FINAL REPORT

I-10/SR 85 Corridor Profile Study

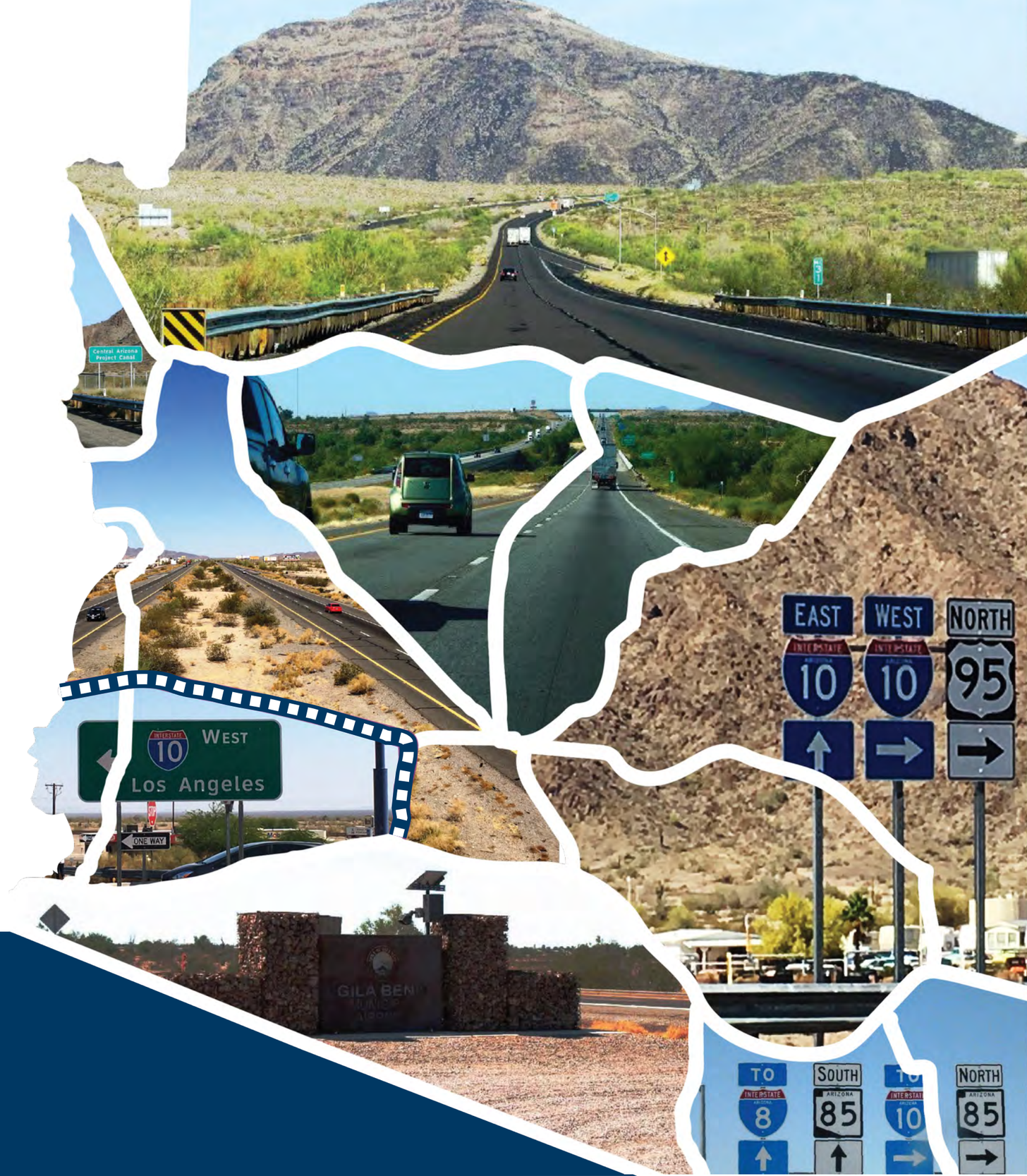
California State Line to I-8

PREPARED FOR ADOT

APRIL 2023

ADOT WORK TASK NO.
MPD 0013-21

ADOT CONTRACT NO.
17-171970



Prepared by

AECOM

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CALIFORNIA STATE LINE TO I-8

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APRIL 2023

PREPARED FOR:
ARIZONA DEPARTMENT OF TRANSPORTATION

PREPARED BY:

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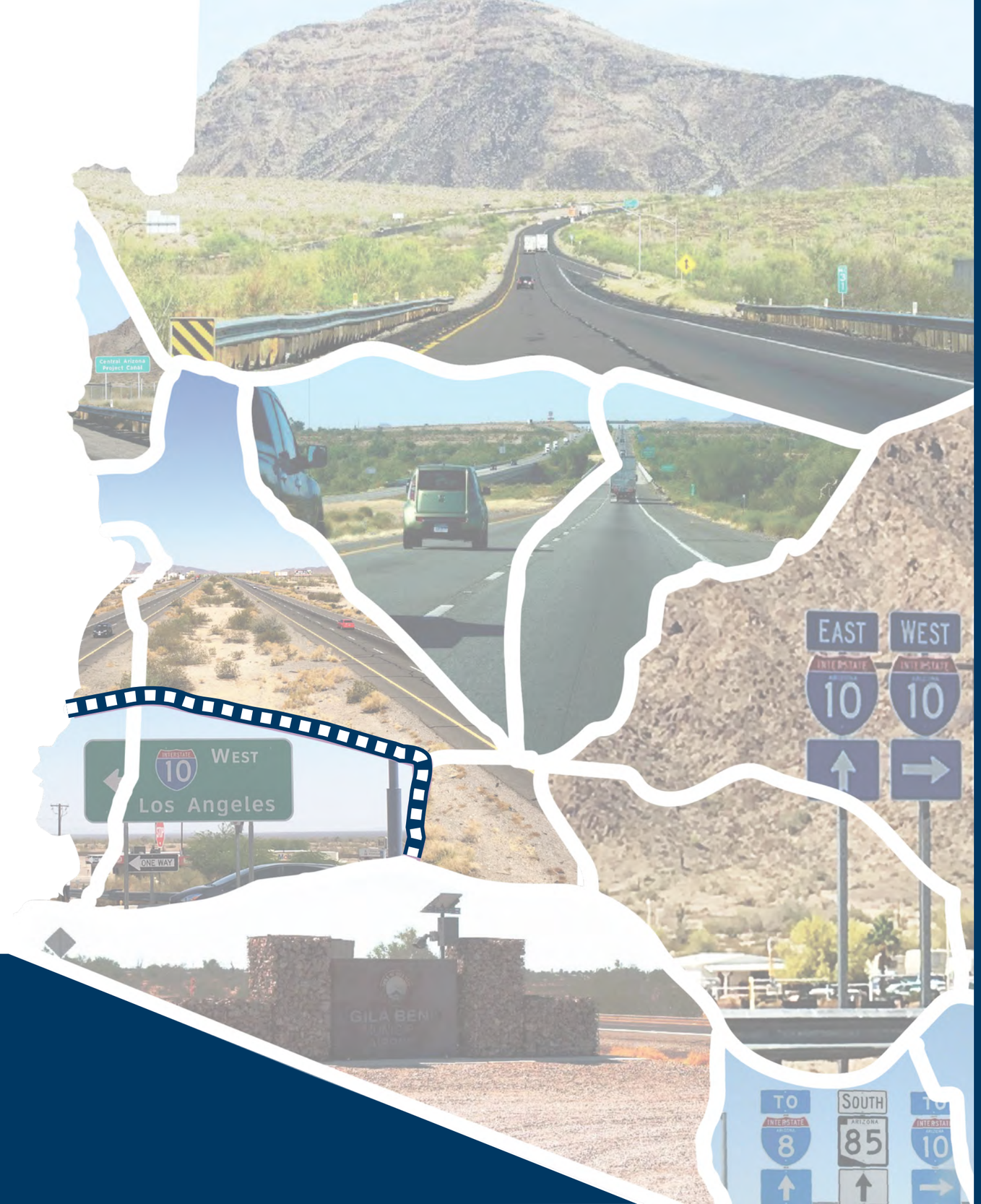
ACRONYMS & ABBREVIATIONS

AADT	Average Annual Daily Traffic
ABISS	Arizona Bridge Information and Storage System
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
ASLD	Arizona State Land Department
AZTDM	Arizona Statewide Travel Demand Model
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe
BQAZ	Building a Quality Arizona
CCTV	Closed Circuit Television
CR	Cracking Rating
DCR	Design Concept Report
DMS	Dynamic Message Sign
EB	Eastbound
ECoNA	Economic Collaborative of Northern Arizona
FHWA	Federal Highway Administration
FMPO	Flagstaff Metropolitan Planning Organization
FY	Fiscal Year
HCRS	Highway Condition Reporting System
HERE	Real time traffic conditions database produced by American Digital Cartography Inc.
HPMS	Highway Performance Monitoring System
I	Interstate
IRI	International Roughness Index
ITS	Intelligent Transportation System
LCCA	Life-Cycle Cost Analysis
LOS	Level of Service
LRTP	Long-Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21st Century
MP	Milepost
MPD	Multimodal Planning Division
NACOG	Northern Arizona Council of Governments
NAU	Northern Arizona University
NB	Northbound
NCFRP	National Cooperative Freight Research Program
NPV	Net Present Value
OP	Overpass
P2P	Planning-to-Programming
PA	Project Assessment
PAG	Pima Association of Governments
PARA	Planning Assistance for Rural Areas
PDI	Pavement Distress Index
PES	Performance Effectiveness Score
POE	Port-of-Entry
PS	Prioritization Score
PSR	Pavement Serviceability Rating
RTP	Regional Transportation Plan
RWIS	Road Weather Information System
SATS	Small Area Transportation Study
SB	Southbound
SCAG	Southern California Association of Governments
SERI	Species of Economic and Recreational Importance
SGCN	Species of Greatest Conservation Need
SHCG	Species and Habitat Conservation Guide
SHSP	Strategic Highway Safety Plan
SOV	Single Occupancy Vehicle
SPUI	Single Point Urban Interchange

ACRONYMS & ABBREVIATIONS (continued)

SR	State Route
STB	Surface Transportation Board
STIP	State Transportation Improvement Program
SWAP	State Wildlife Action Plan
TAC	Technical Advisory Committee
TI	Traffic Interchange
TIP	Transportation Improvement Plan
TTIS	Travel and Tourist Information System
UP	Underpass
USDOT	United States Department of Transportation
V/C	Volume-to-Capacity Ratio
VMT	Vehicle-Miles Travelled
VPD	Vehicles per Day
VSL	Variable Speed Limit
WACOG	Western Arizona Council of Governments
WB	Westbound
WIM	Weigh-in-Motion



Executive Summary

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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 the California State Line and State Route 85 (SR 85), and SR 85 between the I-10 and Interstate 8 (I-8). The study examines key performance measures relative to the I-10/SR 85 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 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 I-10/SR 85, depicted in **Figure ES-1**, 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:

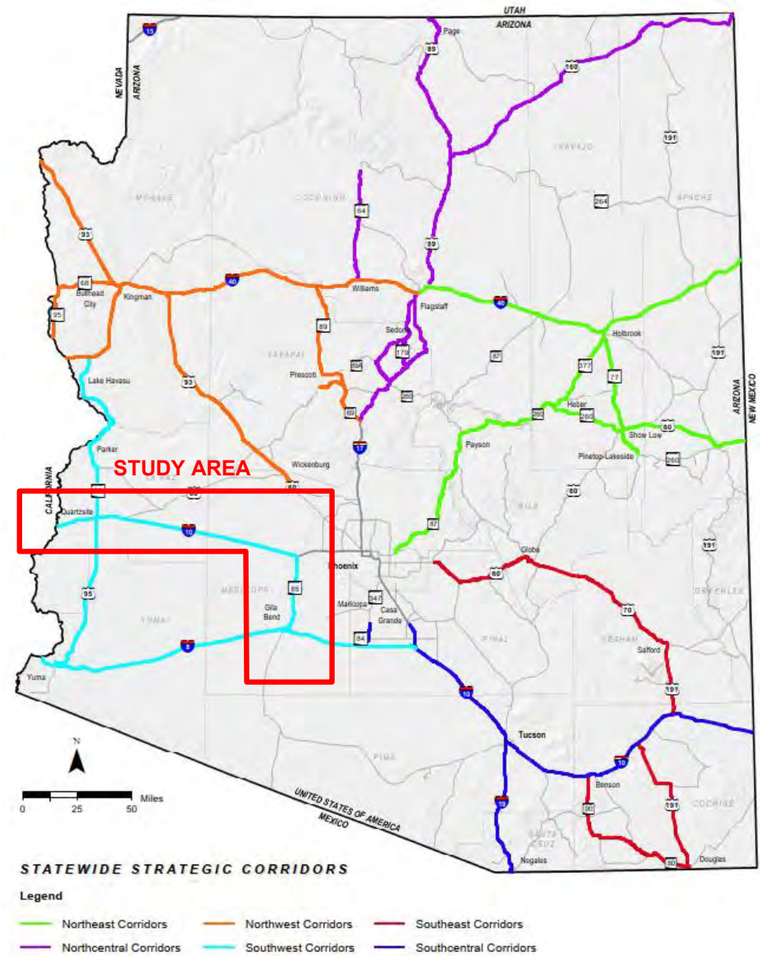
- Inventory past improvement recommendations
- Define corridor goals and objectives
- Assess existing performance based on quantifiable performance measures
- Propose various solutions to improve corridor performance
- Identify specific solutions that can provide quantifiable benefits relative to the 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/SR 85 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 have been identified as the 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.

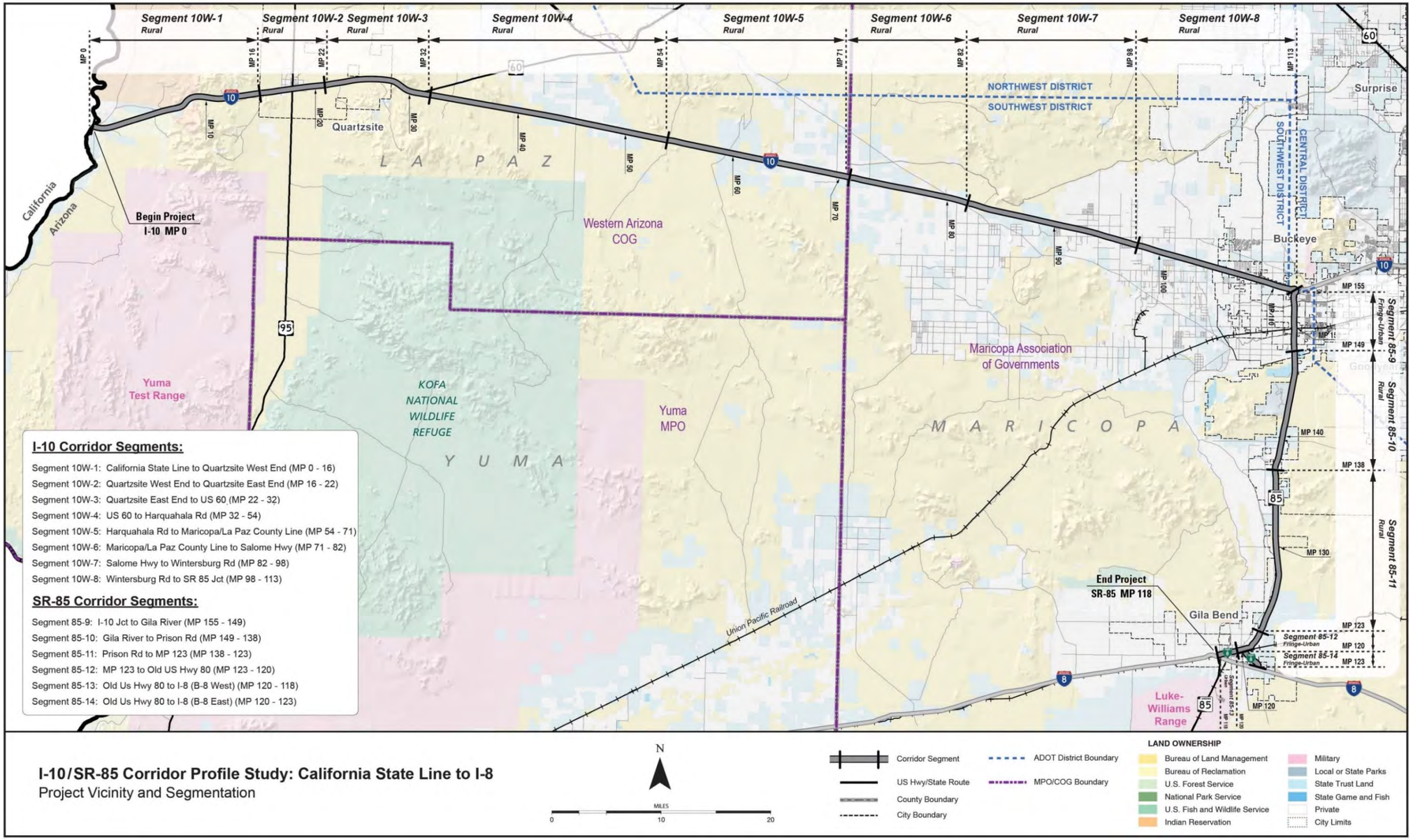
Figure ES-1: Corridor Study Area



Study Location and Corridor Segments

The I-10/SR 85 Corridor is divided into 14 planning segments to allow for an appropriate level of detailed needs analysis, performance evaluation, and comparison between different segments of the corridor. 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 sections. Corridor segments are shown in **Figure ES-2.**

Figure ES-2: Corridor Location and Segments



CORRIDOR PERFORMANCE

This chapter describes the evaluation of the existing performance of the I-10/SR 85 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.

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 analysis:

- 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/SR 85 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.**

Based on the results of performance evaluation, the following general observations were made related to the performance of the I-10/SR 85 Corridor

- Overall Performance: The Pavement, Mobility, and Freight performance areas show generally “good” performance; Bridge and Safety performance areas show generally “fair/average” or “poor/below average”
- Pavement Performance: The weighted average of the Pavement Index shows “good” performance for the I-10 West/SR 85 Corridor; exceptions include Segments 10W-1, 10W-2, 40W-3, 10W-7 and 85-9 which show “fair” performance for the Pavement Index; the weighted average of % Area Failure shows “poor” performance for the majority of the corridor, exceptions are segments 10W-4, 10W-5, 85-12, 85-13 and 85-14 which should “good” performance. Segments 10W-6 and 85-11 show “fair” performance; all segments except Segments 10W-4, 10W-5, 85-12, 85-13, and 85-14 have Pavement hot spots
- Bridge Performance: The weighted average of the Bridge Index shows “fair” performance along the I-10 West Corridor; the Bridge index predominantly shows “fair” performance, except for Segments 10W-1, 10W-6, 85-10, and 85-14, which show “good” performance. The weighted average for Lowest Bridge Rating shows “fair” performance for the corridor
- Mobility Performance: The weighted average of the Mobility Index and all secondary measures show “good” performance throughout the I-10 West/SR85 Corridor
- Safety Performance: The weighted average of the Safety Index shows “average” performance for the I-10 West/SR85 Corridor; performance measures for crashes involving lane departures and trucks had “below average” performance; several segments had insufficient data to generate reliable performance ratings for emphasis area crashes included as secondary measures. Segment 85-14 had insufficient data to calculate any primary or secondary safety measures
- Freight Performance: The weighted average of the Freight Index shows “good” performance along the I-10 West Corridor; Closure Duration shows “good” performance for all Segments except 10W-1 EB, 10W-3 WB, 10W-7 WB, and 85-9 WB

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	Bridge Sufficiency	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/SB	WB/NB							EB/SB	WB/NB	EB/SB	WB/NB	EB/SB	WB/NB		
10-1[b2]	16	3.73	3.74	3.64	41%	6.75	83.24	5	0.42	0.47	0.28	0.28	0.36	0.19	1.04	1.03	100%	8.2%
10-2[b2]	6	3.14	3.03	3.47	92%	6.15	92.98	5	0.40	0.45	0.24	0.23	0.33	0.27	1.03	1.03	100%	9.8%
10-3[b2]	10	3.61	3.67	3.75	60%	6.00	86.37	6	0.42	0.47	0.25	0.24	0.08	0.82	1.02	1.02	99%	13.7%
10-4[b2]	22	3.99	4.16	4.37	0%	6.17	96.05	5.00	0.45	0.51	0.38	0.37	0.16	0.15	1.02	1.02	70%	6.7%
10-5[b2]	17	4.51	4.09	4.18	0%	6.48	96.81	6.00	0.37	0.42	0.19	0.18	0.08	0.13	1.02	1.02	100%	5.0%
10-6[b2]	11	4.31	4.03	4.09	18%	7.00	97.05	7	0.41	0.46	0.16	0.19	0.22	0.22	1.02	1.02	100%	5.3%
10-7[b2]	16	3.26	3.32	3.57	84%	6.25	96.62	6	0.40	0.45	0.25	0.27	0.26	0.36	1.02	1.02	75%	7.3%
10-8[b2]	15	3.89	3.73	3.76	40%	6.44	96.35	5	0.58	0.72	0.3	0.29	0.23	0.22	1.02	1.02	100%	7.2%
85-9	6	3.22	3.04	2.95	25%	No Bridges			0.22	0.16	0.24	0.24	0.13	0.48	1.09	1.08	88%	17.1%
85-10	11	3.61	3.67	3.92	32%	6.53	99.44	6	0.30	0.35	0.23	0.23	0.02	0.02	1.03	1.03	100%	14.0%
85-11	15	3.90	4.24	4.03	10%	No Bridges			0.24	0.28	0.14	0.13	0.04	0.05	1.04	1.03	94%	8.0%
85-12	3	4.08	4.02	3.82	0%	5.00	75.10	5	1.02	1.18	0.58	0.57	0.00	0.20	1.04	1.03	32%	7.2%
85-13	2	3.92	3.80	3.48	0%	5.62	91.63	5.00	0.55	0.62	0.33	0.31	No Data		1.09	1.12	47%	7.0%
85-14	3	3.96	3.90	3.59	0%	6.86	96.40	6.00	1.40	2.41	0.16	0.14	No Data		1.10	1.10	42%	4.1%
Weighted Corridor Average		3.83	3.81	3.87	30%	6.33	94.25	5.44	0.43	0.51	0.26	0.26	0.17	0.23	1.03	1.03	89%	8%

SCALES

Performance Level	Interstate		All				Urban	All	Interrupted (Uninterrupted)	All	
Good/Above Average	> 3.75	> 3.75	< 5%	> 6.5	> 80	> 6	< 0.71	< 0.22	< 1.15	> 90%	> 17%
Fair/Average	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	< 3.00	< 3.40	> 20%	< 5.0	< 50	< 5	> 0.89	> 0.62	> 1.50	< 60%	< 11%
Performance Level	**Non-Interstate**						**Rural**				
Good/Above Average	> 3.60	> 3.50					< 0.56				
Fair/Average	2.8 - 3.60	2.90 - 3.50					0.56 - 0.76				
Poor/Below Average	< 2.8	< 2.90					> 0.76				

[a]Urban 4 Lane Freeway
[b]Rural 4 Lane Freeway with Daily Volume < 25,000

[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	MAX TTTR		Closure Duration (minutes/milepost/year/mile)		Bridge Vertical Clearance (feet)
			EB/SB	WB/NB							EB/SB	WB/NB	EB/SB	WB/NB	
10-1[b2]	16	0.93	0.40	1.46	Insufficient Data	76%	Insufficient Data	24%	Insufficient Data	1.11	1.12	1.09	97.22	26.10	16.17
10-2[b2]	6	2.28	1.90	2.65	Insufficient Data	40%	Insufficient Data	20%	Insufficient Data	1.06	1.06	1.05	39.34	30.40	15.92
10-3[b2]	10	0.92	1.14	0.71	Insufficient Data	67%	Insufficient Data	27%	Insufficient Data	1.05	1.05	1.05	13.18	100.93	16.16
10-4[b2]	22	1.28	1.81	0.74	Insufficient Data	57%	Insufficient Data	39%	Insufficient Data	1.05	1.05	1.05	23.91	21.59	15.9
10-5[b2]	17	0.94	1.10	0.78	Insufficient Data	78%	Insufficient Data	19%	Insufficient Data	1.04	1.04	1.04	12.31	14.75	16.2
10-6[b2]	11	2.10	3.23	0.98	Insufficient Data	67%	Insufficient Data	27%	Insufficient Data	1.04	1.04	1.04	21.31	25.01	16
10-7[b2]	16	1.79	1.95	1.62	Insufficient Data	68%	Insufficient Data	27%	Insufficient Data	1.05	1.05	1.04	30.07	50.94	16.58
10-8[b2]	15	1.01	1.27	0.76	Insufficient Data	58%	Insufficient Data	16%	Insufficient Data	1.05	1.05	1.05	35.17	34.43	15.92
85-9	6	1.86	2.76	0.96	Insufficient Data	0%	Insufficient Data	30%	Insufficient Data	1.29	1.30	1.28	20.67	66.04	No UP
85-10	11	0.54	0.09	0.99	Insufficient Data	40%	Insufficient Data	Insufficient Data	Insufficient Data	1.07	1.07	1.06	2.18	2.18	No UP
85-11	15	0.26	0.02	0.49	Insufficient Data	80%	Insufficient Data	60%	Insufficient Data	1.20	1.19	1.20	7.48	7.67	No UP
85-12	3	1.49	2.98	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.20	1.19	1.20	0.00	20.00	No UP
85-13	2	3.09	4.07	2.10	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.32	1.26	1.37	No Data		16.61
85-14	3	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.59	1.57	1.62	No Data		No UP
Weighted Corridor Average		1.20	1.39	1.02	Insufficient Data	62%	Insufficient Data	36%	Insufficient Data	1.10	1.10	1.09	28.12	30.66	16.16

SCALES									
Performance Level	Rural 4-Lane Freeway with Daily Volume <25,000						Uninterrupted		
Good/Above Average	< 0.84	N/A	< 72.8%	< 1.0%	< 19.0%	< 0.0%	< 1.15	< 44.18	> 16.5
Fair/Average	0.84 - 1.16	N/A	72.8% - 76.4%	1.0% - 3.3%	19.0% - 22.5%	0.0% - 0.9%	1.15 - 1.35	44.18 - 124.86	16.0 - 16.5
Poor/Below Average	> 1.16	N/A	> 76.4%	> 3.3%	> 22.5%	> 0.9%	> 1.35	> 124.86	< 16.5
Performance Level	Rural 4-Lane Freeway with Daily Volume >25,000								
Good/Above Average	< 0.78	N/A	< 69.0%	< 0.7%	< 8.5%	< 0.0%			
Fair/Average	0.78 - 1.22	N/A	69.0% - 77.5%	0.7% - 4.7%	8.5% - 18.0%	0.0% - 0.0%			
Poor/Below Average	> 1.22	N/A	> 77.5%	> 4.7%	> 18.0%	> 0.0%			
Performance Level	2 or 3 or 4 Lane Divided Highway								
Good/Above Average	< 0.81	< 23.4%	< 56.4%	< 2.4%	< 3.7%	< 0.0%			
Fair/Average	0.81 - 1.19	23.4% - 29.3%	56.4% - 65.0%	2.4% - 3.6%	3.7% - 9.9%	0.0% - 2.2%			
Poor/Below Average	> 1.19	> 29.3%	> 65.0%	> 3.6%	> 9.9%	> 2.2%			
Performance Level	4 or 5 Lane Undivided Highway								
Good/Above Average	< 0.78	< 43.8%	< 21.1%	< 8.8%	< 0.8%	< 0.5%			
Fair/Average	0.78 - 1.22	43.8% - 49.5%	21.1 % - 32.1%	8.8% - 13.5%	0.8% - 5.5%	0.5% - 3.8%			
Poor/Below Average	> 1.22	> 49.5%	> 32.1%	> 13.5%	> 5.5%	> 3.8%			
Performance Level	2 or 3 Lane Undivided Highway								
Good/Above Average	< 0.92	< 11.2%	< 66.9%	< 3.8%	< 4.2%	< 0.0%			
Fair/Average	0.92 - 1.08	11.2% - 15.6%	66.9 % - 74.5%	3.8% - 7.2%	4.2% - 8.0%	0.0% - 3.3%			
Poor/Below Average	> 1.08	> 15.6%	> 74.5%	> 7.2%	> 8.0%	> 3.3%			

[a]Urban 4 Lane Freeway
[b]Rural 4 Lane Freeway with Daily Volume < 25,000

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

Notes: "Insufficient Data" indicates there was not enough data available to generate reliable performance ratings
"No UP" indicates no underpasses are present in the segment

NEEDS ASSESSMENT

Corridor Description

The I-10/SR 85 Corridor provides an important connection from Southern California to economic and recreational opportunities in Central Arizona and other destinations to the east. I-10 is a 4-lane divided freeway from the California border to SR 85 while ST 85 is generally a 4-lane divided state route facility connecting I-10 to I-8. Together, the two roadways provide a passage from Southern California to Tucson while bypassing the Metropolitan Phoenix Area.

Corridor Objectives

Statewide goals and performance measures were established by the ADOT Long-Range Transportation Plan (LRTP), 2010-2035. Statewide performance goals that are relevant to I-10/SR 85 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/SR 85 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 identified 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.

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

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 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

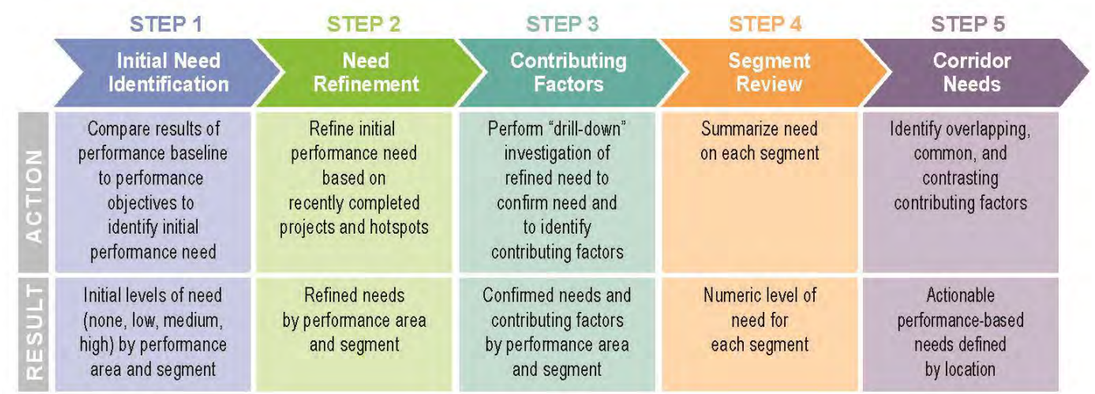


Figure ES-5: Initial Need Ratings in Relation to Baseline Performance (Bridge Example)

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/SR 85 Corridor). There are no segments with a High average need, six segments with a Medium average need, and eight segments with a Low average need.

Pavement Needs

- The Pavement Performance Area is an emphasis area for the I-10/SR 85 Corridor.
- Segments 10W-4 and 10W-5 have a level of need of “None” and have no hot spots
- There are various recently completed projects but do not impact the segment needs as they do not address enough of the corridor to impact performance or the pavement treatment chosen is a life extensions treatment, not a project that would eliminate the needs.

Bridge Needs

- The Bridge Performance Area is not an emphasis area for the I-10/SR 85 Corridor.
- Segment 85-12 contains a Bridge hot spot
- There are no recently completed projects along the Corridor impacting final segment need

Mobility Needs

- The Mobility Performance Area is an emphasis area for the I-10/SR 85 Corridor.
- Overall Mobility needs are “Low” or “None” throughout the corridor, except 85-12 and 85-14 which show “High” need
- There are no recently completed projects along the I-10/SR 85 Corridor impacting final segment need

Safety Needs

- The Safety Performance Area is an emphasis area for the I-10/SR 85 Corridor.
- Segments 10W-2, 10W-4, 10W-6, 10W-7, 85-9, and 85-12 have “High” safety needs

Freight Needs

- The Freight Performance Area is an emphasis area for the I-10/SR 85 Corridor.
- There are four bridge vertical clearance hot spots on the corridor located in Segments 10W-4, and 10W-8
- No Segments have “High” closure duration need
- All Segments have “None” and “Low” freight needs

Overlapping Needs

This section identifies overlapping performance needs on the I-10/SR 85 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:

- Five segments I-10/SR 85 Corridor shows some level of need in four out of the five performance areas
- Segment 10W-2, 10W-4 and 85-12 have the highest levels of overall need
- Segments 10W-2, 10W-4, 10W-6, and 10W-7 have a “High” Emphasis Area need (Safety). Segments 85-12 and 85-14 have “High” Emphasis Area need (Mobility).

Table ES-3: Summary of Needs by Segment

Performance Area	Segment Number and Mileposts (MP)													
	10W-1	10W-2	10W-3	10W-4	10W-5	10W-6	10W-7	10W-8	85-9	85-10	85-11	85-12	85-13	85-14
	MP 0-16	MP 16-22	MP 22-32	MP 32-54	MP 54-71	MP 71-82	MP 82-98	MP 98-113	MP 155-149	MP 149-138	MP 138-123	MP 123-120	MP 120-118	MP 120-123
Pavement	Low	High	Low	None	None	Low	Medium	Low	Low	Low	Low	None	None	None
Bridge	Low	Low	None	Low	None	None	None	Low	N/A	None	N/A	Medium	Low	None
Mobility*	Low	None	Low	Low	None	None	Low	Low	Low	None	None	High	Low	High
Safety*	Low	High	Low	High	Low	High	High	Medium	High	None	Low	High	None	None
Freight*	Low	Low	Low	Low	Low	Low	None	Low	None	None	None	None	None	Low
Average Need	**1.00**	**1.54**	**0.85**	**1.31**	**0.46**	**1.08**	**1.23**	**1.23**	**1.08**	**0.15**	**0.38**	**1.69**	**0.38**	**0.92**

Average Need Scale	
None*	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

+ Identified as an emphasis area for the I-10/SR 85 Corridor

** 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 as addressing these needs will have the greatest effect on corridor performance. 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/SR 85 strategic investment areas (resulting from the elevated needs) are shown in **Figure ES-6.**

Screening Process

In some cases, needs that are identified do not advance to solutions development and are screen 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 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 change 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 screen 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-40 West Corridor will be considered along with other candidate projects in the ADOT statewide programming process.

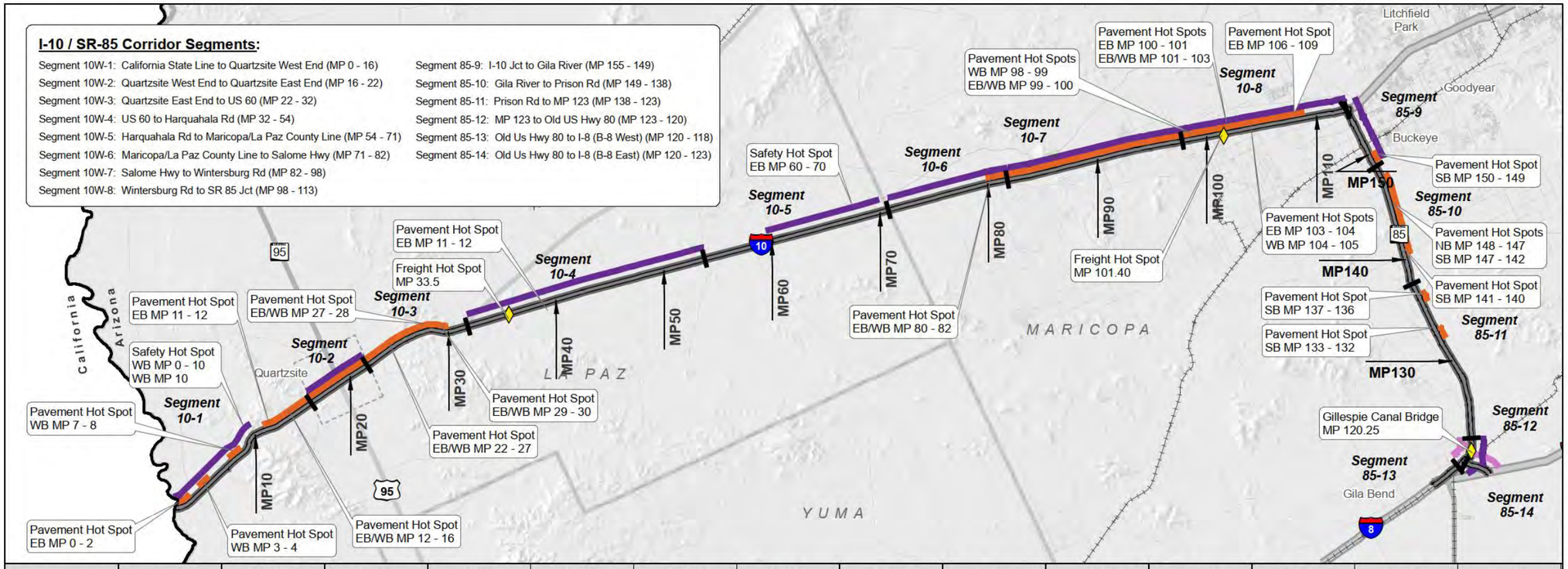
Candidate solutions include some or all of the following characteristics:

- 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 areas 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	10W-1	10W-2	10W-3	10W-4	10W-5	10W-6	10W-7	10W-8	85-9	85-10	85-11	85-12	85-13	85-14
	MP 0-16	MP 16-22	MP 22-32	MP 32-54	MP 54-71	MP 71-82	MP 82-98	MP 98-113	MP 155-149	MP 149-138	MP 138-123	MP 123-120	MP 120-118	MP 120-123
Pavement	Hot Spot	High	Hot Spot	-	-	Hot Spot	Medium	Hot Spot	Hot Spot	Hot Spot	Hot Spot	-	-	-
Bridge	-	-	-	-	-	-	-	-	-	-	-	Medium	-	-
Mobility*	-	-	-	-	-	-	-	-	-	-	-	High	-	High
Safety*	Hot Spot	High	-	High	Hot Spot	High	High	Medium	High	-	-	High	-	-
Freight*	-	-	-	Hot Spot	-	-	-	Hot Spot	-	-	-	-	-	-

* Identified as Emphasis Areas for I-10W/SR 85 Corridor

N/A indicates insufficient or no data available to determine level of need

I-10/SR-85 Corridor Profile Study: California State Line to I-8
Strategic Investment Areas

N

Miles: 0 10 20

Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail

NEEDS SUMMARY
SAFETY
PAVEMENT
FREIGHT
MOBILITY
BRIDGE

Level of Need
Low
Medium
High

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 is 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.

All Mobility, Safety, and Freight strategic investment areas that result in multiple independent candidate solutions are advanced directly to the Performance Effectiveness Evaluation.

Performance Effectiveness Evaluation

After completed 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

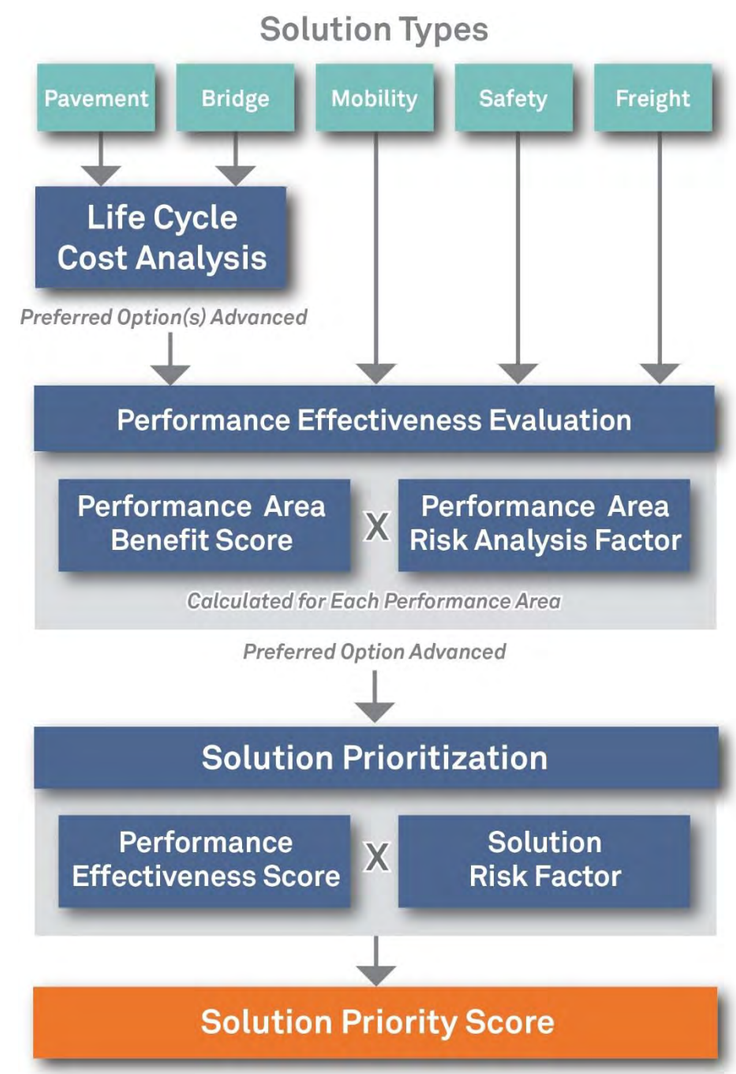
Solution Risk Analysis

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 the 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 indicated 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/SR 85 corridor. Implementation of these solutions is anticipated to improve performance of the I-10/SR 85 corridor in all five performance areas. he 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 solutions address needs near Vicksburg (MP 39-41), Dome Rock (MP 12), and Quartzsite (MP 18) areas, each including safety improvements

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/SR 85 Corridor:

- When recommending future projects along the I-10/SR 85 Corridor, review historical ratings and levels of investment.
- Continue to pursue funding and support the ultimate plan for SR 85 as a full divided facility and for the development of the SR85/I-8 interchange in the future per the approved Design Concept Report
- Review intersection traffic control (minor-street stop control, all-way stop control, signalization), enhance intersection features; potential strategies include larger STOP signs, secondary (left) STOP signs, STOP ahead signs, and pavement marking improvements along SR 85 near Buckeye between MP 151-153.

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/SR 85 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

Next Steps

Candidate solutions developed for the I-10/SR 85 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.

CPS Program Refinements

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

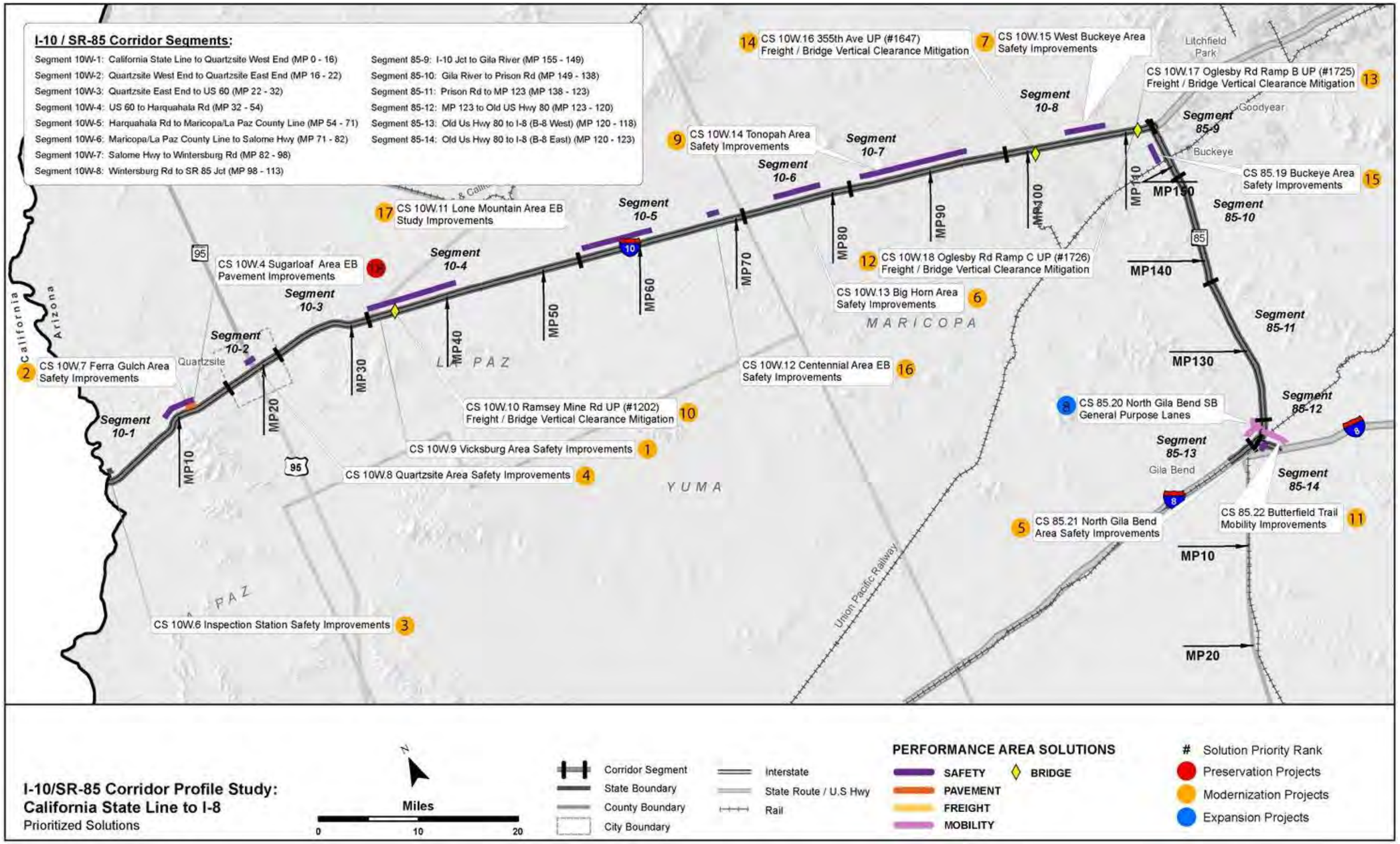
Table ES-4: Prioritized Recommended Solutions

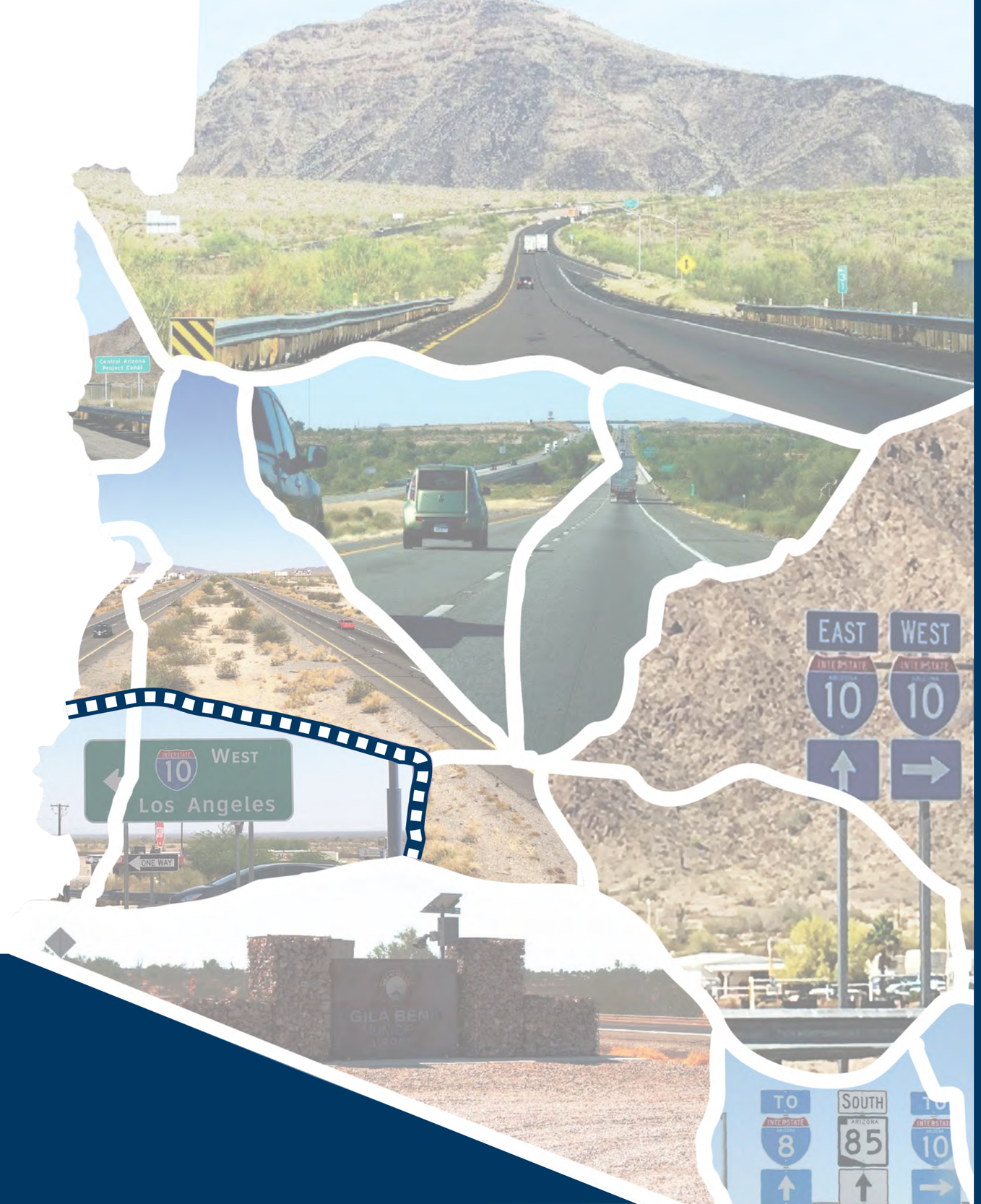
Rank	Candidate Solution #	Segment #	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
1	CS10W.9	10W-4	Vicksburg Area Safety Improvements	-Install reflective raised pavement markers on both edges of traveled way. -Install speed feedback signs at MP 41 -Widen eastbound outside shoulder between MP 39.1 – MP 39.4 in areas adjacent to guardrail to provide space for disabled vehicles	$0.47	M	**928**
2	CS10W.7	10W-1	Ferra Gulch Area Safety Improvements	-Install chevrons along the curve, delineators, and raised reflective pavement markers -Install a westbound speed feedback sign at MP 12	$0.27	M	**602**
3	CS10W.6	10W-1	Inspection Station Safety Improvements	-Install flashing beacons and regulatory/warning signs approaching the CA border inspection station at WB MP 1 -Install transverse rumble strips at WB MP 0.5 -Install westbound speed feedback sign at WB MP 0.5	$0.13	M	**302**
4	CS10W.8	10W-2	Quartzsite Area Safety Improvements	-Install an eastbound speed feedback sign at MP 18.5 -Install pedestrian fencing or other barriers along each side of the highway from Central Avenue to Riggles Avenue, to prevent pedestrians from crossing the highway	$0.79	M	**270**
5	CS85.21	10W-12	North Gila Bend Area Safety Improvements	-Install raised pavement markers in both directions from MP 122.75 – MP 123 -Restripe centerline rumble strip from MP 122 - MP 123	$0.52	M	**118**
6	CS10W.13	10W-6	Big Horn Area Safety Improvements	-Widen shoulders, improving roadside slope, and clear vegetation near the roadway -Install speed feedback signs at eastbound MP 76 and westbound MP 75 -Install guardrail near the drainage underpass at 74.75 in both directions	$3.19	M	**114**
7	CS10W.15	10W-8	West Buckeye Area Safety Improvements	-Widen median shoulders and improve median slope -Install raised reflective pavement markers -Install an eastbound speed feedback sign at MP 104	$3.99	M	**81**
8	CS85.20	10W-12	North Gila Bend SB General Purpose Lanes	-Construct 2 SB general purpose lanes west of existing alignment to create 4-lane divided highway between MP 123 and Maricopa Rd. Existing alignment to become 2 NB general purpose lanes	$20.75	E	**75**
9	CS10W.14	10W-7	Tonopah Area Safety Improvements	-Widen shoulders (MP83-90) -Install eastbound speed feedback signs at MP 83.5 and MP 89.5 -Install westbound speed feedback sign at MP 93.5	$10.66	M	**67**
10	CS10W.10	10W-4	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation (Option A)	-Reprofile mainline	$0.84	M	**65**
			Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation (Option B)	-Replace bridge	$7.19	M	**35**
11	CS85.22	10W-14	Butterfield Trail Mobility Improvements (Option A)	-Widen to two lanes in each direction w/center left turn lane	$20.44	E	**60**
			Butterfield Trail Mobility Improvements (Option B)	-Widen to add center left turn lane and widen shoulder on both sides	$13.66	M	**0**

Table ES-4: Prioritized Recommended Solutions (continued)

Rank	Candidate Solution #	Segment #	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
12	CS10W.18	10W-8	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation (Option A)	-Reprofile mainline	$0.84	M	**59**
			Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation (Option B)	-Replace bridge	$5.52	M	**28**
13	CS10W.17	10W-8	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation (Option A)	-Reprofile mainline	$0.84	M	**58**
			Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation (Option B)	-Replace bridge	$5.40	M	**25**
14	CS10W.16	10W-8	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation (Option B)	-Replace bridge	$2.92	M	**46**
			355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation (Option A)	-Reprofile mainline	$0.84	M	**35**
15	CS85.19	10W-9	Buckeye Area Safety Improvements (Option A)	-Construct dual double-lane roundabouts at Broadway, South, and Baseline Roads	$46.71	M	**12**
			Buckeye Area Safety Improvements (Option B)	-Construct grade separations at Broadway, Southern, and Baseline Roads	$152.86	E	**3**
16	CS10W.12	10W-5	Centennial Area EB Safety Improvements	-Widen shoulders and improve median slopes to reduce injury severity of lane departure crashes. -Install raised reflective pavement markers to prevent lane departure crashes -Install an eastbound speed feedback sign at MP 68	$1.19	M	**8**
17	CS10W.11	10W-5	Lone Mountain Area EB Safety Improvements	-Widen EB inside shoulder	$7.75	M	**6**
18	CS10W.4	10W-1	Sugarloaf Area EB Pavement Improvements (Option B)	-Replace pavement	$6.26	P	**3**

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 the California State Line and State Route 85 (SR 85), and SR 85 between the I-10 and Interstate 8 (I-8). The study examines key performance measures relative to the I-10/SR 85 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 9 corridor studies within the three southern groupings began in Spring 2022 and include:

Southeast

- SR 90/SR 80
- US 60/US 70/US 191: Florence Junction to Douglas

Southcentral

- I-10: SR 202L to the New Mexico State Line
- I-19: Nogales to I-10
- SR 347/SR 84

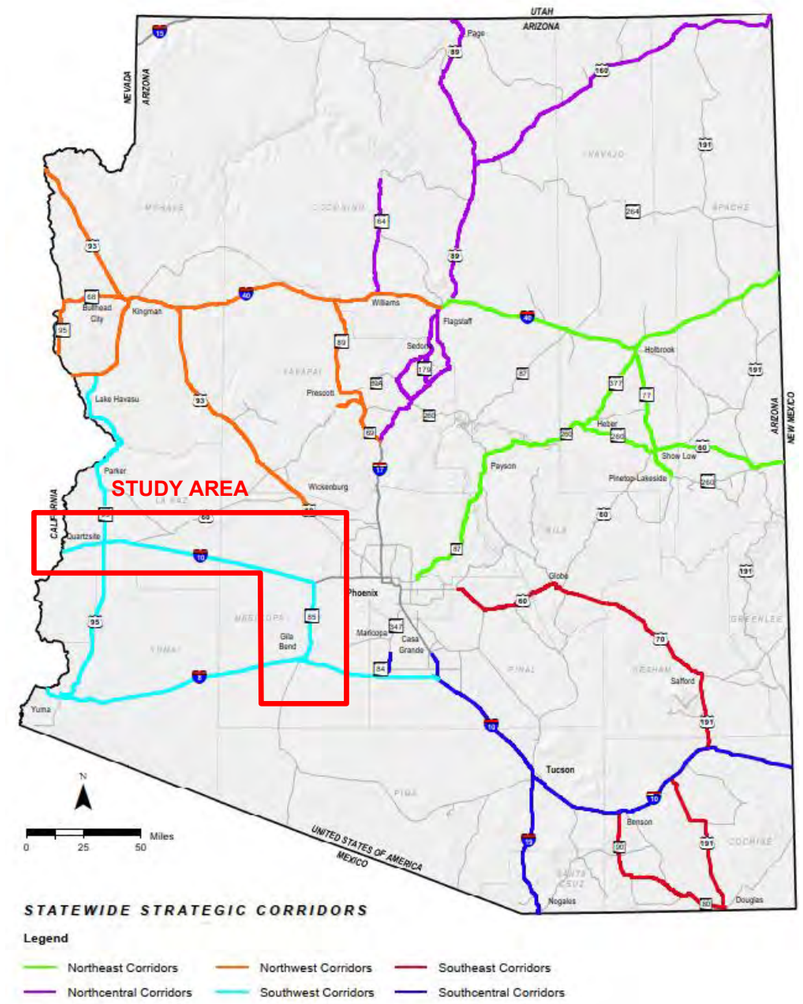
Southwest

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

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/SR 85, depicted in **Figure 1** 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/SR 85 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. Corridor benefits can 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/SR 85 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/SR 85 Corridor provides an important connection from Southern California to economic and recreational opportunities in Central Arizona and other destinations to the east. I-10 is a four-lane divided freeway from the California border to SR 85, while SR 85 is generally a four-lane divided highway between I-10 and I-8, except in Gila Bend where it is a two-lane undivided facility. Together, I-10 and SR 85 provide a passage from Southern California to Tucson while bypassing the Metropolitan Phoenix Area.

Plans have been made to upgrade SR 85 to a freeway facility between I-10 and I-8, which will greatly increase accessibility for both freight and tourism travel. I-10 between California and SR 85 is part of a direct connection between Phoenix and Los Angeles. Similarly, SR 85 between I-10 and I-8 is both a bypass route for freight traffic wishing to avoid the Phoenix Area and a major corridor in the linkage between Phoenix and San Diego. Therefore, the entire corridor is considered an important connection for both freight and tourism travel in the state.

The I-10/SR 85 Corridor extends from the California State Line (milepost [MP] 0) to SR 85 (MP 113) and from I-10 (MP 155) to I-8 (MP 118) on SR 85, which is approximately 150 miles**.** The corridor is located in two ADOT Districts (Southwest and Central), two planning areas (Western Arizona Council of Governments [WACOG] and Maricopa Association of Governments [MAG]), and two counties (La Paz and Maricopa).

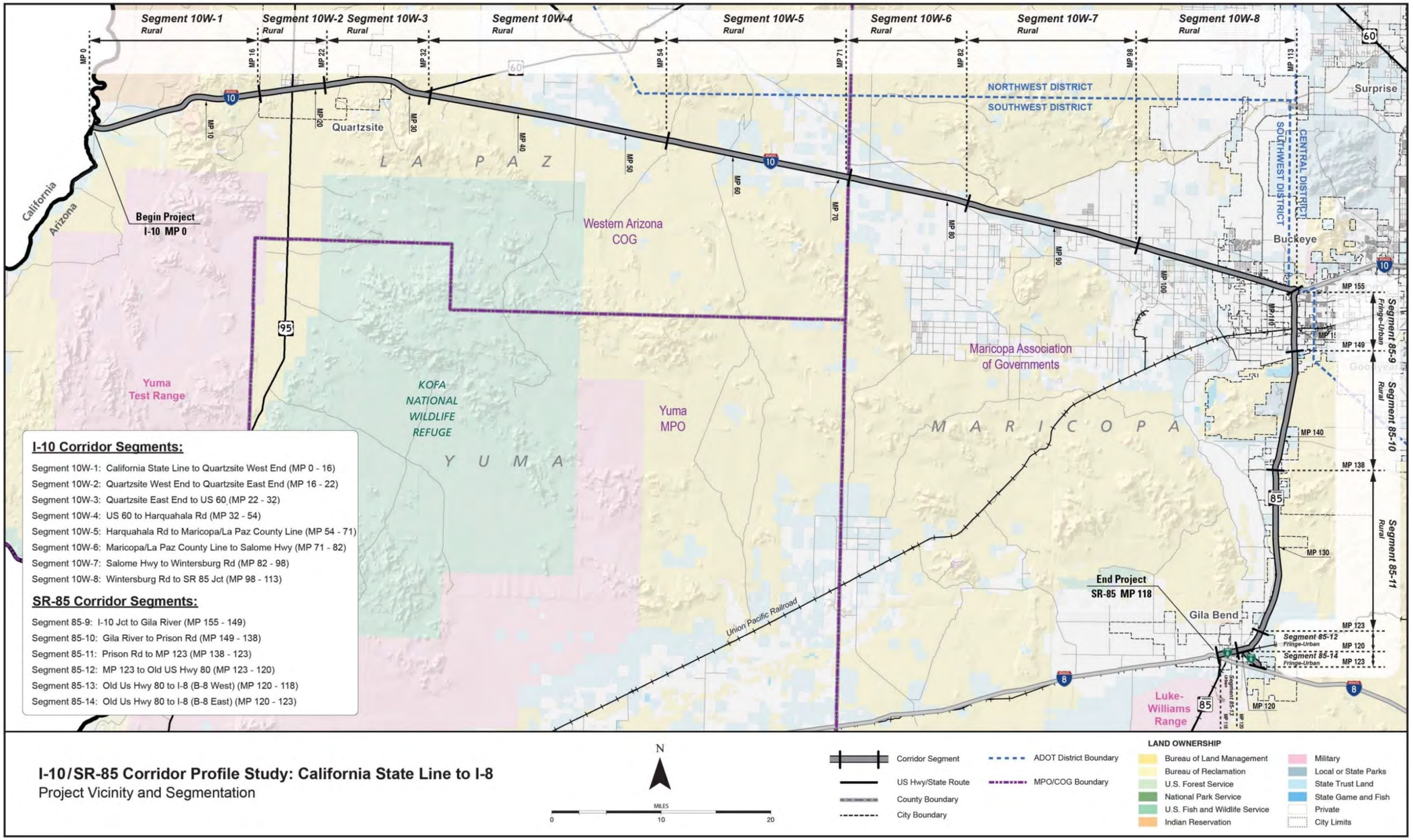
1.4 Corridor Segments

The I-10/SR 85 Corridor is divided into 14 planning segments to allow for an appropriate level of detailed needs analysis, performance evaluation, and comparison between different segments of the corridor. 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 described in **Table 1** and shown in **Figure 2**.

Table 1: I-10/SR 85 Corridor Segments

Segment #	Route	Begin	End	Approx Begin Milepost	Approx End Milepost	Approx Length (miles)	Typical Through Lanes (NB/EB, SB/WB)	2019 (2040) Average Annual Daily Traffic Volume (vpd)	Character Description
10W-1	I-10	California State Line	West Quartzsite	0	16	16	2 EB, 2 WB	25,500/32,750	This segment includes the Ehrenberg Port of Entry at milepost 3.8 which is a required checkpoint for commercial traffic entering Arizona. It is a four-lane divided section that has been classified as a rural operating environment.
10W-2	I-10	West Quartzsite	East Quartzsite	16	22	6	2 EB, 2 WB	24,250/31,250	This segment passes through Quartzsite and includes the I-10/SR 95 junction. It is six miles long and sustains consistent traffic volumes on a four-lane section.
10W-3	I-10	East Quartzsite	Jct US 60	22	32	10	2 EB, 2 WB	25,500/33,000	This segment is 10 miles long between the eastern border of Quartzite and the I-10/US 60 junction. It has been classified as a rural.
10W-4	I-10	Junction US 60	Harquehala Rd	32	54	22	2 EB, 2 WB	28,500/36,500	This segment is 22 miles long between the US 60 junction and Harquehala Road. It is a four-lane section that has been classified as a rural environment.
10W-5	I-10	Harquehala Rd	La Paz/ Maricopa County Border	54	71	17	2 EB, 2 WB	23,000/30,000	This segment runs from Eastern La Paz County to the Maricopa County border. It is 17 miles long and has been classified as a rural environment.
10W-6	I-10	La Paz/ Maricopa County Border	Salome Rd	71	82	11	2 EB, 2 WB	26,000/33,500	This segment is 11 miles long, includes two general purpose lanes in each direction, and has been classified as a rural environment.
10W-7	I-10	Salome Rd	Wintersburg Rd	82	98	16	2 EB, 2 WB	24,500/32,500	This segment includes the Town of Tonopah. It is a four-lane section where traffic volumes begin to increase towards the east.
10W-8	I-10	Wintersburg Rd	I-10/SR 85 Interchange	98	I-10 113, SR 85 155	15	2 EB, 2 WB	32,750/53,750	This segment is 15 miles long and includes the portion of I-10 that serves as a principal evacuation route for the Palo Verde Nuclear Generating Station, which is located six miles south of I-10. It is a four-lane section, and it has been classified as a rural environment.
85-9	SR 85	I-10/SR 85 Interchange	Gila River (MP 149)	I-10 113, SR 85 155	149	6	2 EB, 2 WB	18,000/10,500	This segment is a 4-lane section that connects I-10 south to the Gila River. It passes through the western portion on the Town of Buckeye and has been classified as a fringe urban operating environment.
85-10	SR 85	Gila River (MP 149)	Patterson Rd/ Prison Access	149	138	11	2 NB, 2 SB	15,750/23,000	This segment is 11 miles long and is a four-lane divided section. The southern limit provides direct access to the Arizona State Prison complex.
85-11	SR 85	Patterson Rd/ Prison Access	North Gila Bend Limits	138	123	15	2 NB, 2 SB	12,500/17,750	This segment starts at the southern limits of Buckeye and ends at approximately the northern limits of Gila Bend. It is a 4-lane divided section and has been classified as a rural environment.
85-12	SR 85	North Gila Bend Limits	Jct B-8	123	120	3	2 NB, 2 SB	11,250/15,250	This segment transitions to one lane in each direction on a non-divided section. The speed limit drops entering into Gila Bend and this segment has been classified as fringe urban.
85-13	SR 85	Jct B-8	Jct I-8 WB	120	118	2	2 EB, 2 WB	14,250/18,500	This segment starts at SR 85 and transitions onto B-8 through Gila Bend. It is a five-lane arterial section with a dedicated left-turn (LT) lane. This segment provides direct access to commercial businesses within Gila Bend and acts as an arterial roadway.
85-14	SR 85	Jct B-8	Jct I-8 EB	SR 85 120	123	3	1 NB, 1 SB	4,500/27,750	This segment starts at SR 85 and transitions onto S Butterfield Trail. It is a two lane non-divided section that provides access to I-8 without going through Gila Bend. Various commercial businesses have direct access to this segment as well.

Figure 2: Corridor Location and Segments



1.5 Corridor Characteristics

The I-10/SR 85 Corridor provides an important connection from Southern California to economic and recreational opportunities in Central Arizona and other destinations to the east. I-10 is generally a 4-lane divided freeway from the California border to SR 85 while SR 85 is a four-lane divided highway facility connecting I-10 to I-8. Together, the two roadways provide a passage from Southern California to Tucson while bypassing the Metropolitan Phoenix Area.

Plans have been made to upgrade SR 85 to a freeway facility between I-10 and I-8, which will greatly increase accessibility for both freight and tourism travel. I-10 between California and SR 85 is a direct connection between Phoenix and Los Angeles. Similarly, SR 85 between I-10 and I-8 is both a bypass route for freight traffic wishing to avoid the Phoenix Area and a major corridor in the linkage between Phoenix and San Diego. Therefore, the entire corridor is considered an important connection for both freight and tourism travel in the state.

National Context

I-10 provides east-west connectivity from Arizona to California, and further east as a major corridor to the entire United States. It provides the most direct and fastest link between Phoenix and Los Angeles, and Southern Arizona and the port of Nogales to Los Angeles and the rest of California. Arizona is also uniquely positioned to connect export producers to three of the United States' largest consumer markets (Southern California, Dallas, and Houston), as well as the exponentially growing market in Northwest Mexico.

SR 85 connects I-8 with I-10 as a Phoenix bypass route for traffic traveling beyond Phoenix.

Another major consideration for this corridor is the role it plays in the CANAMEX system. CANAMEX is the name commonly used to describe a planned future roadway system that will connect Mexico to Canada through several U.S. states, Arizona included. The CANAMEX Corridor in Arizona is designated along I-10 from the Tucson area to I-8, west to SR 85, then along SR 85 between I-8 and I-10 to Wickenburg Road. From there the corridor will travel north through Wickenburg, eventually to Las Vegas and beyond. The I-10/SR 85 Corridor constitutes a portion of the Arizona CANAMEX system, making it an important route in interstate and international travel.

Regional Connectivity

I-10/SR 85 crosses the mostly rural terrain of Western Arizona. It provides the most direct and fastest link between Phoenix and the nation's largest two seaports, Los Angeles, and Long Beach. I-10/SR 85 also connects to southern California via I-8, included in its own corridor profile study. The corridor offers a principal interstate highway link for freight traffic from the ports in California to the Southwest, eventually terminating on the East Coast in Jacksonville, Florida.

Total traffic volumes are approximately 23,000 to 32,750 throughout the length of the I-10 portion of corridor, where the daily volumes peak on either end. The traffic volumes for the SR 85 portion of the corridor are approximately 4,500 to 18,000. The Arizona Travel Demand Model (AZTDM) projects that traffic will increase between 50% - 75% by 2040.

Commercial Truck Traffic

Arizona is a pass-through state for freight traffic coming from the ports of Los Angeles and Long Beach and going east to the central U.S. for distribution. ADOT conducted an extensive stakeholder outreach program during the Arizona Multimodal Freight Analysis Study. The I-10 corridor is designated as one of the six Corridors of the Future (COF) under a program sponsored by United States Department of Transportation (USDOT). This designation will expedite delivery of corridor improvements, where the I-10/SR 85 Corridor is located.

SR 85, the popular Phoenix bypass route from I-10 to I-8 carries over 4,000 trucks per day, which is forecasted to exceed the capacity of the roadway before 2030.

The U.S. Department of Transportation, under Section 167(c) of title 23 United States Code (U.S.C.), created by Section 1115 of the Moving Ahead for Progress in the 21st Century Act (MAP–21), is directed to establish a National Freight Network (NFN) to assist States in strategically directing resources toward improved system performance for efficient movement of freight on the highway portion of the Nation's freight transportation system. I-10, a portion of the corridor, has been designated by ADOT as part of the National Primary Freight Network.

Commuter Traffic

Significant commuter traffic is present on I-10/SR 85, especially at the junction around segments 10-8 and 85-9, where peak travel times are congested due to commuters in and out of the Phoenix region. Traffic forecasts indicate that this segment will become severely congested by 2035 without capacity increases and other modifications to the current mainline. Other population centers along the corridor, including the California/Arizona border and Quartzsite, experience intra-city commuter traffic on the I-10/SR 85 to a much lesser degree. Segment 85-13 serves as Main Street in Gila Bend and an access route to many local businesses and residences.

Arizona Public Service (APS), a major utility company in the state, operates a large nuclear power station in Tonopah (Palo Verde Generating Station), located near segment 10-7. This major employment generator attracts commuter traffic to and from the east directions on the corridor.

Recreation and Tourism

Arizona offers a variety of recreational opportunities for its citizens as well as the millions of visitors that travel to the state in search of warmer weather, outdoor adventure, and exploration opportunities. Arizona's warm weather and natural beauty makes tourism one of the state's top industries. According to the Arizona Office of Tourism, in 2020, 32.1 million people visited Arizona who collectively spent $15 billion in the state, which supports jobs and generates tax revenue.

Recreation and tourism is a key industry along the corridor, especially in the Phoenix area. I-10 carries on east, and connects to I-17 the principal gateway to Northern Arizona and the Grand Canyon National Park, one of the most visited sites in the country, with around 5 million visitors

last year. Phoenix offers many outdoor attractions and opportunities for travelers, such as Major League Baseball's Spring Training during March, which attracts a lot of California visitors whose teams train in the Phoenix Metropolitan region.

Multimodal Uses

Freight Rail

Union Pacific Railroad's Sunset Route is a 760-mile corridor between Los Angeles and El Paso that intersects the southern-most portion of the I-10/SR 85 Corridor in Gila Bend. The route then carries on East to meet up and parallel the I-10 East, which is included in its own corridor profile study. As of 2007, the number of trains per day on the route was between 50 and 60.

Just south of the I-10/SR 85 junction is the Wellton Branch line of the Union Pacific Railroad. The track is currently out of service, however, handles roughly 11,000 carloads of grain annually. Several improvements have been identified to reduce the impacts the at-grade crossing on the corridor would have on surrounding communities and traffic congestion.

Passenger Rail

The entire I-10 portion of the corridor, as well as segments 85-9 and 85-10 of the SR 85 portion are identified as potential routes in the Southwest Interstate High Speed Rail Corridor. There has been no planning yet, but prior studies indicate this as a potential key corridor.

Bicycles/Pedestrians

Shoulders generally average 8-10 feet in width to accommodate cyclists on I-10/SR 85.

Bus/Transit

Greyhound operates intercity bus transit the length of the I-10/SR 85 Corridor connecting Phoenix to Los Angeles via the I-10 portion of the corridor, and Phoenix to San Diego via the SR 85 portion of the corridor to I-8. Local transit service by Valley Metro operates rural routes connecting Gila Bend to Phoenix via SR 85.

Aviation

A There is one airport along the I-10/SR 85 Corridor, the Gila Bend Municipal Airport. The airport is located in Gila Bend and is a public use airport.

Land Ownership, Land Uses and Jurisdictions

As shown previously in Figure 2, I-10/SR 85 crosses multiple jurisdictions and land holdings throughout Maricopa and La Paz Counties. A majority of the land surrounding the corridor in segments 10-1 through 10-5 is owned by the Bureau of Reclamation, with sporadic clusters of State Trust Land and Private ownership. A small part of segment 10-1 crosses through a bit of land owned by an Indian Reservation. A majority of the land between segments 10-5 and 10-8 is a checkerboard of State Trust Land and Private Ownership, where Segment 10-8 is also part of Buckeye City Limits. All of segment 85-9 is within Buckeye City Limits, and segments 85-12, 85-13, and 85-14 are within Gila Bend City Limits. Portions of segments 85-10 and 85-11 contain land owned by The Bureau of Reclamation, State Trust Land, and Private Ownership.

Population Centers

The I-10/SR 85 Corridor, through two counties, is mostly rural. There are three major population centers along the corridor in Buckeye, Gila Bend and Quartzsite. Significant growth is projected to continue in the Buckeye and Gila Bend areas. **Table 2** shows current 2020 Census Data population by county and city along with projected future (2040) population and growth.

Table 2: Current and Future Population

Area	2010 Population	2020 Population	2040 Population	% Change 2010-2040	Total Growth
La Paz County	**20,489**	**16557**	**21773**	**6%**	**1,284**
Parker	3,083	3417	3007	-3%	-76
Quartzsite	3,677	4071	5055	27%	1,378
Unincorporated	13,729	14,666	13711	0%	-18
Maricopa County	**3,817,117**	**4,420,568**	**5,415,900**	**30%**	**1,598,783**
Avondale	76,238	89,490	101,800	25%	25,562
Buckeye	50,876	91,154	186,600	73%	135,724
Carefree	3,363	3,800	4,100	18%	737
Cave Creek	5,015	4,904	6,500	23%	1,485
Chandler	236,123	276,330	309,100	24%	72,977
El Mirage	31,797	35,858	36,500	13%	4,703
Fountain Hills	22,489	23,825	26,200	14%	3,711
Gila Bend	1,922	2,700	3,700	48%	1,778
Gilbert	208,453	268,302	293,500	29%	85,047
Glendale	226,721	248,345	306,400	26%	79,679
Goodyear	65,275	95,003	140,300	53%	75,025
Guadalupe	5,523	5,321	6,700	18%	1,177
Litchfield Park	5,476	6,858	15,400	64%	9,924
Mesa	439,041	504,500	607,500	28%	168,459
Paradise Valley	12,820	12,683	14,700	13%	1,880
Peoria	154,065	191,052	232,400	34%	78,335
Phoenix	1,445,632	1,607,739	1,881,900	23%	436,268
Scottsdale	217,385	242,488	281,900	23%	64,515
Surprise	117,517	143,261	216,700	46%	99,183
Tempe	161,719	179,765	217,100	26%	55,381
Tolleson	6,545	7,295	8,600	24%	2,055
Wickenburg	6,363	7,487	9,400	32%	3,037
Youngtown	6,156	6,800	7,300	16%	1,144
Unincorporated	310,603	101,200	110,500	-181%	-200,103

Source: U.S. Census, Arizona Department of Administration – Employment and Population Statistics

Major Traffic Generators

Much of the traffic on I-10/SR 85 results from interstate commercial and long-distance personal travel. The Phoenix Metropolitan region generates high volumes of traffic locally, and Southern California serves as a popular vacation destination for Arizona residents. I-10 serves as the principal gateway to the region, connecting travelers to I-17, a route to two of the state's largest tourist spots, Sedona, and the Grand Canyon, and carries on to I-10 East, a major interstate route connecting major cities across the entire country. SR 85 serves as a bypass route to Southern California via I-8 for those in the Western Phoenix Metropolitan region, as well as a truck by-pass route from the east wishing to avoid the Phoenix region traffic.

The Palo Verde Nuclear Generating Station, operated by APS, constitutes a major employment traffic generator for commuter traffic. The power station is located near Tonopah, 45 miles west of downtown Phoenix, and is the largest power plant in the United States. The power station attracts commuter traffic mostly from the east.

Tribes

The Colorado River Indian Tribes (CRIT) includes the Mohave, Chemehuevi, Hopi, and Navajo tribes, and is primarily located in Parker, Arizona. Parker is located about 40 minutes north of the corridor; however, the land owned by the tribe extends to portions of segment 10-1 of the corridor. The CRIT encompasses the length of the Colorado River on both sides of Arizona and California. *(Source: http://www.crit-nsn.gov/crit_contents/about/)*

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, the following were identified in relation to the I-10/SR 85 Corridor:

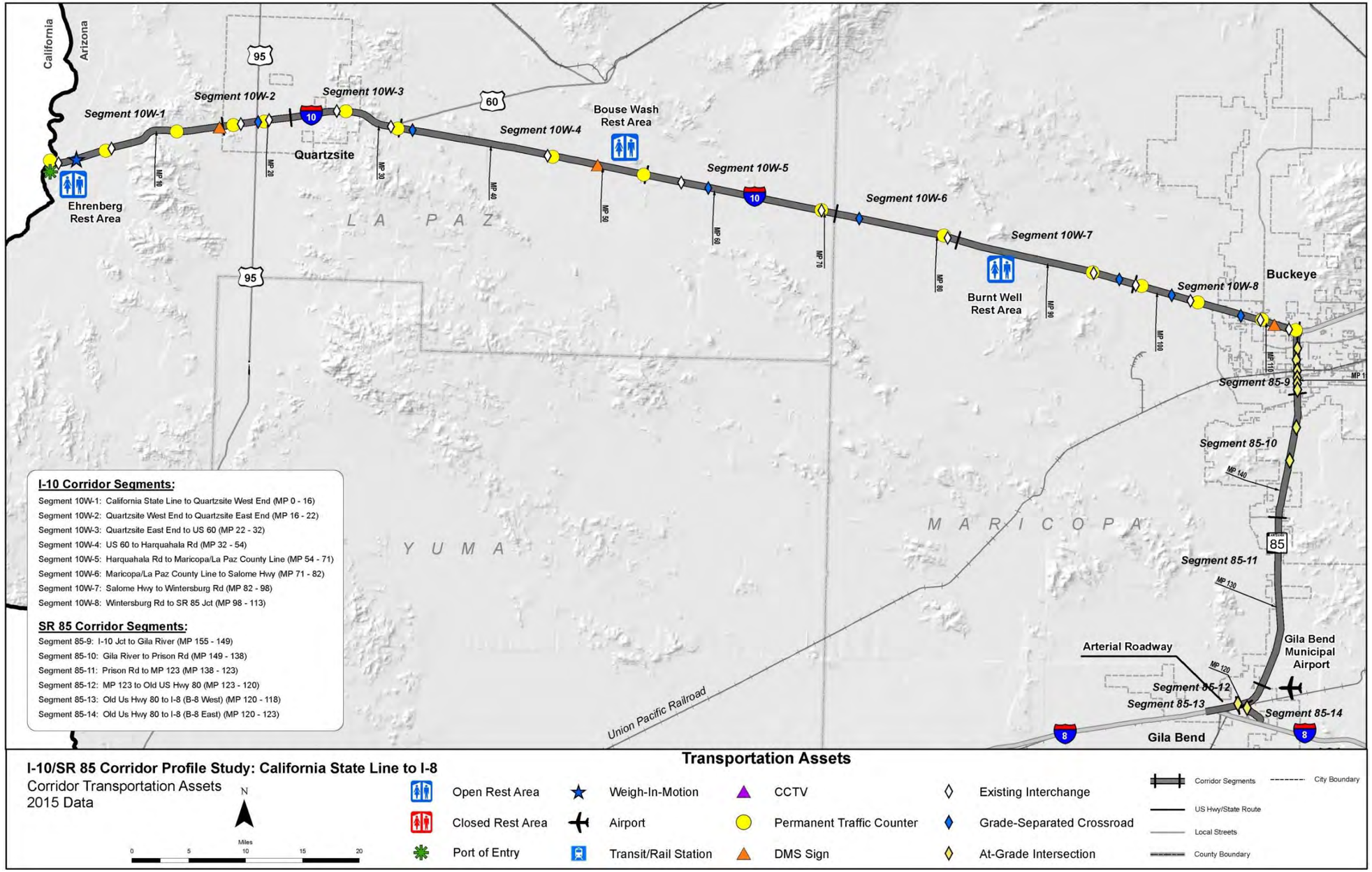
- Wildlife waters to the north and south of I-10 just east of Quartzsite
- I-10/SR 85 travels through the Sonoran Desert National Monument allotments from the California State line to Segment 10W-5 and Segments 85-10 and 85-11
- Gila River is designated as a Riparian, which intersects the SR 85 portion of the corridor at Segment 85-9
- Species of Greatest Conservation need are identified continuously along the entire corridor, and increases at the intersection of SR 85 and the Gila River near segment 85-9
  A high level of Species of Economic and Recreational Importance are identified along the entire SR 85 portion of the corridor. A low level is identified throughout the corridor from the California State Line along I-10 to the SR 85 junction.

Corridor Assets

Corridor transportation assets are summarized in **Figure 3**. Items of interest include the following:

A freight weigh station is located near the California border in Ehrenberg, Arizona. There are seven grade separated road crossings on the corridor, fifteen traffic interchanges along the corridor, and twenty-two at-grade interchanges—the majority located in segment 85-13 due to it serving as Gila Bend's Main Street. There are sixteen permanent traffic counters located along the I-10/SR 85 Corridor.

Figure 3: Corridor 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 were held at key milestones to present results and obtain feedback. In addition, several meetings were held with key stakeholders between February 2022 and March 2023 to present the results and obtain feedback.

