



Arizona Department of Transportation

Environmental Planning

**Project-Level Particulate Matter (PM₁₀)
and Carbon Monoxide (CO)
Consultation Document**

Jackrabbit Trail Traffic Interchange (TI)

**010-MA 122 F0486 01C
010-B(222)T**

April 3, 2024

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by ADOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated April 16, 2019, and executed by FHWA and ADOT.

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Project-Level PM₁₀ and CO Interagency Consultation

Project Setting and Description

The Arizona Department of Transportation (ADOT) is proposing a traffic interchange (TI) reconstruction project at the Jackrabbit Trail/Interstate 10 (I-10) TI in the City of Buckeye, Maricopa County, Arizona.

The preferred alternative would upgrade the existing interchange from its current stop-controlled configuration to a tight diamond interchange with signalized intersections at the westbound and eastbound ramp intersections with Jackrabbit Trail. The project would not increase capacity on I-10 but would reconstruct the I-10 bridges over the TI to accommodate improvements on Jackrabbit Trail at the interchange ramps.

In addition to signalizing the westbound and eastbound I-10 ramp intersections, the project would increase capacity on Jackrabbit Trail from one lane in each direction (northbound and southbound) to 3 lanes in each direction from north of Van Buren Street to south of McDowell Road. At the Jackrabbit Trail TI the alignment would be shifted to the east to avoid impacting the existing drainage channel west of the TI.

Other improvements on Jackrabbit Trail would include a curbed median, bike lanes, sidewalk, curb, and gutter, and streetlighting.

The purpose of the project is to reduce congestion, promote safety, improve traffic operations in a growing region of Maricopa County, and enhance regional mobility.

The proposed project is in Maricopa County currently designated as nonattainment or maintenance for the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), eight-hour ozone, and particulate matter less than or equal to ten microns in diameter (PM₁₀).

The CO Maintenance Plan currently in effect is the "MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area" (MAG, March 2013). As discussed in that plan, there have been no exceedances of the 1-hour NAAQS for CO (35 parts per million [ppm] since 1984 and no violations of the 8-hour NAAQS (9 ppm) since 1996. There has also been a continuous downward trend in monitored CO concentrations over time and the maintenance demonstration summary described in the 2013 Maintenance Plan details continuing compliance with the CO standard through 2025.

The PM₁₀ Nonattainment Plan currently in effect is the "The MAG 2012 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area," the effective date of this plan as approved by Environmental Protection Agency (EPA) is July 10, 2014. The MAG 2020 Eight-Hour Ozone Plan – Submittal of Marginal Area Requirements for the Maricopa Nonattainment Area was submitted to EPA on June 29, 2020.

This project is included in the Maricopa Association of Governments Regional Transportation Plan: Momentum 2050 (MAG, 2021) and the Fiscal Year 2022-2025 Transportation Improvement Program (as of January 31, 2024) as follows:

- TIP ID DOT22-017D - 10 (Papago): Jackrabbit Trail TI (Predesign Traffic Interchange)

-
- TIP ID DOT22-018D - 10(Papago) Jackrabbit Rail TI) (Design Traffic Interchange).

The current conformity determination of the TIP and MOMENTUM 2050 MAG Regional Transportation Plan for the Maricopa nonattainment and maintenance areas was made by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) on September 25, 2023.

The project location is shown in Figure 1 and project study area is shown in Figure 2a and Figure 2b.

