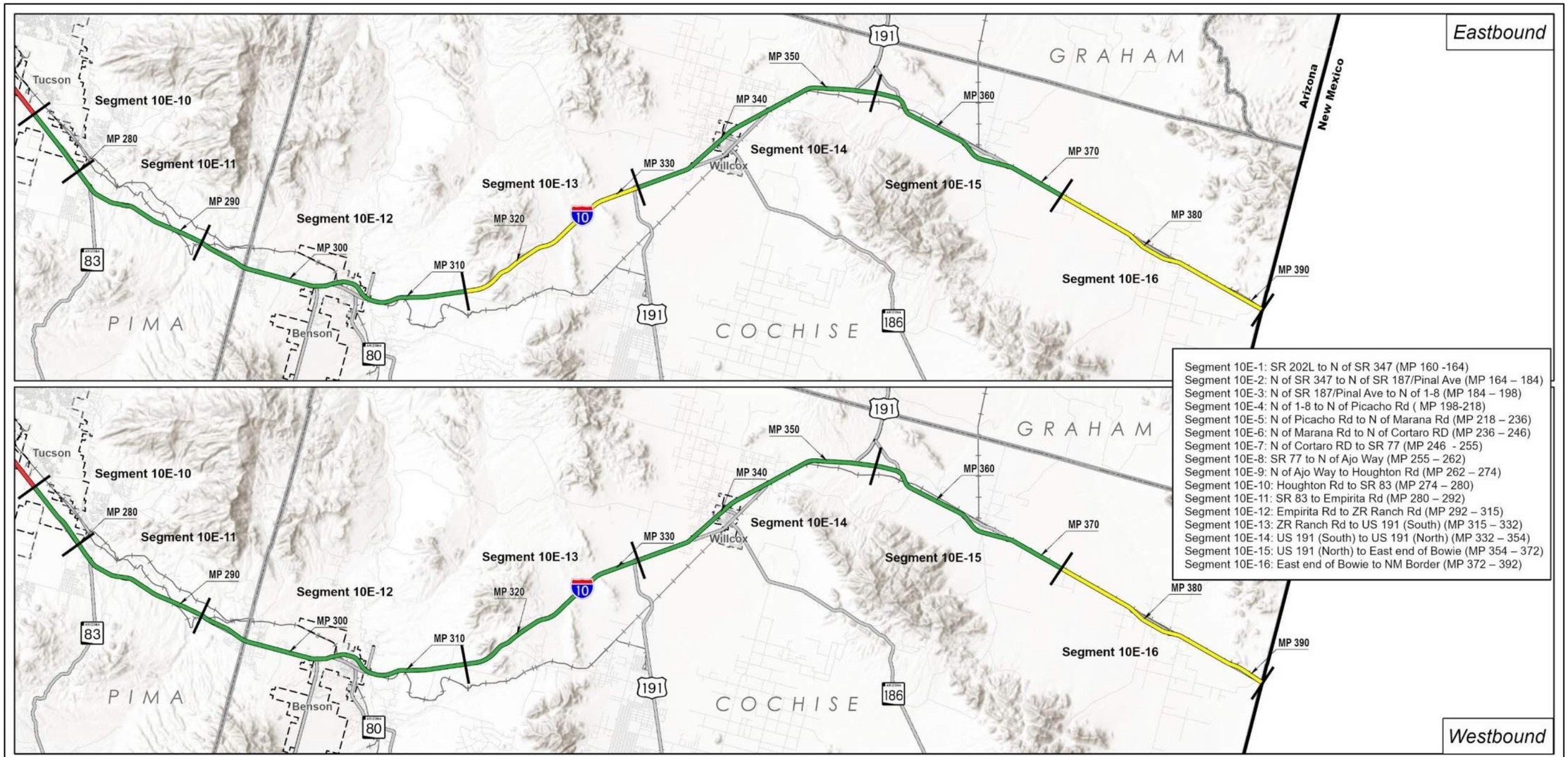
186
19
286
86
83
90
80
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Bicycle Crashes
2016 - 2020 Data
BICYCLE CRASH FREQUENCY
Corridor Segments
Interstate/Highway
Local Streets
City Boundary
County Boundary
Railroad
URBAN OR RURAL 6 LANE FREEWAY (SEGMENTS 10E-3, 10E-4, 10E-5, 10E-6, 10E-7)
GOOD/ABOVE AVERAGE (<0.0%)
FAIR/AVERAGE (0.0% - 1.3%)
POOR/BELOW AVERAGE (>1.3%)
INSUFFICIENT DATA
URBAN >6 LANE FREEWAY (SEGMENTS 10E-8)
GOOD/ABOVE AVERAGE (<0.00%)
FAIR/AVERAGE (0.00% - 0.00%)
POOR/BELOW AVERAGE (>0.00%)
INSUFFICIENT DATA
URBAN 4 LANE FREEWAY (SEGMENTS 10E-9, 10E-10)
GOOD/ABOVE AVERAGE (<0.00%)
FAIR/AVERAGE (0.00% - 0.00%)
POOR/BELOW AVERAGE (>0.00%)
INSUFFICIENT DATA
RURAL 4 LANE WITH DAILY VOLUMES (<25,000) [25,000] (SEGMENTS [10E-11], 10E-12, 10E-13, 10E-14, 10E-15, 10E-16)
GOOD/ABOVE AVERAGE (<0.0%) [<0.0%]
FAIR/AVERAGE (0.0% - 0.9%) [0.0% - 0.0%]
POOR/BELOW AVERAGE (>0.9%) [>0.0%]
INSUFFICIENT DATA
SAFETY HOT SPOT
SAFETY HOT SPOT
Miles
0
12.5
25
N



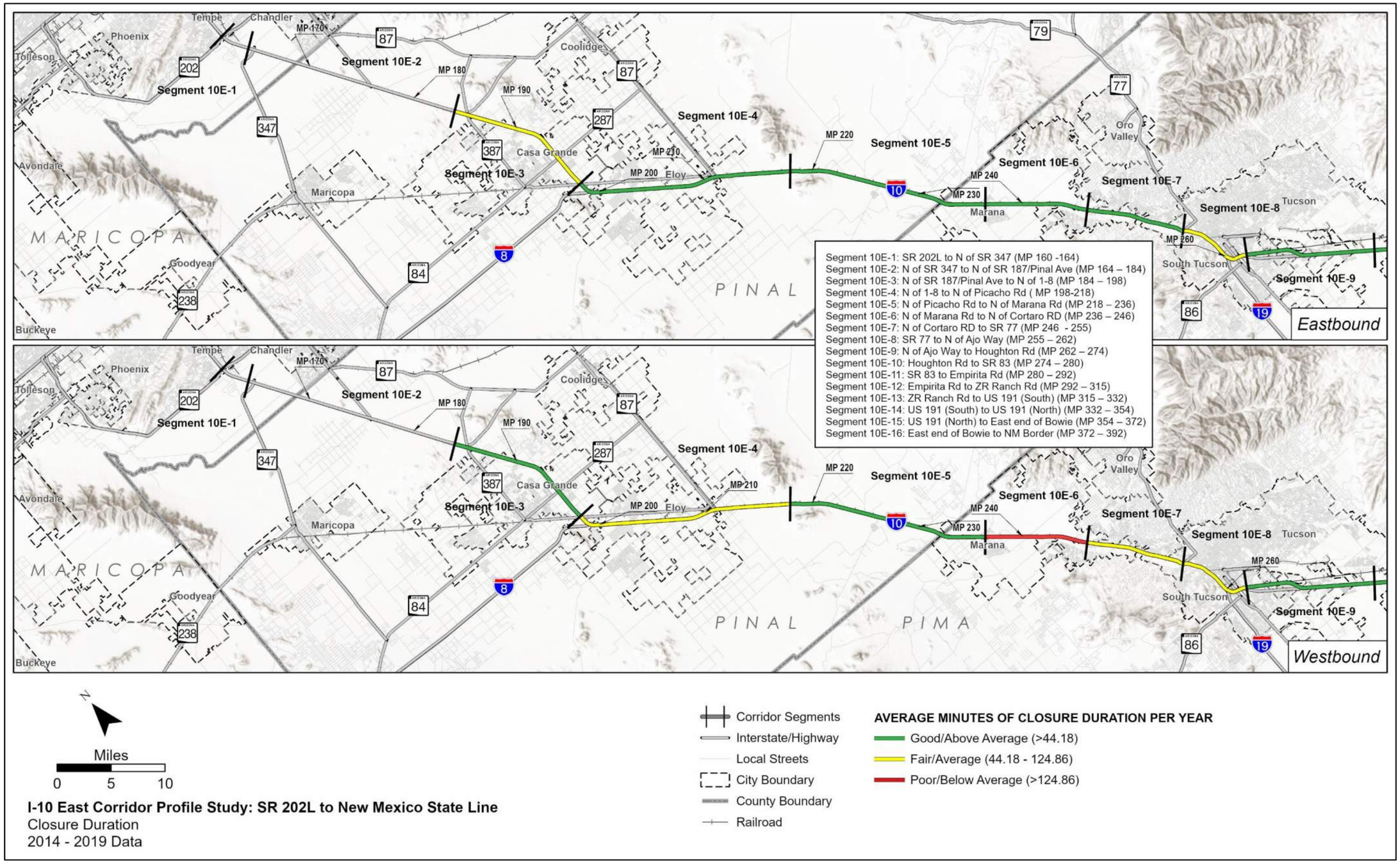
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Freight Index and Hot Spots
2019 Data



I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Truck Travel Time Reliability
2019 Data



I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Truck Travel Time Reliability
2019 Data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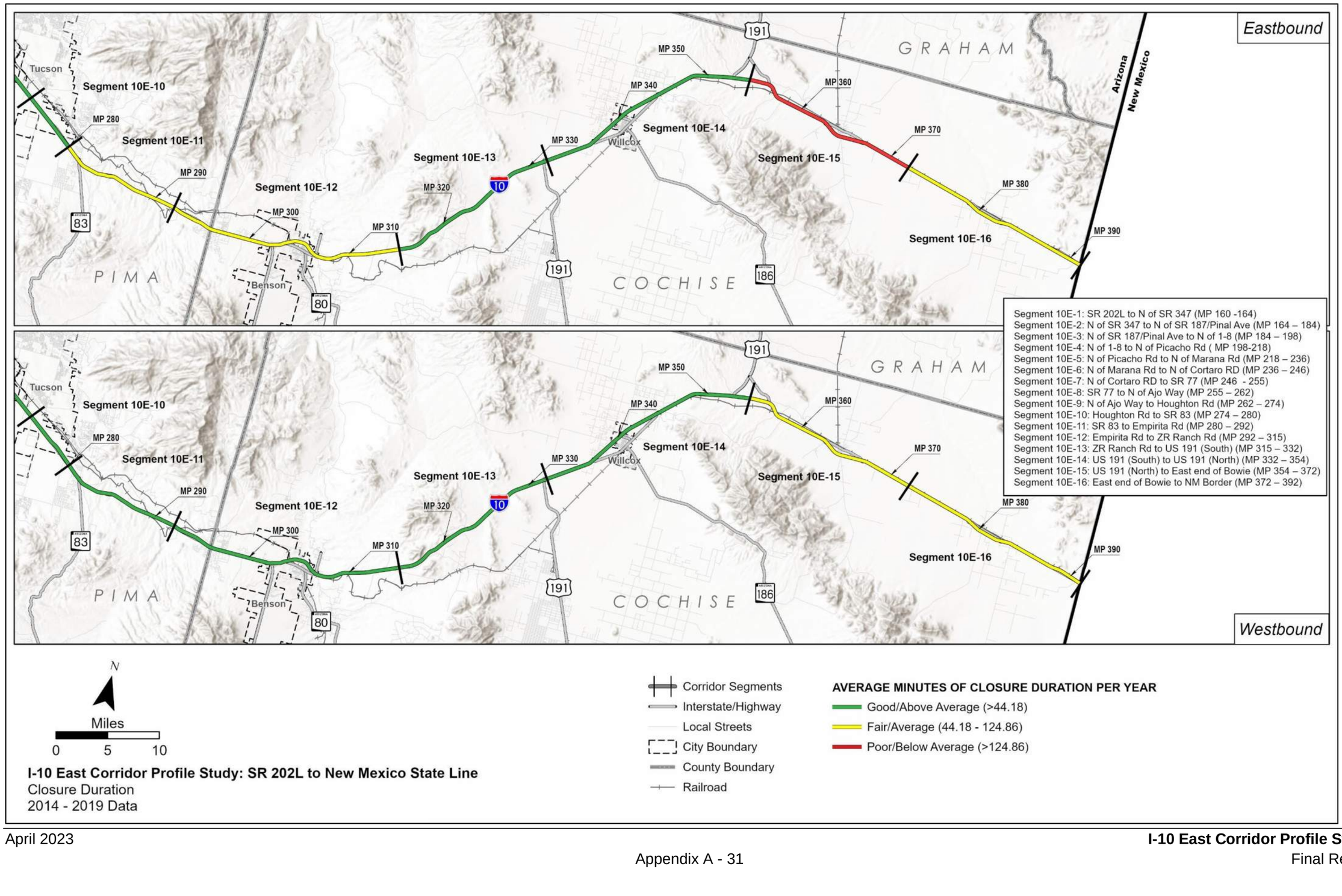
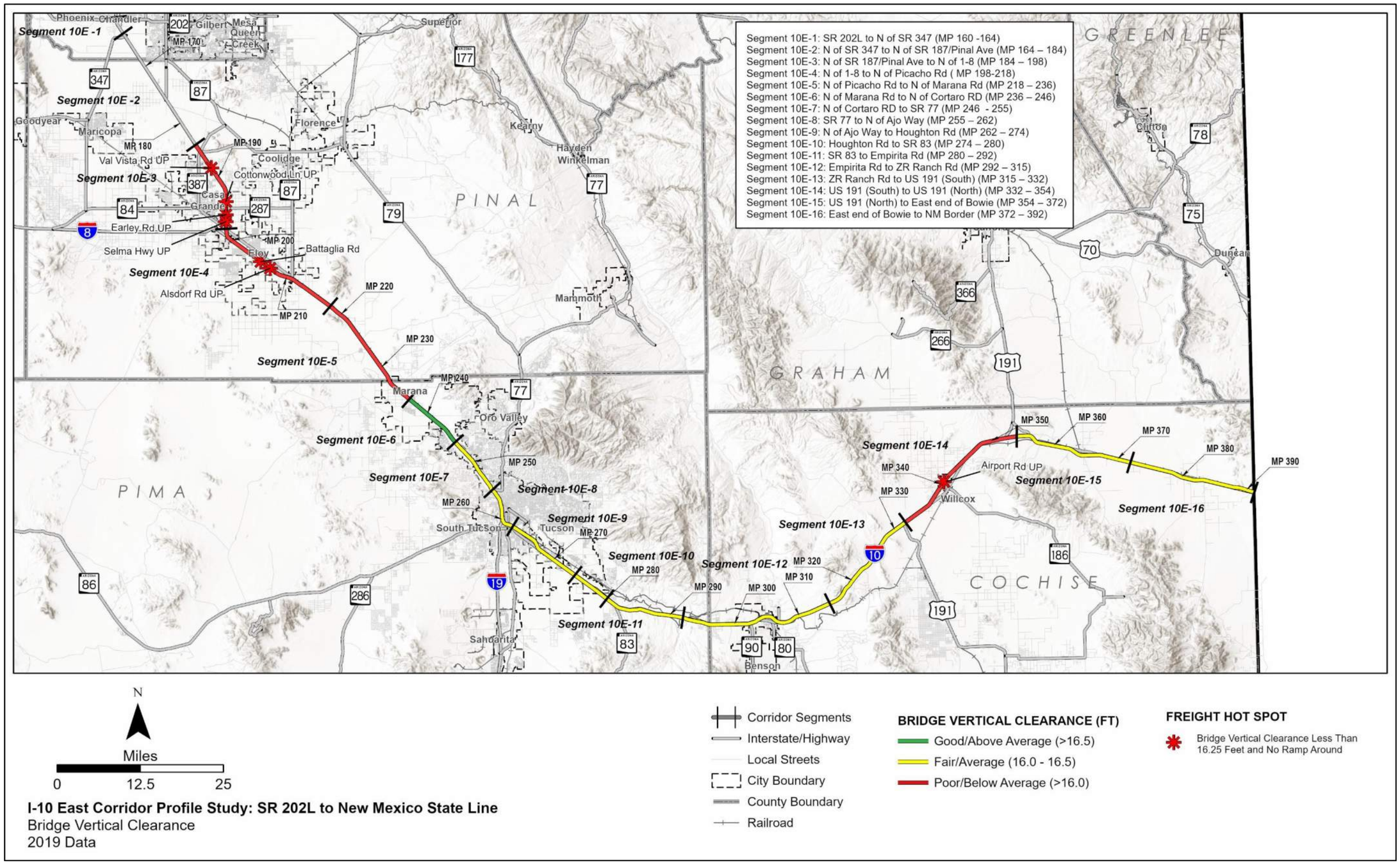
Segment 10E-15: US 191 (North) to East end of Bowie (MP 354 – 372)
Segment 10E-16: East end of Bowie to NM Border (MP 372 – 392)
Eastbound
Westbound
Tempe
Chandler
Phoenix
Tolleson
Coolidge
Avondale
Casa Grande
Eloy
Maricopa
Marana
Oro Valley
Tucson
South Tucson
Goodyear
Buckeye
MARICOPA
PINAL
PIMA
MP 170
MP 180
MP 190
MP 200
MP 210
MP 220
MP 230
MP 240
MP 260
Segment 10E-1
Segment 10E-2
Segment 10E-3
Segment 10E-4
Segment 10E-5
Segment 10E-6
Segment 10E-7
Segment 10E-8
Segment 10E-9
202
87
347
387
287
79
77
10
8
84
238
86
19
N
Miles
0 5 10
I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Closure Duration
2014 - 2019 Data
Corridor Segments
Interstate/Highway
Local Streets
City Boundary
County Boundary
Railroad
AVERAGE MINUTES OF CLOSURE DURATION PER YEAR
Good/Above Average (>44.18)
Fair/Average (44.18 - 124.86)
Poor/Below Average (>124.86)



I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Closure Duration
2014 - 2019 Data

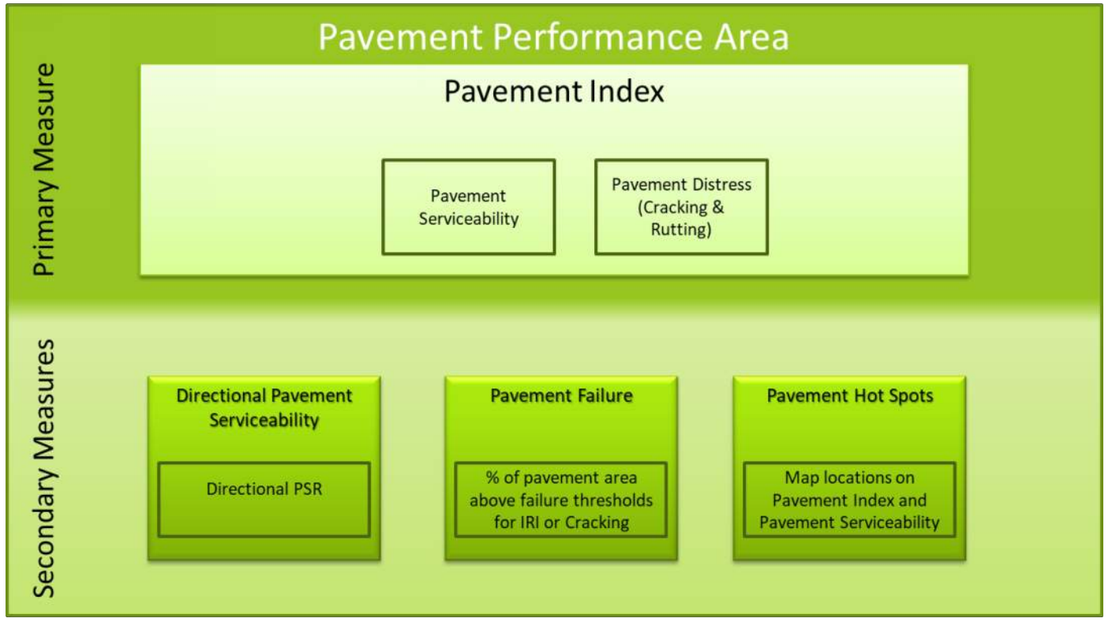


I-10 East Corridor Profile Study: SR 202L to New Mexico State Line
Bridge Vertical Clearance
2019 Data

Appendix B: Performance Area Detailed Calculation Methodologies

Pavement Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Pavement performance area as shown in the following graphic:



This performance area is used to evaluate mainline pavement condition. Pavement condition data for ramps, frontage roads, crossroads, etc. was not included in the evaluation.

Primary Pavement Index

The Pavement Index is calculated based on the use of three pavement condition ratings from the ADOT Pavement Database. The three ratings are the International Roughness Index (IRI), the Cracking rating, and the Rutting rating. The calculation of the Pavement Index uses a combination of these three ratings.

The IRI is a measurement of the pavement roughness based on field-measured longitudinal roadway profiles. To facilitate the calculation of the index, the IRI rating was converted to a Pavement Serviceability Rating (PSR) using the following equation:

$$PSR = 5 * e^{-0.0038*IRI}$$

The Cracking rating is a measurement of the amount of surface cracking based on a field-measured area of 1,000 square feet that serves as a sample for each mile. The Rutting rating is a measurement of the depth of pavement rutting based on field measurements. To facilitate the calculation of the index, the Cracking Rating and Rutting Rating were combined and converted to a Pavement Distress Index (PDI) using the following equation:

$$PDI = 5 - [\,(0.345 * C^{0.66}) + \left(0.01428 * \left(\frac{R}{2} * 100\right)^{1.32}\right) - \left(0.0823 * C^{0.18} * \left(\frac{R}{2} * 100\right)^{0.50}\right)\,]$$

Both the PSR and PDI use a 0 to 5 scale with 0 representing the lowest performance and 5 representing the highest performance. The performance thresholds for interstates and non-interstates shown in the tables below were used for the PSR and PDI.

Performance Level for Interstates	IRI (PSR)	Cracking & Rutting (PDI)
Good	<75 (>3.75)	Cracking <5.75 Rutting < 0.35
Fair	75 - 102 (3.40 - 3.75)	Cracking 5.75 - 12 Rutting 0.35 – 0.55
Poor	>102(<3.40)	Cracking >12 Rutting > 0.55

Performance Level for Non-Interstates	IRI (PSR)	Cracking & Rutting (PDI)
Good	<94 (>3.5)	Cracking < 5.75 Rutting < 0.35
Fair	94 - 142 (2.90 - 3.5)	Cracking 5.75 - 12 Rutting 0.35 – 0.55
Poor	>142 (<2.90)	Cracking >12 Rutting > 0.55

The PSR and PDI are calculated for each 1-mile section of roadway. If PSR or PDI falls into a poor rating (<3.4 for PSR for interstates, for example) for a 1-mile section, then the score for that 1-mile section is entirely (100%) based on the lower score (either PSR or PDI). If neither PSR or PDI fall into a poor rating for a 1-mile section, then the score for that 1-mile section is based on a combination of the lower rating (70% weight) and the higher rating (30% weight). The result is a score between 0 and 5 for each direction of travel of each mile of roadway based on a combination of both the PSR and the PDI.

The project corridor has been divided into segments. The Pavement Index for each segment is a weighted average of the directional ratings based on the number of travel lanes. Therefore, the condition of a section with more travel lanes will have a greater influence on the resulting segment Pavement Index than a section with fewer travel lanes.

Secondary Pavement Measures

Three secondary measures are evaluated:

- Directional Pavement Serviceability
- Pavement Failure
- Pavement Hot Spots

Directional Pavement Serviceability: Similar to the Pavement Index, the Directional Pavement Serviceability is calculated as a weighted average (based on number of lanes) for each segment. However, this rating only utilizes the PSR and is calculated separately for each direction of travel. The PSR uses a 0 to 5 scale with 0 representing the lowest performance and 5 representing the highest performance.

Pavement Failure: The percentage of pavement area rated above the failure thresholds for IRI, Cracking, or Rutting is calculated for each segment. In addition, the Standard score (z-score) is calculated for each segment.

The Standard score (z-score) is the number of standard deviations above or below the mean. Therefore, a Standard score between -0.5 and +0.5 is "average", less than -0.5 is lower (better) than average, and higher than +0.5 is above (worse) than average.

Pavement Hot Spots: The Pavement Index map identifies locations that have an IRI rating, Cracking rating, or Rutting rating that fall above the failure threshold as identified by ADOT Pavement Group. For interstates, an IRI rating above 105, a Cracking rating above 10, or a Rutting rating above 0.4 will be used as the thresholds which are slightly different than the ratings shown previously. For non-interstates, an IRI rating above 142, a Cracking rating above 10, or a Rutting rating above 0.4 will be used as the thresholds.

Scoring

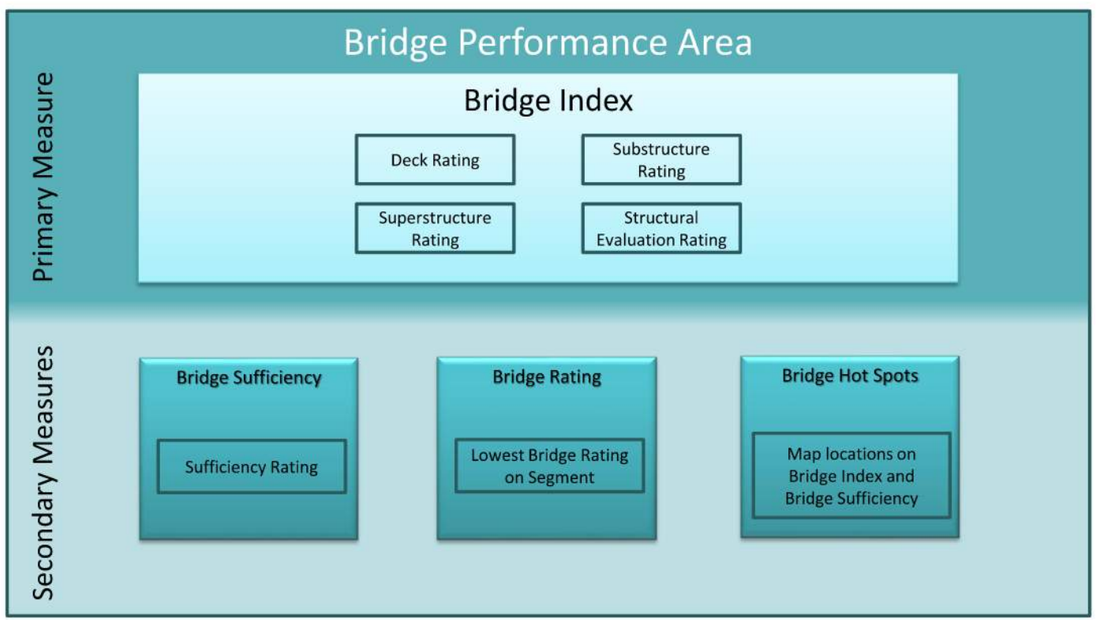
Performance Level	Pavement Index	
	Interstates	Non-Interstates
Good	>3.75	>3.6
Fair	3.0 - 3.75	2.8 - 3.6
Poor	<3.0	<2.8

Performance Level	Directional Pavement Serviceability	
	Interstates	Non-Interstates
Good	>3.75	>3.5
Fair	3.4 - 3.75	2.9 - 3.5
Poor	<3.4	<2.9

Performance Level	% Pavement Failure
Good	< 5%
Fair	5% – 20%
Poor	>20%

Bridge Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Bridge performance area as shown in the following graphic:



This performance area is used to evaluate mainline bridges. Bridges on ramps (that do not cross the mainline), frontage roads, etc. should not be included in the evaluation. Basically, any bridge that carries mainline traffic or carries traffic over the mainline should be included and bridges that do not carry mainline traffic, run parallel to the mainline (frontage roads), or do not cross the mainline should not be included.

Primary Bridge Index

The Bridge Index is calculated based on the use of four bridge condition ratings from the ADOT Bridge Database, also known as the Arizona Bridge Information and Storage System (ABISS). The four ratings are the Deck Rating, Substructure Rating, Superstructure Rating, and Structural Evaluation Rating. The calculation of the Bridge Index uses the lowest of these four ratings.

Each of the four condition ratings use a 0 to 9 scale with 0 representing the lowest performance and 9 representing the highest performance.

The project corridor has been divided into segments and the bridges are grouped together according to the segment definitions. In order to report the Bridge Index for each corridor segment, the Bridge Index for each segment is a weighted average based on the deck area for each bridge. Therefore, the condition of a larger bridge will have a greater influence on the resulting segment Bridge Index than a smaller bridge.

Secondary Bridge Measures

Three secondary measures will be evaluated:

- Bridge Sufficiency
- Bridge Rating
- Bridge Hot Spots

Bridge Sufficiency: Similar to the Bridge Index, the Bridge Sufficiency rating is calculated as a weighted average (based on deck area) for each segment. The Bridge Sufficiency rating is a scale of 0 to 100 with 0 representing the lowest performance and 100 representing the highest performance. A rating of 80 or above represents “good” performance, a rating between 50 and 80 represents “fair” performance, and a rating below 50 represents “poor” performance.

Bridge Rating: The Bridge Rating simply identifies the lowest bridge rating on each segment. This performance measure is not an average and therefore is not weighted based on the deck area. The Bridge Index identifies the lowest rating for each bridge, as described above. Each of the four condition ratings use a 0 to 9 scale with 0 representing the lowest performance and 9 representing the highest performance.

Bridge Hot Spots: The Bridge Index map identifies individual bridge locations that are identified as hot spots. Hot spots are bridges that have a single rating of 4 in any of the four ratings, or multiple ratings of 5 in the deck, substructure or superstructure ratings.

Scoring:

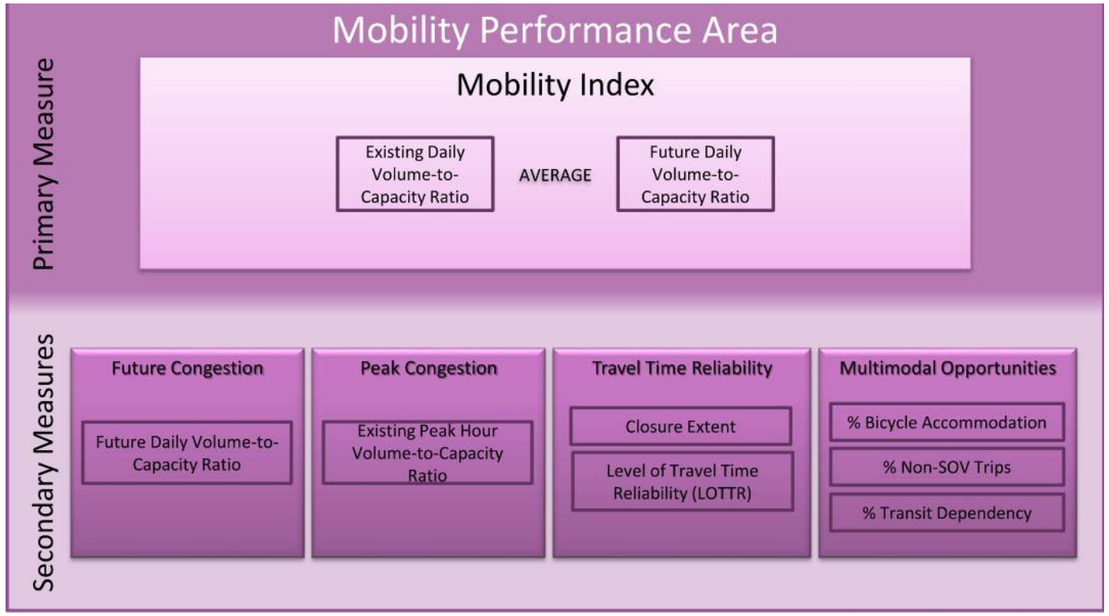
Performance Level	Bridge Index
Good	>6.5
Fair	5.0-6.5
Poor	<5.0

Performance Level	Sufficiency Rating
Good	>80
Fair	50-80
Poor	<50

Performance Level	Bridge Rating
Good	>6
Fair	5-6
Poor	<5

Mobility Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Mobility performance area as shown in the following graphic:



Primary Mobility Index

The primary Mobility Index is an average of the existing daily volume-to-capacity (V/C) ratio and the future daily V/C ratio for each segment of the corridor.

Existing Daily V/C: The existing daily V/C ratio for each segment is calculated by dividing the existing Annual Average Daily Traffic (AADT) volume for each segment by the total Level of Service (LOS) E capacity volume for that segment

The capacity is calculated using the HERS Procedures for Estimating Highway Capacity[1]. The HERS procedure incorporates HCM 2010 methodologies. The methodology includes capacity estimation procedures for multiple facility types including freeways, rural two-lane highways, multilane highways, and signalized and non-signalized urban sections.

The segment capacity is defined as a function of the number of mainline lanes, shoulder width, interrupted or uninterrupted flow facilities, terrain type, percent of truck traffic, and the designated urban or rural environment.

The AADT for each segment is calculated by applying a weighted average across the length of the segment based on the individual 24-hour volumes and distances associated with each HPMS count station within each segment.

The following example equation is used to determine the weighted average of a segment with two HPMS count locations within the corridor

((HPMS 1 Distance x HPMS 1 Volume) + (HPMS 2 Distance x HPMS 2 Volume))/Total Segment Length

For specific details regarding the HERS methodology used, refer to the *Procedures for Estimating Highway Capacity, draft Technical Memorandum.*

Future Daily V/C: The future daily V/C ratio for each segment is calculated by dividing the future AADT volume for each segment by the existing LOS E capacity. The capacity volume used in this calculation is the same as is utilized in the existing daily V/C equation.

The future AADT daily volumes are generated by applying an average annual compound growth rate (ACGR) to each existing AADT segment volume. The following equation is used to apply the average annual compound growth rate:

Future AADT = Existing AADT x ((1+ACGR)^(Future Year-Existing Year))

The ACGR for each segment is defined by comparing the total volumes in the existing Arizona Travel Demand Model (AZTDM2) to the future AZTDM2 traffic volumes at each existing HPMS count station location throughout the corridor. Each existing and future segment volume is defined using the same weighted average equation described in the *Existing Daily V/*C section above and then summing the directional volumes for each location. The following equation is used to determine the ACGR for each segment:

ACGR = ((Future Volume/Existing Volume)^(1/(Future Year-Existing Year))))-1

Secondary Mobility Measures

Four secondary measures are evaluated:

- Future Congestion
- Peak Congestion
- Travel Time Reliability
  - Closure Extent
  - Directional Level of Travel Time Reliability
- Multimodal Opportunities
  - % Bicycle Accommodation
  - % Non-Single Occupancy Vehicle (SOV) Trips

[1] HERS Support – 2011, Task 6: Procedures for Estimating Highway Capacity, draft Technical Memorandum. Cambridge Systematics. Prepared for the Federal Highway Administration. March 2013.

- % Transit Dependency

Future Congestion: The future daily V/C ratios for each segment in the corridor that are calculated and used in the Mobility Index as part of the overall average between Existing Daily V/C and Future Daily V/C are applied independently as a secondary measure. The methods to calculate the Future Daily V/C can be referenced in the Mobility Index section.

Peak Congestion: Peak Congestion has been defined as the peak hour V/C ratio in both directions of the corridor. The peak hour V/C ratio is calculated using the HERS method as described previously. The peak hour volume utilizes the directional AADT for each segment, which is calculated by applying a weighted average across the length of the segment based on the individual directional 24-hour volumes and distances associated with each HPMS count station within each segment. The segment capacity is defined based on the characteristics of each segment including number of lanes, terrain type, and environment, similar to the 24-hour volumes using the HERS method.

Travel Time Reliability: Travel time reliability is a secondary measure that includes two indicators. The two indicators are the number of times a piece of a corridor is closed for any specific reason and the directional Level of Travel Time Reliability (LOTTR).

Closure Extent: The number of times a roadway is closed is documented through the HCRS dataset. Closure Extent is defined as the average number of times a particular milepost of the corridor is closed per year per mile in a specific direction of travel. The weighted average of each occurrence takes into account the distance over which a specific occurrence spans.

Thresholds that determine levels of good, fair, and poor are based on the average number of closures per mile per year within each of the identified statewide significant corridors by ADOT. The thresholds shown at the end of this section represent statewide averages across those corridors.

Directional Level of Travel Time Reliability: In terms of overall mobility, the LOTTR is the relationship of 80th percentile travel time to average (50th percentile) travel time for a given corridor segment in a specific direction.

Using INRIX data provided by ADOT, four time periods for each data point were collected throughout the day (AM peak, mid-day, PM peak, and off-peak). The highest value of the four time periods calculation is defined as the LOTTR for that data point. The weighted average LOTTR is calculated within each segment based on the number of data points collected and the length associated with the TMC location. The value of the weighted average LOTTR across each entry is used as the LOTTR for each respective segment within the corridor.

Multimodal Opportunities: Three multimodal opportunity indicators reflect the characteristics of the corridor that promote alternate modes to a single occupancy vehicle (SOV) for trips along the corridor. The three indicators include the percent bicycle accommodation, non-SOV trips, and transit dependency along the corridor.

Percent Bicycle Accommodation: For this secondary performance evaluation, outside shoulder widths are evaluated considering the roadway's context and conditions. This requires use of the roadway data that includes right shoulder widths, shoulder surface types, and speed limits, all of which are available in the following ADOT geographic information system (GIS) data sets:

- Right Shoulder Widths
- Left Shoulder Widths (for undivided roadways)
- Shoulder Surface Type (Both Left/Right)
- Speed Limit

Additionally, each segment's average AADT, estimated earlier in the Mobility performance area methodology, is used for the criteria to determine if the existing shoulder width meets the effective width.

The criteria for screening if a shoulder segment meets the recommended width criteria are as followed:

(1) If AADT <= 1500 OR Speed Limit <= 25 miles per hour (mph):
The segment's general purpose lane can be shared with bicyclists (no effective shoulder width required)

(2) If AADT > 1500 AND Speed Limit between (25 - 50 mph) AND Pavement Surface is Paved:
Effective shoulder width required is 4 feet or greater

(3) If AADT > 1500 AND Speed Limit >= 50 mph and Pavement Surface is Paved:
Effective shoulder width required is 6 feet or greater

The summation of the length of the shoulder sections that meet the defined effective width criteria, based on criteria above, is divided by the segment's total length to estimate the percent of the segment that accommodates bicycles as illustrated at the end of this section. If shoulder data is not available or appears erroneous, field measurements can substitute for the shoulder data.

Percent Non-SOV Trips: The percentage of non-SOV trips over distances less than 50 miles gives an indication of travel patterns along a section of the corridor that could benefit from additional multimodal options in the future.

Thresholds that determine levels of good, fair, and poor are based on the percent non-SOV trips within each of the identified statewide significant corridors by ADOT. The thresholds shown at the end of this section represent statewide averages across those corridors.

Percent Transit Dependency: U.S. Census American Community Survey tract and state level geographic data and attributes from the tables B08201 (Number of Vehicles Available by Household Size) and B17001 (Population in Poverty within the Last 12 Months) were downloaded with margins of error included from the Census data retrieval application Data Ferret. Population ranges for each tract were determined by adding and subtracting the margin of error to each estimate in excel. The

tract level attribute data was then joined to geographic tract data in GIS. Only tracts within a one mile buffer of each corridor are considered for this evaluation.

Tracts that have a statistically significantly larger number of either people in poverty or households with only one or no vehicles available than the state average are considered potentially transit dependent.

Example: The state average for zero or one vehicles households (HHs) is between 44.1% and 45.0%. Tracts which have the lower bound of their range above the upper bound of the state range have a greater percentage of zero/one vehicle HHs than the state average. Tracts that have their upper bound beneath the lower bound of the state range have a lesser percentage of zero/one vehicles HHs than the state average. All other tracts that have one of their bounds overlapping with the state average cannot be considered statistically significantly different because there is a chance the value is actually the same.

In addition to transit dependency, the following attributes are added to the Multimodal Opportunities map based on available data.

- Shoulder width throughout the corridor based on 'Shoulder Width' GIS dataset provided by ADOT
- Intercity bus routes
- Multiuse paths within the corridor right-of-way, if applicable

Scoring:

Volume-to-Capacity Ratios		
Urban and Fringe Urban		
Good - LOS A-C	V/C ≤ 0.71	*Note - ADOT Roadway Design Standards indicate Urban and Fringe Urban roadways should be designed to level of service C or better
Fair - LOS D	V/C > 0.71 & ≤ 0.89	
Poor - LOS E or less	V/C > 0.89	
Rural		
Good - LOS A-B	V/C ≤ 0.56	*Note - ADOT Roadway Design Standards indicate Rural roadways should be designed to level of service B or better
Fair - LOS C	V/C > 0.56 & ≤ 0.76	
Poor - LOS D or less	V/C > 0.76	

Performance Level	Closure Extent
Good	≤ 0.22
Fair	> 0.22 & ≤ 0.62
Poor	V/C > 0.62

Performance Level	LOTTR on Uninterrupted Flow Facilities
Good	< 1.15
Fair	≥ 1.15 & < 1.50
Poor	≥ 1.50

Performance Level	LOTTR on Interrupted Flow Facilities
Good	< 1.15
Fair	≥ 1.15 & < 1.50
Poor	≥ 1.50

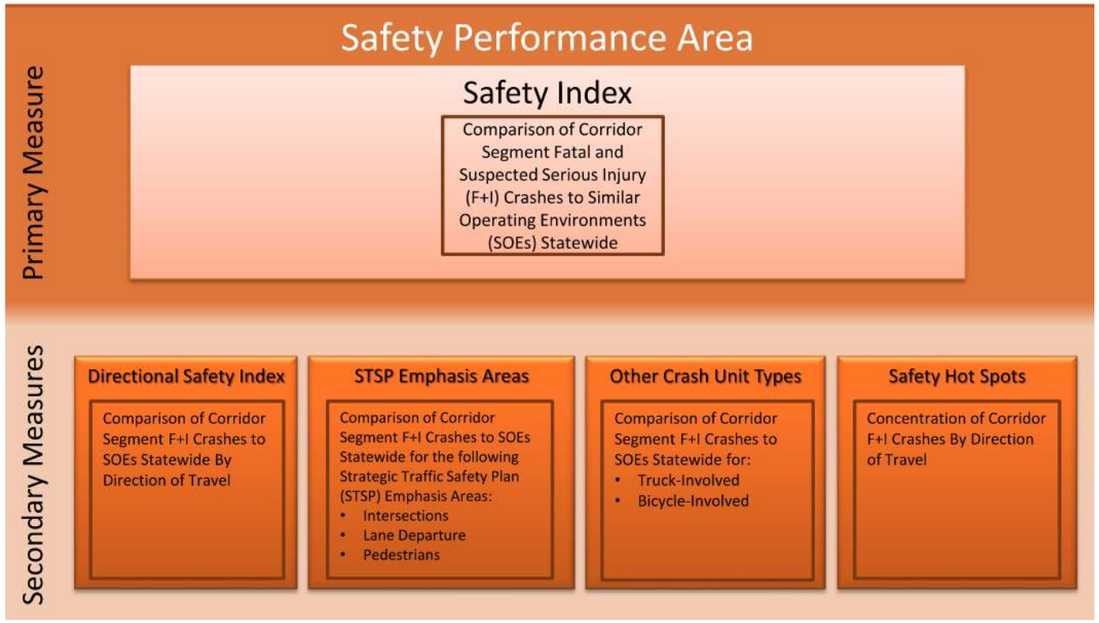
Performance Level	Percent Bicycle Accommodation
Good	≥ 90%
Fair	> 60% & ≤ 90%
Poor	< 60%

Performance Level	Percent Non-SOV Trips
Good	≥ 17%
Fair	> 11% & ≤ 17%
Poor	< 11%

Performance Level	Percent Transit Dependency
Good	Tracts with both zero and one vehicle household population in poverty percentages below the statewide average
Fair	Tracts with either zero and one vehicle household or population in poverty percentages below the statewide average
Poor	Tracts with both zero and one vehicle household and population in poverty percentages above the statewide average

Safety Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Safety performance area as shown in the following graphic:



Primary Safety Index

The Safety Index is a safety performance measure based on the bi-directional (i.e., both directions combined) frequency and rate of fatal and suspected serious injury crashes, the relative cost of those types of crashes, and crash occurrences on similar roadways in Arizona. According to ADOT's 2018 Highway Safety Improvement Program Manual, fatal crashes have an estimated cost that is 17.3 times the estimated cost of suspected serious injury crashes ($9.5 million compared to $550,000).

The Combined Safety Score (CSS) is an interim measure that combines fatal and suspected serious injury crashes into a single value. The CSS is calculated using the following generalized formula:

*CSS = 17.3 * (Normalized Fatal Crash Rate + Frequency) + (Normalized Suspected Serious Injury Crash Rate + Frequency)*

Because crashes vary depending on the operating environment of a particular roadway, statewide CSS values were developed for similar operating environments defined by functional classification, urban vs. rural setting, number of travel lanes, and traffic volumes. To determine the Safety Index of a particular segment, the segment CSS is compared to the average statewide CSS for the similar statewide operating environment.

The Safety Index is calculated using the following formula:

Safety Index = Segment CSS / Statewide Similar Operating Environment CSS

The average annual Safety Index for a segment is compared to the statewide similar operating environment annual average, with one standard deviation from the statewide average forming the scale break points.

The more a particular segment's Safety Index value is below the statewide similar operating environment average, the better the safety performance is for that particular segment as a lower value represents fewer crashes.

Scoring:

The scale for rating the Safety Index depends on the operating environments selected, as shown in the table below.

Similar Operating Environment	Safety Index (Overall & Directional)	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	0.92	1.08
2 or 3 or 4 Lane Divided Highway	0.81	1.19
4 or 5 Lane Undivided Highway	0.78	1.22
6 Lane Highway	0.76	1.24
Rural 4 Lane Freeway with Daily Volume < 25,000	0.84	1.16
Rural 4 Lane Freeway with Daily Volume > 25,000	0.78	1.22
Urban 4 Lane Freeway	0.73	1.27
Urban or Rural 6 Lane Freeway	0.65	1.35
Urban > 6 Lane Freeway	0.89	1.11

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

Some corridor segments may have a very low number of total fatal and suspected serious injury crashes. Low crash frequencies (i.e., a small sample size) can translate into performance ratings that can be unstable. In some cases, a change in crash frequency of one crash (one additional crash or one less crash) could result in a change in segment performance of two levels. To avoid reliance on performance ratings where small changes in crash frequency result in large changes in performance, the following two criteria were developed to identify segments with "insufficient data" for assessing performance for the Safety Index. Both of these criteria must be met for a segment to have "insufficient data" to reliably rate the Safety Index performance:

- If the crash sample size (total fatal plus suspected serious injury crashes) for a given segment is less than five crashes over the five-year analysis period; AND
- If a change in one crash results in a change in segment performance by two levels (i.e., a change from below average to above average performance or a change from above average

to below average frequency), the segment has “insufficient data” and Safety Index performance ratings are unreliable.

Secondary Safety Measures

The Safety performance area has four secondary measures related to fatal and suspected serious injury crashes:

- Directional Safety Index
- Strategic Traffic Safety Plan (SHSP) Emphasis Areas
- Other Crash Unit Types
- Safety Hot Spots

Directional Safety Index: The Directional Safety Index shares the same calculation procedure and thresholds as the Safety Index. However, the measure is based on the directional frequency and rate of fatal and suspected serious injury crashes.

Similar to the Safety Index, the segment CSS is compared to the average statewide CSS for the similar statewide operating environment. The Directional Safety Index follows the lead of the Safety Index in terms of “insufficient data” status. If the Safety Index meets both criteria for “insufficient data”, the Directional Safety Index should also be changed to “insufficient data”. If the Safety Index does not meet both criteria for “insufficient data”, the Directional Safety Index would also not change to say “insufficient data”

STSP Emphasis Areas: ADOT’s 2019 STSP identifies several emphasis areas for reducing fatal and suspected serious injury crashes. The three relevant STSP emphasis areas relate to crashes involving:

- Intersections
- Lane departures
- Pedestrians

To develop a performance measure that reflects these emphasis areas, the percentage of total fatal and suspected serious injury crashes that involves a given emphasis area on a particular segment is compared to the statewide average percentage of crashes involving that same emphasis area on roads with similar operating environments in a process similar to how the Safety Index is developed.

The STSP emphasis areas performance is calculated using the following formula:

% Crashes Involving STSP Emphasis Area = Segment Crashes Involving STSP Emphasis Area / Total Segment Crashes

The percentage of total crashes involving STSP emphasis areas for a segment is compared to the statewide percentages on roads with similar operating environments. One standard deviation from the statewide average percentage forms the scale break points.

When assessing the performance of the STSP emphasis areas, the more the frequency of crashes involving STSP emphasis areas is below the statewide average implies better levels of segment performance. Thus, lower values are better, similar to the Safety Index.

Scoring:

The scale for rating the STSP emphasis areas performance depends on the crash history on similar statewide operating environments, as shown in the tables below:

Similar Operating Environment	Crashes at Intersections	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	11.2%	15.6%
2 or 3 or 4 Lane Divided Highway	23.4%	29.3%
4 or 5 Lane Undivided Highway	43.8%	49.5%
6 Lane Highway	57.8%	73.2%
Rural 4 Lane Freeway with Daily Volume < 25,000	0.00%	0.00%
Rural 4 Lane Freeway with Daily Volume > 25,000	0.00%	0.00%
Urban 4 Lane Freeway	0.00%	0.00%
Urban or Rural 6 Lane Freeway	0.00%	0.00%
Urban > 6 Lane Freeway	0.00%	0.00%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

Similar Operating Environment	Crashes Involving Lane Departures	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	66.9%	74.5%
2 or 3 or 4 Lane Divided Highway	56.4%	65.0%
4 or 5 Lane Undivided Highway	21.1%	32.1%
6 Lane Highway	11.7%	38.1%
Rural 4 Lane Freeway with Daily Volume < 25,000	72.8%	76.4%
Rural 4 Lane Freeway with Daily Volume > 25,000	69.0%	77.5%
Urban 4 Lane Freeway	60.6%	78.1%
Urban or Rural 6 Lane Freeway	55.7%	62.9%
Urban > 6 Lane Freeway	40.4%	43.2%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

Similar Operating Environment	Crashes Involving Pedestrians	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	3.8%	7.2%
2 or 3 or 4 Lane Divided Highway	2.4%	3.6%
4 or 5 Lane Undivided Highway	8.8%	13.5%
6 Lane Highway	0.4%	11.9%
Rural 4 Lane Freeway with Daily Volume < 25,000	1.0%	3.3%
Rural 4 Lane Freeway with Daily Volume > 25,000	0.7%	4.7%
Urban 4 Lane Freeway	0.0%	4.9%
Urban or Rural 6 Lane Freeway	4.0%	7.9%
Urban > 6 Lane Freeway	1.6%	4.7%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

The STSP emphasis area secondary safety performance measures for the Safety performance area include proportions of specific types of crashes within the total fatal and suspected serious injury crash frequencies. This more detailed categorization of fatal and suspected serious injury crashes can result in low crash frequencies (i.e., a small sample size) that translate into performance ratings that can be unstable. In some cases, a change in crash frequency of one crash (one additional crash or one less crash) could result in a change in segment performance of two levels. To avoid reliance on performance ratings where small changes in crash frequency result in large changes in performance, the following criteria were developed to identify segments with "insufficient data" for assessing performance for the STSP emphasis area secondary safety performance measures. If any of these criteria are met for a segment, that segment has "insufficient data" to reliably rate that STSP emphasis area performance:

- If the crash sample size (total fatal plus suspected serious injury crashes) for a given segment is less than five crashes over the five-year analysis period, the segment has "insufficient data" and performance ratings are unreliable. OR
- If a change in one crash results in a change in segment performance by two levels (i.e., a change from below average to above average performance or a change from above average to below average frequency), the segment has "insufficient data" and performance ratings are unreliable. OR
- If the corridor average segment crash frequency for any of the STSP emphasis area performance measures is less than two crashes over the five-year analysis period, that entire STSP emphasis area performance measure has "insufficient data" and performance ratings are unreliable.

Other Crash Unit Types: Other crash unit types of interest are:

- Truck-involved crashes
- Bicycle-involved crashes

To develop a performance measure that reflects the aforementioned crash unit types, the percentage of total fatal and suspected serious injury crashes that involves a given crash unit type on a particular segment is compared to the statewide average percentage of crashes involving that same crash unit type on roads with similar operating environments in a process similar to how the Safety Index is developed.

The crash unit type performance is calculated using the following formula:

% Crashes Involving Crash Unit Type = Segment Crashes Involving Crash Unit Type / Total Segment Crashes

The percentage of total crashes involving each crash unit type for a segment is compared to the statewide percentages on roads with similar operating environments. One standard deviation from the statewide average percentage forms the scale break points.

When assessing the performance of the crash unit types, the more the frequency of crashes involving crash unit types is below the statewide average implies better levels of segment performance. Thus, lower values are better, similar to the Safety Index.

Scoring:

The scale for rating the unit-involved crash performance depends on the crash history on similar statewide operating environments, as shown in the following tables.

Similar Operating Environment	Crashes Involving Trucks	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	4.2%	8.0%
2 or 3 or 4 Lane Divided Highway	3.7%	9.9%
4 or 5 Lane Undivided Highway	0.8%	5.5%
6 Lane Highway	4.3%	7.5%
Rural 4 Lane Freeway with Daily Volume < 25,000	19.0%	22.5%
Rural 4 Lane Freeway with Daily Volume > 25,000	8.5%	18.0%
Urban 4 Lane Freeway	6.9%	12.4%
Urban or Rural 6 Lane Freeway	5.0%	12.9%
Urban > 6 Lane Freeway	1.9%	5.1%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

Similar Operating Environment	Crashes Involving Bicycles	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	0.0%	3.3%
2 or 3 or 4 Lane Divided Highway	0.0%	2.2%
4 or 5 Lane Undivided Highway	0.5%	3.8%
6 Lane Highway	0.0%	7.2%
Rural 4 Lane Freeway with Daily Volume < 25,000	0.0%	0.9%
Rural 4 Lane Freeway with Daily Volume > 25,000	0.0%	0.0%
Urban 4 Lane Freeway	0.0%	0.0%
Urban or Rural 6 Lane Freeway	0.0%	1.3%
Urban > 6 Lane Freeway	0.0%	0.0%

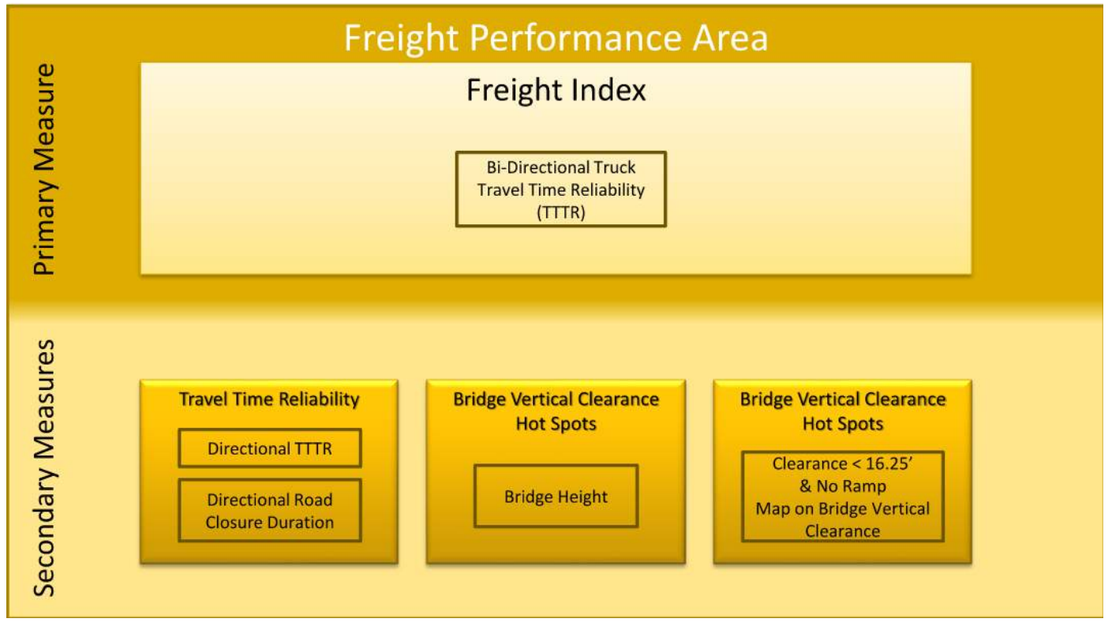
** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

The crash unit types have the same “insufficient data” criteria as the STSP emphasis areas.

Safety Hot Spots: A hot spot analysis was conducted that identified abnormally high concentrations of fatal and suspected serious injury crashes along the study corridor by direction of travel. The identification of crash concentrations involves a GIS-based function known as “kernel density analysis”. This measure is mapped for graphical display purposes with the Directional Safety Index but is not included in the Safety performance area rating calculations.

Freight Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Freight performance area as shown in the following graphic:



Primary Freight Index

The Freight Index is a reliability performance measure based on the bi-directional truck travel time reliability (TTTR) for truck travel. The industry standard definition for the Truck Travel Time Reliability (TTTR) is the ratio of the 95th percentile travel time to average (50th percentile) travel time for trucks.

Using INRIX data provided by ADOT, four time periods for each data point were collected throughout the day (AM peak, mid-day, PM peak, and off-peak).

The highest calculated value of the four time periods is defined as the TTTR for that data point. The weighted average TTTR is calculated within each segment based on the number of data points collected and the length associated with the TMC location. The value of the weighted average TTTR across each entry is used as the TTTR for each respective segment within the corridor.

For each corridor segment, the TTTR is calculated for each direction of travel and then averaged to create a bi-directional TTTR. The Freight Index is equal to the average bi-directional TTTR for the segment.

The scale for rating the Freight Index differs between uninterrupted and interrupted flow facilities.

Secondary Freight Measures

The Freight performance area includes three secondary measures that provide an in-depth evaluation of the different characteristics of freight performance:

- Travel Time Reliability
  - Directional Truck Travel Time Reliability
  - Closure Duration
- Bridge Vertical Clearance
- Bridge Vertical Clearance Hot Spots

Travel Time Reliability: Travel time reliability is a secondary measure that includes two indicators. The two indicators are the directional Truck Travel Time Reliability (TTTR) and the duration a piece of a corridor is closed for any specific reason.

Truck Travel Time Reliability: The performance measure for truck travel time reliability is directional TTTR. The industry standard definition for TTTR is the ratio of 95th percentile travel time to average (50th percentile) travel time for trucks for a given corridor segment in a specific direction.

Using INRIX data provided by ADOT, four time periods for each data point were collected throughout the day (AM peak, mid-day, PM peak, and off-peak). The highest value of the four time periods calculation is defined as the TTTR for that data point. The weighted average TTTR is calculated within each segment based on the number of data points collected and the length associated with the TMC location. The value of the weighted average TTTR across each entry is used as the TTTR for each respective segment within the corridor.

Closure Duration: This performance measure related to road closures is average roadway closure (i.e., full lane closure) duration time in minutes. There are three main components to full closures that affect reliability – frequency, duration, and extent. In the freight industry, closure duration is the most important component because trucks want to minimize travel time and delay.

Data on the frequency, duration, and extent of full roadway closures on the ADOT State Highway System is available in the HCRS database that is managed and updated by ADOT.

The average closure duration in a segment – in terms of the average time a milepost is closed per mile per year on a given segment – is calculated using the following formula:

*Closure Duration = Sum of Segment (Closure Clearance Time * Closure Extent) / Segment Length*

The segment closure duration time in minutes can then be compared to statewide averages for closure duration in minutes, with one-half standard deviation from the average forming the scale break points. The scale for rating closure duration in minutes is found at the end of this section.

Bridge Vertical Clearance: This performance measure uses the vertical clearance information from the ADOT Bridge Database to identify locations with low vertical clearance. The minimum vertical clearance for all underpass structures (i.e., structures under which mainline traffic passes) is determined for each segment.

Bridge Vertical Clearance Hot Spots: This performance measure related to truck restrictions is the locations, or hot spots, where bridge vertical clearance issues restrict truck travel. Sixteen feet three inches (16.25') is the minimum standard vertical clearance value for state highway bridges over travel lanes.

Locations with lower vertical clearance values than the minimum standard are categorized by the ADOT Intermodal Transportation Department Engineering Permits Section as either locations where ramps exist that allow the restriction to be avoided or locations where ramps do not exist and the restriction cannot be avoided. The locations with vertical clearances below the minimum standard that cannot be ramped around are considered hot spots. This measure is mapped for graphical display purposes with the bridge vertical clearance map but is not included in the Freight performance area rating calculations.

Scoring:

Performance Level	Freight Index	
	Uninterrupted Flow Facilities	Interrupted Flow Facilities
Good	< 1.15	< 1.45
Fair	1.15 – 1.35	1.45 – 1.85
Poor	> 1.35	> 1.85

Performance Level	TTTR	
	Uninterrupted Flow Facilities	Interrupted Flow Facilities
Good	< 1.15	< 1.45
Fair	1.15 – 1.35	1.45 – 1.85
Poor	> 1.35	> 1.85

Performance Level	Closure Duration (minutes)
Good	< 44.18
Fair	44.18 – 124.86
Poor	> 124.86

Performance Level	Bridge Vertical Clearance
Good	> 16.5'
Fair	16.0' – 16.5'
Poor	< 16.0'

Appendix C: Performance Area Data

Pavement Performance Area Data

				Direction 1 (Northound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Segment 3		*Interstate?*	**Yes**																	
Milepost	187	to 188		3	36.05	5.40	0.17	3	37.46	1.30	0.12	4.36	4.04	4.34	4.65	4.13	4.55		0	0
Milepost	188	to 189		3	36.67	6.70	0.16	3	41.05	5.00	0.15	4.35	3.89	4.28	4.10	4.03	4.15		0	0
Milepost	189	to 190		3	36.54	3.80	0.17	3	32.96	0.40	0.14	4.35	4.24	4.41	4.81	4.27	4.69		0	0
Milepost	190	to 191		3	41.05	3.10	0.16	3	40.91	10.20	0.15	4.28	4.34	4.28	3.54	4.32	3.76		0	3
Milepost	191	to 192		3	38.65	0.60	0.15	3	40.19	4.20	0.14	4.32	4.75	4.29	4.20	4.62	4.23		0	0
Milepost	192	to 193		3	47.72	0.20	0.17	3	41.49	0.40	0.16	4.17	4.82	4.27	4.79	4.62	4.63		0	0
Milepost	193	to 194		3	38.87	1.40	0.17	3	42.94	3.10	0.16	4.31	4.58	4.25	4.33	4.50	4.31		0	0
Milepost	194	to 195		3	39.42	0.70	0.17	3	38.74	1.70	0.17	4.30	4.71	4.32	4.54	4.59	4.47		0	0
Milepost	195	to 196		3	42.19	0.40	0.16	3	42.08	2.00	0.14	4.26	4.79	4.26	4.51	4.63	4.44		0	0
Milepost	196	to 197		3	38.90	0.10	0.17	3	60.26	1.60	0.16	4.31	4.84	3.98	4.56	4.68	4.15		0	0
Milepost	197	to 198		3	51.73	0.10	0.17	3	53.82	0.00	0.16	4.11	4.84	4.08	4.78	4.33	4.29		0	0
		Total		33				33												3
		Weighted Average										4.28	4.53	4.25	4.44	4.43	4.33			
		Factor										1.00		1.00						
		Indicator Score										4.28		4.25						**4.5%**
		Pavement Index																4.38		
Segment 4		*Interstate?*	**Yes**																	
Milepost	198	to 199		3	56.71	0.10	0.16	3	66.50	0.00	0.16	4.03	4.85	3.88	4.77	4.28	4.15		0	0
Milepost	199	to 200		3	42.16	7.70	0.16	3	52.19	0.60	0.12	4.26	3.78	4.10	4.78	3.93	4.30		0	0
Milepost	200	to 201		3	39.29	16.80	0.24	3	53.73	6.00	0.14	4.31	2.88	4.08	3.99	3.30	4.02		3	0
Milepost	201	to 202		3	45.76	16.50	0.25	3	58.65	5.20	0.17	4.20	2.88	4.00	4.06	3.28	4.04		3	0
Milepost	202	to 203		3	63.11	17.30	0.23	3	48.21	5.50	0.24	3.93	2.85	4.16	3.95	3.17	4.01		3	0
Milepost	203	to 204		3	54.66	17.00	0.20	3	50.12	5.30	0.22	4.06	2.90	4.13	3.99	3.25	4.04		3	0
Milepost	204	to 205		3	56.01	16.60	0.20	3	51.16	7.40	0.21	4.04	2.93	4.12	3.77	3.27	3.87		3	0
Milepost	205	to 206		3	65.91	17.60	0.20	3	52.42	6.90	0.19	3.89	2.85	4.10	3.85	3.16	3.92		3	0
Milepost	206	to 207		3	52.51	17.20	0.18	3	57.43	8.80	0.22	4.10	2.90	4.02	3.61	3.26	3.73		3	0
Milepost	207	to 208		3	45.75	13.20	0.16	3	52.32	2.60	0.23	4.20	3.25	4.10	4.32	3.54	4.26		3	0
Milepost	208	to 209		3	45.24	9.20	0.15	3	43.49	14.30	0.17	4.21	3.64	4.24	3.15	3.81	3.48		0	3
Milepost	209	to 210		3	54.53	7.80	0.12	3	51.99	3.70	0.17	4.06	3.80	4.10	4.24	3.88	4.20		0	0
Milepost	210	to 211		2	90.84	0.30	0.12	2	74.51	0.00	0.14	3.54	4.86	3.77	4.82	3.94	4.08		0	0
Milepost	211	to 212		2	108.70	0.10	-	2	85.01	0.00	-	3.31	4.92	3.62	5.00	3.31	4.03		2	2
Milepost	212	to 213		2	60.10	0.10	0.10	2	58.36	0.00	0.11	3.98	4.93	4.01	4.87	4.26	4.26		0	0
Milepost	213	to 214		3	49.20	16.00	0.22	3	40.57	0.00	0.16	4.15	2.96	4.29	4.79	3.32	4.64		3	0
Milepost	214	to 215		3	50.46	17.40	0.23	3	39.17	0.20	0.21	4.13	2.84	4.31	4.76	3.23	4.62		3	0
Milepost	215	to 216		3	50.54	17.00	0.27	3	37.16	0.00	0.21	4.13	2.83	4.34	4.68	3.22	4.58		3	0

Milepost	216	to	217	3	46.98	16.90	0.23	3	33.05	0.00	0.20	4.18	2.87	4.41	4.70	3.26	4.61		3	0
Milepost	217	to	218	3	59.03	17.30	0.23	3	31.43	0.00	0.21	4.00	2.85	4.44	4.68	3.19	4.60		3	0
			Total	57				57												46
			Weighted Average									4.06	3.35	4.13	4.31	3.47	4.18			
			Factor									1.00		1.00						
			Indicator Score									4.06		4.13						**40.4%**
			Pavement Index															3.82		
Segment 5			***Interstate?***	**Yes**																
Milepost	218	to	219	3	59.43	17.10	0.25	3	33.94	0.10	0.22	3.99	2.84	4.39	4.76	3.18	4.65		3	0
Milepost	219	to	220	3	41.96	0.91	0.15	3	51.49	2.27	0.17	4.26	4.70	4.11	4.44	4.57	4.34		0	0
Milepost	220	to	221	3	36.05	2.78	0.13	3	32.38	0.78	0.14	4.36	4.40	4.42	4.72	4.39	4.63		0	0
Milepost	221	to	222	3	59.23	9.10	0.16	3	87.08	9.70	0.13	3.99	3.64	3.59	3.60	3.75	3.59		0	0
Milepost	222	to	223	3	56.39	8.40	0.17	3	113.38	11.40	0.14	4.04	3.71	3.25	3.43	3.80	3.25		0	3
Milepost	223	to	224	3	47.80	6.40	0.15	3	97.01	6.60	0.12	4.17	3.93	3.46	3.93	4.01	3.60		0	0
Milepost	224	to	225	3	49.93	7.60	0.15	3	81.13	3.70	0.13	4.14	3.80	3.67	4.28	3.90	3.86		0	0
Milepost	225	to	226	3	73.10	13.20	0.17	3	82.13	10.40	0.14	3.79	3.25	3.66	3.53	3.41	3.62		3	3
Milepost	226	to	227	3	78.06	16.00	0.17	3	68.04	7.20	0.13	3.72	3.01	3.86	3.86	3.22	3.86		3	0
Milepost	227	to	228	3	39.06	1.70	0.14	3	70.72	3.30	0.13	4.31	4.56	3.82	4.33	4.49	3.97		0	0
Milepost	228	to	229	3	47.47	1.60	0.14	3	77.64	5.40	0.14	4.17	4.58	3.72	4.06	4.46	3.82		0	0
Milepost	229	to	230	3	37.53	4.10	0.14	3	82.79	14.90	0.16	4.34	4.22	3.65	3.11	4.26	3.27		0	3
Milepost	230	to	231	3	37.16	0.70	0.13	3	91.79	9.40	0.15	4.34	4.75	3.53	3.62	4.63	3.55		0	0
Milepost	231	to	232	3	55.17	6.80	0.15	3	60.35	7.10	0.14	4.05	3.89	3.98	3.87	3.94	3.90		0	0
Milepost	232	to	233	3	41.22	1.70	0.13	3	65.07	5.70	0.15	4.28	4.57	3.90	4.01	4.48	3.98		0	0
Milepost	233	to	234	3	33.73	7.80	0.14	3	57.65	7.50	0.16	4.40	3.79	4.02	3.81	3.97	3.87		0	0
Milepost	234	to	235	3	33.09	15.80	0.15	3	54.52	3.80	0.16	4.41	3.04	4.06	4.24	3.45	4.19		3	0
Milepost	235	to	236	3	38.70	15.20	0.15	3	62.79	0.40	0.18	4.32	3.08	3.94	4.77	3.45	4.19		3	0
			Total	54				54												24
			Weighted Average									4.17	3.88	3.84	4.02	3.96	3.90			
			Factor									1.00		1.00						
			Indicator Score									4.17		3.84						**22.2%**
			Pavement Index															3.93		
Segment 6			***Interstate?***	**Yes**																
Milepost	236	to	237	3	41.37	6.00	0.16	3	57.93	2.36	0.19	4.27	3.97	4.01	4.40	4.06	4.29		0	0
Milepost	237	to	238	3	42.10	1.44	0.16	3	41.83	1.44	0.24	4.26	4.58	4.27	4.49	4.49	4.42		0	0
Milepost	238	to	239	3	32.71	0.45	0.19	3	44.77	1.18	0.21	4.42	4.73	4.22	4.58	4.64	4.47		0	0
Milepost	239	to	240	3	51.64	4.44	0.19	3	56.61	1.00	0.17	4.11	4.13	4.03	4.66	4.13	4.22		0	0
Milepost	240	to	241	3	56.14	11.50	0.14	3	64.09	2.50	0.17	4.04	3.42	3.92	4.41	3.61	4.07		3	0
Milepost	241	to	242	3	55.50	7.30	0.16	3	64.38	3.40	0.17	4.05	3.83	3.91	4.29	3.89	4.03		0	0
Milepost	242	to	243	3	55.09	9.90	0.14	3	58.36	4.00	0.17	4.06	3.57	4.01	4.21	3.72	4.15		0	0
Milepost	243	to	244	3	57.10	6.70	0.21	3	56.00	8.90	0.20	4.02	3.85	4.04	3.63	3.90	3.75		0	0
Milepost	244	to	245	3	81.39	15.00	0.31	3	113.19	26.00	0.32	3.67	2.93	3.25	2.07	3.16	2.07		3	3

Milepost	245	to 246	3	73.09	11.80	0.29	3	145.24	23.30	0.29	3.79	3.24	2.88	2.31	3.41	2.88		3	3
		Total	30				30												15
		Weighted Average									4.07	3.83	3.85	3.90	3.90	3.83			
		Factor									1.00		1.00						
		Indicator Score									4.07		3.85						**25.0%**
		Pavement Index															3.87		
Segment 7		***Interstate?***	**Yes**																
Milepost	246	to 247	3	69.21	12.64	0.20	3	106.44	5.73	0.16	3.84	3.27	3.34	4.00	3.44	3.34		3	3
Milepost	247	to 248	3	66.87	4.00	0.16	3	109.63	10.67	0.17	3.88	4.22	3.30	3.48	3.98	3.30		0	3
Milepost	248	to 249	3	90.09	0.30	-	3	75.22	0.00	-	3.55	4.84	3.76	5.00	3.94	4.13		3	3
Milepost	249	to 250	3	75.07	0.50	0.22	3	81.24	6.80	0.19	3.76	4.68	3.67	3.85	4.04	3.73		0	0
Milepost	250	to 251	3	81.69	0.10	0.28	3	59.56	16.20	0.23	3.67	4.66	3.99	2.93	3.97	3.25		0	3
Milepost	251	to 252	3	72.21	0.10	0.24	3	91.58	17.00	0.30	3.80	4.74	3.53	2.79	4.08	3.01		0	3
Milepost	252	to 253		-	-	-		-	-	-	-	-	-	-	-	-		0	0
Milepost	253	to 254		71.57	0.10	-		-	-	-	3.81	4.92	-	-	4.14	-		0	0
Milepost	254	to 255	4	85.88	0.10	0.14	4	60.61	0.00	0.12	3.61	4.88	3.97	4.85	3.99	4.23		0	0
		Total	22				22												21
		Weighted Average									3.72	4.49	3.66	3.89	3.92	3.60			
		Factor									1.00		1.00						
		Indicator Score									3.72		3.66						**47.7%**
		Pavement Index															3.76		
Segment 8		***Interstate?***	**Yes**																
Milepost	255	to 256	4	51.47	0.10	0.15	4	40.31	0.00	0.13	4.11	4.88	4.29	4.82	4.34	4.66		0	0
Milepost	256	to 257	4	48.67	0.10	0.14	4	47.66	0.00	0.17	4.16	4.89	4.17	4.76	4.67	4.59		0	0
Milepost	257	to 258	4	60.07	0.10	0.13	4	55.24	0.00	0.15	3.98	4.89	4.05	4.79	4.25	4.27		0	0
Milepost	258	to 259	4	55.91	0.10	0.15	4	60.93	2.00	0.12	4.04	4.87	3.97	4.53	4.29	4.14		0	0
Milepost	259	to 260	3	62.91	0.10	0.14	3	75.31	0.00	0.15	3.94	4.88	3.76	4.80	4.22	4.07		0	0
Milepost	260	to 261	3	121.93	0.30	-	3	132.50	0.00	-	3.15	4.84	3.02	5.00	3.15	3.02		3	3
Milepost	261	to 262	3	142.80	0.60	0.14	3	128.57	0.00	-	2.91	4.76	3.07	5.00	2.91	3.07		3	3
		Total	25				25												12
		Weighted Average									3.81	4.86	3.82	4.80	4.04	4.04			
		Factor									1.00		1.00						
		Indicator Score									3.81		3.82						**24.0%**
		Pavement Index															4.04		
Segment 9		***Interstate?***	**Yes**																
Milepost	262	to 263	3	106.66	1.00	0.13	3	111.00	2.00	0.18	3.33	4.70	3.28	4.47	3.33	3.28		3	3
Milepost	263	to 264	2	86.89	1.50	0.15	2	101.54	2.50	0.21	3.59	4.59	3.40	4.37	3.89	3.40		0	0
Milepost	264	to 265	2	98.53	0.90	0.17	2	101.05	0.80	0.16	3.44	4.67	3.41	4.70	3.81	3.79		0	0
Milepost	265	to 266	2	103.49	1.70	0.15	2	92.90	1.20	0.14	3.37	4.56	3.51	4.65	3.37	3.85		0	0
Milepost	266	to 267	2	112.66	3.80	0.14	2	92.55	1.40	0.17	3.26	4.26	3.52	4.58	3.26	3.84		2	0

Milepost	267	to	268	2	84.53	2.30	0.17	2	90.61	1.40	0.17	3.63	4.44	3.54	4.58	3.87	3.85		0	0
Milepost	268	to	269	2	51.23	0.50	0.20	2	56.10	0.10	0.19	4.12	4.71	4.04	4.81	4.53	4.27		0	0
Milepost	269	to	270	2	49.00	0.30	0.20	2	51.24	0.60	0.20	4.15	4.76	4.12	4.69	4.57	4.52		0	0
Milepost	270	to	271	2	39.73	1.40	0.21	2	34.56	0.50	0.21	4.30	4.54	4.38	4.71	4.47	4.61		0	0
Milepost	271	to	272	2	39.16	0.50	0.20	2	36.35	0.70	0.19	4.31	4.72	4.35	4.68	4.59	4.58		0	0
Milepost	272	to	273	2	42.27	10.82	0.15	2	49.98	16.70	0.16	4.26	3.48	4.14	2.95	3.71	3.31		2	2
Milepost	273	to	274	2	45.37	8.00	0.16	2	55.90	17.20	0.12	4.21	3.75	4.04	2.93	3.89	3.26		0	2
			Total	25				25												14
			Weighted Average									3.81	4.44	3.79	4.35	3.92	3.86			
			Factor									1.00		1.00						
			Indicator Score									3.81		3.79						**28.0%**
			Pavement Index															3.89		
Segment 10			***Interstate?***	**Yes**																
Milepost	274	to	275	2	41.87	6.80	0.17	2	48.52	15.30	0.13	4.26	3.88	4.16	3.09	3.99	3.41		0	2
Milepost	275	to	276	2	116.97	22.80	0.19	2	100.88	11.90	0.13	3.21	2.45	3.41	3.39	3.21	3.40		2	2
Milepost	276	to	277	2	130.19	1.00	0.17	2	84.48	0.40	0.13	3.05	4.65	3.63	4.82	3.05	3.99		2	0
Milepost	277	to	278	2	83.30	0.20	0.13	2	89.18	0.50	0.12	3.64	4.87	3.56	4.81	4.01	3.94		0	0
Milepost	278	to	279	2	86.51	0.20	0.13	2	68.72	0.10	0.13	3.60	4.87	3.85	4.89	3.98	4.16		0	0
Milepost	279	to	280	2	85.09	0.60	0.15	2	78.79	0.40	0.12	3.62	4.76	3.71	4.83	3.96	4.04		0	0
			Total	12				12												8
			Weighted Average									3.56	4.25	3.72	4.31	3.70	3.82			
			Factor									1.00		1.00						
			Indicator Score									3.56		3.72						**33.3%**
			Pavement Index															3.76		
Segment 11			***Interstate?***	**Yes**																
Milepost	280	to	281	2	93.17	0.90	0.13	2	66.71	1.10	0.19	3.51	4.71	3.88	4.62	3.87	4.10		0	0
Milepost	281	to	282	2	43.94	0.40	0.16	2	35.68	0.00	0.16	4.23	4.78	4.37	4.78	4.62	4.66		0	0
Milepost	282	to	283	2	35.89	0.10	0.19	2	32.69	0.00	0.16	4.36	4.82	4.42	4.79	4.68	4.68		0	0
Milepost	283	to	284	2	38.74	0.60	0.21	2	30.65	0.00	0.16	4.32	4.68	4.45	4.78	4.57	4.68		0	0
Milepost	284	to	285	2	43.06	0.30	0.18	2	53.67	4.80	0.16	4.25	4.78	4.08	4.11	4.62	4.10		0	0
Milepost	285	to	286	2	44.43	0.20	0.19	2	34.54	0.10	0.18	4.22	4.80	4.38	4.83	4.63	4.70		0	0
Milepost	286	to	287	2	42.91	0.80	0.20	2	36.11	0.20	0.25	4.25	4.66	4.36	4.71	4.54	4.60		0	0
Milepost	287	to	288	2	39.02	0.30	0.18	2	34.66	0.00	0.22	4.31	4.79	4.38	4.66	4.64	4.58		0	0
Milepost	288	to	289	2	61.14	10.80	0.26	2	85.62	8.70	0.23	3.96	3.38	3.61	3.61	3.56	3.61		2	0
Milepost	289	to	290	2	49.78	13.78	0.21	2	53.79	8.11	0.19	4.14	3.16	4.08	3.72	3.45	3.82		2	0
Milepost	290	to	291	2	54.37	3.60	0.18	2	51.64	2.00	0.15	4.07	4.25	4.11	4.51	4.19	4.39		0	0
Milepost	291	to	292	2	49.92	2.30	0.18	2	41.93	0.10	0.15	4.14	4.43	4.26	4.87	4.34	4.69		0	0
			Total	24				24												4
			Weighted Average									4.15	4.44	4.20	4.50	4.31	4.38			
			Factor									1.00		1.00						
			Indicator Score									4.15		4.20						**8.3%**

			Pavement Index															4.35		
Segment 12			*Interstate?*	**Yes**																
Milepost	292	to	293	2	47.64	0.10	0.16	2	42.00	0.20	0.18	4.17	4.85	4.26	4.81	4.65	4.64		0	0
Milepost	293	to	294	2	29.51	0.10	0.18	2	31.54	0.00	0.17	4.47	4.83	4.44	4.75	4.72	4.66		0	0
Milepost	294	to	295	2	27.13	0.10	0.18	2	27.83	0.00	0.17	4.51	4.82	4.50	4.76	4.73	4.68		0	0
Milepost	295	to	296	2	29.44	0.10	0.19	2	27.98	0.10	0.17	4.47	4.82	4.50	4.84	4.71	4.74		0	0
Milepost	296	to	297	2	43.36	0.10	0.20	2	43.09	0.40	0.18	4.24	4.80	4.24	4.77	4.63	4.61		0	0
Milepost	297	to	298	2	36.20	0.10	0.19	2	40.84	1.10	0.19	4.36	4.81	4.28	4.61	4.68	4.51		0	0
Milepost	298	to	299	2	31.53	0.10	0.18	2	38.45	0.10	0.20	4.44	4.83	4.32	4.79	4.71	4.65		0	0
Milepost	299	to	300	2	33.24	0.30	0.17	2	43.35	0.60	0.19	4.41	4.79	4.24	4.70	4.68	4.56		0	0
Milepost	300	to	301	2	42.64	0.10	0.16	2	48.31	0.00	0.18	4.25	4.86	4.16	4.74	4.68	4.56		0	0
Milepost	301	to	302	2	64.59	0.10	0.17	2	74.82	0.00	0.12	3.91	4.84	3.76	4.85	4.19	4.09		0	0
Milepost	302	to	303	2	85.53	4.22	0.16	2	88.27	0.00	0.13	3.61	4.19	3.58	4.83	3.78	3.95		0	0
Milepost	303	to	304	2	98.09	11.40	0.20	2	88.31	8.80	0.21	3.44	3.38	3.57	3.63	3.43	3.59		2	0
Milepost	304	to	305	2	105.11	13.60	0.26	2	111.83	16.70	0.22	3.35	3.12	3.27	2.90	3.35	3.27		2	2
Milepost	305	to	306	2	118.08	11.67	0.20	2	104.18	7.67	0.17	3.19	3.36	3.37	3.78	3.19	3.37		2	0
Milepost	306	to	307	2	113.76	10.47	0.19	2	113.03	10.80	0.22	3.25	3.49	3.25	3.43	3.25	3.25		2	2
Milepost	307	to	308	2	65.37	13.40	0.20	2	68.52	5.00	0.22	3.90	3.20	3.85	4.02	3.41	3.97		2	0
Milepost	308	to	309	2	43.78	1.90	0.27	2	40.44	0.00	0.24	4.23	4.37	4.29	4.62	4.33	4.52		0	0
Milepost	309	to	310	2	45.09	3.30	0.27	2	43.55	0.80	0.23	4.21	4.18	4.24	4.62	4.19	4.50		0	0
Milepost	310	to	311	2	55.36	20.30	0.28	2	40.02	1.90	0.18	4.05	2.55	4.29	4.49	2.55	4.43		2	0
Milepost	311	to	312	2	39.82	16.00	0.25	2	43.72	7.90	0.19	4.30	2.92	4.23	3.74	3.34	3.89		2	0
Milepost	312	to	313	2	35.11	13.40	0.23	2	44.79	4.50	0.17	4.38	3.17	4.22	4.14	3.53	4.16		2	0
Milepost	313	to	314	2	33.52	8.90	0.24	2	44.69	0.50	0.17	4.40	3.59	4.22	4.75	3.83	4.59		0	0
Milepost	314	to	315	2	30.98	6.40	0.23	2	64.33	0.00	0.18	4.44	3.86	3.92	4.74	4.03	4.16		0	0
			Total	46				46												20
			Weighted Average									4.09	4.07	4.04	4.40	4.03	4.23			
			Factor									1.00		1.00						
			Indicator Score									4.09		4.04						**21.7%**
			Pavement Index															4.13		
Segment 13			*Interstate?*	**Yes**																
Milepost	315	to	316	2	33.90	9.40	0.22	2	61.12	3.00	0.17	4.40	3.55	3.96	4.34	3.81	4.23		0	0
Milepost	316	to	317	2	42.56	4.80	0.23	2	35.57	4.20	0.19	4.25	4.05	4.37	4.16	4.11	4.22		0	0
Milepost	317	to	318	2	41.79	5.90	0.22	2	31.51	3.20	0.21	4.27	3.93	4.44	4.26	4.03	4.32		0	0
Milepost	318	to	319	2	53.25	5.10	0.22	2	51.40	5.20	0.22	4.08	4.02	4.11	4.00	4.04	4.04		0	0
Milepost	319	to	320	2	39.64	2.60	0.22	2	39.36	3.70	0.26	4.30	4.34	4.31	4.14	4.33	4.19		0	0
Milepost	320	to	321	2	45.56	5.70	0.20	2	39.89	1.90	0.20	4.21	3.97	4.30	4.46	4.04	4.41		0	0
Milepost	321	to	322	2	122.92	17.30	0.23	2	43.78	3.20	0.25	3.13	2.85	4.23	4.22	3.13	4.22		2	0
Milepost	322	to	323	2	105.28	2.40	0.28	2	66.58	0.10	0.25	3.35	4.29	3.88	4.72	3.35	4.13		2	0
Milepost	323	to	324	2	81.75	5.50	0.27	2	64.18	0.00	0.26	3.66	3.91	3.92	4.58	3.74	4.12		0	0
Milepost	324	to	325	2	82.97	2.90	0.29	2	65.45	0.00	0.27	3.65	4.19	3.90	4.56	3.81	4.10		0	0

Milepost	325	to	326	2	92.64	0.60	0.23	2	72.38	0.00	0.29	3.52	4.65	3.80	4.51	3.86	4.01		0	0
Milepost	326	to	327	2	72.32	0.50	0.25	2	75.07	0.00	0.28	3.80	4.63	3.76	4.53	4.05	3.99		0	0
Milepost	327	to	328	2	75.67	1.30	0.23	2	74.44	0.00	0.30	3.75	4.52	3.77	4.49	3.98	3.98		0	0
Milepost	328	to	329	2	115.66	2.90	0.24	2	68.22	0.00	0.22	3.22	4.27	3.86	4.66	3.22	4.10		2	0
Milepost	329	to	330	2	103.31	1.30	0.30	2	68.83	0.00	0.27	3.38	4.42	3.85	4.55	3.38	4.06		0	0
Milepost	330	to	331	2	77.55	0.10	0.34	2	61.05	0.00	0.28	3.72	4.55	3.96	4.53	3.97	4.13		0	0
Milepost	331	to	332	2	34.89	3.70	0.20	2	67.72	0.00	0.31	4.38	4.21	3.87	4.48	4.26	4.05		0	0
			Total	34				34												6
			Weighted Average									3.83	4.14	4.02	4.42	3.83	4.14			
			Factor									1.00		1.00						
			Indicator Score									3.83		4.02						**8.8%**
			Pavement Index															3.98		
Segment 14		***Interstate?***		**Yes**																
Milepost	332	to	333	2	46.59	0.30	0.16	2	64.14	0.00	0.32	4.19	4.82	3.92	4.43	4.63	4.07		0	0
Milepost	333	to	334	2	32.25	0.40	0.18	2	64.59	0.00	0.37	4.42	4.76	3.91	4.33	4.66	4.04		0	0
Milepost	334	to	335	2	31.73	0.20	0.20	2	69.10	0.00	0.36	4.43	4.78	3.85	4.35	4.68	4.00		0	0
Milepost	335	to	336	2	29.89	3.20	0.20	2	69.51	0.10	0.31	4.46	4.28	3.84	4.60	4.33	4.07		0	0
Milepost	336	to	337	2	33.49	0.10	0.18	2	40.88	0.00	0.18	4.40	4.83	4.28	4.73	4.70	4.60		0	0
Milepost	337	to	338	2	33.26	0.10	0.22	2	36.95	0.00	0.16	4.41	4.77	4.34	4.77	4.66	4.64		0	0
Milepost	338	to	339	2	40.88	0.10	0.20	2	44.94	0.80	0.18	4.28	4.79	4.22	4.68	4.64	4.54		0	0
Milepost	339	to	340	2	44.66	0.30	0.21	2	54.09	0.70	0.18	4.22	4.73	4.07	4.70	4.58	4.26		0	0
Milepost	340	to	341	2	35.84	0.10	0.21	2	34.20	0.00	0.16	4.36	4.78	4.39	4.78	4.66	4.66		0	0
Milepost	341	to	342	2	41.57	0.10	0.23	2	53.73	0.70	0.17	4.27	4.75	4.08	4.72	4.61	4.27		0	0
Milepost	342	to	343	2	37.40	0.10	0.26	2	30.42	0.00	0.16	4.34	4.70	4.45	4.78	4.59	4.68		0	0
Milepost	343	to	344	2	30.74	0.10	0.21	2	30.83	0.70	0.16	4.45	4.78	4.45	4.72	4.68	4.64		0	0
Milepost	344	to	345	2	36.20	0.50	0.22	2	36.30	0.60	0.16	4.36	4.68	4.36	4.75	4.58	4.63		0	0
Milepost	345	to	346	2	58.41	3.20	0.27	2	74.57	15.90	0.40	4.00	4.19	3.77	2.72	4.13	2.72		0	2
Milepost	346	to	347	2	61.51	3.40	0.29	2	54.68	11.00	0.31	3.96	4.13	4.06	3.29	4.08	3.52		0	2
Milepost	347	to	348	2	61.30	8.30	0.29	2	55.72	10.50	0.34	3.96	3.57	4.05	3.29	3.69	3.52		0	2
Milepost	348	to	349	2	61.45	10.70	0.25	2	68.31	11.20	0.28	3.96	3.39	3.86	3.31	3.56	3.48		2	2
Milepost	349	to	350	2	68.99	9.60	0.28	2	65.88	13.00	0.36	3.85	3.46	3.89	3.03	3.58	3.29		0	2
Milepost	350	to	351	2	56.33	13.00	0.29	2	55.50	11.60	0.31	4.04	3.14	4.05	3.23	3.41	3.47		2	2
Milepost	351	to	352	2	56.35	15.30	0.22	2	51.54	5.60	0.29	4.04	3.02	4.11	3.86	3.32	3.94		2	0
Milepost	352	to	353	2	76.83	9.80	0.23	2	66.05	7.70	0.25	3.73	3.51	3.89	3.69	3.58	3.75		0	0
Milepost	353	to	354	2	94.36	5.50	0.24	2	67.10	6.90	0.30	3.49	3.95	3.87	3.70	3.63	3.75		0	0
			Total	44				44												18
			Weighted Average									4.16	4.26	4.08	4.11	4.23	4.02			
			Factor									1.00		1.00						
			Indicator Score									4.16		4.08						**20.5%**
			Pavement Index															4.13		
Segment 15		***Interstate?***		**Yes**																