Key stakeholders identified for this study included:

- ADOT Central District
- ADOT Southwest District
- ADOT Technical Groups
- Maricopa Association of Governments
- Western Arizona Council of Governments
- 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/SR 85 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

- American Association of State Highway and Transportation Officials (AASHTO) U.S Bicycle Route System, 2015 (ADOT)
- 2023-2027 Five-Year Transportation Facilities and Construction Program
- What Moves You Arizona; Long-Range Transportation Plan, 2016-2040, 2018 (ADOT)
- 2019-2023 State Transportation Improvement Program (STIP)
- Arizona's State Wildlife Action Plan 2012-2022, 2012, Arizona Game & Fish Department
- Tentative Arizona Wildlife Conservation Strategy (AWCS)
- Building a Quality Arizona (BQAZ) Interstate 10- Hassayampa Valley Roadway Framework Study, 2007, MAG
- BQAZ Interstate 8 and 10 Hidden Valley, 2009 (MAG)
- Multimodal Freight Analysis Study, 2008 (ADOT)
- Arizona Ports of Entry Study, 2021 (ADOT)
- Arizona's Key Commerce Corridors, 2013 (ADOT)
- State Transportation Improvement Program, FY 2016-2020; 2015 (ADOT)
- Arizona Statewide Dynamic Message Master Plan, 2010 (ADOT)
- Climbing and Passing Lane Prioritization Study, 2015 (ADOT)
- Statewide Bicycle and Pedestrian Plan Update, 2013 (ADOT)
- Pedestrian Safety Action Plan, 2017 (ADOT)
- Arizona State Airports System Plan, 2018 (ADOT)
- Arizona State Rail Plan, 2011 (ADOT)
- Draft Arizona State Rail Plan, 2021 (ADOT)
- Arizona Statewide Rail Framework Study, 2010 (ADOT)
- Arizona Statewide Rest Area Study, 2011 (ADOT)
- Arizona Truck Parking Study, 2021 (ADOT)
- Bureau of Land Management Travel Management Strategy 2018-2022 (BLM)
- Arizona Roadway Departure Safety Implementation Plan (RDSIP), 2014 (ADOT)
- Arizona Strategic Traffic Safety Plan, 2019 (ADOT)
- Arizona Statewide Travel Demand Model (ADOT)
- Arizona State Freight Plan, 2016 (ADOT)
- Update to the Arizona State Freight Plan, 2022 (ADOT)
- Wildlife Vehicle Conflict Study, 2020 (ADOT)
- Arizona Statewide ITS Architecture, 2018 (ADOT)
- Statewide Stormwater & Erosion Control study, 2020 (ADOT)
- Detection and Warning Systems for Wrong-Way Driving, 2015 (ADOT)
- Low Volume Routes Study, 2017 (ADOT)

Regional Planning Studies

- Buckeye in Motion Transportation Master Plan, 2019
- La Paz County Comprehensive Plan, 2005 (La Paz County)
- La Paz Transportation Planning Study, 2010
- Town of Quartzsite General Plan, 2014 (Town of Quartzsite)
- Town of Gila Bend General Plan 2026 (Gila Bend)
- 2050 Regional Transportation Plan (Momentum), 2021 (MAG)
- Southwest Area Transportation Study, 2003 (MAG)
- Tonopah/Arlington Area Plan, 2000 (Maricopa County)
- Western Arizona 2021-2024 Transportation Human Service Coordination Plan Serving Region IV (WACOG and LHMPO)
- WACOG Strategic Transportation Safety Plan, 2018
- Strategic Long-Range Transportation Plan for the Colorado River Indian Tribes, 2014 (Colorado River Indian Tribes)

Planning Assistance for Rural Areas and Small Area Transportation Studies

Design Concept Reports and Project Assessments

- Initial Project Assessment, Bridge Scour Retrofit Project, 2015 (ADOT)
- Statewide Weigh-In-Motion System, Final Feasibility Report, 2015 (ADOT)
- US 60 – MP 42, Ehrenberg-Phoenix Highway, I-10, Final Project Assessment, 2015 (ADOT)
- West Quartzsite Traffic Interchange Ehrenburg to Phoenix Highway, Interstate 10, Final Project Assessment, 2014 (ADOT)
- MP 42 – Hovatter Road, Ehrenberg-Phoenix Highway, I-10, Final Project Assessment, 2013 (ADOT)
- Gas Line Road – County Line, Ehrenberg-Phoenix Highway, I-10, Final Project Assessment, 2011 (ADOT)
- Sun Valley Parkway TI, Ehrenberg-Phoenix Highway, I-10, Final Project Assessment, 2010 (ADOT)
- Copperleaf Traffic Interchange, Final Change or Access Report, 2010, ADOT
- County Line – Salome Road, Ehrenberg-Phoenix Highway, I-10, Final Project Assessment, 2010 (ADOT)
- Bouse Wash Rest Area – Gas Line Road, Ehrenberg-Phoenix Highway, I-10, Final Project Assessment, 2009 (ADOT)
- Final Design Concept Report, SR 85 at Gila Bend, 2009 (ADOT)
- Initial Feasibility Report, Interstate 10 at Canamex T.I., Ehrenberg-Phoenix Highway, 2008 (ADOT)
- I-10 Right-of-Way Delineation/Feasibility Report, I-10: La Paz County Line to SR 85, Ehrenberg-Phoenix Highway, 2007 (ADOT)
- Ehrenberg POE – West Quartzsite, Ehrenberg-Phoenix Highway, I-10, Final Project Assessment, 2003 (ADOT)
- Salome – Burnt Wells, Ehrenberg-Phoenix Highway, I-10, Final Project Assessment, 2003 (ADOT)
- Final Location/Design Concept Report, SR 85, Gila Bend to I-10, 2002 (ADOT)

Summary of Prior Recommendations

Various studies and plans, including several Design Concept Reports (DCRs), have recommended improvements to the I-10/SR 85 Corridor as shown in **Table 3** and **Figure 4**. They include, but are not limited to:

- Widening of numerous sections of I-10/SR 85, some of which will require right-of-way acquisition. Many other proposed improvements are associated with the recommended widening:
    - Widening from 4 to 6 lanes at MP 89 on I-10 W in both directions
    - 2 new General Purpose lanes and 1 Hight Occupancy Vehicle lane in both directions from MP 89-114 on I-10 W
    - Upgrade to 6-lane freeway with HOV lanes on SR 85 from MP 155-35
- Major TI improvements at the following locations:
    - Poston Road TI
    - Tom Wells Road TI
    - Dome Rock Road TI
    - Riggles Avenue TI
    - Gold Nugget Road TI
    - US 60 TI
    - 459th Avenue TI
    - 443rd Avenue TI
    - 427th Avenue TI
    - 395th Avenue TI
    - 379th Avenue TI (Signalize Ramps)
    - 347th Avenue TI
    - Desert Creek Parkway TI
    - Johnson Road TI
    - Wilson Road TI
    - I-10/SR 85 TI (Upgraded System)
    - Hassayampa Freeway System TI
    - Patterson Road
    - MP 133 TI (Proposed)
    - Pierpont Road TI (New)
    - De Anza Scenic Way TI (New)
- Ehrenberg Port of Entry Improvements
- Ehrenberg Rest Areas Parking Expansion and System Repairs
- Bridge Scour Retrofit
- Pavement Preservation
- Traffic Counter Updates
- System Interchange at I-10 to Hassayampa Freeway
- ITS improvements, such as closed circuit television and dynamic message signs
- Curve realignment and flattening
- Construct Warner Street Bridge
- At grade intersection/future interchange location at Lower Buckeye Road
- At-Grade Crossing and Future TI:
    - Broadway Road
    - Southern Avenue
    - Baseline Road

  - Hazen Road
  - Robbins Butte Wildlife Area Access
  - Buckeye Hills Drive
  - Riggs Road
  - MP 136
  - Woods Road
  - Gila Mountain Road
  - Gila Bend Airport Access Road
- SB DMS at SR 30/SR 85 Interchange
- NB DMS south of I-10/SR 85 TI
- Maricopa Road At-Grade intersection for full access
- SB DMS north of I-8 Junction
- I-8 Proposed System TI

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?)	
I-10											
1	0	89	89	Widen from 4 to 6 lanes			√	N/A	-	N	I-10 – Multimodal Corridor Profile Study
2	1	1	-	Poston Road (New TI)			√	N/A	-	N	La Paz Transportation Planning Study, I-10 Multimodal Corridor Profile Study
3	4	4	-	Ehrenberg Rest Areas Parking Expansion and System Repairs			√	FY24/25	-	N	Arizona Statewide Rest Areas Study
4	5	5	-	Tom Wells Road (New TI)			√	N/A	-	N	I-10 – Multimodal Corridor Profile Study
5	9	16	7	Ehrenberg Pavement WB – Replace Pavement (I-10 MP 9-16)	√			-	-	N	I-10 Corridor Profile Study (2017)
6	11	11	-	Dome Rock Road (New TI)			√	-	-	N	I-10 – Multimodal Corridor Profile Study
7	11.71	24	12.29	Dome Rock Road (Road Rehab)	√			FY23	F038501C		2023-2027 5-Year Construction Program
8	19	19	-	Riggles Avenue; TI Improvements	√			-	-	N	I-10 – Multimodal Corridor Profile Study
9	24	30	6	I-10: Scadden Wash to Plomosa - Rehab	√			FY24	-	N	2023-2027 ADOT 5-Year Construction Program
10	26	26	-	Gold Nugget Road; TI Improvements	√			-	-	N	I-10 – Multimodal Corridor Profile Study
11	27	31	4	US 60 Interchange Safety Improvements (I-10 MP 27-31)		√		-	-	N	I-10 Corridor Profile Study (2017)
12	31	31	-	US 60 TI Ramp (I-10 MP 31)		√					I-10 Corridor Profile Study (2017)
13	31	31	-	US 60; TI Improvements	√			-	-	N	I-10 – Multimodal Corridor Profile Study
14	32	50	18	Vicksburg Safety Improvements (I-10 MP 32-50)		√		-	-	N	I-10 Corridor Profile Study (2017)
15	52.5	52.5	-	Bouse Wash Rest Area Ramps (I-10 MP 52.5)		√		-	-	N	I-10 Corridor Profile Study (2017)
16	53	53	-	Harquahala / Hovatter Road; TI Improvements	√			-	-	N	La Paz County Comprehensive Plan
17	54	71	17	Centennial Safety Improvements (I-10 MP 54-71)		√		-	-	N	I-10 Corridor Profile Study (2017)
18	54	103	49	Vicksburg to Palo Verde Lighting (I-10 MP 54-103)		√		-	-	N	I-10 Corridor Profile Study (2017)

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?)**	
19	81	81	-	Salome Road; TI improvements	√			-	-	N	I-10 – Multimodal Corridor Profile Study
20	80	90	10	I-10: Salome Rd to W of Tonopah – Pavement Rehab	√			FY25	-	N	ADOT 2023-2027 5-Year Construction Program
21	82	82	-	Burt Well Rest Areas Parking Expansion and System Repairs			√	-	-	N	Arizona Statewide Rest Areas Study
22	82	112	30	Tonopah to Palo Verde Safety Improvements (I-10 MP 82-112)		√		-	-	N	I-10 Corridor Profile Study (2017)
23	88.2	88.2	-	459th Ave (New TI)			√	-	-	N	BQAZ
24	89	114	25	2 New GP Lanes, 1 HOV Lane in each direction			√	-	-	N	Arizona's Key Commerce Corridors
25	90.2	90.2	-	443rd Ave (New TI)			√	-	-	N	BQAZ
26	90	100	10	I-10 from 443rd Ave to Wintersburg Pavement (Road Rehab)	√			FY23	F034501C	N	2023-2027 5-year construction program
27	92.2	92.2	-	427th Ave (New TI)			√	-	-	N	BQAZ
28	96.3	96.3	-	395th Ave (New TI)			√	2020	H708301C	N	STIP, FY 2016-2020 (RTP Freeway Program)
29	98.3	98.3	-	379th Ave (Signalize TI Ramps)		√		-	-	N	BQAZ; Copperleaf Traffic Interchange, Final Change of Access Report
30	100.45	100.45	-	System interchange I-10 to Hassayampa Freeway			√	-	010 MA 101 H7079 01L	N	BQAZ
31	101.4	101.4	-	355th Ave Vertical Clearance (I-10 MP 101.4)		√		-	-	N	I-10 Corridor Profile Study (2017)
32	102.5	102.5	-	347th Ave (New TI)			√	-	-	N	BQAZ, Statewide Weigh-In-Motion System, Final Feasibility Report
33	105.5	105.5	-	Desert Creek Parkway (New TI)			√	2020	H683801C	N	STIP, FY 2016-2020 (RTP Freeway Program)
34	107.5	107.5	-	Johnson Road Traffic Interchange at I-10 (New TI)			√	-	-	N	2019 Buckeye Transportation Master Plan and BQAZ
35	110	110	-	Wilson Road (New TI)			√	-	-	N	I-10 – Multimodal Corridor Profile Study
36	112	113	1	I-10/SR 85 Jct. Ramps (I-10 MP 112-113)		√		-	-	N	I-10 Corridor Profile Study (2017)
37	112.8	112.8	-	I-10/SR 85 Upgraded System TI		√		-	-	N	BQAZ

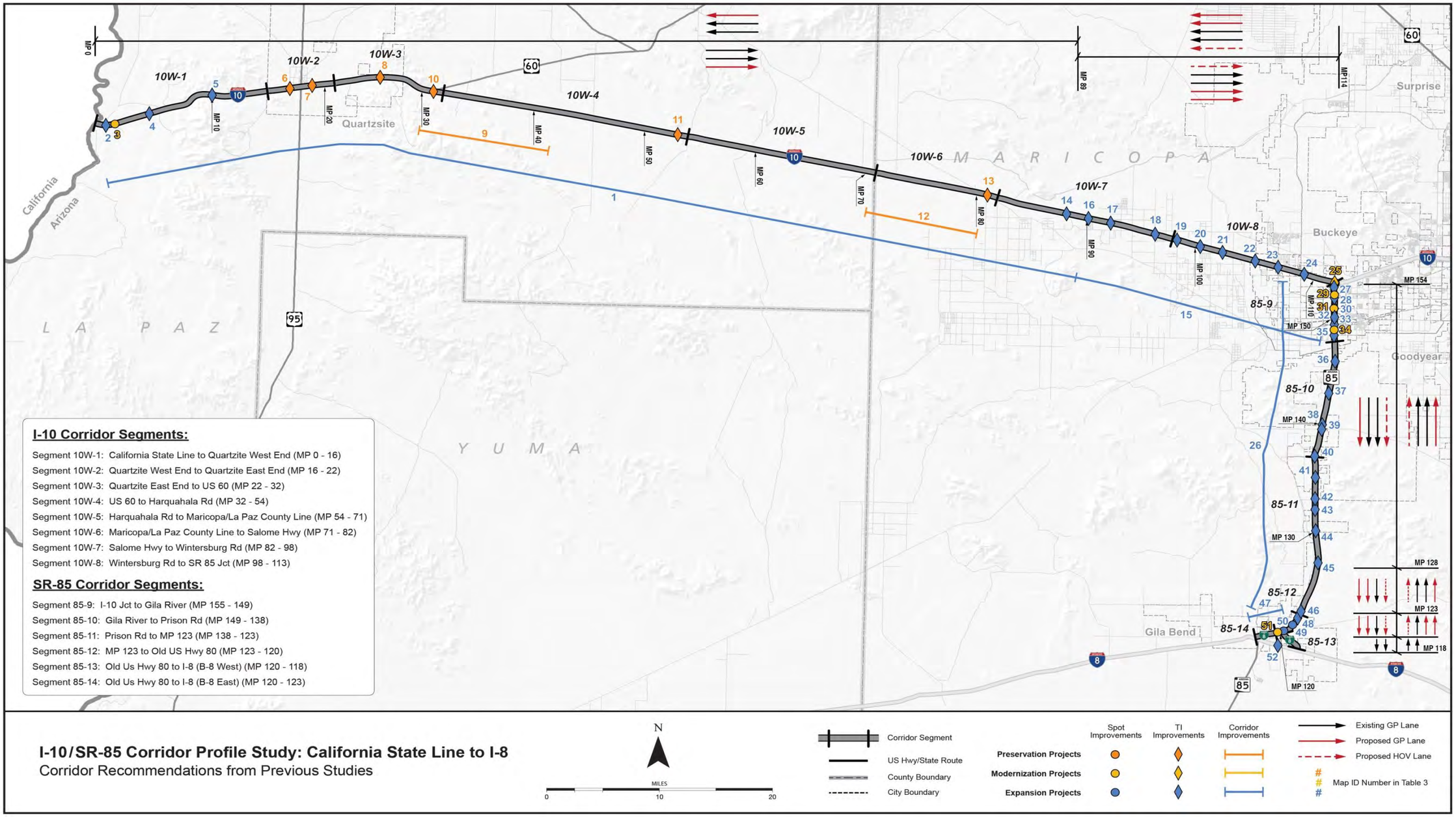
Table 3: Corridor Recommendations from Previous Studies (continued)

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?)**	
SR 85											
39	120	155	35	Upgrade to 6 lane freeway with HOV lanes (Majority of MPs are outside of corridor study zone)			√	-	-	N	2035 Regional Transportation Plan (MAG), Gila Bend SATS
40	153	153	-	Construct Warner Street Bridge			√	2018	44811	N	STIP, FY 2016-2020 (RTP Freeway Program)
41	154	149	5	Buckeye Safety Improvements (SR 85 MP 154-149)		√		-	-	N	I-10 Corridor Profile Study (2017)
42	154	154	-	At grade intersection/ future interchange location at Lower Buckeye Road			√	-	-	N	Access Management Study SR 85
43	153	153	-	Broadway Road At-Grade crossing and future TI			√	-	-	N	Access Management Study SR 85
44	153	153	-	SB DMS at SR 30/SR 85 Interchange		√		-	-	N	Arizona Statewide DMS Master Plan
45	152	152	-	Southern Ave At-Grade crossing and future TI			√	-	-	N	Access Management Study SR 85
46	152	152	-	NB DMS south of I-10/SR 85 TI		√		-	-	N	Arizona Statewide DMS Master Plan
47	151	151	-	Baseline Rd At-Grade crossing and future TI			√	-	-	N	Access Management Study SR 85
48	150.5	150.5	-	MC-85 At-Grade crossing and future TI			√	-	-	N	Access Management Study SR 85
49	150	150	-	NB DMS at SR 30/SR 85 Interchange		√		-	-	N	Arizona Statewide DMS Master Plan
50	149.5	149.5	-	Hazen Road At-Grade crossing and future TI			√	-	-	N	Access Management Study SR 85
51	147	147	-	Robbins Butte Wildlife Area Access At-grade crossing and future TI			√	-	-	N	Access Management Study SR 85
52	144	144	-	Buckeye Hills Drive At-Grade crossing and future new TI			√	-	-	N	BQAZ
53	141	141	-	Hassayampa Freeway, System TI			√	-	-	N	BQAZ
54	140.9	140.9	-	Riggs Rd At grade crossing and future TI			√	-	-	N	Access Management Study SR 85
55	138	138	-	Patterson Road (New TI)			√	-	-	N	BQAZ
56	136	136	-	Future proposed TI Near MP 136			√	-	-	N	BQAZ
57	134	134	-	Woods Rd At-Grade crossing and future new TI			√	-	-	N	BQAZ
58	133	133	-	Proposed TI near MP133			√	-	-	N	BQAZ
59	131	131	-	Pierpont Road (New TI)			√	-	-	N	BQAZ

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	128	128	-	Gila Mountain Rd At-Grade crossing and future TI			√	-	-	N	BQAZ
61	123	123	-	Watermelon Rd At Grade crossing and future TI			√	-	-	N	Access Management Study SR 85
62	123	120	3	N. Gila Bend GP Lanes (SR 85 MP 120-123) – Construct 2 Southbound GP Lanes			√	-	-	N	I-10 Corridor Profile Study (2017)
63	123	120	3	Butterfield Trail Widening (SR 85 MP 120-123)			√	-	-	N	I-10 Corridor Profile Study (2017)
64	120.32	123	2.68	Construct a new 4-lane freeway facility from Gila Bend Airport to I-8 Interchange			√	-	NH-085-B(AOM)	N	Final DCR, SR 85 at Gila Bend
65	122.5	122.5	-	De Anza Scenic Way (New TI)			√	-	-	N	BQAZ
66	121.68	121.68	-	Gila Bend Airport Access Rd At-Grade crossing			√	-	-	N	Final DCR, SR 85 at Gila Bend
67	120.68	120.68	-	Maricopa Rd At-Grade intersection for full access			√	-	-	N	Access Management Study SR 85
68	120	120	-	SB DMS north of I-8 Junction		√		-	-	N	Arizona Statewide DMS Master Plan
69	115	115	-	I-8 Proposed System TI			√	-	-	N	2035 Regional Transportation Plan (MAG)

Figure 4: Corridor Recommendations from Previous Studies



2.0 CORRIDOR PERFORMANCE

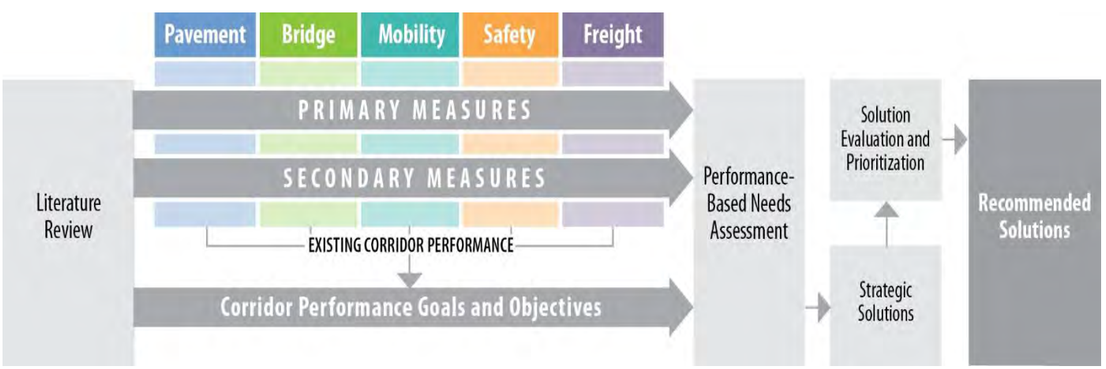
This chapter describes the evaluation of the existing performance of the I-10/SR 85 Corridor. A series of performance measures is used to assess the corridor. The results of the performance evaluation are used to define corridor needs relative to the long-term goals and objectives for the corridor.

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 performance goals 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 adopted for the CPS, consistency is achieved in the performance measures used for various ADOT analysis processes.

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

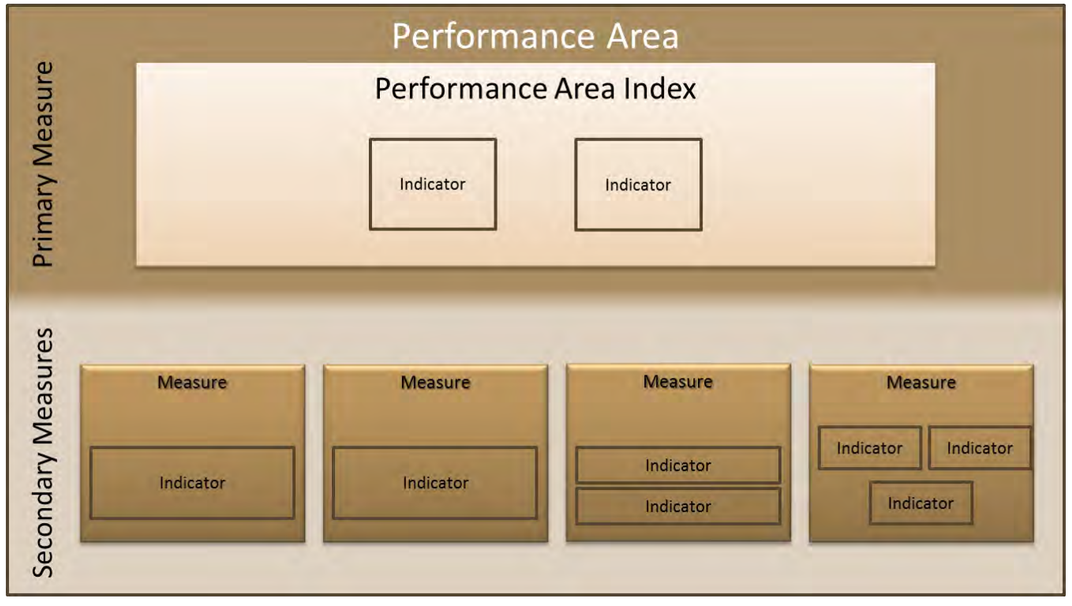
Performance Area	Primary Measure	Secondary Measures
Pavement	**Pavement Index** Based on a combination of International Roughness Index, cracking, and rutting	• Directional Pavement Serviceability • Pavement Failure • Pavement Hot Spots
Bridge	**Bridge Index** Based on lowest of deck, substructure, superstructure 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

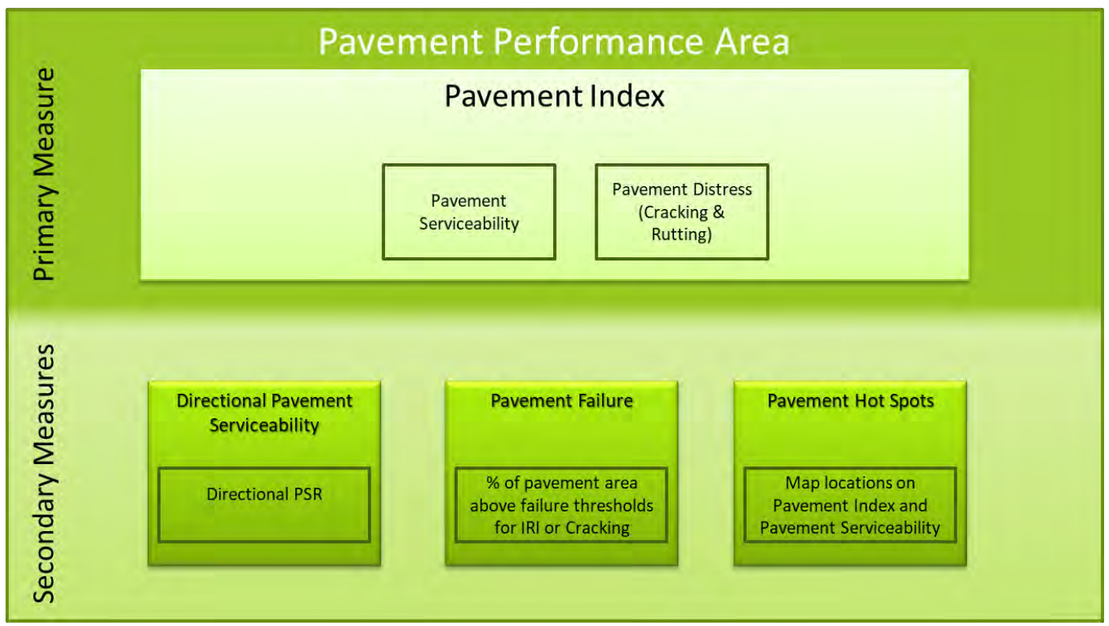


2.2 Pavement Performance Area

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/SR 85 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/SR 85 Corridor, the following operating environments were identified:

- Interstate: all I-10 segments
- Non-Interstate: all SR 85 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:

- Overall, based on the weighted average of the Pavement Index, the pavement is in “good” condition
- According to the Pavement Index, 7 segments are in “good” condition, 7 segments are in “fair” condition. No segments are in “poor” condition
- Pavement hot spots include:

- Segment 10W-1 EB MP 0-2, WB MP 3-4, WB MP 7-8, EB MP 11-12, EB/WB MP 12-16
- Segment 10W-2 EB/WB MP 16-20, EB MP 20-21, EB/WB MP 21-22
- Segment 10W-3 EB/WB MP 22-27, WB MP 27-28, WB MP 29-30
- Segment 10W-6 EB/WB MP 80-82
- Segment 10W-7 EB/WB MP 82-90, EB/WB MP 91-94, EB MP 94-97, EB/WB MP 97-98
- Segment 10W-8 WB MP 98-99, EB/WB MP 99-100, EB MP 100-101, EB/WB MP 101-103, EB MP 103-104, WB MP 104-105, EB MP 106-109
- Segment 85-9 SB/NB MP 155-154, SB MP 150-149
- Segment 85-10 NB MP 148-147, SB MP 147-141, SB MP 141-140
- Segment 85-11 SB MP 137-136, SB MP 133-132

Table 5 summarizes the Pavement performance results for the I-10/SR 85 Corridor. **Figure 8** illustrates the primary Pavement Index performance and locations of Pavement hot spots along the I-10/SR 85 Corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 5: Pavement Performance

Segment	Segment Length (Miles)	Pavement Index	Pavement Serviceability		% Area Failure
			EB/SB	WB/NB	
10W-1	16	3.73	3.74	3.64	41%
10W-2	6	3.14	3.03	3.47	92%
10W-3	10	3.61	3.67	3.75	60%
10W-4	22	3.99	4.16	4.37	0%
10W-5	17	4.51	4.09	4.18	0%
10W-6	11	4.31	4.03	4.09	18%
10W-7	16	3.26	3.32	3.57	84%
10W-8	15	3.64	3.60	3.70	43%
85-9	6	3.22	3.04	2.95	25%
85-10	11	3.61	3.67	3.92	32%
85-11	15	3.90	4.24	4.03	10%
85-12	3	4.08	4.02	3.82	0%
85-13	2	3.92	3.80	3.48	0%
85-14	3	3.96	3.90	3.59	0%
Weighted Corridor Average		3.81	3.80	3.87	30%
SCALES					
Performance Levels		**Interstate**			
Good		> 3.75	> 3.75		< 5%
Fair		3.00 - 3.75	3.40 - 3.75		5% - 20%
Poor		< 3.00	< 3.40		> 20%
Performance Levels		**Non-Interstate**			
Good		> 3.60	> 3.50		< 5%
Fair		2.80 - 3.60	2.90 - 3.50		5% - 20%
Poor		< 2.80	< 2.90		> 20%

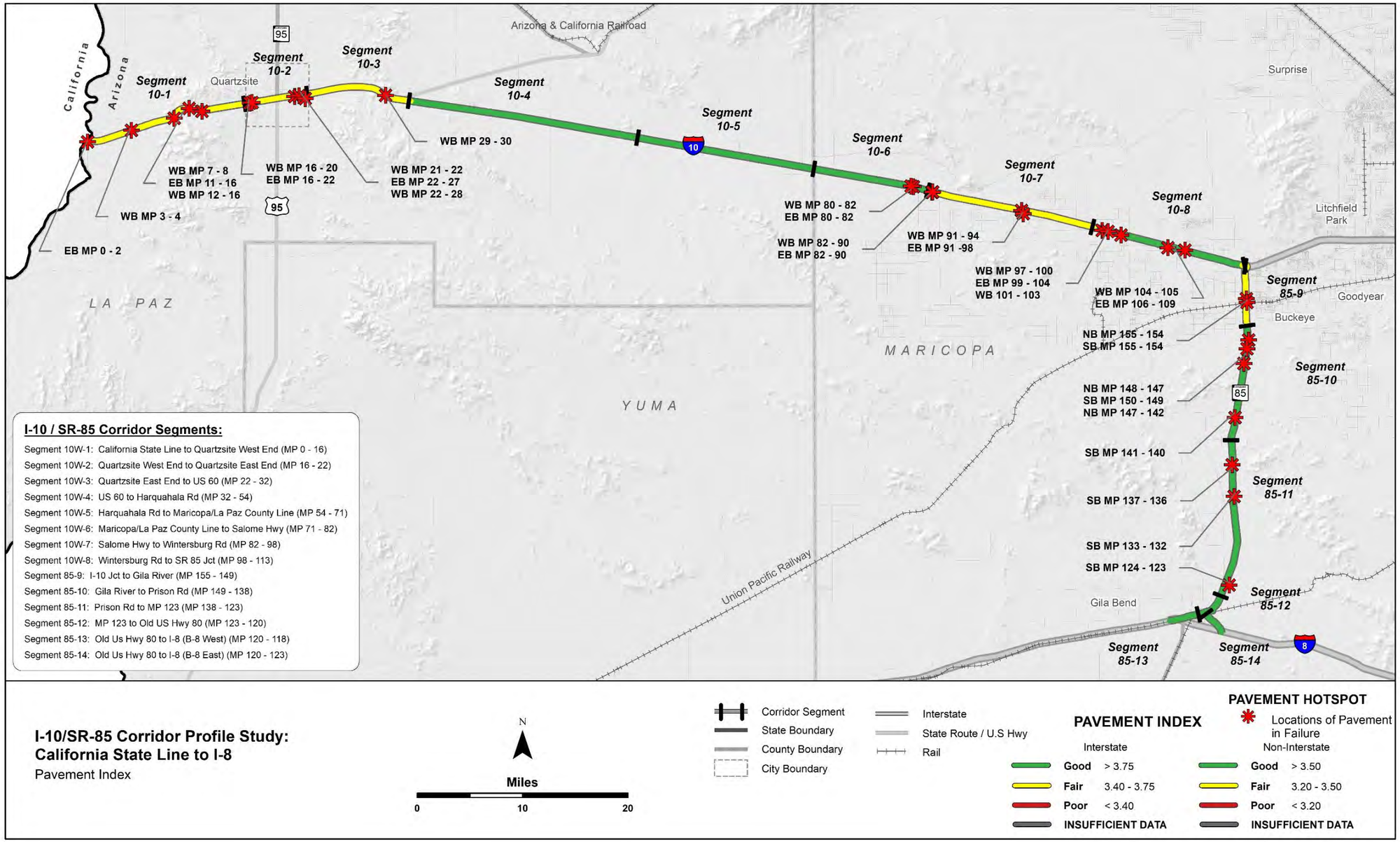
Statewide Transportation Asset Management Plan

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

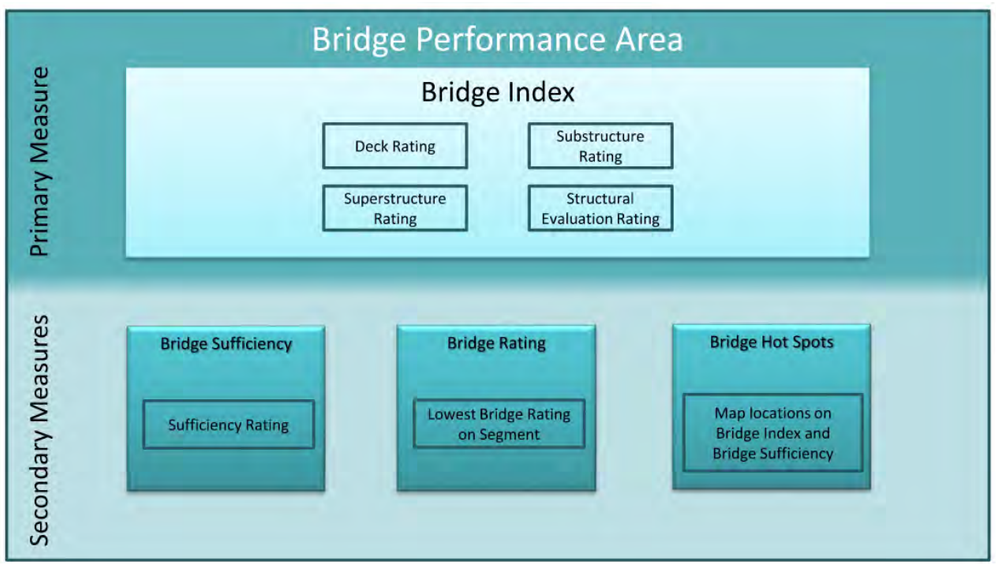


2.3 Bridge Performance Area

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/SR 85 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 three secondary measures provide more detailed information to assess bridge performance.

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

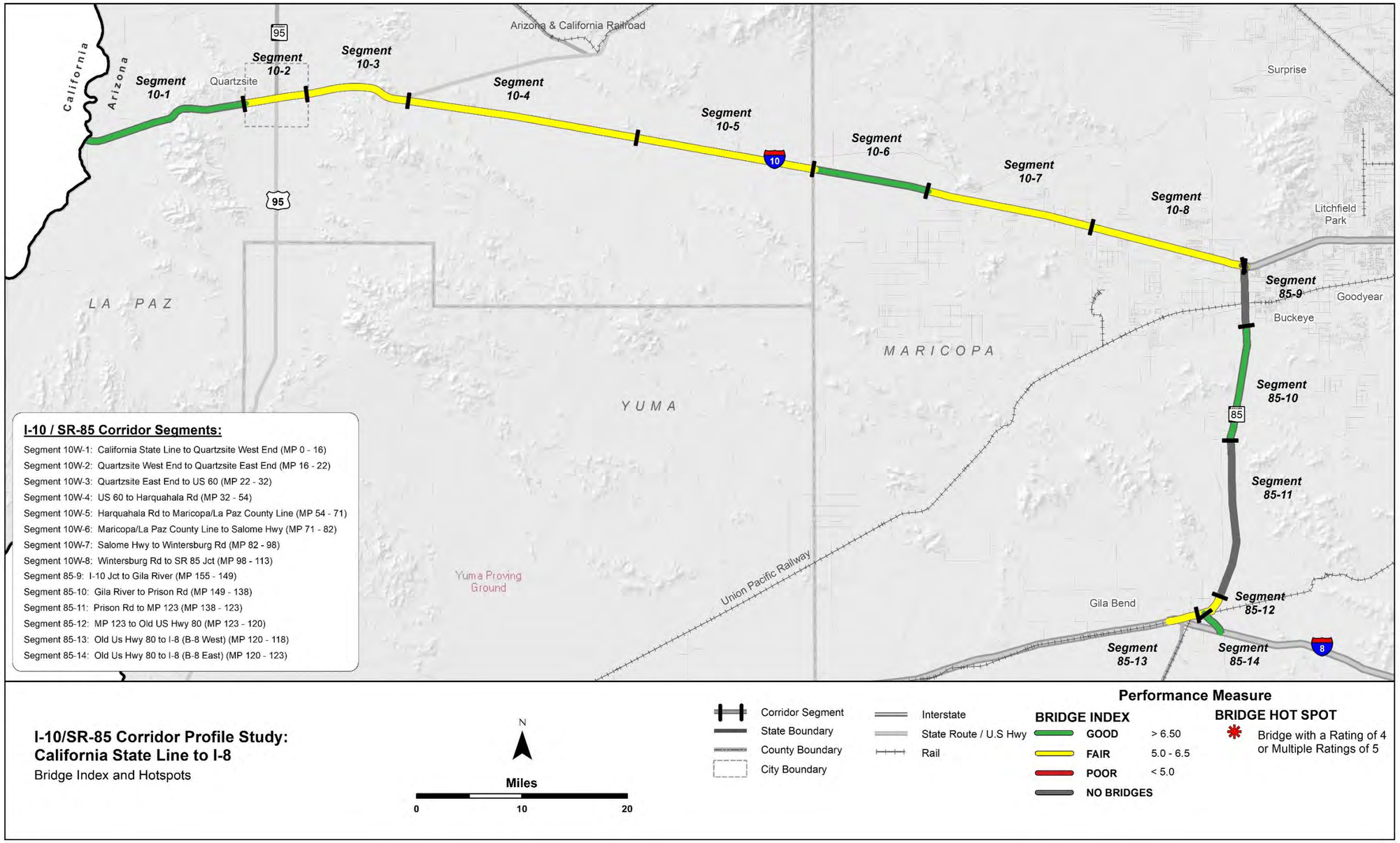
- The weighted average of the Bridge Index shows "fair" performance for the I-10 West/SR 85 Corridor.
- The Bridge Index predominantly shows "fair" performance, with the exception of Segments 10-1, 10-6, 85-10, and 85-14, where the Bridge Index shows "good" performance.
- The corridor has "fair" performance based on the weighted corridor average of Lowest Bridge Rating.
- Every segment along I-10/SR85 Corridor shows "good" performance for Bridge Sufficiency except for 85-12, which shows "fair" performance.
- There are no Bridge Hot Spots throughout the entire corridor.

Table 7 summarizes the Bridge performance results for the I-10/SR 85 Corridor. **Figure 10** illustrates the primary Bridge Index performance and locations of Bridge hot spots along the SR 85 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
10-1	16	5	6.75	83.24	5
10-2	6	6	6.15	92.98	5
10-3	10	2	6.00	86.37	6
10-4	22	9	6.17	96.05	5
10-5	17	6	6.48	96.81	6
10-6	11	2	7.00	97.05	7
10-7	16	6	6.25	96.62	6
10-8	15	10	6.44	96.35	5
85-9	6	No Bridges			
85-10	11	6	6.53	99.44	6
85-11	15	No Bridges			
85-12	3	1	5.00	75.10	5
85-13	2	4	5.62	91.63	5
85-14	3	2	6.86	96.40	6
Weighted Corridor Average			6.33	95.75	5.58
SCALES					
Performance Level			**ALL**		
Good			> 6.5	> 80	> 6
Fair			5.0 – 6.5	50 – 80	5 – 6
Poor			< 5.0	< 50	< 5

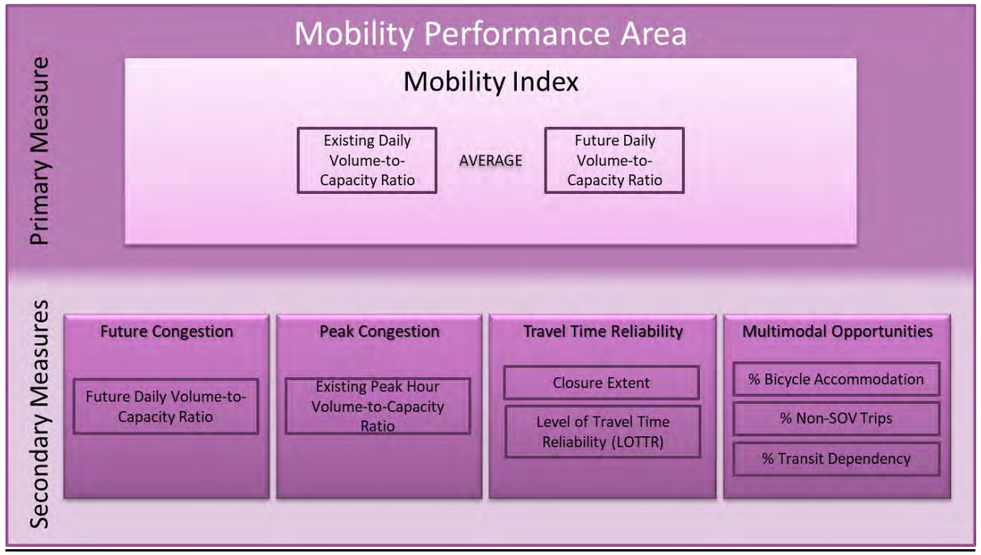
Figure 10: Bridge Performance



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/SR 85 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 (2019) 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/SR 85 Corridor, the following operating environments were identified:

- Urban Fringe Flow: Segments 85-9, 85-13, and 85-14
- Rural Flow: Segments 10W-1 through 10W-8, and 85-10 through 85-12

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– Two 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” performance for the I-10/SR 85 Corridor
- The Directional Existing Peak Hour V/C indicator show “good” performance for each segment of the corridor
- The Future Daily V/C indicator show “good” performance for each segment of the corridor except Segment 10W-8, which shows “fair” performance, and 85-12 and 85-14 which show “poor” performance
- All Segments show either “good” or “fair” for Closures with the exception of 10W-3 which shows “poor”
- The Reliability measures show “good” performance throughout the majority of the corridor
- % Non-SOV Trips show “poor” or “fair” performance throughout the corridor except for Segment 85-10, which shows “good” performance
- Segments 10W-1, 10W-2, 10W-3, 10W-5, 10W-6, 10W-8, 85-10, and 85-11 show good performance for % Bicycle Accommodation. Segments 10W-4, 10W-7, and 85-9 which shows “fair” performance. Segments 85-12, 85-13, and 85-14 show “poor” performance

Table 8 summarizes the Mobility performance results for the I-10/SR 85 Corridor. **Figure 12** illustrates the primary Mobility Index performance along the I-10/SR 85 Corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 8: Mobility Performance

Segment	Length (mi)	Mobility Index	Future V/C	Existing Peak Hour V/C		Closure Extent (instances/milepost/year/mile)		Directional LOTTR (all vehicles)		% Bicycle Accommodation	% Non-SOV Travel
				EB/SB	WB/NB	EB/SB	WB/NB	EB/SB	WB/NB		
10-1	16	0.42	0.47	0.28	0.28	0.36	0.19	1.04	1.03	100%	8.2%
10-2	6	0.40	0.45	0.24	0.23	0.33	0.27	1.03	1.03	100%	9.8%
10-3	10	0.42	0.47	0.25	0.24	0.08	0.82	1.02	1.02	99%	13.7%
10-4	22	0.45	0.51	0.38	0.37	0.16	0.15	1.02	1.02	70%	6.7%
10-5	17	0.37	0.42	0.19	0.18	0.08	0.13	1.02	1.02	100%	5.0%
10-6	11	0.41	0.46	0.16	0.19	0.22	0.22	1.02	1.02	100%	5.3%
10-7	16	0.40	0.45	0.25	0.27	0.26	0.36	1.02	1.02	75%	7.3%
10-8	15	0.58	0.72	0.30	0.29	0.23	0.22	1.02	1.02	100%	7.2%
85-9	6	0.22	0.16	0.24	0.24	0.13	0.48	1.09	1.08	88%	17.1%
85-10	11	0.30	0.35	0.23	0.23	0.02	0.02	1.03	1.03	100%	14.0%
85-11	15	0.24	0.28	0.14	0.13	0.04	0.05	1.04	1.03	94%	8.0%
85-12	3	1.02	1.18	0.58	0.57	0.00	0.20	1.04	1.03	32%	7.2%
85-13	2	0.55	0.62	0.33	0.31	No Data	No Data	1.09	1.12	47%	7.0%
85-14	3	1.40	2.41	0.31	0.28	No Data	No Data	1.10	1.10	42%	4.1%
Weighted Corridor Average		0.43	0.51	0.26	0.26	0.17	0.23	1.03	1.03	89%	8%

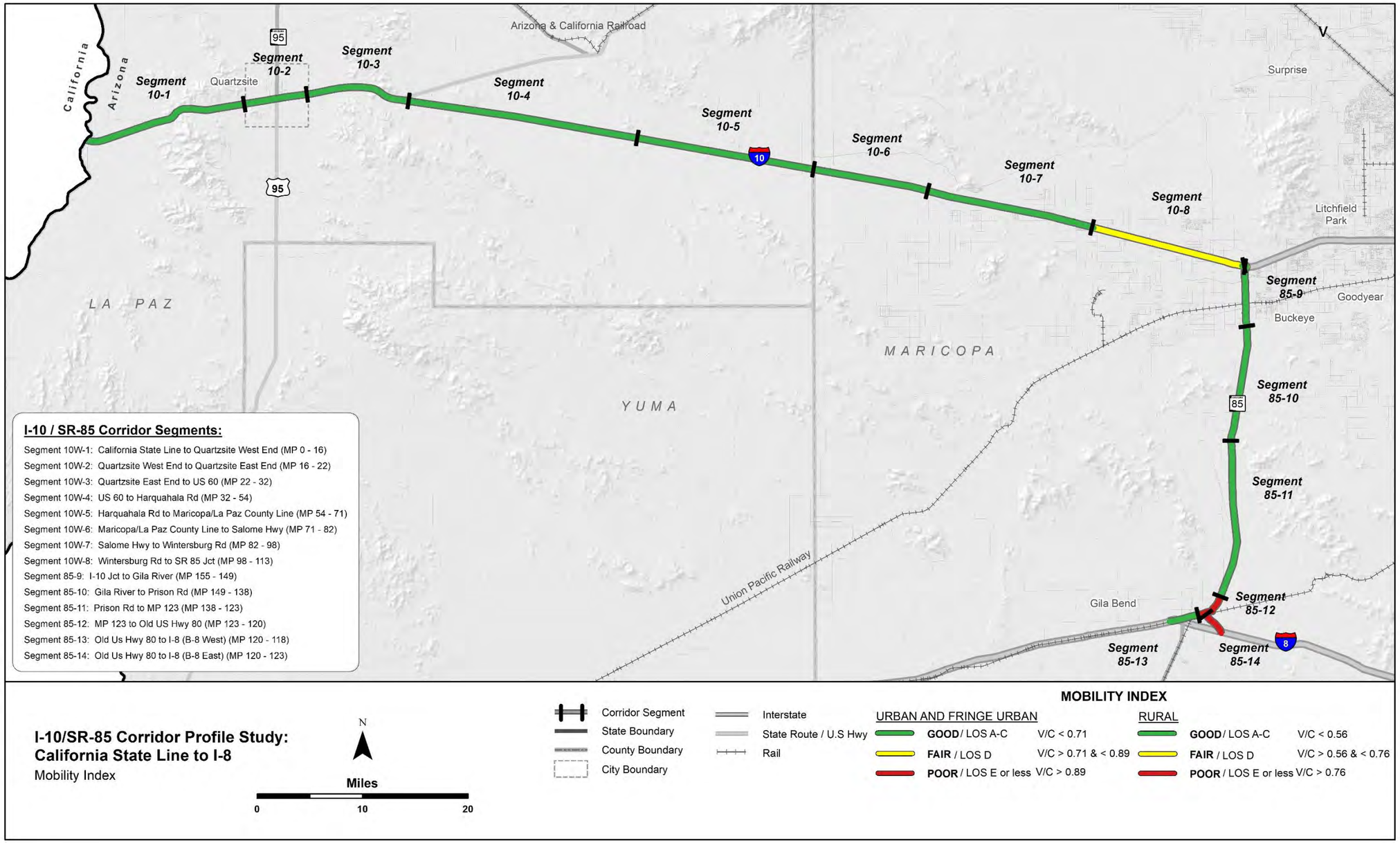
SCALES

Performance Level	Urban and fringe Urban	All	Interrupted / Uninterrupted Flow	All	
Good	< 0.71	< 0.22	< 1.2 < 1.06	> 90%	> 17%
Fair	0.71 - 0.89	0.22 - 0.62	1.2 - 1.50 1.06 - 1.50	60% - 90%	11% - 17%
Poor	> 0.89	> 0.62	> 1.50	< 60%	< 11%

Performance Level	Rural
Good	< 0.56
Fair	0.56 - 0.76
Poor	> 0.76

*Interrupted Flow Facility
^Uninterrupted Flow Facility
[1]Urban Operating Environment
[2]Rural Operating Environment

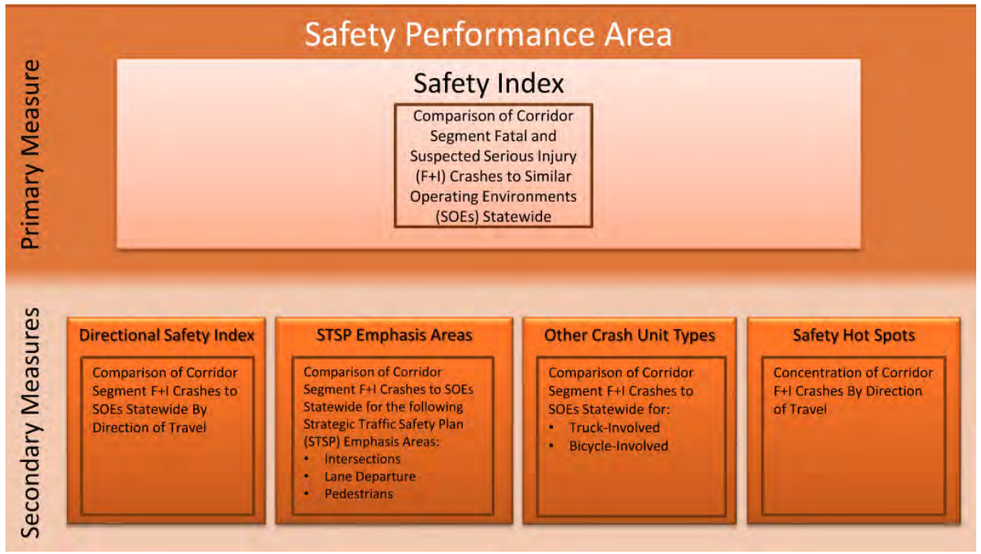
Figure 12: Mobility Performance



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 incapacitating 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/SR 85 Corridor, the following operating environments were identified:

- Rural 4-Lane Freeway: All I-10 Segments
- Fringe Urban: Segments 85-9, 85-13 and 85-14
- Rural Multi-lane Highway: Segments 85-10, 85-11 and 85-12

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 173 Fatal and Suspected Serious Injury Crashes occurred along the I-10 West/SR 85 Corridor in 2015-2019; of these crashes, 68 were fatal and 105 involved Suspected Serious Injuries
- The I-10/SR 85 Corridor is a closed access interstate freeway facility with no intersections and limited permitted pedestrians. Therefore, crash unit type performance measures for Suspected Serious Injury Crashes at Intersections and Suspected Serious Injury Crashes Involving Pedestrians had insufficient data to generate reliable performance ratings for the I-10 West Corridor
- The weighted average of the Safety Index shows “average” performance for the I-10 West/SR 85 Corridor; Segments 10W-2, 10W-4, 10W-6, 10W-7, 85-9, 86-12, and 85-13 show “below average” performance for the Safety Index. Segments 85-10 and 85-11 show “above average” performance
- The Directional Safety Index results show similar findings to the Safety Index with Segments 10W-1, 10W-2, 10W-4, 10W-6, 10W-7, 10W-8, 85-9, 85-12, and 85-13 showing “below average” performance in at least one direction
- Segment 85-14 had insufficient data to calculate reliable measurements, due to limited overall reported crashes and no fatal or suspected serious injury crashes
- All segments show “below average” performance in the % of Segment Fatal + Suspected Serious Injury Crashes Involving Trucks, except for Segments 10W-2, and 10W-5 which show “average” and “above average” performance respectively. Segments 85-10, 85-12, 85-13, and 85-14 have insufficient data
- All the segments show insufficient data in the % of Segment Fatal Suspected Serious Injury Crashes Involving Bicycles
- Safety hot spots include:
    - Segment 1: WB MP 0 – 1
    - Segment 1: WB MP 9 – 10
    - Segment 5: EB MP 67 – 69
    - Segment 8: EB MP 104 - 106

Table 9 summarizes the Safety performance results for the I-10/SR 85 Corridor. **Figure 14** illustrates the primary Safety Index performance and locations of Safety hot spots along the I-10/SR 85 Corridor. Maps for each secondary measure can be found in **Appendix A**.

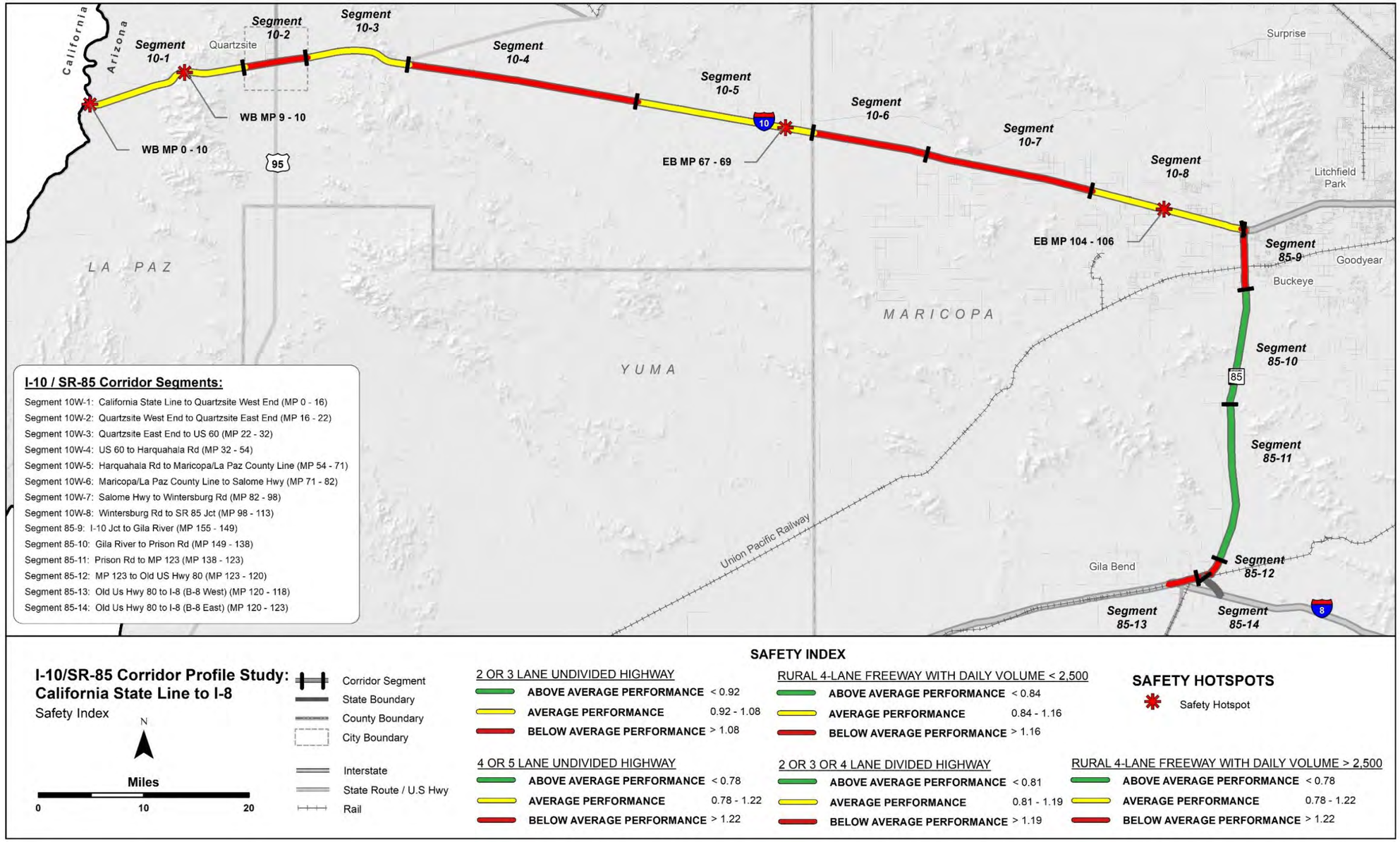
Table 9: Safety Performance

Segment	Segment Length (miles)	Safety Index	NB/EB Directional Safety Index	SB/WB 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
10-1[b]	16	0.93	0.40	1.46	Insufficient Data	76%	Insufficient Data	24%	Insufficient Data
10-2[b]	6	2.28	1.90	2.65	Insufficient Data	40%	Insufficient Data	20%	Insufficient Data
10-3[b]	10	0.92	1.14	0.71	Insufficient Data	67%	Insufficient Data	27%	Insufficient Data
10-4[b]	22	1.28	1.81	0.74	Insufficient Data	57%	Insufficient Data	39%	Insufficient Data
10-5[b]	17	0.94	1.10	0.78	Insufficient Data	78%	Insufficient Data	19%	Insufficient Data
10-6[b]	11	2.10	3.23	0.98	Insufficient Data	67%	Insufficient Data	27%	Insufficient Data
10-7[b]	16	1.79	1.95	1.62	Insufficient Data	68%	Insufficient Data	27%	Insufficient Data
10-8[c]	15	1.01	1.27	0.76	Insufficient Data	58%	Insufficient Data	16%	Insufficient Data
85-9[d]	6	1.86	2.76	0.96	Insufficient Data	0%	Insufficient Data	30%	Insufficient Data
85-10[d]	11	0.54	0.09	0.99	Insufficient Data	40%	Insufficient Data	Insufficient Data	Insufficient Data
85-11[d]	15	0.26	0.02	0.49	Insufficient Data	80%	Insufficient Data	60%	Insufficient Data
85-12[f]	3	1.49	2.98	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
85-13[e]	2	3.09	4.07	2.10	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
85-14[f]	3	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Weighted Corridor Average		1.20	1.39	1.02	Insufficient Data	62%	Insufficient Data	36%	Insufficient Data
SCALES									
Performance Level		**Rural 4-Lane Freeway with Daily Volume <25,000**							
Above Average		< 0.84			N/A	< 72.8%	< 1.0%	< 19.0%	< 0.0%
Average		0.84 - 1.16			N/A	72.8% - 76.4%	1.0% - 3.3%	19.0% - 22.5%	0.0% - 0.9%
Below Average		> 1.16			N/A	> 76.4%	> 3.3%	> 22.5%	> 0.9%
Performance Level		**Rural 4-Lane Freeway with Daily Volume >25,000**							
Above Average		< 0.78			N/A	< 69.0%	< 0.7%	< 8.5%	< 0.0%
Average		0.78 - 1.22			N/A	69.0% - 77.5%	0.7% - 4.7%	8.5% - 18.0%	0.0% - 0.0%
Below Average		> 1.22			N/A	> 77.5%	> 4.7%	> 18.0%	> 0.0%
Performance Level		**2 or 3 or 4 Lane Divided Highway**							
Above Average		< 0.81			< 23.4%	< 56.4%	< 2.4%	< 3.7%	< 0.0%
Average		0.81 - 1.19			23.4% - 29.3%	56.4% - 65.0%	2.4% - 3.6%	3.7% - 9.9%	0.0% - 2.2%
Below Average		> 1.19			> 29.3%	> 65.0%	> 3.6%	> 9.9%	> 2.2%
Performance Level		**4 or 5 Lane Undivided Highway**							
Above Average		< 0.78			< 43.8%	< 21.1%	< 8.8%	< 0.8%	< 0.5%
Average		0.78 - 1.22			43.8% - 49.5%	21.1 % - 32.1%	8.8% - 13.5%	0.8% - 5.5%	0.5% - 3.8%
Below Average		> 1.22			> 49.5%	> 32.1%	> 13.5%	> 5.5%	> 3.8%
Performance Level		**2 or 3 Lane Undivided Highway**							
Above Average		< 0.92			< 11.2%	< 66.9%	< 3.8%	< 4.2%	< 0.0%
Average		0.92 - 1.08			11.2% - 15.6%	66.9 % - 74.5%	3.8% - 7.2%	4.2% - 8.0%	0.0% - 3.3%
Below Average		> 1.08			> 15.6%	> 74.5%	> 7.2%	> 8.0%	> 3.3%

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

[a] Urban 4-Lane Freeway, [b] Rural 4-Lane Freeway with Daily Volume <25,000, [c] Rural 4-Lane Freeway with Daily Volume >25,000, [d] 2 or 3 or 4 Lane Divided Highway, [e] 4 or 5 Lane Undivided Highway [f] 2 or 3 Lane Undivided Highway

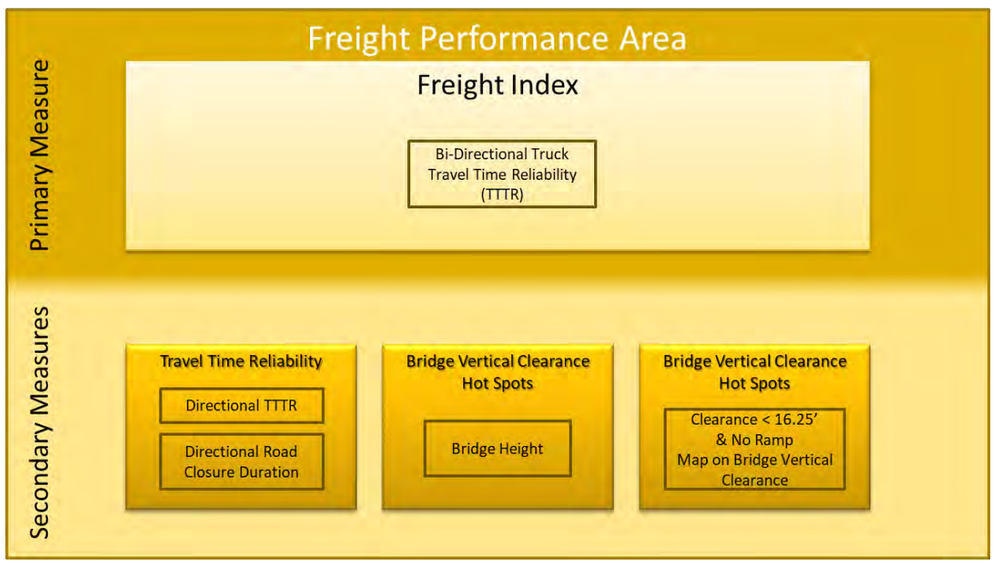
Figure 14: Safety Performance



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/SR 85 Corridor, the following operating environments were identified:

- Interrupted Flow: Segments 85-9, 85-12, 85-13 & 85-14
- Uninterrupted Flow: All I-10 Segments, 85-10 & 85-11

Secondary Freight Measures

The Freight performance area includes five 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 "good" performance for the I-10 West/SR 85 Corridor

- Segment 85-14 shows “poor” performance for the Freight Index primary measure along with the EB TTTR measure; all other segments and measurements for Freight Index and Directional TTTR show either “good” performance
- Closure Duration shows “poor” performance for Segments 10W-1 EB, 10W-3 WB, 10W-7 WB, 85-9 SB. The remaining Segments show “good” performance
- Bridge Vertical Clearance shows “fair” performance for most segments on the corridor, with the exception of Segments 10W-7 and 85-13 which show “good” performance. Segments 85-9, 85-10, 85-11, 85-12, and 85-14 do not have any underpasses; the low-clearance structures on the corridor can be avoided by using the off/on ramps at the adjacent interchange
- Bridge Vertical Clearance hot spots exist in segments 10W-4 and 10W-8

Table 10 summarizes the Freight performance results for the I-10/SR 85 Corridor. **Figure 16** illustrates the primary Freight Index performance and locations of freight hot spots along the SR 95 Corridor. Maps for each secondary measure can be found in **Appendix A**.

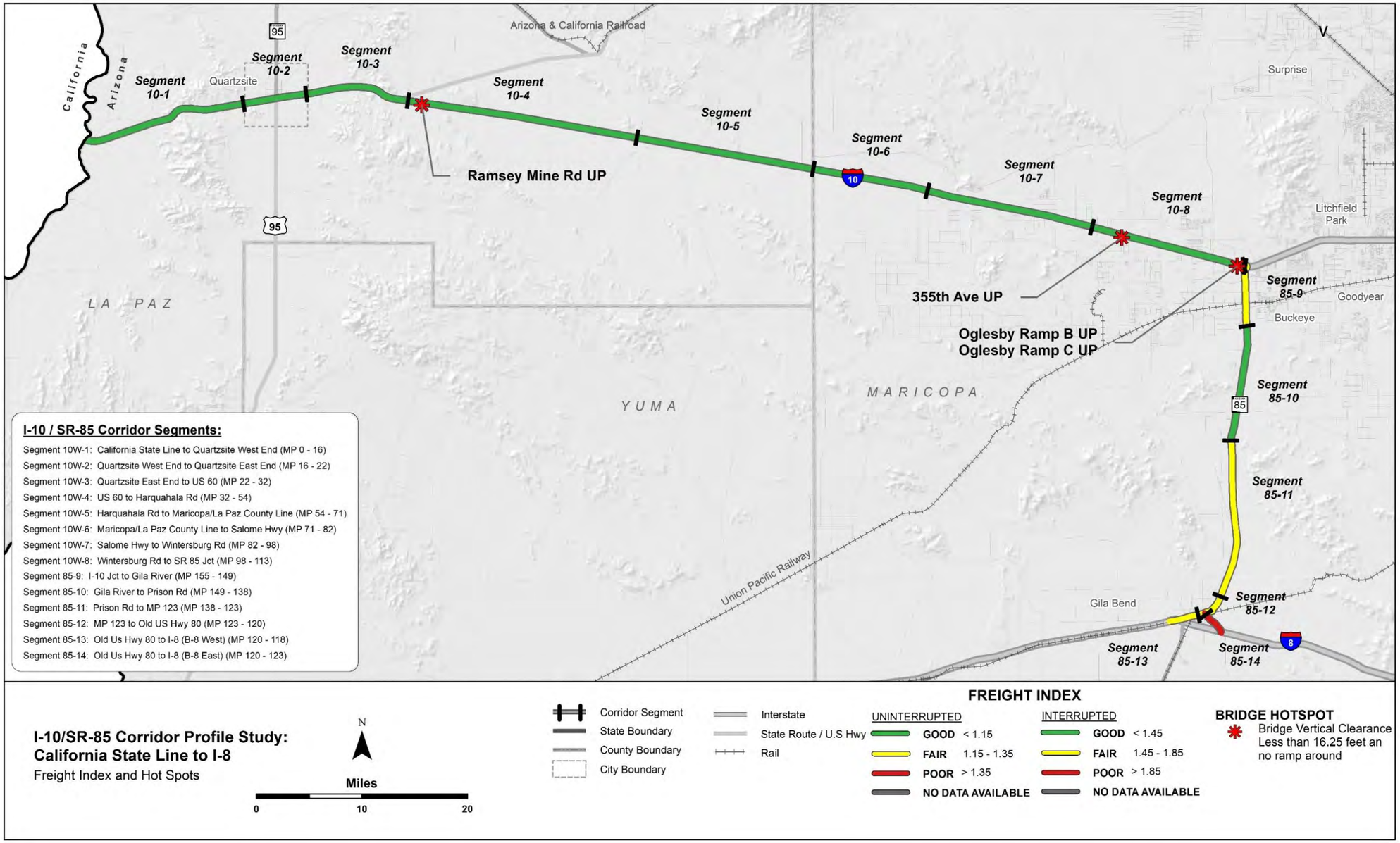
Table 10: Freight Performance

Segment #	Segment Mileposts	Freight Index	NB/EB MAX TTTR	SB/WB MAX TTTR	Average Minutes Per Year Given Milepost Is Closed Per Segment Mile (NB/EB)	Average Minutes Per Year Given Milepost Is Closed Per Segment Mile (SB/WB)	Bridge Vertical Clearance in Feet
10W-1^2	16	1.11	1.12	1.09	97.22	26.10	16.17
10W-2^2	6	1.06	1.06	1.05	39.34	30.40	15.92
10W-3^2	10	1.05	1.05	1.05	13.18	100.93	16.16
10W-4^2	22	1.05	1.05	1.05	23.91	21.59	15.90
10W-5^2	17	1.04	1.04	1.04	12.31	14.75	16.20
10W-6^2	11	1.04	1.04	1.04	21.31	25.01	16.00
10W-7^2	16	1.05	1.05	1.04	30.07	50.94	16.58
10W-8^2	15	1.05	1.05	1.05	35.17	34.43	15.92
85-9^1	6	1.29	1.30	1.28	20.67	66.04	No UP
85-10^2	11	1.07	1.07	1.06	2.18	2.18	No UP
85-11^2	15	1.20	1.19	1.20	7.48	7.67	No UP
85-12*2	3	1.20	1.19	1.20	0.00	20.00	No UP
85-13*1	2	1.32	1.26	1.37	No Data		16.61
85-14*1	3	1.59	1.57	1.62	No Data		No UP
Weighted Corridor Average		1.10	1.10	1.09	28.12	30.66	16.16

SCALES			
Performance Level	**Interrupted / Uninterrupted**	**All**	
Good	< 1.15	< 44.18	> 16.5
Fair	1.15 - 1.35	44.18 - 124.86	16.0 - 16.5
Poor	> 1.35	> 124.86	< 16.0

*Interrupted Flow Facility
^Uninterrupted Flow Facility
[1]Urban Operating Environment
[2]Rural Operating Environment

Figure 16: Freight Performance



2.7 Corridor Performance Summary

Based on the results of the performance evaluation, the following general observations were made related to the performance of the I-10/SR 85 Corridor:

- Overall Performance: The Pavement, Mobility, and Freight performance areas show generally "good" performance; Bridge and Safety performance areas show generally "fair/average" or "poor/below average"
- Pavement Performance: The weighted average of the Pavement Index shows "good" performance for the I-10/SR 85 Corridor; exceptions include Segments 10W-1, 10W-2, 10W-3, 10W-7 and 85-9 which show "fair" performance for the Pavement Index; the weighted average of % Area Failure shows "poor" performance for the majority of the corridor, exceptions are segments 10W-4, 10W-5, 85-12, 85-13 and 85-14 which should "good" performance. Segments 10W-6 and 85-11 show "fair" performance; all segments except Segments 10W-4, 10W-5, 85-12, 85-13, and 85-14 have Pavement hot spots
- Bridge Performance: The weighted average of the Bridge Index shows "fair" performance along the I-10 West Corridor; the Bridge index predominantly shows "fair" performance, except for Segments 10W-1, 10W-6, 85-10, and 85-14, which show "good" performance. The weighted average for Lowest Bridge Rating shows "fair" performance for the corridor
- Mobility Performance: The weighted average of the Mobility Index and all secondary measures show "good" performance throughout the I-10/SR 85 Corridor
- Safety Performance: The weighted average of the Safety Index shows "average" performance for the I-10 West/SR85 Corridor; performance measures for crashes involving lane departures and trucks had "below average" performance; several segments had insufficient data to generate reliable performance ratings for emphasis area crashes included as secondary measures. Segment 85-14 had insufficient data to calculate any primary or secondary safety measures.
- Freight Performance: The weighted average of the Freight Index shows "good" performance along the I-10 West Corridor; Closure Duration shows "good" performance for all Segments except 10W-1 EB, 10W-3 WB, 10W-7 WB, and 85-9 WB.

Figure 17 shows the percentage of the I-10/SR 85 Corridor that rates either "good/above average" performance, "fair/average" performance, or "poor/below average" performance for each primary measure. On the I-10/SR 85 Corridor, Safety is the lowest performing area with 42% of the corridor in "poor" condition as it relates to the primary measure. Pavement, Mobility, and Freight are the highest performing areas along the I-10 West/SR85 Corridor with 65%, 86%, and 81% of the corridor, respectively, in "good" condition as it relates to the primary measures. The lowest performance along the I-10/SR 85 Corridor generally occurs in the Bridge and Safety performance areas.

Table 11 shows a summary of corridor performance for all primary measures and secondary measure indicators for the I-10/SR 85 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

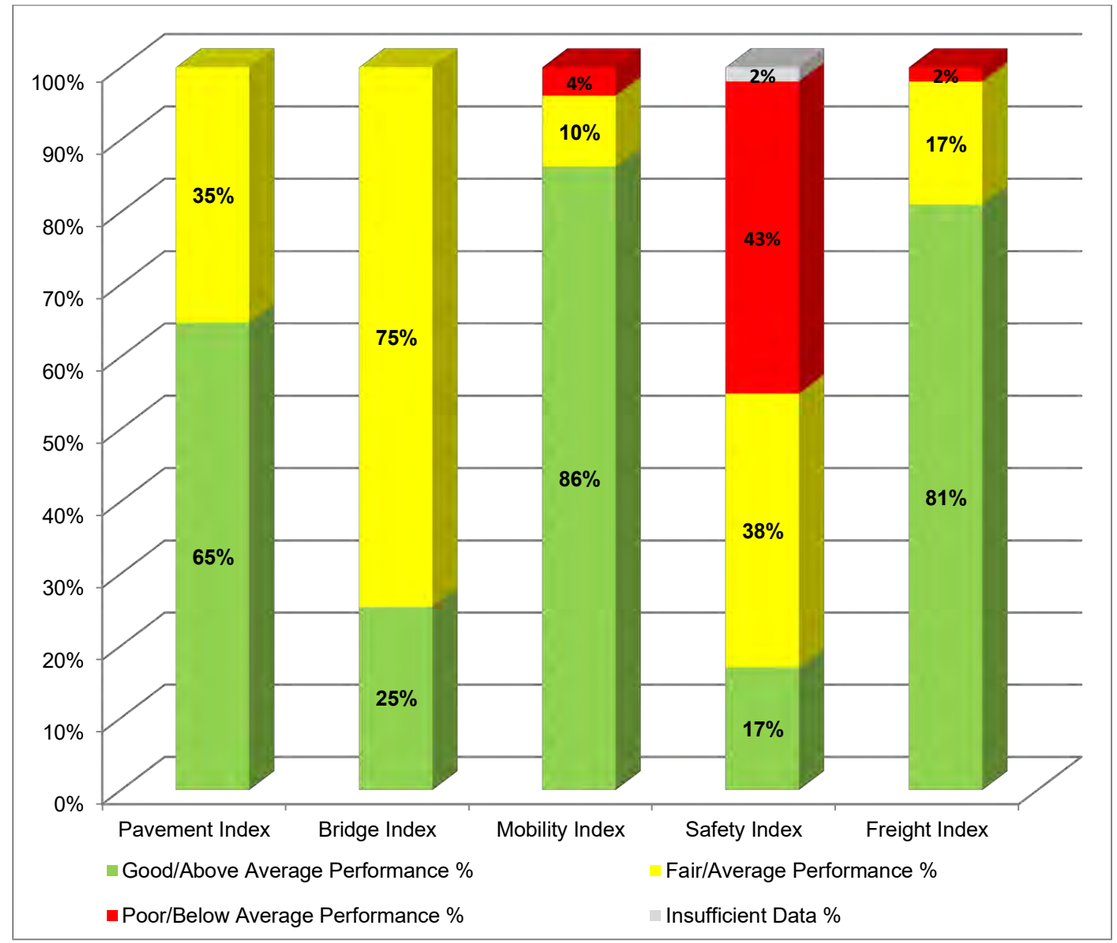


Figure 18: Corridor Performance Summary by Performance Measure

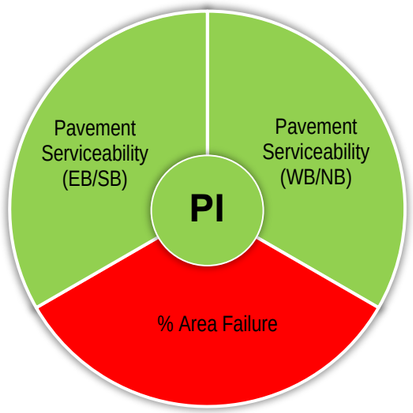
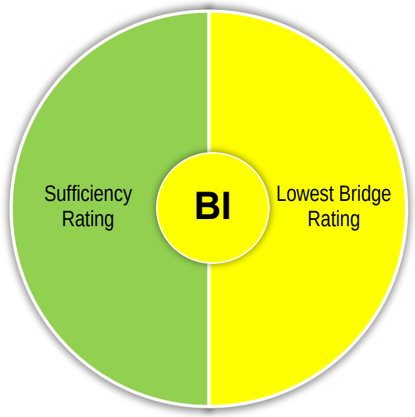
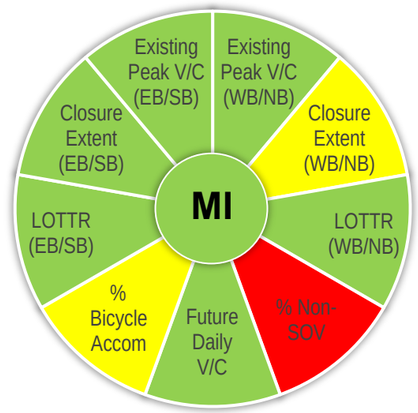
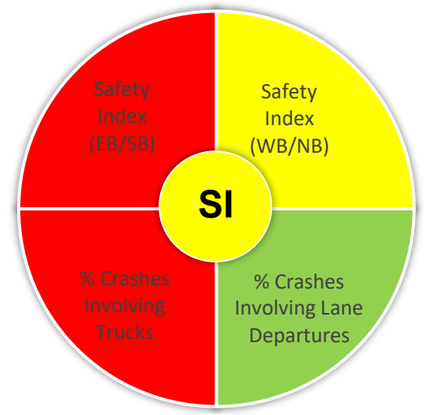
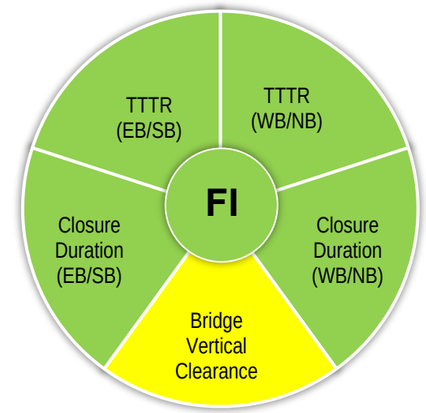
Pavement	Bridge	Mobility	Safety	Freight
				
Pavement Index (PI): based on three pavement condition ratings from the ADOT Pavement Database; the three ratings are the International Roughness Index (IRI), the Cracking Rating, and the Rutting Rating	**Bridge Index (BI):** based on four bridge condition 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 or Cracking	➢ **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	Bridge Sufficiency	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/SB	WB/NB							EB/SB	WB/NB	EB/SB	WB/NB	EB/SB	WB/NB		
10-1[b2]	16	3.73	3.74	3.64	41%	6.75	83.24	5	0.42	0.47	0.28	0.28	0.36	0.19	1.04	1.03	100%	8.2%
10-2[b2]	6	3.14	3.03	3.47	92%	6.15	92.98	5	0.40	0.45	0.24	0.23	0.33	0.27	1.03	1.03	100%	9.8%
10-3[b2]	10	3.61	3.67	3.75	60%	6.00	86.37	6	0.42	0.47	0.25	0.24	0.08	0.82	1.02	1.02	99%	13.7%
10-4[b2]	22	3.99	4.16	4.37	0%	6.17	96.05	5.00	0.45	0.51	0.38	0.37	0.16	0.15	1.02	1.02	70%	6.7%
10-5[b2]	17	4.51	4.09	4.18	0%	6.48	96.81	6.00	0.37	0.42	0.19	0.18	0.08	0.13	1.02	1.02	100%	5.0%
10-6[b2]	11	4.31	4.03	4.09	18%	7.00	97.05	7	0.41	0.46	0.16	0.19	0.22	0.22	1.02	1.02	100%	5.3%
10-7[b2]	16	3.26	3.32	3.57	84%	6.25	96.62	6	0.40	0.45	0.25	0.27	0.26	0.36	1.02	1.02	75%	7.3%
10-8[b2]	15	3.89	3.73	3.76	40%	6.44	96.35	5	0.58	0.72	0.3	0.29	0.23	0.22	1.02	1.02	100%	7.2%
85-9	6	3.22	3.04	2.95	25%	No Bridges			0.22	0.16	0.24	0.24	0.13	0.48	1.09	1.08	88%	17.1%
85-10	11	3.61	3.67	3.92	32%	6.53	99.44	6	0.30	0.35	0.23	0.23	0.02	0.02	1.03	1.03	100%	14.0%
85-11	15	3.90	4.24	4.03	10%	No Bridges			0.24	0.28	0.14	0.13	0.04	0.05	1.04	1.03	94%	8.0%
85-12	3	4.08	4.02	3.82	0%	5.00	75.10	5	1.02	1.18	0.58	0.57	0.00	0.20	1.04	1.03	32%	7.2%
85-13	2	3.92	3.80	3.48	0%	5.62	91.63	5.00	0.55	0.62	0.33	0.31	No Data		1.09	1.12	47%	7.0%
85-14	3	3.96	3.90	3.59	0%	6.86	96.40	6.00	1.40	2.41	0.16	0.14	No Data		1.10	1.10	42%	4.1%
Weighted Corridor Average		3.83	3.81	3.87	30%	6.33	94.25	5.44	0.43	0.51	0.26	0.26	0.17	0.23	1.03	1.03	89%	8%

SCALES

Performance Level	Interstate		All				Urban	All	Interrupted (Uninterrupted)	All	
Good/Above Average	> 3.75	> 3.75	< 5%	> 6.5	> 80	> 6	< 0.71	< 0.22	< 1.15	> 90%	> 17%
Fair/Average	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	< 3.00	< 3.40	> 20%	< 5.0	< 50	< 5	> 0.89	> 0.62	> 1.50	< 60%	< 11%
Performance Level	**Non-Interstate**						**Rural**				
Good/Above Average	> 3.60	> 3.50					< 0.56				
Fair/Average	2.8 - 3.60	2.90 - 3.50					0.56 - 0.76				
Poor/Below Average	< 2.8	< 2.90					> 0.76				

[a]Urban 4 Lane Freeway
[b]Rural 4 Lane Freeway with Daily Volume < 25,000

[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	MAX TTTR		Closure Duration (minutes/milepost/year/mile)		Bridge Vertical Clearance (feet)
			EB/SB	WB/NB							EB/SB	WB/NB	EB/SB	WB/NB	
10-1[b2]	16	0.93	0.40	1.46	Insufficient Data	76%	Insufficient Data	24%	Insufficient Data	1.11	1.12	1.09	97.22	26.10	16.17
10-2[b2]	6	2.28	1.90	2.65	Insufficient Data	40%	Insufficient Data	20%	Insufficient Data	1.06	1.06	1.05	39.34	30.40	15.92
10-3[b2]	10	0.92	1.14	0.71	Insufficient Data	67%	Insufficient Data	27%	Insufficient Data	1.05	1.05	1.05	13.18	100.93	16.16
10-4[b2]	22	1.28	1.81	0.74	Insufficient Data	57%	Insufficient Data	39%	Insufficient Data	1.05	1.05	1.05	23.91	21.59	15.9
10-5[b2]	17	0.94	1.10	0.78	Insufficient Data	78%	Insufficient Data	19%	Insufficient Data	1.04	1.04	1.04	12.31	14.75	16.2
10-6[b2]	11	2.10	3.23	0.98	Insufficient Data	67%	Insufficient Data	27%	Insufficient Data	1.04	1.04	1.04	21.31	25.01	16
10-7[b2]	16	1.79	1.95	1.62	Insufficient Data	68%	Insufficient Data	27%	Insufficient Data	1.05	1.05	1.04	30.07	50.94	16.58
10-8[b2]	15	1.01	1.27	0.76	Insufficient Data	58%	Insufficient Data	16%	Insufficient Data	1.05	1.05	1.05	35.17	34.43	15.92
85-9	6	1.86	2.76	0.96	Insufficient Data	0%	Insufficient Data	30%	Insufficient Data	1.29	1.30	1.28	20.67	66.04	No UP
85-10	11	0.54	0.09	0.99	Insufficient Data	40%	Insufficient Data	Insufficient Data	Insufficient Data	1.07	1.07	1.06	2.18	2.18	No UP
85-11	15	0.26	0.02	0.49	Insufficient Data	80%	Insufficient Data	60%	Insufficient Data	1.20	1.19	1.20	7.48	7.67	No UP
85-12	3	1.49	2.98	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.20	1.19	1.20	0.00	20.00	No UP
85-13	2	3.09	4.07	2.10	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.32	1.26	1.37	No Data		16.61
85-14	3	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.59	1.57	1.62	No Data		No UP
Weighted Corridor Average		1.20	1.39	1.02	Insufficient Data	62%	Insufficient Data	36%	Insufficient Data	1.10	1.10	1.09	28.12	30.66	16.16

SCALES									
Performance Level	Rural 4-Lane Freeway with Daily Volume <25,000						Uninterrupted		
Good/Above Average	< 0.84	N/A	< 72.8%	< 1.0%	< 19.0%	< 0.0%	< 1.15	< 44.18	> 16.5
Fair/Average	0.84 - 1.16	N/A	72.8% - 76.4%	1.0% - 3.3%	19.0% - 22.5%	0.0% - 0.9%	1.15 - 1.35	44.18 - 124.86	16.0 - 16.5
Poor/Below Average	> 1.16	N/A	> 76.4%	> 3.3%	> 22.5%	> 0.9%	> 1.35	> 124.86	< 16.5
Performance Level	Rural 4-Lane Freeway with Daily Volume >25,000								
Good/Above Average	< 0.78	N/A	< 69.0%	< 0.7%	< 8.5%	< 0.0%			
Fair/Average	0.78 - 1.22	N/A	69.0% - 77.5%	0.7% - 4.7%	8.5% - 18.0%	0.0% - 0.0%			
Poor/Below Average	> 1.22	N/A	> 77.5%	> 4.7%	> 18.0%	> 0.0%			
Performance Level	2 or 3 or 4 Lane Divided Highway								
Good/Above Average	< 0.81	< 23.4%	< 56.4%	< 2.4%	< 3.7%	< 0.0%			
Fair/Average	0.81 - 1.19	23.4% - 29.3%	56.4% - 65.0%	2.4% - 3.6%	3.7% - 9.9%	0.0% - 2.2%			
Poor/Below Average	> 1.19	> 29.3%	> 65.0%	> 3.6%	> 9.9%	> 2.2%			
Performance Level	4 or 5 Lane Undivided Highway								
Good/Above Average	< 0.78	< 43.8%	< 21.1%	< 8.8%	< 0.8%	< 0.5%			
Fair/Average	0.78 - 1.22	43.8% - 49.5%	21.1 % - 32.1%	8.8% - 13.5%	0.8% - 5.5%	0.5% - 3.8%			
Poor/Below Average	> 1.22	> 49.5%	> 32.1%	> 13.5%	> 5.5%	> 3.8%			
Performance Level	2 or 3 Lane Undivided Highway								
Good/Above Average	< 0.92	< 11.2%	< 66.9%	< 3.8%	< 4.2%	< 0.0%			
Fair/Average	0.92 - 1.08	11.2% - 15.6%	66.9 % - 74.5%	3.8% - 7.2%	4.2% - 8.0%	0.0% - 3.3%			
Poor/Below Average	> 1.08	> 15.6%	> 74.5%	> 7.2%	> 8.0%	> 3.3%			

[a]Urban 4 Lane Freeway
[b]Rural 4 Lane Freeway with Daily Volume < 25,000
[1]Urban Operating Environment
[2]Rural Operating Environment

Notes: "Insufficient Data" indicates there was not enough data available to generate reliable performance ratings
"No UP" indicates no underpasses are present in the segment

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. Statewide performance goals that are relevant to I-10/SR 85 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/SR 85 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/SR 85 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 incapacitating 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/SR 85 Corridor Goals	I-10/SR 85 Corridor Objectives	Performance Area	Primary Measure	Performance Objective	
				Secondary Measure Indicators	Corridor Average	Segment
Improve Mobility and Accessibility **Support Economic Growth**	Improve mobility through additional capacity and improved roadway geometry Provide a safe and reliable route for recreational and tourist travel to/from Mexico, Southern California, and Southern Arizona destinations Provide safe, reliable and efficient connection to all communities along the corridor to permit efficient regional travel	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 Improve bicycle and pedestrian accommodations	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		
	Provide a safe, reliable and efficient freight route between Arizona, California and Mexico Provide efficient bypass route to/from I-10	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
				Directional Truck Travel Time Reliability		
				Closure Duration		
				Bridge Vertical Clearance		
Preserve and Maintain the State Transportation System	Preserve and modernize highway infrastructure	Maintain structural integrity of bridges	Bridge	Bridge Index	Fair or Better	Fair or better
				Sufficiency Rating		
				Lowest Bridge Rating		
		Improve pavement ride quality for all corridor users Reduce long-term pavement maintenance costs	Pavement	Pavement Index	Fair or Better	Fair or better
				Directional Pavement Serviceability Rating		
				% Area Failure		
Enhance Safety and Security	Provide a safe, reliable, and efficient connection for the communities along the corridor Promote safety by implementing appropriate countermeasures	Reduce fatal and incapacitating injury crashes for all roadway users	Safety (Emphasis Area)	Safety Index	Above Average	Average or better
				Directional Safety Index		
				% Fatal + Suspected Serious Injury Crashes at Intersections		
				% Fatal + Suspected Serious Injury Crashes Involving Lane Departures		
				% Fatal + Suspected Serious Injury Crashes Involving Pedestrians		
				% Fatal + Suspected Serious Injury Crashes Involving Trucks		
				% Fatal + Suspected Serious Injury Crashes Involving Bicyclists		

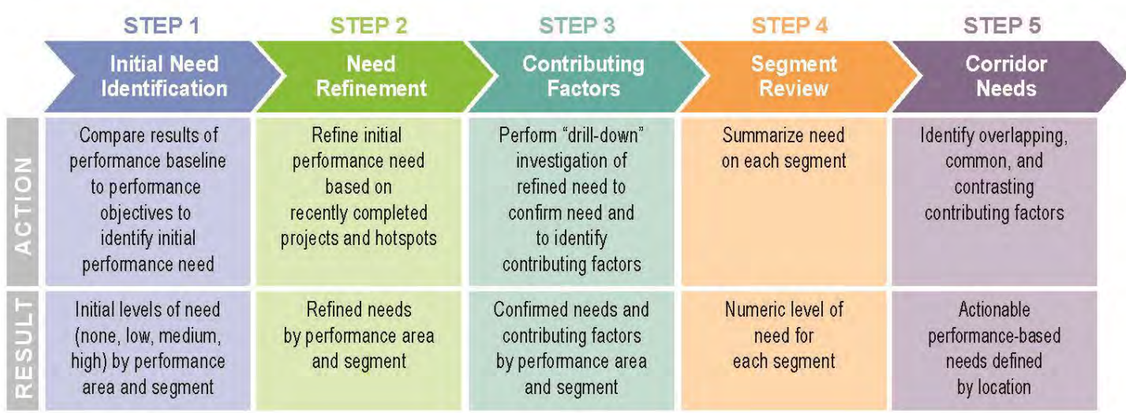
3.2 Needs Assessment Process

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 below 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		
5.0	Fair	Low	Middle 1/3 of Fair (5.5-6.0)
	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 2 and refined in Step 3 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 Refinement and Contributing Factors

- Segments 10W-1 to 10W-3, 10W-7 to 85-11 contain hot spots. All Segments show Low or Medium level of need except Segment 10W-2 which shows a "High" level of need
- There are various recently completed projects but do not impact the segment needs as they do not address enough of the corridor to impact performance or the pavement treatment chosen is a life extensions treatment, not a project that would eliminate the needs.
- 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					
10W-1	3.73	3.74	3.64	41%	0.60	EB MP 0-2, WB MP 3-4, WB MP 7-8, EB MP 11-12, EB/WB MP 12-16	None	Low
10W-2	3.14	3.03	3.47	92%	3.10	EB/WB 16-20, EB MP 20-21, EB/WB MP 21-22	None	High
10W-3	3.61	3.67	3.75	60%	0.60	EB/WB MP 22-27, WB MP 27-28, WB MP 29-30	None	Low
10W-4	3.99	4.16	4.37	0%	0.00	None	None	None
10W-5	4.51	4.09	4.18	0%	0.00	None	None	None
10W-6	4.31	4.03	4.09	18%	0.40	EB/WB MP 80-82	None	Low
10W-7	3.26	3.32	3.70	84%	1.80	EB/WB MP 82-90, EB/WB MP 91-98, EB MP 94-97, EB/WB MP 97-98	None	Medium
10W-8	3.64	3.60	3.76	43%	0.70	WB MP 98-99, EB/WB MP 99-100, EB MP 100-101, EB/WB MP 101-103, EB MP 103-104, WB MP 104-105, EB MP 106-109	None	Low
85-9	3.86	3.65	3.54	10%	0.00	SB MP 150-149	None	Low
85-10	3.61	3.67	3.92	32%	0.60	NP MP 148-147,SB MP 147-142, SB MP 141-140	None	Low
85-11	3.90	4.24	4.03	10%	0.00	SB MP 137-136, SB MP 133-132	None	Low
85-12	4.08	4.02	3.82	0%	0.00	None	None	None
85-13	3.92	3.80	3.48	0%	0.00	None	None	None
85-14	3.96	3.90	3.59	0%	0.00	None	None	None

Need Scales for Interstates

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

Need Scales for Highways (Non-Interstates)

Level of Need (Score)	Performance Score Need Scale			Segment Level Need Scale
None* (0)	> 3.33	> 3.30	< 10%	0
Low (1)	3.07 - 3.33	3.30 - 3.10	10% - 15%	< 1.5
Medium (2)	2.53 - 3.07	3.10 - 2.70	15% - 25%	1.5 - 2.5
High (3)	< 2.53	< 2.70	> 25%	> 2.5

Bridge Needs Refinement and Contributing Factors

- No Segments contain Bridge hot spots
- There are no recently completed projects along the Corridor impacting final segment need
- 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				
10W-1	6.75	83.24	5.00	0.2	None	None	Low
10W-2	6.15	92.98	5.00	0.2	None	None	Low
10W-3	6.00	86.37	6.00	0.0	None	None	None
10W-4	6.17	96.05	5.00	0.2	None	None	Low
10W-5	6.48	96.81	6.00	0.0	None	None	None
10W-6	7.00	97.05	7.00	0.0	None	None	None
10W-7	6.25	96.62	6.00	0.0	None	None	None
10W-8	6.44	96.35	5.00	0.2	None	None	Low
85-9	No Bridges	No Bridges	No Bridges	None	None	None	No Bridges
85-10	6.53	99.44	6.00	0.0	None	None	None
85-11	No Bridges	No Bridges	No Bridges	None	None	None	No Bridges
85-12	5.00	75.10	5.00	2.2	None	None	Medium
85-13	5.62	91.63	5.00	1.2	None	None	Low
85-14	6.86	96.40	6.00	0.0	None	None	None

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 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.*

Mobility Needs Refinement and Contributing Factors

- Overall Mobility needs are "None" or "Low" throughout the corridor except Segments 85-12 and 85-14 which have "High" need
- There are no recently completed projects along the I-10/SR 85 Corridor impacting final segment need
- 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			
			EB	WB	EB	WB	EB	WB				
10W-1	0.42	0.47	0.28	0.28	0.36	0.19	1.04	1.03	100%	0.1	None	Low
10W-2	0.40	0.45	0.24	0.23	0.33	0.27	1.03	1.03	100%	0	None	None
10W-3	0.42	0.47	0.25	0.24	0.08	0.82	1.02	1.02	99%	0.3	None	Low
10W-4	0.45	0.51	0.38	0.37	0.16	0.15	1.02	1.02	70%	0.2	None	Low
10W-5	0.37	0.42	0.19	0.18	0.08	0.13	1.02	1.02	100%	0	None	None
10W-6	0.41	0.46	0.16	0.19	0.22	0.22	1.02	1.02	100%	0	None	None
10W-7	0.40	0.45	0.25	0.27	0.26	0.36	1.02	1.02	75%	0.3	None	Low
10W-8	0.58	0.72	0.30	0.29	0.23	0.22	1.02	1.02	100%	0.4	None	Low
85-9	0.22	0.16	0.24	0.24	0.13	0.48	1.09	1.08	88%	0.1	None	Low
85-10	0.30	0.35	0.23	0.23	0.02	0.02	1.03	1.03	100%	0	None	None
85-11	0.24	0.28	0.14	0.13	0.04	0.05	1.04	1.03	94%	0	None	None
85-12	1.02	1.18	0.58	0.57	0.00	0.20	1.04	1.03	32%	4.2	None	High
85-13	0.55	0.62	0.33	0.31	0.00	0.00	1.09	1.12	47%	0.6	None	Low
85-14	1.40	2.41	0.31	0.28	0.00	0.00	1.10	1.10	42%	4.2	None	High

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]	> 80%	0
Low (1)	0.77 - 0.83 (Urban) 0.63 - 0.69 (Rural)	0.35 - 0.49	1.27 – 1.38	70% - 80%	< 1.5
Medium (2)	0.83 - 0.95 (Urban) 0.69 - 0.83 (Rural)	0.49 - 0.75	1.38 – 1.62	50% - 70%	1.5 - 2.5
High (3)	≥ 0.95 (Urban) ≥ 0.83 (Rural)	> 0.75	> 1.62	< 50%	> 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.*

Safety Needs Refinements and Contributing Factors

- Segments 10W-2, 10W-4, 10W-6, 10W-7, 85-9, and 85-12 has "High" safety needs
- 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									
10-1	0.93	0.40	1.46	Insufficient Data	76%	Insufficient Data	24%	Insufficient Data	1.1	WB MP 0-10, WB MP 10	Ehrenberg Rest Area (2024-25)	Low
10-2	2.28	1.90	2.65	Insufficient Data	40%	Insufficient Data	20%	Insufficient Data	3.6	None	None	High
10-3	0.92	1.14	0.71	Insufficient Data	67%	Insufficient Data	27%	Insufficient Data	0.8	None	None	Low
10-4	1.28	1.81	0.74	Insufficient Data	57%	Insufficient Data	39%	Insufficient Data	3.9	None	None	High
10-5	0.94	1.10	0.78	Insufficient Data	78%	Insufficient Data	19%	Insufficient Data	0.6	EB MP 60-70	None	Low
10-6	2.10	3.23	0.98	Insufficient Data	67%	Insufficient Data	27%	Insufficient Data	4	None	None	High
10-7	1.79	1.95	1.62	Insufficient Data	68%	Insufficient Data	27%	Insufficient Data	4.2	None	None	High
10-8	1.01	1.27	0.76	Insufficient Data	58%	Insufficient Data	16%	Insufficient Data	1.6	EB MP 100-110	Interchange Construction at Desert Creek TI (2022-23)	Medium
85-9	1.86	2.76	0.96	Insufficient Data	0%	Insufficient Data	30%	Insufficient Data	4	None	None	High
85-10	0.29	0.09	0.49	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0	None	None	None
85-11	0.26	0.02	0.49	Insufficient Data	80%	Insufficient Data	60%	Insufficient Data	1.2	None	None	Low
85-12	2.98	2.98	2.98	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	3.6	None	None	High
85-13	0.00	0.00	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0	None	None	None
85-14	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0	None	None	None

Level of Need (Score)		Performance Score Needs Scale					
None* (0)	a	≤ 0.95	≤ 0%	≤ 74%	≤ 2%	≤ 20%	≤ 0%
	b	≤ 0.93	≤ 0%	≤ 72%	≤ 2%	≤ 12%	≤ 0%
	c	≤ 0.97	≤ 13%	≤ 69%	≤ 5%	≤ 5%	≤ 1%
	d	≤ 0.94	≤ 25%	≤ 59%	≤ 3%	≤ 6%	≤ 1%
	e	≤ 0.93	≤ 46%	≤ 25%	≤ 10%	≤ 2%	≤ 2%
Low (1)	a	0.96 - 1.06	0%	75%	3%	21%	0%
	b	0.94 - 1.08	0%	75%	3%	15%	0%
	c	0.98 - 1.02	14%	72%	6%	6%	2%
	d	0.94 - 1.06	26%-27%	60%-61%	3%	7%	2%
	e	0.94 - 1.08	48%	29%	12%	4%	3%
Medium (2)	a	1.07 - 1.26	0%	76% - 77%	> 3% & < 4%	22% - 23%	≥ 1%
	b	1.09 - 1.36	0%	76% - 80%	4% - 5%	16% - 21%	0%
	c	1.03 - 1.12	15% - 16%	73% -76%	7%	7% -8%	3%
	d	1.07 - 1.31	28%- 30%	62%- 67%	4%	8%-11%	3%
	e	1.09 - 1.36	49% - 51%	30% - 35%	13% - 14%	5% - 6%	4%
High (3)	a	≥ 1.27	≥ 0%	≥ 78%	≥ 4%	≥ 24%	≥ 1%
	b	≥ 1.37	≥ 0%	≥ 81%	≥ 6%	≥ 22%	≥ 0%
	c	≥ 1.13	≥ 17%	≥ 77%	≥ 8%	≥ 9%	≥ 4%
	d	≥ 1.32	≥ 31%	≥ 68%	≥ 4%	≥ 12%	≥ 3%
	e	≥ 1.37	≥ 52%	≥ 36%	≥ 15%	≥ 7%	≥ 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.*

Freight Needs Refinements and Contributing Factors

- There are no bridge vertical clearance hot spots on the corridor
- Segment 10W-4 WB has “Medium” closure duration need
- All Segments have “None” or “Low” freight needs
- 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				
		EB	WB	EB	WB					
10W-1	1.11	1.12	1.09	97.22	26.10	16.17	0.3	None	None	Low
10W-2	1.06	1.06	1.05	39.34	30.40	15.92	0.4	None	None	Low
10W-3	1.05	1.05	1.05	13.18	100.93	16.16	0.6	None	None	Low
10W-4	1.05	1.05	1.05	23.91	21.59	15.9	0.4	Ramsey Mine Rd UP	None	Low
10W-5	1.04	1.04	1.04	12.31	14.75	16.2	0.2	None	None	Low
10W-6	1.04	1.04	1.04	21.31	25.01	16	0.4	None	None	Low
10W-7	1.05	1.05	1.04	30.07	50.94	16.58	0	None	None	None
10W-8	1.05	1.05	1.05	35.17	34.43	15.92	0.4	355th Ave Up, Oglesby Rd Ramp B UP, Oglesby Rd Ramp C UP	None	Low
85-9	1.29	1.30	1.28	20.67	66.04	No UP	0	None	None	None
85-10	1.07	1.07	1.06	2.18	2.18	No UP	0	None	None	None
85-11	1.20	1.19	1.20	7.48	7.67	No UP	0	None	None	None
85-12	1.20	1.19	1.20	0.00	20.00	No UP	0	None	None	None
85-13	1.32	1.26	1.37	0.00	0.00	16.61	0	None	None	None
85-14	1.59	1.57	1.62	0.00	0.00	No UP	1.1	None	None	Low

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

**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/SR 85 Corridor). There are no segments with a High average need, seven segments with a Medium average need, and seven segments with a Low average need.