Figure 1. Project Location Map

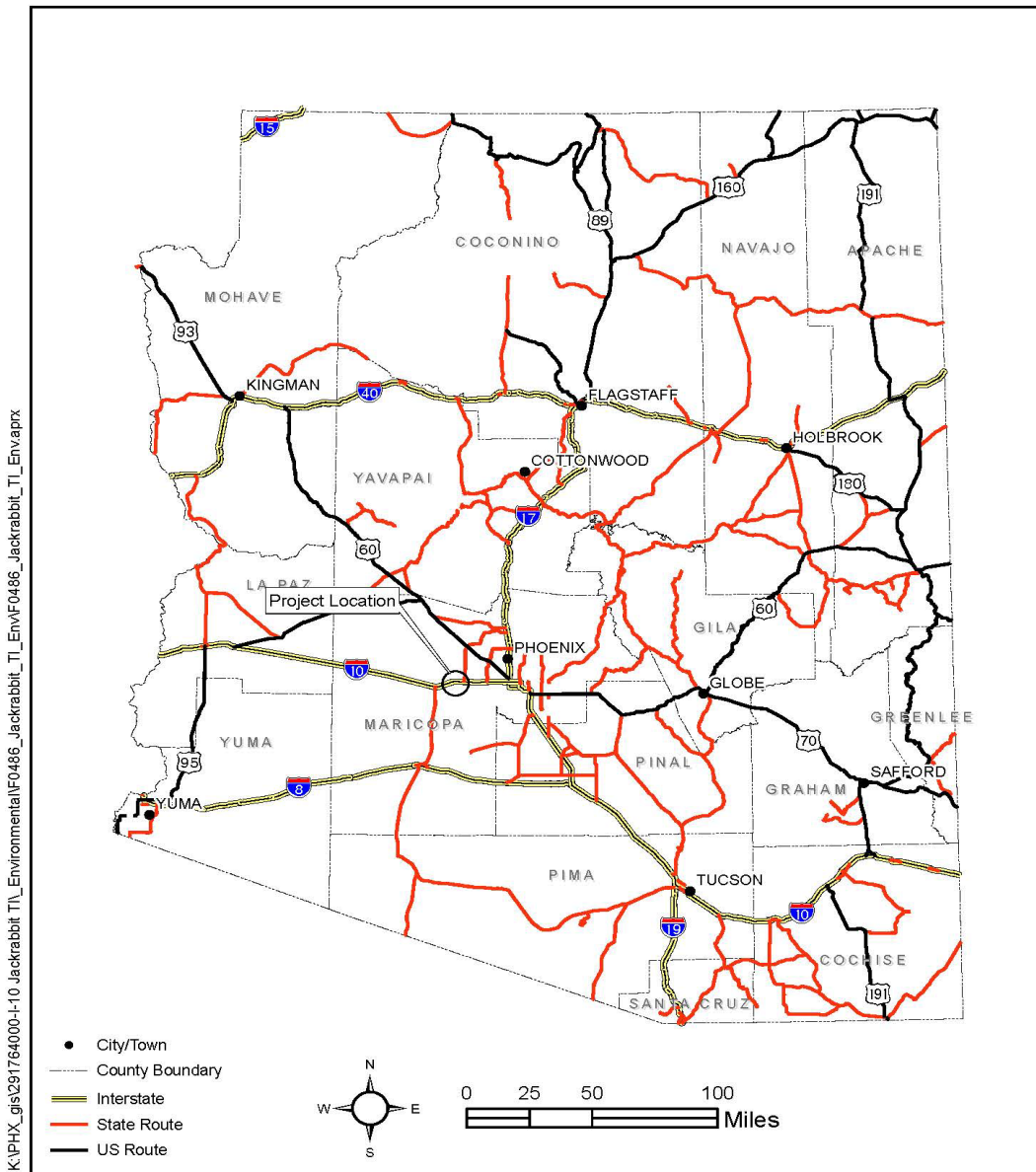


Figure 1. State Map
010-B(222)T
010 MA 122 F0486 01C
Jackrabbit Traffic Interchange (TI)