Milepost	354	to	355	2	103.76	2.30	0.18	2	62.43	8.40	0.36	3.37	4.43	3.94	3.45	3.37	3.60		0	0
Milepost	355	to	356	2	61.22	10.30	0.22	2	83.56	15.30	0.40	3.96	3.47	3.64	2.77	3.62	3.03		2	2
Milepost	356	to	357	2	77.32	8.00	0.19	2	62.08	6.20	0.29	3.73	3.73	3.95	3.80	3.73	3.85		0	0
Milepost	357	to	358	2	82.46	9.60	0.25	2	34.78	0.10	0.19	3.66	3.51	4.38	4.82	3.61	4.69		0	0
Milepost	358	to	359	2	104.55	20.30	0.42	2	40.09	0.10	0.24	3.36	2.34	4.29	4.73	2.34	4.60		2	0
Milepost	359	to	360	2	82.49	13.60	0.33	2	39.10	0.00	0.19	3.65	3.02	4.31	4.73	3.21	4.60		2	0
Milepost	360	to	361	2	127.77	4.30	0.41	2	38.22	0.20	0.16	3.08	3.80	4.32	4.84	3.08	4.68		2	0
Milepost	361	to	362	2	80.55	1.20	0.30	2	37.29	0.00	0.16	3.68	4.44	4.34	4.78	3.91	4.65		0	0
Milepost	362	to	363	2	42.73	7.10	0.21	2	33.66	0.00	0.14	4.25	3.81	4.40	4.82	3.94	4.69		0	0
Milepost	363	to	364	2	37.99	0.10	0.18	2	37.20	0.20	0.15	4.33	4.83	4.34	4.84	4.68	4.69		0	0
Milepost	364	to	365	2	39.97	0.10	0.17	2	42.23	0.00	0.14	4.30	4.84	4.26	4.81	4.67	4.65		0	0
Milepost	365	to	366	2	34.49	0.10	0.15	2	37.49	0.00	0.17	4.39	4.87	4.34	4.76	4.72	4.63		0	0
Milepost	366	to	367	2	36.23	0.10	0.16	2	38.31	0.00	0.15	4.36	4.86	4.32	4.80	4.71	4.66		0	0
Milepost	367	to	368	2	37.79	0.50	0.17	2	35.69	0.40	0.17	4.33	4.75	4.37	4.78	4.62	4.66		0	0
Milepost	368	to	369	2	45.39	0.50	0.21	2	38.93	0.70	0.21	4.21	4.70	4.31	4.66	4.55	4.55		0	0
Milepost	369	to	370	2	39.15	0.10	0.25	2	61.24	2.40	0.23	4.31	4.72	3.96	4.35	4.60	4.23		0	0
Milepost	370	to	371	2	39.65	0.30	0.21	2	40.18	0.70	0.23	4.30	4.75	4.29	4.62	4.61	4.53		0	0
Milepost	371	to	372	2	40.32	0.10	0.21	2	46.29	1.40	0.24	4.29	4.79	4.19	4.49	4.64	4.40		0	0
			Total	36				36												10
			Weighted Average									3.97	4.20	4.22	4.49	4.03	4.41			
			Factor									1.00		1.00						
			Indicator Score									3.97		4.22						**13.9%**
			Pavement Index															4.22		
Segment 16			***Interstate?***	**Yes**																
Milepost	372	to	373	2	47.65	0.50	0.19	2	60.40	4.50	0.21	4.17	4.73	3.97	4.10	4.56	4.06		0	0
Milepost	373	to	374	2	48.56	0.10	0.16	2	42.34	1.10	0.19	4.16	4.86	4.26	4.61	4.65	4.50		0	0
Milepost	374	to	375	2	49.65	0.20	0.18	2	43.67	0.70	0.19	4.14	4.81	4.24	4.68	4.61	4.55		0	0
Milepost	375	to	376	2	48.52	0.80	0.18	2	45.25	1.40	0.20	4.16	4.68	4.21	4.54	4.52	4.44		0	0
Milepost	376	to	377	2	64.90	2.20	0.16	2	55.84	2.10	0.18	3.91	4.46	4.04	4.46	4.07	4.34		0	0
Milepost	377	to	378	2	55.12	1.10	0.19	2	64.19	1.30	0.18	4.06	4.61	3.92	4.59	4.44	4.12		0	0
Milepost	378	to	379	2	53.10	0.50	0.18	2	49.94	0.50	0.17	4.09	4.74	4.14	4.75	4.28	4.56		0	0
Milepost	379	to	380	2	56.40	1.00	0.18	2	37.71	0.60	0.21	4.04	4.64	4.33	4.68	4.22	4.58		0	0
Milepost	380	to	381	2	105.88	4.00	0.24	2	64.70	1.40	0.20	3.34	4.12	3.91	4.54	3.34	4.10		2	0
Milepost	381	to	382	2	103.49	5.00	0.23	2	55.91	0.10	0.18	3.37	4.01	4.04	4.83	3.37	4.28		0	0
Milepost	382	to	383	2	51.41	0.70	0.23	2	51.65	0.40	0.19	4.11	4.63	4.11	4.74	4.47	4.55		0	0
Milepost	383	to	384	2	51.93	1.60	0.21	2	38.40	0.10	0.18	4.10	4.50	4.32	4.83	4.38	4.68		0	0
Milepost	384	to	385	2	48.66	0.10	0.16	2	49.62	1.10	0.22	4.16	4.85	4.14	4.57	4.64	4.44		0	0
Milepost	385	to	386	2	73.85	0.30	0.16	2	61.58	0.00	0.18	3.78	4.81	3.96	4.75	4.09	4.19		0	0
Milepost	386	to	387	2	69.57	0.60	0.20	2	42.85	0.10	0.18	3.84	4.69	4.25	4.83	4.09	4.66		0	0
Milepost	387	to	388	2	53.64	0.10	0.17	2	41.23	0.00	0.16	4.08	4.84	4.27	4.79	4.31	4.63		0	0
Milepost	388	to	389	2	45.58	0.10	0.17	2	44.47	0.00	0.13	4.20	4.85	4.22	4.82	4.65	4.64		0	0
Milepost	389	to	390	2	64.59	0.30	0.15	2	48.39	0.00	0.13	3.91	4.82	4.16	4.83	4.18	4.63		0	0

Milepost	390	to	391	2	82.79	1.30	0.16	2	56.71	0.10	0.13	3.65	4.61	4.03	4.89	3.94	4.29		0	0
			Total	38				38												2
			Weighted Average									3.96	4.64	4.13	4.68	4.25	4.43			
			Factor									1.00		1.00						
			Indicator Score									3.96		4.13						**2.6%**
			Pavement Index															4.34		

Bridge Performance Area Data

Structure Name (A209)	Structure # (N8)	Milepost (A232)	Area (A225)	Bridge Sufficiency	Bridge Index					Bridge Rating	Hot Spots on Bridge Index map
				Sufficiency Rating	Deck (N58)	Sub (N59)	Super (N60)	Eval (N67)	Lowest		
Segment 3											
Val Vista Blvd UP	1152	188.20	10126	86.70	6.00	5.00	7.00	5.00	5.0		
McCartney Rd TI UP	1153	190.73	9672	86.30	6.00	7.00	7.00	7.00	6.0		
Cottonwood Ln UP	1154	193.88	7800	96.00	6.00	7.00	7.00	7.00	6.0		
Hwy 287 TI UP	1156	194.88	21900	90.00	6.00	7.00	6.00	6.00	6.0		
Earley Rd UP	1158	195.89	7800	91.30	6.00	7.00	6.00	6.00	6.0		
Selma Hwy UP	1160	196.89	7831	92.50	6.00	7.00	7.00	7.00	6.0		
Total			65,129								
Weighted Average				90.11					5.84		
Factor				1.00					1.00		
Indicator Score				**90.11**						**5**	
Bridge Index									**5.84**		
Segment 4											
Jimmie Kerr Blv UPRR OP	20049	198.20	91800	90.40	8.00	8.00	8.00	8.00	8.0		
I8 WB TI OP	1102	178.33	10067	77.00	7.00	7.00	7.00	7.00	7.0		
I8 EB TI OP	1103	178.33	8351	90.00	7.00	6.00	7.00	6.00	6.0		
Sunland Gin Rd TI UP	941	200.12	11862	92.20	5.00	6.00	6.00	6.00	5.0		
Toltec Rd TI UP	2152	203.84	20124	93.60	6.00	7.00	7.00	7.00	6.0		
Santa Rosa Cnl Br EB	1426	204.51	4410	96.30	6.00	7.00	7.00	7.00	6.0		
Santa Rosa Cnl Br WB	1427	204.51	4410	96.30	6.00	7.00	7.00	7.00	6.0		
Battaglia Rd UP	943	205.45	13260	86.80	5.00	6.00	6.00	6.00	5.0		
Alsdorf Rd UP	944	207.17	13291	93.00	7.00	7.00	6.00	6.00	6.0		
Sunshine Blvd TI UP	945	208.79	9750	81.40	6.00	7.00	7.00	7.00	6.0		
Drain Channel Br EB	908	209.85	5221	96.40	6.00	6.00	7.00	6.00	6.0		
Drain Channel Br WB	1104	209.85	4856	96.20	6.00	6.00	7.00	6.00	6.0		
Hwy 87 TI UP	2935	210.87	32057	98.90	7.00	8.00	8.00	8.00	7.0		
Total			229,459								
Weighted Average				91.40					6.87		
Factor				1.00					1.00		
Indicator Score				**91.40**						**5**	
Bridge Index									**6.87**		

Segment 5											
Picacho Peak RD TI OP EB	2898	219.85	6845	98.00	6.00	8.00	6.00	6.00	6.0		
Picacho Peak Rd TI OP WB	2899	219.85	6845	98.00	6.00	8.00	6.00	6.00	6.0		
Red Rock TI UP	592	226.45	5022	80.70	5.00	5.00	7.00	5.00	5.0		
Pinal Air Park TI UP	771	232.02	8680	91.80	8.00	7.00	7.00	7.00	7.0		
Total			27,392								
Weighted Average				92.86					6.13		
Factor				1.00					1.00		
Indicator Score				**92.86**						**5**	
Bridge Index									**6.13**		
Segment 6											
Marana OP TI EB	773	236.42	7874	98.00	6.00	6.00	7.00	6.00	6.0		
Marana OP TI WB	774	236.42	7874	87.00	7.00	5.00	7.00	5.00	5.0		
Tangerine TI OP EB	960	240.45	7874	94.00	7.00	7.00	7.00	7.00	7.0		
Tangerine TI OP WB	961	240.45	7874	94.00	7.00	6.00	7.00	6.00	6.0		
APC RR OP EB	973	242.09	9920	94.70	7.00	7.00	6.00	6.00	6.0		
APC RR OP WB	974	242.09	9920	93.70	7.00	7.00	6.00	6.00	6.0		
Avra Valley TI OP EB	975	242.95	7874	96.00	6.00	7.00	7.00	7.00	6.0		
Avra Valley TI OP WB	976	242.95	7874	96.00	7.00	7.00	7.00	7.00	7.0		
Bridge OP EB	977	243.33	9920	95.70	7.00	7.00	7.00	7.00	7.0		
Bridge OP WB	978	243.33	9920	95.80	7.00	7.00	7.00	7.00	7.0		
Twin Peaks TI UP	2890	244.96	34008	97.00	8.00	8.00	8.00	8.00	8.0		
Total			120,932								
Weighted Average				95.23					6.79		
Factor				1.00					1.00		
Indicator Score				**95.23**						**5**	
Bridge Index									**6.79**		
Segment 7											
Cortaro Rd TI OP EB	864	246.60	7874	93.00	5.00	7.00	7.00	7.00	5.0		
Cortaro Rd TI OP WB	865	246.60	7874	83.00	6.00	5.00	7.00	5.00	5.0		
Ina Rd TI UP	20094	248.72	35687	89.80	8.00	8.00	8.00	8.00	8.0		
Ina Rd/UPRR OP	20095	248.72	45553	89.80	7.00	8.00	8.00	8.00	7.0		
Canada Del Oro Br WB	390	249.49	20992	87.40	6.00	6.00	7.00	6.00	6.0		
Canada Del Oro Br EB	853	249.49	20992	94.80	6.00	6.00	7.00	6.00	6.0		
Orange Grove TI OP EB	868	250.04	8428	83.00	6.00	5.00	7.00	5.00	5.0		
Orange Grove TI OP WB	869	250.04	8368	83.00	6.00	5.00	6.00	5.00	5.0		
Rillito Creek Br EB	391	250.66	20992	84.40	6.00	6.00	7.00	5.00	5.0		
Rillito Creek Br WB	854	250.66	20992	94.90	6.00	6.00	7.00	6.00	6.0		

Sunset Rd TI OP EB	870	251.18	7645	97.00	7.00	7.00	7.00	7.00	7.0		
Sunset Rd TI OP WB	871	251.18	7645	97.00	6.00	7.00	7.00	7.00	6.0		
Ruthrauff Rd TI UP	20159	252.00	36352	83.40	8.00	9.00	8.00	8.00	8.0		
Prince Road TI UP	2895	254.34	28465	99.30	8.00	8.00	8.00	8.00	8.0		
Total			277,859								
Weighted Average				89.99					6.72		
Factor				1.00					1.00		
Indicator Score				**89.99**						**5**	
Bridge Index									**6.72**		
Segment 8											
Miracle Mile TI UP	2362	255.28	23526	94.30	6.00	7.00	7.00	7.00	6.0		
Grant Road TI OP	2783	256.15	35712	98.00	7.00	7.00	7.00	7.00	7.0		
Speedway Blvd TI OP	2784	257.31	30058	98.00	7.00	7.00	7.00	7.00	7.0		
St Marys Road TI OP	2186	257.76	36979	98.00	7.00	7.00	7.00	7.00	7.0		
Congress St TI OP	2853	258.40	29243	98.00	8.00	7.00	7.00	7.00	7.0		
Clark St OP	2854	258.63	34465	85.50	7.00	8.00	7.00	7.00	7.0		
18th St OP	2857	259.00	24116	85.50	7.00	7.00	7.00	7.00	7.0		
22nd St TI OP	2858	259.35	29243	98.00	7.00	8.00	7.00	7.00	7.0		
29th Street TI OP EB	2600	259.83	15415	98.00	7.00	7.00	7.00	7.00	7.0		
29th Street TI OP WB	2604	259.83	16740	98.00	7.00	7.00	7.00	7.00	7.0		
10th Ave OP	2194	260.55	46500	86.60	6.00	7.00	7.00	7.00	6.0		
6th Ave TI UP	2195	260.99	21799	93.40	6.00	7.00	7.00	7.00	6.0		
Veterans SPRR OP	2197	261.41	22092	89.00	6.00	7.00	7.00	7.00	6.0		
Park Ave TI OP EB	2162	261.72	18850	94.50	6.00	7.00	7.00	7.00	6.0		
Park Ave TI OP WB	2163	261.72	18600	92.90	6.00	7.00	7.00	7.00	6.0		
Total			403,338								
Weighted Average				93.51					6.62		
Factor				1.00					1.00		
Indicator Score				**93.51**						**6**	
Bridge Index									**6.62**		
Segment 9											
Ajo Way OP EB	1107	262.44	11275	91.50	5.00	6.00	6.00	6.00	5.0		
Ajo Way OP WB	1108	262.44	11275	91.60	5.00	6.00	6.00	6.00	5.0		
Kino Pkwy TI UP NB	1162	262.53	25704	89.40	5.00	6.00	7.00	6.00	5.0		
Kino Pkwy TI UP SB	1163	262.53	18763	71.10	5.00	6.00	7.00	6.00	5.0		
Diversion Chnl Br EB	1109	262.82	6156	94.10	7.00	7.00	7.00	7.00	7.0		
Diversion Chnl Br WB	1110	262.82	4887	91.90	7.00	7.00	7.00	7.00	7.0		
Country Club OP EB	1111	263.82	6450	93.10	6.00	6.00	6.00	6.00	6.0		
Country Club OP WB	1112	263.82	6450	93.00	5.00	7.00	6.00	6.00	5.0		

Irvington Rd OP EB	1217	264.27	12267	75.40	7.00	6.00	7.00	6.00	6.0		
Irvington Rd OP WB	1218	264.27	12267	93.00	7.00	6.00	7.00	6.00	6.0		
Palo Verde TI OP EB	1219	264.37	9165	73.30	7.00	6.00	6.00	6.00	6.0		
Palo Verde TI OP WB	1220	264.37	9165	93.00	7.00	6.00	7.00	6.00	6.0		
Alvernon Wy TI OP EB	2018	265.02	13588	98.00	7.00	6.00	7.00	6.00	6.0		
Alvernon Wy TI OP WB	2019	265.02	13588	98.00	7.00	6.00	7.00	6.00	6.0		
Drexel Rd OP EB	1223	266.00	6091	92.40	6.00	7.00	7.00	7.00	6.0		
Drexel Rd OP WB	1224	266.00	6091	91.70	6.00	7.00	7.00	7.00	6.0		
Valencia Rd TI OP EB	1225	267.10	7862	93.00	6.00	7.00	7.00	7.00	6.0		
Valencia Rd TI OP WB	1226	267.10	8638	94.00	6.00	6.00	7.00	6.00	6.0		
Earp Wash Trib Br EB	1044	267.65	4879	80.60	7.00	7.00	7.00	5.00	5.0		
Earp Wash Trib Br WB	1045	267.65	4879	80.50	7.00	7.00	7.00	5.00	5.0		
Craycroft TI OP EB	594	268.08	7700	95.00	8.00	7.00	6.00	6.00	6.0		
Craycroft TI OP WB	595	268.08	7700	96.00	8.00	7.00	7.00	7.00	7.0		
Wilmot Rd TI OP EB	596	269.36	7700	96.00	8.00	7.00	7.00	7.00	7.0		
Wilmot Rd TI OP WB	597	269.36	7700	96.00	8.00	7.00	7.00	7.00	7.0		
Kolb Road TI UP	1823	270.58	22097	95.40	7.00	6.00	7.00	6.00	6.0		
Rita Road TI UP	711	273.14	8237	62.70	7.00	5.00	6.00	5.00	5.0		
Total			260,574								
Weighted Average				89.04					5.78		
Factor				1.00					1.00		
Indicator Score				**89.04**						**5**	
Bridge Index									**5.78**		
Segment 10											
Houghton Rd TI UP	20173	275.46	30625	100.00	7.00	8.00	8.00	8.00	7.0		
Wash Bridge EB	463	277.46	3873	80.80	6.00	6.00	7.00	5.00	5.0		
Wash Bridge WB	689	277.90	4061	94.40	6.00	6.00	7.00	6.00	6.0		
Vail Rd TI UP EB	744	279.37	5632	88.60	8.00	6.00	6.00	6.00	6.0		
Vail Rd TI UP WB	745	279.37	5632	88.60	7.00	7.00	6.00	6.00	6.0		
Total			49,823								
Weighted Average				95.47					6.54		
Factor				1.00					1.00		
Indicator Score				**95.47**						**5**	
Bridge Index									**6.54**		
Segment 11											
Mountain View TI UP	1053	281.68	11550	75.90	8.00	7.00	6.00	6.00	6.0		
Davidson Canyon Br WB	598	284.45	16273	97.00	8.00	8.00	7.00	7.00	7.0		
Davidson Cyn Br EB	1784	284.45	14645	96.90	6.00	7.00	7.00	7.00	6.0		
Cienega Creek BR EB	2764	289.20	23048	97.10	6.00	8.00	8.00	8.00	6.0		
Cienega Creek Br WB	2765	289.20	23048	97.00	8.00	8.00	8.00	8.00	8.0		
Marsh Station TI UP	2766	291.10	12542	99.60	7.00	8.00	7.00	7.00	7.0		

Total			101,106								
Weighted Average				94.92					6.74		
Factor				1.00					1.00		
Indicator Score				**94.92**						**6**	
Bridge Index									**6.74**		
Segment 12											
Amole RR OP EB	485	292.35	5530	94.60	5.00	7.00	7.00	7.00	5.0		
Amole RR OP WB	786	292.35	5357	94.60	5.00	7.00	7.00	7.00	5.0		
Amole TI OP EB(Bell)	787	292.50	4685	82.60	5.00	5.00	7.00	5.00	5.0		
Amole TI OP WB(Bell)	788	292.50	4753	75.50	6.00	6.00	7.00	6.00	6.0		
Mescal Rd TI UP	517	297.17	7978	85.70	7.00	7.00	7.00	7.00	7.0		
Cornfield Canyon Br WB	73	299.14	3520	71.90	5.00	5.00	5.00	5.00	5.0		
SR 90 TI OP EB	2893	302.38	9734	98.00	7.00	8.00	7.00	7.00	7.0		
SR 90 TI OP WB	2894	302.38	11594	98.00	8.00	8.00	8.00	8.00	8.0		
W Benson TI OP EB	1346	303.86	5156	94.00	6.00	7.00	7.00	7.00	6.0		
W Benson TI OP WB	1347	303.86	5562	95.00	6.00	7.00	6.00	6.00	6.0		
Benson SPRR OP EB	1348	304.28	6334	94.60	6.00	7.00	7.00	7.00	6.0		
Benson SPRR OP WB	1349	304.28	6302	95.30	6.00	6.00	7.00	6.00	6.0		
Ocotillo Rd TI OP EB	2044	304.91	4680	95.40	7.00	7.00	7.00	7.00	7.0		
Ocotillo Rd TI OP WB	2045	304.91	4680	96.00	7.00	6.00	7.00	6.00	6.0		
San Pedro Riv Br EB	1530	306.75	13628	97.40	7.00	7.00	7.00	7.00	7.0		
San Pedro Riv Br WB	1531	306.75	14774	97.30	7.00	7.00	7.00	7.00	7.0		
Pomerene Rd TI OP EB	1673	307.10	8366	97.00	5.00	6.00	8.00	6.00	5.0		
Pomerene Rd TI OP WB	1674	307.10	8366	97.00	5.00	6.00	7.00	6.00	5.0		
Adams Peak Wash Br EB	1604	309.75	6645	97.40	6.00	7.00	7.00	7.00	6.0		
Adams Peak Wash Br WB	1605	309.75	6645	97.40	6.00	7.00	7.00	7.00	6.0		
Sibyl Road TI OP EB	574	312.77	3888	81.70	6.00	6.00	7.00	5.00	5.0		
Sibyl Road TI OP WB	575	312.77	3870	81.70	6.00	6.00	7.00	5.00	5.0		
Total			152,047								
Weighted Average				93.57					6.20		
Factor				1.00					1.00		
Indicator Score				**93.57**						**5**	
Bridge Index									**6.20**		
Segment 13											
Dragoon TI OP EB	760	318.95	4190	83.20	5.00	5.00	7.00	5.00	5.0		
Dragoon TI OP WB	761	318.95	4190	93.30	6.00	6.00	7.00	6.00	6.0		
Johnson Rd TI UP	511	322.60	6592	87.50	6.00	6.00	6.00	6.00	6.0		
Cochise TI UP	518	331.62	8715	69.50	5.00	5.00	6.00	5.00	5.0		
Total			23,687								

	Weighted Average			81.14					5.46		
	Factor			1.00					1.00		
	Indicator Score			**81.14**						**5**	
	Bridge Index								**5.46**		
Segment 14											
W Willcox TI UP	1113	336.90	8800	86.30	8.00	7.00	6.00	6.00	6.0		
Airport Rd UP	1114	339.46	10877	55.90	5.00	4.00	6.00	4.00	4.0		
SR 186 TI UP	2806	340.54	30846	99.80	7.00	8.00	8.00	8.00	7.0		
Stewart Rd UP	1228	344.30	7616	91.20	5.00	6.00	7.00	6.00	5.0		
E Willcox TI UP	1229	344.51	15683	88.00	5.00	7.00	6.00	6.00	5.0		
Safford TI UP	564	352.40	7525	72.00	5.00	6.00	6.00	6.00	5.0		
Total			81,347								
	Weighted Average			86.82					5.73		
	Factor			1.00					1.00		
	Indicator Score			**86.82**						**4**	
	Bridge Index								**5.73**		
Segment 15											
Monk Draw Br EB	429	355.58	4549	89.10	6.00	6.00	6.00	6.00	6.0		
Monk Draw Br WB	1669	355.58	6060	95.80	6.00	6.00	6.00	6.00	6.0		
US 191 TI UP	649	355.97	10395	97.00	5.00	7.00	7.00	7.00	5.0		
Calif Wash Br EB	655	356.55	9854	97.40	6.00	6.00	6.00	6.00	6.0		
Calif Wash Br WB	656	356.55	9854	97.50	6.00	6.00	7.00	6.00	6.0		
Luzena SPRR OP EB	657	356.94	6106	95.40	6.00	7.00	6.00	6.00	6.0		
Luzena SPRR OP WB	1060	356.94	6106	95.50	6.00	7.00	6.00	6.00	6.0		
W Bowie TI UP	1230	362.88	10173	90.80	6.00	7.00	6.00	6.00	6.0		
Roberts Farm Rd OP EB	1231	363.70	4944	95.80	6.00	6.00	6.00	6.00	6.0		
Roberts Farm Rd OP WB	1232	363.70	4944	95.60	6.00	6.00	6.00	6.00	6.0		
Apache Pass Rd OP EB	1233	364.79	4450	95.20	6.00	6.00	6.00	6.00	6.0		
Apache Pass Rd OP WB	1234	364.79	4450	95.60	6.00	6.00	6.00	6.00	6.0		
E Bowie TI UP	1235	366.79	10419	85.80	6.00	7.00	6.00	6.00	6.0		
Holt OP EB	690	370.00	3931	91.30	6.00	6.00	7.00	6.00	6.0		
Holt OP WB	691	370.00	3931	91.40	6.00	6.00	7.00	6.00	6.0		
Total			100,166								
	Weighted Average			93.96					5.90		
	Factor			1.00					1.00		
	Indicator Score			**93.96**						**5**	

Bridge Index									**5.90**		
Segment 16											
Olga OP EB	692	372.62	3931	95.40	6.00	6.00	6.00	6.00	6.0		
Olga OP WB	693	372.62	3931	95.40	6.00	6.00	7.00	6.00	6.0		
W San Simon TI UP	1164	378.93	10982	89.30	6.00	6.00	7.00	6.00	6.0		
Wood Canyon Rd OP EB	1165	380.34	4190	95.50	6.00	6.00	7.00	6.00	6.0		
Wood Canyon Rd OP WB	1166	380.34	4190	95.50	6.00	6.00	7.00	6.00	6.0		
San Simon Riv Br EB	1167	381.68	8166	79.50	6.00	6.00	5.00	5.00	5.0		
San Simon Riv Br WB	1168	381.68	8166	79.40	6.00	6.00	5.00	5.00	5.0		
E San Simon TI UP	1169	382.35	10419	63.90	6.00	4.00	7.00	4.00	4.0		
Island Wash Br WB	210	389.38	3737	77.60	6.00	6.00	6.00	5.00	5.0		
Island Wash Br EB	658	389.38	4795	96.50	6.00	6.00	6.00	6.00	6.0		
Cavot TI OP WB	647	390.77	3931	93.00	6.00	6.00	6.00	6.00	6.0		
Cavot TI OP EB	648	390.77	3931	93.00	6.00	6.00	7.00	6.00	6.0		
Total			70,369								
Weighted Average				84.96					5.42		
Factor				1.00					1.00		
Indicator Score				**84.96**						**4**	
Bridge Index									**5.42**		

Mobility Performance Area Data

Segment	Begin MP	End MP	Length (mi)	Facility Type	Flow Type	Terrain	No. of Lanes	Capacity Environment Type	Lane Width (feet)	EB/NB/EB Right Shoulder Width	WB/SB/WB Right Shoulder Width	EB/NB/EB Left Shoulder Width	WB/SB/WB Left Shoulder Width	NB/EB/EB AADT	SB/WB/WB AADT	2019 AADT	K Factor	D Factor	T Factor	Weighted Average Posted	Divided or Undivided	Access Points (per mile)	% No-Passing Zone	Street Parking
3	187	198	11	Fringe Urban	Uninterrupted	Level	6	Freeway Segment	12.00	11.74	11.97	N/A	N/A	21985	20666	42651.6	8%	52%	17%	75	Divided	N/A	0%	N/A
4	198	218	20	Fringe Urban	Uninterrupted	Level	6	Freeway Segment	12.00	10.73	10.74	N/A	N/A	20773	19938	40710.7	7%	53%	25%	75	Divided	N/A	0%	N/A
5	218	236	18	Rural	Uninterrupted	Level	6	Freeway Segment	12.00	11.56	11.18	N/A	N/A	21780	20721	42500.8	7%	51%	19%	75	Divided	N/A	0%	N/A
6	236	246	10	Fringe Urban	Uninterrupted	Level	6	Freeway Segment	12.00	10.00	10.00	N/A	N/A	29999	27524	57522.4	8%	52%	17%	75	Divided	N/A	0%	N/A
7	246	255	9	Urban	Uninterrupted	Level	6.9	Freeway Segment	12.00	11.85	10.89	N/A	N/A	53698	50388	104,086	7%	53%	13%	67	Divided	N/A	0%	N/A
8	255	262	7	Urban	Uninterrupted	Level	7.1	Freeway Segment	12.00	11.06	11.13	N/A	N/A	72930	71490	144,420	7%	51%	9%	65	Divided	N/A	0%	N/A
9	262	274	12	Urban	Uninterrupted	Level	4.2	Freeway Segment	12.00	9.91	9.67	N/A	N/A	27671	31285	58,955	9%	53%	20%	69	Divided	N/A	0%	N/A
10	274	280	6	Urban	Uninterrupted	Level	4	Freeway Segment	12.00	9.87	9.80	N/A	N/A	17976	18332	36307.8	8%	51%	21%	75	Divided	N/A	0%	N/A
11	280	292	12	Rural	Uninterrupted	Mountainous	4	Freeway Segment	12.00	9.69	9.70	N/A	N/A	14005	13524	27529	7%	51%	31%	75	Divided	N/A	0%	N/A
12	292	315	23	Rural	Uninterrupted	Mountainous	4	Freeway Segment	12.00	10.03	10.18	N/A	N/A	11216	9925	21141.4	7%	53%	31%	75	Divided	N/A	0%	N/A
13	315	332	17	Rural	Uninterrupted	Rolling	4	Freeway Segment	12.00	10.00	10.00	N/A	N/A	9673.27	8242.04	17915.3	9%	54%	40%	75	Divided	N/A	0%	N/A
14	332	354	22	Rural	Uninterrupted	Rolling	4	Freeway Segment	12.00	10.00	9.96	N/A	N/A	9419.23	7462.80	16882	8%	55%	38%	75	Divided	N/A	0%	N/A
15	354	372	18	Rural	Uninterrupted	Rolling	4	Freeway Segment	12.00	9.89	9.94	N/A	N/A	7270.25	6244.24	13514.5	7%	54%	38%	75	Divided	N/A	0%	N/A
16	372	392	20	Rural	Uninterrupted	Mountainous	4	Freeway Segment	12.00	9.84	9.90	N/A	N/A	6682.49	5927.73	12610.2	6%	53%	45%	75	Divided	N/A	0%	N/A

Car LOTTR and Truck TTTR - Northbound

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
3	115P04681	1 AM Peak	I-10	N	0.78	40	42	41	44	1.02	1.05	1.03	1.07	44%	1.04	1.04
3	115P04681	2 Mid Day	I-10	N	0.78	40	42	41	44	1.02	1.06					
3	115P04681	3 PM Peak	I-10	N	0.78	40	42	41	45	1.03	1.07					
3	115P04681	4 Weekend	I-10	N	0.78	40	42	42	44	1.03	1.06					
3	115P04680	1 AM Peak	I-10	N	0.57	30	31	31	33	1.03	1.06	1.04	1.07	33%		
3	115P04680	2 Mid Day	I-10	N	0.57	30	31	31	33	1.03	1.06					
3	115P04680	3 PM Peak	I-10	N	0.57	30	31	31	33	1.03	1.07					
3	115P04680	4 Weekend	I-10	N	0.57	30	31	31	33	1.04	1.07					
3	115P04679	1 AM Peak	I-10	N	0.40	23	23	24	25	1.05	1.10	1.06	1.12	23%		
3	115P04679	2 Mid Day	I-10	N	0.40	23	23	24	25	1.06	1.10					
3	115P04679	3 PM Peak	I-10	N	0.40	22	23	24	25	1.06	1.11					
3	115P04679	4 Weekend	I-10	N	0.40	22	23	23	25	1.06	1.12					
4	115P04679	1 AM Peak	I-10	N	0.40	23	23	24	25	1.05	1.10	1.06	1.12	9%	1.05	1.05
4	115P04679	2 Mid Day	I-10	N	0.40	23	23	24	25	1.06	1.10					
4	115P04679	3 PM Peak	I-10	N	0.40	22	23	24	25	1.06	1.11					
4	115P04679	4 Weekend	I-10	N	0.40	22	23	23	25	1.06	1.12					
4	115P04678	1 AM Peak	I-10	N	0.99	56	57	60	65	1.06	1.13	1.08	1.15	21%		
4	115P04678	2 Mid Day	I-10	N	0.99	56	57	59	65	1.07	1.13					
4	115P04678	3 PM Peak	I-10	N	0.99	55	57	60	66	1.08	1.15					
4	115P04678	4 Weekend	I-10	N	0.99	55	57	59	65	1.07	1.15					
4	115P04677	1 AM Peak	I-10	W	0.55	31	32	33	39	1.07	1.23	1.07	1.24	12%		
4	115P04677	2 Mid Day	I-10	W	0.55	31	32	33	39	1.07	1.22					
4	115P04677	3 PM Peak	I-10	W	0.55	31	32	33	38	1.07	1.20					
4	115P04677	4 Weekend	I-10	W	0.55	31	32	33	39	1.07	1.24					
4	115P04673	1 AM Peak	I-10	W	0.26	15	15	16	16	1.04	1.08	1.04	1.09	6%		
4	115P04673	2 Mid Day	I-10	W	0.26	15	15	16	16	1.04	1.08					
4	115P04673	3 PM Peak	I-10	W	0.26	15	15	16	16	1.04	1.09					
4	115P04673	4 Weekend	I-10	W	0.26	15	15	15	16	1.04	1.08					
4	115P04672	1 AM Peak	I-10	W	0.77	45	45	46	49	1.04	1.08	1.04	1.09	17%		
4	115P04672	2 Mid Day	I-10	W	0.77	44	45	46	49	1.04	1.08					
4	115P04672	3 PM Peak	I-10	W	0.77	44	44	46	48	1.04	1.09					
4	115P04672	4 Weekend	I-10	W	0.77	44	44	45	48	1.04	1.09					
4	115P04676	1 AM Peak	I-10	W	0.63	33	34	33	35	1.02	1.05	1.03	1.06	14%		
4	115P04676	2 Mid Day	I-10	W	0.63	32	34	33	35	1.02	1.05					
4	115P04676	3 PM Peak	I-10	W	0.63	33	34	33	36	1.02	1.06					
4	115P04676	4 Weekend	I-10	W	0.63	33	33	33	35	1.03	1.06					

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
4	115P04675	1 AM Peak	I-10	W	0.60	32	33	33	35	1.03	1.06	1.03	1.07	13%		
4	115P04675	2 Mid Day	I-10	W	0.60	32	33	33	35	1.03	1.06					
4	115P04675	3 PM Peak	I-10	W	0.60	32	33	33	35	1.03	1.07					
4	115P04675	4 Weekend	I-10	W	0.60	32	33	33	35	1.03	1.06					
4	115P04674	1 AM Peak	I-10	W	0.42	24	25	25	27	1.04	1.08	1.04	1.09	9%		
4	115P04674	2 Mid Day	I-10	W	0.42	24	25	25	26	1.04	1.08					
4	115P04674	3 PM Peak	I-10	W	0.42	24	25	25	27	1.04	1.09					
4	115P04674	4 Weekend	I-10	W	0.42	24	24	25	26	1.04	1.08					
5	115P04668	1 AM Peak	I-10	N	0.10	5	5	5	6	1.08	1.14	1.09	1.17	6%	1.04	1.04
5	115P04668	2 Mid Day	I-10	N	0.10	5	5	5	6	1.09	1.15					
5	115P04668	3 PM Peak	I-10	N	0.10	5	5	5	6	1.08	1.17					
5	115P04668	4 Weekend	I-10	N	0.10	5	5	5	6	1.06	1.13					
5	115P04669	1 AM Peak	I-10	N	0.03	2	2	2	2	1.07	1.13	1.08	1.16	2%		
5	115P04669	2 Mid Day	I-10	N	0.03	2	2	2	2	1.08	1.13					
5	115P04669	3 PM Peak	I-10	N	0.03	2	2	2	2	1.08	1.16					
5	115P04669	4 Weekend	I-10	N	0.03	2	2	2	2	1.06	1.12					
5	115P04670	1 AM Peak	I-10	N	0.53	27	28	28	29	1.02	1.05	1.02	1.05	34%		
5	115P04670	2 Mid Day	I-10	N	0.53	27	28	28	29	1.02	1.04					
5	115P04670	3 PM Peak	I-10	N	0.53	27	28	28	30	1.02	1.05					
5	115P04670	4 Weekend	I-10	N	0.53	27	28	28	29	1.02	1.05					
5	115P04671	1 AM Peak	I-10	W	0.79	41	42	42	45	1.02	1.06	1.03	1.08	51%		
5	115P04671	2 Mid Day	I-10	W	0.79	40	42	41	44	1.02	1.05					
5	115P04671	3 PM Peak	I-10	W	0.79	41	42	42	45	1.03	1.08					
5	115P04671	4 Weekend	I-10	W	0.79	41	42	42	45	1.03	1.07					
5	115P04755	1 AM Peak	I-10	N	0.09	5	5	5	6	1.08	1.14	1.09	1.17	6%		
5	115P04755	2 Mid Day	I-10	N	0.09	5	5	5	6	1.09	1.14					
5	115P04755	3 PM Peak	I-10	N	0.09	5	5	5	6	1.09	1.17					
5	115P04755	4 Weekend	I-10	N	0.09	5	5	5	6	1.06	1.13					
6	115P04752	1 AM Peak	I-10	W	0.69	36	37	36	39	1.02	1.04	1.02	1.05	22%	1.03	1.03
6	115P04752	2 Mid Day	I-10	W	0.69	36	37	36	38	1.02	1.04					
6	115P04752	3 PM Peak	I-10	W	0.69	36	37	36	39	1.02	1.05					
6	115P04752	4 Weekend	I-10	W	0.69	36	37	37	39	1.02	1.05					
6	115P04753	1 AM Peak	I-10	W	0.77	40	41	41	43	1.02	1.04	1.02	1.05	24%		
6	115P04753	2 Mid Day	I-10	W	0.77	40	41	41	43	1.02	1.04					
6	115P04753	3 PM Peak	I-10	W	0.77	40	41	41	43	1.02	1.05					
6	115P04753	4 Weekend	I-10	W	0.77	40	41	41	43	1.02	1.05					
6	115P04754	1 AM Peak	I-10	W	0.81	42	43	43	45	1.02	1.04	1.02	1.05	25%		
6	115P04754	2 Mid Day	I-10	W	0.81	42	43	42	45	1.02	1.05					

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
6	115P04754	3 PM Peak	I-10	W	0.81	42	43	43	45	1.02	1.05					
6	115P04754	4 Weekend	I-10	W	0.81	42	43	43	45	1.02	1.05					
6	115P11086	1 AM Peak	I-10	N	0.92	48	50	50	53	1.03	1.07	1.03	1.08	29%		
6	115P11086	2 Mid Day	I-10	N	0.92	48	50	49	53	1.03	1.06					
6	115P11086	3 PM Peak	I-10	N	0.92	48	50	50	53	1.03	1.08					
6	115P11086	4 Weekend	I-10	N	0.92	48	50	50	53	1.03	1.07					
7	115P04357	1 AM Peak	I-10	N	0.78	43	43	43	46	1.02	1.05	1.04	1.52	12%	1.17	1.17
7	115P04357	2 Mid Day	I-10	N	0.78	43	43	43	45	1.02	1.04					
7	115P04357	3 PM Peak	I-10	N	0.78	43	44	45	67	1.04	1.52					
7	115P04357	4 Weekend	I-10	N	0.78	42	43	43	45	1.02	1.05					
7	115P04358	1 AM Peak	I-10	N	1.49	82	82	83	86	1.02	1.04	1.44	2.74	22%		
7	115P04358	2 Mid Day	I-10	N	1.49	81	82	82	86	1.01	1.05					
7	115P04358	3 PM Peak	I-10	N	1.49	83	84	119	231	1.44	2.74					
7	115P04358	4 Weekend	I-10	N	1.49	80	82	82	85	1.02	1.04					
7	115P04359	1 AM Peak	I-10	N	0.89	49	49	49	51	1.02	1.04	1.29	1.53	13%		
7	115P04359	2 Mid Day	I-10	N	0.89	48	49	49	52	1.02	1.05					
7	115P04359	3 PM Peak	I-10	N	0.89	50	51	64	77	1.29	1.53					
7	115P04359	4 Weekend	I-10	N	0.89	48	49	49	51	1.02	1.04					
7	115P04360	1 AM Peak	I-10	N	0.80	44	44	45	46	1.02	1.04	1.06	1.21	12%		
7	115P04360	2 Mid Day	I-10	N	0.80	44	44	45	46	1.02	1.05					
7	115P04360	3 PM Peak	I-10	N	0.80	45	45	48	55	1.06	1.21					
7	115P04360	4 Weekend	I-10	N	0.80	43	44	44	46	1.02	1.04					
7	115P04361	1 AM Peak	I-10	N	0.78	43	43	45	46	1.04	1.07	1.05	1.24	12%		
7	115P04361	2 Mid Day	I-10	N	0.78	43	44	45	46	1.04	1.07					
7	115P04361	3 PM Peak	I-10	N	0.78	44	45	46	55	1.05	1.24					
7	115P04361	4 Weekend	I-10	N	0.78	43	43	44	46	1.03	1.07					
7	115P04362	1 AM Peak	I-10	N	0.89	51	50	54	55	1.06	1.10	1.06	1.16	13%		
7	115P04362	2 Mid Day	I-10	N	0.89	51	50	53	55	1.05	1.10					
7	115P04362	3 PM Peak	I-10	N	0.89	51	51	54	59	1.06	1.16					
7	115P04362	4 Weekend	I-10	N	0.89	49	50	52	54	1.05	1.09					
7	115P04363	1 AM Peak	I-10	N	1.03	56	57	58	60	1.03	1.05	1.03	1.07	15%		
7	115P04363	2 Mid Day	I-10	N	1.03	56	57	57	60	1.02	1.05					
7	115P04363	3 PM Peak	I-10	N	1.03	56	57	58	61	1.03	1.07					
7	115P04363	4 Weekend	I-10	N	1.03	56	57	57	60	1.03	1.06					
8	115P04348	1 AM Peak	I-10	W	0.30	17	17	17	18	1.03	1.08	1.06	1.14	5%	1.04	1.04
8	115P04348	2 Mid Day	I-10	W	0.30	17	17	17	18	1.03	1.08					
8	115P04348	3 PM Peak	I-10	W	0.30	17	17	18	20	1.06	1.14					
8	115P04348	4 Weekend	I-10	W	0.30	16	16	17	17	1.03	1.06					

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
8	115P04349	1 AM Peak	I-10	W	0.48	28	27	28	29	1.03	1.08	1.04	1.13	8%		
8	115P04349	2 Mid Day	I-10	W	0.48	27	27	28	29	1.03	1.07					
8	115P04349	3 PM Peak	I-10	W	0.48	28	28	29	31	1.04	1.13					
8	115P04349	4 Weekend	I-10	W	0.48	27	27	27	28	1.03	1.06					
8	115P04350	1 AM Peak	I-10	W	0.23	13	13	13	14	1.02	1.07	1.04	1.15	4%		
8	115P04350	2 Mid Day	I-10	W	0.23	13	13	13	14	1.02	1.07					
8	115P04350	3 PM Peak	I-10	W	0.23	13	13	14	15	1.04	1.15					
8	115P04350	4 Weekend	I-10	W	0.23	13	13	13	13	1.03	1.06					
8	115P04351	1 AM Peak	I-10	N	1.01	56	56	57	61	1.02	1.08	1.04	1.63	17%		
8	115P04351	2 Mid Day	I-10	N	1.01	56	56	57	60	1.02	1.07					
8	115P04351	3 PM Peak	I-10	N	1.01	56	57	58	93	1.04	1.63					
8	115P04351	4 Weekend	I-10	N	1.01	55	55	56	59	1.02	1.06					
8	115P04352	1 AM Peak	I-10	N	0.40	22	22	23	24	1.02	1.08	1.04	1.54	7%		
8	115P04352	2 Mid Day	I-10	N	0.40	22	22	23	24	1.02	1.06					
8	115P04352	3 PM Peak	I-10	N	0.40	22	23	23	35	1.04	1.54					
8	115P04352	4 Weekend	I-10	N	0.40	22	22	22	23	1.02	1.06					
8	115P04353	1 AM Peak	I-10	N	0.89	50	50	51	53	1.02	1.06	1.04	1.25	15%		
8	115P04353	2 Mid Day	I-10	N	0.89	49	49	50	52	1.02	1.06					
8	115P04353	3 PM Peak	I-10	N	0.89	50	50	52	63	1.04	1.25					
8	115P04353	4 Weekend	I-10	N	0.89	48	49	49	51	1.02	1.05					
8	115P04354	1 AM Peak	I-10	N	0.08	4	4	4	4	1.03	1.07	1.05	1.26	1%		
8	115P04354	2 Mid Day	I-10	N	0.08	4	4	4	4	1.03	1.06					
8	115P04354	3 PM Peak	I-10	N	0.08	4	4	4	5	1.05	1.26					
8	115P04354	4 Weekend	I-10	N	0.08	4	4	4	4	1.02	1.06					
8	115P04355	1 AM Peak	I-10	N	0.82	46	45	47	48	1.03	1.05	1.04	1.29	14%		
8	115P04355	2 Mid Day	I-10	N	0.82	45	45	46	48	1.02	1.05					
8	115P04355	3 PM Peak	I-10	N	0.82	46	46	48	60	1.04	1.29					
8	115P04355	4 Weekend	I-10	N	0.82	44	45	45	47	1.02	1.05					
8	115P04356	1 AM Peak	I-10	N	0.84	46	46	47	49	1.02	1.05	1.04	1.27	14%		
8	115P04356	2 Mid Day	I-10	N	0.84	46	46	46	48	1.02	1.05					
8	115P04356	3 PM Peak	I-10	N	0.84	46	47	48	60	1.04	1.27					
8	115P04356	4 Weekend	I-10	N	0.84	45	46	46	48	1.02	1.04					
8	115P04357	1 AM Peak	I-10	N	0.78	43	43	43	46	1.02	1.05	1.04	1.52	13%		
8	115P04357	2 Mid Day	I-10	N	0.78	43	43	43	45	1.02	1.04					
8	115P04357	3 PM Peak	I-10	N	0.78	43	44	45	67	1.04	1.52					
8	115P04357	4 Weekend	I-10	N	0.78	42	43	43	45	1.02	1.05					
9	115P04340	1 AM Peak	I-10	W	0.53	28	29	28	31	1.03	1.08	1.03	1.08	9%	1.14	1.14
9	115P04340	2 Mid Day	I-10	W	0.53	28	28	28	30	1.02	1.06					

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9	115P04340	3 PM Peak	I-10	W	0.53	28	28	29	30	1.03	1.07					
9	115P04340	4 Weekend	I-10	W	0.53	28	28	28	30	1.02	1.05					
9	115P04341	1 AM Peak	I-10	W	0.85	46	47	47	52	1.03	1.12	1.03	1.12	15%		
9	115P04341	2 Mid Day	I-10	W	0.85	46	46	47	49	1.02	1.06					
9	115P04341	3 PM Peak	I-10	W	0.85	46	46	47	49	1.02	1.06					
9	115P04341	4 Weekend	I-10	W	0.85	46	46	47	48	1.02	1.05					
9	115P04342	1 AM Peak	I-10	W	0.76	41	42	43	64	1.03	1.54	1.03	1.54	13%		
9	115P04342	2 Mid Day	I-10	W	0.76	41	41	42	44	1.02	1.06					
9	115P04342	3 PM Peak	I-10	W	0.76	41	42	42	45	1.02	1.07					
9	115P04342	4 Weekend	I-10	W	0.76	41	41	42	43	1.02	1.05					
9	115P04343	1 AM Peak	I-10	W	0.76	41	42	43	65	1.04	1.56	1.04	1.56	13%		
9	115P04343	2 Mid Day	I-10	W	0.76	41	42	42	44	1.02	1.06					
9	115P04343	3 PM Peak	I-10	W	0.76	41	42	42	45	1.02	1.08					
9	115P04343	4 Weekend	I-10	W	0.76	41	41	42	43	1.02	1.05					
9	115P04344	1 AM Peak	I-10	N	0.80	45	45	46	103	1.04	2.29	1.04	2.29	14%		
9	115P04344	2 Mid Day	I-10	N	0.80	44	44	45	47	1.02	1.07					
9	115P04344	3 PM Peak	I-10	N	0.80	44	45	45	54	1.03	1.20					
9	115P04344	4 Weekend	I-10	N	0.80	44	44	45	47	1.02	1.06					
9	115P04345	1 AM Peak	I-10	W	0.42	23	23	25	32	1.05	1.36	1.12	2.77	7%		
9	115P04345	2 Mid Day	I-10	W	0.42	23	23	24	26	1.03	1.11					
9	115P04345	3 PM Peak	I-10	W	0.42	23	23	26	65	1.12	2.77					
9	115P04345	4 Weekend	I-10	W	0.42	23	23	23	24	1.02	1.05					
9	115P04346	1 AM Peak	I-10	W	0.62	35	35	37	53	1.05	1.53	1.82	4.12	11%		
9	115P04346	2 Mid Day	I-10	W	0.62	34	34	35	50	1.03	1.44					
9	115P04346	3 PM Peak	I-10	W	0.62	35	35	63	145	1.82	4.12					
9	115P04346	4 Weekend	I-10	W	0.62	33	34	34	36	1.02	1.06					
9	115P04347	1 AM Peak	I-10	W	0.68	38	38	40	43	1.04	1.12	1.12	1.25	12%		
9	115P04347	2 Mid Day	I-10	W	0.68	38	38	39	43	1.03	1.12					
9	115P04347	3 PM Peak	I-10	W	0.68	39	39	44	49	1.12	1.25					
9	115P04347	4 Weekend	I-10	W	0.68	37	38	38	40	1.02	1.07					
9	115P04348	1 AM Peak	I-10	W	0.30	17	17	17	18	1.03	1.08	1.06	1.14	5%		
9	115P04348	2 Mid Day	I-10	W	0.30	17	17	17	18	1.03	1.08					
9	115P04348	3 PM Peak	I-10	W	0.30	17	17	18	20	1.06	1.14					
9	115P04348	4 Weekend	I-10	W	0.30	16	16	17	17	1.03	1.06					
10	115P04338	1 AM Peak	I-10	W	0.55	29	29	29	31	1.03	1.06	1.03	1.06	50%	1.03	1.03
10	115P04338	2 Mid Day	I-10	W	0.55	28	29	29	31	1.02	1.06					
10	115P04338	3 PM Peak	I-10	W	0.55	29	29	29	31	1.03	1.06					
10	115P04338	4 Weekend	I-10	W	0.55	29	29	29	31	1.02	1.06					

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
10	115P04339	1 AM Peak	I-10	W	0.56	29	30	30	32	1.03	1.06	1.03	1.06	50%		
10	115P04339	2 Mid Day	I-10	W	0.56	29	30	30	31	1.02	1.06					
10	115P04339	3 PM Peak	I-10	W	0.56	29	30	30	32	1.03	1.06					
10	115P04339	4 Weekend	I-10	W	0.56	29	30	30	31	1.02	1.05					
11	115P04750	1 AM Peak	I-10	W	0.71	36	37	37	40	1.03	1.07	1.03	1.07	76%	1.03	1.03
11	115P04750	2 Mid Day	I-10	W	0.71	36	37	37	39	1.02	1.06					
11	115P04750	3 PM Peak	I-10	W	0.71	36	37	37	39	1.03	1.06					
11	115P04750	4 Weekend	I-10	W	0.71	36	37	37	39	1.03	1.06					
11	115P04751	1 AM Peak	I-10	W	0.22	12	12	12	13	1.03	1.07	1.03	1.11	24%		
11	115P04751	2 Mid Day	I-10	W	0.22	12	12	12	12	1.02	1.06					
11	115P04751	3 PM Peak	I-10	W	0.22	12	12	12	13	1.03	1.11					
11	115P04751	4 Weekend	I-10	W	0.22	12	12	12	12	1.03	1.06					
12	115P04748	1 AM Peak	I-10	W	0.11	6	6	6	6	1.03	1.06	1.03	1.06	3%	1.04	1.04
12	115P04748	2 Mid Day	I-10	W	0.11	6	6	6	6	1.02	1.06					
12	115P04748	3 PM Peak	I-10	W	0.11	6	6	6	6	1.03	1.06					
12	115P04748	4 Weekend	I-10	W	0.11	6	6	6	6	1.02	1.06					
12	115P04749	1 AM Peak	I-10	W	0.23	12	12	12	13	1.03	1.07	1.03	1.07	5%		
12	115P04749	2 Mid Day	I-10	W	0.23	12	12	12	13	1.03	1.06					
12	115P04749	3 PM Peak	I-10	W	0.23	12	12	12	13	1.03	1.06					
12	115P04749	4 Weekend	I-10	W	0.23	12	12	12	12	1.03	1.06					
12	115P04871	1 AM Peak	I-10	W	0.43	22	23	23	24	1.03	1.07	1.03	1.07	10%		
12	115P04871	2 Mid Day	I-10	W	0.43	22	23	23	24	1.02	1.06					
12	115P04871	3 PM Peak	I-10	W	0.43	22	23	23	24	1.03	1.07					
12	115P04871	4 Weekend	I-10	W	0.43	22	23	23	24	1.02	1.06					
12	115P04872	1 AM Peak	I-10	W	0.76	40	41	41	43	1.03	1.07	1.03	1.08	17%		
12	115P04872	2 Mid Day	I-10	W	0.76	40	41	41	43	1.02	1.06					
12	115P04872	3 PM Peak	I-10	W	0.76	40	41	42	44	1.03	1.08					
12	115P04872	4 Weekend	I-10	W	0.76	40	41	41	43	1.02	1.06					
12	115P04873	1 AM Peak	I-10	W	0.60	34	34	35	37	1.03	1.09	1.03	1.09	14%		
12	115P04873	2 Mid Day	I-10	W	0.60	33	34	35	37	1.03	1.08					
12	115P04873	3 PM Peak	I-10	W	0.60	34	34	35	37	1.03	1.09					
12	115P04873	4 Weekend	I-10	W	0.60	34	34	35	36	1.03	1.08					
12	115P04874	1 AM Peak	I-10	W	0.48	32	33	34	38	1.07	1.17	1.07	1.17	11%		
12	115P04874	2 Mid Day	I-10	W	0.48	32	33	34	38	1.07	1.16					
12	115P04874	3 PM Peak	I-10	W	0.48	33	33	35	38	1.07	1.16					
12	115P04874	4 Weekend	I-10	W	0.48	33	33	34	38	1.06	1.14					
12	115P04875	1 AM Peak	I-10	W	0.83	52	53	55	61	1.06	1.15	1.06	1.15	19%		
12	115P04875	2 Mid Day	I-10	W	0.83	52	53	55	61	1.06	1.13					

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12	115P04875	3 PM Peak	I-10	W	0.83	53	54	56	61	1.06	1.14					
12	115P04875	4 Weekend	I-10	W	0.83	53	54	56	60	1.06	1.13					
12	115P04876	1 AM Peak	I-10	W	0.31	16	17	17	18	1.03	1.07	1.03	1.07	7%		
12	115P04876	2 Mid Day	I-10	W	0.31	16	17	17	18	1.02	1.06					
12	115P04876	3 PM Peak	I-10	W	0.31	16	17	17	18	1.03	1.06					
12	115P04876	4 Weekend	I-10	W	0.31	16	17	17	18	1.02	1.06					
12	115P04877	1 AM Peak	I-10	W	0.51	27	27	27	29	1.03	1.06	1.03	1.06	12%		
12	115P04877	2 Mid Day	I-10	W	0.51	26	27	27	28	1.02	1.06					
12	115P04877	3 PM Peak	I-10	W	0.51	26	27	27	29	1.03	1.06					
12	115P04877	4 Weekend	I-10	W	0.51	27	27	27	28	1.02	1.05					
12	115P04878	1 AM Peak	I-10	W	0.13	7	7	7	7	1.03	1.06	1.03	1.06	3%		
12	115P04878	2 Mid Day	I-10	W	0.13	7	7	7	7	1.02	1.06					
12	115P04878	3 PM Peak	I-10	W	0.13	7	7	7	7	1.03	1.06					
12	115P04878	4 Weekend	I-10	W	0.13	7	7	7	7	1.02	1.05					
13	115P04867	1 AM Peak	I-10	W	0.36	19	19	19	21	1.03	1.08	1.03	1.09	22%	1.04	1.04
13	115P04867	2 Mid Day	I-10	W	0.36	19	19	19	21	1.03	1.09					
13	115P04867	3 PM Peak	I-10	W	0.36	19	19	19	20	1.03	1.07					
13	115P04867	4 Weekend	I-10	W	0.36	19	19	19	20	1.02	1.06					
13	115P04868	1 AM Peak	I-10	W	0.39	21	21	22	24	1.04	1.13	1.04	1.13	24%		
13	115P04868	2 Mid Day	I-10	W	0.39	21	21	22	24	1.04	1.11					
13	115P04868	3 PM Peak	I-10	W	0.39	21	22	22	24	1.03	1.10					
13	115P04868	4 Weekend	I-10	W	0.39	21	21	22	23	1.03	1.08					
13	115P04869	1 AM Peak	I-10	S	0.65	35	35	36	45	1.05	1.29	1.05	1.29	40%		
13	115P04869	2 Mid Day	I-10	S	0.65	35	35	36	43	1.04	1.23					
13	115P04869	3 PM Peak	I-10	S	0.65	35	35	36	43	1.04	1.22					
13	115P04869	4 Weekend	I-10	S	0.65	35	35	36	43	1.04	1.23					
13	115P04870	1 AM Peak	I-10	W	0.21	11	11	11	12	1.03	1.08	1.03	1.09	13%		
13	115P04870	2 Mid Day	I-10	W	0.21	11	11	11	12	1.03	1.08					
13	115P04870	3 PM Peak	I-10	W	0.21	11	11	11	12	1.03	1.09					
13	115P04870	4 Weekend	I-10	W	0.21	11	11	11	12	1.03	1.07					
14	115P04863	1 AM Peak	I-10	W	0.78	41	41	42	44	1.03	1.07	1.03	1.07	29%	1.03	1.03
14	115P04863	2 Mid Day	I-10	W	0.78	41	42	42	44	1.03	1.06					
14	115P04863	3 PM Peak	I-10	W	0.78	41	42	42	44	1.03	1.06					
14	115P04863	4 Weekend	I-10	W	0.78	41	41	42	44	1.03	1.06					
14	115P04864	1 AM Peak	I-10	W	0.43	22	22	23	24	1.03	1.06	1.03	1.06	16%		
14	115P04864	2 Mid Day	I-10	W	0.43	22	22	23	24	1.02	1.06					
14	115P04864	3 PM Peak	I-10	W	0.43	22	23	23	24	1.03	1.06					
14	115P04864	4 Weekend	I-10	W	0.43	22	22	23	24	1.02	1.06					

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14	115P04865	1 AM Peak	I-10	S	0.62	32	33	33	35	1.03	1.07	1.03	1.07	23%		
14	115P04865	2 Mid Day	I-10	S	0.62	32	33	33	35	1.03	1.06					
14	115P04865	3 PM Peak	I-10	S	0.62	32	33	33	35	1.03	1.07					
14	115P04865	4 Weekend	I-10	S	0.62	32	33	33	35	1.03	1.06					
14	115P04866	1 AM Peak	I-10	S	0.85	44	45	45	48	1.03	1.07	1.03	1.07	32%		
14	115P04866	2 Mid Day	I-10	S	0.85	44	45	45	47	1.02	1.06					
14	115P04866	3 PM Peak	I-10	S	0.85	44	45	45	48	1.03	1.06					
14	115P04866	4 Weekend	I-10	S	0.85	44	45	45	47	1.02	1.05					
15	115P04860	1 AM Peak	I-10	W	0.41	21	22	22	23	1.03	1.07	1.03	1.07	24%	1.03	1.03
15	115P04860	2 Mid Day	I-10	W	0.41	21	22	22	23	1.03	1.06					
15	115P04860	3 PM Peak	I-10	W	0.41	21	22	22	23	1.03	1.06					
15	115P04860	4 Weekend	I-10	W	0.41	21	22	22	23	1.02	1.06					
15	115P04861	1 AM Peak	I-10	W	0.50	26	27	27	28	1.03	1.07	1.03	1.07	30%		
15	115P04861	2 Mid Day	I-10	W	0.50	26	27	27	28	1.03	1.06					
15	115P04861	3 PM Peak	I-10	W	0.50	26	27	27	28	1.03	1.06					
15	115P04861	4 Weekend	I-10	W	0.50	26	27	27	28	1.02	1.06					
15	115P04862	1 AM Peak	I-10	W	0.78	42	42	43	45	1.03	1.07	1.03	1.07	46%		
15	115P04862	2 Mid Day	I-10	W	0.78	42	42	43	45	1.03	1.06					
15	115P04862	3 PM Peak	I-10	W	0.78	42	42	43	45	1.03	1.06					
15	115P04862	4 Weekend	I-10	W	0.78	42	42	43	45	1.03	1.06					
16	115P04855	1 AM Peak	I-10	W	0.10	6	6	7	9	1.14	1.51	1.14	1.51	7%	1.06	1.06
16	115P04855	2 Mid Day	I-10	W	0.10	6	6	7	8	1.13	1.45					
16	115P04855	3 PM Peak	I-10	W	0.10	6	6	7	9	1.14	1.47					
16	115P04855	4 Weekend	I-10	W	0.10	6	6	7	9	1.14	1.48					
16	115P04856	1 AM Peak	I-10	W	0.47	26	27	28	30	1.06	1.14	1.06	1.14	31%		
16	115P04856	2 Mid Day	I-10	W	0.47	26	27	28	30	1.06	1.13					
16	115P04856	3 PM Peak	I-10	W	0.47	26	26	28	30	1.06	1.14					
16	115P04856	4 Weekend	I-10	W	0.47	26	26	28	30	1.06	1.12					
16	115P04857	1 AM Peak	-	-	0.00	#N/A	#N/A	#N/A	#N/A	-	-	0.00	0.00	0%		
16	115P04857	2 Mid Day	-	-	0.00	#N/A	#N/A	#N/A	#N/A	-	-					
16	115P04857	3 PM Peak	-	-	0.00	#N/A	#N/A	#N/A	#N/A	-	-					
16	115P04857	4 Weekend	-	-	0.00	#N/A	#N/A	#N/A	#N/A	-	-					
16	115P04858	1 AM Peak	I-10	W	0.40	22	22	23	27	1.06	1.24	1.08	1.27	27%		
16	115P04858	2 Mid Day	I-10	W	0.40	22	22	23	27	1.07	1.23					
16	115P04858	3 PM Peak	I-10	W	0.40	22	22	24	28	1.08	1.27					
16	115P04858	4 Weekend	I-10	W	0.40	22	22	23	27	1.07	1.23					
16	115P04859	1 AM Peak	I-10	W	0.53	28	28	29	30	1.03	1.06	1.03	1.06	35%		
16	115P04859	2 Mid Day	I-10	W	0.53	28	28	29	30	1.03	1.06					

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
16	115P04859	3 PM Peak	I-10	W	0.53	28	28	29	30	1.03	1.06					
16	115P04859	4 Weekend	I-10	W	0.53	28	28	29	30	1.03	1.06					

Car LOTTR and Truck TTTR - Southbound

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
3	115N04681	1 AM Peak	I-10	S	0.65	33	35	34	37	1.02	1.05	1.03	1.06	41%	1.05	1.10
3	115N04681	2 Mid Day	I-10	S	0.65	34	35	34	36	1.02	1.05					
3	115N04681	3 PM Peak	I-10	S	0.65	34	35	35	37	1.03	1.06					
3	115N04681	4 Weekend	I-10	S	0.65	33	35	35	37	1.03	1.06					
3	115N04680	1 AM Peak	I-10	S	0.59	31	32	33	36	1.06	1.12	1.06	1.12	37%		
3	115N04680	2 Mid Day	I-10	S	0.59	31	32	33	36	1.06	1.12					
3	115N04680	3 PM Peak	I-10	S	0.59	32	32	33	36	1.06	1.12					
3	115N04680	4 Weekend	I-10	S	0.59	31	32	33	36	1.05	1.12					
3	115N04679	1 AM Peak	I-10	S	0.34	20	20	21	22	1.05	1.11	1.07	1.13	21%		
3	115N04679	2 Mid Day	I-10	S	0.34	20	20	21	22	1.05	1.10					
3	115N04679	3 PM Peak	I-10	S	0.34	20	20	21	22	1.06	1.12					
3	115N04679	4 Weekend	I-10	S	0.34	19	20	21	22	1.07	1.13					
4	115N04679	1 AM Peak	I-10	S	0.34	20	20	21	22	1.05	1.11	1.07	1.13	8%	1.05	1.10
4	115N04679	2 Mid Day	I-10	S	0.34	20	20	21	22	1.05	1.10					
4	115N04679	3 PM Peak	I-10	S	0.34	20	20	21	22	1.06	1.12					
4	115N04679	4 Weekend	I-10	S	0.34	19	20	21	22	1.07	1.13					
4	115N04678	1 AM Peak	I-10	S	0.74	41	43	44	48	1.05	1.13	1.06	1.14	18%		
4	115N04678	2 Mid Day	I-10	S	0.74	42	43	44	48	1.04	1.12					
4	115N04678	3 PM Peak	I-10	S	0.74	42	43	44	49	1.06	1.14					
4	115N04678	4 Weekend	I-10	S	0.74	41	42	44	48	1.06	1.13					
4	115N04673	1 AM Peak	I-10	E	0.27	16	16	16	17	1.05	1.07	1.06	1.08	7%		
4	115N04673	2 Mid Day	I-10	E	0.27	16	16	16	17	1.05	1.07					
4	115N04673	3 PM Peak	I-10	E	0.27	15	16	16	17	1.06	1.08					
4	115N04673	4 Weekend	I-10	E	0.27	15	16	16	17	1.06	1.08					
4	115N04677	1 AM Peak	I-10	E	0.63	33	34	34	37	1.03	1.06	1.03	1.08	16%		
4	115N04677	2 Mid Day	I-10	E	0.63	34	34	34	36	1.03	1.06					
4	115N04677	3 PM Peak	I-10	E	0.63	34	34	35	37	1.03	1.08					
4	115N04677	4 Weekend	I-10	E	0.63	33	34	35	37	1.03	1.08					
4	115N04676	1 AM Peak	I-10	E	0.64	33	34	34	36	1.02	1.05	1.03	1.06	16%		

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
4	115N04676	2 Mid Day	I-10	E	0.64	33	34	34	36	1.02	1.05					
4	115N04676	3 PM Peak	I-10	E	0.64	33	34	34	36	1.02	1.05					
4	115N04676	4 Weekend	I-10	E	0.64	33	34	34	36	1.03	1.06					
4	115N04675	1 AM Peak	I-10	E	0.67	37	39	39	43	1.05	1.11	1.06	1.13	17%		
4	115N04675	2 Mid Day	I-10	E	0.67	37	38	40	43	1.05	1.12					
4	115N04675	3 PM Peak	I-10	E	0.67	37	38	40	43	1.06	1.13					
4	115N04675	4 Weekend	I-10	E	0.67	37	38	39	43	1.06	1.13					
4	115N04674	1 AM Peak	I-10	E	0.29	17	17	18	19	1.05	1.07	1.07	1.09	7%		
4	115N04674	2 Mid Day	I-10	E	0.29	17	17	18	19	1.05	1.07					
4	115N04674	3 PM Peak	I-10	E	0.29	17	17	18	19	1.06	1.09					
4	115N04674	4 Weekend	I-10	E	0.29	17	17	18	19	1.07	1.09					
4	115N04672	1 AM Peak	I-10	E	0.46	27	28	28	30	1.05	1.08	1.06	1.09	11%		
4	115N04672	2 Mid Day	I-10	E	0.46	27	28	28	30	1.05	1.08					
4	115N04672	3 PM Peak	I-10	E	0.46	26	27	28	30	1.06	1.09					
4	115N04672	4 Weekend	I-10	E	0.46	26	27	28	30	1.06	1.09					
5	115N04668	1 AM Peak	I-10	S	0.06	3	3	3	3	1.05	1.09	1.05	1.09	3%	1.04	1.08
5	115N04668	2 Mid Day	I-10	S	0.06	3	3	3	3	1.05	1.08					
5	115N04668	3 PM Peak	I-10	S	0.06	3	3	3	4	1.04	1.09					
5	115N04668	4 Weekend	I-10	S	0.06	3	3	3	3	1.04	1.08					
5	115N04669	1 AM Peak	I-10	S	0.46	24	25	25	27	1.07	1.11	1.07	1.12	22%		
5	115N04669	2 Mid Day	I-10	S	0.46	24	25	26	27	1.07	1.10					
5	115N04669	3 PM Peak	I-10	S	0.46	24	25	26	28	1.06	1.12					
5	115N04669	4 Weekend	I-10	S	0.46	24	25	25	27	1.05	1.09					
5	115N04670	1 AM Peak	I-10	S	0.65	34	35	34	36	1.02	1.04	1.02	1.05	32%		
5	115N04670	2 Mid Day	I-10	S	0.65	34	35	34	36	1.02	1.04					
5	115N04670	3 PM Peak	I-10	S	0.65	34	35	35	37	1.02	1.05					
5	115N04670	4 Weekend	I-10	S	0.65	34	35	35	37	1.02	1.05					
5	115N04671	1 AM Peak	I-10	E	0.78	41	42	42	45	1.02	1.08	1.03	1.08	38%		
5	115N04671	2 Mid Day	I-10	E	0.78	41	42	42	44	1.02	1.06					
5	115N04671	3 PM Peak	I-10	E	0.78	41	42	42	45	1.02	1.08					
5	115N04671	4 Weekend	I-10	E	0.78	41	42	42	45	1.03	1.07					
5	115N04755	1 AM Peak	I-10	S	0.10	5	6	6	6	1.04	1.08	1.04	1.08	5%		
5	115N04755	2 Mid Day	I-10	S	0.10	5	5	6	6	1.04	1.07					
5	115N04755	3 PM Peak	I-10	S	0.10	5	6	6	6	1.04	1.08					
5	115N04755	4 Weekend	I-10	S	0.10	5	5	6	6	1.04	1.08					
6	115N04752	1 AM Peak	I-10	E	0.47	24	25	25	27	1.02	1.05	1.02	1.06	16%	1.03	1.06
6	115N04752	2 Mid Day	I-10	E	0.47	25	25	25	26	1.02	1.04					
6	115N04752	3 PM Peak	I-10	E	0.47	25	25	25	27	1.02	1.06					

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
6	115N04752	4 Weekend	I-10	E	0.47	25	25	25	27	1.02	1.06					
6	115N04753	1 AM Peak	I-10	E	0.76	39	41	40	43	1.02	1.05	1.03	1.05	25%		
6	115N04753	2 Mid Day	I-10	E	0.76	39	40	40	42	1.02	1.04					
6	115N04753	3 PM Peak	I-10	E	0.76	39	40	40	43	1.02	1.05					
6	115N04753	4 Weekend	I-10	E	0.76	39	40	40	43	1.03	1.05					
6	115N04754	1 AM Peak	I-10	E	0.80	41	43	42	45	1.02	1.05	1.02	1.06	27%		
6	115N04754	2 Mid Day	I-10	E	0.80	42	43	42	44	1.02	1.04					
6	115N04754	3 PM Peak	I-10	E	0.80	42	43	43	45	1.02	1.05					
6	115N04754	4 Weekend	I-10	E	0.80	42	43	43	45	1.02	1.06					
6	115N11086	1 AM Peak	I-10	S	0.98	51	53	52	56	1.02	1.07	1.03	1.07	33%		
6	115N11086	2 Mid Day	I-10	S	0.98	51	53	52	55	1.02	1.04					
6	115N11086	3 PM Peak	I-10	S	0.98	52	53	53	56	1.02	1.06					
6	115N11086	4 Weekend	I-10	S	0.98	51	53	53	56	1.03	1.06					
7	115N04357	1 AM Peak	I-10	S	0.76	42	43	44	52	1.04	1.20	1.04	1.20	14%	1.11	1.65
7	115N04357	2 Mid Day	I-10	S	0.76	42	42	43	45	1.02	1.05					
7	115N04357	3 PM Peak	I-10	S	0.76	42	43	43	46	1.02	1.08					
7	115N04357	4 Weekend	I-10	S	0.76	41	42	42	45	1.02	1.06					
7	115N04358	1 AM Peak	I-10	S	0.75	42	43	43	47	1.03	1.10	1.03	1.10	14%		
7	115N04358	2 Mid Day	I-10	S	0.75	42	42	42	44	1.02	1.05					
7	115N04358	3 PM Peak	I-10	S	0.75	41	42	42	45	1.02	1.06					
7	115N04358	4 Weekend	I-10	S	0.75	41	42	42	44	1.03	1.06					
7	115N04359	1 AM Peak	I-10	S	0.87	49	50	53	63	1.08	1.26	1.08	1.26	16%		
7	115N04359	2 Mid Day	I-10	S	0.87	48	48	49	51	1.02	1.05					
7	115N04359	3 PM Peak	I-10	S	0.87	48	49	49	52	1.02	1.06					
7	115N04359	4 Weekend	I-10	S	0.87	48	48	49	51	1.02	1.07					
7	115N04360	1 AM Peak	I-10	S	0.70	40	40	47	67	1.20	1.66	1.20	1.66	13%		
7	115N04360	2 Mid Day	I-10	S	0.70	39	39	40	41	1.02	1.05					
7	115N04360	3 PM Peak	I-10	S	0.70	39	39	40	42	1.03	1.06					
7	115N04360	4 Weekend	I-10	S	0.70	38	39	39	41	1.02	1.06					
7	115N04361	1 AM Peak	I-10	S	0.71	40	41	51	98	1.27	2.39	1.27	2.39	13%		
7	115N04361	2 Mid Day	I-10	S	0.71	39	40	40	42	1.03	1.06					
7	115N04361	3 PM Peak	I-10	S	0.71	39	40	40	43	1.03	1.07					
7	115N04361	4 Weekend	I-10	S	0.71	39	39	40	42	1.03	1.07					
7	115N04362	1 AM Peak	I-10	S	0.79	47	47	51	113	1.10	2.39	1.10	2.39	15%		
7	115N04362	2 Mid Day	I-10	S	0.79	44	45	48	50	1.08	1.11					
7	115N04362	3 PM Peak	I-10	S	0.79	44	45	47	50	1.07	1.11					
7	115N04362	4 Weekend	I-10	S	0.79	44	44	47	49	1.07	1.11					
7	115N04363	1 AM Peak	I-10	S	0.74	40	41	42	67	1.04	1.63	1.04	1.63	14%		

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7	115N04363	2 Mid Day	I-10	S	0.74	40	41	41	43	1.03	1.06					
7	115N04363	3 PM Peak	I-10	S	0.74	40	41	41	44	1.03	1.07					
7	115N04363	4 Weekend	I-10	S	0.74	40	41	41	43	1.03	1.07					
8	115N04348	1 AM Peak	I-10	E	0.19	11	12	12	24	1.05	2.09	1.06	2.44	3%	1.05	1.44
8	115N04348	2 Mid Day	I-10	E	0.19	11	11	12	13	1.03	1.11					
8	115N04348	3 PM Peak	I-10	E	0.19	11	12	12	28	1.06	2.44					
8	115N04348	4 Weekend	I-10	E	0.19	11	11	11	12	1.03	1.09					
8	115N04349	1 AM Peak	I-10	E	0.51	30	31	31	51	1.04	1.66	1.05	1.66	9%		
8	115N04349	2 Mid Day	I-10	E	0.51	30	30	31	33	1.02	1.09					
8	115N04349	3 PM Peak	I-10	E	0.51	30	31	32	50	1.05	1.62					
8	115N04349	4 Weekend	I-10	E	0.51	30	30	30	32	1.03	1.08					
8	115N04350	1 AM Peak	I-10	E	0.28	16	17	17	21	1.05	1.26	1.05	1.26	5%		
8	115N04350	2 Mid Day	I-10	E	0.28	17	17	17	19	1.03	1.11					
8	115N04350	3 PM Peak	I-10	E	0.28	17	17	18	20	1.05	1.20					
8	115N04350	4 Weekend	I-10	E	0.28	16	16	17	18	1.04	1.11					
8	115N04351	1 AM Peak	I-10	S	0.76	43	43	44	51	1.04	1.17	1.08	1.36	13%		
8	115N04351	2 Mid Day	I-10	S	0.76	43	43	45	50	1.04	1.15					
8	115N04351	3 PM Peak	I-10	S	0.76	43	44	47	60	1.08	1.36					
8	115N04351	4 Weekend	I-10	S	0.76	42	43	44	48	1.04	1.13					
8	115N04352	1 AM Peak	I-10	S	0.80	45	45	46	49	1.02	1.09	1.09	1.88	14%		
8	115N04352	2 Mid Day	I-10	S	0.80	45	45	47	50	1.03	1.10					
8	115N04352	3 PM Peak	I-10	S	0.80	46	46	51	87	1.09	1.88					
8	115N04352	4 Weekend	I-10	S	0.80	44	44	45	48	1.03	1.07					
8	115N04353	1 AM Peak	I-10	S	0.78	44	44	45	48	1.03	1.08	1.05	1.56	14%		
8	115N04353	2 Mid Day	I-10	S	0.78	44	44	45	48	1.02	1.07					
8	115N04353	3 PM Peak	I-10	S	0.78	45	45	47	70	1.05	1.56					
8	115N04353	4 Weekend	I-10	S	0.78	43	44	44	46	1.03	1.06					
8	115N04354	1 AM Peak	I-10	S	0.15	8	8	8	9	1.03	1.09	1.04	1.27	3%		
8	115N04354	2 Mid Day	I-10	S	0.15	8	8	8	9	1.02	1.06					
8	115N04354	3 PM Peak	I-10	S	0.15	8	8	9	11	1.04	1.27					
8	115N04354	4 Weekend	I-10	S	0.15	8	8	8	9	1.02	1.07					
8	115N04355	1 AM Peak	I-10	S	0.79	44	45	45	49	1.02	1.09	1.03	1.14	14%		
8	115N04355	2 Mid Day	I-10	S	0.79	44	45	45	47	1.02	1.05					
8	115N04355	3 PM Peak	I-10	S	0.79	45	45	46	51	1.03	1.14					
8	115N04355	4 Weekend	I-10	S	0.79	44	44	45	47	1.02	1.06					
8	115N04356	1 AM Peak	I-10	S	0.69	39	39	40	46	1.04	1.16	1.04	1.16	12%		
8	115N04356	2 Mid Day	I-10	S	0.69	38	39	39	41	1.02	1.06					
8	115N04356	3 PM Peak	I-10	S	0.69	39	39	40	43	1.03	1.10					

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
8	115N04356	4 Weekend	I-10	S	0.69	38	38	39	41	1.02	1.06					
8	115N04357	1 AM Peak	I-10	S	0.76	42	43	44	52	1.04	1.20	1.04	1.20	13%		
8	115N04357	2 Mid Day	I-10	S	0.76	42	42	43	45	1.02	1.05					
8	115N04357	3 PM Peak	I-10	S	0.76	42	43	43	46	1.02	1.08					
8	115N04357	4 Weekend	I-10	S	0.76	41	42	42	45	1.02	1.06					
9	115N04340	1 AM Peak	I-10	E	0.57	30	31	31	33	1.03	1.08	1.04	1.14	10%	1.04	1.42
9	115N04340	2 Mid Day	I-10	E	0.57	30	31	31	32	1.02	1.06					
9	115N04340	3 PM Peak	I-10	E	0.57	31	31	32	35	1.04	1.14					
9	115N04340	4 Weekend	I-10	E	0.57	30	31	31	33	1.03	1.07					
9	115N04341	1 AM Peak	I-10	E	0.80	43	44	44	47	1.02	1.07	1.03	1.36	14%		
9	115N04341	2 Mid Day	I-10	E	0.80	43	44	44	46	1.02	1.06					
9	115N04341	3 PM Peak	I-10	E	0.80	44	44	45	61	1.03	1.36					
9	115N04341	4 Weekend	I-10	E	0.80	43	44	44	47	1.02	1.06					
9	115N04342	1 AM Peak	I-10	E	0.79	44	44	45	48	1.02	1.09	1.04	1.29	14%		
9	115N04342	2 Mid Day	I-10	E	0.79	44	44	44	47	1.02	1.06					
9	115N04342	3 PM Peak	I-10	E	0.79	44	45	46	58	1.04	1.29					
9	115N04342	4 Weekend	I-10	E	0.79	44	44	44	47	1.02	1.07					
9	115N04343	1 AM Peak	I-10	E	0.93	51	52	53	56	1.03	1.08	1.04	1.51	16%		
9	115N04343	2 Mid Day	I-10	E	0.93	51	52	52	55	1.02	1.07					
9	115N04343	3 PM Peak	I-10	E	0.93	52	53	54	80	1.04	1.51					
9	115N04343	4 Weekend	I-10	E	0.93	51	52	52	55	1.03	1.07					
9	115N04344	1 AM Peak	I-10	S	0.64	35	35	36	38	1.02	1.08	1.04	1.24	11%		
9	115N04344	2 Mid Day	I-10	S	0.64	35	35	36	38	1.02	1.07					
9	115N04344	3 PM Peak	I-10	S	0.64	36	36	37	45	1.04	1.24					
9	115N04344	4 Weekend	I-10	S	0.64	35	35	36	38	1.03	1.07					
9	115N04345	1 AM Peak	I-10	E	0.83	46	46	47	50	1.03	1.09	1.04	1.19	14%		
9	115N04345	2 Mid Day	I-10	E	0.83	46	46	47	49	1.03	1.07					
9	115N04345	3 PM Peak	I-10	E	0.83	46	47	48	56	1.04	1.19					
9	115N04345	4 Weekend	I-10	E	0.83	45	46	46	49	1.03	1.07					
9	115N04346	1 AM Peak	I-10	E	0.23	14	13	15	16	1.08	1.22	1.08	1.25	4%		
9	115N04346	2 Mid Day	I-10	E	0.23	13	13	14	15	1.05	1.13					
9	115N04346	3 PM Peak	I-10	E	0.23	13	13	14	17	1.08	1.25					
9	115N04346	4 Weekend	I-10	E	0.23	13	13	13	15	1.04	1.15					
9	115N04347	1 AM Peak	I-10	E	0.75	44	44	46	63	1.05	1.43	1.08	1.88	13%		
9	115N04347	2 Mid Day	I-10	E	0.75	43	43	45	50	1.03	1.14					
9	115N04347	3 PM Peak	I-10	E	0.75	44	44	47	83	1.08	1.88					
9	115N04347	4 Weekend	I-10	E	0.75	42	42	44	46	1.03	1.08					
9	115N04348	1 AM Peak	I-10	E	0.19	11	12	12	24	1.05	2.09	1.06	2.44	3%		

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
9	115N04348	2 Mid Day	I-10	E	0.19	11	11	12	13	1.03	1.11					
9	115N04348	3 PM Peak	I-10	E	0.19	11	12	12	28	1.06	2.44					
9	115N04348	4 Weekend	I-10	E	0.19	11	11	11	12	1.03	1.09					
10	115N04338	1 AM Peak	I-10	E	0.51	27	28	28	30	1.03	1.07	1.03	1.18	50%	1.03	1.13
10	115N04338	2 Mid Day	I-10	E	0.51	27	27	28	29	1.02	1.06					
10	115N04338	3 PM Peak	I-10	E	0.51	27	28	28	33	1.03	1.18					
10	115N04338	4 Weekend	I-10	E	0.51	27	28	28	29	1.03	1.06					
10	115N04339	1 AM Peak	I-10	E	0.52	27	28	28	30	1.03	1.07	1.03	1.07	50%		
10	115N04339	2 Mid Day	I-10	E	0.52	27	28	28	29	1.02	1.05					
10	115N04339	3 PM Peak	I-10	E	0.52	28	28	28	30	1.03	1.07					
10	115N04339	4 Weekend	I-10	E	0.52	27	28	28	30	1.03	1.06					
11	115N04750	1 AM Peak	I-10	E	0.64	34	34	35	38	1.03	1.12	1.03	1.12	62%	1.03	1.15
11	115N04750	2 Mid Day	I-10	E	0.64	34	34	35	37	1.03	1.08					
11	115N04750	3 PM Peak	I-10	E	0.64	34	34	35	37	1.03	1.07					
11	115N04750	4 Weekend	I-10	E	0.64	34	34	35	37	1.03	1.07					
11	115N04751	1 AM Peak	I-10	E	0.39	21	21	22	23	1.03	1.08	1.03	1.20	38%		
11	115N04751	2 Mid Day	I-10	E	0.39	21	21	22	23	1.03	1.06					
11	115N04751	3 PM Peak	I-10	E	0.39	21	21	22	26	1.03	1.20					
11	115N04751	4 Weekend	I-10	E	0.39	21	21	22	23	1.03	1.07					
12	115N04748	1 AM Peak	I-10	E	0.11	6	6	6	7	1.03	1.08	1.03	1.08	3%	1.03	1.09
12	115N04748	2 Mid Day	I-10	E	0.11	6	6	6	7	1.02	1.06					
12	115N04748	3 PM Peak	I-10	E	0.11	6	6	6	7	1.03	1.07					
12	115N04748	4 Weekend	I-10	E	0.11	6	6	6	7	1.03	1.07					
12	115N04749	1 AM Peak	I-10	E	0.20	11	11	11	12	1.03	1.09	1.03	1.09	5%		
12	115N04749	2 Mid Day	I-10	E	0.20	11	11	11	12	1.03	1.06					
12	115N04749	3 PM Peak	I-10	E	0.20	11	11	11	12	1.03	1.08					
12	115N04749	4 Weekend	I-10	E	0.20	11	11	11	12	1.03	1.07					
12	115N04871	1 AM Peak	I-10	E	0.44	24	25	25	28	1.04	1.11	1.04	1.11	10%		
12	115N04871	2 Mid Day	I-10	E	0.44	25	25	26	27	1.03	1.09					
12	115N04871	3 PM Peak	I-10	E	0.44	25	25	26	28	1.04	1.10					
12	115N04871	4 Weekend	I-10	E	0.44	25	25	26	27	1.04	1.10					
12	115N04872	1 AM Peak	I-10	E	0.80	43	43	44	47	1.03	1.08	1.03	1.08	18%		
12	115N04872	2 Mid Day	I-10	E	0.80	43	43	44	46	1.02	1.06					
12	115N04872	3 PM Peak	I-10	E	0.80	43	43	44	46	1.03	1.07					
12	115N04872	4 Weekend	I-10	E	0.80	43	43	44	46	1.03	1.07					
12	115N04873	1 AM Peak	I-10	E	0.61	31	32	32	35	1.03	1.09	1.03	1.09	14%		
12	115N04873	2 Mid Day	I-10	E	0.61	31	32	32	34	1.03	1.07					
12	115N04873	3 PM Peak	I-10	E	0.61	31	32	32	34	1.03	1.07					