Table 18: Summary of Needs by Segment

Performance Area	Segment Number and Mileposts (MP)													
	10W-1	10W-2	10W-3	10W-4	10W-5	10W-6	10W-7	10W-8	85-9	85-10	85-11	85-12	85-13	85-14
	MP 0-16	MP 16-22	MP 22-32	MP 32-54	MP 54-71	MP 71-82	MP 82-98	MP 98-113	MP 155-149	MP 149-138	MP 138-123	MP 123-120	MP 120-118	MP 120-123
Pavement	Low	High	Low	None	None	Low	Medium	Low	Low	Low	Low	None	None	None
Bridge	Low	Low	None	Low	None	None	None	Low	N/A	None	N/A	Medium	Low	None
Mobility*	Low	None	Low	Low	None	None	Low	Low	Low	None	None	High	Low	High
Safety*	Low	High	Low	High	Low	High	High	Medium	High	None	Low	High	None	None
Freight*	Low	Low	Low	Low	Low	Low	None	Low	None	None	None	None	None	Low
Average Need	**1.00**	**1.54**	**0.85**	**1.31**	**0.46**	**1.08**	**1.23**	**1.23**	**1.08**	**0.15**	**0.38**	**1.69**	**0.38**	**0.92**

Average Need Scale	
None*	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

+ Identified as an emphasis area for the I-10/SR 85 Corridor

** 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

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

Pavement Needs

- The Pavement Performance Area is not an emphasis area for the I-10/SR 85 Corridor.
- Segments 10W-4 and 10W-5 have a level of need of “None” and have no hot spots
- There are various recently completed projects but do not impact the segment needs as they do not address enough of the corridor to impact performance or the pavement treatment chosen is a life extensions treatment, not a project that would eliminate the needs.

Bridge Needs

- The Bridge Performance Area is not an emphasis area for the I-10/SR 85 Corridor.
- Segment 85-12 contains a Bridge hot spot
- There are no recently completed projects along the Corridor impacting final segment need

Mobility Needs

- The Mobility Performance Area is an emphasis area for the I-10/SR 85 Corridor.
- Overall Mobility needs are “Low” or “None” throughout the corridor, except 85-12 and 85-14 which show “High” need
- There are no recently completed projects along the I-10/SR 85 Corridor impacting final segment need

Safety Needs

- The Safety Performance Area is an emphasis area for the I-10/SR 85 Corridor.
- Segments 10W-2, 10W-4, 10W-6, 10W-7, 85-9, and 85-12 have “High” safety needs

Freight Needs

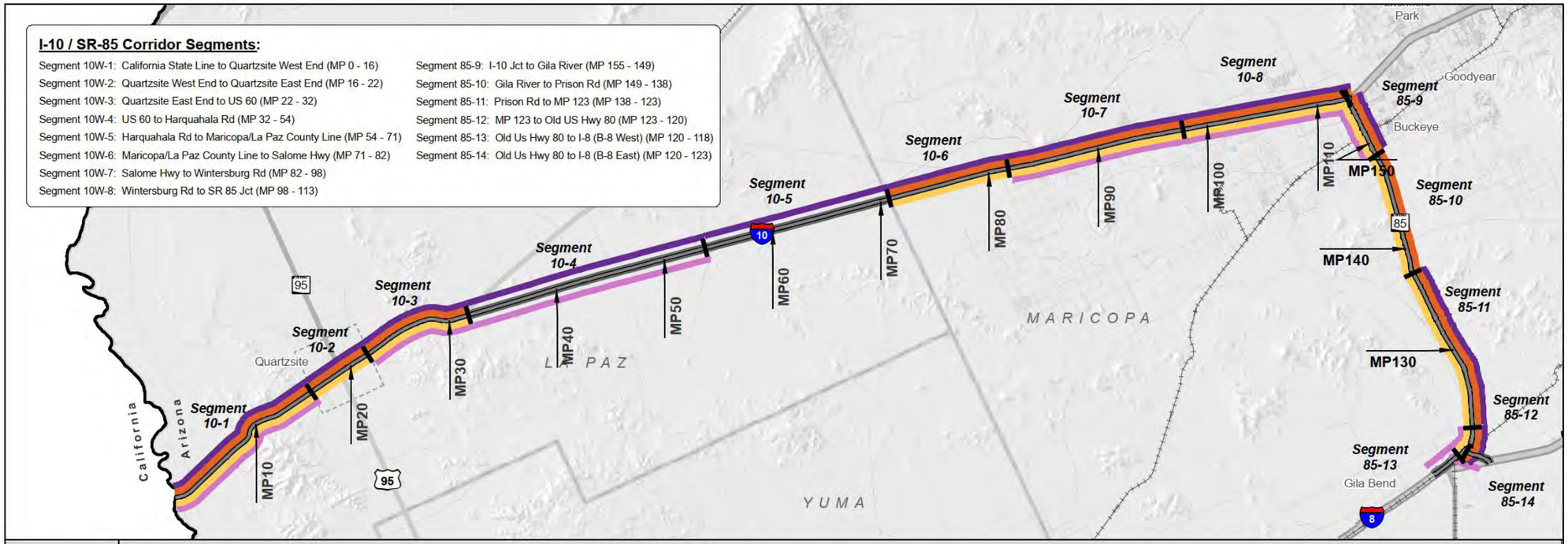
- The Freight Performance Area is an emphasis area for the I-10/SR 85 Corridor.
- There are four bridge vertical clearance hot spots on the corridor located in Segments 10W-4, and 10W-8
- No Segments have “High” closure duration need
- All Segments have “None” and “Low” freight needs

Overlapping Needs

This section identifies overlapping performance needs on the I-10/SR 85 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:

- Five segments I-10/SR 85 Corridor shows some level of need in four out of the five performance areas
- Segment 10W-2, 10W-4 and 85-12 have the highest levels of overall need
- Segments 10W-2, 10W-4, 10W-6, and 10W-7 have a “High” Emphasis Area need (Safety). Segments 85-12 and 85-14 have “High” Emphasis Area need (Mobility).

Figure 21: Corridor Needs Summary



Performance Area	Segment Number and Mileposts (MP)													
	10W-1	10W-2	10W-3	10W-4	10W-5	10W-6	10W-7	10W-8	85-9	85-10	85-11	85-12	85-13	85-14
	MP 0-16	MP 16-22	MP 22-32	MP 32-54	MP 54-71	MP 71-82	MP 82-98	MP 98-113	MP 155-149	MP 149-138	MP 138-123	MP 123-120	MP 120-118	MP 120-123
Pavement	Low	High	Low	None	None	Low	Medium	Low	Low	Low	Low	None	None	None
Bridge	Low	Low	None	Low	None	None	None	Low	N/A	None	N/A	Medium	Low	None
Mobility*	Low	None	Low	Low	None	None	Low	Low	Low	None	None	High	Low	High
Safety*	Low	High	Low	High	Low	High	High	Medium	High	None	Low	High	None	None
Freight*	Low	Low	Low	Low	Low	Low	None	Low	None	None	None	None	None	Low
Average Need	1.00	1.54	0.85	1.31	0.46	1.08	1.23	1.23	1.08	0.15	0.38	1.69	0.38	0.92

* Identified as Emphasis Area
[a] 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

I-10/SR-85 Corridor Profile Study: California State Line to I-8
Corridor Needs Summary

N

Miles
0 10 20

Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail

NEEDS SUMMARY
SAFETY
PAVEMENT
FREIGHT
MOBILITY
BRIDGE

Level of Need	Average Need
None	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

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/SR 85 strategic investment areas (resulting from the elevated needs) are shown in **Figure 22**.

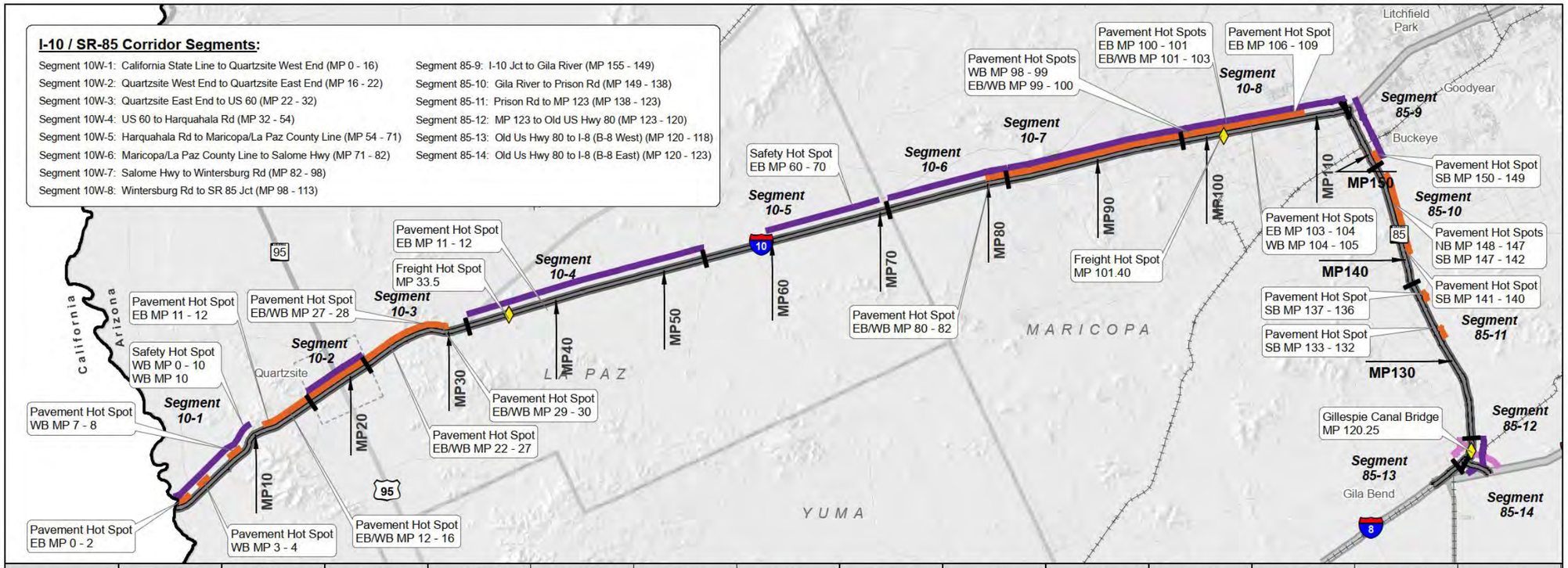
4.1 Screening Process

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	10W-1	10W-2	10W-3	10W-4	10W-5	10W-6	10W-7	10W-8	85-9	85-10	85-11	85-12	85-13	85-14
	MP 0-16	MP 16-22	MP 22-32	MP 32-54	MP 54-71	MP 71-82	MP 82-98	MP 98-113	MP 155-149	MP 149-138	MP 138-123	MP 123-120	MP 120-118	MP 120-123
Pavement	Hot Spot	High	Hot Spot	-	-	Hot Spot	Medium	Hot Spot	Hot Spot	Hot Spot	Hot Spot	-	-	-
Bridge	-	-	-	-	-	-	-	-	-	-	-	Medium	-	-
Mobility*	-	-	-	-	-	-	-	-	-	-	-	High	-	High
Safety*	Hot Spot	High	-	High	Hot Spot	High	High	Medium	High	-	-	High	-	-
Freight*	-	-	-	Hot Spot	-	-	-	Hot Spot	-	-	-	-	-	-

* Identified as Emphasis Areas for I-10W/SR 85 Corridor

N/A indicates insufficient or no data available to determine level of need

I-10/SR-85 Corridor Profile Study: California State Line to I-8
Strategic Investment Areas

N

Miles
0 10 20

Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail

NEEDS SUMMARY
SAFETY
PAVEMENT
FREIGHT
MOBILITY
BRIDGE

Level of Need
Low
Medium
High

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					
10W-1 MP 0-16	Hot Spot	-	-	Hot Spot	-	L1	Pavement	Pavement hot spot EB MP 0-2 (High Cracking and Rutting); High level of historical investment	Y	No programmed project to address the pavement hot spot; High level of historical investment.
						L2	Pavement	Pavement hot spot WB MP 3-4 (High IRI, Cracking, and Rutting); High level of historical investment	Y	No programmed project to address the pavement hot spot; High level of historical investment.
						L3	Pavement	Pavement hot spot WB 7-8 (High IRI, Cracking, and Rutting); High level of historical investment	Y	No programmed project to address the pavement hot spot; High level of historical investment.
						L4	Pavement	Pavement hot spot EB MP 11-12 (High Cracking and Rutting); High level of historical investment	Y	No programmed project to address the pavement hot spot; High level of historical investment.
						L5	Pavement	Pavement hot spot EB/WB MP 12-16 (High IRI and Cracking); High level of historical investment	Y	No programmed project to address the pavement hot spot; High level of historical investment.
						L6	Safety	Hot spots at WB MP 0-10. Crash trends show overturning (38%), collision with a fixed object (33%), and involve speed too fast for conditions (76%). Driver and road conditions show under the influence of drugs or alcohol (19%), no safety device used (19%), and involve dry conditions (86%)	Y	No programmed project to address the Safety hot spots.
10W-2 MP 16-22	High	-	-	High	-	L7	Pavement	Pavement shows a high level of need (High IRI, Cracking, and Rutting), with multiple hot spots at EB/WB MP 16-20, EB MP 20-21, EB/WB MP 21-22; Medium level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic.
						L8	Safety	Safety shows a High need. Crash trends show overturning (40%), running off the road (30%), and involve speed too fast for conditions (50%). Driver and road conditions show under the influence of drugs or alcohol (10%), no safety device used (10%), and involve dry conditions (100%)	Y	No programmed project to address the Safety need.
10W-3 MP 22-32	Hot Spot	-	-	-	-	L9	Pavement	Pavement hot spot EB/WB MP 22-27 (High IRI, Cracking, and Rutting); Low level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic
						L10	Pavement	Pavement hot spot WB MP 27-28 (Cracking and Rutting); Low level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic.
						L11	Pavement	Pavement hot spot WB MP 29-30 (Cracking and Rutting); Low level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic.
10W-4 MP 32-54	-	-	-	High	Hot Spot	L12	Safety	Safety shows a High need. Crash trends show overturning (43%), collision with another vehicle (35%), and involve speed too fast for conditions (65%). Driver and road conditions show fatigued/fell asleep (22%), no safety device used (13%), and involve dry conditions (91%)	Y	No programmed project to address the Safety need.
						L13	Freight	Freight hot spot at Ramsey Mine Rd UP (#1202, MP 33.78) Clearance is 16.16 with no ramp	Y	No programmed project to address the Freight hot spot.
10W-5 MP 54-71	-	-	-	Hot Spot	-	L14	Safety	Hot spots at EB MP 60-70. Crash trends show overturning (48%) and running off the road (45%). Driver and road conditions show fatigued/fell asleep (11%), no safety device used (15%), and involve dry conditions (96%)	Y	No programmed project to address the Safety hot spot.
10W-6 MP 71-82	Hot Spot	-	-	High	-	L15	Pavement	Pavement hot spot EB/WB MP 80-82 (High IRI, Cracking, and Rutting); Low level of historical investment has occurred on Segment 10W-6	N	Does not meet criteria for previous investment, therefore not considered strategic
						L16	Safety	Safety shows a High need. Crash trends show overturning (47%), collision with another vehicle (40%), and involve speed too fast for conditions (47%). Driver and road conditions show under the influence of drugs or alcohol (7%) and involve dry conditions (100%)	Y	No programmed project to address the 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					
10W-7 MP 82-98	Medium	-	-	High	-	L17	Pavement	Pavement shows Medium level of need with multiple hot spots at EB/WB MP 82-90, EB/WB MP 91-94, EB MP 94-97, EB/WB MP 97-98; Low level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic.
						L18	Safety	Crash trends show overturning (59%), collision with another vehicle (32%), and involve speed too fast for conditions (55%). Driver and road conditions show fatigued/fell asleep (14%), no safety device used (27%), and involve dry conditions (95%)	Y	No programmed project to address the Safety need.
10W-8 MP 98-113	Hot Spot	-	-	Medium	Hot Spot	L19	Pavement	Pavement hot spot WB MP 98-99 (High Cracking and Rutting); Low level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic.
						L20	Pavement	Pavement hot spot EB/WB MP 99-100 (High Rutting); Low level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic.
						L21	Pavement	Pavement hot spot EB MP 100-101 (High IRI and Rutting); Low level of historical need	N	Does not meet criteria for previous investment, therefore not considered strategic.
						L22	Pavement	Pavement hot spot EB/WB MP 101-103 (High Cracking and Rutting); Low level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic.
						L23	Pavement	Pavement hot spot EB MP 103-104 (Higher Rutting); Low level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic.
						L24	Pavement	Pavement hot spot WB MP 104-105 (High Cracking and Rutting); Low level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic.
						L25	Pavement	Pavement hot spot EB MP 106-109 (High IRI and Cracking); Low level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic.
						L26	Safety	Hot spots at EB MP 100-110. Crash trends show overturning (42%), collision with another vehicle (42%), and involve speed too fast for conditions (47%). Driver and road conditions show under the influence of drugs or alcohol (11%), no safety device used (11%), and involve dry conditions (95%)	Y	No programmed project to address the Safety need.
						L27	Freight	Freight hot spot at 355th Ave UP (#1647, MP 101.40). Clearance is 16.00 with no ramp	Y	No programmed project to address the Freight hot spot.
						L28	Freight	Freight hot spot at Oglesby Rd Ramp B UP (#1725, MP 112.75). Clearance is 15.92 with no ramp	Y	No programmed project to address the Freight hot spot.
						L29	Freight	Freight hot spot at Oglesby Rd Ramp C UP (#1726, MP 112.92). Clearance is 15.92 with no ramp	Y	No programmed project to address the Freight hot spot.
85-9 MP 155-149	Hot Spot	-	-	-	-	L30	Pavement	Pavement hot spot SB MP 150-149; Low level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic.
	-	-	-	High	-	L31	Safety	Crash trends show collision with another vehicle (90%), running STOP signs (40%), and speed too fast for conditions (30%). Driver and road conditions show under the influence of drugs or alcohol (10%) and involve dry conditions (90%)	Y	No programmed project to address the 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					
85-10 MP 149-138	Hot Spot	-	-	-	-	L32	Pavement	Pavement hot spot NB MP 148-147 (High IRI and Rutting); Medium level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic; Programmed pavement rehab (2022) project will address the pavement hot spot.
						L33	Pavement	Pavement hot spot SB MP 147-142 (High IRI, Cracking, and Rutting); Medium level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic; Programmed pavement rehab (2022) project will address the pavement hot spot.
						L34	Pavement	Pavement hot spot SB MP 141-140 (High Cracking and Rutting); Medium level of historical investment	N	Does not meet criteria for previous investment, therefore not considered strategic; Programmed pavement rehab (2022) project will address the pavement hot spot.
85-11 MP 138-123	Hot Spot	-	-	-	-	L34	Pavement	Pavement hot spot SB MP 137-136 (Higher Cracking and Rutting); High level of historical investment	N	No programmed project to address the pavement hot spot; High level of historical investment.
						L35	Pavement	Pavement hot spot SB MP 133-132 (Cracking); High level of historical investment has	N	No programmed project to address the pavement hot spot; High level of historical investment.
85-12 MP 123-120	-	Medium	High	-	-	L36	Mobility	Mobility needs primarily associated with high Mobility Index, Future V/C levels, poor % non-SOV travel, and poor bicycle accommodation	Y	No programmed project to address the Mobility need.
						L37	Bridge	Bridge shows a Medium level of need. Gillespie Canal Br (#465, MP 120.25), Super (5) without a historical investment issue	N	Bridge does not meet criteria for historical review, therefore not considered strategic.
85-13 MP 120-118	-	-	-	-	-	No Strategic Needs Identified				
85-14 MP 120-123	-	-	High	-	-	L38	Mobility	Mobility shows a High need primarily associated with High Mobility Index, Future V/C levels, poor % Non-SOV Travel, and poor % bicycle accommodation	Y	No programmed project to address the Mobility need.

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/SR 85 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 22 candidate solutions are proposed to address the identified needs on the I-10/SR 85 Corridor.

Table 20 identifies each strategic location that has been assigned a candidate solution with a number (e.g., CS10W.1, CS10W.2, CS85.12 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

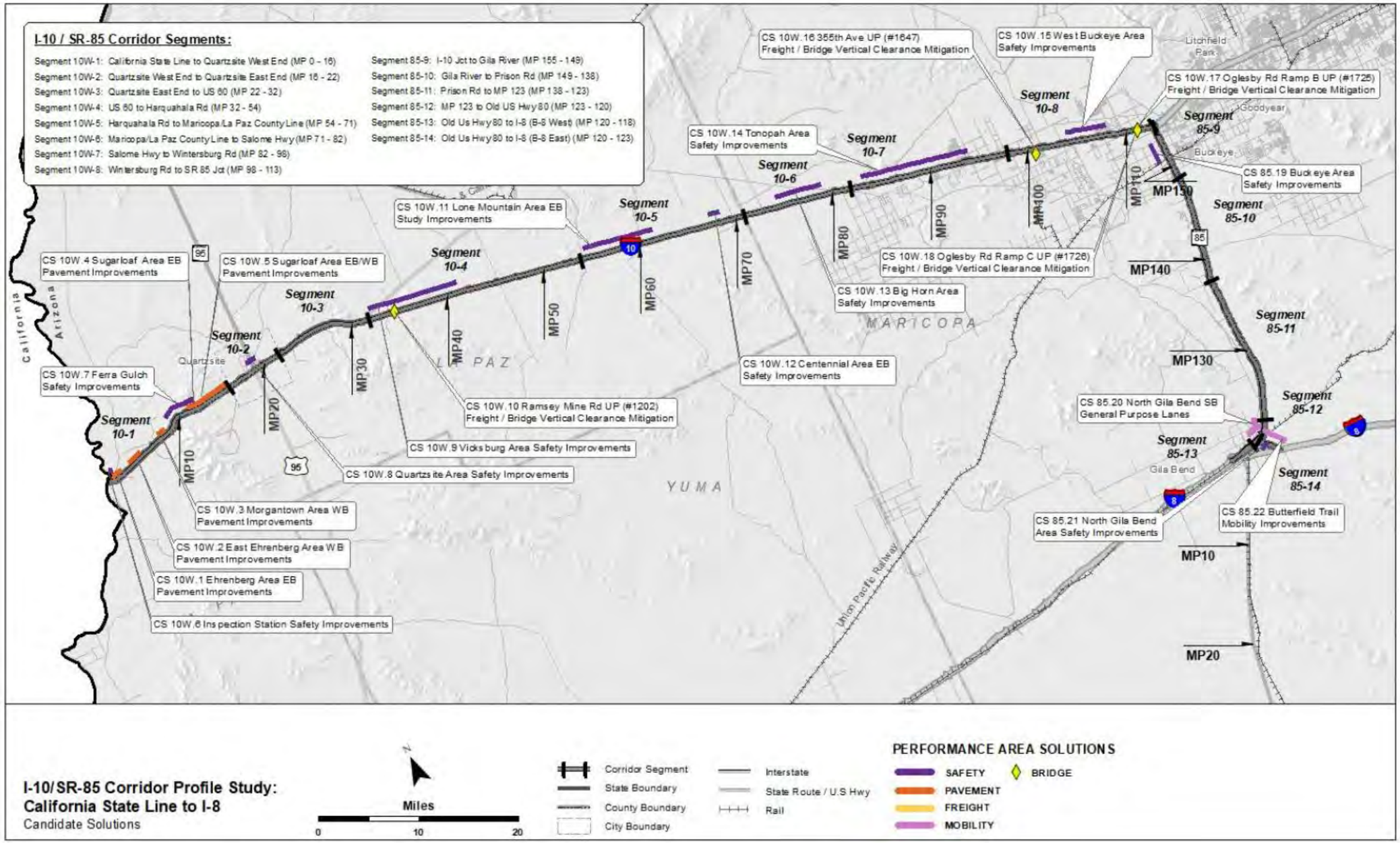
Candidate Solution #	Segment #	Location #	Beginning Milepost	Ending Milepost	Candidate Solution Name	Option*	Candidate Solution Scope	Investment Category (Preservation [P] Modernization [M] Expansion [E])
CS10W.1	10-1	L1	0	2	Ehrenberg Area EB Pavement Improvements	A	-Rehabilitate pavement	P
						B	-Replace pavement	M
CS10W.2	10-1	L2	3	4	East Ehrenberg Area WB Pavement Improvements	A	-Rehabilitate pavement	P
						B	-Replace pavement	M
CS10W.3	10-1	L3	7	8	Morgantown Area WB Pavement Improvements	A	-Rehabilitate pavement	P
						B	-Replace pavement	M
CS10W.4	10-1	L4	11	12	Sugarloaf Area EB Pavement Improvements	A	-Rehabilitate pavement	P
						B	-Replace pavement	M
CS10W.5	10-1	L5	12	16	Sugarloaf Area EB/WB Pavement Improvements	A	-Rehabilitate pavement	P
						B	-Replace pavement	M
CS10W.6	10-1	L6	0	1	Inspection Station Safety Improvements	-	-Install flashing beacons and regulatory/warning signs approaching the CA border inspection station at WB MP 1 -Install transverse rumble strips at WB MP 0.5 -Install westbound speed feedback sign at WB MP 0.5	M
CS10W.7	10-1	L6	9	12	Ferra Gulch Area Safety Improvements	-	-Install chevrons along the curve, delineators, and raised reflective pavement markers -Install a westbound speed feedback sign at MP 11	M
CS10W.8	10-2	L8	18.5	19.5	Quartzsite Area Safety Improvements	-	-Install an eastbound speed feedback sign at MP 18.5 -Install pedestrian fencing or other barriers along each side of the highway from Central Avenue to Riggles Avenue, to prevent pedestrians from crossing the highway	M
CS10W.9	10-4	L12	32	41	Vicksburg Area Safety Improvements	-	-Install reflective raised pavement markers on both edges of traveled way. Install speed feedback signs at MP 41 -Widen eastbound outside shoulder between MP 39.1 – MP 39.4 in areas adjacent to guardrail to provide space for disabled vehicles	M
CS10W.10	10-4	L13	33.78	33.78	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	A	-Reprofile mainline	M
						B	-Replace bridge	M
CS10W.11	10-5	L14	55	62	Lone Mountain Area EB Safety Improvements	-	-Widen EB inside shoulder	M
CS10W.12	10-5	L14	67.5	68.5	Centennial Area EB Safety Improvements	-	-Widen shoulders -Install an eastbound speed feedback sign at MP 68	M
CS10W.13	10-6	L16	74	79	Big Horn Area Safety Improvements	-	-Widen shoulders, and clear vegetation near the roadway -Install speed feedback signs at eastbound MP 76 and westbound MP 75 -Install guardrail near the drainage underpass at 74.75 in both directions	M
CS10W.14	10-7	L18	83	94	Tonopah Area Safety Improvements	-	-Widen shoulders (MP83-90) -Install eastbound speed feedback signs at MP 83.5 and MP 89.5 -Install westbound speed feedback sign at MP 93.5	M

Table 20: Candidate Solutions (continued)

Candidate Solution #	Segment #	Location #	Beginning Milepost	Ending Milepost	Candidate Solution Name	Option*	Candidate Solution Scope	Investment Category (Preservation [P] Modernization [M] Expansion [E])
CS10W.15	10-8	L26	104	108	West Buckeye Area Safety Improvements	-	-Widen median shoulders -Install an eastbound speed feedback sign at MP 104	M
CS10W.16	10-8	L27	101.40	101.40	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	A	-Reprofile mainline	M
						B	-Replace bridge	M
CS10W.17	10-8	L28	112.75	112.75	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	A	-Reprofile mainline	M
						B	-Replace bridge	M
CS10W.18	10-8	L29	112.92	112.92	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	A	-Reprofile mainline	M
						B	-Replace bridge	M
CS85.19	85-9	L30	151	153	Buckeye Area Safety Improvements	A	-Construct grade-separated interchanges at Broadway, Southern, and Baseline Roads	M
						B	-Construct dual double-lane roundabouts at Broadway, Southern, and Baseline Roads	M
CS85.20	85-12	L36	123	120	North Gila Bend SB General Purpose Lanes	-	-Construct 2 SB general purpose lanes west of existing alignment to create 4-lane divided highway between MP 123 and Maricopa Rd. Existing alignment to become 2 NB general purpose lanes	E
CS85.21	85.12	L36	122	123.1	North Gila Bend Area Safety Improvements	-	-Install raised pavement markers in both directions from MP 122.75 – MP 123 -Restripe centerline rumble strip from MP 122 - MP 123	M
CS85.22	85-14	L38	120	123	Butterfield Trail Mobility Improvements	A	-Widen to two lanes in each direction w/center left turn lane	E
						B	-Widen to add center left turn lane and widen shoulder on both sides	M

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

Figure 23: Candidate Solutions



5. 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.

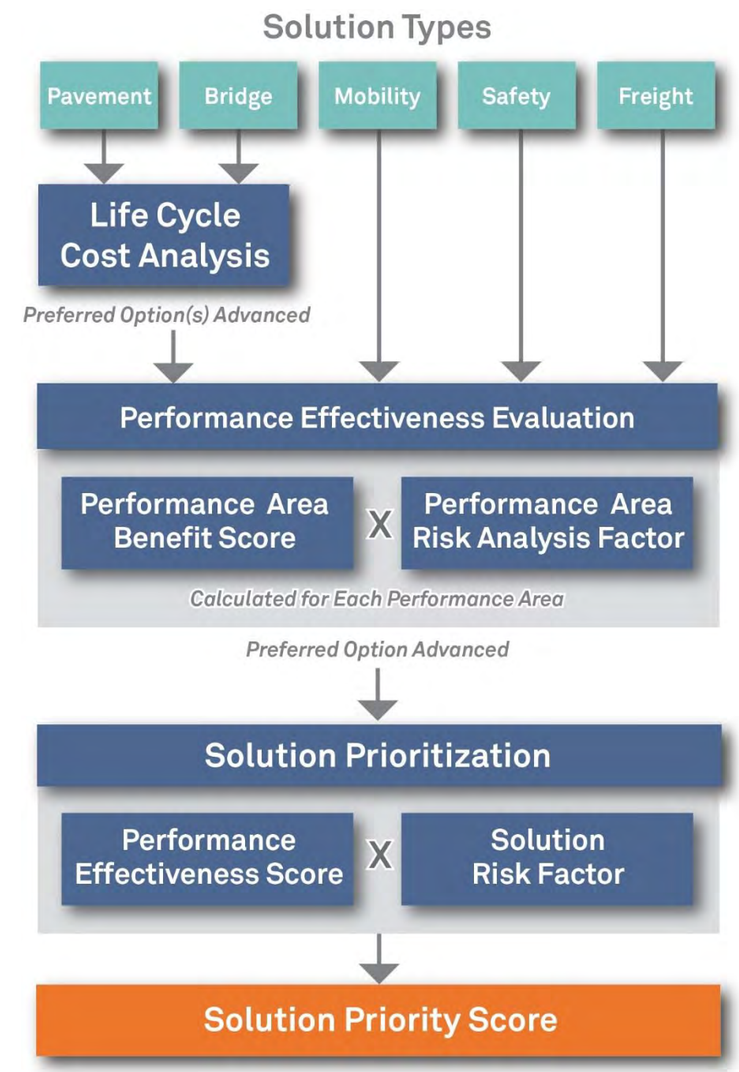
Solution Risk Analysis

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 not conducted for any bridge solutions on the I-10/SR 85 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 five pavement solution on the I-10/SR 85 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:

- Rehabilitation or repair was determined to be the most effective approach for the candidate solutions listed below. Therefore, it is assumed that the identified needs will be addressed by normal programming processes and these candidate solutions will be dropped from further consideration.
  - Ehrenberg Area EB Pavement Improvements (CS 10W.1)
  - East Ehrenberg Area WB Pavement Improvements (CS 10W.2)
  - Morgantown Area WB Pavement Improvements (CS 10W. 3)
  - Sugarloaf Area EB/WB Pavement Improvements (CS 10W.5)
- Replacement or reconstruction was determined to be the most effective approach for the candidate solutions listed below; the replacement/reconstruction option of these solutions was carried forward to the Performance Effectiveness Evaluation:
  - Sugarloaf Area EB Pavement Improvements (CS 10W.4)

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		
No LCCA conducted for any bridges on the I-10/SR 85 Corridor.								

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		
Ehrenberg Area EB Pavement Improvements (CS 10W.1 EB MP 0 – MP 2)	$15,307,836	$14,012,198	$10,979,690	$12,242,639	1.39	1.28	1.00	1.12	Y	Asphalt rehabilitation is the lowest option and reconstruction is not within 15% of lowest cost - Not strategic as a stand-alone solution
East Ehrenberg Area WB Pavement Improvements (CS 10W.2 WB MP 3 – MP 4)	$7,653,918	$7,006,099	$5,489,845	$6,121,319	1.39	1.28	1.00	1.12	Y	Asphalt rehabilitation is the lowest option and reconstruction is not within 15% of lowest cost - Not strategic as a stand-alone solution
Morgantown Area WB Pavement Improvements (CS 10W.3 WB MP 7 – MP 8)	$7,653,918	$6,864,302	$5,489,845	$6,121,319	1.39	1.25	1.00	1.12	Y	Asphalt rehabilitation is the lowest option and reconstruction is not within 15% of lowest cost - Not strategic as a stand-alone solution
Sugarloaf Area EB Pavement Improvements (CS 10W.4 EB MP 11 – MP 12)	$7,653,918	$7,006,099	$6,648,198	$6,121,319	1.25	1.14	1.09	1.00	Y	Asphalt rehabilitation is the lowest option and asphalt reconstruction is within 15% of the lowest rehabilitation cost - Replacement is recommended
Sugarloaf Area EB/WB Pavement Improvements (CS 10W.5 MP 12 – MP 16)	$61,231,342	$56,048,790	$43,918,759	$48,970,556	1.39	1.28	1.00	1.12	Y	Asphalt rehabilitation is the lowest option and reconstruction is not within 15% of lowest cost - Not strategic as a stand-alone solution

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)
- 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/SR 85 Corridor, the following candidate solutions have options to address Mobility, Safety, or Freight needs:

- CS10W.10 (A and B) – Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation
- CS10W.16 (A and B) – 355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation
- CS10W.17 (A and B) – Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation
- CS10W.18 (A and B) – Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation
- CS10W. 22 (A and B) – Butterfield Trail Mobility Improvements

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	Safety	Mobility	Freight				
CS10W.4	10-1	B	Sugarloaf Area EB Pavement Improvements	11-12	$6.26	0.000	0.000	0.000	0.002	0.000	0.959	0.000	0.000	0.961	0.82	15.3	1.92
CS10W.6	10-1	-	Inspection Station Safety Improvements	0-1	$0.13	0.000	0.000	0.000	0.007	0.012	0.960	0.000	0.001	0.981	1.50	15.30	170.4
CS10W.7	10-1	-	Ferra Gulch Area Safety Improvements	9-12	$0.27	0.000	0.000	0.008	0.163	0.650	1.056	0.000	0.081	1.958	3.28	15.30	371.0
CS10W.8	10-2	-	Quartzsite Area Safety Improvements	18.5-19.5	$0.79	0.000	0.000	0.008	2.467	0.004	1.059	0.000	0.042	3.580	1.43	15.30	98.8
CS10W.9	10-4	-	Vicksburg Area Safety Improvements	32-41	$0.47	0.000	0.000	0.008	1.227	0.002	1.221	0.000	0.101	2.558	4.86	15.30	402.9
CS10W.10	10-4	A	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	33.78	$0.84	0.000	0.000	0.000	0.000	2.572	1.017	0.000	0.000	3.589	0.90	8.80	33.7
CS10W.10	10-4	B	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	33.78	$7.19	0.000	1.000	0.000	0.000	2.650	1.017	0.000	0.000	4.667	0.90	30.60	17.8
CS10W.11	10-5	-	Lone Mountain Area EB Safety Improvements	55-62	$7.75	0.000	0.000	0.002	0.148	0.000	0.943	0.000	0.019	1.112	3.37	15.30	7.4
CS10W.12	10-5	-	Centennial Area EB Safety Improvements	67.5-68.5	$1.19	0.000	0.000	0.001	0.116	0.000	0.934	0.000	0.015	1.066	0.74	15.30	10.2
CS10W.13	10-6	-	Big Horn Area Safety Improvements	74-79	$3.19	0.000	0.000	0.004	1.783	0.001	1.138	0.000	0.059	2.986	4.17	15.30	59.7
CS10W.14	10-7	-	Tonopah Area Safety Improvements	83-94	$10.66	0.000	0.000	0.023	2.886	0.003	1.379	0.000	0.117	4.409	4.88	15.30	30.9
CS10W.15	10-8	-	West Buckeye Area Safety Improvements	104-108	$3.99	0.000	0.000	0.008	0.990	0.002	1.248	0.000	0.092	2.338	4.19	15.30	37.6
CS10W.16	10-8	A	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	104.40	$0.84	0.000	0.000	0.000	0.000	1.980	0.000	0.000	0.000	1.980	1.02	8.80	21.0

*: See **Table 24** for total construction costs

Table 24: 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	Safety	Mobility	Freight				
CS10W.16	10-8	B	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	104.40	$2.92	0.000	0.000	0.000	0.000	2.558	0.000	0.000	0.000	2.558	1.02	30.60	27.3
CS10W.17	10-8	A	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	112.75	$0.84	0.000	0.000	0.003	0.279	1.464	1.114	0.000	0.000	2.859	1.02	8.80	30.4
CS10W.17	10-8	B	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	112.75	$5.4	0.000	0.000	0.000	0.000	2.558	0.000	0.000	0.000	2.558	1.02	30.60	14.8
CS10W.18	10-8	A	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	112.92	$0.84	0.000	0.000	0.003	0.279	1.464	1.114	0.000	0.013	2.872	1.02	8.80	30.5
CS10W.18	10-8	B	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	112.92	$5.52	0.000	0.062	0.000	0.048	1.380	1.097	0.000	0.002	2.589	1.02	30.60	14.6
CS85.19	85-9	A	Buckeye Area Safety Improvements	151-153	$46.71	0.000	0.000	0.040	5.673	0.005	1.684	0.000	0.083	7.485	1.97	20.20	6.4
CS85.19	85-9	B	Buckeye Area Safety Improvements	151-153	$152.86	0.000	0.000	0.040	3.798	0.003	1.576	0.000	0.057	5.474	1.97	20.20	1.4
CS85.20	85-12	-	North Gila Bend SB General Purpose Lanes	120-123	$20.75	0.000	0.000	28.243	0.000	0.000	2.819	0.093	0.031	31.186	1.04	20.20	31.6
CS85.21	85-12	-	North Gila Bend Area Safety Improvements	122-123.1	$0.52	0.000	0.000	0.004	0.000	0.415	2.908	0.000	0.022	3.349	0.41	15.30	40.5
CS85.22	8-14	A	Butterfield Trail Mobility Improvements	120-123	$20.44	0.000	0.000	56.412	0.000	0.000	0.000	0.145	0.000	56.557	0.85	20.20	47.5
CS85.22	8-14	B	Butterfield Trail Mobility Improvements	120-123	$13.66	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.85	20.20	0.0

*: See **Table 24** 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 25: 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
CS10W.4	10-1	B	Sugarloaf Area EB Pavement Improvements	11-12	$6.26	1.92	1.780	1.00	**3**	9.86%	0.00%	0.01%	0.12%	0.00%
CS10W.6	10-1	-	Inspection Station Safety Improvements	0-1	$0.13	170.4	1.774	1.00	**302**	0.00%	0.00%	0.01%	0.40%	0.32%
CS10W.7	10-1	-	Ferra Gulch Area Safety Improvements	9-12	$0.27	371.0	1.622	1.00	**602**	0.00%	0.00%	0.22%	9.06%	17.48%
CS10W.8	10-2	-	Quartzsite Area Safety Improvements	18.5-19.5	$0.79	98.8	1.774	1.54	**270**	0.00%	0.00%	0.33%	27.25%	0.11%
CS10W.9	10-4	-	Vicksburg Area Safety Improvements	32-41	$0.47	402.9	1.762	1.31	**928**	-	0.00%	0.13%	26.21%	0.76%
CS10W.10	10-4	A	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	33.78	$0.84	33.7	1.479	1.31	**65**	-	0.00%	0.00%	0.00%	37.85%
CS10W.10	10-4	B	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	33.78	$7.19	17.8	1.484	1.31	**35**	-	83.72%	0.00%	0.00%	38.99%
CS10W.11	10-5	-	Lone Mountain Area EB Safety Improvements	55-62	$7.75	7.4	1.772	0.46	**6**	-	0.00%	0.06%	12.48%	0.00%
CS10W.12	10-5	-	Centennial Area EB Safety Improvements	67.5-68.5	$1.19	10.2	1.774	0.46	**8**	-	0.00%	0.06%	9.72%	0.00%
CS10W.13	10-6	-	Big Horn Area Safety Improvements	74-79	$3.19	59.7	1.771	1.08	**114**	0.00%	-	0.12%	20.10%	0.05%
CS10W.14	10-7	-	Tonopah Area Safety Improvements	83-94	$10.66	30.9	1.766	1.23	**67**	0.00%	30.76%	0.44%	40.73%	0.58%
CS10W.15	10-8	-	West Buckeye Area Safety Improvements	104-108	$3.99	37.6	1.762	1.23	**81**	0.00%	46.14%	0.13%	42.56%	0.05%
CS10W.16	10-8	A	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	104.40	$0.84	21.0	1.360	1.23	**35**	0.00%	0.00%	0.00%	0.00%	29.10%
CS10W.16	10-8	B	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	104.40	$2.92	27.3	1.360	1.23	**46**	0.00%	0.00%	0.00%	0.00%	37.61%
CS10W.17	10-8	A	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	112.75	$0.84	30.4	1.565	1.23	**58**	0.00%	11.97%	0.07%	11.99%	21.52%
CS10W.17	10-8	B	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	112.75	$5.4	14.8	1.360	1.23	**25**	0.00%	0.00%	0.00%	0.00%	37.61%

Table 26: 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
CS10W.18	10-8	A	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	112.92	$0.84	30.5	1.564	1.23	**59**	0.00%	11.97%	0.07%	11.99%	21.52%
CS10W.18	10-8	B	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	112.92	$5.52	14.6	1.549	1.23	**28**	0.00%	2.00%	0.01%	2.06%	20.28%
CS85.19	85-9	A	Buckeye Area Safety Improvements	151-153	$46.71	6.4	1.773	1.08	**12**	0.00%	75.71%	1.72%	54.21%	1.40%
CS85.19	85-9	B	Buckeye Area Safety Improvements	151-153	$152.86	1.4	1.772	1.08	**3**	0.00%	75.71%	1.70%	36.30%	0.95%
CS85.20	85-12	-	North Gila Bend SB General Purpose Lanes	120-123	$20.75	31.6	1.398	1.69	**75**	-	0.00%	78.67%	0.00%	0.00%
CS85.21	85-12	-	North Gila Bend Area Safety Improvements	122-123.1	$0.52	40.5	1.725	1.69	**118**	-	0.00%	0.01%	0.00%	15.98%
CS85.22	8-14	A	Butterfield Trail Mobility Improvements	120-123	$20.44	47.5	1.360	0.92	**60**	-	-	80.75%	-	0.00%
CS85.22	8-14	B	Butterfield Trail Mobility Improvements	120-123	$13.66	0.0	0.000	0.92	**0**	-	-	0.00%	-	0.00%

6. 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/SR 85 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/SR 85 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 solutions address needs near Vicksburg (MP 39-41), Dome Rock (MP 12), and Quartzsite (MP 18) areas, each including safety improvements.

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/SR 85 Corridor:

- When recommending future projects along the I-10/SR 85 Corridor, review historical ratings and levels of investment.
- Continue to pursue funding and support the ultimate plan for SR 85 as a full divided facility and for the development of the SR85/I-8 interchange in the future per the approved Design Concept Report and plans to connect with the future SR 30 corridor.
- Review intersection traffic control (minor-street stop control, all-way stop control, signalization), enhance intersection features; potential strategies include larger STOP signs, secondary (left) STOP signs, STOP ahead signs, and pavement marking improvements along SR 85 near Buckeye between MP 151-153.

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/SR 85 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

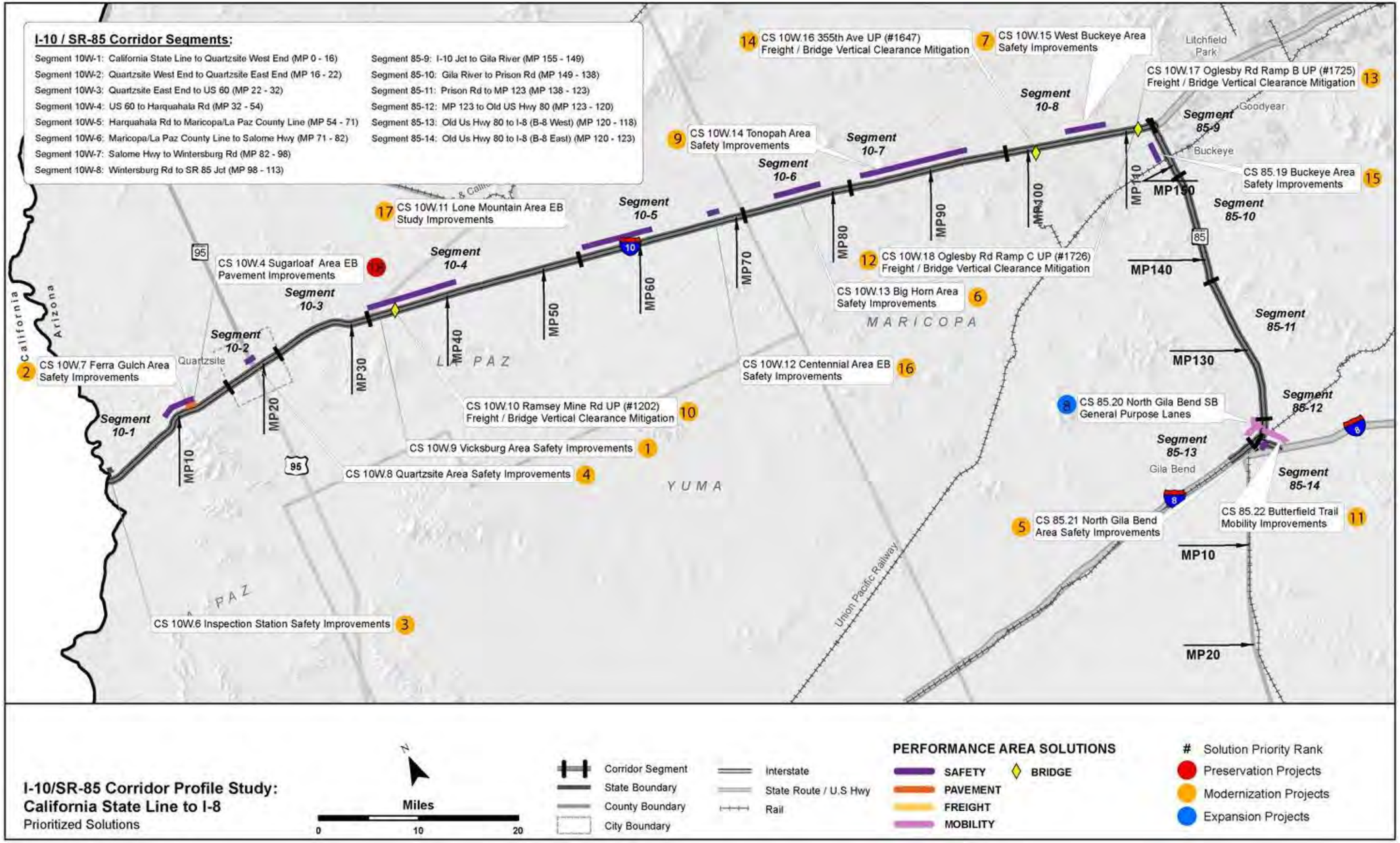
Table 27: Prioritized Recommended Solutions

Rank	Candidate Solution #	Segment #	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
1	CS10W.9	10W-4	Vicksburg Area Safety Improvements	-Install reflective raised pavement markers on both edges of traveled way. Install speed feedback signs at MP 41 -Widen eastbound outside shoulder between MP 39.1 – MP 39.4 in areas adjacent to guardrail to provide space for disabled vehicles	$0.47	M	**928**
2	CS10W.7	10W-1	Ferra Gulch Area Safety Improvements	-Install chevrons along the curve, delineators, and raised reflective pavement markers -Install a westbound speed feedback sign at MP 12	$0.27	M	**602**
3	CS10W.6	10W-1	Inspection Station Safety Improvements	-Install flashing beacons and regulatory/warning signs approaching the CA border inspection station at WB MP 1 -Install transverse rumble strips at WB MP 0.5 -Install westbound speed feedback sign at WB MP 0.5	$0.13	M	**302**
4	CS10W.8	10W-2	Quartzsite Area Safety Improvements	-Install an eastbound speed feedback sign at MP 18.5 -Install pedestrian fencing or other barriers along each side of the highway from Central Avenue to Riggles Avenue, to prevent pedestrians from crossing the highway	$0.79	M	**270**
5	CS85.21	10W-12	North Gila Bend Area Safety Improvements	-Install raised pavement markers in both directions from MP 122.75 – MP 123 -Restripe centerline rumble strip from MP 122 - MP 123	$0.52	M	**118**
6	CS10W.13	10W-6	Big Horn Area Safety Improvements	-Widen shoulders, improving roadside slope, and clear vegetation near the roadway -Install speed feedback signs at eastbound MP 76 and westbound MP 75 -Install guardrail near the drainage underpass at 74.75 in both directions	$3.19	M	**114**
7	CS10W.15	10W-8	West Buckeye Area Safety Improvements	-Widen median shoulders and improve median slope -Install raised reflective pavement markers -Install an eastbound speed feedback sign at MP 104	$3.99	M	**81**
8	CS85.20	10W-12	North Gila Bend SB General Purpose Lanes	-Construct 2 SB general purpose lanes west of existing alignment to create 4-lane divided highway between MP 123 and Maricopa Rd. Existing alignment to become 2 NB general purpose lanes	$20.75	E	**75**
9	CS10W.14	10W-7	Tonopah Area Safety Improvements	-Widen shoulders (MP83-90) -Install eastbound speed feedback signs at MP 83.5 and MP 89.5 -Install westbound speed feedback sign at MP 93.5	$10.66	M	**67**
10	CS10W.10	10W-4	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation (Option A)	-Reprofile mainline	$0.84	M	**65**
			Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation (Option B)	-Replace bridge	$7.19	M	**35**
11	CS85.22	10W-14	Butterfield Trail Mobility Improvements (Option A)	-Widen to two lanes in each direction w/center left turn lane	$20.44	E	**60**
			Butterfield Trail Mobility Improvements (Option B)	-Widen to add center left turn lane and widen shoulder on both sides	$13.66	M	**0**

Table 28: Prioritized Recommended Solutions (continued)

Rank	Candidate Solution #	Segment #	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
12	CS10W.18	10W-8	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation (Option A)	-Reprofile mainline	$0.84	M	**59**
			Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation (Option B)	-Replace bridge	$5.52	M	**28**
13	CS10W.17	10W-8	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation (Option A)	-Reprofile mainline	$0.84	M	**58**
			Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation (Option B)	-Replace bridge	$5.40	M	**25**
14	CS10W.16	10W-8	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation (Option B)	-Replace bridge	$2.92	M	**46**
			355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation (Option A)	-Reprofile mainline	$0.84	M	**35**
15	CS85.19	10W-9	Buckeye Area Safety Improvements (Option A)	Construct dual double-lane roundabouts at Broadway, South, and Baseline Roads	$46.71	M	**12**
			Buckeye Area Safety Improvements (Option B)	Construct grade separations at Broadway, Southern, and Baseline Roads	$152.86	E	**3**
16	CS10W.12	10W-5	Centennial Area EB Safety Improvements	-Widen shoulders and improve median slopes to reduce injury severity of lane departure crashes. -Install raised reflective pavement markers to prevent lane departure crashes -Install an eastbound speed feedback sign at MP 68	$1.19	M	**8**
17	CS10W.11	10W-5	Lone Mountain Area EB Safety Improvements	-Widen EB inside shoulder	$7.75	M	**6**
18	CS10W.4	10W-1	Sugarloaf Area EB Pavement Improvements (Option B)	-Replace pavement	$6.26	P	**3**

Figure 27: Prioritized Recommended Solutions

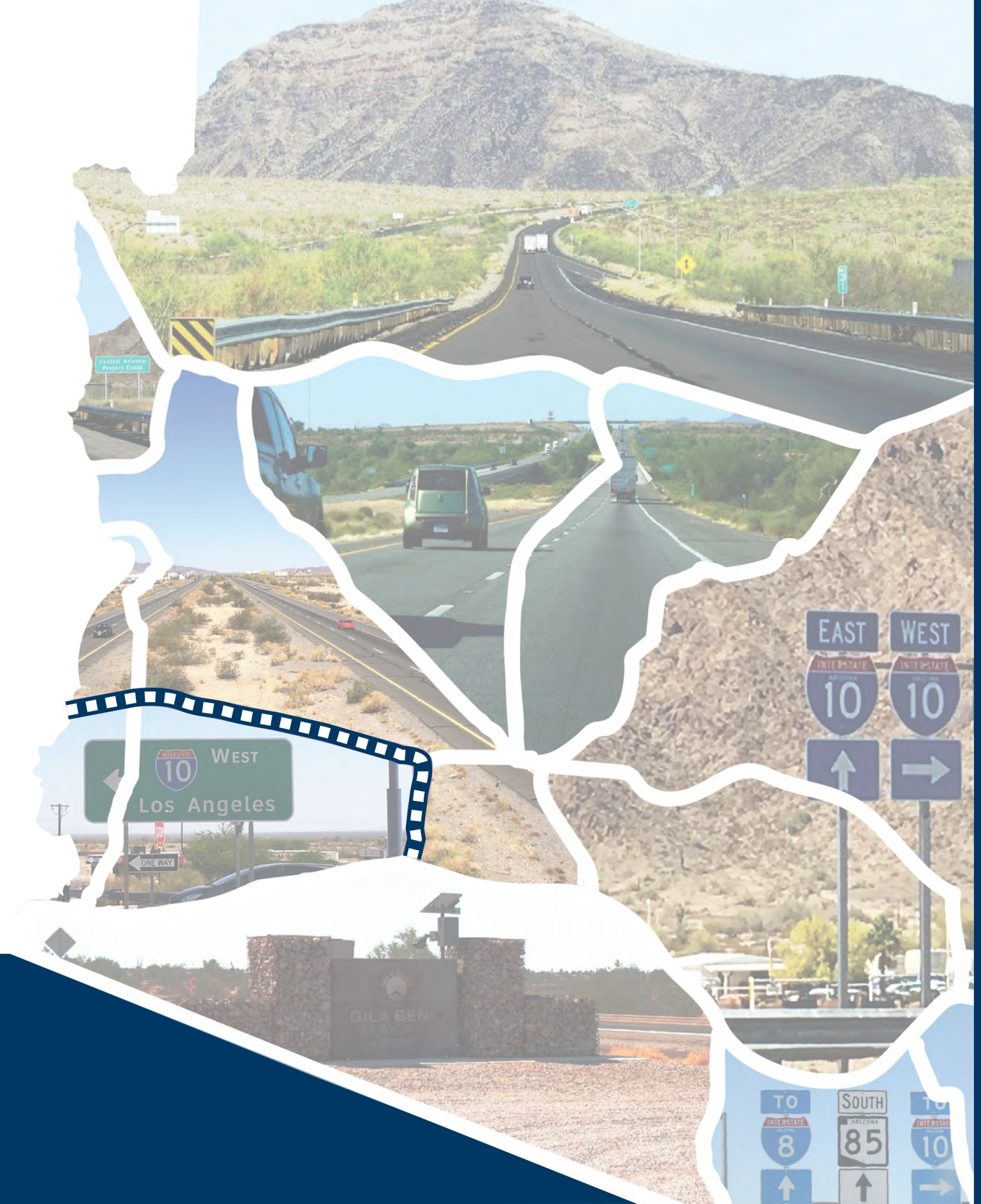


6.4 Next Steps

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/SR 85 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.


Central Arizona Project Canal
INTERSTATE 10 WEST
Los Angeles
ONE WAY
EAST
WEST
10
10
TO
SOUTH
8
85
10

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-8 Corridor. The following are the areas and maps included:

Pavement Performance Area:

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

Bridge Performance Area:

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

Mobility Performance Area:

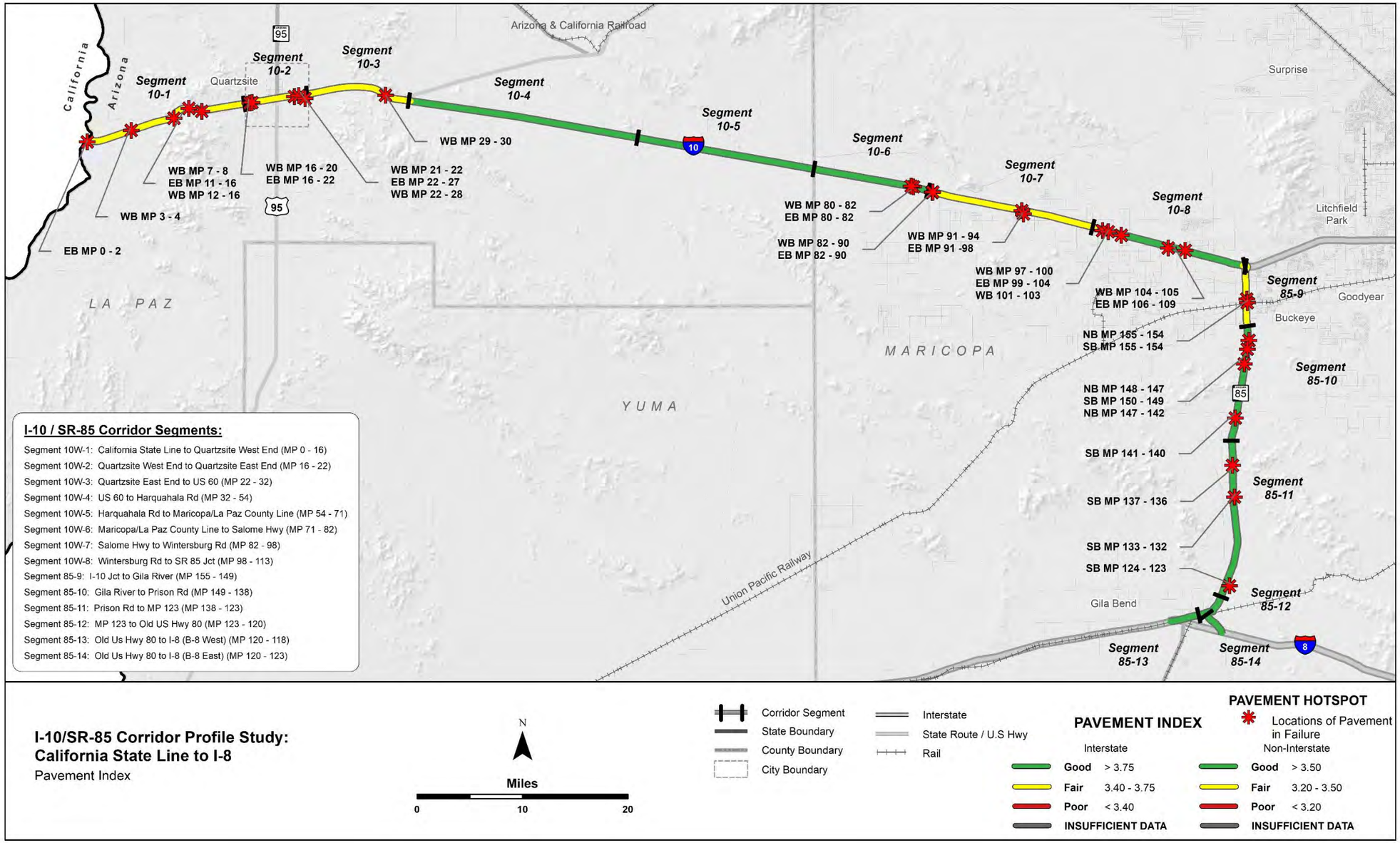
- Mobility Index
- Future Daily V/C Ratio
- Existing Peak Hour V/C (directional)
- Closure Frequency
- Directional LOTTR
- Multimodal Opportunities
- Percentage of Bicycle Accommodation

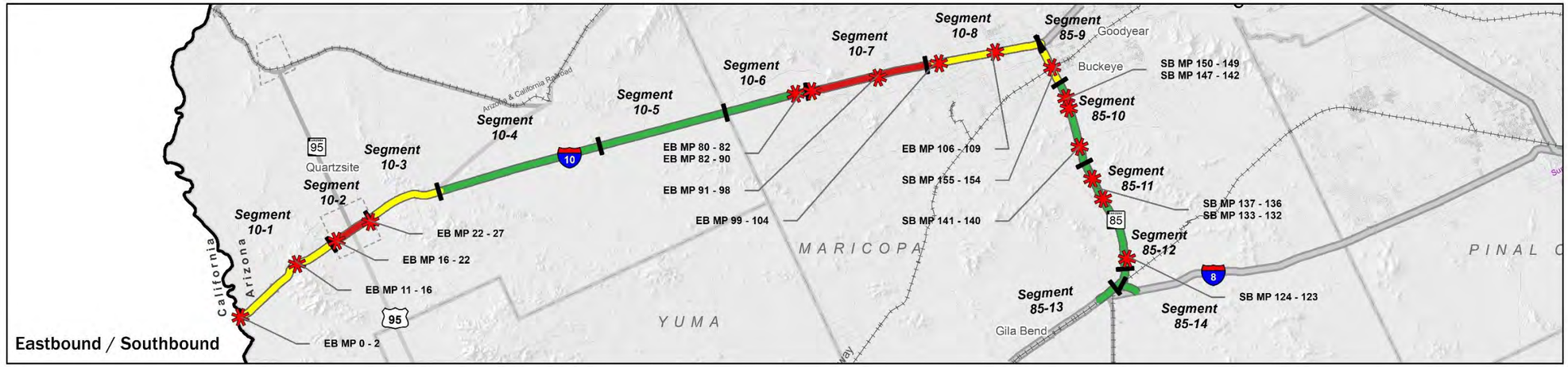
Safety Performance Area:

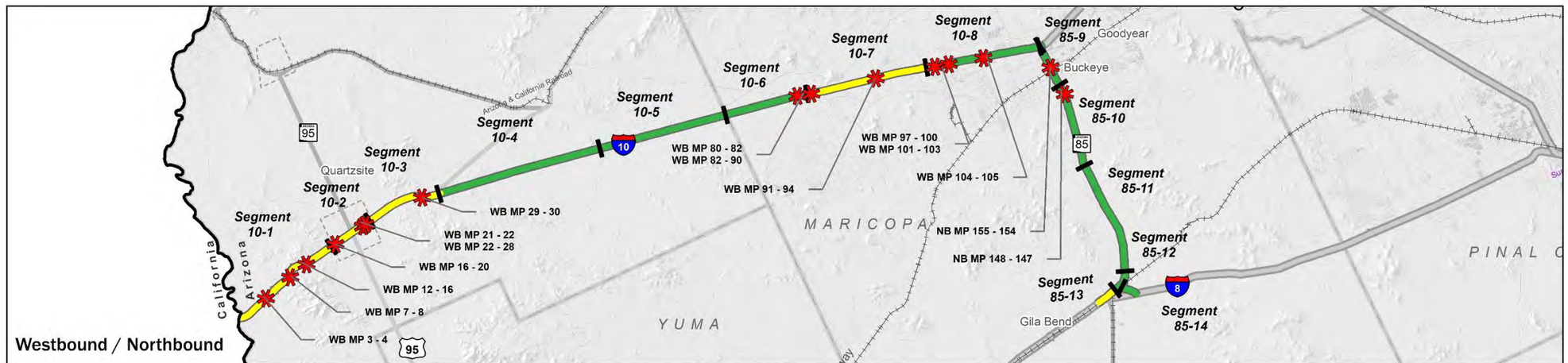
- Safety Index and Hot Spots
- Safety Index and Hot Spots (directional)
- % of Fatal + Suspected Serious Injury Crashes at Intersections – *Not Applicable*
- % of Fatal + Suspected Serious Injury Crashes Involving Lane Departures
- *% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians – Insufficient Data*
- % of Fatal + Suspected Serious Injury Crashes Involving Trucks
- *% of Fatal + Suspected Serious Injury Crashes Involving Bicycles – Insufficient Data*

Freight Performance Area:

- Freight Index and Hot Spots
- Directional TTTR
- Closure Duration
- Bridge Vertical Clearance


California
Arizona
Segment 10-1
Quartzsite
Segment 10-2
Segment 10-3
Arizona & California Railroad
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Surprise
Litchfield Park
Goodyear
Buckeye
Segment 85-9
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Gila Bend
LA PAZ
YUMA
MARICOPA
Union Pacific Railway
95
10
85
8
WB MP 3 - 4
EB MP 0 - 2
WB MP 7 - 8
EB MP 11 - 16
WB MP 12 - 16
WB MP 16 - 20
EB MP 16 - 22
WB MP 21 - 22
EB MP 22 - 27
WB MP 22 - 28
WB MP 29 - 30
WB MP 80 - 82
EB MP 80 - 82
WB MP 82 - 90
EB MP 82 - 90
WB MP 91 - 94
EB MP 91 -98
WB MP 97 - 100
EB MP 99 - 104
WB 101 - 103
WB MP 104 - 105
EB MP 106 - 109
NB MP 155 - 154
SB MP 155 - 154
NB MP 148 - 147
SB MP 150 - 149
NB MP 147 - 142
SB MP 141 - 140
SB MP 137 - 136
SB MP 133 - 132
SB MP 124 - 123
I-10 / SR-85 Corridor Segments:
Segment 10W-1: California State Line to Quartzsite West End (MP 0 - 16)
Segment 10W-2: Quartzsite West End to Quartzsite East End (MP 16 - 22)
Segment 10W-3: Quartzsite East End to US 60 (MP 22 - 32)
Segment 10W-4: US 60 to Harquahala Rd (MP 32 - 54)
Segment 10W-5: Harquahala Rd to Maricopa/La Paz County Line (MP 54 - 71)
Segment 10W-6: Maricopa/La Paz County Line to Salome Hwy (MP 71 - 82)
Segment 10W-7: Salome Hwy to Wintersburg Rd (MP 82 - 98)
Segment 10W-8: Wintersburg Rd to SR 85 Jct (MP 98 - 113)
Segment 85-9: I-10 Jct to Gila River (MP 155 - 149)
Segment 85-10: Gila River to Prison Rd (MP 149 - 138)
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Pavement Index
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
PAVEMENT INDEX
Interstate
Good > 3.75
Fair 3.40 - 3.75
Poor < 3.40
INSUFFICIENT DATA
Non-Interstate
Good > 3.50
Fair 3.20 - 3.50
Poor < 3.20
INSUFFICIENT DATA
PAVEMENT HOTSPOT
Locations of Pavement in Failure





I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Pavement Serviceability and HotSpots

N

Miles
0 10 20

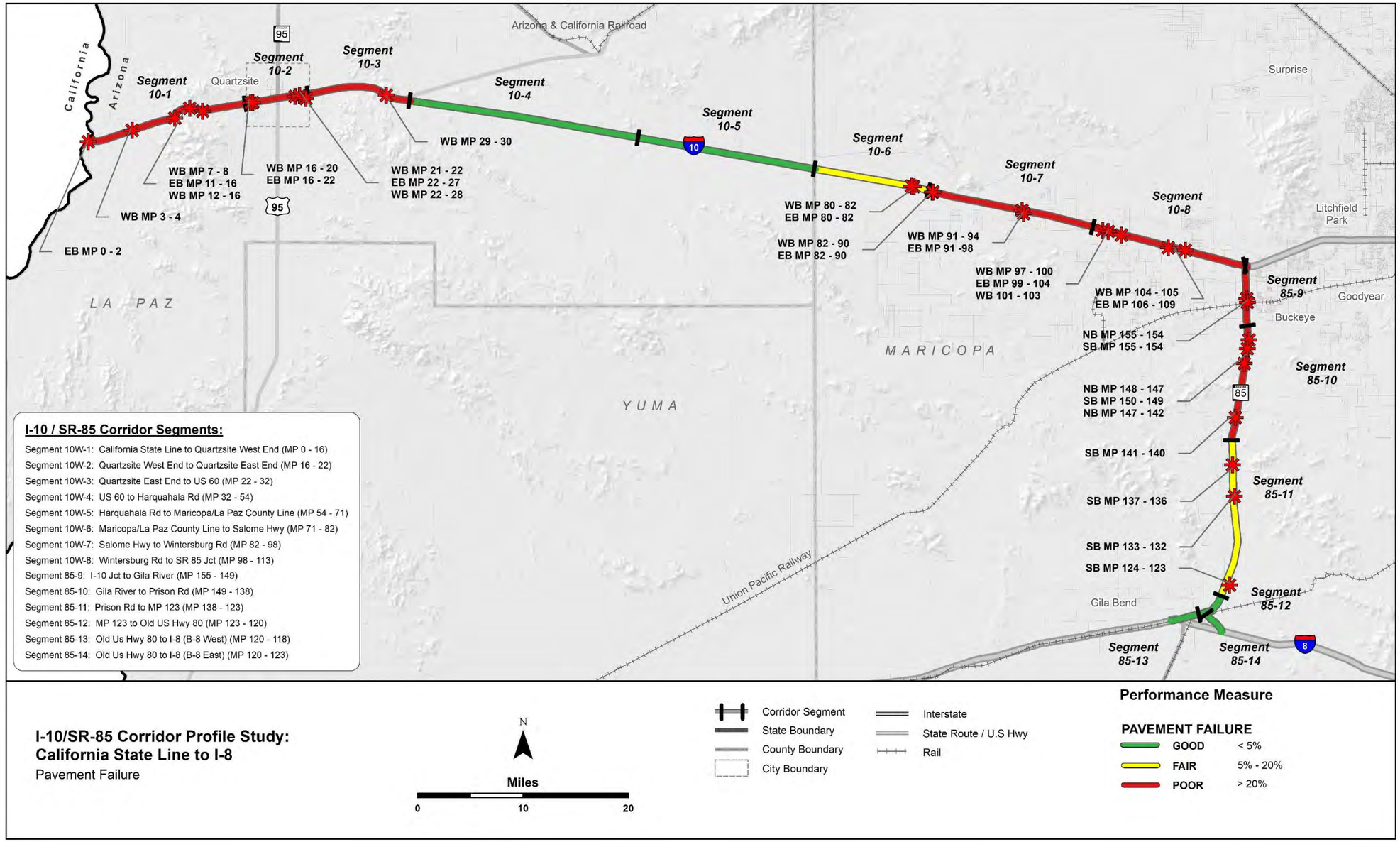
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail

Performance Measure

PAVEMENT SERVICEABILITY

Interstate		Non-Interstate	
Good	> 3.75	Good	> 3.50
Fair	3.40 - 3.75	Fair	3.20 - 3.50
Poor	< 3.40	Poor	< 3.20
INSUFFICIENT DATA		INSUFFICIENT DATA	

PAVEMENT HOTSPOT
Locations of Pavement in Failure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Segment 85-10
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Segment 85-12
Segment 85-13
Segment 85-14
Arizona & California Railroad
Union Pacific Railway
Surprise
Litchfield Park
Goodyear
Buckeye
Gila Bend
LA PAZ
YUMA
MARICOPA
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EB MP 0 - 2
WB MP 3 - 4
WB MP 7 - 8
EB MP 11 - 16
WB MP 12 - 16
WB MP 16 - 20
EB MP 16 - 22
WB MP 21 - 22
EB MP 22 - 27
WB MP 22 - 28
WB MP 29 - 30
WB MP 80 - 82
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EB MP 82 - 90
WB MP 91 - 94
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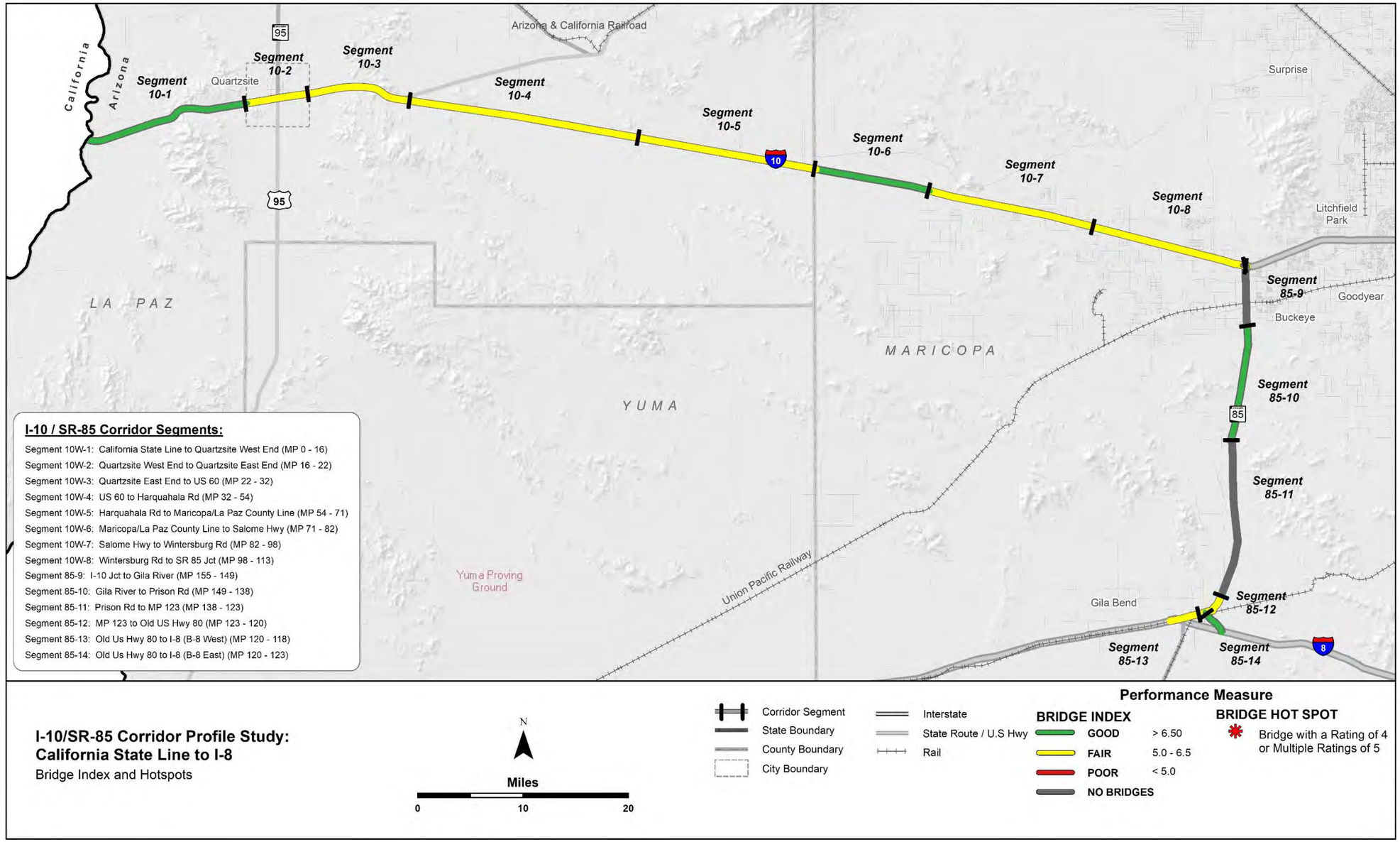
WB MP 97 - 100
EB MP 99 - 104
WB 101 - 103
WB MP 104 - 105
EB MP 106 - 109
NB MP 155 - 154
SB MP 155 - 154
NB MP 148 - 147
SB MP 150 - 149
NB MP 147 - 142
SB MP 141 - 140
SB MP 137 - 136
SB MP 133 - 132
SB MP 124 - 123
I-10 / SR-85 Corridor Segments:
Segment 10W-1: California State Line to Quartzsite West End (MP 0 - 16)
Segment 10W-2: Quartzsite West End to Quartzsite East End (MP 16 - 22)
Segment 10W-3: Quartzsite East End to US 60 (MP 22 - 32)
Segment 10W-4: US 60 to Harquahala Rd (MP 32 - 54)
Segment 10W-5: Harquahala Rd to Maricopa/La Paz County Line (MP 54 - 71)
Segment 10W-6: Maricopa/La Paz County Line to Salome Hwy (MP 71 - 82)
Segment 10W-7: Salome Hwy to Wintersburg Rd (MP 82 - 98)
Segment 10W-8: Wintersburg Rd to SR 85 Jct (MP 98 - 113)
Segment 85-9: I-10 Jct to Gila River (MP 155 - 149)
Segment 85-10: Gila River to Prison Rd (MP 149 - 138)
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Pavement Failure
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
Performance Measure
PAVEMENT FAILURE
GOOD < 5%
FAIR 5% - 20%
POOR > 20%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Segment 10-1
Quartzsite
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Segment 10-3
Arizona & California Railroad
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Segment 10-8
Surprise
Litchfield Park
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Gila Bend
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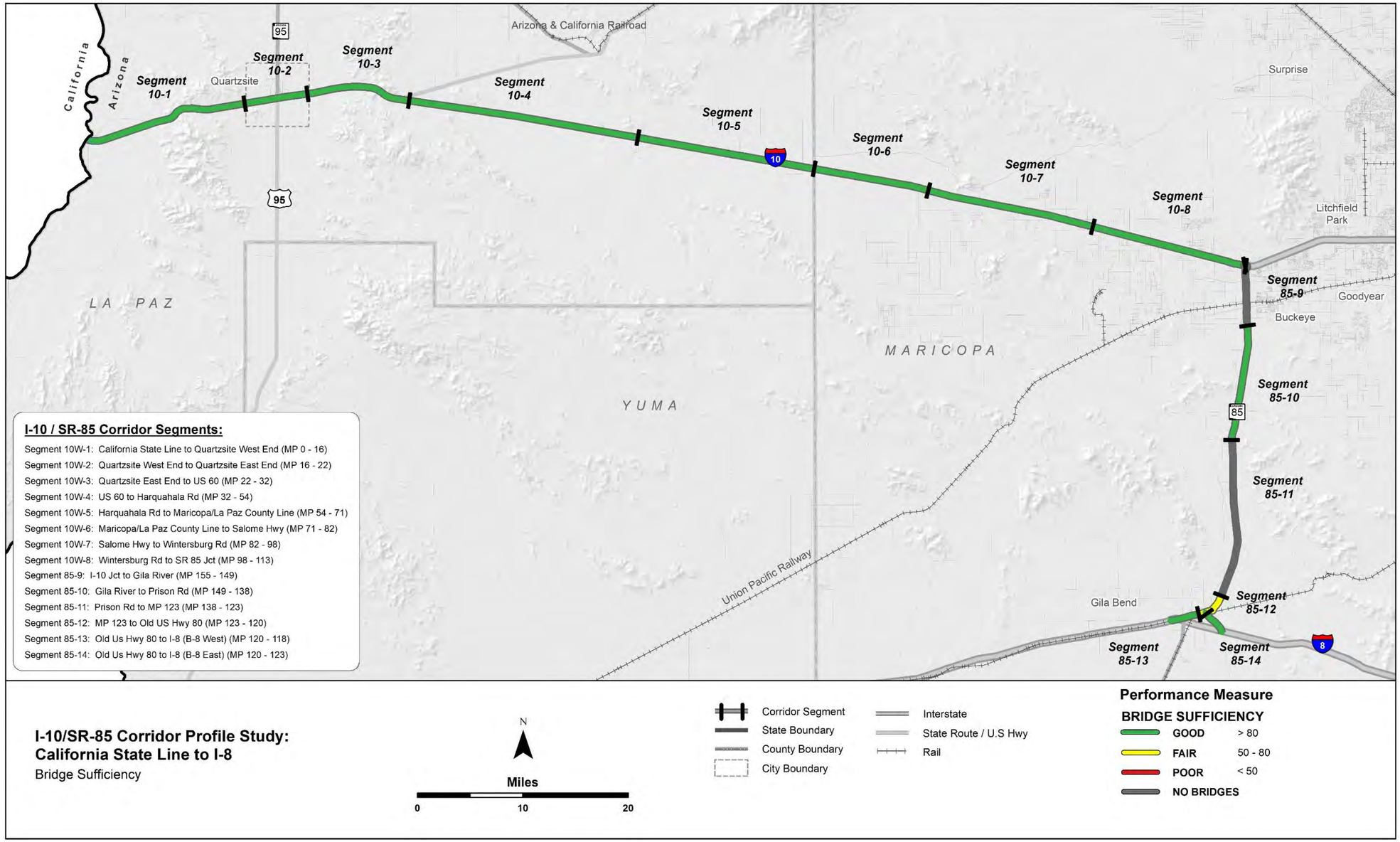
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Bridge Index and Hotspots
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
Performance Measure
BRIDGE INDEX
GOOD > 6.50
FAIR 5.0 - 6.5
POOR < 5.0
NO BRIDGES
BRIDGE HOT SPOT
Bridge with a Rating of 4 or Multiple Ratings of 5


California
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Segment 10-1
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Segment 10-3
Arizona & California Railroad
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Segment 10-8
Surprise
Litchfield Park
Segment 85-9
Goodyear
Buckeye
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Gila Bend
Union Pacific Railway
LA PAZ
YUMA
MARICOPA
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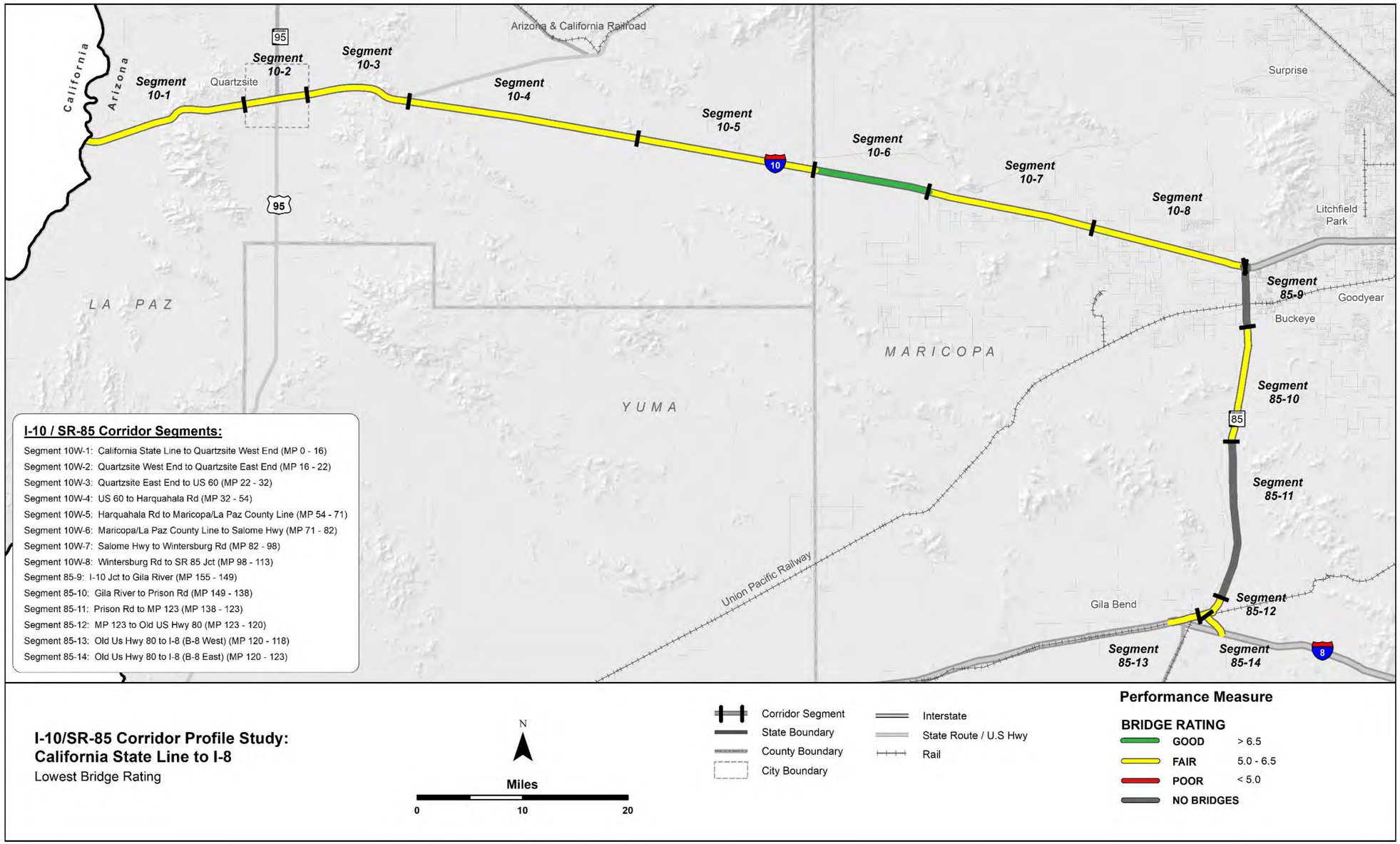
Segment 10W-3: Quartzsite East End to US 60 (MP 22 - 32)
Segment 10W-4: US 60 to Harquahala Rd (MP 32 - 54)
Segment 10W-5: Harquahala Rd to Maricopa/La Paz County Line (MP 54 - 71)
Segment 10W-6: Maricopa/La Paz County Line to Salome Hwy (MP 71 - 82)
Segment 10W-7: Salome Hwy to Wintersburg Rd (MP 82 - 98)
Segment 10W-8: Wintersburg Rd to SR 85 Jct (MP 98 - 113)
Segment 85-9: I-10 Jct to Gila River (MP 155 - 149)
Segment 85-10: Gila River to Prison Rd (MP 149 - 138)
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Bridge Sufficiency
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
Performance Measure
BRIDGE SUFFICIENCY
GOOD > 80
FAIR 50 - 80
POOR < 50
NO BRIDGES


California
Arizona
Segment 10-1
Quartzsite
Segment 10-2
Segment 10-3
Arizona & California Railroad
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Surprise
Litchfield Park
Segment 85-9
Goodyear
Buckeye
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Gila Bend
Union Pacific Railway
LA PAZ
YUMA
MARICOPA
I-10 / SR-85 Corridor Segments:
Segment 10W-1: California State Line to Quartzsite West End (MP 0 - 16)
Segment 10W-2: Quartzsite West End to Quartzsite East End (MP 16 - 22)
Segment 10W-3: Quartzsite East End to US 60 (MP 22 - 32)
Segment 10W-4: US 60 to Harquahala Rd (MP 32 - 54)
Segment 10W-5: Harquahala Rd to Maricopa/La Paz County Line (MP 54 - 71)
Segment 10W-6: Maricopa/La Paz County Line to Salome Hwy (MP 71 - 82)
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Segment 10W-8: Wintersburg Rd to SR 85 Jct (MP 98 - 113)
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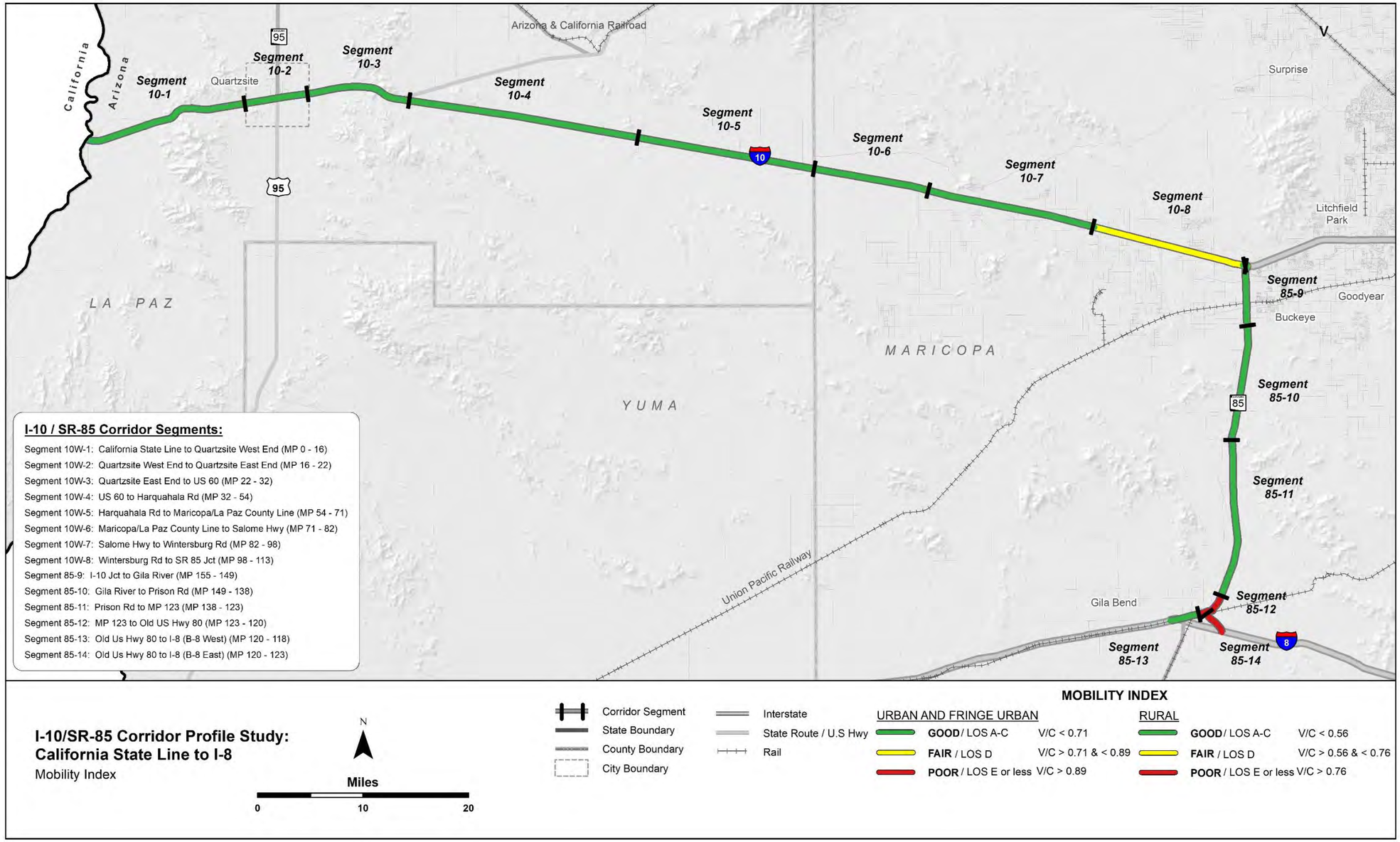
Segment 85-10: Gila River to Prison Rd (MP 149 - 138)
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Lowest Bridge Rating
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
Performance Measure
BRIDGE RATING
GOOD > 6.5
FAIR 5.0 - 6.5
POOR < 5.0
NO BRIDGES


