

Arizona Statewide Rest Area Study



Final Draft Working Paper 2

Forecast of Future Conditions and
Deficiencies

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Contents

- 1 Introduction 4**
- 2 Summary of Deficiencies and Forecasted Needs 5**
 - Traffic Data Collection..... 5
 - Forecast Methodologies..... 5
 - Forecast Constraints 6
 - Forecasts and Deficiencies 13
- 3 Environmental Overview 19**
- 4 Corridor Needs Criteria 23**
 - Spacing Between Rest Areas 23
 - Availability of ASOs and Site Remoteness..... 23
 - Truck Parking Deficiencies..... 27
 - Routes with High AADT 30
 - Water Availability 33
- 5 Corridor Needs 34**
 - New Rest Area Locations..... 34
 - Rest Area Expansions..... 34
 - Safe Parking Only Locations 37
- 6 Emerging Rest Area Needs 39**
 - Facilities Management and Stakeholder Identified Needs 39
 - Truck Parking Availability Systems (TPAS)..... 40
 - Electric Vehicles (EV)..... 41
 - Wireless Internet 41
 - Potential Locations for Emerging Rest Area Services 41
- 7 Public-Private Partnership Opportunities..... 43**
 - Federal Interstate Oasis Program 43
 - New Rest Area Partnerships..... 48

Appendices

Appendix A: Rest Area Hazardous Materials List	56
Appendix B: Rest Area Cultural Resources List.....	57

List of Tables

Table 2-1. Rest Area Parking Forecasts	8
Table 2-2. Rest Area Restroom Forecasts.....	10
Table 2-3. Rest Area Water Usage Forecasts.....	12
Table 3-1. Rest Area Environmental Overview.....	21
Table 4-1. Spacing of Existing Rest Areas, ASOs, and Urban Areas.....	24
Table 4-2. Mainline AADT Adjacent to Rest Areas (2022-2042)	31
Table 5-1. Truck Parking Deficiency Rating Criteria.....	35
Table 5-2. Comparative Analysis of Truck Parking Needs at Rest Areas	35

List of Figures

Figure 2-1. Truck Parking Deficiencies by Corridor	13
Figure 2-2. Average Truck Parking Deficiencies per Corridor.....	14
Figure 2-3. Parks Rest Area	15
Figure 2-4. Restroom Deficiencies by Corridor	16
Figure 2-5. Average Restroom Deficiencies per Corridor	17
Figure 2-6. Water Usage by Rest Area.....	18
Figure 4-1. Statewide Alternative Stopping Opportunities	26
Figure 4-2. Truck Parking Deficiencies by Corridor (2022 - 2042)	27
Figure 4-3. Total Truck Parking Deficiencies per Number of Rest Area Sites by Corridor (2022 - 2042). 28	
Figure 7-1. Examples of Permissible Interstate Oasis Signs and Plaques.....	46

List of Acronyms

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADS	Automated Driving Systems
AFV	Alternative Fuel Vehicles
ASO	Alternative Stopping Opportunities
BEV	Battery Electric Vehicles
BLM	Bureau of Land Management
CCTV	Closed-Circuit Television
EJ	Environmental Justice
EPA	Environmental Protection Agency
EV	Electric Vehicles
EVSE	Electric Vehicle Supply Equipment
FCC	Federal Communication Commission
FHWA	Federal Highway Administration
GIS	Geographic Information System
GPS	Global Positioning System
HOS	Hours of Service
IIJA	Infrastructure Investment and Jobs Act
ITD	Idaho Transportation Department
LTE	Long-Term Evolution
MP	Milepost
NAAQS	National Ambient Air Quality Standard
NATSO	National Association of Truck Stop Operators
PHEV	Hybrid Electric Vehicles
PMT	Project Management Team
ROW	Right-of-Way
SDDOT	South Dakota Department of Transportation
TPAS	Truck Parking Availability System
TSM&O	Transportation Systems Management and Operations
UDOT	Utah Department of Transportation
USFS	U.S. Forest Service

1 Introduction

This document, *Working Paper 2: Forecast of Future Conditions and Deficiencies*, summarizes the findings of existing and future deficiencies at Arizona Department of Transportation (ADOT) rest areas, while evaluating the potential needs of travelers through the year 2042. The deficiencies and needs presented in this document help to identify rest areas that may require preservation/expansion and locations where new rest area facilities may be needed. This document also identifies the need for new rest area services based on emerging trends and benchmarks established in *Working Paper 1: Existing Conditions and Data Collection*.

Section 2: Summary of Deficiencies and Forecasted Needs summarizes the deficiencies of the existing rest areas and forecast methodologies used to identify future needs.

Section 3: Environmental Overview presents an overview of the environmental factors applicable to each of the rest areas under study.

Section 4: Corridor Needs Criteria summarizes the criteria used to identify and analyze locations where existing rest areas may require expansion or preservation, while also determining the need for new rest areas or safe parking only locations along Arizona highways.

Section 5: Corridor Needs summarizes results of the corridor needs analysis that identifies the potential locations that may require new rest areas, expanded rest areas, or rest areas requiring preservation/modernization.

Section 6: Rest Area Needs presents the requirements and potential locations for expanded rest area services based on the emerging trends documented in *Working Paper 1: Existing Conditions and Data Collection*.

Section 7: Public-Private Partnership Opportunities discusses the strategies and frameworks of public-private partnerships applicable to Arizona, which aim to facilitate future needs of rest area users while reducing rest area costs.

2 Summary of Deficiencies and Forecasted Needs

Traffic Data Collection

Although mainline Average Annual Daily Traffic (AADT) adjacent to rest areas was available for this study, additional traffic data was needed to determine the percentage of traffic stopping at Arizona Department of Transportation (ADOT) rest areas, as well as the type of vehicles stopping. Therefore, traffic data was collected between July and September of 2022 to ensure the best possible data to forecast future conditions at ADOT rest areas.

Forecast Methodologies

A key focus of this study was to understand and consider the existing and future demand. The forecasting of ADOT rest area usage through the year 2042 helps in establishing rest area needs, determining needed allocation of ADOT resources, and defining policy goals for ADOT rest areas over the next 20 years. The forecasts at each of the existing rest areas were calculated for parking, restroom facilities, and water usage. The forecast methodologies are discussed in detail below.

Parking

Current and future parking needs were estimated based on parking demand equations provided in AASHTO's 2001 *Guide for Development of Rest Areas on Major Arterials and Freeways*. Parking forecasts were then confirmed with ADOT and District staff as a check against realities on the ground for a particular rest area. Rest area parking needs were estimated over 5, 10, and 20 year planning periods. Future parking needs were compared to the current number of auto and truck/bus parking spaces available at each rest area, and parking deficiencies were estimated for both automobiles and trucks/buses. Rest areas requiring additional parking were then analyzed to determine:

- Whether the rest area could accommodate the necessary parking expansion onsite
- Whether additional parking is required to be developed off-site, either at a new rest area, by expanding the existing right-of-way to accommodate more parking area within the existing rest area, or through use of a public-private partnership for providing rest area services.

The following equations, variables, and assumptions from AASHTO's Guide were used in the estimation of future parking demand for the 5-, 10-, and 20-year planning periods for the rest areas¹: It should be noted that the average length of stay (VHS) in the equation for determining truck parking needs was changed from 20 minutes to 30 minutes. This change provides a more accurate representation of the required Hours of Service break (30 minutes minimum) that commercial drivers must adhere to.

(EQ 1)

$$N_C = \frac{ADT * P * DH * D_C * PF * VHS}{60 \text{ min}}$$

(EQ 2)

$$N_T = \frac{ADT * P * DH * D_T * PF * VHS}{60 \text{ min}}$$

N_C = Number of car parking spaces required

N_T = Number of truck parking spaces required

ADT = Mainline directional ADT

P = Capture rate, determined by $\left(\frac{\text{RA Ramp ADT}}{\text{Mainline Direction ADT}}\right)$

DH = Design hourly factor – Per AASHTO specifications:

AADT < 12,500	→	DH = 0.15
12,500 < AADT < 30,000	→	DH = 0.10
AADT > 30,000	→	DH = 0.075

D_C = Percentage of cars using the facility (if no data is available, assume 0.75)

D_T = Percentage of trucks using the facility (if no data is available, assume 0.25)

PF = Peak Hour Factor, the ratio of the average daily usage during the 5 summer months compared with the average daily usage over the entire year, assumed to be 1.8

VHS = Average length of stay for cars and trucks determined on an hourly basis, assumed to be 15 minutes for cars, and 30 minutes for trucks (required HOS break time)

Forecast Constraints

The forecasts equation's limitations and/or constraints may result in forecasts that do not capture all elements affecting rest area parking. For instance, this forecast equation does not account for the presence of privately owned truck parking facilities near rest areas, nor does it account for the observed variations in parking durations at each rest area. In addition, the forecast model was published in 2001, and may not reflect recent changes in the transportation landscape, such as commercial driver regulations and/or industry trends.

¹ EQ1 and EQ2 from A Guide for the Development of Rest Areas on Major Arterials and Freeways, 2001

In making recommendations regarding the type of parking expansion that ADOT might pursue at particular rest area locations, this analysis first considered the total amount of parking deficiencies at the rest area under each planning period and whether or not existing right-of-way at the rest area is sufficient to provide the additional parking required. Judgments on each rest area's potential expansion to satisfy future parking needs will be necessary to provide specific recommendations for each rest area.

Table 2-1 summarizes the parking demand and deficiencies for the 5, 10, and 20 year planning horizon at each of the rest areas included in the study.

Table 2-1. Rest Area Parking Forecasts

RA Map No.1	REST AREA (RA)	ROUTE	TRAFFIC DIRECTION SERVED	2019 MAINLINE TRAFFIC VOLUME (ADOT AADT)	GROWTH RATE ⁸	MAINLINE AADT				REST AREA RAMP AADT/ADT ¹¹ YEAR 2022 ¹⁰					CAPTURE RATE	DESIGN HOURLY FACTOR (DH) ⁹	PARKING										PARKING: EXCESS (+) / DEFICIENCIES (-) IN FORECAST YEARS							
						2022	2027	2032	2042	CARS ⁶	TRUCKS ⁷	PERCENT CARS ⁶	PERCENT TRUCKS ⁷	TOTAL			EXISTING (FROM FIELD REVIEW) 2022		CALCULATED (PER AASHTO GUIDE) 2022		CALCULATED (PER AASHTO GUIDE) 2027		CALCULATED (PER AASHTO GUIDE) 2032		CALCULATED (PER AASHTO GUIDE) 2042		2022		2027		2032		2042	
																	CARS ⁶	TRUCKS ⁷	CARS ⁶	TRUCKS ⁷	CARS ⁶	TRUCKS ⁷	CARS ⁶	TRUCKS ⁷	CARS ⁶	TRUCKS ⁷	CARS ⁶	TRUCKS ⁷	CARS ⁶	TRUCKS ⁷	CARS ⁶	TRUCKS ⁷	CARS ⁶	TRUCKS ⁷
1	Mohawk	I-8	EB	5,333	2.26%	5,700	6,400	7,100	8,900	267	117	70%	30%	384	6.7%	0.15	25	10	18	16	20	18	22	20	28	25	7	-6	5	-8	3	-10	-3	-15
1	Mohawk	I-8	WB	5,287	2.26%	5,700	6,300	7,100	8,800	400	95	81%	19%	495	8.7%	0.15	28	10	27	13	30	14	34	16	42	20	1	-3	-2	-4	-6	-6	-14	-10
2	Sentinel ⁵	I-8	EB	5,000	2.44%	5,400	6,100	6,800	8,700	402	134	75%	25%	536	9.9%	0.15	28	14	27	18	31	20	34	23	44	29	1	-4	-3	-6	-6	-9	-16	-15
2	Sentinel ⁵	I-8	WB	5,500	2.44%	5,900	6,700	7,500	9,600	194	65	75%	25%	258	4.4%	0.15	28	15	13	9	15	10	17	11	21	14	15	6	13	5	11	4	7	1
3	Ehrenberg	I-10	EB	13,695	2.61%	14,800	16,800	19,100	24,800	775	457	63%	37%	1,232	8.3%	0.10	26	15	35	41	40	47	45	53	58	69	-9	-26	-14	-32	-19	-38	-32	-54
3	Ehrenberg	I-10	WB	13,591	2.61%	14,700	16,700	19,000	24,600	463	273	63%	37%	736	5.0%	0.10	25	15	21	25	24	28	27	32	35	41	4	-10	1	-13	-2	-17	-10	-26
4	Bouse Wash	I-10	EB	13,741	2.66%	14,900	17,000	19,300	25,100	685	403	63%	37%	1,088	7.3%	0.10	42	20	31	36	35	41	40	47	52	61	11	-16	0	-21	2	-27	-10	-41
4	Bouse Wash	I-10	WB	12,598	2.66%	13,600	15,500	17,700	23,000	588	347	63%	37%	935	6.9%	0.10	32	20	26	31	30	36	34	41	45	53	6	-11	2	-16	-2	-21	-13	-33
5	Burnt Well	I-10	EB	11,249	2.61%	12,200	13,800	15,700	20,300	1,178	494	70%	30%	1,672	13.7%	0.15	50	30	80	67	90	75	102	86	132	111	-30	-37	-40	-45	-52	-56	-82	-81
5	Burnt Well	I-10	WB	12,875	2.61%	13,900	15,800	18,000	23,300	973	409	70%	30%	1,382	9.9%	0.10	45	30	44	37	50	42	57	48	73	62	1	-7	-5	-12	-12	-18	-28	-32
6	Sacaton	I-10	EB	31,655	2.17%	33,800	37,600	41,800	51,900	861	409	68%	32%	1,270	3.8%	0.075	56	21	29	28	32	31	36	34	45	42	27	-7	24	-10	20	-13	11	-21
6	Sacaton	I-10	WB	30,974	2.17%	33,000	36,800	40,900	50,700	900	337	73%	27%	1,237	3.7%	0.075	44	18	30	23	34	25	38	28	47	35	14	-5	10	-7	6	-10	-3	-17
7	Texas Canyon	I-10	EB	7,748	2.58%	8,400	9,500	10,800	13,900	496	481	51%	49%	977	11.6%	0.15	35	21	33	65	38	73	43	83	55	107	2	-44	-3	-52	-8	-62	-20	-86
7	Texas Canyon	I-10	WB	9,934	2.58%	10,700	12,200	13,800	17,800	448	542	45%	55%	990	9.3%	0.15	35	22	30	73	34	83	39	94	50	122	5	-51	1	-61	-4	-72	-15	-100
8	San Simon	I-10	EB	7,211	2.61%	7,800	8,900	10,100	13,000	363	320	53%	47%	683	8.8%	0.15	32	18	25	43	28	49	32	56	41	72	7	-25	4	-31	0	-38	-9	-54
8	San Simon	I-10	WB	6,907	2.61%	7,500	8,500	9,700	12,500	319	341	48%	52%	660	8.8%	0.15	42	18	22	46	24	52	28	60	36	77	20	-28	18	-34	14	-42	6	-59
11	Haviland	I-40	EB	9,149	2.76%	9,900	11,400	13,000	17,100	173	337	34%	66%	510	5.2%	0.15	28	29	12	45	13	52	15	60	20	79	16	-16	15	-23	13	-31	8	-50
11	Haviland	I-40	WB	8,519	2.76%	9,200	10,600	12,100	15,900	189	282	40%	60%	471	5.1%	0.15	26	23	13	38	15	44	17	50	22	66	13	-15	11	-21	9	-27	4	-43
17	Parks ⁴	I-40	EB	10,925	2.08%	11,600	12,900	14,300	17,500	(2)	(2)	(2)	(2)	(2)	0.0%	0.15	10	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	Parks ⁴	I-40	WB	9,391	2.08%	10,000	11,100	12,300	15,100	(2)	(2)	(2)	(2)	(2)	0.0%	0.15	10	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	Meteor Crater	I-40	EB	9,736	2.79%	10,600	12,100	13,900	18,300	415	495	46%	54%	910	8.6%	0.15	32	57	28	67	32	76	37	88	48	115	3	-10	-1	-19	-6	-31	-17	-58
18	Meteor Crater	I-40	WB	10,084	2.79%	11,000	12,600	14,400	19,000	389	548	42%	58%	937	8.5%	0.15	31	64	26	74	30	85	34	97	45	128	5	-10	1	-21	-3	-33	-14	-64
12	Painted Cliffs	I-40	Both	23,129	3.00%	25,300	29,300	34,000	45,600	510	227	69%	31%	737	2.9%	0.10	34	9	23	20	27	24	31	27	41	37	11	-11	7	-15	3	-18	-7	-28
16	McGuireville	I-17	NB	13,700	1.68%	14,400	15,700	17,000	20,100	471	246	66%	34%	717	5.0%	0.10	45	20	21	22	23	24	25	26	30	31	24	-2	22	-4	20	-6	15	-11
16	McGuireville	I-17	SB	12,423	1.68%	13,100	14,200	15,400	18,200	530	337	61%	39%	867	6.6%	0.10	45	20	24	30	26	33	28	36	33	42	21	-10	19	-13	17	-16	12	-22
9	Sunset Point ⁵	I-17	Both	37,549	2.25%	40,100	44,900	50,100	62,600	1023	341	75%	25%	1,364	3.4%	0.075	56	27	35	23	39	26	43	29	54	36	21	4	17	1	13	-2	2	-9
19	Christensen ⁶	I-17	NB	12,508	1.61%	13,100	14,200	15,400	18,100	(2)	(2)	(2)	(2)	(2)	0.0%	0.10	10	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	Christensen ⁶	I-17	SB	10,729	1.61%	11,300	12,200	13,200	15,500	(2)	(2)	(2)	(2)	(2)	0.0%	0.15	10	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Canoa Ranch	I-19	NB	8,618	1.91%	9,100	10,000	11,000	13,300	427	53	89%	11%	480	5.3%	0.15	44	18	29	7	32	8	35	9	42	10	15	11	12	10	9	9	2	8
10	Canoa Ranch	I-19	SB	8,696	1.91%	9,200	10,100	11,100	13,400	374	47	89%	11%	421	4.6%	0.15	53	18	25	6	28	7	30	8	37	9	28	12	25	11	23	10	16	9
13	Hassayampa	US 60	Both	18,556	1.44%	19,400	20,800	22,300	25,800	(2)	(2)	(2)	(2)	(2)	0.0%	0.10	27	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Salt River Canyon	US 60	Both	2,788	2.60%	3,000	3,400	3,900	5,000	(2)	(2)	(2)	(2)	(2)	0.0%	0.15	19	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Mazatzal ³	SR 87	Both	13,269	1.53%	13,900	15,000	16,200	18,800	(2)	(2)	(2)	(2)	(2)	0.0%	0.10	(2)	(2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
¹ RA Map No. = Rest area number corresponding to Figure 2.1 of Working Paper 2
² No data available
³ Rest area permanently closed
⁴ Rest area permanently closed, but temporarily open to truck parking
⁵ Rest area under construction, but temporarily open to truck parking
⁶ FHWA vehicles C1, C3 and C5 C7
⁷ FHWA vehicles C4 and C6, C13
⁸ Growth rate provided by ADOT/MPD
⁹ DH was calculated per AASHTO specifications based on mainline AADT
¹⁰ When ramp counts not available, traffic is assumed to be 75% cars, 25% trucks
¹¹ When ramp AADT were not available, ADT was used. AADT were available at Ehrenberg, Bouse Wash, Burnt Well, and Sunset Point.

Restrooms

Current and future restroom need was estimated based on equations provided in AASHTO's Guide. The following equations, variables, and assumptions from AASHTO's Guide were used in the estimation of the number of restrooms for the 5, 10, and 20 year planning periods for the rest areas ²:

$$T = (A) * (UV) * (DH) * (PF) * (P) / UHF$$

$$T_w = T * 0.60$$

$$T_m = T * 0.40$$

T = total toilets and urinals

T_w = Number of women's toilets

T_m = number of men's toilets

A = One-way design year ADT

UV = Restroom users per vehicle [(2 users/car) * (percentage of cars) + (1 user/truck) * (percentage of trucks)]

DH = Design hourly factor – Per AASHTO specifications:

AAADT < 12,500	→	DH = 0.15
12,500 < AAADT < 30,000	→	DH = 0.10
AAADT > 30,000	→	DH = 0.075

PF = Peak Hour Factor (use 1.8)

P = Capture rate, determined by $\left(\frac{\text{RA Ramp ADT}}{\text{Mainline Direction ADT}} \right)$

UHF = Restroom users per hour per fixture based on 2-minute cycle (use 30)

Table 2-2 summarizes the number of restroom projections and deficiencies for the 5, 10, and 20 year planning horizon at each of the rest areas included in the study.