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
12	115N04873	4 Weekend	I-10	E	0.61	31	32	32	34	1.03	1.08					
12	115N04874	1 AM Peak	I-10	E	0.73	38	38	39	42	1.03	1.11	1.03	1.11	17%		
12	115N04874	2 Mid Day	I-10	E	0.73	38	38	39	41	1.03	1.08					
12	115N04874	3 PM Peak	I-10	E	0.73	38	38	39	41	1.03	1.08					
12	115N04874	4 Weekend	I-10	E	0.73	38	38	39	42	1.03	1.09					
12	115N04875	1 AM Peak	I-10	E	0.77	40	40	41	43	1.03	1.07	1.03	1.07	17%		
12	115N04875	2 Mid Day	I-10	E	0.77	40	40	41	43	1.02	1.06					
12	115N04875	3 PM Peak	I-10	E	0.77	40	40	41	43	1.03	1.07					
12	115N04875	4 Weekend	I-10	E	0.77	40	40	41	43	1.03	1.07					
12	115N04876	1 AM Peak	I-10	E	0.33	17	18	18	19	1.03	1.07	1.03	1.07	7%		
12	115N04876	2 Mid Day	I-10	E	0.33	17	18	18	18	1.02	1.05					
12	115N04876	3 PM Peak	I-10	E	0.33	17	18	18	18	1.02	1.05					
12	115N04876	4 Weekend	I-10	E	0.33	17	18	18	19	1.02	1.06					
12	115N04877	1 AM Peak	I-10	E	0.44	23	23	23	25	1.03	1.07	1.03	1.07	10%		
12	115N04877	2 Mid Day	I-10	E	0.44	23	23	24	25	1.02	1.06					
12	115N04877	3 PM Peak	I-10	E	0.44	23	23	24	25	1.03	1.07					
12	115N04877	4 Weekend	I-10	E	0.44	23	23	24	25	1.03	1.07					
12	115N04878	1 AM Peak	I-10	E	0.00	0	0	0	0	NO CORRESPONDING DATA	NO CORRESPONDING DATA	0.00	0.00	0%		
12	115N04878	2 Mid Day	I-10	E	0.00	0	0	0	0	NO CORRESPONDING DATA	NO CORRESPONDING DATA					
12	115N04878	3 PM Peak	I-10	E	0.00	0	0	0	0	NO CORRESPONDING DATA	NO CORRESPONDING DATA					
12	115N04878	4 Weekend	I-10	E	0.00	0	0	0	0	NO CORRESPONDING DATA	NO CORRESPONDING DATA					
13	115N04867	1 AM Peak	I-10	E	0.55	29	29	29	31	1.03	1.08	1.03	1.08	25%	1.04	1.12
13	115N04867	2 Mid Day	I-10	E	0.55	29	29	29	31	1.02	1.07					
13	115N04867	3 PM Peak	I-10	E	0.55	29	29	29	31	1.02	1.06					
13	115N04867	4 Weekend	I-10	E	0.55	29	29	29	31	1.03	1.06					
13	115N04868	1 AM Peak	I-10	E	0.44	23	23	24	25	1.03	1.09	1.03	1.09	19%		
13	115N04868	2 Mid Day	I-10	E	0.44	23	23	23	25	1.02	1.07					
13	115N04868	3 PM Peak	I-10	E	0.44	23	23	23	25	1.02	1.07					

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
13	115N04868	4 Weekend	I-10	E	0.44	23	23	23	25	1.02	1.07					
13	115N04869	1 AM Peak	I-10	N	0.71	40	40	42	48	1.05	1.19	1.05	1.19	32%		
13	115N04869	2 Mid Day	I-10	N	0.71	40	40	42	47	1.05	1.17					
13	115N04869	3 PM Peak	I-10	N	0.71	40	41	42	47	1.04	1.15					
13	115N04869	4 Weekend	I-10	N	0.71	40	40	42	47	1.05	1.17					
13	115N04870	1 AM Peak	I-10	N	0.54	29	30	30	33	1.03	1.09	1.03	1.09	24%		
13	115N04870	2 Mid Day	I-10	N	0.54	30	30	30	32	1.03	1.07					
13	115N04870	3 PM Peak	I-10	N	0.54	30	30	31	32	1.03	1.07					
13	115N04870	4 Weekend	I-10	N	0.54	30	30	31	32	1.03	1.08					
14	115N04863	1 AM Peak	I-10	E	0.69	36	36	37	38	1.03	1.07	1.03	1.07	24%	1.03	1.08
14	115N04863	2 Mid Day	I-10	E	0.69	36	36	36	38	1.02	1.05					
14	115N04863	3 PM Peak	I-10	E	0.69	35	36	36	38	1.02	1.05					
14	115N04863	4 Weekend	I-10	E	0.69	35	36	36	38	1.03	1.06					
14	115N04864	1 AM Peak	I-10	E	0.55	29	29	30	33	1.04	1.14	1.04	1.16	19%		
14	115N04864	2 Mid Day	I-10	E	0.55	29	29	30	34	1.03	1.15					
14	115N04864	3 PM Peak	I-10	E	0.55	29	29	30	34	1.03	1.16					
14	115N04864	4 Weekend	I-10	E	0.55	29	29	30	34	1.04	1.15					
14	115N04865	1 AM Peak	I-10	N	0.68	35	36	36	38	1.03	1.07	1.03	1.07	23%		
14	115N04865	2 Mid Day	I-10	N	0.68	35	36	36	37	1.02	1.05					
14	115N04865	3 PM Peak	I-10	N	0.68	35	36	36	38	1.02	1.06					
14	115N04865	4 Weekend	I-10	N	0.68	35	36	36	38	1.02	1.05					
14	115N04866	1 AM Peak	I-10	N	0.98	51	52	52	55	1.03	1.07	1.03	1.07	34%		
14	115N04866	2 Mid Day	I-10	N	0.98	51	52	52	54	1.02	1.05					
14	115N04866	3 PM Peak	I-10	N	0.98	51	52	52	54	1.02	1.06					
14	115N04866	4 Weekend	I-10	N	0.98	51	52	52	54	1.02	1.06					
15	115N04860	1 AM Peak	I-10	E	0.25	13	13	13	14	1.03	1.07	1.03	1.07	21%	1.03	1.06
15	115N04860	2 Mid Day	I-10	E	0.25	13	13	13	14	1.02	1.06					
15	115N04860	3 PM Peak	I-10	E	0.25	13	13	13	14	1.02	1.05					
15	115N04860	4 Weekend	I-10	E	0.25	13	13	13	14	1.02	1.06					
15	115N04861	1 AM Peak	I-10	E	0.23	12	12	12	13	1.03	1.07	1.03	1.07	20%		
15	115N04861	2 Mid Day	I-10	E	0.23	12	12	12	13	1.02	1.05					
15	115N04861	3 PM Peak	I-10	E	0.23	12	12	12	13	1.02	1.05					
15	115N04861	4 Weekend	I-10	E	0.23	12	12	12	13	1.03	1.05					
15	115N04862	1 AM Peak	I-10	E	0.69	36	36	37	38	1.03	1.06	1.03	1.06	59%		
15	115N04862	2 Mid Day	I-10	E	0.69	36	36	36	38	1.02	1.05					
15	115N04862	3 PM Peak	I-10	E	0.69	36	36	36	38	1.02	1.05					
15	115N04862	4 Weekend	I-10	E	0.69	36	36	36	38	1.02	1.05					
16	115N04855	1 AM Peak	I-10	E	0.12	6	7	7	8	1.06	1.27	1.07	1.27	6%	1.04	1.17

Segment	TMC [Internal ID]	Time Period	Road Name	Direction	Miles	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
16	115N04855	2 Mid Day	I-10	E	0.12	6	7	7	8	1.07	1.27					
16	115N04855	3 PM Peak	I-10	E	0.12	6	7	7	8	1.06	1.25					
16	115N04855	4 Weekend	I-10	E	0.12	6	7	7	8	1.07	1.25					
16	115N04856	1 AM Peak	I-10	E	0.51	28	28	29	35	1.05	1.26	1.05	1.28	27%		
16	115N04856	2 Mid Day	I-10	E	0.51	28	28	29	36	1.05	1.28					
16	115N04856	3 PM Peak	I-10	E	0.51	28	28	29	35	1.05	1.26					
16	115N04856	4 Weekend	I-10	E	0.51	28	28	29	35	1.05	1.25					
16	115N04857	1 AM Peak	I-10	E	0.56	30	30	31	35	1.03	1.16	1.03	1.17	30%		
16	115N04857	2 Mid Day	I-10	E	0.56	30	30	31	34	1.03	1.14					
16	115N04857	3 PM Peak	I-10	E	0.56	30	30	31	34	1.03	1.13					
16	115N04857	4 Weekend	I-10	E	0.56	30	30	31	35	1.03	1.17					
16	115N04858	1 AM Peak	I-10	E	0.36	19	19	19	21	1.03	1.08	1.03	1.08	19%		
16	115N04858	2 Mid Day	I-10	E	0.36	19	19	19	20	1.02	1.07					
16	115N04858	3 PM Peak	I-10	E	0.36	19	19	19	20	1.03	1.07					
16	115N04858	4 Weekend	I-10	E	0.36	19	19	19	20	1.03	1.07					
16	115N04859	1 AM Peak	I-10	E	0.32	17	17	17	18	1.03	1.06	1.03	1.06	17%		
16	115N04859	2 Mid Day	I-10	E	0.32	17	17	17	18	1.02	1.05					
16	115N04859	3 PM Peak	I-10	E	0.32	17	17	17	18	1.02	1.06					
16	115N04859	4 Weekend	I-10	E	0.32	17	17	17	18	1.03	1.06					

Closure Data

			Total miles of closures		Average Occurrences/Mile/Year	
Segment	Length (miles)	# of closures	NB/EB	SB/WB	NB/EB	SB/WB
3	11.00	26	0	44.2	0.80	0.45
4	20.00	42	1	17.0	0.17	0.30
5	18.00	23	2	9.0	0.10	0.21
6	10.00	23	1	9.0	0.18	0.55
7	9.00	26	1	6.0	0.13	0.44
8	7.00	51	1	31.1	0.89	0.57
9	12.00	47	2	21.2	0.35	0.43
10	6.00	11	0	6.0	0.20	0.17
11	12.00	20	2	22.0	0.37	0.12
12	23.00	46	5	44.5	0.39	0.10
13	17.00	22	0	4.0	0.05	0.21
14	22.00	29	2	12.6	0.11	0.23
15	18.00	16	1	23.0	0.26	1.06
16	20.00	20	1	21.0	0.21	1.05

	ITIS Category Description											
	Closures		Incidents/Accidents		Incidents/Crashes		Obstruction Hazards		Winds		Winter Storm Codes	
Segment	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
3	0	1	1	0	7	13	2	0	0	0	0	0
4	0	0	2	1	13	23	0	0	0	0	0	0
5	0	0	0	2	9	11	0	0	0	0	0	0
6	0	0	3	0	6	13	0	0	0	0	0	0
7	0	0	2	0	3	14	0	0	0	0	0	0
8	0	0	3	1	24	5	0	0	0	0	0	0
9	0	1	1	1	20	24	0	0	0	0	0	0
10	0	0	0	1	6	3	0	0	0	0	0	0
11	0	0	1	1	12	6	0	0	0	0	0	0
12	0	1	2	0	32	11	0	0	0	0	0	0
13	0	0	0	1	4	17	0	0	0	0	0	0
14	1	2	0	2	11	13	0	0	0	0	0	0
15	0	2	0	0	6	8	0	0	0	0	0	0
16	0	2	0	0	5	13	0	0	0	0	0	0

HPMS Data

SEGMENT	MP_FROM	MP_TO	WEIGHTED AVERAGE NB/EB/EB AADT	WEIGHTED AVERAGE SB/WB/WB AADT	WEIGHTED AVERAGE AADT	NB/EB/EB AADT	SB/WB/WB AADT	2019 AADT	K Factor	D-Factor	T-Factor
10E-3	187.00	198.00	21449	21708	43157	21985	20666	42652	8	52	17
10E-4	198.00	218.00	22682	22616	45298	20773	19938	40711	7	53	25
10E-5	218.00	236.00	23459	23269	46728	21780	20721	42501	7	51	19
10E-6	236.00	246.00	32018	31167	63185	29999	27524	57522	8	52	17
10E-7	246.00	255.00	52980	50960	103940	53698	50388	104086	7	53	13
10E-8	255.00	262.00	74117	76213	150329	72930	71490	144420	7	51	9
10E-9	262.00	274.00	30728	32217	62945	27671	31285	58955	9	53	20
10E-10	274.00	280.00	19672	19724	39396	17976	18332	36308	8	51	21
10E-11	280.00	292.00	14759	14691	29450	14005	13524	27529	7	51	31
10E-12	292.00	315.00	11092	10770	21862	11216	9925	21141	7	53	31
10E-13	315.00	332.00	9323	8640	17962	9673	8242	17915	9	54	40
10E-14	332.00	354.00	8787	7795	16582	9419	7463	16882	8	55	38
10E-15	354.00	372.00	6869	6467	13336	7270	6244	13514	7	54	38
10E-16	372.00	391.00	6584	6074	12658	6682	5928	12610	6	53	45

SEGMENT	Loc ID	BMP	EMP	Length	Pos Dir AADT	Neg Dir AADT	Corrected Pos Dir AADT	Corrected Neg Dir AADT	2020 AADT	K Factor	D-Factor	D-Factor Adjusted	T-Factor
10E-3	100126	185.31	190.66	5.35	21634	19082	21634	19082	40716	7	53	53	15
	100127	190.66	194.91	4.25	20890	20546	20890	20546	41436	7	51	50	15
	100128	194.91	198.12	3.21	24021	23466	24021	23466	47487	9	55	51	23
10E-4	100129	198.12	199.10	0.98	3575	10585	3575	10585	14160	6	54	75	56
	100130	199.10	200.12	1.02	24523	16191	24523	16191	40714	7	64	60	21
	100131	200.12	203.86	3.74	20680	19644	20680	19644	40324	4	55	51	22
	100132	203.86	208.82	4.96	19403	18123	19403	18123	37526	6	51	52	23
	100133	208.82	211.33	2.51	21223	20003	21223	20003	41226	6	53	51	21
	100134	211.33	212.20	0.87	22355	23732	22355	23732	46087	6	57	51	21
	100135	212.20	219.85	7.65	23081	22504	23081	22504	45585	10	52	51	27
10E-5	100135	212.20	219.85	7.65	23081	22504	23081	22504	45585	10	52	51	27
	100136	219.85	226.48	6.63	19887	18707	19887	18707	38594	6	51	52	16
	100137	226.48	232.02	5.54	21690	20365	21690	20365	42055	6	51	52	15
	100138	232.02	236.43	4.41	22482	21102	22482	21102	43584	7	54	52	16
10E-6	100139	236.43	240.46	4.03	28100	27028	28100	27028	55128	9	52	51	20
	100140	240.46	242.96	2.50	32158	25716	32158	25716	57874	7	51	56	15
	100141	242.96	244.90	1.94	20124	19359	20124	19359	39483	9	52	51	21
	102321	244.93	246.75	1.82	41763	39807	41763	39807	81570	7	66	51	12
10E-7	102321	244.93	246.75	1.82	41763	39807	41763	39807	81570	7	66	51	12
	100142	246.75	248.74	1.99	46420	38297	46420	38297	84717	7	51	55	13

	100143	248.74	250.06	1.32	55000	52500	55000	52500	107500	7	70	51	12
	100144	250.06	251.19	1.13	55963	51435	55963	51435	107398	7	61	52	13
	100145	251.19	252.43	1.24	56365	54697	56365	54697	111062	7	63	51	13
	100146	252.43	254.31	1.88	61640	53203	61640	53203	114843	9	54	54	14
	100147	254.31	255.29	0.98	67664	79687	67664	79687	147351	7	54	54	10
10E-8	100148	255.29	256.18	0.89	73613	82449	73613	82449	156062	7	58	53	10
	100149	256.18	257.32	1.14	88500	84500	88500	84500	173000	9	52	51	9
	100150	257.32	257.77	0.45	89000	86000	89000	86000	175000	5	65	51	9
	100151	257.77	258.36	0.59	80823	77461	80823	77461	158284	7	54	51	10
	100152	258.36	259.35	0.99	87814	81715	87814	81715	169529	8	54	52	9
	100153	259.35	260.38	1.03	74182	75190	74182	75190	149372	8	51	50	8
	100154	260.38	260.70	0.32	57160	47538	57160	47538	104698	7	51	55	9
	100155	260.70	261.17	0.47	48218	45809	48218	45809	94027	7	59	51	10
	100156	261.17	261.61	0.44	48166	45861	48166	45861	94027	7	59	51	10
	100157	261.61	261.92	0.31	44061	43826	44061	43826	87887	7	58	50	11
	100158	261.92	262.27	0.35	45030	45823	45030	45823	90853	7	59	50	12
10E-9	100159	262.27	262.72	0.45	42306	40811	42306	40811	83117	7	51	51	14
	100160	262.72	264.35	1.63	32547	38054	32547	38054	70601	9	61	54	19
	100161	264.35	264.54	0.19	35673	30357	35673	30357	66030	7	53	54	15
	100162	264.54	265.04	0.50	29657	26076	29657	26076	55733	8	63	53	20
	100163	265.04	267.12	2.08	30860	39776	30860	39776	70636	9	52	56	31
	100164	267.12	268.11	0.99	35391	35609	35391	35609	71000	7	54	50	14
	100165	268.11	269.35	1.24	28444	29245	28444	29245	57689	7	55	51	17
	100166	269.35	270.59	1.24	23292	38350	23292	38350	61642	9	74	62	14
	100167	270.59	273.14	2.55	26069	26272	26069	26272	52341	10	62	50	19
	100168	273.14	275.49	2.35	17982	19398	17982	19398	37380	8	57	52	20
10E-10	100168	273.14	275.49	2.35	17982	19398	17982	19398	37380	8	57	52	20
	100169	275.49	279.42	3.93	18760	19054	18760	19054	37814	9	58	50	19
	100170	279.42	281.69	2.27	16613	15977	16613	15977	32590	6	52	51	24
10E-11	100170	279.42	281.69	2.27	16613	15977	16613	15977	32590	6	52	51	24
	100171	281.69	289.44	7.75	12534	12015	12534	12015	24549	6	52	51	33
	100172	289.44	292.50	3.06	15798	15524	15798	15524	31322	9	51	50	30
10E-12	100173	292.50	297.18	4.68	14439	13903	14439	13903	28342	8	64	51	22
	100174	297.18	299.35	2.17	14140	13953	14140	13953	28093	6	52	50	22
	100175	299.35	302.39	3.04	15198	8011	15198	8011	23209	7	54	65	23
	100176	302.39	303.90	1.51	13256	12543	13256	12543	25799	6	53	51	23
	100177	303.90	304.92	1.02	7704	8374	7704	8374	16078	6	55	52	35
	100178	304.92	306.65	1.73	7164	5842	7164	5842	13006	7	50	55	43
	100179	306.65	312.78	6.13	8827	8283	8827	8283	17110	6	50	52	33
	100180	312.78	318.97	6.19	9379	8830	9379	8830	18209	9	61	52	41
10E-13	100180	312.78	318.97	6.19	9379	8830	9379	8830	18209	9	61	52	41
	100181	318.97	322.60	3.63	7217	8233	7217	8233	15450	9	65	53	41

	100182	322.60	331.61	9.01	8266	7476	8266	7476	15742	7	52	53	40
	100183	331.61	336.90	5.29	14100	8865	14100	8865	22965	13	59	61	40
10E-14	100183	331.61	336.90	5.29	14100	8865	14100	8865	22965	13	59	61	40
	100184	336.90	340.54	3.64	7298	7320	7298	7320	14618	6	55	50	40
	100185	340.54	344.50	3.96	8077	7136	8077	7136	15213	6	51	53	36
	100186	344.50	352.39	7.89	8796	7445	8796	7445	16241	6	52	54	34
	100187	352.39	355.98	3.59	7523	5941	7523	5941	13464	6	56	56	43
10E-15	100187	352.39	355.98	3.59	7523	5941	7523	5941	13464	6	56	56	43
	100188	355.98	362.89	6.91	7066	6785	7066	6785	13851	9	51	51	24
	100189	362.89	366.81	3.92	7124	5811	7124	5811	12935	6	54	55	39
	100190	366.81	378.95	12.14	7359	6166	7359	6166	13525	6	52	54	44
10E-16	100190	366.81	378.95	12.14	7359	6166	7359	6166	13525	6	52	54	44
	100191	378.95	382.35	3.40	4889	4165	4889	4165	9054	8	54	54	51
	100192	382.35	390.76	8.41	6512	6237	6512	6237	12749	6	54	51	43
	100193	390.76	391.23	0.47	5233	6991	5233	6991	12224	10	54	57	54

Bicycle Accommodation Data

Segment	BMP	EMP	Divided or Non	NB/EB/WB Right Shoulder Width	SB/WB/EB Right Shoulder Width	NB/EB/WB Left Shoulder Width	SB/WB/EB Left Shoulder Width	NB/EB/WB Effective Length of Shoulder	SB/WB/EB Effective Length of Shoulder	% Bicycle Accommodation
3	187	198	Divided	11.7	12.0	11.9	11.9	11.0	9.7	94%
4	198	218	Divided	10.7	10.7	8.5	8.7	19.9	18.6	96%
5	218	236	Divided	11.6	11.2	11.4	11.2	13.9	17.4	87%
6	236	246	Divided	10.0	10.0	11.2	8.1	10.0	10.0	100%
7	246	255	Divided	11.9	10.9	10.5	10.5	2.6	9.0	64%
8	255	262	Divided	11.1	11.1	10.9	12.3	6.1	6.3	89%
9	262	274	Divided	9.9	9.7	3.8	4.5	11.1	11.2	93%
10	274	280	Divided	9.9	9.8		4.0	5.9	5.8	98%
11	280	292	Divided	9.7	9.7	3.7	3.7	12.0	12.0	100%
12	292	315	Divided	10.0	10.2	4.3	4.5	21.5	23.0	97%
13	315	332	Divided	10.00	10.0	4.0	4.0	9.6	17.0	78%
14	332	354	Divided	10.00	10.0	4.0	4.0	22.0	22.0	100%
15	354	372	Divided	9.89	9.9	4.0	4.0	17.8	17.9	99%

AZTDM Data

SEGMENT	Growth Rate	% Non-SOV
3	1.44%	10.1%
4	1.28%	9.9%
5	1.27%	8.1%
6	1.23%	13.7%
7	1.22%	13.7%
8	0.85%	14.0%
9	0.89%	13.3%
10	1.01%	12.2%
11	1.11%	9.0%
12	1.32%	7.7%
13	1.10%	9%
14	1.11%	11%
15	1.07%	8%
16	1.08%	5%

HERS Capacity Calculation Data

Segment	Capacity Environment Type	Facility Type	Terrain	Lane Width	NB/EB/EB Rt. Shoulder	SB/WB/WB Rt. Shoulder	F_{lw} or f_w or f_{LS}	NB/EB/EB F_{lc}	SB/WB/WB F_{lc}	Total Ramp Density	PHF	E_T	f_{HV}	f_M	f_A	g/C	f_G	f_{NP}	Nm	f_p	NB/EB/EB FFS	SB/WB/WB FFS	NB/EB/EB Peak-Hour Capacity	SB/WB/WB Peak-Hour Capacity	Major Direction Peak-Hour Capacity	Daily Capacity
3	1	Fringe Urban	Level	12.00	11.74	11.97	0.0	0	0	1.4	0.94	1.5	0.922	N/A	N/A	N/A	N/A	N/A	N/A	N/A	71.13	71.13	6239	6239	N/A	118,831
4	1	Fringe Urban	Level	12.00	10.73	10.74	0.0	0	0	1.4	0.94	1.5	0.889	N/A	N/A	N/A	N/A	N/A	N/A	N/A	71.13	71.13	6015	6015	N/A	114,568
5	1	Rural	Level	12.00	11.56	11.18	0.0	0	0	0	0.94	1.5	0.913	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	6176	6176	N/A	117,642
6	1	Fringe Urban	Level	12.00	10.00	10.00	0.0	0	0	1.4	0.94	1.5	0.920	N/A	N/A	N/A	N/A	N/A	N/A	N/A	71.13	71.13	6225	6225	N/A	118,573
7	1	Urban	Level	12.00	11.85	10.89	0.0	0	0	1.52	0.94	1.5	0.941	N/A	N/A	N/A	N/A	N/A	N/A	N/A	70.82	70.82	7311	7311	N/A	139,256
8	1	Urban	Level	12.00	11.06	11.13	0.0	0	0	1.52	0.94	1.5	0.955	N/A	N/A	N/A	N/A	N/A	N/A	N/A	70.82	70.82	7699	7699	N/A	146,638
9	1	Urban	Level	12.00	9.91	9.67	0.0	0	0	1.52	0.94	1.5	0.910	N/A	N/A	N/A	N/A	N/A	N/A	N/A	70.82	70.82	4279	4279	N/A	81,500
10	1	Urban	Level	12.00	9.87	9.80	0.0	0	0	1.52	0.94	1.5	0.907	N/A	N/A	N/A	N/A	N/A	N/A	N/A	70.82	70.82	4092	4092	N/A	77,942
11	1	Rural	Mountainous	12.00	9.69	9.70	0.0	0	0	0	0.94	4.5	0.482	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	2175	2175	N/A	41,420
12	1	Rural	Mountainous	12.00	10.03	10.18	0.0	0	0	0	0.94	4.5	0.479	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	2162	2162	N/A	41,188
13	1	Rural	Rolling	12.00	10.00	10.00	0.0	0	0	0	0.94	2.5	0.624	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	2814	2814	N/A	53,604
14	1	Rural	Rolling	12.00	10.00	9.96	0.0	0	0	0	0.94	2.5	0.640	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	2887	2887	N/A	54,995
15	1	Rural	Rolling	12.00	9.89	9.94	0.0	0	0	0	0.94	2.5	0.638	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	2881	2881	N/A	54,867
16	1	Rural	Mountainous	12.00	9.84	9.90	0.0	0	0	0	0.94	4.5	0.390	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	1761	1761	N/A	33,551

Safety Performance Area Data

Segment	Operating Environment	Segment Length (miles)	NB/EB Fatal Crashes	SB/WB Fatal Crashes	Segment NB/EB/EB Suspected Serious Injury Crashes	Segment SB/WB/WB Suspected Serious Injury Crashes	Fatal + Suspected Serious Injury Crashes at Intersections	Fatal + Suspected Serious Injury Crashes Involving Lane Departures
3	Urban or Rural 6 Lane Freeway	7	11	3	2	2	5	0
4	Urban or Rural 6 Lane Freeway	7	20	4	8	8	5	0
5	Urban or Rural 6 Lane Freeway	7	18	9	4	4	6	0
6	Urban or Rural 6 Lane Freeway	7	10	4	2	5	8	0
7	Urban or Rural 6 Lane Freeway	7	9	4	2	4	6	0
8	Urban > 6 Lane Freeway	8	7	1	2	5	9	0
9	Urban 4 Lane Freeway	6	12	5	3	11	11	0
10	Urban 4 Lane Freeway	6	6	1	1	1	2	0
11	Rural 4 Lane Freeway with Daily Volume > 25,000	5	12	4	2	6	7	0
12	Rural 4 Lane Freeway with Daily Volume < 25,000	4	23	4	6	11	6	0
13	Rural 4 Lane Freeway with Daily Volume < 25,000	4	17	2	3	12	9	0
14	Rural 4 Lane Freeway with Daily Volume < 25,000	4	22	2	3	4	6	0
15	Rural 4 Lane Freeway with Daily Volume < 25,000	4	18	2	4	8	1	0
16	Rural 4 Lane Freeway with Daily Volume < 25,000	4	19	1	2	4	2	0

Segment	Operating Environment	Fatal + Suspected Serious Injury Crashes Involving Pedestrians	Fatal + Suspected Serious Injury Crashes Involving Trucks	Fatal + Suspected Serious Injury Crashes Involving Bicycles	Weighted Average NB/EB AADT	Weighted Average SB/WB AADT	Weighted Average Total AADT
3	Urban or Rural 6 Lane Freeway	0	2	0	21449	21708	43157
4	Urban or Rural 6 Lane Freeway	1	6	0	22682	22616	45298
5	Urban or Rural 6 Lane Freeway	2	3	0	23459	23269	46728
6	Urban or Rural 6 Lane Freeway	2	1	0	32018	31167	63185
7	Urban or Rural 6 Lane Freeway	1	2	0	52980	50960	103940
8	Urban > 6 Lane Freeway	2	0	0	74117	76213	150329
9	Urban 4 Lane Freeway	0	6	0	30728	32217	62945
10	Urban 4 Lane Freeway	0	0	0	19672	19724	39396
11	Rural 4 Lane Freeway with Daily Volume > 25,000	0	1	0	14759	14691	29450
12	Rural 4 Lane Freeway with Daily Volume < 25,000	2	8	1	11092	10770	21862
13	Rural 4 Lane Freeway with Daily Volume < 25,000	0	5	0	9323	8640	17963
14	Rural 4 Lane Freeway with Daily Volume < 25,000	0	5	0	8787	7795	16582
15	Rural 4 Lane Freeway with Daily Volume < 25,000	0	5	1	6869	6467	13336
16	Rural 4 Lane Freeway with Daily Volume < 25,000	0	4	0	6584	6074	12658

HPMS Data

2016-202 Weighted Average						2020			2019			2018			2017			2016		
SEGMENT	MP_FROM	MP_TO	WEIGHTED AVERAGE NB/EB AADT	WEIGHTED AVERAGE SB/WB AADT	WEIGHTED AVERAGE AADT	NB/EB AADT	SB/WB/WB AADT	2020 AADT	NB/EB/ AADT	SB/WB/ AADT	2019 AADT	NB/EB/ AADT	SB/WB/ AADT	2018 AADT	NB/EB/ AADT	SB/WB/ AADT	2017 AADT	NB/EB AADT	SB/WB AADT	2016 AADT
10E-3	187.00	198.00	21449	21708	43157	21985	20666	42652	22345	22345	44690	22271	20571	42843	19195	23120	42315	21446	21839	43284
10E-4	198.00	218.00	22682	22616	45298	20773	19938	40711	23955	23955	47911	23341	23537	46879	23241	23722	46963	22100	21928	44028
10E-5	218.00	236.00	23459	23269	46728	21780	20721	42501	24153	24153	48306	24274	24462	48736	23882	23799	47681	23208	23208	46416
10E-6	236.00	246.00	32018	31167	63185	29999	27524	57522	33790	33790	67580	33164	32328	65492	31009	30896	61905	32129	31296	63424
10E-7	246.00	255.00	52980	50960	103940	53698	50388	104086	57057	57057	114114	50020	47672	97692	49207	45775	94981	54917	53909	108825
10E-8	255.00	262.00	74117	76213	150329	72930	71490	144420	77974	77974	155948	75187	76007	151194	68879	79205	148084	75614	76387	152001
10E-9	262.00	274.00	30728	32217	62945	27671	31285	58955	33219	33219	66438	31250	33366	64617	30712	31858	62571	30789	31358	62146
10E-10	274.00	280.00	19672	19724	39396	17976	18332	36308	20666	20666	41332	20330	20142	40472	19348	19700	39048	20040	19781	39822
10E-11	280.00	292.00	14759	14691	29450	14005	13524	27529	15941	15941	31882	15847	15186	31033	13256	14061	27317	14743	14743	29487
10E-12	292.00	315.00	11092	10770	21862	11216	9925	21141	11356	11356	22711	11634	10459	22092	10145	11520	21665	11108	10590	21697
10E-13	315.00	332.00	9323	8640	17962	9673	8242	17915	10239	10239	20478	10606	7758	18364	8317	9182	17499	7778	7778	15556
10E-14	332.00	354.00	8787	7795	16582	9419	7463	16882	9321	9321	18641	9475	7574	17049	8003	7907	15911	7716	6710	14426
10E-15	354.00	372.00	6869	6467	13336	7270	6244	13514	7370	7370	14740	6539	6437	12976	6591	5922	12513	6574	6363	12938
10E-16	372.00	391.00	6584	6074	12658	6682	5928	12610	7179	7179	14358	6166	5776	11942	6451	5165	11615	6442	6324	12765

Freight Performance Area Data

			Total miles of closures		Average Occurrences/Mile/Year	
Segment	Length (miles)	# of closures	NB/EB	SB/WB	NB/EB	SB/WB
3	11.00	26	0	44.2	0.80	0.45
4	20.00	42	1	17.0	0.17	0.30
5	18.00	23	2	9.0	0.10	0.21
6	10.00	23	1	9.0	0.18	0.55
7	9.00	26	1	6.0	0.13	0.44
8	7.00	51	1	31.1	0.89	0.57
9	12.00	47	2	21.2	0.35	0.43
10	6.00	11	0	6.0	0.20	0.17
11	12.00	20	2	22.0	0.37	0.12
12	23.00	46	5	44.5	0.39	0.10
13	17.00	22	0	4.0	0.05	0.21
14	22.00	29	2	12.6	0.11	0.23
15	18.00	16	1	23.0	0.26	1.06
16	20.00	20	1	21.0	0.21	1.05

	ITIS Category Description											
	Closures		Incidents/Accidents		Incidents/Crashes		Obstruction Hazards		Winds		Winter Storm Codes	
Segment	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
3	0	1	1	0	7	13	2	0	0	0	0	0
4	0	0	2	1	13	23	0	0	0	0	0	0
5	0	0	0	2	9	11	0	0	0	0	0	0
6	0	0	3	0	6	13	0	0	0	0	0	0
7	0	0	2	0	3	14	0	0	0	0	0	0
8	0	0	3	1	24	5	0	0	0	0	0	0
9	0	1	1	1	20	24	0	0	0	0	0	0
10	0	0	0	1	6	3	0	0	0	0	0	0
11	0	0	1	1	12	6	0	0	0	0	0	0
12	0	1	2	0	32	11	0	0	0	0	0	0
13	0	0	0	1	4	17	0	0	0	0	0	0
14	1	2	0	2	11	13	0	0	0	0	0	0
15	0	2	0	0	6	8	0	0	0	0	0	0
16	0	2	0	0	5	13	0	0	0	0	0	0

See the **Mobility Performance Area Data** section for other Freight Performance Area related data.

Appendix D: Needs Analysis Contributing Factors and Scores

Pavement Needs Assessment Methodology (Steps 1-3)

This section documents the approach for conducting the first three steps of a 5-step needs assessment process for the Pavement Performance Area. After completion of Step 3 for all performance areas (Pavement, Bridge, Mobility, Safety, and Freight), Step 4 will review each corridor segment to quantify a total level of need that combines all performance areas. Corridor needs are then identified in Step 5 of the process. The 5-step process is listed below:

- Step 1: Initial Needs
- Step 2: Final Needs
- Step 3: Contributing Factors
- Step 4: Segment Review
- Step 5: Corridor Needs

Step 1: Initial Needs

The input required to populate the Step 1 template includes transferring the existing performance score for each segment to the appropriate "Performance Score" columns. This includes the primary and secondary measures for Pavement. As each performance score is input into the template, the Initial Need will populate based on the weighted scoring system for each measure.

The Level of Need for each performance measure has levels of "None" (score = 0), "Low" (score = 1), "Medium" (score = 2), and "High" (score = 3). The assignment of these levels to individual performance measures for segments is determined by the table entitled "Needs Assessment Scales" within the Step 1 template.

To develop an aggregate Initial Need for each segment, the primary and secondary measures are combined by summing the weighted scored, with the primary measure having a weight of 1.0 while each secondary measure has a weight of 0.2 (0.1 each direction if directional). The Initial Need for each segment (combining the primary and secondary measures) has levels of "None" (score < 0.01), "Low" (score $\geq$ 0.01 and < 1.5), "Medium" (score $\geq$ 1.5 and < 2.5), and "High" (score $\geq$ 2.5).

The steps include:

Step 1.1

Enter the appropriate segment information into the columns titled "Segment", "Segment Length", "Segment Mileposts" and "Facility Type".

Step 1.2

Populate the Step 1 template with the existing (baseline) performance scores for all primary and secondary performance measures from Existing Performance Analysis into the appropriate "Performance Score" columns. Copy the performance score for each segment to the appropriate "Performance Score" column. Paste only the "values" and do not overwrite the formatting.

Step 1.3

Indicate if Pavement is an Emphasis Area by selecting "Yes" or "No" in the row immediately below the segment information.

Step 1.4

Confirm that that the Step 1 template is generating the appropriate "Level of Need" for each primary and secondary measure by reviewing the relationship of baseline performance score to level of need.

Step 2: Final Needs

The Initial Need will be carried over to Step 2. The steps required to complete Step 2 are as follows:

Step 2.1

Confirm that the template has properly populated the segment information and the initial needs from the Step 1 template to the "Initial Need" column of the Step 2 template.

Step 2.2

Note in the "Hot Spots" column any pavement failure hot spots identified as part of the baseline corridor performance. For each entry, include the milepost limits of the hot spot. Hot spots are identified in the Pavement Index spreadsheet by the red cells in the columns titled "% Pavement Failure". These locations are based on the following criteria:

Interstates: IRI > 105 or Cracking > 10 or Rutting > 0.4

Non-Interstates: IRI > 142 or Cracking > 10 or Rutting > 0.4

Every segment that has a % Pavement Failure greater than 0% will have at least one hot spot. Hot spot locations should be described as extending over consecutive miles. For example, if there is a pavement failure location that extends 5 consecutive miles, it should be identified as one hot spot, not 5 separate hot spots.

Step 2.3

Identify recently completed or under construction paving projects in the "Previous Projects" column. Include only projects that were completed after the pavement condition data period (check dates in pavement condition data provided by ADOT) that would supersede the results of the performance system.

Step 2.5

Update the "Final Need" column using the following criteria:

- If "None" but have a hot spot (or hot spots), the Final Need = Low, and note the reason for the change in the "Comments" column (column H).

- If a recent project has superseded the performance rating data, change the Final Need to "None" and note the reason for the change in the "Comments" column.

Example Scales for Level of Need

Pavement Index (Interstates) Performance Thresholds		Initial Need	Description (Non-Emphasis Area)
3.75		None	All of Good Performance and upper third of Fair Performance (>3.50)
		Low	Middle third of Fair Perf. (3.25 - 3.5)
3.0		Medium	Lower third of Fair and top third of Poor Performance (2.75-3.25)
		High	Lower two-thirds of Poor Performance (<2.75)

Need Scale for Interstates

Measure	None >=	Low >=	> Medium <		High <=
Pavement Index (corridor non-emphasis area)	3.5	3.25	3.25	2.75	2.75
Pavement Index (corridor emphasis area)	4.0	3.5	3.5	3.00	3.00
Pavement Index (segments)	3.5	3.25	3.25	2.75	2.75
Directional PSR	3.63	3.52	3.52	3.28	3.28
%Pavement Failure	10%	15%	15%	25%	25%

Need Scale for Highways (Non-Interstates)

Measure	None >=	Low >=	> Medium <		High <=
Pavement Index (corridor non-emphasis area)	3.33	3.07	3.07	2.53	2.53
Pavement Index (corridor emphasis area)	3.87	3.33	3.33	2.80	2.80
Pavement Index (segments)	3.33	3.07	3.07	2.53	2.53
Directional PSR	3.30	3.10	3.10	2.70	2.70
%Pavement Failure	10%	15%	15%	25%	25%

Step 2.6

Note any programmed projects that could have the potential to mitigate pavement needs in in the "Comments" column. Programmed projects are provided as information and do not impact the need rating. The program information can be found in ADOT's 5-year construction program. If there are other comments relevant to the needs analysis (such as information from previous reports), they can be entered in the "Comments" column. However, only include information related to needs that have been identified through this process. Do not add or create needs from other sources.

Step 3: Contributing Factors

The Final Need ratings from Step 2 will populate into the Step 3 tab. The steps to complete Step 3 include:

Step 3.1

Input the level of historical investment for each segment. This will be determined from the numeric score from the Pavement History Table based on the following thresholds:

- Low = < 4.60
- Medium = 4.60 – 6.60
- High = > 6.60

If the PeCoS data shows a high level of maintenance investment, increase the historical investment rating by one level.

Step 3.2

Note the milepost ranges of pavement failure hot spots into the column titled "Contributing Factors and Comments."

Step 3.3

Note any other information that may be contributing to the deficiency, or supplemental information, in the "Contributing Factors and Comments" column. This could come from discussions with ADOT District staff, ADOT Materials/Pavement Group, previous reports, or the historical investment data.

Step 3.4

Include any programmed projects from ADOT's 5-year construction program in the "Contributing Factors and Comments" column.

Bridge Needs Assessment Methodology (Steps 1-3)

This section documents the approach for conducting the first three steps of a 5-step needs assessment process for the Bridge Performance Area. After completion of Step 3 for all performance areas (Pavement, Bridge, Mobility, Safety, and Freight), Step 4 will review each corridor segment to quantify a total level of need that combines all performance areas. Corridor needs are then identified in Step 5 of the process. The 5-step process is listed below:

- Step 1: Initial Needs
- Step 2: Final Needs
- Step 3: Contributing Factors
- Step 4: Segment Review
- Step 5: Corridor Needs

Step 1: Initial Needs

The input required to populate the Step 1 template includes transferring the existing performance score for each segment to the appropriate "Performance Score" columns. This includes the primary and secondary measures for Bridge. As each performance score is input into the template, the Initial Need will populate based on the weighted scoring system for each measure.

The Level of Need for each performance measure has levels of "None" (score = 0), "Low" (score = 1), "Medium" (score = 2), and "High" (score = 3). The assignment of these levels to individual performance measures for segments is determined by the table entitled "Needs Assessment Scales" within the Step 1 template.

To develop an aggregated Initial Need for each segment, the primary and secondary measures are combined by summing the weighted scored, with the primary measure having a weight of 1.0 while each secondary measure has a weight of 0.2 (0.1 each direction if directional). The Initial level of need for each segment (combining the primary and secondary measures) has levels of "None" (score < 0.01), "Low" (score $\geq$ 0.01 and < 1.5), "Medium" (score $\geq$ 1.5 and < 2.5), and "High" (score $\geq$ 2.5).

The steps include:

Step 1.1

Enter the appropriate segment information into the columns titled "Segment", "Segment Length", "Segment Mileposts" and "Number of Bridges."

Step 1.2

Populate the Step 1 template with the existing (baseline) performance scores for all primary and secondary performance measures from Existing Performance Analysis into the appropriate "Performance Score" columns. Copy the performance score for each segment to the appropriate "Performance Score" column. Paste only the "values" and do not overwrite the formatting.

Step 1.3

Indicate if Bridge is an Emphasis Area by selecting "Yes" or "No" in the row immediately below the segment information.

Step 1.4

Confirm that that the Step 1 template is generating the appropriate "Level of Need" for each primary and secondary measure by reviewing the relationship of baseline performance score to level of need.

Step 2: Final Needs

The Initial Need will be carried over to Step 2. The steps required to complete Step 2 are as follows:

Step 2.1

Confirm that the template has properly populated the initial needs from the Step 1 template to the "Initial Need" column of the Step 2 template.

Step 2.2

Note in the column titled "Hot Spots" any bridge hot spots identified as part of the baseline corridor performance. For each entry, note the specific location. Hot spots are identified as having any bridge rating of 4 or less, or multiple ratings of 5 in the deck, substructure, or superstructure ratings.

Step 2.3

Identify recently completed or under construction bridge projects in the "Previous Projects" column. Include only projects that were completed after the bridge condition data period (check dates in bridge condition data provided by ADOT) that would supersede the results of the performance system.

Step 2.4

Update the Final Need on each segment based on the following criteria:

- If the Initial Need is "None" and there is at least one hot spot located on the segment, change the Final Need to "Low".
- If a recent project has superseded the performance rating data, the performance data should be adjusted to increase the specific ratings and the resulting need should be reduced to account for the project.
- Note the reason for any change in the "Comments" column.

Step 2.5

Historical bridge rating data was tabulated and graphed to find any bridges that had fluctuations in the ratings. Note in the “Historical Review” column any bridge that was identified as having a potential historical rating concern based on the following criteria:

- Ratings increase or decrease (bar chart) more than 2 times
- Sufficiency rating drops more than 20 points

This is for information only and does not affect the level of need.

Step 2.6

Note the number of functionally obsolete bridges in each segment in the column titled “# Functionally Obsolete Bridges”. This is for information only and does not affect the level of need.

Step 2.7

Identify each bridge “of concern” in the “Comments” column. Note any programmed projects that could have the potential to mitigate bridge needs. Programmed projects are provided as information and do not impact the need rating. The program information can be found in ADOT’s 5-year construction program. If there are other comments relevant to the needs analysis (such as information from previous reports), they can be entered in the “Comments” column. However, only include information related to needs that have been identified through this process. Do not add or create needs from other sources.

Example Scales for Level of Need

Bridge Index Performance Thresholds	Level of Need		Description (Non-Emphasis Area)
6.5	Good	None	All of Good Performance and upper third of Fair Performance (>6.0)
	Good		
	Good		
	Fair		
	Fair	Low	Middle third of Fair Performance (5.5-6.0)
5.0	Fair	Medium	Lower third of Fair and top third of Poor Performance (4.5-5.5)
	Poor		
	Poor	High	Lower two-thirds of Poor Performance (<4.5)
	Poor		

Need Scale

Measure	None >=	Low >=	> Medium <		High <=
Bridge Index (corridor non-emphasis area)	6.0	5.5	5.5	4.5	4.5
Bridge Index (corridor emphasis area)	7.0	6.0	6.0	5.0	5.0
Bridge Index (segments)	6.0	5.5	5.5	4.5	4.5
Bridge Sufficiency	70	60	60	40	40
Bridge Rating	6.0	5.0	4.0	4.0	3.0

Step 3: Contributing Factors

The Final Need ratings from Step 2 will populate into the Step 3 tab. The steps to compete Step 3 include:

Step 3.1

Input the bridge name, structure number, and milepost information for each bridge “of concern” resulting from Step 2.

Step 3.2

For bridges that have a current rating of 5 or less, enter the specific rating, or state “No current ratings less than 6”.

Step 3.3

For bridges that were identified for a historical review (step 2.5), state “Could have a repetitive investment issue”. If a bridge was not identified for a historical review, state “This structure was not identified in historical review”.

Step 3.4

Input any programmed projects from ADOT’s 5-year construction program. Note any other information that may be contributing to the deficiency, or supplemental information. This could come from discussions with ADOT District staff, ADOT Bridge Group, or previous reports.

Mobility Needs Assessment Methodology (Steps 1-3)

This section documents the approach for conducting the first three steps of a 5-step needs assessment process for the Mobility Performance Area. After completion of Step 3 for all performance areas (Pavement, Bridge, Mobility, Safety, and Freight), Step 4 will review each corridor segment to quantify a total level of need that combines all performance areas. Corridor needs are then identified in Step 5 of the process. The 5-step process is listed below:

- Step 1: Initial Needs
- Step 2: Refined Needs
- Step 3: Contributing Factors
- Step 4: Segment Review
- Step 5: Corridor Needs

Step 1: Initial Needs

The input required to populate the Step 1 template includes transferring the existing performance score for each segment to the appropriate "Performance Score" columns from Existing Performance Analysis. This includes the primary and secondary measures for Mobility. As each performance score is input into the template, the Initial Need will populate based on the weighted scoring system for each measure.

The Level of Need for each performance measure has levels of "None" (score = 0), "Low" (score = 1), "Medium" (score = 2), and "High" (score = 3). The assignment of these levels to individual performance measures for segments is determined by the table entitled "Needs Assessment Scales" in the Step 1 tab.

To develop an aggregated Initial Need for each segment, the primary and secondary measures are combined by summing the weighted scores, with the primary measure having a weight of 1.0 while each secondary measure has a weight of 0.2 (0.1 each direction if directional). The Initial Need for each segment (combining the primary and secondary measures) has levels of "None" (score < 0.01), "Low" (score $\geq$ 0.01 and < 1.5), "Medium" (score $\geq$ 1.5 and < 2.5), and "High" (score $\geq$ 2.5).

The steps include:

Step 1.1

Input the accurate number of segments for your corridor in the column titled 'Segment' and the appropriate segment milepost limits and segment lengths in adjacent columns.

Step 1.2

Select the appropriate 'Environment Type' and 'Facility Operation Type' from the drop down menus as defined in Existing Performance Analysis.

Step 1.3

Select 'Yes' or 'No' from the drop down list to not if the Mobility Performance Area is an Emphasis Area for your corridor.

Step 1.4

Populate the Step 1 template with the existing (baseline) performance scores for all primary and secondary performance measures from Existing Performance Analysis. Copy the performance score for each segment to the appropriate "Performance Score" column.

Step 1.5

Confirm that that the Step 1 template is generating the appropriate "Level of Need" for each primary and secondary measure by reviewing the relationship of baseline performance score to level of need.

Step 2: Final Needs

The Initial Need will be carried over to Step 2 The steps required to complete Step 2 are as follows:

Step 2.1

Confirm that the template has properly populated the initial deficiencies from the Step 1 template to the Step 2 template.

Step 2.2

Identify recently completed or under construction projects that would be considered relevant to mobility performance. Include only projects that were constructed after the date for which the HPMS data used for traffic volumes would not include. Any completed or under construction roadway project after the HPMS data date that has the potential to mitigate a mobility issue on a corridor segment should be listed in the template. Such projects should include the construction of new travel lanes or speed limit changes on the main corridor only. Do not include projects involving frontage roads or crossings as they would not impact the corridor level performance.

Step 2.3

Update the Final Need using the following criteria:

- If a recent project has superseded the performance rating data and it is certain the project addressed the deficiency, change the need rating to "None".
- If a recent project has superseded the performance rating data but it is uncertain that a project addressed the need, maintain the current deficiency rating and note the uncertainty as a comment.

Step 2.4

Note any programmed or planned projects that have the potential to mitigate any mobility needy on the segment. Programmed and Planned projects are provided as information and do not impact the deficiency rating. Future projects will be reviewed in the development of solution sets for identified needs and deficiencies. The source of future projects can be found in ADOT's 5-year construction program or other planning documents. Other comments relevant to the needs analysis can be entered.

Example Scales for Level of Need

Mobility Index (Urban and Fringe Urban) Performance Thresholds	Initial Need	Description (Non-Emphasis Area)
0.71	None	All of Good Performance and upper third of Fair Performance (<0.77)
	Low	Middle third of Fair Performance (0.77 - 0.83)
0.89	Medium	Lower third of Fair and top third of Poor Performance (0.83-0.95)
	High	Lower two-thirds of Poor Performance (>0.95)

Needs Scale

Measure		None <=	Low <=	> Medium <		High >=
Mobility Index (Corridor Emphasis Area)		Weighted calculation for the segment totals in corridor (urban vs. rural)				
Mobility Index (Corridor Non-Emphasis Area)		Weighted calculation for the segment totals in corridor (urban vs. rural)				
Mobility Index (Segment)	Urban	0.77	0.83	0.83	0.95	0.95
	Rural	0.63	0.69	0.69	0.83	0.83
Future Daily V/C	Urban	0.77	0.83	0.83	0.95	0.95
	Rural	0.63	0.69	0.69	0.83	0.83
Existing Peak hour V/C	Urban	0.77	0.83	0.83	0.95	0.95
	Rural	0.63	0.69	0.69	0.83	0.83
Closure Extent		0.35	0.49	0.49	0.75	0.75
Directional LOTTR	Uninterrupted	1.27	1.38	1.38	1.62	1.62
	Interrupted	1.27	1.38	1.38	1.62	1.62
Bicycle Accommodation		80%	70%	70%	50%	50%

Step 3: Contributing Factors

The Final Need ratings from Step 2 will populate into the Step 3 tab. The steps to compete Step 3 include:

Step 3.1

Input data from Mobility Index worksheet and corridor observations in appropriate columns for Roadway Variables.

Step 3.2

Input traffic variable data in appropriate columns as indicated, Buffer Index scores will auto populate.

Step 3.3

Input relevant mobility related infrastructure located within each segment as appropriate

Step 3.4

Input the Closure Extents that have occurred along the study corridor. Road closure information can be detailed out by the reason for the closure as documented in Highway Condition Reporting System (HCRS) data analyzed as part of the baseline corridor performance. Closure reasons include incident/accidents, winter storms, obstruction hazards, and undefined closures. Statewide average percentages for the various closure reasons have been calculated for most recent five-year period on ADOT's designated strategic corridors. Compare these statewide average percentages to the corridor percentages for the various closure reasons to identify higher than average percentages of one or more closure reasons on any given segment. Input the closures as follows and use red text to indicate that the segment percentage exceeds statewide averages:

- Total Number of Closures
- % Incidents/Accidents
- % Obstructions/Hazards
- % Weather Related

Step 3.5

List the non-actionable conditions that are present within each segment by milepost if possible. Non-Actionable conditions are conditions that exist within the environment of each segment that cannot be improved through an engineered solution. For example, the border patrol check point in Segment 3 of I-19 is a non-actionable condition.

Step 3.6

Considering all information input, identify and list the contributing factors to the Final Need score.

Safety Needs Assessment Methodology (Steps 1-3)

This section documents the approach for conducting the first three steps of a 5-step needs assessment process for the Safety Performance Area. After completion of Step 3 for all performance areas (Pavement, Bridge, Mobility, Safety, and Freight), Step 4 will review each corridor segment to quantify a total level of need that combines all performance areas. Corridor needs are then identified in Step 5 of the process. The 5-step process is listed below:

- Step 1: Initial Needs
- Step 2: Final Needs
- Step 3: Contributing Factors
- Step 4: Segment Review
- Step 5: Corridor Needs

Step 1: Initial Needs

The input required to populate the Step 1 template includes transferring the corridor characteristics and existing performance score for each segment to the appropriate "Performance Score" columns. This includes the primary and secondary measures for safety. As each performance score is input into the template, the Level of Need will populate based on the weighted scoring system for each measure.

The Level of Need for each performance measure has levels of "None" (score = 0), "Low" (score = 1), "Medium" (score = 2), and "High" (score = 3). The assignment of these levels to individual performance measures for segments is determined by the table entitled "Needs Scale" within the Step 1 template.

To develop an aggregated Initial Need for each segment, the primary and secondary measures are combined by summing the weighted scored, with the primary measure having a weight of 1.0 while each secondary measure has a weight of 0.2 (0.1 each direction if directional). The Initial Need for each segment (combining the primary and secondary measures) has levels of "None" (score < 0.01), "Low" (score $\geq$ 0.01 and < 1.5), "Medium" (score $\geq$ 1.5 and < 2.5), and "High" (score $\geq$ 2.5).

The steps include:

Step 1.1

Populate the Step 1 template with the corridor characteristics information. This includes segment operating environments and segment length. Also specify if the safety performance area is an emphasis area as determined in Goals and Objectives. The "Level of Need" is dependent on the input of the operating environment and "Emphasis Area" as the thresholds dynamically update accordingly.

Input the existing (baseline) performance scores for all primary and secondary performance measures from Existing Performance Analysis. Copy the performance score (paste values only) for each segment to the appropriate "Performance Score" column and conditional formatting should color each cell green, yellow, or red based on the corresponding performance thresholds.

Step 1.2

The thresholds for the corridor safety index are based on the segments' operating environments. To ensure that the correct corridor safety index threshold is applied, input the unique segment operating environments that exist with the corridor. Once the input is complete, the average of the Good/Fair and Fair/Poor thresholds for each of the operating environments is calculated and the "Level of Need" thresholds will be derived and applied to the main Step 1 Table.

Step 1.3

Confirm that the following criteria for "Insufficient Data" have been applied and that the resulting Level of Need has been shown as "N/A" where applicable.

- Crash frequency for a segment is less than 5 crashes over the 5-year crash analysis period.
- The change in +/- 1 crash results in the change of need level of 2 levels (i.e., changes from Above Average to Below Average or changes from Below Average to Above Average).
- The average segment crash frequency for the overall corridor (total fatal plus suspected serious injury crash frequency divided by the number of corridor segments) is less than 2 per segment over the 5-year crash analysis period.

Step 1.4

Confirm that the Step 1 template is generating the appropriate "Level of Need" for each primary and secondary measure by reviewing the relationship of baseline performance score to level of need.

Step 2: Final Needs

The Initial Need will be carried over to Step 2. The steps required to complete Step 2 are as follows:

Step 2.1

Confirm that the template has properly populated the initial needs from the Step 1 template to the Step 2 template**.**

Step 2.2

Using the crash concentration (hot spot) map developed as part of the baseline corridor performance, note the direction of travel and approximate milepost limits of each hot spot.

Step 2.3

Identify recently completed or under construction projects that would be considered relevant to safety performance. Include only projects that were not taken into account during the five-year

crash data analysis period. Any completed or under construction roadway project after the crash analysis period that has the potential to mitigate a safety issue on a corridor segment should be listed in the template. Sources of recent or current project activity can include ADOT MPD staff, ADOT public notices, and ADOT District staff.

Step 2.4

Update the Final Need based on the following criteria:

- If there is a crash hot spot concentration on a “None” segment, upgrade the need rating to “Low.”

Step 2.5

Note any programmed projects that could have the potential to mitigate any safety need on the segment. Programmed projects are provided as information and do not impact the need rating. Programmed projects will be reviewed in the development of solution sets for identified needs. The source of the programming information can be found in ADOT’s 5-year construction program. Any other relevant issues identified in previous reports should also be reported.

Example Scales for Level of Need

Safety Index (6 Lane Highway) Performance Thresholds	Initial Need	Description (Non-Emphasis Area)
0.76	None	All of Above Average Performance and upper third of Average Performance (<0.92)
	Low	Middle third of Average Performance (0.92 - 1.08)
1.24	Medium	Lower third of Average and top third of Below Average Performance (1.08-1.40)
	High	Lower two-thirds of Below Average Performance (>1.40)

Needs Scale

Measure		None <=	Low <=	> Medium <		High >=
Safety Index (Corridor Emphasis Area)		Weighted calculation for the segment totals in corridor (operating environments)				
Safety Index (Corridor Non-Emphasis Area)		Weighted calculation for the segment totals in corridor (operating environments)				
Safety Index and	2 or 3 Lane Undivided Highway	0.97	1.02	1.02	1.13	1.13
	2 or 3 or 4 Lane Divided Highway	0.94	1.07	1.07	1.32	1.32
Directional Safety Index (Segment)	4 or 5 Lane Undivided Highway	0.93	1.08	1.08	1.37	1.37
	6 Lane Highway	0.92	1.08	1.08	1.4	1.4
	Rural 4 Lane Freeway with Daily Volume < 25,000	0.95	1.06	1.06	1.27	1.27
	Rural 4 Lane Freeway with Daily Volume > 25,000	0.93	1.08	1.08	1.37	1.37
	Urban 4 Lane Freeway	0.91	1.09	1.09	1.45	1.45
	Urban or Rural 6 Lane Freeway	0.88	1.11	1.11	1.58	1.58
	Urban > 6 Lane Freeway	0.96	1.03	1.03	1.18	1.18
% of Fatal + Susp. Serious Injury Crashes at Intersections	2 or 3 Lane Undivided Highway	13%	14%	14%	17%	17%
	2 or 3 or 4 Lane Divided Highway	25%	27%	27%	31%	31%
	4 or 5 Lane Undivided Highway	46%	48%	48%	52%	52%
	6 Lane Highway	63%	68%	68%	78%	78%
	Rural 4 Lane Freeway with Daily Volume < 25,000	0%	0%	0%	0%	0%
	Rural 4 Lane Freeway with Daily Volume > 25,000	0%	0%	0%	0%	0%
	Urban 4 Lane Freeway	0%	0%	0%	0%	0%
	Urban or Rural 6 Lane Freeway	0%	0%	0%	0%	0%
	Urban > 6 Lane Freeway	0%	0%	0%	0%	0%
% of Fatal + Susp. Serious Injury Crashes Involving Lane Departures	2 or 3 Lane Undivided Highway	69%	72%	72%	77%	77%
	2 or 3 or 4 Lane Divided Highway	59%	62%	62%	68%	68%
	4 or 5 Lane Undivided Highway	25%	29%	29%	36%	36%
	6 Lane Highway	21%	30%	30%	47%	47%
	Rural 4 Lane Freeway with Daily Volume < 25,000	74%	75%	75%	78%	78%
	Rural 4 Lane Freeway with Daily Volume > 25,000	72%	75%	75%	81%	81%
	Urban 4 Lane Freeway	66%	72%	72%	84%	84%
	Urban or Rural 6 Lane Freeway	58%	60%	60%	65%	65%
	Urban > 6 Lane Freeway	41%	42%	42%	44%	44%
% of Fatal + Susp. Serious Injury Crashes Involving Pedestrians	2 or 3 Lane Undivided Highway	5%	6%	6%	8%	8%
	2 or 3 or 4 Lane Divided Highway	3%	3%	3%	4%	4%
	4 or 5 Lane Undivided Highway	10%	12%	12%	15%	15%
	6 Lane Highway	4%	8%	8%	16%	16%
	Rural 4 Lane Freeway with Daily Volume < 25,000	2%	3%	3%	4%	4%
	Rural 4 Lane Freeway with Daily Volume > 25,000	2%	3%	3%	6%	6%
	Urban 4 Lane Freeway	2%	4%	4%	7%	7%
	Urban or Rural 6 Lane Freeway	5%	6%	6%	9%	9%
	Urban > 6 Lane Freeway	3%	4%	4%	6%	6%

% of Fatal + Susp. Serious Injury Crashes Involving Trucks	2 or 3 Lane Undivided Highway	5%	6%	6%	9%	9%
	2 or 3 or 4 Lane Divided Highway	6%	8%	8%	12%	12%
	4 or 5 Lane Undivided Highway	2%	4%	4%	7%	7%
	6 Lane Highway	5%	6%	6%	8%	8%
	Rural 4 Lane Freeway with Daily Volume < 25,000	20%	21%	21%	24%	24%
	Rural 4 Lane Freeway with Daily Volume > 25,000	12%	15%	15%	22%	22%
	Urban 4 Lane Freeway	9%	11%	11%	15%	15%
	Urban or Rural 6 Lane Freeway	8%	11%	11%	16%	16%
	Urban > 6 Lane Freeway	3%	4%	4%	6%	6%
% of Fatal + Susp. Serious Injury Crashes Involving Bicycles	2 or 3 Lane Undivided Highway	1%	2%	2%	4%	4%
	2 or 3 or 4 Lane Divided Highway	1%	2%	2%	3%	3%
	4 or 5 Lane Undivided Highway	2%	3%	3%	5%	5%
	6 Lane Highway	2%	4%	4%	9%	9%
	Rural 4 Lane Freeway with Daily Volume < 25,000	0%	0%	0%	1%	1%
	Rural 4 Lane Freeway with Daily Volume > 25,000	0%	0%	0%	0%	0%
	Urban 4 Lane Freeway	0%	0%	0%	0%	0%
	Urban or Rural 6 Lane Freeway	0%	0%	0%	1%	1%
	Urban > 6 Lane Freeway	0%	0%	0%	0%	0%

Step 3: Contributing Factors

The Final Need ratings from Step 2 will populate into the Step 3 tab.

Table 3 - Step 3 Template

A separate *Crash Summary Sheet* file contains summaries for 8 crash attributes for the entire corridor, for each corridor segment, and for statewide roadways with similar operating environments (the database of crashes on roadways with similar operating environments was developed in Existing Performance Analysis (the baseline corridor performance)). The crash attribute summaries are consistent with the annual ADOT Publication, *Crash Facts*. The 8 crash attribute summaries consist of the following:

- First Harmful Event (FHET)
- Crash Type (CT)
- Violation or Behavior (VB)
- Lighting Condition (LC)
- Roadway Surface Type (RST)
- First Unit Event (FUE)
- Driver Physical Condition (Impairment)
- Safety Device Usage (Safety Device)

Non-colored tabs in this spreadsheet auto-populate with filtered crash attributes. Each tab is described below:

- **Step_3_Summary** – This tab contains the filtered summary of crashes that exceed statewide thresholds for crashes on roadways with similar operating environments. Data in this tab are copied into the Step 3 template.
- **Statewide** – This tab contains a summary of statewide crashes from roadways with similar operating environments filtered by the 8 crash type summaries listed above. The crash type summaries calculate statewide crash thresholds (% total for fatal plus suspected serious crashes). The crash thresholds were developed to provide a statewide expected proportion of crash attributes against which the corridor segments' crash attributes can be compared. The crash thresholds were developed using the *Probability of Specific Crash Types Exceeding a Threshold Proportion* as shown in the Highway Safety Manual, Volume 1 (2010). The thresholds are automatically calculated within the spreadsheet. The threshold proportion was calculated as follows:

$$p*_i = \frac{\sum N_{Observed,i}}{\sum N_{Observed,i(total)}}$$

Where:

$p*_i$ = Threshold proportion

$\sum N_{Observed,i}$ = Sum of observed target crash frequency within the population

$\sum N_{Observed,i(total)}$ = Sum of total observed crash frequency within the population

A minimum crash sample size of 5 crashes over the 5-year crash analysis period is required for a threshold exceedance to be displayed in the Step 3 template. The probability of exceeding the crash threshold was not calculated to simplify the process.

- **Corridor** – A summary of corridor-wide crashes filtered by the 8 crash attribute summaries listed above.
- **Segment FHET** – A segment-by-segment summary of crashes filtered by first harmful event attributes.
- **Segment CT** – A segment-by-segment summary of crashes filtered by crash type attributes.
- **Segment VB** - A segment-by-segment summary of crashes filtered by violation or behavior attributes.
- **Segment LC** – A segment-by-segment summary of crashes filtered by lighting condition attributes.
- **Segment RST** – A segment-by-segment summary of crashes filtered by roadway surface attributes.

- **Segment FUE** – A segment-by-segment summary of crashes filtered by first unit event attributes.
- **Segment Impairment** – A segment-by-segment summary of crashes filtered by driver physical condition attributes related to impairment.
- **Segment Safety Device** – A segment-by-segment summary of crashes filtered by safety device usage attributes.

The steps to compete Step 3 include:

Step 3.1

Using the Crash_Summary_Sheet.xlsx, go to the “Step_3_Summary” tab. Input the operating environments for each segment in the table.

Step 3.2

Filter data from the ADOT database for the “CORRIDOR_DATA” tab by inserting the following data in the appropriate columns that are highlighted in gray for the “INPUT_CORRIDOR_DATA” tab:

- Incident ID
- Incident Crossing Feature (MP)
- Segment Number (Non-native ADOT data – must be manually assigned based on the location of the crash)
- Operating Environment (Non-native ADOT data – should already be assigned but if for some reason it isn’t, it will need to be manually assigned)
- Incident Injury Severity
- Incident First Harmful Description
- Incident Collision Manner
- Incident Lighting Condition Description
- Unit Body Style
- Surface Condition
- First Unit Event Sequence
- Person Safety Equipment
- Personal Violation or Behavior
- Impairment

Note that columns highlighted in yellow perform a calculated input to aggregate specific crash descriptions. For example, crashes can contain various attributes for animal-involved crashes. The crash attributes that involve an animal were combined into a common attribute, such as “ANIMAL”. This will allow the summaries to be consistent with the ADOT *Crash Facts*.

The data in the Impairment category contains blank descriptions if it was found that there was “No Apparent Influence” or if it was “Unknown”. Using the crash data fields “PersonPhysicalDescription” 0 - 99, fill in the blank columns to reflect if the physical description is described as “No Apparent Influence” or “Unknown”. Note that the native physical description data from the ADOT database may need to be combined to a single column.

Step 3.3

Confirm that the crash database is being properly filtered by comparing crash frequencies from the summary tables with the frequencies developed in Existing Performance Analysis. For example, the lookup function will fail if the filter is for “NO IMPROPER ACTION” if the database has the attribute of “NO_IMPROPER_ACTION”.

Step 3.4

Copy and paste the Step_3_Summary into the Safety Needs Assessment spreadsheet in the Step 3 tab. Paste values only and remove the summaries with “0%s” for a clean display. Where duplicate values exist, go to the "Calcs" tab in the Crash_Summary_Sheet file to determine which categories have the same %. If there are more crash types with the same % than there is space in the table, select the crash type with the highest difference between the segment % and the statewide average %

Step 3.5

The Step 3 table in the Safety Needs Assessment spreadsheet should be similar to the Step 3 template. In the Segment Crash Summaries row, the top three crash attributes are displayed. Change the font color of the crash attributes that exceed the statewide crash threshold to red for emphasis. The attributes with a red font in the “Calcs” tab have exceeded statewide crash thresholds. Note that corridor-wide values are not compared to statewide values as corridor-wide values are typically a blend of multiple similar operating environments while the statewide values apply to one specific similar operating environment.

Step 3.6

Provide a summary of any observable patterns found within the crash Hot Spots, if any exist in the segments.

Step 3.7

Input any historic projects (going no further back than 15 years) that can be related to improving safety. Projects more than five years old may have exceeded their respective design life and could be contributing factors to safety performance needs.

Step 3.8

Input key points from District interviews or any important information from past discussions with District staff that is consistent with needs and crash patterns identified as part of the performance and needs assessment as this may be useful in identifying contributing causes. This information may be obtained from District Maintenance personnel by requesting the mile post locations that may be considered safety issues.

Step 3.9

For segments with one or more of the following characteristics, review crashes of all severity levels (not just fatal and suspected serious injury crashes). Identify likely contributing factors and compare that to the above statewide average comparison findings already calculated for fatal and suspected serious injury crashes. Refine the contributing factors list accordingly.

- Segments with Medium or High need
- Segments with a crash hot spot concentration (but only review crashes at the concentration areas)
- Segments with no apparent predominant contributing factors based on the comparison of fatal and suspected serious injury crashes to statewide averages if the segment has a Medium or High need.

Step 3.10

Considering all information in Steps 1-3, list the contributing factors using engineering judgment and the information on contributing factors available in Section 6.2 of the 2010 Highway Safety Manual. Additional sources for determining contributing factors may include aerial, “streetview”, and/or ADOT photologs. Other documents such as Design Concept Reports (DCR) or Road Safety Assessments can provide insight into the study corridor’s contributing factors.

Add comments as needed on additional information related to contributing factors that may have been provided by input from ADOT staff.

Freight Needs Assessment Methodology (Steps 1-3)

This section documents the approach for conducting the first three steps of a 5-step needs assessment process for the Freight Performance Area. After completion of Step 3 for all performance areas (Pavement, Bridge, Mobility, Safety, and Freight), Step 4 will review each corridor segment to quantify a total level of need that combines all performance areas. Corridor needs are then identified in Step 5 of the process. The 5-step process is listed below:

- Step 1: Initial Needs
- Step 2: Final Needs
- Step 3: Contributing Factors
- Step 4: Segment Review
- Step 5: Corridor Needs

Step 1: Initial Needs

The input required to populate the Step 1 template includes transferring the existing performance score and color for each segment to the appropriate "Performance Score" columns. This includes the primary and secondary measures for Freight. As each performance score is input into the template, the Initial Need will populate based on the weighted scoring system for each measure.

The Level of Need for each performance measure has levels of "None" (score = 0), "Low" (score = 1), "Medium" (score = 2), and "High" (score = 3). The assignment of these levels to individual performance measures for segments is determined by the table entitled "Needs Assessment Scale" within the Step 1 template.

To develop an aggregated Initial Need for each segment, the primary and secondary measures are combined by summing the weighted score, with the primary measure having a weight of 1.0 while each secondary measure has a weight of 0.2 (0.1 each direction if directional). The Initial Need for each segment (combining the primary and secondary measures) has levels of "None" (score < 0.01), "Low" (score $\geq$ 0.01 and < 1.5), "Medium" (score $\geq$ 1.5 and < 2.5), and "High" (score $\geq$ 2.5).

The steps include:

Step 1.1

Populate the Step 1 template with the existing (baseline) performance scores for all primary and secondary performance measures from Existing Performance Analysis. Copy the performance score for each segment to the appropriate "Performance Score" column. Select the *Facility Operations* for each segment from the drop-down list and input whether or not the performance area is an emphasis area. The corridor needs assessment scales will be updated automatically.

Step 1.2

Confirm that that the Step 1 template is generating the appropriate "Level of Need" for each primary and secondary measure by reviewing the relationship of baseline performance score to level of need.

Step 2: Final Needs

The Initial Need will be carried over to Step 2. The steps required to complete Step 2 are as follows:

Step 2.1

Confirm that the template has properly populated the initial need from the Step 1 template to the Step 2 template.

Step 2.2

Note any truck height restriction hot spots (clearance < 16.25') identified as part of the baseline corridor performance. For each entry, note the milepost of the height restriction and if the height restriction can be detoured by ramping around the obstruction. If it is not possible for a truck to ramp around the height restriction, note the existing height as well.

Step 2.3

Identify recently completed or under construction projects that would be considered relevant to freight performance. Include only projects that were not taken into account during the freight data analysis period. Any completed or under construction roadway project after the date of the data that has the potential to mitigate a freight issue on a corridor segment should be listed in the template. Such projects can include the construction of climbing lanes or Dynamic Message Signs (DMS) installation. Sources of recent or current project activity can be ADOT MPD staff, ADOT public notices, and ADOT District staff.

Step 2.4

Update the Final Need using the following criteria:

- If there is one or more truck height restriction hot spots where a truck cannot ramp around on a 'None' segment, increase (i.e., worsen) the need rating to 'Low'.
- If a recent project has superseded the performance rating data and it is certain the project addressed the need, change the need rating to "None".
- If a recent project has superseded the performance rating data but it is uncertain that a project addressed the need, maintain the current need rating and note the uncertainty as a comment.

Step 2.5

Note any programmed projects that could have the potential to mitigate any freight need on the segment. Programmed projects are provided as information and do not impact the need rating. Programmed projects will be reviewed in the development of solution sets for identified needs. The source of the programming information can be found in ADOT's 5-year construction program. If there are other comments relevant to the needs analysis, they can be entered in the right-most column.

Example Scales for Level of Need

Freight Index (Interrupted) Performance Score Thresholds	Performance Level	Initial Performance Level of Need	Description (Non-emphasis Area)
	Good	None	All levels of Good and the top third of Fair (<1.58)
	Good		
1.45	Good		
	Fair		
	Fair	Low	Middle third of Fair (1.58-1.72)
1.85	Fair	Medium	Lower third of Fair and top third of Poor (1.72-1.98)
	Poor		
	Poor	High	Lower two-thirds of Poor (>1.98)
	Poor		

Needs Scale

Measure	None <=	Low <=	> Medium <		High >=
Corridor Freight Index (Emphasis Area)	Dependent on weighted average of interrupted vs. uninterrupted segments				
Corridor Freight Index (Non-Emphasis Area)	Dependent on weighted average of interrupted vs. uninterrupted segments				
Freight Index (Segment)					
Interrupted	1.58	1.72	1.72	1.98	1.98
Uninterrupted	1.22	1.28	1.28	1.42	1.42
Directional TTTR					
Interrupted	1.58	1.72	1.72	1.98	1.98
Uninterrupted	1.22	1.28	1.28	1.42	1.42
Closure Duration					
All Facility Operations	71.07	97.97	97.97	151.75	151.75
Measure	**None >=**	**Low >=**	**< Medium >**		**High <=**
Bridge Clearance (feet)					
All Bridges	16.33	16.17	16.17	15.83	15.83

Step 3: Contributing Factors

The Final Need ratings from Step 2 will populate into the Step 3 tab.

The steps to compete Step 3 include:

Step 3.1

Input all roadway variable data that describe each segment into the appropriate columns. Note that this data can be copied from the Mobility Needs Assessment spreadsheet for Needs Assessment.

Step 3.2

Input all traffic variables for each segment into the appropriate columns. Note that this data can be copied from the Mobility Needs Assessment spreadsheet for Needs Assessment.

Step 3.3

Input any freight-related infrastructure that currently exists on the corridor for each segment. The relevant infrastructure can include DMS locations, weigh stations, Ports of Entry (POE), rest areas, parking areas, and climbing lanes. Include the mileposts of the listed infrastructure. This data can be extracted from the most recent Highway Log and the 2015 Climbing and Passing Lane Prioritization Study.

Step 3.4

Input the Closure Extents that have occurred along the study corridor. Road closure information can be detailed out by the reason for the closure as documented in Highway Condition Reporting System (HCRS) data analyzed as part of the baseline corridor performance. Closure reasons include incident/accidents, winter storms, obstruction hazards, and undefined closures. Statewide average percentages for the various closure reasons have been calculated for the analysis period on ADOT's designated strategic corridors. Compare these statewide average percentages to the corridor percentages for the various closure reasons to identify higher than average percentages of one or more closure reasons on any given segment. Note that this data can be copied from the Mobility Needs Assessment spreadsheet for Needs Assessment. Input the closures as follows and use red text to indicate that the segment percentage exceeds statewide averages:

- Total Number of Closures
- % Closures (No Reason)
- % Incidents/Accidents
- % Obstructions/Hazards
- % Weather Related

Step 3.5

List the non-actionable conditions that are present within each segment by milepost if possible. Non-Actionable conditions are conditions that exist within the environment of each segment that

cannot be improved through an engineered solution. Examples of Non-Actionable conditions can include border patrol check points and other closures/restrictions not controlled by ADOT. Note that this data can be copied from the Mobility Needs Assessment spreadsheet for Needs Assessment.

Step 3.6

Input any programmed and planned projects or issues that have been identified from previous documents or studies that are relevant to the Final Need. Sources for this data include the current Highway Log, the 2015 Climbing and Passing Lane Prioritization Study, and ADOT's 5-year construction program.

Step 3.7

Considering all information in Steps 1-3, identify the contributing factors to the Final Need column. Potential contributing factors to freight performance needs include roadway vertical grade, number of lanes, traffic volume-to-capacity ratios, presence/lack of a climbing lanes, and road closures. Also identify higher than average percentages of one or more closure reasons on any given segment.