California
Arizona
Segment 10-1
Quartzsite
Segment 10-2
Segment 10-3
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Segment 85-9
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Arizona & California Railroad
Union Pacific Railway
Surprise
Litchfield Park
Goodyear
Buckeye
Gila Bend
LA PAZ
YUMA
MARICOPA
95
10
85
8
I-10 / SR-85 Corridor Segments:
Segment 10W-1: California State Line to Quartzsite West End (MP 0 - 16)
Segment 10W-2: Quartzsite West End to Quartzsite East End (MP 16 - 22)
Segment 10W-3: Quartzsite East End to US 60 (MP 22 - 32)
Segment 10W-4: US 60 to Harquahala Rd (MP 32 - 54)
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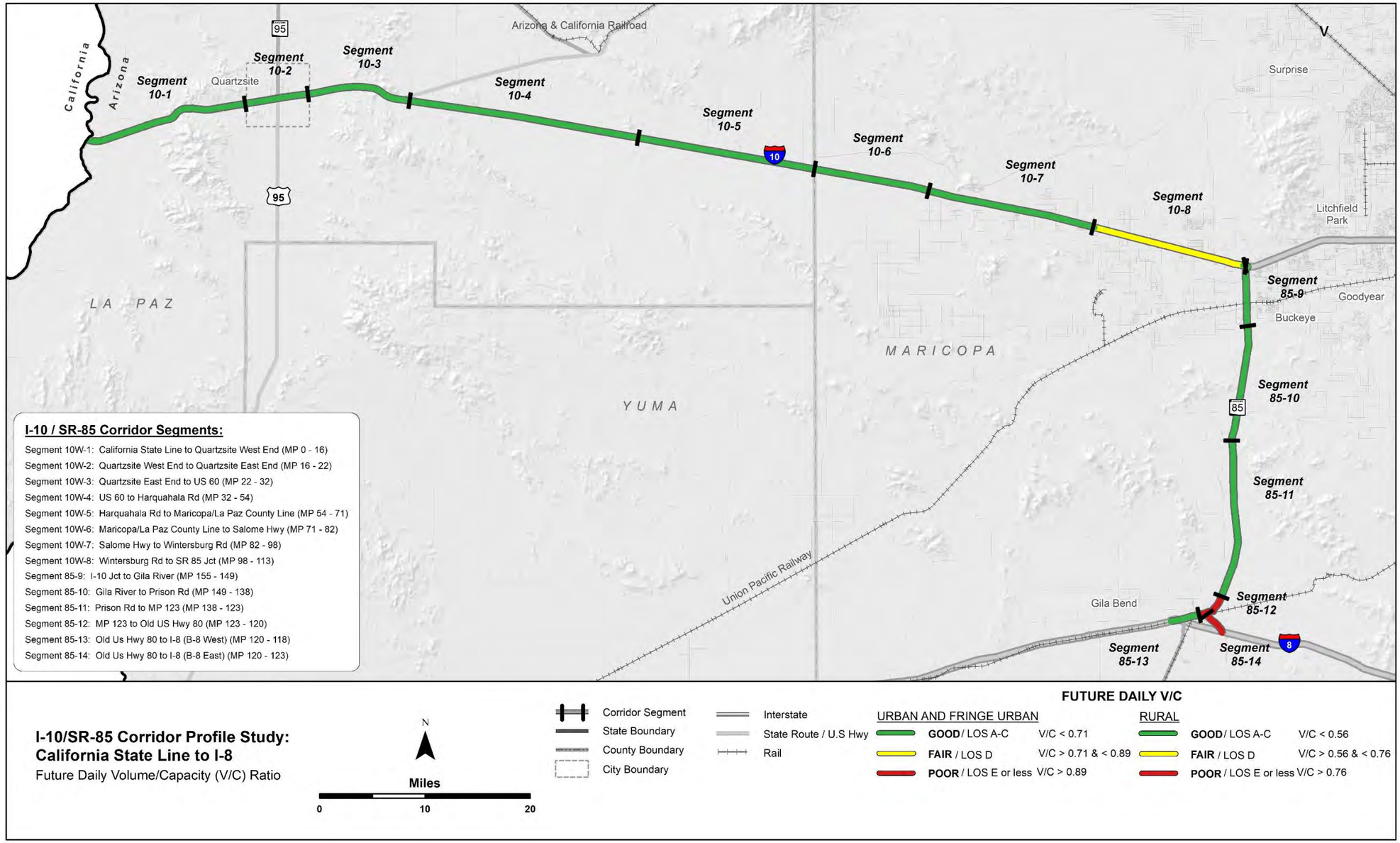
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Mobility Index
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
MOBILITY INDEX
URBAN AND FRINGE URBAN
GOOD / LOS A-C V/C < 0.71
FAIR / LOS D V/C > 0.71 & < 0.89
POOR / LOS E or less V/C > 0.89
RURAL
GOOD / LOS A-C V/C < 0.56
FAIR / LOS D V/C > 0.56 & < 0.76
POOR / LOS E or less V/C > 0.76


California
Arizona
Segment 10-1
Quartzsite
Segment 10-2
Segment 10-3
Arizona & California Railroad
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Surprise
Litchfield Park
Segment 85-9
Goodyear
Buckeye
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Gila Bend
Union Pacific Railway
LA PAZ
YUMA
MARICOPA
95
10
85
8
I-10 / SR-85 Corridor Segments:
Segment 10W-1: California State Line to Quartzsite West End (MP 0 - 16)
Segment 10W-2: Quartzsite West End to Quartzsite East End (MP 16 - 22)
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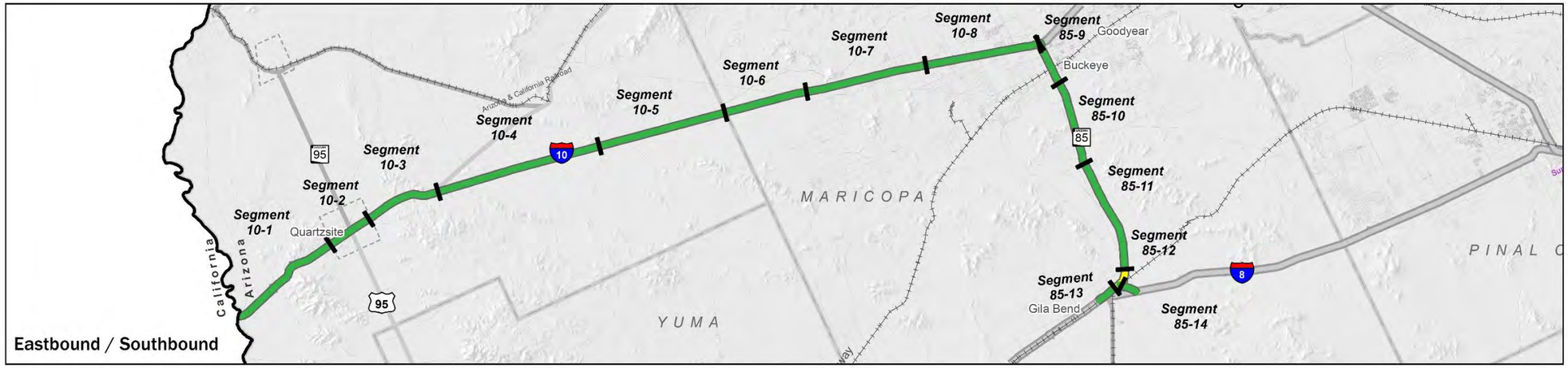
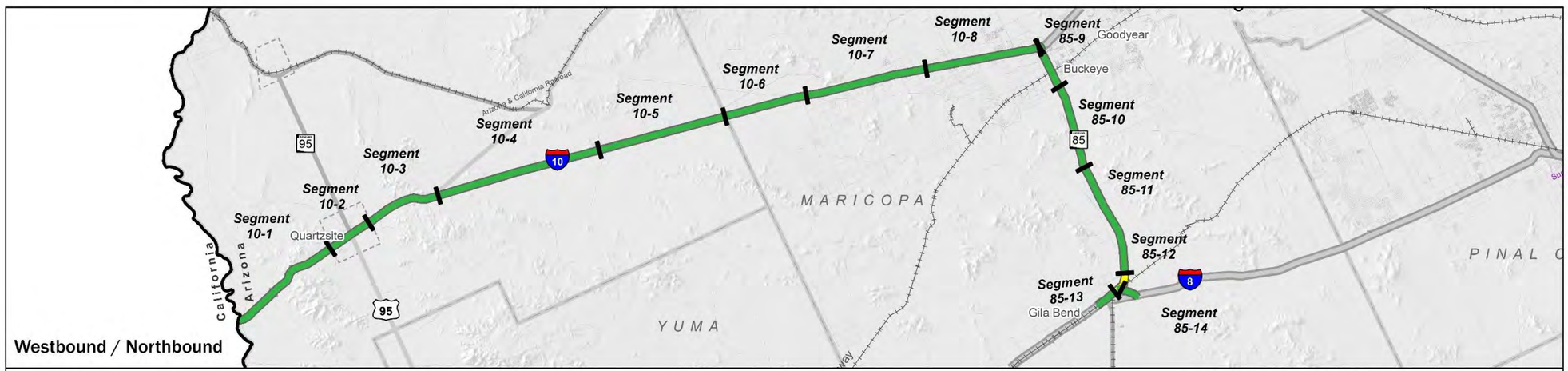
Segment 85-10: Gila River to Prison Rd (MP 149 - 138)
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Future Daily Volume/Capacity (V/C) Ratio
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
FUTURE DAILY V/C
URBAN AND FRINGE URBAN
GOOD / LOS A-C V/C < 0.71
FAIR / LOS D V/C > 0.71 & < 0.89
POOR / LOS E or less V/C > 0.89
RURAL
GOOD / LOS A-C V/C < 0.56
FAIR / LOS D V/C > 0.56 & < 0.76
POOR / LOS E or less V/C > 0.76





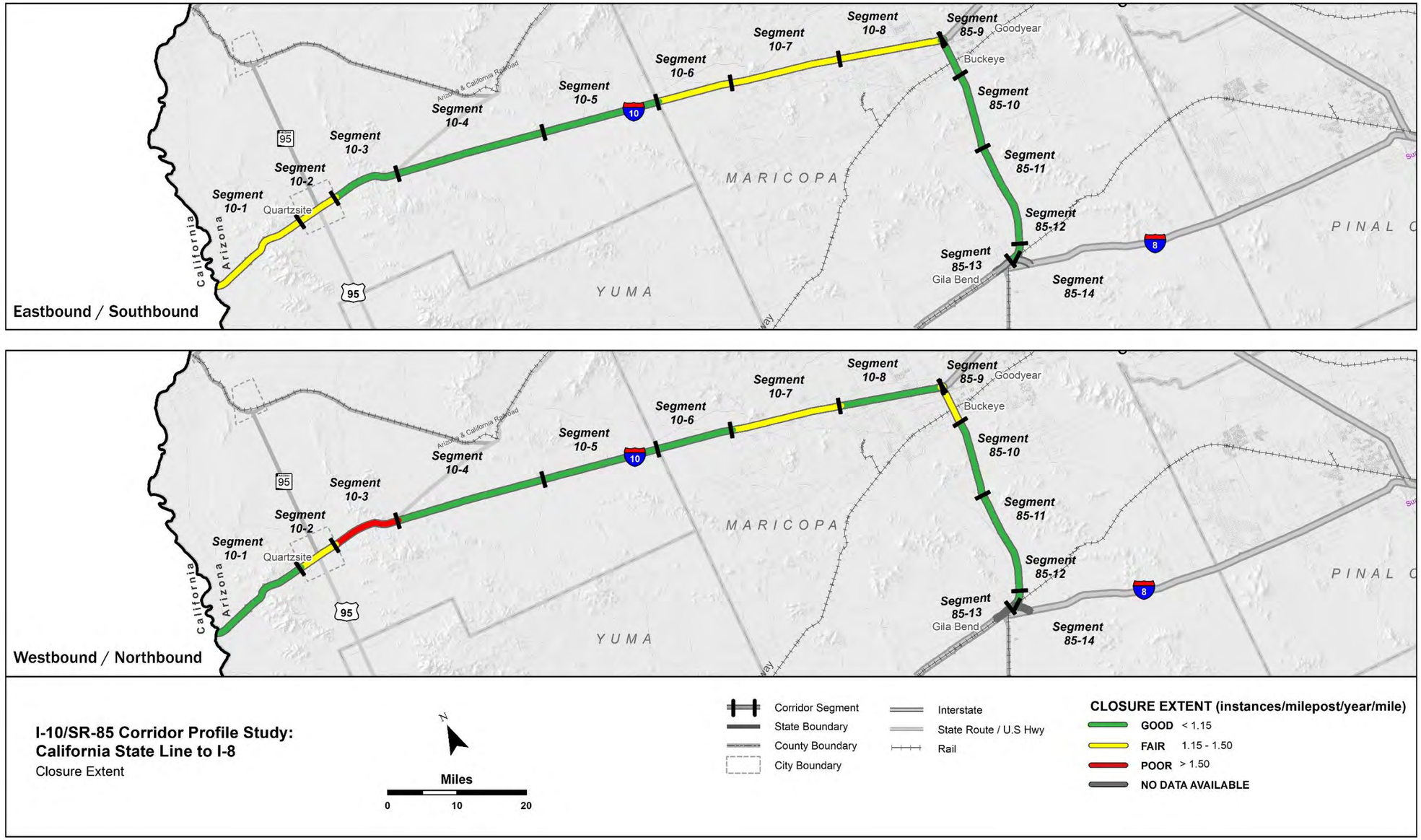
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Existing Peak Hour Volume/Capacity (V/C) Ratio

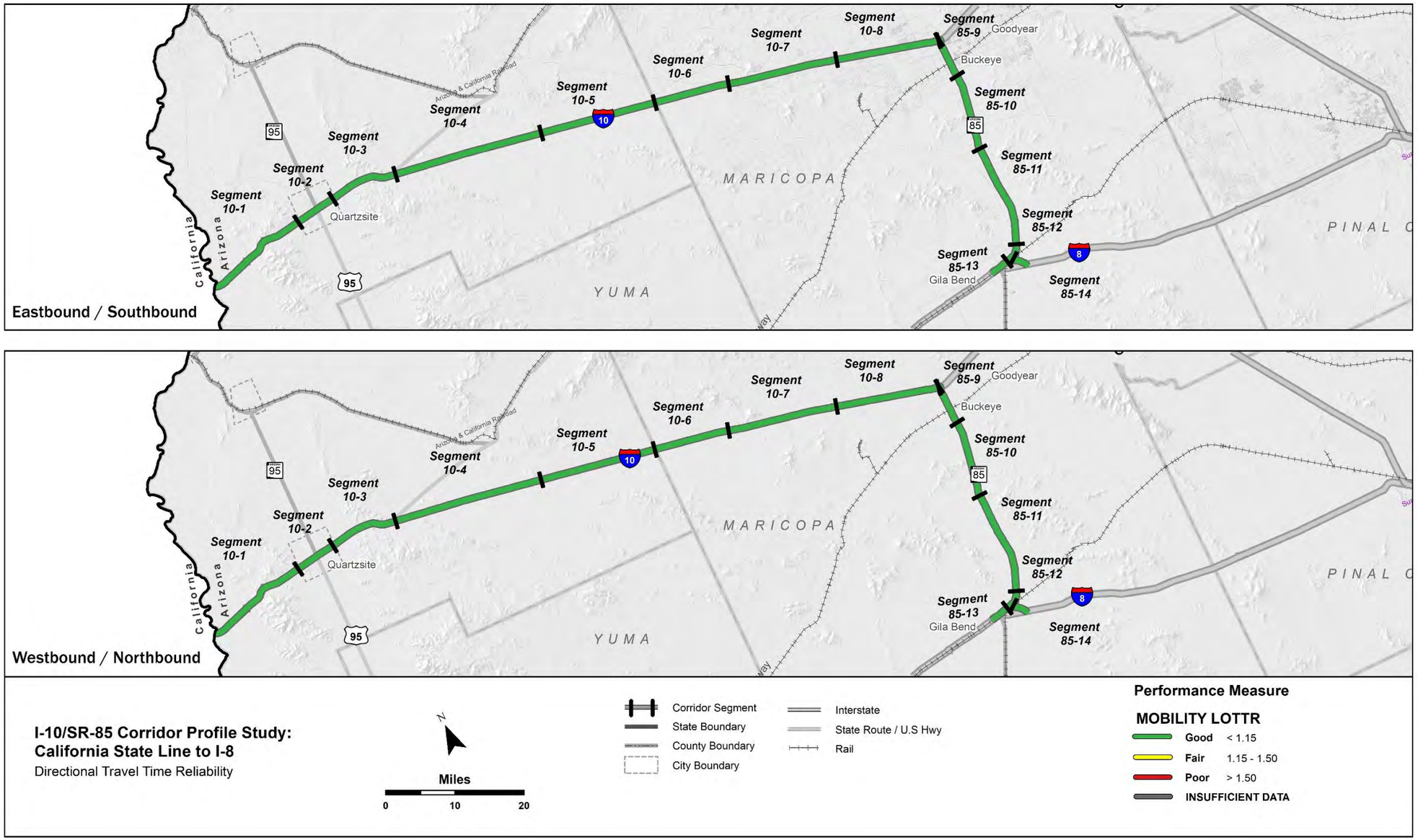
Miles: 0 10 20

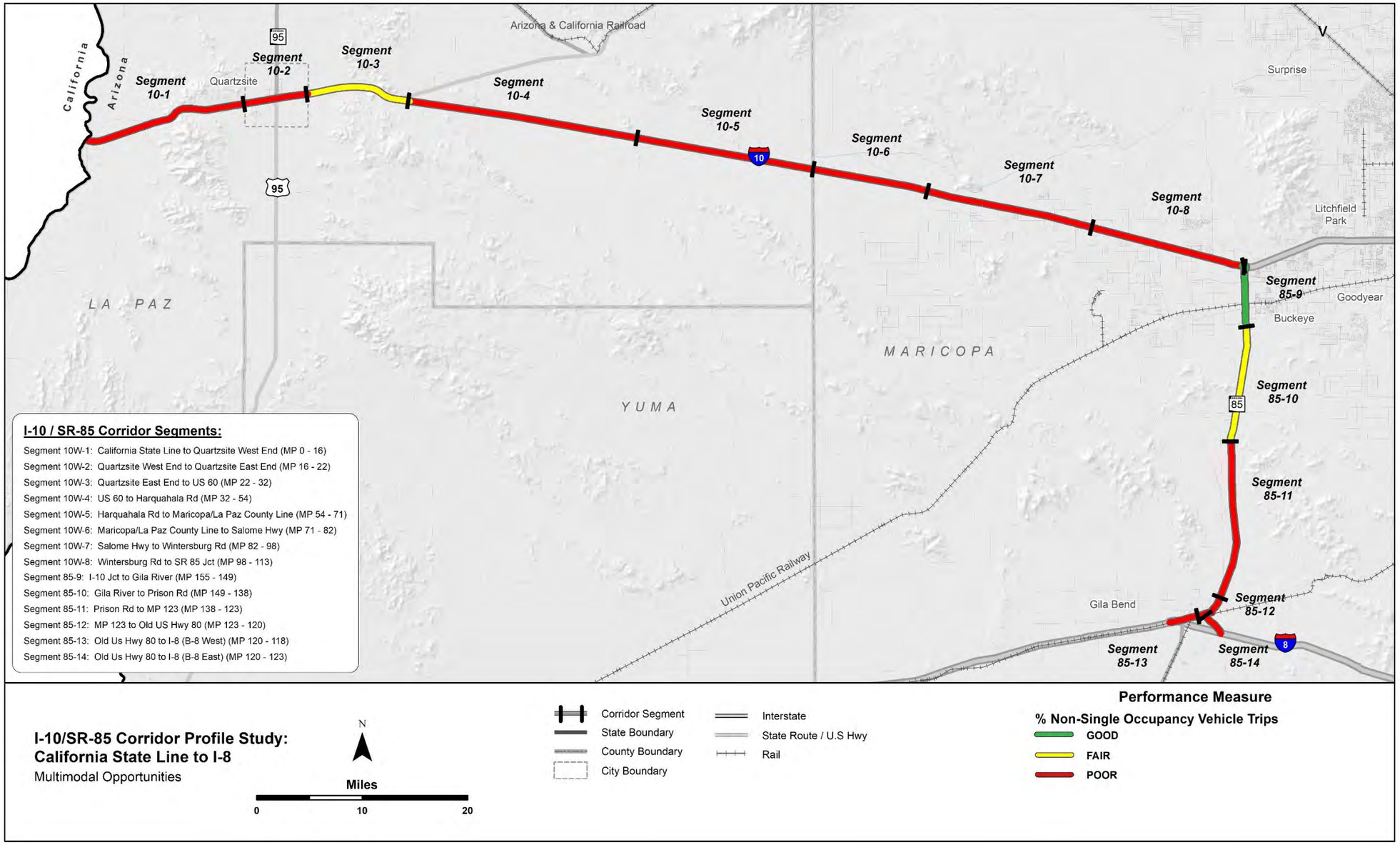
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail

EXISTING PEAK HOUR V/C

URBAN AND FRINGE URBAN		RURAL	
GOOD / LOS A-C	V/C < 0.71	**GOOD** / LOS A-C	V/C < 0.56
FAIR / LOS D	V/C > 0.71 & < 0.89	**FAIR** / LOS D	V/C > 0.56 & < 0.76
POOR / LOS E or less	V/C > 0.89	**POOR** / LOS E or less	V/C > 0.76


Segment 10-1
Segment 10-2
Segment 10-3
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Segment 85-9
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Quartzsite
Goodyear
Buckeye
Gila Bend
California
Arizona
MARICOPA
YUMA
PINAL
Eastbound / Southbound
Westbound / Northbound
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Closure Extent
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
CLOSURE EXTENT (instances/milepost/year/mile)
GOOD < 1.15
FAIR 1.15 - 1.50
POOR > 1.50
NO DATA AVAILABLE


Segment 10-1
Segment 10-2
Segment 10-3
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Segment 85-9
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Quartzsite
Goodyear
Buckeye
Gila Bend
California
Arizona
MARICOPA
YUMA
PINAL
Eastbound / Southbound
Westbound / Northbound
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Directional Travel Time Reliability
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
Performance Measure
MOBILITY LOTTR
Good < 1.15
Fair 1.15 - 1.50
Poor > 1.50
INSUFFICIENT DATA


California
Arizona
Segment 10-1
Quartzsite
Segment 10-2
Segment 10-3
Arizona & California Railroad
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Surprise
Litchfield Park
Segment 85-9
Goodyear
Buckeye
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Gila Bend
Union Pacific Railway
LA PAZ
YUMA
MARICOPA
I-10 / SR-85 Corridor Segments:
Segment 10W-1: California State Line to Quartzsite West End (MP 0 - 16)
Segment 10W-2: Quartzsite West End to Quartzsite East End (MP 16 - 22)
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Segment 10W-7: Salome Hwy to Wintersburg Rd (MP 82 - 98)
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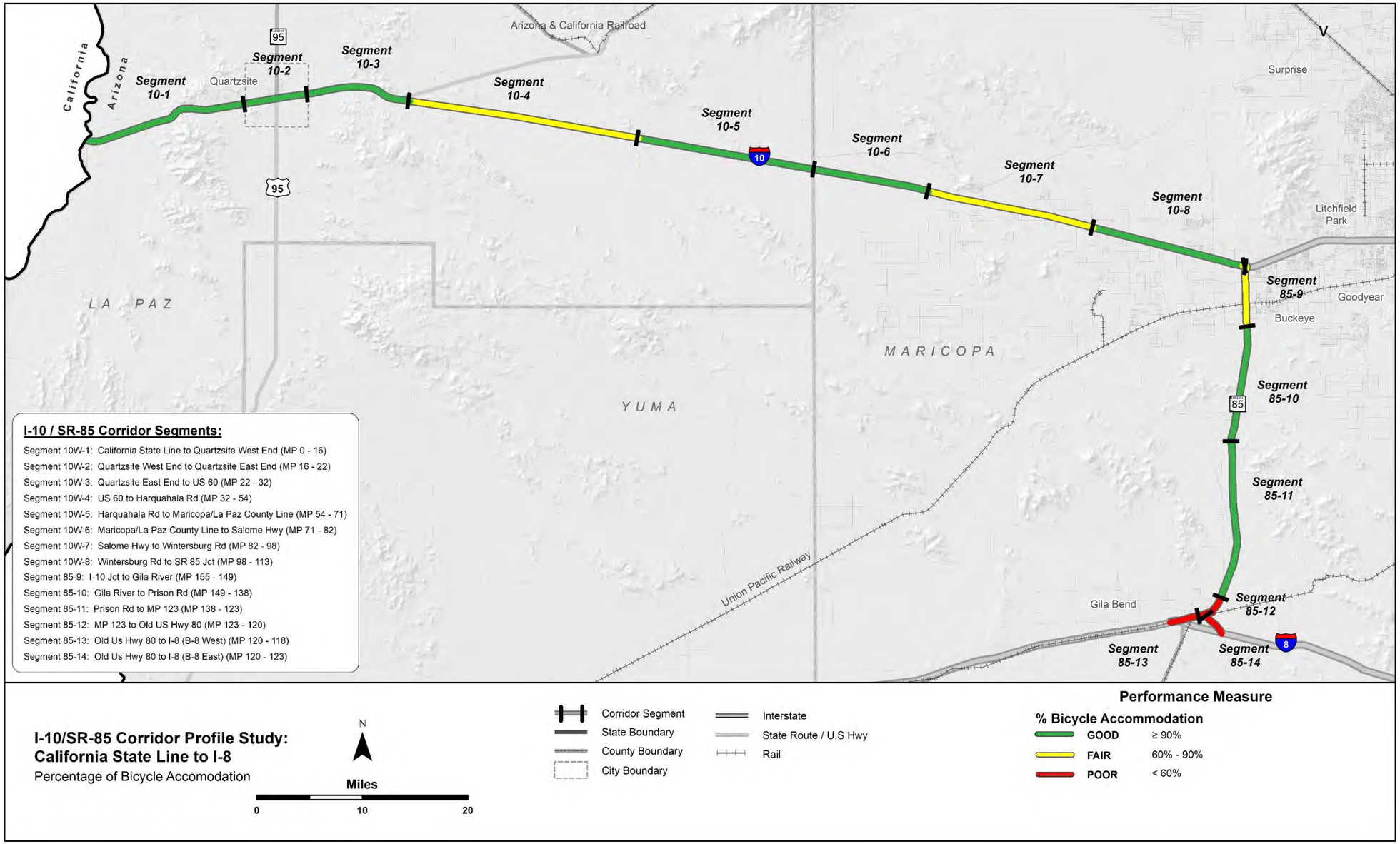
Segment 85-9: I-10 Jct to Gila River (MP 155 - 149)
Segment 85-10: Gila River to Prison Rd (MP 149 - 138)
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Multimodal Opportunities
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
Performance Measure
% Non-Single Occupancy Vehicle Trips
GOOD
FAIR
POOR


California
Arizona
Segment 10-1
Quartzsite
Segment 10-2
Segment 10-3
Arizona & California Railroad
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Surprise
Litchfield Park
Segment 85-9
Goodyear
Buckeye
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Gila Bend
Union Pacific Railway
LA PAZ
YUMA
MARICOPA
I-10 / SR-85 Corridor Segments:
Segment 10W-1: California State Line to Quartzsite West End (MP 0 - 16)
Segment 10W-2: Quartzsite West End to Quartzsite East End (MP 16 - 22)
Segment 10W-3: Quartzsite East End to US 60 (MP 22 - 32)
Segment 10W-4: US 60 to Harquahala Rd (MP 32 - 54)
Segment 10W-5: Harquahala Rd to Maricopa/La Paz County Line (MP 54 - 71)
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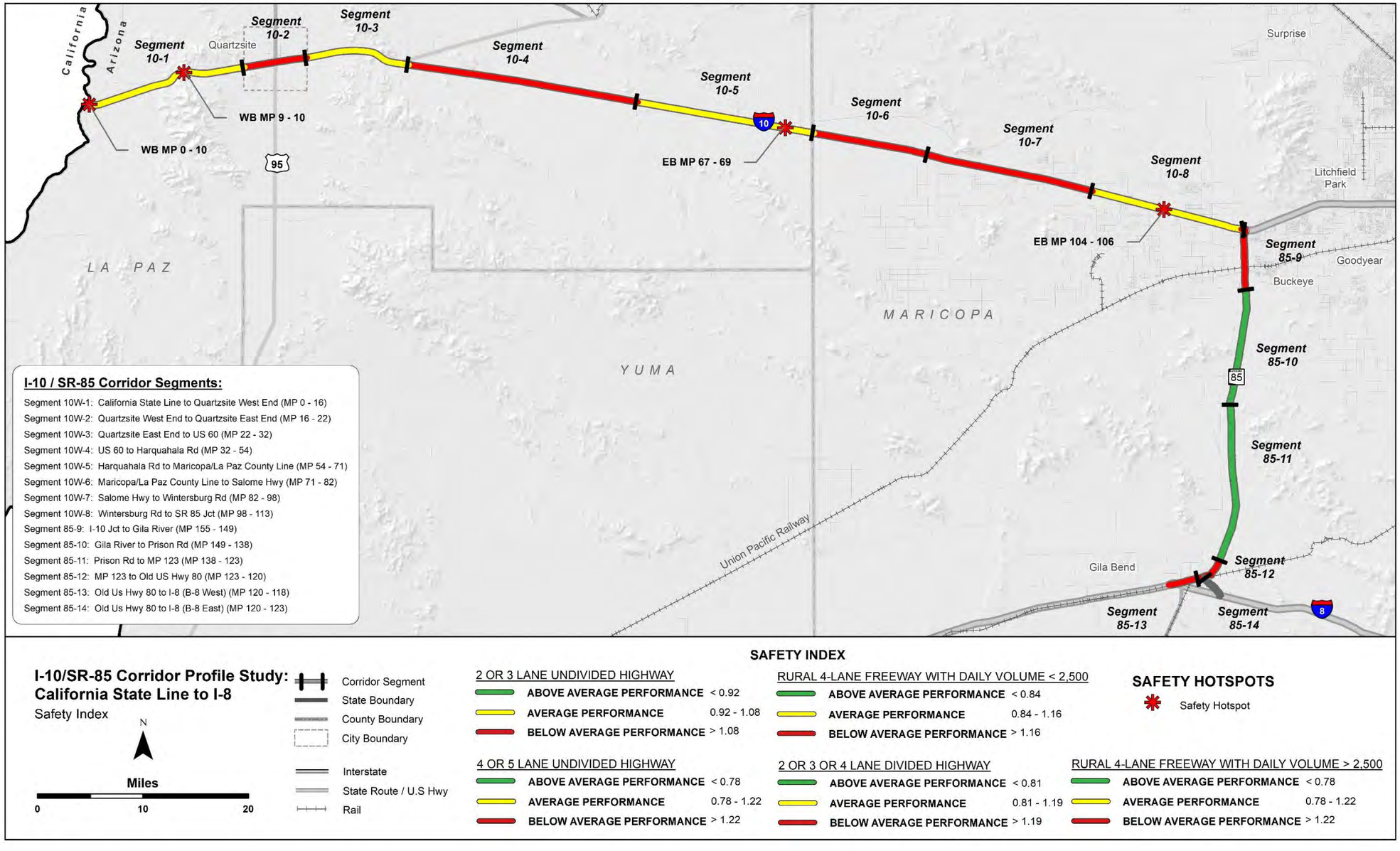
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Percentage of Bicycle Accomodation
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
Performance Measure
% Bicycle Accommodation
GOOD ≥ 90%
FAIR 60% - 90%
POOR < 60%


California
Arizona
Segment 10-1
Quartzsite
Segment 10-2
Segment 10-3
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Segment 85-9
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
WB MP 9 - 10
WB MP 0 - 10
EB MP 67 - 69
EB MP 104 - 106
95
10
85
8
Surprise
Litchfield Park
Goodyear
Buckeye
Gila Bend
LA PAZ
YUMA
MARICOPA
Union Pacific Railway
I-10 / SR-85 Corridor Segments:
Segment 10W-1: California State Line to Quartzsite West End (MP 0 - 16)
Segment 10W-2: Quartzsite West End to Quartzsite East End (MP 16 - 22)
Segment 10W-3: Quartzsite East End to US 60 (MP 22 - 32)
Segment 10W-4: US 60 to Harquahala Rd (MP 32 - 54)
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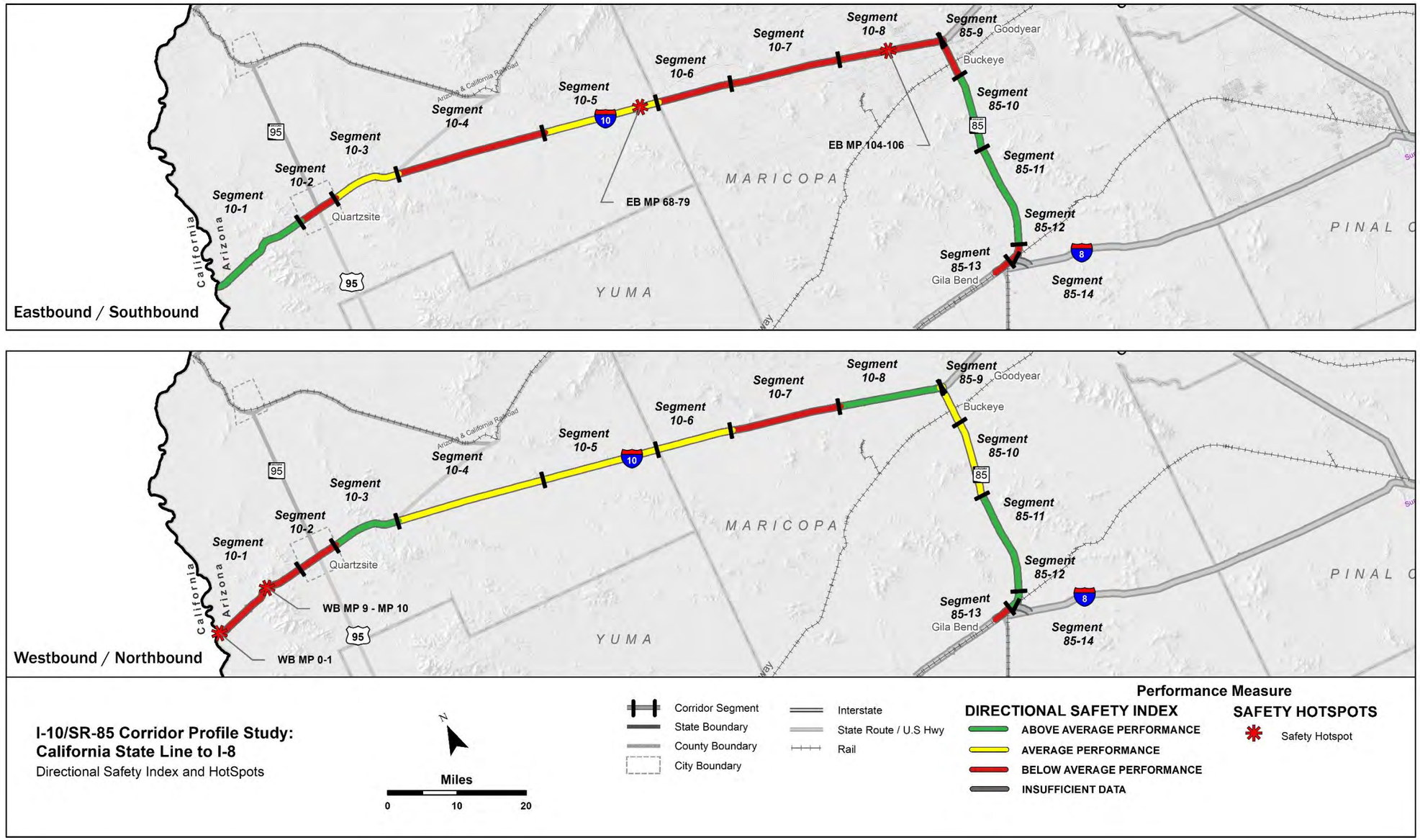
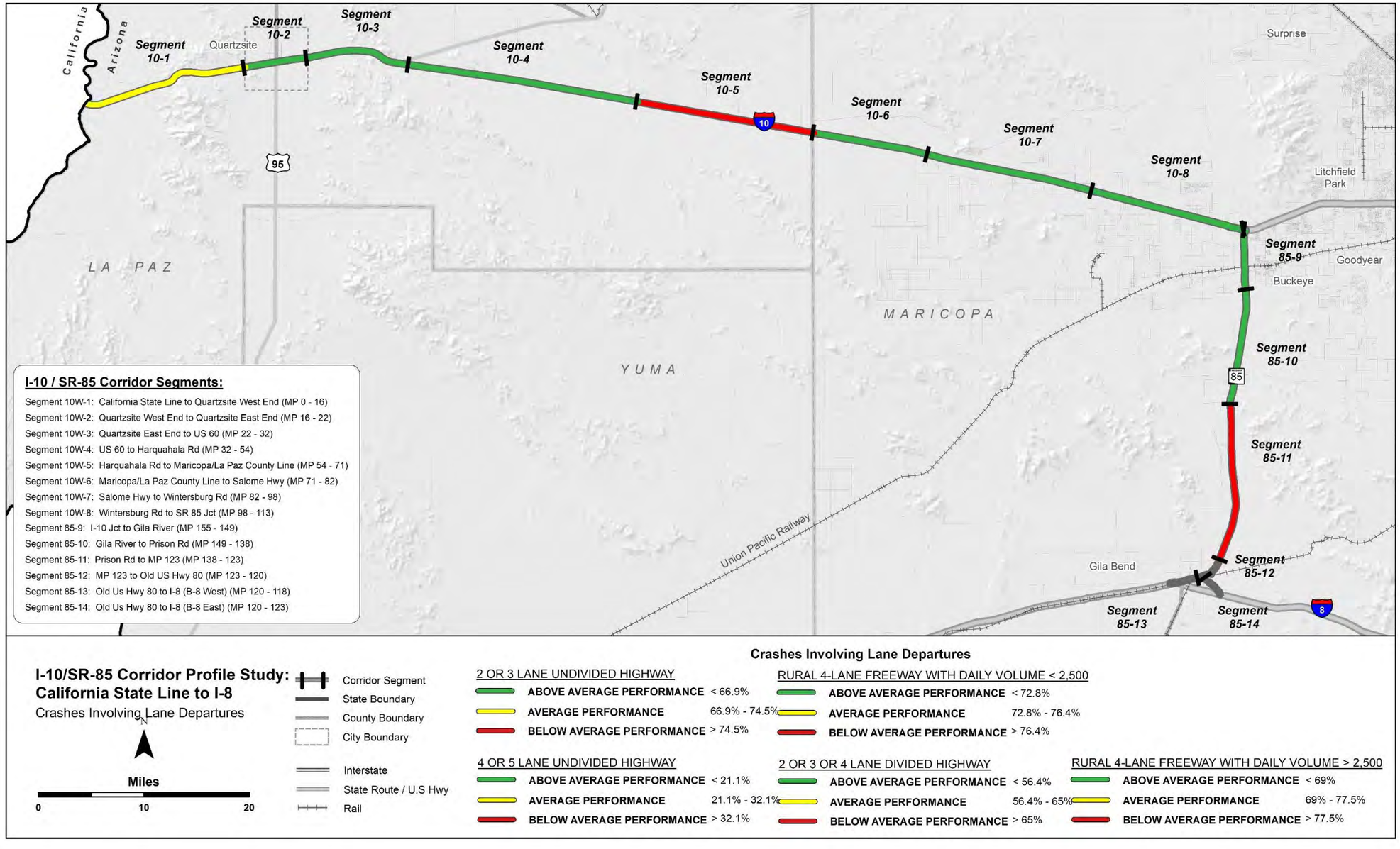
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Safety Index
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
SAFETY INDEX
2 OR 3 LANE UNDIVIDED HIGHWAY
ABOVE AVERAGE PERFORMANCE < 0.92
AVERAGE PERFORMANCE 0.92 - 1.08
BELOW AVERAGE PERFORMANCE > 1.08
RURAL 4-LANE FREEWAY WITH DAILY VOLUME < 2,500
ABOVE AVERAGE PERFORMANCE < 0.84
AVERAGE PERFORMANCE 0.84 - 1.16
BELOW AVERAGE PERFORMANCE > 1.16
SAFETY HOTSPOTS
Safety Hotspot
4 OR 5 LANE UNDIVIDED HIGHWAY
ABOVE AVERAGE PERFORMANCE < 0.78
AVERAGE PERFORMANCE 0.78 - 1.22
BELOW AVERAGE PERFORMANCE > 1.22
2 OR 3 OR 4 LANE DIVIDED HIGHWAY
ABOVE AVERAGE PERFORMANCE < 0.81
AVERAGE PERFORMANCE 0.81 - 1.19
BELOW AVERAGE PERFORMANCE > 1.19
RURAL 4-LANE FREEWAY WITH DAILY VOLUME > 2,500
ABOVE AVERAGE PERFORMANCE < 0.78
AVERAGE PERFORMANCE 0.78 - 1.22
BELOW AVERAGE PERFORMANCE > 1.22


Eastbound / Southbound
Segment 10-1
Segment 10-2
Segment 10-3
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Segment 85-9
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Quartzsite
Goodyear
Buckeye
Gila Bend
EB MP 68-79
EB MP 104-106
MARICOPA
YUMA
PINAL C
California
Arizona
Arizona & California Railroad
Westbound / Northbound
WB MP 9 - MP 10
WB MP 0-1
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Directional Safety Index and HotSpots
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
Performance Measure
DIRECTIONAL SAFETY INDEX
ABOVE AVERAGE PERFORMANCE
AVERAGE PERFORMANCE
BELOW AVERAGE PERFORMANCE
INSUFFICIENT DATA
SAFETY HOTSPOTS
Safety Hotspot


California
Arizona
Segment 10-1
Quartzsite
Segment 10-2
Segment 10-3
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Segment 85-9
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
10
95
85
8
Surprise
Litchfield Park
Goodyear
Buckeye
Gila Bend
LA PAZ
YUMA
MARICOPA
Union Pacific Railway
I-10 / SR-85 Corridor Segments:
Segment 10W-1: California State Line to Quartzsite West End (MP 0 - 16)
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Segment 10W-3: Quartzsite East End to US 60 (MP 22 - 32)
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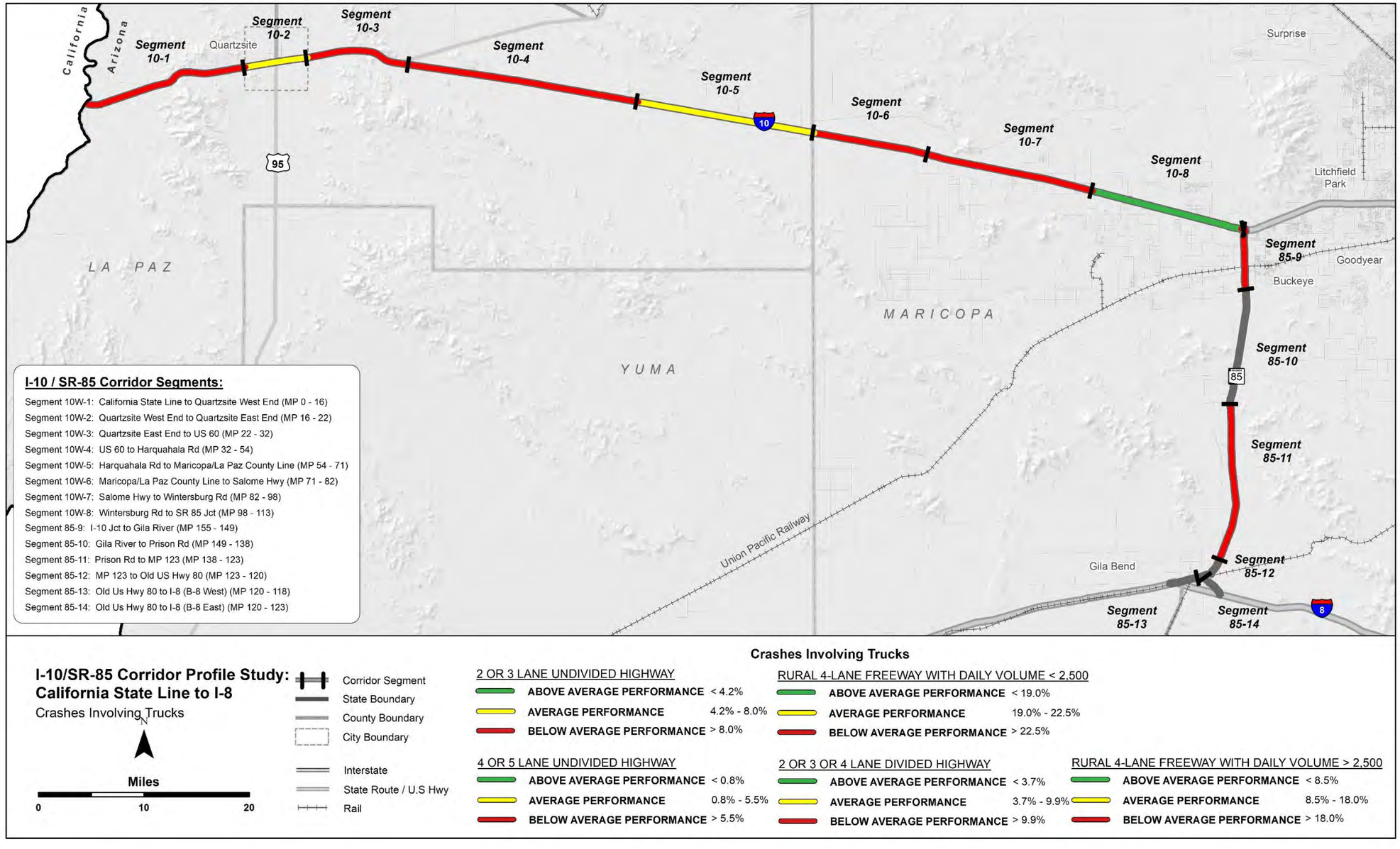
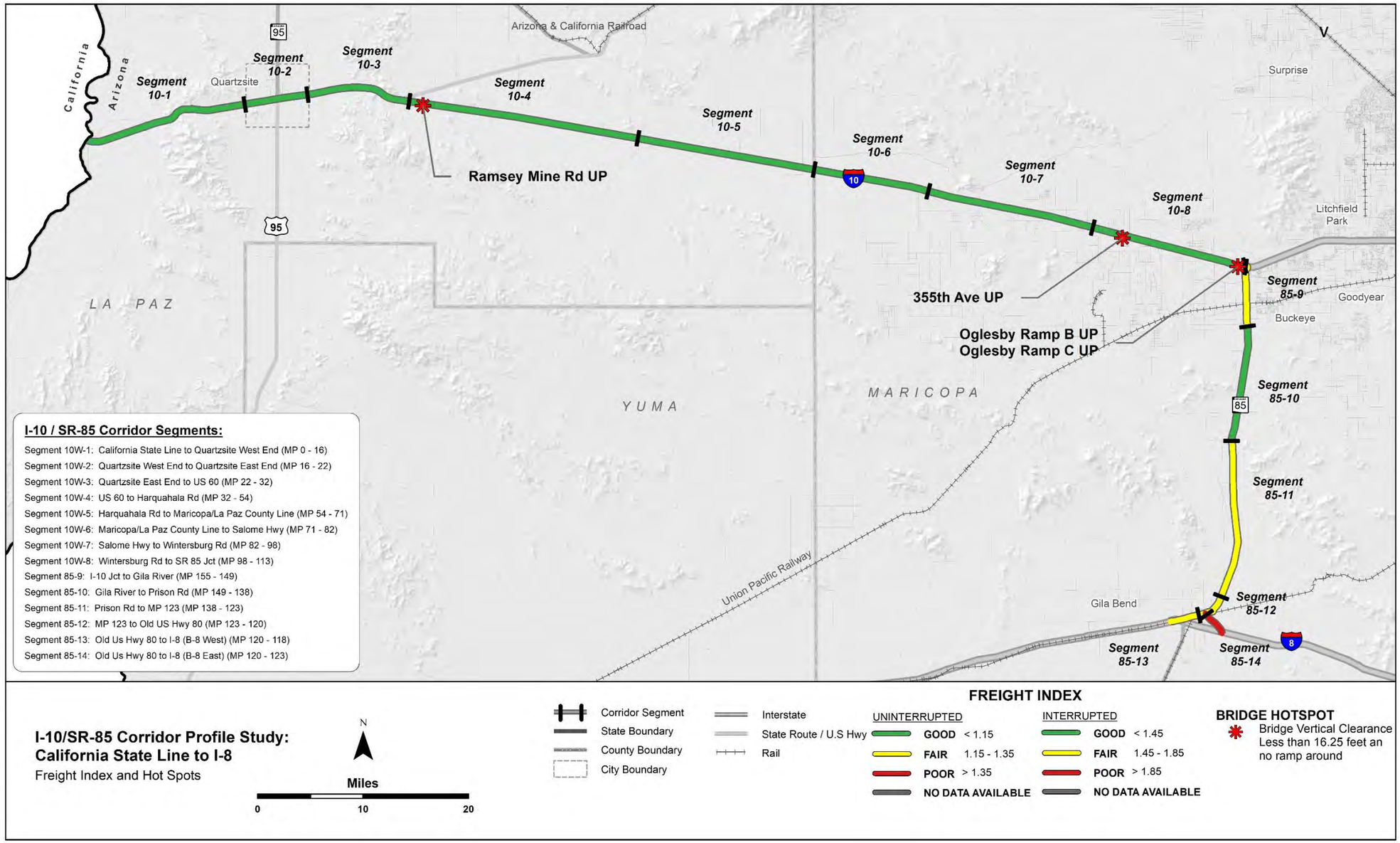
Segment 10W-8: Wintersburg Rd to SR 85 Jct (MP 98 - 113)
Segment 85-9: I-10 Jct to Gila River (MP 155 - 149)
Segment 85-10: Gila River to Prison Rd (MP 149 - 138)
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Crashes Involving Lane Departures
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
Crashes Involving Lane Departures
2 OR 3 LANE UNDIVIDED HIGHWAY
ABOVE AVERAGE PERFORMANCE < 66.9%
AVERAGE PERFORMANCE 66.9% - 74.5%
BELOW AVERAGE PERFORMANCE > 74.5%
RURAL 4-LANE FREEWAY WITH DAILY VOLUME < 2,500
ABOVE AVERAGE PERFORMANCE < 72.8%
AVERAGE PERFORMANCE 72.8% - 76.4%
BELOW AVERAGE PERFORMANCE > 76.4%
4 OR 5 LANE UNDIVIDED HIGHWAY
ABOVE AVERAGE PERFORMANCE < 21.1%
AVERAGE PERFORMANCE 21.1% - 32.1%
BELOW AVERAGE PERFORMANCE > 32.1%
2 OR 3 OR 4 LANE DIVIDED HIGHWAY
ABOVE AVERAGE PERFORMANCE < 56.4%
AVERAGE PERFORMANCE 56.4% - 65%
BELOW AVERAGE PERFORMANCE > 65%
RURAL 4-LANE FREEWAY WITH DAILY VOLUME > 2,500
ABOVE AVERAGE PERFORMANCE < 69%
AVERAGE PERFORMANCE 69% - 77.5%
BELOW AVERAGE PERFORMANCE > 77.5%


California
Arizona
Segment 10-1
Quartzsite
Segment 10-2
Segment 10-3
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Segment 85-9
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
10
95
85
8
Surprise
Litchfield Park
Goodyear
Buckeye
Gila Bend
LA PAZ
YUMA
MARICOPA
Union Pacific Railway
I-10 / SR-85 Corridor Segments:
Segment 10W-1: California State Line to Quartzsite West End (MP 0 - 16)
Segment 10W-2: Quartzsite West End to Quartzsite East End (MP 16 - 22)
Segment 10W-3: Quartzsite East End to US 60 (MP 22 - 32)
Segment 10W-4: US 60 to Harquahala Rd (MP 32 - 54)
Segment 10W-5: Harquahala Rd to Maricopa/La Paz County Line (MP 54 - 71)
Segment 10W-6: Maricopa/La Paz County Line to Salome Hwy (MP 71 - 82)
Segment 10W-7: Salome Hwy to Wintersburg Rd (MP 82 - 98)
Segment 10W-8: Wintersburg Rd to SR 85 Jct (MP 98 - 113)
Segment 85-9: I-10 Jct to Gila River (MP 155 - 149)
Segment 85-10: Gila River to Prison Rd (MP 149 - 138)
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Crashes Involving Trucks
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
Crashes Involving Trucks
2 OR 3 LANE UNDIVIDED HIGHWAY
ABOVE AVERAGE PERFORMANCE < 4.2%
AVERAGE PERFORMANCE 4.2% - 8.0%
BELOW AVERAGE PERFORMANCE > 8.0%
RURAL 4-LANE FREEWAY WITH DAILY VOLUME < 2,500
ABOVE AVERAGE PERFORMANCE < 19.0%
AVERAGE PERFORMANCE 19.0% - 22.5%
BELOW AVERAGE PERFORMANCE > 22.5%
4 OR 5 LANE UNDIVIDED HIGHWAY
ABOVE AVERAGE PERFORMANCE < 0.8%
AVERAGE PERFORMANCE 0.8% - 5.5%
BELOW AVERAGE PERFORMANCE > 5.5%
2 OR 3 OR 4 LANE DIVIDED HIGHWAY
ABOVE AVERAGE PERFORMANCE < 3.7%
AVERAGE PERFORMANCE 3.7% - 9.9%
BELOW AVERAGE PERFORMANCE > 9.9%
RURAL 4-LANE FREEWAY WITH DAILY VOLUME > 2,500
ABOVE AVERAGE PERFORMANCE < 8.5%
AVERAGE PERFORMANCE 8.5% - 18.0%
BELOW AVERAGE PERFORMANCE > 18.0%


California
Arizona
Segment 10-1
Quartzsite
Segment 10-2
Segment 10-3
Arizona & California Railroad
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Ramsey Mine Rd UP
355th Ave UP
Oglesby Ramp B UP
Oglesby Ramp C UP
Surprise
Litchfield Park
Goodyear
Buckeye
Segment 85-9
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Gila Bend
Union Pacific Railway
LA PAZ
YUMA
MARICOPA
95
10
85
8
I-10 / SR-85 Corridor Segments:
Segment 10W-1: California State Line to Quartzsite West End (MP 0 - 16)
Segment 10W-2: Quartzsite West End to Quartzsite East End (MP 16 - 22)
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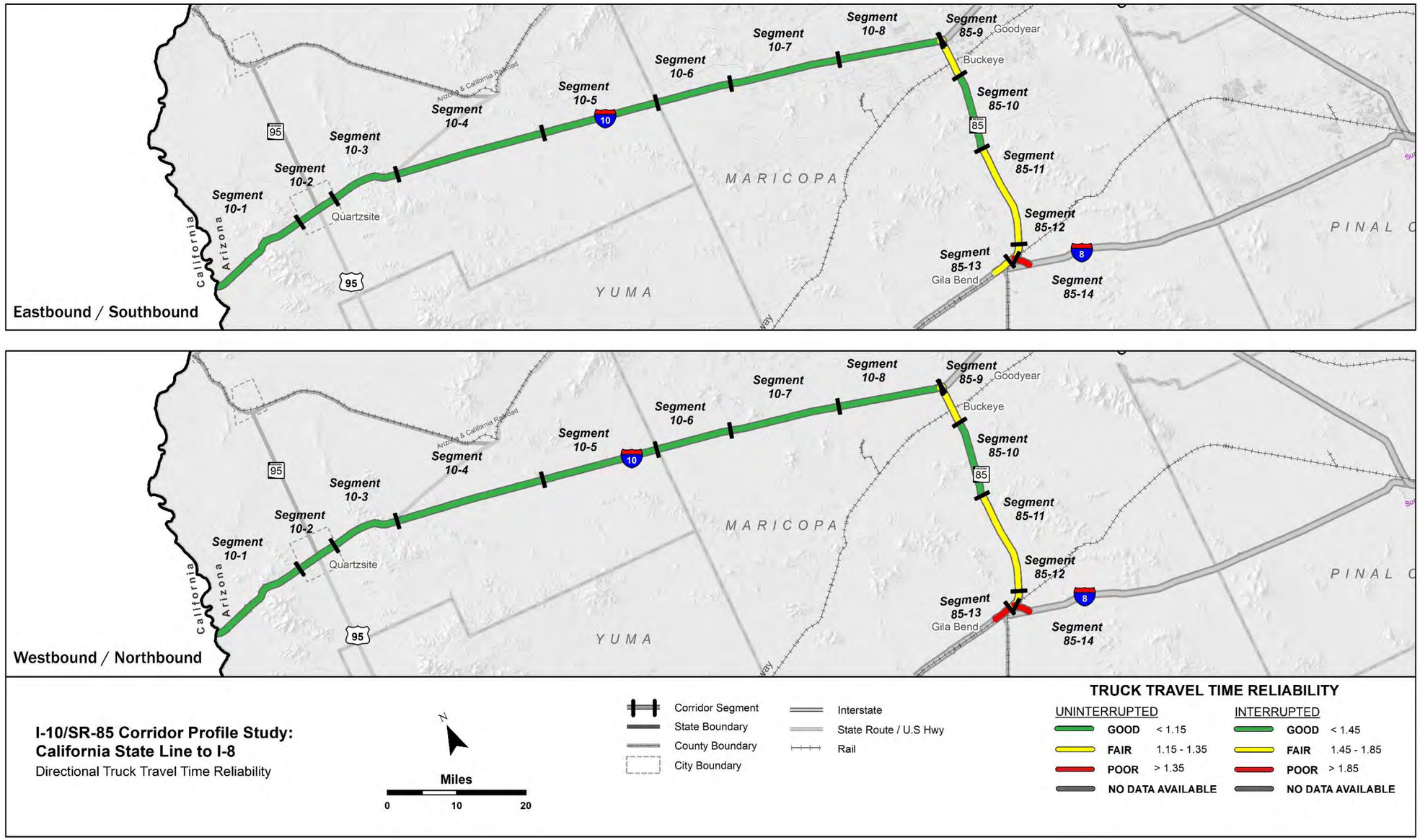
Segment 10W-4: US 60 to Harquahala Rd (MP 32 - 54)
Segment 10W-5: Harquahala Rd to Maricopa/La Paz County Line (MP 54 - 71)
Segment 10W-6: Maricopa/La Paz County Line to Salome Hwy (MP 71 - 82)
Segment 10W-7: Salome Hwy to Wintersburg Rd (MP 82 - 98)
Segment 10W-8: Wintersburg Rd to SR 85 Jct (MP 98 - 113)
Segment 85-9: I-10 Jct to Gila River (MP 155 - 149)
Segment 85-10: Gila River to Prison Rd (MP 149 - 138)
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Freight Index and Hot Spots
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
FREIGHT INDEX
UNINTERRUPTED
GOOD < 1.15
FAIR 1.15 - 1.35
POOR > 1.35
NO DATA AVAILABLE
INTERRUPTED
GOOD < 1.45
FAIR 1.45 - 1.85
POOR > 1.85
NO DATA AVAILABLE
BRIDGE HOTSPOT
Bridge Vertical Clearance Less than 16.25 feet an no ramp around


Segment 10-1
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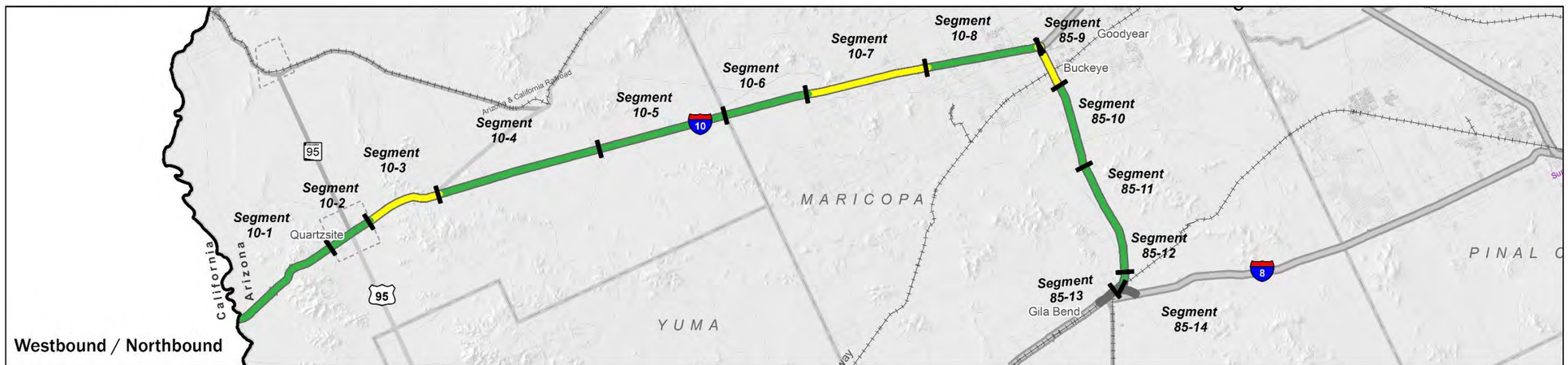
Segment 10-4
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
Segment 85-9
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Quartzsite
Goodyear
Buckeye
Gila Bend
MARICOPA
YUMA
PINAL C
California
Arizona
Arizona & California Railroad
Eastbound / Southbound
Westbound / Northbound
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Directional Truck Travel Time Reliability
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
TRUCK TRAVEL TIME RELIABILITY
UNINTERRUPTED
GOOD < 1.15
FAIR 1.15 - 1.35
POOR > 1.35
NO DATA AVAILABLE
INTERRUPTED
GOOD < 1.45
FAIR 1.45 - 1.85
POOR > 1.85
NO DATA AVAILABLE



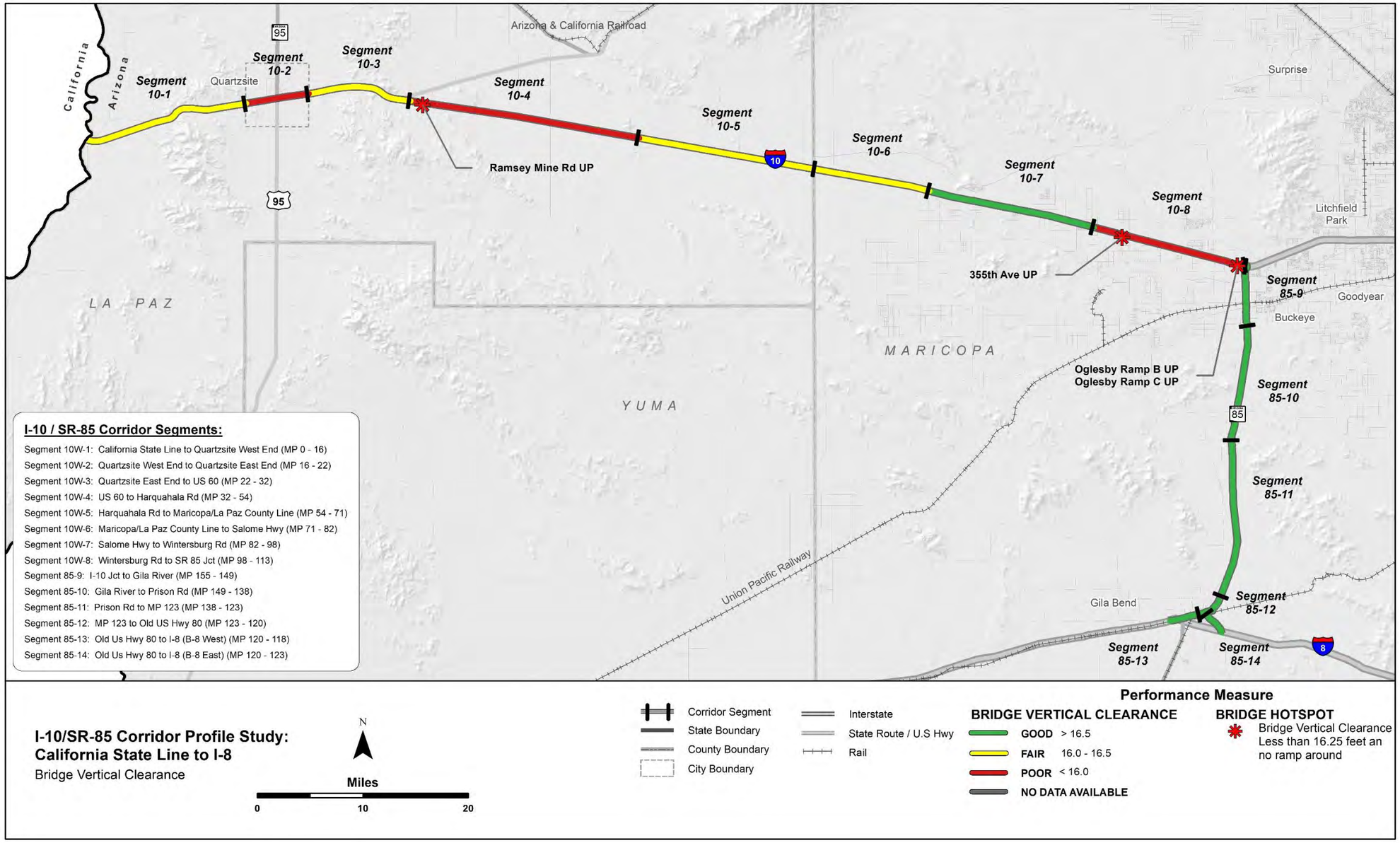
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Closure Duration

N

Miles
0 10 20

Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail

CLOSURE DURATION (min/miles/year)
GOOD < 44.2
FAIR 44.2 - 124.9
POOR > 124.9
NO DATA AVAILABLE


California
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Segment 10-1
Quartzsite
Segment 10-2
Segment 10-3
Arizona & California Railroad
Segment 10-4
Ramsey Mine Rd UP
Segment 10-5
Segment 10-6
Segment 10-7
Segment 10-8
355th Ave UP
Surprise
Litchfield Park
Goodyear
Buckeye
Segment 85-9
Segment 85-10
Segment 85-11
Segment 85-12
Segment 85-13
Segment 85-14
Oglesby Ramp B UP
Oglesby Ramp C UP
Gila Bend
Union Pacific Railway
LA PAZ
YUMA
MARICOPA
95
10
85
8
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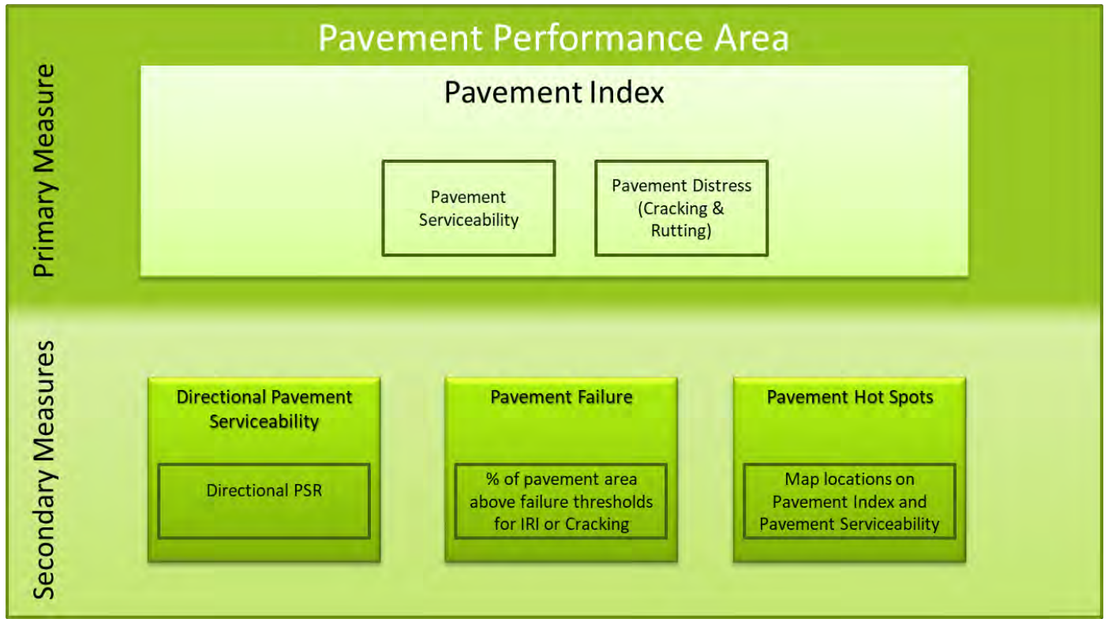
Segment 10W-6: Maricopa/La Paz County Line to Salome Hwy (MP 71 - 82)
Segment 10W-7: Salome Hwy to Wintersburg Rd (MP 82 - 98)
Segment 10W-8: Wintersburg Rd to SR 85 Jct (MP 98 - 113)
Segment 85-9: I-10 Jct to Gila River (MP 155 - 149)
Segment 85-10: Gila River to Prison Rd (MP 149 - 138)
Segment 85-11: Prison Rd to MP 123 (MP 138 - 123)
Segment 85-12: MP 123 to Old US Hwy 80 (MP 123 - 120)
Segment 85-13: Old Us Hwy 80 to I-8 (B-8 West) (MP 120 - 118)
Segment 85-14: Old Us Hwy 80 to I-8 (B-8 East) (MP 120 - 123)
I-10/SR-85 Corridor Profile Study:
California State Line to I-8
Bridge Vertical Clearance
N
Miles
0
10
20
Corridor Segment
State Boundary
County Boundary
City Boundary
Interstate
State Route / U.S Hwy
Rail
Performance Measure
BRIDGE VERTICAL CLEARANCE
GOOD > 16.5
FAIR 16.0 - 16.5
POOR < 16.0
NO DATA AVAILABLE
BRIDGE HOTSPOT
Bridge Vertical Clearance Less than 16.25 feet an no ramp around

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

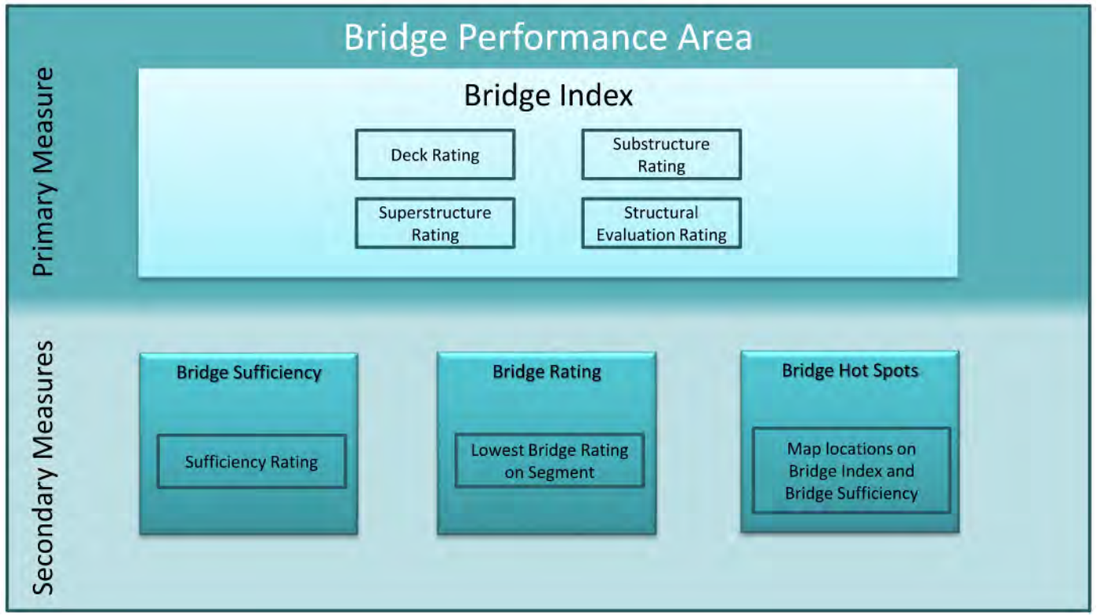
Performance Level	Pavement Index	
	Interstates	Non-Interstates
Good	>3.75	>3.6
Fair	3.0 - 3.75	2.8 - 3.6
Poor	<3.0	<2.8

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:

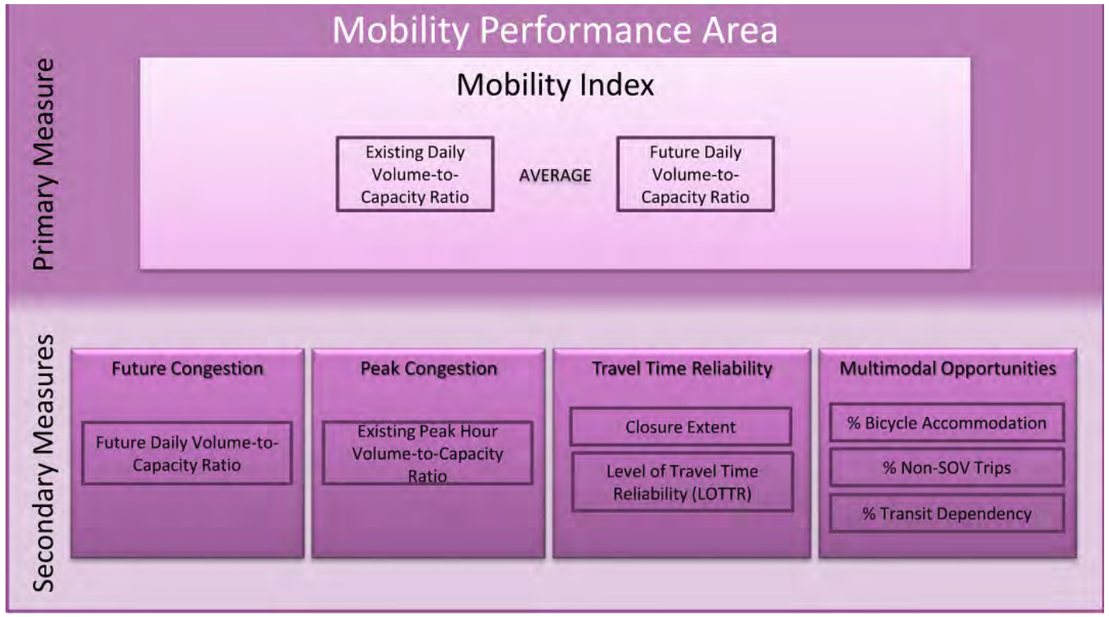
Performance Level	Bridge Index
Good	>6.5
Fair	5.0-6.5
Poor	<5.0

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

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

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

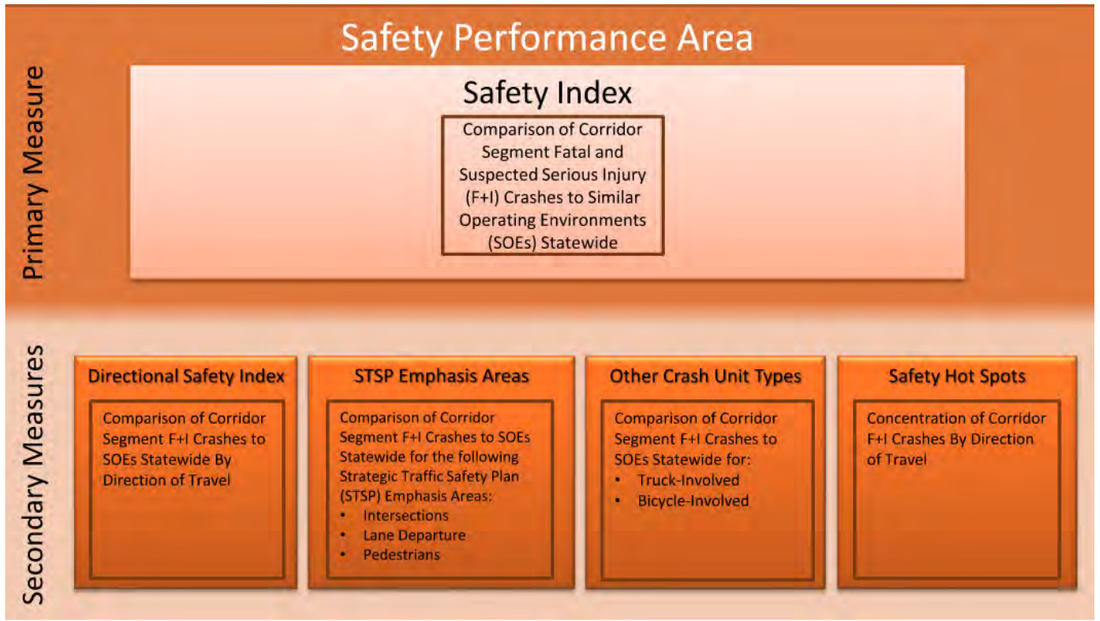
Performance Level	Percent Bicycle Accommodation
Good	≥ 90%
Fair	> 60% & ≤ 90%
Poor	< 60%

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 (EB/SB)			Direction 2 (WB/NB)				Direction 1 (EB/SB)		Direction 2 (WB/NB)		Composite			% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (EB/SB)	Dir 2 (WB/NB)	Pavement Index	Dir 1 (EB/SB)	Dir 2 (WB/NB)
Segment 1		*Interstate?*		Yes																
Milepost	0	to	1	2	71.49	10.44	0.20	2	67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		2	0
Milepost	1	to	2	2	102.54	13.00	0.22	2	68.29	8.00	0.22	3.39	3.22	3.86	3.70	3.39	3.75		2	0
Milepost	2	to	3	2	57.42	0.00	0.20	2	57.17	6.40	0.18	4.02	4.71	4.02	3.91	4.23	3.94		0	0
Milepost	3	to	4	2	53.11	0.00	0.16	2	117.64	20.40	0.22	4.09	4.77	3.20	2.61	4.29	3.20		0	2
Milepost	4	to	5	2	57.00	0.00	0.18	2	56.97	7.30	0.20	4.03	4.74	4.03	3.79	4.24	3.86		0	0
Milepost	5	to	6	2	52.55	0.00	0.16	2	76.43	7.10	0.21	4.09	4.78	3.74	3.81	4.30	3.76		0	0
Milepost	6	to	7	2	53.87	0.00	0.20	2	52.82	6.70	0.19	4.07	4.71	4.09	3.86	4.26	3.93		0	0
Milepost	7	to	8	2	56.77	0.00	0.19	2	102.18	11.80	0.22	4.03	4.72	3.39	3.32	4.24	3.39		0	2
Milepost	8	to	9	2	54.52	0.00	0.18	2	69.06	4.50	0.17	4.06	4.74	3.85	4.14	4.27	3.93		0	0
Milepost	9	to	10	2	69.47	0.00	0.17	2	62.28	4.20	0.17	3.84	4.76	3.95	4.18	4.12	4.11		0	0
Milepost	10	to	11	2	49.65	0.00	0.18	2	35.52	0.00	0.18	4.14	4.75	4.37	4.74	4.56	4.63		0	0
Milepost	11	to	12	2	76.91	12.00	0.22	2	61.09	4.80	0.18	3.73	3.31	3.96	4.10	3.44	4.06		2	0
Milepost	12	to	13	2	121.98	26.40	0.20	2	115.78	19.70	0.18	3.15	2.18	3.22	2.69	3.15	3.22		2	2
Milepost	13	to	14	2	117.14	25.70	0.21	2	134.54	21.70	0.22	3.20	2.22	3.00	2.51	3.20	3.00		2	2
Milepost	14	to	15	2	147.25	26.20	0.20	2	128.03	19.30	0.21	2.86	2.19	3.07	2.70	2.86	3.07		2	2
Milepost	15	to	16	2	110.76	18.70	0.18	2	175.44	26.40	0.23	3.28	2.77	2.57	2.16	3.28	2.57		2	2
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
		Total		32				32												26
		Weighted Average										3.74	3.88	3.64	3.48	3.84	3.63			
		Factor										1.00		1.00						
		Indicator Score										3.74		3.64						40.6%
		Pavement Index																3.73		
Segment 2		*Interstate?*		Yes																
Milepost	16	to	17	2	118.55	19.20	0.17	2	120.71	20.20	0.20	3.19	2.74	3.16	2.64	3.19	3.16		2	2
Milepost	17	to	18	2	123.08	22.80	0.18	2	107.93	17.10	0.15	3.13	2.46	3.32	2.92	3.13	3.32		2	2
Milepost	18	to	19	2	147.38	22.00	0.18	2	85.34	14.40	0.17	2.86	2.51	3.62	3.14	2.86	3.28		2	2
Milepost	19	to	20	2	121.60	20.00	0.17	2	82.20	13.20	0.15	3.15	2.68	3.66	3.26	3.15	3.38		2	2
Milepost	20	to	21	2	144.42	19.20	0.18	2	86.19	9.70	0.15	2.89	2.73	3.60	3.59	2.89	3.60		2	0
Milepost	21	to	22	2	139.22	25.90	0.21	2	98.05	19.20	0.19	2.95	2.20	3.44	2.73	2.95	2.73		2	2
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
		Total		12				12												22
		Weighted Average										3.03	2.55	3.47	3.05	3.03	3.25			
		Factor										1.00		1.00						
		Indicator Score										3.03		3.47						91.7%
		Pavement Index																3.14		
Segment 3		*Interstate?*		Yes																
Milepost	22	to	23	2	141.47	31.00	0.21	2	107.19	18.50	0.21	2.92	1.85	3.33	2.77	2.92	3.33		2	2
Milepost	23	to	24	2	138.94	16.10	0.17	2	169.93	25.80	0.25	2.95	2.99	2.62	2.18	2.95	2.62		2	2
Milepost	24	to	25	2	105.76	14.10	0.27	2	116.52	19.10	0.26	3.35	3.06	3.21	2.67	3.35	3.21		2	2
Milepost	25	to	26	2	93.38	20.80	0.31	2	91.53	12.60	0.26	3.51	2.47	3.53	3.20	2.47	3.43		2	2
Milepost	26	to	27	2	92.64	12.30	0.27	2	64.96	16.30	0.31	3.52	3.22	3.91	2.82	3.43	3.15		2	2
Milepost	27	to	28	2	77.42	6.00	0.26	2	64.90	15.20	0.32	3.73	3.86	3.91	2.91	3.77	3.21		0	2
Milepost	28	to	29	2	72.17	7.80	0.28	2	49.25	1.70	0.32	3.80	3.65	4.15	4.32	3.69	4.27		0	0
Milepost	29	to	30	2	59.67	2.90	0.27	2	78.35	10.50	0.27	3.99	4.23	3.71	3.39	4.15	3.48		0	2

Milepost	30	to	31	2	30.61	0.00	0.16	2	26.27	0.00	0.17	4.45	4.78	4.53	4.76	4.68	4.69		0	0
Milepost	31	to	32	2	27.53	0.00	0.16	2	23.03	0.00	0.14	4.50	4.78	4.58	4.81	4.70	4.74		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
			Total	20				20												24
			Weighted Average									3.67	3.49	3.75	3.38	3.61	3.61			
			Factor									1.00		1.00						
			Indicator Score									3.67		3.75						60.0%
			Pavement Index															3.61		
Segment 4		*Interstate?*		Yes																
Milepost	32	to	33	2	24.67	0.00	0.16	2	22.05	0.00	0.15	4.55	4.78	4.60	4.79	4.71	4.74		0	0
Milepost	33	to	34	2	28.60	0.00	0.15	2	25.07	0.00	0.15	4.49	4.79	4.55	4.79	4.70	4.72		0	0
Milepost	34	to	35	2	26.71	0.00	0.14	2	27.57	0.00	0.14	4.52	4.82	4.50	4.81	4.73	4.72		0	0
Milepost	35	to	36	2	29.74	0.00	0.15	2	26.51	0.00	0.16	4.47	4.80	4.52	4.78	4.70	4.70		0	0
Milepost	36	to	37	2	34.78	0.00	0.16	2	24.31	0.00	0.16	4.38	4.78	4.56	4.77	4.66	4.71		0	0
Milepost	37	to	38	2	57.88	0.00	0.13	2	27.04	0.00	0.15	4.01	4.83	4.51	4.80	4.26	4.71		0	0
Milepost	38	to	39	2	56.08	0.00	0.16	2	24.83	0.00	0.14	4.04	4.79	4.55	4.81	4.26	4.73		0	0
Milepost	39	to	40	2	44.49	0.00	0.16	2	28.18	0.00	0.15	4.22	4.77	4.49	4.79	4.61	4.70		0	0
Milepost	40	to	41	2	31.54	0.00	0.16	2	23.52	0.00	0.15	4.44	4.79	4.57	4.80	4.68	4.73		0	0
Milepost	41	to	42	2	36.51	0.00	0.16	2	28.21	0.00	0.14	4.35	4.77	4.49	4.82	4.65	4.72		0	0
Milepost	42	to	43	2	39.74	0.00	0.21	2	36.83	0.00	0.15	4.30	4.68	4.35	4.79	4.57	4.66		0	0
Milepost	43	to	44	2	35.16	0.00	0.19	2	36.10	0.10	0.15	4.37	4.73	4.36	4.87	4.62	4.72		0	0
Milepost	44	to	45	2	39.41	0.00	0.18	2	40.43	0.30	0.16	4.30	4.74	4.29	4.81	4.61	4.65		0	0
Milepost	45	to	46	2	43.12	0.00	0.16	2	48.39	0.00	0.15	4.24	4.78	4.16	4.79	4.62	4.60		0	0
Milepost	46	to	47	2	50.72	0.00	0.19	2	47.70	0.00	0.17	4.12	4.73	4.17	4.76	4.54	4.58		0	0
Milepost	47	to	48	2	73.45	0.00	0.23	2	47.64	0.10	0.16	3.78	4.65	4.17	4.85	4.04	4.65		0	0
Milepost	48	to	49	2	39.96	0.00	0.19	2	42.18	0.00	0.15	4.30	4.71	4.26	4.79	4.59	4.63		0	0
Milepost	49	to	50	2	45.71	0.00	0.17	2	40.84	0.10	0.16	4.20	4.75	4.28	4.86	4.59	4.68		0	0
Milepost	50	to	51	2	56.58	0.00	0.17	2	39.88	0.20	0.17	4.03	4.76	4.30	4.82	-	-			
Milepost	51	to	52	2	53.48	0.10	0.16	2	43.96	0.30	0.15	4.08	4.85	4.23	4.82	4.31	4.64		0	0
Milepost	52	to	53	2	128.83	0.00	0.15	2	63.84	1.80	0.14	3.06	4.80	3.92	4.55	-	-			
Milepost	53	to	54	2	112.78	0.20	0.14	2	41.51	0.00	0.12	3.26	4.86	4.27	4.85	-	-			
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	-	-			
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
			Total	44				44												0
			Weighted Average									4.16	4.77	4.37	4.80	3.93	4.05			
			Factor									1.00		1.00						
			Indicator Score									4.16		4.37						0.0%
			Pavement Index															3.99		
Segment 5		*Interstate?*		Yes																
Milepost	54	to	55	2	87.33	0.00	0.12	2	48.70	0.00	0.13	3.59	4.84	4.16	4.83	3.96	4.63		0	0
Milepost	55	to	56	2	60.29	0.00	0.10	2	45.25	0.00	0.14	3.98	4.88	4.21	4.81	4.25	4.63		0	0
Milepost	56	to	57	2	57.77	0.20	0.10	2	45.46	0.00	0.14	4.01	4.90	4.21	4.81	4.28	4.63		0	0
Milepost	57	to	58	2	57.90	0.00	0.11	2	42.11	0.00	0.14	4.01	4.87	4.26	4.82	4.27	4.65		0	0
Milepost	58	to	59	2	58.60	0.70	0.13	2	38.02	0.00	0.14	4.00	4.76	4.33	4.81	4.23	4.67		0	0
Milepost	59	to	60	2	57.87	0.10	0.14	2	40.58	0.20	0.15	4.01	4.88	4.29	4.85	4.27	4.68		0	0
Milepost	60	to	61	2	42.08	0.00	0.16	2	49.10	0.00	0.16	4.26	4.78	4.15	4.77	4.63	4.58		0	0
Milepost	61	to	62	2	53.14	0.00	0.15	2	46.98	0.00	0.15	4.09	4.80	4.18	4.79	4.30	4.61		0	0
Milepost	62	to	63	2	45.78	0.80	0.14	2	47.80	0.00	0.15	4.20	4.72	4.17	4.80	4.56	4.61		0	0
Milepost	63	to	64	2	57.03	0.00	0.12	2	50.61	0.00	0.14	4.03	4.85	4.13	4.81	4.27	4.61		0	0
Milepost	64	to	65	2	48.71	0.00	0.11	2	50.03	0.00	0.15	4.16	4.87	4.13	4.80	4.66	4.60		0	0
Milepost	65	to	66	2	39.70	0.00	0.10	2	45.19	0.00	0.16	4.30	4.88	4.21	4.78	4.70	4.61		0	0
Milepost	66	to	67	2	41.67	0.00	0.11	2	50.66	0.00	0.17	4.27	4.86	4.12	4.77	4.68	4.58		0	0
Milepost	67	to	68	2	52.26	0.00	0.11	2	50.25	0.00	0.14	4.10	4.86	4.13	4.81	4.33	4.60		0	0
Milepost	68	to	69	2	52.23	0.00	0.11	2	44.57	0.00	0.13	4.10	4.86	4.22	4.84	4.33	4.65		0	0
Milepost	69	to	70	2	47.36	0.00	0.11	2	48.85	0.00	0.14	4.18	4.86	4.15	4.82	4.66	4.62		0	0
Milepost	70	to	71	2	45.15	0.00	0.14	2	58.44	0.00	0.16	4.21	4.81	4.00	4.78	4.63	4.24		0	0

Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
			Total	34				34												0
			Weighted Average									4.09	4.84	4.18	4.81	4.41	4.60			
			Factor									1.00		1.00						
			Indicator Score									4.09		4.18						0.0%
			Pavement Index															4.51		
Segment 6		*Interstate?*		Yes																
Milepost	71	to	72	2	42.30	0.00	0.17	2	47.11	0.00	0.18	4.26	4.76	4.18	4.74	4.61	4.57		0	0
Milepost	72	to	73	2	39.92	0.00	0.19	2	50.90	0.00	0.17	4.30	4.73	4.12	4.76	4.60	4.57		0	0
Milepost	73	to	74	2	36.39	0.00	0.16	2	40.32	0.00	0.17	4.35	4.77	4.29	4.76	4.65	4.62		0	0
Milepost	74	to	75	2	35.95	0.00	0.17	2	41.31	0.00	0.17	4.36	4.76	4.27	4.75	4.64	4.61		0	0
Milepost	75	to	76	2	40.67	0.00	0.17	2	38.43	0.00	0.17	4.28	4.75	4.32	4.75	4.61	4.62		0	0
Milepost	76	to	77	2	44.86	0.00	0.17	2	43.01	0.00	0.17	4.22	4.75	4.25	4.75	4.59	4.60		0	0
Milepost	77	to	78	2	42.51	0.00	0.19	2	44.48	0.00	0.19	4.25	4.73	4.22	4.73	4.58	4.58		0	0
Milepost	78	to	79	2	44.87	0.00	0.20	2	40.73	0.10	0.17	4.22	4.70	4.28	4.85	4.56	4.68		0	0
Milepost	79	to	80	2	49.99	1.80	0.19	2	39.43	1.00	0.17	4.14	4.50	4.30	4.65	4.39	4.55		0	0
Milepost	80	to	81	2	146.68	20.60	0.24	2	115.26	18.80	0.26	2.86	2.57	3.23	2.69	2.86	3.23		2	2
Milepost	81	to	82	2	122.33	17.10	0.21	2	93.86	17.40	0.30	3.14	2.88	3.50	2.76	3.14	2.98		2	2
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
			Total	22				22												8
			Weighted Average									4.03	4.35	4.09	4.38	4.29	4.33			
			Factor									1.00		1.00						
			Indicator Score									4.03		4.09						18.2%
			Pavement Index															4.31		
Segment 7		*Interstate?*		Yes																
Milepost	82	to	83	2	162.53	20.50	0.34	2	96.26	17.20	0.28	2.70	2.46	3.47	2.79	2.70	2.99		2	2
Milepost	83	to	84	2	137.93	19.00	0.28	2	86.73	17.00	0.24	2.96	2.65	3.60	2.86	2.96	3.08		2	2
Milepost	84	to	85	2	121.04	17.50	0.24	2	125.23	18.50	0.25	3.16	2.82	3.11	2.72	3.16	3.11		2	2
Milepost	85	to	86	2	94.51	17.50	0.24	2	84.41	17.60	0.23	3.49	2.82	3.63	2.82	3.02	3.06		2	2
Milepost	86	to	87	2	93.98	17.20	0.22	2	79.15	17.30	0.23	3.50	2.87	3.70	2.84	3.06	3.10		2	2
Milepost	87	to	88	2	118.23	17.40	0.24	2	94.26	17.20	0.25	3.19	2.82	3.49	2.83	3.19	3.03		2	2
Milepost	88	to	89	2	122.70	17.10	0.25	2	96.39	17.70	0.26	3.14	2.84	3.47	2.78	3.14	2.98		2	2
Milepost	89	to	90	2	129.03	17.30	0.25	2	91.03	17.70	0.24	3.06	2.82	3.54	2.80	3.06	3.02		2	2
Milepost	90	to	91	2	88.28	3.70	0.28	2	82.76	5.00	0.26	3.58	4.10	3.65	3.98	3.73	3.75		0	0
Milepost	91	to	92	2	125.36	6.00	0.51	2	113.91	17.50	0.55	3.11	3.43	3.24	2.30	3.11	2.30		2	2
Milepost	92	to	93	2	94.30	2.70	0.70	2	99.96	11.70	0.64	3.49	3.36	3.42	2.59	3.45	2.59		2	2
Milepost	93	to	94	2	122.51	5.70	0.58	2	93.11	10.40	0.51	3.14	3.29	3.51	2.99	3.14	3.15		2	2
Milepost	94	to	95	2	96.30	5.80	0.61	2	64.93	2.10	0.23	3.47	3.22	3.91	4.39	3.39	4.05		2	0
Milepost	95	to	96	2	81.17	2.40	0.49	2	74.93	1.10	0.38	3.67	3.89	3.76	4.31	3.74	3.93		2	0
Milepost	96	to	97	2	77.79	2.44	0.45	2	69.57	5.70	0.37	3.72	3.97	3.84	3.73	3.80	3.76		2	0
Milepost	97	to	98	2	74.75	2.00	0.44	2	71.25	2.60	0.40	3.76	4.05	3.81	4.04	3.85	3.88		2	2
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
			Total	32				32												54
			Weighted Average									3.32	3.21	3.57	3.17	3.28	3.24			
			Factor									1.00		1.00						
			Indicator Score									3.32		3.57						84.4%
			Pavement Index															3.26		
Segment 8		*Interstate?*		Yes																