Figure 2a. Project Study Area - Van Buren Street to Roosevelt Street

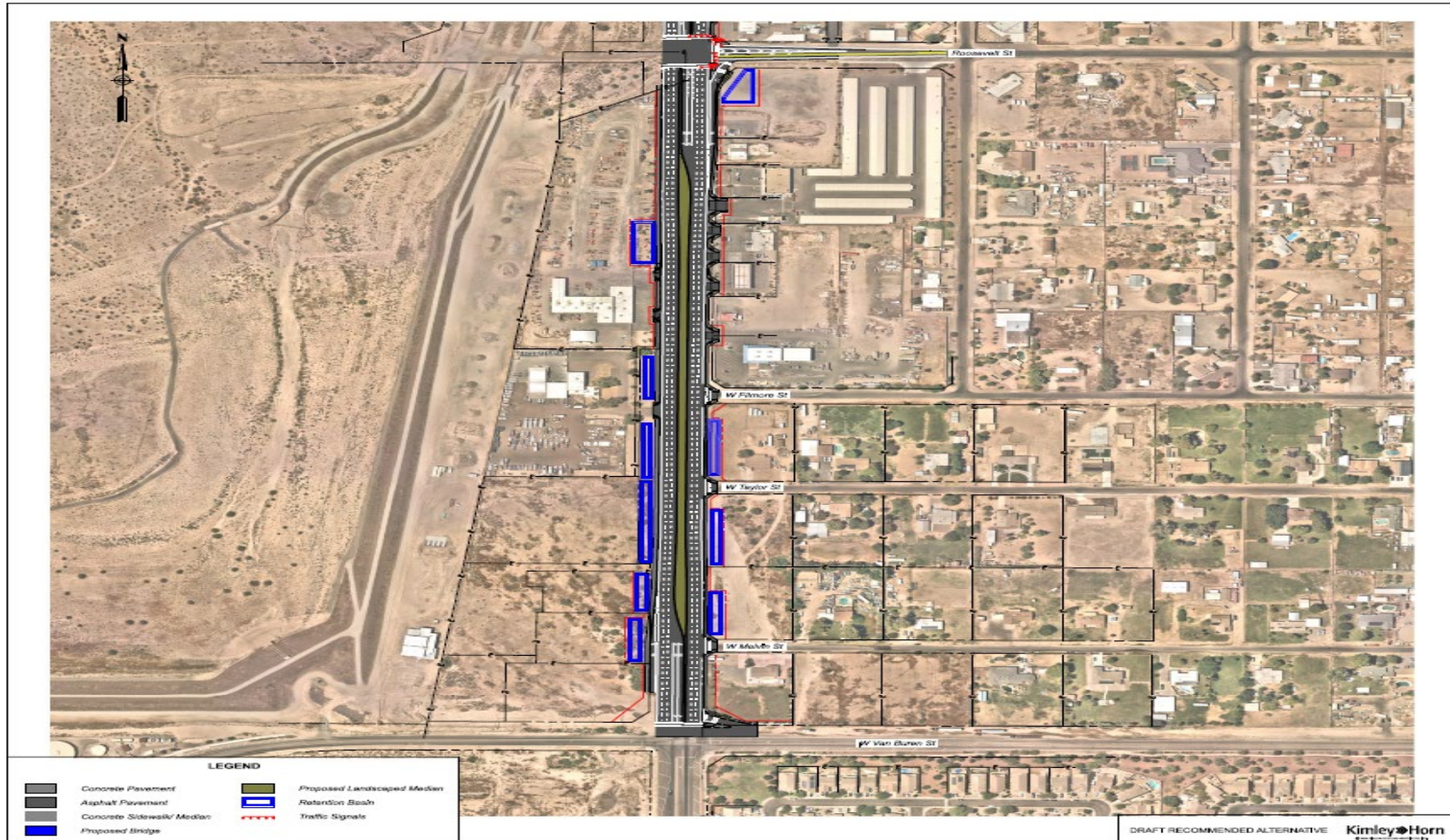
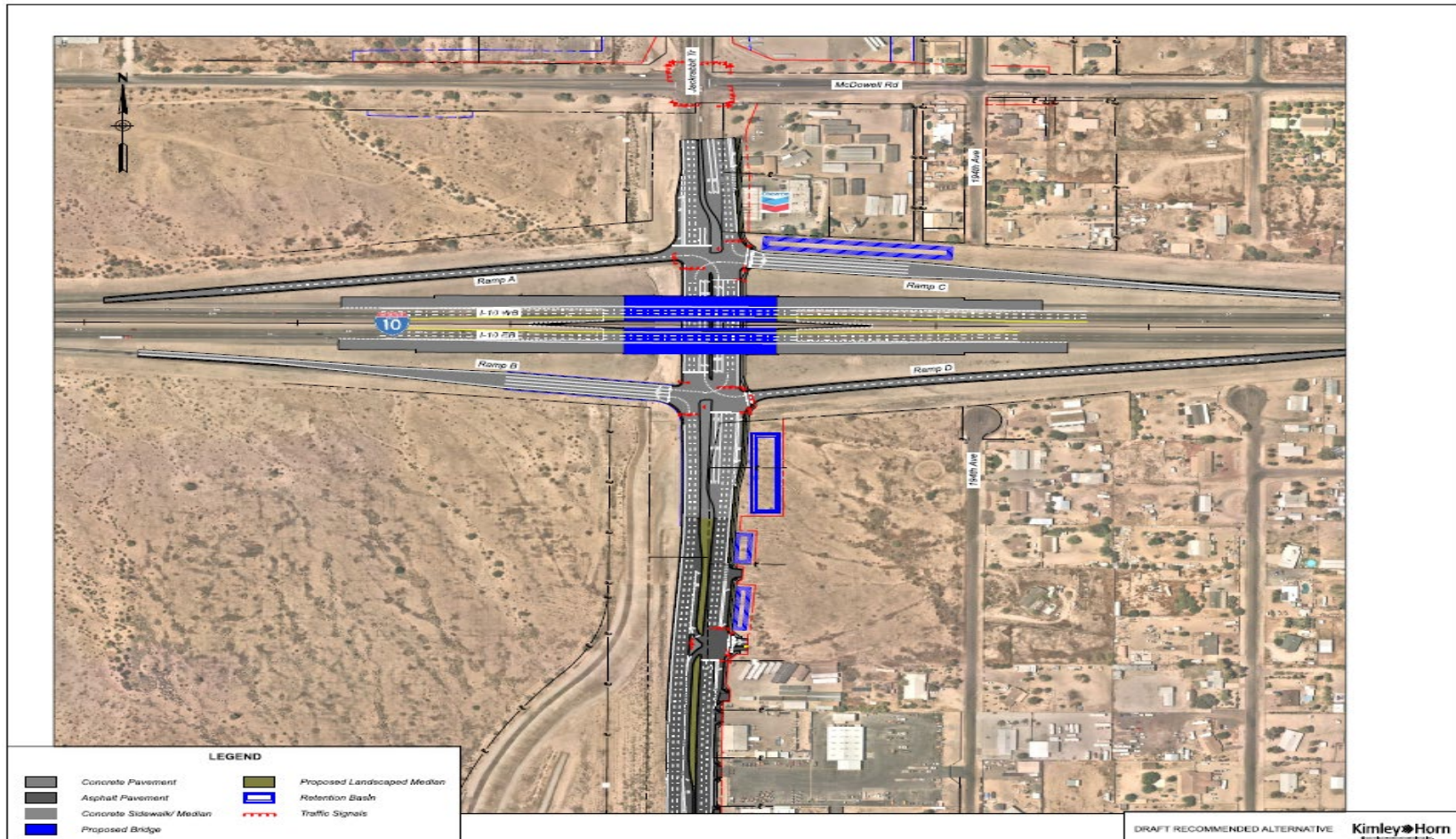