Pavement Performance Needs Analysis

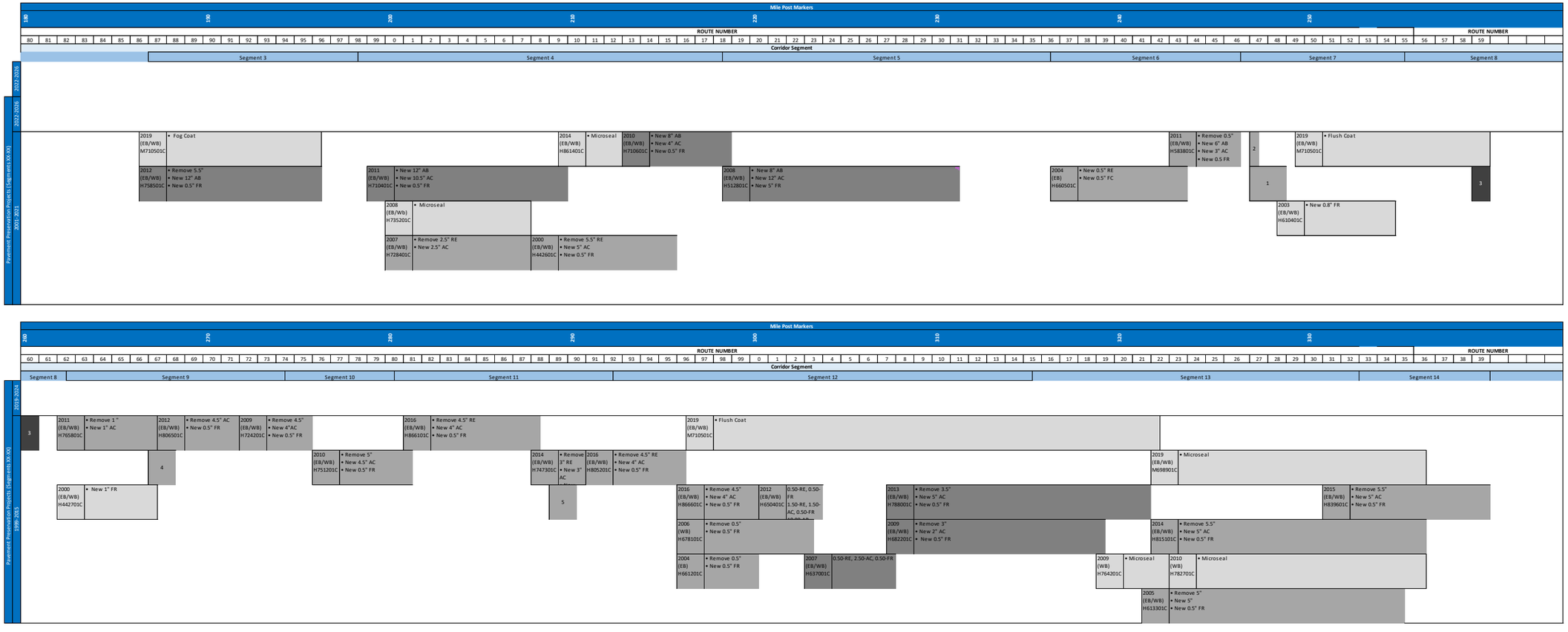
Segment #	Segment Length (miles)	Segment Mileposts (MP)	Facility Type	Pavement Index			Directional PSR					% Area Failure			Initial Need
							Performance Score			Level of Need					
				Performance Score	Performance Objective	Level of Need	NB/EB	SB/WB	Performance Objective	NB/EB	SB/WB	Performance Score	Performance Objective	Level of Need	
10E-3	11	187-198	Interstate	4.38	Fair or Better	None	4.28	4.25	Fair or Better	None	None	4.55%	Fair or Better	None	None
10E-4	20	198-218	Interstate	3.82	Fair or Better	None	4.06	4.13	Fair or Better	None	None	40.35%	Fair or Better	High	Low
10E-5	18	218-236	Interstate	3.93	Fair or Better	None	4.17	3.84	Fair or Better	None	None	22.22%	Fair or Better	Medium	Low
10E-6	10	236-246	Interstate	3.87	Fair or Better	None	4.07	3.85	Fair or Better	None	None	25.00%	Fair or Better	High	Low
10E-7	9	246-255	Interstate	3.76	Fair or Better	None	3.72	3.66	Fair or Better	None	None	47.73%	Fair or Better	High	Low
10E-8	7	255-262	Interstate	4.04	Fair or Better	None	3.81	3.82	Fair or Better	None	None	24.00%	Fair or Better	Medium	Low
10E-9	12	262-274	Interstate	3.89	Fair or Better	None	3.81	3.79	Fair or Better	None	None	28.00%	Fair or Better	High	Low
10E-10	6	274-280	Interstate	3.76	Fair or Better	None	3.56	3.72	Fair or Better	Low	None	33.33%	Fair or Better	High	Low
10E-11	12	280-292	Interstate	4.35	Fair or Better	None	4.15	4.20	Fair or Better	None	None	8.33%	Fair or Better	None	None
10E-12	23	292-315	Interstate	4.13	Fair or Better	None	4.09	4.04	Fair or Better	None	None	21.74%	Fair or Better	Medium	Low
10E-13	17	315-332	Interstate	3.98	Fair or Better	None	3.83	4.02	Fair or Better	None	None	8.82%	Fair or Better	None	None
10E-14	22	332-354	Interstate	4.13	Fair or Better	None	4.16	4.08	Fair or Better	None	None	20.45%	Fair or Better	Medium	Low
10E-15	18	354-372	Interstate	4.22	Fair or Better	None	3.97	4.22	Fair or Better	None	None	13.89%	Fair or Better	Low	Low
10E-16	20	372-392	Interstate	4.34	Fair or Better	None	3.96	4.13	Fair or Better	None	None	2.63%	Fair or Better	None	None
Emphasis Area?	No	Weighted Average		4.07	Fair or Better	None									

Segment #	Segment Length (miles)	Segment Mileposts (MP)	Initial Need	Need Adjustments		Final Need	Comments (may include programmed projects or issues from previous reports)
				Hot Spots	Previous Projects (which supersede condition data)		
10E-3	11	187-198	None	MP 190-191	None	Low	With MP 190-191 hot spot, changed Need to Low
10E-4	20	198-218	Low	MP 200-209, MP 211-212, and MP 213-218	Widen to 6 lanes MP 209.6-213.8 (2020)	Low	Recent widening addressed MP 211-212 hot spot but not MP 200-209 and MP 214-218 hot spots so Need was kept at Low
10E-5	18	218-236	Low	MP 218-219, MP 222-223, MP 225-227, and MP 234-236	Pavement rehab MP 222-231.71 (2022)	Low	Pavement rehab performed at MP 222-231.71 (2022) addressed MP 222-223 and MP 225-227 hot spots but not MP 218-219 and MP 234-336 so Need was kept at Low; No programmed project for MP 218-219 and MP 234-236
10E-6	10	236-246	Low	MP 240-241 and MP 244-246	Pavement rehab MP 237.47-246 (2022)	None	Pavement rehab performed at MP 237.47-246 (2022) addresses all pavement hot spots so changed Need to None
10E-7	9	246-255	Low	MP 246-249 and MP 250-255	Ina Rd TI Reconstruct MP 247.8-249.8 (2019) Ruthrauff Rd TI Reconstruct MP 252-253.1 (2021)	Low	TI reconstruction at MP 248-249 (2019) and MP 252-253 (2021) and pavement rehab performed at MP 246-247.89 (2022) addressed MP 246-249 and MP 252-253 hot spots but not MP 250-252 and MP 253-255 hot spots so Need was kept at Low; the freeway will be widened at MP 247.57-253.4 (2023), which will address MP 250-252 hot spot but not MP 253-255
10E-8	7	255-262	Low	MP 260-262	None	Low	
10E-9	12	262-274	Low	MP 262-263, MP 266-267, and MP 272-274	None	Low	Programmed pavement rehab projects at MP 262.4-272 (2022), Country Club Rd Traffic Interchange construction at MP 263.8 (2025), and widening MP 264-267 (2026) will address MP 262-263 and MP 266-267 hot spots but not MP 272-274
10E-10	6	274-280	Low	MP 274-277	None	Low	
10E-11	12	280-292	None	MP 288-290	None	Low	
10E-12	23	292-315	Low	MP 303-308 and MP 310-313	Pavement Rehab MP 303-308 (2021)	Low	Pavement rehab MP 303-308 (2021) addressed MP 303-308 rehab but not MP 310-313 so Need was kept at Low; Climbing lane construction at MP 302.95-303.4 (2024) will not address remaining MP 310-313 hot spot
10E-13	17	315-332	None	MP 321-323 and MP 328-329	None	Low	
10E-14	22	332-354	Low	MP 345-352	None	Low	
10E-15	18	354-372	Low	MP 355-356 and MP 358-361	None	Low	
10E-16	20	372-392	None	MP 380-381	None	Low	

Segment	Segment Length (miles)	Segment Mileposts (MP)	Final Need	Bid History Investment	PeCos History Investment	Resulting Historical Investment	Contributing Factors and Comments
10E-3	11	187-198	Low	Low	Low	Low	No historical investment identified; remaining hot spot at MP 190-191
10E-4	20	198-218	Low	Medium	Low	Medium	No historical investment identified; remaining hot spots at MP 200-209 and MP 214-218
10E-5	18	218-236	Low	Low	Low	Low	No historical investment identified; remaining hot spots at MP 218-219 and MP 234-236
10E-6	10	236-246	None	Low	High	Medium	No historical investment identified
10E-7	9	246-255	Low	Low	High	Medium	No historical investment identified; the freeway will be widened at MP 247.57-253.4 (2023), which will address MP 250-252 hot spot; remaining hot spot at MP 253-255
10E-8	7	255-262	Low	Low	High	Medium	No historical investment identified; remaining hot spot at MP 260-262
10E-9	12	262-274	Low	Low	Low	Low	No historical investment identified; programmed pavement rehab projects at MP 262.4-272 (2022), Country Club Rd Traffic Interchange construction at MP 263.8 (2025), and widening MP 264-267 (2026) will address MP 262-263 and MP 266-267 hot spots; remaining hot spot at MP 272-274
10E-10	6	274-280	Low	Low	Low	Low	No historical investment identified; remaining hot spot at MP 274-277
10E-11	12	280-292	Low	Low	Medium	Low	No historical investment identified; remaining hot spot at MP 288-290
10E-12	23	292-315	Low	High	Medium	High	High historical investment identified; remaining hot spot at MP 310-313
10E-13	17	315-332	Low	High	Low	High	High historical investment identified; remaining hot spots at MP 321-323 and MP 328-329
10E-14	22	332-354	Low	Medium	Low	Medium	No historical investment identified; remaining hot spot at MP 345-352
10E-15	18	354-372	Low	Medium	Medium	Medium	No historical investment identified; remaining hot spots at MP 355-356 and MP 358-361
10E-16	20	372-392	Low	Low	Medium	Low	No historical investment identified; remaining hot spot at MP 380-381

Pavement History

I-10 East Pavement History



Pavement Treatment Reference Numbers	
1. 2004 (EB/WB) H434701C: New 12" AB, New 11" AC, New 0 .5" FR **2. 2006 (EB/WB) H458201C:** New 11" AB, New 10" AC, New 0.5" FR **3. 2005 (EB/WB) H319003C:** New 14" AB, New 6" AC **4. 2005 (EB/WB) H613201C:** New 3" CR, New 0.5" FC **5. 2005 (EB/WB) H661301C:** Remove 2", New 2" AC	

Legend

- New Paving or Reconstruction
- Mill and Overlay (Adding Structural Thickness)
- Mill and Replace (No Change Structural Thickness)
- Fog Coat or Thin Overlay Treatments
- PCCP Pavement Border
- AC Pavement Border

		Segment Number																											
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17	
Value	Level	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir
1	L1						83%		40%						72%		64%		46%						85%	23%	37%	16%	16%						
1									18%						67%		7%		21%							57%	63%								
1																																			
1																																			
1																																			
1																																			
3	L2								40%		3%	75%	35%		6%		7%		46%		25%		8%		17%		63%		16%	33%	31%		40%		
3									40%						22%				38%		75%		63%		20%		66%		12%		89%		38%		
3																							25%	20%	15%		11%		16%						
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4	L3						83%		55%		72%														22%		23%			39%	33%				
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Sub-Total		0.0	0.0	0.0	0.0	0.0	4.2	0.0	6.3	0.0	3.0	2.3	1.1	0.0	2.2	0.0	2.7	0.0	3.2	0.0	3.0	0.0	3.7	1.6	6.1	0.8	7.6	0.2	4.6	2.6	4.9	0.0	2.3	0.0	0.0
Total		**0.0**		**0.0**		**4.2**		**6.3**		**3.0**		**2.2**		**2.2**		**2.7**		**3.2**		**3.0**		**3.7**		**6.9**		**8.0**		**4.7**		**6.2**		**2.3**		**0.0**	

		Segment Number															
Value	Level	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
1	L1	0.0	0.0	0.8	0.6	0.0	0.0	1.4	0.7	0.7	0.0	0.0	0.9	1.4	0.2	0.0	0.0	0.0
3	L2	0.0	0.0	0.0	2.4	0.1	2.2	0.8	0.2	2.5	3.0	3.7	2.4	4.2	4.5	4.1	2.3	0.0
4	L3	0.0	0.0	3.3	3.3	2.9	0.0	0.0	0.0	0.0	0.0	0.0	3.7	2.4	0.0	2.1	0.0	0.0
6	L4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		0.0	0.0	4.2	6.3	3.0	2.2	2.2	2.7	3.2	3.0	3.7	6.9	8.0	4.7	6.2	2.3	0.0

Bridge Performance Needs Analysis

Segment #	Segment Length (miles)	Segment Mileposts (MP)	Number of Bridges in Segment	Bridge Index			Lowest Bridge Rating			Sufficiency Rating			Initial Need
				Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	
I10E-3	11	187-198	6	5.84	Fair or Better	Low	5	Fair or Better	Low	90.1	Fair or Better	None	90.1
I10E-4	20	198-218	13	6.87	Fair or Better	None	5	Fair or Better	Low	91.4	Fair or Better	None	91.4
I10E-5	18	218-236	4	6.13	Fair or Better	None	5	Fair or Better	Low	92.9	Fair or Better	None	92.9
I10E-6	10	236-246	11	6.79	Fair or Better	None	5	Fair or Better	Low	95.2	Fair or Better	None	95.2
I10E-7	9	246-255	14	6.72	Fair or Better	None	5	Fair or Better	Low	90.0	Fair or Better	None	90.0
I10E-8	7	255-262	15	6.62	Fair or Better	None	6	Fair or Better	None	93.5	Fair or Better	None	93.5
I10E-9	12	262-274	26	5.78	Fair or Better	Low	5	Fair or Better	Low	89.0	Fair or Better	None	89.0
I10E-10	6	274-280	5	6.54	Fair or Better	None	5	Fair or Better	Low	95.5	Fair or Better	None	95.5
I10E-11	12	280-292	6	6.74	Fair or Better	None	6	Fair or Better	None	94.9	Fair or Better	None	94.9
I10E-12	23	292-315	22	6.20	Fair or Better	None	5	Fair or Better	Low	93.6	Fair or Better	None	93.6
I10E-13	17	315-332	4	5.46	Fair or Better	Medium	5	Fair or Better	Low	81.1	Fair or Better	None	81.1
I10E-14	22	332-354	6	5.73	Fair or Better	Low	4	Fair or Better	Medium	86.8	Fair or Better	None	86.8
I10E-15	18	354-372	15	5.90	Fair or Better	Low	5	Fair or Better	Low	94.0	Fair or Better	None	94.0
I10E-16	20	372-392	12	5.42	Fair or Better	Medium	4	Fair or Better	Medium	85.0	Fair or Better	None	85.0
Emphasis Area?	No	Weighted Avg		6.21	Fair or Better	None							

Segment #	Segment Length (miles)	Segment Mileposts (MP)	Number of Bridges in Segment	Initial Need	Need Adjustments		Final Need	Historical Review	Comments
					Hot Spots (Rating of 4 or multiple 5's)	Previous Projects (which supersede condition data)			
I10E-3	11	187-198	6	Low	None	None	Low	None	No bridges with current ratings below 6 or any historical issues
I10E-4	20	198-218	13	Low	None	None	Low	Drain Channel Br EB OP (MP 209.85) Drain Channel Br WB OP (MP 209.85) Hwy 84 TI OP EB (MP 210.97) Hwy 84 TI OP WB (MP 210.97) Picacho 5th St OP EB (MP 211.34) Picacho 5th St OP WB (MP 211.34) E Picacho TI OP EB (MP 212.21)	No bridges with current ratings below 6 or any historical issues
I10E-5	18	218-236	4	Low	Red Rock TI UP (#592)(MP 226.45)	None	Low	Red Rock TI UP (MP 226.45) Pinal Air Park TI UP (MP 232.02)	**Hot Spots:** Red Rock TI UP (#592) (MP 226.45); design for Red Rock TI UP Rehab programmed in 2026 with construction slated in future years
I10E-6	10	236-246	11	Low	None	None	Low	None	No bridges with current ratings below 6 or any historical issues
I10E-7	9	246-255	14	Low	None	None	Low	Ina Road TI OP EB (MP 248.72) Ina Rd TI OP WB (MP 248.72) Ruthrauff Rd TI OP EB (MP 252.43)	No bridges with current ratings below 6 or any historical issues
I10E-8	7	255-262	15	None	None	None	None	None	No bridges with current ratings below 6 or any historical issues
I10E-9	12	262-274	26	Low	None	None	Low	Ajo Way OP EB (MP 262.44) Ajo Way OP WB (MP 262.44) Kino Pkwy TI UP NB (MP 262.53) Country Club OP EB (MP 263.82) Earp Wash Trib Br EB OP (MP 267.65) Earp Wash Trib Br WB OP (MP 267.65) Craycroft TI OP EB (MP 268.08) Craycroft TI OP WB (MP 268.08) Wilmot Rd TI OP EB (MP 269.36) Wilmot TI OP WB (MP 269.36)	No bridges with current ratings below 6 or any historical issues
I10E-10	6	274-280	5	Low	None	None	Low	None	No bridges with current ratings below 6 or any historical issues

I10E-11	12	280-292	6	None	None	None	None	Mountain View TI UP (MP 281.68) Davidson Canyon Br WB OP (MP 284.45)	No bridges with current ratings below 6 or any historical issues
I10E-12	23	292-315	22	Low	Amole TI OP EB (Bell) (#787) (MP 292.50) Cornfield Canyon Br WB (#73) (MP 299.14)	None	Low	San Pedro Riv Br EB OP (MP 306.75) San Pedro Riv Br WB OP (MP 306.75)	**Hot Spots:** Amole TI OP EB (Bell) (#787) (MP 292.50) and Cornfield Canyon Br WB (#73) (MP 299.14); construction for Amole RR OP EB/WB (#485/#786) (MP 292.35) programmed in 2024
I10E-13	17	315-332	4	Medium	Dragoon TI OP EB (#760) (MP 318.95) Cochise TI UP (#518) (MP 331.62)	None	Medium	Cochise TI UP (MP 331.62)	**Hot Spots:** Dragoon TI OP EB (MP 318.95) and Cochise TI UP (MP 331.62)
I10E-14	22	332-354	6	Low	Airport Rd UP (#1114) (MP339.46)	None	Low	Airport Rd UP (MP 339.46)	**Hot Spots:** Airport Rd UP (MP 339.46); construction for East Willcox TI UP (#1229) (MP 344.51) programmed in 2025
I10E-15	18	354-372	15	Low	None	None	Low	Roberts Farm Rd OP EB (MP 363.70) Roberts Farm Rd OP WB (MP 363.70) Apache Pass Rd OP EB (MP 364.79) Apache Pass Rd OP WB (MP 364.79)	No bridges with current ratings below 6 or any historical issues
I10E-16	20	372-392	12	Medium	E San Simon TI UP (#1169) (MP 382.35)	None	Medium	None	**Hot Spots:** E San Simon TI UP (#1169) (MP 382.35)

Segment #	Segment Length (Miles)	Segment Mileposts (MP)	Number of Bridges in Segment	Final Need	Contributing Factors			Comments
					Bridge	Current Ratings	Historical Review	
I10E-3	11	187-198	6	Low	Val Vista Blvd UP (#1152)(MP 188.20)	2019 Current Substructure and Structural Evaluation Rating of 5	Not identified through Historical Review	
I10E-4	20	198-218	13	Low	Sunland Gin Rd TI UP (#941)(MP 200.12)	2019 Current Deck Rating of 5	Not identified through Historical Review	
					Battaglia Rd UP (#943)(205.45)	2019 Current Deck Rating of 5	Not identified through Historical Review	
I10E-5	18	218-236	4	Low	Red Rock TI UP (#592)(226.45)	2019 Current Deck, Substructure, and Structural Evaluation Rating of 5	Identified through Historical Review	Programmed project, FY 2026 Design Only, Red Rock TI UP Bridge (#592), Bridge Rehabilitation
I10E-6	10	236-246	11	Low	Marana OP TI WB (#774)(MP 236.42)	2019 Current Deck, Substructure, and Structural Evaluation Rating of 5	Not identified through Historical Review	
I10E-7	9	246-255	14	Low	Cortaro Rd TI OP EB (#864)(MP 246.60)	2019 Current Deck Rating of 5	Not identified through Historical Review	
					Cortaro Rd TI OP WB (#865)(MP 246.60)	2019 Current Substructure and Structural Evaluation Rating of 5	Not identified through Historical Review	
					Orange Grove TI OP EB (#868)(MP 250.04)	2019 Current Substructure and Structural Evaluation Rating of 5	Not identified through Historical Review	
					Orange Grove TI OP WB (#869)(MP 250.04)	2019 Current Substructure and Structural Evaluation Rating of 5	Not identified through Historical Review	
					Rillito Creek Br EB (#870)(MP 250.66)	2019 Current Structural Evaluation Rating of 5	Not identified through Historical Review	
I10E-8	7	255-262	15	None	None	No current ratings less than 6	Not identified through Historical Review	
I10E-9	12	262-274	26	Low	Ajo Way OP EB (#1107)(MP 262.44)	2019 Current Deck Rating of 5	Not identified through Historical Review	
					Ajo Way OP WB (#1108)(MP 262.44)	2019 Current Deck Rating of 5	Not identified through Historical Review	
					Kino Pkwy TI UP NB (#1162)(MP 262.53)	2019 Current Deck Rating of 5	Not identified through Historical Review	
					Kino Pkwy TI UP SB (#1163)(MP 262.53)	2019 Current Deck Rating of 5	Not identified through Historical Review	
					Country Club OP WB (#1112)(MP 263.82)	2019 Current Deck Rating of 5	Not identified through Historical Review	
					Earp Wash Trib Br EB (#1044)(MP 267.65)	2019 Current Structural Evaluation Rating of 5	Not identified through Historical Review	
					Earp Wash Trib Br EB (#1045)(MP 267.65)	2019 Current Structural Evaluation Rating of 5	Not identified through Historical Review	
					Rita Road TI UP (#711)(MP 273.14)	2019 Current Substructure and Structural Evaluation Rating of 5	Not identified through Historical Review	
I10E-10	6	274-280	5	Low	Wash Bridge EB (#463)(MP 277.46)	2019 Current Structural Evaluation Rating of 5	Not identified through Historical Review	

I10E-11	12	280-292	6	None	None	No current ratings less than 6	Not identified through Historical Review	
I10E-12	23	292-315	22	Low	Amole RR OP EB (#485)(MP 292.35)	2019 Current Deck Rating of 5	Not identified through Historical Review	Programmed project, FY 2024, Amole RR OP EB Bridge (#485), Bridge Rehabilitation/Replacement
					Amole RR OP WB (#786)(MP 292.35)	2019 Current Deck Rating of 5	Not identified through Historical Review	Programmed project, FY 2024, Amole RR OP WB Bridge (#786), Bridge Rehabilitation/Replacement
					Amole TI OP EB (Bell) (#787) (MP 292.50)	2019 Current Deck, Substructure, and Structural Evaluation Rating of 5	Not identified through Historical Review	
					Cornfield Canyon Br WB (#73)(MP 299.14)	2019 Current Deck, Substructure, Superstructure, and Structural Evaluation Rating of 5	Not identified through Historical Review	
					Pomerene Rd TI OP EB (#1673)(MP 307.10)	2019 Current Deck Rating of 5	Not identified through Historical Review	
					Pomerene Rd TI OP WB (#1674)(MP 307.10)	2019 Current Deck Rating of 5	Not identified through Historical Review	
					Sibyl Road TI OP EB (#574)(MP 312.77)	2019 Current Structural Evaluation Rating of 5	Not identified through Historical Review	
					Sibyl Road TI OP WB (#575)(MP 312.77)	2019 Current Structural Evaluation Rating of 5	Not identified through Historical Review	
I10E-13	17	315-332	4	Medium	Dragoon TI OP EB (#760)(MP 318.95)	2019 Current Deck, Substructure, and Structural Evaluation Rating of 5	Not identified through Historical Review	
					Cochise TI UP (#518)(MP 331.62)	2019 Current Deck, Substructure, and Structural Evaluation Rating of 5	Identified through Historical Review	
I10E-14	22	332-354	6	Low	Airport Rd UP (#1114)(MP339.46)	2019 Current Deck Rating of 5 and Substructure and Structural Evaluation Rating of 4	Identified through Historical Review	
					Stewart Rd UP (#1228)(MP 344.30)	2019 Current Deck Rating of 5	Not identified through Historical Review	
					E Willcox TI UP (#1229)(MP 344.51)	2019 Current Deck Rating of 5	Not identified through Historical Review	Programmed project, FY 2025, E Wilcox TI UP Bridge(#1229), Bridge Rehabilitation
					Stafford TI UP (#564)(MP 352.40)	2019 Current Deck Rating of 5	Not identified through Historical Review	
I10E-15	18	354-372	15	Low	US 191 TI UP (#649)(MP 355.97)	2019 Current Deck Rating of 5	Not identified through Historical Review	
I10E-16	20	372-392	12	Medium	San Simon Riv Br EB (#1167)(MP 381.68)	2019 Current Superstructure and Structural Evaluation Rating of 5	Not identified through Historical Review	
					San Simon Riv Br WB (#1168)(MP 381.68)	2019 Current Superstructure and Structural Evaluation Rating of 5	Not identified through Historical Review	
					E San Simon TI UP (#1169)(MP 382.35)	2019 Current Substructure and Structural Evaluation Rating of 4	Not identified through Historical Review	
					Island Wash Br WB (#210)(MP 389.38)	2019 Current Structural Evaluation Rating of 5	Not identified through Historical Review	

Mobility Performance Needs Analysis

Segment #	Segment Mileposts	Segment Length (miles)	Environment Type	Facility Operation	Mobility Index			Future Daily V/C			Existing Peak Hour V/C					Closure Extent (occurrences/year/mile)				
											Performance Score			Level of Need		Performance Score			Level of Need	
					Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	NB/EB	SB/WB	Performance Objective	NB/EB	SB/WB	NB/EB	SB/WB	Performance Objective	NB/EB	SB/WB
10E-3	187-198	11	Urban	Uninterrupted	0.42	Fair or Better	None	0.49	Fair or Better	None	0.26	0.25	Fair or Better	None	None	0.80	0.45	Fair or Better	High	Low
10E-4	198-218	20	Urban	Uninterrupted	0.41	Fair or Better	None	0.47	Fair or Better	None	0.25	0.24	Fair or Better	None	None	0.17	0.30	Fair or Better	None	None
10E-5	218-236	18	Rural	Uninterrupted	0.42	Fair or Better	None	0.48	Fair or Better	None	0.26	0.25	Fair or Better	None	None	0.10	0.21	Fair or Better	None	None
10E-6	236-246	10	Urban	Uninterrupted	0.56	Fair or Better	None	0.63	Fair or Better	None	0.39	0.36	Fair or Better	None	None	0.18	0.55	Fair or Better	None	Medium
10E-7	246-255	9	Urban	Uninterrupted	0.86	Fair or Better	Medium	0.98	Fair or Better	High	0.54	0.51	Fair or Better	None	None	0.13	0.44	Fair or Better	None	Low
10E-8	255-262	7	Urban	Uninterrupted	1.09	Fair or Better	High	1.19	Fair or Better	High	0.71	0.70	Fair or Better	None	None	0.89	0.57	Fair or Better	High	Medium
10E-9	262-274	12	Urban	Uninterrupted	0.80	Fair or Better	Low	0.88	Fair or Better	Medium	0.55	0.62	Fair or Better	None	None	0.35	0.43	Fair or Better	None	Low
10E-10	274-280	6	Urban	Uninterrupted	0.52	Fair or Better	None	0.58	Fair or Better	None	0.35	0.36	Fair or Better	None	None	0.20	0.17	Fair or Better	None	None
10E-11	280-292	12	Rural	Uninterrupted	0.76	Fair or Better	Medium	0.85	Fair or Better	High	0.43	0.42	Fair or Better	None	None	0.37	0.12	Fair or Better	Low	None
10E-12	292-315	23	Rural	Uninterrupted	0.60	Fair or Better	None	0.69	Fair or Better	Low	0.38	0.33	Fair or Better	None	None	0.39	0.10	Fair or Better	Low	None
10E-13	315-332	17	Rural	Uninterrupted	0.38	Fair or Better	None	0.43	Fair or Better	None	0.31	0.27	Fair or Better	None	None	0.05	0.21	Fair or Better	None	None
10E-14	332-354	22	Rural	Uninterrupted	0.35	Fair or Better	None	0.39	Fair or Better	None	0.25	0.19	Fair or Better	None	None	0.11	0.23	Fair or Better	None	None
10E-15	354-372	18	Rural	Uninterrupted	0.28	Fair or Better	None	0.31	Fair or Better	None	0.17	0.15	Fair or Better	None	None	0.26	1.06	Fair or Better	None	High
10E-16	372-392	20	Rural	Uninterrupted	0.43	Fair or Better	None	0.48	Fair or Better	None	0.24	0.21	Fair or Better	None	None	0.21	1.05	Fair or Better	None	High
Mobility Emphasis Area		Yes	Weighted Average		0.51	Good	None													

Mobility Performance Needs Analysis (continued)

Segment #	Segment Mileposts	Segment Length (miles)	Environment Type	Facility Operation	Directional LOTTR (all vehicles)					Bicycle Accommodation			Initial Need
					Performance Score		Performance Objective	Level of Need		Performance Score	Performance Objective	Level of Need	
					NB/EB	SB/WB		NB/EB	SB/WB				
10E-3	187-198	11	Urban	Uninterrupted	1.04	1.05	Fair or Better	None	None	94%		None	Low
10E-4	198-218	20	Urban	Uninterrupted	1.05	1.05	Fair or Better	None	None	96%		None	None
10E-5	218-236	18	Rural	Uninterrupted	1.04	1.04	Fair or Better	None	None	87%		None	None
10E-6	236-246	10	Urban	Uninterrupted	1.03	1.03	Fair or Better	None	None	100%		None	Low
10E-7	246-255	9	Urban	Uninterrupted	1.17	1.11	Fair or Better	None	None	64%		Medium	High
10E-8	255-262	7	Urban	Uninterrupted	1.04	1.05	Fair or Better	None	None	89%		None	High
10E-9	262-274	12	Urban	Uninterrupted	1.14	1.04	Fair or Better	None	None	93%		None	Medium
10E-10	274-280	6	Urban	Uninterrupted	1.03	1.03	Fair or Better	None	None	98%		None	None
10E-11	280-292	12	Rural	Uninterrupted	1.03	1.03	Fair or Better	None	None	100%		None	High
10E-12	292-315	23	Rural	Uninterrupted	1.04	1.03	Fair or Better	None	None	97%		None	Low
10E-13	315-332	17	Rural	Uninterrupted	1.04	1.04	Fair or Better	None	None	78%		Low	Low
10E-14	332-354	22	Rural	Uninterrupted	1.03	1.03	Fair or Better	None	None	100%		None	None
10E-15	354-372	18	Rural	Uninterrupted	1.03	1.03	Fair or Better	None	None	99%		None	Low
10E-16	372-392	20	Rural	Uninterrupted	1.06	1.04	Fair or Better	None	None	99%		None	Low

Mobility Performance Needs Analysis (continued)

Segment #	Segment Mileposts (MP)	Segment Length (miles)	Initial Need	Need Adjustments Recently Completed Projects	Final Need	Planned and Programmed Future Projects
10E-3	187-198	11	Low	None	Low	**Programmed:** None **Planned:** None
10E-4	198-218	20	None	None	None	**Programmed:** None **Planned:** None
10E-5	218-236	18	None	None	None	**Programmed:** None **Planned:** None
10E-6	236-246	10	Low	None	Low	**Programmed:** None **Planned:** None
10E-7	246-255	9	High	None	High	**Programmed:** Widen to 8 lanes MP 247.57-253.40 (2023)\ **Planned:** None
10E-8	255-262	7	High	None	High	**Programmed:** None **Planned:** None
10E-9	262-274	12	Medium	None	Medium	**Programmed:** Widen to 6 lanes and add Country Club Rd TI MP 263.80 (2025); Widen to 6 lanes MP 264-267 (2026) **Planned:** None
10E-10	274-280	6	None	Houghton Rd TI Reconstruct MP 274.8-274.9 (2021)	None	**Programmed:** None **Planned:** None
10E-11	280-292	12	High	None	High	**Programmed:** None **Planned:** None
10E-12	292-315	23	Low	None	Low	**Programmed:** Climbing Lane MP 302.95-303.40 (2024) **Planned:** None
10E-13	315-332	17	Low	None	Low	**Programmed:** None **Planned:** None
10E-14	332-354	22	None	None	None	**Programmed:** None **Planned:** None
10E-15	354-372	18	Low	None	Low	**Programmed:** Non **Planned:** None
10E-16	372-392	20	Low	None	Low	**Programmed:** None **Planned:** None

Mobility Performance Needs Analysis (continued)

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Roadway Variables								Traffic Variables			Relevant Mobility Related Existing Infrastructure
				Functional Classification	Environmental Type (Urban/Rural)	Terrain	# of Lanes/ Direction	Weighted Average Speed Limit	Aux Lanes	Divided/ Non-Divided	% No Passing	Existing LOS	Future 2035 LOS	% Trucks	
10E-3	187-198	11	Low	Interstate	FringeUrban	Level	6.0	75	No	Divided	0%	A-C	A-C	17%	
10E-4	198-218	20	None	Interstate	Fringe Urban	Level	6.0	75	Yes	Divided	0%	A-C	A-C	25%	
10E-5	218-236	18	None	Interstate	Rural	Level	6.0	75	No	Divided	0%	A-C	A-C	19%	
10E-6	236-246	10	Low	Interstate	Fringe Urban	Level	6.0	75	No	Divided	0%	A-C	A-C	17%	
10E-7	246-255	9	High	Interstate	Urban	Level	6.9	67	Yes	Divided	0%	A-C	E/F	13%	
10E-8	255-262	7	High	Interstate	Urban	Level	7.1	65	Yes	Divided	0%	A-C	E/F	9%	
10E-9	262-274	12	Medium	Interstate	Urban	Level	4.2	69	Yes	Divided	0%	A-C	A-C	20%	
10E-10	274-280	6	None	Interstate	Urban	Level	4.0	75	No	Divided	0%	A-C	A-C	21%	
10E-11	280-292	12	High	Interstate	Rural	Mountainous	4.0	75	No	Divided	0%	A-C	E/F	31%	
10E-12	292-315	23	Low	Interstate	Rural	Mountainous	4.0	75	No	Divided	0%	A-C	A-C	31%	
10E-13	315-332	17	Low	Interstate	Rural	Rolling	4.0	75	No	Divided	0%	A-C	A-C	40%	
10E-14	332-354	22	None	Interstate	Rural	Rolling	4.0	75	No	Divided	0%	A-C	A-C	38%	
10E-15	354-372	18	Low	Interstate	Rural	Rolling	4.0	75	No	Divided	0%	A-C	A-C	38%	
10E-16	372-392	20	Low	Interstate	Rural	Mountainous	4.0	75	No	Divided	0%	A-C	A-C	45%	

Mobility Performance Needs Analysis (continued)

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Closure Extent							Non-Actionable Conditions	Programmed and Planned Projects or Issues from Previous Documents Relevant to Final Need	Contributing Factors
				Total Number of Closures	# Incidents/ Accidents	% Incidents/ Accidents	# Obstructions/ Hazards	% Obstructions/ Hazards	# Weather Related	% Weather Related			
10E-3	187-198	11	Low	26	24	92%	2	8%	0	0%		- 92% of closures were related to incidents/accidents	
10E-4	198-218	20	None	42	39	93%	0	0%	0	0%		- 93% of closures were related to incidents/accidents	
10E-5	218-236	18	None	23	22	96%	0	0%	0	0%		- 96% of closures were related to incidents/accidents	
10E-6	236-246	10	Low	23	22	96%	0	0%	0	0%		- 96% of closures were related to incidents/accidents	
10E-7	246-255	9	High	26	19	73%	0	0%	0	0%		- 73% of closures were related to incidents/accidents	
10E-8	255-262	7	High	51	33	65%	0	0%	0	0%		- 65% of closures were related to incidents/accidents	
10E-9	262-274	12	Medium	47	47	100%	0	0%	0	0%		- 100% of closures were related to incidents/accidents	
10E-10	274-280	6	None	11	10	91%	0	0%	0	0%		- 91% of closures were related to incidents/accidents	
10E-11	280-292	12	High	20	20	100%	0	0%	0	0%		- 100% of closures were related to incidents/accidents	
10E-12	292-315	23	Low	46	46	100%	0	0%	0	0%		- 100% of closures were related to incidents/accidents	
10E-13	315-332	17	Low	22	22	100%	0	0%	0	0%		- 100% of closures were related to incidents/accidents	
10E-14	332-354	22	None	29	29	100%	0	0%	0	0%		- 100% of closures were related to incidents/accidents	
10E-15	354-372	18	Low	16	16	100%	0	0%	0	0%		- 100% of closures were related to incidents/accidents	
10E-16	372-392	20	Low	20	20	100%	0	0%	0	0%		- 100% of closures were related to incidents/accidents	

Safety Performance Needs Analysis

Segment	Operating Environment	Segment Length (miles)	Segment Mileposts (MP)	Safety Index			Directional Safety Index					% of Fatal + Incapacitating Injury Crashes at Intersections		
				Performance Score	Performance Objective	Level of Need	NB/EB Performance Score	SB/WB Performance Score	Performance Objective	NB/EB Level of Need	SB/WB Level of Need	Performance Score	Performance Objective	Level of Need
10E-3	Urban or Rural 6 Lane Freeway	7	11	0.98	Average or Better	Low	1.13	0.83	Average or Better	Medium	None	*Insufficient Data*	Average or Better	N/A
10E-4	Urban or Rural 6 Lane Freeway	7	20	1.24	Average or Better	Medium	0.86	1.61	Average or Better	None	High	*Insufficient Data*	Average or Better	N/A
10E-5	Urban or Rural 6 Lane Freeway	7	18	1.43	Average or Better	Medium	1.95	0.92	Average or Better	High	Low	*Insufficient Data*	Average or Better	N/A
10E-6	Urban or Rural 6 Lane Freeway	7	10	1.09	Average or Better	Low	1.38	0.80	Average or Better	Medium	None	*Insufficient Data*	Average or Better	N/A
10E-7	Urban or Rural 6 Lane Freeway	7	9	0.96	Average or Better	Low	1.22	0.69	Average or Better	Medium	None	*Insufficient Data*	Average or Better	N/A
10E-8	Urban > 6 Lane Freeway	8	7	0.44	Average or Better	None	0.30	0.58	Average or Better	None	None	*Insufficient Data*	Average or Better	N/A
10E-9	Urban 4 Lane Freeway	6	12	1.04	Average or Better	Low	1.27	0.80	Average or Better	Medium	None	*Insufficient Data*	Average or Better	N/A
10E-10	Urban 4 Lane Freeway	6	6	0.59	Average or Better	None	0.58	0.61	Average or Better	None	None	*Insufficient Data*	Average or Better	N/A
10E-11	Rural 4 Lane Freeway with Daily Volume > 25,000	5	12	0.77	Average or Better	None	0.99	0.55	Average or Better	Low	None	*Insufficient Data*	Average or Better	N/A
10E-12	Rural 4 Lane Freeway with Daily Volume < 25,000	4	23	1.22	Average or Better	Medium	1.02	1.42	Average or Better	Low	High	*Insufficient Data*	Average or Better	N/A
10E-13	Rural 4 Lane Freeway with Daily Volume < 25,000	4	17	1.02	Average or Better	Low	0.87	1.18	Average or Better	None	Medium	*Insufficient Data*	Average or Better	N/A
10E-14	Rural 4 Lane Freeway with Daily Volume < 25,000	4	22	0.74	Average or Better	None	0.57	0.91	Average or Better	None	None	*Insufficient Data*	Average or Better	N/A
10E-15	Rural 4 Lane Freeway with Daily Volume < 25,000	4	18	1.18	Average or Better	Medium	0.87	1.49	Average or Better	None	High	*Insufficient Data*	Average or Better	N/A
10E-16	Rural 4 Lane Freeway with Daily Volume < 25,000	4	19	0.59	Average or Better	None	0.42	0.76	Average or Better	None	None	*Insufficient Data*	Average or Better	N/A
Safety Emphasis Area?		**Yes**	**Weighted Average**	1.00	Above Average	Medium								

Safety Performance Needs Analysis (continued)

Segment	Operating Environment	Segment Length (miles)	Segment Mileposts (MP)	% of Fatal + Incapacitating Injury Crashes Involving Lane Departures			% of Fatal + Incapacitating Injury Crashes Involving Pedestrians			% of Fatal + Incapacitating Injury Crashes Involving Trucks		
				Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need
10E-3	Urban or Rural 6 Lane Freeway	11	MP187-MP198	67%	Average or Better	High	*Insufficient Data*	Average or Better	N/A	17%	Average or Better	High
10E-4	Urban or Rural 6 Lane Freeway	20	MP198-MP218	68%	Average or Better	High	*Insufficient Data*	Average or Better	N/A	24%	Average or Better	High
10E-5	Urban or Rural 6 Lane Freeway	18	MP218-MP236	61%	Average or Better	Medium	*Insufficient Data*	Average or Better	N/A	13%	Average or Better	Medium
10E-6	Urban or Rural 6 Lane Freeway	10	MP236-MP246	63%	Average or Better	Medium	*Insufficient Data*	Average or Better	N/A	5%	Average or Better	None
10E-7	Urban or Rural 6 Lane Freeway	9	MP246-MP255	56%	Average or Better	None	*Insufficient Data*	Average or Better	N/A	13%	Average or Better	Medium
10E-8	Urban > 6 Lane Freeway	7	MP255-MP262	35%	Average or Better	None	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A
10E-9	Urban 4 Lane Freeway	12	MP262-MP274	63%	Average or Better	None	*Insufficient Data*	Average or Better	N/A	20%	Average or Better	High
10E-10	Urban 4 Lane Freeway	6	MP274-MP280	100%	Average or Better	High	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A
10E-11	Rural 4 Lane Freeway with Daily Volume > 25,000	12	MP280-MP292	84%	Average or Better	High	*Insufficient Data*	Average or Better	N/A	5%	Average or Better	None
10E-12	Rural 4 Lane Freeway with Daily Volume < 25,000	23	MP292-MP315	59%	Average or Better	None	*Insufficient Data*	Average or Better	N/A	30%	Average or Better	High
10E-13	Rural 4 Lane Freeway with Daily Volume < 25,000	17	MP315-MP332	81%	Average or Better	High	*Insufficient Data*	Average or Better	N/A	19%	Average or Better	None
10E-14	Rural 4 Lane Freeway with Daily Volume < 25,000	22	MP332-MP354	80%	Average or Better	High	*Insufficient Data*	Average or Better	N/A	33%	Average or Better	High
10E-15	Rural 4 Lane Freeway with Daily Volume < 25,000	18	MP354-MP372	80%	Average or Better	High	*Insufficient Data*	Average or Better	N/A	33%	Average or Better	High
10E-16	Rural 4 Lane Freeway with Daily Volume < 25,000	19	MP372-MP391	56%	Average or Better	None	*Insufficient Data*	Average or Better	N/A	44%	Average or Better	High

Safety Performance Needs Analysis (continued)

Segment	Operating Environment	Segment Length (miles)	Segment Mileposts (MP)	% of Fatal + Incapacitating Injury Crashes Involving Bicycles			Initial Need
				Performance Score	Performance Objective	Level of Need	
10E-3	Urban or Rural 6 Lane Freeway	11	MP187-MP198	*Insufficient Data*	Average or Better	N/A	Medium
10E-4	Urban or Rural 6 Lane Freeway	20	MP198-MP218	*Insufficient Data*	Average or Better	N/A	High
10E-5	Urban or Rural 6 Lane Freeway	18	MP218-MP236	*Insufficient Data*	Average or Better	N/A	High
10E-6	Urban or Rural 6 Lane Freeway	10	MP236-MP246	*Insufficient Data*	Average or Better	N/A	Medium
10E-7	Urban or Rural 6 Lane Freeway	9	MP246-MP255	*Insufficient Data*	Average or Better	N/A	Medium
10E-8	Urban > 6 Lane Freeway	7	MP255-MP262	*Insufficient Data*	Average or Better	N/A	None
10E-9	Urban 4 Lane Freeway	12	MP262-MP274	*Insufficient Data*	Average or Better	N/A	Medium
10E-10	Urban 4 Lane Freeway	6	MP274-MP280	*Insufficient Data*	Average or Better	N/A	Low
10E-11	Rural 4 Lane Freeway with Daily Volume > 25,000	12	MP280-MP292	*Insufficient Data*	Average or Better	N/A	Low
10E-12	Rural 4 Lane Freeway with Daily Volume < 25,000	23	MP292-MP315	*Insufficient Data*	Average or Better	N/A	High
10E-13	Rural 4 Lane Freeway with Daily Volume < 25,000	17	MP315-MP332	*Insufficient Data*	Average or Better	N/A	Medium
10E-14	Rural 4 Lane Freeway with Daily Volume < 25,000	22	MP332-MP354	*Insufficient Data*	Average or Better	N/A	Low
10E-15	Rural 4 Lane Freeway with Daily Volume < 25,000	18	MP354-MP372	*Insufficient Data*	Average or Better	N/A	High
10E-16	Rural 4 Lane Freeway with Daily Volume < 25,000	19	MP372-MP391	*Insufficient Data*	Average or Better	N/A	Low

Safety Performance Needs Analysis (continued)

Segment	Segment Length (miles)	Segment Mileposts (MP)	Initial Need	Hot Spots	Relevant Recently Completed or Under Construction Projects (which supersede performance data)*	Final Need	Comments (may include tentatively programmed projects with potential to address need or other relevant issues identified in previous reports)
10E-3	11	MP187-MP198	Medium	None	Widen to 6 lanes MP 196.4-218.6 (2020)	Medium	
10E-4	20	MP198-MP218	High	None	Widen to 6 lanes MP 196.4-218.6 (2020), SR 87 TI Reconstruct MP 210-212 (2019)	High	
10E-5	18	MP218-MP236	High	None	Pavement Rehab MP 222-231.71 (2022)	High	
10E-6	10	MP236-MP246	Medium	None	Pavement Rehab MP 237.47-247.89 (2022)	Medium	
10E-7	9	MP246-MP255	Medium	EB MP 247.67- 248.00, WB MP 252.5 - 253.75	Pavement Rehab MP 237.47-247.89 (2022), Ina Rd TI Reconstruct MP 247.8-249.8 (2019), Ruthrauff Rd TI Reconstruct MP 252-253.1 (2021)	Medium	Widen to 8 lanes MP 247.57-253.4 (2023)
10E-8	7	MP255-MP262	None	WB MP 256.05 - 258.16	None	Low	
10E-9	12	MP262-MP274	Medium	EB MP 262.92 - 265.72	Pavement Rehab MP 262.4-272 (2022)	Medium	Widen to 6 lanes and add Country Club Rd TI MP 263.8 (2025), Widen to 6 lanes MP 264-267 (2026)
10E-10	6	MP274-MP280	Low	None	Houghton Rd TI Reconstruct MP 274.8-274.9 (2021)	Low	
10E-11	12	MP280-MP292	Low	WB MP 291.11 - 291.50	Superelevation Improvements MP 281.3-288.12 (2016)	Low	
10E-12	23	MP292-MP315	High	None	Superelevation Improvements MP 291.7-297.7 (2016), Pavement Rehab MP 296-301 (2016), Pavement Rehab MP 303-308 (2021)	High	Bridge Rehab/Replacement MP 292.35-293.35 (2024), Climbing Lane MP 302.95-303.4 (2024)
10E-13	17	MP315-MP332	Medium	EB MP 316.27- 318.25	Safety Improvements MP 316 (2018), Rockfall Mitigation MP 316-322 (2016), Rest Area Rehab MP 320.5 (2016)	Medium	
10E-14	22	MP332-MP354	Low	None	None	Low	
10E-15	18	MP354-MP372	High	None	Pavement Rehab MP 362.2-367.7 (2017), Tree Removal MP 368-390 (2022)	High	
10E-16	19	MP372-MP391	Low	None	Tree Removal MP 368-390 (2022), Rest Area Rehab MP 388 (2016)	Low	

Safety Performance Needs Analysis (continued)

		10E-3	10E-4	10E-5	10E-6	10E-7	10E-8	Corridor-Wide Crash Characteristics
Segment Number		10E-3	10E-4	10E-5	10E-6	10E-7	10E-8	
Segment Length (miles)		11	20	18	10	9	7	
Segment Milepost (MP)		MP187-MP198	MP198-MP218	MP218-MP236	MP236-MP246	MP246-MP255	MP255-MP262	
Final Need		Medium	High	High	Medium	Medium	Low	
Segment Crash Overview		5 Crashes were fatal 7 Crashes had suspected serious injuries 0 Crashes at intersections 8 Crashes involve lane departures 0 Crashes involve pedestrians 2 Crashes involve trucks 0 Crashes involve bicycles	12 Crashes were fatal 13 Crashes had suspected serious injuries 0 Crashes at intersections 17 Crashes involve lane departures 1 Crashes involve pedestrians 6 Crashes involve trucks 0 Crashes involve bicycles	13 Crashes were fatal 10 Crashes had suspected serious injuries 0 Crashes at intersections 14 Crashes involve lane departures 2 Crashes involve pedestrians 3 Crashes involve trucks 0 Crashes involve bicycles	6 Crashes were fatal 13 Crashes had suspected serious injuries 0 Crashes at intersections 12 Crashes involve lane departures 2 Crashes involve pedestrians 1 Crashes involve trucks 0 Crashes involve bicycles	6 Crashes were fatal 10 Crashes had suspected serious injuries 0 Crashes at intersections 9 Crashes involve lane departures 1 Crashes involve pedestrians 2 Crashes involve trucks 0 Crashes involve bicycles	3 Crashes were fatal 14 Crashes had suspected serious injuries 0 Crashes at intersections 6 Crashes involve lane departures 2 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	90 Crashes were fatal 168 Crashes had suspected serious injuries 0 Crashes at intersections 172 Crashes involve lane departures 10 Crashes involve pedestrians 48 Crashes involve trucks 2 Crashes involve bicycles
Segment Crash Summaries (Fatal and Suspected Serious Injury Crashes)	First Harmful Event Type	33% Involve Collision with Fixed Object 25% Involve Overturning 25% Involve Collision with Non-Fixed Object	40% Involve Collision with Motor Vehicle 36% Involve Overturning 16% Involve Collision with Fixed Object	35% Involve Collision with Motor Vehicle 30% Involve Overturning 13% Involve Collision with Non-Fixed Object	42% Involve Collision with Motor Vehicle 26% Involve Overturning 16% Involve Collision with Fixed Object	69% Involve Collision with Motor Vehicle 19% Involve Collision with Fixed Object 6% Involve Overturning	53% Involve Collision with Motor Vehicle 18% Involve Overturning 12% Involve Collision with Pedestrian	38% Involve Collision with Motor Vehicle 31% Involve Overturning 20% Involve Collision with Fixed Object
	Collision Type	50% Involve Single Vehicle 25% Involve Rear End 17% Involve Other	40% Involve Single Vehicle 28% Involve Other 16% Involve Rear End	30% Involve Single Vehicle 26% Involve Rear End 26% Involve Other	42% Involve Single Vehicle 26% Involve Rear End 16% Involve Other	38% Involve Rear End 25% Involve Single Vehicle 19% Involve Sideswipe (same)	41% Involve Rear End 35% Involve Single Vehicle 12% Involve Sideswipe (same)	48% Involve Single Vehicle 24% Involve Rear End 15% Involve Other
	Violation or Behavior	67% Involve Speed too Fast for Conditions 8% Involve No Improper Action 8% Involve Failure to Keep in Proper Lane	44% Involve Speed too Fast for Conditions 20% Involve Unknown 12% Involve Failure to Keep in Proper Lane	30% Involve Speed too Fast for Conditions 22% Involve Other 13% Involve Crossed Median	32% Involve Speed too Fast for Conditions 16% Involve No Improper Action 16% Involve Other	50% Involve Speed too Fast for Conditions 19% Involve Other 13% Involve No Improper Action	47% Involve Speed too Fast for Conditions 24% Involve No Improper Action 6% Involve Followed Too Closely	41% Involve Speed too Fast for Conditions 16% Involve No Improper Action 12% Involve Unknown
	Lighting Conditions	50% Occur in Daylight Conditions 42% Occur in Dark-Unlighted Conditions 8% Occur in Dark-Lighted Conditions	48% Occur in Daylight Conditions 36% Occur in Dark-Unlighted Conditions 8% Occur in Dark-Lighted Conditions	48% Occur in Daylight Conditions 35% Occur in Dark-Unlighted Conditions 13% Occur in Dark-Lighted Conditions	53% Occur in Dark-Unlighted Conditions 37% Occur in Daylight Conditions 11% Occur in Dark-Lighted Conditions	56% Occur in Daylight Conditions 25% Occur in Dark-Unlighted Conditions 19% Occur in Dark-Lighted Conditions	59% Occur in Dark-Lighted Conditions 29% Occur in Daylight Conditions 6% Occur in Dusk Conditions	54% Occur in Daylight Conditions 30% Occur in Dark-Unlighted Conditions 12% Occur in Dark-Lighted Conditions
	Surface Conditions	92% Involve Dry Conditions 8% Involve Slush Conditions	88% Involve Dry Conditions 8% Involve Wet Conditions 4% Involve Unknown Conditions	87% Involve Dry Conditions 13% Involve Wet Conditions	95% Involve Dry Conditions 5% Involve Wet Conditions	100% Involve Dry Conditions	88% Involve Dry Conditions 6% Involve Wet Conditions 6% Involve Wet Conditions	92% Involve Dry Conditions 6% Involve Wet Conditions 1% Involve Unknown Conditions
	First Unit Event	17% Involve a first unit event of Collision with Fixed Object 17% Involve a first unit event of Ran off Road (Left) 17% Involve a first unit event of Ran off Road (Right)	36% Involve a first unit event of Motor Vehicle in Transport 24% Involve a first unit event of Ran Off the Road (Left) 24% Involve a first unit event of Overturn	39% Involve a first unit event of Motor Vehicle in Transport 30% Involve a first unit event of Overturn 13% Involve a first unit event of Ran Off the Road (Right)	42% Involve a first unit event of Motor Vehicle in Transport 26% Involve a first unit event of Overturn 5% Involve a first unit event of Collision with Fixed Object	81% Involve a first unit event of Motor Vehicle in Transport 13% Involve a first unit event of Ran Off the Road (Right) 6% Involve a first unit event of Overturn	59% Involve a first unit event of Motor Vehicle in Transport 18% Involve a first unit event of Overturn 12% Involve a first unit event of Other Non-Fixed Object	38% Involve a first unit event of Motor Vehicle in Transport 21% Involve a first unit event of Overturn 12% Involve a first unit event of Ran Off the Road (Left)
	Driver Physical Condition	58% No Apparent Influence 17% Under the Influence of Drugs or Alcohol 17% Fell Asleep/Fatigued	56% No Apparent Influence 24% Unknown 12% Under the Influence of Drugs or Alcohol	43% No Apparent Influence 30% Under the Influence of Drugs or Alcohol 17% Unknown	47% No Apparent Influence 21% Under the Influence of Drugs or Alcohol 21% Unknown	56% No Apparent Influence 25% Under the Influence of Drugs or Alcohol 13% Unknown	65% No Apparent Influence 24% Under the Influence of Drugs or Alcohol 12% Unknown	55% No Apparent Influence 16% Unknown 16% Under the Influence of Drugs or Alcohol
	Safety Device Usage	58% Shoulder And Lap Belt Used 42% None Used	64% Shoulder And Lap Belt Used 16% None Used 12% Unknown	57% Shoulder And Lap Belt Used 22% None Used 9% Not Applicable	63% Shoulder And Lap Belt Used 26% None Used 11% Not Applicable	50% Shoulder And Lap Belt Used 31% None Used 13% Air Bag Deployed/Shoulder-Lap Belt	38% Shoulder And Lap Belt Used 19% Not Applicable 13% None Used	56% Shoulder And Lap Belt Used 24% None Used 8% Unknown
Hot Spot Crash Summaries		None	None	None	None	EB MP 247.67- 248.00, WB MP 252.5 - 253.75	WB MP 256.05 - 258.16	
Previously Completed Safety-Related Projects		Widen to 6 lanes MP 196.4-218.6 (2020)	Widen to 6 lanes MP 196.4-218.6 (2020), SR 87 TI Reconstruct MP 210-212 (2019)	Pavement Rehab MP 222-231.71 (2022)	Pavement Rehab MP 237.47-247.89 (2022)	Pavement Rehab MP 237.47-247.89 (2022), Ina Rd TI Reconstruct MP 247.8-249.8 (2019), Ruthrauff Rd TI Reconstruct MP 252-253.1 (2021)	None	
District Interviews/Discussions		N/A	N/A	N/A	N/A	N/A	N/A	
Contributing Factors		• High frequency of single vehicle crashes, many involve collision with fixed objects or overturning. • High frequency of nighttime crashes. • Potential contributing factors include speeding, roadside slope/recoverable area, vegetation near roadway, and roadway lighting.	• High frequency of single vehicle crashes, many involving overturning and run off road collisions. • High frequency of nighttime crashes. • Potential contributing factors include speeding, roadside slope/recoverable area, vegetation near roadway, and roadway lighting.	• High trend of single vehicle/overturn crashes and rear end crashes. • High frequency of nighttime crashes. • Potential contributing factors include speeding, roadside slope/recoverable area, vegetation near roadway, roadway lighting, and roadway curvature.	• High trend of single vehicle/overturn crashes and rear end crashes. • High frequency of nighttime crashes. • Potential contributing factors include speeding, roadside slope/recoverable area, roadway lighting, and roadway curvature.	•High trend of vehicle-vehicle crashes, often involving rear-end and sideswipe crashes. • High frequency of nighttime crashes. • Potential contributing factors include speeding, impairment, traffic congestion (rear end) failure to stay in lane/unsafe lane changes (sideswipe) and roadway lighting.	•High trend of vehicle-vehicle crashes, often involving rear-end and sideswipe crashes. • High frequency of nighttime crashes. • Potential contributing factors include speeding, impairment,traffic congestion (rear end) failure to stay in lane/unsafe lane changes (sideswipe) and roadway lighting.	

Safety Performance Needs Analysis (continued)

		10E-9	10E-10	10E-11	10E-12	10E-13	10E-14	Corridor-Wide Crash Characteristics
Segment Number		10E-9	10E-10	10E-11	10E-12	10E-13	10E-14	
Segment Length (miles)		12	6	12	23	17	22	
Segment Milepost (MP)		MP262-MP274	MP274-MP280	MP280-MP292	MP292-MP315	MP315-MP332	MP332-MP354	
Final Need		Medium	Low	Low	High	Medium	Low	
Segment Crash Summaries (Fatal and Suspected Serious Injury Crashes)	Segment Crash Overview	8 Crashes were fatal 22 Crashes had suspected serious injuries 0 Crashes at intersections 19 Crashes involve lane departures 0 Crashes involve pedestrians 6 Crashes involve trucks 0 Crashes involve bicycles	2 Crashes were fatal 3 Crashes had suspected serious injuries 0 Crashes at intersections 5 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	6 Crashes were fatal 13 Crashes had suspected serious injuries 0 Crashes at intersections 16 Crashes involve lane departures 0 Crashes involve pedestrians 1 Crashes involve trucks 0 Crashes involve bicycles	10 Crashes were fatal 17 Crashes had suspected serious injuries 0 Crashes at intersections 16 Crashes involve lane departures 2 Crashes involve pedestrians 8 Crashes involve trucks 1 Crashes involve bicycles	5 Crashes were fatal 21 Crashes had suspected serious injuries 0 Crashes at intersections 21 Crashes involve lane departures 0 Crashes involve pedestrians 5 Crashes involve trucks 0 Crashes involve bicycles	5 Crashes were fatal 10 Crashes had suspected serious injuries 0 Crashes at intersections 12 Crashes involve lane departures 0 Crashes involve pedestrians 5 Crashes involve trucks 0 Crashes involve bicycles	90 Crashes were fatal 168 Crashes had suspected serious injuries 0 Crashes at intersections 172 Crashes involve lane departures 10 Crashes involve pedestrians 48 Crashes involve trucks 2 Crashes involve bicycles
	First Harmful Event Type	50% Involve Collision with Motor Vehicle 27% Involve Overturning 23% Involve Collision with Fixed Object	60% Involve Overturning 20% Involve Collision with Motor Vehicle 20% Involve Collision with Fixed Object	58% Involve Overturning 21% Involve Collision with Motor Vehicle 21% Involve Collision with Fixed Object	41% Involve Collision with Motor Vehicle 22% Involve Overturning 19% Involve Collision with Fixed Object	31% Involve Overturning 31% Involve Collision with Fixed Object 19% Involve Collision with Motor Vehicle	53% Involve Overturning 33% Involve Collision with Motor Vehicle 13% Involve Collision with Fixed Object	38% Involve Collision with Motor Vehicle 31% Involve Overturning 20% Involve Collision with Fixed Object
	Collision Type	47% Involve Single Vehicle 33% Involve Rear End 10% Involve Sideswipe (same)	60% Involve Single Vehicle 20% Involve Sideswipe (same) 20% Involve Other	79% Involve Single Vehicle 16% Involve Rear End 5% Involve Sideswipe (same)	41% Involve Single Vehicle 22% Involve Other 19% Involve Rear End	65% Involve Single Vehicle 19% Involve Other 12% Involve Rear End	53% Involve Single Vehicle 20% Involve Rear End 13% Involve Other	48% Involve Single Vehicle 24% Involve Rear End 15% Involve Other
	Violation or Behavior	43% Involve Speed too Fast for Conditions 13% Involve No Improper Action 13% Unknown	60% Involve Speed too Fast for Conditions 40% Involve Other 0% Involve No Improper Action	42% Involve Speed too Fast for Conditions 21% Involve Unsafe Lane Change 21% Involve Unknown	37% Involve Speed too Fast for Conditions 22% Involve Unknown 15% Involve No Improper Action	42% Involve Speed too Fast for Conditions 23% Involve No Improper Action 15% Involve Failure to Keep in Proper Lane	33% Involve Speed too Fast for Conditions 27% Involve No Improper Action 13% Involve Failure to Keep in Proper Lane	41% Involve Speed too Fast for Conditions 16% Involve No Improper Action 12% Involve Unknown
	Lighting Conditions	67% Occur in Daylight Conditions 20% Occur in Dark-Unlighted Conditions 10% Occur in Dark-Lighted Conditions	40% Occur in Daylight Conditions 40% Occur in Dark-Unlighted Conditions 20% Occur in Dark-Lighted Conditions	63% Occur in Daylight Conditions 37% Occur in Dark-Unlighted Conditions	56% Occur in Daylight Conditions 30% Occur in Dark-Unlighted Conditions 7% Occur in Dark-Lighted Conditions	62% Occur in Daylight Conditions 27% Occur in Dark-Unlighted Conditions 8% Occur in Dawn Conditions	53% Occur in Daylight Conditions 33% Occur in Dark-Unlighted Conditions 13% Occur in Dark-Lighted Conditions	54% Occur in Daylight Conditions 30% Occur in Dark-Unlighted Conditions 12% Occur in Dark-Lighted Conditions
	Surface Conditions	100% Involve Dry Conditions	80% Involve Dry Conditions 20% Involve Wet Conditions	95% Involve Dry Conditions 5% Involve Wet Conditions	96% Involve Dry Conditions 4% Involve Wet Conditions	88% Involve Dry Conditions 12% Involve Wet Conditions 0% Involve Snow Conditions	87% Involve Dry Conditions 13% Involve Wet Conditions 0% Involve Snow Conditions	92% Involve Dry Conditions 6% Involve Wet Conditions 1% Involve Unknown Conditions
	First Unit Event	43% Involve a first unit event of Motor Vehicle in Transport 20% Involve a first unit event of Ran Off the Road (Right) 13% Involve a first unit event of Ran Off the Road (Left)	60% Involve a first unit event of Overturn 40% Involve a first unit event of Motor Vehicle in Transport	32% Involve a first unit event of Overturn 26% Involve a first unit event of Motor Vehicle in Transport 21% Involve a first unit event of Ran Off the Road (Left)	26% Involve a first unit event of Motor Vehicle in Transport 26% Involve a first unit event of Overturn 15% Involve a first unit event of Ran Off the Road (Left)	27% Involve a first unit event of Motor Vehicle in Transport 19% Involve a first unit event of Ran Off the Road (Left) 19% Involve a first unit event of Overturn	40% Involve a first unit event of Motor Vehicle in Transport 20% Involve a first unit event of Ran Off the Road (Left) 13% Involve a first unit event of Ran Off the Road (Right)	38% Involve a first unit event of Motor Vehicle in Transport 21% Involve a first unit event of Overturn 12% Involve a first unit event of Ran Off the Road (Left)
	Driver Physical Condition	50% No Apparent Influence 23% Unknown 13% Fatigued/Fell Asleep	40% Fatigued/Fell Asleep 40% Unknown 20% No Apparent Influence	37% No Apparent Influence 26% Unknown 21% Under the Influence of Drugs or Alcohol	67% No Apparent Influence 15% Unknown 11% Fatigued/Fell Asleep	65% No Apparent Influence 23% Under the Influence of Drugs or Alcohol 12% Fatigued/Fell Asleep	60% No Apparent Influence 13% Under the Influence of Drugs or Alcohol 13% Fell Asleep/Fatigued	55% No Apparent Influence 16% Unknown 16% Under the Influence of Drugs or Alcohol
	Safety Device Usage	53% Shoulder And Lap Belt Used 27% None Used 7% Helmet Used	60% None Used 40% Shoulder And Lap Belt Used	47% Shoulder And Lap Belt Used 47% None Used 5% Helmet Used	56% Shoulder And Lap Belt Used 19% Unknown 15% None Used	58% Shoulder And Lap Belt Used 15% None Used 8% Air Bag Deployed/Shoulder-Lap Belt	53% Shoulder And Lap Belt Used 27% None Used 13% Unknown	56% Shoulder And Lap Belt Used 24% None Used 8% Unknown
Hot Spot Crash Summaries		EB MP 262.92 - 265.72	None	WB MP 291.11 - 291.50	None	EB MP 316.27- 318.25	None	
Previously Completed Safety-Related Projects		Pavement Rehab MP 262.4-272 (2022)	Houghton Rd TI Reconstruct MP 274.8-274.9 (2021)	Superelevation Improvements MP 281.3-288.12 (2016)	Superelevation Improvements MP 291.7-297.7 (2016), Pavement Rehab MP 296-301 (2016), Pavement Rehab MP 303-308 (2021)	Safety Improvements MP 316 (2018), Rockfall Mitigation MP 316-322 (2016), Rest Area Rehab MP 320.5 (2016)	None	
District Interviews/Discussions		N/A	N/A	N/A	N/A	N/A	N/A	
Contributing Factors		• High trend of single vehicle/overturn crashes and rear end crashes. • High frequency of nighttime crashes. • Potential contributing factors include speeding, traffic congestion (rear end), roadside slope/recoverable area, and roadway lighting.	• High trend of single vehicle crashes, many of which involve overturning and run off road. • High frequency of nighttime crashes. • Potential contributing factors include speeding, driver fatigue, roadside slope/recoverable area, vegetation near roadway, and roadway lighting.	• High trend of single vehicle/overturn crashes and rear end crashes. • Potential contributing factors include speeding, roadside slope/recoverable area, and vegetation near roadway.	• High trend of single vehicle crashes, many of which involve overturning and run off road. • High frequency of nighttime crashes. • Potential contributing factors include speeding, roadside slope/recoverable area, vegetation near roadway, roadway lighting, roadway curvature, and delineation.	• High trend of single vehicle crashes, many of which involve overturning and collision with fixed objects. • High frequency of nighttime crashes. • Potential contributing factors include speeding, impairment, roadside slope/recoverable area, vegetation near roadway, roadway lighting, roadway curvature, and delineation.	• High trend of single vehicle crashes, many of which involve overturning. • High frequency of nighttime crashes. • Potential contributing factors include speeding, roadside slope/recoverable area, vegetation near roadway, roadway lighting, roadway curvature, and delineation.	

Freight Performance Needs Analysis

Segment #	Facility Operations	Segment Mileposts (MP)	Segment Length (miles)	Freight Index			Directional TTTR (trucks only)				
				Performance Score	Performance Objective	Level of Need	Performance Score		Performance Objective	Level of Need	
							NB/EB	SB/WB		NB/EB	SB/WB
10E-3	Uninterrupted	187-198	11	1.09	Fair or Better	None	1.08	1.10	Fair or Better	None	None
10E-4	Uninterrupted	198-218	20	1.11	Fair or Better	None	1.12	1.10	Fair or Better	None	None
10E-5	Uninterrupted	218-236	18	1.08	Fair or Better	None	1.08	1.08	Fair or Better	None	None
10E-6	Uninterrupted	236-246	10	1.06	Fair or Better	None	1.06	1.06	Fair or Better	None	None
10E-7	Uninterrupted	246-255	9	1.63	Fair or Better	High	1.60	1.65	Fair or Better	High	High
10E-8	Uninterrupted	255-262	7	1.40	Fair or Better	Medium	1.36	1.44	Fair or Better	Medium	High
10E-9	Uninterrupted	262-274	12	1.64	Fair or Better	High	1.86	1.42	Fair or Better	High	High
10E-10	Uninterrupted	274-280	6	1.09	Fair or Better	None	1.06	1.13	Fair or Better	None	None
10E-11	Uninterrupted	280-292	12	1.11	Fair or Better	None	1.08	1.15	Fair or Better	None	None
10E-12	Uninterrupted	292-315	23	1.09	Fair or Better	None	1.10	1.09	Fair or Better	None	None
10E-13	Uninterrupted	315-332	17	1.15	Fair or Better	None	1.18	1.12	Fair or Better	None	None
10E-14	Uninterrupted	332-354	22	1.08	Fair or Better	None	1.07	1.08	Fair or Better	None	None
10E-15	Uninterrupted	354-372	18	1.07	Fair or Better	None	1.07	1.06	Fair or Better	None	None
10E-16	Uninterrupted	372-392	20	1.17	Fair or Better	None	1.17	1.17	Fair or Better	None	None
Emphasis Area?	Yes	**Weighted Average**		1.17	Good	Low					

Freight Performance Needs Analysis (continued)

Segment	Facility Operations	Segment Mileposts (MP)	Segment Length (miles)	Closure Duration (minutes/mile/year)					Bridge Clearance (feet)			Initial Need
				Performance Score		Performance Objective	Level of Need		Performance Score	Performance Objective	Level of Need	
				NB/EB	SB/WB		NB/EB	SB/WB				
10E-3	Uninterrupted	187-198	11	74.69	40.20	Fair or Better	Low	None	15.76	Fair or Better	High	Low
10E-4	Uninterrupted	198-218	20	22.21	55.16	Fair or Better	None	None	15.90	Fair or Better	Medium	Low
10E-5	Uninterrupted	218-236	18	9.48	16.92	Fair or Better	None	None	15.84	Fair or Better	Medium	Low
10E-6	Uninterrupted	236-246	10	20.86	233.15	Fair or Better	None	High	17.51	Fair or Better	None	Low
10E-7	Uninterrupted	246-255	9	32.13	47.71	Fair or Better	None	None	16.50	Fair or Better	None	High
10E-8	Uninterrupted	255-262	7	98.36	64.47	Fair or Better	Medium	None	16.50	Fair or Better	None	High
10E-9	Uninterrupted	262-274	12	38.57	35.20	Fair or Better	None	None	16.13	Fair or Better	Medium	High
10E-10	Uninterrupted	274-280	6	12.00	14.00	Fair or Better	None	None	16.15	Fair or Better	Medium	Low
10E-11	Uninterrupted	280-292	12	48.10	15.44	Fair or Better	None	None	16.22	Fair or Better	Low	Low
10E-12	Uninterrupted	292-315	23	47.31	11.98	Fair or Better	None	None	16.20	Fair or Better	Low	Low
10E-13	Uninterrupted	315-332	17	3.54	38.82	Fair or Better	None	None	16.40	Fair or Better	None	None
10E-14	Uninterrupted	332-354	22	21.52	32.85	Fair or Better	None	None	15.96	Fair or Better	Medium	Low
10E-15	Uninterrupted	354-372	18	145.45	71.37	Fair or Better	Medium	Low	16.31	Fair or Better	Low	Low
10E-16	Uninterrupted	372-392	20	117.98	70.16	Fair or Better	Medium	None	16.00	Fair or Better	Medium	Low

Freight Performance Needs Analysis (continued)

Segment #	Segment Length (miles)	Segment Mileposts (MP)	Initial Need	Vertical Clearance Hot Spots (Vertical Clearance < 16.25' and No Ramps)	Relevant Recently Completed or Under Construction Projects (which supersede performance data)*	Final Need	Comments (may include tentatively programmed projects with potential to address needs or other relevant issues identified in previous reports)
10E-3	11	187-198	Low	Val Vista Rd UP (#1152 MP 188.20), Cottonwood Ln UP(#1154 MP 193.88), Earley Rd UP(#1158 MP 195.89), Selma Hwy UP (#1160 MP 196.89)	Widen to 6 lanes MP 196.4-198 (2020)	Low	
10E-4	20	198-218	Low	Battaglia Rd (#943 MP 205.45), Alsdorf Rd UP (#944 MP 207.17)	SR 87 TI Reconstruct MP 210-212 (2019) Widen to 6 lanes MP 198-218 (2020)	Low	
10E-5	18	218-236	Low	None	Widen to 6 lanes MP 218-218.6 (2020)	Low	
10E-6	10	236-246	Low	None	None	Low	
10E-7	9	246-255	High	None	Ina Rd TI Reconstruct MP 247.8-249.8 (2019) Ruthrauff Rd TI Reconstruct MP 252-253.1 (2021)	Medium	Final need changed to reflect recently completed projects Widen to 8 lanes MP 247.57-253.4 (2024)
10E-8	7	255-262	High	None	None	High	
10E-9	12	262-274	High	None	None	High	Widen to 6 lanes and add Country Club Rd TI MP 263.8 (2025); Widen to 6 lanes MP 264-267 (2026)
10E-10	6	274-280	Low	None	Houghton Rd TI Reconstruct MP 274.8-274.9 (2021)	None	Final need was adjusted to reflect recently completed projects
10E-11	12	280-292	Low	None	None	Low	
10E-12	23	292-315	Low	None	None	Low	Climbing lane MP 302.95-303.4 (2024)
10E-13	17	315-332	None	None	None	None	
10E-14	22	332-354	Low	Airport Rd UP (#1114 MP 339.46)	None	Low	
10E-15	18	354-372	Low	None	None	Low	
10E-16	20	372-392	Low	None	None	Low	

Freight Performance Needs Analysis (continued)

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Roadway Variables								Traffic Variables			Relevant Freight Related Existing Infrastructure
				Functional Classification	Environmental Type (Urban/Rural)	Terrain	# of Lanes/ Direction	Weighted Average Speed Limit	Aux Lanes	Divided/ Non-Divided	% No Passing	Existing LOS	Future 2035 LOS	% Trucks	
10E-3	187-198	11	Low	Interstate	Urban	Level	6	75	Yes	Divided	0%	A-C	A-C	17%	
10E-4	198-218	20	Low	Interstate	Fringe Urban	Level	6	75	No	Divided	0%	A-C	A-C	25%	
10E-5	218-236	18	Low	Interstate	Rural	Level	6	75	No	Divided	0%	A-C	A-C	19%	
10E-6	236-246	10	Low	Interstate	Fringe Urban	Level	6	75	Yes	Divided	0%	A-C	A-C	17%	
10E-7	246-255	9	Medium	Interstate	Urban	Level	6	67	Yes	Divided	0%	A-C	E/F	13%	
10E-8	255-262	7	High	Interstate	Urban	Level	8	65	No	Divided	0%	A-C	E/F	9%	
10E-9	262-274	12	High	Interstate	Urban	Level	6	69	No	Divided	0%	A-C	A-C	20%	
10E-10	274-280	6	None	Interstate	Urban	Level	4	75	No	Divided	0%	A-C	A-C	21%	
10E-11	280-292	12	Low	Interstate	Rural	Mountainous	4	75	No	Divided	0%	A-C	E/F	31%	
10E-12	292-315	23	Low	Interstate	Fringe Urban	Mountainous	4	75	No	Divided	0%	A-C	A-C	31%	
10E-13	315-332	17	None	Interstate	Rural	Rolling	4	75	No	Divided	0%	A-C	A-C	40%	
10E-14	332-354	22	Low	Interstate	Rural	Rolling	4	75	No	Divided	0%	A-C	A-C	38%	
10E-15	354-372	18	Low	Interstate	Rural	Rolling	4	75	No	Divided	0%	A-C	A-C	38%	
10E-16	372-392	20	Low	Interstate	Rural	Mountainous	4	75	No	Divided	0%	A-C	A-C	45%	

Freight Performance Needs Analysis (continued)

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Closure Extent							Non-Actionable Conditions	Programmed and Planned Projects or Issues from Previous Documents Relevant to Final Need	Contributing Factors
				Total Number of Closures	# Incidents/ Accidents	% Incidents/ Accidents	# Obstructions/ Hazards	% Obstructions/ Hazards	# Weather Related	% Weather Related			
10E-3	187-198	11	Low	26	24	92%	2	8%	0	0%			
10E-4	198-218	20	Low	42	39	93%	0	0%	0	0%			
10E-5	218-236	18	Low	23	22	96%	0	0%	0	0%			
10E-6	236-246	10	Low	23	22	96%	0	0%	0	0%			
10E-7	246-255	9	Medium	26	19	73%	0	0%	0	0%			
10E-8	255-262	7	High	51	33	65%	0	0%	0	0%			
10E-9	262-274	12	High	47	47	100%	0	0%	0	0%			
10E-10	274-280	6	None	11	10	91%	0	0%	0	0%			
10E-11	280-292	12	Low	20	20	100%	0	0%	0	0%			
10E-12	292-315	23	Low	46	46	100%	0	0%	0	0%			
10E-13	315-332	17	None	22	22	100%	0	0%	0	0%			
10E-14	332-354	22	Low	29	29	100%	0	0%	0	0%			
10E-15	354-372	18	Low	16	16	100%	0	0%	0	0%			
10E-16	372-392	20	Low	20	20	100%	0	0%	0	0%			
10E-3	187-198	11	Low	26	24	92%	2	8%	0	0%			
10E-4	198-218	20	Low	42	39	93%	0	0%	0	0%			

Needs Summary Table

Performance Area	Segment Number and Mileposts (MP)													
	10E-3	10E-4	10E-5	10E-6	10E-7	10E-8	10E-9	10E-10	10E-11	10E-12	10E-13	10E-14	10E-15	10E-16
	MP 187-198	MP 198-218	MP 218-236	MP 236-246	MP 246-255	MP 255-262	MP 262-274	MP 274-280	MP 280-292	MP 292-315	MP 315-332	MP 332-354	MP 354-372	MP 372-392
Pavement*	Low	Low	Low	None	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Bridge	Low	Low	Low	Low	Low	None	Low	Low	None	Low	Medium	Low	Low	Medium
Mobility*	Low	None	None	Low	High	High	Medium	None	High	Low	Low	None	Low	Low
Safety*	Medium	High	High	Medium	Medium	Low	Medium	Low	Low	High	Medium	Low	High	Low
Freight	Low	Low	Low	Low	Medium	High	High	None	Low	Low	None	Low	Low	Low
Average Need	**1.23**	**1.23**	**1.23**	**1.08**	**1.92**	**1.77**	**1.92**	**0.54**	**1.31**	**1.46**	**1.15**	**0.77**	**1.46**	**1.15**

* Identified as Emphasis Area for I-10 East Corridor
# N/A indicates insufficient or no data available to determine level of need
+ A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study

Level of Need	Average Need Range
None+	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

Appendix E: Life-Cycle Cost Analysis

Airport Road UP (#1114) /I-10 East / MP 339.46

COST COMPARISON Present Value 2021 Dollars - Raw Costs			
OPTION	AGENCY COST	3%	7%
Option 1 (Replace)	$ 3,953,973.80	$2,999,407.30	$2,282,353.04
Option 2 (Rehab)	$ 4,665,329.90	$2,691,212.85	$1,460,354.54
Option 3 (Repair)	$ 3,985,517.40	$2,133,054.46	$1,026,270.15

Comparison to Replacement			
Option	Agency Cost	3%	7%
2 (Rehab)	84.75%	111.45%	156.29%
3 (Repair)	99.21%	140.62%	222.39%

COST COMPARISON Present Value 2021 Dollars - Fully Loaded Costs			
OPTION	AGENCY COST	3%	7%
Option 1 (Replace)	$8,698,742	$6,598,696	$5,021,177
Option 2 (Rehab)	$10,263,726	$5,920,668	$3,212,780
Option 3 (Repair)	$8,768,138	$4,692,720	$2,257,794

Bridge Ratings Per Option		
OPTION	AVG RATING	END RATING
Option 1 (Replace)	5.80	4
Option 2 (Rehab)	5.97	5
Option 3 (Repair)	5.93	5

Cost Ratio at 3% Discount Rate

1.41 Ratio of Immediate Replacement to Lowest Cost

1.26 Ratio of Rehabilitation to Lowest Cost

1.00 Ratio of Repair to Lowest Cost

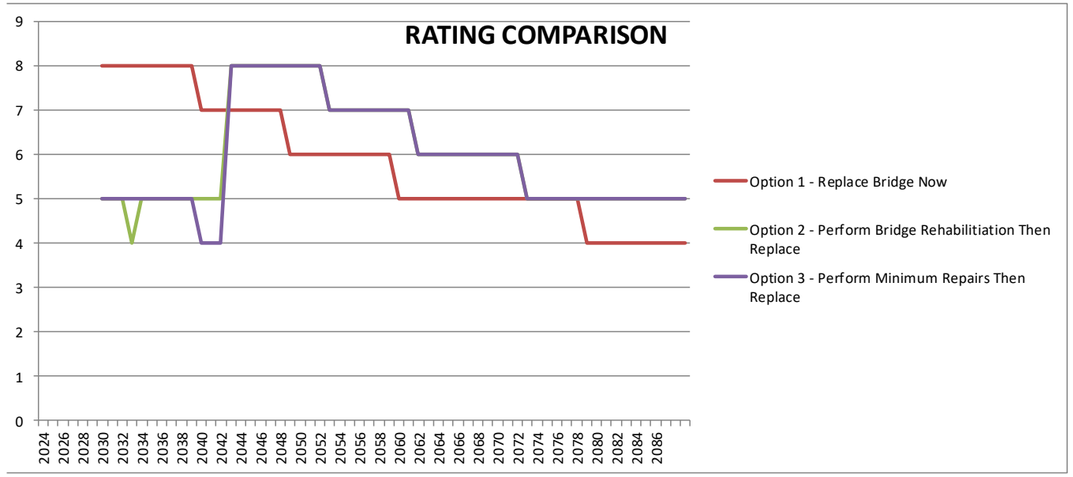
Cost Ratio at 7% Discount Rate

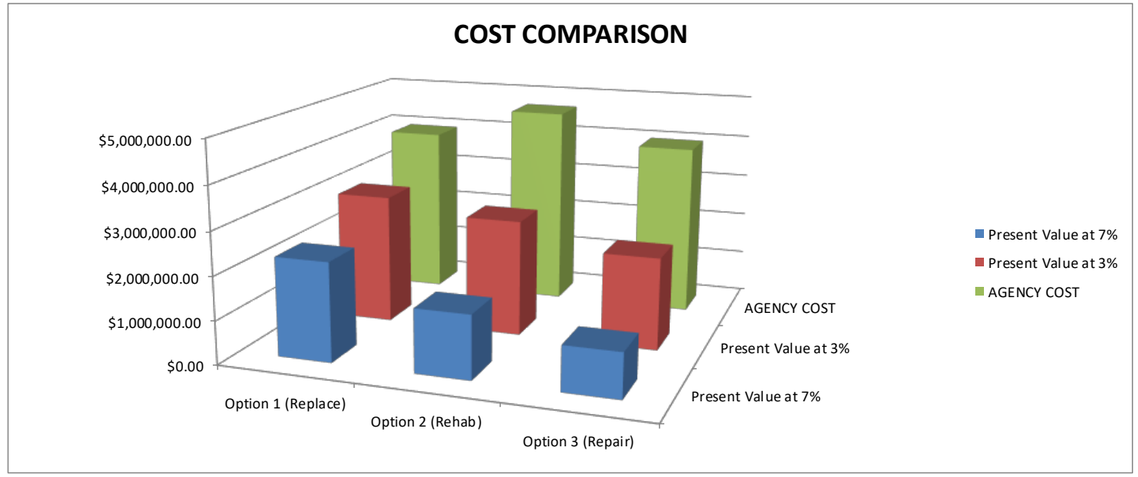
2.22 Ratio of Immediate Replacement to Lowest Cost

1.42 Ratio of Rehabilitation to Lowest Cost

1.00 Ratio of Repair to Lowest Cost

Note: A cost ratio < 1.15 means the Net Present Value (NPV) of replacement is within 15% of the NPV of the lower of the repair and rehabilitation costs so replacement should likely be the initial improvement solution options. A cost ratio > 1.15 means the NPV of replacement is more than 15% of the NPV of the lower of the repair and rehabilitation costs so either repair or rehabilitation, whichever is lower cost, should likely be the initial improvement solution.





Cochise TI UP (#518) / I-10 East / MP 331.62

COST COMPARISON Present Value 2021 Dollars - Raw Costs			
OPTION	AGENCY COST	3%	7%
Option 1 (Replace)	$ 3,100,747.20	$2,394,466.40	$1,829,570.39
Option 2 (Rehab)	$ 3,100,747.20	$2,005,327.91	$1,219,120.00
Option 3 (Repair)	$ 3,100,747.20	$2,005,327.91	$1,219,120.00

Comparison to Replacement			
Option	Agency Cost	3%	7%
2 (Rehab)	100.00%	119.41%	150.07%
3 (Repair)	100.00%	119.41%	150.07%

COST COMPARISON Present Value 2021 Dollars - Fully Loaded Costs			
OPTION	AGENCY COST	3%	7%
Option 1 (Replace)	$6,821,644	$5,267,826	$4,025,055
Option 2 (Rehab)	$6,821,644	$4,411,721	$2,682,064
Option 3 (Repair)	$6,821,644	$4,411,721	$2,682,064

Bridge Ratings Per Option		
OPTION	AVG RATING	END RATING
Option 1 (Replace)	5.82	4
Option 2 (Rehab)	5.88	4
Option 3 (Repair)	5.87	4

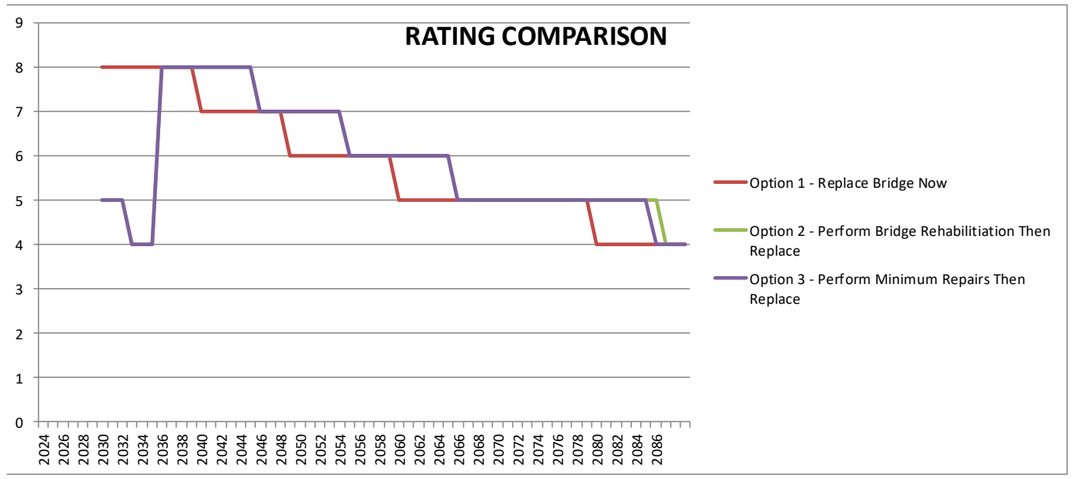
Cost Ratio at 3% Discount Rate

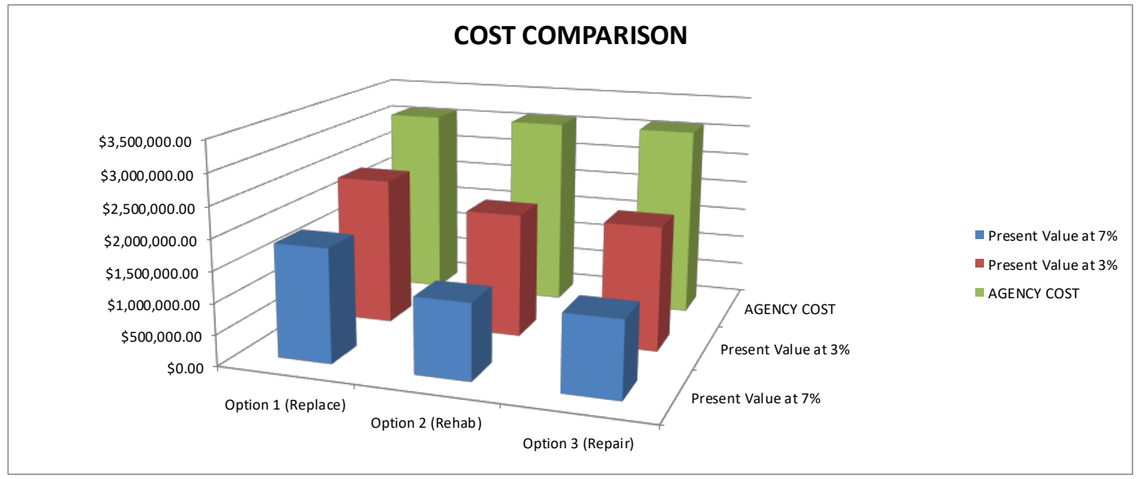
1.19 Ratio of Immediate Replacement to Lowest Cost
1.00 Ratio of Rehabilitation to Lowest Cost
1.00 Ratio of Repair to Lowest Cost

Cost Ratio at 7% Discount Rate

1.50 Ratio of Immediate Replacement to Lowest Cost
1.00 Ratio of Rehabilitation to Lowest Cost
1.00 Ratio of Repair to Lowest Cost

Note: A cost ratio < 1.15 means the Net Present Value (NPV) of replacement is within 15% of the NPV of the lower of the repair and rehabilitation costs so replacement should likely be the initial improvement solution options. A cost ratio > 1.15 means the NPV of replacement is more than 15% of the NPV of the lower of the repair and rehabilitation costs so either repair or rehabilitation, whichever is lower cost, should likely be the initial improvement solution.





Red Rock TI UP (#592) / I-10 East / MP 226.45

COST COMPARISON Present Value 2021 Dollars - Raw Costs			
OPTION	AGENCY COST	3%	7%
Option 1 (Replace)	$ 1,414,195.20	$1,089,451.23	$831,368.80
Option 2 (Rehab)	$ 1,828,510.20	$1,227,494.32	$784,492.83
Option 3 (Repair)	$ 1,502,582.40	$959,037.93	$575,185.95

Comparison to Replacement			
Option	Agency Cost	3%	7%
2 (Rehab)	77.34%	88.75%	105.98%
3 (Repair)	94.12%	113.60%	144.54%

COST COMPARISON Present Value 2021 Dollars - Fully Loaded Costs			
OPTION	AGENCY COST	3%	7%
Option 1 (Replace)	$3,111,229	$2,396,793	$1,829,011
Option 2 (Rehab)	$4,022,722	$2,700,487	$1,725,884
Option 3 (Repair)	$3,305,681	$2,109,883	$1,265,409

Bridge Ratings Per Option		
OPTION	AVG RATING	END RATING
Option 1 (Replace)	5.82	4
Option 2 (Rehab)	6.00	4
Option 3 (Repair)	5.92	4

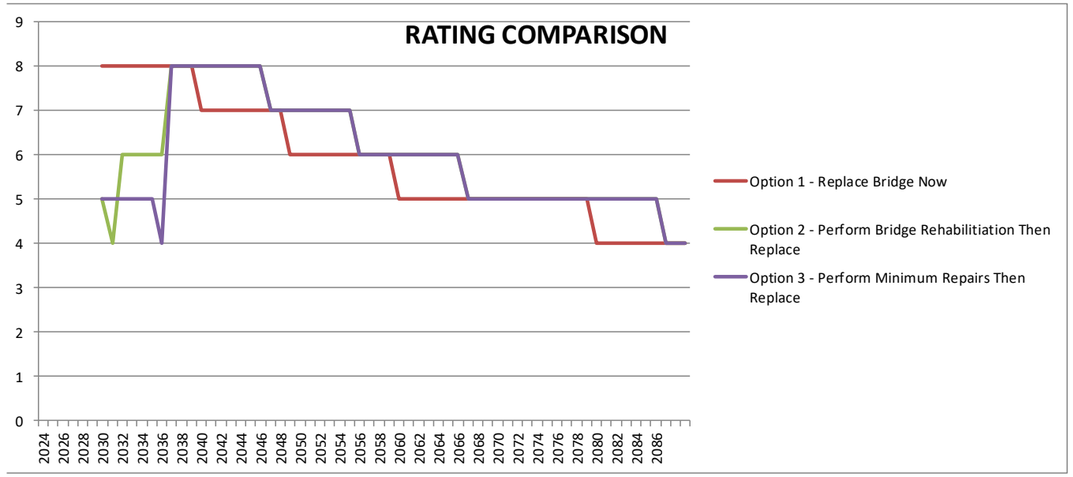
Cost Ratio at 3% Discount Rate

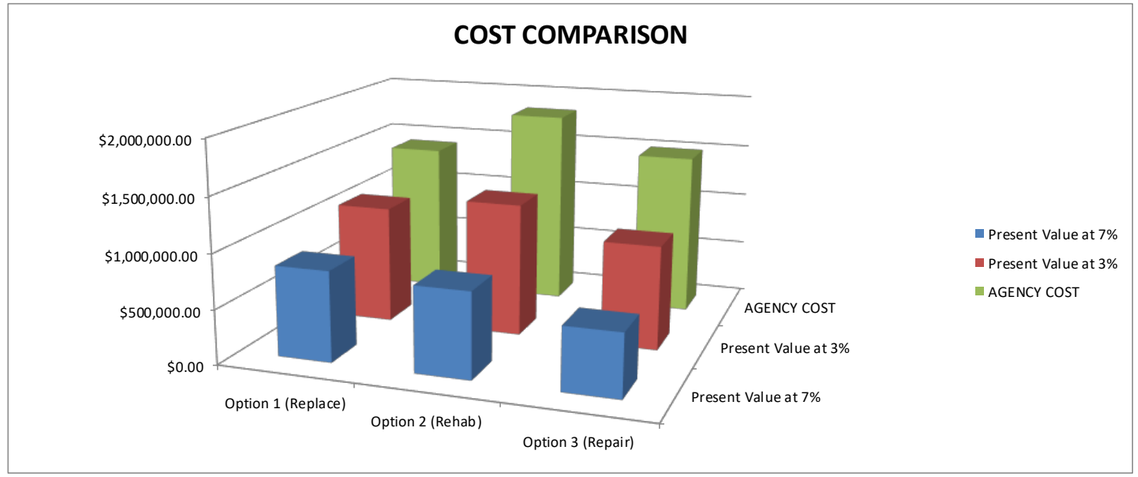
1.14 Ratio of Immediate Replacement to Lowest Cost
1.28 Ratio of Rehabilitation to Lowest Cost
1.00 Ratio of Repair to Lowest Cost

Cost Ratio at 7% Discount Rate

1.45 Ratio of Immediate Replacement to Lowest Cost
1.36 Ratio of Rehabilitation to Lowest Cost
1.00 Ratio of Repair to Lowest Cost

Note: A cost ratio < 1.15 means the Net Present Value (NPV) of replacement is within 15% of the NPV of the lower of the repair and rehabilitation costs so replacement should likely be the initial improvement solution options. A cost ratio > 1.15 means the NPV of replacement is more than 15% of the NPV of the lower of the repair and rehabilitation costs so either repair or rehabilitation, whichever is lower cost, should likely be the initial improvement solution.





Summary of LCCA Results

I-10 East MP 310 - MP 313

	Concrete Reconstruction	Asphalt Reconstruction	Asphalt Medium Rehab Focus	Asphalt Light Rehab Focus
Net Present Value - 3%	$27,348,236	$28,648,858	$22,404,367	$25,404,357
Net Present Value - 7%	$21,656,429	$20,055,001	$12,691,027	$15,843,009
Agency Cost	$34,400,157	$40,766,381	$36,958,680	$39,467,325

Cost Ratio at 3% Discount Rate

1.22 Ratio of Concrete Reconstruction to Lowest Cost Rehab

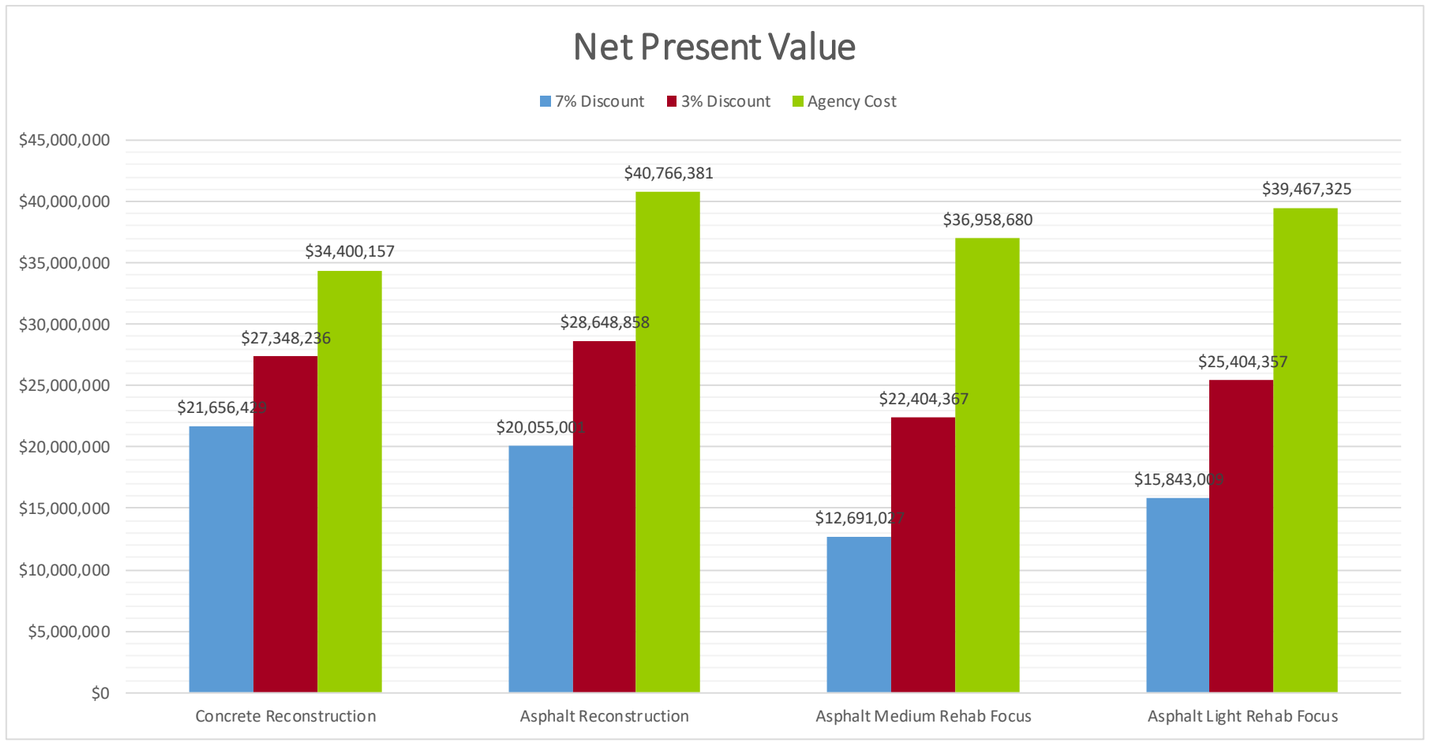
1.28 Ratio of Asphalt Reconstruction to Lowest Cost Rehab

Cost Ratio at 7% Discount Rate

1.71 Ratio of Concrete Reconstruction to Lowest Cost Rehab

1.58 Ratio of Asphalt Reconstruction to Lowest Cost Rehab

Note: A cost ratio < 1.15 means the Net Present Value (NPV) of reconstruction is within 15% of the NPV of the lowest cost rehab so reconstruction should likely be the initial improvement solution. A cost ratio > 1.15 means the NPV of reconstruction is more than 15% of the NPV of the lowest cost rehab so rehab should likely be the initial improvement solution.