Milepost	98	to	99	2	84.69	0.80	0.29	2	70.48	0.20	0.41	3.62	4.52	3.83	4.39	3.89	3.99		0	2
Milepost	99	to	100	2	73.48	1.30	0.46	2	68.77	0.30	0.44	3.78	4.11	3.85	4.31	3.88	3.99		2	2
Milepost	100	to	101	2	108.77	7.10	0.42	2	76.94	4.50	0.35	3.31	3.48	3.73	3.89	3.31	3.78		2	0
Milepost	101	to	102	2	89.50	10.40	0.39	2	115.16	14.10	0.32	3.56	3.21	3.23	3.00	3.46	3.23		2	2
Milepost	102	to	103	2	90.63	11.20	0.40	2	108.89	9.40	0.32	3.54	3.12	3.31	3.42	3.25	3.31		2	2
Milepost	103	to	104	2	69.71	3.70	0.43	2	71.07	1.90	0.37	3.84	3.85	3.82	4.19	3.84	3.93		2	0
Milepost	104	to	105	2	84.98	7.87	0.37	2	81.36	12.29	0.30	3.62	3.49	3.67	3.18	3.58	3.33		0	2
Milepost	105	to	106	2	55.08	0.70	0.20	2	55.93	1.30	0.20	4.06	4.68	4.04	4.57	4.24	4.41		0	0
Milepost	106	to	107	2	103.24	43.10	0.00	2	78.96	4.44	0.33	3.38	0.86	3.70	3.93	0.86	3.77		2	0
Milepost	107	to	108	2	135.85	15.20	0.00	2	80.66	3.30	0.38	2.98	2.92	3.68	4.00	2.98	3.77		2	0
Milepost	108	to	109	2	119.58	0.50	0.34	2	74.22	3.80	0.38	3.17	4.49	3.77	3.92	3.17	3.82		2	0
Milepost	109	to	110	2	83.89	2.30	0.36	2	80.49	3.80	0.35	3.64	4.16	3.68	3.99	3.79	3.77		0	0
Milepost	110	to	111	2	83.24	1.30	0.37	2	80.63	2.90	0.35	3.64	4.28	3.68	4.09	3.84	3.80		0	0
Milepost	111	to	112	2	73.26	0.70	0.40	2	90.64	1.20	0.37	3.78	4.33	3.54	4.31	3.95	3.77		0	0
Milepost	112	to	113	2	51.80	0.50	0.29	2	64.60	0.40	0.19	4.11	4.58	3.91	4.75	4.44	4.16		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
			Total	30				30												26
			Weighted Average									3.60	3.74	3.70	4.00	3.50	3.79			
			Factor									1.00		1.00						
			Indicator Score									3.60		3.70						43.3%
			Pavement Index															3.64		
Segment 9			*Interstate?*	No																
Milepost	155	to	154		-	-	-		-	-	-	-	-	-	-	-	-		0	0
Milepost	154	to	153	2	108.23	0.67	0.14	2	110.53	0.00	0.10	3.31	4.75	3.29	4.88	3.74	3.76		0	0
Milepost	153	to	152	2	66.63	3.50	0.07	2	67.03	0.00	0.09	3.88	4.33	3.88	4.89	4.20	4.18		0	0
Milepost	152	to	151	2	83.16	3.90	0.15	2	75.01	0.00	0.15	3.65	4.24	3.76	4.80	3.82	4.07		0	0
Milepost	151	to	150	2	54.83	5.70	0.24	2	111.65	0.00	0.16	4.06	3.92	3.27	4.77	3.96	3.72		0	0
Milepost	150	to	149	2	106.87	10.80	0.29	2	93.11	0.00	0.33	3.33	3.33	3.51	4.43	3.33	3.79		2	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
			Total	10				10												2
			Weighted Average									3.65	4.11	3.54	4.76	3.81	3.91			
			Factor									1.00		1.00						
			Indicator Score									3.65		3.54						10.0%
			Pavement Index															3.86		
Segment 10			*Interstate?*	No																
Milepost	149	to	148	2	81.92	8.80	0.37	2	79.72	0.00	0.17	3.66	3.41	3.69	4.76	3.48	4.01		0	0
Milepost	148	to	147	2	108.05	0.50	0.08	2	140.94	0.00	0.47	3.32	4.84	2.93	4.07	3.77	3.27		0	2
Milepost	147	to	146	2	85.89	10.57	0.14	2	97.96	0.00	0.31	3.61	3.51	3.45	4.46	3.54	3.75		2	0
Milepost	146	to	145	2	103.87	23.20	0.22	2	65.58	0.00	0.23	3.37	2.39	3.90	4.65	2.39	4.12		2	0
Milepost	145	to	144	2	101.65	36.60	0.24	2	46.92	0.00	0.29	3.40	1.46	4.18	4.52	1.46	4.42		2	0
Milepost	144	to	143	2	127.52	50.38	0.33	2	48.04	0.00	0.30	3.08	0.51	4.17	4.50	0.51	4.40		2	0
Milepost	143	to	142	2	162.19	43.90	0.28	2	43.31	0.00	0.25	2.70	0.95	4.24	4.60	0.95	4.49		2	0
Milepost	142	to	141	2	0.00	0.00	0.00	2	51.51	0.00	0.24	5.00	5.00	4.11	4.61	5.00	4.46		0	0
Milepost	141	to	140	2	64.64	10.20	0.18	2	42.84	0.00	0.28	3.91	3.52	4.25	4.54	3.64	4.46		2	0
Milepost	140	to	139	2	41.66	2.70	0.15	2	46.22	0.00	0.25	4.27	4.40	4.19	4.61	4.36	4.48		0	0
Milepost	139	to	138	2	51.96	4.00	0.17	2	57.30	0.00	0.22	4.10	4.21	4.02	4.65	4.17	4.21		0	0

Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
			Total	22				22												14
			Weighted Average									3.67	3.11	3.92	4.54	3.03	4.19			
			Factor									1.00		1.00						
			Indicator Score									3.67		3.92						31.8%
			Pavement Index															3.61		
Segment 11			*Interstate?*	No																
Milepost	138	to	137	2	44.80	7.90	0.21	2	58.30	0.00	0.19	4.22	3.72	4.01	4.71	3.87	4.22		0	0
Milepost	137	to	136	2	56.07	11.90	0.21	2	62.87	0.00	0.23	4.04	3.33	3.94	4.63	3.54	4.15		2	0
Milepost	136	to	135	2	29.92	3.00	0.12	2	34.70	0.00	0.17	4.46	4.38	4.38	4.76	4.40	4.65		0	0
Milepost	135	to	134	2	37.17	3.70	0.12	2	41.40	0.00	0.14	4.34	4.29	4.27	4.81	4.30	4.65		0	0
Milepost	134	to	133	2	37.81	3.80	0.10	2	60.30	0.00	0.16	4.33	4.28	3.98	4.77	4.30	4.22		0	0
Milepost	133	to	132	2	45.55	10.20	0.09	2	68.30	0.00	0.19	4.21	3.56	3.86	4.71	3.76	4.11		2	0
Milepost	132	to	131	2	38.38	0.20	0.08	2	72.80	0.00	0.17	4.32	4.92	3.79	4.77	4.74	4.08		0	0
Milepost	131	to	130	2	42.17	5.70	0.10	2	73.66	0.00	0.17	4.26	4.04	3.78	4.75	4.11	4.07		0	0
Milepost	130	to	129	2	48.69	8.90	0.15	2	95.24	0.00	0.25	4.16	3.67	3.48	4.60	3.82	3.82		0	0
Milepost	129	to	128	2	43.67	0.30	0.16	2	63.03	0.00	0.17	4.24	4.80	3.94	4.76	4.63	4.18		0	0
Milepost	128	to	127	2	40.31	8.00	0.15	2	53.46	0.00	0.15	4.29	3.76	4.08	4.79	3.92	4.29		0	0
Milepost	127	to	126	2	50.63	7.20	0.16	2	49.93	0.00	0.14	4.12	3.84	4.14	4.81	3.93	4.60		0	0
Milepost	126	to	125	2	54.13	11.80	0.18	2	44.84	0.00	0.11	4.07	3.37	4.22	4.87	-	-			
Milepost	125	to	124	2	43.30	8.50	0.20	2	39.13	0.00	0.11	4.24	3.67	4.31	4.86	3.84	4.69		0	0
Milepost	124	to	123	2	42.17	15.50	0.23	2	39.70	0.00	0.12	4.26	2.99	4.30	4.85	3.37	4.68		2	0
			Total	30				30												6
			Weighted Average									4.24	3.91	4.03	4.76	3.77	4.03			
			Factor									1.00		1.00						
			Indicator Score									4.24		4.03						10.0%
			Pavement Index															3.90		
Segment 12			*Interstate?*	No																
Milepost	123	to	122	2	47.04	7.50	0.15	2	46.87	0.00	0.12	4.18	3.81	4.18	4.84	3.92	4.65		0	0
Milepost	122	to	121	2	61.22	1.90	0.13	2	55.83	0.00	0.12	3.96	4.54	4.04	4.84	4.14	4.28		0	0
Milepost	121	to	120	2	63.52	8.50	0.12	2	113.74	0.00	0.17	3.93	3.73	3.25	4.76	3.79	3.70		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
			Total	6				6												0
			Weighted Average									4.02	4.03	3.82	4.81	3.95	4.21			
			Factor									1.00		1.00						
			Indicator Score									4.02		3.82						0.0%
			Pavement Index															4.08		
Segment 13			*Interstate?*	No																
Milepost	120	to	119	2	72.45	3.50	0.12	2	95.19	0.00	0.12	3.80	4.31	3.48	4.85	3.95	3.89		0	0
Milepost	119	to	118		-	-	-		-	-	-	-	-	-	-	-	-		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0

Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
			Total	2				2												0
			Weighted Average									3.80	4.31	3.48	4.85	3.95	3.89			
			Factor									1.00		1.00						
			Indicator Score									3.80		3.48						0.0%
			Pavement Index															3.92		
Segment 14			*Interstate?*	No																
Milepost	120	to	121	2	72.45	3.50	0.12	2	95.19	0.00	0.12	3.80	4.31	3.48	4.85	3.95	3.89		0	0
Milepost	121	to	122	2	63.52	8.50	0.12	2	113.74	0.00	0.17	3.93	3.73	3.25	4.76	3.79	3.70		0	0
Milepost	122	to	123	2	61.22	1.90	0.13	2	55.83	0.00	0.12	3.96	4.54	4.04	4.84	4.14	4.28		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
Milepost		to	1		71.49	10.44	0.20		67.07	9.44	0.25	3.81	3.48	3.88	3.52	3.58	3.63		0	0
			Total	6				6												0
			Weighted Average									3.90	4.19	3.59	4.81	3.96	3.96			
			Factor									1.00		1.00						
			Indicator Score									3.90		3.59						0.0%
			Pavement Index															3.96		

Bridge Performance Area Data

Structure Name (A209)	Structure # (N8)	Milepost (A232)	Area (A225)	Bridge Sufficiency	Bridge Index					Functionally Obsolete Bridges	Bridge Rating	Hot Spots on Bridge Index map
				Sufficiency Rating	Deck (N58)	Sub (N59)	Super (N60)	Eval (N67)	Lowest	Deck Area on Func Obsolete		
Segment 1												
Ehrenberg Bridge	619	0.01	115418	81.50	7.00	7.00	7.00	7.00	7.0	0		
Poston Rd TI UP	1704	0.62	9227.0	94.90	5.00	6.00	7.00	6.00	5.0	0		
Tom Wells Rd TI UP	767	5.84	8200.0	83.50	5.00	6.00	7.00	6.00	5.0	0		
Dome Rock TI OP EB	755	11.95	3888.0	95.00	7.00	7.00	7.00	7.00	7.0	0		
Dome Rock TI OP WB	756	11.95	3888.0	95.00	7.00	7.00	7.00	7.00	7.0	0		
Total			140,621									
Weighted Average				83.24					6.75	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				83.24						0.00%	5	
Bridge Index									6.75			
Segment 2												
West Quartzsite TI UP	826	17.50	8267	78.40	5.00	6.00	7.00	6.00	5.0	0		
Quartzsite Ped OP	813	18.09	2183	-2.00	6.00	6.00	7.00	N	6.0	0		
Tyson Wash Bridge EB	791	18.61	18532	97.20	6.00	7.00	6.00	6.00	6.0	0		
Tyson Wash Bridge WB	792	18.61	18532	97.20	6.00	7.00	6.00	6.00	6.0	0		
SR 95 UP	1451	18.89	22512	86.10	6.00	8.00	7.00	7.00	6.0	0		
Riggles Avenue TI UP	2726	19.90	21566	98.50	7.00	8.00	7.00	7.00	7.0	0		
Total			91,592									
Weighted Average				92.98					6.15	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				92.98						0.00%	5	
Bridge Index									6.15			
Segment 3												
Gold Nugget TI UP	769	26.65	7800	93.90	6.00	6.00	7.00	6.00	6.0	0		
Brenda TI UP	1201	31.17	13421	82.00	7.00	6.00	7.00	6.00	6.0	0		
Total			21,221									
Weighted Average				86.37					6.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				86.37						0.00%	6	
Bridge Index									6.00			
Segment 4												
Ramsey Mine Rd UP	1202	33.78	10428	98.00	7.00	6.00	7.00	6.00	6.0	0		
Wash Bridge EB	1203	37.11	6658	95.90	6.00	6.00	7.00	6.00	6.0	0		
Wash Bridge WB	1204	37.11	6658	95.90	6.00	6.00	6.00	6.00	6.0	0		
New Water Mtn Br EB	1205	39.37	4507	95.90	6.00	6.00	7.00	6.00	6.0	0		
New Water Mtn Br WB	1206	39.37	4507	96.10	6.00	6.00	7.00	6.00	6.0	0		
Vicksburg Rd TI UP	1207	45.34	11819	91.80	5.00	6.00	7.00	6.00	5.0	0		
CAP Canal Br WB	1410	52.24	10382	97.00	7.00	8.00	7.00	7.00	7.0	0		
CAP Canal Br EB	1409	52.25	11042	96.90	6.00	8.00	7.00	7.00	6.0	0		
Hovatter Rd TI UP	1384	53.94	15030	96.90	7.00	7.00	7.00	7.00	7.0	0		
Total			81,031									
Weighted Average				96.05					6.17	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				96.05						0.00%	5	
Bridge Index									6.17			
Segment 5												
CAP Canal Br EB	1411	54.34	5126	97.00	7.00	8.00	7.00	7.00	7.0	0		
CAP Canal Br WB	1412	54.35	4339	97.10	7.00	7.00	7.00	7.00	7.0	0		
CAP Canal Br WB	1414	59.15	4836	97.10	7.00	7.00	7.00	7.00	7.0	0		
CAP Canal Br EB	1413	59.16	4836	97.00	7.00	8.00	7.00	7.00	7.0	0		
Sore Finger Rd UP	1282	59.47	10428	100.00	7.00	6.00	7.00	6.00	6.0	0		
Ave 75 E TI UP	1283	69.66	10460	93.20	6.00	6.00	7.00	6.00	6.0	0		
Total			40,025									
Weighted Average				96.81					6.48	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				96.81						0.00%	6	
Bridge Index									6.48			
Segment 6												
Eagle Eye Road UP	1208	72.71	10460	95.90	7.00	7.00	7.00	7.00	7.0	0		

Salome Road TI UP		1209	81.21	12634	98.00	7.00	7.00	7.00	7.00	7.0	0		
	Total			23,094									
	Weighted Average				97.05					7.00	0.00%		
	Factor				1.00					1.00	1.00		
	Indicator Score				97.05						0.00%	7	
	Bridge Index									7.00			
Segment 7													
411th Ave TI UP		1523	94.15	10437	99.70	6.00	7.00	7.00	7.00	6.0	0		
Old Camp Wash Br WB		1524	95.30	3816	95.00	7.00	7.00	6.00	6.00	6.0	0		
Old Camp Wash Br EB		1525	95.30	3816	95.00	7.00	7.00	6.00	6.00	6.0	0		
Belmont Rd UP		1526	96.21	8232	97.10	6.00	6.00	7.00	6.00	6.0	0		
Coyote Wash Br WB		1527	96.53	4344	93.90	7.00	7.00	7.00	7.00	7.0	0		
Coyote Wash Br EB		1528	96.53	4344	93.90	7.00	7.00	7.00	7.00	7.0	0		
	Total			34,989									
	Weighted Average				96.62					6.25	0.00%		
	Factor				1.00					1.00	1.00		
	Indicator Score				96.62						0.00%	6	
	Bridge Index									6.25			
Segment 8													
Wintersburg Rd TI UP		1529	98.29	8232	90.10	6.00	6.00	7.00	6.00	6.0	0		
355th Ave UP		1647	101.40	7236	98.00	6.00	6.00	6.00	6.00	6.0	0		
339th Avenue TI UP		1644	103.44	7742	81.10	6.00	6.00	6.00	6.00	6.0	0		
Hassayampa Rvr Br WB		1645	104.69	52864	96.90	6.00	6.00	6.00	6.00	6.0	0		
Hassayampa Rvr Br EB		1646	104.69	52864	96.80	7.00	7.00	7.00	7.00	7.0	0		
Johnson Road UP		1664	107.60	7236	94.30	6.00	6.00	6.00	6.00	6.0	0		
Palo Verde Rd TI UP		2078	109.68	32737	99.40	7.00	7.00	7.00	7.00	7.0	0		
Oglesby Rd Ramp B UP		1725	112.75	7836	96.00	5.00	7.00	7.00	7.00	5.0	0		
Oglesby Rd Ramp C OP		1727	112.83	4748	96.80	7.00	7.00	7.00	7.00	7.0	0		
Oglesby Rd Ramp C UP		1726	112.92	8008	98.90	7.00	6.00	6.00	6.00	6.0	0		
	Total			189,503									
	Weighted Average				96.35					6.44	0.00%		
	Factor				1.00					1.00	1.00		
	Indicator Score				96.35						0.00%	5	
	Bridge Index									6.44			
Segment 9													
#N/A			#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
	Total			#REF!									
	Weighted Average				#REF!					#REF!	#REF!		
	Factor				1.00					1.00	1.00		
	Indicator Score				#REF!						#REF!	#REF!	
	Bridge Index									#REF!			
Segment 10													
Lewis Prison RD TI OP NB		2524	138.38	6182	100.00	7.00	8.00	7.00	7.00	7.0	0		
Lewis Prison RD TI OP SB		2680	138.38	6182	100.00	7.00	8.00	8.00	8.00	7.0	0		
Rainbow Wash Bridge NB		466	141.08	3645	92.20	7.00	7.00	7.00	6.00	6.0	0		
Rainbow Wash Bridge SB		2771	141.10	9050	99.40	7.00	7.00	8.00	7.00	7.0	0		
Gila River Bridge SB		2279	147.75	163850	99.50	6.00	8.00	7.00	7.00	6.0	0		
Gila River Bridge NB		2280	147.75	163850	99.50	7.00	8.00	7.00	7.00	7.0	0		
	Total			352,759									
	Weighted Average				99.44					6.53	0.00%		
	Factor				1.00					1.00	1.00		
	Indicator Score				99.44						0.00%	6	
	Bridge Index									6.53			
Segment 11													
#N/A			#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
	Total			#N/A									
	Weighted Average				#N/A					#N/A	#N/A		
	Factor				1.00					1.00	1.00		
	Indicator Score				#N/A						#N/A	#N/A	
	Bridge Index									#N/A			
Segment 12													
Gillespie Canal Br		465	120.25	5368	75.10	6.00	6.00	5.00	5.00	5.0	0		
	Total			5,368									
	Weighted Average				75.10					5.00	0.00%		
	Factor				1.00					1.00	1.00		

	Indicator Score				75.10						0.00%	5	
	Bridge Index									5.00			
Segment 13													
Wash Bridge		443	118.15	2688	85.20	6.00	6.00	6.00	5.00	5.0	0		
State Rte 85 OP		702	118.23	6242	94.70	6.00	6.00	7.00	6.00	6.0	0		
E Gila Bend TI UP		1345	119.42	11928	97.30	6.00	7.00	7.00	7.00	6.0	0		
Sand Tank Wash Br		444	119.76	8262	83.20	6.00	6.00	6.00	5.00	5.0	0		
	Total			29,120									
	Weighted Average				91.63					5.62	0.00%		
	Factor				1.00					1.00	1.00		
	Indicator Score				91.63						0.00%	5	
	Bridge Index									5.62			
Segment 14													
SPRR OP EB		118	120.46	4023	93.90	6.00	6.00	6.00	6.00	6.0	0		
UPRR OP		2966	120.46	24916	96.80	7.00	8.00	7.00	7.00	7.0	0		
	Total			28,939									
	Weighted Average				96.40					6.86	0.00%		
	Factor				1.00					1.00	1.00		
	Indicator Score				96.40						0.00%	6	
	Bridge Index									6.86			

Mobility Performance Area Data

Segment	Begin MP	End MP	Facility Type	Flow Type	Terrain	No. of Lanes	Capacity Environment Type	Lane Width (feet)	NB/EB AADT	SB/WB AADT	2019 AADT	K Factor	D Factor	T Factor	Weighted Average Posted Speed Limit (mph)	Divided or Undivided
10-1	0	16	Rural	Uninterrupted	Level	4	Freeway Segment	12.00	12806	12814	25620	8%	51%	44%	72	Divided
10-2	16	22	Rural	Uninterrupted	Level	4	Freeway Segment	12.00	12380	11892	24272	7%	52%	46%	75	Divided
10-3	22	32	Rural	Uninterrupted	Level	4	Freeway Segment	12.00	12999	12578	25577	7%	51%	45%	75	Divided
10-4	32	54	Rural	Uninterrupted	Level	4	Freeway Segment	12.00	14408	14089	28497	10%	51%	39%	75	Divided
10-5	54	71	Rural	Uninterrupted	Level	4	Freeway Segment	12.00	11904	11166	23070	6%	52%	41%	75	Divided
10-6	71	82	Rural	Uninterrupted	Level	4	Freeway Segment	12.00	11788	14135	25923	5%	55%	38%	75	Divided
10-7	82	98	Rural	Uninterrupted	Level	4	Freeway Segment	12.00	12017	12586	24603	8%	54%	39%	75	Divided
10-8	98	113	Rural	Uninterrupted	Level	4	Freeway Segment	12.00	16445	16307	32752	7%	54%	32%	75	Divided
85-9	155	149	Fringe Urban	Interrupted	Level	4	Multilane Highway	12.00	8994	8972	17965	9%	51%	26%	52.7	Divided
85-10	149	138	Rural	Uninterrupted	Level	4	Multilane Highway	12.00	7985	7835	15821	10%	50%	26%	65	Divided
85-11	138	123	Rural	Uninterrupted	Level	4	Multilane Highway	12.00	6412	6097	12509	7%	51%	36%	65	Divided
85-12	123	120	Rural	Interrupted	Level	2	Urban/Rural Single or Multilane Signalized	12.00	5607	5576	11183	7%	51%	38%	43.2	Undivided
85-13	120	118	Fringe Urban	Interrupted	Level	4	Urban/Rural Single or Multilane Signalized	12.00	7473	7053	14256	7%	52%	20%	35	Undivided
85-14	120	123	Fringe Urban	Interrupted	Level	2	Urban/Rural Single or Multilane Signalized	12.00	2367	2096	4463	8%	53%	56%	49.5	Undivided

LOTTR and TTTR Eastbound

Segment	TMC [Internal ID]	Time Period	RoadNumber	RoadName	Direction	Miles	Cars 50th % Travel Time (seconds) Location1	Trucks 50th % Travel Time (seconds) Location1	Cars 80th % Travel Time (seconds) Location1	Trucks 95th % Travel Time (seconds) Location1	Posted Speed limit	Posted Speed Travel Time (Seconds)	Assumed car free-flow speed	Assumed truck free-flow speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR		Weighted TTTR	
1	115N04891	1 AM Peak	I-10	I-10	E	0.131024312	8	8	9	12	65	7	65	65	1.13	1.56	1.15	1.56	1%	1.04	1.04	1.12	1.12
1	115N04891	2 Mid Day	I-10	I-10	E	0.131024312	8	8	9	12	65	7	65	65	1.14	1.48							
1	115N04891	3 PM Peak	I-10	I-10	E	0.131024312	8	8	9	12	65	7	65	65	1.13	1.49							
1	115N04891	4 Weekend	I-10	I-10	E	0.131024312	8	8	9	12	65	7	65	65	1.15	1.49							
1	115N04890	1 AM Peak	I-10	I-10	E	0.543559278	32	33	34	36	65	30	65	65	1.04	1.11	1.04	1.11	3%				
1	115N04890	2 Mid Day	I-10	I-10	E	0.543559278	32	33	33	36	65	30	65	65	1.04	1.09							
1	115N04890	3 PM Peak	I-10	I-10	E	0.543559278	32	33	34	35	65	30	65	65	1.03	1.08							
1	115N04890	4 Weekend	I-10	I-10	E	0.543559278	32	33	33	36	65	30	65	65	1.04	1.09							
1	115-04889	1 AM Peak	I-10	I-10	E	4.606867956	283	286	302	344	75	221	75	65	1.07	1.20	1.07	1.24	28%				
1	115-04889	2 Mid Day	I-10	I-10	E	4.606867956	278	283	296	331	75	221	75	65	1.06	1.17							
1	115-04889	3 PM Peak	I-10	I-10	E	4.606867956	280	283	297	333	75	221	75	65	1.06	1.18							
1	115-04889	4 Weekend	I-10	I-10	E	4.606867956	276	281	295	349	75	221	75	65	1.07	1.24							
1	115-04888	1 AM Peak	I-10	I-10	E	5.757240868	329	333	338	356	75	276	75	65	1.03	1.07	1.03	1.07	36%				
1	115-04888	2 Mid Day	I-10	I-10	E	5.757240868	326	331	334	349	75	276	75	65	1.03	1.06							
1	115-04888	3 PM Peak	I-10	I-10	E	5.757240868	329	333	337	351	75	276	75	65	1.02	1.06							
1	115-04888	4 Weekend	I-10	I-10	E	5.757240868	326	331	336	354	75	276	75	65	1.03	1.07							
1	115-04887	1 AM Peak	I-10	I-10	E	5.153635241	277	280	283	297	75	247	75	65	1.02	1.06	1.03	1.06	32%				
1	115-04887	2 Mid Day	I-10	I-10	E	5.153635241	274	280	280	293	75	247	75	65	1.02	1.05							
1	115-04887	3 PM Peak	I-10	I-10	E	5.153635241	276	280	282	295	75	247	75	65	1.02	1.05							
1	115-04887	4 Weekend	I-10	I-10	E	5.153635241	274	280	281	298	75	247	75	65	1.03	1.06							
2	115-04887	1 AM Peak	I-10	I-10	E	5.153635241	277	280	283	297	75	247	75	65	1.02	1.06	1.03	1.06	40%	1.03	1.03	1.06	1.06
2	115-04887	2 Mid Day	I-10	I-10	E	5.153635241	274	280	280	293	75	247	75	65	1.02	1.05							
2	115-04887	3 PM Peak	I-10	I-10	E	5.153635241	276	280	282	295	75	247	75	65	1.02	1.05							
2	115-04887	4 Weekend	I-10	I-10	E	5.153635241	274	280	281	298	75	247	75	65	1.03	1.06							
2	115-04886	1 AM Peak	I-10	I-10	E	1.807160606	98	99	100	106	75	87	75	65	1.02	1.07	1.03	1.07	14%				
2	115-04886	2 Mid Day	I-10	I-10	E	1.807160606	97	99	99	104	75	87	75	65	1.02	1.06							

Segment	TMC [Internal ID]	Time Period	RoadNumber	RoadName	Direction	Miles	Cars 50th % Travel Time (seconds) Location1	Trucks 50th % Travel Time (seconds) Location1	Cars 80th % Travel Time (seconds) Location1	Trucks 95th % Travel Time (seconds) Location1	Posted Speed limit	Posted Speed Travel Time (Seconds)	Assumed car free-flow speed	Assumed truck free-flow speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR		Weighted TTTR	
2	115-04886	3 PM Peak	I-10	I-10	E	1.807160606	97	99	100	105	75	87	75	65	1.02	1.07							
2	115-04886	4 Weekend	I-10	I-10	E	1.807160606	97	99	99	106	75	87	75	65	1.03	1.07							
2	115-04885	1 AM Peak	I-10	I-10	E	6.07896449	333	335	340	354		#DIV/0!	0	0	1.02	1.06	1.02	1.06	47%				
2	115-04885	2 Mid Day	I-10	I-10	E	6.07896449	330	335	337	351		#DIV/0!	0	0	1.02	1.05							
2	115-04885	3 PM Peak	I-10	I-10	E	6.07896449	332	337	339	352		#DIV/0!	0	0	1.02	1.04							
2	115-04885	4 Weekend	I-10	I-10	E	6.07896449	329	335	337	353		#DIV/0!	0	0	1.02	1.05							
3	115-04885	1 AM Peak	I-10	I-10	E	6.07896449	333	335	340	354	75	292	75	65	1.02	1.06	1.02	1.06	62%	1.02	1.02	1.05	1.05
3	115-04885	2 Mid Day	I-10	I-10	E	6.07896449	330	335	337	351	75	292	75	65	1.02	1.05							
3	115-04885	3 PM Peak	I-10	I-10	E	6.07896449	332	337	339	352	75	292	75	65	1.02	1.04							
3	115-04885	4 Weekend	I-10	I-10	E	6.07896449	329	335	337	353	75	292	75	65	1.02	1.05							
3	115-04884	1 AM Peak	I-10	I-10	E	3.775373715	207	209	211	219	75	181	75	65	1.02	1.05	1.03	1.05	38%				
3	115-04884	2 Mid Day	I-10	I-10	E	3.775373715	205	208	209	218	75	181	75	65	1.02	1.05							
3	115-04884	3 PM Peak	I-10	I-10	E	3.775373715	206	209	210	219	75	181	75	65	1.02	1.05							
3	115-04884	4 Weekend	I-10	I-10	E	3.775373715	204	208	209	219	75	181	75	65	1.03	1.05							
4	115-04883	1 AM Peak	I-10	I-10	E	13.92300271	738	748	752	780	75	668	75	65	1.02	1.04	1.02	1.04	66%	1.02	1.02	1.05	1.05
4	115-04883	2 Mid Day	I-10	I-10	E	13.92300271	734	748	745	776	75	668	75	65	1.02	1.04							
4	115-04883	3 PM Peak	I-10	I-10	E	13.92300271	737	748	748	777	75	668	75	65	1.02	1.04							
4	115-04883	4 Weekend	I-10	I-10	E	13.92300271	730	748	748	780	75	668	75	65	1.02	1.04							
4	115-04882	1 AM Peak	I-10	I-10	E	6.44321025	345	348	351	365	75	309	75	65	1.02	1.05	1.02	1.05	30%				
4	115-04882	2 Mid Day	I-10	I-10	E	6.44321025	341	348	348	363	75	309	75	65	1.02	1.04							
4	115-04882	3 PM Peak	I-10	I-10	E	6.44321025	343	348	350	363	75	309	75	65	1.02	1.04							
4	115-04882	4 Weekend	I-10	I-10	E	6.44321025	341	348	348	365	75	309	75	65	1.02	1.05							
4	115-04881	1 AM Peak	I-10	I-10	E	0.864475555	47	48	49	54	75	41	75	65	1.03	1.12	1.03	1.12	4%				
4	115-04881	2 Mid Day	I-10	I-10	E	0.864475555	47	48	48	52	75	41	75	65	1.03	1.10							
4	115-04881	3 PM Peak	I-10	I-10	E	0.864475555	47	48	48	52	75	41	75	65	1.03	1.08							
4	115-04881	4 Weekend	I-10	I-10	E	0.864475555	46	48	48	52	75	41	75	65	1.03	1.10							
5	115-04880	1 AM Peak	I-10	I-10	E	15.00227727	798	806	810	840	75	720	75	65	1.01	1.04	1.02	1.04	96%	1.02	1.02	1.04	1.04
5	115-04880	2 Mid Day	I-10	I-10	E	15.00227727	790	806	802	840	75	720	75	65	1.02	1.04							
5	115-04880	3 PM Peak	I-10	I-10	E	15.00227727	794	806	806	835	75	720	75	65	1.01	1.04							
5	115-04880	4 Weekend	I-10	I-10	E	15.00227727	790	806	802	836	75	720	75	65	1.02	1.04							
5	115-04879	1 AM Peak	I-10	I-10	E	0.610074564	32	33	33	34	75	29	75	65	1.02	1.05	1.03	1.05	4%				
5	115-04879	2 Mid Day	I-10	I-10	E	0.610074564	32	33	33	34	75	29	75	65	1.02	1.05							
5	115-04879	3 PM Peak	I-10	I-10	E	0.610074564	32	33	33	34	75	29	75	65	1.02	1.05							
5	115-04879	4 Weekend	I-10	I-10	E	0.610074564	32	33	33	35	75	29	75	65	1.03	1.05							
6	115-04690	1 AM Peak	I-10	I-10	E	9.948704668	527	535	537	554	75	478	75	65	1.02	1.04	1.02	1.04	100%	1.02	1.02	1.04	1.04
6	115-04690	2 Mid Day	I-10	I-10	E	9.948704668	522	535	532	552	75	478	75	65	1.02	1.03							
6	115-04690	3 PM Peak	I-10	I-10	E	9.948704668	527	535	535	554	75	478	75	65	1.01	1.04							
6	115-04690	4 Weekend	I-10	I-10	E	9.948704668	522	535	532	557	75	478	75	65	1.02	1.04							
7	115-04689	1 AM Peak	I-10	I-10	E	4.442190869	236	239	241	250	75	213	75	65	1.02	1.05	1.02	1.05	30%	1.02	1.02	1.05	1.05
7	115-04689	2 Mid Day	I-10	I-10	E	4.442190869	234	239	239	249	75	213	75	65	1.02	1.04							
7	115-04689	3 PM Peak	I-10	I-10	E	4.442190869	235	240	240	250	75	213	75	65	1.02	1.04							
7	115-04689	4 Weekend	I-10	I-10	E	4.442190869	234	239	240	251	75	213	75	65	1.02	1.05							
7	115-04688	1 AM Peak	I-10	I-10	E	7.204529299	383	387	389	403	75	346	75	65	1.02	1.04	1.02	1.05	48%				
7	115-04688	2 Mid Day	I-10	I-10	E	7.204529299	380	387	385	402	75	346	75	65	1.02	1.04							
7	115-04688	3 PM Peak	I-10	I-10	E	7.204529299	381	389	389	403	75	346	75	65	1.02	1.04							
7	115-04688	4 Weekend	I-10	I-10	E	7.204529299	379	387	387	406	75	346	75	65	1.02	1.05							
7	115-04687	1 AM Peak	I-10	I-10	E	3.353345123	179	181	182	190	75	161	75	65	1.02	1.05	1.03	1.05	22%				
7	115-04687	2 Mid Day	I-10	I-10	E	3.353345123	177	181	180	190	75	161	75	65	1.02	1.05							
7	115-04687	3 PM Peak	I-10	I-10	E	3.353345123	178	181	181	190	75	161	75	65	1.02	1.05							
7	115-04687	4 Weekend	I-10	I-10	E	3.353345123	177	181	181	190	75	161	75	65	1.03	1.05							
8	115-04686	1 AM Peak	I-10	I-10	E	4.336625418	231	234	235	244	75	208	75	65	1.02	1.04	1.02	1.05	36%	1.02	1.02	1.05	1.05
8	115-04686	2 Mid Day	I-10	I-10	E	4.336625418	229	234	233	244	75	208	75	65	1.02	1.04							
8	115-04686	3 PM Peak	I-10	I-10	E	4.336625418	230	234	234	245	75	208	75	65	1.02	1.05							
8	115-04686	4 Weekend	I-10	I-10	E	4.336625418	228	234	234	246	75	208	75	65	1.02	1.05							
8	115-04685	1 AM Peak	I-10	I-10	E	5.560602686	296	301	302	316	75	267	75	65	1.02	1.05	1.02	1.05	46%				
8	115-04685	2 Mid Day	I-10	I-10	E	5.560602686	293	300	299	315	75	267	75	65	1.02	1.05							
8	115-04685	3 PM Peak	I-10	I-10	E	5.560602686	294	301	300	313	75	267	75	65	1.02	1.04							
8	115-04685	4 Weekend	I-10	I-10	E	5.560602686	293	300	300	315	75	267	75	65	1.02	1.05							
8	115-04684	1 AM Peak	I-10	I-10	E	2.202757179	118	120	120	125	75	106	75	65	1.02	1.05	1.02	1.06	18%				
8	115-04684	2 Mid Day	I-10	I-10	E	2.202757179	117	120	119	125	75	106	75	65	1.02	1.05							

Segment	TMC [Internal ID]	Time Period	RoadNumber	RoadName	Direction	Miles	Cars 50th % Travel Time (seconds) Location1	Trucks 50th % Travel Time (seconds) Location1	Cars 80th % Travel Time (seconds) Location1	Trucks 95th % Travel Time (seconds) Location1	Posted Speed limit	Posted Speed Travel Time (Seconds)	Assumed car free-flow speed	Assumed truck free-flow speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR		Weighted TTTR	
8	115-04684	3 PM Peak	I-10	I-10	E	2.202757179	117	120	120	127	75	106	75	65	1.02	1.05							
8	115-04684	4 Weekend	I-10	I-10	E	2.202757179	117	119	120	127	75	106	75	65	1.02	1.06							
9	115-06167	1 AM Peak	AZ-85	AZ-85	S	1.120840534	67	68	70	78	55	73	55	55	1.04	1.14	1.04	1.15	22%	1.09	1.09	1.30	1.30
9	115-06167	2 Mid Day	AZ-85	AZ-85	S	1.120840534	67	68	70	76	55	73	55	55	1.03	1.12							
9	115-06167	3 PM Peak	AZ-85	AZ-85	S	1.120840534	68	68	70	79	55	73	55	55	1.04	1.15							
9	115-06167	4 Weekend	AZ-85	AZ-85	S	1.120840534	67	68	70	77	55	73	55	55	1.04	1.13							
9	115-06166	1 AM Peak	AZ-85	AZ-85	S	0.982335297	59	60	61	65	55	64	55	55	1.03	1.07	1.04	1.09	20%				
9	115-06166	2 Mid Day	AZ-85	AZ-85	S	0.982335297	60	60	61	65	55	64	55	55	1.03	1.08							
9	115-06166	3 PM Peak	AZ-85	AZ-85	S	0.982335297	60	60	62	66	55	64	55	55	1.03	1.09							
9	115-06166	4 Weekend	AZ-85	AZ-85	S	0.982335297	59	60	62	65	55	64	55	55	1.04	1.09							
9	115-06165	1 AM Peak	AZ-85	S OGLESBY RD	S	1.5375798	118	121	130	173	55	101	55	55	1.10	1.43	1.13	1.49	31%				
9	115-06165	2 Mid Day	AZ-85	S OGLESBY RD	S	1.5375798	117	119	130	175	55	101	55	55	1.10	1.47							
9	115-06165	3 PM Peak	AZ-85	S OGLESBY RD	S	1.5375798	118	119	131	169	55	101	55	55	1.11	1.43							
9	115-06165	4 Weekend	AZ-85	S OGLESBY RD	S	1.5375798	116	118	131	175	55	101	55	55	1.13	1.49							
9	115-06164	1 AM Peak	AZ-85	AZ-85	S	1.350518055	98	101	107	134	45	108	45	45	1.09	1.33	1.11	1.38	27%				
9	115-06164	2 Mid Day	AZ-85	AZ-85	S	1.350518055	98	99	107	131	45	108	45	45	1.09	1.32							
9	115-06164	3 PM Peak	AZ-85	AZ-85	S	1.350518055	98	99	107	131	45	108	45	45	1.10	1.32							
9	115-06164	4 Weekend	AZ-85	AZ-85	S	1.350518055	97	99	109	137	45	108	45	45	1.11	1.38							
10	115-06163	1 AM Peak	AZ-85	AZ-85	S	10.30648214	565	571	577	609	65	571	65	65	1.02	1.07	1.03	1.07	100%	1.03	1.03	1.07	1.07
10	115-06163	2 Mid Day	AZ-85	AZ-85	S	10.30648214	565	569	577	601	65	571	65	65	1.02	1.06							
10	115-06163	3 PM Peak	AZ-85	AZ-85	S	10.30648214	567	571	580	608	65	571	65	65	1.02	1.07							
10	115-06163	4 Weekend	AZ-85	AZ-85	S	10.30648214	564	571	580	613	65	571	65	65	1.03	1.07							
11	115-05958	1 AM Peak	AZ-85	AZ-85	S	17.409372	1001	1014	1028	1149	65	964	65	65	1.03	1.13	1.04	1.19	100%	1.04	1.04	1.19	1.19
11	115-05958	2 Mid Day	AZ-85	AZ-85	S	17.409372	1006	1017	1028	1119	65	964	65	65	1.02	1.10							
11	115-05958	3 PM Peak	AZ-85	AZ-85	S	17.409372	1016	1022	1045	1144	65	964	65	65	1.03	1.12							
11	115-05958	4 Weekend	AZ-85	AZ-85	S	17.409372	1002	1017	1039	1212	65	964	65	65	1.04	1.19							
12	115-05958	1 AM Peak	AZ-85	AZ-85	S	17.409372	1001	1014	1028	1149	55	1140	55	55	1.03	1.13	1.04	1.19	100%	1.04	1.04	1.19	1.19
12	115-05958	2 Mid Day	AZ-85	AZ-85	S	17.409372	1006	1017	1028	1119	55	1140	55	55	1.02	1.10							
12	115-05958	3 PM Peak	AZ-85	AZ-85	S	17.409372	1016	1022	1045	1144	55	1140	55	55	1.03	1.12							
12	115-05958	4 Weekend	AZ-85	AZ-85	S	17.409372	1002	1017	1039	1212	55	1140	55	55	1.04	1.19							
13	115-06169	1 AM Peak	AZ-85	W PIMA ST	W	1.915213305	195	200	212	246	35	197	35	35	1.09	1.23	1.09	1.26	100%	1.09	1.09	1.26	1.26
13	115-06169	2 Mid Day	AZ-85	W PIMA ST	W	1.915213305	198	203	214	246	35	197	35	35	1.08	1.21							
13	115-06169	3 PM Peak	AZ-85	W PIMA ST	W	1.915213305	201	203	218	255	35	197	35	35	1.09	1.26							
13	115-06169	4 Weekend	AZ-85	W PIMA ST	W	1.915213305	192	197	208	246	35	197	35	35	1.08	1.25							
14	115-11292	1 AM Peak		S BUTTERFIELD TRL	S	1.935449479	158	159	172	239	45	155	45	45	1.09	1.50	1.10	1.57	100%	1.10	1.10	1.57	1.57
14	115-11292	2 Mid Day		S BUTTERFIELD TRL	S	1.935449479	158	158	170	225	45	155	45	45	1.08	1.42							
14	115-11292	3 PM Peak		S BUTTERFIELD TRL	S	1.935449479	160	160	174	219	45	155	45	45	1.09	1.36							
14	115-11292	4 Weekend		S BUTTERFIELD TRL	S	1.935449479	158	158	174	249	45	155	45	45	1.10	1.57							

LOTTR and TTTR Westbound

Segment	TMC [Internal ID]	Time Period	RoadNumber	RoadName	Direction	Miles	Cars 50th % Travel Time (seconds) Location1	Trucks 50th % Travel Time (seconds) Location1	Cars 80th % Travel Time (seconds) Location1	Trucks 95th % Travel Time (seconds) Location1	Posted Speed limit	Posted Speed Travel Time (Seconds)	Assumed car free-flow speed	Assumed truck free-flow speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
1	115+04891	1 AM Peak	I-10	I-10	W	0.280585243	17	17	18	21	45	22	45	45	1.07	1.21	1.14	2.53	2%	1.03	1.09
1	115+04891	2 Mid Day	I-10	I-10	W	0.280585243	18	18	20	46	45	22	45	45	1.14	2.53					
1	115+04891	3 PM Peak	I-10	I-10	W	0.280585243	18	18	20	32	45	22	45	45	1.09	1.78					
1	115+04891	4 Weekend	I-10	I-10	W	0.280585243	17	17	18	22	45	22	45	45	1.07	1.27					
1	115+04890	1 AM Peak	I-10	I-10	W	4.678699233	253	256	259	282	55	306	55	55	1.03	1.10	1.03	1.10	30%		
1	115+04890	2 Mid Day	I-10	I-10	W	4.678699233	254	258	259	279	55	306	55	55	1.02	1.08					
1	115+04890	3 PM Peak	I-10	I-10	W	4.678699233	255	258	261	275	55	306	55	55	1.02	1.07					
1	115+04890	4 Weekend	I-10	I-10	W	4.678699233	252	256	258	279	55	306	55	55	1.03	1.09					
1	115+04889	1 AM Peak	I-10	I-10	W	5.636870154	296	300	303	316	65	312	65	65	1.02	1.05	1.02	1.05	36%		
1	115+04889	2 Mid Day	I-10	I-10	W	5.636870154	297	302	303	316	65	312	65	65	1.02	1.05					
1	115+04889	3 PM Peak	I-10	I-10	W	5.636870154	299	303	305	316	65	312	65	65	1.02	1.04					
1	115+04889	4 Weekend	I-10	I-10	W	5.636870154	296	301	303	317	65	312	65	65	1.02	1.05					
1	115+04888	1 AM Peak	I-10	I-10	W	5.061126382	272	276	279	291	75	243	75	65	1.03	1.05	1.03	1.05	32%		
1	115+04888	2 Mid Day	I-10	I-10	W	5.061126382	273	278	278	291	75	243	75	65	1.02	1.05					
1	115+04888	3 PM Peak	I-10	I-10	W	5.061126382	275	279	280	292	75	243	75	65	1.02	1.05					
1	115+04888	4 Weekend	I-10	I-10	W	5.061126382	272	277	278	292	75	243	75	65	1.02	1.05					
2	115+04888	1 AM Peak	I-10	I-10	W	5.061126382	272	276	279	291	75	243	75	65	1.03	1.05	1.03	1.05	40%	1.03	1.05
2	115+04888	2 Mid Day	I-10	I-10	W	5.061126382	273	278	278	291	75	243	75	65	1.02	1.05					
2	115+04888	3 PM Peak	I-10	I-10	W	5.061126382	275	279	280	292	75	243	75	65	1.02	1.05					
2	115+04888	4 Weekend	I-10	I-10	W	5.061126382	272	277	278	292	75	243	75	65	1.02	1.05					
2	115+04887	1 AM Peak	I-10	I-10	W	1.596017375	85	86	87	93	75	77	75	65	1.03	1.07	1.03	1.07	12%		
2	115+04887	2 Mid Day	I-10	I-10	W	1.596017375	85	87	87	92	75	77	75	65	1.02	1.06					
2	115+04887	3 PM Peak	I-10	I-10	W	1.596017375	86	87	88	93	75	77	75	65	1.02	1.07					
2	115+04887	4 Weekend	I-10	I-10	W	1.596017375	85	86	87	93	75	77	75	65	1.03	1.07					
2	115+04886	1 AM Peak	I-10	I-10	W	6.151135104	322	327	329	343	75	295	75	65	1.02	1.05	1.02	1.05	48%		
2	115+04886	2 Mid Day	I-10	I-10	W	6.151135104	323	329	329	343	75	295	75	65	1.02	1.04					
2	115+04886	3 PM Peak	I-10	I-10	W	6.151135104	326	331	331	344	75	295	75	65	1.02	1.04					
2	115+04886	4 Weekend	I-10	I-10	W	6.151135104	321	328	329	343	75	295	75	65	1.02	1.05					
3	115+04886	1 AM Peak	I-10	I-10	W	6.151135104	322	327	329	343	75	295	75	65	1.02	1.05	1.02	1.05	62%	1.02	1.05
3	115+04886	2 Mid Day	I-10	I-10	W	6.151135104	323	329	329	343	75	295	75	65	1.02	1.04					
3	115+04886	3 PM Peak	I-10	I-10	W	6.151135104	326	331	331	344	75	295	75	65	1.02	1.04					
3	115+04886	4 Weekend	I-10	I-10	W	6.151135104	321	328	329	343	75	295	75	65	1.02	1.05					
3	115+04885	1 AM Peak	I-10	I-10	W	3.837269534	202	206	207	216	75	184	75	65	1.02	1.05	1.02	1.05	38%		
3	115+04885	2 Mid Day	I-10	I-10	W	3.837269534	203	207	207	216	75	184	75	65	1.02	1.04					
3	115+04885	3 PM Peak	I-10	I-10	W	3.837269534	205	208	209	217	75	184	75	65	1.02	1.04					
3	115+04885	4 Weekend	I-10	I-10	W	3.837269534	202	206	207	216	75	184	75	65	1.02	1.05					
4	115+04884	1 AM Peak	I-10	I-10	W	13.50350994	715	727	730	764	75	648	75	65	1.02	1.05	1.02	1.05	65%	1.02	1.05
4	115+04884	2 Mid Day	I-10	I-10	W	13.50350994	718	733	733	764	75	648	75	65	1.02	1.04					
4	115+04884	3 PM Peak	I-10	I-10	W	13.50350994	722	733	737	760	75	648	75	65	1.02	1.04					
4	115+04884	4 Weekend	I-10	I-10	W	13.50350994	715	729	729	760	75	648	75	65	1.02	1.04					
4	115+04883	1 AM Peak	I-10	I-10	W	6.500475159	341	348	348	364	75	312	75	65	1.02	1.05	1.02	1.05	31%		
4	115+04883	2 Mid Day	I-10	I-10	W	6.500475159	343	351	349	364	75	312	75	65	1.02	1.04					
4	115+04883	3 PM Peak	I-10	I-10	W	6.500475159	345	350	351	364	75	312	75	65	1.02	1.04					
4	115+04883	4 Weekend	I-10	I-10	W	6.500475159	341	348	348	364	75	312	75	65	1.02	1.05					
4	115+04882	1 AM Peak	I-10	I-10	W	0.643019939	34	34	35	39	75	31	75	65	1.03	1.13	1.03	1.13	3%		
4	115+04882	2 Mid Day	I-10	I-10	W	0.643019939	34	35	35	39	75	31	75	65	1.03	1.12					
4	115+04882	3 PM Peak	I-10	I-10	W	0.643019939	34	35	35	38	75	31	75	65	1.02	1.09					
4	115+04882	4 Weekend	I-10	I-10	W	0.643019939	34	34	35	38	75	31	75	65	1.03	1.10					
5	115+04881	1 AM Peak	I-10	I-10	W	15.00177556	787	802	802	831	75	720	75	65	1.02	1.04	1.02	1.04	96%	1.02	1.04
5	115+04881	2 Mid Day	I-10	I-10	W	15.00177556	791	810	806	835	75	720	75	65	1.02	1.03					
5	115+04881	3 PM Peak	I-10	I-10	W	15.00177556	794	806	806	835	75	720	75	65	1.01	1.04					
5	115+04881	4 Weekend	I-10	I-10	W	15.00177556	787	802	802	831	75	720	75	65	1.02	1.04					
5	115+04880	1 AM Peak	I-10	I-10	W	0.679242558	36	36	36	38	75	33	75	65	1.02	1.05	1.02	1.05	4%		
5	115+04880	2 Mid Day	I-10	I-10	W	0.679242558	36	37	37	38	75	33	75	65	1.02	1.04					
5	115+04880	3 PM Peak	I-10	I-10	W	0.679242558	36	37	37	38	75	33	75	65	1.02	1.04					
5	115+04880	4 Weekend	I-10	I-10	W	0.679242558	36	36	36	38	75	33	75	65	1.02	1.05					
6	115+04691	1 AM Peak	I-10	I-10	W	9.845534083	516	527	526	546	75	473	75	65	1.02	1.04	1.02	1.04	100%	1.02	1.04
6	115+04691	2 Mid Day	I-10	I-10	W	9.845534083	521	532	529	548	75	473	75	65	1.02	1.03					
6	115+04691	3 PM Peak	I-10	I-10	W	9.845534083	521	529	532	548	75	473	75	65	1.02	1.04					
6	115+04691	4 Weekend	I-10	I-10	W	9.845534083	516	529	527	548	75	473	75	65	1.02	1.04					

Segment	TMC [Internal ID]	Time Period	RoadNumber	RoadName	Direction	Miles	Cars 50th % Travel Time (seconds) Location1	Trucks 50th % Travel Time (seconds) Location1	Cars 80th % Travel Time (seconds) Location1	Trucks 95th % Travel Time (seconds) Location1	Posted Speed limit	Posted Speed Travel Time (Seconds)	Assumed car free-flow speed	Assumed truck free-flow speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
7	115+04690	1 AM Peak	I-10	I-10	W	4.5309216	238	243	243	254	75	217	75	65	1.02	1.04	1.02	1.04	31%	1.02	1.04
7	115+04690	2 Mid Day	I-10	I-10	W	4.5309216	240	245	244	254	75	217	75	65	1.02	1.04					
7	115+04690	3 PM Peak	I-10	I-10	W	4.5309216	240	244	245	254	75	217	75	65	1.02	1.04					
7	115+04690	4 Weekend	I-10	I-10	W	4.5309216	238	243	243	254	75	217	75	65	1.02	1.04					
7	115+04689	1 AM Peak	I-10	I-10	W	6.930072272	365	373	372	388	75	333	75	65	1.02	1.04	1.02	1.04	47%		
7	115+04689	2 Mid Day	I-10	I-10	W	6.930072272	369	376	374	388	75	333	75	65	1.02	1.03					
7	115+04689	3 PM Peak	I-10	I-10	W	6.930072272	369	374	376	390	75	333	75	65	1.02	1.04					
7	115+04689	4 Weekend	I-10	I-10	W	6.930072272	365	373	373	389	75	333	75	65	1.02	1.04					
7	115+04688	1 AM Peak	I-10	I-10	W	3.352426948	177	180	180	188	75	161	75	65	1.02	1.04	1.02	1.05	23%		
7	115+04688	2 Mid Day	I-10	I-10	W	3.352426948	178	181	181	189	75	161	75	65	1.02	1.04					
7	115+04688	3 PM Peak	I-10	I-10	W	3.352426948	178	181	182	189	75	161	75	65	1.02	1.04					
7	115+04688	4 Weekend	I-10	I-10	W	3.352426948	176	180	180	189	75	161	75	65	1.02	1.05					
8	115+04687	1 AM Peak	I-10	I-10	W	4.208769064	222	227	226	237	75	202	75	65	1.02	1.04	1.02	1.05	36%	1.02	1.05
8	115+04687	2 Mid Day	I-10	I-10	W	4.208769064	224	228	227	237	75	202	75	65	1.02	1.04					
8	115+04687	3 PM Peak	I-10	I-10	W	4.208769064	224	227	228	237	75	202	75	65	1.02	1.04					
8	115+04687	4 Weekend	I-10	I-10	W	4.208769064	222	226	226	237	75	202	75	65	1.02	1.05					
8	115+04686	1 AM Peak	I-10	I-10	W	5.441013189	285	293	291	306	75	261	75	65	1.02	1.05	1.02	1.05	46%		
8	115+04686	2 Mid Day	I-10	I-10	W	5.441013189	288	295	294	306	75	261	75	65	1.02	1.04					
8	115+04686	3 PM Peak	I-10	I-10	W	5.441013189	289	294	294	308	75	261	75	65	1.02	1.05					
8	115+04686	4 Weekend	I-10	I-10	W	5.441013189	287	293	292	305	75	261	75	65	1.02	1.04					
8	115+04685	1 AM Peak	I-10	I-10	W	2.130332921	112	116	115	121	75	102	75	65	1.02	1.05	1.02	1.05	18%		
8	115+04685	2 Mid Day	I-10	I-10	W	2.130332921	114	116	116	121	75	102	75	65	1.02	1.04					
8	115+04685	3 PM Peak	I-10	I-10	W	2.130332921	114	116	117	122	75	102	75	65	1.02	1.05					
8	115+04685	4 Weekend	I-10	I-10	W	2.130332921	113	116	116	121	75	102	75	65	1.02	1.04					
9	115+05959	1 AM Peak	AZ-85	AZ-85	N	1.126518161	70	71	73	78	55	74	55	55	1.04	1.10	1.04	1.11	23%	1.08	1.28
9	115+05959	2 Mid Day	AZ-85	AZ-85	N	1.126518161	70	71	72	78	55	74	55	55	1.03	1.09					
9	115+05959	3 PM Peak	AZ-85	AZ-85	N	1.126518161	70	72	73	80	55	74	55	55	1.04	1.11					
9	115+05959	4 Weekend	AZ-85	AZ-85	N	1.126518161	70	71	73	78	55	74	55	55	1.04	1.10					
9	115+06167	1 AM Peak	AZ-85	AZ-85	N	0.982370925	62	62	64	68	55	64	55	55	1.04	1.09	1.04	1.11	20%		
9	115+06167	2 Mid Day	AZ-85	AZ-85	N	0.982370925	61	62	63	68	55	64	55	55	1.03	1.10					
9	115+06167	3 PM Peak	AZ-85	AZ-85	N	0.982370925	62	62	64	69	55	64	55	55	1.04	1.11					
9	115+06167	4 Weekend	AZ-85	AZ-85	N	0.982370925	61	62	64	68	55	64	55	55	1.04	1.10					
9	115+06166	1 AM Peak	AZ-85	S OGLESBY RD	N	1.532153133	119	123	131	178	55	100	55	55	1.10	1.45	1.11	1.45	31%		
9	115+06166	2 Mid Day	AZ-85	S OGLESBY RD	N	1.532153133	119	123	130	174	55	100	55	55	1.10	1.42					
9	115+06166	3 PM Peak	AZ-85	S OGLESBY RD	N	1.532153133	121	125	132	172	55	100	55	55	1.09	1.38					
9	115+06166	4 Weekend	AZ-85	S OGLESBY RD	N	1.532153133	119	123	133	178	55	100	55	55	1.11	1.45					
9	115+06165	1 AM Peak	AZ-85	AZ-85	N	1.344927079	101	102	111	136	45	108	45	45	1.10	1.33	1.11	1.36	27%		
9	115+06165	2 Mid Day	AZ-85	AZ-85	N	1.344927079	100	102	109	138	45	108	45	45	1.09	1.35					
9	115+06165	3 PM Peak	AZ-85	AZ-85	N	1.344927079	102	103	111	140	45	108	45	45	1.09	1.36					
9	115+06165	4 Weekend	AZ-85	AZ-85	N	1.344927079	99	101	110	136	45	108	45	45	1.11	1.35					
10	115+06164	1 AM Peak	AZ-85	AZ-85	N	10.36581722	568	571	579	602	65	574	65	65	1.02	1.05	1.03	1.06	100%	1.03	1.06
10	115+06164	2 Mid Day	AZ-85	AZ-85	N	10.36581722	563	571	574	602	65	574	65	65	1.02	1.05					
10	115+06164	3 PM Peak	AZ-85	AZ-85	N	10.36581722	560	568	571	602	65	574	65	65	1.02	1.06					
10	115+06164	4 Weekend	AZ-85	AZ-85	N	10.36581722	560	566	574	600	65	574	65	65	1.03	1.06					
11	115+06163	1 AM Peak	AZ-85	AZ-85	N	17.63552536	1014	1020	1047	1222	65	977	65	65	1.03	1.20	1.03	1.20	100%	1.03	1.20
11	115+06163	2 Mid Day	AZ-85	AZ-85	N	17.63552536	1003	1019	1031	1171	65	977	65	65	1.03	1.15					
11	115+06163	3 PM Peak	AZ-85	AZ-85	N	17.63552536	1002	1014	1030	1156	65	977	65	65	1.03	1.14					
11	115+06163	4 Weekend	AZ-85	AZ-85	N	17.63552536	998	1010	1031	1201	65	977	65	65	1.03	1.19					
12	115+06163	1 AM Peak	AZ-85	AZ-85	N	17.63552536	1014	1020	1047	1222		#DIV/0!	0	0	1.03	1.20	1.03	1.20	100%	1.03	1.20
12	115+06163	2 Mid Day	AZ-85	AZ-85	N	17.63552536	1003	1019	1031	1171		#DIV/0!	0	0	1.03	1.15					
12	115+06163	3 PM Peak	AZ-85	AZ-85	N	17.63552536	1002	1014	1030	1156		#DIV/0!	0	0	1.03	1.14					
12	115+06163	4 Weekend	AZ-85	AZ-85	N	17.63552536	998	1010	1031	1201		#DIV/0!	0	0	1.03	1.19					
13	115+05958	1 AM Peak	AZ-85	W PIMA ST	E	1.908494912	202	200	227	275	35	196	35	35	1.12	1.37	1.12	1.37	100%	1.12	1.37
13	115+05958	2 Mid Day	AZ-85	W PIMA ST	E	1.908494912	197	201	217	269	35	196	35	35	1.10	1.34					
13	115+05958	3 PM Peak	AZ-85	W PIMA ST	E	1.908494912	199	202	217	268	35	196	35	35	1.09	1.33					
13	115+05958	4 Weekend	AZ-85	W PIMA ST	E	1.908494912	194	198	213	264	35	196	35	35	1.10	1.34					
14	115+11293	1 AM Peak		S BUTTERFIELD TRL	N	1.933731031	148	148	162	221	45	155	45	45	1.10	1.49	1.10	1.62	100%	1.10	1.62
14	115+11293	2 Mid Day		S BUTTERFIELD TRL	N	1.933731031	147	148	161	240	45	155	45	45	1.09	1.62					
14	115+11293	3 PM Peak		S BUTTERFIELD TRL	N	1.933731031	151	151	166	232	45	155	45	45	1.10	1.53					
14	115+11293	4 Weekend		S BUTTERFIELD TRL	N	1.933731031	148	148	163	221	45	155	45	45	1.10	1.49					

Closure Data

				Total miles of closures		Avg Occurances/Mile/Year	
Segment	Length (miles)	# of closures	# with F&I	EB/SB	WB/NB	EB/SB	WB/NB
1	16	42	0	29.0	15.0	0.36	0.19
2	6	18	1	10.0	8.0	0.33	0.27
3	10	20	1	4.0	41.0	0.08	0.82
4	22	35	2	18.0	17.0	0.16	0.15
5	17	18	0	7.0	11.0	0.08	0.13
6	11	24	1	12.0	12.0	0.22	0.22
7	16	35	1	21.0	29.0	0.26	0.36
8	15	33	1	17.0	16.3	0.23	0.22
9	9	27	1	6.0	21.5	0.13	0.48
10	11	2	0	1.0	1.0	0.02	0.02
11	15	7	1	3.0	4.0	0.04	0.05
12	3	3	0	0.0	3.0	0.00	0.20
13	2	0	0	0.0	0.0	0.00	0.00
14	3	0	0	0.0	0.0	0.00	0.00

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

HPMS Data

SEGMENT	MP_FROM	MP_TO	NB/EB AADT	SB/WB AADT	2019 AADT	K Factor	D-Factor	T-Factor
1	0	16	12806	12814	25620	8	51	44
2	16	22	12380	11892	24272	7	52	46
3	22	32	12999	12578	25577	7	51	45
4	32	54	14408	14089	28497	10	51	39
5	54	71	11904	11166	23070	6	52	41
6	71	82	11788	14135	25923	5	55	38
7	82	98	12017	12586	24603	8	54	39
8	98	113	16445	16307	32752	7	54	32
9	155	149	8994	8972	17965	9	51	26
10	149	138	7985	7835	15821	10	50	26
11	138	123	6412	6097	12509	7	51	36
12	123	120	5607	5576	11183	7	51	38
13	120	118	7473	7053	14526	7	52	20
14	120	123	2367	2096	4463	8	53	56

SEGMENT	Loc ID	BMP	EMP	Length	Pos Dir AADT	Neg Dir AADT	Corrected Pos Dir AADT	Corrected Neg Dir AADT	2014 AADT	K Factor	D-Factor	D-Factor Adjusted	T-Factor
1	100063	0.00	0.71	0.71	14210	15278	14210	15278	29488	6	51	52	40
	100064	0.71	5.85	5.14	13695	13591	13695	13591	27286	12	57	50	41
	100065	5.85	11.93	6.08	12361	11574	12361	11574	23935	7	59	52	43
	100066	11.93	16.00	4.07	12104	13255	12104	13255	25359	6	53	52	48
2	100066	16.00	17.49	1.49	12104	13255	12104	13255	25359	6	53	52	48
	100067	17.49	19.80	2.31	11996	10513	11996	10513	22509	7	58	53	45
	100068	19.80	22.00	2.20	12969	12417	12969	12417	25386	7	52	51	45
3	100068	22.00	26.66	4.66	12969	12417	12969	12417	25386	7	52	51	45
	100069	26.66	31.17	4.51	12690	12289	12690	12289	24979	6	58	51	45
	100070	31.17	32.00	0.83	14841	15054	14841	15054	29895	9	50	50	42
4	100070	32.00	45.37	13.37	14841	15054	14841	15054	29895	9	50	50	42
	100071	45.37	53.98	8.61	13741	12598	13741	12598	26339	11	52	52	35
	100072	53.98	54.00	0.02	11910	10904	11910	10904	22814	6	59	52	42
5	100072	54.00	69.66	15.66	11910	10904	11910	10904	22814	6	59	52	42
	100073	69.66	71.00	1.34	11828	14229	11828	14229	26057	5	59	55	37
6	100073	71.00	81.24	10.24	11828	14229	11828	14229	26057	5	59	55	37
	100074	81.24	82.00	0.76	11249	12875	11249	12875	24124	7	66	53	40
7	100074	82.00	94.17	12.17	11249	12875	11249	12875	24124	7	66	53	40
	100075	94.17	98.00	3.83	14456	11671	14456	11671	26127	12	57	55	35
8	100075	98.00	98.30	0.30	14456	11671	14456	11671	26127	12	57	55	35

SEGMENT	Loc ID	BMP	EMP	Length	Pos Dir AADT	Neg Dir AADT	Corrected Pos Dir AADT	Corrected Neg Dir AADT	2014 AADT	K Factor	D-Factor	D-Factor Adjusted	T-Factor
	100076	98.30	103.45	5.15	12192	15293	12192	15293	27485	6	52	56	35
	100077	103.45	109.68	6.23	16716	14859	16716	14859	31575	7	56	53	32
	100078	109.68	112.74	3.06	22178	20954	22178	20954	43132	7	54	51	28
	100079	112.74	113.00	0.26	29011	21754	29011	21754	50765	6	63	57	29
9	100926	153.00	155.00	2.00	9872	9862	9872	9862	19734	9	53	50	25
	100925	152.00	153.00	1.00	9233	8944	9233	8944	18177	8	58	51	25
	100924	151.00	152.00	1.00	8648	8492	8648	8492	17140	7	60	50	32
	100923	150.49	151.00	0.51	9477	10503	9477	10503	19980	8	55	53	24
	100922	149.00	150.49	1.49	7722	7592	7722	7592	15314	10	57	50	26
10	100922	140.53	149.00	8.47	7722	7592	7722	7592	15314	10	57	50	26
	100921	138.36	140.53	2.17	9200	9000	9200	9000	18200	8	55	51	23
	100920	138.00	138.36	0.36	6865	6532	6865	6532	13397	10	54	51	34
11	100920	130.85	138.00	7.15	6865	6532	6865	6532	13397	10	54	51	34
	100919	123.00	130.85	7.85	6000	5700	6000	5700	11700	5	50	51	38
12	100919	122.66	123.00	0.34	6000	5700	6000	5700	11700	5	50	51	38
	100918	120.67	122.66	1.99	4933	5110	4933	5110	10043	7	51	51	41
	100917	120.00	120.67	0.67	7409	6897	7409	6897	14306	7	52	52	31
13	101729	118.00	118.37	0.37	4834	5024	4834	5024	9858	6	52	51	19
	101730	118.37	120.00	1.63	8072	7514	8072	7514	15586	7	55	52	21
14	101733	120.00	123.00	3.00	2367	2096	2367	2096	4463	8	52	53	56

Bicycle Accommodation Data

	Segment	BMP	EMP	Divided or Non	NB/EB Right Shoulder Width	SB/WB Right Shoulder Width	NB/EB Left Shoulder Width	SB/WB Left Shoulder Width	NB/EB Effective Length of Shoulder	SB/WB Effective Length of Shoulder	% Bicycle Accommodation
1	10-1	0	16	Divided	9.8	9.8	4.0	4.0	16.0	16.0	100%
2	10-2	16	22	Divided	9.0	9.0		3.0	6.0	6.0	100%
3	10-3	22	32	Divided	9.7	9.6	3.8	3.8	9.9	9.8	99%
4	10-4	32	54	Divided	9.8	9.9	4.0	4.0	9.0	22.0	70%
5	10-5	54	71	Divided	9.9	9.9	4.0	4.0	17.0	17.0	100%
6	10-6	71	82	Divided	9.9	10.0	3.9	3.9	11.0	11.0	100%
7	10-7	82	98	Divided	9.7	10.0	3.7	3.8	16.0	8.0	75%
8	10-8	98	113	Divided	10.0	10.0	4.0	4.0	15.0	15.0	100%
9	85-9	155	149	Divided	8.9	8.8	7.9	5.8	5.3	5.2	88%
10	85-10	149	138	Divided	9.8	9.8	4.0	5.9	11.0	11.0	100%
11	85-11	138	123	Divided	9.6	9.9	5.9	4.0	14.1	14.2	94%
12	85-12	123	120	Undivided	6.0	7.6	N/A	N/A	0.3	1.6	32%
13	85-13	120	118	Undivided	4.91	5.0	N/A	N/A	1.9	0.0	47%
14	85-14	120	123	Undivided	6.76	5.3	N/A	N/A	2.4	0.1	42%

AZTDM Data

SEGMENT	Growth Rate	% Non-SOV
10-1	1.13%	8.2%
10-2	1.14%	9.8%
10-3	1.15%	13.7%
10-4	1.15%	6.7%
10-5	1.20%	5.0%
10-6	1.16%	5.3%
10-7	1.29%	7.3%
10-8	2.27%	7.2%
85-9	-2.43%	17.1%
85-10	1.69%	14.0%
85-11	1.60%	8.0%
85-12	1.43%	7.2%
85-13	1.17%	7%
85-14	8.66%	4%

HERS Capacity Calculation Data

Segment	Capacity Environment Type	Facility Type	Terrain	Lane Width (Rounded, feet)	NB/EB Rt. Shoulder	SB/WB Rt. Shoulder	F_{lw} or f_w or f_{LS}	NB/EB F_{lc}	SB/WB F_{lc}	Total Ramp Density[1]	PHF	E_T	f_{HV}	f_M	f_A	g/C^2	f_G	f_{NP}	Nm	f_p	NB/EB FFS	SB/WB FFS	NB/EB Peak-Hour Capacity	SB/WB Peak-Hour Capacity
10-1	1	Rural	Level	12.00	9.83	9.84	0.0	0	0	0	0.94	1.5	0.820	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	3698	3698
10-2	1	Rural	Level	12.00	9.00	9.00	0.0	0	0	0	0.94	1.5	0.813	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	3668	3668
10-3	1	Rural	Level	12.00	9.71	9.58	0.0	0	0	0	0.94	1.5	0.816	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	3683	3683
10-4	1	Rural	Level	12.00	9.93	9.90	0.0	0	0	0	0.94	1.5	0.837	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	3776	3776
10-5	1	Rural	Level	12.00	9.92	9.94	0.0	0	0	0	0.94	1.5	0.830	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	3744	3744
10-6	1	Rural	Level	12.00	9.91	10.00	0.0	0	0	0	0.94	1.5	0.840	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	3792	3792
10-7	1	Rural	Level	12.00	9.67	10.00	0.0	0	0	0	0.94	1.5	0.837	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	3776	3776
10-8	1	Rural	Level	12.00	10.00	10.00	0.0	0	0	0	0.94	1.5	0.862	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75.40	75.40	3890	3890
85-9	2	Fringe Urban	Level	12.00	8.85	8.83	0.0	0	0	N/A	0.95	1.5	0.885	0	1.5	N/A	N/A	N/A	N/A	N/A	51.20	51.20	3403	3403
85-10	2	Rural	Level	12.00	9.82	9.76	0.0	0	0.4	N/A	0.88	1.5	0.885	0	0.25	N/A	N/A	N/A	N/A	N/A	64.75	64.35	3427	3427
85-11	2	Rural	Level	12.00	9.58	9.94	0.0	0	0	N/A	0.88	1.5	0.847	0	0.25	N/A	N/A	N/A	N/A	N/A	64.75	64.75	3281	3281
85-12	3	Rural	Level	12.00	6.00	7.61	1.0	N/A	N/A	N/A	0.9	2	0.725	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
85-13	3	Fringe Urban	Level	12.00	4.91	4.99	1.0	N/A	N/A	N/A	0.9	2	0.833	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
85-14	3	Fringe Urban	Level	12.00	6.76	5.32	1.0	N/A	N/A	N/A	0.9	2	0.641	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Safety Performance Area Data

Segment	Segment Similar Operating Environment Type	Segment Length (miles)	Segment NB/EB Fatal Crashes	Segment SB/WB Fatal Crashes	Segment NB/EB Suspected Serious Injury Crashes	Segment SB/WB Suspected Serious Injury Crashes	Fatal + Suspected Serious Injury Crashes at Intersections	Fatal + Suspected Serious Injury Crashes Involving Lane Departures	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
1	Rural 4 Lane Freeway with Daily Volume < 25,000	16	1	4	5	11	0	16	0	5	0	11558	11282
2	Rural 4 Lane Freeway with Daily Volume < 25,000	6	2	3	4	1	0	4	2	2	0	10954	10486
3	Rural 4 Lane Freeway with Daily Volume < 25,000	10	2	1	5	7	0	10	0	4	0	11766	11179
4	Rural 4 Lane Freeway with Daily Volume < 25,000	22	8	3	5	7	0	13	2	9	0	12851	12741
5	Rural 4 Lane Freeway with Daily Volume < 25,000	17	3	2	12	10	0	21	0	5	0	11142	10743
6	Rural 4 Lane Freeway with Daily Volume < 25,000	11	7	2	3	3	0	10	1	4	0	11839	11791
7	Rural 4 Lane Freeway with Daily Volume < 25,000	16	6	5	7	4	0	15	1	6	0	12265	11841
8	Rural 4 Lane Freeway with Daily Volume > 25,000	15	7	4	4	4	0	11	1	3	0	15805	15199
9	2 or 3 or 4 Lane Divided Highway	6	3	1	4	2	6	0	0	3	0	8147	8056
10	2 or 3 or 4 Lane Divided Highway	11	0	2	3	0	1	2	0	0	1	7227	7188
11	2 or 3 or 4 Lane Divided Highway	15	0	1	1	3	0	4	0	3	0	5419	5330
12	2 or 3 Lane Undivided Highway	3	1	0	0	0	0	1	0	0	0	5545	5481
13	4 or 5 Lane Undivided Highway	2	2	1	0	0	1	1	2	1	0	6364	6040
14	2 or 3 Lane Undivided Highway	3	0	0	0	0	0	0	0	0	0	4898	4703

HPMS Data

SEGMENT	MP_FROM	MP_TO	WEIGHTED AVERAGE NB/EB AADT	WEIGHTED AVERAGE SB/WB AADT	WEIGHTED AVERAGE AADT
1	0	16	11558	11282	22840
2	16	22	10954	10486	21441
3	22	32	11766	11179	22945
4	32	54	12851	12741	25592
5	54	71	11142	10743	21885
6	71	82	11839	11791	23630
7	82	98	12265	11841	24106
8	98	113	15805	15199	31004
9	155	149	8147	8056	16203
10	149	138	7227	7188	14415
11	138	123	5419	5330	10749
12	123	120	5545	5481	11026
13	120	118	6364	6040	12404
14	120	123	4898	4703	9600

Freight Performance Area Data

				Total minutes of closures		Avg Mins/Mile/Year	
Segment	Length (miles)	# of closures	# with F&I	EB/SB	WB/NB	EB/SB	WB/NB
1	16	42	0	7777.8	2087.8	97.22	26.10
2	6	18	1	1180.3	912.0	39.34	30.40
3	10	20	1	659.0	5046.6	13.18	100.93
4	22	35	2	2630.3	2374.9	23.91	21.59
5	17	18	0	1046.7	1254.1	12.31	14.75
6	11	24	1	1171.8	1375.4	21.31	25.01
7	16	35	1	2405.6	4075.5	30.07	50.94
8	15	33	1	2637.6	2582.6	35.17	34.43
9	9	27	1	930.2	2971.7	20.67	66.04
10	11	2	0	120.0	120.0	2.18	2.18
11	15	7	1	561.0	575.0	7.48	7.67
12	3	3	0	0.0	300.0	0.00	20.00
13	2	0	0	0.0	0.0	0.00	0.00
14	3	0	0	0.0	0.0	0.00	0.00

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

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

Appendix D: Needs Methodology

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)
	Good	None	All of Good Performance and upper third of Fair Performance (>6.0)
	Good		
6.5	Good		
	Fair		
	Fair	Low	Middle third of Fair Performance (5.5-6.0)
	Fair	Medium	Lower third of Fair and top third of Poor Performance (4.5-5.5)
5.0	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 ≥ 0.01 and < 1.5), "Medium" (score ≥ 1.5 and < 2.5), and "High" (score ≥ 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 TTI	Uninterrupted	1.21	1.27	1.27	1.39	1.39
	Interrupted	1.53	1.77	1.77	2.23	2.23
Directional PTI	Uninterrupted	1.37	1.43	1.43	1.57	1.57
	Interrupted	4.00	5.00	5.00	7.00	7.00
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 ≥ 0.01 and < 1.5), "Medium" (score ≥ 1.5 and < 2.5), and "High" (score ≥ 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 Directional Safety Index (Segment)	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
	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	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%

Involving Pedestrians	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 ≥ 0.01 and < 1.5), "Medium" (score ≥ 1.5 and < 2.5), and "High" (score ≥ 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 Area - Needs Analysis Step 1

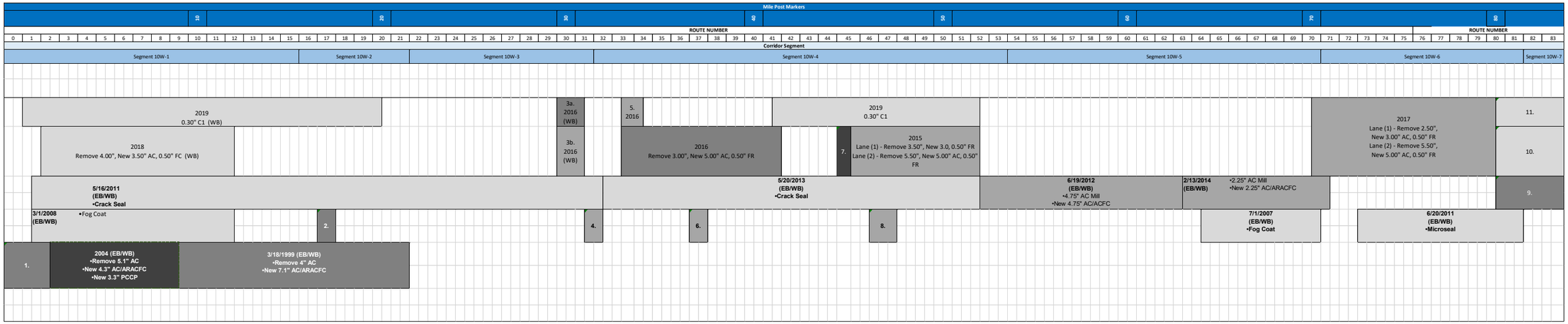
Segment #	Segment Length (miles)	Segment Mileposts (MP)	Facility Type	Pavement Index			Directional PSR					% Area Failure			Initial Need
				Performance Score	Performance Objective	Level of Need	Performance Score		Performance Objective	Level of Need		Performance Score	Performance Objective	Level of Need	
							NB	SB		NB	SB				
10W-1	16	0 - 16	Interstate	3.73	Fair or Better	None	3.74	3.64	Fair or Better	None	None	41%	Fair or Better	High	Low
10W-2	6	16 - 22	Interstate	3.14	Fair or Better	Medium	3.03	3.47	Fair or Better	High	Medium	92%	Fair or Better	High	High
10W-3	10	22 - 32	Interstate	3.61	Fair or Better	None	3.67	3.75	Fair or Better	None	None	60%	Fair or Better	High	Low
10W-4	22	32 - 54	Interstate	3.99	Fair or Better	None	4.16	4.37	Fair or Better	None	None	0%	Fair or Better	None	None
10W-5	17	54 - 71	Interstate	4.51	Fair or Better	None	4.09	4.18	Fair or Better	None	None	0%	Fair or Better	None	None
10W-6	11	71 - 82	Interstate	4.31	Fair or Better	None	4.03	4.09	Fair or Better	None	None	18%	Fair or Better	Medium	Low
10W-7	16	82 - 98	Interstate	3.26	Fair or Better	Low	3.32	3.70	Fair or Better	Medium	None	84%	Fair or Better	High	Medium
10W-8	15	98 - 113	Interstate	3.64	Fair or Better	None	3.60	3.76	Fair or Better	Low	None	43%	Fair or Better	High	Low
85-9	6	155 - 149	Highway	3.86	Fair or Better	None	3.65	3.54	Fair or Better	None	None	10%	Fair or Better	None	None
85-10	11	149 - 138	Highway	3.61	Fair or Better	None	3.67	3.92	Fair or Better	None	None	32%	Fair or Better	High	Low
85-11	15	138 - 123	Highway	3.90	Fair or Better	None	4.24	4.03	Fair or Better	None	None	10%	Fair or Better	None	None
85-12	3	123 - 120	Highway	4.08	Fair or Better	None	4.02	3.82	Fair or Better	None	None	0%	Fair or Better	None	None
85-13	2	120 - 118	Highway	3.92	Fair or Better	None	3.80	3.48	Fair or Better	None	None	0%	Fair or Better	None	None
85-14	3	120 - 123	Highway	3.96	Fair or Better	None	3.90	3.59	Fair or Better	None	None	0%	Fair or Better	None	None

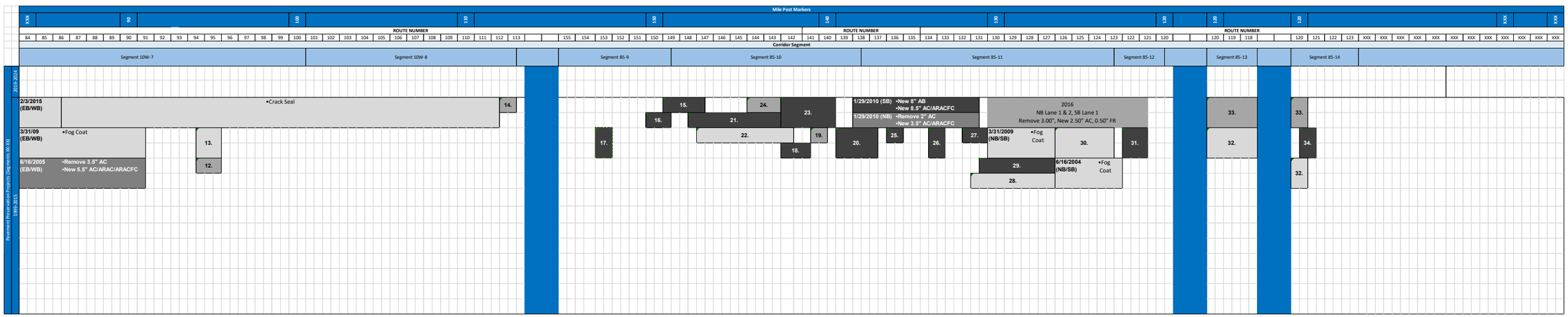
Pavement Performance Area - Needs Analysis Step 2

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)		
10W-1	16	0 - 16	Low	EB MP 0-2, WB MP 3-4, WB MP 7-8, EB MP 11-12, EB/WB MP 12-16	None	Low	Pavement Rehab from Dome Rock Rd to NE of Scadden Wash, MP 11.71-24 (2023 Start) ADOT 2022-2026 Program
10W-2	6	16 - 22	High	EB/WB 16-20, EB MP 20-21, EB/WB MP 21-22	None	High	Pavement Rehab from Dome Rock Rd to NE of Scadden Wash, MP 11.71-24 (2023 Start) ADOT 2022-2026 Program
10W-3	10	22 - 32	Low	EB/WB MP 22-27, WB MP 27-28, WB MP 29-30	None	Low	Pavement Rehab from Scaddan Wash to Plomosa MP 24-30 (2022-24)
10W-4	22	32 - 54	None	None	None	None	
10W-5	17	54 - 71	None	None	None	None	
10W-6	11	71 - 82	Low	EB/WB MP 80-82	None	Low	
10W-7	16	82 - 98	Medium	EB/WB MP 82-90, EB/WB MP 91-98, EB MP 94-97, EB/WB MP 97-98	None	Medium	Pavement Rehab from Salome Rd to W of Tonopah, MP 80-90 (FY 2025), 443rd Ave - Wintersburg Rd MP 90-100 (2023)
10W-8	15	98 - 113	Low	WB MP 98-99, EB/WB MP 99-100,	None	Low	Pavement Rehab Projects: MP 105.95 W. of Buckeye - Jct SR85 MP 105.95-112.5 (2022),

				EB MP 100-101, EB/WB MP 101-103, EB MP 103-104, WB MP 104-105, EB MP 106-109			MP 105.95 W of Buckeye to Jct SR-85 MP 105.9-111.9 (2022-23), 367th Ave to 315th Ave MP 100-105.9 (2022), 443rd Ave - Wintersburg Rd MP 90-100 (2023)
85-9	6	155 - 149	None	SB MP 150-149	None	Low	Changed final need to "Low" due to hot spot
85-10	11	149 - 138	Low	NP MP 148-147, SB MP 147-142, SB MP 141-140	None	Low	Pavement Rehab from Rainbow Wash to Hazen Rd MP 141-7 to 150.48 (2022 Start), ADOT 2022-2026 Program
85-11	15	138 - 123	None	SB MP 137-136, SB MP 133-132	None	Low	Changed final need to "Low" due to hot spots
85-12	3	123 - 120	None	None	None	None	
85-13	2	120 - 118	None	None	None	None	
85-14	3	120 - 123	None	None	None	None	

Pavement History





Bid History Investment

Value	Level	Segment Number 1 Uni-Dir	1 Bi-Dir	2 Uni-Dir	2 Bi-Dir	3 Uni-Dir	3 Bi-Dir	4 Uni-Dir	4 Bi-Dir	5 Uni-Dir	5 Bi-Dir	6 Uni-Dir	6 Bi-Dir	7 Uni-Dir	7 Bi-Dir	8 Uni-Dir	8 Bi-Dir	9 Uni-Dir	9 Bi-Dir	10 Uni-Dir	10 Bi-Dir	11 Uni-Dir	11 Bi-Dir	12 Uni-Dir	12 Bi-Dir	13 Uni-Dir	13 Bi-Dir	14 Uni-Dir	14 Bi-Dir
1	L1	95%	90%	75%	100 %		100 %		50%		35%		80%		100 %		75%			45%		35%	25%		15%				
1		65%	65%						90%				15%		60%								25%						
1													15%		10%								25%						
1																													
3	L2					15%	5%	5%	5%	5%	55%	85%	15%	10%		5%				20%			50%				100 %		35%
3								5%	10%	5%	40%									10%									
3								30%	5%																				
3																													
3																													
3																													
4	L3		15%		15%	15%		40%							60%					5%		45%					100 %		35%
4			40%		100 %																								
4																													
4																													
6	L4		45%					5%										10%	15%	20%	30%	45%	5%		50%				35%
6																		25%		45%	15%	5%	5%						
6																				15%		10%							
6																				5%		30%							
6																													
6																													
Sub-Total		1.6	6.5	0.8	5.6	1.1	1.2	3.1	2.0	0.3	3.2	2.6	1.6	0.3	4.1	0.2	0.8	2.1	0.9	6.7	2.7	7.6	2.9	0.0	3.2	0.0	7.0	0.0	4.6
Total		**7.3**		**6.0**		**1.7**		**3.6**		**3.4**		**2.8**		**4.3**		**0.8**		**2.0**		**6.0**		**6.6**		**3.2**		**7.0**		**4.6**	

Pavement Historical Investment

Segment	Pavement History Value (bid projects)	Pavement History (bid projects)	PeCos ($/mile/yr)	PeCos
10W-1	7.3	High	$1,026.77	Low
10W-2	6.0	Medium	$693.75	Low
10W-3	1.7	Low	$1,230.51	Medium
10W-4	3.6	Low	$5,618.26	High
10W-5	3.4	Low	$61.73	Low
10W-6	2.8	Low	$14.84	Low
10W-7	4.3	Low	$1,130.20	Medium
10W-8	0.8	Low	$183.58	Low
85-9	2.0	Low	$0.00	Low
85-10	6.0	Medium	$158.29	Low
85-11	6.6	High	$6,464.93	High
85-12	3.2	Low	$1,537.81	Medium
85-13	7.0	High		Low
85-14	4.6	Low		Low

Resulting Historical Investment
High
Medium
Low
Medium
Low
Low
Low
Low
Low
Medium
High
Low
High
Low

Pavement Performance Area - Needs Analysis Step 3

Segment #	Segment Length (miles)	Segment Mileposts (MP)	Final Need	Bid History Investment	PeCos History Investment	Resulting Historical Investment	Contributing Factors and Comments
10W-1	16	0 - 16	Low	High	Low	High	
10W-2	6	16 - 22	High	Medium	Low	Medium	
10W-3	10	22 - 32	Low	Low	Medium	Low	
10W-4	22	32 - 54	None	Low	High	Medium	
10W-5	17	54 - 71	None	Low	Low	Low	
10W-6	11	71 - 82	Low	Low	Low	Low	
10W-7	16	82 - 98	Medium	Low	Medium	Low	
10W-8	15	98 - 113	Low	Low	Low	Low	
85-9	6	155 - 149	Low	Low	Low	Low	
85-10	11	149 - 138	Low	Medium	Low	Medium	
85-11	15	138 - 123	Low	High	High	High	
85-12	3	123 - 120	None	Low	Medium	Low	
85-13	2	120 - 118	None	High	-	High	
85-14	3	120 - 123	None	Medium	-	Low	

Bridge Performance Area – Needs Analysis Step 1

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	
10W-1	16	0 - 16	5	6.75	Fair or Better	None	5	Fair or Better	Low	83.24	Fair or Better	None	Low
10W-2	6	16 - 22	6	6.15	Fair or Better	None	5	Fair or Better	Low	92.98	Fair or Better	None	Low
10W-3	10	22 - 32	2	6.00	Fair or Better	None	6	Fair or Better	None	86.37	Fair or Better	None	None
10W-4	22	32 - 54	9	6.17	Fair or Better	None	5	Fair or Better	Low	96.05	Fair or Better	None	Low
10W-5	17	54 - 71	6	6.48	Fair or Better	None	6	Fair or Better	None	96.81	Fair or Better	None	None
10W-6	11	71 - 82	2	7.00	Fair or Better	None	7	Fair or Better	None	97.05	Fair or Better	None	None
10W-7	16	82 - 98	6	6.25	Fair or Better	None	6	Fair or Better	None	96.62	Fair or Better	None	None
10W-8	15	98 - 113	10	6.44	Fair or Better	None	5	Fair or Better	Low	96.35	Fair or Better	None	Low
85-9	6	SR85 155 - 149	0	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	N/A
85-10	11	149 - 138	6	6.53	Fair or Better	None	6	Fair or Better	None	99.44	Fair or Better	None	None
85-11	15	138 - 123	0	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	N/A
85-12	3	123 - 120	1	5.00	Fair or Better	Medium	5	Fair or Better	Low	75.10	Fair or Better	None	Medium
85-13	2	120 - 118	4	5.62	Fair or Better	Low	5	Fair or Better	Low	91.63	Fair or Better	None	Low
85-14	3	SR85 - 120 - 123	2	6.86	Fair or Better	None	6	Fair or Better	None	96.40	Fair or Better	None	None