Figure 2b. Project Study Area -
Roosevelt Street to McDowell Road



Project-Level PM₁₀ Consultation Project of Air Quality Concern

PM₁₀ Project Assessment

The following questionnaire is used to compare the proposed project to a list of project types in 40 CFR 93.123(b) requiring a quantitative analysis of local particulate emissions (Hot-spots) in nonattainment or maintenance areas, which include:

- i) New highway projects that have a significant number of diesel vehicles, and expanded highway projects that have a significant increase in the number of diesel vehicles;
- ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of an increase in traffic volumes from a significant number of diesel vehicles related to the project;
- iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
- iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and
- v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM₁₀ or PM_{2.5} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

If the project matches one of the listed project types in 40 CFR 123(b)(1) above, it is considered a project of local air quality concern, and the hot-spot demonstration must be based on quantitative analysis methods in accordance with 40 CFR 93.116(a) and the consultation requirements of 40 CFR 93.105(c)(1)(i). If the project does not require a PM hot-spot analysis, a qualitative assessment will be developed that demonstrates that the project will not contribute to any new localized violations, increase the frequency or severity of any existing violations, or delay the timely attainment of any NAAQS or any required emission reductions or milestones in any nonattainment or maintenance area.

On March 10, 2006, EPA published *PM_{2.5} and PM₁₀ Hot-Spot Analyses in Project-Level Transportation Conformity Determinations for the New PM_{2.5} and Existing PM₁₀ National Ambient Air Quality Standards; Final Rule* describing the types of projects that would be considered a project of air quality concern and that require a hot-spot analysis (71 FR 12468-12511). Specifically on page 12491, EPA provides the following clarification: "Some examples of *projects of air quality concern* that would be covered by §93.123(b)(1)(i) and (ii) are: A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) and 8% or more of such AADT is diesel truck traffic;" .."Expansion of an existing highway or other facility that affects a congested intersection (operated at Level-of-Service D, E, or F) that has a significant increase in the number of diesel trucks;" While these examples were provided in the rulemaking, interagency consultation will be used to determine if a project is a project of air quality concern.

New Highway Capacity

Is this a new highway project that has a significant number of diesel vehicles?

NO - The proposed project is not a new highway project.

Expanded Highway Capacity

Is this an expanded highway project that has a significant increase in the number of diesel vehicles?

NO - The proposed project is not an expanded highway capacity project that has a significant increase in the volume of diesel-fueled vehicles related to the project.

As shown in Table 1, the average daily traffic (ADT) volumes on Jackrabbit Trail south of I-10 range from about 13,800 vehicles per day (vpd) under 2022 Existing Conditions to about 31,000 vpd under the 2050 Build Alternative. The ADT on Jackrabbit Trail north of I-10 ranges from about 12,700 vpd under 2022 Existing Conditions to about 36,000 vpd under the 2050 Build Alternative.