² Figure 13 from A Guide for the Development of Rest Areas on Major Arterials and Freeways, 2001

Table 2-2. Rest Area Restroom Forecasts

RA Map No. 1	REST AREA (RA)	ROUTE	TRAFFIC DIRECTION SERVED	2019 MAINLINE TRAFFIC VOLUME (ADOT AADT)	GROWTH RATE ⁸	MAINLINE AADT				REST AREA RAMP AADT/ADT ¹¹ YEAR 2022 ¹⁰					CAPTURE RATE	DESIGN HOURLY FACTOR (DH) ⁹	EXISTING RESTROOM FIXTURES (Toilets/Urinals)				CALCULATED RESTROOM NEED (PER AASHTO GUIDE)								RESTROOM EXCESS (+) / DEFICIENCIES (-) IN FORECAST YEARS									
						2022	2027	2032	2042	CAVS ⁶	TRUCKS ⁷	PERCENT CAVS ⁶	PERCENT TRUCKS ⁷	TOTAL			Men	Women	Family	Total	2022		2027		2032		2042		2022		2027		2032		2042			
																					Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women				
1	Mohawk	I-8	EB	5,333	2.26%	5,700	6,400	7,100	8,900	267	117	70%	30%	384	6.7%	0.15	7	7	0	14	2	3	2	3	2	3	3	4	5	4	5	4	5	4	5	4	3	2
1	Mohawk	I-8	WB	5,287	2.26%	5,700	6,300	7,100	8,800	400	95	81%	19%	495	8.7%	0.15	7	7	0	14	2	3	3	4	3	4	4	5	5	4	4	3	4	3	4	3	2	
2	Sentinel ⁵	I-8	EB	5,000	2.44%	5,400	6,100	6,800	8,700	402	134	75%	25%	536	9.9%	0.15	6	6	2	14	3	4	3	4	3	5	4	6	3	2	3	2	3	1	2	0		
2	Sentinel ⁵	I-8	WB	5,500	2.44%	5,900	6,700	7,500	9,600	194	65	75%	25%	258	4.4%	0.15	6	6	2	14	1	2	1	2	2	2	2	3	5	4	5	4	4	4	4	3		
3	Ehrenberg	I-10	EB	13,695	2.61%	14,800	16,800	19,100	24,800	775	457	63%	37%	1,232	8.3%	0.10	6	7	0	13	4	6	4	7	5	7	6	10	2	1	2	0	1	0	0	-3		
3	Ehrenberg	I-10	WB	13,591	2.61%	14,700	16,700	19,000	24,600	463	273	63%	37%	736	5.0%	0.10	6	7	0	13	2	3	3	4	3	4	4	6	4	4	3	3	3	3	2	1		
4	Bouse Wash	I-10	EB	13,741	2.66%	14,900	17,000	19,300	25,100	685	403	63%	37%	1,088	7.3%	0.10	4	4	0	8	3	5	4	6	4	7	6	9	1	-1	0	-2	0	-3	-2	-5		
4	Bouse Wash	I-10	WB	12,598	2.66%	13,600	15,500	17,700	23,000	588	347	63%	37%	935	6.9%	0.10	4	4	0	8	3	4	3	5	4	6	5	7	1	0	1	-1	0	-2	-1	-3		
5	Burnt Well	I-10	EB	11,249	2.61%	12,200	13,800	15,700	20,300	1178	494	70%	30%	1,672	13.7%	0.10	6	7	0	13	5	8	6	9	7	10	9	13	1	-1	0	-2	-1	-3	-3	-6		
5	Burnt Well	I-10	WB	12,875	2.61%	13,900	15,800	18,000	23,300	973	409	70%	30%	1,382	9.9%	0.10	6	7	0	13	4	6	5	7	6	8	7	11	2	1	1	0	0	-1	-1	-4		
6	Sacaton	I-10	EB	31,655	2.17%	33,800	37,600	41,800	51,900	861	409	68%	32%	1,270	3.8%	0.075	6	6	0	12	3	4	3	5	4	6	5	7	3	2	3	1	2	0	1	-1		
6	Sacaton	I-10	WB	30,974	2.17%	33,000	36,800	40,900	50,700	900	337	73%	27%	1,237	3.7%	0.075	6	6	0	12	3	4	3	5	4	5	4	7	3	2	3	1	2	1	2	-1		
7	Texas Canyon	I-10	EB	7,748	2.58%	8,400	9,500	10,800	13,900	496	481	51%	49%	977	11.6%	0.10	6	6	0	12	3	5	3	5	4	6	5	8	3	1	3	1	2	0	1	-2		
7	Texas Canyon	I-10	WB	9,934	2.58%	10,700	12,200	13,800	17,800	448	542	45%	55%	990	9.3%	0.10	6	6	0	12	3	5	4	5	4	6	5	8	3	1	2	1	2	0	1	-2		
8	San Simon	I-10	EB	7,211	2.61%	7,800	8,900	10,100	13,000	363	320	53%	47%	683	8.8%	0.10	6	7	0	13	2	3	2	4	3	4	4	5	4	4	4	3	3	3	2	2		
8	San Simon	I-10	WB	6,907	2.61%	7,500	8,500	9,700	12,500	319	341	48%	52%	660	8.8%	0.10	6	7	0	13	2	3	2	4	3	4	3	5	4	4	4	3	3	3	3	2		
11	Haviland	I-40	EB	9,149	2.76%	9,900	11,400	13,000	17,100	173	337	34%	66%	510	5.2%	0.10	8	6	0	14	2	2	2	3	2	3	3	4	6	4	6	3	6	3	5	2		
11	Haviland	I-40	WB	8,519	2.76%	9,200	10,600	12,100	15,900	189	282	40%	60%	471	5.1%	0.10	8	6	0	14	1	2	2	3	2	3	3	4	7	4	6	3	6	3	5	2		
17	Parks ⁴	I-40	EB	10,925	2.08%	11,600	12,900	14,300	17,500	(2)	(2)	(2)	(2)	(2)	0.0%	0.10	(2)	(2)	(2)	(2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
17	Parks ⁴	I-40	WB	9,391	2.08%	10,000	11,100	12,300	15,100	(2)	(2)	(2)	(2)	(2)	0.0%	0.10	(2)	(2)	(2)	(2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
18	Meteor Crater	I-40	EB	9,736	2.79%	10,600	12,100	13,900	18,300	415	495	46%	54%	910	8.6%	0.10	8	8	1	17	3	4	3	5	4	6	5	7	5	4	5	3	4	2	3	1		
18	Meteor Crater	I-40	WB	10,084	2.79%	11,000	12,600	14,400	19,000	389	548	42%	58%	937	8.5%	0.10	8	8	1	17	3	4	3	5	4	6	5	8	5	4	5	3	4	2	3	0		
12	Painted Cliffs	I-40	Both	23,129	3.00%	25,300	29,300	34,000	45,600	510	227	69%	31%	737	2.9%	0.075	6	6	0	12	2	3	2	3	2	3	3	5	4	3	4	3	4	3	3	1		
16	McGuireville	I-17	NB	13,700	1.68%	14,400	15,700	17,000	20,100	471	246	66%	34%	717	5.0%	0.10	6	6	0	12	2	3	2	4	3	4	3	5	4	3	4	2	3	2	3	1		
16	McGuireville	I-17	SB	12,423	1.68%	13,100	14,200	15,400	18,200	530	337	61%	39%	867	6.6%	0.10	6	6	0	12	3	4	3	4	3	5	4	6	3	2	3	2	3	1	2	0		
9	Sunset Point ⁵	I-17	Both	37,549	2.25%	40,100	44,900	50,100	62,600	1023	341	75%	25%	1,364	3.4%	0.075	8	8	1	17	3	5	4	5	4	6	5	7	5	3	4	3	4	2	3	1		
19	Christensen ⁴	I-17	NB	12,508	1.61%	13,100	14,200	15,400	18,100	(2)	(2)	(2)	(2)	(2)	0.0%	0.10	(2)	(2)	(2)	(2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
19	Christensen ⁴	I-17	SB	10,729	1.61%	11,300	12,200	13,200	15,500	(2)	(2)	(2)	(2)	(2)	0.0%	0.10	(2)	(2)	(2)	(2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
10	Canoa Ranch	I-19	NB	8,618	1.91%	9,100	10,000	11,000	13,300	427	53	89%	11%	480	5.3%	0.10	8	8	1	17	1	2	2	2	2	3	2	3	7	6	6	6	6	5	6	5		
10	Canoa Ranch	I-19	SB	8,696	1.91%	9,200	10,100	11,100	13,400	374	47	89%	11%	421	4.6%	0.10	8	8	1	17	1	2	1	2	2	2	2	3	7	6	7	6	6	6	6	5		
13	Hassayampa	US 60	Both	18,556	1.44%	19,400	20,800	22,300	25,800	(2)	(2)	(2)	(2)	(2)	0.0%	0.10	2	2	0	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
14	Salt River Canyon	US 60	Both	2,788	2.60%	3,000	3,400	3,900	5,000	(2)	(2)	(2)	(2)	(2)	0.0%	0.15	5	5	0	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
15	Mazatzal ³	SR 87	Both	13,269	1.53%	13,900	15,000	16,200	18,800	(2)	(2)	(2)	(2)	(2)	0.0%	0.10	(2)	(2)	(2)	(2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			

Notes:
¹ RA Map No. = Rest area number corresponding to Figure 2-1 of Working Paper
² No data available
³ Rest area permanently closed
⁴ Rest area permanently closed, but temporarily open to truck parking
⁵ Rest area under construction, but temporarily open to truck parking
⁶ FHWA vehicles C1-C3 and C5-C7
⁷ FHWA vehicles C4 and C8-C13
⁸ Growth rate provided by ADOT/MPD
⁹ DH was calculated per AASHTO specifications based on mainline AADT
¹⁰ When ramp counts not available, traffic is assumed to be 75% cars, 25% trucks
¹¹ When ramp AADT were not available, ADT was used. AADT were available at Ehrenberg, Bouse Wash, Burnt Well, and Sunset Point.

Water Usage

Based on AASHTO research, each rest area (restrooms, drinking water, and cleanup) uses an average of 1,000,000 gallons of water per year. Current and future water needs were estimated based on equations in AASHTO's Guide³:

$$\text{PHD} = \text{ADT} * \text{DH} * \text{PF} * \text{P} * \text{UV} * (3.5 \text{ gallons/user})$$

PHD = Peak hourly demand

ADT = One-way design year ADT

DH = Design hourly factor – Per AASHTO specifications:

AAADT < 12,500	→	DH = 0.15
12,500 < AAADT < 30,000	→	DH = 0.10
AAADT > 30,000	→	DH = 0.075

PF = Peak Hour Factor (use 1.8)

P = Capture rate, determined by $\left(\frac{\text{RA Ramp ADT}}{\text{Mainline Direction ADT}} \right)$

UV = Restroom users per vehicle [(2 users/car) * (percentage of cars) + (1 user/truck) * (percentage of trucks)]

Table 2-3 summarizes the water usage forecast for the 5, 10, and 20 year planning horizon at each of the rest areas included in the study.

³ Figure 13 from A Guide for the Development of Rest Areas on Major Arterials and Freeways, 2001

Table 2-3. Rest Area Water Usage Forecasts

RA Map No. 1	REST AREA (RA)	ROUTE	TRAFFIC DIRECTION SERVED	MAINLINE AADT				CALCULATED WATER USAGE: PEAK HOURLY DEMAND ⁵ (gallons/hour)			
				2022	2027	2032	2042	2022	2027	2032	2042
1	Mohawk	I-8	EB	5,700	6,400	7,100	8,900	615	691	766	961
1	Mohawk	I-8	WB	5,700	6,300	7,100	8,800	846	935	1,054	1,306
2	Sentinel ⁴	I-8	EB	5,400	6,100	6,800	8,700	886	1,001	1,116	1,428
2	Sentinel ⁴	I-8	WB	5,900	6,700	7,500	9,600	427	485	542	694
3	Ehrenberg	I-10	EB	14,800	16,800	19,100	24,800	1,897	2,153	2,448	3,178
3	Ehrenberg	I-10	WB	14,700	16,700	19,000	24,600	1,133	1,287	1,464	1,896
4	Bouse Wash	I-10	EB	14,900	17,000	19,300	25,100	1,675	1,912	2,170	2,822
4	Bouse Wash	I-10	WB	13,600	15,500	17,700	23,000	1,439	1,640	1,873	2,434
5	Burnt Well	I-10	EB	12,200	13,800	15,700	20,300	2,693	3,046	3,466	4,481
5	Burnt Well	I-10	WB	13,900	15,800	18,000	23,300	2,225	2,530	2,882	3,730
6	Sacaton	I-10	EB	33,800	37,600	41,800	51,900	2,014	2,240	2,490	3,092
6	Sacaton	I-10	WB	33,000	36,800	40,900	50,700	2,019	2,252	2,503	3,103
7	Texas Canyon	I-10	EB	8,400	9,500	10,800	13,900	1,392	1,574	1,790	2,303
7	Texas Canyon	I-10	WB	10,700	12,200	13,800	17,800	1,359	1,549	1,753	2,261
8	San Simon	I-10	EB	7,800	8,900	10,100	13,000	988	1,128	1,280	1,647
8	San Simon	I-10	WB	7,500	8,500	9,700	12,500	925	1,049	1,197	1,542
11	Haviland	I-40	EB	9,900	11,400	13,000	17,100	645	743	848	1,115
11	Haviland	I-40	WB	9,200	10,600	12,100	15,900	624	719	820	1,078
17	Parks ³	I-40	EB	11,600	12,900	14,300	17,500	-	-	-	-
17	Parks ³	I-40	WB	10,000	11,100	12,300	15,100	-	-	-	-
18	Meteor Crater	I-40	EB	10,600	12,100	13,900	18,300	1,252	1,429	1,642	2,162
18	Meteor Crater	I-40	WB	11,000	12,600	14,400	19,000	1,253	1,435	1,640	2,164
12	Painted Cliffs	I-40	Both	25,300	29,300	34,000	45,600	1,178	1,365	1,584	2,124
16	McGuireville	I-17	NB	14,400	15,700	17,000	20,100	1,123	1,224	1,325	1,567
16	McGuireville	I-17	SB	13,100	14,200	15,400	18,200	1,320	1,431	1,552	1,834
9	Sunset Point ⁴	I-17	Both	40,100	44,900	50,100	62,600	2,256	2,526	2,818	3,521
19	Christensen ³	I-17	NB	13,100	14,200	15,400	18,100	-	-	-	-
19	Christensen ³	I-17	SB	11,300	12,200	13,200	15,500	-	-	-	-
10	Canoa Ranch	I-19	NB	9,100	10,000	11,000	13,300	857	942	1,036	1,253
10	Canoa Ranch	I-19	SB	9,200	10,100	11,100	13,400	751	825	906	1,094
13	Hassayampa	US 60	Both	19,400	20,800	22,300	25,800	-	-	-	-
14	Salt River Canyon	US 60	Both	3,000	3,400	3,900	5,000	-	-	-	-
15	Mazatzal ²	SR 87	Both	13,900	15,000	16,200	18,800	-	-	-	-

Notes:

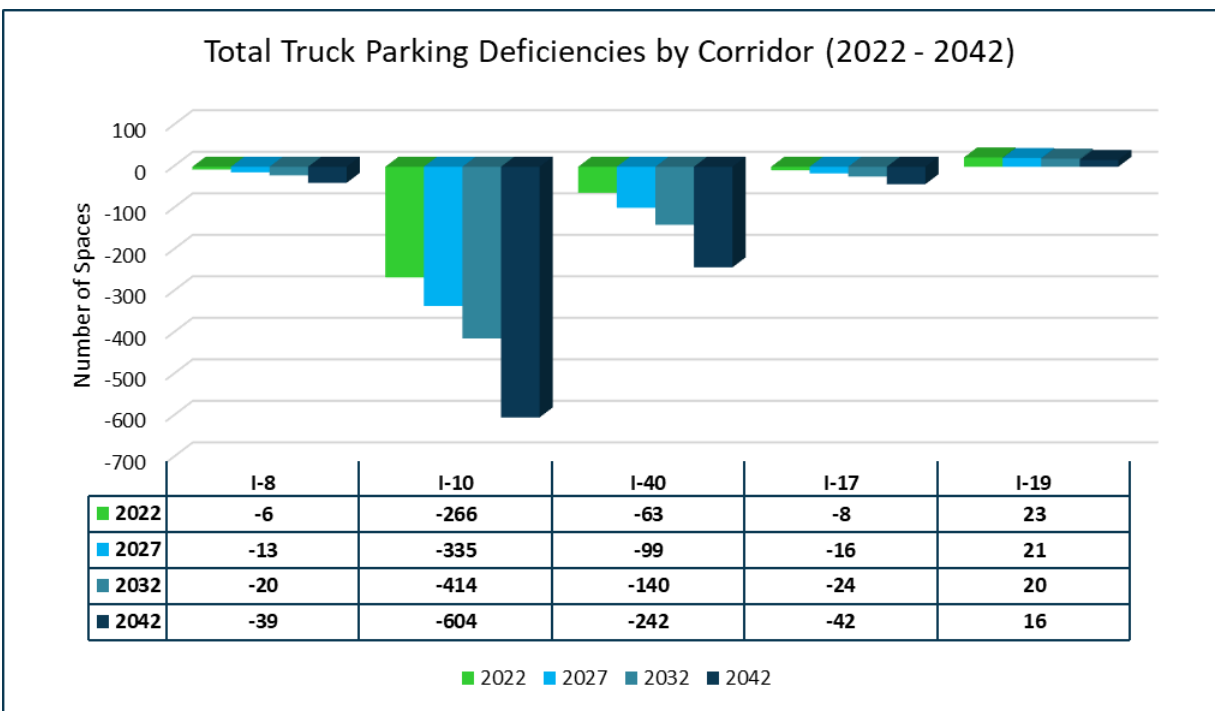
- ¹ RA Map No. = Rest area number corresponding to Figure 2-1 of Working Paper #1
- ² Rest area permanently closed
- ³ Rest area permanently closed, but temporarily open to truck parking
- ⁴ Rest area under construction, but temporarily open to truck parking
- ⁵ Water demand calculated by: ADT * DH * (Peak Hour Factor) * (capture rate) * (restroom users/vehicle) * (3.5 gallons/user)
 Peak Hour Factor assumed to be 1.8
 Restroom users/vehicle = (2 users/car) * (percentage of cars) + (1 user/truck) * (percentage of trucks)

Forecasts and Deficiencies

Parking Forecasts and Deficiencies

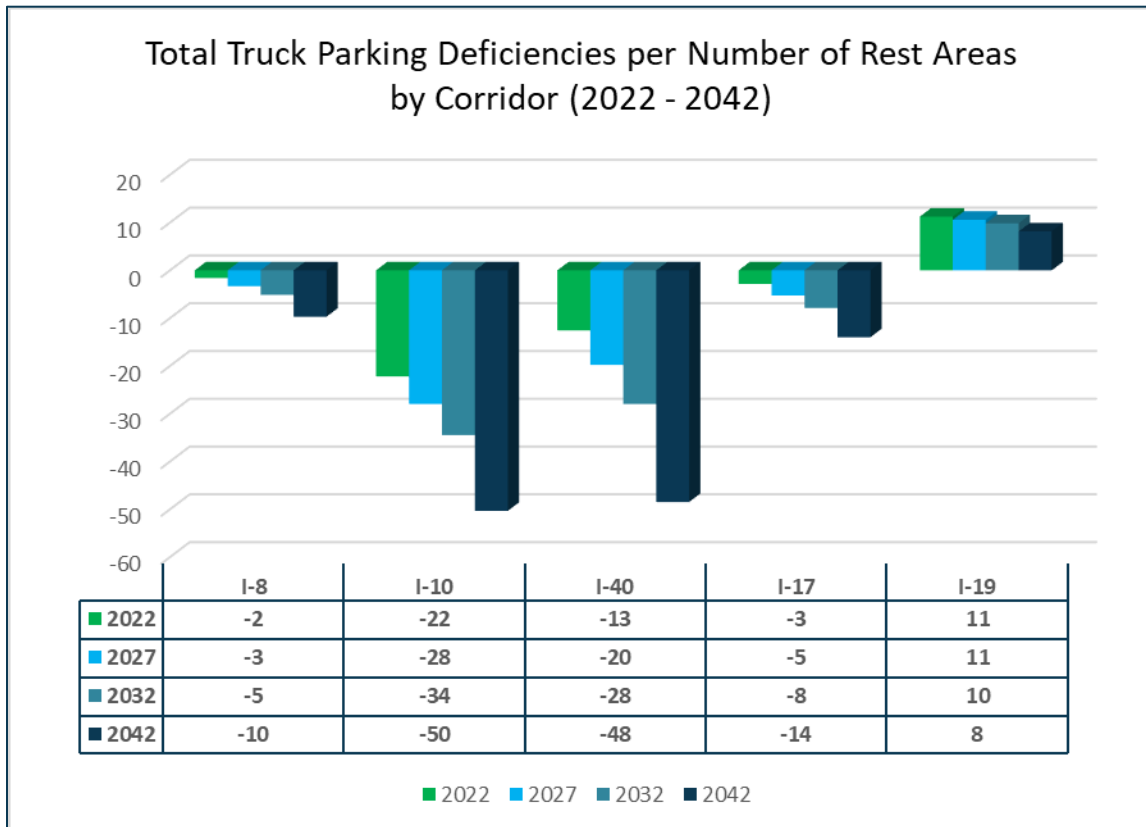
Based on the forecast data in **Table 2-1**, existing car parking at rest areas is generally adequate. However, the eastbound Burnt Well and eastbound Ehrenberg rest areas do show existing (2022) deficiencies (30 and 9 spaces, respectively). Truck parking at ADOT rest areas is much more deficient as compared to car parking. In fact, all rest areas along I-10 were found to be deficient and range from needing 5 spaces to 51 spaces. In addition, all rest areas forecasted along I-40 were also deficient in truck parking, though not as severe as I-10. The total parking deficiencies per corridor were calculated and provided below in **Figure 2-1**. As shown, I-10 and I-40 have the largest deficits in existing year 2022 and in future year 2042. I-19 is the only corridor to not be in deficit by the year 2042.