Bridge Performance Area – Needs Analysis Step 2

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)			
10W-1	16	0 - 16	5	Low	None	None	Low		
10W-2	6	16 - 22	6	Low	None	None	Low		
10W-3	10	22 - 32	2	None	None	None	None		
10W-4	22	32 - 54	9	Low	None	None	Low		
10W-5	17	54 - 71	6	None	None	None	None		
10W-6	11	71 - 82	2	None	None	None	None		
10W-7	16	82 - 98	6	None	None	None	None		
10W-8	15	98 - 113	10	Low	None	None	Low		
85-9	6	SR85 155 - 149	0	N/A	None	None	No Bridges		
85-10	11	149 - 138	6	None	None	None	None		
85-11	15	138 - 123	0	N/A	None	None	No Bridges		
85-12	3	123 - 120	1	Medium	None	None	Medium		
85-13	2	120 - 118	4	Low	None	None	Low		
85-14	3	SR85 - 120 - 123	2	None	None	None	None		

Bridge Performance Area – Needs Analysis Step 3

Segment #	Segment Length (Miles)	Segment Mileposts (MP)	Number of Bridges in Segment	Final Need	Contributing Factors		
					Bridge	Current Ratings	Historical Review
10W-1	16	0 - 16	5	Low			
10W-2	6	16 - 22	6	Low			
10W-3	10	22 - 32	2	None			
10W-4	22	32 - 54	9	Low			
10W-5	17	54 - 71	6	None			
10W-6	11	71 - 82	2	None			
10W-7	16	82 - 98	6	None			
10W-8	15	98 - 113	10	Low			
85-9	6	SR85 155 - 149	0	N/A			
85-10	11	149 - 138	6	None			
85-11	15	138 - 123	0	N/A			
85-12	3	123 - 120	1	Medium			
85-13	2	120 - 118	4	Low			
85-14	3	SR85 - 120 - 123	2	None			

Safety Performance Area – Needs Analysis Step 1

Segment	Operating Environment	Offset	Segment Length (miles)	Segment Mileposts (MP)	Safety Index			Directional Safety Index								% of Fatal + Suspected Serious 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
10-1	Rural 4 Lane Freeway with Daily Volume < 25,000	4	16	0 - 16	0.93	Average or Better	None	0.40	1.46	Average or Better				None	High	*Insufficient Data*	Average or Better	N/A
10-2	Rural 4 Lane Freeway with Daily Volume < 25,000	4	6	16 - 22	2.28	Average or Better	High	1.90	2.65	Average or Better				High	High	*Insufficient Data*	Average or Better	N/A
10-3	Rural 4 Lane Freeway with Daily Volume < 25,000	4	10	22 - 32	0.92	Average or Better	None	1.14	0.71	Average or Better				Medium	None	*Insufficient Data*	Average or Better	N/A
10-4	Rural 4 Lane Freeway with Daily Volume < 25,000	4	22	32 - 54	1.28	Average or Better	High	1.81	0.74	Average or Better				High	None	*Insufficient Data*	Average or Better	N/A
10-5	Rural 4 Lane Freeway with Daily Volume < 25,000	4	17	54 - 71	0.94	Average or Better	None	1.10	0.78	Average or Better				Medium	None	*Insufficient Data*	Average or Better	N/A
10-6	Rural 4 Lane Freeway with Daily Volume < 25,000	4	11	71 - 82	2.10	Average or Better	High	3.23	0.98	Average or Better				High	Low	*Insufficient Data*	Average or Better	N/A
10-7	Rural 4 Lane Freeway with Daily Volume < 25,000	4	16	82 - 98	1.79	Average or Better	High	1.95	1.62	Average or Better				High	High	*Insufficient Data*	Average or Better	N/A
10-8	Rural 4 Lane Freeway with Daily Volume > 25,000	5	15	98 - 113	1.01	Average or Better	Low	1.27	0.76	Average or Better				Medium	None	*Insufficient Data*	Average or Better	N/A
Safety Emphasis Area?			**Yes**	**Weighted Average**	1.32	Above Average	High											

Segment	Operating Environment		Segment Length (miles)	Segment Mileposts (MP)	% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures			% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians			% of Fatal + Suspected Serious Injury Involving Pedestrians Scale			% of Fatal + Suspected Serious Injury Crashes Involving Trucks			Initial Need
					Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	None <=	Low <=	High >=	Performance Score	Performance Objective	Level of Need	
10-1	Rural 4 Lane Freeway with Daily Volume < 25,000	4	16	0 - 16	76%	Average or Better	Medium	*Insufficient Data*	Average or Better	N/A	0.02	0.03	0.04	24%	Average or Better	Medium	Low
10-2	Rural 4 Lane Freeway with Daily Volume < 25,000	4	6	16 - 22	40%	Average or Better	None	*Insufficient Data*	Average or Better	N/A	0.02	0.03	0.04	20%	Average or Better	None	High
10-3	Rural 4 Lane Freeway with Daily Volume < 25,000	4	10	22 - 32	67%	Average or Better	None	*Insufficient Data*	Average or Better	N/A	0.02	0.03	0.04	27%	Average or Better	High	Low
10-4	Rural 4 Lane Freeway with Daily Volume < 25,000	4	22	32 - 54	57%	Average or Better	None	*Insufficient Data*	Average or Better	N/A	0.02	0.03	0.04	39%	Average or Better	High	High
10-5	Rural 4 Lane Freeway with Daily Volume < 25,000	4	17	54 - 71	78%	Average or Better	Medium	*Insufficient Data*	Average or Better	N/A	0.02	0.03	0.04	19%	Average or Better	None	Low
10-6	Rural 4 Lane Freeway with Daily Volume < 25,000	4	11	71 - 82	67%	Average or Better	None	*Insufficient Data*	Average or Better	N/A	0.02	0.03	0.04	27%	Average or Better	High	High
10-7	Rural 4 Lane Freeway with Daily Volume < 25,000	4	16	82 - 98	68%	Average or Better	None	*Insufficient Data*	Average or Better	N/A	0.02	0.03	0.04	27%	Average or Better	High	High
10-8	Rural 4 Lane Freeway with Daily Volume > 25,000	5	15	98 - 113	58%	Average or Better	None	*Insufficient Data*	Average or Better	N/A	0.02	0.03	0.06	16%	Average or Better	Medium	Medium

Safety Performance Area – Needs Analysis Step 2

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)
10-1	16	0 - 16	Low	WB MP 0-1, WB MP 9-10	Ehrenberg Rest Area (2024-25), Pavement Rehab at Dome Rock Rd - NE of Scaddan Wash MP 11.71-24 (2023)	Low	
10-2	6	16 - 22	High	None	Pavement Rehab at Dome Rock Rd - NE of Scaddan Wash MP 11.71-24 (2023)	High	
10-3	10	22 - 32	Low	None	Pavement Rehab from Scaddan Wash to Plomosa MP 24-30 (2022-24)	Low	
10-4	22	32 - 54	High	None	None	High	
10-5	17	54 - 71	Low	EB MP 67-69	None	Low	
10-6	11	71 - 82	High	None	None	High	
10-7	16	82 - 98	High	None	Bridge Replacement at 395th Ave (Belmont Road) MP 96.2 (2022-23), Pavement Rehab from 443rd Ave - Wintersburg Rd MP 90-100 (2023)	High	
10-8	15	98 - 113	Medium	EB MP 104-106	Pavement Rehab Projects: MP 105.95 W. of Buckeye - Jct SR85 MP 105.95-112.5 (2022), MP 105.95 W of Buckeye to Jct SR-85 MP 105.9-111.9 (2022-23), 367th Ave to 315th Ave MP 100-105.9 (2022), SR 85 - Verrado Way MP 111.8-120.3, 443rd Ave - Wintersburg Rd MP 90-100 (2023), Interchange Construction at Desert Creek TI (2022-23).	Medium	

Safety Performance Area – Needs Analysis Step 3

Segment Number		10-1	10-2	10-3	10-4	10-5	10-6	10-7	10-8	Corridor-Wide Crash Characteristics
Segment Length (miles)		16	6	10	22	17	11	16	15	
Segment Milepost (MP)		0 - 16	16 - 22	22 - 32	32 - 54	54 - 71	71 - 82	82 - 98	98 - 113	
Final Need		Low	High	Low	High	Low	High	High	Medium	
Segment Crash Overview		5 Crashes were fatal 16 Crashes had suspected serious injuries 0 Crashes at intersections 16 Crashes involve lane departures 0 Crashes involve pedestrians 5 Crashes involve trucks 0 Crashes involve bicycles	5 Crashes were fatal 5 Crashes had suspected serious injuries 0 Crashes at intersections 4 Crashes involve lane departures 2 Crashes involve pedestrians 2 Crashes involve trucks 0 Crashes involve bicycles	3 Crashes were fatal 12 Crashes had suspected serious injuries 0 Crashes at intersections 10 Crashes involve lane departures 0 Crashes involve pedestrians 4 Crashes involve trucks 0 Crashes involve bicycles	11 Crashes were fatal 12 Crashes had suspected serious injuries 0 Crashes at intersections 13 Crashes involve lane departures 2 Crashes involve pedestrians 9 Crashes involve trucks 0 Crashes involve bicycles	5 Crashes were fatal 22 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	9 Crashes were fatal 6 Crashes had suspected serious injuries 0 Crashes at intersections 10 Crashes involve lane departures 1 Crashes involve pedestrians 4 Crashes involve trucks 0 Crashes involve bicycles	11 Crashes were fatal 11 Crashes had suspected serious injuries 0 Crashes at intersections 15 Crashes involve lane departures 1 Crashes involve pedestrians 6 Crashes involve trucks 0 Crashes involve bicycles	11 Crashes were fatal 8 Crashes had suspected serious injuries 0 Crashes at intersections 11 Crashes involve lane departures 1 Crashes involve pedestrians 3 Crashes involve trucks 0 Crashes involve bicycles	60 Crashes were fatal 92 Crashes had suspected serious injuries 0 Crashes at intersections 100 Crashes involve lane departures 7 Crashes involve pedestrians 38 Crashes involve trucks 0 Crashes involve bicycles
Segment Crash Summaries (Fatal and Suspected Serious Injury Crashes)	First Harmful Event Type	38% Involve Overturning 33% Involve Collision with Fixed Object 29% Involve Collision with Motor Vehicle	40% Involve Overturning 20% Involve Collision with Motor Vehicle 20% Involve Collision with Pedestrian	47% Involve Collision with Motor Vehicle 47% Involve Overturning 7% Involve Collision with Fixed Object	43% Involve Overturning 35% Involve Collision with Motor Vehicle 9% Involve Collision with Pedestrian	48% Involve Overturning 26% Involve Collision with Motor Vehicle 15% Involve Collision with Fixed Object	47% Involve Overturning 40% Involve Collision with Motor Vehicle 7% Involve Collision with Pedestrian	59% Involve Overturning 32% Involve Collision with Motor Vehicle 5% Involve Collision with Pedestrian	42% Involve Collision with Motor Vehicle 42% Involve Overturning 11% Involve Collision with Fixed Object	46% Involve Overturning 34% Involve Collision with Motor Vehicle 11% Involve Collision with Fixed Object
	Collision Type	57% Involve Single Vehicle 24% Involve Rear End 10% Involve Other	50% Involve Single Vehicle 30% Involve Other 10% Involve Angle	47% Involve Single Vehicle 20% Involve Rear End 20% Involve Other	52% Involve Single Vehicle 30% Involve Rear End 9% Involve Other	70% Involve Single Vehicle 11% Involve Rear End 7% Involve Sideswipe (same)	53% Involve Single Vehicle 27% Involve Rear End 13% Involve Sideswipe (same)	64% Involve Single Vehicle 27% Involve Rear End 5% Involve Head On	47% Involve Single Vehicle 26% Involve Rear End 21% Involve Other	57% Involve Single Vehicle 22% Involve Rear End 12% Involve Other
	Violation or Behavior	76% Involve Speed too Fast for Conditions 10% Involve Failure to Keep in Proper Lane 10% Involve Other	50% Involve Speed too Fast for Conditions 20% Involve Other 10% Involve No Improper Action	53% Involve Speed too Fast for Conditions 27% Involve No Improper Action 13% Involve Unsafe Lane Change	65% Involve Speed too Fast for Conditions 13% Involve No Improper Action 9% Involve Failure to Keep in Proper Lane	33% Involve Speed too Fast for Conditions 26% Involve No Improper Action 26% Involve Failure to Keep in Proper Lane	47% Involve Speed too Fast for Conditions 13% Involve No Improper Action 13% Involve Exceeded Lawful Speed	55% Involve Speed too Fast for Conditions 14% Involve Unknown 9% Involve Failure to Keep in Proper Lane	47% Involve Speed too Fast for Conditions 21% Involve Unknown 11% Involve Other	53% Involve Speed too Fast for Conditions 13% Involve No Improper Action 11% Involve Failure to Keep in Proper Lane
	Lighting Conditions	57% Occur in Daylight Conditions 33% Occur in Dark-Unlighted Conditions 5% Occur in Dawn Conditions	60% Occur in Daylight Conditions 30% Occur in Dark-Unlighted Conditions 10% Occur in Dark-Lighted Conditions	60% Occur in Daylight Conditions 27% Occur in Dark-Unlighted Conditions 7% Occur in Dawn Conditions	57% Occur in Dark-Unlighted Conditions 30% Occur in Daylight Conditions 4% Occur in Dawn Conditions	56% Occur in Daylight Conditions 37% Occur in Dark-Unlighted Conditions 4% Occur in Dawn Conditions	47% Occur in Daylight Conditions 47% Occur in Dark-Unlighted Conditions 7% Occur in Dusk Conditions	45% Occur in Dark-Unlighted Conditions 36% Occur in Daylight Conditions 9% Occur in Dusk Conditions	58% Occur in Daylight Conditions 37% Occur in Dark-Unlighted Conditions 5% Occur in Dawn Conditions	49% Occur in Daylight Conditions 40% Occur in Dark-Unlighted Conditions 4% Occur in Dawn Conditions
	Surface Conditions	86% Involve Dry Conditions 14% Involve Wet Conditions	100% Involve Dry Conditions	100% Involve Dry Conditions	91% Involve Dry Conditions 9% Involve Wet Conditions	96% Involve Dry Conditions 4% Involve Wet Conditions	100% Involve Dry Conditions	95% Involve Dry Conditions 5% Involve Wet Conditions	95% Involve Dry Conditions 5% Involve Wet Conditions	95% Involve Dry Conditions 5% Involve Wet Conditions
	First Unit Event	33% Involve a first unit event of Ran Off the Road (Left) 33% Involve a first unit event of Motor Vehicle in Transport 24% 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) 10% Involve a first unit event of Ran Off the Road (Right)	40% Involve a first unit event of Motor Vehicle in Transport 27% Involve a first unit event of Overturn 20% Involve a first unit event of Ran Off the Road (Right)	35% 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 (Left)	33% Involve a first unit event of Overturn 30% Involve a first unit event of Ran Off the Road (Right) 15% Involve a first unit event of Ran Off the Road (Left)	40% Involve a first unit event of Motor Vehicle in Transport 27% Involve a first unit event of Ran Off the Road (Right) 27% Involve a first unit event of Overturn	41% Involve a first unit event of Overturn 27% Involve a first unit event of Motor Vehicle in Transport 14% Involve a first unit event of Ran Off the Road (Left)	42% Involve a first unit event of Motor Vehicle in Transport 26% Involve a first unit event of Overturn 11% Involve a first unit event of Ran Off the Road (Left)	32% Involve a first unit event of Motor Vehicle in Transport 29% Involve a first unit event of Overturn 16% Involve a first unit event of Ran Off the Road (Left)
	Driver Physical Condition	57% No Apparent Influence 19% Under the Influence of Drugs or Alcohol 14% Unknown	40% No Apparent Influence 40% Unknown 10% Under the Influence of Drugs or Alcohol	60% No Apparent Influence 13% Under the Influence of Drugs or Alcohol 13% Fatigued/Fell Asleep	57% No Apparent Influence 22% Fatigued/Fell Asleep 22% Unknown	70% No Apparent Influence 11% Fatigued/Fell Asleep 11% Unknown	53% No Apparent Influence 27% Unknown 7% Under the Influence of Drugs or Alcohol	50% No Apparent Influence 23% Unknown 14% Fatigued/Fell Asleep	63% No Apparent Influence 26% Unknown 11% Under the Influence of Drugs or Alcohol	58% No Apparent Influence 20% Unknown 11% Fatigued/Fell Asleep
	Safety Device Usage	62% Shoulder And Lap Belt Used 19% None Used 14% Unknown	40% Shoulder And Lap Belt Used 30% Not Applicable 10% None Used	73% Shoulder And Lap Belt Used 13% None Used 7% Helmet Used	78% Shoulder And Lap Belt Used 13% None Used 4% Unknown	70% Shoulder And Lap Belt Used 15% None Used 11% Unknown	93% Shoulder And Lap Belt Used 7% Unknown	45% Shoulder And Lap Belt Used 27% None Used 9% Air Bag Deployed/Shoulder-Lap Belt	79% Shoulder And Lap Belt Used 11% None Used 5% Unknown	68% Shoulder And Lap Belt Used 14% None Used 8% Unknown
Hot Spot Crash Summaries		WB MP 0-1, WB MP 9-10	None	None	None	EB MP 67-69	None	None	EB MP 104-106	
Previously Completed Safety-Related Projects		Ehrenberg Rest Area (2024-25), Pavement Rehab at Dome Rock Rd - NE of Scaddan Wash MP 11.71-24 (2023)	Pavement Rehab at Dome Rock Rd - NE of Scaddan Wash MP 11.71-24 (2023)	Pavement Rehab from Scaddan Wash to Plomosa MP 24-30 (2022-24)	None	None	None	Bridge Replacement at 395th Ave (Belmont Road) MP 96.2 (2022-23), Pavement Rehab from 443rd Ave - Wintersburg Rd MP 90-100 (2023)	Pavement Rehab Projects: MP 105.95 W. of Buckeye - Jct SR85 MP 105.95-112.5 (2022), MP 105.95 W of Buckeye to Jct SR-85 MP 105.9-111.9 (2022-23), 367th Ave to 315th Ave MP 100-105.9 (2022), SR 85 - Verrado Way MP 111.8-120.3, 443rd Ave - Wintersburg Rd MP 90-100	-
District Interviews/Discussions		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Mobility Performance Area – Needs Analysis Step 1

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	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	Performance Score		Performance Objective	Level of Need		Performance Score		Performance Objective	Level of Need	
											NB/EB	SB/WB		NB/EB	SB/WB	NB/EB	SB/WB		NB/EB	SB/WB
10-1	0-16	16	Rural	Uninterrupted	0.42	Fair or Better	None	0.47	Fair or Better	None	0.28	0.28	Fair or Better	None	None	0.36	0.19	Fair or Better	Low	None
10-2	16-22	6	Rural	Uninterrupted	0.40	Fair or Better	None	0.45	Fair or Better	None	0.24	0.23	Fair or Better	None	None	0.33	0.27	Fair or Better	None	None
10-3	22-32	10	Rural	Uninterrupted	0.42	Fair or Better	None	0.47	Fair or Better	None	0.25	0.24	Fair or Better	None	None	0.08	0.82	Fair or Better	None	High
10-4	32-54	22	Rural	Uninterrupted	0.45	Fair or Better	None	0.51	Fair or Better	None	0.38	0.37	Fair or Better	None	None	0.16	0.15	Fair or Better	None	None
10-5	54-71	17	Rural	Uninterrupted	0.37	Fair or Better	None	0.42	Fair or Better	None	0.19	0.18	Fair or Better	None	None	0.08	0.13	Fair or Better	None	None
10-6	71-82	11	Rural	Uninterrupted	0.41	Fair or Better	None	0.46	Fair or Better	None	0.16	0.19	Fair or Better	None	None	0.22	0.22	Fair or Better	None	None
10-7	82-98	16	Rural	Uninterrupted	0.40	Fair or Better	None	0.45	Fair or Better	None	0.25	0.27	Fair or Better	None	None	0.26	0.36	Fair or Better	None	Low
10-8	98-113	15	Rural	Uninterrupted	0.58	Fair or Better	None	0.72	Fair or Better	Medium	0.30	0.29	Fair or Better	None	None	0.23	0.22	Fair or Better	None	None
85-9	155-149	6	Urban	Interrupted	0.22	Fair or Better	None	0.16	Fair or Better	None	0.24	0.24	Fair or Better	None	None	0.13	0.48	Fair or Better	None	Low
85-10	149-138	11	Rural	Uninterrupted	0.30	Fair or Better	None	0.35	Fair or Better	None	0.23	0.23	Fair or Better	None	None	0.02	0.02	Fair or Better	None	None
85-11	138-123	15	Rural	Uninterrupted	0.24	Fair or Better	None	0.28	Fair or Better	None	0.14	0.13	Fair or Better	None	None	0.04	0.05	Fair or Better	None	None
85-12	123-120	3	Rural	Interrupted	1.02	Fair or Better	High	1.18	Fair or Better	High	0.58	0.57	Fair or Better	None	None	0.00	0.20	Fair or Better	None	None
85-13	120-118	2	Urban	Interrupted	0.55	Fair or Better	None	0.62	Fair or Better	None	0.33	0.31	Fair or Better	None	None	0.00	0.00	Fair or Better	None	None
85-14	120-123	3	Urban	Interrupted	1.40	Fair or Better	High	2.41	Fair or Better	High	0.31	0.28	Fair or Better	None	None	0.00	0.00	Fair or Better	None	None

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				
10-1	0-16	16	Rural	Uninterrupted	1.04	1.03	Fair or Better	None	None	100%	Fair or Better	None	Low
10-2	16-22	6	Rural	Uninterrupted	1.03	1.03	Fair or Better	None	None	100%	Fair or Better	None	None
10-3	22-32	10	Rural	Uninterrupted	1.02	1.02	Fair or Better	None	None	99%	Fair or Better	None	Low
10-4	32-54	22	Rural	Uninterrupted	1.02	1.02	Fair or Better	None	None	70%	Fair or Better	Low	Low
10-5	54-71	17	Rural	Uninterrupted	1.02	1.02	Fair or Better	None	None	100%	Fair or Better	None	None
10-6	71-82	11	Rural	Uninterrupted	1.02	1.02	Fair or Better	None	None	100%	Fair or Better	None	None
10-7	82-98	16	Rural	Uninterrupted	1.02	1.02	Fair or Better	None	None	75%	Fair or Better	Low	Low
10-8	98-113	15	Rural	Uninterrupted	1.02	1.02	Fair or Better	None	None	100%	Fair or Better	None	Low
85-9	155-149	6	Urban	Interrupted	1.09	1.08	Fair or Better	None	None	88%	Fair or Better	None	Low
85-10	149-138	11	Rural	Uninterrupted	1.03	1.03	Fair or Better	None	None	100%	Fair or Better	None	None
85-11	138-123	15	Rural	Uninterrupted	1.04	1.03	Fair or Better	None	None	94%	Fair or Better	None	None
85-12	123-120	3	Rural	Interrupted	1.04	1.03	Fair or Better	None	None	32%	Fair or Better	High	High
85-13	120-118	2	Urban	Interrupted	1.09	1.12	Fair or Better	None	None	47%	Fair or Better	High	Low
85-14	120-123	3	Urban	Interrupted	1.10	1.10	Fair or Better	None	None	42%	Fair or Better	High	High

Mobility Performance Area – Needs Analysis Step 2

Segment	Segment Mileposts (MP)	Segment Length (miles)	Initial Need	Need Adjustments Recent Projects Since 2019	Final Need	Planned and Programmed Future Projects
10-1	0-16	16	Low	None	Low	
10-2	16-22	6	None	None	None	
10-3	22-32	10	Low	None	Low	
10-4	32-54	22	Low	None	Low	
10-5	54-71	17	None	None	None	
10-6	71-82	11	None	None	None	
10-7	82-98	16	Low	None	Low	
10-8	98-113	15	Low	None	Low	
85-9	155-149	6	Low	None	Low	
85-10	149-138	11	None	None	None	
85-11	138-123	15	None	None	None	
85-12	123-120	3	High	None	High	
85-13	120-118	2	Low	None	Low	
85-14	120-123	3	High	None	High	

Mobility Performance Area – Needs Analysis Step 3

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 2040 LOS	% Trucks	
10-1	0-16	16	Low	Interstate	Rural	Level	2	72.2	No	Divided	0%	A/B	A/B	44%	Ehrenberg Port of Entry; DMS EB MP 15.6
10-2	16-22	6	None	Interstate	Rural	Level	2	75	No	Divided	0%	A/B	A/B	46%	None
10-3	22-32	10	Low	Interstate	Rural	Level	2	75	No	Divided	0%	A/B	A/B	45%	None
10-4	32-54	22	Low	Interstate	Rural	Level	2	75	No	Divided	0%	A/B	A/B	39%	DMS EB MP 49.4
10-5	54-71	17	None	Interstate	Rural	Level	2	75	No	Divided	0%	A/B	A/B	41%	None
10-6	71-82	11	None	Interstate	Rural	Level	2	75	No	Divided	0%	A/B	A/B	38%	None
10-7	82-98	16	Low	Interstate	Rural	Level	2	75	No	Divided	0%	A/B	A/B	39%	None
10-8	98-113	15	Low	Interstate	Rural	Level	2	75	No	Divided	0%	A/B	A/B	32%	DMS EB MP 110.3
85-9	155-149	6	Low	State Highway	FringeUrban	Level	2	52.7	No	Divided	0%	A-C	A-C	26%	Railroad Crossing at MP 151
85-10	149-138	11	None	State Highway	Rural	Level	2	65	No	Divided	0%	A/B	A/B	26%	None
85-11	138-123	15	None	State Highway	Rural	Level	2	65	No	Divided	0%	A/B	A/B	36%	None
85-12	123-120	3	High	State Highway	Rural	Level	2	43.2	No	Divided	50%	A/B	A/B	38%	None
85-13	120-118	2	Low	State Highway	FringeUrban	Level	2	35	No	Non-Divided	0%	A-C	A-C	20%	Arterial roadway for Gila Bend
85-14	120-123	3	High	State Highway	FringeUrban	Level	2	49.5	No	Non-Divided	0%	A-C	A-C	56%	None

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
				Total Number of Closures	# Incidents/ Accidents	% Incidents/ Accidents	# Obstructions/ Hazards	% Obstructions/ Hazards	# Weather Related	% Weather Related		
10-1	0-16	16	Low	42	7	17%	0	0%	0	0%	Ehrenberg POE	
10-2	16-22	6	None	18	3	17%	2	11%	0	0%	None	
10-3	22-32	10	Low	20	4	20%	0	0%	0	0%	None	
10-4	32-54	22	Low	35	8	23%	0	0%	0	0%	None	
10-5	54-71	17	None	18	3	17%	0	0%	0	0%	None	
10-6	71-82	11	None	24	4	17%	0	0%	0	0%	None	
10-7	82-98	16	Low	35	11	31%	0	0%	0	0%	None	
10-8	98-113	15	Low	33	4	12%	0	0%	0	0%	None	
85-9	155-149	6	Low	27	9	33%	0	0%	0	0%	None	
85-10	149-138	11	None	2	1	50%	1	50%	0	0%	None	
85-11	138-123	15	None	7	2	29%	0	0%	0	0%	None	
85-12	123-120	3	High	3	1	33%	0	0%	0	0%	None	
85-13	120-118	2	Low	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	None	
85-14	120-123	3	High	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	None	

Freight Performance Area – Needs Analysis Step 1

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
10-1	Uninterrupted	0 - 16	16	1.11	Fair or Better	None	1.12	1.09	Fair or Better	None	None
10-2	Uninterrupted	16 - 22	6	1.06	Fair or Better	None	1.06	1.05	Fair or Better	None	None
10-3	Uninterrupted	22 - 32	10	1.05	Fair or Better	None	1.05	1.05	Fair or Better	None	None
10-4	Uninterrupted	32 - 54	22	1.05	Fair or Better	None	1.05	1.05	Fair or Better	None	None
10-5	Uninterrupted	54 - 71	17	1.04	Fair or Better	None	1.04	1.04	Fair or Better	None	None
10-6	Uninterrupted	71 - 82	11	1.04	Fair or Better	None	1.04	1.04	Fair or Better	None	None
10-7	Uninterrupted	82 - 98	16	1.05	Fair or Better	None	1.05	1.04	Fair or Better	None	None
10-8	Uninterrupted	98 - 113	15	1.05	Fair or Better	None	1.05	1.05	Fair or Better	None	None
85-9	Interrupted	155 - 149	6	1.29	Fair or Better	None	1.30	1.28	Fair or Better	None	None
85-10	Uninterrupted	149 - 138	11	1.07	Fair or Better	None	1.07	1.06	Fair or Better	None	None
85-11	Uninterrupted	138 - 123	15	1.20	Fair or Better	None	1.19	1.20	Fair or Better	None	None
85-12	Interrupted	123 - 120	3	1.20	Fair or Better	None	1.19	1.20	Fair or Better	None	None
85-13	Interrupted	120 - 118	2	1.32	Fair or Better	None	1.26	1.37	Fair or Better	None	None
85-14	Interrupted	120 - 123	3	1.59	Fair or Better	Low	1.57	1.62	Fair or Better	None	Low

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				
10-1	Uninterrupted	0 - 16	16	97.22	26.10	Fair or Better	Low	None	16.17	Fair or Better	Low	Low
10-2	Uninterrupted	16 - 22	6	39.34	30.40	Fair or Better	None	None	15.92	Fair or Better	Medium	Low
10-3	Uninterrupted	22 - 32	10	13.18	100.93	Fair or Better	None	Medium	16.16	Fair or Better	Medium	Low
10-4	Uninterrupted	32 - 54	22	23.91	21.59	Fair or Better	None	None	15.90	Fair or Better	Medium	Low
10-5	Uninterrupted	54 - 71	17	12.31	14.75	Fair or Better	None	None	16.20	Fair or Better	Low	Low
10-6	Uninterrupted	71 - 82	11	21.31	25.01	Fair or Better	None	None	16.00	Fair or Better	Medium	Low
10-7	Uninterrupted	82 - 98	16	30.07	50.94	Fair or Better	None	None	16.58	Fair or Better	None	None
10-8	Uninterrupted	98 - 113	15	35.17	34.43	Fair or Better	None	None	15.92	Fair or Better	Medium	Low
85-9	Interrupted	155 - 149	6	20.67	66.04	Fair or Better	None	None	No UP	Fair or Better	None	None
85-10	Uninterrupted	149 - 138	11	2.18	2.18	Fair or Better	None	None	No UP	Fair or Better	None	None
85-11	Uninterrupted	138 - 123	15	7.48	7.67	Fair or Better	None	None	No UP	Fair or Better	None	None
85-12	Interrupted	123 - 120	3	0.00	20.00	Fair or Better	None	None	No UP	Fair or Better	None	None
85-13	Interrupted	120 - 118	2	0.00	0.00	Fair or Better	None	None	16.61	Fair or Better	None	None
85-14	Interrupted	120 - 123	3	0.00	0.00	Fair or Better	None	None	No UP	Fair or Better	None	Low
##-15	0	0	0			Fair or Better				Fair or Better		

Freight Performance Area – Needs Analysis Step 2

Segment	Segment Length (miles)	Segment Mileposts (MP)	Initial Need	Truck Height Restriction Hot Spots (Clearance < 16.25')	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)
10-1	16	0 - 16	Low			Low	
10-2	6	16 - 22	Low			Low	
10-3	10	22 - 32	Low			Low	
10-4	22	32 - 54	Low			Low	
10-5	17	54 - 71	Low			Low	
10-6	11	71 - 82	Low			Low	
10-7	16	82 - 98	None			None	
10-8	15	98 - 113	Low			Low	
85-9	6	155 - 149	None			None	
85-10	11	149 - 138	None			None	
85-11	15	138 - 123	None			None	
85-12	3	123 - 120	None			None	
85-13	2	120 - 118	None			None	
85-14	3	120 - 123	Low			Low	

Freight Performance Area – Needs Analysis Step 3

Segment	Segment Mileposts (MP)	Segment Length (miles)		Roadway Variables								Traffic Variables			Relevant Freight Related Existing Infrastructure
			Final Need	Functional Classification	Environmental Type (Urban/Rural)	Terrain	# of Lanes/ Direction	Weighted Average Speed Limit	Aux Lanes	Divided/ Non-Divided	% No Passing	Existing LOS	Future 2040 LOS	% Trucks	
10-1	0 - 16	16	Low												
10-2	16 - 22	6	Low												
10-3	22 - 32	10	Low												
10-4	32 - 54	22	Low												
10-5	54 - 71	17	Low												
10-6	71 - 82	11	Low												
10-7	82 - 98	16	None												
10-8	98 - 113	15	Low												
85-9	155 - 149	6	None												
85-10	149 - 138	11	None												
85-11	138 - 123	15	None												
85-12	123 - 120	3	None												
85-13	120 - 118	2	None												
85-14	120 - 123	3	Low												

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			
10-1	0 - 16	16	Low			#DIV/0!		#DIV/0!		#DIV/0!			
10-2	16 - 22	6	Low			#DIV/0!		#DIV/0!		#DIV/0!			
10-3	22 - 32	10	Low			#DIV/0!		#DIV/0!		#DIV/0!			
10-4	32 - 54	22	Low			#DIV/0!		#DIV/0!		#DIV/0!			
10-5	54 - 71	17	Low			#DIV/0!		#DIV/0!		#DIV/0!			
10-6	71 - 82	11	Low			#DIV/0!		#DIV/0!		#DIV/0!			
10-7	82 - 98	16	None			#DIV/0!		#DIV/0!		#DIV/0!			
10-8	98 - 113	15	Low			#DIV/0!		#DIV/0!		#DIV/0!			
85-9	155 - 149	6	None			#DIV/0!		#DIV/0!		#DIV/0!			
85-10	149 - 138	11	None			#DIV/0!		#DIV/0!		#DIV/0!			
85-11	138 - 123	15	None			#DIV/0!		#DIV/0!		#DIV/0!			
85-12	123 - 120	3	None			#DIV/0!		#DIV/0!		#DIV/0!			
85-13	120 - 118	2	None			#DIV/0!		#DIV/0!		#DIV/0!			
85-14	120 - 123	3	Low			#DIV/0!		#DIV/0!		#DIV/0!			

Needs Summary Table

Performance Area	Segment Number and Mileposts (MP)													
	10W-1	10W-2	10W-3	10W-4	10W-5	10W-6	10W-7	10W-8	85-9	85-10	85-11	85-12	85-13	85-14
	MP 0-16	MP 16-22	MP 22-32	MP 32-54	MP 54-71	MP 71-82	MP 82-98	MP 98-113	MP 155-149	MP 149-138	MP 138-123	MP 123-120	MP 120-118	MP 120-123
Pavement	Low	High	Low	None	None	Low	Medium	Low	Low	Low	Low	None	None	None
Bridge	Low	Low	None	Low	None	None	None	Low	N/A	None	N/A	Medium	Low	None
Mobility*	Low	None	Low	Low	None	None	Low	Low	Low	None	None	High	Low	High
Safety*	Low	High	Low	High	Low	High	High	Medium	High	None	Low	High	None	None
Freight*	Low	Low	Low	Low	Low	Low	None	Low	None	None	None	None	None	Low
Average Need	**1.00**	**1.54**	**0.85**	**1.31**	**0.46**	**1.08**	**1.23**	**1.23**	**1.08**	**0.15**	**0.38**	**1.69**	**0.38**	**0.92**

**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.*

+ Identified as an emphasis area for the I-10W/SR 85 Corridor.

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

Pavement Life-Cycle Cost Analysis Worksheet

Project Details	
Project title	WB Pavement Improvements
Route	I-10W
Milepost begin	3
Milepost end	4

Existing Roadway Characteristics			
Surface type (Asphalt or Concrete)	=	Asphalt	*<<Select from Pull-down List>>*
# of directions of travel (1 = one-way; 2 = two-way)	=	1	
# of lanes (in one direction)	=	2	
Width of typical lane (ft)	=	12	
Left shoulder width (ft)	=	4	
Right shoulder width (ft)	=	10	
Total roadway analysis segment length (centerline miles)	=	1	
Current year	=	2023	
Elevation (> 4,000 ft or < 4,000 ft)?	=	< 4,000 ft	*<<Select from Pull-down List>>*
Roadway width (ft) [each direction lanes & shoulders]	=	38	
Total lane-miles [total traffic direction lanes & shoulders]	=	3.2	
Total square feet [total traffic direction lanes & shoulders]	=	200,640	
Total square yards [total traffic direction lanes & shoulders]	=	22,293	

LCCA Parameters		
Analysis period (years)	=	40
Year of net present value	=	2024
First year of improvements	=	2028
Discount rate (%) - low	=	3%
Discount rate (%) - high	=	7%

Design Alternatives (DA)

	Characteristics		Pavement Material Cost ($)		
Treatment Type	*Pavement Thickness*	*Typical Service Life (years)*	*Lane-miles*	*Square Feet*	*Square Yards*
Concrete Reconstruction	8"-12"	30-34	$609,000	$9.6	$87
Asphalt Reconstruction	8"-12"	26-30	$487,000	$7.7	$69
Concrete Medium Rehab	1"-3"	24-28	$131,000	$2.1	$19
Concrete Light Rehab	<1"	18-22	$87,000	$1.4	$12
Asphalt Medium Rehab	3"-8"	20-24	$183,000	$2.9	$26
Asphalt Light Rehab	<3"	14-18	$122,000	$1.9	$17

Reconstruction: Other Materials Cost Factor
1.60

Rehab: Other Materials Cost Factor
1.20

Total Cost Factor (e.g., includes design, mobilization, traffic control, contingency, etc.)
2.44

Treatment Type	Pavement Thickness	Typical Service Life (years)	Total Unit Cost ($) [includes material costs and indirect costs] Lane-miles	Square Feet	Square Yards	Total Bi-Directional Cost ($) Total Cost
Concrete Reconstruction	8"-12"	30-34	$2,377,536	$37.5	$338	$7,528,864
Asphalt Reconstruction	8"-12"	26-30	$1,901,248	$30.0	$270	$6,020,619
Concrete Medium Rehab	1"-3"	24-28	$383,568	$6.1	$54	$1,214,632
Concrete Light Rehab	<1"	18-22	$254,736	$4.0	$36	$806,664
Asphalt Medium Rehab	3"-8"	20-24	$535,824	$8.5	$76	$1,696,776
Asphalt Light Rehab	<3"	14-18	$357,216	$5.6	$51	$1,131,184

Pavement Life-Cycle Cost Analysis Worksheet

Project Details		
Project title	WB Pavement Improvements	
Route	I-10W	
Milepost begin	7	
Milepost end	8	

Existing Roadway Characteristics			
Surface type (Asphalt or Concrete)	=	Asphalt	*<<Select from Pull-down List>>*
# of directions of travel (1 = one-way; 2 = two-way)	=	1	
# of lanes (in one direction)	=	2	
Width of typical lane (ft)	=	12	
Left shoulder width (ft)	=	4	
Right shoulder width (ft)	=	10	
Total roadway analysis segment length (centerline miles)	=	1	
Current year	=	2023	
Elevation (> 4,000 ft or < 4,000 ft)?	=	< 4,000 ft	*<<Select from Pull-down List>>*
Roadway width (ft) [each direction lanes & shoulders]	=	38	
Total lane-miles [total traffic direction lanes & shoulders]	=	3.2	
Total square feet [total traffic direction lanes & shoulders]	=	200,640	
Total square yards [total traffic direction lanes & shoulders]	=	22,293	

LCCA Parameters		
Analysis period (years)	=	40
Year of net present value	=	2024
First year of improvements	=	2028
Discount rate (%) - low	=	3%
Discount rate (%) - high	=	7%

Design Alternatives (DA)

	Characteristics		Pavement Material Cost ($)		
Treatment Type	*Pavement Thickness*	*Typical Service Life (years)*	*Lane-miles*	*Square Feet*	*Square Yards*
Concrete Reconstruction	8"-12"	30-34	$609,000	$9.6	$87
Asphalt Reconstruction	8"-12"	26-30	$487,000	$7.7	$69
Concrete Medium Rehab	1"-3"	24-28	$131,000	$2.1	$19
Concrete Light Rehab	<1"	18-22	$87,000	$1.4	$12
Asphalt Medium Rehab	3"-8"	20-24	$183,000	$2.9	$26
Asphalt Light Rehab	<3"	14-18	$122,000	$1.9	$17

Reconstruction: Other Materials Cost Factor
1.60

Rehab: Other Materials Cost Factor
1.20

Total Cost Factor (e.g., includes design, mobilization, traffic control, contingency, etc.)
2.44

			Total Unit Cost ($) [includes material costs and indirect costs]			Total Bi-Directional Cost ($)
Treatment Type	Pavement Thickness	Typical Service Life (years)	Lane-miles	Square Feet	Square Yards	Total Cost
Concrete Reconstruction	8"-12"	30-34	$2,377,536	$37.5	$338	$7,528,864
Asphalt Reconstruction	8"-12"	26-30	$1,901,248	$30.0	$270	$6,020,619
Concrete Medium Rehab	1"-3"	24-28	$383,568	$6.1	$54	$1,214,632
Concrete Light Rehab	<1"	18-22	$254,736	$4.0	$36	$806,664
Asphalt Medium Rehab	3"-8"	20-24	$535,824	$8.5	$76	$1,696,776
Asphalt Light Rehab	<3"	14-18	$357,216	$5.6	$51	$1,131,184

Pavement Life-Cycle Cost Analysis Worksheet

Project Details	
Project title	Ehrenberb EB/WB Pavement Improvements

Route	I-10W
Milepost begin	12
Milepost end	16

Existing Roadway Characteristics			
Surface type (Asphalt or Concrete)	=	Asphalt	*<<Select from Pull-down List>>*
# of directions of travel (1 = one-way; 2 = two-way)	=	2	
# of lanes (in one direction)	=	2	
Width of typical lane (ft)	=	12	
Left shoulder width (ft)	=	4	
Right shoulder width (ft)	=	10	
Total roadway analysis segment length (centerline miles)	=	4	
Current year	=	2023	
Elevation (> 4,000 ft or < 4,000 ft)?	=	< 4,000 ft	*<<Select from Pull-down List>>*
Roadway width (ft) [each direction lanes & shoulders]	=	38	
Total lane-miles [total traffic direction lanes & shoulders]	=	25.3	
Total square feet [total traffic direction lanes & shoulders]	=	1,605,120	
Total square yards [total traffic direction lanes & shoulders]	=	178,347	

LCCA Parameters		
Analysis period (years)	=	40
Year of net present value	=	2024
First year of improvements	=	2028
Discount rate (%) - low	=	3%
Discount rate (%) - high	=	7%

Design Alternatives (DA)

Characteristics			Pavement Material Cost ($)		
Treatment Type	*Pavement Thickness*	*Typical Service Life (years)*	*Lane-miles*	*Square Feet*	*Square Yards*
Concrete Reconstruction	8"-12"	30-34	$609,000	$9.6	$87
Asphalt Reconstruction	8"-12"	26-30	$487,000	$7.7	$69
Concrete Medium Rehab	1"-3"	24-28	$131,000	$2.1	$19
Concrete Light Rehab	<1"	18-22	$87,000	$1.4	$12
Asphalt Medium Rehab	3"-8"	20-24	$183,000	$2.9	$26
Asphalt Light Rehab	<3"	14-18	$122,000	$1.9	$17

Pavement Life-Cycle Cost Analysis Worksheet

Project Details	
Project title	EB Pavement Improvements
Route	I-10

Milepost begin	11
Milepost end	12

Existing Roadway Characteristics

Surface type (Asphalt or Concrete)	=	Asphalt	*<<Select from Pull-down List>>*
# of directions of travel (1 = one-way; 2 = two-way)	=	1	
# of lanes (in one direction)	=	2	
Width of typical lane (ft)	=	12	
Left shoulder width (ft)	=	4	
Right shoulder width (ft)	=	10	
Total roadway analysis segment length (centerline miles)	=	1	
Current year	=	2023	
Elevation (> 4,000 ft or < 4,000 ft)?	=	< 4,000 ft	*<<Select from Pull-down List>>*
Roadway width (ft) [each direction lanes & shoulders]	=	38	
Total lane-miles [total traffic direction lanes & shoulders]	=	3.2	
Total square feet [total traffic direction lanes & shoulders]	=	200,640	
Total square yards [total traffic direction lanes & shoulders]	=	22,293	

LCCA Parameters

Analysis period (years)	=	40
Year of net present value	=	2024
First year of improvements	=	2028
Discount rate (%) - low	=	3%
Discount rate (%) - high	=	7%

Design Alternatives (DA)

	Characteristics		Pavement Material Cost ($)		
Treatment Type	*Pavement Thickness*	*Typical Service Life (years)*	*Lane-miles*	*Square Feet*	*Square Yards*
Concrete Reconstruction	8"-12"	30-34	$609,000	$9.6	$87
Asphalt Reconstruction	8"-12"	26-30	$487,000	$7.7	$69
Concrete Medium Rehab	1"-3"	24-28	$131,000	$2.1	$19
Concrete Light Rehab	<1"	18-22	$87,000	$1.4	$12
Asphalt Medium Rehab	3"-8"	20-24	$183,000	$2.9	$26
Asphalt Light Rehab	<3"	14-18	$122,000	$1.9	$17

Reconstruction: Other Materials Cost Factor

1.60

Rehab: Other Materials Cost Factor

1.20

Total Cost Factor (e.g., includes design, mobilization, traffic control, contingency, etc.)

2.44

			Total Unit Cost ($) [includes material costs and indirect costs]			Total Bi-Directional Cost ($)
Treatment Type	Pavement Thickness	Typical Service Life (years)	Lane-miles	Square Feet	Square Yards	Total Cost
Concrete Reconstruction	8"-12"	30-34	$2,377,536	$37.5	$338	$7,528,864
Asphalt Reconstruction	8"-12"	26-30	$1,901,248	$30.0	$270	$6,020,619
Concrete Medium Rehab	1"-3"	24-28	$383,568	$6.1	$54	$1,214,632
Concrete Light Rehab	<1"	18-22	$254,736	$4.0	$36	$806,664
Asphalt Medium Rehab	3"-8"	20-24	$535,824	$8.5	$76	$1,696,776
Asphalt Light Rehab	<3"	14-18	$357,216	$5.6	$51	$1,131,184

Pavement Life-Cycle Cost Analysis Worksheet

Project Details			
Project title	EB Pavement Improvements		
Route	I-10W		
Milepost begin	0		
Milepost end	2		
Existing Roadway Characteristics			
Surface type (Asphalt or Concrete)	=	Asphalt	*<<Select from Pull-down List>>*
# of directions of travel (1 = one-way; 2 = two-way)	=	1	
# of lanes (in one direction)	=	2	
Width of typical lane (ft)	=	12	
Left shoulder width (ft)	=	4	
Right shoulder width (ft)	=	10	
Total roadway analysis segment length (centerline miles)	=	2	
Current year	=	2023	
Elevation (> 4,000 ft or < 4,000 ft)?	=	< 4,000 ft	*<<Select from Pull-down List>>*
Roadway width (ft) [each direction lanes & shoulders]	=	38	
Total lane-miles [total traffic direction lanes & shoulders]	=	6.3	
Total square feet [total traffic direction lanes & shoulders]	=	401,280	
Total square yards [total traffic direction lanes & shoulders]	=	44,587	
LCCA Parameters			
Analysis period (years)	=	40	
Year of net present value	=	2024	
First year of improvements	=	2028	

Discount rate (%) - low	=	3%
Discount rate (%) - high	=	7%

Design Alternatives (DA)

Characteristics			Pavement Material Cost ($)		
Treatment Type	*Pavement Thickness*	*Typical Service Life (years)*	*Lane-miles*	*Square Feet*	*Square Yards*
Concrete Reconstruction	8"-12"	30-34	$609,000	$9.6	$87
Asphalt Reconstruction	8"-12"	26-30	$487,000	$7.7	$69
Concrete Medium Rehab	1"-3"	24-28	$131,000	$2.1	$19
Concrete Light Rehab	<1"	18-22	$87,000	$1.4	$12
Asphalt Medium Rehab	3"-8"	20-24	$183,000	$2.9	$26
Asphalt Light Rehab	<3"	14-18	$122,000	$1.9	$17

Reconstruction: Other Materials Cost Factor
1.60

Rehab: Other Materials Cost Factor
1.20

Total Cost Factor (e.g., includes design, mobilization, traffic control, contingency, etc.)
2.44

			Total Unit Cost ($) [includes material costs and indirect costs]			Total Bi-Directional Cost ($)
Treatment Type	Pavement Thickness	Typical Service Life (years)	Lane-miles	Square Feet	Square Yards	Total Cost
Concrete Reconstruction	8"-12"	30-34	$2,377,536	$37.5	$338	$15,057,728
Asphalt Reconstruction	8"-12"	26-30	$1,901,248	$30.0	$270	$12,041,237
Concrete Medium Rehab	1"-3"	24-28	$383,568	$6.1	$54	$2,429,264
Concrete Light Rehab	<1"	18-22	$254,736	$4.0	$36	$1,613,328
Asphalt Medium Rehab	3"-8"	20-24	$535,824	$8.5	$76	$3,393,552
Asphalt Light Rehab	<3"	14-18	$357,216	$5.6	$51	$2,262,368

*Based on the candidate solutions presented in **Table 19**, LCCA was not conducted for any bridges and pavement on the I-8 Corridor.*

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

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 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	0.89 installing sidewalk 0.24 (pedestrian	From CMF Clearinghouse Avg of 6 values from FHWA Desktop Reference

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
									crashes only)	crashes only)	
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

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
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
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 coordination)	0.78 (adaptive control)0.90 (signal coordination)	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.)

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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.)
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	0.90 (Cross-median and head	All cross median and head-on fatal or incapacitating injury crashes are eliminated completely; all remaining crashes have 0.90 applied

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									on crashes eliminated completely)	on crashes eliminated completely)	
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
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

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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
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											

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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
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	$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

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(e.g., stop sign ahead, signal ahead, etc.)											
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
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
Install Rectangular Rapid Flashing Beacons (RRFB)	$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	n/a	0.53 (pedestrian)	CMF Clearinghouse Countermeasures Tech Sheet
Install Larger Stop Sign with Beacons	$10,000	1.25	$12,500	Each	2.20	$22,000	$27,500	In one direction; includes large stop sign, post, and foundation, and flashing beacons (assumes solar power) at one location	0.85/0.81	0.85/0.81	Use 0.85 for adding beacons to an existing sign; 0.81 for installing a larger sign with flashing beacons; CMF applies to intersection-related crashes
Install Advanced Warning Signal System	$108,000	1.25	$135,000	each	2.20	$238,000	$297,000	Overhead static sign with flashing beacons, detectors, and radar system. Signs for each mainline approach of the intersection (2)	0.61	0.61	FHWA Desktop Reference for CRF
DATA COLLECTION											

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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
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

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 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
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
- Caries 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
- Buffer Index (PTI-TTI)
- 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

Buffer Index

Buffer Index x 10

Score	Condition
0	Buffer Index = 0.00
0-5	Buffer Index 0.00-0.50
5	Buffer Index > 0.50

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
- Truck Buffer Index (TPTI-TTTI)
- 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

Truck Buffer Index

Truck Buffer Index x 10

Score	Condition
0	Buffer Index = 0.00
0-5	Buffer Index 0.00-0.50
5	Buffer Index > 0.50

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

Risk Priority

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
10.1	25,620	2		250				11,273	N	2	N	10	N
10.2	25,620	1		250				11,273	N	2	N	10	N
10.3	25,620	1		250				11,273	N	2	N	10	N
10.4	25,620	1		350				11,273	N	2	N	10	N
10.5	25,620	4		350				11,273	N	2	N	10	N
10.6	25,620	1		150				11,273	Y	2	N	10	N
10.7	25,620	3		350				11,273	Y	2	N	10	N
10.8	24,272	1		450				11,165	Y	2	N	10	N
10.9	28,497	9		1,000				11,114	Y	2	N	10	N
10.10A	28,497	0.3		1,400				11,114	Y	2	N	10	N
10.10B	28,497	0	20	1,400	8	N	16.16	11,114	Y	2	N	10	N
10.11	23,070	7		1,410				9,459	Y	2	N	10	N
10.12	23,070	1		1,410				9,459	Y	2	N	10	N
10.13	25,293	5		1,305				9,851	Y	2	N	10	N
10.14	24,603	11		1,180				9,595	Y	2	N	10	N
10.15	32,752	4		1,090				10,481	Y	2	N	10	N
10.16A	32,752	0.3		1,096				10,481	Y	2	N	10	N
10.16B	32,752	0	6	1,096	8	N	15.92	10,481	Y	2	N	10	N
10.17A	32,752	0.3		1,040				10,481	Y	2	N	10	N
10.17B	32,752	0	4	1,040	8	N	15.92	10,481	Y	2	N	10	N
10.18A	32,752	0.3		1,046				10,481	Y	2	N	10	N
10.18B	32,752	0	4	1,046	8	N	15.92	10,481	Y	2	N	10	N
85.19	17,965	2		960				4,671	Y	2	N	8	N
85.20	11,183	3		755				4,250	Y	2	Y	7.5	Y

Solution Number	Bridge	Pavement	Mobility	Safety	Freight	Risk Score (0 to 10)				
						Bridge	Pavement	Mobility	Safety	Freight
10.1	N	Y	Y	Y	Y	0.00	5.23	1.70	1.26	3.14
10.2	N	Y	Y	Y	Y	0.00	5.23	1.00	1.26	3.14
10.3	N	Y	Y	Y	Y	0.00	5.23	1.00	1.26	3.14
10.4	N	Y	Y	Y	Y	0.00	5.23	1.00	1.26	3.14
10.5	N	Y	Y	Y	Y	0.00	5.23	2.53	1.26	3.14
10.6	N	N	Y	Y	Y	0.00	0.00	4.33	1.26	6.47
10.7	N	N	Y	Y	Y	0.00	0.00	5.52	1.26	6.47
10.8	N	N	Y	Y	Y	0.00	0.00	4.29	1.22	6.47
10.9	N	N	Y	Y	Y	0.00	0.00	6.57	1.33	6.46
10.10A	N	Y	Y	Y	Y	0.00	5.35	3.71	1.33	6.46
10.10B	Y	N	Y	Y	Y	2.78	0.00	3.33	1.33	6.46
10.11	N	N	Y	Y	Y	0.00	0.00	6.31	1.18	6.36
10.12	N	N	Y	Y	Y	0.00	0.00	4.25	1.18	6.36
10.13	N	N	Y	Y	Y	0.00	0.00	6.09	1.25	6.39
10.14	N	N	Y	Y	Y	0.00	0.00	6.59	1.23	6.37
10.15	N	N	Y	Y	Y	0.00	0.00	6.13	1.44	6.43
10.16A	N	Y	Y	Y	Y	0.00	5.49	3.76	1.44	6.43
10.16B	Y	N	Y	Y	Y	2.26	0.00	3.33	1.44	6.43
10.17A	N	Y	Y	Y	Y	0.00	5.49	3.76	1.44	6.43
10.17B	Y	N	Y	Y	Y	1.93	0.00	3.33	1.44	6.43
10.18A	N	Y	Y	Y	Y	0.00	5.49	3.76	1.44	6.43
10.18B	Y	N	Y	Y	Y	1.93	0.00	3.33	1.44	6.43
85.19	N	N	Y	Y	Y	0.00	0.00	4.64	1.80	5.64
85.20	N	N	Y	Y	Y	0.00	0.00	6.24	3.70	7.19

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
CS10.1	L1	EB Pavement Improvements	P	A	Rehabilitate Pavement	0	2	Mile	2	$1,060,000	$63,600	$212,000		$2,120,000	$2,395,600
								Mile	0		$0	$0		$0	$0
										Solution Total	$63,600	$212,000	$0	$2,120,000	$2,395,600
			M	B	Replace Pavement	0	2	Mile	2	$5,540,000	$332,400	$1,108,000		$11,080,000	$12,520,400
								Each			$0	$0		$0	$0
										Solution Total	$332,400	$1,108,000	$0	$11,080,000	$12,520,400
CS10.2	L2	WB Pavement Improvements	P	A	Rehabilitate Pavement	3	4	Mile	2	$1,060,000	$63,600	$212,000		$2,120,000	$2,395,600
										Solution Total	$63,600	$212,000	$0	$2,120,000	$2,395,600
	L2	WB Pavement Improvements	M	B	Replace Pavement	3	4	Mile	1	$5,540,000	$166,200	$554,000		$5,540,000	$6,260,200
								Mile	0		$0	$0		$0	$0
										Solution Total	$166,200	$554,000	$0	$5,540,000	$6,260,200
CS10.3	L3	WB Pavement Improvements	P	A	Rehabilitate Pavement	7	8	Mile	1.0	$1,060,000	$31,800	$106,000		$1,060,000	$1,197,800
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$31,800	$106,000	$0	$1,060,000	$1,197,800
	L3	WB Pavement Improvements	M	B	Replace Pavement	7	8	Mile	1.0	$5,540,000	$166,200	$554,000		$5,540,000	$6,260,200
										Solution Total	$166,200	$554,000	$0	$5,540,000	$6,260,200
CS10.4	L4	EB Pavement Improvements	P	A	Rehabilitate Pavement	11	12	Mile	1.0	$1,060,000	$31,800	$106,000		$1,060,000	$1,197,800
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$31,800	$106,000	$0	$1,060,000	$1,197,800
	L4	EB Pavement Improvements	M	B	Replace Pavement	11	12	Mile	1.0	$5,540,000	$166,200	$554,000		$5,540,000	$6,260,200
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$166,200	$554,000	$0	$5,540,000	$6,260,200
CS10.5	L5	Ehrenberg EB/WB Pavement Improvements	P	A	Rehabilitate Pavement	12	16	Mile	8.0	$1,060,000	$254,400	$848,000		$8,480,000	$9,582,400
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$254,400	$848,000	$0	$8,480,000	$9,582,400
	L5	Ehrenberg EB/WB Pavement Improvements	M	B	Replace Pavement	12	16	Mile	8.0	$5,540,000	$1,329,600	$4,432,000		$44,320,000	$50,081,600
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$1,329,600	$4,432,000	$0	$44,320,000	$50,081,600
CS10.6	L6	Inspection Station Safety Improvements	M	-	Install additional warning features for WB slowing/stop conditions	0	1	Each	1.0	$6,900	$200	$700		$6,900	$7,800
					Install flashing beacons	0	0.5	Each	0.5	$41,300	$600	$2,100		$20,650	$23,350
					Install rumble strips	0	0.5	Mile	1.0	$21,000	$600	$2,100		$21,000	$23,700
					Install WB speed feedback sign at MP .5	0.5	0.5	Each	1.0	$68,800	$2,100	$6,900		$68,800	$77,800
											$0	$0		$0	$0
										Solution Total	$3,500	$11,800	$0	$117,350	$132,650
CS10.7	L6	Ferra Gulch Safety Improvements	M		Install chevrons along curve	9.5	10	Mile	0.5	$50,600	$800	$2,500		$25,300	$28,600
					Install delineators	9	12	Mile	6.0	$17,900	$3,200	$10,700		$107,400	$121,300
					Install reflective pavement markers	9	12	Mile	6.0	$5,500	$1,000	$3,300		$33,000	$37,300
					Install WB speed feedback sign at MP 11	11	11	Each	1.0	$68,800	$2,100	$6,900		$68,800	$77,800
										Solution Total	$7,100	$23,400	$0	$234,500	$265,000
CS10.8	L8	Quartzsite Area Safety Improvements	M	-	Install EB speed feedback sign at MP 19.5	19.5	19.5	Each	1.0	$68,800	$2,100	$6,900		$68,800	$77,800
					Access barrier fencing	19	20	LF	10560.0	$60	$19,000	$63,400		$633,600	$716,000
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$21,100	$70,300	$0	$702,400	$793,800
CS10.9	L12	Vicksburg Area Safety Improvements	M	-	Install reflective raised pavement markers	32	42	Mile	10.0	$5,500	$1,700	$5,500		$55,000	$62,200
					Install speed feedback signs at MP 41	41.5	42.5	Each	1.0	$68,800	$2,100	$6,900		$68,800	$77,800
					MP 39.1-39.4 - Widen EB outside shoulder	39.1	39.4	Mile	0.3	$980,000	$8,800	$29,400		$294,000	$332,200
										Solution Total	$12,600	$41,800	$0	$417,800	$472,200
CS10.10	L13	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	M	A	Reprofile Mainline	33.78	33.78	Mile	0.2	$3,730,000	$22,400	$74,600		$746,000	$843,000
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$22,400	$74,600	$0	$746,000	$843,000
	L13	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	M	B	Replace Bridge	33.78	33.78	SF	10428.0	$610	$190,800	$636,100		$6,361,080	$7,187,980
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$190,800	$636,100	$0	$6,361,080	$7,187,980
CS10.11	L14	Lone Mountain Area EB Safety Improvements	M	-	Widen EB shoulders	55	62	Mile	7.0	$980,000	$205,800	$686,000		$6,860,000	$7,751,800
								Mile			$0	$0		$0	$0
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$205,800	$686,000	$0	$6,860,000	$7,751,800
CS10.12	L14	Centennial Area EB Safety Improvements	M	-	Widen EB shoulders	67.5	68.5	Mile	1.0	$980,000	$29,400	$98,000		$980,000	$1,107,400
					Install EB speed feedback sign at MP 68	68	68	Each	1.0	$68,800	$2,100	$6,900		$68,800	$77,800

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
											$0	$0		$0	$0
										Solution Total	$31,500	$104,900	$0	$1,048,800	$1,185,200
CS10.13	L16	Big Horn Area Safety Improvements	M	-	Install delineators	74	79	Mile	10.0	$17,900	$5,400	$17,900		$179,000	$202,300
					Clear vegetation	74	79	Mile	10.0	$226,000	$67,800	$226,000		$2,260,000	$2,553,800
					Install speed feedback signs at MP 75 and 76	75	76	Each	2.0	$68,800	$4,100	$13,800		$137,600	$155,500
					Install guardrail near drainage culvert at 74.75 - both directions	74.5	75	Mile	0.5	$498,000	$7,500	$24,900		$249,000	$281,400
									0.0		$0	$0		$0	$0
										Solution Total	$84,800	$282,600	$0	$2,825,600	$3,193,000
CS10.14	L18	Tonopah Area Safety Improvements	M	-	Rehab shoulders	83	90	Mile	14.0	$433,000	$181,900	$606,200		$6,062,000	$6,850,100
					Clear vegetation	83	90	Mile	14.0	$226,000	$94,900	$316,400		$3,164,000	$3,575,300
					Install EB speed feedback signs at MP 83.5 and MP 89.5	83.5	89.5	Each	2.0	$68,800	$4,100	$13,800		$137,600	$155,500
					Install WB speed feedback sign at MP 94	94	94	Each	1.0	$68,800	$2,100	$6,900		$68,800	$77,800
										Solution Total	$283,000	$943,300	$0	$9,432,400	$10,658,700
CS10.15	L26	West Buckeye Area Safety Improvements	M	-	Rehab shoulders	104	108	Mile	8.0	$433,000	$103,900	$346,400		$3,464,000	$3,914,300
					Install EB speed feedback sign at MP 104	104	104	Each	1.0	$68,800	$2,100	$6,900		$68,800	$77,800
											$0	$0		$0	$0
										Solution Total	$106,000	$353,300	$0	$3,532,800	$3,992,100
CS10.16	L27	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	M	A	Reprofile Mainline	101.4	101.4	Mile	0.2	$3,730,000	$22,400	$74,600		$746,000	$843,000
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$22,400	$74,600	$0	$746,000	$843,000
			M	B	Replace Bridge	101.4	101.4	SF	4236.0	$610	$77,500	$258,400		$2,583,960	$2,919,860
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$77,500	$258,400	$0	$2,583,960	$2,919,860
CS10.17	L28	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Mitigation	M	A	Reprofile Mainline	112.75	112.75	Mile	0.2	$3,730,000	$22,400	$74,600		$746,000	$843,000
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$22,400	$74,600	$0	$746,000	$843,000
			M	B	Replace Bridge	112.75	112.75	SF	7836.0	$610	$143,400	$478,000		$4,779,960	$5,401,360
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$143,400	$478,000	$0	$4,779,960	$5,401,360
CS10.18	L29	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Mitigation	M	A	Reprofile Mainline	112.92	112.92	Mile	0.2	$3,730,000	$22,400	$74,600		$746,000	$843,000
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$22,400	$74,600	$0	$746,000	$843,000
			M	B	Replace Bridge	112.92	112.92	SF	8008.0	$610	$146,500	$488,500		$4,884,880	$5,519,880
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$146,500	$488,500	$0	$4,884,880	$5,519,880
CS85.19	L30	Buckeye Area Safety Improvements	M	A	Construct Entry/Exit Ramp			Each	10.0	$2,790,000	$837,000	$2,790,000		$27,900,000	$31,527,000
					Construct 6 bridge structures			SF	48000.0	$610	$878,400	$2,928,000		$29,280,000	$33,086,400
					Construct new roadway			Mile	3.4	$22,968,000	$2,342,700	$7,809,100		$78,091,200	$88,243,000
										Solution Total	$4,058,100	$13,527,100	$0	$135,271,200	$152,856,400
			M	B	Construct 6 double roundabouts			Each	6.0	$6,890,000	$1,240,200	$4,134,000		$41,340,000	$46,714,200
									0.0		$0	$0		$0	$0
										Solution Total	$1,240,200	$4,134,000	$0	$41,340,000	$46,714,200
CS85.20	L37	North Gila Bend SB General Purpose Lanes	M	-	Construct 2 SB general purpose lanes west of existing alignment	121	123	Mile	4.0	$4,590,000	$550,800	$1,836,000		$18,360,000	$20,746,800
											$0	$0		$0	$0
											$0	$0		$0	$0
										Solution Total	$550,800	$1,836,000	$0	$18,360,000	$20,746,800
CS85.21	L39	North Gila Bend Area Safety Improvements	M	-	Install centerline rumble strip	122	122.6	Mile	0.6	$11,000	$200	$700		$6,600	$7,500
					Install delineators	122	123	Mile	2.0	$226,000	$13,600	$45,200		$452,000	$510,800
									0.0		$0	$0		$0	$0
									0.0	$14,300	$0	$0		$0	$0
										Solution Total	$13,800	$45,900	$0	$458,600	$518,300
CS85.22	L40	Butterfield Trail Mobility Improvements	E	A	Widen to 2 lanes in each direction w/center left turn	120	123	Mile	3.0	$6,030,000	$542,700	$1,809,000		$18,090,000	$20,441,700
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$542,700	$1,809,000	$0	$18,090,000	$20,441,700
			M	B	Widen to add center turn lane and widen shoulder on both sides	120	123	Mile	3.0	$4,030,000	$362,700	$1,209,000		$12,090,000	$13,661,700

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
								Mile	0.0		$0	$0		$0	$0
										Solution Total	$362,700	$1,209,000	$0	$12,090,000	$13,661,700

Appendix I: Performance Effectiveness Scores

Need Reduction

	Solution #	C10W.1A	C10W.1B	C10W.2A	C10W.2B	C10W.3A	C10W.3B	C10W.4A	C10W.4B	C10W.5A	C10W.5B	C10W.6	C10W.7	C10W.8	C10W.9	C10W.10A	C10W.10B	C10W.11	C10W.12	C10W.13	C10W.14	C10W.15	C10W.16A	C10W.16B	C10W.17A	C10W.17B	C10W.18A	C10W.18B	C10W.19A	C10W.19B	C10W.20	C10W.21	C10W.22A	C10W.22B
	Description	<Ehrenberg Area EB Pavement Improvements>	<Ehrenberg Area EB Pavement Improvements>	<East Ehrenberg WB Pavement Improvements>	<East Ehrenberg WB Pavement Improvements>	<Morgantown Area WB Pavement Improvements>	<Morgantown Area WB Pavement Improvements>	<Sugarloaf Area EB Pavement Improvements>	<Sugarloaf Area EB Pavement Improvements>	<Sugarloaf Area EB/WB Pavement Improvements>	<Sugarloaf Area EB/WB Pavement Improvements>	<Inspection Station Safety Improvements>	<Ferrell-Gulch Safety Improvements>	<Quartzsite Area Safety Improvements>	<Salisbury Area Safety Improvements>	<Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation>	<Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation>	<Lone Mountain Area EB Safety Improvements>	<Centennial Area EB Safety Improvements>	<Big Horn Area Safety Improvements>	<Tonopah Area Safety Improvements>	<West Buckeye Area Safety Improvements>	<EB/Dn Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation>	<EB/Dn Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation>	<Dgleby Rd Ramp B UP (#1721) Freight / Bridge Vertical Clearance Mitigation>	<Dgleby Rd Ramp B UP (#1721) Freight / Bridge Vertical Clearance Mitigation>	<Dgleby Rd Ramp C UP (#1722) Freight / Bridge Vertical Clearance Mitigation>	<Dgleby Rd Ramp C UP (#1722) Freight / Bridge Vertical Clearance Mitigation>	<Buckeye Area Safety Improvements>	<Buckeye Area Safety Improvements>	<North Gila Bend SB General Purpose Lanes>	<North Gila Bend Area Safety Improvements>	<Butterfield Trail Mobility Improvements>	<Butterfield Trail Mobility Improvements>
LEGEND:	Project Beg MP	0	0	3	3	7	7	11	11	12	12	0	9	18.5	32	33.78	33.78	55	67.5	74	83	104	101.4	101.4	112.75	112.75	113.92	113.92	151	151	120	122	120	120
user entered value	Project End MP	2	2	4	4	8	8	12	12	16	16	1	12	19.9	41	33.78	33.78	62	68.5	79	94	108	101.4	101.4	112.75	112.75	113.92	113.92	153	153	123	123	123	123
calculated value for reference only	Project Length (miles)	2	2	1	1	1	1	1	1	4	4	1	3	1.4	9	0	0	7	1	5	11	4	0	0	0	0	0	0	2	2	3	1.1	3	3
calculated value for entry/use in other spreadsheet	Segment Beg MP	0	0	0	0	0	0	0	0	0	0	0	0	16	32	32	32	54	54	71	82	98	98	98	98	98	98	98	149	149	120	120	120	120
for input into Performance Effectiveness Score spreadsheet	Segment End MP	16	16	16	16	16	16	16	16	16	16	16	16	22	54	54	54	71	71	82	98	112	112	112	112	112	112	112	155	155	123	123	123	123
assumed values (do not modify)	Segment Length (miles)	16	16	16	16	16	16	16	16	16	16	16	16	6	22	22	22	17	17	11	16	15	15	15	15	15	15	15	6	6	3	3	3	3
	Current # of Lanes (both directions)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Project Type (one-way or two-way)	one-way	one-way	one-way	one-way	one-way	one-way	one-way	one-way	two-way	two-way	one-way	two-way	two-way	two-way	two-way	two-way	one-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	two-way	two-way	two-way	two-way
	Additional Lanes (one-way)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Pro-Rated # of Lanes	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	4.00	2.71	2.00	2.00
Notes and Directions	Description																																	
SAFETY – INTERSECTION SAFETY	Input current value from performance system (direction 1) — Orig Segment Directional Safety Index (DI/SI)	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403	1.901	1.906	1.806	1.806	1.103	1.103	2.228	1.954	1.271	1.271	1.271	1.271	1.271	1.271	1.271	2.756	2.756	2.975	2.975	0.000	0.000
Input current value from performance system (direction 1) — Orig Segment Directional Fatal Crashes (DI/SI)	1	1	1	1	1	1	1	1	1	1	1	1	1	2	8	8	8	2	2	7	6	7	7	7	7	7	7	7	3	3	1	1	0	0
Input current value from performance system (direction 1) — Orig Segment Directional Suspected Serious Crashes (DI/SI)	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	12	12	2	7	4	4	4	4	4	4	4	4	4	4	4	0	0
Input current value from performance system (direction 1) — Original Fatal Crashes in project limits (DI/SI)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	4	0	0	0	0	0	0	0	2	2	2	1	0	0
Input current value from performance system (direction 1) — Original Suspected Serious Crashes in project limits (DI/SI)	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	2	2	6	2	2	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Input current value from performance system (direction 1) — Original Segment Safety Index (DI/SI)	0.68	0.70	1.0	1.0	1.0	1.0	1.0	0.68	0.70	0.68	0.70	1.00	0.70	0.95	0.68	0.70	0.95	0.68	0.70	1.0	1.0	0.70	0.95	0.70	0.95	0.70	0.95	0.70	0.95	0.70	0.90	0.70	0.70	0.95
input CMF value (direction 1) - if no CMF enter 1.0	CMF 2 (DI/SI)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	1
input CMF value (direction 1) - if no CMF enter 1.0	CMF 3 (DI/SI)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Office Calc	Office Calc	Office Calc	Office Calc	1.0	1.0	1	1	Office Calc	Office Calc	Office Calc	Office Calc	1.0	1.0	1.0	Office Calc	Office Calc	1.0	Office Calc	1	1
input CMF value (direction 1) - if no CMF enter 1.0	CMF 4 (DI/SI)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	1	Office Calc	Office Calc	Office Calc	Office Calc	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	1
input CMF value (direction 1) - if no CMF enter 1.0	CMF 5 (DI/SI)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	1
Calculated Value (both directions)	Total CMF (DI/SI)	0.680	0.700	1.000	1.000	1.000	1.000	0.680	0.700	0.680	0.700	1.000	Office Calc	Office Calc	Office Calc	0.700	0.950	0.680	0.700	1.000	0.700	0.700	0.950	0.700	0.950	0.700	0.950	0.700	Office Calc	Office Calc	0.900	Office Calc	0.700	0.950
Calculated Value (direction 1)	Total Crash reduction (DI/SI)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.419	0.000	1.318	0.000	0.000	0.320	0.306	0.972	1.941	0.480	0.000	0.000	0.300	0.000	0.000	0.000	0.050	1.500	1.020	0.000	0.010	0.000
Calculated Value (both directions)	Suspected Serious Crash reduction (DI/SI)	0.000	0.000	0.000	0.000	0.000	0.000	0.120	0.000	0.440	0.000	0.000	0.027	0.000	1.901	0.000	0.000	1.020	0.000	0.000	1.320	1.240	0.000	0.000	0.000	0.000	0.000	0.000	2.200	1.260	0.000	0.000	0.000	0.000
Enter in Safety Index spreadsheet to calculate new Safety Index (direction 1)	Post-Project Segment Directional Safety Index (DI/SI)	1.050	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.681	2.000	8.000	8.000	8.000	2.680	2.684	5.128	4.039	6.020	7.000	7.000	6.700	7.000	6.700	6.950	1.500	1.980	1.000	0.850	0.000	0.000
Enter in Safety Index spreadsheet to calculate new Safety Index (direction 2)	Post-Project Segment Directional Suspected Serious Crashes (DI/SI)	5.000	5.000	5.000	5.000	5.000	5.000	4.600	4.700	4.300	4.400	5.000	4.363	4.000	4.119	5.000	5.000	10.400	11.528	2.107	5.080	2.720	4.000	4.000	4.000	4.000	4.000	4.000	2.000	2.500	3.000	0.000	0.000	0.000
input value from updated Safety Index spreadsheet (direction 1)	Post-Project Segment Directional Safety Index (DI/SI)	0.403	0.403	0.403	0.403	0.403	0.403	0.397	0.397	0.391	0.391	0.403	0.292	1.901	1.538	1.806	1.806	0.979	1.003	2.815	1.122	1.086	1.271	1.271	1.218	1.271	1.218	1.362	1.178	1.459	2.975	2.529	0.000	0.000
Enter in Safety Needs spreadsheet to calculate new segment level Safety Need (direction 1)	Post-Project Segment Directional Safety Index (DI/SI)	0.403	0.403	0.403	0.403	0.403	0.403	0.397	0.397	0.391	0.391	0.403	0.292	1.901	1.538	1.806	1.806	0.979	1.003	2.815	1.122	1.086	1.271	1.271	1.218	1.271	1.218	1.362	1.178	1.459	2.975	2.529	0.000	0.000
Input current value from performance system (direction 2)	Orig Segment Directional Safety Index (DI/SI/M)	1.463	1.463	1.463	1.463	1.463	1.463	1.463	1.463	1.463	1.463	1.463	1.463	2.604	0.596	0.744	0.744	0.782	0.782	0.880	1.028	0.758	0.758	0.758	0.758	0.758	0.758	0.758	0.556	0.556	0.000	0.000	0.000	0.000
Input current value from performance system (direction 2)	Orig Segment Directional Fatal Crashes (MI/M)	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	2	2	2	5	4	4	4	4	4	4	4	1	1	0	0	0	0
Input current value from performance system (direction 2)	Orig Segment Directional Suspected Serious Crashes (MI/M/M)	11	11	11	11	11	11	11	11	11	11	11	11	7	7	7	7	10	10	3	3	3	4	4	4	4	4	4	2	2	0	0	0	0
Input current value from performance system (direction 2)	Original Fatal Crashes in project limits (MI/M/M)	0	0	0	0	0	0	0	0	0	0	1	0	2	3	3	1	0	0	1	1	3	3	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 (MI/M/M)	0	0	0	0	0	1	1	0	0	1	2	0	3	0	0	1	1	2	3	4	2	3	4	3	4	3	4	1	1	0	0	0	0
input CMF value (direction 2) - if no CMF enter 1.0	CMF 1 (MI/M/M)(Overall CMF)	0.9	1.0	0.68	0.70	0.68	0.70	1.0	1.0	1.0	1.0	1.0	1.0	0.70	0.95	1.0	1.0	0.70	0.95	1.0	0.9	0.70	0.95	0.70	0.95	0.70	0.95	0.70	0.95	0.70	1.0	0.70	0.70	0.95
input CMF value (direction 2) - if no CMF enter 1.0	CMF 2 (MI/M/M)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	1
input CMF value (direction 2) - if no CMF enter 1.0	CMF 3 (MI/M/M)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Office Calc	Office Calc	Office Calc	Office Calc	1.0	1.0	1	1	Office Calc	Office Calc	Office Calc	Office Calc	1.0	1.0	1.0	Office Calc	Office Calc	1.0	Office Calc	1	1
input CMF value (direction 2) - if no CMF enter 1.0	CMF 4 (MI/M/M)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	1
input CMF value (direction 2) - if no CMF enter 1.0	CMF 5 (MI/M/M)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	1
Calculated Value (direction 2)	Total CMF (MI/M/M)	1.000	1.000	0.680	0.700	0.680	0.700	1.000	1.000	1.000	1.000	1.000	Office Calc	Office Calc	Office Calc	0.700	0.950	1.000	1.000	Office Calc	Office Calc	Office Calc	0.700	0.950	0.700	0.950	0.700	0.950	Office Calc	Office Calc	1.000	Office Calc	0.700	0.950
Calculated Value (direction 2)	Fatal Crash reduction (MI/M/M)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.410	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	0.000	0.000	0.000	0.000	0.000	0.000
Calculated Value (direction 2)	Suspected Serious Crash reduction (MI/M/M)	0.000	0.000	0.000	0.000	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.000	0.000	0.000	0.050	0.000	0.000	0.087	0.108	0.035	0.000	0.000	0.001	0.000	0.001	0.000	0.014	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 Safety Index (MI/M/M)	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	3.540	1.940	2.860	3.000	3.000	2.800	2.800	1.500	3.730	3.340	4.000	4.000	4.000	4.000	4.000	4.000	1.500	1.500	0.000	0.000	0.000	0.000
Enter in Safety Index spreadsheet to calculate new Safety Index (direction 2)	Post-Project Segment Directional Suspected Serious Crashes (MI/M/M)	11.000	11.000	11.000	11.000	10.680	10.700	11.000	11.000	11.000	11.000	10.500	10.014	1.000	6.020	6.700	6.950	10.000	10.000	1.628	2.720	3.360	4.000	4.000	4.000	4.000	4.000	4.000	1.500	1.660	0.000	0.000	0.000	0.000
input value from updated Safety Index spreadsheet (direction 2)	Post-Project Segment Safety Index (MI/M/M)	1.463	1.463	1.463	1.463	1.457	1.457	1.463	1.463	1.463	1.463	1.454	1.312	1.734	0.755	0.744	0.744	0.782	0.782	0.759	1.139	0.579	0.758	0.758	0.758	0.758	0.758	0.758	0.932	0.940	0.000	0.000	0.000	0.000
Enter in Safety Needs spreadsheet to calculate new segment level Safety Need (direction 2)	Post-Project Segment Directional Safety Index (MI/M/M)	1.463	1.463	1.463	1.463	1.457	1.457	1.463	1.463	1.463	1.463	1.454	1.312	1.734	0.755	0.744	0.744	0.782	0.782	0.759	1.139	0.579	0.758	0.758	0.758	0.758	0.758	0.758	0.932	0.940	0.000	0.000	0.000	0.000
SAFETY – PAVEMENT CONDITION	Calculated Value - verify that it matches current performance system	0.933	0.933	0.933	0.933	0.933	0.933	0.933	0.933	0.933	0.933	0.933	0.933	2.277	1.275	1.275	1.275	0.943	0.943	2.104	1.786	1.014	1.014	1.014	1.014	1.014	1.014	1.014	1.856	1.856	1.488	1.488	0.000	0.000
Enter in Safety Needs spreadsheet to calculate new segment level Safety Need	Post-Project Safety Index	0.933	0.933	0.933	0.933	0.930	0.930	0.930	0.930	0.927	0.928	0.928	0.802	1.857	1.535	1.275	1.275	0.881	0.893	1.767	1.258	0.815	1.014	1.014	0.988	1.014	0.988	1.014	1.050	1.155	1.379	1.488	1.264	0.000
Needs	User entered value from Safety Needs spreadsheet and for use in Performance Effectiveness spreadsheet — Original Segment Safety Need	1.433	1.433	1.433	1.433	1.428	1.428	1.433	1.433	1.433	1.433	1.433	1.433	7.440	3.505	3.505	3.505	1.007	1.007	7.110	5.775	1.620	1.620	1.620	1.620	1.620	1.620	1.620	5.811	5.811	4.742	4.742	0.000	0.000
	User entered value from Safety Needs spreadsheet and for use in Performance Effectiveness spreadsheet — Post-Project Segment Safety Need	1.433	1.433	1.433	1.433	1.429	1.429	1.429	1.431	1.429	1.430	1.427	1.303	1.412	2.536	3.505	3.505	0.882	0.909	5.680	3.433	0.931	1.620	1.620	1.426	1.620	1.426	1.588	2.661	3.702	4.742	3.716	0.000	0.000

	Solution #	C10W.1A	C10W.1B	C10W.2A	C10W.2B	C10W.3A	C10W.3B	C10W.4A	C10W.4B	C10W.5A	C10W.5B	C10W.6	C10W.7	C10W.8	C10W.9	C10W.10A	C10W.10B	C10W.11	C10W.12	C10W.13	C10W.14	C10W.15	C10W.16A	C10W.16B	C10W.17A	C10W.17B	C10W.18A	C10W.18B	C10W.19A	C10W.19B	C10W.20	C10W.21	C10W.22A	C10W.22B
	Description	<Ehrenberg Area EB Pavement Improvements>	<Ehrenberg Area EB Pavement Improvements>	<East Ehrenberg WB Pavement Improvements>	<East Ehrenberg WB Pavement Improvements>	<Morgantown Area WB Pavement Improvements>	<Morgantown Area WB Pavement Improvements>	<Sugarloaf Area EB Pavement Improvements>	<Sugarloaf Area EB Pavement Improvements>	<Sugarloaf Area EB/WB Pavement Improvements>	<Sugarloaf Area EB/WB Pavement Improvements>	<Inspection Station Safety Improvements>	<Ferrell-Gulch Safety Improvements>	<Quartzsite Area Safety Improvements>	<Salisbury Area Safety Improvements>	<Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation>	<Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation>	<Lone Mountain Area EB Safety Improvements>	<Centennial Area EB Safety Improvements>	<Big Horn Area Safety Improvements>	<Tonopah Area Safety Improvements>	<West Buckeye Area Safety Improvements>	<EB/Dn Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation>	<EB/Dn Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation>	<Dgleby Rd Ramp B UP (#1721) Freight / Bridge Vertical Clearance Mitigation>	<Dgleby Rd Ramp B UP (#1721) Freight / Bridge Vertical Clearance Mitigation>	<Dgleby Rd Ramp C UP (#1722) Freight / Bridge Vertical Clearance Mitigation>	<Dgleby Rd Ramp C UP (#1722) Freight / Bridge Vertical Clearance Mitigation>	<Buckeye Area Safety Improvements>	<Buckeye Area Safety Improvements>	<North Gila Bend SB General Purpose Lanes>	<North Gila Bend Area Safety Improvements>	<Butterfield Trail Mobility Improvements>	<Butterfield Trail Mobility Improvements>
MOBILITY – VOLUME/CAPACITY	Input current value from performance system — Orig Segment Future V/C	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.450	0.510	0.510	0.510	0.420	0.420	0.460	0.450	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.160	0.160	1.180	1.180	2.410	2.410
Input current value from performance system — Post-Project Future V/C	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.450	0.510	0.510	0.510	0.420	0.420	0.460	0.450	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.160	0.160	1.180	1.210	2.410	2.410
Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Post-Project Segment Future V/C	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.470	0.450	0.510	0.510	0.510	0.420	0.420	0.460	0.450	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.160	0.160	0.590	0.590	1.210	2.410
MOBILITY – PEAK HOUR V/C	Input current value from performance system (direction 1) — Original Segment Peak Hour V/C (DI)	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.240	0.380	0.380	0.380	0.190	0.190	0.160	0.250	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.240	0.240	0.040	0.580	0.310	0.310
Input current value from performance system (direction 2) — Original Segment Peak Hour V/C (MI/M)	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.230	0.270	0.370	0.370	0.160	0.160	0.190	0.270	0.290	0.290	0.290	0.290	0.290	0.290	0.290	0.240	0.240	0.570	0.570	0.260	0.280
If Over-Capacity, enter Adjusted Peak Hour V/C to determine new segment level Peak Hour V/C, if Too Many project, disregard — Adjusted Input V/C curves for use in directional peak hr	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	N/A	N/A	2.00	N/A	N/A	N/A	N/A	N/A	2.00	2.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.00	2.00	N/A	N/A
Input value from updated Mobility Index spreadsheet (direction 1) — Post-Project Segment Peak Hr V/C (DI)	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.24	0.38	0.38	0.38	0.19	0.19	0.16	0.25	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.24	0.24	0.29	0.58	0.16	0.31
Input value from updated Mobility Index spreadsheet (direction 2) — Post-Project Segment Peak Hr V/C (MI/M)	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.23	0.27	0.37	0.37	0.18	0.18	0.18	0.27	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.24	0.24	0.29	0.57	0.14	0.28
Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 1) — Post-Project Segment Peak Hr V/C (DI)	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.240	0.380	0.380	0.380	0.190	0.190	0.160	0.250	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.240	0.240	0.290	0.580	0.160	0.310
Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 2) — Post-Project Segment Peak Hr V/C (MI/M)	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.230	0.370	0.370	0.370	0.160	0.160	0.190	0.270	0.290	0.290	0.290	0.290	0.290	0.290	0.290	0.240	0.240	0.570	0.570	0.140	0.280
MOBILITY – UTILITY	Calculated Value (both directions) — Safety Reduction Factor	1.000	1.000	1.000	1.000	0.997	0.997	0.997	0.997	0.994	0.994	0.995	0.900	0.708	0.842	1.000	1.000	0.914	0.947	0.840	0.704	0.832	1.000	1.000	0.974	1.000	0.974	0.996	0.422	0.742	1.000	0.853	#DIV/0!	#DIV/0!
Calculated Value (both directions) — Safety Reduction	0.000	0.000	0.000	0.000	0.003	0.003	0.003	0.003	0.006	0.006	0.005	0.140	0.202	0.114	0.000	0.000	0.086	0.053	0.160	0.296	0.179	0.000	0.000	0.026	0.000	0.026	0.004	0.578	0.257	0.000	0.150	#DIV/0!	#DIV/0!
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	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	0.500	0.500	0.500	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	0.000	0.000	0.000	0.000	0.000