Compared to the 2050 No-Build Alternative, the total truck ADT on Jackrabbit Trail north of I-10 increases by less than 150 trucks per day as a result of the project. South of I-10 total truck volumes increase by less than 500 trucks per day. Truck volumes on Jackrabbit Trail are relatively low under the 2050 Build Alternative because increased traffic volumes in 2050 are primarily due to the growth in gasoline-fueled vehicles (that is, passenger cars and other gasoline-fueled vehicles) and not diesel-fueled trucks. The City of Buckeye expects substantial residential development north of McDowell Road.

The total truck ADT increases by less than 200 trucks per day at the I-10/Jackrabbit Trail westbound offramp and eastbound onramp and decreases by about 300 to 400 trucks per day at the I-10/Jackrabbit Trail westbound onramp and eastbound offramp.

The total truck volumes shown in Table 1 include both medium- and heavy-duty trucks, not all of which would be diesel-fueled. The combined medium- and heavy-duty truck ADT volumes represent a worst-case assumption when considering if the increase in truck volumes represents a significant increase in the number of diesel-fueled vehicles resulting from the project.

As discussed above under the Project Setting and Description, the project would not increase capacity on I-10 (that is, add additional travel lanes on I-10) but would reconstruct the I-10 bridges over the TI to accommodate improvements on Jackrabbit Trail at the interchange ramps.

Table 2 shows the ADT on I-10 at locations east and west of the Jackrabbit Trail interchange in 2050 under a No-Build and Build condition. Total truck volumes on I-10 increase by less than 300 trucks per day west of the interchange or decrease by about 700 to 1,250 trucks per day between the interchange ramps and east of the Jackrabbit Trail TI. Under the 2050 Build Alternative traffic volumes on I-10 are expected to be less than under the 2050 No-Build Alternative due to other area-wide improvements

such as those on Jackrabbit Trail, McDowell Road, and other arterials. Other area-wide improvements provide more capacity, allowing for shorter trips making it more efficient to stay on the arterials rather than use I-10 for a short distance and then return to the arterial streets.

Table 1. Jackrabbit Trail ADT and Truck Volumes

Roadway Segment	2022 Existing				2050 No-Build				2050 Build				Total Truck ADT Difference (Build - No-Build)
	ADT	Total Truck ADT	MT Volume	HT Volume	ADT	Total Truck ADT	MT Volume	HT Volume	ADT	Total Truck ADT	MT Volume	HT Volume	
Jackrabbit Trail North of I-10	12,781	1,661	1,150	511	34,882	4,534	3,139	1,395	36,003	4,680	3,240	1,440	146
Jackrabbit Trail South of I-10	13,822	968	553	415	24,174	1,692	967	725	31,000	2,170	1,240	930	478
Jackrabbit Trail & WB I-10 Offramp	7,046	916	634	282	12,062	1,568	1,086	482	13,120	1,706	1,181	525	138
Jackrabbit Trail & WB I-10 Onramp	1,976	257	178	79	10,005	1,300	900	400	6,952	904	626	278	-396
Jackrabbit Trail & EB I-10 Offramp	1,918	250	173	77	8,731	1,135	786	349	6,397	832	576	256	-303
Jackrabbit Trail & EB I-10 Onramp	6,787	882	611	271	11,692	1,520	1,052	468	13,081	1,700	1,177	523	180

Notes:

ADT - Average Daily Traffic

MT - Medium Trucks (vehicles with 2 axles & 6 wheels; gross vehicle weight - 10,000 to 26,400 pounds).

HT - Heavy Trucks (vehicles with 3 or more axles; gross vehicle weight greater than 26,400 pounds).

Source: Draft Final Design Concept Report; Interstate 10 and Jackrabbit Trail Traffic Interchange, Appendix F (March 2024)

Table 2. Interstate 10 ADT at Jackrabbit Trail Traffic Interchange

Interstate 10 Location		2050 No Build Updated MAG Model ADT		2050 Build Updated MAG Model ADT		Difference (Build - No Build)
I-10 West of JRT TI Ramps	ADT	220,505		213,114		-7,391
	MT	30,871 (14%)		29,836 (14%)		-1,035
	HT	24,256 (11%)		25,574 (12%)		1,318
	Total Trucks (MT + HT)	55,127		55,410		283
I-10 Between JRT TI Ramps	ADT	211,035		206,353		-4,682
	MT	31,655 (15%)		30,953 (15%)		-702
	HT	25,324 (12%)		24,762 (12%)		-562
	Total Trucks (MT + HT)	56,979		55,715		-1,264
I-10 East of JRT TI Ramps	ADT	229,839		227,096		-2,743
	MT	32,177 (14%)		31,793 (14%)		-384
	HT	25,282 (11%)		24,981 (11%)		-301
	Total Trucks (MT + HT)	57,459		56,774		-685