Figure 2-1. Truck Parking Deficiencies by Corridor



The average deficit per rest area along each corridor was also calculated and provided in **Figure 2-2**. On an average, the rest areas along I-10 averaged an additional 50 truck parking spaces per rest area to provide for the expected growth by 2042. Similarly, rest areas along I-40 will need an average of 48 more truck parking spaces per rest area. Truck parking deficiencies are discussed in more detail in Section 5 of this working paper.

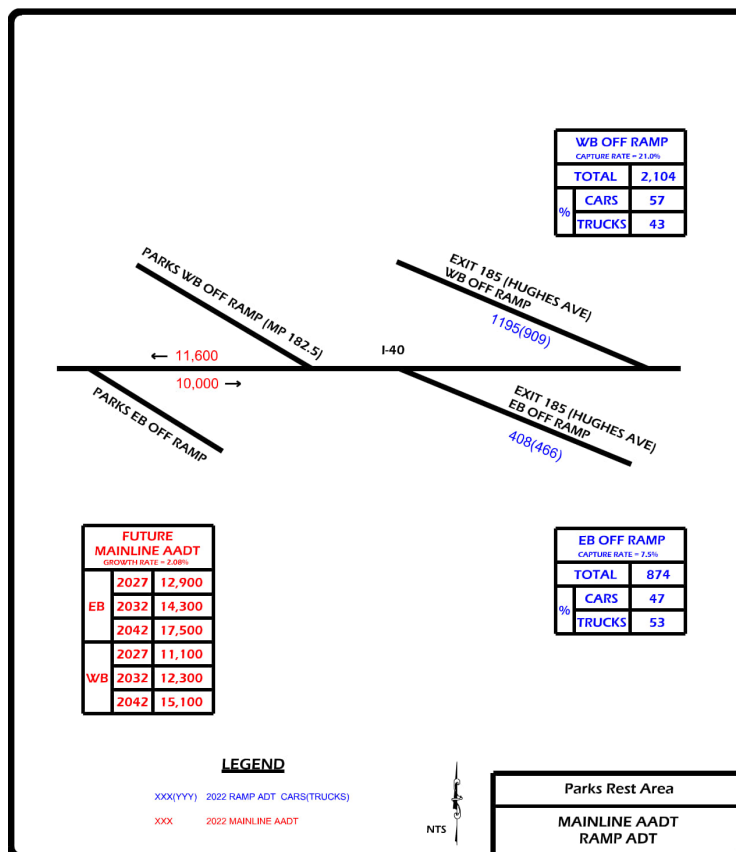
Figure 2-2. Average Truck Parking Deficiencies per Corridor



Since the Parks rest area is only temporarily open to trucks during the pandemic, ramp data was not collected for these rest areas. Instead, eastbound and westbound ramp data was collected for exit 185 (Hughes Avenue), near the City of Bellemont, approximately 4 miles east of Parks rest areas. This data was used to provide a better indication of traveler tendencies in the region. It should be noted that the Hughes Avenue exit is the only access to the community of Bellemont from I-40. North of the interchange is a Pilot Travel Center and Truck Stop, otherwise, the surrounding area is populated with residential and commercial properties and may not provide an accurate representation of travelers stopping to rest in the region.

Although the collected data cannot give direct insight into the potential usage of Parks Rest Area, it portrays a general overview of the area. Exit 185 at Hughes Avenue serves an almost even split of cars and trucks for both the eastbound and westbound exit ramps. In the westbound direction, collected ADT data shows 57% car and 43% truck usage. However, in the eastbound direction, there is a higher volume of trucks (53%) served than cars (47%). See **Figure 2-3** for the details at Parks Rest Area and Bellemont exit traffic data.

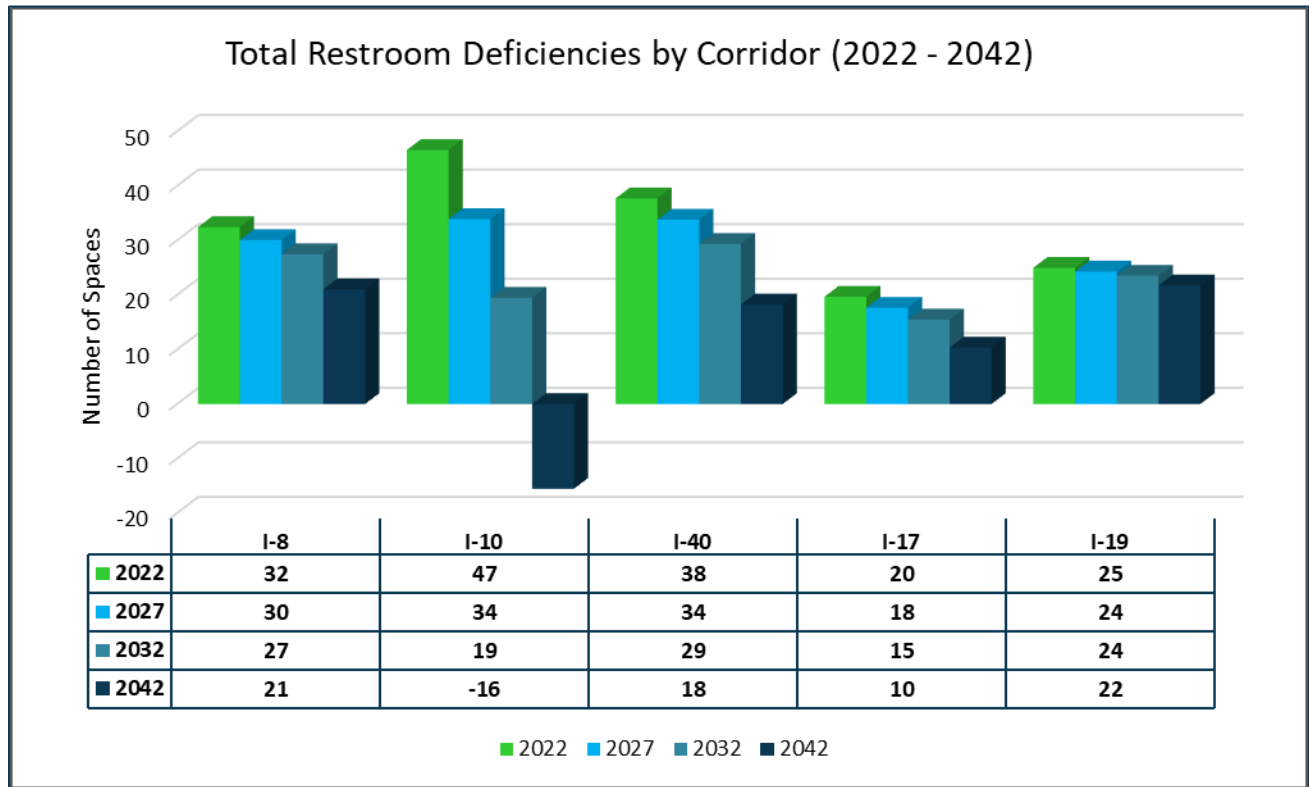
Figure 2-3. Parks Rest Area



Restrooms Forecasts and Deficiencies

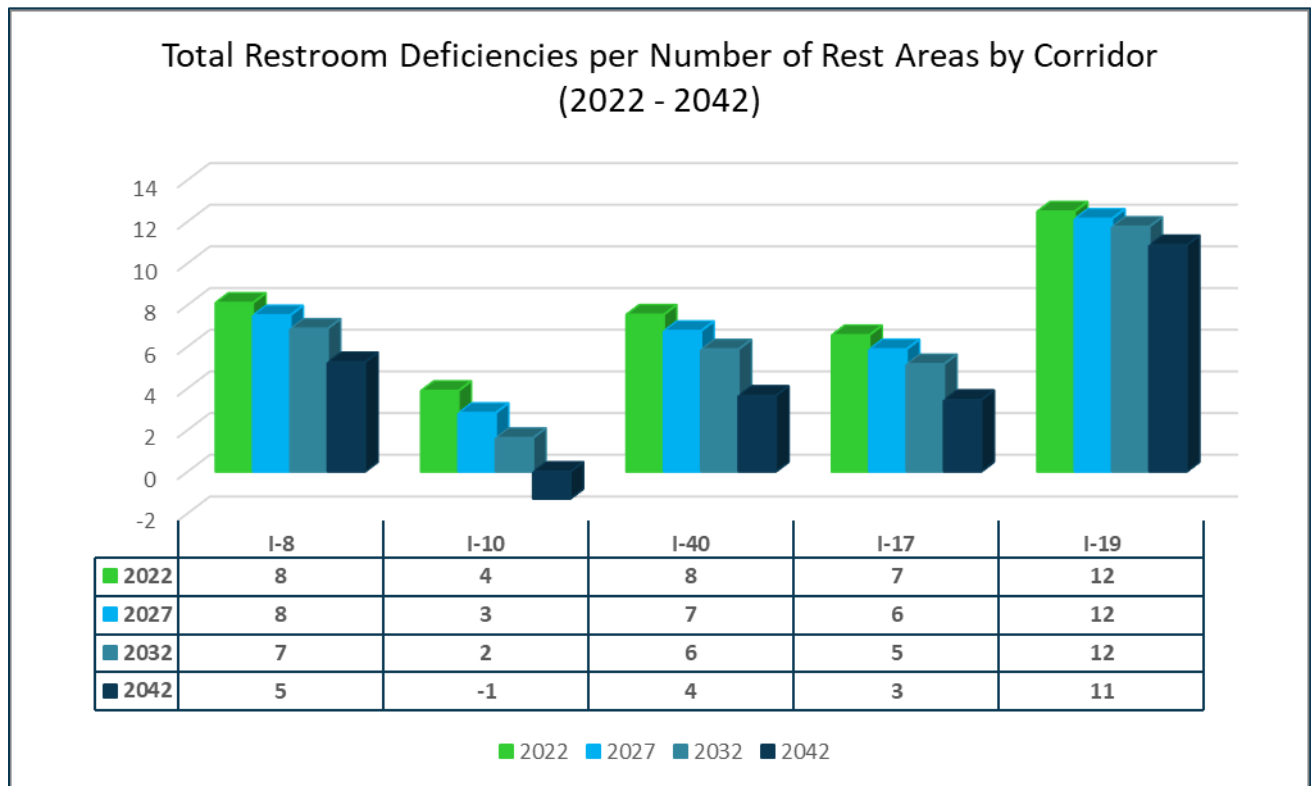
The total restroom deficiencies per corridor were calculated and are presented in **Figure 2-4**. As shown, I-10 is the only rest area corridor with deficiencies in future year 2042.

Figure 2-4. Restroom Deficiencies by Corridor



The average restroom demand per the number of rest areas along each corridor was also calculated and provided in **Figure 2-5**. On an average, the rest areas along I-10 may require, on average, one additional restroom stall by 2042.

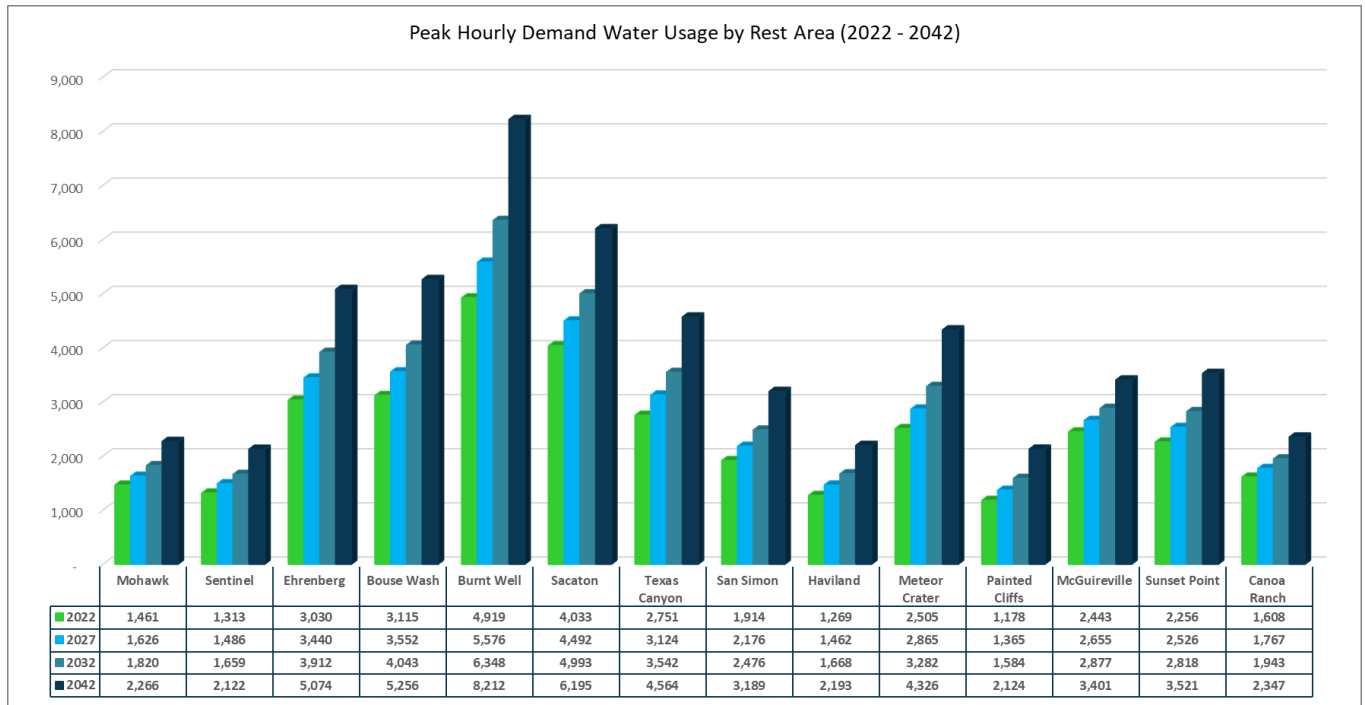
Figure 2-5. Average Restroom Deficiencies per Corridor



Water Usage Forecasts and Deficiencies

The water usage for each rest area is shown in **Figure 2-6**. Burnt Well and Sacaton rest areas are the leading rest areas with the highest projected peak hourly water demand over the next 20 years.

Figure 2-6. Water Usage by Rest Area



3 Environmental Overview

Each of the 19 rest area locations owned and operated by ADOT was reviewed for the presence or absence of resources in a variety of environmental resource categories. The review included a 0.25-mile buffer around each rest area to account for potential impacts to resources in proximity to the rest areas. For a general environmental review, 0.25 mile is assumed to be a typical distance within which impacts could occur. The following resources are not included in the table because no such resources are located near the rest areas or would be affected by new construction or expansion:

- Wild and Scenic Rivers
- Navigable Waters
- Prime or unique farmland
- Section 4(f) Wildlife or Waterfowl Refuges
- Section 6(f) properties
- Scenic Roads or Byways

In addition, the following resource categories are better evaluated during preliminary or final design:

Biological Resources: Table 2-2 in Working Paper 1 identifies threatened and endangered species within the vicinity of each rest area. Species information is summarized in **Table 3-1**. Additional biological survey and coordination would be required to determine whether species and habitats occur within the vicinity (0.25-mile) of each rest area and whether expansion or construction would affect those species or habitats.

Section 404 Waters and Section 401 Water Quality Certification: Impacts to waters of the U.S. will determine the appropriate Section 404/401 permitting requirements. At least 14 of the rest areas have washes, streams, or creeks in close proximity. Fieldwork would be required to determine the appropriate level of jurisdictional delineation and as necessary, wetland delineations. Work within Tribal waters would require an Individual Section 401 Water Quality Certification.

Sole Source Aquifer: Because the Canoa Ranch Rest Area is located within the Upper Santa Cruz and Avra Basin Sole Source Aquifer, construction/expansion at this location would require, at a minimum, a notification letter to the Environmental Protection Agency (EPA).

Air Quality: The Burnt Well Rest Area and the Sacaton Rest Area are both located within nonattainment areas that do not meet the applicable the National Ambient Air Quality Standard (NAAQS). The Burnt Well Rest Area is located within the Phoenix ozone nonattainment area, while the Sacaton Rest Area is located within the West Pinal PM₁₀ (particulate matter 10 microns or less in diameter) nonattainment area (ADEQ 2022a and ADEQ 2022b)^{4, 5}. No federally funded project may cause or contribute to any new NAAQS violation, increase the frequency or severity of any existing NAAQS violation, or delay

⁴ Arizona Department of Environmental Quality (ADEQ). 2022a. Phoenix | Ozone Nonattainment Area. February 1. Available at: <https://azdeq.gov/phoenix-ozone-nonattainment-area>.

⁵ Arizona Department of Environmental Quality (ADEQ). 2022b. West Pinal | Particulate Matter (PM-10) Nonattainment Area. March 17. Available at: <https://azdeq.gov/west-pinal-particulate-matter-pm-10-nonattainment-area>.

attainment of any NAAQS (42 U.S.C. § 7506(c)(1)). Any proposed expansion or modifications provided by federal funding at any rest area would not be significant enough to cause any areas within attainment to reach nonattainment of any NAAQS or contribute to the nonattainment status within the Phoenix ozone nonattainment area or the West Pinal PM₁₀ nonattainment area.

Noise Impacts: **Table 3-1** presents noise-sensitive receptors (e.g., homes, parks, schools) in proximity to each rest area. Coordination with ADOT Environmental Planning is recommended to determine if proposed construction/expansion plans constitute a "substantial alteration" of an existing rest area. "Substantial alterations" would trigger a noise analysis.

Hazardous Materials: Based on a review of existing environmental database records and aerial photographs, all the rest areas present potential hazardous materials issues with a relatively high degree of risk. The "high" rankings are primarily derived from the regulatory process required for wastewater permit modification for renovation/expansion and well abandonment for closure, as well as the potential for asbestos-containing materials and/or lead-based paint issues associated with the existing rest area structures and ancillary facilities. A summary of hazardous materials at each rest area can be found in **Appendix A**.

Cultural Resources: Cultural resources data was obtained from AZSITE, Arizona's Cultural Resource Inventory, and addresses a 0.25-mile radius around each rest area. The data provided is a limited snapshot of the sites near each rest area; the scope of research for this review does not include site information from sources such as Bureau of Land Management (BLM), State Historic Preservation Office, U.S. Forest Service (USFS), or Tribes. Additional sites may be discovered during subsequent cultural resources investigation and/or survey. A summary of cultural resources at each rest area can be found in **Appendix B**.

Socioeconomic Impacts, Including Environmental Justice (EJ)/Title VI: **Table 3-1** identifies the presence of environmental justice populations within the vicinity of each rest area by identifying low-income and minority populations for the U.S. Census block group each rest area is located in compared to the proportion of low-income and minority populations for the county the rest area is in and for the entire state. Environmental justice populations are considered present if the proportion of low-income or minority residents within the block group exceeds that of the county or state. None of the rest areas are located near residential neighborhoods or commercial districts. In addition, most impacts from rest area construction or expansion would be borne equally by the traveling public and are, therefore, not considered to be disproportionately high and adverse to any specific population. If impacts to homes and/or businesses would result from new right-of-way requirements, an EJ analysis should be considered when right-of-way requirements are identified. Regarding rest areas on Tribal lands, coordination should be undertaken to address unpermitted vending during construction/expansion work.