Summary of LCCA Results

I-10 East MP 321 - MP 323

	Concrete Reconstruction	Asphalt Reconstruction	Asphalt Medium Rehab Focus	Asphalt Light Rehab Focus
Net Present Value - 3%	$18,232,157	$19,099,238	$16,218,488	$18,364,008
Net Present Value - 7%	$14,437,619	$13,370,000	$9,234,823	$11,960,693
Agency Cost	$22,933,438	$27,177,588	$27,040,405	$27,473,424

Cost Ratio at 3% Discount Rate

1.12 Ratio of Concrete Reconstruction to Lowest Cost Rehab

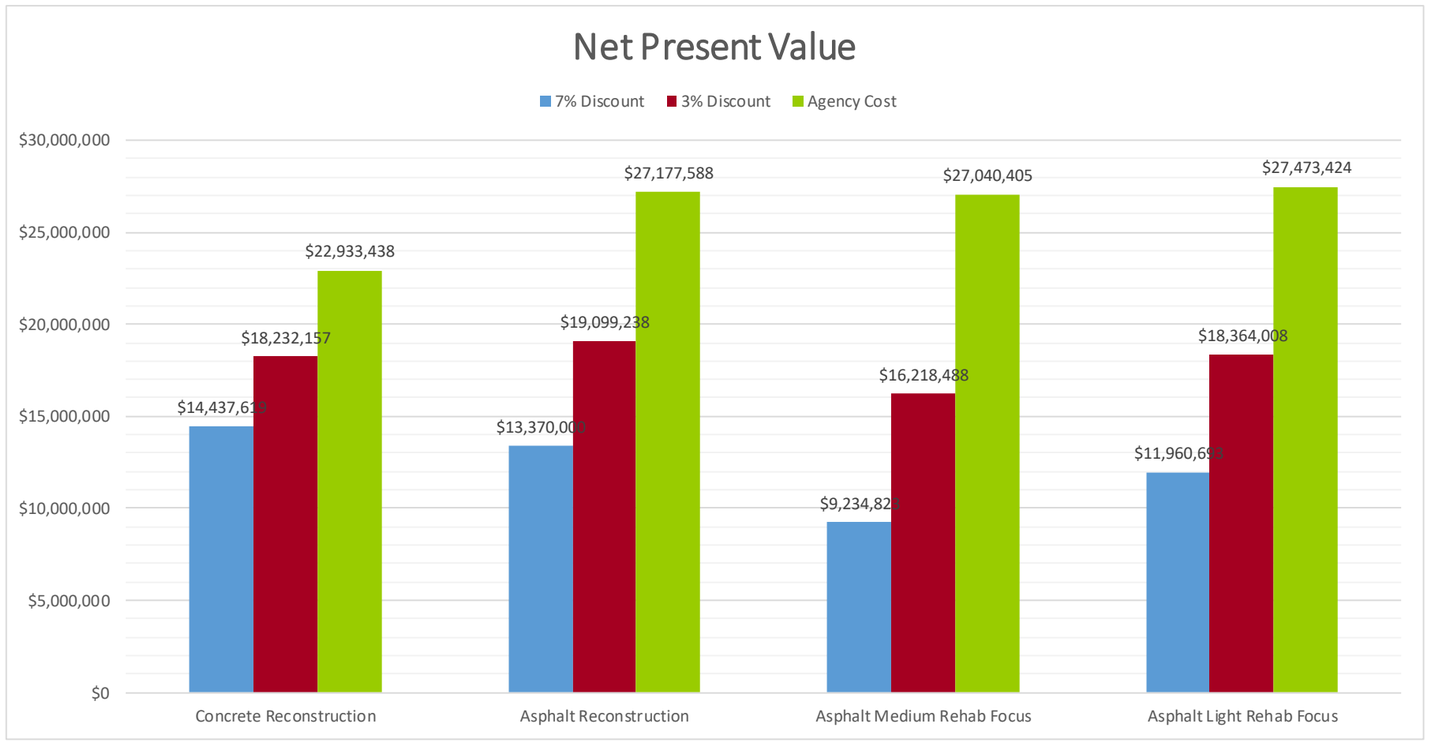
1.18 Ratio of Asphalt Reconstruction to Lowest Cost Rehab

Cost Ratio at 7% Discount Rate

1.56 Ratio of Concrete Reconstruction to Lowest Cost Rehab

1.45 Ratio of Asphalt Reconstruction to Lowest Cost Rehab

Note: A cost ratio < 1.15 means the Net Present Value (NPV) of reconstruction is within 15% of the NPV of the lowest cost rehab so reconstruction should likely be the initial improvement solution. A cost ratio > 1.15 means the NPV of reconstruction is more than 15% of the NPV of the lowest cost rehab so rehab should likely be the initial improvement solution.



Summary of LCCA Results

I-10 East MP 328 - MP 329

	Concrete Reconstruction	Asphalt Reconstruction	Asphalt Medium Rehab Focus	Asphalt Light Rehab Focus
Net Present Value - 3%	$9,116,079	$9,549,619	$8,109,244	$9,182,004
Net Present Value - 7%	$7,218,810	$6,685,000	$4,617,412	$5,980,347
Agency Cost	$11,466,719	$13,588,794	$13,520,203	$13,736,712

Cost Ratio at 3% Discount Rate

1.12 Ratio of Concrete Reconstruction to Lowest Cost Rehab

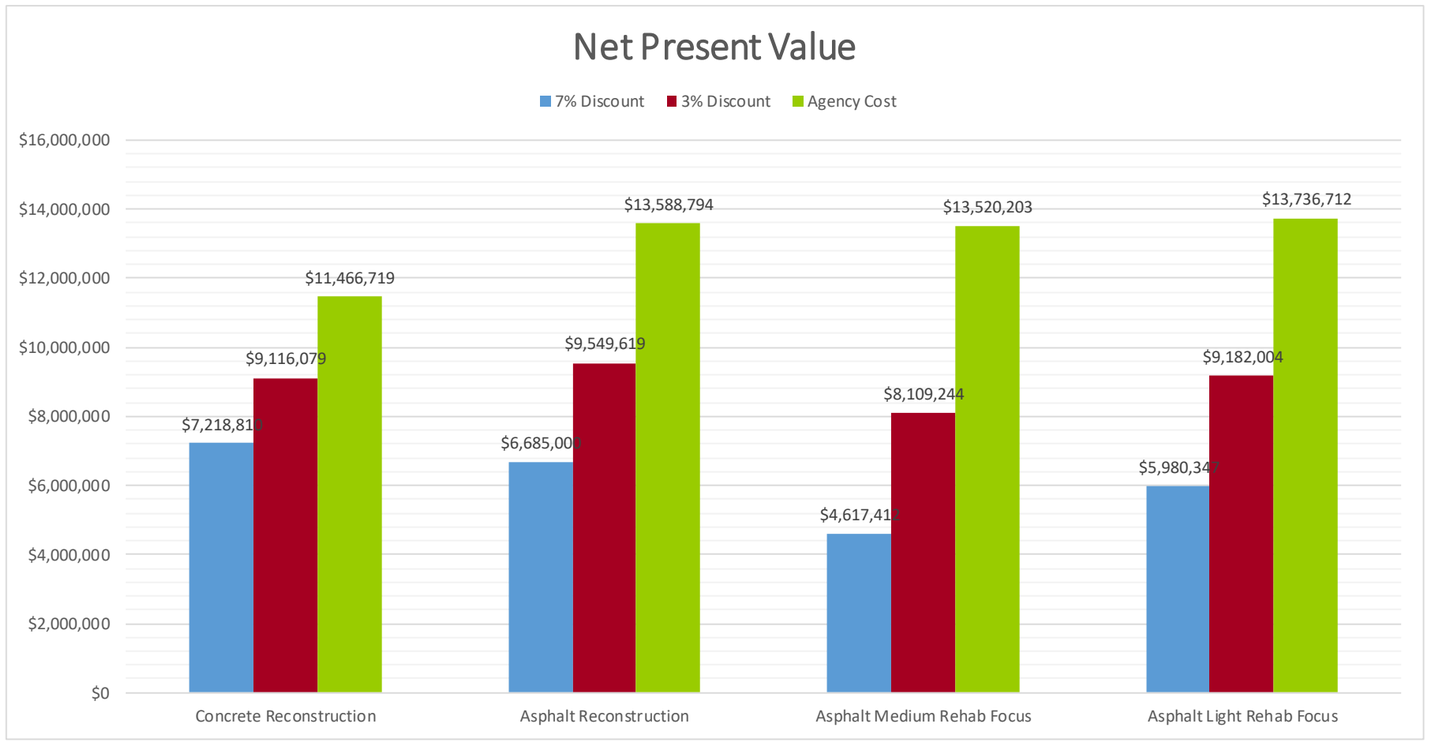
1.18 Ratio of Asphalt Reconstruction to Lowest Cost Rehab

Cost Ratio at 7% Discount Rate

1.56 Ratio of Concrete Reconstruction to Lowest Cost Rehab

1.45 Ratio of Asphalt Reconstruction to Lowest Cost Rehab

Note: A cost ratio < 1.15 means the Net Present Value (NPV) of reconstruction is within 15% of the NPV of the lowest cost rehab so reconstruction should likely be the initial improvement solution. A cost ratio > 1.15 means the NPV of reconstruction is more than 15% of the NPV of the lowest cost rehab so rehab should likely be the initial improvement solution.



Appendix F: Crash Modification Factors and Factored Unit Construction Costs

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
REHABILITATION											
Rehabilitate Pavement (AC)	$276,500	1.74	$481,110	Mile	2.20	$610,000	$1,060,000	Mill and replace 1"-3" AC pavement; accounts for 38' width; for one direction of travel on two-lane roadway; includes pavement, striping, delineators, RPMs, rumble strips	0.70	0.68	Updated to include 2 additional values (in addition to 3 previous values) from CMF Clearinghouse and revised combination of rehabilitate pavement (0.88), striping, delineators, RPMs (0.77 for combination), and rumble strips (0.89) = 0.68
Rehabilitate Bridge	$65	1.74	$113	SF	2.20	$140	$250	Based on deck area; bridge only - no other costs included	0.95	0.95	Assumed - should have a minor effect on crashes at the bridge
GEOMETRIC IMPROVEMENT											
Re-profile Roadway	$974,500	1.74	$1,695,630	Mile	2.20	$2,140,000	$3,730,000	Includes excavation of approximately 3", pavement replacement (AC), striping, delineators, RPMs, rumble strips, for one direction of travel on two-lane roadway (38' width)	0.70	0.70	Assumed - this is similar to rehab pavement. This solution is intended to address vertical clearance at bridge, not profile issue; factor the cost as a ratio of needed depth to 3".
Realign Roadway	$2,960,000	1.74	$5,150,400	Mile	2.20	$6,510,000	$11,330,000	All costs per direction except bridges; applicable to areas with small or moderate fills and cuts, minimal retaining walls	0.50	0.50	Based on Caltrans and NCDOT
Improve Skid Resistance	$675,000	1.74	$1,174,500	Mile	2.20	$1,490,000	$2,580,000	Average cost of pavement replacement and variable depth paving to increase super-elevation; for one direction of travel on two-lane roadway; includes pavement, striping, delineators, RPMs, rumble strips	0.66	0.65	Updated to include 6 additional values (in addition to 6 previous values) from CMF Clearinghouse (0.71) and calculated composite CMF value using that 0.71 value, the HSM value (0.87) for skid resistance; striping, delineators, RPMs (0.77 for combination), and rumble strips (0.89) = 0.65
INFRASTRUCTURE IMPROVEMENT											
Reconstruct to Urban Section	$1,000,000	1.74	$1,740,000	Mile	2.20	$2,200,000	$3,828,000	Includes widening by 16' total (AC = 12'+2'+2') to provide median, curb & gutter along both side of roadway, single curb for median, striping (doesn't include widening for additional travel lane).	0.88	0.88	From HSM

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
Construct Auxiliary Lanes (AC)	$914,000	1.74	$1,590,360	Mile	2.20	$2,011,000	$3,499,000	For addition of aux lane (AC) in one direction of travel; includes all costs except bridges; for generally at-grade facility with minimal walls and no major drainage improvements	0.78	0.78	Average of 4 values from clearinghouse
Construct Climbing Lane (High)	$3,000,000	1.74	$5,220,000	Mile	2.20	$6,600,000	$11,484,000	In one direction; all costs except bridges; applicable to areas with large fills and cuts, retaining walls, rock blasting, steep slopes on both sides of road	0.75	0.75	From HSM
Construct Climbing Lane (Medium)	$2,250,000	1.74	$3,915,000	Mile	2.20	$4,950,000	$8,613,000	In one direction; all costs except bridges; applicable to areas with medium or large fills and cuts, retaining walls, rock blasting, steep slopes on one side of road	0.75	0.75	From HSM
Construct Climbing Lane (Low)	$1,500,000	1.74	$2,610,000	Mile	2.20	$3,300,000	$5,742,000	In one direction; all costs except bridges; applicable to areas with small or moderate fills and cuts, minimal retaining walls	0.75	0.75	From HSM
Construct Reversible Lane (Low)	$2,400,000	1.74	$4,176,000	Lane-Mile	2.20	$5,280,000	$9,190,000	All costs except bridges; applicable to areas with small or moderate fills and cuts, minimal retaining walls	0.73 for uphill and 0.88 for downhill	0.73 for uphill and 0.88 for downhill	Based on proposed conditions on I-17 with 2 reversible lanes and a concrete barrier
Construct Reversible Lane (High)	$4,800,000	1.74	$8,352,000	Lane-Mile	2.20	$10,560,000	$18,370,000	All costs except bridges; applicable to areas with large fills and cuts, retaining walls, rock blasting, mountainous terrain	0.73 for uphill and 0.88 for downhill	0.73 for uphill and 0.88 for downhill	Based on proposed conditions on I-17 with 2 reversible lanes and a concrete barrier
Construct Passing Lane	$1,500,000	1.74	$2,610,000	Mile	2.20	$3,300,000	$5,742,000	In one direction; all costs except bridges; applicable to areas with small or moderate fills and cuts, minimal retaining walls	0.63	0.63	Average of 3 values from clearinghouse
Construct Entry/Exit Ramp	$730,000	1.74	$1,270,200	Each	2.20	$1,610,000	$2,790,000	Cost per ramp; includes pavement, striping, signing, RPMs, lighting, typical earthwork & drainage; does not include any major structures or improvements on crossroad	1.09	1.09	Average of 16 values on clearinghouse; for adding a ramp not reconstructing. CMF applied to crashes 0.25 miles upstream/downstream from the gore.
Relocate Entry/Exit Ramp	$765,000	1.74	$1,331,100	Each	2.20	$1,680,000	$2,930,000	Cost per ramp; includes pavement, striping, signing, RPMs, lighting, typical earthwork, drainage and demolition of existing ramp; does not include any major structures or improvements on crossroad	1.00	1.00	Assumed to not add any crashes since the ramp is simply moving and not being added. CMF applied to crashes 0.25 miles upstream/downstream from the gore.

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
Construct Turn Lanes	$42,500	1.74	$73,950	Each	2.20	$93,500	$163,000	Includes 14' roadway widening (AC) for one additional turn lane (250' long) on one leg of an intersection; includes AC pavement, curb & gutter, sidewalk, ramps, striping, and minor signal modifications	0.81	0.81	Average of 7 values from HSM; CMF applied to intersection-related crashes; this solution also applies when installing a deceleration lane
Modify Entry/Exit Ramp	$445,000	1.74	$774,300	Each	2.20	$979,000	$1,703,000	Cost per ramp; includes pavement, striping, signing, RPMs, lighting, minor earthwork, & drainage; For converting existing ramp to parallel-type configuration	0.21	0.21	Average of 4 values from clearinghouse (for exit ramps) and equation from HSM (for entrance ramp). CMF applied to crashes within 1/8 mile upstream/downstream from the gore.
Widen & Modify Entry/Exit Ramp	$619,000	1.74	$1,077,060	Each	2.20	$1,361,800	$2,370,000	Cost per ramp; includes pavement, striping, signing, RPMs, lighting, minor earthwork, & drainage; For converting 1-lane ramp to 2-lane ramp and converting to parallel-type ramp	0.21	0.21	Will be same as "Modify Ramp"
Replace Pavement (AC) (with overexcavation)	$1,446,500	1.74	$2,516,910	Mile	2.20	$3,180,000	$5,540,000	Accounts for 38' width; for one direction of travel on two-lane roadway; includes pavement, overexcavation, striping, delineators, RPMs, rumble strips	0.70	0.70	Same as rehab
Replace Pavement (PCCP) (with overexcavation)	$1,736,500	1.74	$3,021,510	Mile	2.20	$3,820,000	$6,650,000	Accounts for 38' width; for one direction of travel on two-lane roadway; includes pavement, overexcavation, striping, delineators, RPMs, rumble strips	0.70	0.70	Same as rehab
Replace Bridge (Short)	$125	1.74	$218	SF	2.20	$280	$480	Based on deck area; bridge only - no other costs included; cost developed generally applies to bridges crossing small washes	0.95	0.95	Assumed - should have a minor effect on crashes at the bridge
Replace Bridge (Medium)	$160	1.74	$278	SF	2.20	$350	$610	Based on deck area; bridge only - no other costs included; cost developed generally applies to bridges crossing over the mainline freeway, crossroads, or large washes	0.95	0.95	Assumed - should have a minor effect on crashes at the bridge
Replace Bridge (Long)	$180	1.74	$313	SF	2.20	$400	$690	Based on deck area; bridge only - no other costs included; cost developed generally applies to bridges crossing large rivers or canyons	0.95	0.95	Assumed - should have a minor effect on crashes at the bridge
Widen Bridge	$175	1.74	$305	SF	2.20	$390	$670	Based on deck area; bridge only - no other costs included	0.90	0.90	Assumed - should have a minor effect on crashes at the bridge

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Install Pedestrian Bridge	$135	1.74	$235	SF	2.20	$300	$520	Includes cost to construct bridge based on linear feet of the bridge. This cost includes and assumes ramps and sidewalks leading to the structure.	0.1 (pedestrian only)	0.1 (pedestrian only)	Assumed direct access on both sides of structure
Implement Automated Bridge De-icing	$115	1.74	$200	SF	2.20	$250	$440	Includes cost to replace bridge deck and install system	0.72 (snow/ice)	0.72 (snow/ice)	Average of 3 values on clearinghouse for snow/ice
Install Wildlife Crossing Under Roadway	$650,000	1.74	$1,131,000	Each	2.20	$1,430,000	$2,488,000	Includes cost of structure for wildlife crossing under roadway and 1 mile of fencing in each direction that is centered on the wildlife crossing	0.25 (wildlife)	0.25 (wildlife)	Assumed; CMF applies to wildlife-related crashes within 0.5 miles both upstream and downstream of the wildlife crossing in both directions
Install Wildlife Crossing Over Roadway	$1,140,000	1.74	$1,983,600	Each	2.20	$2,508,000	$4,364,000	Includes cost of structure for wildlife crossing over roadway and 1 mile of fencing in each direction that is centered on the wildlife crossing	0.25 (wildlife)	0.25 (wildlife)	Assumed; CMF applies to wildlife-related crashes within 0.5 miles both upstream and downstream of the wildlife crossing in both directions
Construct Drainage Structure - Minor	$280,000	1.74	$487,200	Each	2.20	$616,000	$1,072,000	Includes 3-36" pipes and roadway reconstruction (approx. 1,000 ft) to install pipes	0.70	0.70	Same as rehab; CMF applied to crashes 1/8 mile upstream/downstream of the structure
Construct Drainage Structure - Intermediate	$540,000	1.74	$939,600	Each	2.20	$1,188,000	$2,067,000	Includes 5 barrel 8'x6' RCBC and roadway reconstruction (approx. 1,000 ft) to install RCBC	0.70	0.70	Same as rehab; CMF applied to crashes 1/8 mile upstream/downstream of the structure
Construct Drainage Structure - Major	$8,000	1.74	$13,920	LF	2.20	$17,600	$30,600	Includes bridge that is 40' wide and reconstruction of approx. 500' on each approach	0.70	0.70	Same as rehab; CMF applied to crashes 1/8 mile upstream/downstream of the structure
Install Acceleration Lane	$127,500	1.74	$221,850	Each	2.20	$280,500	$488,000	For addition of an acceleration lane (AC) on one leg of an intersection that is 1,000' long plus a taper; includes all costs except bridges; for generally at-grade facility with minimal walls and no major drainage improvements	0.85	0.85	Average of 6 values from the FHWA Desktop Reference for Crash Reduction Factors
Install Curb and Gutter	$211,200	1.74	$367,488	Mile	2.20	$465,000	$808,000	In both directions; curb and gutter	0.89	0.89	From CMF Clearinghouse
Install Sidewalks, Curb, and Gutter	$475,200	1.74	$826,848	Mile	2.20	$1,045,000	$1,819,000	In both directions; 5' sidewalks, curb, and gutter	0.89 installing sidewalk 0.24 (pedestrian crashes only)	0.89 installing sidewalk 0.24 (pedestrian crashes only)	From CMF Clearinghouse Avg of 6 values from FHWA Desktop Reference

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Install Sidewalks	$264,000	1.74	$459,360	Mile	2.20	$581,000	$1,011,000	In both directions; 5' sidewalks	0.24 (pedestrian crashes only)	0.24 (pedestrian crashes only)	Avg of 6 values from FHWA Desktop Reference
OPERATIONAL IMPROVEMENT											
Implement Variable Speed Limits (Wireless, Overhead)	$718,900	1.25	$898,625	Mile	2.20	$1,580,000	$1,980,000	In one direction; includes 1 sign assembly per mile (foundation and structure), wireless communication, detectors	0.92	0.91 (all crashes) 0.69 (weather-related)	Originally only 1 value from CMF Clearinghouse. Updated to include 1 value for all crashes and 2 additional values for weather-related crashes
Implement Variable Speed Limits (Wireless, Ground-mount)	$169,700	1.25	$212,125	Mile	2.20	$373,300	$467,000	In one direction; includes 2 signs per mile (foundations and posts), wireless communication, detectors	0.92	0.91 (all crashes) 0.69 (weather-related)	Originally only 1 value from CMF Clearinghouse. Updated to include 1 value for all crashes and 2 additional values for weather-related crashes
Implement Variable Speed Limits (Wireless, Solar, Overhead)	$502,300	1.25	$627,875	Mile	2.20	$1,110,000	$1,380,000	In one direction; includes 1 sign assembly per mile (foundation and structure), wireless communication, detectors, solar power	0.92	0.91 (all crashes) 0.69 (weather-related)	Originally only 1 value from CMF Clearinghouse. Updated to include 1 value for all crashes and 2 additional values for weather-related crashes
Implement Variable Speed Limits (Wireless, Solar, Ground-mount)	$88,400	1.25	$110,500	Mile	2.20	$194,500	$243,000	In one direction; includes 2 signs per mile (foundations and posts), wireless communication, detectors, solar power	0.92	0.91 (all crashes) 0.69 (weather-related)	Originally only 1 value from CMF Clearinghouse. Updated to include 1 value for all crashes and 2 additional values for weather-related crashes
Implement Ramp Metering (Low)	$25,000	1.25	$31,250	Each	2.20	$55,000	$68,800	For each entry ramp location; urban area with existing ITS backbone infrastructure; includes signals, poles, timer, pull boxes, etc.	0.64	0.64	From 1 value from clearinghouse; CMF applied to crashes 0.25 miles after gore
Implement Ramp Metering (High)	$150,000	1.25	$187,500	Mile	2.20	$330,000	$413,000	Area without existing ITS backbone infrastructure; in addition to ramp meters, also includes conduit, fiber optic lines, and power	0.64	0.64	From 1 value from clearinghouse
Implement Signal Coordination	$140,000	1.25	$175,000	Mile	2.20	$308,000	$385,000	Includes conduit, conductors, and controllers for 4 intersections that span a total of approximately 2 miles	0.90	0.90	Assumed

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Implement Left-Turn Phasing	$7,500	1.25	$9,375	Each	2.20	$16,500	$20,600	Includes four new signal heads (two in each direction) and associated conductors for one intersection	0.88 (protected) 0.98 (permitted /protected or protected/ permitted)	0.88 (protected) 0.98 (permitted /protected or protected/ permitted)	From HSM; CMF = 0.94 for each protected approach and 0.99 for each permitted/protected or protected/permitted approach. CMFs of different approaches should be multiplied together. CMF applied to crashes within intersection
Install Adaptive Signal Control and Signal Coordination	$363,500	1.25	$454,375	mile	2.20	$800,000	$1,000,000	Controller upgrades, advanced detection, software configuration, cameras; includes conduit, conductors, and controllers for 4 intersections that span a total of approximately 2 miles for coordination	0.81 (adaptive control) 0.90 (signal coordinatio n)	0.78 (adaptive control) 0.90 (signal coordinatio n)	Updated to include 15 additional values (in addition to 2 previous values) for adaptive control from CMF Clearinghouse
ROADSIDE DESIGN											
Install Guardrail	$130,000	1.74	$226,200	Mile	2.20	$286,000	$498,000	One side of road	0.62 (ROR)	0.62 (ROR)	0.62 is average of 2 values from clearinghouse
Install Cable Barrier	$80,000	1.74	$139,200	Mile	2.20	$176,000	$306,000	In median	0.81	0.65	Updated to include 5 additional values (in addition to 5 previous values) from CMF Clearinghouse
Widen Shoulder (AC)	$256,000	1.74	$445,440	Mile	2.20	$563,000	$980,000	Assumes 10' of existing shoulder (combined left and right), includes widening shoulder by a total of 4'; new pavement for 4' width and mill and replace existing 10' width; includes pavement, minor earthwork, striping edge lines, RPMs, high-visibility delineators, safety edge, and rumble strips	0.68 (1-4') 0.64 (>= 4')	0.68 (1-4') 0.64 (>= 4')	0.86 is average of 5 values from clearing house for widening shoulder 1-4'. 0.76 is calculated from HSM for widening shoulder >= 4'. (Cost needs to be updated if dimension of existing and widened shoulder differ from Description.)
Rehabilitate Shoulder (AC)	$113,000	1.74	$196,620	Mile	2.20	$249,000	$433,000	One direction of travel (14' total shoulder width-4' left and 10' right); includes paving (mill and replace), striping, high-visibility delineators, RPMs, safety edge, and rumble strips for both shoulders	0.72	0.72	0.98 is average of 34 values on clearinghouse for shoulder rehab/replace; include striping, delineators, RPMs (0.77 combined CMF), and rumble strips (0.89). (Cost needs to be updated if dimension of existing shoulder differs from Description.)

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
Replace Shoulder (AC)	$364,000	1.74	$633,360	Mile	2.20	$801,000	$1,393,000	One direction of travel (14' total shoulder width-4' left and 10' right); includes paving (full reconstruction), striping, high-visibility delineators, RPMs, safety edge, and rumble strips for both shoulders	0.72	0.72	0.98 is average of 34 values on clearinghouse for shoulder rehab/replace; include striping, delineators, RPMs (0.77 combined CMF), and rumble strips (0.89). (Cost needs to be updated if dimension of existing shoulder differs from Description.)
Install Rumble Strip	$5,500	1.74	$9,570	Mile	2.20	$12,000	$21,000	Both edges - one direction of travel; includes only rumble strip; no shoulder rehab or paving or striping	0.89	0.89	Average of 75 values on clearinghouse and consistent with HSM
Install Centerline Rumble Strip	$2,800	1.74	$4,872	Mile	2.20	$6,000	$11,000	Includes rumble strip only; no pavement rehab or striping	0.85	0.85	From HSM
Install Wildlife Fencing	$340,000	1.74	$591,600	Mile	2.20	$748,000	$1,302,000	Fencing only plus jump outs for 1 mile (both directions)	0.50 (wildlife)	0.50 (wildlife)	Assumed
Remove Tree/Vegetation	$200,000	1.74	$348,000	Mile	2.20	$440,000	$766,000	Intended for removing trees that shade the roadway to allow sunlight to help melt snow and ice (see Increase Clear Zone CMF for general tree/vegetation removal in clear zone)	0.72 (snow/ice)	0.72 (snow/ice)	Average of 3 values on clearinghouse for snow/ice
Increase Clear Zone	$59,000	1.74	$102,660	Mile	2.20	$130,000	$226,000	In one direction; includes widening the clear zone by 10' to a depth of 3'	0.71	0.71	Median of 14 values from FHWA Desktop Reference for Crash Reduction Values
Install Access Barrier Fence	$15	1.74	$26	LF	2.20	$33	$60	8' fencing along residential section of roadway	0.10 (pedestrian only)	0.10 (pedestrian only)	Equal to pedestrian overpass
Install Rock-Fall Mitigation - Wire Mesh	$1,320,000	1.74	$2,296,800	Mile	2.20	$2,904,000	$5,053,000	Includes wire mesh and rock stabilization (one direction)	0.75 (debris)	0.75 (debris)	Assumed
Install Rock-Fall Mitigation - Containment Fence & Barrier	$2,112,000	1.74	$3,674,880	Mile	2.20	$4,646,000	$8,085,000	Includes containment fencing, concrete barrier, and rock stabilization (one direction)	0.75 (debris)	0.75 (debris)	Assumed
Install Raised Concrete Barrier in Median	$650,000	1.74	$1,131,000	Mile	2.20	$1,430,000	$2,488,000	Includes concrete barrier with associated striping and reflective markings; excludes lighting in barrier (one direction)	0.90 (Cross-median and head on crashes eliminated completely)	0.90 (Cross-median and head on crashes eliminated completely)	All cross median and head-on fatal or incapacitating injury crashes are eliminated completely; all remaining crashes have 0.90 applied
Formalize Pullout (Small)	$7,500	1.74	$13,050	Each	2.20	$17,000	$29,000	Includes paving and signage (signs, posts, and foundations) - approximately 4,200 sf	0.97	0.97	Assumed - similar to Install Other General Warning Signs; CMF applied to crashes within 0.25 miles after sign

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Formalize Pullout (Medium)	$27,500	1.74	$47,850	Each	2.20	$61,000	$105,000	Includes paving and signage (signs, posts, and foundations) - approximately 22,500 sf	0.97	0.97	Assumed - similar to Install Other General Warning Signs; CMF applied to crashes within 0.25 miles after sign
Formalize Pullout (Large)	$80,500	1.74	$140,070	Each	2.20	$177,100	$308,000	Includes paving and signage (signs, posts, and foundations) - approximately 70,000 sf	0.97	0.97	Assumed - similar to Install Other General Warning Signs; CMF applied to crashes within 0.25 miles after sign
INTERSECTION IMPROVEMENTS											
Construct Traffic Signal	$150,000	1.74	$261,000	Each	2.20	$330,000	$574,000	4-legged intersection; includes poles, foundations, conduit, controller, heads, luminaires, mast arms, etc.	0.95	0.95	From HSM; CMF applied to crashes within intersection only
Improve Signal Visibility	$35,000	1.74	$60,900	Each	2.20	$77,000	$134,000	4-legged intersection; signal head size upgrade, installation of new back-plates, and installation of additional signal heads on new poles.	0.85	0.85	Average of 7 values from clearinghouse; CMF applied to crashes within intersection only
Install Raised Median	$360,000	1.74	$626,400	Mile	2.20	$792,000	$1,378,000	Includes removal of 14' wide pavement and construction of curb & gutter; does not include cost to widen roadway to accommodate the median; if the roadway needs to be widened, include cost from New General Purpose Lane	0.83	0.83	Average from HSM
Install Transverse Rumble Strip/Pavement Markings	$3,000	1.74	$5,220	Each	2.20	$7,000	$11,000	Includes pedestrian markings and rumble strips only across a 30' wide travelway; no pavement rehab or other striping	0.95	0.95	Average of 17 values from clearinghouse; CMF applied to crashes within 0.5 miles after the rumble strips and markings
Construct Single-Lane Roundabout	$1,500,000	1.74	$2,610,000	Each	2.20	$3,300,000	$5,742,000	Removal of signal at 4-legged intersection; realignment of each leg for approx. 800 feet including paving, curbs, sidewalk, striping, lighting, signing	0.22	0.22	From HSM; CMF applied to crashes within intersection only
Construct Double-Lane Roundabout	$1,800,000	1.74	$3,132,000	Each	2.20	$3,960,000	$6,890,000	Removal of signal at 4-legged intersection; realignment of each leg for approx. 800 feet including paving, curbs, sidewalk, striping, lighting, signing	0.40	0.40	From HSM; CMF applied to crashes within intersection only
Install Indirect Left Turn Intersection	$1,140,000	1.74	$1,983,600	each	2.20	$2,500,000	$4,364,000	Raised concrete median improvements; intersection improvements; turn lanes	0.80	0.76	Updated to include 2 additional values (in addition to 1 previous value) from CMF Clearinghouse

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
Convert Standard Diamond Interchange to Diverging Diamond Interchange	$2,272,700	1.74	$3,954,498	each	2.20	$5,000,000	$8,700,000	Convert traditional diamond interchange into diverging diamond interchange; assumes re-use of existing bridges	0.67	0.56	Updated to include 2 additional values (in addition to 1 previous value) from CMF Clearinghouse
Left-in Only Center Raised Median Improvements	$84,100	1.74	$146,334	each	2.20	$185,000	$322,000	Left-in only center raised median improvements	0.87	0.87	CMF Clearinghouse
ROADWAY DELINEATION											
Install High-Visibility Edge Line Striping	$10,800	1.25	$13,500	Mile	2.20	$23,800	$29,700	2 edge lines and lane line - one direction of travel	0.77	0.77	Average of 3 values from clearinghouse. Assumes package of striping, delineators, and RPMs. (If implemented separately, CMF will be higher.)
Install High-Visibility Delineators	$6,500	1.25	$8,125	Mile	2.20	$14,300	$17,900	Both edges - one direction of travel			Average of 3 values from clearinghouse. Assumes package of striping, delineators, and RPMs. (If implemented separately, CMF will be higher.)
Install Raised Pavement Markers	$2,000	1.25	$2,500	Mile	2.20	$4,400	$5,500	Both edges - one direction of travel			Average of 3 values from clearinghouse. Assumes package of striping, delineators, and RPMs. (If implemented separately, CMF will be higher.)
Install In-Lane Route Markings	$6,000	1.25	$7,500	Each	2.20	$13,200	$16,500	Installation of a series of three in-lane route markings in one lane	0.95	0.95	Assumed; CMF applied to crashes within 1.0 mile before the gore
IMPROVED VISIBILITY											
Cut Side Slopes	$80	1.74	$139	LF	2.20	$200	$300	For small grading to correct sight distance issues; not major grading	0.85	0.85	Intent of this solution is to improve sight distance. Most CMF's are associated with vehicles traveling on slope. Recommended CMF is based on FDOT and NCDOT but is more conservative.
Install Lighting (connect to existing power)	$270,000	1.74	$469,800	Mile	2.20	$594,000	$1,034,000	One side of road only; offset lighting, not high-mast; does not include power supply; includes poles, luminaire, pull boxes, conduit, conductor	0.75 (night)	0.75 (night)	Average of 3 values on clearinghouse & consistent with HSM

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
Install Lighting (solar powered LED)	$10,000	1.74	$17,400	Pole	2.20	$22,000	$38,300	Offset lighting, not high-mast; solar power LED; includes poles, luminaire, solar panel	0.75 (night)	0.75 (night)	Average of 3 values on clearinghouse & consistent with HSM
DRIVER INFORMATION/WARNING											
Install Dynamic Message Sign (DMS)	$250,000	1.25	$312,500	Each	2.20	$550,000	$688,000	Includes sign, overhead structure, and foundations; wireless communication; does not include power supply	1.00	1.00	Not expected to reduce crashes
Install Dynamic Weather Warning Beacons	$40,000	1.25	$50,000	Each	2.20	$88,000	$110,000	Assumes solar operation and wireless communication or connection to existing power and communication; ground mounted; includes posts, foundations, solar panel, and dynamic sign	0.80 (weather-related)	0.80 (weather-related)	Average of 3 values from FHWA Desktop Reference for Crash Reduction Factors; CMF applies to crashes within 0.25 miles after a sign
Install Dynamic Speed Feedback Signs	$25,000	1.25	$31,250	Each	2.20	$55,000	$68,800	Assumes solar operation and no communication; ground mounted; includes regulatory sign, posts, foundations, solar panel, and dynamic sign	0.94	0.94	Average of 2 clearinghouse values; CMF applies to crashes within 0.50 miles after a sign
Install Chevrons	$18,400	1.25	$23,000	Mile	2.20	$40,500	$50,600	On one side of road - includes signs, posts, and foundations	0.79	0.79	Average of 11 clearinghouse values
Install Curve Warning Signs	$2,500	1.25	$3,125	Each	2.20	$5,500	$6,900	Includes 2 signs, posts, and foundations	0.83	0.83	Average of 4 clearinghouse values; CMF applies to crashes within 0.25 miles after a sign
Install Traffic Control Device Warning Signs (e.g., stop sign ahead, signal ahead, etc.)	$2,500	1.25	$3,125	Each	2.20	$5,500	$6,900	Includes 2 signs, posts, and foundations	0.85	0.85	FHWA Desktop Reference for Crash Reduction Factors; CMF applies to crashes within 0.25 miles after a sign
Install Other General Warning Signs (e.g., intersection ahead, wildlife in area, slow vehicles, etc.)	$2,500	1.25	$3,125	Each	2.20	$5,500	$6,900	Includes 2 signs, posts, and foundations	0.97	0.97	Assumed; CMF applies to crashes within 0.25 miles after a sign

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
Install Wildlife Warning System	$162,000	1.25	$202,500	Each	2.20	$356,400	$446,000	Includes wildlife detection system at a designated wildlife crossing, flashing warning signs (assumes solar power), advance signing, CCTV (solar and wireless), game fencing for approximately 0.25 miles in each direction - centered on the wildlife crossing, and regular fencing for 1.0 mile in each direction - centered on the wildlife crossing.	0.50 (wildlife)	0.50 (wildlife)	Assumed; CMF applies to wildlife-related crashes within 0.5 miles both upstream and downstream of the wildlife crossing in both directions
Install Warning Sign with Beacons	$15,000	1.25	$18,750	Each	2.20	$33,000	$41,300	In both directions; includes warning sign, post, and foundation, and flashing beacons (assumes solar power) at one location	0.75	0.75	FHWA Desktop Reference for Crash Reduction Factors for Installing Flashing Beacons as Advance Warning; CMF applies to crashes within 0.25 miles after a sign
DATA COLLECTION											
Install Roadside Weather Information System (RWIS)	$60,000	1.25	$75,000	Each	2.20	$132,000	$165,000	Assumes wireless communication and solar power, or connection to existing power and communications	1.00	1.00	Not expected to reduce crashes
Install Closed Circuit Television (CCTV) Camera	$25,000	1.25	$31,250	Each	2.20	$55,000	$68,800	Assumes connection to existing ITS backbone or wireless communication; does not include fiber-optic backbone infrastructure; includes pole, camera, etc.	1.00	1.00	Not expected to reduce crashes
Install Vehicle Detection Stations	$15,000	1.25	$18,750	Each	2.20	$33,000	$41,300	Assumes wireless communication and solar power, or connection to existing power and communications	1.00	1.00	Not expected to reduce crashes
Install Flood Sensors (Activation)	$15,000	1.25	$18,750	Each	2.20	$33,000	$41,300	Sensors with activation cabinet to alert through texting (agency)	1.00	1.00	Not expected to reduce crashes
Install Flood Sensors (Gates)	$100,000	1.25	$125,000	Each	2.20	$220,000	$275,000	Sensors with activation cabinet to alert through texting (agency) and beacons (public) plus gates	1.00	1.00	Not expected to reduce crashes
WIDEN CORRIDOR											
Construct New General Purpose Lane (PCCP)	$1,740,000	1.74	$3,027,600	Mile	2.20	$3,830,000	$6,660,000	For addition of 1 GP lane (PCCP) in one direction; includes all costs except bridges; for generally at-grade facility with minimal walls and no major drainage improvements	0.90	0.90	North Carolina DOT uses 0.90 and Florida DOT uses 0.87

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
Construct New General Purpose Lane (AC)	$1,200,000	1.74	$2,088,000	Mile	2.20	$2,640,000	$4,590,000	For addition of 1 GP lane (AC) in one direction; includes all costs except bridges; for generally at-grade facility with minimal walls and no major drainage improvements	0.90	0.90	North Carolina DOT uses 0.90 and Florida DOT uses 0.88
Convert a 2-Lane undivided highway to a 5-Lane highway	$1,576,000	1.74	$2,742,240	Mile	2.20	$3,467,200	$6,030,000	For expanding a 2-lane undivided highway to a 5-lane highway (4 through lanes with TWLTL), includes standard shoulder widths but no curb, gutter, or sidewalks	0.60	0.60	Assumed to be slightly lower than converting from a 4-lane to a 5-lane highway
Install Center Turn Lane	$1,053,000	1.74	$1,832,220	Mile	2.20	$2,316,600	$4,030,000	For adding a center turn lane (i.e., TWLTL); assumes symmetrical widening on both sides of the road; includes standard shoulder widths but no curb, gutter, or sidewalk	0.75	0.75	From FHWA Desktop Reference for Crash Reduction Factors, CMF Clearinghouse, and SR 87 CPS comparison
Construct 4-Lane Divided Highway (Using Existing 2-Lane Road for one direction)	$3,000,000	1.74	$5,220,000	Mile	2.20	$6,600,000	$11,484,000	In both directions; one direction uses existing 2-lane road; other direction assumes addition of 2 new lanes (AC) with standard shoulders; includes all costs except bridges	0.67	0.67	Assumed
Construct 4-Lane Divided Highway (No Use of Existing Roads)	$6,000,000	1.74	$10,440,000	Mile	2.20	$13,200,000	$22,968,000	In both directions; assumes addition of 2 new lanes (AC) with standard shoulders in each direction; includes all costs except bridges	0.67	0.67	Assumed
Construct Bridge over At-Grade Railroad Crossing	$10,000,000	1.74	$17,400,000	Each	2.20	$22,000,000	$38,280,000	Assumes bridge width of 4 lanes (AC) with standard shoulders; includes abutments and bridge approaches; assumes vertical clearance of 23'4" + 6'8" superstructure	0.72 (All train-related crashes eliminated)	0.72 (All train-related crashes eliminated)	Removes all train-related crashes at at-grade crossing; all other crashes CMF = 0.72
Construct Underpass at At-Grade Railroad Crossing	$15,000,000	1.74	$26,100,000	Each	2.20	$33,000,000	$57,420,000	Assumes underpass width of 4 lanes (AC) with standard shoulders; includes railroad bridge with abutments and underpass approaches; assumes vertical clearance of 16'6" + 6'6" superstructure	0.72 (All train-related crashes eliminated)	0.72 (All train-related crashes eliminated)	Removes all train-related crashes at at-grade crossing; all other crashes CMF = 0.72
Construct High-Occupancy Vehicle (HOV) Lane	$900,000	1.74	$1,566,000	Mile	2.20	$1,980,000	$3,445,000	For addition of 1 HOV lane (AC) in one direction with associated signage and markings; includes all costs except bridges; for generally at-grade facility with minimal walls and no major drainage improvements	0.95	0.95	Similar to general purpose lane

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
ALTERNATE ROUTE											
Construct Frontage Roads	$2,400,000	1.74	$4,176,000	Mile	2.20	$5,280,000	$9,190,000	For 2-lane AC frontage road; includes all costs except bridges; for generally at-grade facility with minimal walls	0.90	0.90	Assumed - similar to new general purpose lane
Construct 2-Lane Undivided Highway	$3,000,000	1.74	$5,220,000	Mile	2.20	$6,600,000	$11,484,000	In both directions; assumes addition of 2 new lanes (AC) with standard shoulders in each direction; includes all costs except bridges	0.90	0.90	Assuming new alignment for a bypass

^ Factor accounts for traffic control, erosion control, construction surveying and quality control, mobilization, construction engineering, contingencies, indirect cost allocation, and miscellaneous work

Appendix G: Performance Area Risk Factors

Pavement Performance Area

- Elevation
- Mainline Daily Traffic Volume
- Mainline Daily Truck Volume

Elevation

Variance above 4000' divided by 1000; (Elev-4000)/1000

Score	Condition
0	< 4000’
0-5	4000’- 9000’
5	> 9000’

Mainline Daily Traffic Volume

Exponential equation; score = $5-(5*e^{(ADT*-0.000039)})$

Score	Condition
0	< 6,000
0-5	6,000 – 160,000
5	>160,000

Mainline Daily Truck Volume

Exponential equation; score = $5-(5*e^{(ADT*-0.00025)})$

Score	Condition
0	<900
0-5	900-25,000
5	>25,000

Bridge Performance Area

- Mainline Daily Traffic Volume
- Elevation
- Carries Mainline Traffic
- Detour Length
- Scour Critical Rating
- Vertical Clearance

Mainline Daily Traffic Volume

Exponential equation; score = $5-(5*e^{(ADT*-0.000039)})$

Score	Condition
0	<6,000
0-5	6,000-160,000
5	>160,000

Elevation

Variance above 4000' divided by 1000; (Elev-4000)/1000

Score	Condition
0	< 4000’
0-5	4000’- 9000’
5	> 9000’

Carries Mainline Traffic

Score	Condition
0	Does not carry mainline traffic
5	Carries mainline traffic

Detour Length

Divides detour length by 10 and multiplies by 2.5

Score	Condition
0	0 miles
0-5	0-20 miles
5	> 20 miles

Scour Critical Rating

Variance below 8

Score	Condition
0	Rating > 8
0-5	Rating 8 - 3
5	Rating < 3

Vertical Clearance

Variance below 16’ x 2.5; (16 –Clearance) x 2.5

Score	Condition
0	>16’
0-5	16’-14’
5	<14’

Mobility Performance Area

- Mainline VMT
- Detour Length
- Outside Shoulder Width

Mainline VMT

Exponential equation; score = 5-(5*e(ADT*-0.0000139))

Score	Condition
0	<16,000
0-5	16,000-400,000
5	>400,000

Detour Length

Score	Condition
0	Detour < 10 miles
5	Detour > 10 miles

Outside Shoulder Width

Variance below 10', if only 1 lane in each direction

Score	Condition
0	10' or above or >1 lane in each direction
0-5	10'-5' and 1 lane in each direction
5	5' or less and 1 lane in each direction

Safety Performance Area

- Mainline Daily Traffic Volume
- Interrupted Flow
- Elevation
- Outside Shoulder Width
- Vertical Grade

Mainline Daily Traffic Volume

Exponential equation; score = $5-(5*e^{(ADT*-0.000039)})$

Score	Condition
0	<6,000
0-5	6,000-160,000
5	>160,000

Interrupted Flow

Score	Condition
0	Not interrupted flow
5	Interrupted Flow

Elevation

Variance above 4000' divided by 1000; (Elev-4000)/1000

Score	Condition
0	< 4000'
0-5	4000'- 9000'
5	> 9000'

Outside Shoulder Width

Variance below 10'

Score	Condition
0	10' or above
0-5	10' - 5'
5	5' or less

Grade

Variance above 3% x 1.5

Score	Condition
0	< 3%
0-5	3% - 6.33%
5	>6.33%

Freight Performance Area

- Mainline Daily Truck Volume
- Detour Length
- Outside Shoulder Width

Mainline Daily Truck Volume

Exponential equation; score = $5-(5*e^{(ADT*-0.00025)})$

Score	Condition
0	<900
0-5	900-25,000
5	>25,000

Detour Length

Score	Condition
0	Detour < 10 miles
5	Detour > 10 miles

Outside Shoulder Width

Variance below 10', if only 1 lane in each direction

Score	Condition
0	10' or above or >1 lane in each direction
0-5	10'-5' and 1 lane in each direction
5	5' or less and 1 lane in each direction

Solution Number	Mainline Traffic Vol (vpd) (2-way)	Solution Length (miles)	Bridge Detour Length (miles) (N19)	Elevation (ft)	Scour Critical Rating (0-9)	Carries Mainline Traffic (Y/N)	Bridge Vert. Clear (ft)	Mainline Truck Vol (vpd) (2-way)	Detour Length > 10 miles (Y/N)	Grade (%)	Interrupted Flow (Y/N)	Outside/ Right Shoulder Width (ft)	1-lane each direction
CS10E.1	42,652	3		1,566				7,238	Y	0.9	N	12	N
CS10E.2	42,652	3		1,566				7,238	Y	0.9	N	12	N
CS10E.3A	42,652		10	1,566	8	N	16.03	7,238	Y	0.8	N	12	N
CS10E.3B	42,652			1,566				7,238	Y	0.8	N	12	N
CS10E.4A	42,652		2	1,566	8	N	15.76	7,238	Y	0.2	N	12	N
CS10E.4B	42,652			1,566				7,238	Y	0.2	N	12	N
CS10E.5A	42,652		6	1,566	8	N	16.17	7,238	Y	0	N	12	N
CS10E.5B	42,652			1,566				7,238	Y	0	N	12	N
CS10E.6A	42,652		2	1,566	8	N	16.17	7,238	Y	0.8	N	12	N
CS10E.6B	42,652			1,566				10,195	Y	0.8	N	10.7	N
CS10E.7A	40,711		2	1,753	8	N	16.03	10,195	Y	0.8	N	10.7	N
CS10E.7B	40,711			1,753				10,195	Y	0.8	N	10.7	N
CS10E.8A	40,711		2	1,753	8	N	15.97	10,195	Y	0	N	10.7	N
CS10E.8B	40,711			1,753				10,195	Y	0	N	10.7	N
CS10E.9A	42,501		15	1,886	8	N	15.84			1.3	N	11.2	
CS10E.9B	42,501		15	1,886	8	N	15.84			1.3	N	11.2	
CS10E.10	42,501	18		1,997				8,145	Y	0.95	N	11.2	N
CS10E.11	42,501	18		1,997				8,145	Y	0.95	N	11.2	N
CS10E.12	57,522	6		2,093				10,034	N	1.7	N	10	N
CS10E.13	57,522	6		2,093				10,034	N	1.7	N	10	N
CS10E.14A	144,420	7		2,495				13,455	N	0.8	N	11.1	N
CS10E.14B	144,420	7		2,495				13,455	N	0.8	N	11.1	N
CS10E.14C	144,420	7		2,495				13,455	N	0.8	N	11.1	N
CS10E.15A	58,955	12		2,885				11,609	Y	0.76	N	9.7	N
CS10E.15B	58,955	12		2,885				11,609	Y	0.76	N	9.7	N
CS10E.15C	58,955	12		2,885				11,609	Y	0.76	N	9.7	N
CS10E.16	58,955	11		2,885				11,609	Y	0.76	N	9.7	N
CS10E.17	27,529	12		3,869				8,455	Y	1.35	N	9.7	N
CS10E.18	27,529	5		3,733				8,455	Y	1.35	N	9.7	N
CS10E.19	27,529	2		3,733				8,455	Y	2.6	N	9.7	N
CS10E.20A	21,141	3		4,198				6,563	Y	2.6	N	10.2	N
CS10E.20B	21,141			4,198				6,563	Y	2.6	N	10.2	N
CS10E.21	21,141	23		4,217				6,563	Y	2.6	N	10.2	N
CS10E.22	17,915	2		4,973				7,205	Y	4	N	10	N
CS10E.23	17,915	2		4,982				7,205	Y	4	N	10	N
CS10E.24	17,915	1		4,981				7,205	Y	4.5	N	10	N
CS10E.25A	17,915			4,975				7,205		2.4	N	10	
CS10E.25B	17,915			4,975				7,205		2.4	N	10	

CS10E.26A	17,915			4,552				7,205		1.7	N	10	
CS10E.26B	17,915			4,552				7,205		1.7	N	10	
CS10E.26B	17,915			4,552				7,205		1.7	N	10	
CS10E.27A	17,915		30	4,244	8	N	16.40			1	N	10	
CS10E.27B	17,915		30	4,244	8	N	16.40			1	N	10	
CS10E.28A	16,882		2	4,182	8	N	15.96	6,333	Y	0	N	10	N
CS10E.28B	16,882		2	4,182	8	N	15.96	6,333	Y	0	N	10	N
CS10E.29	13,514	18		4,161				5,103	Y	1.31	N	9.9	N
CS10E.26B	17,915			4,552				7,205		1.7	N	10	
CS10E.27A	17,915		30	4,244	8	N	16.40			1	N	10	
CS10E.27B	17,915		30	4,244	8	N	16.40			1	N	10	
CS10E.28A	16,882		2	4,182	8	N	15.96	6,333	Y	0	N	10	N
CS10E.28B	16,882		2	4,182	8	N	15.96	6,333	Y	0	N	10	N
CS10E.29	13,514	18		4,161				5,103	Y	1.31	N	9.9	N

Solution Number	Bridge	Pavement	Mobility	Safety	Freight	Risk Score (0 to 10)				
						Bridge	Pavement	Mobility	Safety	Freight
CS10E.1	N	N	Y	Y	Y	0.00	0.00	6.10	1.62	6.13
CS10E.2	N	N	Y	Y	Y	0.00	0.00	6.10	1.62	6.13
CS10E.3A	Y	N	N	Y	Y	3.01	0.00	0.00	1.62	6.13
CS10E.3B	N	N	N	Y	Y	0.00	0.00	0.00	1.62	6.13
CS10E.4A	Y	N	N	Y	Y	1.88	0.00	0.00	1.62	6.13
CS10E.4B	N	N	N	Y	Y	0.00	0.00	0.00	1.62	6.13
CS10E.5A	Y	N	N	Y	Y	2.35	0.00	0.00	1.62	6.13
CS10E.5B	N	N	N	Y	Y	0.00	0.00	0.00	1.62	6.13
CS10E.6A	Y	N	N	Y	Y	1.68	0.00	0.00	1.62	6.13
CS10E.6B	N	N	N	Y	Y	0.00	0.00	0.00	1.62	6.41
CS10E.7A	Y	N	N	Y	Y	1.65	0.00	0.00	1.59	6.41
CS10E.7B	N	N	N	Y	Y	0.00	0.00	0.00	1.59	6.41
CS10E.8A	Y	N	N	Y	Y	1.68	0.00	0.00	1.59	6.41
CS10E.8B	N	N	N	Y	Y	0.00	0.00	0.00	1.59	6.41
CS10E.9A	Y	N	N	Y	N	3.14	0.00	0.00	1.61	0.00
CS10E.9B	Y	N	N	Y	N	3.14	0.00	0.00	1.61	0.00
CS10E.10	N	N	Y	Y	Y	0.00	0.00	6.67	1.61	6.24
CS10E.11	N	N	Y	Y	Y	0.00	0.00	6.67	1.61	6.24
CS10E.12	N	N	Y	Y	Y	0.00	0.00	3.31	1.78	3.07
CS10E.13	N	N	Y	Y	Y	0.00	0.00	3.31	1.78	3.07
CS10E.14A	N	N	Y	Y	Y	0.00	0.00	3.33	1.99	3.22

CS10E.14B	N	N	Y	Y	Y	0.00	0.00	3.33	1.99	3.22
CS10E.14C	N	N	Y	Y	Y	0.00	0.00	3.33	1.99	3.22
CS10E.15A	N	N	Y	Y	Y	0.00	0.00	6.67	1.91	6.49
CS10E.15B	N	N	Y	Y	Y	0.00	0.00	6.67	1.91	6.49
CS10E.15C	N	N	Y	Y	Y	0.00	0.00	6.67	1.91	6.49
CS10E.16	N	N	Y	Y	Y	0.00	0.00	6.67	1.91	6.49
CS10E.17	N	N	Y	Y	Y	0.00	0.00	6.63	1.43	6.27
CS10E.18	N	Y	Y	Y	Y	0.00	5.12	6.17	1.43	6.27
CS10E.19	N	N	Y	Y	Y	0.00	0.00	5.11	1.43	6.27
CS10E.20A	N	Y	Y	Y	Y	0.00	4.69	5.29	1.20	6.03
CS10E.20B	N	Y	N	Y	Y	0.00	4.69	0.00	1.20	6.03
CS10E.21	N	N	Y	Y	Y	0.00	0.00	6.66	1.20	6.03
CS10E.22	N	N	Y	Y	Y	0.00	0.00	4.64	1.99	6.12
CS10E.23	N	N	Y	Y	Y	0.00	0.00	4.64	1.99	6.12
CS10E.24	N	N	Y	Y	Y	0.00	0.00	4.07	2.29	6.12
CS10E.25A	N	Y	N	Y	N	0.00	5.10	0.00	1.39	0.00
CS10E.25B	N	Y	N	Y	N	0.00	5.10	0.00	1.39	0.00
CS10E.26A	N	Y	N	Y	N	0.00	4.82	0.00	1.22	0.00
CS10E.26B	N	Y	N	Y	N	0.00	4.82	0.00	1.22	0.00
CS10E.27A	Y	N	N	Y	N	2.58	0.00	0.00	1.10	0.00
CS10E.27B	Y	N	N	Y	N	2.58	0.00	0.00	1.10	0.00
CS10E.28A	Y	N	N	Y	Y	1.23	0.00	0.00	1.03	5.99
CS10E.28B	Y	N	N	Y	Y	1.23	0.00	0.00	1.03	5.99
CS10E.29	N	N	Y	Y	Y	0.00	0.00	6.55	0.92	5.74

Appendix H: Candidate Solution Cost Estimates

Solution #	Location #	Name	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Option	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost (assuming $12/sf)	Construction Cost	Total Cost	Notes	CMF
CS10E.1	L2	Casa Grande Lighting Improvements	M	-	Install Lighting (EB)	187	190	Mile	3	$1,034,000	$93,100	$310,200		$3,102,000	$3,505,300		0.75
					Install Lighting (WB)	187	190	Mile	3	$1,034,000	$93,100	$310,200		$3,102,000	$3,505,300		0.75
										Solution Total	**$186,200**	**$620,400**	**$0**	**$6,204,000**	**$7,010,600**		
CS10E.2	L2	Casa Grande Safety Improvements	M	-	Rehabilitate Shoulders (AC) (EB)	187	190	Mile	3	$433,000	$39,000	$129,900		$1,299,000	$1,467,900	Shoulder width varies across project length but appears to average to 14' total shoulder in each direction so cost was not adjusted	0.72
					Rehabilitate Shoulders (AC) (WB)	187	190	Mile	3	$433,000	$39,000	$129,900		$1,299,000	$1,467,900		0.72
					Install Dynamic Message Sign (DMS) (EB)	190	190	Each	1	$688,000	$20,600	$68,800		$688,000	$777,400		1
					Install Dynamic Message Sign (DMS) (WB)	190	190	Each	1	$688,000	$20,600	$68,800		$688,000	$777,400		1
										Solution Total	**$119,200**	**$397,400**	**$0**	**$3,974,000**	**$4,490,600**		
CS10E.3	L3	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	M	A	Replace Bridge (Medium)	188.2	188.2	SF	10400	$610	$190,300	$634,400		$6,344,000	$7,168,700		0.95
										Option A: Solution Total	**$190,300**	**$634,400**	**$0**	**$6,344,000**	**$7,168,700**		
			M	B	Re-profile Roadway	188.2	188.2	Mile	1	$12,756,600	$382,700	$1,275,700		$12,756,600	$14,415,000	cost is for 38' roadway in one direction. Multiplied by 2 for both directions and factored up 1.71 for 65' in each direction	0.7
										Option B: Solution Total	**$382,700**	**$1,275,700**	**$0**	**$12,756,600**	**$14,415,000**		

Solution #	Location #	Name	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Option	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost (assuming $12/sf)	Construction Cost	Total Cost	Notes	CMF
CS10E.4	L4	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	M	A	Replace Bridge (Medium)	193.88	193.88	SF	15275.0	$610	$279,500	$931,800		$9,317,750	$10,529,050		0.95
					Option A: Solution Total						**$279,500**	**$931,800**	**$0**	**$9,317,750**	**$10,529,050**		
			M	B	Re-profile Roadway	193.88	193.88	Mile	1.0	$12,756,600	$382,700	$1,275,700		$12,756,600	$14,415,000	cost is for 38' roadway in one direction. Multiplied by 2 for both directions and factored up 1.71 for 65' in each direction	0.7
					Option B: Solution Total						**$382,700**	**$1,275,700**	**$0**	**$12,756,600**	**$14,415,000**		
CS10E.5	L5	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	M	A	Replace Bridge	195.89	195.89	SF	16000.0	$610	$292,800	$976,000		$9,760,000	$11,028,800		0.95
					Option A: Solution Total						**$292,800**	**$976,000**	**$0**	**$9,760,000**	**$11,028,800**		
			M	B	Re-profile Roadway	195.89	195.89	Mile	1.0	$11,786,800	$353,600	$1,178,700		$11,786,800	$13,319,100	cost is for 38' roadway in one direction. Multiplied by 2 for both directions and factored up 1.58 for 60' in each direction	0.7
					Option B: Solution Total						**$353,600**	**$1,178,700**	**$0**	**$11,786,800**	**$13,319,100**		
CS10E.6	L6	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	M	A	Replace Bridge (Medium)	196.89	196.89	SF	14000.0	$610	$256,200	$854,000		$8,540,000	$9,650,200		0.95
					Option A: Solution Total						**$256,200**	**$854,000**	**$0**	**$8,540,000**	**$9,650,200**		
			M	B	Re-profile Roadway	196.89	196.89	Mile	1.0	$12,756,600	$382,700	$1,275,700		$12,756,600	$14,415,000	cost is for 38' roadway in one direction. Multiplied by 2 for both directions and factored up	0.7

Solution #	Location #	Name	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Option	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost (assuming $12/sf)	Construction Cost	Total Cost	Notes	CMF
																1.71 for 65' in each direction	
					Option B: Solution Total						**$382,700**	**$1,275,700**	**$0**	**$12,756,600**	**$14,415,000**		
CS10E.7	L9	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	M	A	Replace Bridge (Medium)	205.45	205.45	SF	11250.0	$610	$205,900	$686,300		$6,862,500	$7,754,700		0.95
					Option A: Solution Total						**$205,900**	**$686,300**	**$0**	**$6,862,500**	**$7,754,700**		
			M	B	Re-profile Roadway	205.45	205.45	Mile	1.0	$11,786,800	$353,600	$1,178,700		$11,786,800	$13,319,100	cost is for 38' roadway in one direction. Multiplied by 2 for both directions and factored up 1.58 for 60' in each direction	0.7
					Option B: Solution Total						**$353,600**	**$1,178,700**	**$0**	**$11,786,800**	**$13,319,100**		
CS10E.8	L10	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	M	A	Replace Bridge (Medium)	207.17	207.17	SF	12000.0	$610	$219,600	$732,000		$7,320,000	$8,271,600		0.95
					Option A: Solution Total						**$219,600**	**$732,000**	**$0**	**$7,320,000**	**$8,271,600**		
			M	B	Re-profile Roadway	207.17	207.17	Mile	1.0	$12,756,600	$382,700	$1,275,700		$12,756,600	$14,415,000	cost is for 38' roadway in one direction. Multiplied by 2 for both directions and factored up 1.71 for 65' in each direction	0.7
					Option B: Solution Total						**$382,700**	**$1,275,700**	**$0**	**$12,756,600**	**$14,415,000**		
CS10E.9	L12	Red Rock TI UP (#592) Bridge Project	M	A	Rehabilitate Bridge	226.45	226.45	SF	4400.0	$250	$33,000	$110,000		$1,100,000	$1,243,000		0.95
					Option A: Solution Total						**$33,000**	**$110,000**	**$0**	**$1,100,000**	**$1,243,000**		

Solution #	Location #	Name	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Option	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost (assuming $12/sf)	Construction Cost	Total Cost	Notes	CMF
			M	B	Replace Bridge (Short)	226.45	226.45	SF	4400.0	$480	$63,400	$211,200		$2,112,000	$2,386,600	No specific SF for Short denotation, Short chosen because less than 5k SF	0.95
					Option B: Solution Total						**$63,400**	**$211,200**	**$0**	**$2,112,000**	**$2,386,600**		
CS10E.10	L13	Picacho Safety Improvements	M	-	Rehabilitate Shoulders (AC) (EB)	218	236	Mile	18.0	$720,120	$388,900	$1,296,200		$12,962,160	$14,647,260	Shoulder width varies across project length but appears to average to 25' total shoulder in each direction so cost for mill and replace ($358,900) adjusted by 1.8	0.72
					Rehabilitate Shoulders (AC) (WB)	218	236	Mile	18.0	$720,120	$388,900	$1,296,200		$12,962,160	$14,647,260		0.72
					Solution Total						**$777,800**	**$2,592,400**	**$0**	**$25,924,320**	**$29,294,520**		
CS10E.11	L13	Picacho Lighting Improvements	M	-	Install Lighting (EB)	218	236	Mile	18.0	$1,034,000	$558,400	$1,861,200		$18,612,000	$21,031,600		0.75
					Install Lighting (WB)	218	236	Mile	18.0	$1,034,000	$558,400	$1,861,200		$18,612,000	$21,031,600		0.75
					Solution Total						**$1,116,800**	**$3,722,400**	**$0**	**$37,224,000**	**$42,063,200**		
CS10E.12	L14	Marana Safety Improvements	M	-	Rehabilitate Shoulders (AC) (EB)	236	242	Mile	6.0	$720,120	$129,600	$432,100		$4,320,720	$4,882,420	Shoulder width varies across project length but appears to average to 25' total shoulder in each direction so cost for mill and replace ($358,900) adjusted by 1.8	0.72
					Rehabilitate Shoulders (AC) (WB)	236	242	Mile	6.0	$720,120	$129,600	$432,100		$4,320,720	$4,882,420		0.72

Solution #	Location #	Name	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Option	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost (assuming $12/sf)	Construction Cost	Total Cost	Notes	CMF
					Solution Total						**$259,200**	**$864,200**	**$0**	**$8,641,440**	**$9,764,840**		
CS10E.13	L14	Marana Lighting Improvements	M	-	Install Lighting (EB)	236	242	Mile	6.0	$1,034,000	$186,100	$620,400		$6,204,000	$7,010,500		0.75
					Install Lighting (WB)	236	242	Mile	6.0	$1,034,000	$186,100	$620,400		$6,204,000	$7,010,500		0.75
					Solution Total						**$372,200**	**$1,240,800**	**$0**	**$12,408,000**	**$14,021,000**		
CS10E.14	L20/L21/L22	Tucson Mobility, Safety, and Freight Improvements	E	A	Construct General Purpose Lane	255	262	Mile	14.0	$4,590,000	$1,930,000	$6,430,000	$10,644,480	$64,260,000	$83,264,480	R/W acquisition cost from previous round	0.9
					Widen Grant Road TI OP	256.15	256.15	SF	4800	$670	$100,000	$320,000	$0	$3,216,000	$3,636,000		0.9
					Widen Speedway Blvd TI OP	257.31	257.31	SF	5040	$670	$100,000	$340,000	$0	$3,376,800	$3,816,800		0.9
					Widen St Marys Road TI OP	257.76	257.76	SF	4320	$670	$90,000	$290,000	$0	$2,894,400	$3,274,400		0.9
					Widen Congress St TI OP	258.4	258.4	SF	5040	$670	$100,000	$340,000	$0	$3,376,800	$3,816,800		0.9
					Widen Clark St OP	258.63	258.63	SF	9000	$670	$180,000	$600,000	$0	$6,030,000	$6,810,000		0.9
					Widen 18th St OP	259	259	SF	3360	$670	$70,000	$230,000	$0	$2,251,200	$2,551,200		0.9
					Widen 22nd St TI OP	259.35	259.35	SF	4920	$670	$100,000	$330,000	$0	$3,296,400	$3,726,400		0.9
					Widen 29th Street TI OP EB	259.83	259.83	SF	3600	$670	$70,000	$240,000	$0	$2,412,000	$2,722,000		0.9
					Widen 29th Street TI OP WB	259.83	259.83	SF	3600	$670	$70,000	$240,000	$0	$2,412,000	$2,722,000		0.9
					Widen 10th Ave OP	260.55	260.55	SF	5640	$670	$110,000	$380,000	$0	$3,778,800	$4,268,800		0.9
					Widen Veterans SPRR OP	261.41	261.41	SF	5400	$670	$110,000	$360,000	$0	$3,618,000	$4,088,000		0.9
					Widen Park Ave TI OP EB	261.72	261.72	SF	3840	$670	$80,000	$260,000	$0	$2,572,800	$2,912,800		0.9
					Widen Park Ave TI OP WB	261.72	261.72	SF	3840	$670	$80,000	$260,000	$0	$2,572,800	$2,912,800		0.9
					Option A: Solution Total						**$3,190,000**	**$10,620,000**	**$10,644,480**	**$106,068,000**	**$130,522,480**		

Solution #	Location #	Name	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Option	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost (assuming $12/sf)	Construction Cost	Total Cost	Notes	CMF
			M	B	Implement Ramp Metering (High)	255	262	Mile	14.0	$413,000	$173,500	$578,200	$0	$5,782,000	$6,533,700		0.64
					Option B: Solution Total						**$173,500**	**$578,200**	**$0**	**$5,782,000**	**$6,533,700**		
CS10E.15	L24/L25/ L26	East Tucson Mobility, Safety, and Freight Improvements	E	A	Construct General Purpose Lane	265	274	Mile	18.0	$4,590,000	$2,480,000	$8,260,000	$13,685,760	$82,620,000	$107,045,760		0.9
					Widen Drexel Rd EB Bridge	266	266	SF	1980	$670	$40,000	$130,000	$0	$1,326,600	$1,496,600		0.9
					Widen Drexel Rd WB Bridge	266	266	SF	1980	$670	$40,000	$130,000	$0	$1,326,600	$1,496,600		0.9
					Widen Valencia Rd EB Bridge	267.1	267.1	SF	2460	$670	$50,000	$160,000	$0	$1,648,200	$1,858,200		0.9
					Widen Valencia Rd WB Bridge	267.1	267.1	SF	2460	$670	$50,000	$160,000	$0	$1,648,200	$1,858,200		0.9
					Widen Earp Wash Trib EB Bridge	267.65	267.65	SF	1140	$607	$20,000	$70,000	$0	$691,980	$781,980		0.9
					Widen Earp Wash Trib WB Bridge	267.65	267.65	SF	1140	$670	$20,000	$80,000	$0	$763,800	$863,800		0.9
					Widen Craycroft EB Bridge	268.08	268.08	SF	2760	$670	$60,000	$180,000	$0	$1,849,200	$2,089,200		0.9
					Widen Craycroft WB Bridge	268.08	268.08	SF	2760	$670	$60,000	$180,000	$0	$1,849,200	$2,089,200		0.9
					Widen Wilmot Rd EB Bridge	269.36	269.36	SF	2700	$670	$50,000	$180,000	$0	$1,809,000	$2,039,000		0.9
					Widen Wilmot Rd WB Bridge	269.36	269.36	SF	2700	$670	$50,000	$180,000	$0	$1,809,000	$2,039,000		0.9
					Option A: Solution Total						**$2,920,000**	**$9,710,000**	**$13,685,760**	**$97,341,780**	**$123,657,540**		
			E	B	Construct Auxilary Lane	265	274	Mile	18.0	$3,499,000	$1,890,000	$6,300,000	$13,685,760	$62,982,000	$84,857,760		0.78
					Widen Drexel Rd EB Bridge	266	266	SF	1980	$670	$40,000	$130,000	$0	$1,326,600	$1,496,600		0.9
					Widen Drexel Rd WB Bridge	266	266	SF	1980	$670	$40,000	$130,000	$0	$1,326,600	$1,496,600		0.9
					Option B: Solution Total						**$1,970,000**	**$6,560,000**	**$13,685,760**	**$65,635,200**	**$87,850,960**		
			M	C	Implement Ramp Metering (High)	265	274	Mile	18.0	$413,000	$223,000	$743,400		$7,434,000	$8,400,400		0.64

Solution #	Location #	Name	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Option	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost (assuming $12/sf)	Construction Cost	Total Cost	Notes	CMF
					Widen Shoulder (AC) (EB)	265	274	Mile	9.0	$980,000	$264,600	$882,000		$8,820,000	$9,966,600		0.68
					Widen Shoulder (AC) (WB)	265	274	Mile	9.0	$980,000	$264,600	$882,000		$8,820,000	$9,966,600		0.68
					Install Dynamic Speed Feedback Signs	268	268	Each	2.0	$68,800	$4,100	$13,800		$137,600	$155,500		0.94
					Install Dynamic Message Sign (DMS) (EB)	266	266	Each	1.0	$688,000	$20,600	$68,800		$688,000	$777,400		1
					Option C: Solution Total						**$776,900**	**$2,590,000**	**$0**	**$25,899,600**	**$29,266,500**		
CS10E.16	L25	East Tucson Lighting Improvements	M	-	Install Lighting (EB)	263	274	Mile	11.0	$1,034,000	$341,200	$1,137,400		$11,374,000	$12,852,600		0.75
					Install Lighting (WB)	263	274	Mile	11.0	$1,034,000	$341,200	$1,137,400		$11,374,000	$12,852,600		0.75
					Solution Total						**$682,400**	**$2,274,800**	**$0**	**$22,748,000**	**$25,705,200**		
CS10E.17	L29/L30	Vail Mobility and Safety Improvements	M	-	Widen Left Shoulder (AC) (EB)	280	292	Mile	12.0	$1,339,212	$482,100	$1,607,100		$16,070,544	$18,159,744	Widening from approx. 2 ft to 10 ft. Widen cost adjusted by 2.0, rehab of right shoulder removed (included seperately) striping, RPM etc adjusted by half for left side only	0.68
					Widen Left Shoulder (AC) (WB)	280	292	Mile	12.0	$1,339,212	$482,100	$1,607,100		$16,070,544	$18,159,744		0.68
					Rehabilitate Right Shoulders (AC) (EB)	280	292	Mile	12.0	$291,869	$105,100	$350,200		$3,502,428	$3,957,728	Rehab 10 ft of shoulder width.	0.72

Solution #	Location #	Name	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Option	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost (assuming $12/sf)	Construction Cost	Total Cost	Notes	CMF
					Rehabilitate Right Shoulders (AC) (WB)	280	292	Mile	12.0	$291,869	$105,100	$350,200		$3,502,428	$3,957,728	Rehab cost adjusted by 0.71, striping, RPM, etc adjusted by half for right side only	0.72
										Solution Total	**$1,174,400**	**$3,914,600**	**$0**	**$39,145,944**	**$44,234,944**		
CS10E.18	L30	Marsh Station EB Climbing Lane	M	-	Construct Climbing Lane (Low) (EB)	286	291	Mile	5.0	$5,742,000	$861,300	$2,871,000		$28,710,000	$32,442,300		0.75
										Solution Total	**$861,300**	**$2,871,000**	**$0**	**$28,710,000**	**$32,442,300**		
CS10E.19	L34	Benson WB Climbing Lane	M	-	Construct Climbing Lane (Low) (WB)	303	305	Mile	2.0	$5,742,000	$344,500	$1,148,400		$11,484,000	$12,976,900		0.75
					Widen W Benson TI OP WB	303.86		SF	1644.0	$670	$33,000	$110,100		$1,101,480	$1,244,580		
					Widen Benson SPRR OP WB	304.28		SF	1872.0	$670	$37,600	$125,400		$1,254,240	$1,417,240		
					Widen Ocotillo Rd TI OP WB	304.91		SF	1248.0	$670	$25,100	$83,600		$836,160	$944,860		
										Solution Total	**$440,200**	**$1,467,500**	**$0**	**$14,675,880**	**$16,583,580**		
CS10E.21	L34	Mescal Shoulder Widening	M	-	Widen Left Shoulder (AC) (EB)	292	315	Mile	23.0	$1,631,081	$1,125,400	$3,751,500		$37,514,863	$42,391,763	Widen shoulders by 8 ft, widen cost adjusted 2.0	0.68
					Widen Left Shoulder (AC) (WB)	292	315	Mile	23.0	$1,631,081	$1,125,400	$3,751,500		$37,514,863	$42,391,763		0.68
										Solution Total	**$2,250,800**	**$7,503,000**	**$0**	**$75,029,726**	**$84,783,526**		
CS10E.22	L38	Dragoon EB Climbing Lane	M	-	Construct Climbing Lane (Medium)	316	318	Mile	2.0	$8,613,000	$516,800	$1,722,600		$17,226,000	$19,465,400	Medium cost used in previous round	0.75
										Solution Total	**$516,800**	**$1,722,600**	**$0**	**$17,226,000**	**$19,465,400**		
CS10E.23	L38	Dragoon Safety Improvements	M	-	Rehabilitate Shoulders (AC) (EB)	316	318	Mile	2.0	$433,000	$26,000	$86,600		$866,000	$978,600		0.72
					Rehabilitate Shoulders (AC) (WB)	316	318	Mile	2.0	$433,000	$26,000	$86,600		$866,000	$978,600		0.72

Solution #	Location #	Name	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Option	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost (assuming $12/sf)	Construction Cost	Total Cost	Notes	CMF
					Install Dynamic Speed Feedback Signs	317	317	Each	2.0	$68,800	$4,100	$13,800		$137,600	$155,500		0.94
					Install Dynamic Message Sign (DMS) (EB)	317	317	Each	1.0	$688,000	$20,600	$68,800		$688,000	$777,400		1
					Install Dynamic Message Sign (DMS) (WB)	317	317	Each	1.0	$688,000	$20,600	$68,800		$688,000	$777,400		1
					Solution Total						**$97,300**	**$324,600**	**$0**	**$3,245,600**	**$3,667,500**		
CS10E.24	L35	Exit 318 Lighting Improvements	M	-	Install lighting at exit	318	318	Mile	0.25	$1,034,000	$7,800	$25,900		$258,500	$292,200	0.25 miles before and past the exit in both directions	0.75
					Install lighting at exit	318	318	Mile	0.25	$1,034,000	$7,800	$25,900		$258,500	$292,200		0.75
					Install lighting at exit	318	318	Mile	0.25	$1,034,000	$7,800	$25,900		$258,500	$292,200		0.75
					Install lighting at exit	318	318	Mile	0.25	$1,034,000	$7,800	$25,900		$258,500	$292,200		0.75
					Solution Total						**$31,200**	**$103,600**	**$0**	**$1,034,000**	**$1,168,800**		
CS10E.25	L35	Texas Canyon Area Pavement Improvements	M	A	Rehabilitate Pavement (AC)	321	323	Mile	2.0	$1,060,000	$63,600	$212,000		$2,120,000	$2,395,600		0.68
					Option A: Solution Total						**$63,600**	**$212,000**	**$0**	**$2,120,000**	**$2,395,600**		
			M	B	Replace Pavement (PCCP)	321	323	Mile	2.0	$6,650,000	$399,000	$1,330,000		$13,300,000	$15,029,000	Concrete reconstruction is more cost effective per LCCA	0.7
					Option B: Solution Total						**$399,000**	**$1,330,000**	**$0**	**$13,300,000**	**$15,029,000**		
CS10E.26	L35	Red Bird Hills Area Pavement Improvements	M	A	Rehabilitate Pavement (AC)	328	329	Mile	1.0	$1,060,000	$31,800	$106,000		$1,060,000	$1,197,800		0.68
					Option A: Solution Total						**$31,800**	**$106,000**	**$0**	**$1,060,000**	**$1,197,800**		
			M	B	Replace Pavement (PCCP)	328	329	Mile	1.0	$6,650,000	$199,500	$665,000		$6,650,000	$7,514,500	Concrete reconstruction is more cost effective per LCCA	0.7
					Option B; Solution Total						**$199,500**	**$665,000**	**$0**	**$6,650,000**	**$7,514,500**		

Solution #	Location #	Name	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Option	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost (assuming $12/sf)	Construction Cost	Total Cost	Notes	CMF
CS10E.28	L40/L41	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	M	A	Replace Bridge (Medium)	339.46	339.46	SF	10877.0	$610	$199,000	$663,500		$6,634,970	$7,497,470		0.95
					Option A: Solution Total						**$199,000**	**$663,500**	**$0**	**$6,634,970**	**$7,497,470**		
			M	B	Rehabilitate Bridge	339.46	339.46	SF	10877.0	$250	$81,600	$271,900		$2,719,250	$3,072,750		0.95
					Reprofile Mainline	339.46	339.46	Mile	2.0	$3,730,000	$223,800	$746,000		$7,460,000	$8,429,800		0.7
					Option B: Solution Total						**$305,400**	**$1,017,900**	**$0**	**$10,179,250**	**$11,502,550**		
CS10E.29	L43	Bowie Area Safety Improvements	M	-	Rehabilitate Shoulders (AC) (EB)	354	372	Mile	18.0	$433,000	$233,800	$779,400		$7,794,000	$8,807,200		0.72
					Rehabilitate Shoulders (AC) (WB)	354	372	Mile	18.0	$433,000	$233,800	$779,400		$7,794,000	$8,807,200		0.72
					Install Dynamic Message Sign (DMS) (WB)	356	356	Each	1.0	$688,000	$20,600	$68,800		$688,000	$777,400		1
					Solution Total						**$488,200**	**$1,627,600**	**$0**	**$16,276,000**	**$18,391,800**		

Appendix I: Performance Effectiveness Scores

Need Reduction

- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

Notes and Directions	Description	Solution #	CS10E.1	CS10E.2	CS10E.3A	CS10E.3B	CS10E.4A	CS10E.4B	CS10E.5A	CS10E.5B	CS10E.6A	CS10E.6B	CS10E.7A	CS10E.7B	CS10E.8A	CS10E.8B	CS10E.9A
		Description	Casa Grande Lighting Improvements	Casa Grande Safety Improvements	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	Red Rock TI UP (#592) Bridge Project
		Project Beg MP	187	187	188.2	188.2	193.88	193.88	195.89	195.89	196.89	196.89	205.45	205.45	207.17	207.17	226.45
		Project End MP	190	190	188.2	188.2	193.88	193.88	195.89	195.89	196.89	196.89	205.45	205.45	207.17	207.17	226.45
		Project Length (miles)	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0
		Segment Beg MP	187	187	187	187	187	187	187	187	187	187	198	198	198	198	218
		Segment End MP	198	198	198	198	198	198	198	198	198	198	218	218	218	218	236
		Segment Length (miles)	11	11	11	11	11	11	11	11	11	11	20	20	20	20	18
		Segment #	3	3	3	3	3	3	3	3	3	3	4	4	4	4	5
		Current # of Lanes (both directions)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
		Additional Lanes (one-way)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Pro-Rated # of Lanes	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Input current value from performance system (direction 1)	Orig Segment Directional Safety Index (EB)		1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	0.860	0.860	0.860	0.860	1.950
Input current value from performance system (direction 1)	Orig Segment Directional Fatal Crashes (EB)		3	3	3	3	3	3	3	3	3	3	4	4	4	4	9
Input current value from performance system (direction 1)	Orig Segment Directional Suspected Serious Crashes (EB)		2	2	2	2	2	2	2	2	2	2	8	8	8	8	4
Input current value from performance system (direction 1)	Original Fatal Crashes in project limits (EB)		0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Input current value from performance system (direction 1)	Original Suspected Serious Crashes in project limits (EB)		1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Input CMF value (direction 1) - If no CMF enter 1.0	CMF 1 (EB)(lowest CMF)		0.75		0.95	0.7	0.95	0.7	0.95	0.7	0.95	0.7	0.95	0.7	0.95	0.7	0.95
Input CMF value (direction 1) - If no CMF enter 1.0	CMF 2 (EB)		1	Total CMF calculated in separate worksheet	1	1	1	1	1	1	1	1	1	1	1	1	1
Input CMF value (direction 1) - If no CMF enter 1.1	CMF 3 (EB)		1		1	1	1	1	1	1	1	1	1	1	1	1	1
Input CMF value (direction 1) - If no CMF enter 1.2	CMF 4 (EB)		1		1	1	1	1	1	1	1	1	1	1	1	1	1
Input CMF value (direction 1) - If no CMF enter 1.0	CMF 5 (EB)		1		1	1	1	1	1	1	1	1	1	1	1	1	1
Calculated Value (direction 1)	Total CMF (EB)		0.750	-	0.950	0.700	0.950	0.700	0.950	0.700	0.950	0.700	0.950	0.700	0.950	0.700	0.950
Calculated Value (direction 1)	Fatal Crash reduction (EB)		0.000	0.560	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calculated Value (direction 1)	Suspected Serious Crash reduction (EB)		0.250	0.280	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Enter in Safety Index spreadsheet to calculate new Safety Index (direction 1)	Post-Project Segment Directional Fatal Crashes (EB)		3.000	2.440	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	4.000	4.000	4.000	4.000	9.000
Enter in Safety Index spreadsheet to calculate new Safety Index (direction 1)	Post-Project Segment Directional Suspected Serious Crashes (EB)		1.750	1.720	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	8.000	8.000	8.000	8.000	4.000
Input value from updated Safety Index spreadsheet (direction 1)	Post-Project Segment Directional Safety Index (EB)		1.130	0.920	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	0.860	0.860	0.860	0.860	1.940
Enter in Safety Needs spreadsheet to calculate new segment level Safety Need (direction 1)	Post-Project Segment Directional Safety Index (EB)		1.130	0.920	1.130	1.130	1.130	1.130	1.130	1.130	1.130	1.130	0.860	0.860	0.860	0.860	1.940
Input current value from performance system (direction 2)	Orig Segment Directional Safety Index (WB)		0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	1.610	1.610	1.610	1.610	0.920
Input current value from performance system (direction 2)	Orig Segment Directional Fatal Crashes (WB)		2	2	2	2	2	2	2	2	2	2	8	8	8	8	4
Input current value from performance system (direction 2)	Orig Segment Directional Suspected Serious Crashes (WB)		5	5	5	5	5	5	5	5	5	5	5	5	5	5	6
Input current value from performance system (direction 2)	Original Fatal Crashes in project limits (WB)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Input current value from performance system (direction 2)	Original Suspected Serious Crashes in project limits (WB)		2	5	0	0	0	0	0	0	0	0	0	0	0	0	0
Input CMF value (direction 2) - If no CMF enter 1.0	CMF 1 (WB)(lowest CMF)		0.75		0.95	0.7	0.95	0.7	0.95	0.7	0.95	0.7	0.95	0.7	0.95	0.7	0.95
Input CMF value (direction 2) - If no CMF enter 1.0	CMF 2 (WB)		1	Total CMF calculated in separate worksheet	1	1	1	1	1	1	1	1	1	1	1	1	1
Input CMF value (direction 2) - If no CMF enter 1.1	CMF 3 (WB)		1		1	1	1	1	1	1	1	1	1	1	1	1	1
Input CMF value (direction 2) - If no CMF enter 1.2	CMF 4 (WB)		1		1	1	1	1	1	1	1	1	1	1	1	1	1
Input CMF value (direction 2) - If no CMF enter 1.0	CMF 5 (WB)		1		1	1	1	1	1	1	1	1	1	1	1	1	1
Calculated Value (direction 2)	Total CMF (WB)		0.750	-	0.950	0.700	0.950	0.700	0.950	0.700	0.950	0.700	0.950	0.700	0.950	0.700	0.950
Calculated Value (direction 2)	Fatal Crash reduction (WB)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Calculated Value (direction 2)	Suspected Serious Crash reduction (WB)		0.500	1.120	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Enter in Safety Index spreadsheet to calculate new Safety Index (direction 2)	Post-Project Segment Directional Fatal Crashes (WB)		2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	8.000	8.000	8.000	8.000	4.000
Enter in Safety Index spreadsheet to calculate new Safety Index (direction 2)	Post-Project Segment Directional Suspected Serious Crashes (WB)		4.500	3.880	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	6.000
Input value from updated Safety Index spreadsheet (direction 2)	Post-Project Segment Directional Safety Index (WB)		0.820	0.800	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	1.610	1.610	1.610	1.610	0.920
Enter in Safety Needs spreadsheet to calculate new segment level Safety Need (direction 2)	Post-Project Segment Directional Safety Index (WB)		0.820	0.800	0.830	0.830	0.830	0.830	0.830	0.830	0.830	0.830	1.610	1.610	1.610	1.610	0.920
Calculated Value - verify that it matches current performance system	Current Safety Index		0.980	0.980	0.980	0.980	0.980	0.980	0.980	0.980	0.980	0.980	1.235	1.235	1.235	1.235	1.435
Enter in Safety Needs spreadsheet to calculate new segment level Safety Need	Post-Project Safety Index		0.975	0.860	0.980	0.980	0.980	0.980	0.980	0.980	0.980	0.980	1.235	1.235	1.235	1.235	1.430
User entered value from Safety Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Safety Need		**2.133**	**2.133**	**2.133**	**2.133**	**2.133**	**2.133**	**2.133**	**2.133**	**2.133**	**2.133**	**3.075**	**3.075**	**3.075**	**3.075**	**3.243**
User entered value from Safety Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Safety Need		**2.114**	**1.601**	**2.133**	**2.133**	**2.133**	**2.133**	**2.133**	**2.133**	**2.133**	**2.133**	**3.075**	**3.075**	**3.075**	**3.075**	**3.243**