Notes:
 ADT - Average Daily Traffic
 MT - Medium Trucks (vehicles with 2 axles & 6 wheels; gross vehicle weight - 10,000 to 26,400 pounds).
 HT - Heavy Trucks (vehicles with 3 or more axles; gross vehicle weight greater than 26,400 pounds).
 Source: Email from Daniel Iwicki (Kimley-Horn) to Emma Weiss, Michael Grandy, et. al. (Kimley-Horn) re: F0486 Jackrabbit Trail TI Traffic for Noise Analysis (November 9, 2023)

Projects with Congested Intersections

Is this a project that affects a congested intersection (LOS D or greater) that has a significant number of diesel trucks, OR will change LOS to D or greater because of an increase in traffic volumes from a significant number of diesel trucks related to the project?

NO - This is not a project that affects a congested intersection at LOS D or that will change to LOS D (or greater) because of a significant increase in the number of diesel-fueled trucks resulting from the project (see discussion above and Table 1 and Table 2).

Table 3 summarizes the LOS at the intersections in the project area that would be affected by the proposed project improvements. As shown in Table 3, all intersections in the project corridor would operate at LOS D or worse in both the AM and PM peak-hours under the 2050 No-Build Alternative.

Under the 2050 Build Alternative with the proposed interchange improvements at the I-10/Jackrabbit Trail TI and an additional travel lane on Jackrabbit Trail from north of Van Buren Street to south of McDowell Road, all intersections would operate at LOS C or better in the AM and PM peak hours.

Under the 2050 Build Alternative, total truck volumes at all intersections increase by less than 75 trucks per hour compared to the 2050 No-Build Alternative in both the AM and PM peak-hour because, as noted above, a substantial portion of the area-wide traffic growth is expected to be the result of increased passenger cars and not diesel-fueled vehicles.

The total truck volumes at all intersections in the project corridor and on I-10 in the vicinity of the TI are not considered to be a significant number of diesel-fueled vehicles or represent a significant increase in the volume of diesel-fueled vehicles related to the project.

Table 3. Jackrabbit Trail Intersection Level of Service and Peak-Hour Volume Summary

AM Peak-Hour													
Intersection	2022 Existing Conditions				2050 No-Build				2050 Build				Truck Difference (Build - No-Build, vph) ³
	LOS	Volumes (vph)	Medium Truck Volumes (vph)	Heavy Truck Volumes (vph)	LOS (delay, sec.)	Volumes (vph)	Medium Truck Volumes (vph)	Heavy Truck Volumes (vph)	LOS (delay, sec.)	Volumes (vph)	Medium Truck Volumes (vph)	Heavy Truck Volumes (vph)	
I-10 WB Ramps & Jackrabbit Trail	E	1,123	101	45	F (55)²	2,315	208	92	C (24) ¹	2,776	250	111	61
I-10 EB Ramps & Jackrabbit Trail	C	1,117	101	45	C (17)²	2,175	196	87	C (25) ¹	2,558	230	102	49
Gas Station Access & Jackrabbit Trail	-- ⁴	--	---	--	A (6)¹	1,496	60	45	A (7) ¹	1,723	69	52	16
Roosevelt Street & Jackrabbit Trail	C	1,027	41	31	B (16)¹	1,425	57	43	B (16) ¹	1,792	72	54	26
PM Peak-Hour													
I-10 WB Ramps & Jackrabbit Trail	C	1,723	155	69	F (192)	3,346	301	134	C (22)	3,775	340	151	56
I-10 EB Ramps & Jackrabbit Trail	D	1,252	113	50	F (218)	3,019	272	121	C (22)	3,391	305	136	48
Gas Station Access & Jackrabbit Trail	--	--	---	--	E (60)	2,569	103	77	A (10)	2,825	113	85	18
Roosevelt Street & Jackrabbit Trail	C	1,175	47	35	F (616)	2,088	84	63	C (26)	3,013	121	90	64

¹ Signalized in AM & PM Peak Hour
² All-Way Stop Controlled in AM & PM Peak-Hour
³ Truck ADT Difference includes both MT and HT
⁴ Intersection does not exist in 2022 Existing Conditions
 Intersections at LOS D or greater in **bold**
 MT - Medium Trucks (vehicles with 2 axles & 6 wheels; gross vehicle weight - 10,000 to 26,400 pounds)
 HT - Heavy Trucks (vehicles with 3 or more axles; gross vehicle weight greater than 26,400 pounds).
 Source: Draft Final Design Concept Report: Interstate 10 and Jackrabbit Trail Traffic Interchange (March 2024),

New Bus and Rail Terminals

Does the project involve construction of a new bus or intermodal terminal that accommodates a significant number of diesel vehicles?