Table 3-1. Rest Area Environmental Overview

Rest Areas	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Mohawk	Sentinel	Ehrenberg	Bouse Wash	Burnt Well	Sacaton	Texas Canyon	San Simon	Sunset Point	Canoa Ranch	Haviland	Painted Cliffs	Hasayampa	Salt River Canyon	Mazatzal	McGuireville	Parks	Meteor Crater	Christensen
Special Status Species	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Critical Habitat	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No
Other Wildlife and Habitat Concerns	Habitat Block, Sentinel Plain Linkage	Habitat Block, Sentinel Plain Linkage	Habitat Block	Habitat Block	Bighon Belmont – Saddle Mountain Linkage	Habitat Block	Galliuoro – Winchester – Dragoon Linkage	Habitat Block, Pinaleno – Dos Cabezas – San Simon Valley Linkage	Habitat Block	None	Habitat Block	None	Wickenburg – Hassayampa Linkage	Habitat Block, Sevenmile – Sevenmile East US 60 Linkage	Habitat Block	Habitat Block, Northern I-17 Corridor Linkage	Habitat Block, Valle – Belmont Linkage	Mogollon Rim – Navajo Nation Linkage	Habitat Block, Oak Creek Canyon – Munds Park Linkage
Wetland Areas	No	No	No	No	No	No	No	No	No	Potential wetlands	No	No	Potential wetlands	No	No	No	No	No	No
Riparian Areas	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No
100-Year Floodplain (FEMA ⁶ FIRM ⁷ Number)	No (04027C1725E)	Zone D ⁸ (04013C3705L)	Yes (04012C1501C and 04012C1505C)	Yes (04012C1240C)	Zone D ⁵ (04013C1550M)	Zone D ⁵ (04021C0800E)	No (04003C0980F)	No (040003C0900F)	No (04025C3225G)	Yes (04019C3945L)	Yes (04015C5450G)	Zone D ⁵ (04001C3000E)	Yes (04013C0345M)	Zone D ⁵ (04007C1375D)	Zone D ⁵ (04007C0625D)	Zone D ⁵ (04025C1820G)	No (04005C6800G)	No (04005C7300G)	Yes (04005C7460G)
Section 404 Waters	Unnamed washes	Unnamed washes	Unnamed washes	Unnamed washes	Unnamed washes	Unnamed washes	Unnamed washes	Unnamed washes	Unnamed washes	Potential wetlands; Santa Cruz River; unnamed washes	Unnamed washes	Unnamed washes	Potential wetlands; Hassayampa River; unnamed washes	Salt River	Unnamed washes	Unnamed washes	No	Unnamed washes	Unnamed washes
Section 401 Water Quality Certification	Conditional with NWP	Conditional with NWP	Conditional with NWP	Conditional with NWP	Conditional with NWP	Individual Certification	Conditional with NWP	Conditional with NWP	Conditional with NWP	Conditional with NWP; Individual with IP	Conditional with NWP	Individual Certification	Conditional with NWP; Individual with IP	Individual Certification	Conditional with NWP	Conditional with NWP	No	Conditional with NWP	Conditional with NWP
Sole Source Aquifer	No	No	No	No	No	No	No	No	No	Upper Santa Cruz & Avra Basin	No	No	No	No	No	No	No	No	No
Noise-Sensitive Receptors	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence	No sensitive receptors	Residence	Residence	Residence	Residence	Residence
Hazardous Materials Relative Risk Assessment (see Appendix A)	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High	High

⁶ FEMA = Federal Emergency Management Agency

⁷ FIRM = Flood Insurance Rate Map

⁸ Zone D indicates areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted.

Arizona Statewide Rest Area Study

Section 4(f) Resources	Section 4(f) Historic Site	Yes	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No
	Section 4(f) Park or Recreational Site	No	No	No	No	No	No	No	No	Potential (Agua Fria National Monument)	No	No	No	No	No	Potential (Tonto National Forest)	Potential (Coconino National Forest)	Potential (Kaibab National Forest)	No	Potential (Coconino National Forest)
Cultural Resource	Archaeological/Historic Resources	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Visual Resource	Visual Resource Management Requirements	No	Yes (BLM Visual Quality Objectives)	No	Yes (BLM Visual Quality Objectives)	No	No	No	Yes (BLM Visual Quality Objectives)	Yes (BLM Visual Quality Objectives)	No	Yes (BLM Visual Quality Objectives)	No	No	No	Yes (USFS Visual Resource Management System)	Yes (USFS Visual Resource Management System)	Yes (USFS Visual Resource Management System)	No	Yes (USFS Visual Resource Management System)
Socioeconomic Resources	Existing Development	Union Pacific Railroad (UPRR); caretaker's residence	Caretaker's residence	Caretaker's residence; Morgan Corporation	Caretaker's residence; Central Arizona Project Canal; wastewater treatment	Caretaker's residence	Caretaker's residence	Caretaker's residence	Caretaker's residence; UPRR	Caretaker's residence; wastewater treatment	Caretaker's residence	Caretaker's residence	Caretaker's residence; Atchinson Topeka Santa Fe Railroad; residences, businesses	Burlington Northern Santa Fe (BNSF) Railroad; residences	None	Caretaker's residence	Caretaker's residence; wastewater treatment; planned residential development	Caretaker's residence; BNSF railroad; mining pit	Caretaker's residence; wastewater treatment	Caretaker's residence
	Ownership	ASLD, Military (Barry M. Goldwater Air Force Range), Private	ASLD, BLM, Private	ASLD, Bureau of Reclamation, Private	BLM	ASLD, BLM, Private	Tribal (Gila River Indian Community)	Private, BLM	BLM	BLM, Private	Private	BLM	Private, Tribal (Navajo Indian Reservation)	Private, BLM	Tribal (San Carlos Indian Reservation)	USFS (Tonto National Forest)	USFS (Coconino National Forest), Private	USFS (Kaibab National Forest), Private, Military (Navajo Army Depot)	ASLD, Private	USFS (Coconino National Forest), Private
	Socioeconomics, including Title VI/EJ	No EJ population present (BG ⁹ 040270121002)	EJ population present (BG 040137233052)	EJ population present (BG 040120206022)	No EJ population present (BG 040120201003)	EJ population present (BGs 040130506031 and 040130506032)	EJ population present (BGs 040219412002 and 040219413001)	No EJ population present (BGs 040030003031 and 040030003021)	EJ population present (BG 040030001001)	No EJ population present (BG 040250014011)	No EJ population present (BG 040190043241)	No EJ population present (BG 040159548002)	No EJ population present (BG 040019450021)	No EJ population present (BG 040130405152)	No EJ population present (BG 040079404001)	No EJ population present (BG 040070006001)	EJ population present (BG 040250016033)	EJ population present (BG 040050022004)	EJ population present (BG 040050015003)	No EJ population present (BG 040050015002)

⁹ BG = U.S. Census block group

4 Corridor Needs Criteria

The following criterion was used to identify and analyze locations where new rest areas might be needed on highways in Arizona. New rest area types considered include full amenity rest areas and safe parking only locations with limited amenities. This criterion is also used to identify potential expansions or preservation of existing ADOT rest areas.

Spacing Between Rest Areas

Spacing between ADOT rest areas is a key consideration when identifying locations for new rest areas or rest area expansions. Since the previous 2011 study, the spacing recommendations of 60 miles or one-hour drivetime, provided by AASHTO and Federal Highway Administration (FHWA), has not changed. Similarly, the existing spacing between ADOT rest areas has not changed. In general, spacing between rest areas on the same route ranges from a maximum of 175 miles (between the Hassayampa and Salt River Canyon Rest Areas on U.S. 60), to a minimum of 28 miles (between the Mohawk and Sentinel Rest Areas on I-8).

It should be noted that although some rest areas are spaced beyond the recommended distance or drivetime, regions between these rest areas often have urban areas or communities that provide Alternative Stopping Opportunities (ASOs) for travelers. A map of ASOs is presented in the following section.

Availability of ASOs and Site Remoteness

The availability and number of ASOs between rest areas spaced beyond the AASHTO and FHWA recommended spacing were also considered when identifying locations where new or expanded rest area services may be warranted. ASOs provide travelers with an opportunity to stop and refresh themselves, often in locations where there are no rest areas. ASOs were also evaluated for their ability to provide services considered important for a rest area, such as being open 24 hours a day, 7 days a week. Highway segments where there are few ASOs, or the distance between ASOs and/or existing rest areas is beyond the AASHTO and FHWA recommended spacing, represent regions where rest area services are may be needed.

The number and location of existing ASOs was updated from the previous study using a desktop review of Google Maps and Geographic Information System (GIS) data. **Figure 4-1** presents the existing ASOs along ADOT's highway system. Additional information about specific ASOs is provided in Section 7.

The distance between urban areas and ASOs or existing rest areas was also considered when evaluating gaps in rest area services. For this study, the census designated urban areas were used to measure the distance from rest areas. Urban areas generally have higher concentrations of ASOs compared to less densely populated regions. Furthermore, highway segments in more remote areas also typically have lower traffic volumes. **Table 4-1** summarizes the distance between existing rest areas, ASOs, and urban areas.

Table 4-1. Spacing of Existing Rest Areas, ASOs, and Urban Areas

MAP No. ¹	REST AREA (RA)	ROUTE	TRAFFIC DIRECTION SERVED	MILE POST	DISTANCE TO NEAREST RA (mi)		DISTANCE TO NEAREST ASO ⁵ (mi)		DISTANCE TO NEAREST URBAN AREA ⁶ (mi)	
					N or E	S or W	N or E	S or W	N or E	S or W
1	Mohawk	I-8	EB	55.8	28	None	11	15	130	41
1	Mohawk	I-8	WB	56.5	28	None	11	15	130	41
2	Sentinel ⁴	I-8	EB	83.6	None	28	32	14	103	70
2	Sentinel ⁴	I-8	WB	84.9	None	28	32	14	103	70
3	Ehrenberg	I-10	EB	4.4	48	None	<1	4	12	5
3	Ehrenberg	I-10	WB	5.3	48	None	<1	4	12	5
4	Bouse Wash	I-10	EB	52.2	34	48	42	7	60	33
4	Bouse Wash	I-10	WB	52.9	34	48	42	7	60	33
5	Burnt Well	I-10	EB	86.0	97	34	8	41	26	67
5	Burnt Well	I-10	WB	86.8	97	34	8	41	26	67
6	Sacaton	I-10	EB	181.7	138	97	16	10	20	13
6	Sacaton	I-10	WB	183.5	138	97	16	10	20	13
7	Texas Canyon	I-10	EB	320.2	68	138	2	13	20	16
7	Texas Canyon	I-10	WB	320.8	68	138	2	13	20	16
8	San Simon	I-10	EB	388.4	None	68	7	10	83	88
8	San Simon	I-10	WB	389.0	None	68	7	10	83	88
11	Haviland	I-40	EB	22.6	159	None	22	13	25	36
11	Haviland	I-40	WB	23.2	159	None	22	13	25	36
17	Parks ³	I-40	EB	181.6	54	159	3	19	13	19
17	Parks ³	I-40	WB	182.7	54	159	3	19	13	19
18	Meteor Crater	I-40	EB	235.2	123	54	19	35	16	34
18	Meteor Crater	I-40	WB	236.4	123	54	19	35	16	34
12	Painted Cliffs	I-40	Both	359.0	None	123	<1	20	21	70

9	Sunset Point ⁴	I-17	Both	253	45	None	11	21	34	26
16	McGuireville	I-17	NB	297	27	45	40	10	42	8
16	McGuireville	I-17	SB	297	27	45	40	10	42	8
19	Christensen ³	I-17	NB	324	None	27	13	37	15	35
19	Christensen ³	I-17	SB	324	None	27	13	37	15	35
10	Canoa Ranch	I-19	NB	32.7	None	None	30	20	30	29
10	Canoa Ranch	I-19	SB	33.7	None	None	30	20	30	29
13	Hassayampa	US 60	Both	116.1	175	None	4	14	5	22
14	Salt River Canyon	US 60	Both	292.9	None	175	47	38	47	39
15	Mazatzal ²	SR 87	Both	235.7	None	None	15	47	15	47

Notes:

¹RA Map No. = Rest area number corresponding to Figure 4-1

²Rest area permanently closed

³Rest area permanently closed, but temporarily open to truck parking

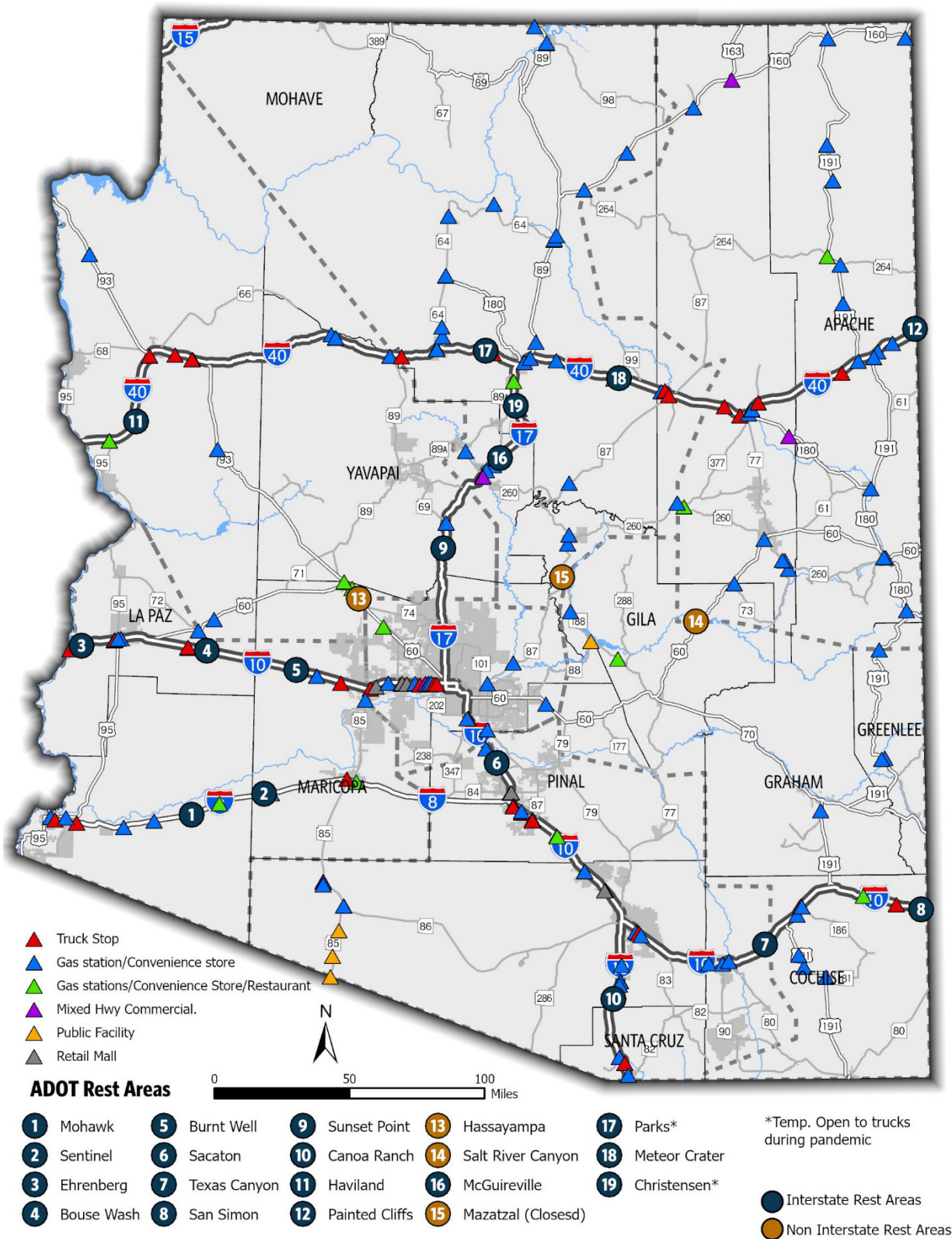
⁴Rest area under construction, but temporarily open to truck parking

⁵Alternative Stopping Opportunities

⁶Urban Clusters and Urbanized Areas as designated by U.S. Census Bureau (2010)

Highway segments in remote areas with greater spacing between rest areas, few existing ASOs, limited urban areas, or where no rest areas currently exist, represent regions where new rest area services may be warranted. Despite several rest areas being spaced beyond the recommended 60 miles or one-hour drivetime, none of the rest areas are without an available ASO or urban area beyond the recommended distance.

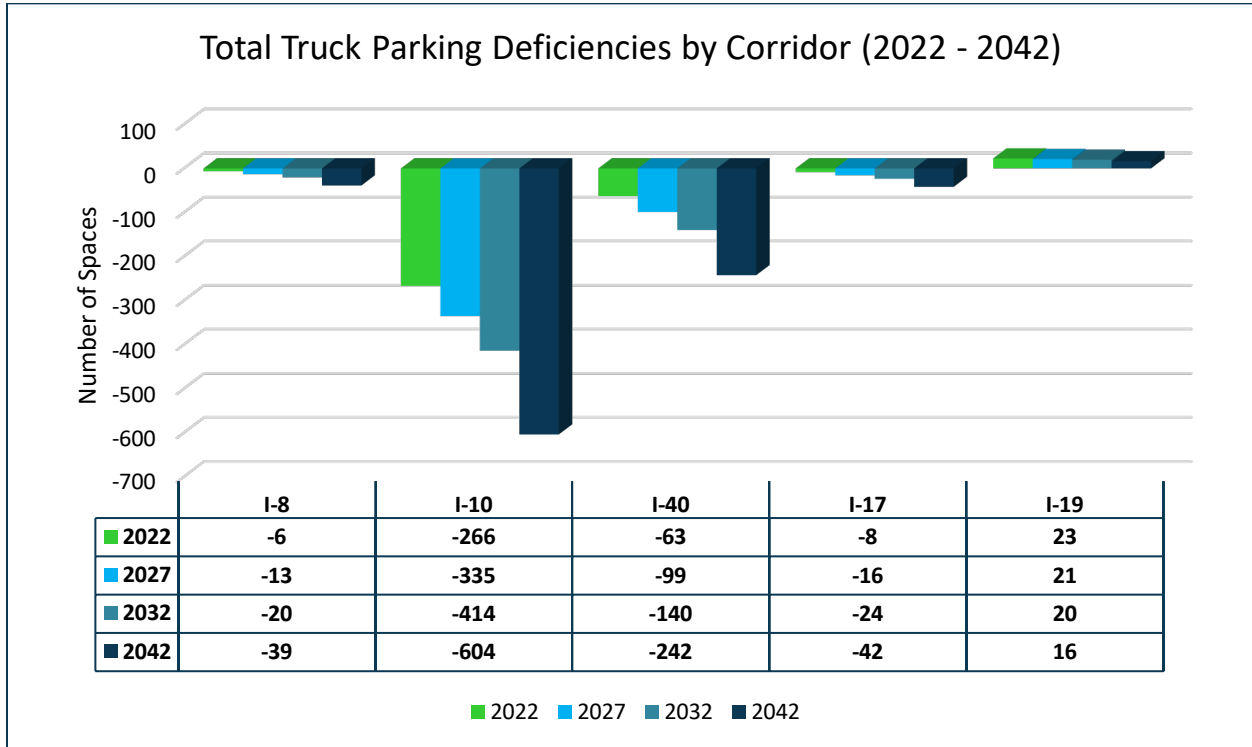
Figure 4-1. Statewide Alternative Stopping Opportunities



Truck Parking Deficiencies

Based on the truck parking forecast model through year 2042, I-10 has the most deficient amount of truck parking among all corridors with rest areas, as presented in **Figure 4-2**. According to the data presented, I-10 is expected to require an additional 604 truck parking spaces by 2042. Furthermore, I-40 and I-8 will also require additional truck parking spaces by 2042 (242 and 39, respectively).