LEGEND:

- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

		Solution #	CS10E.9B	CS10E.10	CS10E.11	CS10E.12	CS10E.13	CS10E.14A	CS10E.14B	CS10E.14C	CS10E.15A	CS10E.15B	CS10E.15C	CS10E.16	CS10E.17	CS10E.18	CS10E.19
		Description	Red Rock TI UP (#592) Bridge Project	Picacho Safety Improvements	Picacho Lighting Improvements	Marana Safety Improvements	Marana Lighting Improvements	Tucson Mobility, Safety, and Freight Improvements	Tucson Mobility, Safety, and Freight Improvements	Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Lighting Improvements	Vail Mobility and Safety Improvements	Marsh Station EB Climbing Lane	Benson WB Climbing Lane
		Project Beg MP	226.45	218	218	236	236	255	255	255	262	262	262	263	280	286	303
		Project End MP	226.45	236	236	242	242	262	262	262	274	274	274	274	292	291	305
		Project Length (miles)	0	18	18	6	6	7	7	7	12	12	12	11	12	5	2
		Segment Beg MP	218	218	218	236	236	255	255	255	262	262	262	262	280	280	292
		Segment End MP	236	236	236	242	242	262	262	262	274	274	274	274	292	292	315
		Segment Length (miles)	18	18	18	6	6	7	7	7	12	12	12	12	12	12	23
		Segment #	5	5	5	6	6	8	8	8	9	9	9	9	11	11	12
		Current # of Lanes (both directions)	6	6	6	6	6	8	8	8	4	4	4	4	4	4	4
		Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	one-way	one-way
		Additional Lanes (one-way)	0	0	0	0	0	1	0.5	0	1	0.5	0	0	0	1	1
		Pro-Rated # of Lanes	6.00	6.00	6.00	6.00	6.00	10.00	9.00	8.00	6.00	5.00	4.00	4.00	4.00	4.42	4.09
	Notes and Directions	**Description**															
DIRECTIONAL SAFETY	Input current value from performance system (direction 1)	Orig Segment Directional Safety Index (EB)	1.950	1.950	1.950	1.380	1.380	0.300	0.300	0.300	1.270	1.270	1.270	1.270	0.990	0.990	1.020
	Input current value from performance system (direction 1)	Orig Segment Directional Fatal Crashes (EB)	9	9	9	4	4	1	1	1	5	5	5	5	4	4	4
	Input current value from performance system (direction 1)	Orig Segment Directional Suspected Serious Crashes (EB)	4	4	4	5	5	5	5	5	11	11	11	11	6	6	11
	Input current value from performance system (direction 1)	Original Fatal Crashes in project limits (EB)	0	9	4	1	0	1	1	1	5	5	5	1	4	0	
	Input current value from performance system (direction 1)	Original Suspected Serious Crashes in project limits (EB)	0	4	2	3	2	5	5	5	11	11	11	3	6	1	
	Input CMF value (direction 1) - If no CMF enter 1.0	CMF 1 (EB)(lowest CMF)	0.75	0.72	0.75	0.72	0.75	0.9	0.78	0.64	0.9	0.78		0.75	0.64	0.75	
	Input CMF value (direction 1) - If no CMF enter 1.0	CMF 2 (EB)	1	1	1	1	1	1	1	1	1	1	Total CMF calculated in separate worksheet	1	0.72	1	
	Input CMF value (direction 1) - If no CMF enter 1.1	CMF 3 (EB)	1	1	1	1	1	1	1	1	1	1		1	1	1	
	Input CMF value (direction 1) - If no CMF enter 1.2	CMF 4 (EB)	1	1	1	1	1	1	1	1	1	1		1	1	1	
	Input CMF value (direction 1) - If no CMF enter 1.0	CMF 5 (EB)	1	1	1	1	1	1	1	1	1	1		1	1	1	
	Calculated Value (direction 1)	Total CMF (EB)	0.750	0.720	0.750	0.720	0.750	0.900	0.780	0.640	0.900	0.780	-	0.750	0.550	0.750	0.500
	Calculated Value (direction 1)	Fatal Crash reduction (EB)	0.000	2.520	1.000	0.280	0.000	0.100	0.220	0.360	0.500	1.100	3.400	0.250	1.798	0.000	0.000
	Calculated Value (direction 1)	Suspected Serious Crash reduction (EB)	0.000	1.120	0.500	0.840	0.500	0.500	1.100	1.800	1.100	2.420	7.540	0.750	2.698	0.250	0.000
	Enter in Safety Index spreadsheet to calculate new Safety Index (direction 1)	Post-Project Segment Directional Fatal Crashes (EB)	9.000	6.480	8.000	3.720	4.000	0.900	0.780	0.640	4.500	3.900	1.600	4.750	2.202	4.000	4.000
	Enter in Safety Index spreadsheet to calculate new Safety Index (direction 1)	Post-Project Segment Directional Suspected Serious Crashes (EB)	4.000	2.880	3.500	4.160	4.500	4.500	3.900	3.200	9.900	8.580	3.460	10.250	3.302	5.750	11.000
	Input value from updated Safety Index spreadsheet (direction 1)	Post-Project Segment Directional Safety Index (EB)	1.940	1.400	1.730	1.280	1.370	0.230	0.230	0.190	1.140	0.990	0.410	1.200	0.500	0.980	1.020
	Enter in Safety Needs spreadsheet to calculate new segment level Safety Need (direction 1)	Post-Project Segment Directional Safety Index (EB)	1.940	1.400	1.730	1.280	1.370	0.230	0.230	0.190	1.140	0.990	0.410	1.200	0.500	0.980	1.020
	Input current value from performance system (direction 2)	Orig Segment Directional Safety Index (WB)	0.920	0.920	0.920	0.800	0.800	0.580	0.580	0.580	0.800	0.800	0.800	0.800	0.550	0.550	1.420
	Input current value from performance system (direction 2)	Orig Segment Directional Fatal Crashes (WB)	4	4	4	2	2	2	2	2	3	3	3	3	2	2	6
	Input current value from performance system (direction 2)	Orig Segment Directional Suspected Serious Crashes (WB)	6	6	6	8	8	9	9	9	11	11	11	11	7	7	6
	Input current value from performance system (direction 2)	Original Fatal Crashes in project limits (WB)	0	4	1	1	0	2	2	2	3	3	3	0	2		1
	Input current value from performance system (direction 2)	Original Suspected Serious Crashes in project limits (WB)	0	6	1	4	3	9	9	9	11	11	11	2	7		0
	Input CMF value (direction 2) - If no CMF enter 1.0	CMF 1 (WB)(lowest CMF)	0.75	0.72	0.75	0.72	0.75	0.9	0.78	0.64	0.9	0.78		0.75	0.64		0.75
	Input CMF value (direction 2) - If no CMF enter 1.0	CMF 2 (WB)	1	1	1	1	1	1	1	1	1	1	Total CMF calculated in separate worksheet	1	0.72		1
	Input CMF value (direction 2) - If no CMF enter 1.1	CMF 3 (WB)	1	1	1	1	1	1	1	1	1	1		1	1		1
	Input CMF value (direction 2) - If no CMF enter 1.2	CMF 4 (WB)	1	1	1	1	1	1	1	1	1	1		1	1		1
	Input CMF value (direction 2) - If no CMF enter 1.0	CMF 5 (WB)	1	1	1	1	1	1	1	1	1	1		1	1		1
	Calculated Value (direction 2)	Total CMF (WB)	0.750	0.720	0.750	0.720	0.750	0.900	0.780	0.640	0.900	0.780	-	0.750	0.550	0.500	0.750
	Calculated Value (direction 2)	Fatal Crash reduction (WB)	0.000	1.120	0.250	0.280	0.000	0.200	0.440	0.720	0.300	0.660	2.040	0.000	0.899	0.000	0.250
	Calculated Value (direction 2)	Suspected Serious Crash reduction (WB)	0.000	1.680	0.250	1.120	0.750	0.900	1.980	3.240	1.100	2.420	7.600	0.500	3.147	0.000	0.000
	Enter in Safety Index spreadsheet to calculate new Safety Index (direction 2)	Post-Project Segment Directional Fatal Crashes (WB)	4.000	2.880	3.750	1.720	2.000	1.800	1.560	1.280	2.700	2.340	0.960	3.000	1.101	2.000	5.750
	Enter in Safety Index spreadsheet to calculate new Safety Index (direction 2)	Post-Project Segment Directional Suspected Serious Crashes (WB)	6.000	4.320	5.750	6.880	7.250	8.100	7.020	5.760	9.900	8.580	3.400	10.500	3.853	7.000	6.000
	Input value from updated Safety Index spreadsheet (direction 2)	Post-Project Segment Directional Safety Index (WB)	0.920	0.660	0.870	0.690	0.790	0.520	0.450	0.370	0.720	0.630	0.260	0.800	0.300	0.550	1.360
	Enter in Safety Needs spreadsheet to calculate new segment level Safety Need (direction 2)	Post-Project Segment Directional Safety Index (WB)	0.920	0.660	0.870	0.690	0.790	0.520	0.450	0.370	0.720	0.630	0.260	0.800	0.300	0.550	1.360
SAFETY INDEX	Calculated Value - verify that it matches current performance system	Current Safety Index	1.435	1.435	1.435	1.090	1.090	0.440	0.440	0.440	1.035	1.035	1.035	1.035	0.770	0.770	1.220
	Enter in Safety Needs spreadsheet to calculate new segment level Safety Need	Post-Project Safety Index	1.430	1.030	1.300	0.985	1.080	0.375	0.340	0.280	0.930	0.810	0.335	1.000	0.400	0.765	1.190
Needs	User entered value from Safety Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Safety Need	**3.243**	**3.243**	**3.243**	**1.984**	**1.984**	**0.275**	**0.275**	**0.275**	**1.951**	**1.951**	**1.951**	**1.951**	**1.031**	**1.031**	**3.198**
	User entered value from Safety Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Safety Need	**3.243**	**2.001**	**2.859**	**1.482**	**1.920**	**0.234**	**0.213**	**0.175**	**1.315**	**1.074**	**0.718**	**1.725**	**0.755**	**1.024**	**3.020**

	Solution #	CS10E.20A	CS10E.20B	CS10E.21	CS10E.22	CS10E.23	CS10E.24	CS10E.25A	CS10E.25B	CS10E.26A	CS10E.26B	CS10E.27A	CS10E.27B	CS10E.28A	CS10E.28B	CS10E.29
	Description	Benson Area Pavement Improvements	Benson Area Pavement Improvements	Mescal Shoulder Widening	Dragoon EB Climbing Lane	Dragoon Safety Improvements	Exit 318 Lighting Improvements	Texas Canyon Area Pavement Improvements	Texas Canyon Area Pavement Improvements	Red Bird Hills Area Pavement Improvements	Red Bird Hills Area Pavement Improvements	Cochise TI UP (#518) Bridge Project	Cochise TI UP (#518) Bridge Project	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	Bowie Area Safety Improvements
	Project Beg MP	310	310	292	316	316	318	321	321	328	328	331.62	331.62	339.46	339.46	354
- user entered value	Project End MP	313	313	315	318	318	318	323	323	329	329	331.62	331.62	339.46	339.46	372
- calculated value for reference only	Project Length (miles)	3	3	23	2	2	1	2	2	1	1	0	0	0	0	18
- calculated value for entry/use in other spreadsheet	Segment Beg MP	292	292	292	315	315	315	315	315	315	315	315	315	332	332	354
- for input into Performance Effectiveness Score spreadsheet	Segment End MP	315	315	315	332	332	332	332	332	332	332	332	332	354	354	372
- assumed values (do not modify)	Segment Length (miles)	23	23	23	17	17	17	17	17	17	17	17	17	22	22	18
	Segment #	12	12	12	13	13	13	13	13	13	13	13	13	14	14	15
	Current # of Lanes (both directions)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Project Type (one-way or two-way)	two-way	two-way	two-way	one-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
	Additional Lanes (one-way)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	Pro-Rated # of Lanes	4.00	4.00	4.00	4.12	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Notes and Directions	**Description**															
Input current value from performance system (direction 1)	Orig Segment Directional Safety Index (EB)	1.020	1.020	1.020	0.870	0.870	0.870	0.870	0.870	0.870	0.870	0.870	0.870	0.570	0.570	0.870
Input current value from performance system (direction 1)	Orig Segment Directional Fatal Crashes (EB)	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2
Input current value from performance system (direction 1)	Orig Segment Directional Suspected Serious Crashes (EB)	11	11	11	12	12	12	12	12	12	12	12	12	4	4	8
Input current value from performance system (direction 1)	Original Fatal Crashes in project limits (EB)	0	0	4	1	1	0	0	0	0	0	0	0	0	0	2
Input current value from performance system (direction 1)	Original Suspected Serious Crashes in project limits (EB)	1	1	11	4	4	1	2	1	1	1	1	1	0	0	8
Input CMF value (direction 1) - If no CMF enter 1.0	CMF 1 (EB)(lowest CMF)	0.68	0.7	0.68	0.75	Total CMF calculated in separate worksheet	0.75	0.68	0.7	0.68	0.7	0.95	0.75	0.95	0.95	
Input CMF value (direction 1) - If no CMF enter 1.0	CMF 2 (EB)	1	1	1	1		1	1	1	1	1	1	1	1	0.7	Total CMF calculated in separate worksheet
Input CMF value (direction 1) - If no CMF enter 1.1	CMF 3 (EB)	1	1	1	1		1	1	1	1	1	1	1	1	1	
Input CMF value (direction 1) - If no CMF enter 1.2	CMF 4 (EB)	1	1	1	1		1	1	1	1	1	1	1	1	1	
Input CMF value (direction 1) - If no CMF enter 1.0	CMF 5 (EB)	1	1	1	1		1	1	1	1	1	1	1	1	1	
Calculated Value (direction 1)	Total CMF (EB)	0.680	0.700	0.680	0.750	-	0.750	0.680	0.700	0.680	0.700	0.950	0.750	0.950	0.808	-
Calculated Value (direction 1)	Fatal Crash reduction (EB)	0.000	0.000	1.280	0.250	0.280	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.440
Calculated Value (direction 1)	Suspected Serious Crash reduction (EB)	0.320	0.300	3.520	1.000	1.240	0.250	0.640	0.300	0.320	0.300	0.050	0.250	0.000	0.000	5.700
Enter in Safety Index spreadsheet to calculate new Safety Index (direction 1)	Post-Project Segment Directional Fatal Crashes (EB)	4.000	4.000	2.720	1.750	1.720	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	0.560
Enter in Safety Index spreadsheet to calculate new Safety Index (direction 1)	Post-Project Segment Directional Suspected Serious Crashes (EB)	10.680	10.700	7.480	11.000	10.760	11.750	11.360	11.700	11.680	11.700	11.950	11.750	4.000	4.000	2.300
Input value from updated Safety Index spreadsheet (direction 1)	Post-Project Segment Directional Safety Index (EB)	1.020	1.020	0.700	0.770	0.770	0.860	0.860	0.860	0.860	0.860	0.870	0.870	0.570	0.570	0.250
Enter in Safety Needs spreadsheet to calculate new segment level Safety Need (direction 1)	Post-Project Segment Directional Safety Index (EB)	1.020	1.020	0.700	0.770	0.770	0.860	0.860	0.860	0.860	0.860	0.870	0.870	0.570	0.570	0.250
Input current value from performance system (direction 2)	Orig Segment Directional Safety Index (WB)	1.420	1.420	1.420	1.180	1.180	1.180	1.180	1.180	1.180	1.180	1.180	1.180	0.910	0.910	1.490
Input current value from performance system (direction 2)	Orig Segment Directional Fatal Crashes (WB)	6	6	6	3	3	3	3	3	3	3	3	3	3	3	4
Input current value from performance system (direction 2)	Orig Segment Directional Suspected Serious Crashes (WB)	6	6	6	9	9	9	9	9	9	9	9	9	6	6	1
Input current value from performance system (direction 2)	Original Fatal Crashes in project limits (WB)	0	0	6		0	0	0	0	0	0	0	0	0	0	4
Input current value from performance system (direction 2)	Original Suspected Serious Crashes in project limits (WB)	2	2	6		1	1	0	0	2	1	0	0	0	0	1
Input CMF value (direction 2) - If no CMF enter 1.0	CMF 1 (WB)(lowest CMF)	0.68	0.7	0.68		Total CMF calculated in separate worksheet	0.75	0.68	0.7	0.68	0.7	0.95	0.75	0.95	0.95	
Input CMF value (direction 2) - If no CMF enter 1.0	CMF 2 (WB)	1	1	1			1	1	1	1	1	1	1	1	0.7	Total CMF calculated in separate worksheet
Input CMF value (direction 2) - If no CMF enter 1.1	CMF 3 (WB)	1	1	1			1	1	1	1	1	1	1	1	1	
Input CMF value (direction 2) - If no CMF enter 1.2	CMF 4 (WB)	1	1	1			1	1	1	1	1	1	1	1	1	
Input CMF value (direction 2) - If no CMF enter 1.0	CMF 5 (WB)	1	1	1			1	1	1	1	1	1	1	1	1	
Calculated Value (direction 2)	Total CMF (WB)	0.680	0.700	0.680	0.500	-	0.750	0.680	0.700	0.680	0.700	0.950	0.750	0.950	0.808	-
Calculated Value (direction 2)	Fatal Crash reduction (WB)	0.000	0.000	1.920	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.880
Calculated Value (direction 2)	Suspected Serious Crash reduction (WB)	0.640	0.600	1.920	0.000	0.280	0.250	0.000	0.000	0.640	0.300	0.000	0.000	0.000	0.000	0.720
Enter in Safety Index spreadsheet to calculate new Safety Index (direction 2)	Post-Project Segment Directional Fatal Crashes (WB)	6.000	6.000	4.080	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	1.120
Enter in Safety Index spreadsheet to calculate new Safety Index (direction 2)	Post-Project Segment Directional Suspected Serious Crashes (WB)	5.360	5.400	4.080	9.000	8.720	8.750	9.000	9.000	8.360	8.700	9.000	9.000	6.000	6.000	0.280
Input value from updated Safety Index spreadsheet (direction 2)	Post-Project Segment Directional Safety Index (WB)	1.410	1.410	0.970	1.180	1.170	1.170	1.180	1.180	1.170	1.170	1.180	1.180	0.910	0.910	0.420
Enter in Safety Needs spreadsheet to calculate new segment level Safety Need (direction 2)	Post-Project Segment Directional Safety Index (WB)	1.410	1.410	0.970	1.180	1.170	1.170	1.180	1.180	1.170	1.170	1.180	1.180	0.910	0.910	0.420
Calculated Value - verify that it matches current performance system	Current Safety Index	1.220	1.220	1.220	1.025	1.025	1.025	1.025	1.025	1.025	1.025	1.025	1.025	0.740	0.740	1.180
Enter in Safety Needs spreadsheet to calculate new segment level Safety Need	Post-Project Safety Index	1.215	1.215	0.835	0.975	0.970	1.015	1.020	1.020	1.015	1.015	1.025	1.025	0.740	0.740	0.335
User entered value from Safety Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Safety Need	**3.198**	**3.198**	**3.198**	**1.921**	**1.921**	**1.921**	**1.921**	**1.921**	**1.921**	**1.921**	**1.921**	**1.921**	**1.468**	**1.468**	**3.455**
User entered value from Safety Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Safety Need	**3.161**	**3.161**	**1.044**	**1.474**	**1.425**	**1.839**	**1.888**	**1.888**	**1.843**	**1.839**	**1.934**	**1.934**	**1.468**	**1.468**	**1.212**

LEGEND:
- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

			Solution #	CS10E.1	CS10E.2	CS10E.3A	CS10E.3B	CS10E.4A	CS10E.4B	CS10E.5A	CS10E.5B	CS10E.6A	CS10E.6B	CS10E.7A	CS10E.7B	CS10E.8A	CS10E.8B	CS10E.9B
			Description	Casa Grande Lighting Improvements	Casa Grande Safety Improvements	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	Red Rock TI UP (#592) Bridge Project
			Project Beg MP	187	187	188.2	188.2	193.88	193.88	195.89	195.89	196.89	196.89	205.45	205.45	207.17	207.17	226.45
			Project End MP	190	190	188.2	188.2	193.88	193.88	195.89	195.89	196.89	196.89	205.45	205.45	207.17	207.17	226.45
			Project Length (miles)	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0
			Segment Beg MP	187	187	187	187	187	187	187	187	187	187	198	198	198	198	218
			Segment End MP	198	198	198	198	198	198	198	198	198	198	218	218	218	218	236
			Segment Length (miles)	11	11	11	11	11	11	11	11	11	11	20	20	20	20	18
			Segment #	3	3	3	3	3	3	3	3	3	3	4	4	4	4	5
			Current # of Lanes (both directions)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
			Additional Lanes (one-way)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Pro-Rated # of Lanes	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
		Notes and Directions	Description															
MOBILITY	MOBILITY INDEX	Input current value from performance system	Original Segment Mobility Index	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.410	0.410	0.410	0.410	0.420
		Enter in Mobility Index Spreadsheet to determine new segment level Mobility Index	Post-Project # of Lanes (both directions)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Mobility Index	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.410	0.410	0.410	0.410	0.420
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Mobility Index	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.420	0.410	0.410	0.410	0.410	0.420
	FUT V/C	Input current value from performance system	Original Segment Future V/C	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Future V/C	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Future V/C	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
	PEAK HOUR V/C	Input current value from performance system (direction 1)	Original Segment Peak Hour V/C (EB)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input current value from performance system (direction 2)	Original Segment Peak Hour V/C (WB)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		***If One-Way project,** enter in Mobility Index Spreadsheet to determine new segment level Peak Hour V/C. **If Two-Way project,** disregard	Adjusted total # of Lanes for use in directional peak hr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Input value from updated Mobility Index spreadsheet (direction 1)	Post-Project Segement Peak Hr V/C (EB)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input value from updated Mobility Index spreadsheet (direction 2)	Post-Project Segement Peak Hr V/C (WB)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Peak Hr V/C (EB)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Peak Hr V/C (WB)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
	LOTTR	Calculated Value (both directions)	Safety Reduction Factor	0.995	0.878	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.997
		Calculated Value (both directions)	Safety Reduction	0.005	0.122	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003
		Calculated Value (both directions)	Mobility Reduction Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
		Calculated Value (both directions)	Mobility Reduction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Assumed effect on LOTTR/% of mobility reduction)	Mobility effect on LOTTR	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
		Assumed effect on LOTTR FR of safety reduction)	Safety effect on LOTTR	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
		Input current value from performance system (direction 1)	Original Directional Segment LOTTR (EB)	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.050	1.050	1.050	1.050	1.040
		Input current value from performance system (direction 2)	Original Directional Segment LOTTR (WB)	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.040
		Calculated Value (both directions)	Reduction Factor for Segment LOTTR	0.002	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 1)	Post-Project Directional Segment LOTTR (EB)	1.038	1.002	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.050	1.050	1.050	1.050	1.039
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 2)	Post-Project Directional Segment LOTTR (WB)	1.048	1.011	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.039
	CLOSURE EXTENT	Input current value from performance system (direction 1)	Orig Segment Directional Closure Extent (EB)	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.170	0.170	0.170	0.170	0.100
		Input current value from performance system (direction 2)	Orig Segment Directional Closure Extent (WB)	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.300	0.300	0.300	0.300	0.210
		Input value from HCRS	Segment Closures with fatalities/injuries	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2
		Input value from HCRS	Total Segment Closures	26	26	26	26	26	26	26	26	26	26	42	42	42	42	23
		Calculated Value (both directions)	% Closures with Fatality/Injury	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.09
		Calculated Value (both directions)	Closure Reduction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Calculated Value (both directions)	Closure Reduction Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 1)	Post-Project Segment Directional Closure Extent (EB)	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.170	0.170	0.170	0.170	0.100
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 2)	Post-Project Segment Directional Closure Extent (WB)	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.450	0.300	0.300	0.300	0.300	0.210
	BICYCLE ACCOM	Input current value from performance system	Orig Segment Bicycle Accomodation %	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input current value from performance system	Orig Segment Outside Shoulder width	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Outside Shoulder width	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Bicycle Accomodation (%)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Enter in Mobility Needs spreadsheet to calculate new segment level Mobility Need	Post-Project Segment Bicycle Accomodation (%)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
	Needs	User entered value from Mobility Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Mobility Need	**0.876**	**0.876**	**0.876**	**0.876**	**0.876**	**0.876**	**0.876**	**0.876**	**0.876**	**0.876**	**0.528**	**0.528**	**0.528**	**0.528**	**0.644**
		User entered value from Mobility Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Mobility Need	**0.876**	**0.873**	**0.876**	**0.876**	**0.876**	**0.876**	**0.876**	**0.876**	**0.876**	**0.876**	**0.528**	**0.528**	**0.528**	**0.528**	**0.644**

LEGEND:

- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

			Solution #	CS10E.10	CS10E.11	CS10E.12	CS10E.13	CS10E.14A	CS10E.14B	CS10E.14C	CS10E.15A	CS10E.15B	CS10E.15C	CS10E.16	CS10E.17	CS10E.18	CS10E.19	CS10E.21
			Description	Picacho Safety Improvements	Picacho Lighting Improvements	Marana Safety Improvements	Marana Lighting Improvements	Tucson Mobility, Safety, and Freight Improvements	Tucson Mobility, Safety, and Freight Improvements	Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Lighting Improvements	Vail Mobility and Safety Improvements	Marsh Station EB Climbing Lane	Benson WB Climbing Lane	Mescal Shoulder Widening
			Project Beg MP	218	218	236	236	255	255	255	262	262	262	263	280	286	303	292
			Project End MP	236	236	242	242	262	262	262	274	274	274	274	292	291	305	315
			Project Length (miles)	18	18	6	6	7	7	7	12	12	12	11	12	5	2	23
			Segment Beg MP	218	218	236	236	255	255	255	262	262	262	262	280	280	292	292
			Segment End MP	236	236	242	242	262	262	262	274	274	274	274	292	292	315	315
			Segment Length (miles)	18	18	6	6	7	7	7	12	12	12	12	12	12	23	23
			Segment #	5	5	6	6	8	8	8	9	9	9	9	11	11	12	12
			Current # of Lanes (both directions)	6	6	6	6	8	8	8	4	4	4	4	4	4	4	4
			Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	one-way	one-way	two-way
			Additional Lanes (one-way)	0	0	0	0	1	0.5	0	1	0.5	0	0	0	1	1	0
			Pro-Rated # of Lanes	6.00	6.00	6.00	6.00	10.00	9.00	8.00	6.00	5.00	4.00	4.00	4.00	4.42	4.09	4.00
		Notes and Directions	Description															
MOBILITY	MOBILITY INDEX	Input current value from performance system	Original Segment Mobility Index	0.420	0.420	0.560	0.560	1.090	1.090	1.090	0.800	0.800	0.800	0.800	0.760	0.760	0.600	0.600
		Enter in Mobility Index Spreadsheet to determine new segment level Mobility Index	Post-Project # of Lanes (both directions)	6.00	6.00	6.00	6.00	10.00	9.00	8.00	6.00	5.00	4.00	4.00	4.00	4.42	4.09	4.00
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Mobility Index	0.420	0.420	0.560	0.560	0.780	0.860	1.09	0.56	0.67	0.80	0.80	0.76	0.69	0.59	0.60
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Mobility Index	0.420	0.420	0.560	0.560	0.780	0.860	1.090	0.560	0.670	0.800	0.800	0.760	0.690	0.590	0.600
	FUT V/C	Input current value from performance system	Original Segment Future V/C	No Change	No Change	No Change	No Change	1.190	1.190	1.190	0.880	0.880	0.880	No Change	No Change	0.850	0.690	No Change
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Future V/C	No Change	No Change	No Change	No Change	0.850	0.940	1.190	0.610	0.730	0.880	No Change	No Change	0.770	0.670	No Change
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Future V/C	No Change	No Change	No Change	No Change	0.850	0.940	1.190	0.610	0.730	0.880	No Change	No Change	0.770	0.670	No Change
	PEAK HOUR V/C	Input current value from performance system (direction 1)	Original Segment Peak Hour V/C (EB)	No Change	No Change	No Change	No Change	0.710	0.710	0.710	0.550	0.550	0.550	No Change	No Change	0.430	0.380	No Change
		Input current value from performance system (direction 2)	Original Segment Peak Hour V/C (WB)	No Change	No Change	No Change	No Change	0.700	0.700	0.700	0.620	0.620	0.620	No Change	No Change	0.420	0.330	No Change
		***If One-Way project**, enter in Mobility Index Spreadsheet to determine new segment level Peak Hour V/C. **If Two-Way project,** disregard	Adjusted total # of Lanes for use in directional peak hr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.83	4.17	N/A
		Input value from updated Mobility Index spreadsheet (direction 1)	Post-Project Segement Peak Hr V/C (EB)	No Change	No Change	No Change	No Change	0.51	0.56	0.64	0.380	0.460	0.500	No Change	No Change	0.36	0.37	No Change
		Input value from updated Mobility Index spreadsheet (direction 2)	Post-Project Segement Peak Hr V/C (WB)	No Change	No Change	No Change	No Change	0.50	0.55	0.63	0.430	0.520	0.570	No Change	No Change	0.38	0.32	No Change
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Peak Hr V/C (EB)	No Change	No Change	No Change	No Change	0.510	0.560	0.640	0.380	0.460	0.500	No Change	No Change	0.360	0.370	No Change
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Peak Hr V/C (WB)	No Change	No Change	No Change	No Change	0.500	0.550	0.630	0.430	0.520	0.570	No Change	No Change	0.380	0.320	No Change
	LOTTR	Calculated Value (both directions)	Safety Reduction Factor	0.718	0.906	0.904	0.991	0.852	0.773	0.636	0.899	0.783	0.324	0.966	0.519	0.994	0.975	0.684
		Calculated Value (both directions)	Safety Reduction	0.282	0.094	0.096	0.009	0.148	0.227	0.364	0.101	0.217	0.676	0.034	0.481	0.006	0.025	0.316
		Calculated Value (both directions)	Mobility Reduction Factor	1.000	1.000	1.000	1.000	0.716	0.789	1.000	0.700	0.838	1.000	1.000	1.000	0.908	0.983	1.000
		Calculated Value (both directions)	Mobility Reduction	0.000	0.000	0.000	0.000	0.284	0.211	0.000	0.300	0.163	0.000	0.000	0.000	0.092	0.017	0.000
		Assumed effect on LOTTR(% of mobility reduction)	Mobility effect on LOTTR	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
		Assumed effect on LOTTR (% of safety reduction)	Safety effect on LOTTR	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
		Input current value from performance system (direction 1)	Original Directional Segment LOTTR (EB)	1.040	1.040	1.030	1.030	1.040	1.040	1.040	1.140	1.140	1.140	1.140	1.030	1.030	1.040	1.040
		Input current value from performance system (direction 2)	Original Directional Segment LOTTR (WB)	1.040	1.040	1.030	1.030	1.050	1.050	1.050	1.040	1.040	1.040	1.040	1.030	1.030	1.030	1.030
		Calculated Value (both directions)	Reduction Factor for Segment LOTTR	0.085	0.028	0.029	0.003	0.101	0.110	0.109	0.090	0.098	0.203	0.010	0.144	0.020	0.011	0.095
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 1)	Post-Project Directional Segment LOTTR (EB)	1.020	1.011	1.000	1.027	1.020	1.020	1.020	1.037	1.029	1.070	1.128	1.015	1.009	1.029	1.020
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 2)	Post-Project Directional Segment LOTTR (WB)	1.020	1.011	1.000	1.027	1.025	1.025	1.025	1.020	1.020	1.020	1.029	1.015	1.030	1.030	1.015
	CLOSURE EXTENT	Input current value from performance system (direction 1)	Orig Segment Directional Closure Extent (EB)	0.100	0.100	0.180	0.180	0.890	0.890	0.890	0.350	0.350	0.350	0.350	0.370	0.370	0.390	0.390
		Input current value from performance system (direction 2)	Orig Segment Directional Closure Extent (WB)	0.210	0.210	0.550	0.550	0.570	0.570	0.570	0.43	0.43	0.43	0.43	0.120	0.120	0.100	0.100
		Input value from HCRS	Segment Closures with fatalities/injuries	2	2	1	1	1	1	1	2	2	2	2	2	2	5	5
		Input value from HCRS	Total Segment Closures	23	23	23	23	51	51	51	47	47	47	47	20	20	46	46
		Calculated Value (both directions)	% Closures with Fatality/Injury	0.09	0.09	0.04	0.04	0.02	0.02	0.02	0.04	0.04	0.04	0.04	0.10	0.10	0.11	0.11
		Calculated Value (both directions)	Closure Reduction	0.025	0.008	0.004	0.000	0.003	0.004	0.007	0.004	0.009	0.029	0.001	0.048	0.001	0.003	0.034
		Calculated Value (both directions)	Closure Reduction Factor	0.975	0.992	0.996	1.000	0.997	0.996	0.993	0.996	0.991	0.971	0.999	0.952	0.999	0.997	0.966
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 1)	Post-Project Segment Directional Closure Extent (EB)	0.098	0.099	0.179	0.180	0.887	0.886	0.884	0.348	0.347	0.340	0.349	0.352	0.370	0.389	0.377
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 2)	Post-Project Segment Directional Closure Extent (WB)	0.205	0.208	0.548	0.550	0.568	0.567	0.566	0.428	0.426	0.418	0.429	0.114	0.120	0.100	0.097
	BICYCLE ACCOM	Input current value from performance system	Orig Segment Bicycle Accomodation %	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input current value from performance system	Orig Segment Outside Shoulder width	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Outside Shoulder width	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Bicycle Accomodation (%)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Enter in Mobiity Needs spreadsheet to calculate new segment level Mobility Need	Post-Project Segment Bicycle Accomodation (%)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	45.0%	No Change	No Change	No Change	No Change	No Change
	Needs	User entered value from Mobility Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Mobility Need	**0.644**	**0.644**	**0.774**	**0.774**	**5.278**	**5.278**	**5.278**	**1.74**	**1.74**	**1.74**	**1.74**	**2.761**	**2.761**	**1.104**	**1.104**
		User entered value from Mobility Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Mobility Need	**0.642**	**0.641**	**0.771**	**0.744**	**1.682**	**2.921**	**5.263**	**0.781**	**0.862**	**1.716**	**1.735**	**2.749**	**2.084**	**0.945**	**1.004**

LEGEND:

- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

			Solution #	CS10E.22	CS10E.23	CS10E.24	CS10E.25B	CS10E.26B	CS10E.28A	CS10E.28B	CS10E.29
			Description	Dragoon EB Climbing Lane	Dragoon Safety Improvements	Exit 318 Lighting Improvements	Texas Canyon Area Pavement Improvements	Red Bird Hills Area Pavement Improvements	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	Bowie Area Safety Improvements
			Project Beg MP	316	316	318	321	328	339.46	339.46	354
			Project End MP	318	318	318	323	329	339.46	339.46	372
			Project Length (miles)	2	2	1	2	1	0	0	18
			Segment Beg MP	315	315	315	315	315	332	332	354
			Segment End MP	332	332	332	332	332	354	354	372
			Segment Length (miles)	17	17	17	17	17	22	22	18
			Segment #	13	13	13	13	13	14	14	15
			Current # of Lanes (both directions)	4	4	4	4	4	4	4	4
			Project Type (one-way or two-way)	one-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
			Additional Lanes (one-way)	1	0	0	0	0	0	0	0
			Pro-Rated # of Lanes	4.12	4.00	4.00	4.00	4.00	4.00	4.00	4.00
		Notes and Directions	**Description**								
MOBILITY	MOBILITY INDEX	Input current value from performance system	Original Segment Mobility Index	0.380	0.380	0.380	0.380	0.380	0.350	0.350	0.280
		Enter in Mobility Index Spreadsheet to determine new segment level Mobility Index	Post-Project # of Lanes (both directions)	4.12	4.00	4.00	4.00	4.00	4.00	4.00	4.00
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Mobility Index	0.37	0.38	0.38	0.38	0.38	0.35	0.35	0.28
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Mobility Index	0.370	0.380	0.380	0.380	0.380	0.350	0.350	0.280
	FUT V/C	Input current value from performance system	Original Segment Future V/C	0.430	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Future V/C	0.410	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Future V/C	0.410	No Change	No Change	No Change	No Change	No Change	No Change	No Change
	PEAK HOUR V/C	Input current value from performance system (direction 1)	Original Segment Peak Hour V/C (EB)	0.310	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input current value from performance system (direction 2)	Original Segment Peak Hour V/C (WB)	0.270	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		***If One-Way project**, enter in Mobility Index Spreadsheet to determine new segment level Peak Hour V/C. **If Two-Way project,** disregard	Adjusted total # of Lanes for use in directional peak hr	4.24	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Input value from updated Mobility Index spreadsheet (direction 1)	Post-Project Segement Peak Hr V/C (EB)	0.30	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input value from updated Mobility Index spreadsheet (direction 2)	Post-Project Segement Peak Hr V/C (WB)	0.26	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Peak Hr V/C (EB)	0.300	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Peak Hr V/C (WB)	0.260	No Change	No Change	No Change	No Change	No Change	No Change	No Change
	LOTTR	Calculated Value (both directions)	Safety Reduction Factor	0.951	0.946	0.990	0.995	0.990	1.000	1.000	0.284
		Calculated Value (both directions)	Safety Reduction	0.049	0.054	0.010	0.005	0.010	0.000	0.000	0.716
		Calculated Value (both directions)	Mobility Reduction Factor	0.974	1.000	1.000	1.000	1.000	1.000	1.000	1.000
		Calculated Value (both directions)	Mobility Reduction	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Assumed effect on LOTTR(% of mobility reduction)	Mobility effect on LOTTR	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
		Assumed effect on LOTTR (% of safety reduction)	Safety effect on LOTTR	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
		Input current value from performance system (direction 1)	Original Directional Segment LOTTR (EB)	1.040	1.040	1.040	1.040	1.040	1.030	1.030	1.030
		Input current value from performance system (direction 2)	Original Directional Segment LOTTR (WB)	1.040	1.040	1.040	1.040	1.040	1.030	1.030	1.030
		Calculated Value (both directions)	Reduction Factor for Segment LOTTR	0.020	0.016	0.003	0.001	0.003	0.000	0.000	0.215
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 1)	Post-Project Directional Segment LOTTR (EB)	1.019	1.023	1.037	1.038	1.037	1.030	1.030	1.015
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 2)	Post-Project Directional Segment LOTTR (WB)	1.0400	1.023	1.037	1.038	1.037	1.030	1.030	1.015
	CLOSURE EXTENT	Input current value from performance system (direction 1)	Orig Segment Directional Closure Extent (EB)	0.050	0.050	0.050	0.050	0.050	0.110	0.110	0.260
		Input current value from performance system (direction 2)	Orig Segment Directional Closure Extent (WB)	0.210	0.210	0.210	0.210	0.210	0.230	0.230	1.060
		Input value from HCRS	Segment Closures with fatalities/injuries	0	0	0	0	0	2	2	1
		Input value from HCRS	Total Segment Closures	22	22	22	22	22	29	29	16
		Calculated Value (both directions)	% Closures with Fatality/Injury	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.06
		Calculated Value (both directions)	Closure Reduction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.045
		Calculated Value (both directions)	Closure Reduction Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.955
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 1)	Post-Project Segment Directional Closure Extent (EB)	0.050	0.050	0.050	0.050	0.050	0.110	0.110	0.248
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 2)	Post-Project Segment Directional Closure Extent (WB)	0.210	0.210	0.210	0.210	0.210	0.230	0.230	1.013
	BICYCLE ACCOM	Input current value from performance system	Orig Segment Bicycle Accomodation %	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input current value from performance system	Orig Segment Outside Shoulder width	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Outside Shoulder width	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Input value from updated Mobility Index spreadsheet	Post-Project Segment Bicycle Accomodation (%)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
		Enter in Mobiity Needs spreadsheet to calculate new segment level Mobility Need	Post-Project Segment Bicycle Accomodation (%)	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change
	Needs	User entered value from Mobility Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Mobility Need	**0.669**	**0.669**	**0.669**	**0.669**	**0.669**	**0.506**	**0.506**	**0.783**
		User entered value from Mobility Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Mobility Need	**0.656**	**0.668**	**0.669**	**0.669**	**0.669**	**0.506**	**0.506**	**0.765**

LEGEND:

- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

		Solution #	CS10E.1	CS10E.2	CS10E.3A	CS10E.3B	CS10E.4A	CS10E.4B	CS10E.5A	CS10E.5B	CS10E.6A	CS10E.6B	CS10E.7A	CS10E.7B	CS10E.8A	CS10E.8B	CS10E.9B	CS10E.10	CS10E.11	CS10E.12	CS10E.13
		Description	Casa Grande Lighting Improvements	Casa Grande Safety Improvements	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	Red Rock TI UP (#592) Bridge Project	Picacho Safety Improvements	Picacho Lighting Improvements	Marana Safety Improvements	Marana Lighting Improvements
		Project Beg MP	187	187	188.2	188.2	193.88	193.88	195.89	195.89	196.89	196.89	205.45	205.45	207.17	207.17	226.45	218	218	236	236
		Project End MP	190	190	188.2	188.2	193.88	193.88	195.89	195.89	196.89	196.89	205.45	205.45	207.17	207.17	226.45	236	236	242	242
		Project Length (miles)	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	18	18	6	6
		Segment Beg MP	187	187	187	187	187	187	187	187	187	187	198	198	198	198	218	218	218	236	236
		Segment End MP	198	198	198	198	198	198	198	198	198	198	218	218	218	218	236	236	236	242	242
		Segment Length (miles)	11	11	11	11	11	11	11	11	11	11	20	20	20	20	18	18	18	6	6
		Segment #	3	3	3	3	3	3	3	3	3	3	4	4	4	4	5	5	5	6	6
		Current # of Lanes (both directions)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
		Additional Lanes (one-way)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Pro-Rated # of Lanes	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
		Notes and Directions	**Description**																		
	TTTR	Assumed effect on TTTR (% of mobility reduction)	Mobility effect on TTTR	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
		Assumed effect on TTTR (% of safety reduction)	Safety effect on TTTR	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
		Input current value from performance system (direction 1)	Original Directional Segment TTTR (EB)	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.117	1.120	1.120	1.120	1.080	1.080	1.080	1.060	1.060
		Input current value from performance system (direction 2)	Original Directional Segment TTTR (WB)	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.101	1.100	1.100	1.100	1.080	1.080	1.080	1.060	1.060
		Calculated Value (both directions)	Reduction Factor for Segment TTTR (both directions)	0.001	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.042	0.014	0.014	0.001
		Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 1)	Post-Project Directional Segment TTTR (EB)	1.079	1.060	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.117	1.120	1.120	1.120	1.079	1.034	1.065	1.045	1.059
		Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 2)	Post-Project Directional Segment TTTR (WB)	1.099	1.080	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.101	1.100	1.100	1.100	1.079	1.034	1.065	1.045	1.059
	FREIGHT INDEX	Value from above	Original Segment MAX TTTR (EB)	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.117	1.120	1.120	1.120	1.080	1.080	1.080	1.060	1.060
		Value from above	Original Segment MAX TTTR (WB)	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.101	1.100	1.100	1.100	1.080	1.080	1.080	1.060	1.060
		Calculated Value	Original Segment Freight Index	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.11	1.11	1.11	1.11	1.08	1.08	1.08	1.06	1.06
		Calculated Value	Post-Project Segment MAX TTTR (EB)	1.079	1.060	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.117	1.120	1.120	1.120	1.079	1.034	1.065	1.045	1.059
		Calculated Value	Post-Project Segment MAX TTTR (WB)	1.099	1.080	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.101	1.100	1.100	1.100	1.079	1.034	1.065	1.045	1.059
		Enter in Freight Needs spreadsheet to update segment level Freight Need	Post-Project Segment Freight Index	1.089	1.070	1.090	1.090	1.090	1.090	1.090	1.090	1.090	1.090	1.109	1.110	1.110	1.110	1.079	1.034	1.065	1.045	1.059
	CLOSURE DURATION	Input current value from performance system (direction 1)	Orig Segment Directional Closure Duration (dir 1)	74.69	74.69	74.69	74.69	74.69	74.69	74.69	74.69	74.69	74.69	22.21	22.21	22.21	22.21	9.48	9.48	9.48	20.86	20.86
		Input current value from performance system (direction 2)	Orig Segment Directional Closure Duration (dir 2)	40.20	40.20	40.20	40.20	40.20	40.20	40.20	40.20	40.20	40.20	55.16	55.16	55.16	55.16	16.92	16.92	16.92	233.15	233.15
		Calculated Value	Segment Closures with fatalities	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	1	1
		Calculated Value	Total Segment Closures	26	26	26	26	26	26	26	26	26	26	42	42	42	42	23	23	23	23	23
		Calculated Value	% Closures with Fatality	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.09	0.09	0.09	0.04	0.04
		Calculated Value	Closure Reduction	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.008	0.004	0.000
		Calculated Value	Closure Reduction Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.975	0.992	0.996	1.000
		Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 1)	Post-Project Segment Directional Closure Duration (EB)	74.69	74.69	74.69	74.69	74.69	74.69	74.69	74.69	74.69	74.69	22.21	22.21	22.21	22.21	9.48	9.25	9.40	20.77	20.85
		Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 2)	Post-Project Segment Directional Closure Duration (WB)	40.20	40.20	40.20	40.20	40.20	40.20	40.20	40.20	40.20	40.20	55.16	55.16	55.16	55.16	16.91	16.50	16.78	232.17	233.06
	VERT CLR	Input current value from performance system	Original Segment Vertical Clearance	15.76	15.76	15.76	15.76	15.76	15.76	15.76	15.76	15.76	15.76	15.90	15.90	15.90	15.90	15.84	15.84	15.84	17.51	17.51
		Input current value from performance system	Original vertical clearance for specific bridge	NA	NA	16.03	16.03	15.76	15.76	16.17	16.17	16.17	16.17	16.03	16.03	15.97	15.97	15.84	NA	NA	NA	NA
		Input post-project value (depends on solution)	Post-Project vertical clearance for specific bridge	NA	NA	16.50	16.28	16.50	16.01	16.50	16.42	16.50	16.42	16.50	16.28	16.50	16.22	16.50	NA	NA	NA	NA
		Input post-project value (depends on solution)(force segment clearance to equal this specific bridge)	Post-Project Segment Vertical Clearance	15.76	15.76	16.50	16.28	16.50	16.01	16.50	16.42	16.50	16.42	16.50	16.28	16.50	16.22	16.50	15.84	15.84	17.51	17.51
		Enter in Freight Needs spreadsheet to update segment level Freight Need	Post-Project Segment Vertical Clearance	15.76	15.76	16.50	16.28	16.50	16.01	16.50	16.42	16.50	16.42	16.50	16.28	16.50	16.22	16.50	15.84	15.84	17.51	17.51
	Needs	User entered value from Freight Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Freight Need	**0.624**	**0.624**	**0.624**	**0.624**	**0.624**	**0.624**	**0.624**	**0.624**	**0.624**	**0.624**	**0.629**	**0.629**	**0.629**	**0.629**	**0.515**	**0.515**	**0.515**	**0.416**	**0.416**
		User entered value from Freight Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Freight Need	**0.62**	**0.593**	**0.173**	**0.287**	**0.173**	**0.517**	**0.173**	**0.197**	**0.173**	**0.197**	**0.219**	**0.333**	**0.219**	**0.405**	**0.069**	**0.514**	**0.514**	**0.414**	**0.416**

LEGEND:

- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

			Solution #	CS10E.14A	CS10E.14B	CS10E.14C	CS10E.15A	CS10E.15B	CS10E.15C	CS10E.16	CS10E.17	CS10E.18	CS10E.19	CS10E.21	CS10E.22	CS10E.23	CS10E.24	CS10E.25B	CS10E.26B	CS10E.28A	CS10E.28B	CS10E.29
			Description	Tucson Mobility, Safety, and Freight Improvements	Tucson Mobility, Safety, and Freight Improvements	Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Lighting Improvements	Vail Mobility and Safety Improvements	Marsh Station EB Climbing Lane	Benson WB Climbing Lane	Mescal Shoulder Widening	Dragoon EB Climbing Lane	Dragoon Safety Improvements	Exit 318 Lighting Improvements	Texas Canyon Area Pavement Improvements	Red Bird Hills Area Pavement Improvements	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	Bowie Area Safety Improvements
			Project Beg MP	255	255	255	262	262	262	263	280	286	303	292	316	316	318	321	328	339.46	339.46	354
			Project End MP	262	262	262	274	274	274	274	292	291	305	315	318	318	318	323	329	339.46	339.46	372
			Project Length (miles)	7	7	7	12	12	12	11	12	5	2	23	2	2	1	2	1	0	0	18
			Segment Beg MP	255	255	255	262	262	262	262	280	280	292	292	315	315	315	315	315	332	332	354
			Segment End MP	262	262	262	274	274	274	274	292	292	315	315	332	332	332	332	332	354	354	372
			Segment Length (miles)	7	7	7	12	12	12	12	12	12	23	23	17	17	17	17	17	22	22	18
			Segment #	8	8	8	9	9	9	9	11	11	12	12	13	13	13	13	13	14	14	15
			Current # of Lanes (both directions)	8	8	8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	one-way	one-way	two-way	one-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
			Additional Lanes (one-way)	1	0.5	0	1	0.5	0	0	0	1	1	0	1	0	0	0	0	0	0	0
			Pro-Rated # of Lanes	10.00	9.00	8.00	6.00	5.00	4.00	4.00	4.00	4.42	4.09	4.00	4.12	4.00	4.00	4.00	4.00	4.00	4.00	4.00
		Notes and Directions		**Description**																			
	TTTR	Assumed effect on TTTR (% of mobility reduction)		Mobility effect on TTTR	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
		Assumed effect on TTTR (% of safety reduction)		Safety effect on TTTR	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
		Input current value from performance system (direction 1)		Original Directional Segment TTTR (EB)	1.360	1.360	1.360	1.860	1.860	1.860	1.860	1.080	1.080	1.100	1.100	1.180	1.180	1.180	1.180	1.180	1.070	1.070	1.070
		Input current value from performance system (direction 2)		Original Directional Segment TTTR (WB)	1.440	1.440	1.440	1.420	1.420	1.420	1.420	1.150	1.150	1.090	1.090	1.120	1.120	1.120	1.120	1.120	1.080	1.080	1.060
		Calculated Value (both directions)		Reduction Factor for Segment TTTR (both directions)	0.051	0.055	0.055	0.045	0.049	0.101	0.005	0.072	0.010	0.005	0.047	0.010	0.008	0.001	0.001	0.001	0.000	0.000	0.107
		Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 1)		Post-Project Directional Segment TTTR (EB)	1.291	1.285	1.286	1.776	1.769	1.671	1.851	1.002	1.069	1.094	1.048	1.168	1.171	1.178	1.179	1.178	1.070	1.070	1.013
		Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 2)		Post-Project Directional Segment TTTR (WB)	1.367	1.361	1.361	1.356	1.351	1.276	1.413	1.067	1.150	1.090	1.038	1.120	1.111	1.118	1.119	1.118	1.080	1.080	1.030
	FREIGHT INDEX	Value from above		Original Segment MAX TTTR (EB)	1.360	1.360	1.360	1.860	1.860	1.860	1.860	1.080	1.080	1.100	1.100	1.180	1.180	1.180	1.180	1.180	1.070	1.070	1.070
		Value from above		Original Segment MAX TTTR (WB)	1.440	1.440	1.440	1.420	1.420	1.420	1.420	1.150	1.150	1.090	1.090	1.120	1.120	1.120	1.120	1.120	1.080	1.080	1.060
		Calculated Value		Original Segment Freight Index	1.40	1.40	1.40	1.64	1.64	1.64	1.64	1.12	1.12	1.10	1.10	1.15	1.15	1.15	1.15	1.15	1.08	1.08	1.07
		Calculated Value		Post-Project Segment MAX TTTR (EB)	1.291	1.285	1.286	1.776	1.769	1.671	1.851	1.002	1.069	1.094	1.048	1.168	1.171	1.178	1.179	1.178	1.070	1.070	1.013
		Calculated Value		Post-Project Segment MAX TTTR (WB)	1.367	1.361	1.361	1.356	1.351	1.276	1.413	1.067	1.150	1.090	1.038	1.120	1.111	1.118	1.119	1.118	1.080	1.080	1.030
		Enter in Freight Needs spreadsheet to update segment level Freight Need		Post-Project Segment Freight Index	1.329	1.323	1.324	1.566	1.560	1.474	1.632	1.035	1.110	1.092	1.043	1.144	1.141	1.148	1.149	1.148	1.075	1.075	1.021
	CLOSURE DURATION	Input current value from performance system (direction 1)		Orig Segment Directional Closure Duration (dir 1)	98.36	98.36	98.36	38.57	38.57	38.57	38.57	48.10	48.10	47.31	47.31	3.54	3.54	3.54	3.54	3.54	21.52	21.52	145.45
		Input current value from performance system (direction 2)		Orig Segment Directional Closure Duration (dir 2)	64.47	64.47	64.47	35.20	35.20	35.20	35.20	15.44	15.44	11.98	11.98	38.82	38.82	38.82	38.82	38.82	32.85	32.85	71.37
		Calculated Value		Segment Closures with fatalities	1	1	1	2	2	2	2	2	2	5	5	0	0	0	0	0	2	2	1
		Calculated Value		Total Segment Closures	51	51	51	47	47	47	47	20	20	46	46	22	22	22	22	22	29	29	16
		Calculated Value		% Closures with Fatality	0.02	0.02	0.02	0.04	0.04	0.04	0.04	0.10	0.10	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.06
		Calculated Value		Closure Reduction	0.003	0.004	0.007	0.004	0.009	0.029	0.001	0.048	0.001	0.003	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.045
		Calculated Value		Closure Reduction Factor	0.997	0.996	0.993	0.996	0.991	0.971	0.999	0.952	0.999	0.997	0.966	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.955
		Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 1)		Post-Project Segment Directional Closure Duration (EB)	98.08	97.92	97.66	38.40	38.21	37.46	38.51	45.79	48.07	47.18	45.69	3.54	3.54	3.54	3.54	3.54	21.52	21.52	138.94
		Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 2)		Post-Project Segment Directional Closure Duration (WB)	64.28	64.18	64.01	35.05	34.87	34.19	35.15	14.70	15.44	11.98	11.57	38.82	38.82	38.82	38.82	38.82	32.85	32.85	68.18
	VERT CLR	Input current value from performance system		Original Segment Vertical Clearance	16.50	16.50	16.50	16.13	16.13	16.13	16.13	16.22	16.22	16.20	16.20	16.40	16.40	16.40	16.40	16.40	15.96	15.96	16.31
		Input current value from performance system		Original vertical clearance for specific bridge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.96	15.96	NA
		Input post-project value (depends on solution)		Post-Project vertical clearance for specific bridge	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	16.50	16.21	NA
		Input post-project value (depends on solution)(force segment clearance to equal this specific bridge)		Post-Project Segment Vertical Clearance	16.50	16.50	16.50	16.13	16.13	16.13	16.13	16.22	16.22	16.20	16.20	16.40	16.40	16.40	16.40	16.40	16.50	16.21	16.31
		Enter in Freight Needs spreadsheet to update segment level Freight Need		Post-Project Segment Vertical Clearance	16.50	16.50	16.50	16.13	16.13	16.13	16.13	16.22	16.22	16.20	16.20	16.40	16.40	16.40	16.40	16.40	16.50	16.21	16.31
	Needs	User entered value from Freight Needs spreadsheet and for use in Performance Effectiveness spreadsheet		Original Segment Freight Need	**3.118**	**3.118**	**3.118**	**5.355**	**5.355**	**5.355**	**5.355**	**0.417**	**0.417**	**0.345**	**0.345**	**0.405**	**0.405**	**0.405**	**0.405**	**0.405**	**0.462**	**0.462**	**0.417**
		User entered value from Freight Needs spreadsheet and for use in Performance Effectiveness spreadsheet		Post-Project Segment Freight Need	**2.456**	**2.402**	**2.409**	**4.718**	**4.663**	**3.882**	**5.312**	**0.279**	**0.406**	**0.341**	**0.3**	**0.383**	**0.369**	**0.401**	**0.405**	**0.401**	**0.088**	**0.286**	**0.402**

LEGEND:
- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

			Solution #	CS10E.1	CS10E.2	CS10E.1A	CS10E.3B	CS10E.4A	CS10E.4B	CS10E.5A	CS10E.5B	CS10E.6A	CS10E.6B	CS10E.7A	CS10E.7B	CS10E.8A	CS10E.8B	CS10E.9B	CS10E.10	CS10E.11	CS10E.12	CS10E.13
			Description	Casa Grande Lighting Improvements	Casa Grande Safety Improvements	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	Red Rock TI UP (#592) Bridge Project	Picacho Safety Improvements	Picacho Lighting Improvements	Marana Safety Improvements	Marana Lighting Improvements
			Project Beg MP	187	187	188.2	188.2	193.88	193.88	195.89	195.89	196.89	196.89	205.45	205.45	207.17	207.17	226.45	218	218	236	236
			Project End MP	190	190	188.2	188.2	193.88	193.88	195.89	195.89	196.89	196.89	205.45	205.45	207.17	207.17	226.45	236	236	242	242
			Project Length (miles)	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	18	18	6	6
			Segment Beg MP	187	187	187	187	187	187	187	187	187	187	198	198	198	198	218	218	218	236	236
			Segment End MP	198	198	198	198	198	198	198	198	198	198	218	218	218	218	236	236	236	242	242
			Segment Length (miles)	11	11	11	11	11	11	11	11	11	11	20	20	20	20	18	18	18	6	6
			Segment #	3	3	3	3	3	3	3	3	3	3	4	4	4	4	5	5	5	6	6
			Current # of Lanes (both directions)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
			Additional Lanes (one-way)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Pro-Rated # of Lanes	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
		Notes and Directions	Description																			
BRIDGE	BRIDGE INDEX	Input current value from performance system	Original Segment Bridge Index	No Changes	No Changes	5.84	No Changes	5.84	No Changes	5.84	No Changes	5.84	No Changes	6.87	No Changes	6.87	No Changes	6.13	No Changes	No Changes	No Changes	No Changes
		Input current value from performance system	Original lowest rating for specific bridge	No Changes	No Changes	5	No Changes	6	No Changes	6	No Changes	6	No Changes	5	No Changes	6	No Changes	5	No Changes	No Changes	No Changes	No Changes
		Input post-project value (For repair +1, rehab +2, replace=8)	Post-Project lowest rating for specific bridge	No Changes	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	No Changes	No Changes	No Changes
		Enter in Bridge Index spreadsheet to calculate new Bridge Index	Post-Project lowest rating for specific bridge	No Changes	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	No Changes	No Changes	No Changes
		Input updated segment value from updated Bridge Index spreadsheet	Post-Project Segment Bridge Index	No Changes	No Changes	6.31	No Changes	6.08	No Changes	6.08	No Changes	6.09	No Changes	7.05	No Changes	6.99	No Changes	6.68	No Changes	No Changes	No Changes	No Changes
		Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Bridge Index	No Changes	No Changes	6.31	No Changes	6.08	No Changes	6.08	No Changes	6.09	No Changes	7.05	No Changes	6.99	No Changes	6.68	No Changes	No Changes	No Changes	No Changes
	SUFF RATING	Input current value from performance system	Original Segment Sufficiency Rating	No Changes	No Changes	90.11	No Changes	90.11	No Changes	90.11	No Changes	90.11	No Changes	91.40	No Changes	91.40	No Changes	92.86	No Changes	No Changes	No Changes	No Changes
		Input current value from performance system	Original Sufficiency Rating for specific bridge	No Changes	No Changes	86.70	No Changes	96.00	No Changes	91.30	No Changes	92.50	No Changes	86.80	No Changes	93.00	No Changes	80.70	No Changes	No Changes	No Changes	No Changes
		Input post-project value (For repair +10, rehab +20, replace=98)	Post-Project Sufficiency Rating for specific bridge	No Changes	No Changes	98.00	No Changes	98.00	No Changes	98.00	No Changes	98.00	No Changes	98.00	No Changes	98.00	No Changes	98.00	No Changes	No Changes	No Changes	No Changes
		Enter in Bridge Index spreadsheet to calculate new Bridge Index	Post-Project Sufficiency Rating for specific bridge	No Changes	No Changes	98.00	No Changes	98.00	No Changes	98.00	No Changes	98.00	No Changes	98.00	No Changes	98.00	No Changes	98.00	No Changes	No Changes	No Changes	No Changes
		Input updated segment value from updated Bridge Index spreadsheet	Post-Project Segment Sufficiency Rating	No Changes	No Changes	91.87	No Changes	90.35	No Changes	90.31	No Changes	90.77	No Changes	92.05	No Changes	91.69	No Changes	96.04	No Changes	No Changes	No Changes	No Changes
		Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Sufficiency Rating	No Changes	No Changes	91.87	No Changes	90.35	No Changes	90.91	No Changes	90.77	No Changes	92.05	No Changes	91.69	No Changes	96.04	No Changes	No Changes	No Changes	No Changes
	BR RTNG	Input current value from performance system	Original Segment Bridge Rating	No Changes	No Changes	5	No Changes	5	No Changes	5	No Changes	5	No Changes	5	No Changes	6	No Changes	5	No Changes	No Changes	No Changes	No Changes
		Input updated segment value from updated Bridge Index spreadsheet	Post-Project Segment Bridge Rating	No Changes	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	No Changes	No Changes	No Changes
		Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Bridge Rating	No Changes	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	8	No Changes	No Changes	No Changes	No Changes
	Needs	User entered value from Bridge Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Bridge Need	**0.911**	**0.911**	**0.911**	**0.911**	**0.911**	**0.911**	**0.911**	**0.911**	**0.911**	**0.911**	**0.1**	**0.1**	**0.1**	**0.1**	**0.466**	**0.466**	**0.466**	**0.1**	**0.1**
		User entered value from Bridge Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Bridge Need	**0.911**	**0.911**	**0.19**	**0.911**	**0.42**	**0.911**	**0.42**	**0.911**	**0.41**	**0.911**	**0**	**0.1**	**0**	**0.1**	**0**	**0.466**	**0.466**	**0.1**	**0.1**

LEGEND:
- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

			Solution #	CS10E.14A	CS10E.14B	CS10E.14C	CS10E.15A	CS10E.15B	CS10E.15C	CS10E.16	CS10E.17	CS10E.18	CS10E.19	CS10E.21	CS10E.22	CS10E.23	CS10E.24	CS10E.25B	CS10E.26B	CS10E.28A	CS10E.28B	CS10E.29
			Description	Tucson Mobility, Safety, and Freight Improvements	Tucson Mobility, Safety, and Freight Improvements	Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Lighting Improvements	Vail Mobility and Safety Improvements	Marsh Station EB Climbing Lane	Benson WB Climbing Lane	Mescal Shoulder Widening	Dragoon EB Climbing Lane	Dragoon Safety Improvements	Exit 318 Lighting Improvements	Texas Canyon Area Pavement Improvements	Red Bird Hills Area Pavement Improvements	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	Bowie Area Safety Improvements
			Project Beg MP	255	255	255	262	262	262	263	280	286	303	292	316	316	318	321	328	339.46	339.46	354
			Project End MP	262	262	262	274	274	274	274	292	291	305	315	318	318	318	323	329	339.46	339.46	372
			Project Length (miles)	7	7	7	12	12	12	11	12	5	2	23	2	2	1	2	1	0	0	18
			Segment Beg MP	255	255	255	262	262	262	262	280	280	292	292	315	315	315	315	315	332	332	354
			Segment End MP	262	262	262	274	274	274	274	292	292	315	315	332	332	332	332	332	354	354	372
			Segment Length (miles)	7	7	7	12	12	12	12	12	12	23	23	17	17	17	17	17	22	22	18
			Segment #	8	8	8	9	9	9	9	11	11	12	12	13	13	13	13	13	14	14	15
			Current # of Lanes (both directions)	8	8	8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
			Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	one-way	one-way	two-way	one-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
			Additional Lanes (one-way)	1	0.5	0	1	0.5	0	0	0	1	1	0	1	0	0	0	0	0	0	0
			Pro-Rated # of Lanes	10.00	9.00	8.00	6.00	5.00	4.00	4.00	4.00	4.42	4.09	4.00	4.12	4.00	4.00	4.00	4.00	4.00	4.00	4.00
		Notes and Directions	Description																			
BRIDGE	BRIDGE INDEX	Input current value from performance system	Original Segment Bridge Index	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	5.73	5.73	No Changes
		Input current value from performance system	Original lowest rating for specific bridge	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	4	4	No Changes
		Input post-project value (For repair +1, rehab +2, replace=8)	Post-Project lowest rating for specific bridge	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	8	6	No Changes
		Enter in Bridge Index spreadsheet to calculate new Bridge Index	Post-Project lowest rating for specific bridge	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	8	6	No Changes
		Input updated segment value from updated Bridge Index spreadsheet	Post-Project Segment Bridge Index	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	6.27	6.00	No Changes
		Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Bridge Index	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	6.27	6.00	No Changes
	SUFF RATING	Input current value from performance system	Original Segment Sufficiency Rating	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	86.82	86.82	No Changes
		Input current value from performance system	Original Sufficiency Rating for specific bridge	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	55.90	55.90	No Changes
		Input post-project value (For repair +10, rehab +20, replace=98)	Post-Project Sufficiency Rating for specific bridge	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	98.00	75.90	No Changes
		Enter in Bridge Index spreadsheet to calculate new Bridge Index	Post-Project Sufficiency Rating for specific bridge	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	98.00	75.90	No Changes
		Input updated segment value from updated Bridge Index spreadsheet	Post-Project Segment Sufficiency Rating	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	91.24	89.49	No Changes
		Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Sufficiency Rating	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	91.24	89.49	No Changes
	BR RTNG	Input current value from performance system	Original Segment Bridge Rating	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	4	4	No Changes
		Input updated segment value from updated Bridge Index spreadsheet	Post-Project Segment Bridge Rating	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	8	6	No Changes
		Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Bridge Rating	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	8	6	No Changes
	Needs	User entered value from Bridge Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Bridge Need	**0**	**0**	**0**	**1.04**	**1.04**	**1.04**	**1.04**	**0**	**0**	**0.4**	**0.4**	**1.645**	**1.645**	**1.645**	**1.645**	**1.645**	**1.334**	**1.334**	**0.808**
		User entered value from Bridge Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Bridge Need	**0**	**0**	**0**	**1.04**	**1.04**	**1.04**	**1.04**	**0**	**0**	**0.4**	**0.4**	**1.645**	**1.645**	**1.645**	**1.645**	**1.645**	**0.23**	**0.5**	**0.808**

LEGEND:
- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

		Solution #	CS10E.1	CS10E.2	CS10E.3A	CS10E.3B	CS10E.4A	CS10E.4B	CS10E.5A	CS10E.5B	CS10E.6A	CS10E.6B	CS10E.7A	CS10E.7B	CS10E.8A	CS10E.8B	CS10E.9B	CS10E.10	CS10E.11	CS10E.12	CS10E.13
		Description	Casa Grande Lighting Improvements	Casa Grande Safety Improvements	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	Red Rock TI UP (#592) Bridge Project	Picacho Safety Improvements	Picacho Lighting Improvements	Marana Safety Improvements	Marana Lighting Improvements
		Project Beg MP	187	187	188.2	188.2	193.88	193.88	195.89	195.89	196.89	196.89	205.45	205.45	207.17	207.17	226.45	218	218	236	236
		Project End MP	190	190	188.2	188.2	193.88	193.88	195.89	195.89	196.89	196.89	205.45	205.45	207.17	207.17	226.45	236	236	242	242
		Project Length (miles)	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	18	18	6	6
		Segment Beg MP	187	187	187	187	187	187	187	187	187	187	198	198	198	198	218	218	218	236	236
		Segment End MP	198	198	198	198	198	198	198	198	198	198	218	218	218	218	236	236	236	242	242
		Segment Length (miles)	11	11	11	11	11	11	11	11	11	11	20	20	20	20	18	18	18	6	6
		Segment #	3	3	3	3	3	3	3	3	3	3	4	4	4	4	5	5	5	6	6
		Current # of Lanes (both directions)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
		Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
		Additional Lanes (one-way)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Pro-Rated # of Lanes	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
		Notes and Directions	Description																		
PAVEMENT	PAVEMENT INDEX	Input current value from performance system	Original Segment Pavement Index	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Input current value from performance system	Original Segment IRI in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Input current value from performance system	Original Segment Cracking in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Input current value from performance system	Original Segment Rutting in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Input post-project value (For rehab, increase to 45; for replace increase to 30)	Post-Project IRI in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Enter in Pavement Index spreadsheet to calculate new Pavement Index	Post-Project IRI in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Input post-project value (Lower to 0 for rehab or replace)	Post-Project Cracking in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Enter in Pavement Index spreadsheet to calculate new Pavement Index	Post-Project Cracking in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Input post-project value (Lower to 0 for rehab or replace)	Post-Project Rutting in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Enter in Pavement Index spreadsheet to calculate new Pavement Index	Post-Project Rutting in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Input updated segment value from updated Pavement Index spreadsheet	Post-Project Segment Pavement Index	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Pavement Index	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
	DIRECTION PSR	Input current value from performance system (direction 1)	Original Segment Directional PSR (NB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Input current value from performance system (direction 2)	Original Segment Directional PSR (SB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Value from above	Original Segment IRI in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Value from above	Post-Project directional IRI in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Input updated segment value from updated Pavement Index spreadsheet (direction 1)	Post-Project Segment Directional PSR (NB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Input updated segment value from updated Pavement Index spreadsheet (direction 2)	Post-Project Segment Directional PSR (SB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Directional PSR (NB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Directional PSR (SB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
	% FAIL	Input current value from performance system	Original Segment % Failure	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Input value from updated Pavement Index spreadsheet	Post-Project Segment % Failure	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment % Failure	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes
	Needs	User entered value from Pavement Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Pavement Need	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.807**	**0.807**	**0.807**	**0.807**	**0.444**	**0.444**	**0.444**	**0.500**	**0.500**
		User entered value from Pavement Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Pavement Need	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.045**	**0.807**	**0.807**	**0.807**	**0.807**	**0.444**	**0.444**	**0.444**	**0.5**	**0.5**

LEGEND:
- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

		Solution #	CS10E.14A	CS10E.14B	CS10E.14C	CS10E.15A	CS10E.15B	CS10E.15C	CS10E.16	CS10E.17	CS10E.18	CS10E.19	CS10E.21	CS10E.22	CS10E.23	CS10E.24	CS10E.25B	CS10E.26B	CS10E.28A	CS10E.28B	CS10E.29
		Description	Tucson Mobility, Safety, and Freight Improvements	Tucson Mobility, Safety, and Freight Improvements	Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Mobility, Safety, and Freight Improvements	East Tucson Lighting Improvements	Vail Mobility and Safety Improvements	Marsh Station EB Climbing Lane	Benson WB Climbing Lane	Mescal Shoulder Widening	Dragoon EB Climbing Lane	Dragoon Safety Improvements	Exit 318 Lighting Improvements	Texas Canyon Area Pavement Improvements	Red Bird Hills Area Pavement Improvements	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	Bowie Area Safety Improvements
		Project Beg MP	255	255	255	262	262	262	263	280	286	303	292	316	316	318	321	328	339.46	339.46	354
		Project End MP	262	262	262	274	274	274	274	292	291	305	315	318	318	318	323	329	339.46	339.46	372
		Project Length (miles)	7	7	7	12	12	12	11	12	5	2	23	2	2	1	2	1	0	0	18
		Segment Beg MP	255	255	255	262	262	262	262	280	280	292	292	315	315	315	315	315	332	332	354
		Segment End MP	262	262	262	274	274	274	274	292	292	315	315	332	332	332	332	332	354	354	372
		Segment Length (miles)	7	7	7	12	12	12	12	12	12	23	23	17	17	17	17	17	22	22	18
		Segment #	8	8	8	9	9	9	9	11	11	12	12	13	13	13	13	13	14	14	15
		Current # of Lanes (both directions)	8	8	8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	one-way	one-way	two-way	one-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
		Additional Lanes (one-way)	1	0.5	0	1	0.5	0	0	0	1	1	0	1	0	0	0	0	0	0	0
		Pro-Rated # of Lanes	10.00	9.00	8.00	6.00	5.00	4.00	4.00	4.00	4.42	4.09	4.00	4.12	4.00	4.00	4.00	4.00	4.00	4.00	4.00
		Notes and Directions	Description																		
PAVEMENT	PAVEMENT INDEX	Input current value from performance system	Original Segment Pavement Index	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	3.98	3.98	No Changes	No Changes	No Changes
		Input current value from performance system	Original Segment IRI in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	84.64	183.88	No Changes	No Changes	No Changes
		Input current value from performance system	Original Segment Cracking in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	5.75	1.45	No Changes	No Changes	No Changes
		Input current value from performance system	Original Segment Rutting in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	0.25	0.25	No Changes	No Changes	No Changes
		Input post-project value (For rehab, increase to 45; for replace increase to 30)	Post-Project IRI in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	30	30	No Changes	No Changes	No Changes
		Enter in Pavement Index spreadsheet to calculate new Pavement Index	Post-Project IRI in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	30	30	No Changes	No Changes	No Changes
		Input post-project value (Lower to 0 for rehab or replace)	Post-Project Cracking in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	0	0	No Changes	No Changes	No Changes
		Enter in Pavement Index spreadsheet to calculate new Pavement Index	Post-Project Cracking in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	0	0	No Changes	No Changes	No Changes
		Input post-project value (Lower to 0 for rehab or replace)	Post-Project Rutting in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	0	0	No Changes	No Changes	No Changes
		Enter in Pavement Index spreadsheet to calculate new Pavement Index	Post-Project Rutting in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	0	0	No Changes	No Changes	No Changes
		Input updated segment value from updated Pavement Index spreadsheet	Post-Project Segment Pavement Index	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	4.11	4.05	No Changes	No Changes	No Changes
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Pavement Index	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	4.11	4.05	No Changes	No Changes	No Changes
	DIRECTION PSR	Input current value from performance system (direction 1)	Original Segment Directional PSR (NB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	3.83	3.83	No Changes	No Changes	No Changes
		Input current value from performance system (direction 2)	Original Segment Directional PSR (SB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	4.02	4.02	No Changes	No Changes	No Changes
		Value from above	Original Segment IRI in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	84.64	183.88	No Changes	No Changes	No Changes
		Value from above	Post-Project directional IRI in project limits	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	30	30	No Changes	No Changes	No Changes
		Input updated segment value from updated Pavement Index spreadsheet (direction 1)	Post-Project Segment Directional PSR (NB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	3.97	3.9	No Changes	No Changes	No Changes
		Input updated segment value from updated Pavement Index spreadsheet (direction 2)	Post-Project Segment Directional PSR (SB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	4.06	4.05	No Changes	No Changes	No Changes
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Directional PSR (NB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	3.97	3.9	No Changes	No Changes	No Changes
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Directional PSR (SB)	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	4.06	4.05	No Changes	No Changes	No Changes
	% FAIL	Input current value from performance system	Original Segment % Failure	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	8.8%	8.8%	No Changes	No Changes	No Changes
		Input value from updated Pavement Index spreadsheet	Post-Project Segment % Failure	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	2.9%	5.9%	No Changes	No Changes	No Changes
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment % Failure	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	No Changes	2.9%	5.9%	No Changes	No Changes	No Changes
	Needs	User entered value from Pavement Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Pavement Need	**0.480**	**0.480**	**0.480**	**0.560**	**0.560**	**0.560**	**0.560**	**0.083**	**0.083**	**0.435**	**0.435**	**0.088**	**0.088**	**0.088**	**0.088**	**0.088**	**0.409**	**0.409**	**0.256**
		User entered value from Pavement Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Pavement Need	**0.48**	**0.48**	**0.48**	**0.56**	**0.56**	**0.56**	**0.56**	**0.083**	**0.083**	**0.435**	**0.435**	**0.088**	**0.088**	**0.088**	**0.029**	**0.059**	**0.409**	**0.409**	**0.256**

CMF Application

I-10 E Corridor Profile Study
CMF Application

=user input

CS10E.1 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
187	190.00	0.75	1.00	1	1	EB	0.750			0	1	0.000	0.750	0.000	0.250
								3	2			**3.000**	**1.750**	0.000	0.250

CS10E.1 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
187	190	0.75	1.00	1	1	WB	0.750			0	2	0.000	1.500	0.000	0.500
								2	5			**2.000**	**4.500**	0.000	0.500

CS10E.2 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
187	190	0.72	1.00	1.00	1	EB	0.72			2	1	1.440	0.720	0.560	0.280
190	190	1	1.00	1.00	1	EB	1			0	0	0.000	0.000	0.000	0.000
								3	2			**2.440**	**1.720**	0.560	0.280

CS10E.2 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
187	190	0.72	1.00	1	1	WB	0.720			0	4	0.000	2.880	0.000	1.120
187	190	1	1.00	1	1	WB	1.000			0	1	0.000	1.000	0.000	0.000
								2	5			**2.000**	**3.880**	0.000	1.120

CS10E.3A (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
188.2	188.2	0.95	1.00	1	1	EB	0.950			0	0	0.000	0.000	0.000	0.000
								3	2			**3.000**	**2.000**	0.000	0.000

CS10E.3A (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
188.2	188.2	0.95	1.00	1	1	WB	0.950			0	0	0.000	0.000	0.000	0.000
								2	5			**2.000**	**5.000**	0.000	0.000

CS10E.3B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
188.2	188.2	0.7	1.00	1	1	EB	0.700			0	0	0.000	0.000	0.000	0.000
								3	2			**3.000**	**2.000**	0.000	0.000

CS10E.3B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
188.2	188.2	0.7	1.00	1	1	WB	0.700			0	0	0.000	0.000	0.000	0.000
								2	5			**2.000**	**5.000**	0.000	0.000

CS10E.4A (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
193.88	193.88	0.95	1.00	1	1	EB	0.950			0	0	0.000	0.000	0.000	0.000
								3	2			**3.000**	**2.000**	0.000	0.000

CS10E.4A (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
193.88	193.88	0.95	1.00	1	1	WB	0.950			0	0	0.000	0.000	0.000	0.000
								2	5			**2.000**	**5.000**	0.000	0.000

CS10E.4B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
193.88	193.88	0.7	1.00	1	1	EB	0.700			0	0	0.000	0.000	0.000	0.000
								3	2			**3.000**	**2.000**	0.000	0.000

CS10E.4B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
193.88	193.88	0.7	1.00	1	1	WB	0.700			0	0	0.000	0.000	0.000	0.000
								2	5			**2.000**	**5.000**	0.000	0.000

CS10E.5A (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
195.89	195.89	0.95	1.00	1	1	EB	0.950			0	0	0.000	0.000	0.000	0.000
								3	2			**3.000**	**2.000**	0.000	0.000

CS10E.5A (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
195.89	195.89	0.95	1.00	1	1	WB	0.950			0	0	0.000	0.000	0.000	0.000
								2	5			**2.000**	**5.000**	0.000	0.000

CS10E.5B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
195.89	195.89	0.7	1.00	1	1	EB	0.700			0	0	0.000	0.000	0.000	0.000
								3	2			**3.000**	**2.000**	0.000	0.000

CS10E.5B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
195.89	195.89	0.7	1.00	1	1	WB	0.700			0	0	0.000	0.000	0.000	0.000
								2	5			**2.000**	**5.000**	0.000	0.000

CS10E.6A (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
196.89	196.89	0.95	1.00	1	1	EB	0.950			0	0	0.000	0.000	0.000	0.000
								3	2			**3.000**	**2.000**	0.000	0.000

CS10E.6A (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
196.89	196.89	0.95	1.00	1	1	WB	0.950			0	0	0.000	0.000	0.000	0.000
								2	5			**2.000**	**5.000**	0.000	0.000

CS10E.6B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
196.89	196.89	0.7	1.00	1	1	EB	0.700			0	0	0.000	0.000	0.000	0.000
								3	2			**3.000**	**2.000**	0.000	0.000

CS10E.6B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
196.89	196.89	0.7	1.00	1	1	WB	0.700			0	0	0.000	0.000	0.000	0.000
								2	5			**2.000**	**5.000**	0.000	0.000

CS10E.7A (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
205.45	205.45	0.95	1.00	1	1	EB	0.950			0	0	0.000	0.000	0.000	0.000
						WB		4	8			**4.000**	**8.000**	0.000	0.000

CS10E.7A (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
205.45	205.45	0.95	1.00	1	1		0.950			0	0	0.000	0.000	0.000	0.000
								8	5			**8.000**	**5.000**	0.000	0.000

CS10E.7B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
205.45	205.45	0.7	1.00	1	1	EB	0.700			0	0	0.000	0.000	0.000	0.000
								4	8			**4.000**	**8.000**	0.000	0.000

CS10E.7B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
205.45	205.45	0.7	1.00	1	1	WB	0.700			0	0	0.000	0.000	0.000	0.000
								8	5			**8.000**	**5.000**	0.000	0.000

CS10E.8A (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
207.17	207.17	0.95	1.00	1	1	EB	0.950			0	0	0.000	0.000	0.000	0.000
								4	8			**4.000**	**8.000**	0.000	0.000

CS10E.8A (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
207.17	207.17	0.95	1.00	1	1	WB	0.950			0	0	0.000	0.000	0.000	0.000
								8	5			**8.000**	**5.000**	0.000	0.000

CS10E.8B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
207.17	207.17	0.7	1.00	1	1	EB	0.700			0	0	0.000	0.000	0.000	0.000
								4	8			**4.000**	**8.000**	0.000	0.000

CS10E.8B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
207.17	207.17	0.7	1.00	1	1	WB	0.700			0	0	0.000	0.000	0.000	0.000
								8	5			**8.000**	**5.000**	0.000	0.000

CS10E.9A (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
226.45	226.45	0.95	1.00	1	1	EB	0.950			0	0	0.000	0.000	0.000	0.000
								9	4			**9.000**	**4.000**	0.000	0.000

CS10E.9B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
226.45	226.45	0.75	1.00	1	1	EB	0.750			0	0	0.000	0.000	0.000	0.000
								9	4			**9.000**	**4.000**	0.000	0.000

CS10E.9B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
226.45	226.45	0.75	1.00	1	1	WB	0.750			0	0	0.000	0.000	0.000	0.000
								4	6			**4.000**	**6.000**	0.000	0.000

CS10E.10 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
218	236	0.72	1.00	1	1	EB	0.720			9	4	6.480	2.880	2.520	1.120
								9	4			**6.480**	**2.880**	2.520	1.120

CS10E.10 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
218	236	0.72	1.00	1	1	WB	0.720			4	6	2.880	4.320	1.120	1.680
								4	6			**2.880**	**4.320**	1.120	1.680

CS10E.11 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
218	236	0.75	1.00	1	1	EB	0.750			4	2	3.000	1.500	1.000	0.500
								9	4			**8.000**	**3.500**	1.000	0.500

CS10E.11 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
218	236	0.75	1.00	1	1	WB	0.750			1	1	0.750	0.750	0.250	0.250
								4	6			**3.750**	**5.750**	0.250	0.250

CS10E.12 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
236	242	0.72	1.00	1	1	EB	0.720			1	3	0.720	2.160	0.280	0.840
								4	5			**3.720**	**4.160**	0.280	0.840

CS10E.12 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
236	242	0.72	1.00	1	1	WB	0.720			1	4	0.720	2.880	0.280	1.120
								2	8			**1.720**	**6.880**	0.280	1.120

CS10E.13 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
236	242	0.75	1.00	1	1	EB	0.750			0	2	0.000	1.500	0.000	0.500
								4	5			**4.000**	**4.500**	0.000	0.500

CS10E.13 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
236	242	0.75	1.00	1	1	WB	0.750			0	3	0.000	2.250	0.000	0.750
								2	8			**2.000**	**7.250**	0.000	0.750

C S10E.14A (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reductior Fatal	Total Crash Reductior Incap
255	262	0.9	1.00	1	1	EB	0.900			1	5	0.900	4.500	0.100	0.500
								1	5			**0.900**	**4.500**	0.100	0.500

C S10E.14A (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reductior Fatal	Total Crash Reductior Incap
255	262	0.9	1.00	1	1	WB	0.900			2	9	1.800	8.100	0.200	0.900
								2	9			**1.800**	**8.100**	0.200	0.900

C S10E.14B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reductior Fatal	Total Crash Reductior Incap
255	262	0.64	1.00	1	1	EB	0.640			1	5	0.640	3.200	0.360	1.800
								1	5			**0.640**	**3.200**	0.360	1.800

C S10E.14B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reductior Fatal	Total Crash Reductior Incap
255	262	0.64	1.00	1	1	WB	0.640			2	9	1.280	5.760	0.720	3.240
								2	9			**1.280**	**5.760**	0.720	3.240

C S10E.15A (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reductior Fatal	Total Crash Reductior Incap
262	274	0.9	1.00	1	1	EB	0.900			5	11	4.500	9.900	0.500	1.100
								5	11			**4.500**	**9.900**	0.500	1.100

C S10E.15A (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reductior Fatal	Total Crash Reductior Incap
262	274	0.9	1.00	1	1	WB	0.900			3	11	2.700	9.900	0.300	1.100
								3	11			**2.700**	**9.900**	0.300	1.100

C S10E.15B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reductior Fatal	Total Crash Reductior Incap
262	274	0.78	1.00	1	1	EB	0.780			5	11	3.900	8.580	1.100	2.420
								5	11			**3.900**	**8.580**	1.100	2.420

C S10E.15B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reductior Fatal	Total Crash Reductior Incap
262	274	0.78	1.00	1	1	WB	0.780			3	11	2.340	8.580	0.660	2.420
								3	11			**2.340**	**8.580**	0.660	2.420

CS10E.15C (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
262	274	0.64	1.00	1	1	EB	0.640			5	11	3.200	7.040	1.800	3.960
262	274	0.68	1.00	1	1	EB	0.680			5	11	3.400	7.480	1.600	3.520
268	268	0.94	1	1	1	EB	0.940			0	1	0.000	0.940	0.000	0.060
266	266	1	1	1	1	EB	1.000			0	0	0.000	0.000	0.000	0.000
								5	11			**1.600**	**3.460**	3.400	7.540

CS10E.15C (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
262	274	0.64	1.00	1	1	WB	0.640			3	11	1.920	7.040	1.080	3.960
262	274	0.68	1.00	1	1	WB	0.680			3	11	2.040	7.480	0.960	3.520
268	268	0.94	1	1	1	WB	0.940			0	2	0.000	1.880	0.000	0.120
								3	11			**0.960**	**3.400**	2.040	7.600

CS10E.16 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
263	274	0.75	1.00	1	1	EB	0.750			1	3	0.750	2.250	0.250	0.750
								5	11			**4.750**	**10.250**	0.250	0.750

CS10E.16 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
263	274	0.75	1.00	1	1	WB	0.750			0	2	0.000	1.500	0.000	0.500
								3	11			**3.000**	**10.500**	0.000	0.500

CS10E.17 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
280	292	0.64	0.72	1	1	EB	0.550			4	6	2.202	3.302	1.798	2.698
								4	6			**2.202**	**3.302**	1.798	2.698

CS10E.17 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
280	292	0.64	0.72	1	1	WB	0.550			2	7	1.101	3.853	0.899	3.147
								2	7			**1.101**	**3.853**	0.899	3.147

CS10E.18 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
286	291	0.75	1.00	1	1	EB	0.750			0	1	0.000	0.750	0.000	0.250
								4	6			**4.000**	**5.750**	0.000	0.250

CS10E.19 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
303	305	0.75	1.00	1	1	WB	0.750			1	0	0.750	0.000	0.250	0.000
								6	6			**5.750**	**6.000**	0.250	0.000

CS10E.21 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
292	315	0.68	1.00	1	1	EB	0.680			4	11	2.720	7.480	1.280	3.520
								4	11			**2.720**	**7.480**	1.280	3.520

CS10E.21 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
292	315	0.68	1.00	1	1	EB	0.680			6	6	4.080	4.080	1.920	1.920
								6	6			**4.080**	**4.080**	1.920	1.920

CS10E.22 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
316	318	0.75	1.00	1	1	EB	0.750			1	4	0.750	3.000	0.250	1.000
								2	12			**1.750**	**11.000**	0.250	1.000

CS10E.23 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
316	318	0.72	1.00	1	1	EB	0.720			1	4	0.720	2.880	0.280	1.120
317	317	0.94	1.00	1	1	EB	0.940			0	2	0.000	1.880	0.000	0.120
317	317	1	1	1	1	EB	1.000			0	2	0.000	2.000	0.000	0.000
								2	12			**1.720**	**10.760**	0.280	1.240

CS10E.23 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
316	318	0.72	1.00	1	1	EB	0.720			0	1	0.000	0.720	0.000	0.280
317	317	0.94	1.00	1	1	EB	0.940			0	0	0.000	0.000	0.000	0.000
317	317	1	1	1	1	EB	1.000			0	0	0.000	0.000	0.000	0.000
								3	9			**3.000**	**8.720**	0.000	0.280

CS10E.24 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
318	318	0.75	1.00	1	1	EB	0.750			0	1	0.000	0.750	0.000	0.250
								2	12			**2.000**	**11.750**	0.000	0.250