NO – The proposed project does not involve construction of new bus or rail terminals.

Expanded Bus and Rail Terminals

Does the project involve an existing bus or intermodal terminal that has a large vehicle fleet where the number of diesel buses (or trains) increases by 50% or more, as measured by arrivals?

NO – The proposed project does not involve an existing bus or intermodal terminal.

Project of Air Quality Concern Determination

Under the 2050 Build Alternative traffic volumes on Jackrabbit Trail are about 36,000 ADT (Table 1). The increase in diesel-fueled truck volumes due to the project are low; less than 500 ADT compared to the 2050 No-Build Alternative and include both medium- and heavy-duty trucks, not all of which are diesel-fueled (that is, the truck volumes represent a worst-case condition and likely overstate the number of diesel-fueled trucks in the project area). While overall traffic volumes are expected to increase, the project does not significantly increase diesel-fueled total truck volumes.

In addition, total truck volumes at all intersections in the project corridor increase by less than 65 trucks per hour compared to the 2050 No-Build Alternative in both the AM and PM peak hours (Table 3).

The LOS at all intersections in the Jackrabbit Trail corridor are improved over the 2050 No-Build Alternative and operate at LOS C or better under the 2050 Build Alternative.

The March 2006, *PM_{2.5} and PM₁₀ Hot-Spot Analyses in Project-Level Transportation Conformity Determinations for the New PM_{2.5} and Existing PM₁₀ National Ambient Air Quality Standards; Final Rule* (71 Federal Register 12486-12511) also provided examples of projects that would not be covered by 40 CFR 93.123(b)(1) and would not require a PM_{2.5} or PM₁₀ hot-spot analysis.

The proposed project fits as “any new or expanded highway project that primarily services gasoline vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles), including such projects involving congested intersections operating at Level-of-Service D, E, or F.”

Therefore, the proposed improvements on Jackrabbit Trail from north of Van Buren Street to south of McDowell Road, including proposed improvements at the Jackrabbit Trail interchange are NOT of Air Quality Concern and will not require a PM hot-spot analysis.

Carbon Monoxide Project Assessment

The following questionnaire is used to compare the proposed project to a list of project types in 40 CFR 93.123(a) requiring a quantitative analysis of local CO emissions (Hot-spots) in nonattainment or maintenance areas, which include:

- i. Projects in or affecting locations, area, or categories of sites which are identified in the applicable implementation plan as sites of violation or possible violation;
- ii. Projects affecting intersections that are at Level-of-Service D, E, or F, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes related to the project;
- iii. Any project affecting one or more of the top three intersections in the nonattainment area or maintenance area with highest traffic volumes, as identified in the applicable implementation plan; and
- iv. Any project affecting one or more of the top three intersections in the nonattainment or maintenance area with the worst level of service, as identified in the applicable implementation plan.

If the project matches one of the listed project types in 40 CFR 123(a)(1) above, it is considered a project of local air quality concern, and the hot-spot demonstration must be based on quantitative analysis methods in accordance with 40 CFR 93.116(a) and the consultation requirements of 40 CFR 93.105(c)(1)(i).

Projects Affecting CO Sites of Violation or Possible Violation

Does the project affect locations, areas, or categories of sites that are identified in the CO applicable plan or implementation plan submissions, as appropriate, as sites of violation or potential violation?.

NO - The MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County (MAG, March 2013) does not identify sites or categories of potential violation for CO.

Projects with Congested Intersections

Is this a project that affects a congested intersection (LOS D or greater) will change LOS to D or greater because of increased traffic volumes related to the project?

YES - As shown in Table 3, under 2022 Existing Conditions, the I-10 WB Ramps/Jackrabbit Trail intersection operates at LOS E in the AM peak-hour and the I-10 EB Ramps/Jackrabbit Trail intersection operates at LOS D in the PM peak-hour.

Under the 2050 No-Build alternative, the Jackrabbit Trail TI would remain as a stop-controlled interchange and there would be no additional travel lanes on Jackrabbit Trail. Under the 2050 No-Build Alternative, the TI and most intersections from north of Van Buren Street to south of McDowell Road would operate at LOS E or F.