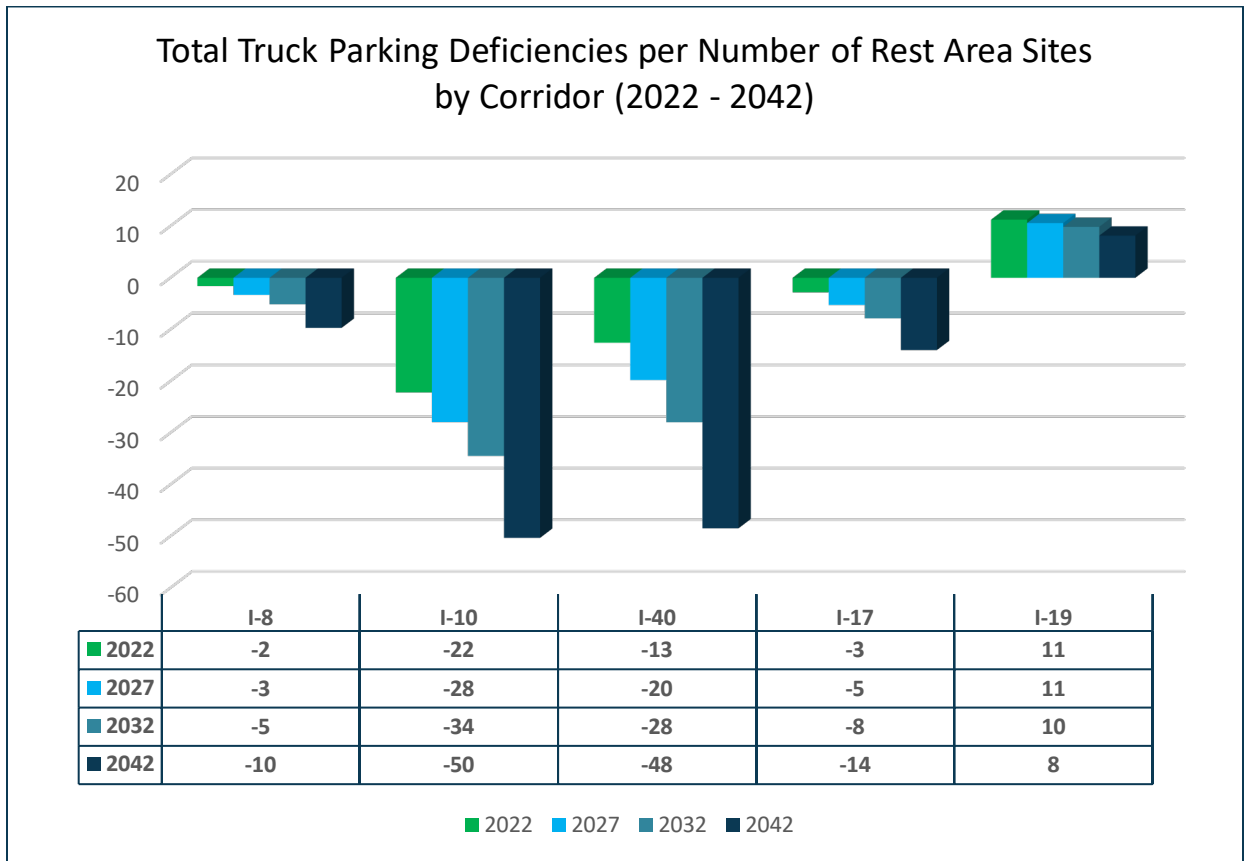
Figure 4-2. Truck Parking Deficiencies by Corridor (2022 - 2042)



As part of the analysis, the number of rest area sites was also considered. Since I-10 also has the greatest number of rest area sites as compared to other corridors, a comparison of truck parking deficiencies per number of rest area sites was also evaluated. Although I-10 has the greatest number of truck parking spaces needed, when compared to the number of sites, I-40 has a similar deficiency per site by 2042 (50 and 48, respectively). **Figure 4-3** presents the total truck parking deficiencies per number of rest area sites through 2042. However, it is important to note that although both corridors have similar truck parking deficiencies when comparing the number of rest area sites considered, public truck parking spaces along I-10 comprises approximately 41 percent of the total truck parking spaces along the corridor. In comparison, public truck parking spaces along I-40 contribute only 21 percent of the total truck parking spaces along I-40.¹⁰

¹⁰ <https://azdot.gov/sites/default/files/2019/08/wp3-truck-parking-supply-demand-and-gaps.pdf>

Figure 4-3. Total Truck Parking Deficiencies per Number of Rest Area Sites by Corridor (2022 - 2042)



This study acknowledges that although the truck parking forecast model projects several rest areas to have deficient truck parking, the model does not account for existing private truck parking. Therefore, this study also considered the existing amount, density, and location of private truck parking and its potential to offset the need for expanded truck parking at rest areas.

According to the *2019 Arizona Truck Parking Study*, private truck parking along I-10 equals a total of 3,846 spaces, with high densities occurring between the Ehrenberg and Bouse Wash rest areas, as well as east of the Burnt Well rest areas and south of the Sacaton rest areas. Along I-40, private truck parking equals a total of 1,723 spaces, with a high density of locations occurring around the Haviland rest area near the City of Kingsman. Several large private truck parking facilities are located east of the Meteor Crater rest area near the cities of Winslow and Holbrook.

Undesignated Truck Parking

The *2019 Arizona Truck Parking Study* found that five ADOT rest areas were among the top 15 locations where undesignated truck parking occurs. The five rest areas referenced in the study include the Haviland, Sunset Point, Texas Canyon, Ehrenberg, and Meteor Crater rest areas. It also noted that the exits near the Bouse Wash rest area, were also among the top 15 locations for undesignated truck parking. In addition, the 2019 Arizona Truck Parking Study found that even though the Parks and Christensen rest areas were closed at the time of the study, over the eight week GPS sample, 30 trucks parked at the on/off ramp at the Christensen rest area, while 106 trucks parked along the on/off ramps

at the Parks rest area. Over 70 percent of the trucks parked at the Parks rest area were along the eastbound portion of I-40 and were limited to less than two hours in duration. This suggests that those trucks were stopping for their mandatory 30-minute Hours of Service (HOS) break and were likely staging for deliveries in Flagstaff.¹¹

According to the undesignated truck parking being tracked by ADOT's Facilities Management, the Haviland (eastbound/westbound) and Sunset Point rest areas experienced the highest total of undesignated truck parking (1985/974 and 881, respectively), as well as the highest average number of trucks parked in undesignated locations per day (10.8/5.3 and 4.8, respectively). It should be noted that although the Painted Cliffs rest area experienced an average of 4.3 trucks per day parked in undesignated locations, this may be partially due to a vertical clearance constraint for large trucks exiting from the eastbound direction.

Future Changes in Truck Parking Demand

Since the previous study, several advancements and changes have occurred regarding commercial trucks and their use. One of those changes has been in the advancement of Automated Driving Systems (ADS). In fact, the U.S. Department of Transportation's *Automated Vehicles Comprehensive Plan* (updated January 11, 2021) noted that several trucking companies have already begun developing fully automated commercial vehicles for use on limited access highways, that would operate without a human operator between exits, and then operate with a human in more complex environments, such as urban areas.¹²

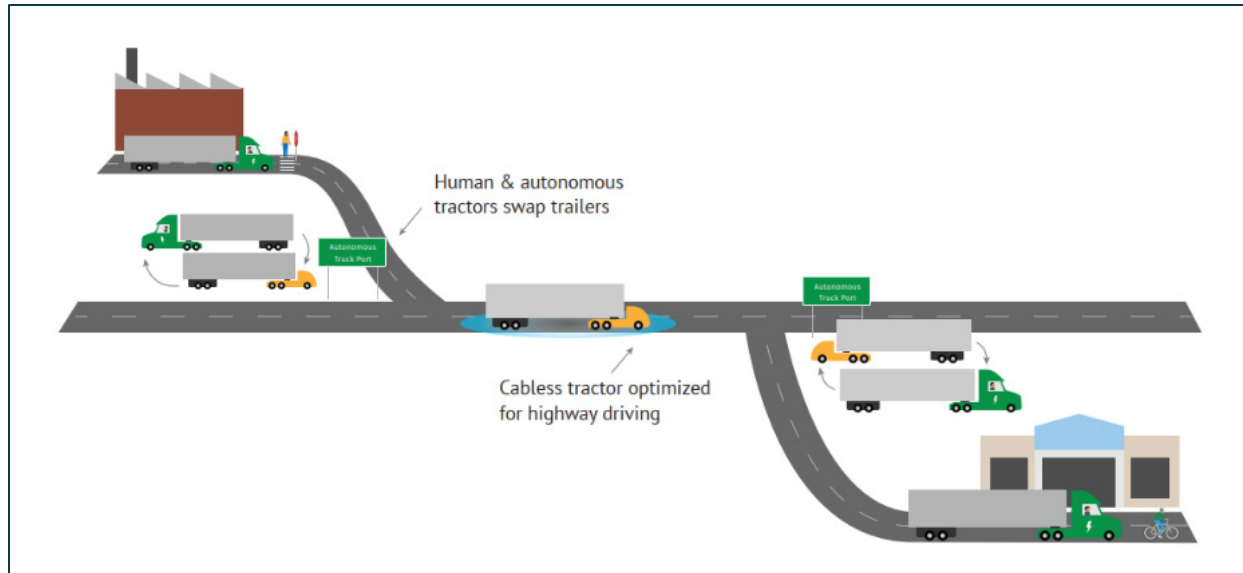
As a result of these developments, there exists potential changes to truck parking demand along ADOT highways. Currently, commercial drivers must adhere to mandatory breaks and are required to stop and park at locations while their break is completed. As driverless or fully automated commercial vehicles are further adopted and technology improves, that requirement may become less impactful to ADOT rest areas. Meaning, as more and more driverless commercial vehicles are adopted, the truck parking demand along ADOT's highways would likely decrease.

A 2018 report by UC Berkely Center for Labor Research and Education and Working Partnerships USA, documented six potential scenarios for the autonomous commercial vehicles. Noted as the most likely in the near future, was the use of exit-to-exit autonomous trucks. This scenario involves commercial vehicles using rest areas or Autonomous Trucking Ports, where commercial vehicles drivers would transfer their trailer to a driverless vehicle for interstate portions of the freight's trip. Conversely, once the vehicle reaches approaches its destination the trailer could then be transferred back to a human operated vehicles to navigate to its final delivery.¹³

¹¹ <https://azdot.gov/sites/default/files/2019/08/wp3-truck-parking-supply-demand-and-gaps.pdf>

¹² https://www.transportation.gov/sites/dot.gov/files/2021-01/USDOT_AVCP.pdf

¹³ <http://driverlessreport.org/files/driverless.pdf>



Exit-to-Exit Autonomous Trucks (Source: DRIVERLESS? Autonomous Trucks and the Future of the American Trucker)

Routes with High AADT

As documented in Working Paper #1, 2019's Annual Average Daily Traffic (AADT) was used to better represent traffic conditions prior to the pandemic. Future AADT adjacent to rest areas was then projected for each planning period using site-specific growth rates derived from ADOT's Traffic Monitoring data. **Table 4-2** summarizes the forecasted AADT adjacent to ADOT rest areas for each planning period, through 2042.

Table 4-2. Mainline AADT Adjacent to Rest Areas (2022-2042)

RA Map No. ¹	REST AREA (RA)	ROUTE	TRAFFIC DIRECTION SERVED	ADOT DISTRICT	2019 MAINLINE TRAFFIC VOLUME (ADOT AADT)	GROWTH RATE ⁵	MAINLINE AADT AT ADOT REST AREAS				PERCENTAGE CHANGE IN AADT (2022-2042)
							2022	2027	2032	2042	
1	Mohawk	I-8	EB	Southwest	5,333	2.26%	5,700	6,400	7,100	8,900	56.1%
1	Mohawk	I-8	WB	Southwest	5,287	2.26%	5,700	6,300	7,100	8,800	54.4%
2	Sentinel ⁴	I-8	EB	Southwest	5,000	2.44%	5,400	6,100	6,800	8,700	61.1%
2	Sentinel ⁴	I-8	WB	Southwest	5,500	2.44%	5,900	6,700	7,500	9,600	62.7%
3	Ehrenberg	I-10	EB	Southwest	13,695	2.61%	14,800	16,800	19,100	24,800	67.6%
3	Ehrenberg	I-10	WB	Southwest	13,591	2.61%	14,700	16,700	19,000	24,600	67.3%
4	Bouse Wash	I-10	EB	Southwest	13,741	2.66%	14,900	17,000	19,300	25,100	68.5%
4	Bouse Wash	I-10	WB	Southwest	12,598	2.66%	13,600	15,500	17,700	23,000	69.1%
5	Burnt Well	I-10	EB	Southwest	11,249	2.61%	12,200	13,800	15,700	20,300	66.4%
5	Burnt Well	I-10	WB	Southwest	12,875	2.61%	13,900	15,800	18,000	23,300	67.6%
6	Sacaton	I-10	EB	Southcentral	31,655	2.17%	33,800	37,600	41,800	51,900	53.6%
6	Sacaton	I-10	WB	Southcentral	30,974	2.17%	33,000	36,800	40,900	50,700	53.6%
7	Texas Canyon	I-10	EB	Southcentral	7,748	2.58%	8,400	9,500	10,800	13,900	65.5%
7	Texas Canyon	I-10	WB	Southcentral	9,934	2.58%	10,700	12,200	13,800	17,800	66.4%
8	San Simon	I-10	EB	Southeast	7,211	2.61%	7,800	8,900	10,100	13,000	66.7%
8	San Simon	I-10	WB	Southeast	6,907	2.61%	7,500	8,500	9,700	12,500	66.7%
9	Sunset Point ⁴	I-17	Both	Northwest	37,549	2.25%	40,100	44,900	50,100	62,600	56.1%
10	Canoa Ranch	I-19	NB	Southcentral	8,618	1.91%	9,100	10,000	11,000	13,300	46.2%
10	Canoa Ranch	I-19	SB	Southcentral	8,696	1.91%	9,200	10,100	11,100	13,400	45.7%
11	Haviland	I-40	EB	Northwest	9,149	2.76%	9,900	11,400	13,000	17,100	72.7%
11	Haviland	I-40	WB	Northwest	8,519	2.76%	9,200	10,600	12,100	15,900	72.8%
12	Painted Cliffs	I-40	Both	Northeast	23,129	3.00%	25,300	29,300	34,000	45,600	80.2%

Arizona Statewide Rest Area Study

13	Hassayampa	US 60	Both	Southwest	18,556	1.44%	19,400	20,800	22,300	25,800	33.0%
14	Salt River Canyon	US 60	Both	Southwest	2,788	2.60%	3,000	3,400	3,900	5,000	66.7%
15	Mazatzal ²	SR 87	Both	Southwest	13,269	1.53%	13,900	15,000	16,200	18,800	35.3%
16	McGuireville	I-17	NB	Northcentral	13,700	1.68%	14,400	15,700	17,000	20,100	39.6%
16	McGuireville	I-17	SB	Northcentral	12,423	1.68%	13,100	14,200	15,400	18,200	38.9%
17	Parks ³	I-40	EB	Northcentral	10,925	2.08%	11,600	12,900	14,300	17,500	50.9%
17	Parks ³	I-40	WB	Northcentral	9,391	2.08%	10,000	11,100	12,300	15,100	51.0%
18	Meteor Crater	I-40	EB	Northcentral	9,736	2.79%	10,600	12,100	13,900	18,300	72.6%
18	Meteor Crater	I-40	WB	Northcentral	10,084	2.79%	11,000	12,600	14,400	19,000	72.7%
19	Christensen ³	I-17	NB	Northcentral	12,508	1.61%	13,100	14,200	15,400	18,100	38.2%
19	Christensen ³	I-17	SB	Northcentral	10,729	1.61%	11,300	12,200	13,200	15,500	37.2%

Notes:

¹RA Map No. = Rest area number corresponding to Figure 4-1

²Rest area permanently closed

³Rest area permanently closed, but temporarily open to truck parking

⁴Rest area under construction, but temporarily open to truck parking

⁵Growth rate provided by ADOT/MPD

Water Availability

The availability of water in a region identified for new rest areas will be a key consideration in ultimately identifying a specific site or sites. The issue of water supply will be discussed in more detail in Working Paper 3, where specific recommendations will be made regarding the priority locations that are most in need of new rest areas.

5 Corridor Needs

This section summarizes the results of a preliminary review of corridor needs using the proposed draft criteria discussed in the previous section, which includes potential safe parking locations, new rest area locations, and rest areas that are candidates for expansion.

New Rest Area Locations

Based on the criteria discussed in the previous section, no new full service rest area locations may be needed. As summarized in **Table 4-1**, the existing spacing between some rest areas exceeds the AASHTO and FHWA recommended 60 miles or one-hour drivetime. However, all the rest areas have ASOs within 60 miles, indicating that travelers have stopping opportunities between those rest areas that are spaced beyond 60 miles or one-hour drivetime. In fact, some rest areas have multiple ASOs within 20 miles. In addition, most rest areas are within 60 miles of census designated urban area, which offers further stopping opportunities, such as restaurants and parks.

Although the remote areas along I-40 between Williams (urban cluster) and Kingsman (urban cluster) have no existing rest areas, the existing ASOs are spaced within 60 miles or one-hour drivetime. ADOT Facilities Management also noted that in the winter, commercial drivers will take routes along more southern portions of Arizona to avoid hazardous weather conditions.

In addition, many of the ADOT highways and routes without existing rest areas, are either less than 60 miles in length or have existing ASOs and/or urban areas along their respective routes that are spaced close to or within the recommended 60 miles.

However, based on the forecasts and deficiencies described in Section 2, some rest areas may require rehabilitation or expansion. There is also potential to provide safe parking locations at interchanges or off-system locations that can supplement the truck parking deficiencies summarized in **Table 2-1** and to reduce undesignated parking along corridors.

Rest Area Expansions

This section summarizes the potential need for rest area expansions based on findings from the Corridor Needs Criteria and the Forecasts and Deficiencies summarized in previous sections. Because minimal rest areas had deficient car parking through 2042, the subsequent sections focus on expansions based on restroom and truck parking deficiencies.

Based on Restroom Deficiencies

According to the restroom forecast model used for projecting restroom needs over the next 20 years, none of the rest areas should be considered for additional restrooms in the next five years. In fact, only the Burnt Well and Bouse Wash rest areas showed a deficiency in the near term, but the number of restroom stall required is not significant enough to require rehabilitation. However, the potential exists for these rest areas to require restroom expansions by 2042. These forecasts should be reevaluated in the next 10 years before prioritizing additional restroom stalls at the Burnt Well and Bouse Wash rest areas.

Based on Truck Parking Deficiencies

Based on data from the Corridor Needs Criterion, as well as information obtained from the *2019 Arizona Truck Parking Study*, several rest areas may require expansion for supplemental truck parking. When analyzing the need for truck parking expansion at rest areas, the following elements were considered:

- Forecasted truck parking deficiencies
- Large amount of undesignated truck parking near or at rest areas
- Density of private truck parking near rest areas
- Distance to large, urbanized areas

When considering the criterion listed, only rest areas that are permanently open, had associated forecast data, or have designated truck parking were evaluated. The truck parking deficiencies were rated based on a statistical analysis using the mean number of truck parking spaces required and a standard deviation for the deficient truck parking for the existing year (2022). The following criteria used to rate truck parking deficiencies at rest areas is summarized in **Table 5-1**.

Table 5-1. Truck Parking Deficiency Rating Criteria

Range		Rating
Min	Max	
-44	-59	Very High
-28	-43	High
-12	-27	Moderate
-1	-11	Low
18	0	None

When identifying undesignated truck parking near rest areas, this study relied on *2019 Arizona Truck Parking Study*, by evaluating if a rest area was listed as being near one of the top 15 areas with undesignated truck parking. The *2019 Arizona Truck Parking Study* and this study’s evaluation of existing ASOs were used to identify areas with existing high densities of private truck parking. Lastly, because commercial drivers often stage and park near large, urbanized areas for deliveries, rest areas within 60 miles of a census designated urbanized area (population greater than 50,000) were considered as particularly important for truck parking. **Table 5-2** provides an overview of the comparative analysis using the listed criterion.

Table 5-2. Comparative Analysis of Truck Parking Needs at Rest Areas

Rest Area	Traffic Direction Served	Route	Truck Parking Deficiency	Nearby Undesignated Truck Parking	High Density of Private Truck Parking	Within 60 miles of Urbanized Area
Mohawk	EB	I-8	Low	No	No	No
Mohawk	WB	I-8	Low	No	No	No

Sentinel¹	EB	I-8	Low	No	No	No
Sentinel¹	WB	I-8	None	No	No	No
Ehrenberg	EB	I-10	Moderate	Yes	Yes	No
Ehrenberg	WB	I-10	Low	Yes	Yes	No
Bouse Wash	EB	I-10	Moderate	Yes	Yes	No
Bouse Wash	WB	I-10	Low	Yes	Yes	No
Burnt Well	EB	I-10	High	No	Yes	Yes
Burnt Well	WB	I-10	Low	No	Yes	Yes
Sacaton	EB	I-10	Low	Yes	Yes	Yes
Sacaton	WB	I-10	Low	Yes	Yes	Yes
Texas Canyon	EB	I-10	Very High	Yes	No	Yes
Texas Canyon	WB	I-10	Very High	Yes	No	Yes
San Simon	EB	I-10	Moderate	No	No	No
San Simon	WB	I-10	High	No	No	No
Haviland	EB	I-40	Moderate	Yes	Yes	No
Haviland	WB	I-40	Moderate	Yes	Yes	No
Meteor Crater	EB	I-40	Low	Yes	Yes	Yes
Meteor Crater	WB	I-40	Low	Yes	Yes	Yes
Painted Cliffs	Both	I-40	Low	No	No	No
McGuireville	NB	I-17	Low	No	No	No
McGuireville	SB	I-17	Low	No	No	No
Sunset Point¹	Both	I-17	None	Yes	No	Yes
Canoa Ranch	NB	I-19	None	No	Yes	Yes
Canoa Ranch	SB	I-19	None	No	Yes	Yes

Notes:

¹Rest area under construction, but temporarily open to truck parking

Based on the comparative analysis, Texas Canyon rest areas have the largest amount of truck parking need, as these rest areas have a “very high” parking deficiency, have document undesignated parking nearby, lack a high density of private truck parking, and are within 60 miles of Tucson. In addition, Haviland rest areas have moderate truck parking deficiency, and were documented in the *2019 Arizona Truck Parking Study* as the number one location with undesignated truck parking.

Although the eastbound Burnt Well rest area has a “high” parking deficiency, the rest area is situated in an area with a high density of private truck parking and was not documented as having a large amount if undesignated parking nearby. Although the forecast did not identify any existing truck parking deficiency at the Sunset Point rest area, the *2019 Arizona Truck Parking Study* found that this rest area to be among the top 10 of locations with high amounts of undesignated parking. The high amount of undesignated parking at Sunset Point might be a result of truck being parked for extended periods of time.