CS10E.24 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
318	318	0.75	1.00	1	1	WB	0.750			0	1	0.000	0.750	0.000	0.250
								3	9			**3.000**	**8.750**	0.000	0.250

CS10E.25B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
321	323	0.7	1.00	1	1	EB	0.700			0	1	0.000	0.700	0.000	0.300
								2	12			**2.000**	**11.700**	0.000	0.300

CS10E.25B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
321	323	0.7	1.00	1	1	WB	0.700			0	0	0.000	0.000	0.000	0.000
								3	9			**3.000**	**9.000**	0.000	0.000

CS10E.26B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
328	329	0.7	1.00	1	1	EB	0.700			0	1	0.000	0.700	0.000	0.300
								2	12			**2.000**	**11.700**	0.000	0.300

CS10E.26B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
328	329	0.7	1.00	1	1	WB	0.700			0	1	0.000	0.700	0.000	0.300
								3	9			**3.000**	**8.700**	0.000	0.300

CS10E.28A (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
339.46	339.46	0.95	1.00	1	1	EB	0.950			0	0	0.000	0.000	0.000	0.000
								2	4			**2.000**	**4.000**	0.000	0.000

CS10E.28A (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
339.46	339.46	0.95	1.00	1	1	WB	0.950			0	0	0.000	0.000	0.000	0.000
								3	6			**3.000**	**6.000**	0.000	0.000

CS10E.28B (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
339.46	339.46	0.95	0.70	1	1	EB	0.808			0	0	0.000	0.000	0.000	0.000
								2	4			**2.000**	**4.000**	0.000	0.000

CS10E.28B (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
339.46	339.46	0.95	0.70	1	1	WB	0.808			0	0	0.000	0.000	0.000	0.000
								3	6			**3.000**	**6.000**	0.000	0.000

CS10E.29 (Eastbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
354	372	0.72	1.00	1	1	EB	0.720			2	8	1.440	5.760	0.560	2.240
356	356	0.94	1.00	1	1	EB	0.940			0	1	0.000	0.940	0.000	0.060
								2	8			**1.440**	**5.700**	0.560	2.300

CS10E.29 (Westbound)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
354	372	0.72	1.00	1	1	WB	0.720			4	1	2.880	0.720	1.120	0.280
356	356	0.94	1.00	1	1	WB	0.940			0	0	0.000	0.000	0.000	0.000
356	356	1	1	1	1	WB	1.000			0	0	0.000	0.000	0.000	0.000
								4	1			**2.880**	**0.720**	1.120	0.280

Performance Area Scoring

Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	Pavement					Bridge					Safety					Mobility					Freight					Total Risk Factored Performance Area Benefit
				Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	
CS10E.1	Casa Grande Lighting Improvements	187-190	7.01	0.045	0.045	0.000	0.00	0.000	0.911	0.911	0.000	0.00	0.000	2.133	2.114	0.019	1.62	0.031	0.876	0.876	0.000	6.10	0.000	0.624	0.620	0.004	6.13	0.025	0.055
CS10E.2	Casa Grande Safety Improvements	187-190	4.49	0.045	0.045	0.000	0.00	0.000	0.911	0.911	0.000	0.00	0.000	2.133	1.601	0.532	1.62	0.862	0.876	0.873	0.003	6.10	0.018	0.624	0.593	0.031	6.13	0.190	1.070
CS10E.3A	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	188.2	7.17	0.045	0.045	0.000	0.00	0.000	0.911	0.190	0.721	3.01	2.172	2.133	2.133	0.000	1.62	0.000	0.876	0.876	0.000	0.00	0.000	0.624	0.173	0.451	6.13	2.763	4.935
CS10E.3B	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	188.2	14.42	0.045	0.045	0.000	0.00	0.000	0.911	0.911	0.000	0.00	0.000	2.133	2.133	0.000	1.62	0.000	0.876	0.876	0.000	0.00	0.000	0.624	0.287	0.337	6.13	2.065	2.065
CS10E.4A	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	193.88	10.53	0.045	0.045	0.000	0.00	0.000	0.911	0.420	0.491	1.88	0.923	2.133	2.133	0.000	1.62	0.000	0.876	0.876	0.000	0.00	0.000	0.624	0.173	0.451	6.13	2.763	3.686
CS10E.4B	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	193.88	14.42	0.045	0.045	0.000	0.00	0.000	0.911	0.911	0.000	0.00	0.000	2.133	2.133	0.000	1.62	0.000	0.876	0.876	0.000	0.00	0.000	0.624	0.517	0.107	6.13	0.656	0.656
CS10E.5A	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	195.89	11.03	0.045	0.045	0.000	0.00	0.000	0.911	0.420	0.491	2.35	1.152	2.133	2.133	0.000	1.62	0.000	0.876	0.876	0.000	0.00	0.000	0.624	0.173	0.451	6.13	2.763	3.915
CS10E.5B	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	195.89	13.32	0.045	0.045	0.000	0.00	0.000	0.911	0.911	0.000	0.00	0.000	2.133	2.133	0.000	1.62	0.000	0.876	0.876	0.000	0.00	0.000	0.624	0.197	0.427	6.13	2.616	2.616
CS10E.6A	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	196.89	9.65	0.045	0.045	0.000	0.00	0.000	0.911	0.410	0.501	1.68	0.841	2.133	2.133	0.000	1.62	0.000	0.876	0.876	0.000	0.00	0.000	0.624	0.173	0.451	6.13	2.763	3.604
CS10E.6B	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	196.89	14.42	0.045	0.045	0.000	0.00	0.000	0.911	0.911	0.000	0.00	0.000	2.133	2.133	0.000	1.62	0.000	0.876	0.876	0.000	0.00	0.000	0.624	0.197	0.427	6.41	2.737	2.737
CS10E.7A	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	205.45	7.75	0.807	0.807	0.000	0.00	0.000	0.100	0.000	0.100	1.65	0.165	3.075	3.075	0.000	1.59	0.000	0.528	0.528	0.000	0.00	0.000	0.629	0.219	0.410	6.41	2.628	2.793
CS10E.7B	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	205.45	13.32	0.807	0.807	0.000	0.00	0.000	0.100	0.100	0.000	0.00	0.000	3.075	3.075	0.000	1.59	0.000	0.528	0.528	0.000	0.00	0.000	0.629	0.333	0.296	6.41	1.897	1.897
CS10E.8A	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	207.17	8.27	0.807	0.807	0.000	0.00	0.000	0.100	0.000	0.100	1.68	0.168	3.075	3.075	0.000	1.59	0.000	0.528	0.528	0.000	0.00	0.000	0.629	0.219	0.410	6.41	2.628	2.796
CS10E.8B	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	207.17	14.42	0.807	0.807	0.000	0.00	0.000	0.100	0.100	0.000	0.00	0.000	3.075	3.075	0.000	1.59	0.000	0.528	0.528	0.000	0.00	0.000	0.629	0.405	0.224	6.41	1.436	1.436
CS10E.9B	Red Rock TI UP (#592) Bridge Project	226.45	2.39	0.444	0.444	0.000	0.00	0.000	0.466	0.000	0.466	3.14	1.465	3.243	3.243	0.000	1.61	0.000	0.644	0.644	0.000	0.00	0.000	0.515	0.069	0.446	0.00	0.000	1.465
CS10E.10	Picacho Safety Improvements	218-236	29.29	0.444	0.444	0.000	0.00	0.000	0.466	0.466	0.000	0.00	0.000	3.243	2.001	1.242	1.61	2.000	0.644	0.642	0.002	6.67	0.013	0.515	0.514	0.001	6.24	0.006	2.019
CS10E.11	Picacho Lighting Improvements	218-236	42.06	0.444	0.444	0.000	0.00	0.000	0.466	0.466	0.000	0.00	0.000	3.243	2.859	0.384	1.61	0.618	0.644	0.641	0.003	6.67	0.020	0.515	0.514	0.001	6.24	0.006	0.644
CS10E.12	Marana Safety Improvements	236-242	9.76	0.500	0.500	0.000	0.00	0.000	0.100	0.100	0.000	0.00	0.000	1.984	1.482	0.502	1.78	0.894	0.774	0.771	0.003	3.31	0.010	0.416	0.414	0.002	3.07	0.006	0.910

Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	Pavement					Bridge					Safety					Mobility					Freight					Total Risk Factored Performance Area Benefit
				Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	
CS10E.13	Marana Lighting Improvements	236-242	14.02	0.500	0.500	0.000	0.00	0.000	0.100	0.100	0.000	0.00	0.000	1.984	1.920	0.064	1.78	0.114	0.774	0.744	0.030	3.31	0.099	0.416	0.416	0.000	3.07	0.000	0.213
CS10E.14A	Tucson Mobility, Safety, and Freight Improvements	255-262	130.52	0.480	0.480	0.000	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.275	0.234	0.041	1.99	0.082	5.278	1.682	3.596	3.33	11.987	3.118	2.456	0.662	3.22	2.132	14.200
CS10E.14B	Tucson Mobility, Safety, and Freight Improvements	255-262	6.53	0.480	0.480	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.000	0.275	0.175	0.10	1.99	0.199	5.278	5.263	0.015	3.33	0.050	3.118	2.409	0.709	3.22	2.283	2.532
CS10E.15A	East Tucson Mobility, Safety, and Freight Improvements	265-274	123.66	0.560	0.560	0.000	0.00	0.000	1.040	1.040	0.00	0.00	0.000	1.951	1.315	0.64	1.91	1.215	1.740	0.781	0.959	6.67	6.393	5.355	4.718	0.637	6.49	4.132	11.740
CS10E.15B	East Tucson Mobility, Safety, and Freight Improvements	265-274	87.85	0.560	0.560	0.000	0.00	0.000	1.040	1.040	0.00	0.00	0.000	1.951	1.074	0.88	1.91	1.675	1.740	0.862	0.878	6.67	5.853	5.355	4.663	0.692	6.49	4.489	12.017
CS10E.15C	East Tucson Mobility, Safety, and Freight Improvements	265-274	29.27	0.560	0.560	0.000	0.00	0.000	1.040	1.040	0.00	0.00	0.000	1.951	0.718	1.23	1.91	2.355	1.740	1.716	0.024	6.67	0.160	5.355	3.882	1.473	6.49	9.555	12.070
CS10E.16	East Tucson Lighting Improvements	263-274	25.71	0.560	0.560	0.000	0.00	0.000	1.040	1.040	0.00	0.00	0.000	1.951	1.725	0.23	1.91	0.432	1.740	1.735	0.005	6.67	0.033	5.355	5.312	0.043	6.49	0.279	0.744
CS10E.17	Vail Mobility and Safety Improvements	280-292	44.23	0.083	0.083	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.000	1.031	0.755	0.28	1.43	0.395	2.761	2.749	0.012	6.63	0.080	0.417	0.279	0.138	6.27	0.865	1.339
CS10E.18	Marsh Station EB Climbing Lane	286-291	32.44	0.083	0.083	0.000	5.12	0.000	0.000	0.000	0.00	0.00	0.000	1.031	1.024	0.01	1.43	0.010	2.761	2.084	0.677	6.17	4.180	0.417	0.406	0.011	6.27	0.069	4.259
CS10E.19	Benson WB Climbing Lane	303-305	16.58	0.435	0.435	0.000	0.00	0.000	0.400	0.400	0.00	0.00	0.000	3.198	3.020	0.18	1.43	0.255	1.104	0.945	0.159	5.11	0.813	0.345	0.341	0.004	6.27	0.025	1.093
CS10E.21	Mescal Shoulder Widening	292-315	84.78	0.435	0.435	0.000	0.00	0.000	0.400	0.400	0.00	0.00	0.000	3.198	1.044	2.15	1.20	2.585	1.104	1.004	0.100	6.66	0.666	0.345	0.300	0.045	6.03	0.271	3.522
CS10E.22	Dragoon EB Climbing Lane	316-318	19.47	0.088	0.088	0.000	0.00	0.000	1.645	1.645	0.00	0.00	0.000	1.921	1.474	0.45	1.99	0.890	0.669	0.656	0.013	4.64	0.060	0.405	0.383	0.022	6.12	0.135	1.085
CS10E.23	Dragoon Safety Improvements	316-318	3.67	0.088	0.088	0.000	0.00	0.000	1.645	1.645	0.00	0.00	0.000	1.921	1.425	0.50	1.99	0.987	0.669	0.668	0.001	4.64	0.005	0.405	0.369	0.036	6.12	0.220	1.212
CS10E.24	Exit 318 Lighting Improvements	318	1.17	0.088	0.088	0.000	0.00	0.000	1.645	1.645	0.00	0.00	0.000	1.921	1.839	0.08	2.29	0.188	0.669	0.669	0.000	4.07	0.000	0.405	0.401	0.004	6.12	0.024	0.212
CS10E.25B	Texas Canyon Area Pavement Improvements	321-323	15.03	0.088	0.029	0.059	5.10	0.301	1.645	1.645	0.00	0.00	0.000	1.921	1.888	0.03	1.39	0.046	0.669	0.669	0.000	0.00	0.000	0.405	0.405	0.000	0.00	0.000	0.347
CS10E.26B	Red Bird Hills Area Pavement Improvements	328-329	7.51	0.088	0.059	0.03	4.82	0.140	1.645	1.645	0.00	0.00	0.000	1.921	1.839	0.08	1.22	0.100	0.669	0.669	0.000	0.00	0.000	0.405	0.401	0.004	0.00	0.000	0.240
CS10E.28A	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	339.46	7.50	0.409	0.409	0.000	0.00	0.000	1.334	0.230	1.10	1.23	1.353	1.468	1.468	0.00	1.03	0.000	0.506	0.506	0.000	0.00	0.000	0.462	0.088	0.374	5.99	2.240	3.593
CS10E.28B	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	339.46	11.50	0.409	0.409	0.00	0.00	0.000	1.334	0.500	0.83	1.23	1.022	1.468	1.468	0.00	1.03	0.000	0.506	0.506	0.000	0.00	0.000	0.462	0.286	0.176	5.99	1.054	2.076
CS10E.29	Bowie Area Safety Improvements	354-372	18.39	0.256	0.256	0.00	0.00	0.000	0.808	0.808	0.00	0.00	0.000	3.455	1.212	2.24	0.92	2.064	0.783	0.765	0.018	6.55	0.118	0.417	0.402	0.015	5.74	0.086	2.268

Performance Effectiveness Scoring

Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	Safety Emphasis Area						Mobility Emphasis Area						Freight Emphasis Area						Total Factored Benefit	VMT Factor	NPV Factor	Performance Effectiveness Score	miles	2020 ADT	1-way or 2-way	VMT
				Existing Corridor Need	Post-Solution Corridor Need	Raw Score	Risk Factor	Emphasis Factor	Factored Score	Existing Corridor Need	Post-Solution Corridor Need	Raw Score	Risk Factor	Emphasis Factor	Factored Score	Existing Corridor Need	Post-Solution Corridor Need	Raw Score	Risk Factor	Emphasis Factor	Factored Score								
CS10E.1	Casa Grande Lighting Improvements	187-190	7.01	1.739	1.738	0.001	1.62	1.50	0.002	0.464	0.464	0.000	6.10	1.50	0.000	1.129	1.128	0.001	6.13	1.50	0.009	0.067	4.16	15.3	0.6	3.00	42652	2	127954.7705
CS10E.2	Casa Grande Safety Improvements	187-190	4.49	1.739	1.718	0.021	1.62	1.50	0.051	0.464	0.464	0.000	6.10	1.50	0.000	1.129	1.121	0.008	6.13	1.50	0.074	1.195	4.16	15.3	16.9	3.00	42652	2	127954.7705
CS10E.3A	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	188.2	7.17	1.739	1.739	0.000	1.62	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.13	1.50	0.000	4.935	1.28	30.6	27.0	0.50	42652	2	21325.79508
CS10E.3B	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	188.2	14.415	1.739	1.739	0.000	1.62	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.13	1.50	0.000	2.065	2.24	15.3	4.9	1.00	42652	2	42651.59016
CS10E.4A	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	193.88	10.529	1.739	1.739	0.000	1.62	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.13	1.50	0.000	3.686	1.28	30.6	13.7	0.50	42652	2	21325.79508
CS10E.4B	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	193.88	14.415	1.739	1.739	0.000	1.62	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.13	1.50	0.000	0.656	2.24	15.3	1.6	1.00	42652	2	42651.59016
CS10E.5A	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	195.89	11.029	1.739	1.739	0.000	1.62	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.13	1.50	0.000	3.915	1.28	30.6	13.9	0.50	42652	2	21325.79508
CS10E.5B	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	195.89	13.319	1.739	1.739	0.000	1.62	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.13	1.50	0.000	2.616	2.24	15.3	6.7	1.00	42652	2	42651.59016
CS10E.6A	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	196.89	9.65	1.739	1.739	0.000	1.62	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.13	1.50	0.000	3.604	1.28	30.6	14.7	0.50	42652	2	21325.79508
CS10E.6B	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	196.89	14.415	1.739	1.739	0.000	1.62	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.41	1.50	0.000	2.737	2.24	15.3	6.5	1.00	42652	2	42651.59016
CS10E.7A	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	205.45	7.754	1.739	1.739	0.000	1.59	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.41	1.50	0.000	2.793	1.23	30.6	13.6	0.50	40711	2	20355.5
CS10E.7B	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	205.45	13.319	1.739	1.739	0.000	1.59	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.41	1.50	0.000	1.897	2.16	15.3	4.7	1.00	40711	2	40711
CS10E.8A	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	207.17	8.271	1.739	1.739	0.000	1.59	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.41	1.50	0.000	2.796	1.23	30.6	12.7	0.50	40711	2	20355.5
CS10E.8B	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	207.17	14.415	1.739	1.739	0.000	1.59	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	6.41	1.50	0.000	1.436	2.16	15.3	3.3	1.00	40711	2	40711
CS10E.9B	Red Rock TI UP (#592) Bridge Project	226.45	2.386	1.739	1.739	0.000	1.61	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.127	0.002	0.00	1.50	0.000	1.465	1.28	30.60	24.0	0.50	42501	2	21250.38403
CS10E.10	Picacho Safety Improvements	218-236	29.294	1.739	1.624	0.115	1.61	1.50	0.278	0.464	0.464	0.000	6.67	1.50	0.000	1.129	1.097	0.032	6.24	1.50	0.299	2.596	5.00	15.30	6.8	18.00	42501	2	765013.825
CS10E.11	Picacho Lighting Improvements	218-236	42.063	1.739	1.701	0.038	1.61	1.50	0.092	0.464	0.464	0.000	6.67	1.50	0.000	1.129	1.118	0.011	6.24	1.50	0.103	0.839	5.00	15.30	1.5	18.00	42501	2	765013.825
CS10E.12	Marana Safety Improvements	236-242	9.764	1.739	1.722	0.017	1.78	1.50	0.045	0.464	0.464	0.000	3.31	1.50	0.000	1.129	1.123	0.006	3.07	1.50	0.028	0.983	4.96	15.30	7.6	6.00	57522	2	345134.2624

Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	Safety Emphasis Area						Mobility Emphasis Area						Freight Emphasis Area						Total Factored Benefit	VMT Factor	NPV Factor	Performance Effectiveness Score	miles	2020 ADT	1-way or 2-way	VMT
				Existing Corridor Need	Post-Solution Corridor Need	Raw Score	Risk Factor	Emphasis Factor	Factored Score	Existing Corridor Need	Post-Solution Corridor Need	Raw Score	Risk Factor	Emphasis Factor	Factored Score	Existing Corridor Need	Post-Solution Corridor Need	Raw Score	Risk Factor	Emphasis Factor	Factored Score								
CS10E.13	Marana Lighting Improvements	236-242	14.021	1.739	1.737	0.002	1.78	1.50	0.005	0.464	0.464	0.000	3.31	1.50	0.000	1.129	1.128	0.001	3.07	1.50	0.005	0.223	4.96	15.30	1.2	6.00	57522	2	345134.2624
CS10E.14A	Tucson Mobility, Safety, and Freight Improvements	255-262	130.52	1.739	1.732	0.007	1.99	1.50	0.021	0.464	0.455	0.009	3.33	1.50	0.045	1.129	1.110	0.019	3.22	1.50	0.092	14.358	5.00	20.20	11.1	7.00	144420	2	1010939.458
CS10E.14B	Tucson Mobility, Safety, and Freight Improvements	255-262	6.533	1.739	1.721	0.018	1.99	1.50	0.054	0.464	0.464	0.000	3.33	1.50	0.000	1.129	1.108	0.021	3.22	1.50	0.101	2.687	5.00	15.30	31.5	7.00	144420	2	1010939.458
CS10E.15A	East Tucson Mobility, Safety, and Freight Improvements	265-274	123.66	1.739	1.670	0.069	1.91	1.50	0.198	0.464	0.451	0.013	6.67	1.50	0.130	1.129	1.097	0.032	6.49	1.50	0.311	12.379	5.00	20.20	10.1	9.00	58955	2	530598.5741
CS10E.15B	East Tucson Mobility, Safety, and Freight Improvements	265-274	87.85	1.739	1.647	0.092	1.91	1.50	0.264	0.464	0.457	0.007	6.67	1.50	0.070	1.129	1.095	0.034	6.49	1.50	0.331	12.681	5.00	20.20	14.6	9.00	58955	2	530598.5741
CS10E.15C	East Tucson Mobility, Safety, and Freight Improvements	265-274	29.27	1.739	1.556	0.183	1.91	1.50	0.524	0.464	0.464	0.000	6.67	1.50	0.000	1.129	1.057	0.072	6.49	1.50	0.701	13.295	5.00	15.30	34.7	9.00	58955	2	530598.5741
CS10E.16	East Tucson Lighting Improvements	263-274	25.705	1.739	1.683	0.056	1.91	1.50	0.160	0.464	0.464	0.000	6.67	1.50	0.000	1.129	1.126	0.003	6.49	1.50	0.029	0.934	5.00	15.30	2.8	11.00	58955	2	648509.3684
CS10E.17	Vail Mobility and Safety Improvements	280-292	44.234	1.739	1.668	0.071	1.43	1.50	0.152	0.464	0.464	0.000	6.63	1.50	0.000	1.129	1.094	0.035	6.27	1.50	0.329	1.821	4.95	15.30	3.1	12.00	27529	2	330348.0459
CS10E.18	Marsh Station EB Climbing Lane	286-291	32.442	1.739	1.739	0.000	1.43	1.50	0.000	0.464	0.460	0.004	6.17	1.50	0.037	1.129	1.127	0.002	6.27	1.50	0.019	4.314	3.08	20.20	8.3	5.00	27529	1	68822.50956
CS10E.19	Benson WB Climbing Lane	303-305	16.583	1.739	1.727	0.012	1.43	1.50	0.026	0.464	0.463	0.001	5.11	1.50	0.008	1.129	1.128	0.001	6.27	1.50	0.009	1.136	1.59	20.20	2.2	2.00	27529	1	27529.00382
CS10E.21	Mescal Shoulder Widening	292-315	84.783	1.739	1.598	0.141	1.20	1.50	0.254	0.464	0.464	0.000	6.66	1.50	0.000	1.129	1.087	0.042	6.03	1.50	0.380	4.156	4.99	15.30	3.7	23.00	21141	2	486251.6022
CS10E.22	Dragoon EB Climbing Lane	316-318	19.465	1.739	1.726	0.013	1.99	1.50	0.039	0.464	0.463	0.001	4.64	1.50	0.007	1.129	1.125	0.004	6.12	1.50	0.037	1.167	1.10	20.20	1.3	2.00	17915	1	17915.31841
CS10E.23	Dragoon Safety Improvements	316-318	3.667	1.739	1.725	0.014	1.99	1.50	0.042	0.464	0.464	0.000	4.64	1.50	0.000	1.129	1.124	0.005	6.12	1.50	0.046	1.300	1.96	15.30	10.6	2.00	17915	2	35830.63682
CS10E.24	Exit 318 Lighting Improvements	318	1.17	1.739	1.737	0.002	2.29	1.50	0.007	0.464	0.464	0.000	4.07	1.50	0.000	1.129	1.128	0.001	6.12	1.50	0.009	0.228	1.10	15.30	3.3	1.00	17915	2	17915.31841
CS10E.25B	Texas Canyon Area Pavement Improvements	321-323	15.029	1.739	1.738	0.001	1.39	1.50	0.002	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	0.00	1.50	0.000	0.349	1.96	8.80	0.4	2.00	17915	2	35830.63682
CS10E.26B	Red Bird Hills Area Pavement Improvements	328-329	7.514	1.739	1.737	0.002	1.22	1.50	0.004	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.128	0.001	0.00	1.50	0.000	0.244	1.10	8.80	0.3	1.00	17915	2	17915.31841
CS10E.28A	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	339.46	7.497	1.739	1.739	0.000	1.03	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	5.99	1.50	0.000	3.593	0.55	30.60	8.1	0.50	16882	2	8441.015593
CS10E.28B	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	339.46	11.5	1.739	1.739	0.000	1.03	1.50	0.000	0.464	0.464	0.000	0.00	1.50	0.000	1.129	1.129	0.000	5.99	1.50	0.000	2.076	1.05	15.30	2.9	1.00	16882	2	16882.03119
CS10E.29	Bowie Area Safety Improvements	354-372	18.391	1.739	1.498	0.241	0.92	1.50	0.333	0.464	0.464	0.000	6.55	1.50	0.000	1.129	1.098	0.031	5.74	1.50	0.267	2.867	4.83	15.30	11.5	18.00	13514	2	243260.8306

Appendix J: Solution Prioritization Scores

Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	Pavement		Bridge		Safety		Mobility		Freight		Total Factored Score	Risk Factors					Weighted Risk Factor	Segment Need	Prioritization Score
				Score	%	Score	%	Score	%	Score	%	Score	%		Pavement	Bridge	Safety	Mobility	Freight			
CS10E.1	Casa Grande Lighting Improvements	187-190	7.01	0.000	0.0%	0.000	0.0%	0.033	49.6%	0.000	0.0%	0.034	50.4%	0.067	1.14	1.51	1.78	1.36	1.36	1.568	1.23	**1**
CS10E.2	Casa Grande Safety Improvements	187-190	4.49	0.000	0.0%	0.000	0.0%	0.913	76.4%	0.018	1.5%	0.263	22.1%	1.195	1.14	1.51	1.78	1.36	1.36	1.681	1.23	**35**
CS10E.3A	Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation	188.2	7.17	0.000	0.0%	2.172	44.0%	0.000	0.0%	0.000	0.0%	2.763	56.0%	4.935	1.14	1.51	1.78	1.36	1.36	1.426	1.23	**47**
CS10E.4A	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	193.88	10.529	0.000	0.0%	0.923	25.0%	0.000	0.0%	0.000	0.0%	2.763	75.0%	3.686	1.14	1.51	1.78	1.36	1.36	1.398	1.23	**24**
CS10E.4B	Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation	193.88	14.415	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.656	100.0%	0.656	1.14	1.51	1.78	1.36	1.36	1.360	1.23	**3**
CS10E.5A	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	195.89	11.029	0.000	0.0%	1.152	29.4%	0.000	0.0%	0.000	0.0%	2.763	70.6%	3.915	1.14	1.51	1.78	1.36	1.36	1.404	1.23	**24**
CS10E.5B	Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation	195.89	13.319	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	2.616	100.0%	2.616	1.14	1.51	1.78	1.36	1.36	1.360	1.23	**11**
CS10E.6A	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	196.89	9.65	0.000	0.0%	0.841	23.3%	0.000	0.0%	0.000	0.0%	2.763	76.7%	3.604	1.14	1.51	1.78	1.36	1.36	1.395	1.23	**25**
CS10E.6B	Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation	196.89	14.415	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	2.737	100.0%	2.737	1.14	1.51	1.78	1.36	1.36	1.360	1.23	**11**
CS10E.7A	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	205.45	7.754	0.000	0.0%	0.165	5.9%	0.000	0.0%	0.000	0.0%	2.628	94.1%	2.793	1.14	1.51	1.78	1.36	1.36	1.369	1.23	**23**
CS10E.7B	Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation	205.45	13.32	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	1.897	100.0%	1.897	1.14	1.51	1.78	1.36	1.36	1.360	1.23	**8**
CS10E.8A	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	207.17	8.271	0.000	0.0%	0.168	6.0%	0.000	0.0%	0.000	0.0%	2.628	94.0%	2.796	1.14	1.51	1.78	1.36	1.36	1.369	1.23	**21**
CS10E.8B	Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation	207.17	14.415	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	1.436	100.0%	1.436	1.14	1.51	1.78	1.36	1.36	1.360	1.23	**6**
CS10E.9B	Red Rock TI UP (#592) Bridge Project	226.45	2.386	0.000	0.0%	1.465	100.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	1.465	1.14	1.51	1.78	1.36	1.36	1.510	1.23	**45**
CS10E.10	Picacho Safety Improvements	218-236	29.294	0.000	0.0%	0.000	0.0%	2.277	87.7%	0.013	0.5%	0.306	11.8%	2.596	1.14	1.51	1.78	1.36	1.36	1.728	1.23	**14**
CS10E.11	Picacho Lighting Improvements	218-236	42.063	0.000	0.0%	0.000	0.0%	0.710	84.6%	0.020	2.4%	0.109	13.0%	0.839	1.14	1.51	1.78	1.36	1.36	1.715	1.23	**3**

Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	Pavement		Bridge		Safety		Mobility		Freight		Total Factored Score	Risk Factors					Weighted Risk Factor	Segment Need	Prioritization Score
				Score	%	Score	%	Score	%	Score	%	Score	%		Pavement	Bridge	Safety	Mobility	Freight			
CS10E.12	Marana Safety Improvements	236-242	9.76	0.000	0.0%	0.000	0.0%	0.939	95.6%	0.010	1.0%	0.034	3.4%	0.983	1.14	1.51	1.78	1.36	1.36	1.761	1.08	**15**
CS10E.13	Marana Lighting Improvements	236-242	14.021	0.000	0.0%	0.000	0.0%	0.119	53.5%	0.099	44.5%	0.005	2.1%	0.223	1.14	1.51	1.78	1.36	1.36	1.585	1.08	**2**
CS10E.14B	Tucson Mobility, Safety, and Freight Improvements	255-262	6.533	0.000	0.0%	0.000	0.0%	0.253	9.4%	0.050	1.9%	2.384	88.7%	2.687	1.14	1.51	1.78	1.36	1.36	1.400	1.08	**48**
CS10E.15C	East Tucson Mobility, Safety, and Freight Improvements	265-274	29.27	0.000	0.0%	0.000	0.0%	2.879	21.7%	0.160	1.2%	10.255	77.1%	13.295	1.14	1.51	1.78	1.36	1.36	1.451	1.92	**97**
CS10E.16	East Tucson Lighting Improvements	263-274	25.705	0.000	0.0%	0.000	0.0%	0.592	63.4%	0.033	3.6%	0.308	33.0%	0.934	1.14	1.51	1.78	1.36	1.36	1.626	1.92	**9**
CS10E.17	Vail Mobility and Safety Improvements	280-292	44.234	0.000	0.0%	0.000	0.0%	0.547	30.0%	0.080	4.4%	1.194	65.6%	1.821	1.14	1.51	1.78	1.36	1.36	1.486	1.31	**6**
CS10E.18	Marsh Station EB Climbing Lane	286-291	32.442	0.000	0.0%	0.000	0.0%	0.010	0.2%	4.217	97.7%	0.088	2.0%	4.314	1.14	1.51	1.78	1.36	1.36	1.361	1.31	**15**
CS10E.19	Benson WB Climbing Lane	303-305	16.58	0.000	0.0%	0.000	0.0%	0.280	24.7%	0.821	72.3%	0.034	3.0%	1.136	1.14	1.51	1.78	1.36	1.36	1.464	1.46	**5**
CS10E.21	Mescal Shoulder Widening	292-315	84.783	0.000	0.0%	0.000	0.0%	2.839	68.3%	0.666	16.0%	0.651	15.7%	4.156	1.14	1.51	1.78	1.36	1.36	1.647	1.46	**9**
CS10E.22	Dragoon EB Climbing Lane	316-318	19.465	0.000	0.0%	0.000	0.0%	0.928	79.5%	0.067	5.8%	0.171	14.7%	1.167	1.14	1.51	1.78	1.36	1.36	1.694	1.15	**3**
CS10E.23	Dragoon Safety Improvements	316-318	3.667	0.000	0.0%	0.000	0.0%	1.029	79.2%	0.005	0.4%	0.266	20.5%	1.300	1.14	1.51	1.78	1.36	1.36	1.692	1.15	**21**
CS10E.24	Exit 318 Lighting Improvements	318	1.17	0.000	0.0%	0.000	0.0%	0.195	85.3%	0.000	0.0%	0.034	14.7%	0.228	1.14	1.51	1.78	1.36	1.36	1.718	1.15	**7**
CS10E.25B	Texas Canyon Area Pavement Improvements	321-323	15.029	0.301	86.3%	0.000	0.0%	0.048	13.7%	0.000	0.0%	0.000	0.0%	0.349	1.14	1.51	1.78	1.36	1.36	1.228	1.15	**1**
CS10E.26B	Red Bird Hills Area Pavement Improvements	328-329	7.514	0.140	57.4%	0.000	0.0%	0.104	42.6%	0.000	0.0%	0.000	0.0%	0.244	1.14	1.51	1.78	1.36	1.36	1.413	1.15	**1**
CS10E.28A	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	339.46	7.497	0.000	0.0%	1.353	37.7%	0.000	0.0%	0.000	0.0%	2.240	62.3%	3.593	1.14	1.51	1.78	1.36	1.36	1.416	0.77	**9**
CS10E.28B	Airport Road UP (#1114) Bridge Vertical Clearance Mitigation	339.46	11.5	0.000	0.0%	1.022	49.2%	0.000	0.0%	0.000	0.0%	1.054	50.8%	2.076	1.14	1.51	1.78	1.36	1.36	1.434	0.77	**3**
CS10E.29	Bowie Area Safety Improvements	354-372	18.391	0.000	0.0%	0.000	0.0%	2.396	83.6%	0.118	4.1%	0.353	12.3%	2.867	1.14	1.51	1.78	1.36	1.36	1.711	1.46	**29**

Appendix K: Preliminary Scoping Reports for Prioritized Solutions

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Casa Grande Lighting Improvements (CS10E.1)	
City/Town: Casa Grande	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 187	
End Limit: MP 190	
Project Length: 3 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Safety Need: From MP 187 to 190, there is a Medium level of need for safety improvements based on the percentage of fatal and serious injury crashes involving trucks and lane departure crashes above the statewide average.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by installing roadway lighting in both directions of travel.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

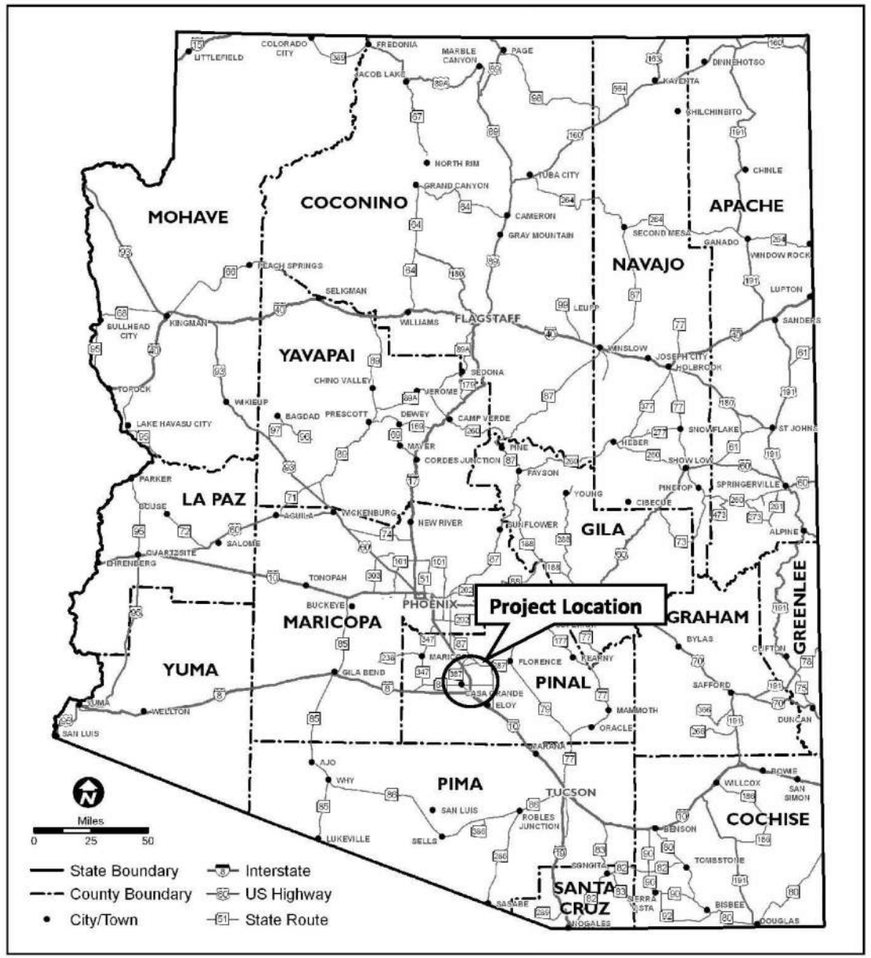
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$186,200	$620,400	$0	$6,204,000	$7,010,600

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



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ATTACHMENT 2 – PROJECT VICINITY MAP

4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Install lighting (both directions) MP 187 to MP 190.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Casa Grande Safety Improvements (CS10E.2)	
City/Town: Casa Grande	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 187	
End Limit: MP 190	
Project Length: 3 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Safety Need: From MP 187 to 190, there is a Medium level of need for safety improvements based on the percentage of fatal and serious injury crashes involving trucks and lane departure crashes above the statewide average.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by rehabilitating shoulders in both directions and installing DMS signs.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

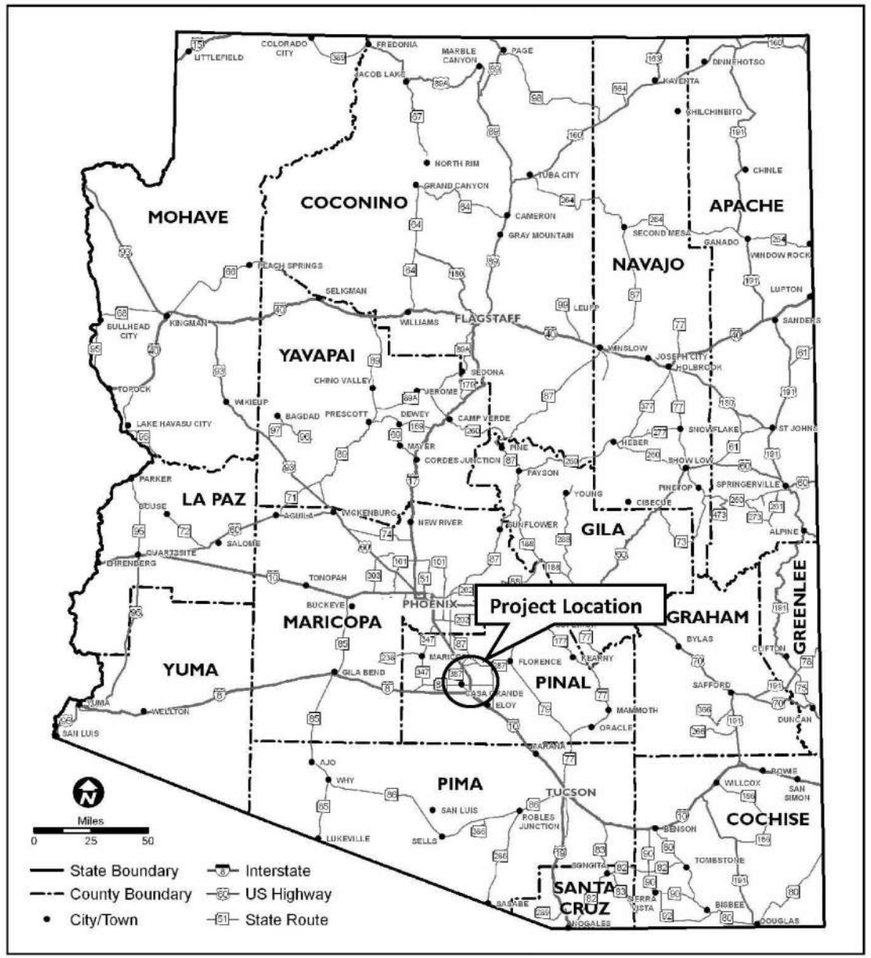
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$119,200	$397,400	$0	$3,974,000	$4,490,600

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



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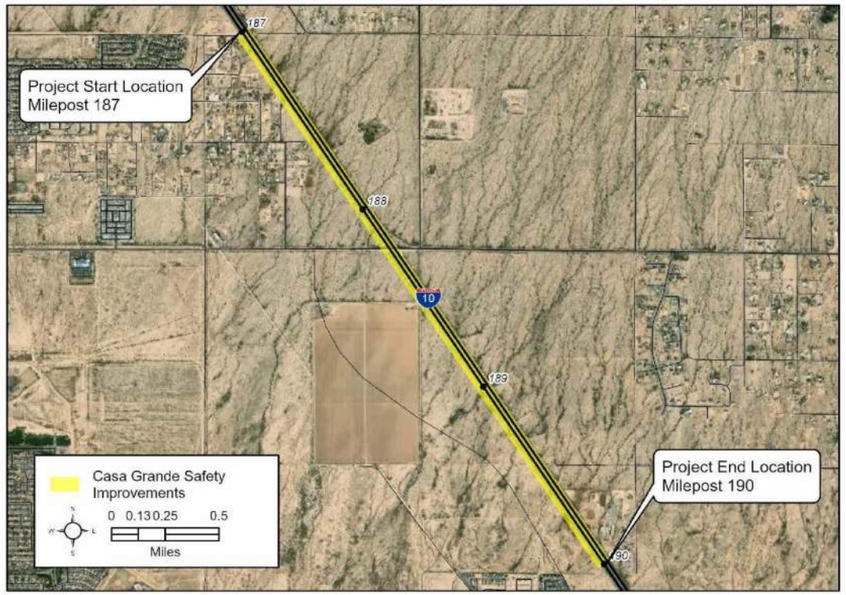
ATTACHMENT 2 – PROJECT VICINITY MAP



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ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Rehabilitate shoulder in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders). • Install DMS signs (EB MP 190 and WB MP 190).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Val Vista Boulevard UP (#1151) Bridge Vertical Clearance Mitigation (CS10E.3A)	
City/Town: Casa Grande	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 188.2	
End Limit: MP 188.2	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Freight Need: At MP 188.2, The Val Vista Boulevard UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a ramp bypass option.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by replacing the bridge to provide adequate vertical clearance.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

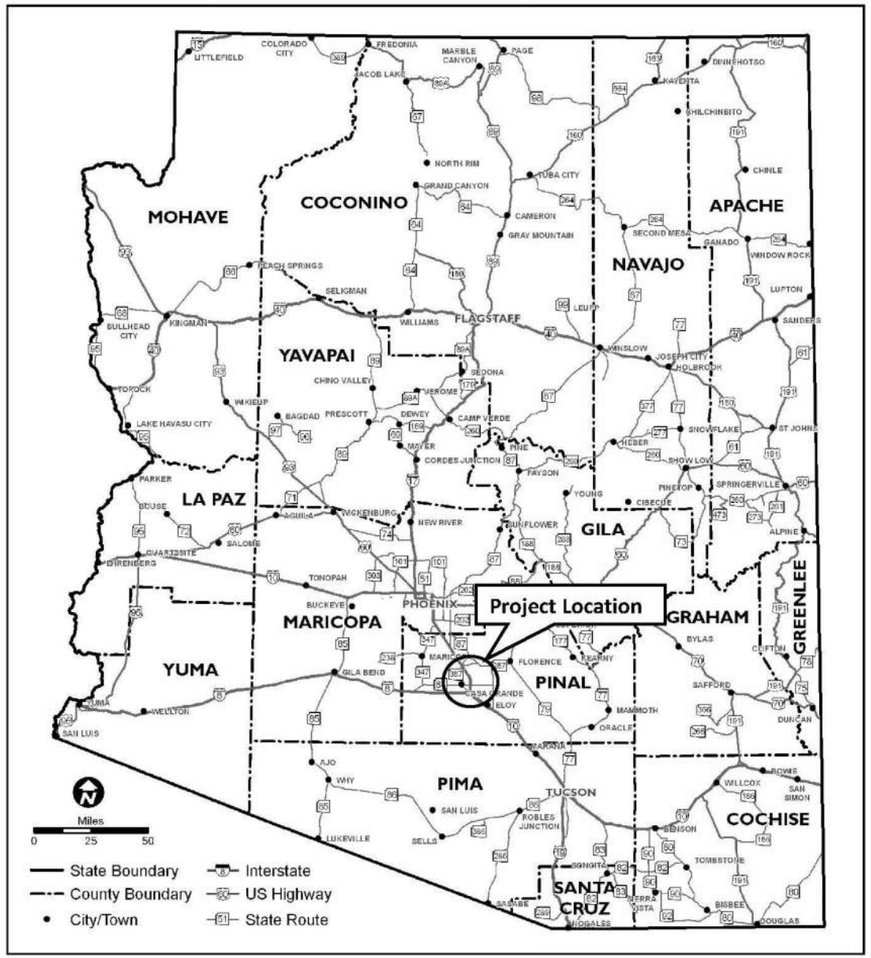
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$190,300	$634,400	$0	$6,344,000	$7,168,700

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



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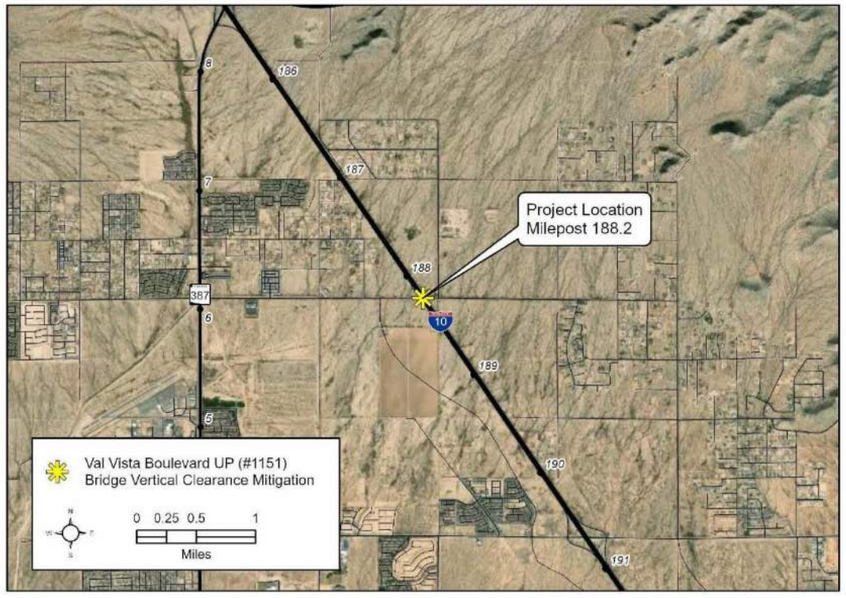
ATTACHMENT 2 – PROJECT VICINITY MAP



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ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Replace bridge at Val Vista Boulevard UP (MP 188.2).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation (CS10E.4A)	
City/Town: Casa Grande	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 193.88	
End Limit: MP 193.88	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Freight Need: At MP 193.88, the Cottonwood Lane UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a ramp bypass option.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by replacing the bridge to provide adequate vertical clearance.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

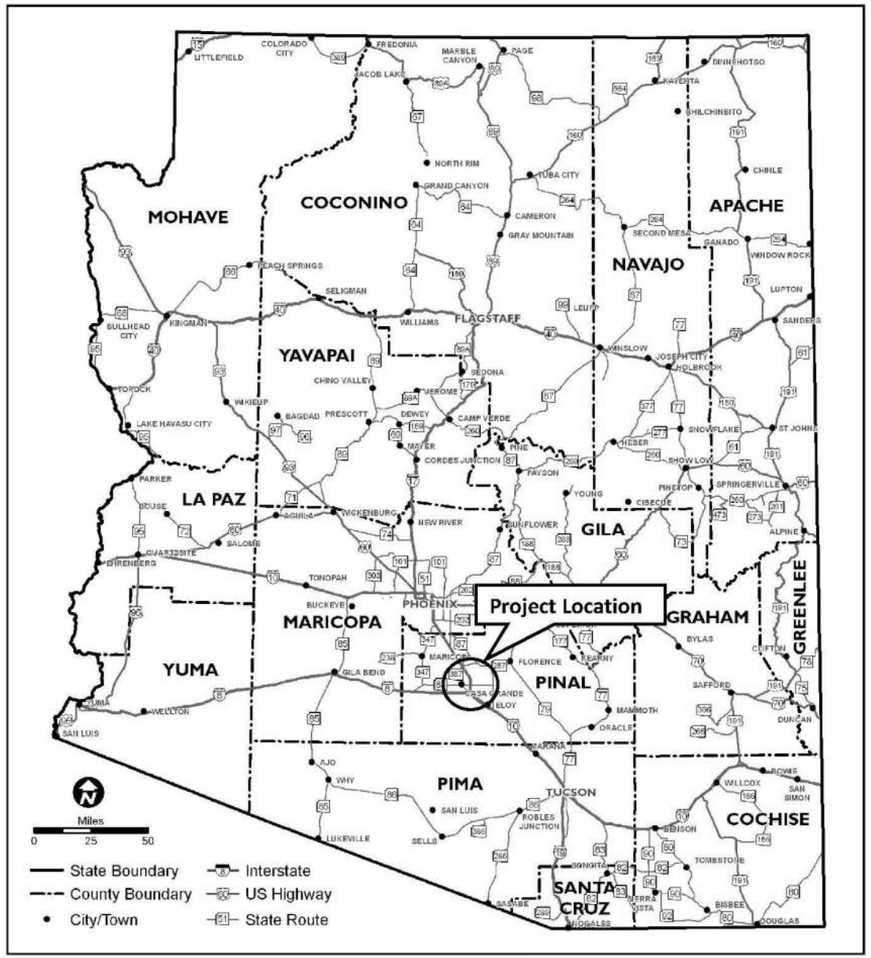
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$279,500	$931,800	$0	$9,317,750	$10,529,050

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



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ATTACHMENT 2 – PROJECT VICINITY MAP

4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Replace bridge at Cottonwood Lane UP (MP 193.88).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Cottonwood Lane UP (#1154) Bridge Vertical Clearance Mitigation (CS10E.4B)	
City/Town: Casa Grande	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 193.88	
End Limit: MP 193.88	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Freight Need: At MP 193.88, the Cottonwood Lane UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a ramp bypass option.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by replacing the mainline to provide adequate vertical clearance.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

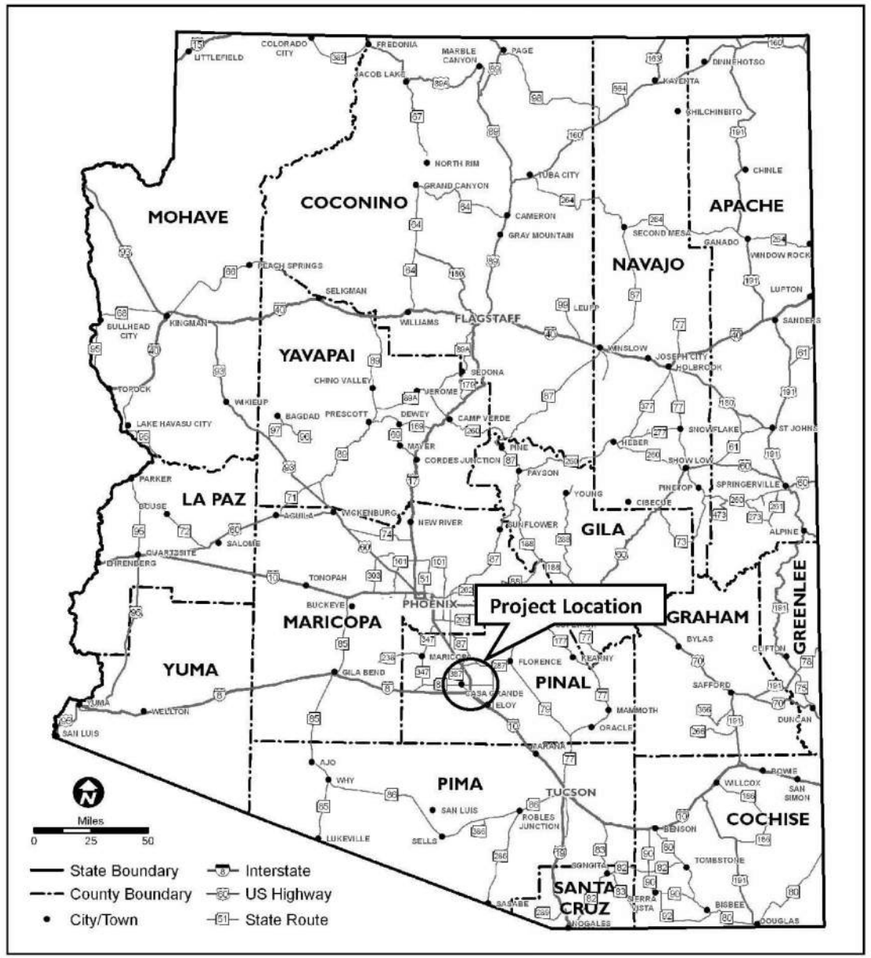
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$382,700	$1,275,700	$0	$12,756,600	$14,415,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



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ATTACHMENT 2 – PROJECT VICINITY MAP

4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Reprofile the mainline for a one mile segment near the Cottonwood Lane UP at MP 193.88.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation (CS10E.5A)	
City/Town: Casa Grande	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 195.89	
End Limit: MP 195.89	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Freight Need: At MP 195.89, the Earley Rd UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a ramp bypass option.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by replacing the bridge.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

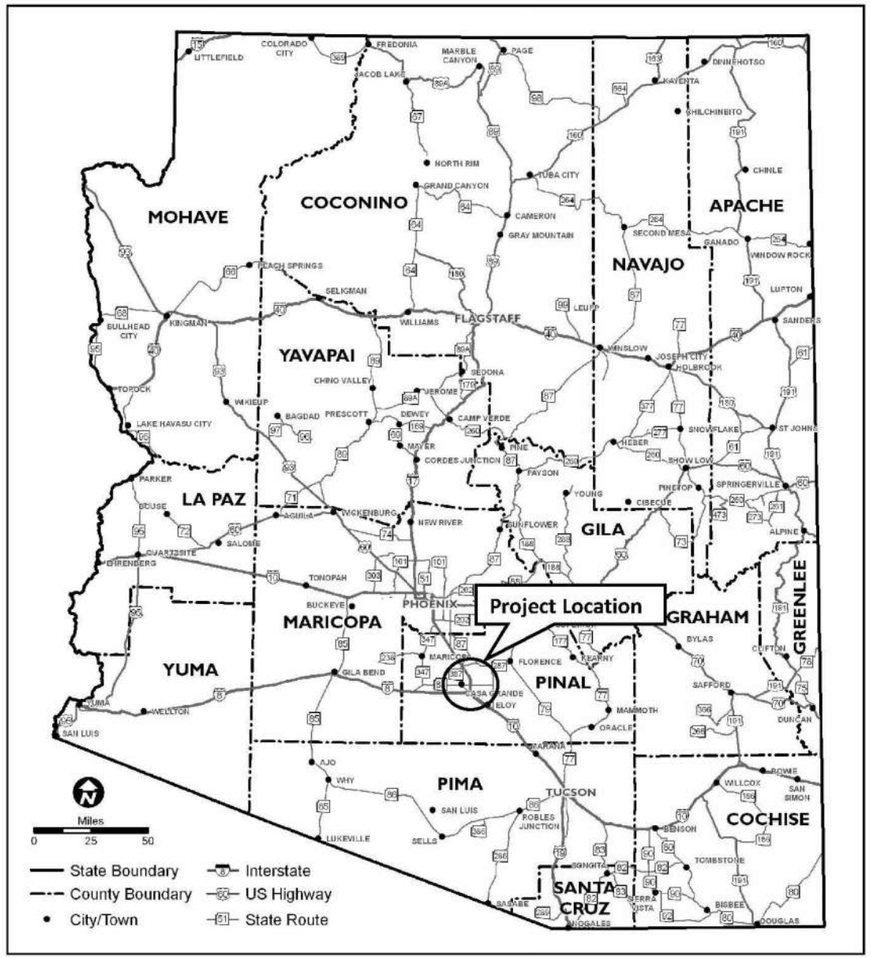
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$292,800	$976,000	$0	$9,760,000	$11,028,800

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



3

ATTACHMENT 2 – PROJECT VICINITY MAP

4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Replace bridge at the Earley Road UP (MP 195.89).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Earley Rd UP (#1158) Bridge Vertical Clearance Mitigation (CS10E.5B)	
City/Town: Casa Grande	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 195.89	
End Limit: MP 195.89	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Freight Need: At MP 195.89, the Earley Rd UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a ramp bypass option.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by reprofiling the mainline.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

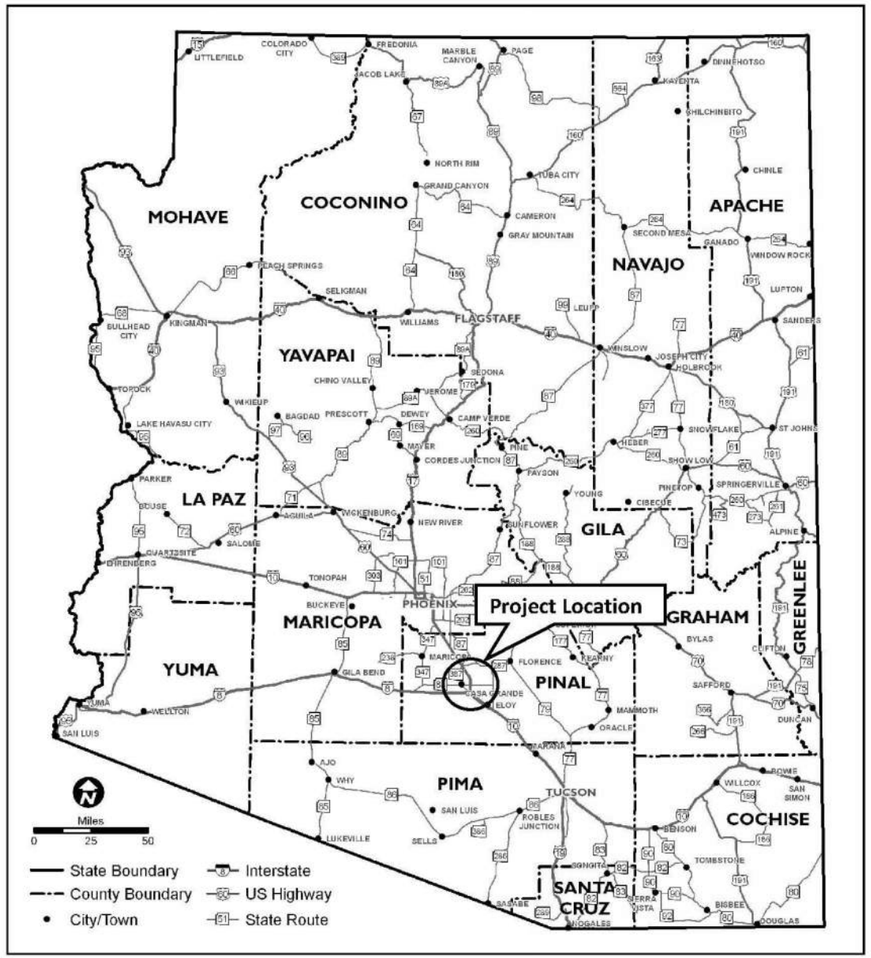
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$353,600	$1,178,700	$0	$11,786,800	$13,319,100

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



3

ATTACHMENT 2 – PROJECT VICINITY MAP

4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Reprofile the mainline for a one mile segment near the Earley Road UP bridge at MP 195.89.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation (CS10E.6A)	
City/Town: Casa Grande	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 196.89	
End Limit: MP 196.89	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Freight Need: At MP 196.89, the Selma Hwy UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a ramp bypass.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by replacing the bridge to provide adequate vertical clearance.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

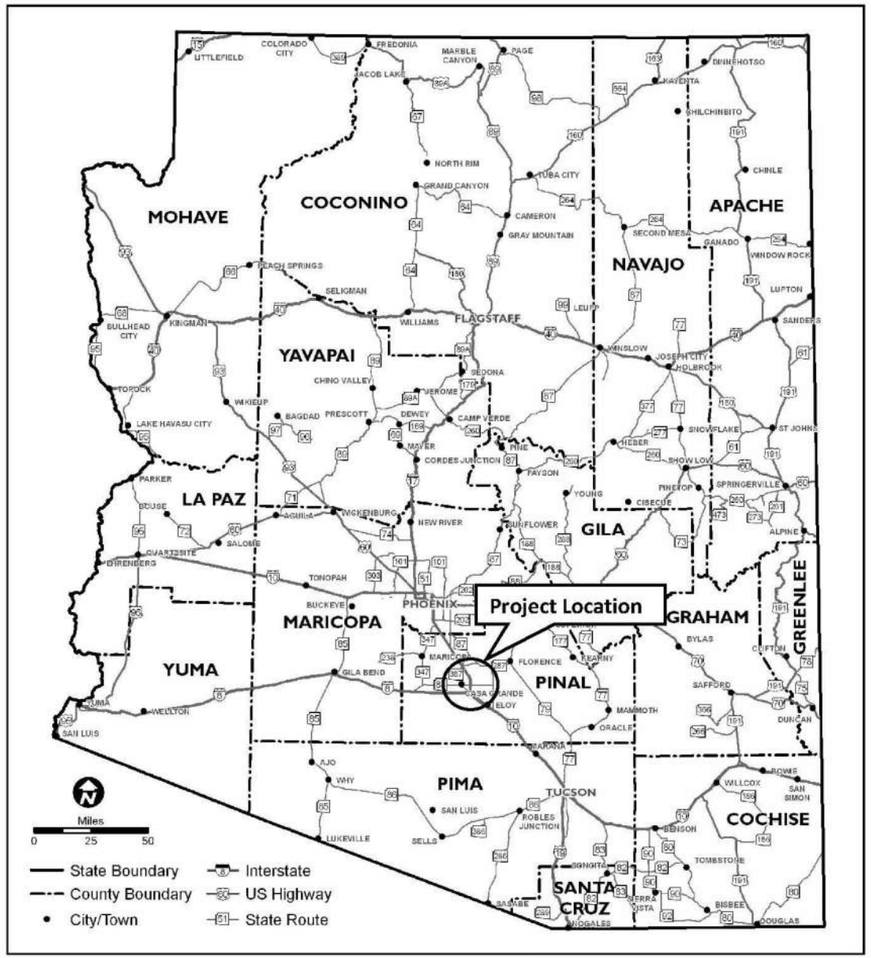
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$256,200	$854,000	$0	$8,540,000	$9,650,200

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



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ATTACHMENT 2 – PROJECT VICINITY MAP

4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Replace bridge at Selma Hwy UP (MP 196.89).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Selma Hwy UP (#1160) Bridge Vertical Clearance Mitigation (CS10E.6B)	
City/Town: Casa Grande	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 196.89	
End Limit: MP 196.89	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Freight Need: At MP 196.89, the Selma Hwy UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a ramp bypass.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by reprofiling the mainline to provide adequate vertical clearance.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

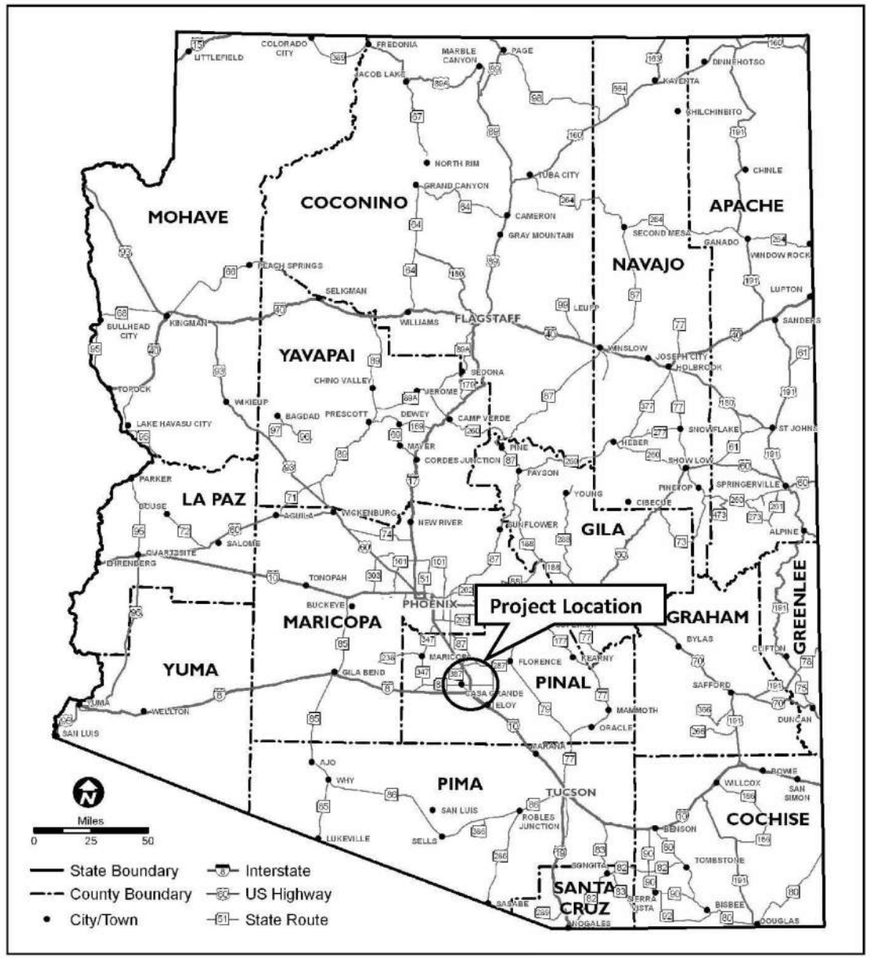
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$382,700	$1,275,700	$0	$12,756,600	$14,415,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) State Location Map **2) Project Vicinity Map** **3) Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



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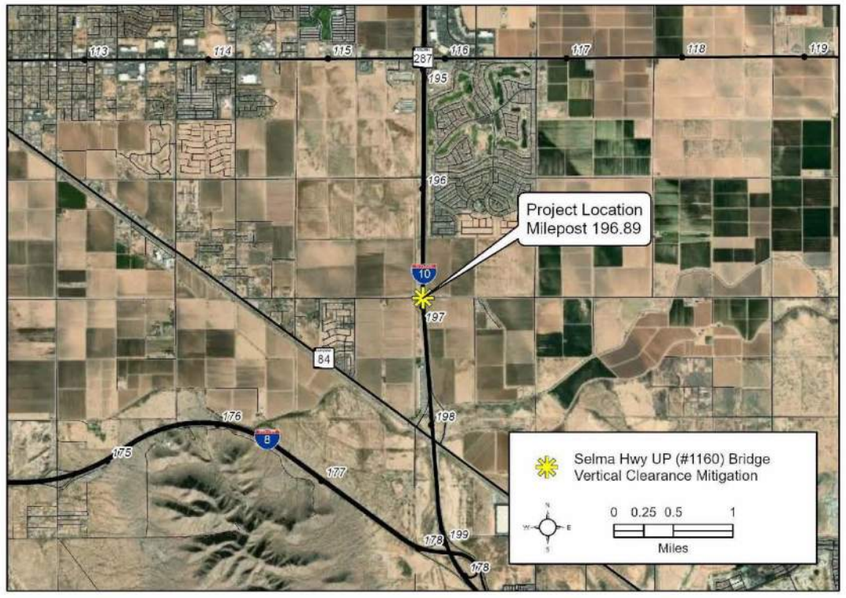
ATTACHMENT 2 – PROJECT VICINITY MAP



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ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Reprofile mainline for a one-mile segment near the Selma Hwy UP at MP 196.89.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation (CS10E.7A)	
City/Town: Eloy	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 205.45	
End Limit: MP 205.45	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Freight Need: At MP 205.45, the Battaglia Road UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a bypass ramp option.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by replacing the bridge to provide adequate vertical clearance.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

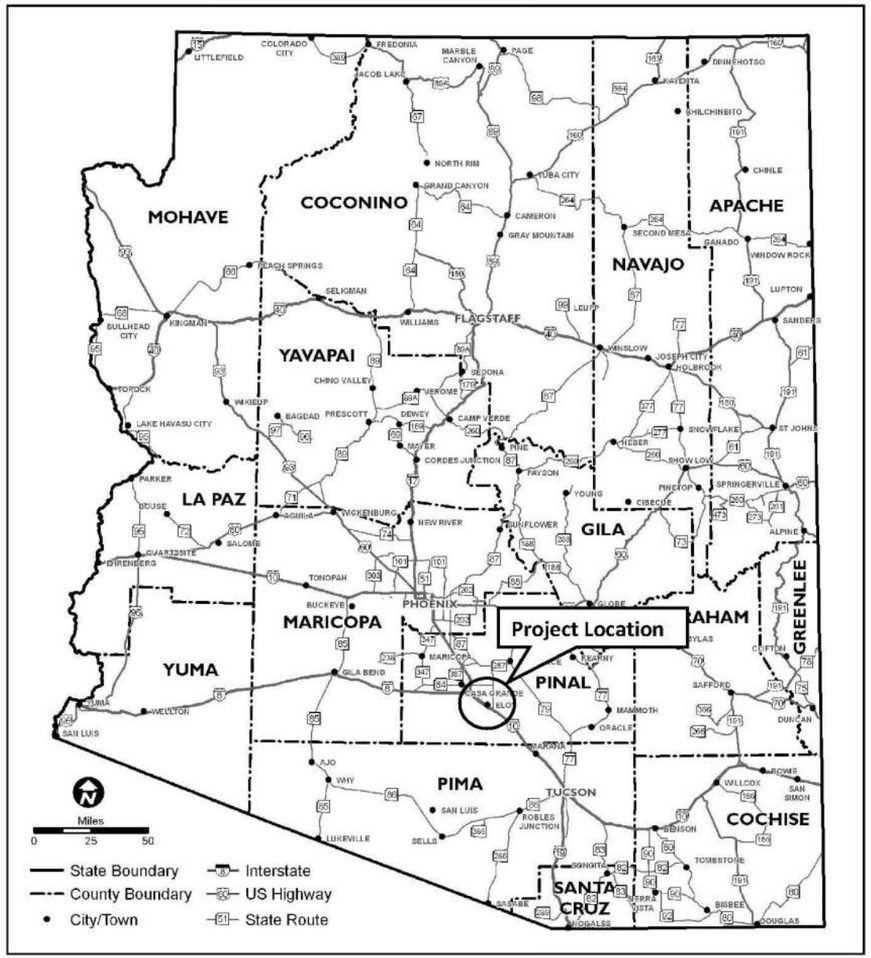
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$205,900	$686,300	$0	$6,862,500	$7,754,700

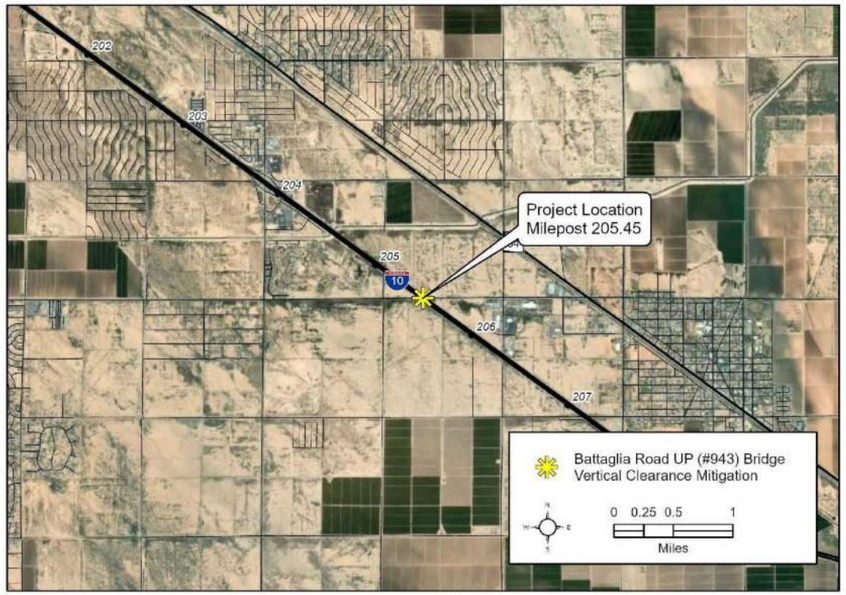
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Replace bridge at Battaglia Road UP (MP 205.45).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Battaglia Road UP (#943) Bridge Vertical Clearance Mitigation (CS10E.7B)	
City/Town: Eloy	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 205.45	
End Limit: MP 205.45	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Freight Need: At MP 205.45, the Battaglia Road UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a bypass ramp option.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by reprofiling the mainline to provide adequate vertical clearance.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

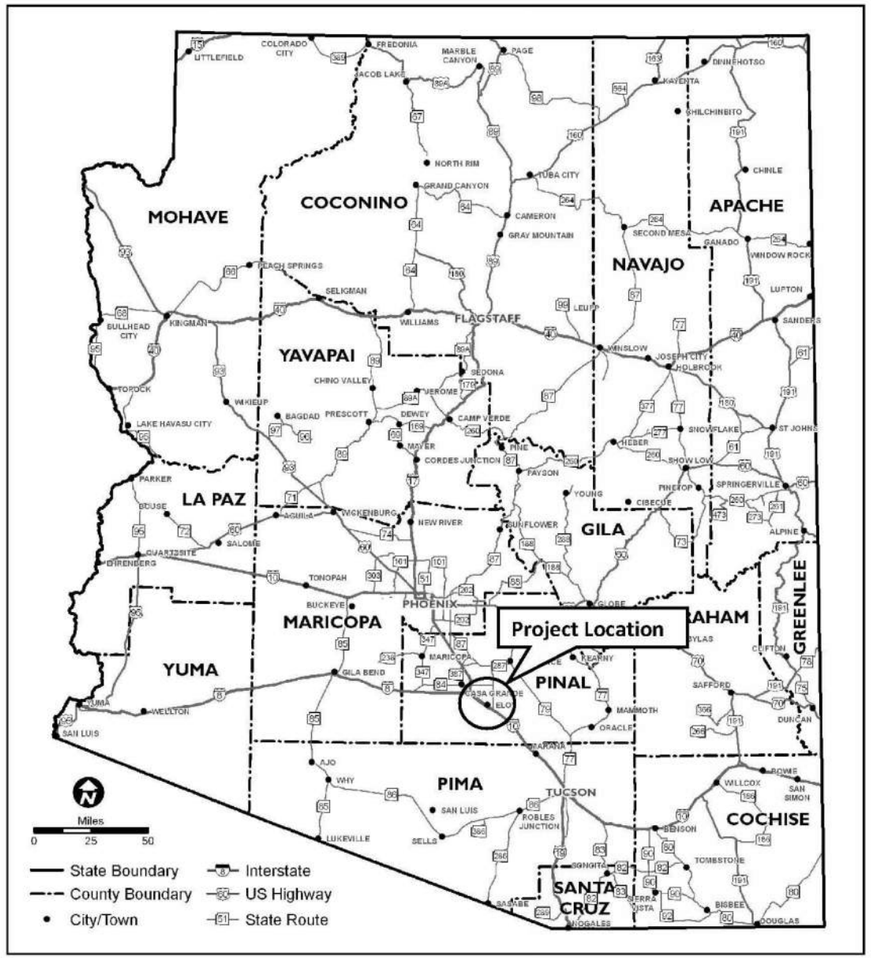
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$353,600	$1,178,700	$0	$11,786,800	$13,319,100

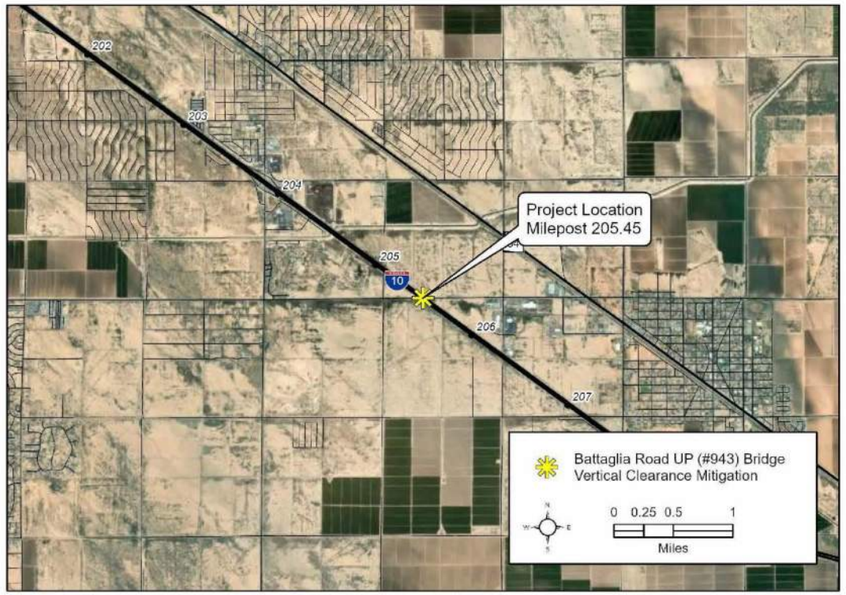
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Reprofile mainline for a one mile segment near the Battaglia Road UP at MP 205.45.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation (CS10E.8A)	
City/Town: Eloy	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 207.17	
End Limit: MP 207.17	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Freight Need: At MP 207.17, the Alsdorf Road UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a ramp bypass option.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by replacing the bridge to provide adequate vertical clearance.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

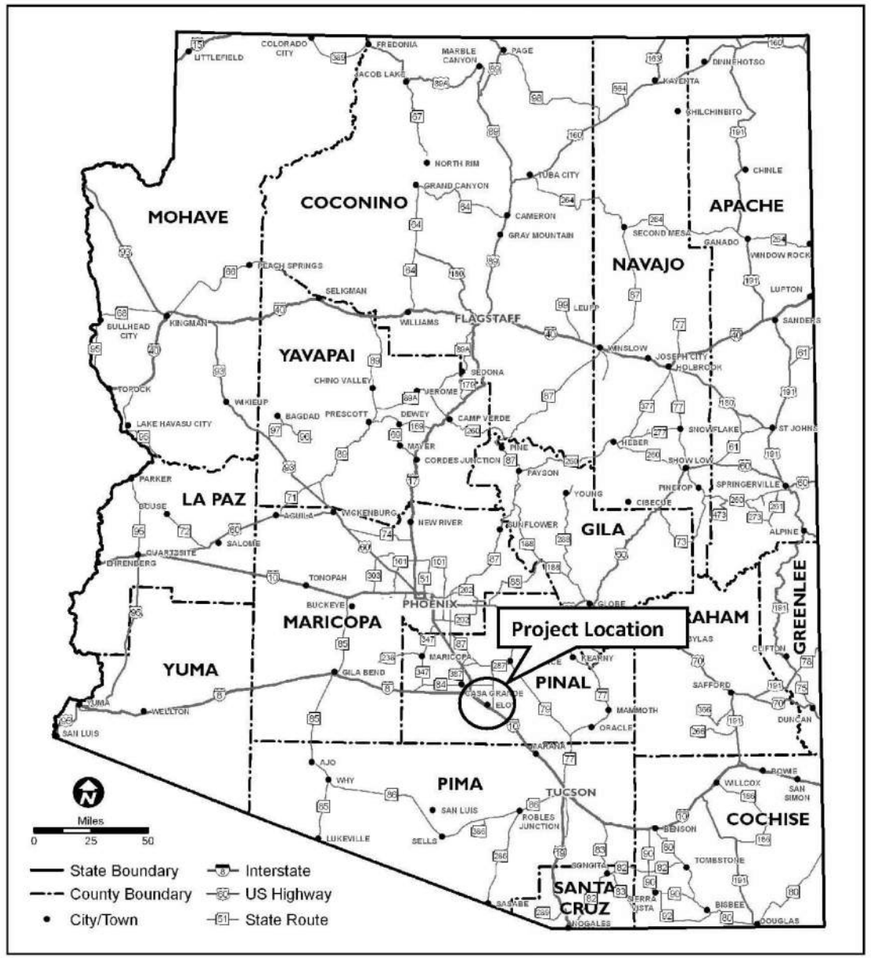
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$219,600	$732,000	$0	$7,320,000	$8,271,600

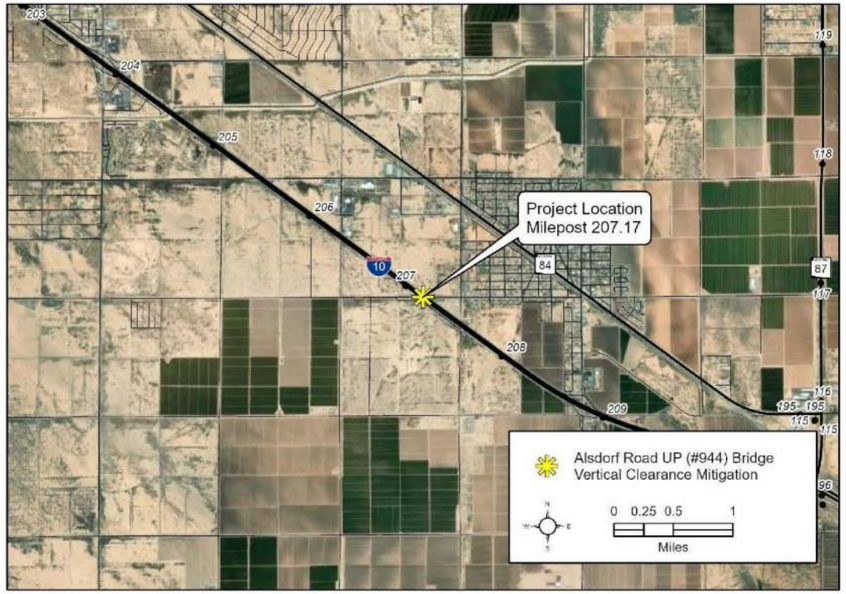
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Replace bridge at Alsdorf Road UP (MP 207.17).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Alsdorf Road UP (#944) Bridge Vertical Clearance Mitigation (CS10E.8B)	
City/Town: Eloy	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 207.17	
End Limit: MP 207.17	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Freight Need: At MP 207.17, the Alsdorf Road UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a ramp bypass option.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by reprofiling the mainline to provide adequate vertical clearance.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

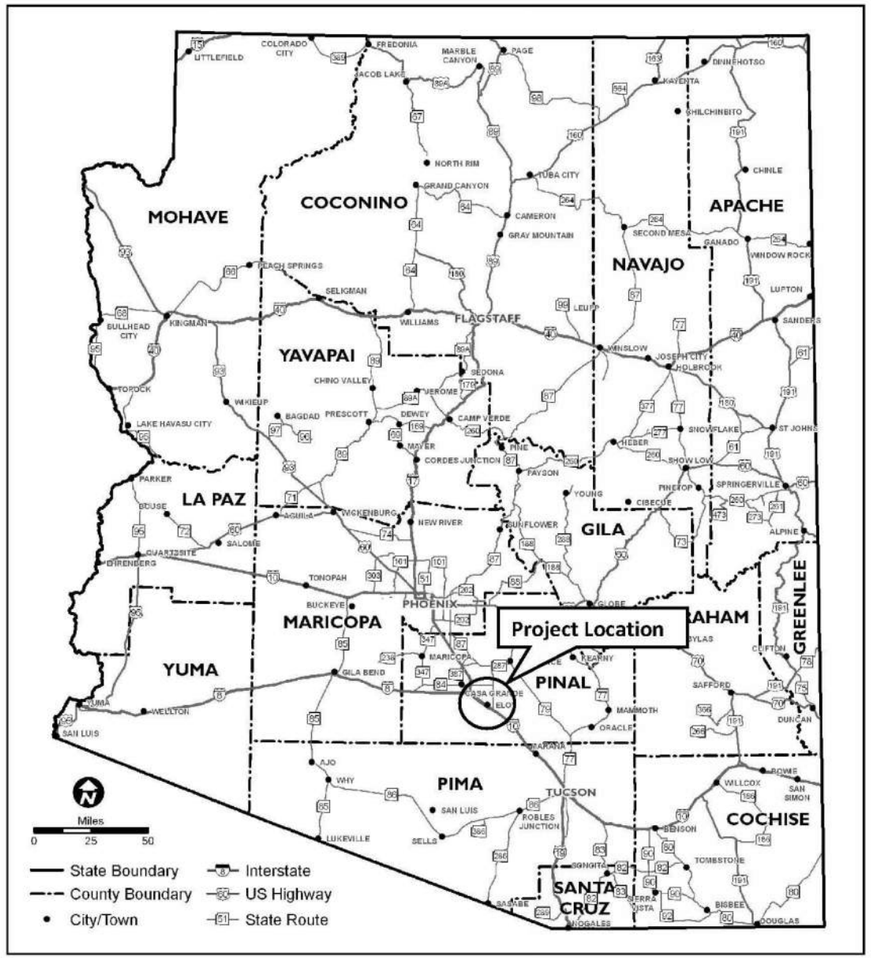
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$382,700	$1,275,700	$0	$12,756,600	$14,415,000

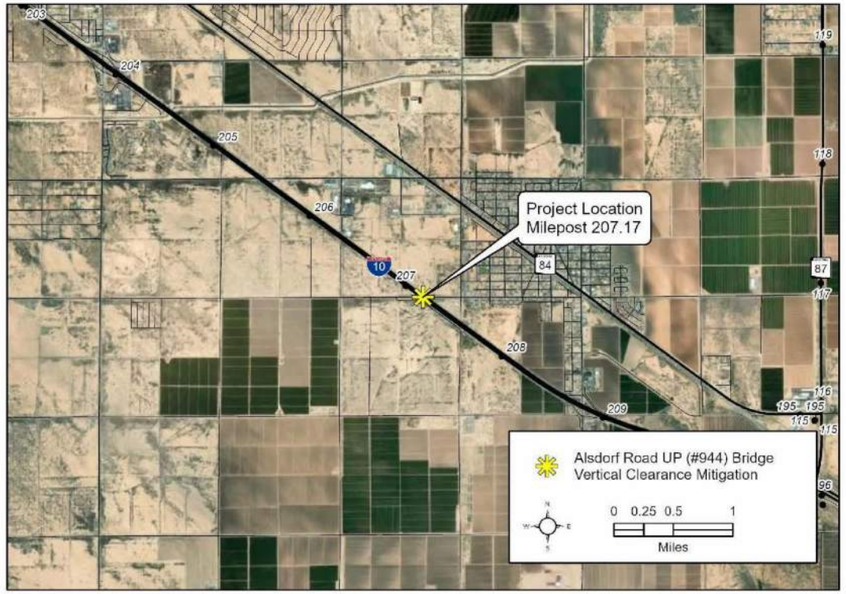
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Reprofile the mainline for a one mile segment near the Alsdorf Road UP bridge at 207.17.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Red Rock TI UP (#592) Bridge Project (CS10E.9B)	
City/Town: Red Rock	**County:** Pinal
COG/MPO: CAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 226.45	
End Limit: MP 226.45	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*			
LPA/Tribal Name:			
LPA/Tribal Contact:			
Email Address:	**Phone Number:**		
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance	

PROJECT NEED
Bridge Need: A hot spot was identified at MP 226.45 with bridge deck rating of 5 and bridge substructure rating 5.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Bridge Need by replacing the bridge.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

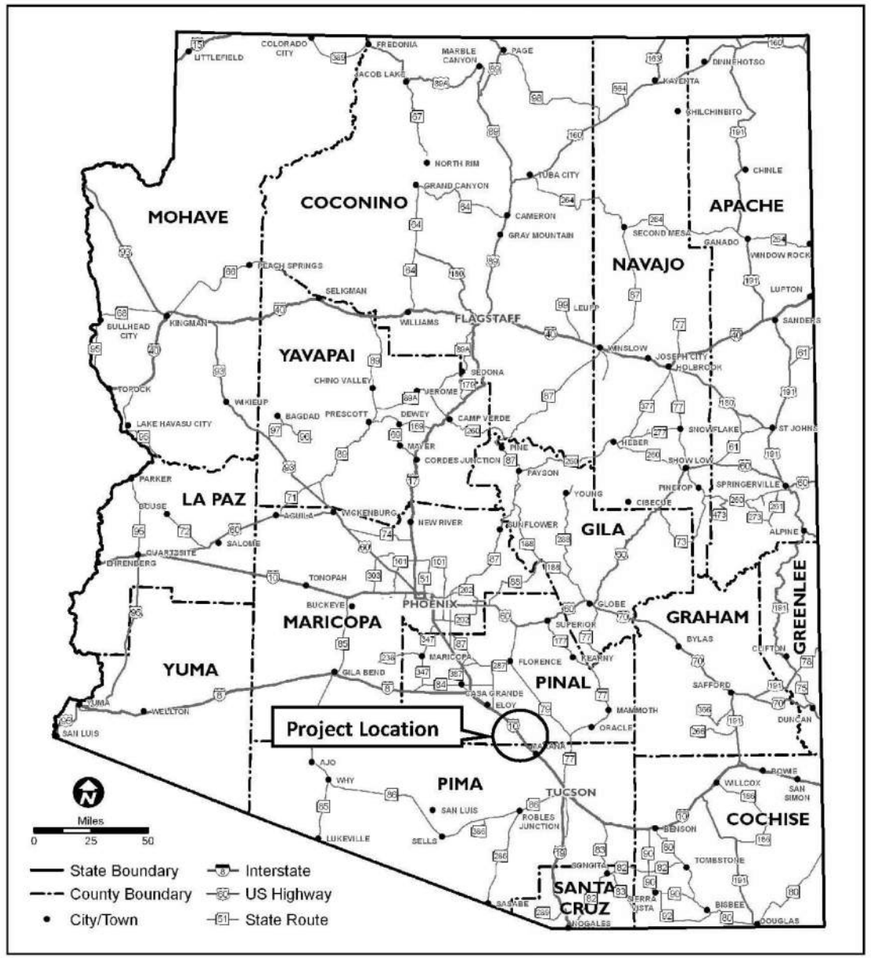
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$63,400	$211,200	$0	$2,112,000	$2,386,600