		Solution #	C10.0W.1A	C10.0W.1B	C10.0W.2A	C10.0W.2B	C10.0W.3A	C10.0W.3B	C10.0W.4A	C10.0W.4B	C10.0W.5A	C10.0W.5B	C10.0W.6	C10.0W.7	C10.0W.8	C10.0W.9	C10.0W.10A	C10.0W.10B	C10.0W.11	C10.0W.12	C10.0W.13	C10.0W.14	C10.0W.15	C10.0W.16A	C10.0W.16B	C10.0W.17A	C10.0W.17B	C10.0W.18A	C10.0W.18B	C185.19A	C185.20	C185.21	C185.22A	C185.22B
		Description	<Ehrenberg Area EB Pavement Improvements>	<Ehrenberg Area EB Pavement Improvements>	<East Ehrenberg WB Pavement Improvements>	<East Ehrenberg WB Pavement Improvements>	<Morgantown Area WB Pavement Improvements>	<Morgantown Area WB Pavement Improvements>	<Sugarloaf Area EB Pavement Improvements>	<Sugarloaf Area EB Pavement Improvements>	<Sugarloaf Area EB/WB Pavement Improvements>	<Sugarloaf Area EB/WB Pavement Improvements>	<Inspection Sation Safety Improvements>	<Ferrah Gulch Safety Improvements>	<Quartzsite Area Safety Improvements>	<Vikisburg Area Safety Improvements>	<Ramsey Mine Rd UP (#120) Freight / Bridge Vertical Clearance Mitigation>	<Ramsey Mine Rd UP (#120) Freight / Bridge Vertical Clearance Mitigation>	<Lone Mountain Area EB Safety Improvements>	<Centennial Area EB Safety Improvements>	<Big Horn Area Safety Improvements>	<Tonopah Area Safety Improvements>	<West Buckeye Area Safety Improvements>	<DS3th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation>	<DS3th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation>	<Sgbedy Rd Ramp B UP (#1731) Freight / Bridge Vertical Clearance Mitigation>	<Sgbedy Rd Ramp B UP (#1731) Freight / Bridge Vertical Clearance Mitigation>	<Sgbedy Rd Ramp C UP (#1732) Freight / Bridge Vertical Clearance Mitigation>	<Sgbedy Rd Ramp C UP (#1732) Freight / Bridge Vertical Clearance Mitigation>	<Buckeye Area Safety Improvements>	<Buckeye Area Safety Improvements>	<North Gila Bend SB General Purpose Lanes>	<North Gila Bend Area Safety Improvements>	<Butterfield Trail Mobility Improvements>	<Butterfield Trail Mobility Improvements>
LEGEND:		Project Beg MP	0	0	3	3	7	7	11	11	12	12	0	9	18.5	32	33.78	33.78	55	67.5	74	83	104	101.4	101.4	112.75	112.75	112.92	112.92	151	151	120	122	120	120
	user entered value	Project End MP	2	2	4	4	8	8	12	12	16	16	1	12	19.8	41	33.78	33.78	62	68.5	79	93	108	103.4	103.4	112.75	112.75	112.92	112.92	153	153	123	123.1	123	123
	calculated value for reference only	Project Length (miles)	2	2	1	1	1	1	1	1	4	4	1	3	1.4	9	0	0	7	1	5	11	4	0	0	0	0	0	0	2	2	3	1.1	3	3
	calculated value for entry/use in other spreadsheet	Segment Beg MP	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.001	0.001	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	for input into Performance Effectiveness Score spreadsheet	Segment End MP	16	16	16	16	16	16	16	16	16	16	16	16	16	22	22	22	54	54	71	71	82	98	113	113	113	113	113	155	155	123	123	123	123
	assumed values (do not modify)	Segment Length (miles)	16	16	15	15	9	9	5	5	12	12	15	4	17.2	13	22	22	47	53	66	82	108	98	113	113	113	113	113	153	153	123	122	123	123
		Current # of Lanes (both directions)	3	3	2	2	2	2	2	2	3	3	2	2	2	2	3	3	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Project Type (one-way or two-way)	one-way	one-way	one-way	one-way	one-way	one-way	one-way	one-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	two-way	two-way	two-way	two-way	two-way	two-way	two-way	one-way	one-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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Pro-Rated # of Lanes	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
		Notes and Directions	**Description**																															
TTTR		Roadway Segment TTTR (%)	Roadway Segment TTTR (%)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Input current value from performance system (direction 1)	Original Directional Segment TTTR (EB/SB)	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.063	1.047	1.047	1.047	1.042	1.042	1.042	1.050	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.304	1.304	1.193	1.193	1.571	1.571
	Input current value from performance system (direction 2)	Original Directional Segment TTTR (WB/NB)	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.058	1.052	1.052	1.052	1.037	1.037	1.036	1.044	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.282	1.282	1.158	1.158	1.419	1.419
	Input current value from performance system	Segment Length (miles)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 1)	Post-Project Directional Segment TTTR (EB)	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.121	1.121	1.121	1.099	1.029	1.026	1.047	1.047	1.022	1.034	1.016	1.033	1.025	1.053	1.053	1.049	1.053	1.049	1.052	1.230	1.254	1.113	1.106	#DIV/0!	#DIV/0!
	Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 2)	Post-Project Directional Segment TTTR (WB)	1.091	1.091	1.091	1.091	1.091	1.091	1.091	1.094	1.094	1.091	1.072	1.072	1.023	1.021	1.052	1.052	1.037	1.037	1.051	1.022	1.019	1.047	1.047	1.043	1.047	1.043	1.046	1.229	1.212	1.108	1.108	#DIV/0!	#DIV/0!
INTERSECTION	Value from above	Original Segment MAX TTTR (EB)	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.122	1.063	1.047	1.047	1.047	1.042	1.042	1.050	1.050	1.053	1.053	1.053	1.053	1.053	1.053	1.053	1.304	1.304	1.193	1.193	1.571	1.571
	Value from above	Original Segment MAX TTTR (SB)	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.054	1.052	1.052	1.052	1.037	1.037	1.036	1.044	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.282	1.282	1.158	1.158	1.419	1.419
	Calculated Value	Original Segment MAX TTTR (WB)	1.108	1.108	1.108	1.108	1.108	1.108	1.108	1.108	1.108	1.108	1.108	1.108	1.058	1.050	1.050	1.050	1.040	1.040	1.039	1.047	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.293	1.293	1.195	1.195	1.495	1.495
	Calculated Value	Original Segment MAX TTTR (SB)	1.143	1.143	1.143	1.143	1.143	1.143	1.143	1.143	1.143	1.143	1.143	1.143	1.066	1.026	1.047	1.047	1.043	1.043	1.061	1.003	1.025	1.043	1.043	1.040	1.043	1.040	1.046	1.238	1.254	1.118	1.106	#DIV/0!	#DIV/0!
	Calculated Value	Original Value MAX TTTR (SB)	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.095	1.094	1.094	1.095	1.095	1.052	1.052	1.052	1.052	1.037	1.037	1.051	1.022	1.019	1.047	1.047	1.043	1.047	1.043	1.046	1.229	1.212	1.108	1.108	#DIV/0!	#DIV/0!
	Enter in Freight Needs spreadsheet to update segment level Freight Need	Post-Project Segment Freight Index	1.108	1.108	1.108	1.108	1.108	1.108	1.108	1.108	1.107	1.107	1.108	1.085	1.035	1.028	1.050	1.050	1.034	1.035	1.054	1.012	1.022	1.050	1.050	1.046	1.050	1.046	1.049	1.230	1.243	1.161	1.152	#DIV/0!	#DIV/0!
DESIGN-DURATION	Input current value from performance system (direction 1)	Orig Segment Directional Closure Duration (dir 1)	87.222	87.222	87.222	87.222	97.222	97.222	97.222	97.222	97.222	97.222	97.222	97.222	89.344	23.912	23.912	23.912	13.314	12.314	21.306	26.055	25.167	25.167	25.167	25.167	25.167	25.167	25.167	20.476	20.476	24.476	0.000	0.000	0.000
	Input current value from performance system (direction 2)	Orig Segment Directional Closure Duration (dir 2)	26.097	26.097	26.097	26.097	26.097	26.097	26.097	26.097	26.097	26.097	26.097	26.097	30.400	21.590	21.590	21.590	14.754	14.754	21.306	30.944	34.435	34.435	34.435	34.435	34.435	34.435	34.435	66.037	66.037	20.000	20.000	0.000	0.000
	Calculated Value	Segment Closures with Facilities	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	0	0	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0
	Calculated Value	Total Segment Closures	42	42	42	42	42	42	42	42	42	42	42	42	58	25	25	25	58	58	24	33	33	33	33	33	33	33	33	33	33	24	24	0	0
	Calculated Value	% Closures with Facility	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	0.080	0.080	0.080	0.000	0.000	0.083	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.083	0.083	#DIV/0!	#DIV/0!
	Calculated Value	Closure Reduction Factor	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	0.000	0.000	0.000	0.087	0.038	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.083	0.083	#DIV/0!	#DIV/0!
	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	0.989	0.992	1.000	1.000	1.000	1.000	0.983	0.992	0.995	1.000	1.000	0.999	1.000	0.999	1.000	0.986	0.990	1.000	1.000	#DIV/0!	#DIV/0!
	Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 1)	Post-Project Segment Directional Closure Duration (EB/SB)	97.222	97.222	97.222	97.222	97.222	97.222	97.222	97.222	97.222	97.222	97.222	97.222	86.903	23.729	23.911	23.911	12.314	12.314	21.163	26.816	34.976	35.167	35.167	35.140	35.167	35.140	35.163	20.381	20.476	0.000	0.000	#DIV/0!	#DIV/0!
	Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 2)	Post-Project Segment Directional Closure Duration (WB/NB)	26.097	26.097	26.097	26.097	26.097	26.097	26.097	26.097	26.097	26.097	26.097	26.097	30.059	21.425	21.590	21.590	14.754	14.754	24.841	30.531	34.248	34.435	34.435	34.435	34.435	34.435	34.435	65.439	66.037	20.000	20.000	#DIV/0!	#DIV/0!
HWY CLR	Input current value from performance system	Original Segment Vertical Clearance	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	15.90	15.90	15.90	15.90	16.20	16.20	16.00	16.58	15.92	15.92	15.92	15.92	15.92	15.92	15.92	No UP	No UP	No UP	No UP	No UP	No UP
	Input current value from performance system	Original vertical clearance for specific bridge													16.16	16.16								16.00	16.00	15.92	15.92	15.92	15.92							
	Input post-project value (depends on solution)	Post-project vertical clearance for specific bridge													16.46									16.30	16.50	16.22	16.50	16.22	16.50							
	Input post-project value (depends on solution)(force segment clearance to equal this specific bridge)	Post-Project Segment Vertical Clearance	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	15.92	15.90	16.46	16.50	16.20	16.20	16.00	16.58	15.92	16.30	16.50	16.22	16.50	16.22	16.50	No UP	No UP	No UP	No UP	No UP	No UP
	Enter in Freight Needs spreadsheet to update segment level Freight Need	Post-Project Segment Vertical Clearance	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	16.17	15.92	15.90	16.46	16.50	16.20	16.20	16.00	16.58	15.92	16.30	16.50	16.22	16.50	16.22	16.50	No UP	No UP	No UP	No UP	No UP	No UP
Needs	User entered value from Freight Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Freight Need	0.574	0.574	0.574	0.574	0.576	0.576	0.574	0.574	0.574	0.574	0.574	0.574	0.497	0.032	0.032	0.032	0.270	0.279	0.402	0.083	0.497	0.497	0.497	0.497	0.497	0.497	0.497	0.061	0.061	0.014	0.014	0.709	0.709
	User entered value from Freight Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Freight Need	0.574	0.574	0.574	0.574	0.576	0.576	0.574	0.574	0.570	0.570	0.572	0.476	0.497	0.032	0.032	0.032	0.270	0.279	0.402	0.083	0.497	0.189	0.099	0.281	0.099	0.281	0.099	0.060	0.060	0.014	0.014	0.709	0.709

		Solution #	C10.0W.1A	C10.0W.1B	C10.0W.2A	C10.0W.2B	C10.0W.3A	C10.0W.3B	C10.0W.4A	C10.0W.4B	C10.0W.5A	C10.0W.5B	C10.0W.6	C10.0W.7	C10.0W.8	C10.0W.9	C10.0W.10A	C10.0W.10B	C10.0W.11	C10.0W.12	C10.0W.13	C10.0W.14	C10.0W.15	C10.0W.16A	C10.0W.16B	C10.0W.17A	C10.0W.17B	C10.0W.18A	C10.0W.18B	C185.19A	C185.20	C185.21	C185.22A	C185.22B
		Description	<Ehrenberg Area EB Pavement Improvements>	<Ehrenberg Area EB Pavement Improvements>	<East Ehrenberg WB Pavement Improvements>	<East Ehrenberg WB Pavement Improvements>	<Morgantown Area WB Pavement Improvements>	<Morgantown Area WB Pavement Improvements>	<Sugarloaf Area EB Pavement Improvements>	<Sugarloaf Area EB Pavement Improvements>	<Sugarloaf Area EB/WB Pavement Improvements>	<Sugarloaf Area EB/WB Pavement Improvements>	<Inspection Sation Safety Improvements>	<Ferrah Gulch Safety Improvements>	<Quartzsite Area Safety Improvements>	<Vikisburg Area Safety Improvements>	<Ramsey Mine Rd UP (#120) Freight / Bridge Vertical Clearance Mitigation>	<Ramsey Mine Rd UP (#120) Freight / Bridge Vertical Clearance Mitigation>	<Lone Mountain Area EB Safety Improvements>	<Centennial Area EB Safety Improvements>	<Big Horn Area Safety Improvements>	<Tonopah Area Safety Improvements>	<West Buckeye Area Safety Improvements>	<DS3th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation>	<DS3th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation>	<Sgbedy Rd Ramp B UP (#1731) Freight / Bridge Vertical Clearance Mitigation>	<Sgbedy Rd Ramp B UP (#1731) Freight / Bridge Vertical Clearance Mitigation>	<Sgbedy Rd Ramp C UP (#1732) Freight / Bridge Vertical Clearance Mitigation>	<Sgbedy Rd Ramp C UP (#1732) Freight / Bridge Vertical Clearance Mitigation>	<Buckeye Area Safety Improvements>	<Buckeye Area Safety Improvements>	<North Gila Bend SB General Purpose Lanes>	<North Gila Bend Area Safety Improvements>	<Butterfield Trail Mobility Improvements>	<Butterfield Trail Mobility Improvements>
LEGEND:		Project Beg MP	0	0	3	3	7	7	11	11	12	12	0	9	18.5	32	33.78	33.78	55	67.5	74	83	104	101.4	101.4	112.75	112.75	112.92	112.92	151	151	120	122	120	120
	user entered value	Project End MP	2	2	4	4	8	8	12	12	16	16	1	12	19.8	41	33.78	33.78	62	68.5	79	93	108	103.4	103.4	112.75	112.75	112.92	112.92	153	153	123	123.1	123	123
	calculated value for reference only	Project Length (miles)	2	2	1	1	1	1	1	1	4	4	1	3	1.4	9	0	0	7	1	5	11	4	0	0	0	0	0	0	2	2	3	1.1	3	3
	calculated value for entry/use in other spreadsheet	Segment Beg MP	0.000	0.000	0	0	0.000	0.000	0.000	0.000	0.001	0.001	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	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	for input into Performance Effectiveness Score spreadsheet	Segment End MP	16	16	16	16	16	16	16	16	16	16	16	16	16	22	22	22	54	54	71	71	82	98	113	113	113	113	113	155	155	123	123	123	123
	assumed values (do not modify)	Segment Length (miles)	16	16	15	15	9	9	5	5	12	12	15	4	17.2	13	22	22	47	53	66	82	108	98	113	113	113	113	113	153	153	123	122	123	123
		Current # of Lanes (both directions)	3	3	2	2	2	2	2	2	3	3	2	2	2	2	3	3	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Project Type (one-way or two-way)	one-way	one-way	one-way	one-way	one-way	one-way	one-way	one-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	two-way	two-way	two-way	two-way	two-way	two-way	two-way	one-way	one-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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Pro-Rated # of Lanes	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
		Notes and Directions	**Description**																															
BRIDGE INDEX	Input current value from performance system	Original Segment Bridge Index																						6.17			6.44							
	Input current value from performance system	Original lowest rating for specific bridge																						6			5		6					
	Input post-project value (For repair =1, rehab =2, replace=8)	Post-Project lowest rating for specific bridge																						8			8		8					
	Enter in Bridge Index spreadsheet to calculate new Bridge Index	Post-Project lowest rating for specific bridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	0	8	0	0	0	0	0
	Input updated segment value from updated Bridge Index spreadsheet	Post-Project Segment Bridge Index																						6.41			6.51		6.52					
	Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Bridge Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.41	0.00	0.00	6.51	0.00	6.52	0.00	0.00	0.00	0.00	0.00	0.00
HWY CLR RATING	Input current value from performance system	Original Segment Sufficiency Rating																						96.05			96.35		96.35					
	Input current value from performance system	Original Sufficiency Rating for specific bridge																						98.00			98.00		98.00					
	Input post-project value (For repair =50, rehab =20, replace=99)	Post-Project Sufficiency Rating for specific bridge																						98.00			98.00		98.00					
	Enter in Bridge Index spreadsheet to calculate new Bridge Index	Post-Project Sufficiency Rating for specific bridge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.00	0.00	0.00	98.00	0.00	98.00	0.00	0.00	0.00	0.00	0.00	0.00
	Input updated segment value from updated Bridge Index spreadsheet	Post-Project Segment Sufficiency Rating																						96.05			96.35		96.35					
	Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Sufficiency Rating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	96.05	0.00	0.00	96.35	0.00	96.35	0.00	0.00	0.00	0.00	0.00	0.00
B-R FRAG	Input current value from performance system	Original Segment Bridge Rating																						5			5		5					
	Input updated segment value from updated Bridge Index spreadsheet	Post-Project Segment Bridge Rating																						5			6		5					
	Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Bridge Rating	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	6	0	5	0	0	0	0	0	0
Needs	User entered value from Bridge Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Bridge Need	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.45	0.43	0.43	0.43	0.02	0.02	0.02	0.00	0.25	0.16	0.16	0.16	0.16	0.16	0.16	0.00	0.00	2.149	2.149	0.0	0.0
	User entered value from Bridge Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Bridge Need	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.45	0.43	0.43	0.07	0.02	0.02	0.02	0.00	0.25	0.16	0.16	0.30	0.16	0.00	0.16	0.00	0.00	2.149	2.149	0.0	0.0

		Solution #	C10W.1A	C10W.1B	C10W.2A	C10W.2B	C10W.3A	C10W.3B	C10W.4A	C10W.4B	C10W.5A	C10W.5B	C10W.6	C10W.7	C10W.8	C10W.9	C10W.10A	C10W.10B	C10W.11	C10W.12	C10W.13	C10W.14	C10W.15	C10W.16A	C10W.16B	C10W.17A	C10W.17B	C10W.18A	C10W.18B	C10W.19A	C10W.19B	C85.19A	C85.20	C85.21	C85.22A	C85.22B
		Description	<Ehrenberg Area EB Pavement Improvements>	<Ehrenberg Area EB Pavement Improvements>	<East Ehrenberg WB Pavement Improvements>	<East Ehrenberg WB Pavement Improvements>	<Morgantown Area WB Pavement Improvements>	<Morgantown Area WB Pavement Improvements>	<Sugarloaf Area EB Pavement Improvements>	<Sugarloaf Area EB Pavement Improvements>	<Sugarloaf Area EB/WB Pavement Improvements>	<Sugarloaf Area EB/WB Pavement Improvements>	<Inspection Station Safety Improvements>	<Ferrish Gulch Safety Improvements>	<Quartzsite Area Safety Improvements>	<Hickiboy Area Safety Improvements>	<Ramsey Mine Rd UP (#13E2) Freight / Bridge Vertical Clearance Mitigation>	<Ramsey Mine Rd UP (#13D2) Freight / Bridge Vertical Clearance Mitigation>	<Lone Mountain Area EB Safety Improvements>	<Centennial Area EB Safety Improvements>	<Big Horn Area Safety Improvements>	<Tonopah Area Safety Improvements>	<Wind Buckeye Area Safety Improvements>	<DS3th Ave UP (#164T) Freight / Bridge Vertical Clearance Mitigation>	<DS3th Ave UP (#164T) Freight / Bridge Vertical Clearance Mitigation>	<Dysinby Rd Ramp B UP (#172J) Freight / Bridge Vertical Clearance Mitigation>	<Dysinby Rd Ramp B UP (#172J) Freight / Bridge Vertical Clearance Mitigation>	<Dysinby Rd Ramp C UP (#173G) Freight / Bridge Vertical Clearance Mitigation>	<Dysinby Rd Ramp C UP (#173G) Freight / Bridge Vertical Clearance Mitigation>	<Buckeye Area Safety Improvements>	<North Gila Bend SB General Purpose Lanes>	<North Gila Bend Area Safety Improvements>	<Butterfield Trail Mobility Improvements>	<Butterfield Trail Mobility Improvements>
LEGEND		Project Beg MP	0	0	3	3	7	7	11	11	12	12	0	9	18.5	32	33.78	33.78	55	67.5	79	83	104	101.4	101.4	112.75	112.75	112.82	112.82	151	120	120	120	120	120
	user entered value	Project End MP	2	2	4	4	8	8	12	12	16	16	1	12	19.4	41	33.78	33.78	62	68.5	79	94	108	101.4	101.4	112.75	112.75	112.82	112.82	152	123	123.1	123	123	123
	calculated value for reference only	Project Length (miles)	2	2	1	1	1	1	1	1	4	4	1	3	1.4	9	0	0	7	1	5	11	4	0	0	0	0	0	0	2	3	3.1	3	3	3
	calculated value for entry/use in other spreadsheet	Segment Beg MP	0	0	0	0	0	0	0	0	0	0	0	0	16	32	32	32	54	54	75	82	98	98	98	98	98	98	98	149	120	120	120	120	120
	for input into Performance Effectiveness Score spreadsheet	Segment End MP	16	16	16	16	16	16	16	16	16	16	16	16	22	54	54	54	71	74	82	98	113	113	113	113	113	113	113	150	123	123	123	123	123
	assumed values (do not modify)	Segment Length (miles)	16	16	16	16	16	16	16	16	16	16	16	16	6	22	22	22	17	17	11	16	15	15	15	15	15	15	15	6	3	3	3	3	3
		Segment #	1	1	2	2	1	1	1	1	1	1	1	1	2	4	4	4	3	3	3	2	8	8	8	8	8	8	8	3	12	12	14	14	14
		Current # of Lanes (one-way)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		Project Type (one way or two way)	one-way	one-way	one-way	one-way	one-way	one-way	one-way	one-way	two-way	two-way	one-way	two-way	two-way	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	one-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	0	0	0	0	0	0	0	0	0	0	0	1	1	0
		Pro-Rated # of Lanes	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.73	4.00	4.00	1.00
	Notes and Directions	**Description**																																		
PAVEMENT	PAVEMENT INDEX	Input current value from performance system	3.73	3.73	3.73	3.73	3.73	3.73	3.73	3.73	3.73	3.73																				4.08				
		Input current value from performance system	87.02	87.02	117.64	111.44	102.18	102.18	76.91	76.91	131.37	131.37																				56.07				
		Input current value from performance system	11.72	11.72	20.40	20.40	11.80	11.80	12.00	12.00	23.01	23.01																				11.9				
		Input current value from performance system	0.21	0.21	0.22	0.22	0.22	0.22	0.22	0.22	0.20	0.20																				0.21				
		Input post-project value (For rehab, increase to 45; for replace increase to 30)	45	30	30	45	30	45	30	45	30	45	30	30	45	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	45	30	30	30	30
		Enter in Pavement Index spreadsheet to calculate new Pavement Index	Post-Project IRI in project limits	45	30	45	30	45	30	45	30	45	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0	0	0	0
		Input post-project value (Lower to 0 for rehab or replace)	Post-Project Cracking in project limits	0	0	0	0	0	0	0	0	0	0																				0				
		Enter in Pavement Index spreadsheet to calculate new Pavement Index	Post-Project Cracking in project limits	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Input post-project value (Lower to 0 for rehab or replace)	Post-Project Rutting in project limits	0	0	0	0	0	0	0	0	0	0																				0				
		Enter in Pavement Index spreadsheet to calculate new Pavement Index	Post-Project Rutting in project limits	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Input updated segment value from updated Pavement Index spreadsheet	Post-Project Segment Pavement Index	3.81	3.82	3.78	3.78	3.78	3.78	3.77	3.78	4.16	4.18																				3.93				
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Pavement Index	3.81	3.82	3.78	3.78	3.78	3.78	3.77	3.78	4.16	4.18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.93	0	0	0	0
DIRECTIONAL	DIRECTIONAL	Input current value from performance system (direction 1)	Original Segment Directional PSR (EB/SB)	3.74	3.74	3.64	3.64	3.64	3.64	3.74	3.74	3.74	3.74																				4.12				
		Input current value from performance system (direction 2)	Original Segment Directional PSR (WB/NB)			3.64	3.64	3.64	3.64			3.64	3.64																								
		Value from above	Original Segment IRI in project limits	87.02	87.02	117.64	111.44	102.18	102.18	76.91	76.91	131.37	131.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56.07	0	0	0	0
		Value from above	Post-Project directional IRI in project limits	45	30	45	30	45	30	45	30	45	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0	0	0	0
		Input updated segment value from updated Pavement Index spreadsheet (direction 1)	Post-Project Segment Directional PSR (EB/SB)	3.81	3.85					3.77	3.78	4.01	4.07																				4.25				
		Input updated segment value from updated Pavement Index spreadsheet (direction 2)	Post-Project Segment Directional PSR (WB/NB)			3.70	3.72	3.69	3.7			3.95	4.01																								
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Directional PSR (EB/SB)	3.81	3.85	0	0	0	0	3.77	3.78	4.01	4.07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.25	0	0	0	0
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Directional PSR (WB/NB)	0	0	3.7	3.72	3.69	3.7	0	0	3.95	4.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% F.R.	% F.R.	Input current value from performance system	Original Segment % Failure	41.0%	41.0%	41.0%	41.0%	41.0%	41.0%	41.0%	41.0%	41.0%	41.0%																				0.0%				
		Input value from updated Pavement Index spreadsheet	Post-Project Segment % Failure	34.0%	34.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	36.0%	36.0%																				0.0%				
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment % Failure	34.0%	34.0%	38.0%	38.0%	38.0%	38.0%	38.0%	38.0%	36.0%	36.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Needs	User entered value from Pavement Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Pavement Need	**0.895**	**0.895**	**0.895**	**0.895**	**0.895**	**0.895**	**0.895**	**0.895**	**0.895**	**0.895**	**0.895**	**0.895**	**3.991**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.364**	**3.407**	**1.153**	**1.153**	**1.153**	**1.153**	**1.153**	**1.153**	**1.153**	**0.1**	**0.00**	**0.00**	**0.00**	**0.00**
		User entered value from Pavement Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Pavement Need	**0.727**	**0.727**	**0.825**	**0.770**	**0.784**	**0.779**	**0.807**	**0.807**	**0.320**	**0.320**	**0.895**	**0.895**	**3.991**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.364**	**3.407**	**1.153**	**1.153**	**1.153**	**1.153**	**1.153**	**1.153**	**1.153**	**0.1**	**0.00**	**0.00**	**0.00**	**0.00**

Application of Multiple Crash Modification Factors

CS 10W.7 (MP 9-12) EB

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Current Fatal	Current Incap	Post-Project Fatal	Post-Project Incap	Reduction Fatal	Reduction Incap		Length	Notes
9	9.5	0.77	0.77	1	1	Both	0.681	0	1	0.000	0.681	0.000	0.319	Segment 1	0.5	Install delineators and RRPMS
9.5	10	0.79	1	1	1	Both	0.790	0	0	0.000	0.000	0.000	0.000	Segment 1	0.5	Chevrons along curve + Delineators + RRPMs
10	12	0.77	0.77	1	1	Both	0.681	1	1	0.681	0.681	0.319	0.319	Segment 1	2	Install delineators and RRPMS
								1	2			0.319	0.637			

CS 10W.7 (MP 9-12) WB

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Current Fatal	Current Incap	Post-Project Fatal	Post-Project Incap	Reduction Fatal	Reduction Incap		Length	Notes
9	9.5	0.77	0.77	1	1	Both	0.681	0	0	0.000	0.000	0.000	0.000	Segment 1	0.5	Install delineators and RPMS
9.5	10	0.79	1	1	1	Both	0.790	2	0	1.580	0.000	0.420	0.000	Segment 1	0.5	Chevrons along curve + Delineators + RRPMs
10	11	0.77	0.77	1	1	Both	0.681	0	2	0.000	1.363	0.000	0.637	Segment 2	1	Install delineators and RPMS
11	11.5	0.77	0.77	0.94	1	Both	0.661	0	1	0.000	0.661	0.000	0.339	Segment 1	0.5	Speed feedback sign at MP 11
								2	3			0.420	0.976			

CS 10W.21 NB

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Current Fatal	Current Incap	Post-Project Fatal	Post-Project Incap	Reduction Fatal	Reduction Incap		Length	Notes
122	122.75	0.85	1	1	1	Both	0.850	1	0	0.850	0.000	0.150	0.000		0.75	Centerline Rumble Strips
122.75	123	0.77	0.85	1	1	Both	0.712	0	0	0.000	0.000	0.000	0.000		0.25	Centerline Rumble Strips and RPMS
								1	0			0.150	0.000			

CS 10W.21 SB

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Current Fatal	Current Incap	Post-Project Fatal	Post-Project Incap	Reduction Fatal	Reduction Incap		Length	Notes
122	122.75	0.85	1	1	1	Both	0.850	0	0	0.000	0.000	0.000	0.000		0.75	Centerline Rumble Strips
122.75	123	0.77	0.85	1	1	Both	0.712	1	0	0.712	0.000	0.288	0.000		0.25	Centerline Rumble Strips and RPMS
								1	0			0.288	0.000			

CS 10W.6 WB

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Current Fatal	Current Incap	Post-Project Fatal	Post-Project Incap	Reduction Fatal	Reduction Incap		Length	Notes
0	0.5	0.94	0.95	1	1	Both	0.917	0	3	0.000	2.750	0.000	0.251	Segment 1	0.5	Speed feedback sign at MP .5 + transverse rumble strip
0.5	1	0.75	1	1	1	Both	0.750	0	1	0.000	0.750	0.000	0.250	Segment 1	0.5	flashing beacon + signing
								0	4			0.000	0.501			

CS 10W.15 EB

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Current Fatal	Current Incap	Post-Project Fatal	Post-Project Incap	Reduction Fatal	Reduction Incap		Length	Notes
104	104.5	0.68	0.94	1	1	Both	0.660	1	0	0.660	0.000	0.340	0.000	Segment 1	0.5	widen shoulders + speed feedback

104.5	108	0.68	1	1	1	Both	0.680	2	4	1.360	2.720	0.640	1.280	Segment 1	3.5	widen shoulders
								3	4			0.980	1.280			

CS 10W.15 WB

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
104	108	0.68	1	1	1	Both	0.680	3	2	2.040	1.360	0.960	0.640	Segment 1	4	Install delineators and RRPMS
								3	2			0.960	0.640			

CS 10W.14 EB

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
83	83.5	0.68	1	1	1	Both	0.680	1	0	0.680	0.000	0.320	0.000	Segment 1	0.5	Widen shoulder
83.5	84	0.68	0.94	1	1	Both	0.660	1	0	0.660	0.000	0.340	0.000	Segment 2	0.5	widen shoulders + speed feedback
84	89.5	0.68	1	1	1	Both	0.680	2	4	1.360	2.720	0.640	1.280	Segment 3	5.5	Widen shoulder
89.5	90	0.68	0.94	1	1	Both	0.660	1	0	0.660	0.000	0.340	0.000	Segment 4	0.5	widen shoulders + speed feedback
90	94	0.68	1	1	1	Both	0.680	1	2	0.680	1.360	0.320	0.640	Segment 1	4	Widen shoulder
								6	6			1.961	1.920			

CS 10W.14 WB

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
83	93.5	0.68	1	1	1	Both	0.680	3	4	2.040	2.720	0.960	1.280	Segment 1	10.5	Widen shoulder
93.5	94	0.68	0.94	1	1	Both	0.660	1	0	0.660	0.000	0.340	0.000	Segment 1	0.5	widen shoulders + speed feedback
								4	4			1.300	1.280			

~~CS 10W.XX (MP 18.5-18.5)~~ - - - - - - - - - - - - - - -

							~~Effective~~	~~Current~~		~~Post-Project~~		~~Reduction~~				
~~BMP~~	~~EMP~~	~~CMF1~~	~~CMF2~~	~~CMF3~~	~~CMF4~~	~~Dir~~	~~CMF~~	~~Fatal~~	~~Incap~~	~~Fatal~~	~~Incap~~	~~Fatal~~	~~Incap~~	-	~~Length~~	~~Notes~~
~~12~~	~~12.5~~	~~0.94~~	~~1~~	~~1~~	~~1~~	~~WB~~	~~0.940~~	~~0~~	~~0~~	~~0.000~~	~~0.000~~	~~0.000~~	~~0.000~~	~~Segment 1~~	~~0.5~~	~~Speed feedback sign at MP 12~~
												~~0~~	~~0~~			

CS 10W.XX (MP 0-1)

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
0	0.25	0.75	0.95	1	1	WB	0.731	0	3	0.000	2.194	0.000	0.806	Segment 1	0.25	Flashing beacons on warning signs + Transverse rumble strips
0.5	1	0.94	1	1	1	WB	0.940	0	1	0.000	0.940	0.000	0.060	Segment 1	0.5	Speed feedback sign at MP 0.5
								0	4			0.000	0.866			

~~CS 10W.XX (MP 9-12)~~ - - - - - - - - - - - - - - -

							Effective	Current		Post-Project		Reduction						
~~BMP~~	~~EMP~~	~~CMF1~~	~~CMF2~~	~~CMF3~~	~~CMF4~~	~~Dir~~	~~CMF~~	~~Fatal~~	~~Incap~~	~~Fatal~~	~~Incap~~	~~Fatal~~	~~Incap~~	~~-~~	~~-~~	~~-~~	~~Length~~	~~Notes~~
~~9.5~~	~~10~~	~~0.79~~	~~1~~	~~1~~	~~1~~	~~Both~~	~~0.790~~	~~3~~	~~0~~	~~2.370~~	~~0.000~~	~~0.630~~	~~0.000~~	~~Segment 1~~			~~0.5~~	~~Chevrons along curve + Delineators + RRPMs~~
~~9~~	~~12~~	~~0.77~~	~~0.77~~	~~1~~	~~1~~	~~Both~~	~~0.681~~	~~3~~	~~5~~	~~2.044~~	~~3.407~~	~~0.956~~	~~1.593~~	~~Segment 1~~			~~3~~	~~Install delineators and RRPMS~~
~~12~~	~~12.5~~	~~0.94~~	~~1~~	~~1~~	~~1~~	~~Both~~	~~0.940~~	~~0~~	~~3~~	~~0.000~~	~~2.820~~	~~0.000~~	~~0.180~~	~~Segment 1~~			~~0.5~~	~~Speed feedback sign at MP 12~~
								~~6~~	~~8~~			~~1.586~~	~~1.773~~					

CS 10W.8 (MP 18.5-18.5) WB

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
19	20	0.1	1	1	1	Both	0.500	2	0	1.000	0.000	1.000	0.000	Segment 2	1	Pedestrian fencing (Ped Only)
19	19.5	0.94	1	1	1	WB	0.940	1	0	0.940	0.000	0.060	0.000	Segment 2	0.5	EB speed feedback sign (all minus Ped)
								3	0			1.060	0.000			

CS 10W.8 (MP 18.5-18.5) EB

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
19	20	0.1	1	1	1	EB	0.500			0.000	0.000	0.000	0.000	Segment 2	0.5	Pedestrian fencing (Ped Only)
								0	0			0.000	0.000			

CS 10W.XX (MP 18.9-19.9)

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
19	20	0.1	1	1	1	Both	0.500	2	0	1.000	0.000	1.000	0.000	Segment 2	1	Pedestrian fencing
19.5	20	0.94	1	1	1	EB	0.940	0	0	0.000	0.000	0.000	0.000	Segment 2	0.5	WB speed feedback sign
								2	0			1.000	0.000			

CS 10W.9 (MP 32-41) EB

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
32	39.1	0.77	1	1	1	Both	0.770	3	0	2.310	0.000	0.690	0.000	Segment 4	7.1	RRPMs
39.1	39.4	0.68	0.77	1	1	EB	0.602	1	1	0.602	0.602	0.398	0.398	Segment 4	0.3	Widen shoulders + RRPMs
39.4	41.5	0.77	1	1	1	Both	0.770	1	1	0.770	0.770	0.230	0.230	Segment 4	2.1	RRPMs
41.5	42	0.77	0.94	1	1	Both	0.747	0	1	0.000	0.747	0.000	0.253	Segment 4	0.5	Speed feedback sign at MP 41 + RRPMs
								5	3			1.318	0.881			

CS 10W.9 (MP 32-41) WB

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
32	41.5	0.86	1	1	1	Both	0.860	1	7	0.860	6.020	0.140	0.980	Segment 4	9.5	RRPMs
41.5	42	0.94	0.86	1	1	Both	0.874	0	0	0.000	0.000	0.000	0.000	Segment 4	0.5	Speed feedback sign at MP 41 + RRPMs
								1	7			0.140	0.980			

CS 10W.XX (MP 55-62)

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
55	62	0.86	0.98	0.86	1	Both	0.792	1	12	0.792	9.502	0.208	2.498	Segment 5	7	Widen shoulders + improve median slope + RRPMs
								1	12			0.208	2.498			

CS 10W.12 (MP 67.5-68.5) EB

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
67.5	68	0.86	1	1	1	EB	0.860	1	1	0.860	0.860	0.140	0.140	Segment 5	0.5	Widen shoulders
68	68.51	0.86	0.94	1	1	EB	0.834	1	2	0.834	1.668	0.166	0.332	Segment 5	0.51	Widen shoulders + Install speed feedback sign at MP 68
								2	3			0.306	0.472			

CS 10W.13 (MP 74-79) EB

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
74	74.5	0.71	0.77	1	1	Both	0.628	0	0	0.000	0.000	0.000	0.000	Segment 6	0.5	Install delineators + clear vegatation
74.5	75	0.62	0.71	0.77	1	Both	0.500	1	0	0.500	0.000	0.500	0.000	Segment 6	0.5	Install delineators + clear vegetation (increase clear zone) + Guardrail near drainage culvert (both directions)
76	76.5	0.94	1	1	1	Both	0.940	0	1	0.000	0.940	0.000	0.060	Segment 6	0.5	Speed feedback sign MP 76
76.5	79	0.71	0.77	1	1	Both	0.628	1	2	0.628	1.257	0.372	0.743	Segment 6	2.5	Install delineators + clear vegetation (increase clear zone)
								2	3			0.872	0.803			

CS 10W.13 (MP 74-79) WB

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
74	74.5	0.71	0.77	1	1	Both	0.628	0	0	0.000	0.000	0.000	0.000	Segment 6	0.5	Install delineators + clear vegatation
74.5	75	0.62	0.71	0.77	0.98	Both	0.500	1	2	0.500	1.000	0.500	1.000	Segment 6	0.5	Install delineators + clear vegetation (increase clear zone) + Guardrail near drainage culvert (both directions) + speed feedback sign
76.5	79	0.71	0.77	1	1	Both	0.628	0	1	0.000	0.628	0.000	0.372	Segment 6	2.5	Install delineators + clear vegetation (increase clear zone)
								1	3			0.500	1.372			

CS 10W.XX (MP 83-94)

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
83	84	0.86	0.98	1	1	WB	0.851	0	0	0.000	0.000	0.000	0.000	Segment 7	1	Widen shoulders + improve roadside slope
83	84	0.86	0.98	0.94	1	EB	0.826	2	0	1.652	0.000	0.348	0.000	Segment 7	1	Widen shoulders + improve roadside slope + speed feedback sign at MP 83.5

CS 10W.XX (MP 104-108)

							Effective	Current		Post-Project		Reduction				

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
104	104.5	0.86	0.98	0.86	0.94	EB	0.768	1	1	0.768	0.768	0.232	0.232	Segment 8	0.5	Widen shoulders + improve roadside slope + RRPMs + Speed feedback sign at MP 104
104.5	108	0.86	0.98	0.86	1	Both	0.792	6	5	4.751	3.959	1.249	1.041	Segment 8	3.5	Widen shoulders + improve roadside slope + RRPMs
								7	6			1.249	1.041			

CS 85.XX A (MP 151-153)

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
152.75	153.25	0.75	0.81	1	1	Both	0.679	1	1	0.679	0.679	0.321	0.321	Segment 9	0.5	Broadway Road: Intersection warning beacons + larger stop signs with beacons
151.75	152.25	0.75	0.81	1	1	NB	0.679	1	0	0.679	0.000	0.321	0.000	Segment 9	0.5	Southern Avenue: Intersection warning beacons + larger stop signs with beacons
150.75	151.25	0.75	0.81	1	1	Both	0.679	1	4	0.679	2.715	0.321	1.285	Segment 9	0.5	Baseline Road: Intersection warning beacons + larger stop signs with beacons
		1	1	1	1	NB	1.000			0.000	0.000	0.000	0.000	Segment 9	0	
		1	1	1	1	NB	1.000			0.000	0.000	0.000	0.000	Segment 9	0	
		1	1	1	1	NB	1.000			0.000	0.000	0.000	0.000	Segment 9	0	
		1	1	1	1	NB	1.000			0.000	0.000	0.000	0.000	Segment 9	0	
		1	1	1	1	NB	1.000			0.000	0.000	0.000	0.000	Segment 9	0	
		1	1	1	1	NB	1.000			0.000	0.000	0.000	0.000	Segment 9	0	
								3	5			0.964	1.606			

CS 85.19 A (MP 151-153) Pos

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
152.75	153.25	0.4	1	1	1	Both	0.500	1	1	0.500	0.500	0.500	0.500	Segment 9	0.5	Roundabout at Broadway Road
152.25	152.75	0.67	1	1	1	Both	0.670	0	0	0.000	0.000	0.000	0.000	Segment 10	0.5	
151.75	152.25	0.4	1	1	1	Both	0.500	1	0	0.500	0.000	0.500	0.000	Segment 11	0.5	Roundabout at Southern Avenue
151.25	151.75	0.67	1	1	1	Both	0.670	0	0	0.000	0.000	0.000	0.000	Segment 12	0.5	
150.75	151.25	0.4	1	1	1	Both	0.500	1	3	0.500	1.500	0.500	1.500	Segment 13	0.5	Roundabout at Baseline Road
								3	4			1.500	2.000			

CS 85.19 A (MP 151-153) Neg

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
152.75	153.25	0.4	1	1	1	Both	0.500	0	0	0.000	0.000	0.000	0.000	Segment 9	0.5	Roundabout at Broadway Road
152.25	152.75	0.67	1	1	1	Both	0.670	0	0	0.000	0.000	0.000	0.000	Segment 10	0.5	
151.75	152.25	0.4	1	1	1	Both	0.500	0	0	0.000	0.000	0.000	0.000	Segment 11	0.5	Roundabout at Southern Avenue
151.25	151.75	0.67	1	1	1	Both	0.670	0	0	0.000	0.000	0.000	0.000	Segment 12	0.5	
150.75	151.25	0.4	1	1	1	Both	0.500	0	1	0.000	0.500	0.000	0.500	Segment 13	0.5	Roundabout at Baseline Road
								0	1			0.000	0.500			

CS 85.19 B (MP 151-153) Pos

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
152.75	153.25	0.66	1	1	1	Both	0.660	1	1	0.660	0.660	0.340	0.340	Segment 9	0.5	Grade separation at Broadway Road

151.75	152.25	0.66	1	1	1	Both	0.660	1	0	0.660	0.000	0.340	0.000	Segment 9	0.5	Grade separation at Southern Avenue
150.75	151.25	0.66	1	1	1	Both	0.660	1	3	0.660	1.980	0.340	1.020	Segment 9	0.5	Grade separation at Baseline Road
								3	4			1.020	1.360			

CS 85.19 B (MP 151-153) Neg

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
152.75	153.25	0.66	1	1	1	Both	0.660	0	0	0.000	0.000	0.000	0.000	Segment 9	0.5	Grade separation at Broadway Road
151.75	152.25	0.66	1	1	1	Both	0.660	0	0	0.000	0.000	0.000	0.000	Segment 9	0.5	Grade separation at Southern Avenue
150.75	151.25	0.66	1	1	1	Both	0.660	0	1	0.000	0.660	0.000	0.340	Segment 9	0.5	Grade separation at Baseline Road
								0	1			0.000	0.340			

CS 85.XX (MP 122-123.1)

							Effective	Current		Post-Project		Reduction				
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap		Length	Notes
122	123	0.62	0.86	0.85	1	NB	0.533	2	0	1.067	0.000	0.933	0.000	Segment 12	1	Median guardrail + RRPMs + Restripe centerline with centerline rumblestrips (restrict passing)
								2	0			0.933	0.000			

Performance Area Scoring

				Pavement					Bridge					Safety					Mobility					Freight					
Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	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	Total Risk Factored Performance Area Benefit
CS10W.4B	Sugarloaf Area EB Pavement Improvements	MP 11-12	6.26	0.895	0.807	0.000	5.23	0.000	0.100	0.100	0.000	0.00	0.000	1.433	1.431	0.002	1.26	0.002	0.620	0.620	0.000	1.00	0.000	1.297	1.297	0.000	3.14	0.000	0.002
CS10W.6	Inspection Station Safety Improvements	MP 0-1	0.13	0.895	0.895	0.000	0.00	0.000	0.100	0.100	0.000	0.00	0.000	1.433	1.427	0.006	1.26	0.007	0.620	0.620	0.000	4.33	0.000	0.574	0.572	0.002	6.47	0.012	0.019
CS10W.7	Ferra Gulch Area Safety Improvements	MP 9-12	0.27	0.895	0.895	0.000	0.00	0.000	0.100	0.100	0.000	0.00	0.000	1.433	1.303	0.130	1.26	0.163	0.620	0.619	0.001	5.52	0.008	0.574	0.474	0.100	6.47	0.650	0.820
CS10W.8	Quartzsite Area Safety Improvements	MP 18.5-19.5	0.79	3.991	3.991	0.000	0.00	0.000	0.450	0.450	0.000	0.00	0.000	7.440	5.412	2.028	1.22	2.467	0.594	0.592	0.002	4.29	0.008	0.497	0.497	0.001	6.47	0.004	2.479
CS10W.9	Vicksburg Area Safety Improvements	MP 32-41	0.47	0.000	0.000	0.000	0.00	0.000	0.430	0.430	0.000	0.00	0.000	3.505	2.586	0.919	1.33	1.227	0.919	0.918	0.001	6.57	0.008	0.032	0.032	0.000	6.46	0.002	1.236
CS10W.10A	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	MP 33.78	0.84	0.000	0.000	0.000	5.35	0.000	0.430	0.430	0.000	0.00	0.000	3.505	3.505	0.000	1.33	0.000	0.919	0.919	0.000	3.71	0.000	1.051	0.653	0.398	6.46	2.572	2.572
CS10W.10B	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	MP 33.78	7.19	0.000	0.000	0.000	0.00	0.000	0.430	0.070	0.360	2.78	1.000	3.505	3.505	0.000	1.33	0.000	0.919	0.919	0.000	3.33	0.000	1.051	0.641	0.410	6.46	2.650	3.650
CS10W.11	Lone Mountain Area EB Safety Improvements	MP 55-62	7.75	0.000	0.000	0.000	0.00	0.000	0.020	0.020	0.000	0.00	0.000	1.007	0.882	0.126	1.18	0.148	0.502	0.502	0.000	6.31	0.002	0.279	0.279	0.000	6.36	0.000	0.150
CS10W.12	Centennial Area EB Safety Improvements	MP 67.5-68.5	1.19	0.000	0.000	0.000	0.00	0.000	0.020	0.020	0.000	0.00	0.000	1.007	0.909	0.098	1.18	0.116	0.502	0.502	0.000	4.25	0.001	0.279	0.279	0.000	6.36	0.000	0.117
CS10W.13	Big Horn Area Safety Improvements	MP 74-79	3.19	0.364	0.364	0.000	0.00	0.000	0.000	0.000	0.000	0.00	0.000	7.110	5.680	1.429	1.25	1.783	0.571	0.570	0.001	6.09	0.004	0.433	0.432	0.000	6.39	0.001	1.788
CS10W.14	Tonopah Area Safety Improvements	MP 83-94	10.66	3.407	3.407	0.000	0.00	0.000	5.775	3.999	1.776	0.00	0.000	5.775	3.423	2.352	1.23	2.886	0.806	0.802	0.004	6.59	0.023	0.083	0.083	0.000	6.37	0.003	2.912
CS10W.15	West Buckeye Area Safety Improvements	MP 104-108	3.99	1.153	1.153	0.000	0.00	0.000	1.620	0.873	0.748	0.00	0.000	1.620	0.931	0.689	1.44	0.990	0.993	0.992	0.001	6.13	0.008	0.497	0.497	0.000	6.43	0.002	0.999
CS10W.16A	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	MP 101.40	0.84	1.153	1.153	0.000	5.49	0.000	1.620	1.620	0.000	0.00	0.000	1.620	1.620	0.000	1.44	0.000	0.993	0.993	0.000	3.76	0.000	1.058	0.750	0.308	6.43	1.980	1.980
CS10W.16B	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	MP 101.40	2.92	1.153	1.153	0.000	0.00	0.000	1.620	1.620	0.00	2.26	0.000	1.620	1.620	0.00	1.44	0.000	0.993	0.993	0.000	3.33	0.000	1.058	0.660	0.398	6.43	2.558	2.558
CS10W.17A	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	MP 112.75	0.84	1.153	1.153	0.000	5.49	0.000	1.620	1.426	0.19	0.00	0.000	1.620	1.426	0.19	1.44	0.279	0.993	0.993	0.001	3.76	0.003	1.058	0.831	0.228	6.43	1.464	1.745
CS10W.17B	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	MP 112.75	5.40	1.153	1.153	0.000	0.00	0.000	1.620	1.620	0.00	1.93	0.000	1.620	1.620	0.00	1.44	0.000	0.993	0.993	0.000	3.33	0.000	1.058	0.660	0.398	6.43	2.558	2.558
CS10W.18A	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	MP 112.92	0.84	1.153	1.153	0.000	5.49	0.000	1.620	1.426	0.19	0.00	0.000	1.620	1.426	0.19	1.44	0.279	0.993	0.993	0.001	3.76	0.003	1.058	0.831	0.228	6.43	1.464	1.745
CS10W.18B	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	MP 112.92	5.52	1.153	1.153	0.000	0.00	0.000	1.620	1.588	0.03	1.93	0.062	1.620	1.587	0.03	1.44	0.048	0.993	0.993	0.000	3.33	0.000	1.058	0.844	0.215	6.43	1.380	1.490
CS85.19A	Buckeye Area Safety Improvements	MP 151-153	46.71	0.100	0.100	0.000	0.00	0.000	5.811	1.411	4.40	0.00	0.000	5.811	2.661	3.15	1.80	5.673	0.504	0.495	0.009	4.64	0.040	0.061	0.060	0.001	5.64	0.005	5.718
CS85.19B	Buckeye Area Safety Improvements	MP 151-153	152.86	0.100	0.100	0.000	0.00	0.000	5.811	1.411	4.40	0.00	0.000	5.811	3.702	2.11	1.80	3.798	0.504	0.495	0.009	4.64	0.040	0.061	0.060	0.001	5.64	0.003	3.841
CS85.20	North Gila Bend SB General Purpose Lanes	MP 123-120	20.75	0.000	0.000	0.000	0.00	0.000	2.149	2.149	0.00	0.00	0.000	4.742	4.742	0.00	3.70	0.000	5.752	1.227	4.525	6.24	28.243	0.014	0.014	0.000	7.19	0.000	28.243
CS85.21	North Gila Bend Area Safety Improvements	MP 122-123.1	0.52	0.000	0.000	0.000	0.00	0.000	2.149	2.149	0.00	0.00	0.000	11.149	11.149	0.00	3.70	0.000	5.752	5.751	0.001	5.52	0.004	0.362	0.304	0.058	7.19	0.415	0.419
CS85.22A	Butterfield Trail Mobility Improvements	MP 120-123	20.44	0.000	0.000	0.00	0.00	0.000	0.000	0.000	0.00	0.00	0.000	0.000	0.000	0.00	4.24	0.000	9.841	1.894	7.947	7.10	56.412	1.261	1.261	0.000	8.09	0.000	56.412
CS85.22B	Butterfield Trail Mobility Improvements	MP 120-123	13.66	0.000	0.000	0.00	0.00	0.000	0.000	0.000	0.00	0.00	0.000	0.000	0.000	0.00	4.24	0.000	9.841	9.841	0.000	7.10	0.000	1.261	1.261	0.000	8.09	0.000	0.000

Emphasis Area 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
				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				
CS10W.4B	Sugarloaf Area EB Pavement Improvements	MP 11-12	6.26	3.048	2.539	0.509	1.26	1.50	0.959	0.425	0.425	0.000	1.00	1.50	0.000	0.471	0.471	0.000	3.14	1.50	0.000	0.961	0.82	15.3	1.92
CS10W.6	Inspection Station Safety Improvements	MP 0-1	0.132	3.048	2.538	0.509	1.26	1.50	0.960	0.425	0.425	0.000	4.33	1.50	0.000	0.471	0.470	0.000	6.47	1.50	0.001	0.981	1.50	15.30	170.4
CS10W.7	Ferra Gulch Area Safety Improvements	MP 9-12	0.265	3.048	2.487	0.560	1.26	1.50	1.056	0.425	0.425	0.000	5.52	1.50	0.000	0.471	0.462	0.008	6.47	1.50	0.081	1.958	3.28	15.30	371.0
CS10W.8	Quartzsite Area Safety Improvements	MP 18.5-19.5	0.794	3.048	2.467	0.580	1.22	1.50	1.059	0.425	0.425	0.000	4.29	1.50	0.000	0.471	0.466	0.004	6.47	1.50	0.042	3.580	1.43	15.30	98.8
CS10W.9	Vicksburg Area Safety Improvements	MP 32-41	0.472	3.048	2.438	0.610	1.33	1.50	1.221	0.425	0.425	0.000	6.57	1.50	0.000	0.471	0.460	0.010	6.46	1.50	0.101	2.558	4.86	15.30	402.9
CS10W.10A	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	MP 33.78	0.843	3.048	2.540	0.508	1.33	1.50	1.017	0.425	0.425	0.000	3.71	1.50	0.000	0.471	0.471	0.000	6.46	1.50	0.000	3.589	0.90	8.80	33.7
CS10W.10B	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	MP 33.78	7.188	3.048	2.540	0.508	1.33	1.50	1.017	0.425	0.425	0.000	3.33	1.50	0.000	0.471	0.471	0.000	6.46	1.50	0.000	4.667	0.90	30.60	17.8
CS10W.11	Lone Mountain Area EB Safety Improvements	MP 55-62	7.752	3.048	2.515	0.533	1.18	1.50	0.943	0.425	0.425	0.000	6.31	1.50	0.000	0.471	0.469	0.002	6.36	1.50	0.019	1.112	3.37	15.30	7.4
CS10W.12	Centennial Area EB Safety Improvements	MP 67.5-68.5	1.185	3.048	2.520	0.528	1.18	1.50	0.934	0.425	0.425	0.000	4.25	1.50	0.000	0.471	0.469	0.002	6.36	1.50	0.015	1.066	0.74	15.30	10.2
CS10W.13	Big Horn Area Safety Improvements	MP 74-79	3.193	3.048	2.439	0.608	1.25	1.50	1.138	0.425	0.425	0.000	6.09	1.50	0.000	0.471	0.464	0.006	6.39	1.50	0.059	2.986	4.17	15.30	59.7
CS10W.14	Tonopah Area Safety Improvements	MP 83-94	10.659	3.048	2.298	0.750	1.23	1.50	1.379	0.425	0.425	0.000	6.59	1.50	0.000	0.471	0.458	0.012	6.37	1.50	0.117	4.409	4.88	15.30	30.9
CS10W.15	West Buckeye Area Safety Improvements	MP 104-108	3.992	3.048	2.468	0.579	1.44	1.50	1.248	0.425	0.425	0.000	6.13	1.50	0.000	0.471	0.461	0.010	6.43	1.50	0.092	2.338	4.19	15.30	37.6
CS10W.16A	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	MP 101.40	0.843	3.048	3.048	0.000	1.44	1.50	0.000	0.425	0.425	0.000	3.76	1.50	0.000	0.471	0.471	0.000	6.43	1.50	0.000	1.980	1.02	8.80	21.0
CS10W.16B	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	MP 101.40	2.92	3.048	3.048	0.000	1.44	1.50	0.000	0.425	0.425	0.000	3.33	1.50	0.000	0.471	0.471	0.000	6.43	1.50	0.000	2.558	1.02	30.60	27.3
CS10W.17A	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	MP 112.75	0.843	3.048	2.530	0.517	1.44	1.50	1.114	0.425	0.425	0.000	3.76	1.50	0.000	0.471	0.471	0.000	6.43	1.50	0.000	2.859	1.02	8.80	30.4
CS10W.17B	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	MP 112.75	5.401	3.048	3.048	0.000	1.44	1.50	0.000	0.425	0.425	0.000	3.33	1.50	0.000	0.471	0.471	0.000	6.43	1.50	0.000	2.558	1.02	30.60	14.8
CS10W.18A	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	MP 112.92	0.843	3.048	2.530	0.517	1.44	1.50	1.114	0.425	0.425	0.000	3.76	1.50	0.000	0.471	0.469	0.001	6.43	1.50	0.013	2.872	1.02	8.80	30.5
CS10W.18B	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	MP 112.92	5.52	3.048	2.538	0.509	1.44	1.50	1.097	0.425	0.425	0.000	3.33	1.50	0.000	0.471	0.470	0.000	6.43	1.50	0.002	2.589	1.02	30.60	14.6
CS85.19A	Buckeye Area Safety Improvements	MP 151-153	46.714	3.048	2.424	0.623	1.80	1.50	1.684	0.425	0.425	0.000	4.64	1.50	0.000	0.471	0.461	0.010	5.64	1.50	0.083	7.485	1.97	20.20	6.4
CS85.19B	Buckeye Area Safety Improvements	MP 151-153	152.856	3.048	2.464	0.583	1.80	1.50	1.576	0.425	0.425	0.000	4.64	1.50	0.000	0.471	0.464	0.007	5.64	1.50	0.057	5.474	1.97	20.20	1.4
CS85.20	North Gila Bend SB General Purpose Lanes	MP 123-120	20.747	3.048	2.540	0.508	3.70	1.50	2.819	0.425	0.416	0.010	6.24	1.50	0.093	0.471	0.468	0.003	7.19	1.50	0.031	31.186	1.04	20.20	31.6
CS85.21	North Gila Bend Area Safety Improvements	MP 122-123.1	0.518	3.048	2.524	0.524	3.70	1.50	2.908	0.425	0.425	0.000	5.52	1.50	0.000	0.471	0.469	0.002	7.19	1.50	0.022	3.349	0.41	15.30	40.5
CS85.22A	Butterfield Trail Mobility Improvements	MP 120-123	20.442	3.048	3.048	0.000	4.24	1.50	0.000	0.425	0.412	0.014	7.10	1.50	0.145	0.471	0.471	0.000	8.09	1.50	0.000	56.557	0.85	20.20	47.5
CS85.22B	Butterfield Trail Mobility Improvements	MP 120-123	13.662	3.048	3.048	0.000	4.24	1.50	0.000	0.425	0.425	0.000	7.10	1.50	0.000	0.471	0.471	0.000	8.09	1.50	0.000	0.000	0.85	20.20	0.0

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			
CS10W.4B	Sugarloaf Area EB Pavement Improvements	MP 11-12	6.26	0.000	0.0%	0.000	0.0%	0.961	100.0%	0.000	0.0%	0.000	0.0%	0.961	1.14	1.51	1.78	1.36	1.36	1.780	1.00	3
CS10W.6	Inspection Station Safety Improvements	MP 0-1	0.132	0.000	0.0%	0.000	0.0%	0.968	98.6%	0.000	0.0%	0.013	1.4%	0.981	1.14	1.51	1.78	1.36	1.36	1.774	1.00	302
CS10W.7	Ferra Gulch Area Safety Improvements	MP 9-12	0.27	0.000	0.0%	0.000	0.0%	1.219	62.3%	0.008	0.4%	0.731	37.3%	1.958	1.14	1.51	1.78	1.36	1.36	1.622	1.00	602
CS10W.8	Quartzsite Area Safety Improvements	MP 18.5-19.5	0.794	0.000	0.0%	0.000	0.0%	3.526	98.5%	0.008	0.2%	0.045	1.3%	3.580	1.14	1.51	1.78	1.36	1.36	1.774	1.54	270
CS10W.9	Vicksburg Area Safety Improvements	MP 32-41	0.472	0.000	0.0%	0.000	0.0%	2.447	95.7%	0.008	0.3%	0.102	4.0%	2.558	1.14	1.51	1.78	1.36	1.36	1.762	1.31	928
CS10W.10A	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	MP 33.78	0.843	0.000	0.0%	0.000	0.0%	1.017	28.3%	0.000	0.0%	2.572	71.7%	3.589	1.14	1.51	1.78	1.36	1.36	1.479	1.31	65
CS10W.10B	Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	MP 33.78	7.188	0.000	0.0%	1.000	21.4%	1.017	21.8%	0.000	0.0%	2.650	56.8%	4.667	1.14	1.51	1.78	1.36	1.36	1.484	1.31	35
CS10W.11	Lone Mountain Area EB Safety Improvements	MP 55-62	7.752	0.000	0.0%	0.000	0.0%	1.091	98.1%	0.002	0.2%	0.019	1.7%	1.112	1.14	1.51	1.78	1.36	1.36	1.772	0.46	6
CS10W.12	Centennial Area EB Safety Improvements	MP 67.5-68.5	1.185	0.000	0.0%	0.000	0.0%	1.050	98.5%	0.001	0.1%	0.015	1.4%	1.066	1.14	1.51	1.78	1.36	1.36	1.774	0.46	8
CS10W.13	Big Horn Area Safety Improvements	MP 74-79	3.19	0.000	0.0%	0.000	0.0%	2.921	97.8%	0.004	0.1%	0.060	2.0%	2.986	1.14	1.51	1.78	1.36	1.36	1.771	1.08	114
CS10W.14	Tonopah Area Safety Improvements	MP 83-94	10.659	0.000	0.0%	0.000	0.0%	4.265	96.7%	0.023	0.5%	0.120	2.7%	4.409	1.14	1.51	1.78	1.36	1.36	1.766	1.23	67
CS10W.15	West Buckeye Area Safety Improvements	MP 104-108	3.992	0.000	0.0%	0.000	0.0%	2.237	95.7%	0.008	0.3%	0.093	4.0%	2.338	1.14	1.51	1.78	1.36	1.36	1.762	1.23	81
CS10W.16A	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	MP 101.40	0.843	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	1.980	100.0%	1.980	1.14	1.51	1.78	1.36	1.36	1.360	1.23	35
CS10W.16B	355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	MP 101.40	2.92	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	2.558	100.0%	2.558	1.14	1.51	1.78	1.36	1.36	1.360	1.23	46
CS10W.17A	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	MP 112.75	0.843	0.000	0.0%	0.000	0.0%	1.393	48.7%	0.003	0.1%	1.464	51.2%	2.859	1.14	1.51	1.78	1.36	1.36	1.565	1.23	58
CS10W.17B	Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	MP 112.75	5.401	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	2.558	100.0%	2.558	1.14	1.51	1.78	1.36	1.36	1.360	1.23	25
CS10W.18A	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	MP 112.92	0.843	0.000	0.0%	0.000	0.0%	1.393	48.5%	0.003	0.1%	1.477	51.4%	2.872	1.14	1.51	1.78	1.36	1.36	1.564	1.23	59
CS10W.18B	Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	MP 112.92	5.52	0.000	0.0%	0.062	2.4%	1.145	44.2%	0.000	0.0%	1.382	53.4%	2.589	1.14	1.51	1.78	1.36	1.36	1.549	1.23	28
CS85.19A	Buckeye Area Safety Improvements	MP 151-153	46.714	0.000	0.0%	0.000	0.0%	7.357	98.3%	0.040	0.5%	0.088	1.2%	7.485	1.14	1.51	1.78	1.36	1.36	1.773	1.08	12
CS85.19B	Buckeye Area Safety Improvements	MP 151-153	152.856	0.000	0.0%	0.000	0.0%	5.374	98.2%	0.040	0.7%	0.060	1.1%	5.474	1.14	1.51	1.78	1.36	1.36	1.772	1.08	3
CS85.20	North Gila Bend SB General Purpose Lanes	MP 123-120	20.747	0.000	0.0%	0.000	0.0%	2.819	9.0%	28.336	90.9%	0.031	0.1%	31.186	1.14	1.51	1.78	1.36	1.36	1.398	1.69	75
CS85.21	North Gila Bend Area Safety Improvements	MP 122-123.1	0.518	0.000	0.0%	0.000	0.0%	2.908	86.8%	0.004	0.1%	0.437	13.0%	3.349	1.14	1.51	1.78	1.36	1.36	1.725	1.69	118
CS85.22A	Butterfield Trail Mobility Improvements	MP 120-123	20.442	0.000	0.0%	0.000	0.0%	0.000	0.0%	56.557	100.0%	0.000	0.0%	56.557	1.14	1.51	1.78	1.36	1.36	1.360	0.92	60
CS85.22B	Butterfield Trail Mobility Improvements	MP 120-123	13.662	0.000	#DIV/0!	0.000	#DIV/0!	0.000	#DIV/0!	0.000	#DIV/0!	0.000	#DIV/0!	0.000	1.14	1.51	1.78	1.36	1.36	#DIV/0!	0.92	#DIV/0!

Appendix K: Preliminary Scoping Reports for Prioritized Solutions

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: 3/31/2023	ADOT Project Manager:
Project Name: Sugarloaf Area EB Pavement Improvements	
City/Town: West Quartzsite	County: La Paz
COG/MPO: WACOG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 11	
End Limit: MP 12	
Project Length: 1	
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
Segment 10W-1 has several pavement hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the hot spots. The recommended solution is intended to improve pavement performance in segment 10W-1.			

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)* The recommended solution could significantly impact normal traffic operations during construction. The recommended solution proposes new infrastructure, which could have environmental impacts	

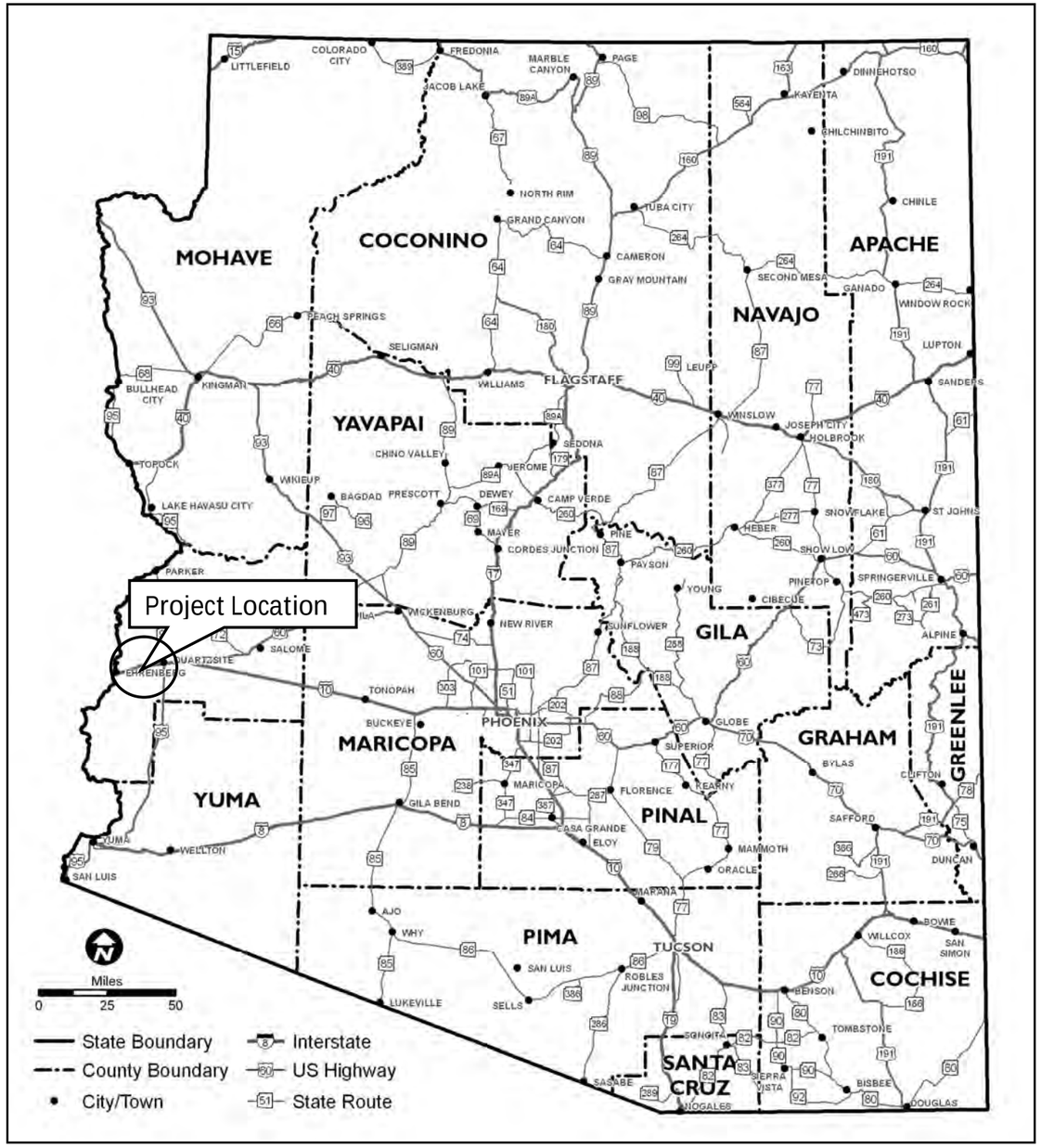
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$166,200	$554,000	$0	$5,540,000	$6,260,200

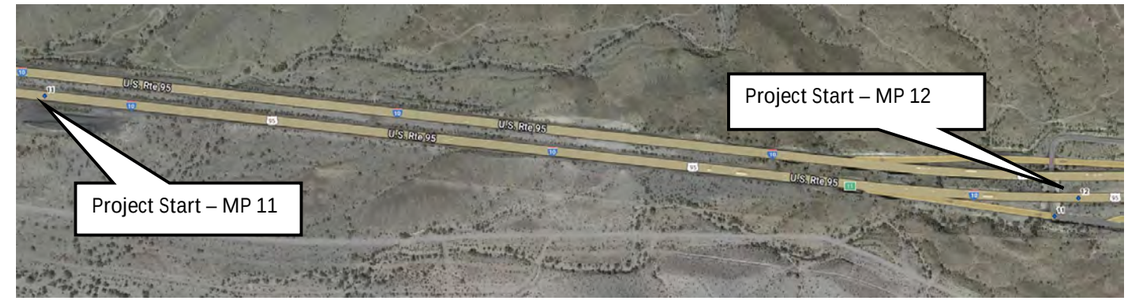
RECOMMENDED PROJECT DELIVERY		
Delivery: ☐ Design-Bid-Build	☐ Design-Build	☐ Other:
Design Program Year: FY		
Construction Program Year: FY		

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
(Provide a detailed breakdown of the project's scope of work using bullet format) • Option B • Replace pavement • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • Option A • Rehabilitate pavement • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Inspection Station Safety Improvements	
City/Town: Ehrenberg	County: La Paz
COG/MPO: WACOG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 0	
End Limit: MP 1	
Project Length: 1	
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
Segment 10W-1 has several safety hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the safety hot spots. The recommended solution is intended to improve safety performance and reduce the overall occurrence of crashes.			

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)* The recommended solution could significantly impact normal traffic operations during construction. The recommended solution proposes the implementation of signing, which requires ground disturbance with new poles and foundations, presenting an environmental risk.	

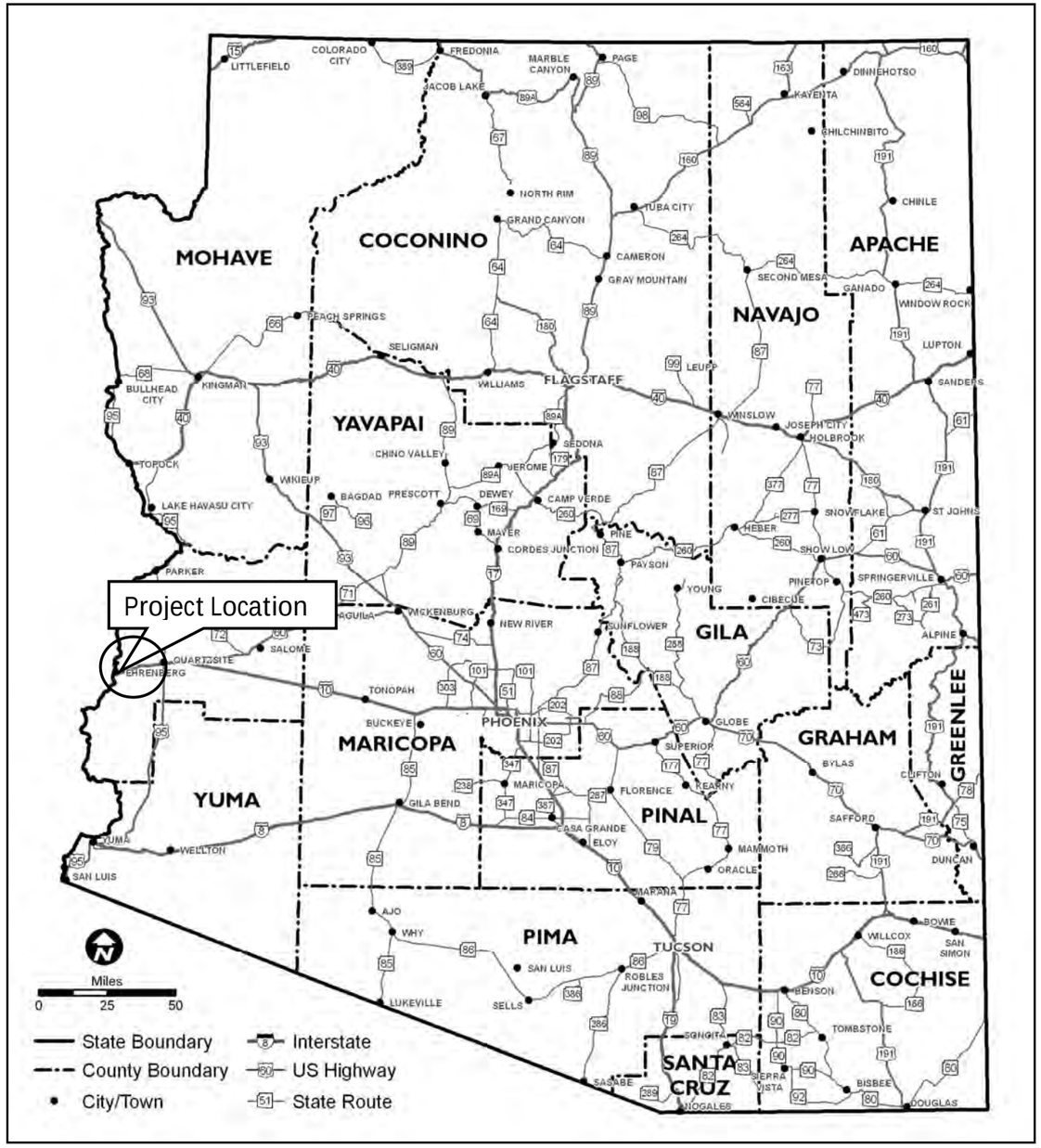
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$3,500	$11,800	$0	$117,350	$132,650

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
4) State Location Map 5) Project Vicinity Map 6) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Install additional warning features for westbound slowing/stop conditions • Install flashing beacons • Install rumble strips • Install WB speed feedback sign at MP 0.5 • • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Ferra Gulch Area Safety Improvements	
City/Town: East of Ehrenberg	County: La Paz
COG/MPO: WACOG	ADOT District: Southwest
Primary Route/Street:	
Beginning Limit: MP 9	
End Limit: MP 12	
Project Length: 3	
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
Segment 10W-1 has safety hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the safety hot spots. The recommended solution is intended to improve safety and reduce the overall occurrence of crashes.			

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)* The recommended solution could significantly impact normal traffic operations during construction. The recommended solution proposes the implementation of signing, requiring a ground disturbance with new poles and foundations, presenting an environmental risk.	

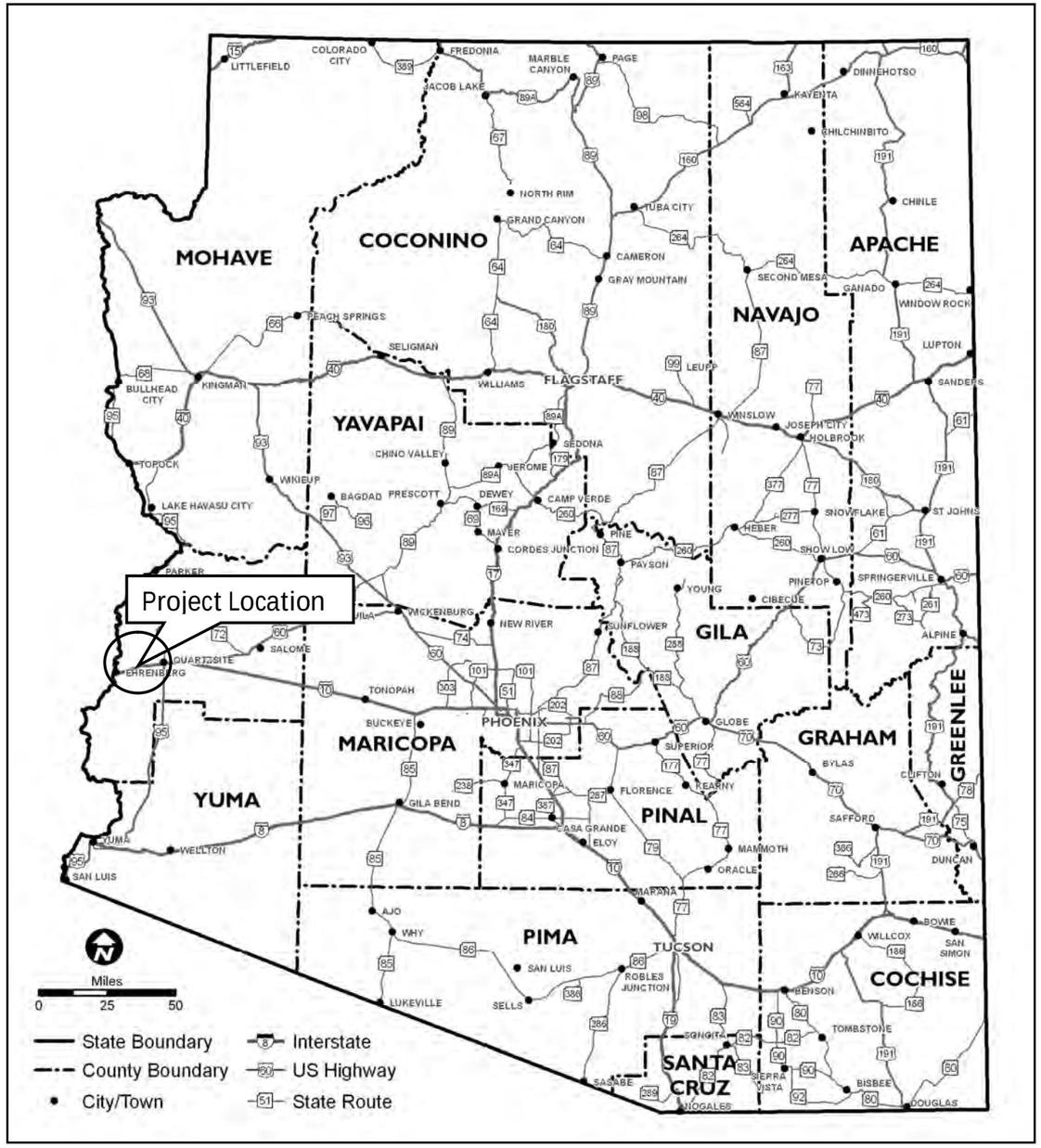
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$7,100	$23,400	$0	$234,000	$265,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
7) State Location Map 8) Project Vicinity Map 9) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Install chevrons along the curve MP 9.5-10 • Install delineators • Install raised pavement markers • Install a westbound speed feedback sign at MP 11 • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • 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: 3/31/2023	ADOT Project Manager:
Project Name: Quartzsite Area Safety Improvements	
City/Town: Quartzsite	County: La Paz
COG/MPO: WACOG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 19	
End Limit: MP 20	
Project Length: 1	
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
Segment 8-2 has a high safety need.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the safety need. The recommended solution is intended to improve safety and reduce the overall occurrence of crashes.			

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)* The recommended solution proposes implementing fencing, which requires ground disturbance presenting an environmental risk. The recommended solution is located in an urbanized area, which could present stakeholder issues.	

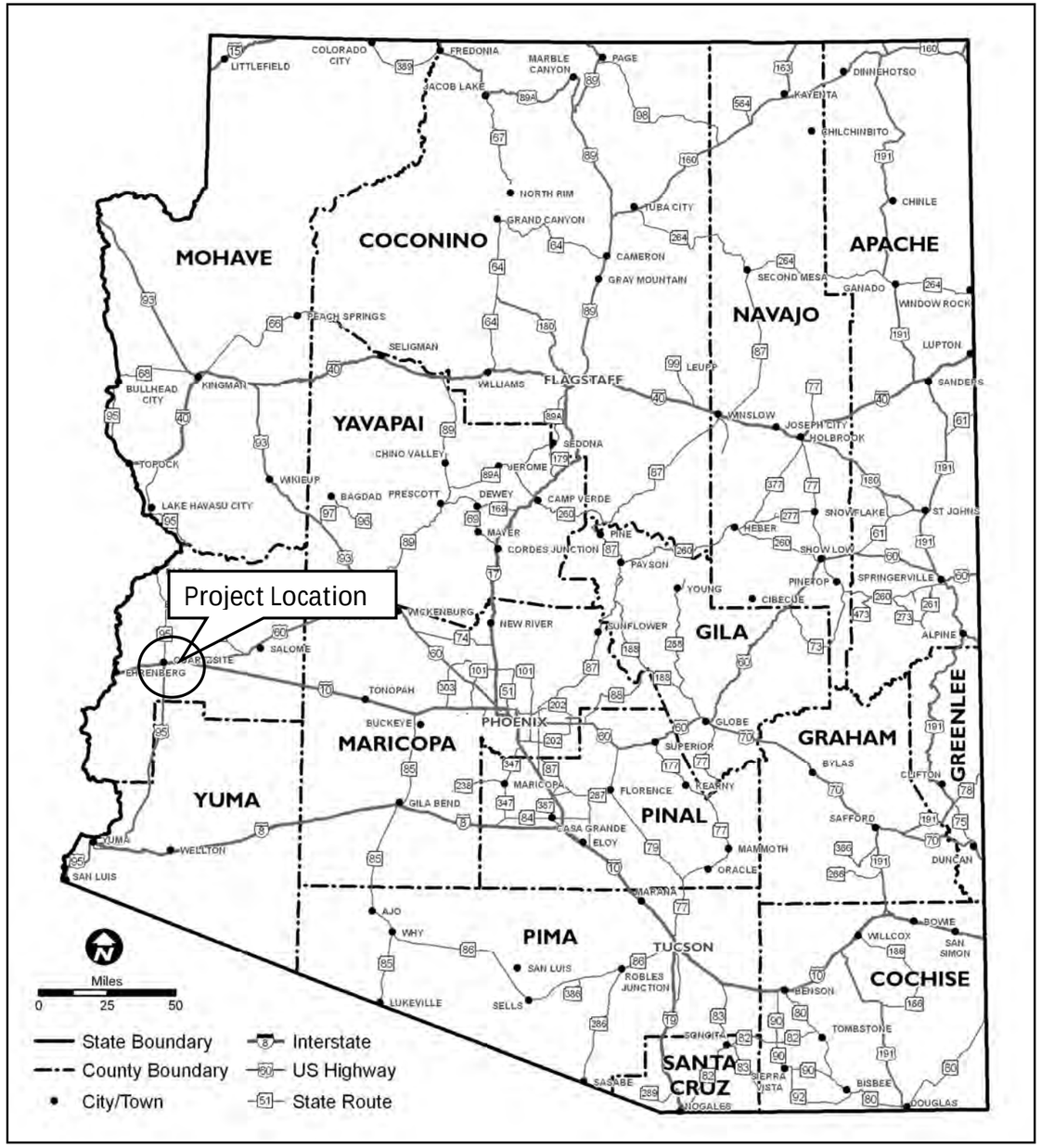
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$21,100	$70,30	$0	$702,400	$793,800

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
10) State Location Map 11) Project Vicinity Map 12) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Install EB speed feedback sign at MP 19.5 • Install access barrier fencing 19-20 • • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • 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: 3/31/2023	ADOT Project Manager:
Project Name: Vicksburg Area Safety Improvements	
City/Town:	County: La Paz
COG/MPO: WACOG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 32	
End Limit: MP 42	
Project Length: 10	
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
Segment 10W-4 has high safety needs.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the safety needs. The recommended solution is intended to improve safety and reduce the overall occurrence of crashes.			

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)* The recommended solution could significantly impact normal traffic operations during construction. The recommended solution proposes the implementation of signing, requiring a ground disturbance with new poles and foundations, presenting an environmental risk.	

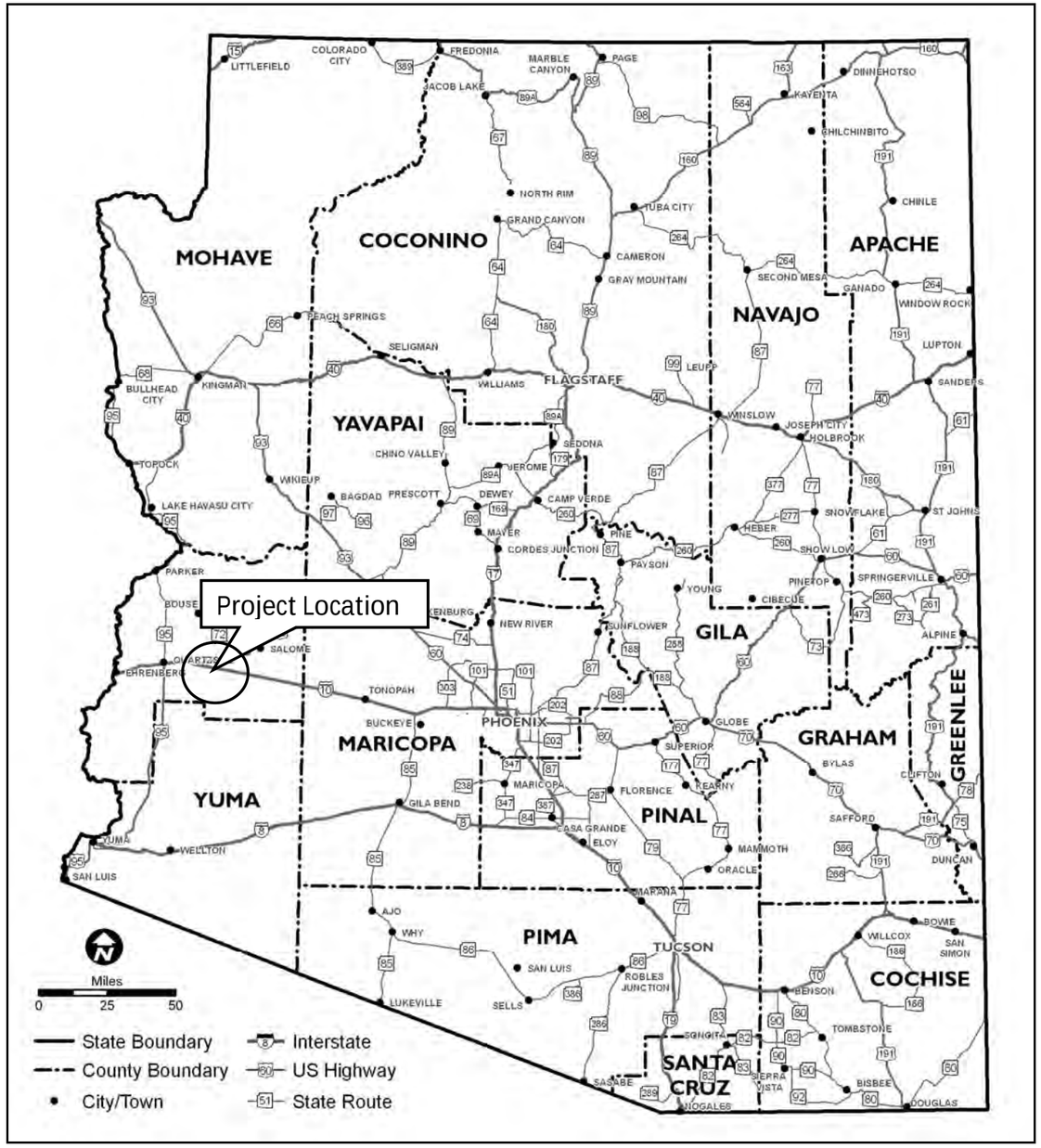
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$12,600	$41,800	$0	$417,80	$472,200

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
13) State Location Map 14) Project Vicinity Map 15) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Install reflective raised pavement markers on both edges of traveled way. • Install speed feedback signs at MP 41 • MP 39.1-39.4: Widen eastbound outside shoulder • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • 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: 3/31/2023	ADOT Project Manager:
Project Name: Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	
City/Town: East of Quartzsite	County: La Paz
COG/MPO: WACOG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 33.78	
End Limit: MP 33.78	
Project Length:	
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
Segment 10W-4 has several freight hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the freight hot spots. The recommended solution is intended to improve freight performance in Segment 10W-4.			

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)* The recommended solution could significantly impact normal traffic operations during construction.	

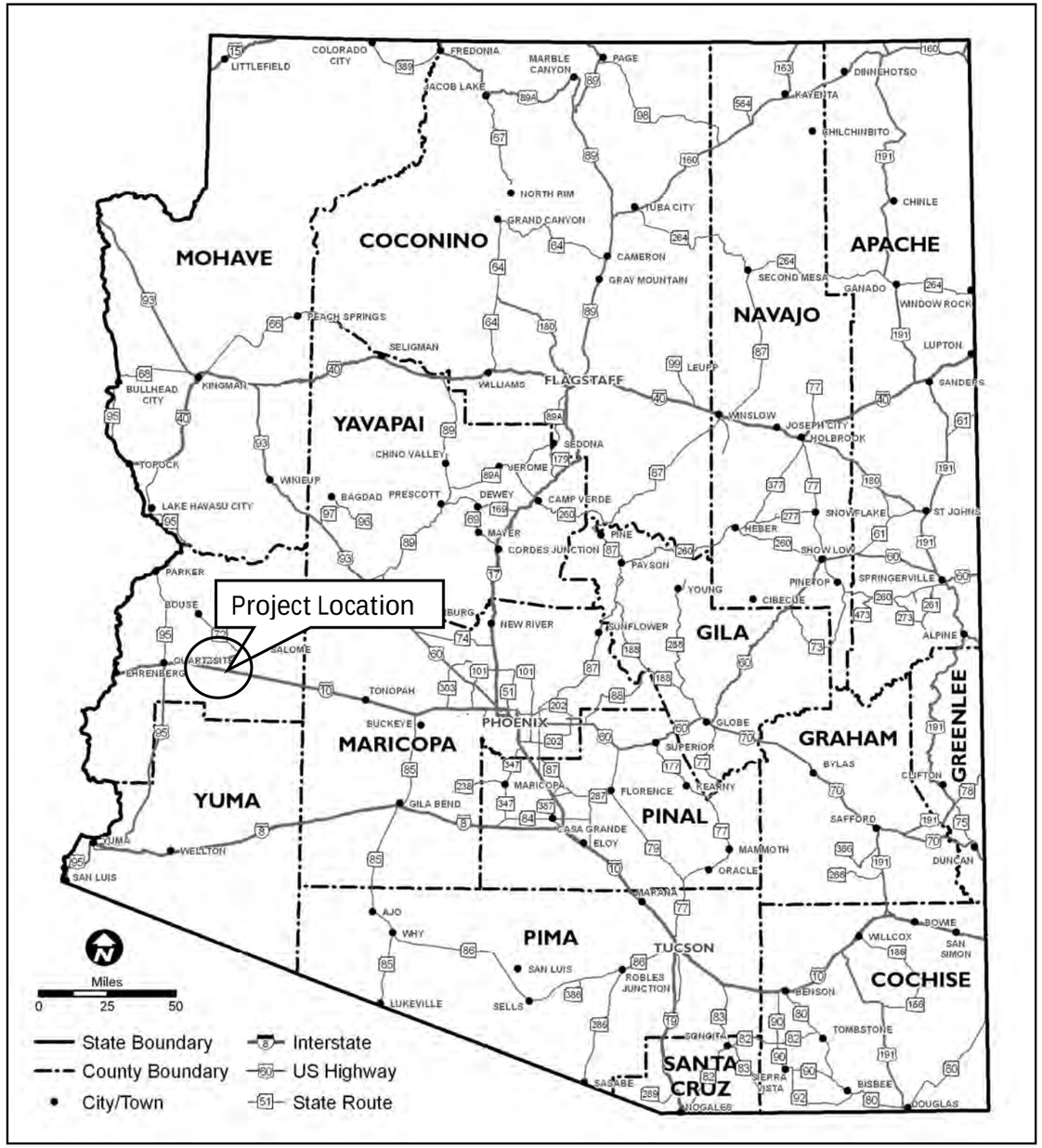
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$22,400	$74,600	$0	$746,000	$843,000

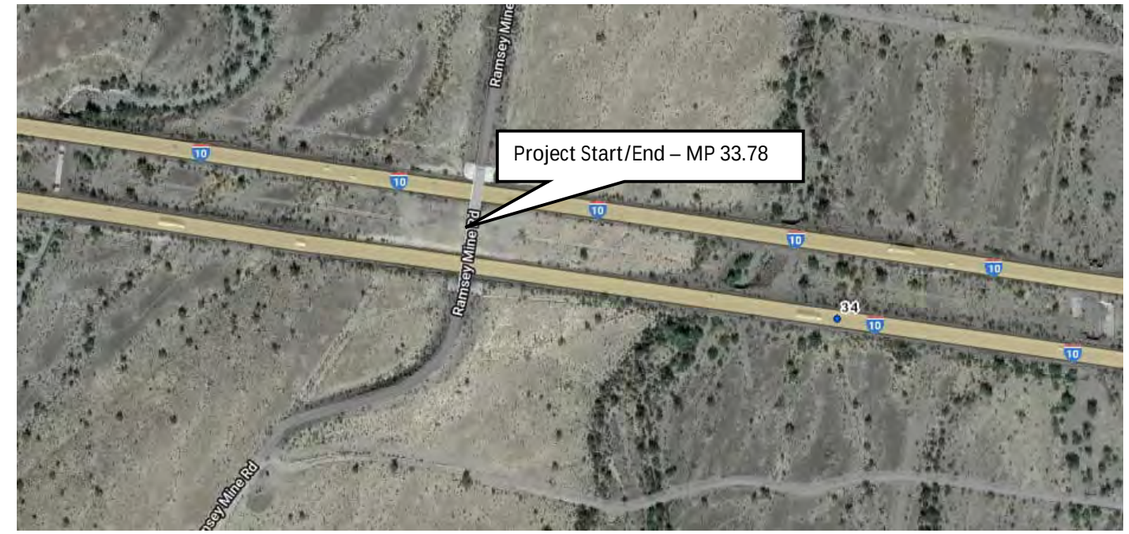
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
16) State Location Map 17) Project Vicinity Map 18) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Option A • Reprofile mainline • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • Option B • Replace bridge • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Ramsey Mine Rd UP (#1202) Freight / Bridge Vertical Clearance Mitigation	
City/Town: East of Quartzsite	County: La Pas
COG/MPO: WACOG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 33.78	
End Limit: MP 33.78	
Project Length:	
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
Segment 10W-4 has several freight hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☐	Expansion ☐
The recommended solution addresses a portion of the freight hot spots. The recommended solution is intended to improve freight performance.			

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)* The recommended solution could significantly impact normal traffic operations during construction.	