It should also be noted that since the *2019 Arizona Truck Parking Study*, truck parking at the Meteor Crater rest areas was expanded and the concentration of undesignated truck parking in the area may

have changed. The following rest areas are ranked by priority for either truck parking expansion or locations where ADOT should consider providing nearby supplemental parking:

1. Texas Canyon (Eastbound and Westbound) Rest Areas
2. Haviland (Eastbound and Westbound) Rest Areas
3. San Simon (Eastbound and Westbound) Rest Areas
4. Bouse Wash (Eastbound) Rest Area
5. Sunset Point Rest Area

The feasibility of expanding truck parking at the rest area locations listed previously will be documented in more detail in Working Paper 3. These rest areas will be also evaluated for their potential to provide informal overflow truck parking lots adjacent to the rest areas, thereby reducing the need to reconstruct the existing parking lots. Existing rest areas with ROW or geographic constraints that limit expanding truck parking should be further evaluated for safe parking only locations with limited amenities, or for potential P3 opportunities, as discussed in the following sections.

Safe Parking Only Locations

Although no full service rest area locations were identified as a need, there is potential to implement safe parking only locations to offset the demand at rest areas. Some rest areas with existing and future truck parking deficiencies are constrained by either ROW or geography and expanding truck parking at these locations may not be feasible. Therefore, implementing safe parking only locations nearby within ADOT's existing ROW could help offset capacity limitations at these deficient rest areas. Safe parking only locations can be constructed within existing interchange footprints with limited to no amenities. These locations could be constructed similar to the example used in the *2019 Arizona Truck Parking Study*, which highlighted Nebraska's low cost solution to supplement parking needs.¹⁴ These locations can be constructed using a gravel lot and minimal amenities, such lighting and trash receptacles, thereby reducing capital investment and operational and maintenance costs.

¹⁴ <https://azdot.gov/sites/default/files/2019/08/wp3-truck-parking-supply-demand-and-gaps.pdf>

Low or No Amenity Truck Parking

Other states such as Nebraska have embraced the development of low amenity truck parking spaces by developing truck parking where it had previously not existed or was not in service. Figure 2-12 displays a gravel lot occupying unused right of way (ROW) at the interchange of I-80 and US 138 in Nebraska. The gravel lot has no amenities beyond a couple of overhead lights. Additionally, the entrance to the location is located on the US 138, which has lower posted speed than I-80, requiring less entering and exiting infrastructure.

Figure 2-12: Low Cost Truck Parking Solution in Nebraska



Source: Imagery ©2018 Google, Map data ©2018 Google

Example of Low or No Amenity Truck Parking in Nebraska (Source: 2019 Arizona Truck Parking Study)

These locations are particularly important for regions or corridors with high AADT, deficient truck parking nearby, high amounts of documented undesignated truck parking, or limited ASOs. Corridors or regions that meet this criterion include:

- I-17 between the Sunset Point Rest Area and Phoenix
- I-40 between Kingsman and Ash Fork
- I-10 between the Texas Canyon and San Simon Rest Area

6 Emerging Rest Area Needs

This study's goals include the evaluation and identification of future conditions, which includes identifying emerging trends and needs. Emerging needs and trends in the transportation landscape were identified through peer state reviews, review of recent long-range planning initiatives, and coordination with ADOT staff and stakeholders. This section summarizes the results of those efforts and highlights key considerations for ADOT's rest areas over the next 20 years.

Facilities Management and Stakeholder Identified Needs

Throughout this study, coordination with stakeholders such as Tribes and ADOT staff was held to help identify growing issues, trends, and needs at ADOT rest areas. The following section summarizes the input provided resulting from those coordination efforts.

Tribal Consultation

Since three of the of the existing ADOT rest areas (Sacaton, Salt River Canyon, and Painted Cliffs) are located on Tribal Land, consultation with each Tribe was requested to identify issues and needs at those rest areas. Through coordination with ADOT's Tribal Liaison office, letters were sent to the Tribes in June 2022. Of the four tribes contacted, only one Tribe (San Carlos Apache) provided a response. Following a response from the San Carlos Apache Tribe, a coordination meeting was held to discuss needs and issues related to the Salt River Canyon rest area. The San Carlos Apache Tribe noted the following issues and needs for the Salt River Canyon rest area:

- Expanded Solar Panels
- Safety Improvements (e.g., security cameras, lighting, and hazard signing)
- Installation of Digital Cultural Displays
- Flash Flood Warning Signs for Salt River
- Wireless Internet
- Information Displays for nearby recreational activities and services.

Salt River Canyon is located along US Highway 60 in a remote region of Arizona and has limited access to power, water, and cellular coverage. Since power and water access is very limited for this rest area, security cameras, wireless internet, and digital displays are not currently feasible. However, the potential to implement these features may become feasible in future years as the energy generated from solar panels becomes more efficient. As an alternative to digital displays, static displays at the Salt River Canyon rest area to highlight cultural, recreational activities, and services related to the San Carlos Apache Tribe and the region are feasible.

Facilities Management and TSM&O Input

ADOT Transportation Systems Management and Operations (TSM&O) are responsible for managing the operation and maintenance of ADOT rest areas, while Facilities Management staff are responsible for managing the maintenance and operations of water and wastewater facilities at rest areas. Therefore, they are included as part of this study's Project Management Team (PMT). Their knowledge and experience of ADOT rest areas was relied upon to garner information related to rest area needs or issues. The following items were noted as needs or considerations when planning for future improvements at ADOT rest areas:

- High-Mast Lighting
- Solar Panels
- Conceptual Electric Vehicle Charging Spaces
- Telephone Call Boxes
- Overflow Truck Parking Lots (where needed)

Truck Parking Availability Systems (TPAS)

As documented in Working Paper #1, TPAS is being implemented along the I-10 corridor as part of a joint effort among departments of transportation for California, Arizona, New Mexico, and Texas. The TPAS system will be deployed at 4 ADOT rest areas (8 sites) along the I-10 corridor in Arizona, which include the Ehrenberg, Bouse Wash, Texas Canyon, and San Simon rest areas. The system is being designed to detect truck parking availability at rest areas and to disseminate this information in real-time to commercial drivers through Dynamic Messaging Signs and ADOT's Arizona 511. The result of this project is expected to provide benefits such as improved mobility and safety, reduction of infrastructure damage and emissions, and reducing lost earnings for commercial drivers through increased efficiency and productivity.¹⁵

Infrastructure Requirements

According to ADOT TSM&O, the TPAS project is being implemented using fixed radar technology using on-site power that detects which truck parking spaces at the rest areas are occupied. Radar units can detect approximately 10 truck parking spaces per unit and were selected because they are easier to maintain and avoid ground disturbance. Radar units were also found to be more accurate and cheaper than alternative technologies. Occupancy data is transmitted through cellular data to nearby modems, which is then shared to Dynamic Messaging Signs located prior to each rest area. Occupancy accuracy will be verified by staff using imagery from CCTV cameras.

Although ADOT's TPAS data will initially rely on cellular coverage to transmit data, the potential exists to convert to broadband as the broadband is extended along ADOT's highways. Additional items associated with implementing TPAS at rest areas include new pullboxes, 55-inch CCTV poles, radar sensor poles, and electric improvements. The initial estimate to implement TPAS at the 4 ADOT rest areas (8 sites) is approximately \$3 million dollars.

Alternatives to TPAS

The limitations to implementing a statewide system of collecting truck parking availability data at rest areas includes an initial capital investment, loss or lack of cellular coverage, and the additional staff required to monitor, verify, and maintain the system. Therefore, ADOT plans to evaluate the potential for standardizing the TPAS system at the remaining rest areas following a period of operation and evaluation. However, as part of this study's goal to consider future conditions, TPAS was evaluated for potential limitations for implementing TPAS at all rest areas in Arizona, as well as alternatives for disseminating truck parking availability data.

All but one rest area (Salt River Canyon) has access to power to operate the TPAS infrastructure. However, the potential exists to utilize solar power to operate radar and CCTV cameras for rest areas

¹⁵ <https://i10connects.com/node/4656>

with limited power and would also reduce long-term operational costs. The Federal Communication Commission (FCC) provides a Mobile LTE Coverage Map that shows existing mobile broadband coverage throughout the U.S.¹⁶ Based on the FCC's Mobile LTE Coverage Map, only one rest area does not have mobile broadband cellular coverage (Salt River Canyon).

Based on the infrastructure requirements, TPAS is currently feasible at all but one (Salt River Canyon) of the existing ADOT rest areas. However, the Salt River Canyon rest area does not have any existing designated truck parking, therefore the need to install a truck parking availability system is not necessary. Even without the implementation of dynamic messaging signs, truck parking availability data could be utilized by commercial vehicle dispatchers to relay truck parking availability data to commercial drivers.

Electric Vehicles (EV)

ADOT is not considering electric vehicle charging stations in rest areas during the development of this study. To learn more about the implementation of electric vehicle charging stations in Arizona, see the most recent version of the [Arizona Electric Vehicle Plan](#).

Wireless Internet

As discussed in Working Paper #1, as travelers continue to use and rely on mobile devices, wireless connectivity at rest areas provides travelers the ability to access needed information such as weather updates, traffic conditions, and directions. States such as Texas and Florida have made Wi-Fi available at many of their facilities. However, connectivity and service at remote rest area locations are dependent on existing utilities. The Governor's Office, the Arizona Commerce Authority and ADOT are partnering to bring broadband to much more of Arizona. Within this partnership, and as such, the implementation of Wi-Fi access has been considered and may be coming to rest areas throughout Arizona.¹⁷

Potential Locations for Emerging Rest Area Services

TPAS

The potential to implement TPAS at the remaining rest areas not included in the I-10 coalition was analyzed for this study. Based on the infrastructure and resource requirements documented in the previous section, TPAS is currently feasible at all but one (Salt River Canyon) of the existing rest areas. Not only does the Salt River Canyon rest area has not have reliable cellular or satellite signal, and power is limited to what is produced through solar energy, this rest area does not have any existing designated truck parking.

Each of the remaining rest areas have access to power and cellular coverage, thereby allowing truck parking availability data to be collected and transmitted. Even without the implementation of dynamic messaging signs, truck parking availability data could be utilized by dispatchers and third party applications that relay truck parking availability data to commercial drivers.

Based on input provided by ADOT's TSMO staff, the limitations to implementing a statewide system of collecting truck parking availability data at rest areas includes an initial capital investment, as well as

¹⁶ <https://www.fcc.gov/BroadbandData/MobileMaps/mobile-map>

¹⁷ Information provided by ADOT's P3 Office on May 4, 2022.

additional staff required to monitor, verify, and maintain the system. Therefore, ADOT plans to evaluate the potential for standardizing the TPAS system at the remaining rest areas following a period of operation and evaluation.

Wireless Internet

As the broadband network is extended along ADOT's highway system, rest areas should be upgraded to include wi-fi access. Access to wi-fi in these locations provides travelers the ability to access needed information such as weather updates, traffic conditions, and directions when cellular coverage may be limited. Specifically, rest areas with high usage rates, high AADT volumes, close to adjacent state borders, and locations where extreme weather events occur should be considered first. Rest areas that meet this criterion include but are not limited to:

- Rest Areas along I-10
- Sunset Point Rest Area
- Haviland and Painted Cliffs Rest Areas

7 Public-Private Partnership Opportunities

Public-private partnerships (P3s) provide the ability to expand rest area services in needed areas, while potentially reducing capital and operating costs. These partnerships also allow for additional rest area services that may not be permissible within ADOT right-of-way but are a growing need to traveling public. The potential for P3s to expand rest area services at a lower cost than developing a traditional state-owned rest area offers a unique approach to mitigating Arizona’s continuing budgetary challenges, while continuing to address highway traffic growth in Arizona.

Since the previous study, P3s for the development and adoption of rest areas have remained limited. However, the confluence of special interest group support, availability of federal approval and implementation guidelines, and the compelling economic advantages make public-private rest area partnerships worthy of consideration. The consideration of P3s to provide rest area services in the near and long term is an important component to any long-range planning strategy to expand needed rest area services while simultaneously reducing the costs to the state for providing these additional services.

The following sections discuss the key aspects of P3s programs and potential partnership models evaluated for help improving the rest area system in Arizona.

Federal Interstate Oasis Program

The federal Interstate Oasis Program was enacted as part of SAFETEA-LU in 2005. In 2006, the FHWA published the “Interstate Oasis Program and Policy” which presented finalized rules/policies governing the Interstate Oasis Program. Since the previous 2011 study, none of the criteria outlined by FHWA policy document has changed. The following standards and excerpts are from the FHWA policy document.¹⁸

The FHWA describes the purpose of the Interstate Oasis Program as being:

“...to enhance safety and convenience for Interstate highway users by allowing States, in accordance with this policy, to designate and provide signing to certain facilities off the freeway that will provide increased opportunities for stopping to rest, using restroom facilities, and obtaining basic services.”

Under the final program rules the FHWA went on to define an Interstate Oasis as:

“...a facility near an Interstate highway but not within the Interstate right-of-way, designated by a State after meeting the eligibility criteria of this policy, that provides products and services to the public, 24-hour access to public restrooms, and parking for automobiles and heavy trucks.”

Criteria

The Interstate Oasis Program allows states to partner with private operators who meet the minimum criteria to provide basic rest area services in exchange for online highway signing and official designation as an Interstate Oasis. Therefore, by designating and signing commercial operations that meet the

¹⁸ The FHWA’s Interstate Oasis Program and Policy document can be found online at: <https://www.federalregister.gov/documents/2006/10/18/E6-17367/interstate-oasis-program>

minimum eligibility criteria for an Oasis, the state may expand guaranteed free parking and rest room services to augment the services available at existing rest areas without having to construct and maintain expensive new rest area facilities. Importantly, the Interstate Oasis Program has the support of NATSO, the most powerful industry lobbying group that opposes public-private partnerships or any commercialization of existing or new online rest areas. As such, the Interstate Oasis Program provides an alternative type of public-private partnership offline, and which is supported by the very industry lobbying groups that have in the past been so successful in defeating every significant attempt to overturn or bypass the federal prohibition against providing commercial services at rest areas.

The following represent the seven minimum eligibility criteria for an operator to be designated and signed as an Interstate Oasis, according to FHWA standards:

Distance from Interchange. “Shall be located no more than 3 miles from an interchange with an Interstate highway, except that:

- A lesser distance may be required when a State’s laws specifically restrict truck travel to lesser distances from the Interstate system; and
- Greater distances, in 3-mile increments up to a maximum of 15 miles, may be considered by States for interchanges in very sparsely developed rural areas where eligible facilities are not available within the 3-mile limit;”

Access from Route. “Shall be accessible via a route that an engineering study determines can safely and conveniently accommodate vehicles of the types, sizes, and weights that would be traveling to the facility, entering and leaving the facility, returning to the Interstate highway, and continuing in the original direction of travel.”

Physical Geometry of Site Layout. “Shall have physical geometry of site layout, including parking areas and ingress/egress points, that an engineering study determines can safely and efficiently accommodate movements into and out of the site, onsite circulation, and parking by all vehicles, including heavy trucks of the types, sizes, and weights anticipated to use the facility.”

Restrooms. “Shall always have restrooms available to the public (24 hours per day, 365 days per year). Restrooms should be modern and sanitary and should have drinking water. The restrooms and drinking water should be available at no charge or obligation;”

Parking. “Shall have parking spaces available to the public for automobiles and heavy trucks. The parking spaces should be well lit and should be available at no charge or obligation for parking durations of up to 10 hours or more, in sufficient numbers for the various vehicle types, including heavy trucks, to meet anticipated demands based on volumes, the percentage of heavy vehicles in the Interstate highway traffic, and other pertinent factors as described in formulas contained in AASHTO’s Guide.

Products and Services to be Provided. “Shall provide products and services to the public. These products and services should include:

- Public telephone;

- Food (vending, snacks, fast food, and/or full service); and
- Fuel, oil, and water for automobiles, trucks, and other motor vehicles;”

Security and Staffing. “Should be staffed by at least one person on duty at all times (24 hours per day, 365 days per year).”

These criteria include the basic services that are available at most rest areas in Arizona, including free parking for cars and trucks for extended periods and in sufficient numbers to meet demand, free access to sanitary restrooms, water, and access to public telephones. Additionally, the Interstate Oasis program provides commercial services and onsite security available 24-hours per day.

In exchange for providing the above services, the operator is eligible to be designated and signed as an Interstate Oasis.

Signing Guidelines. The FHWA’s 2009 MUTCD provides specific guidance on signing for Interstate Oases. The following summarizes the FHWA’s proposed guidelines relating to Interstate Oasis signing under Section 21.04.¹⁹

The 2009 MUTCD revisions indicate that states providing Interstate Oasis signing should implement the following signing practices on the freeway for any given exit to identify the Interstate Oasis:

Online Highway Sign: Option 1. “If adequate sign spacing allows, a separate Interstate Oasis (D5-12) sign should be installed in an effective location with spacing of at least 800 feet from other adjacent guide signs, including any Specific Service signs. This Interstate Oasis sign should be located upstream from the Advance Guide sign or between the Advance Guide sign and the Exit Direction sign for the exit leading to the Interstate Oasis. The Interstate Oasis sign should have a white legend with a letter height of at least 10 inches and a white border on a blue background and should contain the words INTERSTATE OASIS and the exit number or, for an unnumbered interchange, an action message such as NEXT RIGHT. The names or logos of the businesses designated as Interstate Oases should not be included on this sign.”

The 2009 MUCTD indicates that the “Interstate Oasis sign panel shall only be used on the separate Interstate Oasis sign where it is accompanied by the words INTERSTATE OASIS and shall not be used independently without the words.”

Online Highway Sign: Option 2. “If the spacing of the other guide signs precludes the use of a separate sign as described in Item A [Option 1], an INTERSTATE OASIS (D5- 12P) supplemental plaque with a letter height of at least 10 inches and with a white legend and border on a blue background should be appended above or below an existing D9-18 series General Service sign for the interchange.”

Ramp/Interchange Signing: Option 1. “If Specific Service signing is provided at the interchange, a business designated as an Interstate Oasis and having a business logo sign panel on the Food and/or Gas Specific Service signs may use the bottom portion of the business logo sign panel to display the word OASIS.”

¹⁹ <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2r3/mutcd2009r1r2r3edition.pdf>

Ramp/Interchange Signing: Option 2. “If Specific Services signs containing the OASIS legend as a part of the business logo(s) are not used on the ramp and if the Interstate Oasis is not clearly visible and identifiable from the exit ramp, a sign with a white INTERSTATE OASIS legend with a letter height of at least 6 inches and a white border on a blue background shall be provided on the exit ramp to indicate the direction and distance to the Interstate Oasis.”

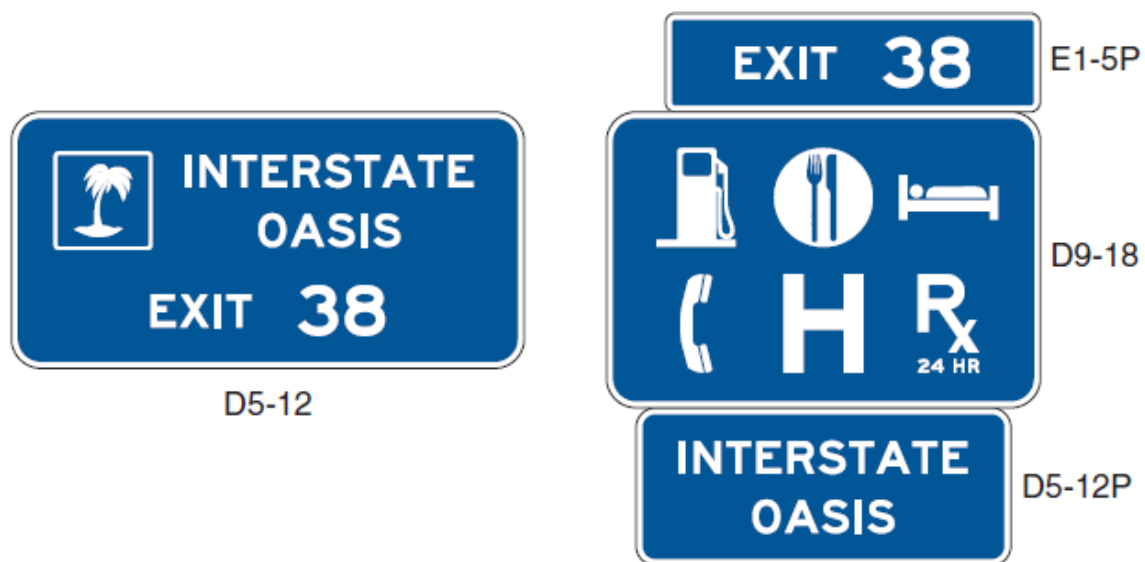
Guide Signs. “If needed, additional trailblazer guide signs shall be used along the crossroad to guide road users to an Interstate Oasis.”