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

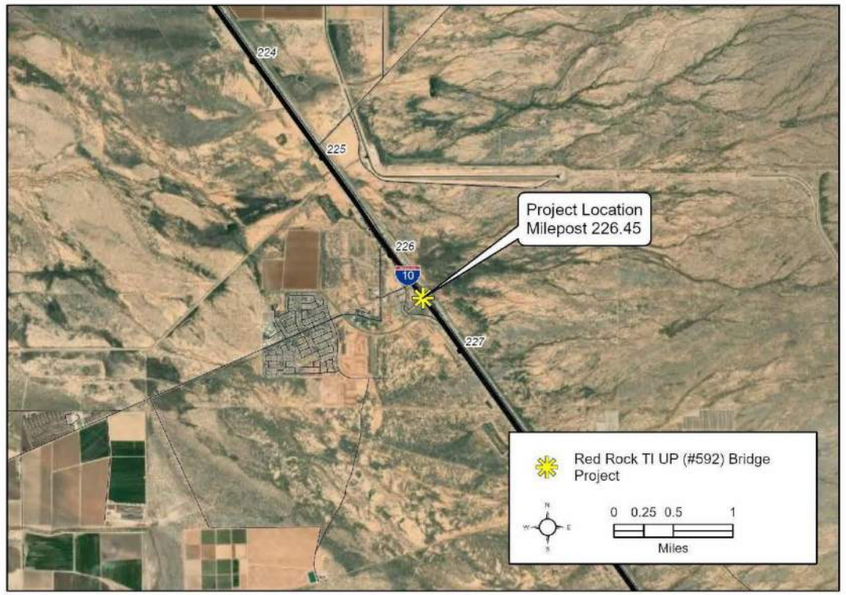
ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



3

ATTACHMENT 2 – PROJECT VICINITY MAP



4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Replace bridge at Red Rock TI UP (MP 226.45).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Picacho Safety Improvements (CS10E.10)	
City/Town: N/A	**County:** Pinal/Pima
COG/MPO: CAG/PAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 218	
End Limit: MP 236	
Project Length: 18 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land, State Park *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Safety Need: From MP 218 to MP 236, there is a High level of need based on the overall Safety Index, eastbound Directional Safety Index, and percentage of fatal and serious injury crashes involving truck crashes above the statewide average.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by rehabilitating shoulders in both directions.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

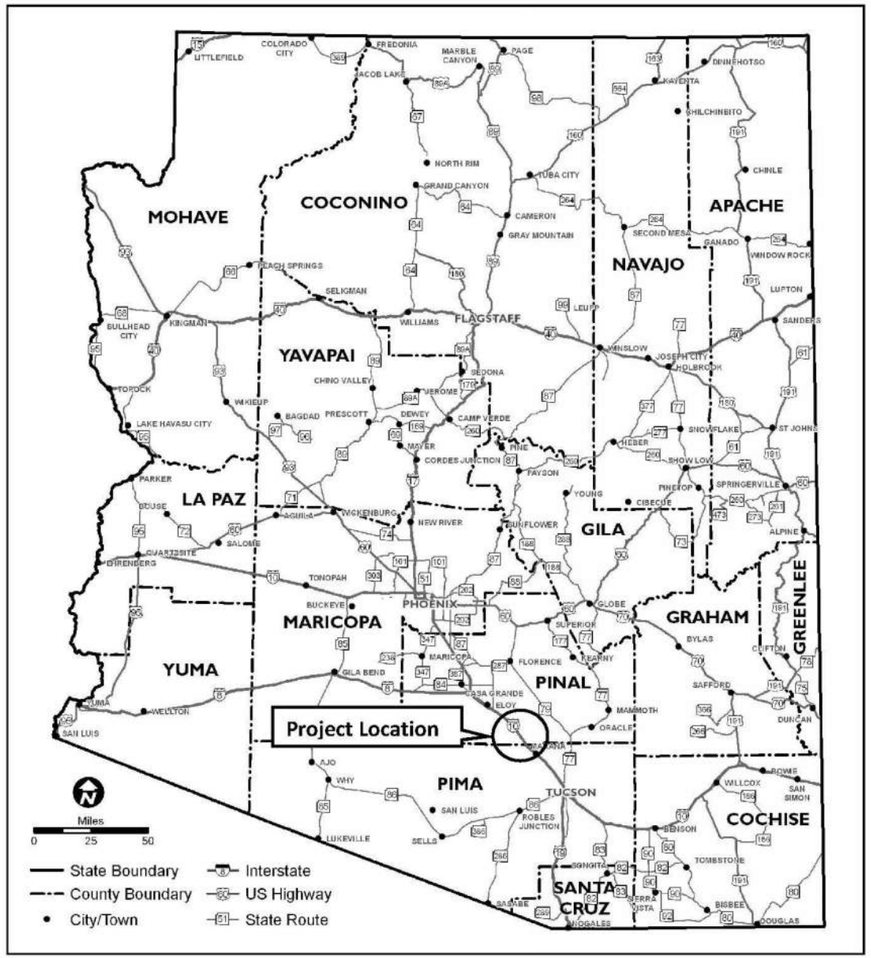
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$777,800	$2,592,400	$0	$25,924,320	$29,294,520

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

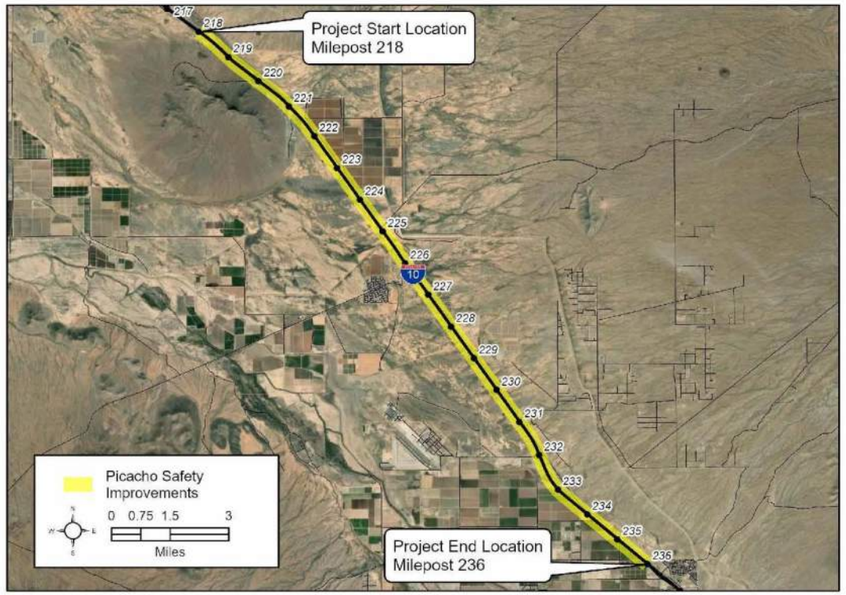
ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



3

ATTACHMENT 2 – PROJECT VICINITY MAP



4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) from MP 218 to MP 236.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Picacho Lighting Improvements (CS10E.11)	
City/Town: N/A	**County:** Pinal/Pima
COG/MPO: CAG/PAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 218	
End Limit: MP 236	
Project Length: 18 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land, State Park *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Safety Need: From MP 218 to MP 236, there is a High level of need based on the overall Safety Index, eastbound Directional Safety Index, and the percentage of fatal and serious injury crashes involving truck crashes above the statewide average.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by installing roadway lighting in both directions of travel.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

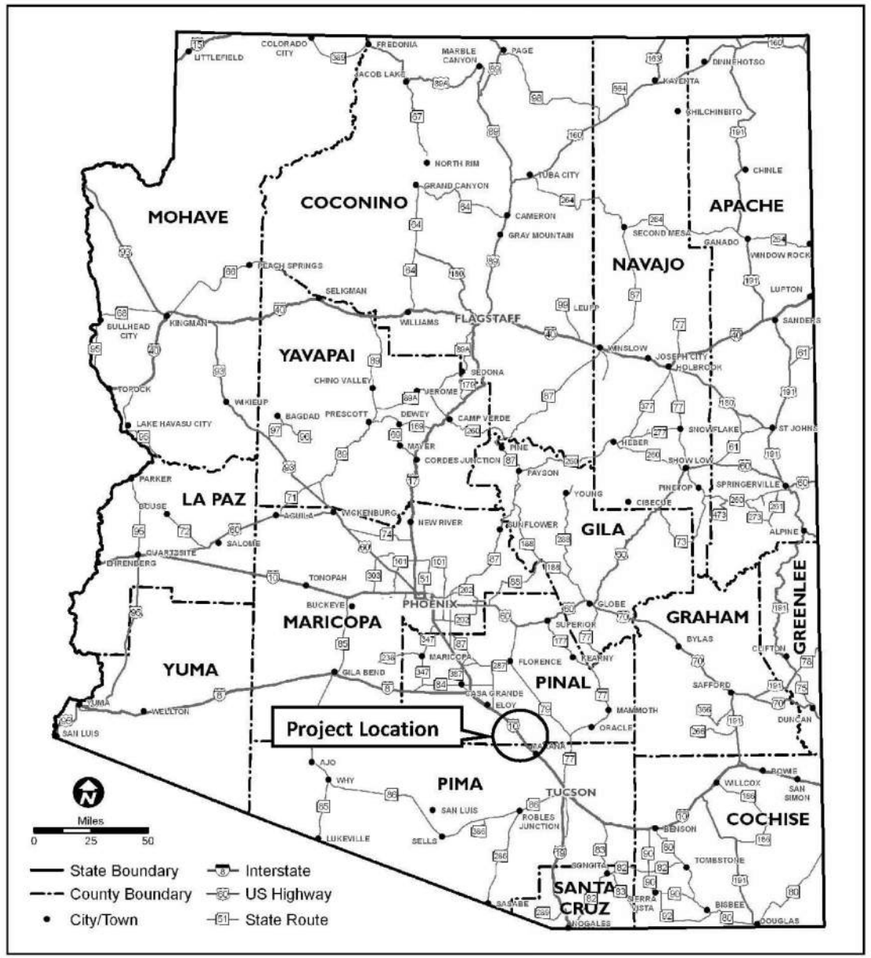
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$1,116,800	$3,722,400	$0	$37,224,000	$42,063,200

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

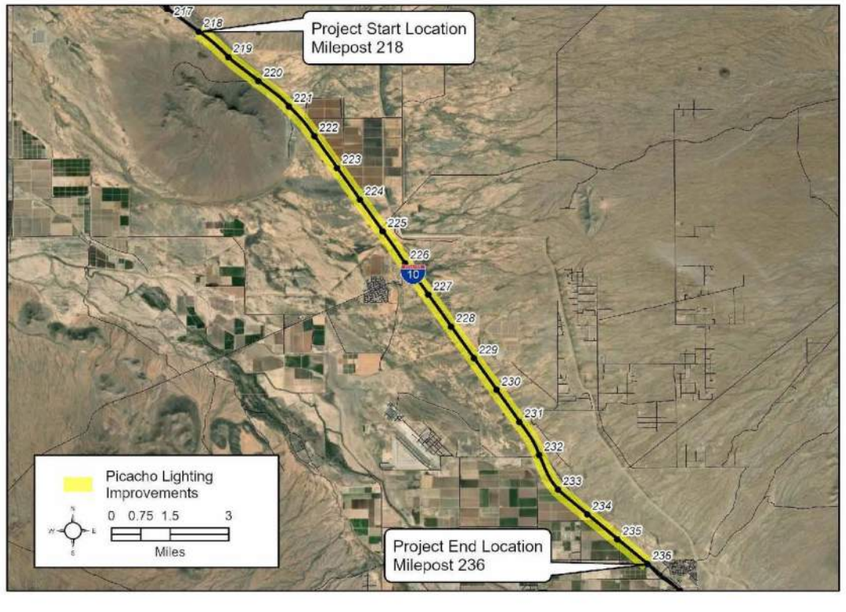
ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



3

ATTACHMENT 2 – PROJECT VICINITY MAP



4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Install lighting (both directions) from MP 218 to MP 236.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Marana Safety Improvements (CS10E.12)	
City/Town: Marana	**County:** Pima
COG/MPO: PAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 236	
End Limit: MP 242	
Project Length: 6 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Safety Need: From MP 236 to MP 242, there is a Medium level of need based on the eastbound Directional Safety Index and percentage of fatal and suspected serious injury crashes involving lane departures above the statewide average.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by rehabilitating shoulders in both directions.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

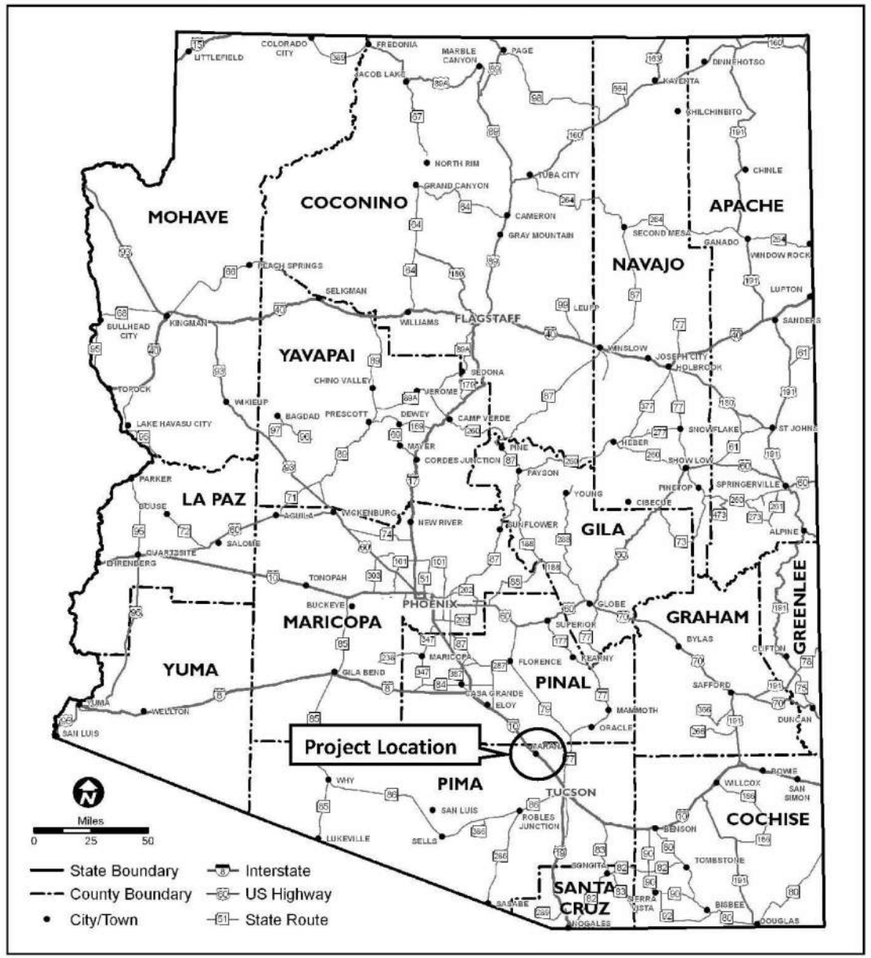
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$259,200	$864,200	$0	$8,641,440	$9,764,840

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) from MP 236 to MP 242.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Marana Lighting Improvements (CS10E.13)	
City/Town: Marana	**County:** Pima
COG/MPO: PAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 236	
End Limit: MP 242	
Project Length: 6 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Safety Need: From MP 236 to MP 242, there is a Medium level of need based on the eastbound Directional Safety Index and percentage of fatal and suspected serious injury crashes involving lane departures above the statewide average.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by installing roadway lighting in both directions.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

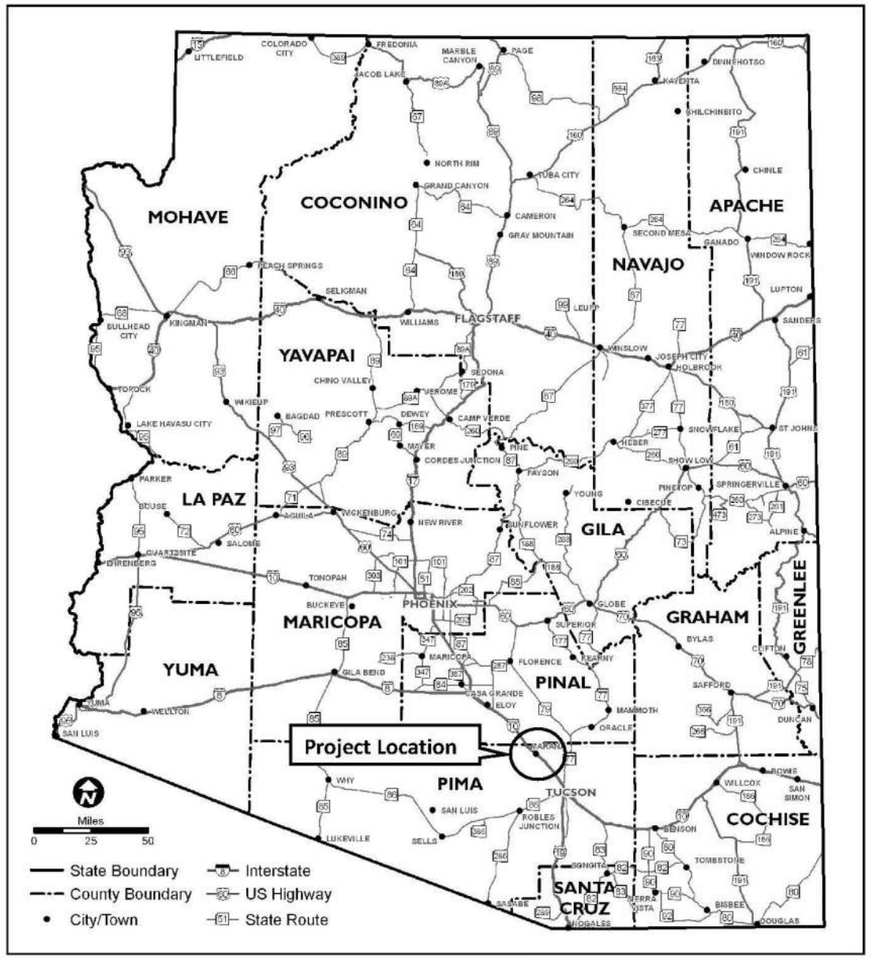
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$372,200	$1,240,800	$0	$12,408,000	$14,021,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Install lighting (both directions) from MP 236 to MP 242.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Tucson Mobility, Safety, and Freight Improvements (CS10E.14B)	
City/Town: Tucson	**County:** Pima
COG/MPO: PAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 255	
End Limit: MP 262	
Project Length: 7 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur)**:** *(Check all that apply)* ☐ City/Town**;** ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Mobility Need: From MP 255 to MP 262, there is a High level of need based on the Future V/C, overall Mobility Index, and EB Closure Extent. *Safety Need: A hot spot was identified from MP 256.05 to 258.16.* *Freight Need: From 255 to MP 262, there is a High level of need based on the Freight Index and Directional Truck Travel Time Reliability in both directions.*

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Mobility, Safety, and Freight needs by implementing ramp metering when warranted on all ramps at the ten traffic interchanges within the project limits.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

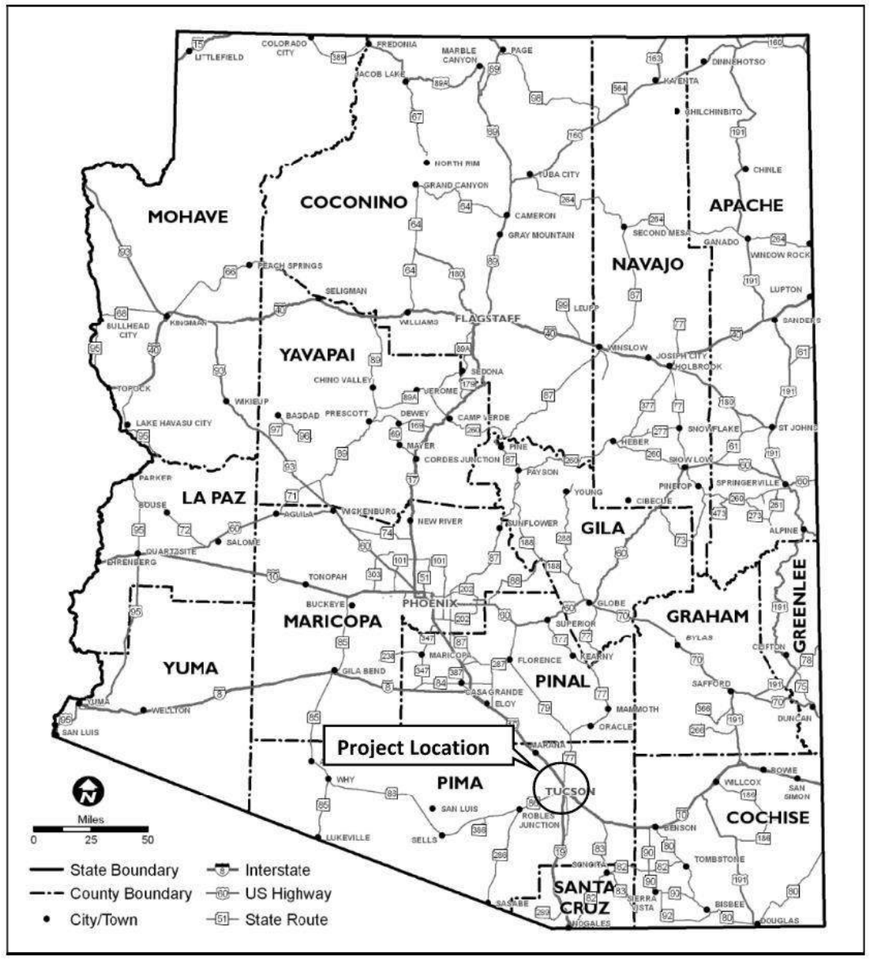
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$173,500	$578,200	$0	$5,782,000	$6,533,700

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) State Location Map **2) Project Vicinity Map** **3) Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Implement ramp metering when warranted on all ramps at the ten TIs within project limits from MP 255 to MP 262.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: East Tucson Mobility, Safety, and Freight Improvements (CS10E.15A)	
City/Town: Tucson	**County:** Pima
COG/MPO: PAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 265	
End Limit: MP 274	
Project Length: 9 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Mobility Need: From MP 262 to MP 274, there is a Medium level of need based on the Future V/C and overall Mobility Index. *Safety Need: From MP 262 to MP 274, there is a Medium level of need based on the percentage of fatal and suspected serious injury crashes involving trucks above the statewide average. A hot spot was identified from EB MP 262.92 to MP 265.72.* *Freight Need: From 262 to MP 274, there is a High level of need based on the Freight Index and Directional Truck Travel Time Reliability in both directions.*

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☐	Expansion ☒
Address Mobility, Safety, and Freight needs by constructing a general-purpose lane and widening 20 bridges within the project limits.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

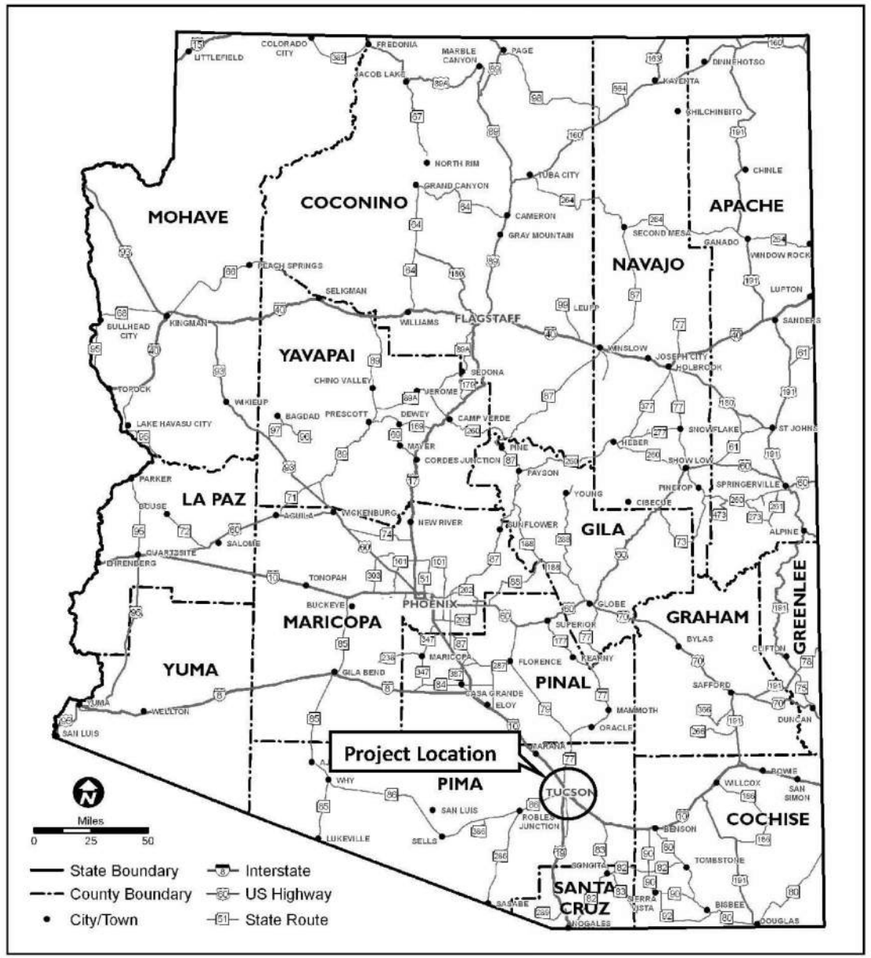
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$2,920,000	$9,710,000	$13,685,760	$97,341,780	$123,657,540

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

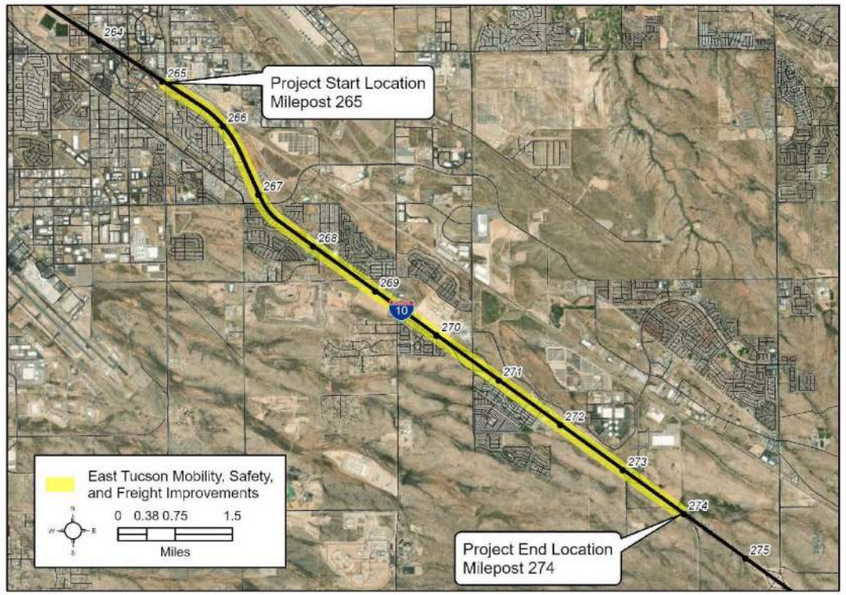
ATTACHMENTS
1) State Location Map **2) Project Vicinity Map** **3) Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



3

ATTACHMENT 2 – PROJECT VICINITY MAP



4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Construct general purpose lane (MP 265-274). • Widen 20 bridges within the project limits.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: East Tucson Mobility, Safety, and Freight Improvements (CS10E.15C)	
City/Town: Tucson	**County:** Pima
COG/MPO: PAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 265	
End Limit: MP 274	
Project Length: 12 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur)**:** *(Check all that apply)* ☐ City/Town**;** ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Mobility Need: From MP 262 to MP 274, there is a Medium level of need based on the Future V/C and overall Mobility Index. *Safety Need: From MP 262 to MP 274, there is a Medium level of need based on the percentage of fatal and suspected serious injury crashes involving trucks above the statewide average. A hot spot was identified from EB MP 262.92 to MP 265.72.* *Freight Need: From 262 to MP 274, there is a High level of need based on the Freight Index and Directional Truck Travel Time Reliability in both directions.*

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Mobility, Safety, and Freight needs by implementing ramp metering at the traffic interchanges within the project limits when warranted, widening the left shoulder in both directions, consider installing speed feedback signs, and installing eastbound DMS signs.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

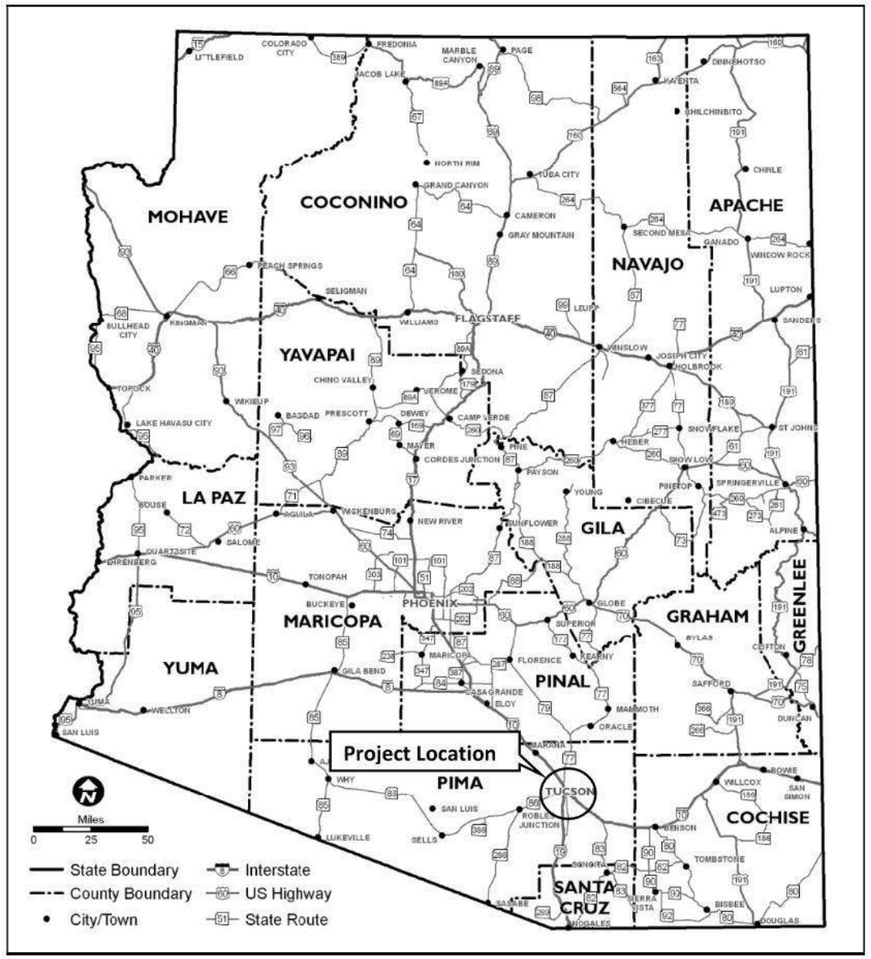
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$776,900	$2,590,000	$0	$25,899,600	$29,266,500

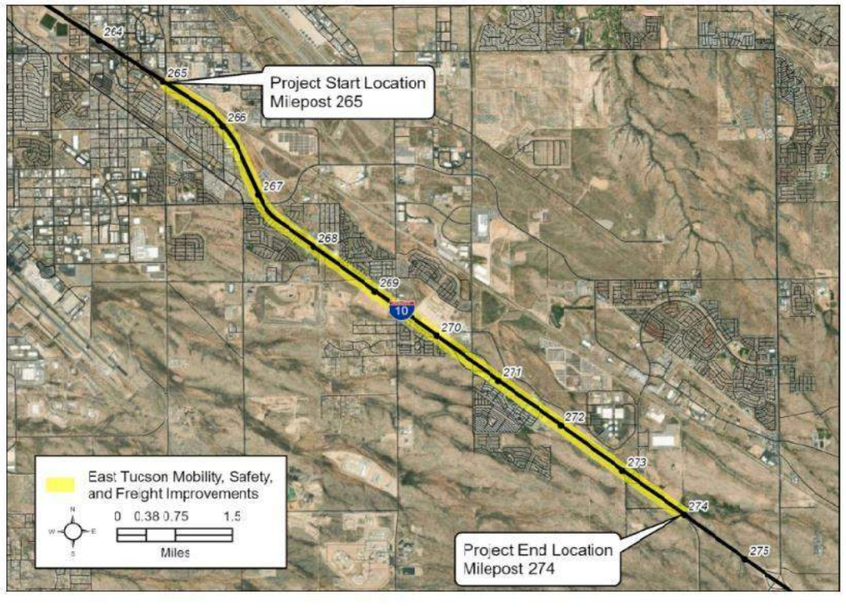
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) State Location Map **2) Project Vicinity Map** **3) Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Implement ramp metering when warranted on all ramps at the ten TIs within project limits. • Widen left shoulder in both directions (MP 265 to MP 274). • Consider installing speed feedback signs (MP 268). • Install EB DMS sign (MP 266).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: East Tucson Lighting Improvements (CS10E.16)	
City/Town: Tucson	**County:** Pima
COG/MPO: PAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 263	
End Limit: MP 274	
Project Length: 11 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Safety Need: From MP 262 to MP 274, there is a Medium level of need based on the percentage of fatal and suspected serious injury crashes involving trucks above the statewide average. A hot spot was identified from EB MP 262.92 to MP 265.72.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by installing roadway lighting in both directions.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

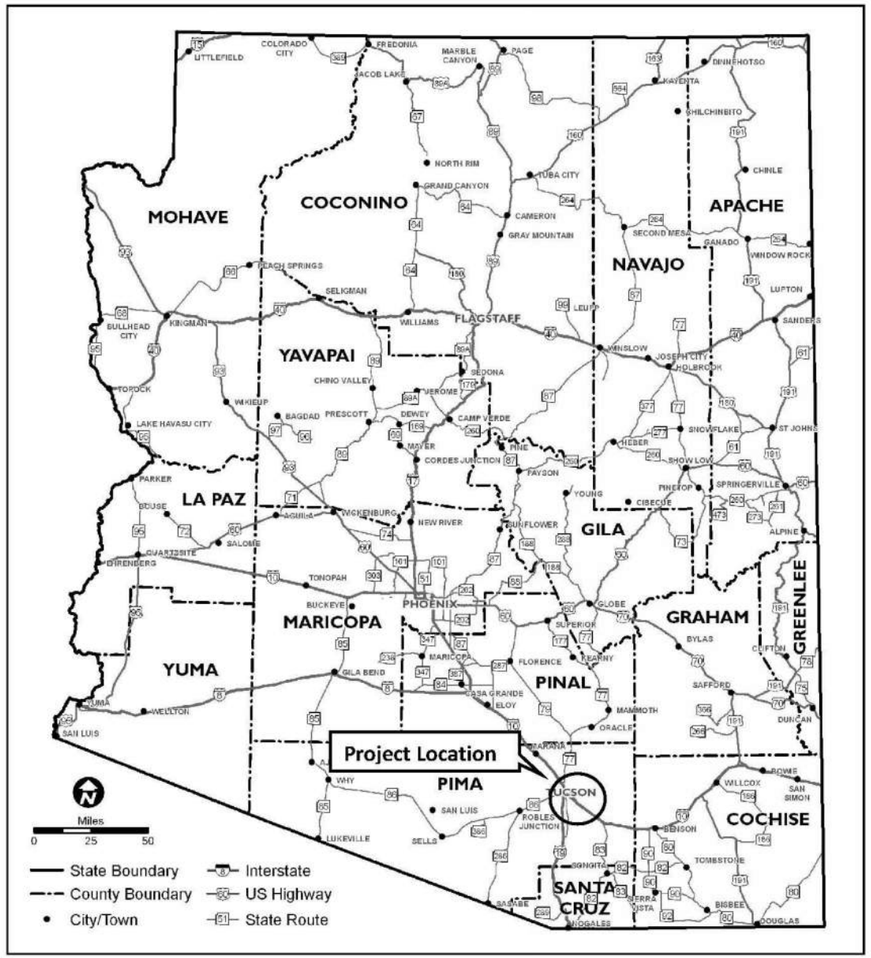
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$682,400	$2,274,800	$0	$22,748,000	$25,705,200

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Install lighting (both directions) from MP 263 to MP 274.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Vail Mobility and Safety Improvements (CS10E.17)	
City/Town: N/A	**County:** Pima
COG/MPO: PAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 280	
End Limit: MP 292	
Project Length: 12 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*			
LPA/Tribal Name:			
LPA/Tribal Contact:			
Email Address:	**Phone Number:**		
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance	

PROJECT NEED
Mobility Need: From MP 280 to MP 292, there is a High level of need based on the Future V/C and overall Mobility index. *Safety Need: A hot spot was identified from WB MP 291.1 to MP 291.5.*

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Mobility and Safety Needs by widening the left shoulder in each direction and rehabilitating the right shoulder in each direction.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

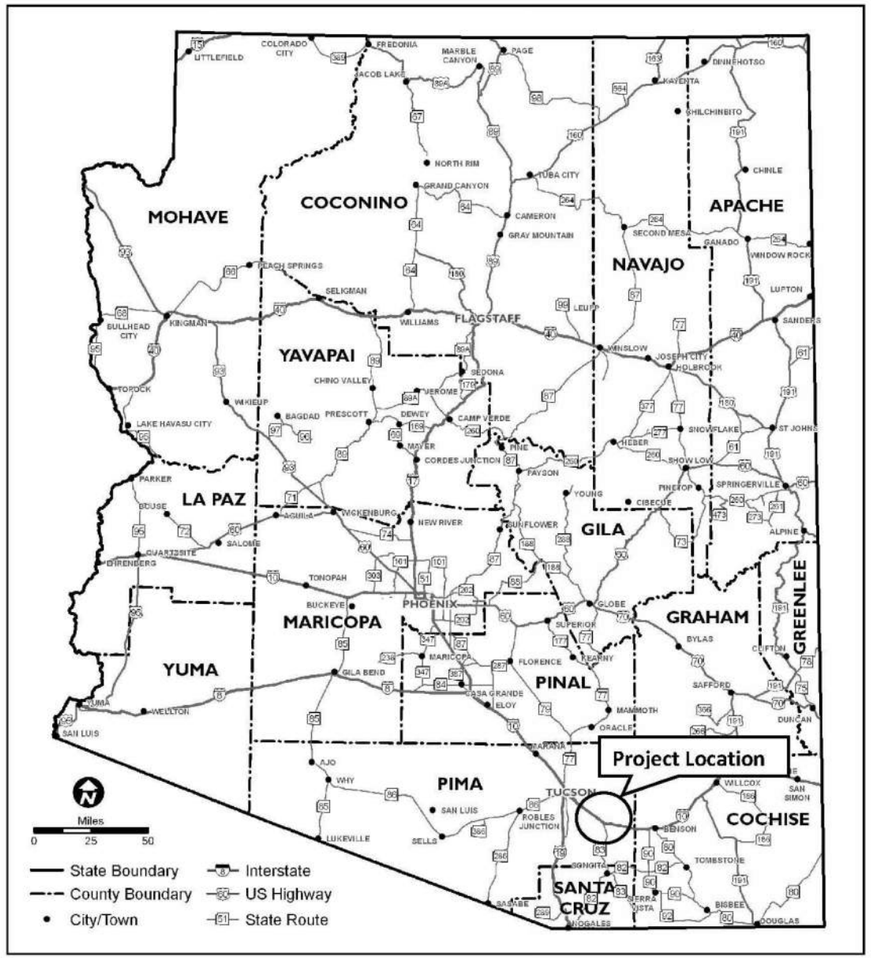
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$1,174,400	$3,914,600	$0	$39,145,944	$44,234,944

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

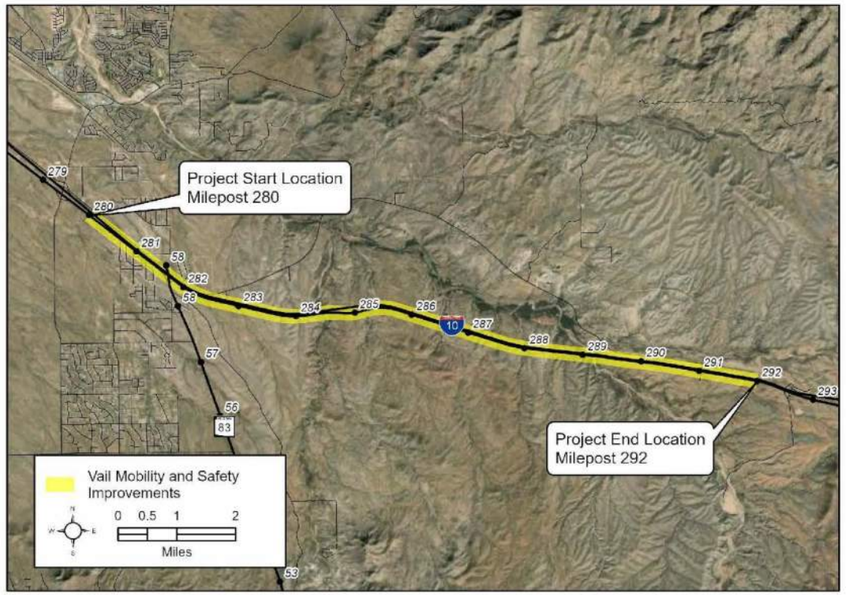
ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



3

ATTACHMENT 2 – PROJECT VICINITY MAP



4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Widen left shoulder to 10 feet in both directions (striping, delineators, RPMs, safety edge, and rumble strips). • Rehabilitate right shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Marsh Station EB Climbing Lane (CS10E.18)	
City/Town: N/A	**County:** Pima
COG/MPO: PAG	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 286	
End Limit: MP 291	
Project Length: 5 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Mobility Need: From MP 280 to MP 292, there is a High level of need based on the Future V/C and percentage of non-single occupancy vehicle trips.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Mobility Need by constructing a climbing lane.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

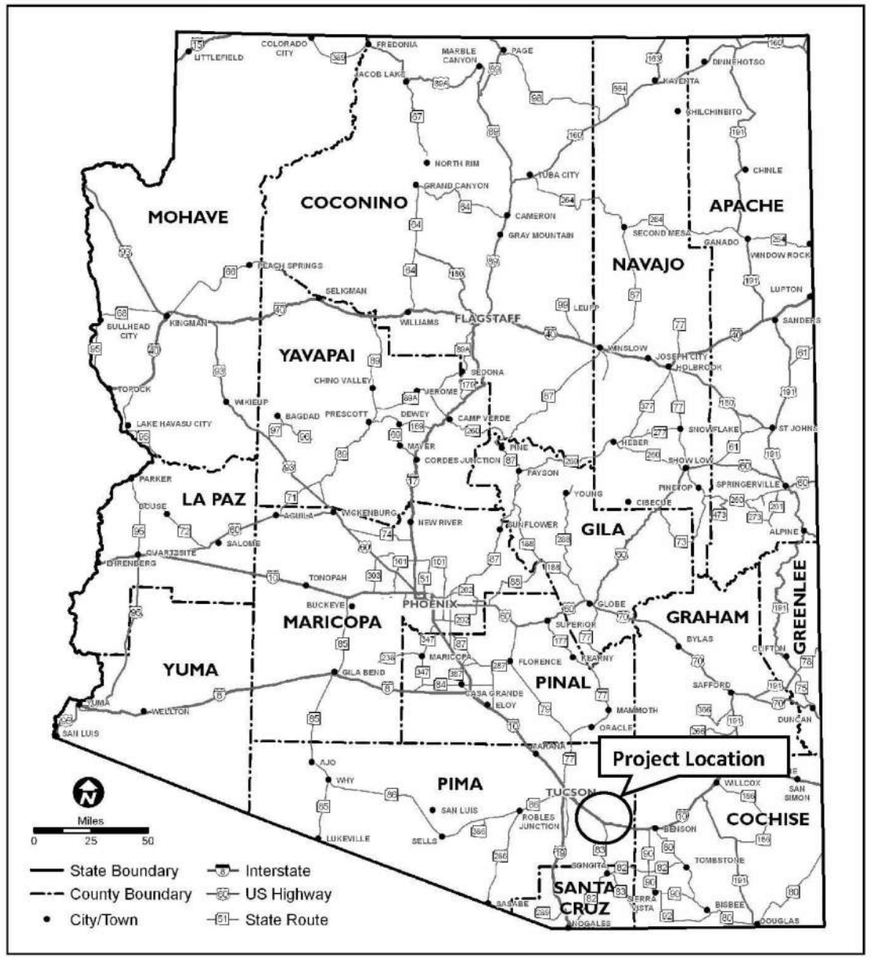
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$861,300	$2,871,000	$0	$28,710,000	$32,442,300

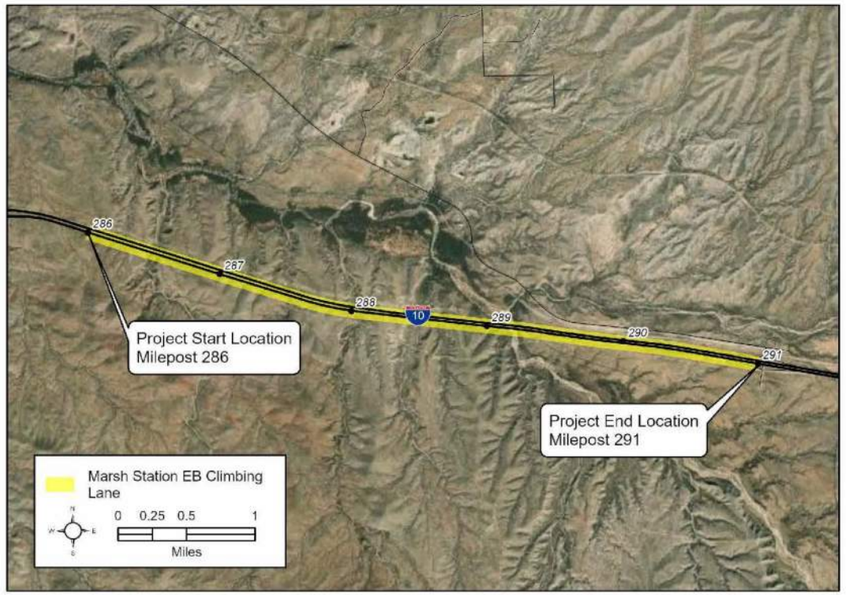
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Construct an eastbound climbing lane from MP 286 to MP 291.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Benson WB Climbing Lane (CS10E.19)	
City/Town: Benson	**County:** Cochise
COG/MPO: SEAGO	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 303	
End Limit: MP 305	
Project Length: 2 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Safety Need: From MP 303 to MP 305, there is a High level of need based on the Overall Safety Index, the westbound Directional Safety Index, and the percentage of fatal and suspected serious injury crashes involving lane departures and trucks compared to statewide averages.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Pavement Need by constructing a climbing lane.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

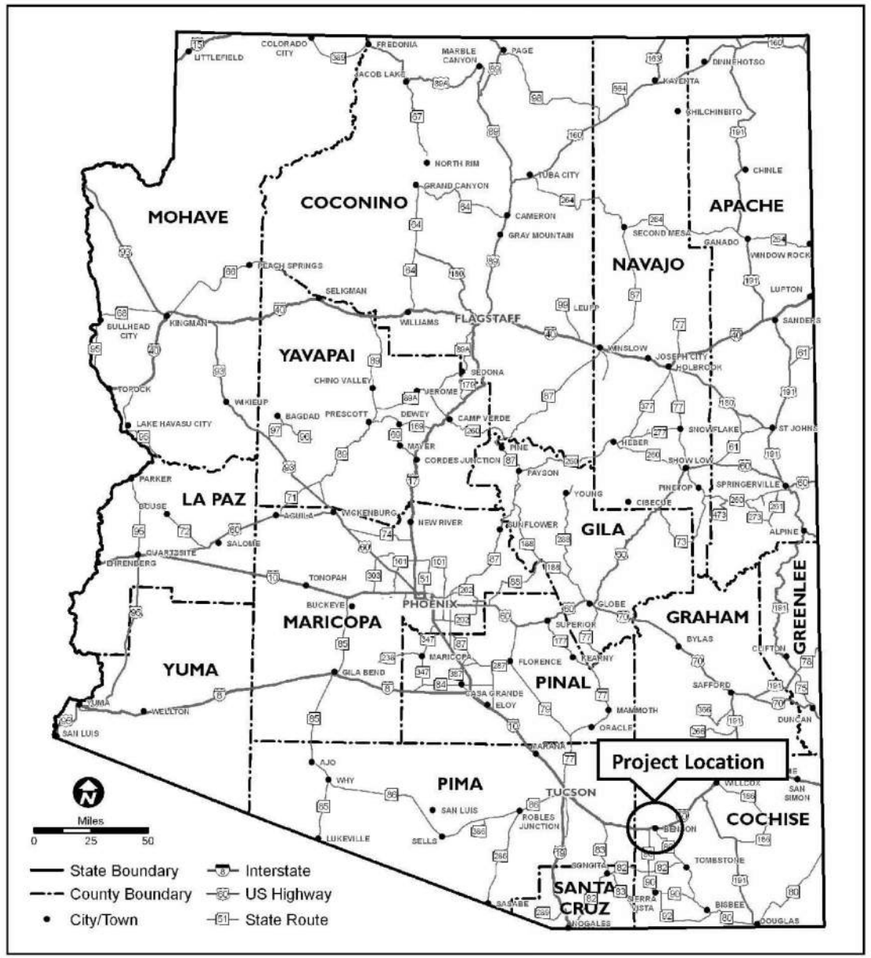
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$440,200	$1,467,500	$0	$14,675,880	$16,583,580

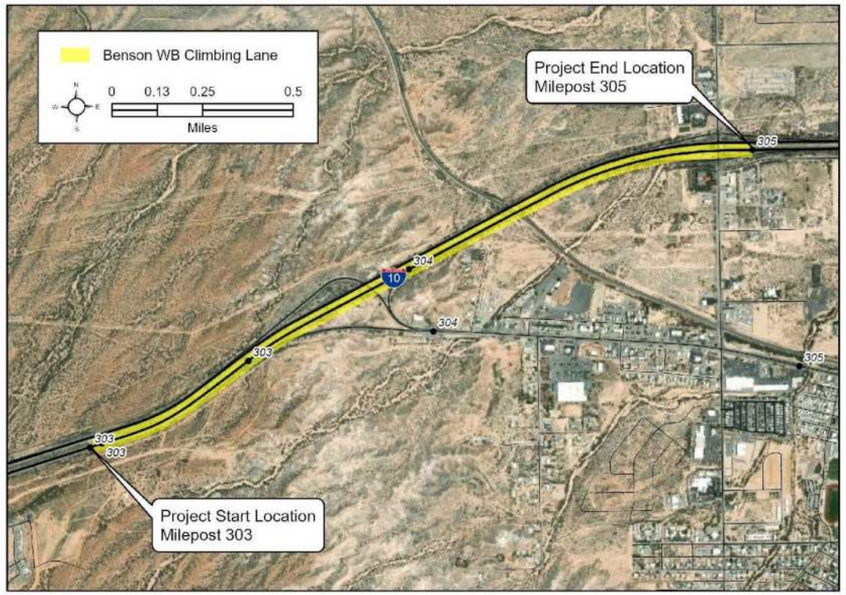
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Construct a westbound climbing lane from MP 303 to MP 305. • Widen 3 bridges within the project limits including W Benson TI, Benson SPRR, and Ocotillo Road.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Mescal Shoulder Widening (CS10E.21)	
City/Town: Benson/N/A	**County:** Pima/Cochise
COG/MPO: PAG/SEAGO	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 292	
End Limit: MP 315	
Project Length: 23 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Safety Need: From MP 292 to MP 315, there is a High level of need based on the overall Safety Index, westbound Directional Safety Index, and percentage of fatal and suspected serious injury crashes involving trucks above the statewide average.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by widening the left shoulder in both directions.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

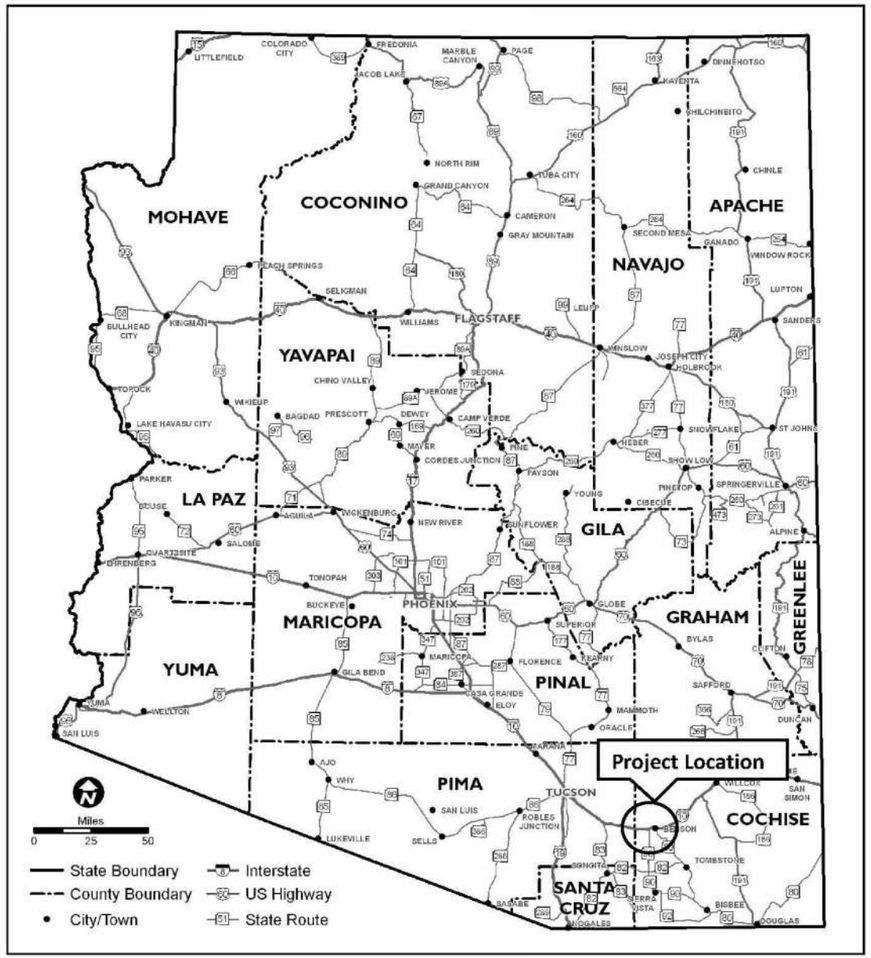
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$2,250,800	$7,503,000	$0	$75,029,726	$84,783,526

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

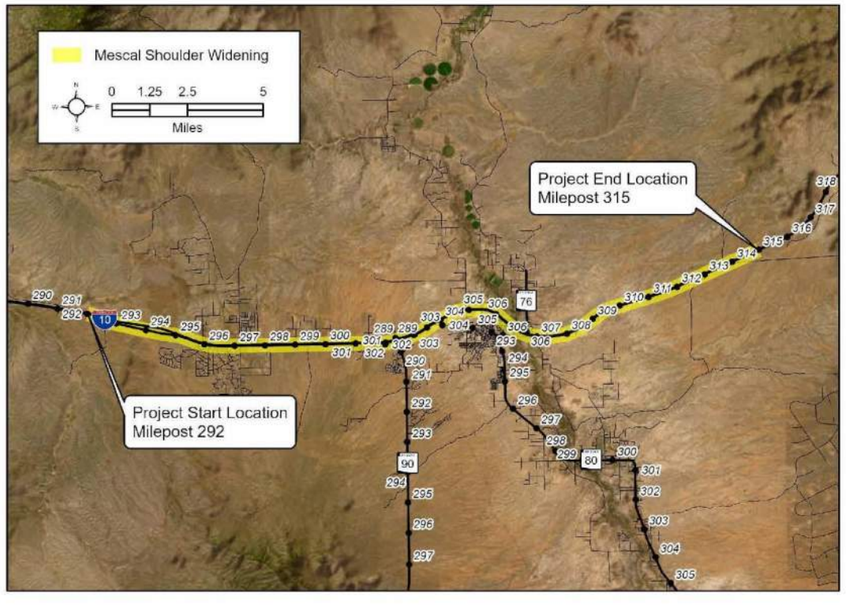
ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



3

ATTACHMENT 2 – PROJECT VICINITY MAP



4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Widen left shoulder to 10 feet in both directions (striping, delineators, RPMs, safety edge, and rumble strips) from MP 292 to MP 315.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Dragoon EB Climbing Lane (CS10E.22)	
City/Town: N/A	**County:** Cochise
COG/MPO: SEAGO	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 316	
End Limit: MP 318	
Project Length: 2 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Safety Need: From MP 315 to MP 332, there is a Medium level of need based on the westbound Directional Safety Index and the percentage of fatal and suspected serious injury crashes involving lane departures above the statewide average. A hot spot was identified from MP 316.1 to MP 318.25.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by constructing a climbing lane.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

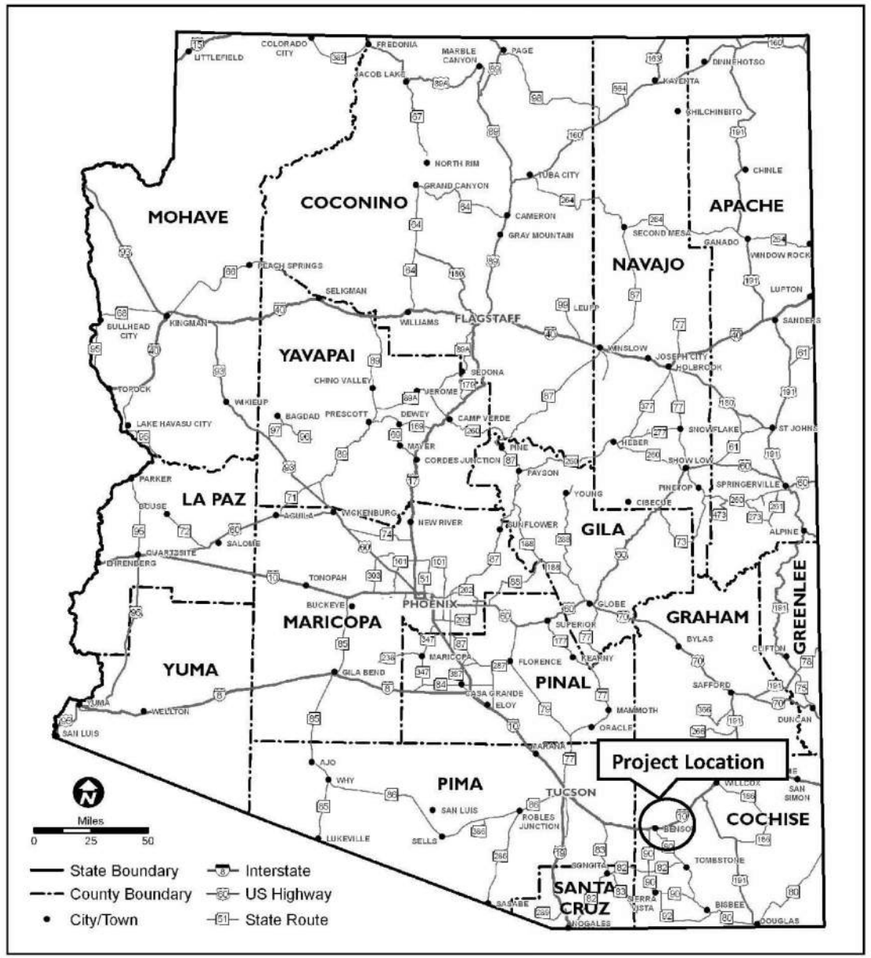
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$516,800	$1,722,600	$0	$17,226,000	$19,465,400

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



3

ATTACHMENT 2 – PROJECT VICINITY MAP

4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Construct climbing lane from MP 316 to MP 318.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Dragoon Safety Improvements (CS10E.23)	
City/Town: N/A	**County:** Cochise
COG/MPO: SEAGO	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 316	
End Limit: MP 318	
Project Length: 2 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land, BLM *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Safety Need: From MP 315 to MP 332, there is a Medium level of need based on the westbound Directional Safety Index and the percentage of fatal and suspected serious injury crashes involving lane departures above the statewide average. A hot spot was identified from MP 316.1 to MP 318.25.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by rehabilitating shoulders in both directions, installing speed feedback signs, and installing westbound DMS signs.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

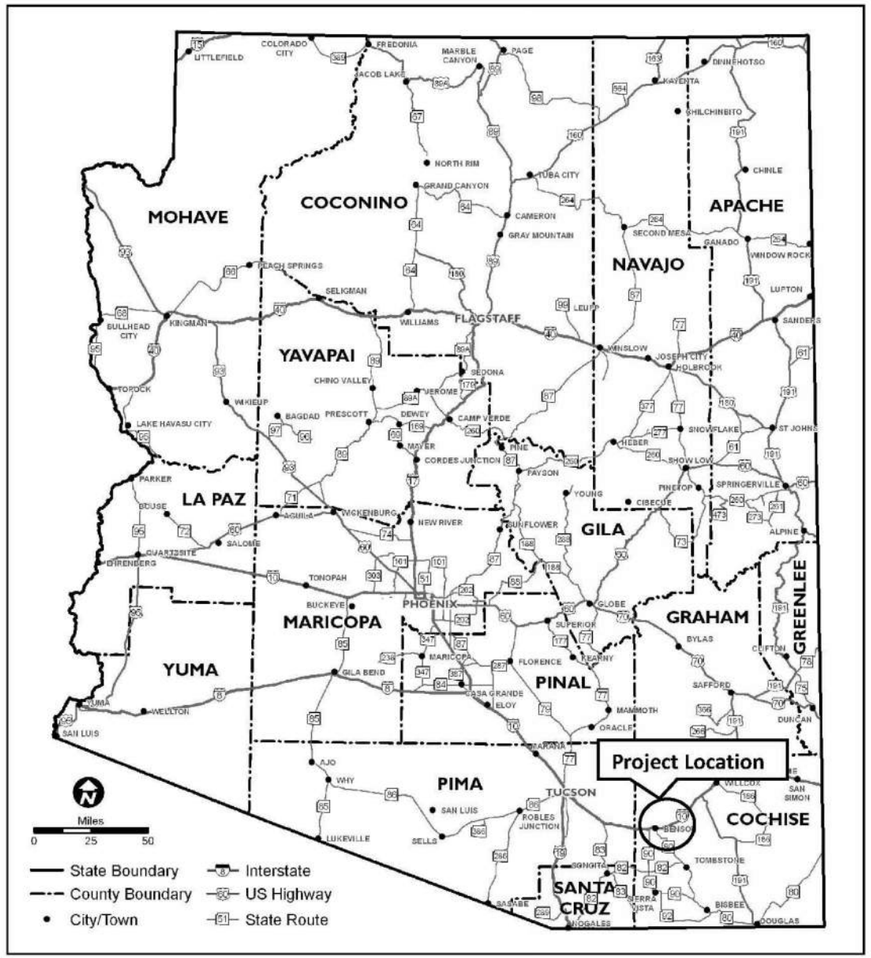
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$97,300	$324,600	$0	$3,245,600	$3,667,500

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



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ATTACHMENT 2 – PROJECT VICINITY MAP

4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) (MP 316-318). • Consider installing speed feedback signs in both directions (MP 317). • Install DMS sign in both directions (MP 317).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Exit 318 Lighting Improvements (CS10E.24)	
City/Town: N/A	**County:** Cochise
COG/MPO: SEAGO	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 316	
End Limit: MP 318	
Project Length: 2 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Safety Need: From MP 315 to MP 332, there is a Medium level of need based on the westbound Directional Safety Index and the percentage of fatal and suspected serious injury crashes involving lane departures above the statewide average. A hot spot was identified from MP 316.1 to MP 318.25.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by installing roadway lighting.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

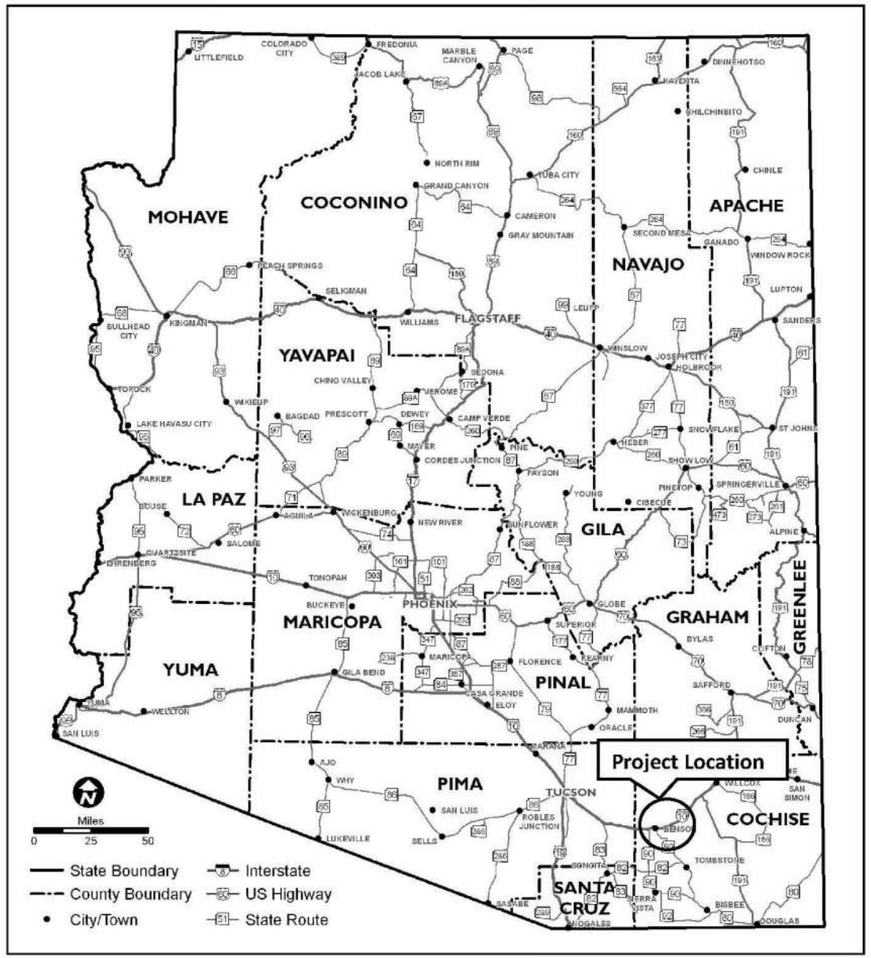
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$31,200	$103,600	$0	$1,034,000	$1,168,800

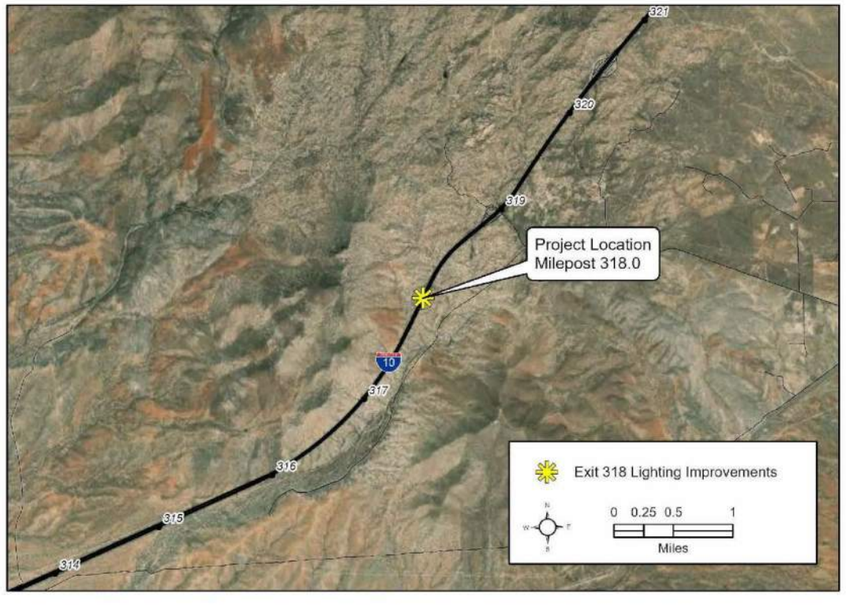
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Install lighting at Exit 318.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Texas Canyon Area Pavement Improvements (CS10E.25B)	
City/Town: N/A	**County:** Cochise
COG/MPO: SEAGO	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 321	
End Limit: MP 323	
Project Length: 2 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Pavement Need: A hot spot was identified from MP 321 to MP 323.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Pavement Need by replacing the existing pavement.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

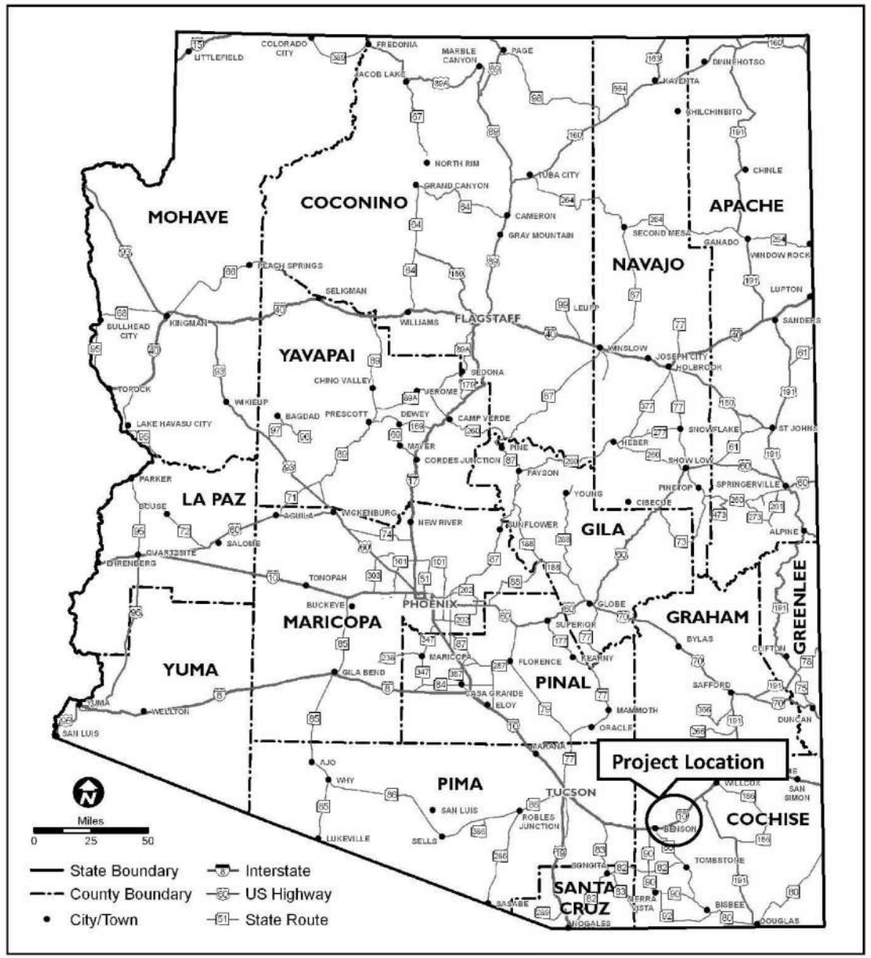
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$399,000	$1,330,000	$0	$13,300,000	$15,029,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



3

ATTACHMENT 2 – PROJECT VICINITY MAP

4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Replace pavement from MP 321 to MP 323.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Red Bird Hills Area Pavement Improvements (CS10E.26B)	
City/Town: N/A	**County:** Cochise
COG/MPO: SEAGO	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 328	
End Limit: MP 329	
Project Length: 1 mile	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Pavement Need: A hot spot was identified from MP 328 to MP 329.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Pavement Need by replacing the existing pavement.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

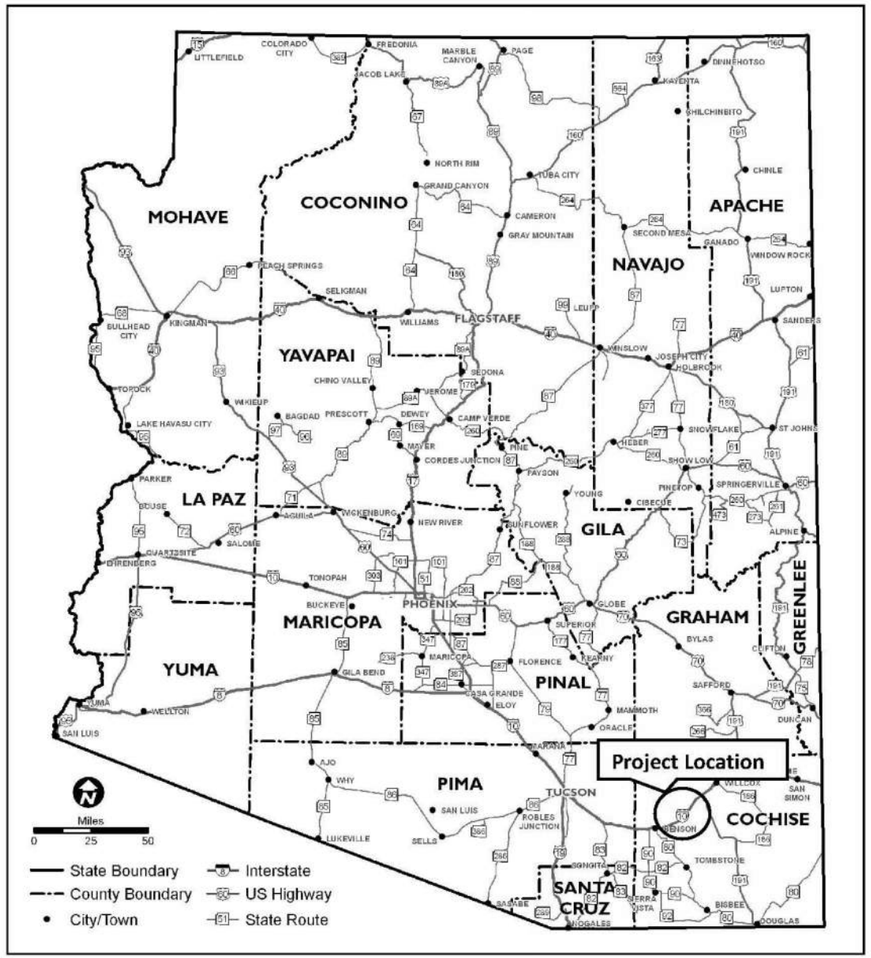
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$199,500	$665,000	$0	$6,650,000	$7,514,500

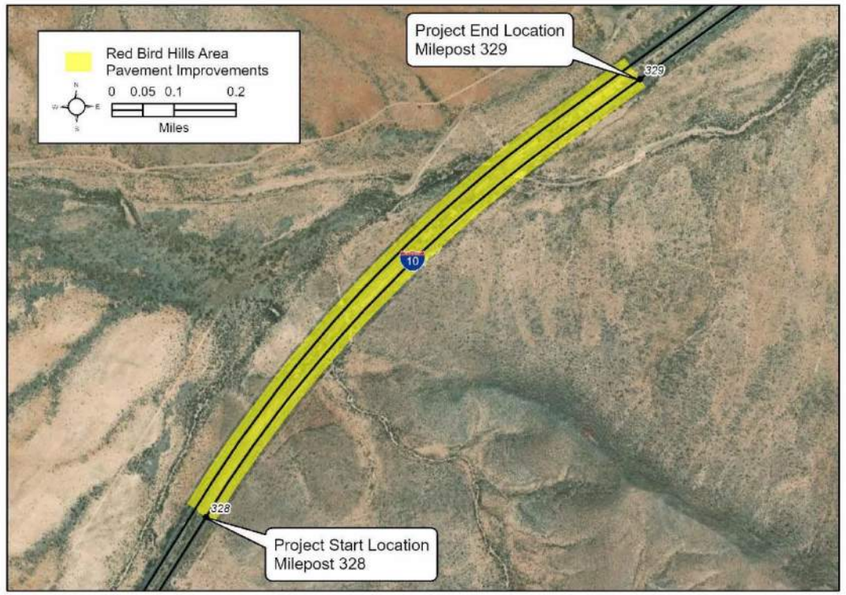
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Replace pavement from MP 328 to MP 329.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Airport Road UP (#1114) Bridge Vertical Clearance Mitigation (CS10E.28A)	
City/Town: Wilcox	**County:** Cochise
COG/MPO: SEAGO	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 339.46	
End Limit: MP 339.46	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Bridge Need: A hot spot was identified at MP 339.46 with a bridge deck rating 5 and bridge substructure rating 4. *Freight Need: At MP 339.46, The Airport Road UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a ramp bypass option.*

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Bridge Need and Freight Need by replacing the existing bridge.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

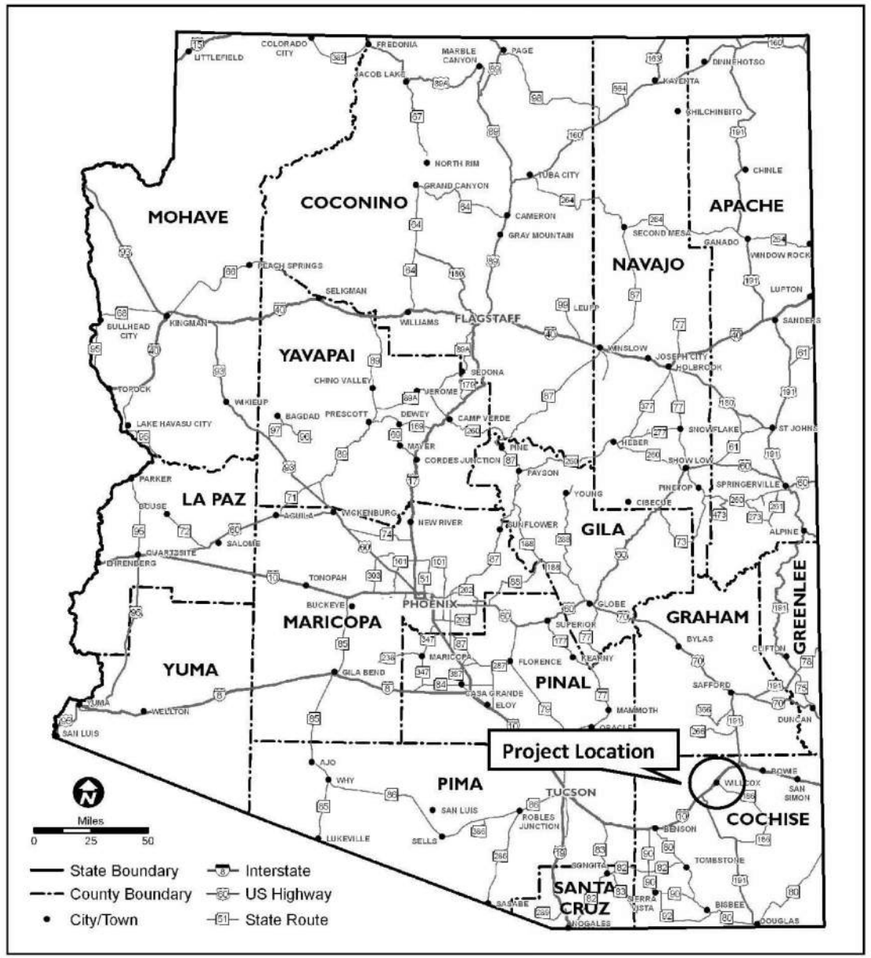
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$199,000	$663,500	$0	$6,634,970	$7,497,470

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



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ATTACHMENT 2 – PROJECT VICINITY MAP

4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Replace bridge at Airport Road UP (MP 339.46).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Airport Road UP (#1114) Bridge Vertical Clearance Mitigation (CS10E.28B)	
City/Town: Wilcox	**County:** Cochise
COG/MPO: SEAGO	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 339.46	
End Limit: MP 339.46	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Bridge Need: A hot spot was identified at MP 339.46 with a bridge deck rating 5 and bridge substructure rating 4. *Freight Need: At MP 339.46, The Airport Road UP was identified as a Freight hot spot with vertical clearance less than 16.25 feet without a ramp bypass option.*

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Bridge Need and Freight Need by rehabilitating the existing bridge and reprofiling the mainline.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

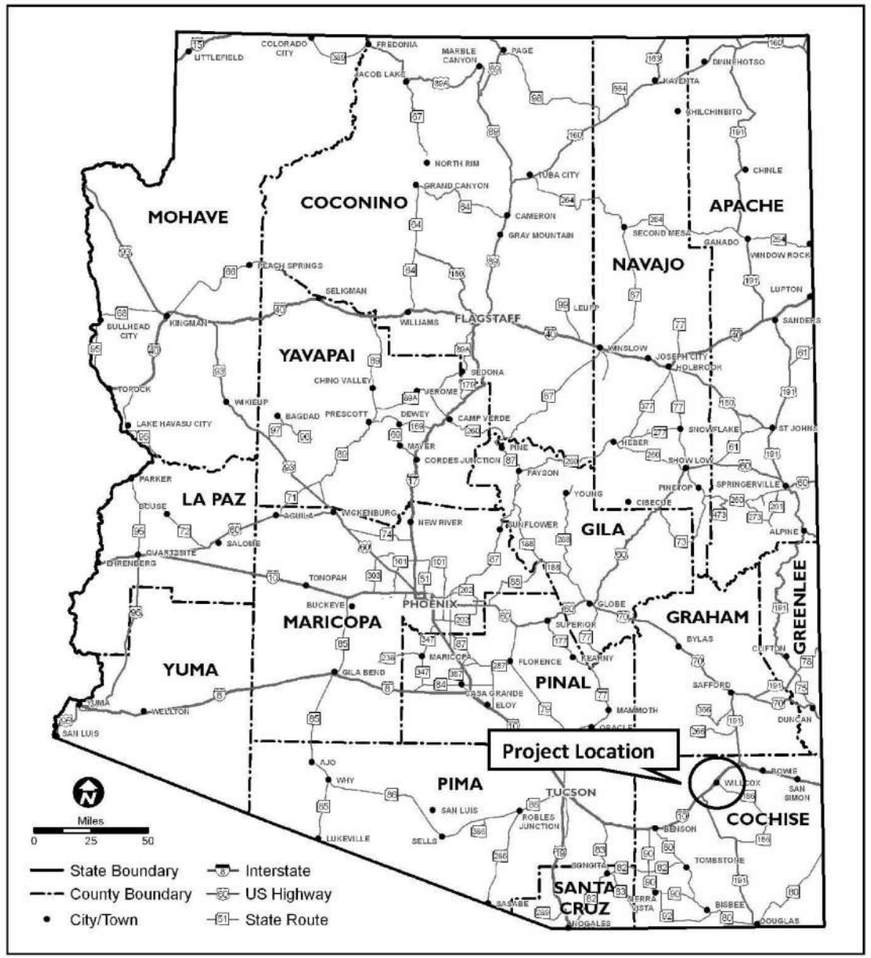
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$305,400	$1,017,900	$0	$10,179,250	$11,502,550

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



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ATTACHMENT 2 – PROJECT VICINITY MAP

4

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Rehabilitate bridge and reprofile mainline at Airport Road UP (MP 339.46).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: February 17, 2023	**ADOT Project Manager:**
Project Name: Bowie Area Safety Improvements (CS10E.29)	
City/Town: N/A	**County:** Cochise
COG/MPO: SEAGO	**ADOT District:** Southcentral
Primary Route/Street: I-10	
Beginning Limit: MP 354	
End Limit: MP 372	
Project Length: 18 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Land *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Safety Need: From MP 354 to MP 372, there is a High level of need based on the overall Safety Index, westbound Directional Safety Index, and percentage of fatal and suspected serious injury crashes involving lane departures and trucks.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Safety Need by rehabilitating shoulders in both directions and installing a westbound DMS sign.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

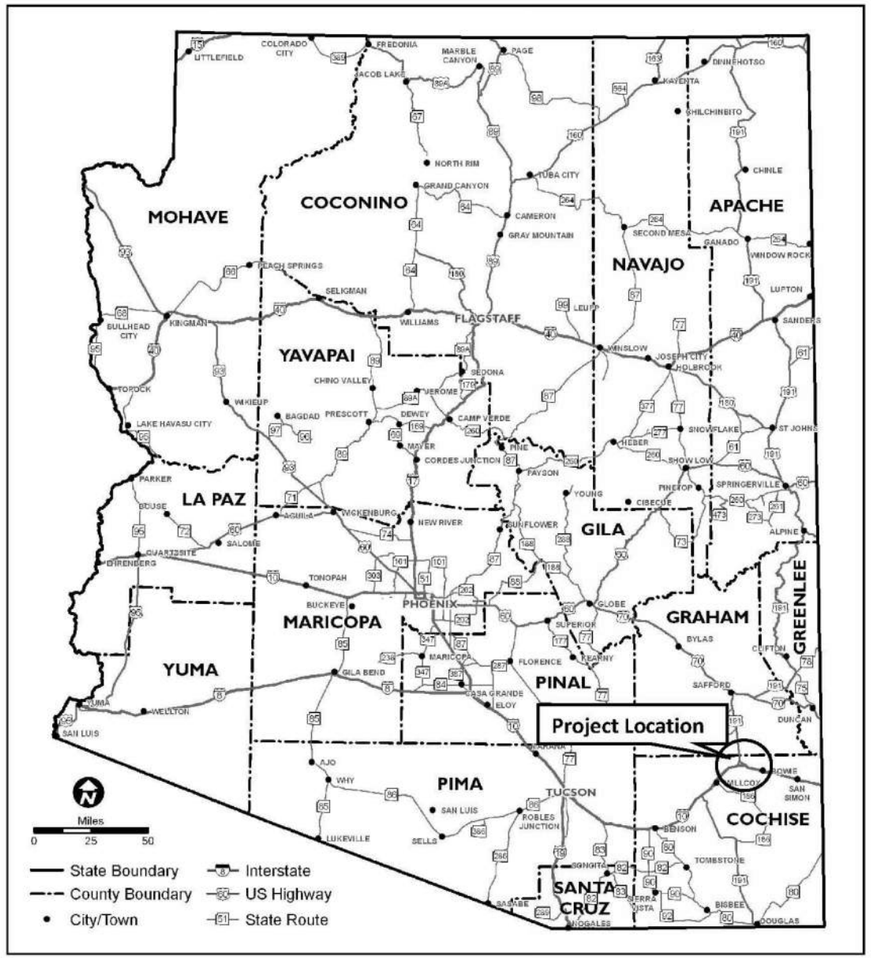
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$488,200	$1,627,600	$0	$16,276,000	$18,391,800

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



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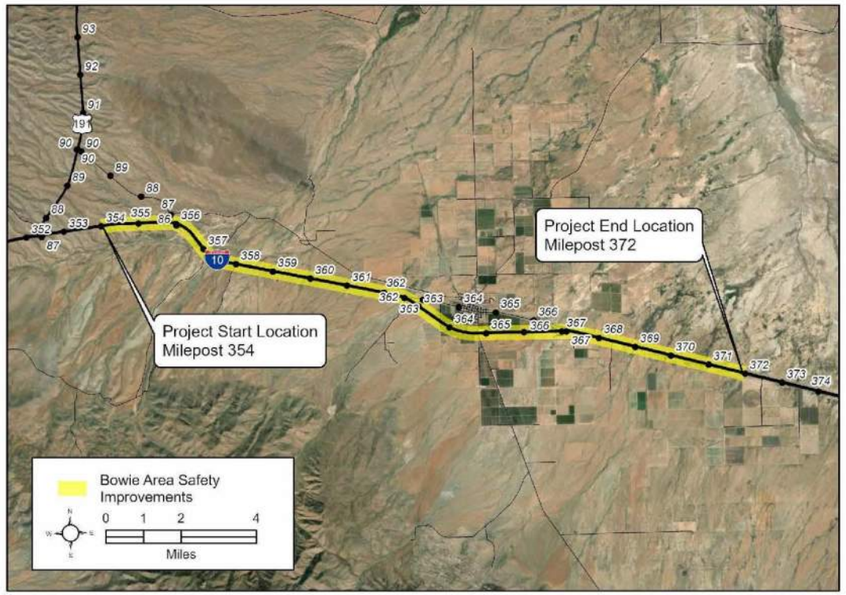
ATTACHMENT 2 – PROJECT VICINITY MAP



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ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Rehabilitate shoulders in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders) from MP 354 to MP 372. • Install westbound DMS sign (MP 356).

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• N/A

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.