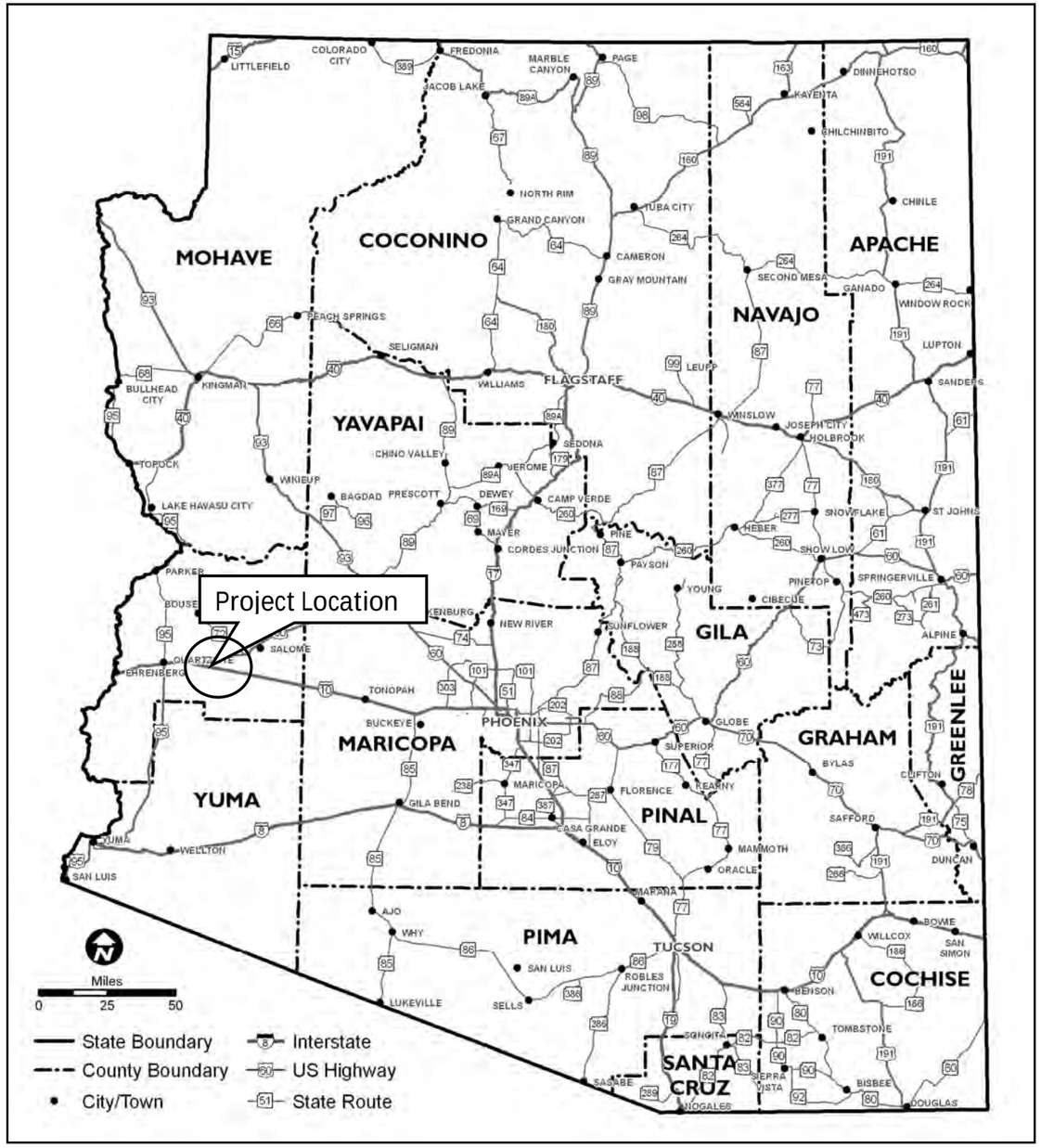
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$190,800	$636,100	$0	$6,361,080	$7,187,980

RECOMMENDED PROJECT DELIVERY		
Delivery: ☐ Design-Bid-Build	☐ Design-Build	☐ Other:
Design Program Year: FY		
Construction Program Year: FY		

ATTACHMENTS
19) State Location Map 20) Project Vicinity Map 21) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Option B • Replace bridge • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Lone Mountain Area EB Safety Improvements	
City/Town: Approximately 30 miles east of Quartzsite	County: La Paz
COG/MPO: WACOG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 55	
End Limit: MP 62	
Project Length: 7	
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
Segment 10W-5 has several safety hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the safety hot spots. The recommended solution is intended to improve safety performance and reduce the overall occurrence of crashes.			

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)*	

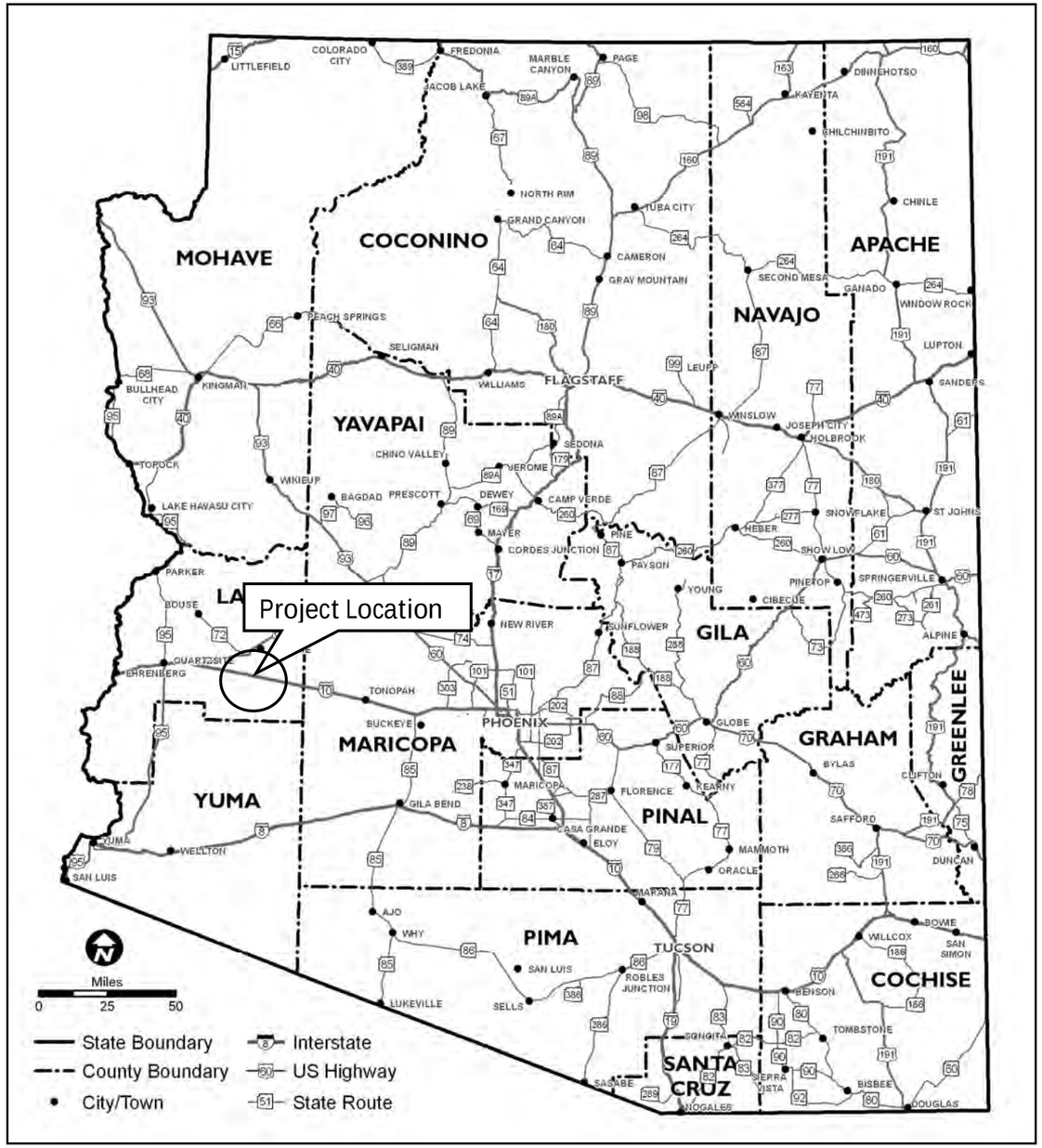
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$205,800	$686,000	$0	$6,860,000	$7,751,800

RECOMMENDED PROJECT DELIVERY		
Delivery: ☐ Design-Bid-Build	☐ Design-Build	☐ Other:
Design Program Year: FY		
Construction Program Year: FY		

ATTACHMENTS
22) State Location Map 23) Project Vicinity Map 24) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Widen EB shoulders • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Big Horn Area Safety Improvements	
City/Town: Approximately 55 miles east of Quartzsite	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 74	
End Limit: MP 79	
Project Length: 5	
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
Segment 10W-6 has high safety needs.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the safety needs. The recommended solution is intended to improve safety and reduce the overall occurrence of crashes.			

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)* The recommended solution could significantly impact normal traffic operations during construction. The recommended solution proposes the implementation of signing, requiring ground disturbance with new poles and foundations, presenting an environmental risk.	

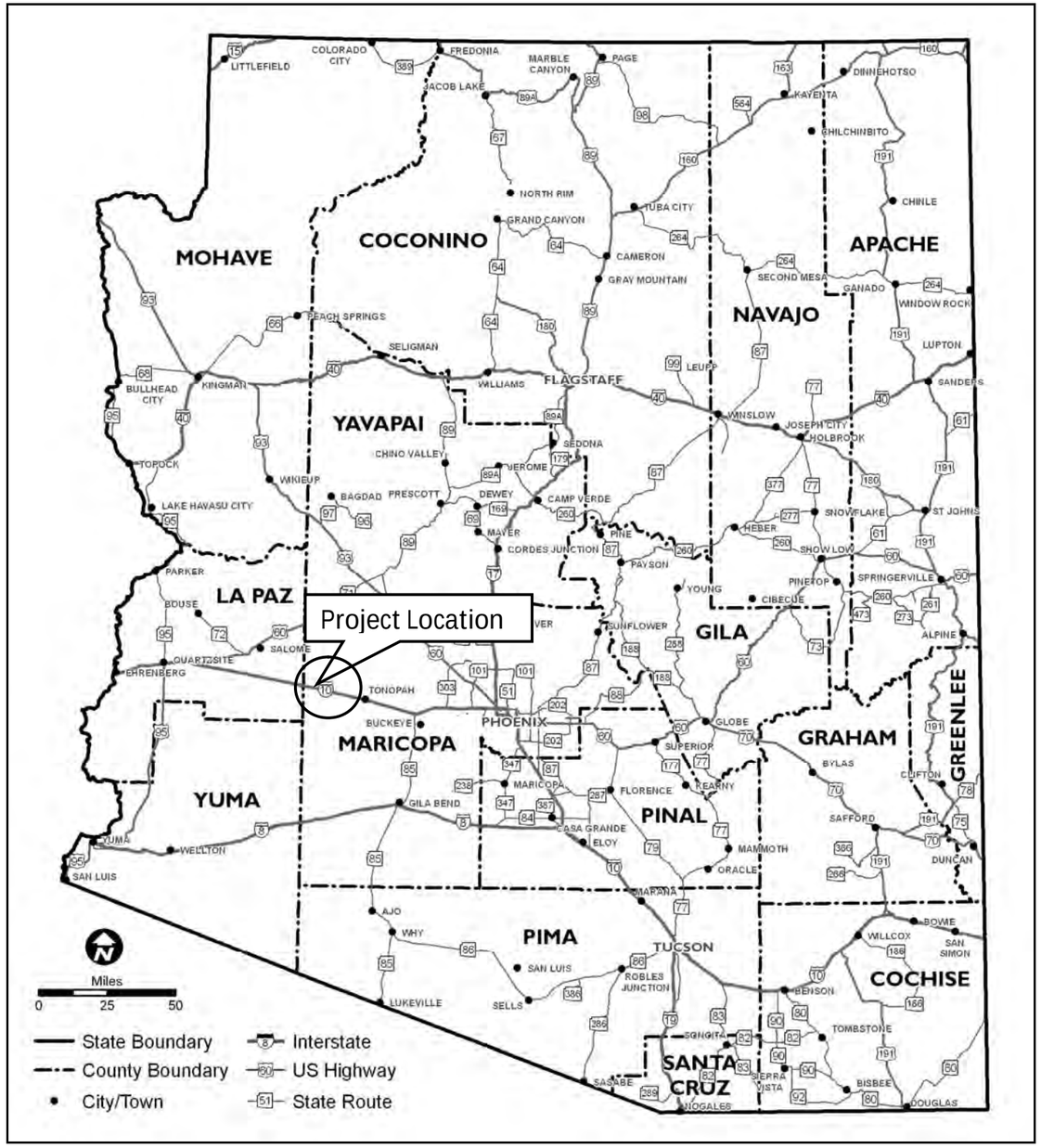
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$84,800	$282,600	$0	$2,825,600	$3,193,000

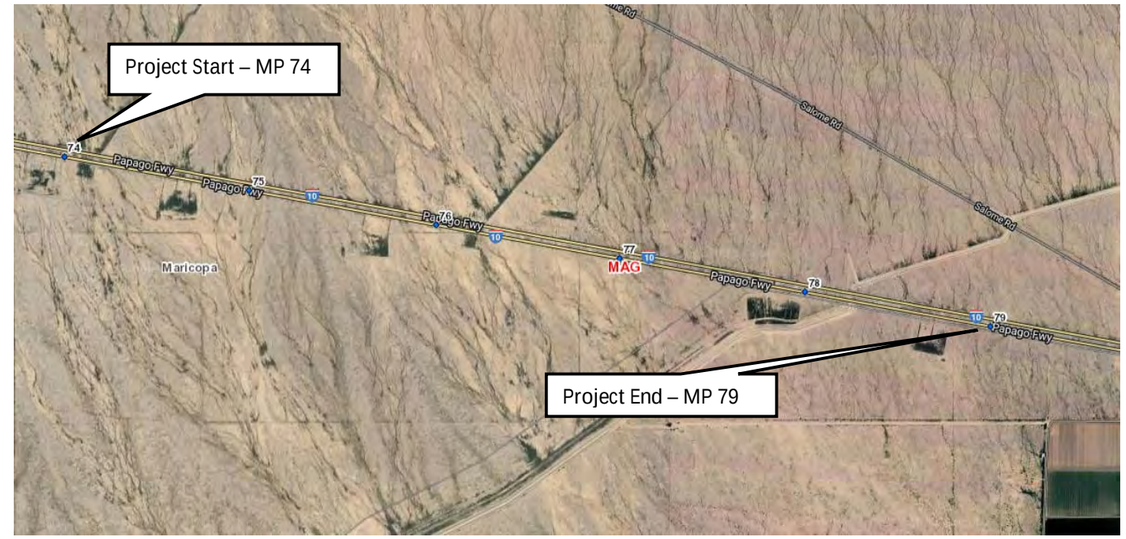
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
25) State Location Map 26) Project Vicinity Map 27) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Install delineators • Clear vegetation • Install speed feedback signs at MP 75 and MP 76 • Install guardrail near the drainage culvert at 74.75 in both directions • • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Tonopah Area Safety Improvements	
City/Town: West of Buckeye	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 83	
End Limit: MP 94	
Project Length: 11	
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
Segment 10W-7 has high safety needs.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the safety needs. The recommended solution is intended to improve safety and reduce the overall occurrence of crashes in segment 10W-7.			

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)* The recommended solution proposes the implementation of signing, which requires ground disturbance with new pols and foundations, presenting an environmental risk.	

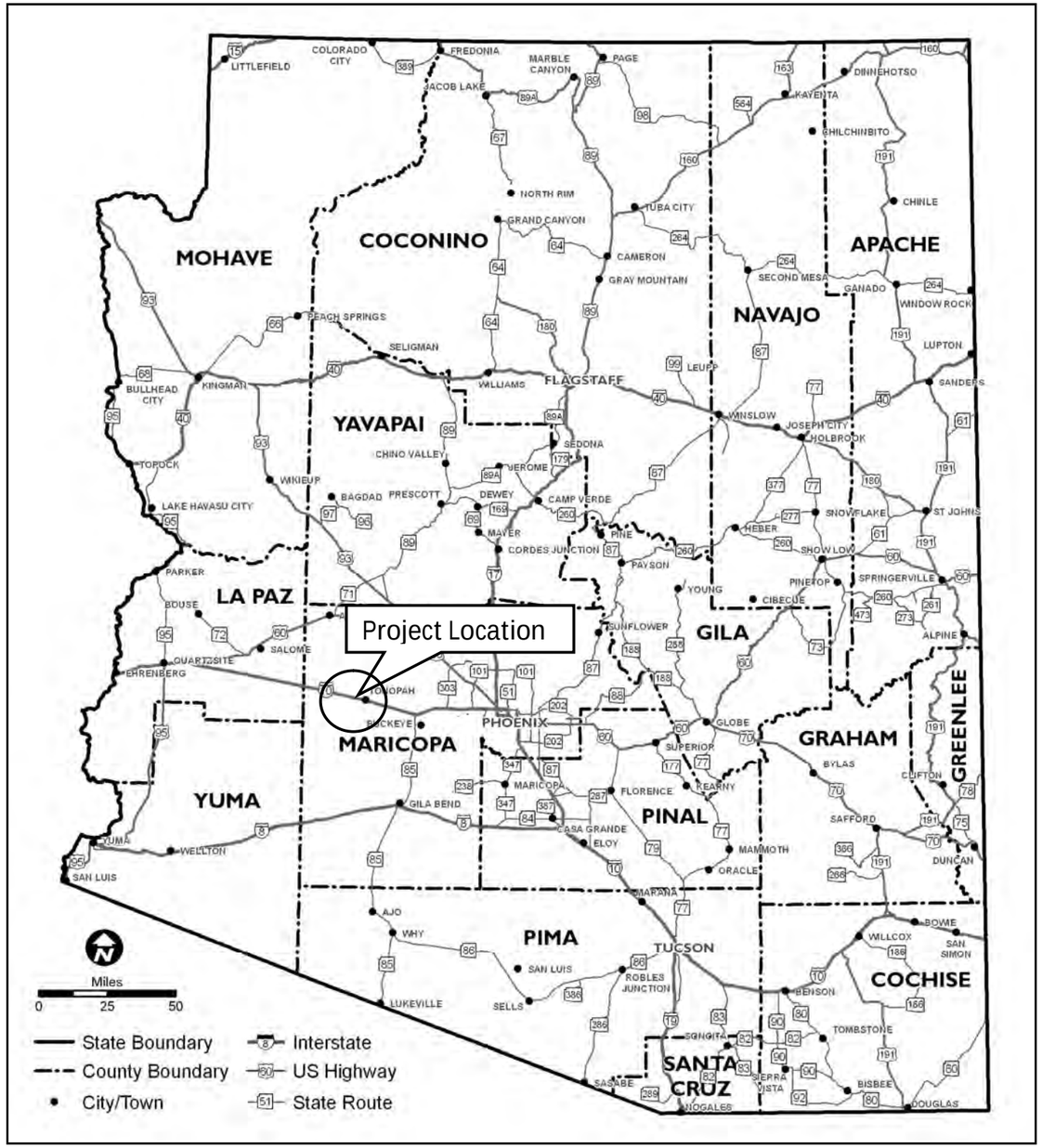
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$283,000	$943,000	$0	$9,432,400	$10,658,700

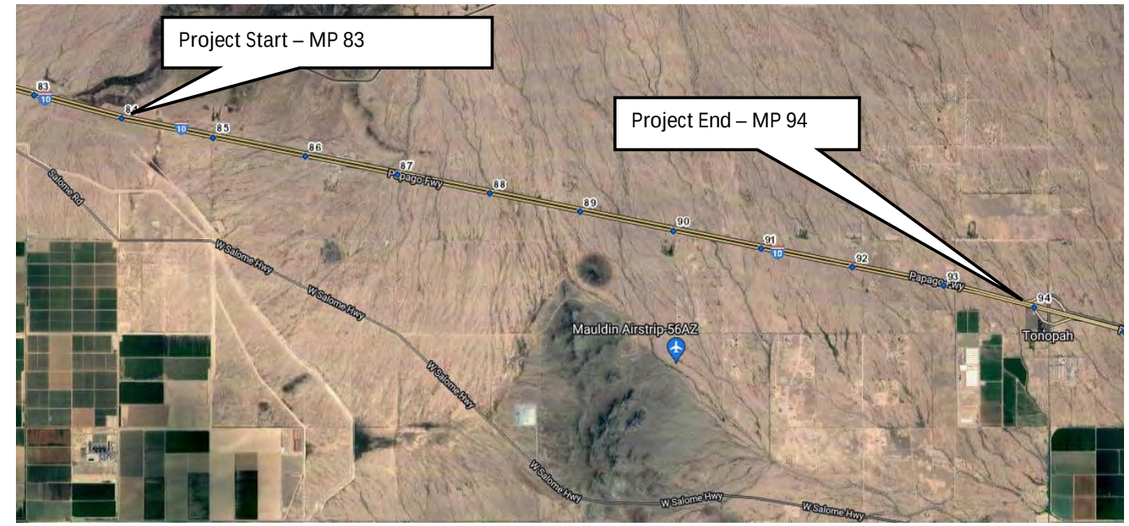
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
28) State Location Map 29) Project Vicinity Map 30) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Rehab shoulders MP 83-90 • Clear vegetation MP 83-90 • Install EB speed feedback signs at MP 83.5 and 89.5 • Install WB speed feedback sign at MP 94 • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • • •

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.

ATTACHMENT 3 – SCOPE OF WORK

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: 3/31/2023	ADOT Project Manager:
Project Name: West Buckeye Area Safety Improvements	
City/Town: Buckeye	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 104	
End Limit: MP 108	
Project Length: 4	
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
Segment 10W-8 has medium safety needs.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the safety needs. The recommended solution is intended to improve safety and reduce the overall occurrence of crashes.			

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)* The recommended solution could significantly impact normal traffic operations during construction. The recommended solution proposes implementation of signing, which requires ground disturbance with new poles and foundation, presenting an environmental risk.	

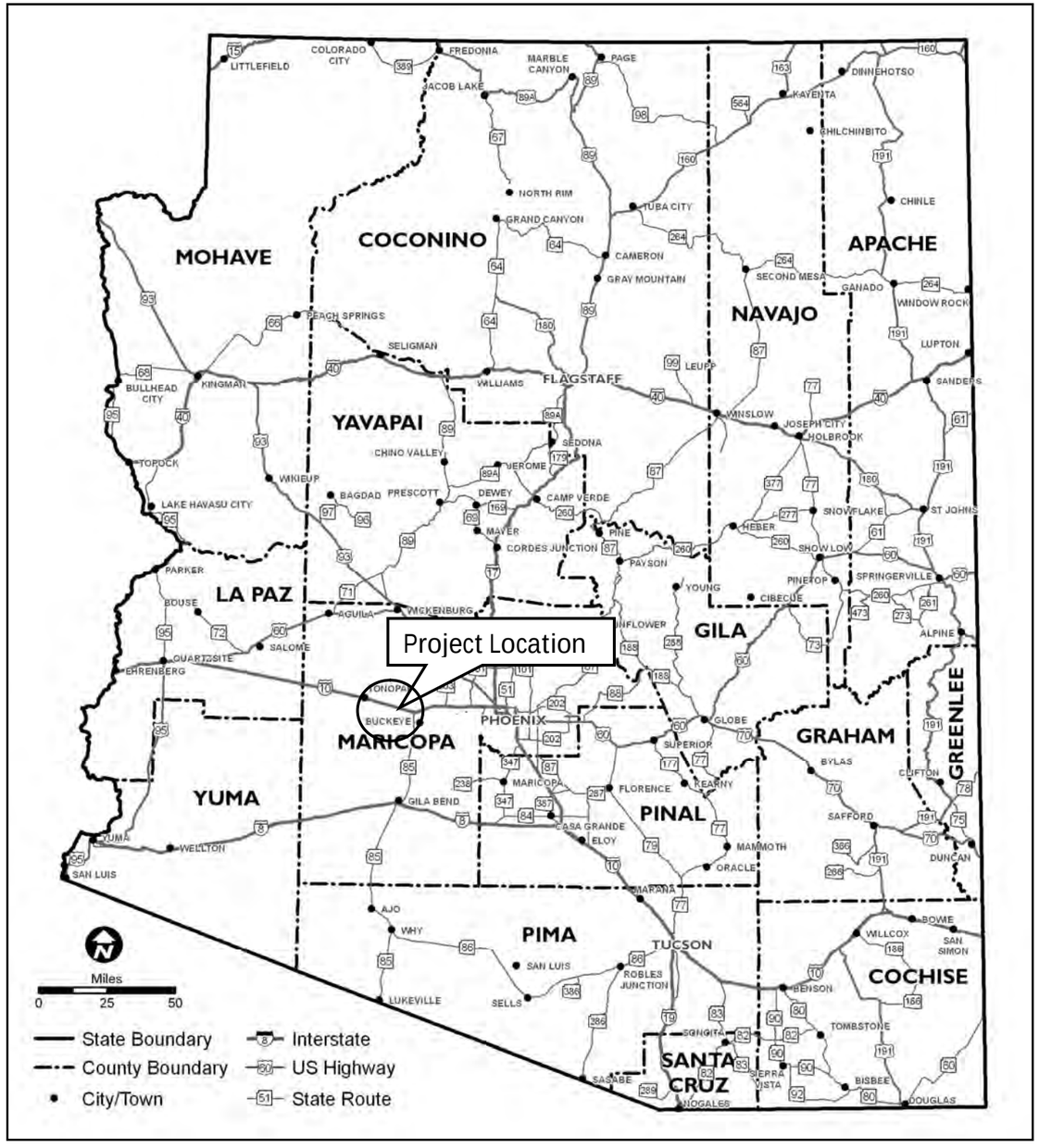
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$106,000	$353,300	$0	$3,532,800	$3,992,100

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
31) State Location Map 32) Project Vicinity Map 33) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Rehab shoulders • Install an EB speed feedback sign at MP 104 • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: 355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	
City/Town: West of Buckeye	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 101.30	
End Limit: MP 101.60	
Project Length: 0.3	
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
Segment 10W-8 has several freight hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the freight hot spots. The recommended solution is intended to increase freight performance in segment 10W-8.			

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)* The recommended solution could significantly impact normal traffic operations during construction.	

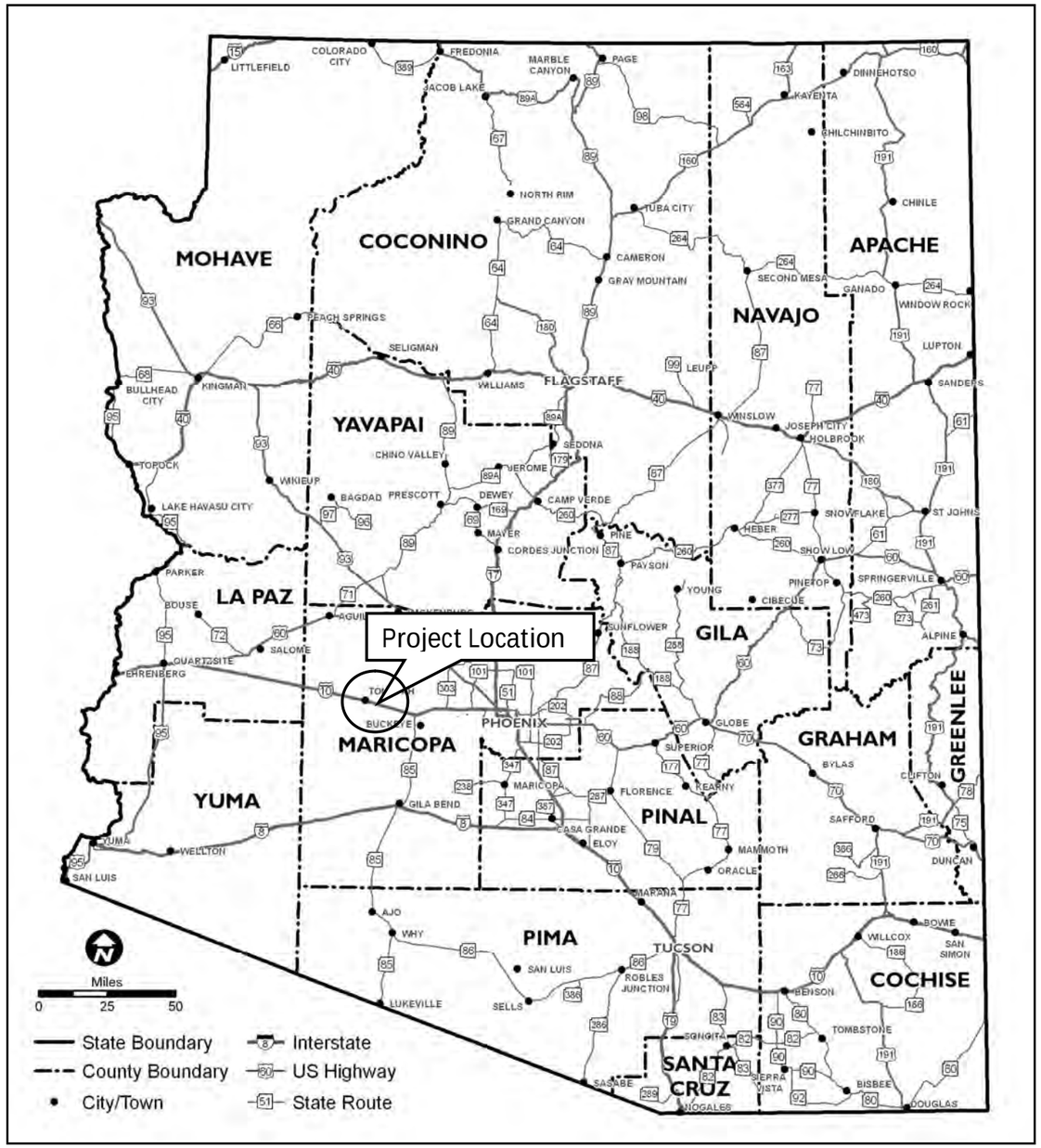
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$22,400	$74,600	$0	$746,000	$843,000

RECOMMENDED PROJECT DELIVERY		
Delivery: ☐ Design-Bid-Build	☐ Design-Build	☐ Other:
Design Program Year: FY		
Construction Program Year: FY		

ATTACHMENTS
34) State Location Map 35) Project Vicinity Map 36) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Option A • Reprofile mainline • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: 355th Ave UP (#1647) Freight / Bridge Vertical Clearance Mitigation	
City/Town: West of Buckeye	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 101.40	
End Limit: MP 101.40	
Project Length:	
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
Segment 10W-8 has several freight hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the freight hot spots. The recommended solution is intended to increase freight performance.			

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)* The recommended solution proposes replacing the bridge, which could significantly impact normal traffic operations during construction.	

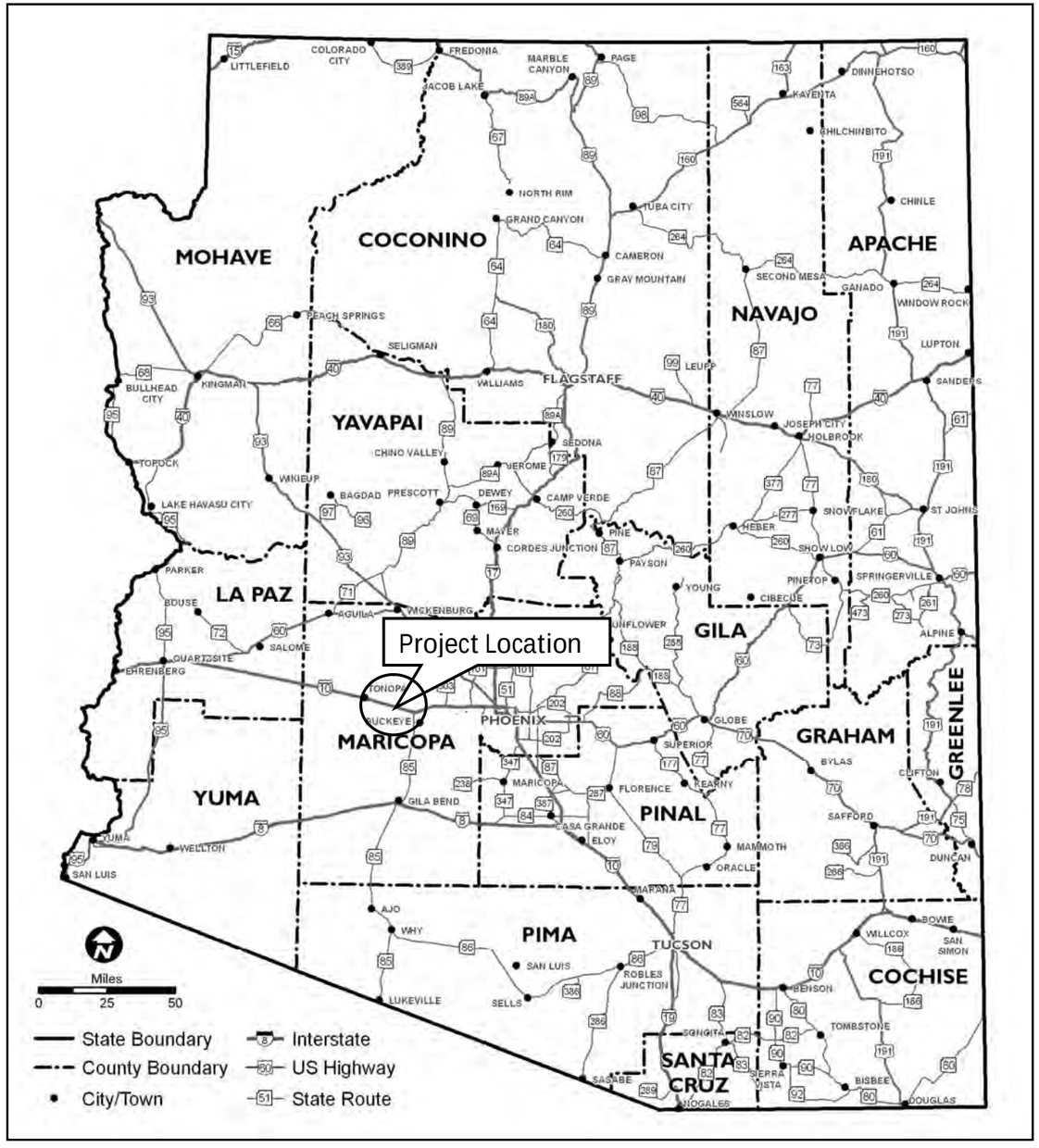
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$77,500	$258,400	$0	$2,583,960	$2,919,860

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
37) State Location Map 38) Project Vicinity Map 39) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Option B • Replace Bridge • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	
City/Town: Buckeye	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 112.60	
End Limit: MP 112.90	
Project Length: 0.3	
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
Segment 10W-8 has several freight hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the freight hot spots. The recommended solution is intended to improve freight performance in segment 10W-8.			

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)* The recommended solution could significantly impact normal traffic operations.	

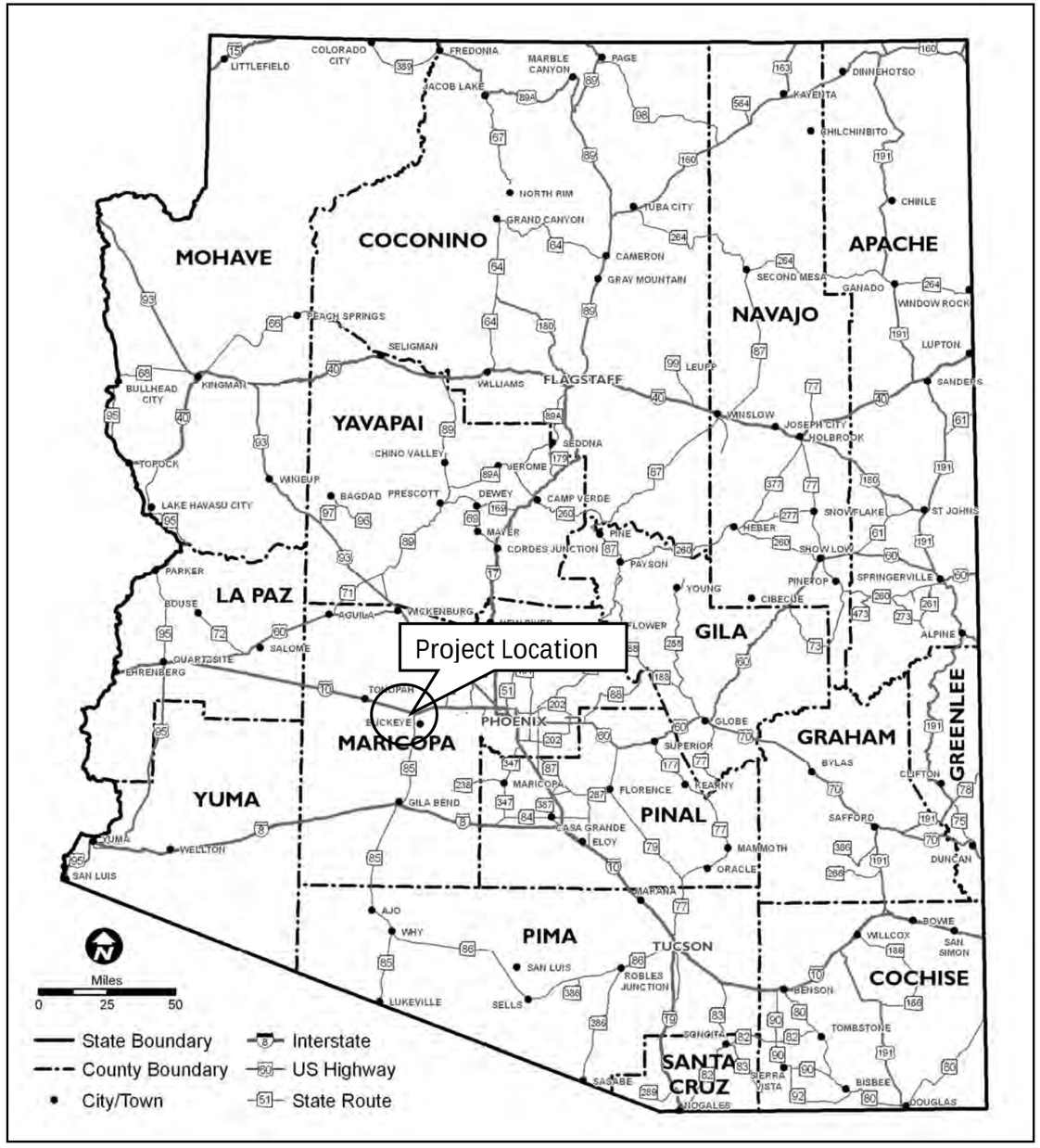
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$22,400	$74,600	$0	$746,000	$843,000

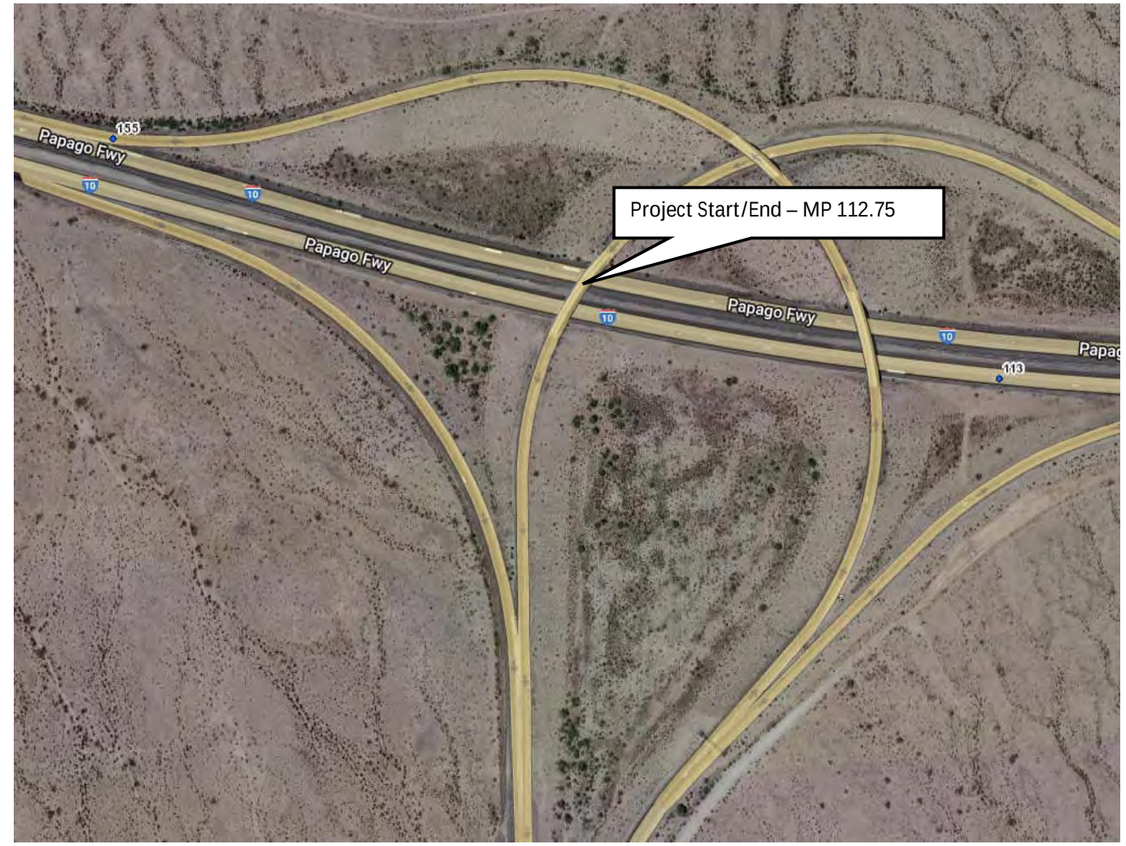
RECOMMENDED PROJECT DELIVERY		
Delivery: ☐ Design-Bid-Build	☐ Design-Build	☐ Other:
Design Program Year: FY		
Construction Program Year: FY		

ATTACHMENTS
40) State Location Map 41) Project Vicinity Map 42) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Option A • Reprofile mainline • • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • Option B • Replace bridge • •

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: 3/7/2023	ADOT Project Manager:
Project Name: Oglesby Rd Ramp B UP (#1725) Freight / Bridge Vertical Clearance Mitigation	
City/Town: Buckeye	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 112.75	
End Limit: MP 112.75	
Project Length:	
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
Segment 10W-8 has several freight hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the freight hot spots. The recommended solution is intended to improve freight performance.			

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)* The recommended solution could significantly impact normal traffic operations during construction.	

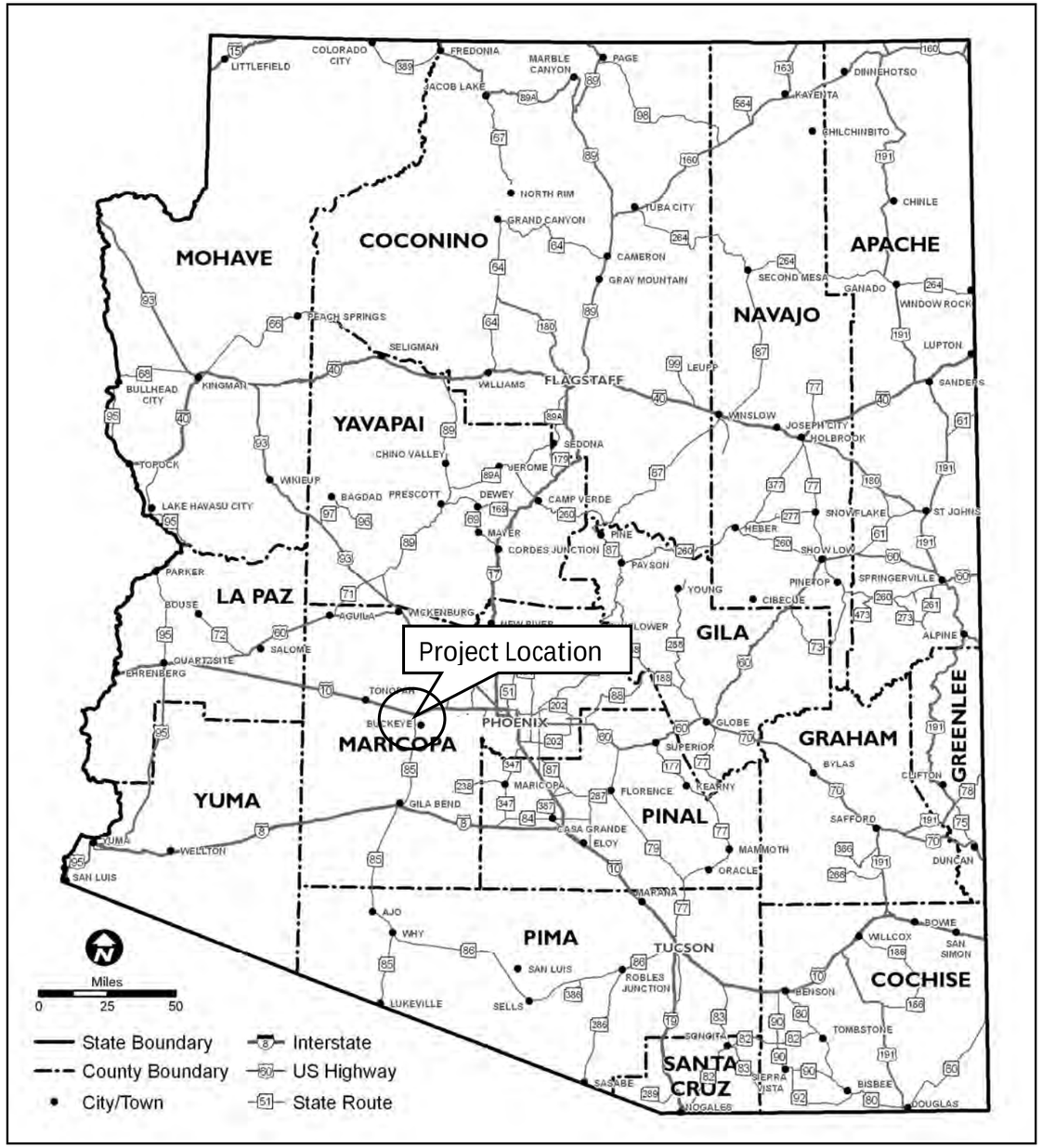
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$143,400	$478,000	$0	$4,779,960	$5,401,360

RECOMMENDED PROJECT DELIVERY		
Delivery: ☐ Design-Bid-Build	☐ Design-Build	☐ Other:
Design Program Year: FY		
Construction Program Year: FY		

ATTACHMENTS
43) State Location Map 44) Project Vicinity Map 45) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Option B • Replace bridge • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • Option A • Reprofile mainline • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	
City/Town: Buckeye	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 112.92	
End Limit: MP 112.92	
Project Length:	
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
Segment 10W-8 has several freight hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the freight hot spots. The recommended solution is intended to improve freight performance in segment 10W-8.			

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)* The recommended solution could significantly impact normal traffic operations during construction.	

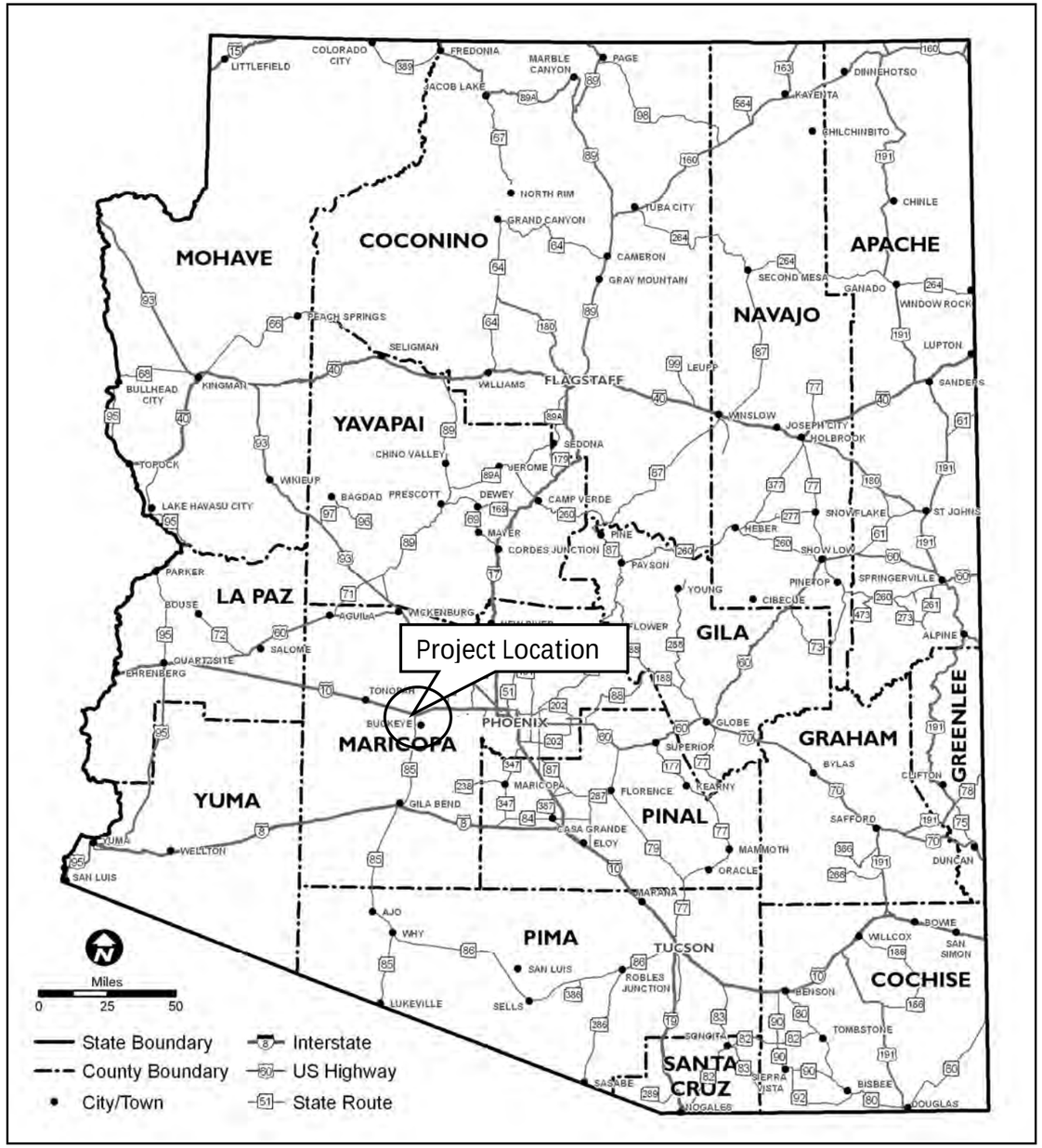
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$22,400	$74,600	$0	$746,000	$843,000

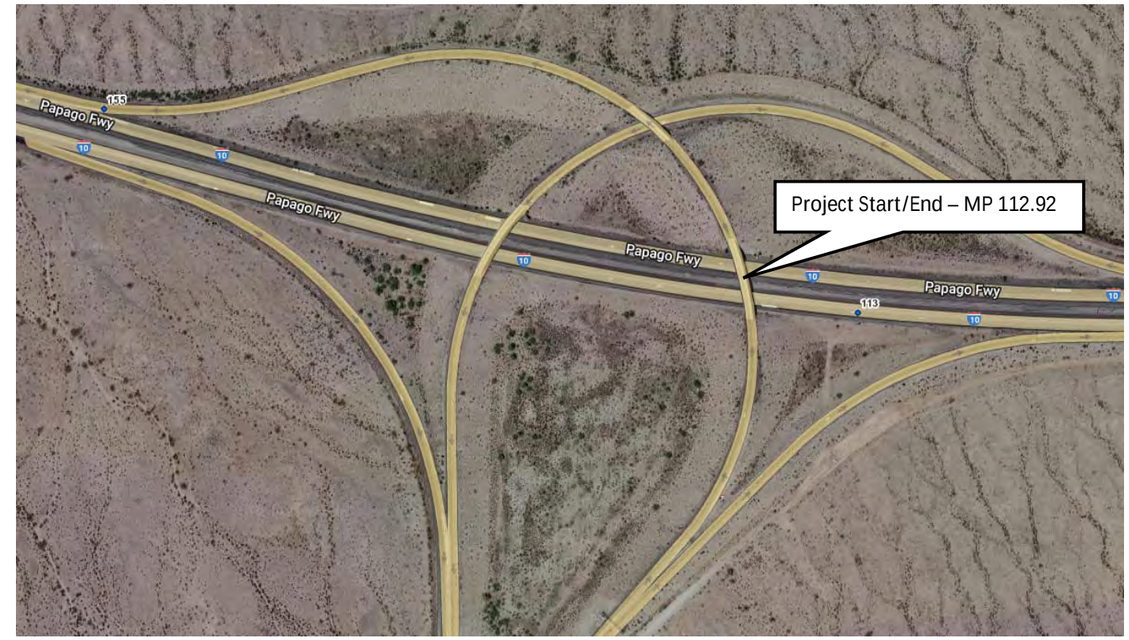
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
46) State Location Map 47) Project Vicinity Map 48) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Option A • Reprofile mainline • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Oglesby Rd Ramp C UP (#1726) Freight / Bridge Vertical Clearance Mitigation	
City/Town: Buckeye	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: I-10	
Beginning Limit: MP 112.92	
End Limit: MP 112.92	
Project Length:	
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
Segment 10W-8 has several freight hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the freight hot spots. The recommended solution is intended to increase freight performance.			

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)* The recommended solution could significantly impact normal traffic operations during construction.	

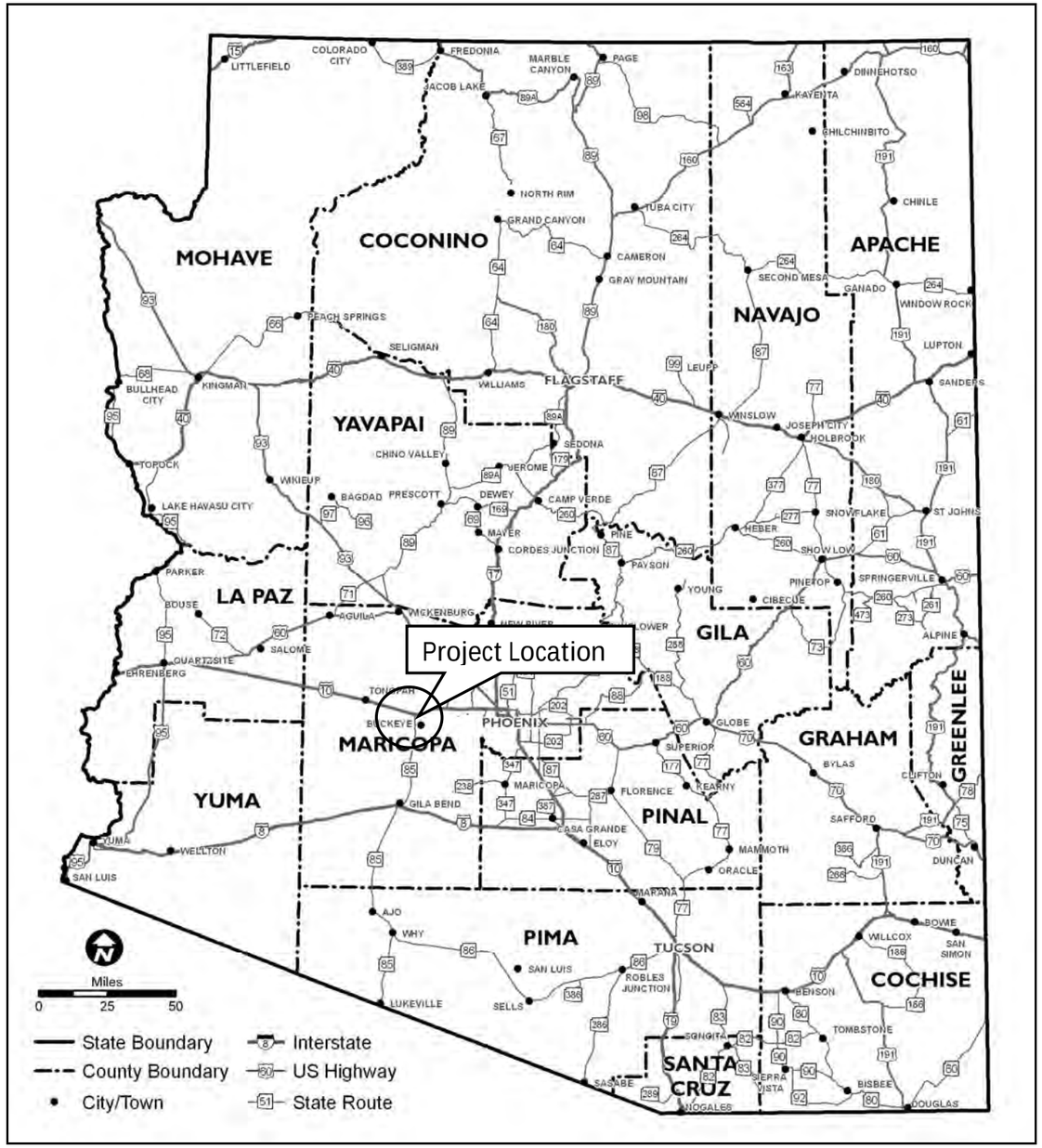
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$146,500	$488,500	$0	$4,884,880	$5,519,880

RECOMMENDED PROJECT DELIVERY		
Delivery: ☐ Design-Bid-Build	☐ Design-Build	☐ Other:
Design Program Year: FY		
Construction Program Year: FY		

ATTACHMENTS
49) State Location Map 50) Project Vicinity Map 51) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Option B • Replace bridge • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • Option A • Reprofile mainline • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Buckeye Area Safety Improvements	
City/Town: Buckeye	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: SR 85	
Beginning Limit: MP 153	
End Limit: MP 151	
Project Length: 2	
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
Segment 10W-8 has several freight hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the freight hot spots. The recommended solution is intended to improve freight performance.			

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)* The recommended solution could significantly impact normal traffic operations during construction. The recommended solution new infrastructure, presenting an environmental risk.	

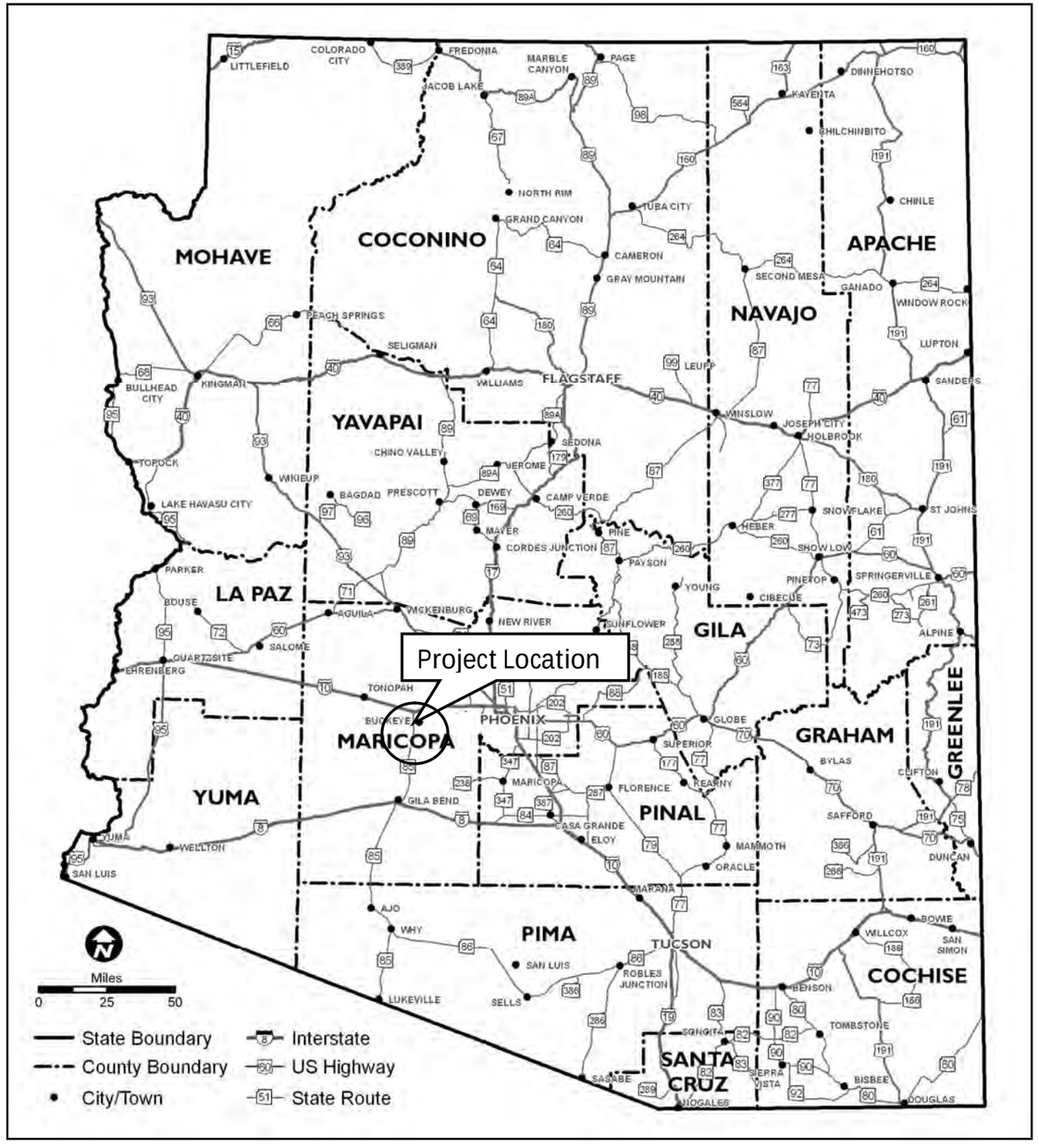
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$4,058,100	$13,527,100	$0	$135,271,200	$152,856,400

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
52) State Location Map 53) Project Vicinity Map 54) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Construct entry/exit ramps • Construct 6 bridge structures • Construct new roadway • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Buckeye Area Safety Improvements	
City/Town: Buckeye	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: SR 85	
Beginning Limit: MP 153	
End Limit: MP 151	
Project Length: 2	
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
Segment 10W-8 has several freight hot spots.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the freight hot spots. The recommended solution is intended to improve freight performance.			

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)* The recommended solution could significantly impact normal traffic operations during construction. The recommended solution new infrastructure, presenting an environmental risk.	

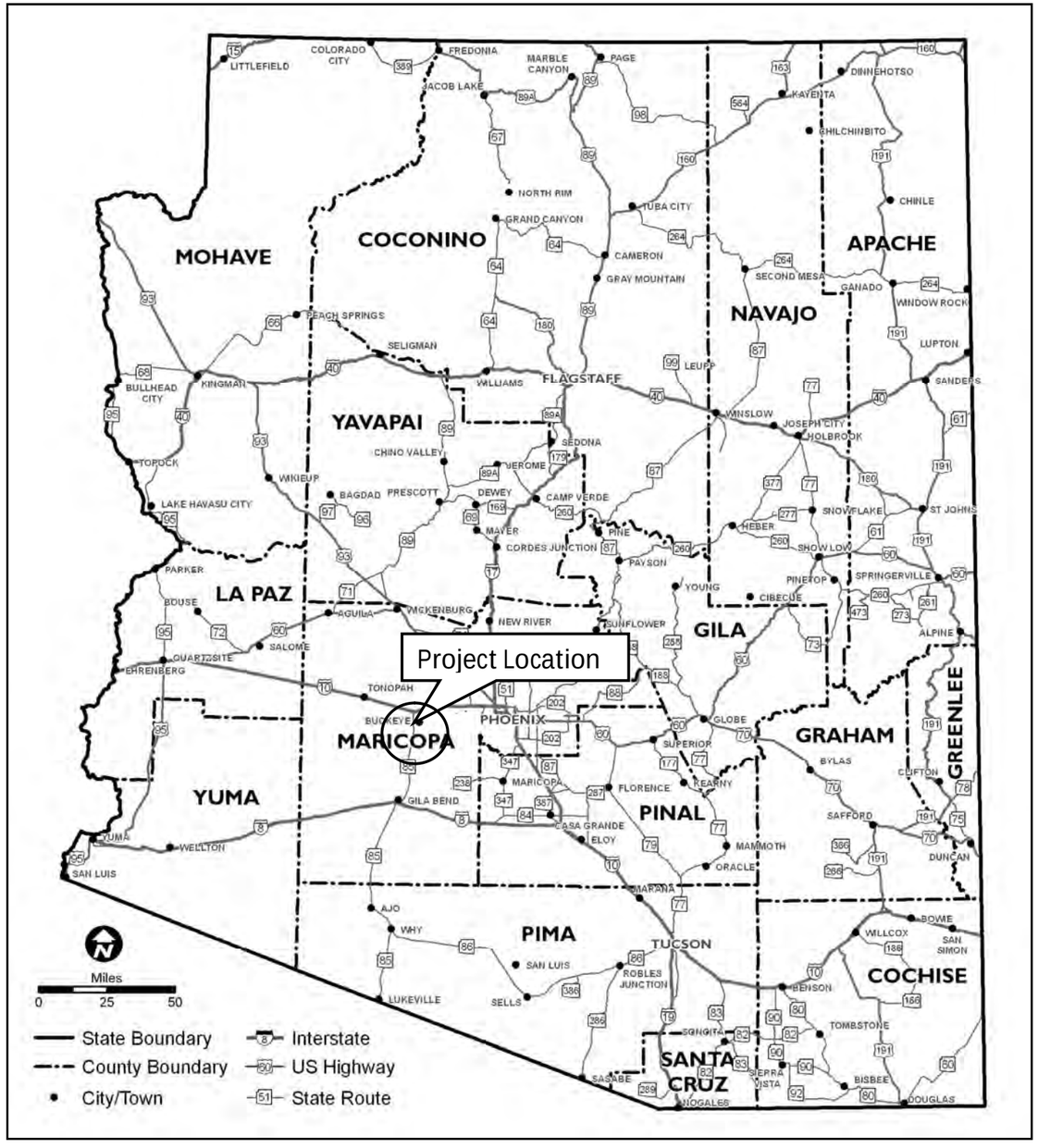
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$1,240,000	$4,134,000	$0	$41,340,000	$46,714,200

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
55) State Location Map 56) Project Vicinity Map 57) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Construct 6 double roundabouts • • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: North Gila Bend SB General Purpose Lanes	
City/Town: Gila Bend	County: Maricopa
COG/MPO: MAG	ADOT District: Southcentral
Primary Route/Street: SR 85	
Beginning Limit: MP 121	
End Limit: MP 123	
Project Length: 2	
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
Segment 85-12 has high mobility and safety needs.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☐	Expansion ☒
The recommended solution addresses a portion of the of the mobility and safety needs. The recommended solution is intended to improve mobility performance and reduce the overall occurrence of crashes.			

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)* The recommended solution could significantly impact normal traffic operations during construction. The recommended solution recommends new infrastructure, which could have potential environmental risks.	

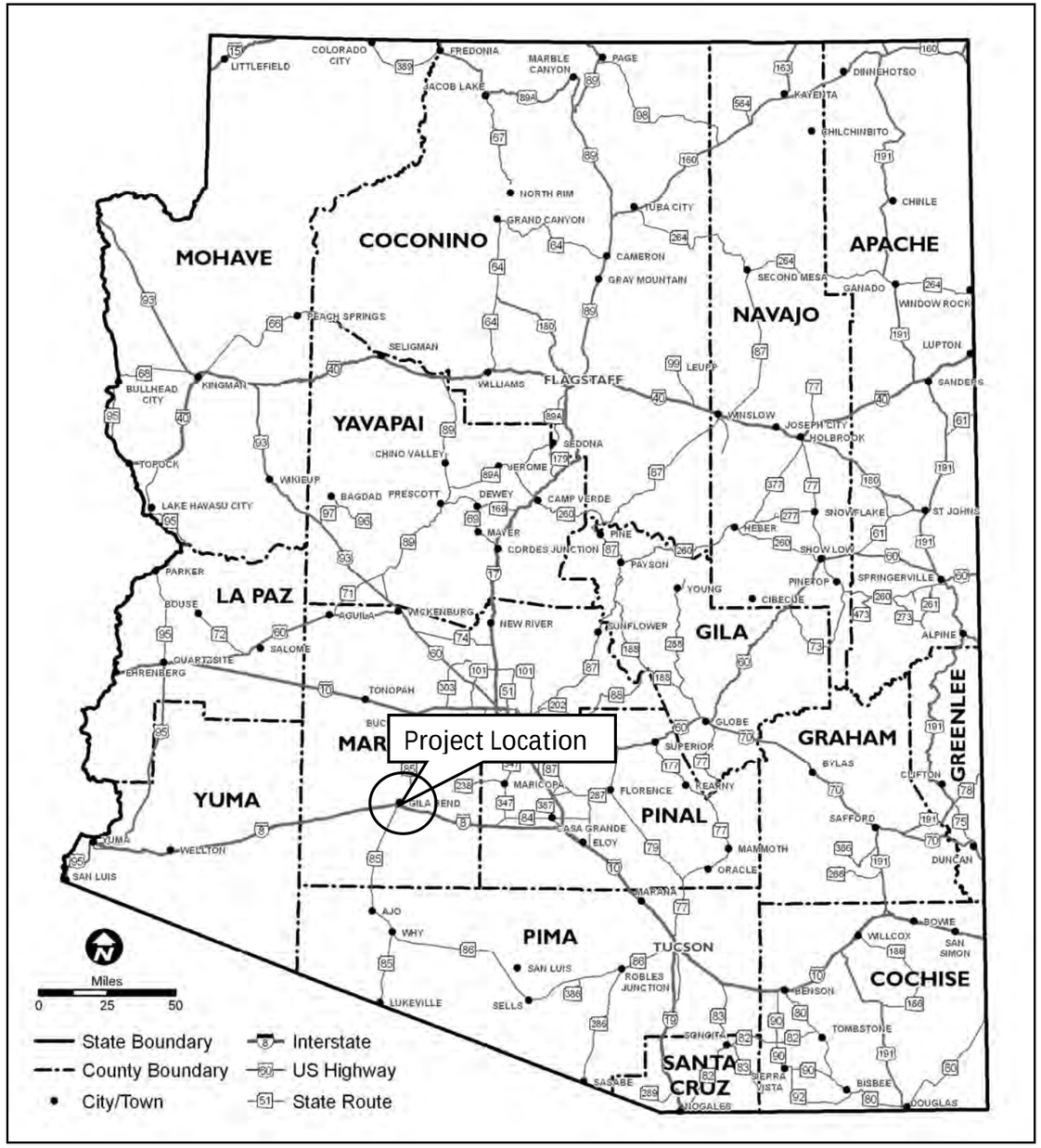
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$550,800	$1,836,000	$0	$18,360,000	$20,746,800

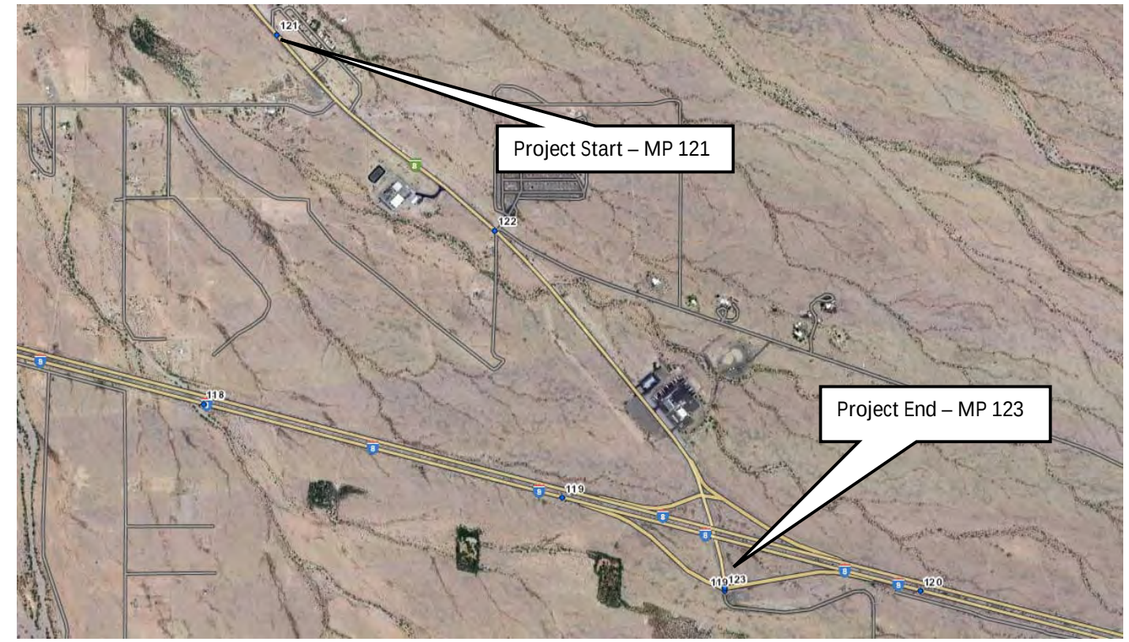
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
58) State Location Map 59) Project Vicinity Map 60) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Construct 2 SB general purpose lanes • • • • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • • •

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: 3/31/20203	ADOT Project Manager:
Project Name: North Gila Bend Area Safety Improvements	
City/Town: Gila Bend	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: SR 85	
Beginning Limit: MP 123	
End Limit: MP 122	
Project Length: 1	
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
Segment 85-9 has high safety needs.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the of the safety needs. The recommended solution is intended to improve safety performance and reduce the overall occurrence of crashes.			

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)* The recommended solution could significantly impact normal traffic operations during construction. The recommended solution proposes new infrastructure, presenting an environmental risk.	

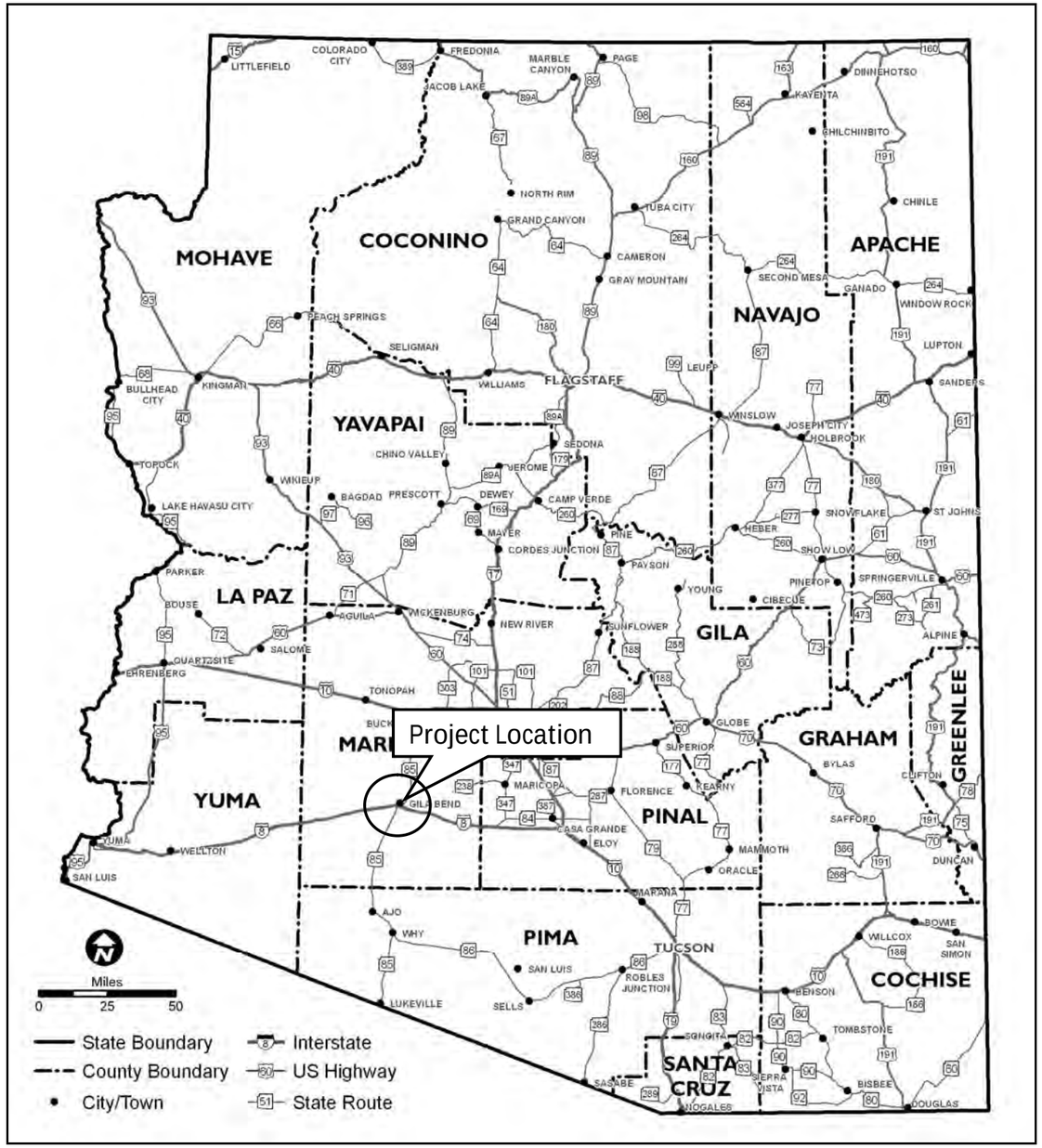
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$13,800	$45,900	$0	$458,600	$518,300

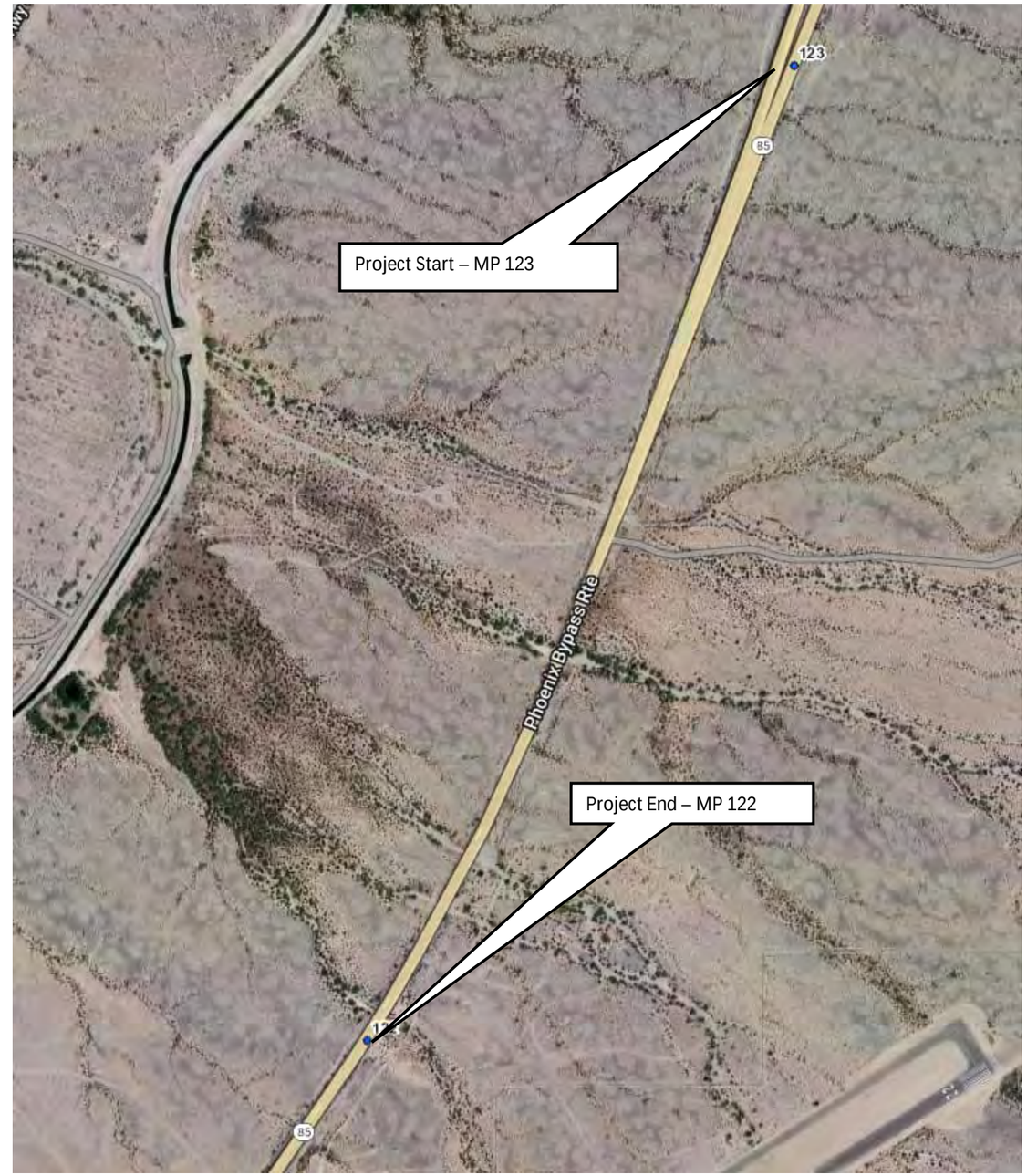
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
61) State Location Map 62) Project Vicinity Map 63) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Install centerline rumble strip MP 122-122.6 • Install delineators • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Butterfield Trail Mobility Improvements	
City/Town: Gila Bend	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: SR 85	
Beginning Limit: MP 120	
End Limit: MP 123	
Project Length: 3	
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
Segment 85-14 has a high mobility need.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☐	Expansion ☒
The recommended solution addresses a portion of the of the mobility needs. The recommended solution is intended to improve the mobility needs in Segment 85-14.			

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)* The recommended solution proposes widening, which would significantly impact normal traffic operations during construction. The recommended solution requires the addition of new infrastructure, presenting both environmental and utility risks. The recommended solution is located near an urbanized portion of the route, which could present potential stakeholder opposition.	

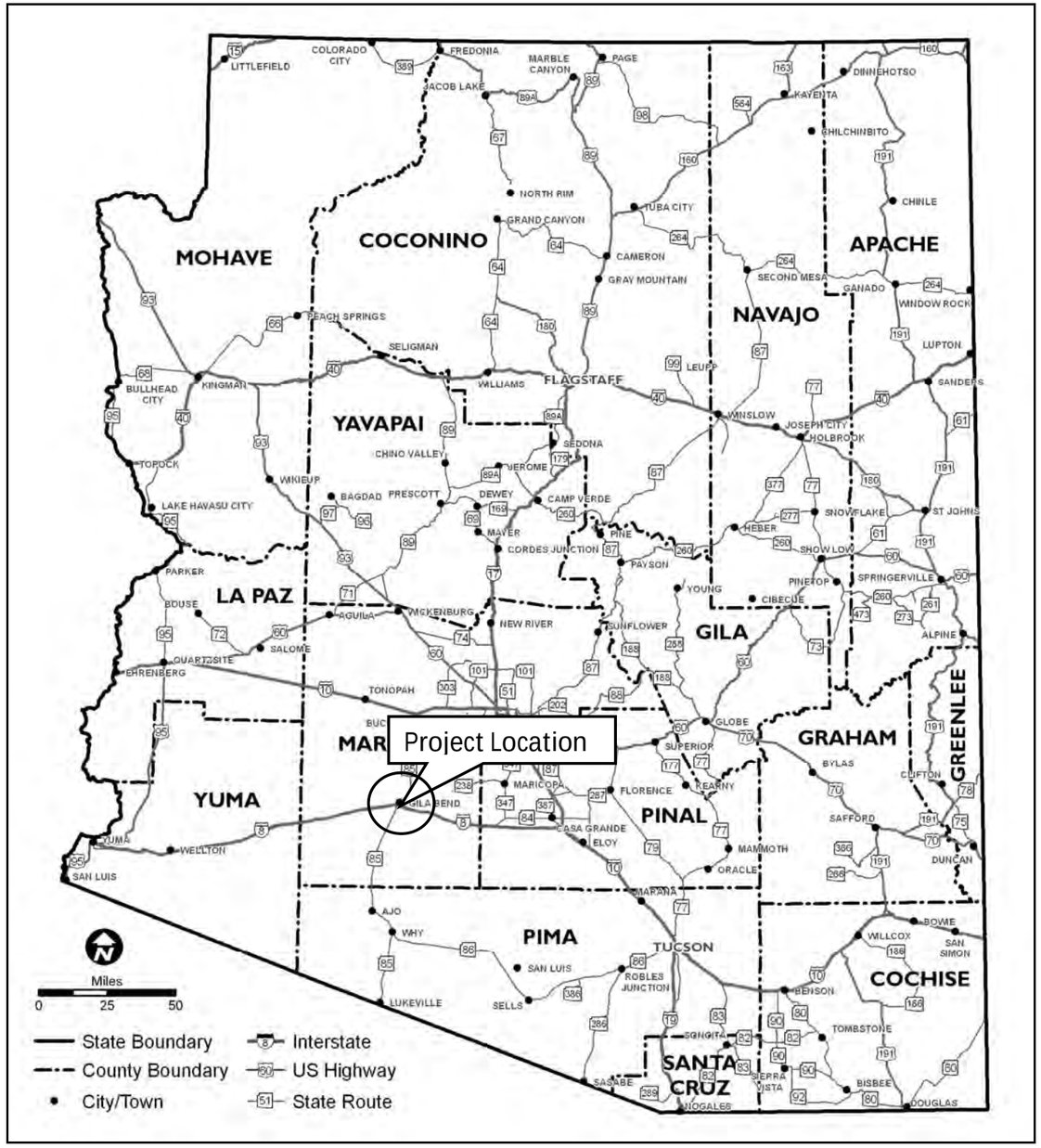
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$542,700	$1,809,000	$0	$18,090,000	$20,441,700

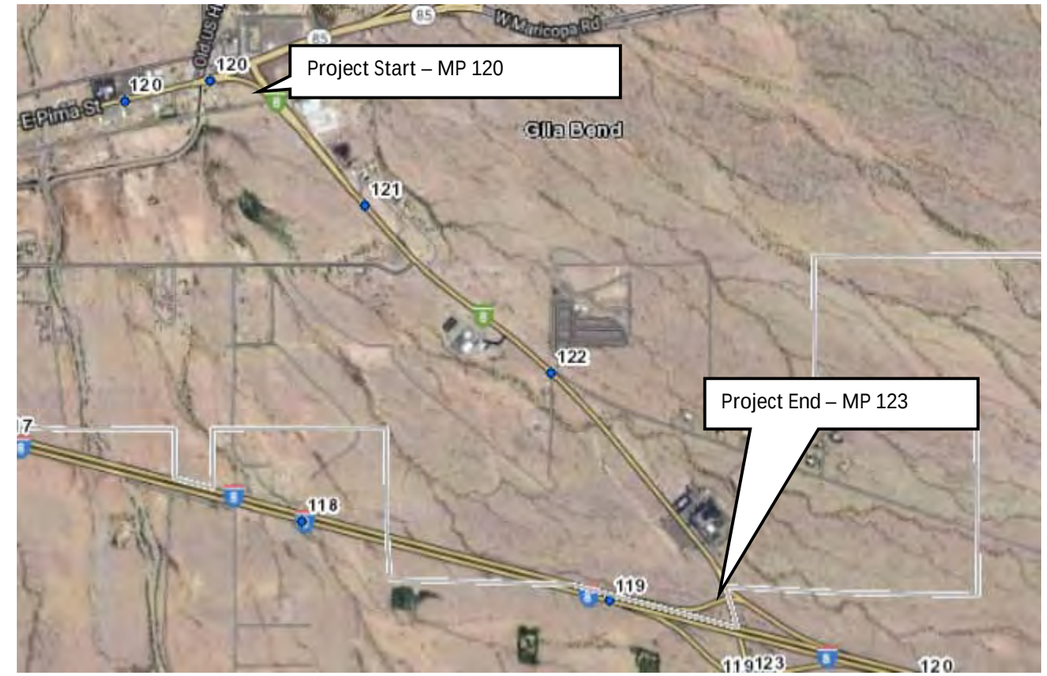
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
64) State Location Map 65) Project Vicinity Map 66) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Option A • Widen to two lanes in each direction w/center left turn lane • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • • •

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: 3/31/2023	ADOT Project Manager:
Project Name: Butterfield Trail Mobility Improvements	
City/Town: Gila Bend	County: Maricopa
COG/MPO: MAG	ADOT District: Southwest
Primary Route/Street: SR 85	
Beginning Limit: MP 120	
End Limit: MP 123	
Project Length: 3	
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
Segment 85-14 has a high mobility need.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The recommended solution addresses a portion of the of the mobility needs. The recommended solution is intended to improve the mobility needs in Segment 85-14.			

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)* The recommended solution is located near an urbanized portion of the route, which could present potential stakeholder opposition. The recommended solution proposes widening, presenting an environmental risk.	

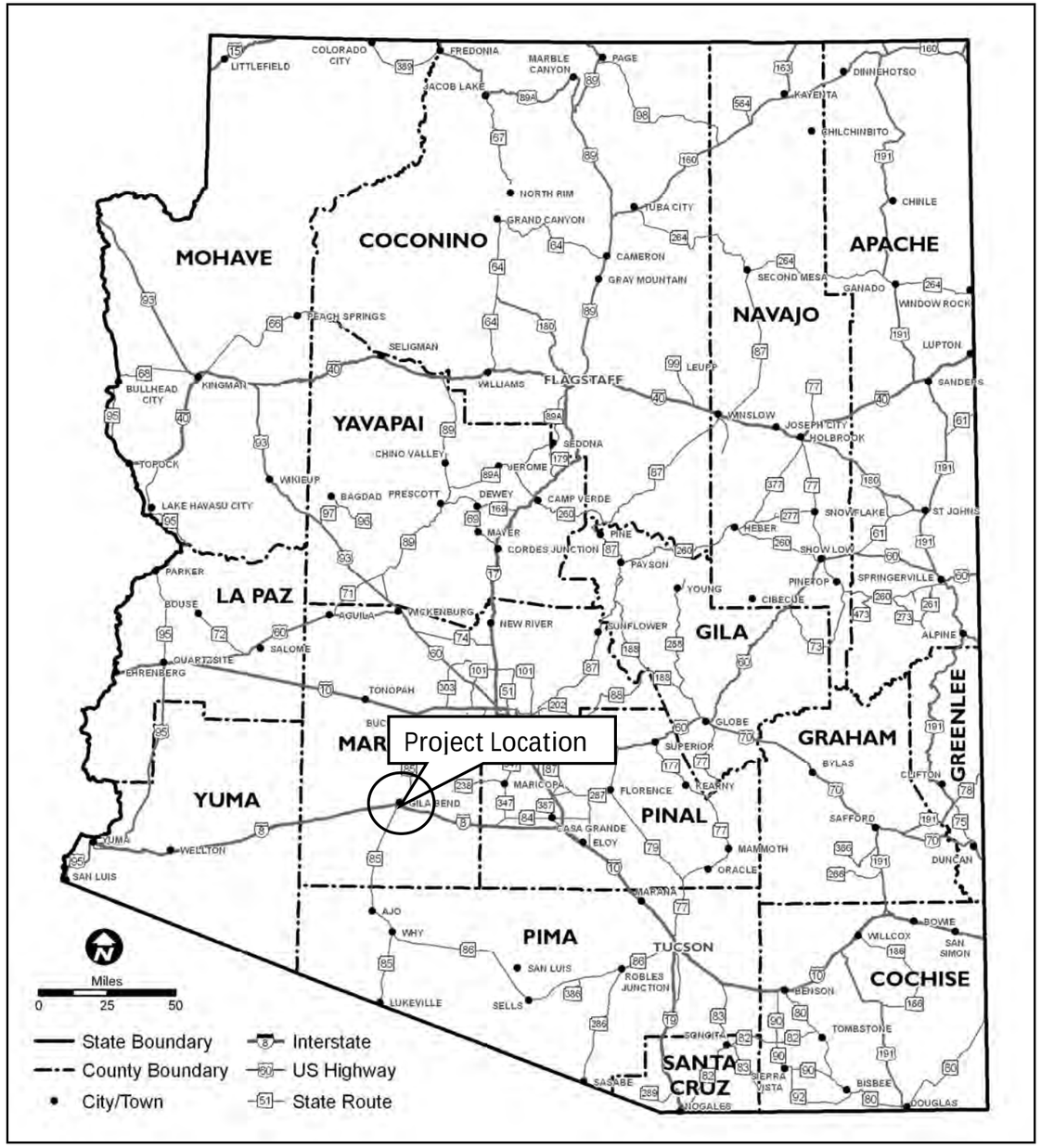
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$362,700	$1,209,000	$0	$12,090,000	$13,661,700

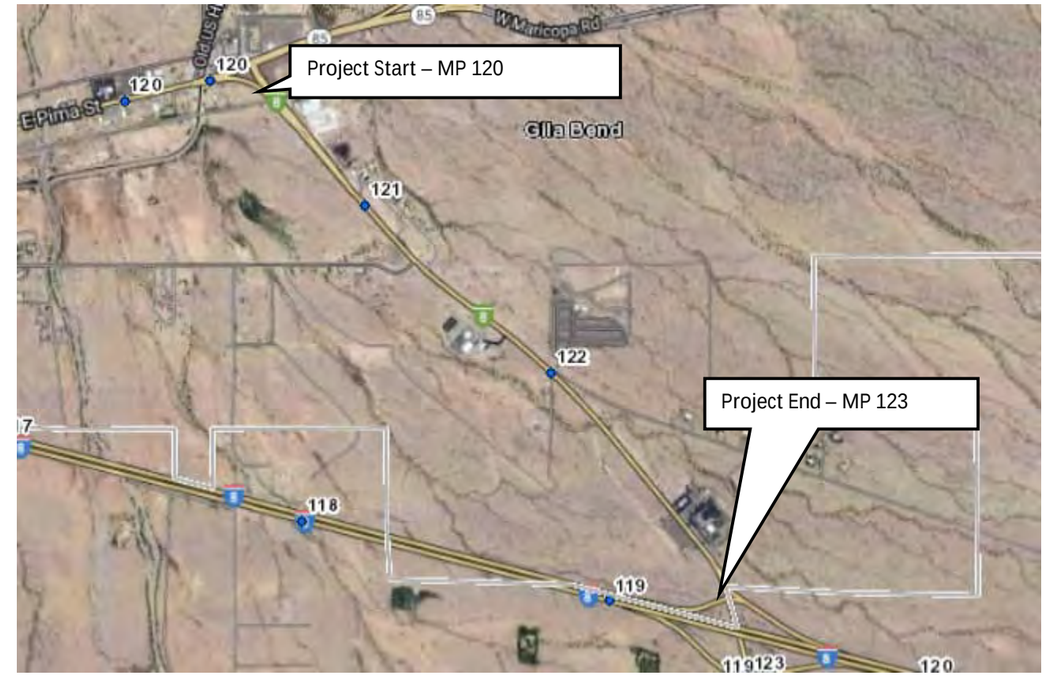
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
67) State Location Map 68) Project Vicinity Map 69) Project Scope of Work

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Option A • Widen to add center left turn lane and widen shoulder on both sides • •

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why) • •

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.