These signing requirements indicate that two Oasis signs will be provided along the Interstate right-of-way in each direction of travel – or a total of four highway signs per Oasis – with one sign being on the mainline of the highway in advance of the exit where the Interstate Oasis is located, and the second sign be located at the off ramp leading to the Oasis. In addition, guide signs may be used on cross streets/frontage roads where needed to direct travelers from the highway off-ramp to the Oasis.

Given that highway signing represents the primary incentive for private partners to participate in the Interstate Oasis Program, these regulations will have important implications for potential partners’ interest in participating in the program. For example, the requirement that the partners’ business name or logo cannot be used on the mainline sign would somewhat diminish the attractiveness of the opportunity. However, since travelers will be guided directly to the facility by exit/trailblazing signs and given that the partner presumably has the authority to provide additional signing onsite, advertising itself as an Interstate Oasis, this is not considered to be a major impediment to attracting partners.

The following figure (**Figure 7-1**) presents examples of Interstate Oasis signs as provided under the 2009 MUTCD.

Figure 7-1. Examples of Permissible Interstate Oasis Signs and Plaques



Other important Interstate Oasis requirements specified by the FHWA include the following:

Routes where Oases are Permitted. As the name suggests, Interstate Oases can only be established on Interstate highways. Therefore, at present, Interstate Oases could not be developed on U.S. or State highways in Arizona under this program.

Multiple Operators. The Interstate Oasis Program standards indicate that in the case where no one business at an interchange satisfies all the Oasis eligibility criteria, that states can allow two or more businesses that are located at an interchange, are immediately adjacent to each other, and are mutually accessible by foot to combine to satisfy the Oasis requirements. Clearly, this will allow a greater degree of flexibility in creating Oasis partnerships. For example, an adjacent gas station and a restaurant at an interchange could collaborate to satisfy the minimum Oasis eligibility requirements.

Non-Exclusion. The Interstate Oasis Program standards insist that if a state provides or permits Interstate Oasis signing, then any facility/operator meeting the minimum criteria shall be eligible for designation as an Interstate Oasis. Given that the state cannot require additional criteria for designating an operator as an Interstate Oasis, states would not be able to deny operators from being designated and signed as an Oasis, while permitting others, if all meet the Oasis requirements. However, if the Oasis Program proved popular, the provision might enable a significant number of Oases, and therefore traveler stopping opportunities, while also multiplying the state's signing obligation.

Additional State Criteria. A state cannot impose additional criteria beyond the criteria specified by the FHWA to qualify for designation as an Interstate Oasis. However, a business designated as an Interstate Oasis would be permitted to provide additional products, services, or amenities. This requirement effectively blocks the state from imposing any additional criteria/standards on Oasis partners not specified in the act, while allowing the operator to offer them. For example, a state could not require the operator to provide a landscaped lawn and picnic area as a requirement to be designated as an Interstate Oasis, because this is not one of the eligibility criteria specified under the Interstate Oasis Program. However, the Oasis partner might provide such amenities voluntarily.

Use of the Term "Interstate Oasis." The FHWA recommends that the state policies, program, and procedures developed to govern the Interstate Oasis Program should include legislation or rules to limit the use of the phrase "Interstate Oasis" on business premises and advertising media to only those businesses approved by the state as an Interstate Oasis. Doing so would provide a branding advantage to only those businesses designated as an Oasis, and who could use the designation in their marketing efforts. If use of the term were not limited to only those businesses designated as an Interstate Oasis, it would reduce the attractiveness of such designation both from the perspective of the traveling public's confidence in the program and private partners' ability to benefit from meeting the program's standards. Therefore, failure to restrict the term's use would reduce partner's participation in, and the public's acceptance of, the program.

Educational/Marketing Campaign. The FHWA recommends that if a state chooses to participate, it should "undertake educational and marketing efforts, in cooperation with trucking and travel industry partners as appropriate, to familiarize travelers and businesses with the program before it is implemented and during the initial period of implementation." Marketing the Oasis concept will be important for attracting both future Oasis partners and travelers to individual Oases. Since the program

is new and the traveling public in Arizona is unfamiliar with the term and concept of an Interstate Oasis, the state should attempt to distribute educational information on the locations of Oases, the services provided, and company contact information for the Oasis partner. A very low cost option for doing all three would be for ADOT to develop a dedicated website, accessible by mobile devices, that provided statewide maps of Oases locations, services provided, and links to the Oasis operators' websites.

Program Success

Peer states providing input as part of this study expressed P3 implementation problems stemming from legal restrictions, opposition from special interest groups, and community opposition to pursue such partnerships. Based on input provided from peer states and additional desktop research, only one state (Idaho) was found to have successfully deployed the use of the Interstate Oasis Program.

According to the Idaho Transportation Department's (ITD) website, the agenda packet for the July 21, 2021, District 5 Tour and Regular Meeting of the Idaho Transportation Board shows five active public-private partnerships along I-84, US 95, and I-15B.²⁰ The first ITD Oasis partnership was implemented in 2006 with Flying J Corp., where ITD provided \$328,000 and signing along I-15B for a new Flying J facility in McCammon. In return, Flying J agreed to provide 24 hour access to restrooms for free that were built and maintained to meet ITD standards.



ITD's McCammon Interstate Oasis Signing (Source: ©Google Images 2022)

The ITD's Oasis partnerships were implemented following the initial success observed with Utah Department of Transportation's (UDOT) implementation of four rest area public-private partnerships. However, in the completed questionnaire UDOT provided for this study, they noted that they have since cancelled those P3s and are not currently pursuing any new ones.

In 2018, South Dakota Department of Transportation (SDDOT) requested information regarding the existence of Interstate Oasis signing in other states, as posted on the AASHTO website. The inquiry found that only Idaho has installed Interstate Oasis Signs.²¹

New Rest Area Partnerships

Another goal of this study is to identify new potential funding sources, as well as document potential P3 opportunities that could provide expanded rest area services while reducing annual operational and maintenance costs. This section describes the following three key funding and P3 opportunities identified for this study:

- ASO Public-Private Partnerships (Interstate Oasis)
- Public-Private Partnerships on Publicly Owned Land

²⁰ https://itd.idaho.gov/wp-content/uploads/2021/07/July2021_BoardPacket.pdf

²¹ <https://traffic.transportation.org/wp-content/uploads/sites/26/2019/10/Interstate-Oasis-Signing-Inquiry.pdf>

- Sponsorships

Potential ASO Partnerships

The latest Infrastructure Investment and Jobs Act (Public Law 117-58), approved November 15, 2021, did not alter the existing 1956 restriction on commercial activity within interstate rest areas.²²

Opposition for removing this commercial ban from special interest groups further reinforces the need to explore P3s outside of the ADOT's interstate ROW.

In reviewing the success of other states' rest area P3s, this study found that the success of those partnerships generally stemmed from coordination with private commercial owners and DOTs to identify planned private facilities for construction. Existing private facilities would likely require extensive reconstruction and capital investment to meet the FHWA Interstate Oasis Program requirements, or to meet ADOT's engineering standards. Therefore, this study recommends early coordination with U.S. fuel retailers to identify planned facilities along ADOT highways that may require expanded rest area services.

However, existing ASOs also provide the potential for P3s near existing rest areas that might provide additional rest area services where parking demand at nearby rest areas are forecast to exceed existing capacity in the future. The potential partners identified are within a 20-mile radius from each rest area. The following potential private partners are based primarily on the criteria specified under the Federal Interstate Oasis Program.

Mohawk Rest Area (I-8, MP 56)

- Minute Mart Travel Center (Pilot Travel Center) – This ASO is located 15 miles west of the Mohawk Rest Area at Exit 42. It is open 24 hours a day, 7 days a week and has 6 fuel lanes and 120 parking spots.

Sentinel Rest Area (I-8, MP 83.8)

- Dateland Travel Center (Texaco Station) - This ASO is located 14 miles west of the Sentinel Rest Area along I-8 at Exit 67. It is open 24 hours a day, 7 days a week. This ASO is also 11 miles east of Mohawk Rest Area.

Ehrenberg Rest Area (I-10, MP 4.7-5.1)

- Shell Gas Station – This ASO is located 1/2 mile east of the Ehrenberg Rest Area, along I-10 at exit 5. It is open 24 hours a day, 7 days a week.
- Flying J Travel Plaza – This ASO is located 4 miles west of the Ehrenberg Rest Area, at I-10 exit 1. It is open 24 hours a day, 7 days a week and has 10 fuel lanes and 271 truck parking spaces.
- 76 Gas Station - This ASO is located 4 miles west of the Ehrenberg Rest Area, along I-10 at exit 1. It is open 24 hours a day, 7 days a week.
- Love's Travel Stop - This ASO is located 13 miles east of the Ehrenberg Rest Area, along I-10 at exit 17. It is open 24 hours a day, 7 days a week and has 81 truck parking spaces.

²² <https://www.congress.gov/117/plaws/publ58/PLAW-117publ58.pdf>

- Pilot Travel Center - This ASO is located 13 miles east of the Ehrenberg Rest Area, along I-10 exit 17. It is open 24 hours a day, 7 days a week and has 9 fuel lanes and 100 truck parking spots.
- Exxon Gas Station (Previously Mobil Station) - This ASO is located miles 13 east of the Ehrenberg Rest Area along I-10 at exit 17. It is open from 6:00 a.m. to 1:00 a.m. Sunday-Thursday and open 24 hours Friday-Saturday.
- Arco AM/PM - This ASO is located 16 miles east of the Ehrenberg Rest Area, along I-10 at exit 19. It is open 24 hours a day, 7 days a week.
- Chevron Gas Station - This ASO is located 16 miles east of Ehrenberg Rest Area, along I-10 at exit 19. It is open 5:00 am to 10:00 pm every day.

Bouse Wash (I-10, MP 52)

- Pilot Travel Center - This ASO is located 7 miles west of the Bouse Wash Rest Area, along I-10 at exit 45. It is open 24 hours a day, 7 days a week and has 8 fuel lanes and 20 parking spots.
- Pride Travel Center - This ASO is located 7 miles west of the Bouse Wash Rest Area, along I-10 at exit 45. It is open 24 hours a day, 7 days a week and has 7 fuel lanes.

Burnt Well Rest Area (I-10, MP 86.1)

- Exxon Mobil Gas Station - This ASO is located 7.5 miles east of the Burnt Well Rest Area, along I-10 at exit 94. It is open 24 hours a day, 7 days a week.
- Pilot Travel Center - This ASO is located 7.5 miles east of the Burnt Well Rest Area, along I-10 at exit 94. It is open 24 hours a day, 7 days a week and has 6 fuel lanes and 66 parking spots.

Sacaton Rest Area (I-10, MP 181.5-183.5)

- Multiple Commercial Operators – These establishments are located 12 miles south of the Sacaton Rest Area at exit 194. Operators at this location include several gas stations and restaurants. Together these operators might individually or jointly meet the criteria to be considered as an Interstate Oasis. There are vacant lots adjacent to several operators which could potentially be used to provide additional auto/truck parking. There are multiple auto parking spaces yet no truck/bus parking spaces at each of the locations.
- Shell Gas Station - This ASO is located 16 miles north of Sacaton Rest Area, along I-10 at exit 167. It is open 5:00 am to 9:00 pm every day.
- Petro Travel Center - This ASO is located 16 miles south of Sacaton Rest Area, along I-10 at exit 200. It is open 24 hours a day, 7 days a week and has 11 fuel lanes and 175 truck parking spaces.
- Pride Travel Center - This ASO is located 16 miles south of Sacaton Rest Area, along I-10 at exit 200. It is open 24 hours a day, 7 days a week.
- Love's Travel Stop - This ASO is located 16 miles south of Sacaton Rest Area, along I-10 at exit 200. It is open 24 hours a day, 7 days a week and has 8 fuel lanes and 105 truck parking spaces.

Texas Canyon Rest Area (I-10, MP 320.5)

- Bowlin's The THING Travel Center - This ASO is located 2 miles east of Texas Canyon Rest Area, along I-10 at exit 322. It is open 7:00 a.m. to 7:00 p.m., seven days a week.
- Multiple Commercial Operators - These establishments are located 16 miles west of the Texas Canyon Rest Area. Operators at this location include several gas stations and restaurants.

Together these operators might individually or jointly meet the criteria to be considered as an Interstate Oasis. There are multiple auto spaces yet no truck/bus parking spaces at each location, however there are vacant lots adjacent to several of the operators which could potentially be used to provide additional auto/truck parking.

- Love's Travel Stop – This ASO is located 18 miles west of the Texas Canyon Rest Area, along I-10 at exit 302. This ASO is open 24 hours a day, seven days a week and has 6 fuel lanes and 85 truck parking spaces.

San Simon Rest Area (I-10, MP 388)

- 76 Gas Station - This ASO is located 10 miles west of San Simon Rest Area, along I-10 at exit 378. It is open 24 hours a day, 7 days a week.
- Shell Gas Station - This ASO is located 10 miles west of San Simon Rest Area, along I-10 at exit 378. It is open 24 hours a day, 7 days a week.
- Shady Grove Truck Stop – This ASO is located 7 miles east of the San Simon Rest Area, along I-10 at exit 5 (New Mexico). It is open 24 hours a day, 7 days a week.

Haviland Rest Area (I-40, MP 22.7)

- Pride (Flying J) Travel Center - This ASO is located 2.5 miles north of Haviland Rest Area, along I-40 at exit 25. It is open 24 hours a day, 7 days a week and has 8 fuel lanes and 86 truck parking spaces.
- Pilot Travel Center - This ASO is located 13 miles south of Haviland Rest Area, along I-40 at exit 9. It is open 24 hours a day, 7 days a week and has 10 fuel lanes and 85 parking spots.
- Chevron Station - This ASO is located 13 miles south of Haviland Rest Area, along I-40 at exit 9. It is open from 4:00 a.m. to 2:00 a.m. every day.
- Love's Travel Stop - This ASO is located 13 miles south of Haviland Rest Area, along I-40 at exit 9. It is open 24 hours a day, 7 days a week and has 8 fuel lanes and 84 truck parking spaces.

Parks Rest Area (I-40, MP 182)

- Pilot Travel Center - This ASO is located 3.6 miles East of Parks Rest Area, at I-40 exit 185. It is open 24 hours a day, 7 days a week.
- Texaco Gas Station - This ASO is located 4 miles West of Parks Rest Area, at I-40 exit 178. It is open from 6:00 am to 7:00 pm every day.
- Loves Travel Center - This ASO is located 19 miles West of Parks Rest Area, at I-40 exit 163. It is open 24 hours a day 7 days a week.
- Shell Gas Station - This ASO is located 19 miles West of Parks Rest Area, at I-40 exit 163. It is open 24 hours a day 7 days a week.
- Exxon Gas Station - This ASO is located 19 miles West of Parks Rest Area, at I-40 exit 163. It is open from 7:00 am to 11:00 pm every day.

Meteor Crater Rest Area (I-40 MP 235.2-236.3)

- Flying J Travel Plaza - This ASO is located 20 miles East of Meteor Crater Rest Area, at I-40 exit 255. It is open 24 hours a day, 7 days a week. It has 12 fuel lanes and 150 parking spots.

- 76 Gas Station - This ASO is located 16.5 miles East of Meteor Crater Rest Area, at I-40 exit 252. It is open from 6:00 am to 10:00 pm every day.
- Chevron Gas Station - This ASO is located 18 miles East of Meteor Crater Rest Area, at I-40 exit 253. It is open 24 hours a day, 7 days a week.
- Maverick Gas Station - This ASO is located 18 miles East of Meteor Crater Rest Area, at I-40 exit 253. It is open 24 hours a day, 7 days a week.
- Mobil Station - This ASO is located 2.5 miles West of Meteor Crater Rest Area, at I-40 exit 233. It is open from 7:00 am to 7:00 pm every day.

Painted Cliffs Rest Area (I-40, MP 359.6)

- Speedy's Truck Stop - This ASO is located 1 mile East of Painted Cliff Rest Area, at I-40 exit 359. It is open 24 hours a day, 7 days a week.
- Armco Gas Station/Indian Center Trading Post - This ASO is located 17 miles West of Painted Cliff Rest Area, at I-40 exit 341. It is open from 8:00 am to 5:00 pm every day.

McGuireville Rest Area (I-17, MP 297)

- McGuireville Mini Mart - This ASO is located 4 miles West of McGuireville Rest Area, at I-17 exit 293. It is open 5:00 am to 9:00 pm Monday-Friday, 6:30 am 10:00 pm on Saturday and 7:00 am to 9:00 pm on Sunday.
- Conoco Gas Station - This ASO is located 7 miles West of McGuireville Rest Area, at I-17 exit 293.
- Multiple Commercial Operators (Exit 287)
- Chevron Station - This ASO is located 7 miles West of McGuireville Rest Area, at I-17 exit 289. It is open 24 hours a day, 7 days a week.

Sunset Point Rest Area (I-17, MP 251.9)

- Chevron Station - This ASO is located 7 miles West of McGuireville Rest Area, at I-17 exit 289. It is open from 5:00 am to 10:00 pm every day.
- Pilot Travel Center - This ASO is located 11 miles North of Sunset Point Rest Area, at I-17 exit 262. It is open 24 hours a day, 7 days a week.
- Loves Travel Stop – This ASO is located 11 miles North of Sunset Point Rest Area, at I-17 exit 262. It is open 24 hours a day, 7 days a week.

Canoa Ranch Rest Area (I-19, MP 32.7-32.9)

- Chevron Station - This ASO is located 6 miles North of Canoa Ranch Rest Area, at I-19 exit 63. It is open from 5:00 am to 10:00 pm every day.
- Multiple Commercial Operators (Exit 63)
- Shell Gas Station - This ASO is located 7 miles North of Canoa Ranch Rest Area, at I-19 exit 65.

Hassayampa Rest Area (US 60, MP 116)

- Shell Station - This ASO is located 4 miles West of Hassayampa Rest Area, at US 60. It is open 24 hours a day, 7 days a week.
- Shell Station - This ASO is located 5 miles West of Hassayampa Rest Area, at US 60. It is open 24 hours a day, 7 days a week.

- Circle K Gas Station - This ASO is located 6 miles West of Hassayampa Rest Area, at US 60. It is open 24 hours a day, 7 days a week.

Salt River Canyon Rest Area (US 60, MP 292.9)

No ASOs within 20 miles.

Mazatzal Rest Area (SR 87, MP 235.7)

- Mobil Station

Christensen Rest Area (I-17, MP 322-324)

- Chevron Gas Station - This ASO is located 1 mile East of Christensen Rest Area, at 1-17 exit 322. It is open from 7:00 am to 8:30 pm every day.
- Shell Gas Station - This ASO is located 1 mile East of Christensen Rest Area, at 1-17 exit 322.
- Shell Gas Station - This ASO is located 10 miles West of Christensen Rest Area, at 1-17 exit 333.

Partnerships on Publicly Owned Land

This partnership arrangement consists of ADOT owning and controlling the land outside the interstate ROW and a private operator would lease and share responsibility for developing, operating and/or maintaining the facility. Since the land would not be located within the interstate ROW, the private partner would be able to operate commercial services onsite, such as food/beverage, retail, fuel, EV charging and other needed commercial services. ADOT could set the terms and conditions of the lease and review the private entity's facility design and operation standards to align with the Department's standards.

In this P3 model, the benefits to the private partner would include not having to purchase property, avoiding purchasing highway signage, and other financial benefits that the state might provide, such as a property tax exemption or favorable lease terms, low or no lease fees, or a long-term contract. However, the private partner would sacrifice long-term control of the land through ownership and would in most cases need to make some amount of financial contribution to development, operation, maintenance of the facility. In this partnership model, ADOT would reduce their cost to design and construct a new rest area, reduce or annual rest area maintenance costs, and/or receive income in the form of lease payments from the private operator.

This model would also require ADOT to acquire new land at locations outside the interstate ROW to initiate and develop this type of P3. The acquisition of new lands would be a more costly and complicated partnership arrangement compared to developing Interstate Oasis partnership where a private partner owns/controls the land. However, this P3 model may provide more incentive and favorable terms to private operators than the traditional Interstate Oasis program. For this P3 model it is recommended that ADOT coordinate with U.S. fuel retailers to identify ideal locations for implementing and constructing a new facility.

Sponsorships

Since the current federal restrictions still limit commercial activity within the interstate ROW, this study examined potential sponsorships at existing rest areas that could help to reduce the annual operating and maintenance costs, while also providing expanded services. A P3 model for sponsorship at existing

rest areas should follow the existing “Safe Phone Zone” partnership between ADOT and Geico. These sponsorships provide new, non-toll and non-tax revenue to ADOT that can offset the operation and maintenance costs associated with rest areas. Similarly, Texas Department of Transportation (TxDOT), noted that they used a similar model to provide wireless internet to rest areas through a partnership with Geico. This study recommends ADOT explore sponsorship opportunities such as providing sponsorship signing in return for compensation or rest areas services such as wireless internet. Per the FHWA, “the most common ways for highway agencies to recognize the support provided by sponsors is through acknowledgment signs. However, there are a number of other options to recognize sponsors, including acknowledgment on in-vehicle transponders, service patrol vehicles, maintenance vehicles, outreach and educational materials, and Internet Web sites, as well as within telephone messages such as those of 511 systems.”²³

The sponsorship policies and regulations should adhere to the following principles:

- Sponsorship agreements can allow sponsors to provide products, services, or monetary contributions.
- Sponsorship agreements may be of any duration. However, these agreements should:
 - be economically viable and provide a net benefit to the public, and
 - include provisions for maintenance and removal of physical elements of the sponsorship acknowledgment after the agreement expires or the sponsor withdraws.
- Agreements can be applicable to a highway site, a highway corridor, or a specific highway operation. If a sponsor is making a monetary contribution, the recipient agency needs to identify specific highway sites, corridors, or operations supported by the monetary contribution in the sponsorship agreement.
- If Federal-aid funds were used within the corridor or facility for which sponsored services are being provided, then monetary contributions received as a part of sponsorship agreements shall be spent for highway purposes.
- All sponsorship agreements involving the Interstate highway system should be approved by the FHWA Division Administrator.

In addition, FHWA policy states, “For sponsorship of rest areas, one acknowledgment sign for each direction of travel may be installed on the highway mainline. Additional acknowledgment signs may be placed within the rest area, provided that these sign legends are not visible to highway mainline traffic and do not pose safety risks to rest area users. In accordance with the provisions of the MUTCD, the acknowledgment signs must not be appended to any other sign, sign assembly, or other traffic control device. In accordance with Section 2H.08 of the MUTCD, rest area acknowledgment signs on the highway mainline should not be located within 500 feet of other traffic control devices.” It is important to note that use of a company or brand logo on signs along highway mainlines for new sponsorships will likely be prohibited by FHWA, and companies may find little value in having sponsorship acknowledgements limited to only lettering on these signs.

²³ <https://www.fhwa.dot.gov/legisregs/directives/orders/51601a.cfm>

ADOT could also explore revisiting existing lease agreements with cellular providers that have existing cell towers on ADOT right-of-way. These leasing fees could be reduced or eliminated in turn for providing wireless internet.

Appendix A

Rest Area Hazardous Materials List

Preliminary Hazardous Materials Evaluation Results^a

Rest Area	Environmental Database Ranking^b	Aerial Review (Ancillary Buildings and Structures) Ranking^c
Mohawk Rest Area	<p>High: This facility is part of the Groundwater Protection Program (GPP) and has a wastewater permit. Compliance required for regulatory closure.</p> <p>Medium: 3 wells in area: 2 registered to the Arizona Department of Transportation (ADOT).</p>	<p>High: Buildings.</p> <ul style="list-style-type: none"> • West Bound (WB): 2 structures, western portion of rest area. • East Bound (EB): Building, eastern portion of rest area. <p>Unknown: Disturbed areas.</p> <ul style="list-style-type: none"> • WB: Disturbed rectangular area, western portion of rest area. • EB: Irregular disturbed area, eastern portion of rest area. Another disturbed area east of previous listed area.
Ehrenberg Rest Area	<p>High: This facility is part of the Drinking Water Program (DWP and Refuse Disposal Program, and a wastewater permit (possible septic tanks). Compliance required for regulatory closure.</p> <p>Low: other listings. 1 well in area, none registered to ADOT.</p>	<p>High: Buildings and ponds.</p> <ul style="list-style-type: none"> • WB: Water tank and pump house, northeastern portion of rest area. 2 evaporation/settling ponds, northwestern portion of rest area. Cluster of 2 shed/housing buildings and another structure, western portion of rest area. • EB: Nothing identified based on review of aerial photographs.
Bouse Wash Rest Area	<p>High: This facility is part of the DWP and GPP, and has a wastewater permit. Compliance required for regulatory closure.</p>	<p>High: Buildings and ponds.</p> <ul style="list-style-type: none"> • WB: water tank and pump house, northwestern portion of rest area. • EB: 2 large rectangular evaporation/settling ponds, southeastern portion of rest area.
Burnt Well Rest Area	<p>High: The facility is part of the DWP and has a wastewater permit (possible septic tanks). Compliance required for regulatory closure.</p> <p>Medium: 3 wells in area registered to ADOT.</p>	<p>High: Buildings.</p> <ul style="list-style-type: none"> • WB: Storage/housing structure with another possible structure, eastern portion of rest area. • EB: Water tank, pump house, storage shed/housing, southeastern portion of rest area. Another possible structure in same cluster. <p>Unknown: Disturbed areas.</p> <ul style="list-style-type: none"> • WB: Disturbed rectangular area northeastern portion of rest area. • EB: Irregular disturbed area, eastern portion of rest area. Possible septic field, south of the rest area.

Preliminary Hazardous Materials Evaluation Results^a

Rest Area	Environmental Database Ranking^b	Aerial Review (Ancillary Buildings and Structures) Ranking^c
Sacaton Rest Area	<p>High: This facility is part of the DWP and GPP, and has a wastewater permit. Compliance required for regulatory closure.</p> <p>Medium: 2 wells registered to ADOT.</p> <p>Low: other listings.</p>	<p>High: Buildings and ponds.</p> <ul style="list-style-type: none"> • SB: 2 evaporation/settling ponds, northwestern portion of rest area; 2 structures, southeastern portion of rest area. • NB: 1 evaporation/settling pond, northwestern portion of rest area; storage/housing building to SE. <p>Unknown: Disturbed area.</p> <ul style="list-style-type: none"> • SB: No disturbed areas identified based on review of aerial photographs. • NB: Disturbed square area, eastern portion of rest area.
Texas Canyon Rest Area	<p>High: This facility is part of the DWP and GPP, and has a wastewater permit. Compliance required for regulatory closure.</p> <p>Low: other listing.</p>	<p>High: Buildings and ponds.</p> <ul style="list-style-type: none"> • WB: 3 evaporation/settling ponds, southwestern portion of rest area; water tank and pump house, northern portion of rest area. • EB: 3 evaporation/settling ponds, southern portion of rest area; storage shed/housing structure, southeastern portion of rest area.
San Simon Rest Area	<p>High: This facility is part of the DWP and GPP, and has a wastewater permit. Compliance required for regulatory closure.</p> <p>Medium: 1 well in area registered to ADOT.</p> <p>Low: other listings.</p>	<p>High: Buildings.</p> <ul style="list-style-type: none"> • WB: Nothing identified based on review of aerial photographs. • EB: Water tank, pump house, and shed/housing buildings, southeastern portion of rest area. <p>Unknown: Disturbed areas</p> <ul style="list-style-type: none"> • WB: Disturbed area to the west of the rest area, potential septic field; second disturbed area on the western portion of the rest area. • EB: Disturbed area southwest of rest area, potential septic field; second potential septic field between housing buildings and pump house.
Sunset Point Rest Area (only SB)	<p>High: This facility is part of the DWP and GPP, and has a wastewater permit. Compliance required for regulatory closure.</p> <p>Medium: 1 well in area registered to ADOT.</p> <p>Low: other listings.</p>	<p>High: Buildings and ponds.</p> <ul style="list-style-type: none"> • SB: 2 large evaporation/settling ponds, water tank, pump house, and 2 additional structures near ponds, northern portion of rest area. Solar panel array, southwest of the water tank and pump house. 12 manhole covers, various locations. <p>Unknown: Disturbed area.</p> <ul style="list-style-type: none"> • SB: 1 disturbed square area, northern portion of rest area and south of ponds. Former pond.

Preliminary Hazardous Materials Evaluation Results^a

Rest Area	Environmental Database Ranking^b	Aerial Review (Ancillary Buildings and Structures) Ranking^c
Canoa Ranch Rest Area	Medium: 1 well in area registered to ADOT. Unknown: ADEQ listing incomplete; possible permit.	High: Buildings. <ul style="list-style-type: none"> • SB: Water tank, pump house and shed/housing building, southwestern portion of rest area. • NB: Nothing identified based on review of aerial photographs. Unknown: Storage Area. <ul style="list-style-type: none"> • SB: A storage area is located on the northern portion of rest area. Vehicles and construction equipment are apparent in aerial photographs. • NB: No disturbed areas identified based on review of aerial photographs.
Painted Cliffs Rest Area (only WB)	Medium: This facility is part of the DWP and GPP. Compliance required for regulatory closure. Low: other listing.	High: Buildings. <ul style="list-style-type: none"> • WB: Water tank, pump house, and shed/housing, southwestern portion of rest area; other possible structures in cluster.
Hassayampa Rest Area (only SB)	Medium: 6 wells in area, 1 registered to ADOT. Low: other listings. Unknown: Tier 2 listing for a facility (Circle City Co, ERIS ID #1) with no listed address, no evidence that facility exists at mapped location.	Low: Buildings. <ul style="list-style-type: none"> • SB: Nothing identified based on review of aerial photographs.
Salt River Canyon Rest Area (only EB)	Medium: 1 well registered to ADOT. Low: other listings.	High: Buildings. <ul style="list-style-type: none"> • EB: 1 building to north but resolution is not clear enough to determine more.
Mazatzal Rest Area (only SB)	High: This facility is part of the DWP and GPP, and has a wastewater permit. Compliance required for regulatory closure.	High: Buildings and ponds. <ul style="list-style-type: none"> • SB: Water tank and other structures, southeastern portion of rest area. Probable 1 large, 2 smaller evaporation/settling ponds filled in with vegetation adjacent to water tank and structures.

Preliminary Hazardous Materials Evaluation Results^a

Rest Area	Environmental Database Ranking^b	Aerial Review (Ancillary Buildings and Structures) Ranking^c
McGuireville Rest Area	<p>High: This facility is part of the DWP and has a wastewater permit. Compliance required for regulatory closure.</p> <p>Medium: 4 wells in area, 3 registered to ADOT.</p>	<p>High: Buildings and ponds.</p> <ul style="list-style-type: none"> • SB: 1 large and 1 small evaporation/settling pond. • NB: 2 evaporation/settling ponds filled with vegetation to the southeast; 1 large building with water tank, possible pump house, and an unknown structure, southern portion of rest area.
Parks Rest Area	<p>Low: other listings.</p> <p>Unknown: ADEQ listing incomplete; possible permit.</p>	<p>High: Buildings.</p> <ul style="list-style-type: none"> • WB: Cluster of structures/buildings, northwestern portion of rest area. • EB: Nothing identified based on review of aerial photographs. <p>Unknown: Disturbed areas.</p> <ul style="list-style-type: none"> • WB: No disturbed areas identified based on review of aerial photographs. • EB: Disturbed rectangular area, southern portion of rest area.
Meteor Crater Rest Area	<p>High: WB and EB: This facility is part of the GPP and has a wastewater permit. Compliance required for regulatory closure.</p> <p>EB only: This facility is part of the DWP and Air Programs. Compliance required for regulatory closure.</p> <p>Medium: 1 well in area registered to ADOT.</p> <p>Low: other listing.</p>	<p>High: Buildings and ponds.</p> <ul style="list-style-type: none"> • WB: 2 evaporation/settling ponds, northeastern portion of rest area. • EB: 2 buildings, southwestern portion of rest area, 2 water tanks and pump house.. Possible house or storage building, with another small structure on the south-central portion. 2 rectangular evaporation/settling ponds eastern portion of rest area. Overflow parking area, west of evaporation/settling ponds.
Christensen Rest Area	<p>High: This facility is part of the DWP. Compliance required for regulatory closure.</p> <p>Low: other listing.</p>	<p>Unknown: Disturbed areas.</p> <ul style="list-style-type: none"> • NB: Disturbed area with potential concrete foundations and water tank, western portion. • SB: Rectangular disturbed area on southeast portion.
Haviland Rest Area	<p>High: This facility is part of the DWP. Compliance required for regulatory closure.</p> <p>Medium: 3 wells registered to ADOT.</p> <p>Low: other listings.</p>	<p>High: Buildings and septic fields</p> <ul style="list-style-type: none"> • EB: Building cluster on northern portion, pump house and water tank, potential residence or storage building, septic field northwest of residence/storage building. Septic field east of rest area. • WB: Septic field west of rest area. Potential structure south of rest area.

Preliminary Hazardous Materials Evaluation Results^a

Rest Area	Environmental Database Ranking ^b	Aerial Review (Ancillary Buildings and Structures) Ranking ^c
Sentinel Rest Area	<p>High: This facility is part of the DWP and has a wastewater permit. Compliance required for regulatory closure.</p> <p>Medium: 1 well registered to ADOT.</p> <p>Low: other listings.</p>	<p>High: Buildings and ponds.</p> <ul style="list-style-type: none"> • EB: Building cluster, east of rest area; evaporation/settling pond filled with vegetation, southwest portion of rest area. • WB: 2 buildings, one on the northeast and one on the west portion of the rest area; evaporation/settling pond filled with vegetation, southwest portion of rest area.

^a If any of the rest areas have a dump station for recreational vehicles, the contents of the dump station may need to be sampled in the event of a closure.

^b Environmental Database Rankings. For permits, rankings based on regulatory process required for permit modification for renovation/expansion and permit closure for demolition. Rankings for wells based on well capacity for renovation/expansion and well abandonment for closure. Rankings for other listings, including spills, based on perceived hazardous materials issues regardless of renovation/expansion or closure.

^c Aerial Review Rankings. Rankings based on perceived hazardous materials issues associated with visible buildings and ancillary structures, including asbestos and/or lead based paint sampling and abatement for structure renovation or demolition. Rankings may coincide with environmental database rankings for permits. Unknown rankings based on indeterminate origin of disturbed areas.

Appendix B

Rest Area Cultural Resources List

Appendix B–Cultural Resources Identified Within 0.25 Miles of Rest Area Locations

Discussion: If the proposed rest area rehabilitations are completed using federal or state funds, they will be subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (54 United States Code [USC] 306108, implementing regulations at 36 Code of Federal Regulations [CFR] Part 800, the Arizona Antiquities Act (Arizona Revised Statutes [ARS] §§ 41-841 through 846) and the State Historic Preservation Act (ARS §§ 41-861 through 41-864). **Table 1-1** summarizes the results of a desktop review of known cultural resources within an 0.25-mile review area of each rest area. The data contained in the desktop review is derived from AZSITE, Arizona’s electronic cultural resources database

Only general locational information is presented in **Table 1-1** given the fact that a disturbance footprint for any future planned rehabilitation projects is unknown.

Once these rehabilitation projects are funded and a disturbance footprint is established, future cultural resources compliance would include the following general tasks:

- Establishment of a project area of potential effects (APE), including relevant land ownership, for the analysis of cultural resources data.
- Review of cultural resources site and project data within the APE and review area with the ADOT Historic Preservation Team Portal and relevant land managing agencies to determine if new or additional cultural resources survey is required and to identify the locations and NRHP eligibility status of previously recorded cultural resources sites.
- Determine whether any avoidance or mitigation measure as required for potential historic properties in the APE.
- Review of the construction data of each rest area to establish whether the facilities are of historic age and require evaluation for National Register of Historic Places (NRHP) eligibility.
- Review the project under the provisions of ADOT's *Programmatic Agreement Pursuant to Section 106 of the National Historic Preservation Act Regarding Implementation of Federal-Aid Transportation Projects in the State of Arizona* (2016) and as amended to determine whether the project qualifies as a screened exemption.
- Conduct Section 106 or SHPA consultation with relevant agencies and tribal nations, as applicable.

Table 1-1. Cultural Resources Identified within 0.25 Miles of Rest Area Locations

Site Name/No.	Site Description	NRHP Eligibility (Criterion) ^{1, 2}
Mohawk		
AZ Y:2:33(ASM)	1870s communications (telegraph) line	Determined eligible (A)
AZ FF:9:17(ASM)	Road-US 80	Determined eligible (D)

Site Name/No.	Site Description	NRHP Eligibility (Criterion) ^{1,2}
Sentinel		
AZ FF:9:17(ASM)	Road-US 80	Determined eligible (D)
Ehrenberg		
AZ-050-0763	Desert pavement clearing and trail	Unknown eligibility
Bouse Wash		
None identified		
Burnt Well		
None identified		
Sacaton		
None identified		
Texas Canyon		
None identified		
San Simon		
AZ AA:16:377(ASM)/ Ajo-Tucson Highway	Road-State Route (SR) 86	Determined eligible (D)
AZ CC:16:16(ASM)	Communications (telephone) line	Not considered eligible
Sunset Point		
AZ N:16:142(ASM)	Prehistoric artifact scatter, field house, petroglyph	Considered eligible (D)
Canoa Ranch		
AZ DD:4:53(ASM)	Hohokam artifact scatter, undefined rock alignment and rock pile	Determined eligible (D)
AZ DD:4:54(ASM)	Hohokam artifact scatter	Determined eligible (D)
AZ DD:4:55(ASM)	Hohokam artifact scatter	Determined eligible (D)
AZ DD:4:56(ASM)	Hohokam pithouse	Determined eligible (D)
AZ DD:4:74(ASM)/ Canoa Ranch	Historic ranch	NRHP-listed (No. 04001158) (A, C)
AZ DD:4:234(ASM)	Hohokam rock piles and rock ring	Determined eligible (D)
AZ DD:4:235(ASM)	Archaic/Hohokam lithic scatter	Not considered eligible
AZ DD:4:250(ASM)	Prehistoric hearths, lithic scatter, rock pile, and rock rings	Determined eligible (D)
Haviland		
AZ I:15:156(ASM)/ Historic Route 66	Road – US 66	Determined eligible (A)
Painted Cliffs³ (Tribal Land)		
AZ I:15:156(ASM)/ Historic Route 66	Road – US 66	Determined eligible (A)

Site Name/No.	Site Description	NRHP Eligibility (Criterion) ^{1,2}
AZ K:12:3(ASM)/ The Green Bear Site	Prehistoric artifact scatter and pithouse village site	Determined eligible/Contributor (D)
AZ K:12:78(ASM)	Prehistoric pueblo site with up to 150 rooms (up to 3 stories), artifact scatter, and 2 burials	Determined eligible/Individually (D)
AZ K:12:237(ASM)	Prehistoric room block with 40-50 rooms and artifact scatter	Determined eligible/Individually (D)
AZ K:12:238(ASM)	Prehistoric pueblo site, room block with up to 10 rooms, and artifact scatter	Determined eligible/Individually (D)
AZ K:12:239(ASM)	Prehistoric artifact scatter	Determined eligible/Individually (D)
AZ K:12:260(ASM)	Prehistoric artifact scatter	Unevaluated
AZ K:12:261(ASM)	Historic road trails and two clusters of structures	Determined eligible/Individually (D)
AZ K:12:262(ASM)	Prehistoric artifact scatter	Unevaluated
AZ K:12:263(ASM)	Prehistoric bedrock staircase with 23 hand and foot holds	Determined eligible/Individually (C, D)
AZ K:12:264(ASM)	Prehistoric rock art with at least seven elements	Determined eligible/Individually (C, D)
AZ K:12:265(ASM)	Historic house remnants	Determined ineligible/Individually
NA22492	Hearth with basalt cobbles and auto parts	Status unknown
NA22494	Large pithouse village with 12+ depressions, possible kiva, and trash	Status unknown
Hassayampa		
AZ N:3:32(ASM)/Santa Fe, Prescott, and Phoenix Railway Line/Atchison, Topeka & Santa Fe Railway	Railroad line constructed in 1890s	Determined eligible (A)
AZ T:2:143(ASM)/Wickenburg to Dysart-69kV Transmission Line	Historic transmission Line	Determined eligible individually (A)
Salt River Canyon		
None identified		
Mazatzal		
AZ AA:6:63(ASM)/SR 87/ Beeline Highway/ SR 65/SR 166	Road-SR 87	Considered eligible (D)
AZ O:15:110 (ASM)	Salado habitation	Considered eligible

Site Name/No.	Site Description	NRHP Eligibility (Criterion)^{1,2}
AZ O:15:111 (ASM)	Salado field house	Not considered eligible
AZ O:15:112(ASM)	Salado field house and undefined rock alignment	Not considered eligible
NA17230	Salado/Sinagua artifact scatter, masonry structure, and check dams	Status unknown
NA17231	Salado/Sinagua artifact scatter and habitation	Status unknown
NA17232	Salado/Sinagua rock alignments and lithic scatter	Status unknown
NA17233	Salado/Sinagua artifact scatter and habitation	Status unknown
McGuireville		
AZ O:5:177(ASM)	Historic road trail/two-track road	Not evaluated
Parks		
AZ I:15:156(ASM)/ Historic Route 66	Road – US 66	Determined eligible (A)
Meteor Crater		
AZ I:15:156(ASM)/ Historic Route 66	Road – US 66	Determined eligible (A)
AZ J:13:6(ASM)	Historic room block	Status unknown
Christiansen		
NA21196	Historic logging camp and lithic scatter	Not evaluated

¹ Considered/Recommended=recorder's opinion. Determined=agency determination with State Historic Preservation Office (SHPO) concurrence.

²NRHP eligibility derived from AZSITE, Arizona's electronic cultural resources database.

³ Data returned from AZSITE for the Painted Cliffs Rest Area suggests the presence of a historic district. This could not be confirmed by the desktop review.