Under the 2050 Build Alternative, the Jackrabbit Trail TI would be upgraded to a signalized interchange and additional travel lanes would be added on Jackrabbit Trail in the northbound and southbound direction from north of Van Buren Road to south of McDowell Road. Under the 2050 Build Alternative the intersection LOS ranges from LOS A to LOS C as shown in Table 3.

Projects Affecting Intersections with Highest Traffic Volumes

Does the project affect one or more of the top three intersections in the CO maintenance area with the highest traffic volumes identified in the CO applicable implementation plan?

NO - There are four intersections within the project limits as shown in Table 3. The three intersections with the highest traffic volumes in the *MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area, March 2013* are located outside the project limits:

- Priest Drive & Southern Avenue
- 16th Street & Camelback Road
- 107th Avenue & Grand Avenue

Projects Affecting Intersections with the Worst Level of Service

Does the project affect one or more of the top three intersections in the CO maintenance area with the worst level of services identified in the CO applicable maintenance plan?

NO - There are four intersections within the project limits as shown in Table 3. The three intersections with worst level of service in the *MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area, March 2013* are located outside the project limits:

- 7th Avenue & Van Buren Street
- Germann Road & Gilbert Road
- Thomas Road & 27th Avenue

The modeling conducted for the *MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area*, approved by EPA effective April 4, 2016, demonstrates continuing maintenance of the CO standard through 2025.

The modeling in that plan used 2025 in the future-year evaluation (*MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area - Appendices*, page 180ff, March 2013). Based on the Motor Vehicle Emissions Simulator (MOVES) model used at that time (MOVES2010b), the highest 1-hour modeled CO concentration at the six highest intersections identified in the maintenance plan was 0.5 ppm. The highest 8-hour modeled CO concentration at the six intersections was 1.7 ppm which included a background CO concentration of 1.3 ppm.

Based on improved fuel standards and other technological improvements in vehicle operating efficiencies since 2013, including revisions to the MOVES model, it is reasonable to assume that the intersections associated with the proposed project would not exceed the CO NAAQS of 35 ppm (1-hour) or 9 ppm (8-hour) under the 2050 Build alternative.

Project Assessment – Part B

Hot-Spot Determination

Decide which type of hot-spot analysis is required for the project by choosing a category below.

If answered “Yes” to any of the questions in the Project Assessment – Part A

A quantitative CO hot-spot analysis is required under 40 CFR 93.123(a)(1).

Check **If** a formal air quality report for conformity is required for this project.

The applicable air quality models, data bases, and other requirements specified in 40 CFR part 51, Appendix W (Guideline on Air Quality Models) should be completed as documented below.

Or

Check **If** the project fits the condition of the “**CO Categorical Hot-Spot Finding.**”

In the January 24, 2008, Transportation Conformity Rule Amendments, EPA included a provision at 40 CFR 93.123(a)(3) to allow the U.S. DOT, in consultation with EPA, to make categorical hot-spot findings in CO nonattainment and maintenance areas if appropriate modeling showed that a type of highway or transit project would not cause or contribute to a new or worsened air quality violation of the CO NAAQS or delay timely attainment of the NAAQS or required interim milestone(s), as required under 40 CFR 93.116(a).

Projects Fitting the Condition of the CO Categorical Hot-Spot Finding (Updated 2/1/23)

If the project’s parameters fall within the acceptable range of modeled parameters, use FHWA 2023 CO Categorical Hot-Spot Finding Spreadsheet Tool:

https://www.fhwa.dot.gov/environment/air_quality/conformity/policy_and_guidance/cmcf_2023/index.cfm

The project intersections fit the conditions of the CO Categorical Hot-Spot Finding. The Categorical Hot-Spot Finding Tool results are included below.

Excerpts from the *Draft Final Design Concept Report: Interstate 10 and Jackrabbit Trail Traffic Interchange* (Kimley Horn, March 2024) and other data sources supporting the Categorical Hot-Spot Finding are included as Attachment A.

If answered “No” to all of the questions in the Project Assessment – Part A

A qualitative CO analysis is required under 40 CFR 93.123(a)(2). The demonstrations required by 40 CFR 93.116 Localized CO, PM10, and PM2.5 violations (hot-spots) may be based on either:

(i) Quantitative methods that represent reasonable and common professional practice;

Check **If** an Air Quality Report includes CO modeling for NEPA EA/EIS use this report to satisfy option (i)

Or

(ii) A qualitative consideration of local factors if this can provide a clear demonstration that the requirements of 40 CFR 93.116 are met.

Check **If** there is an Air Quality Report that does not include CO modeling for NEPA EA/EIS use this report to satisfy (ii)

Check **If** the project is a CE under NEPA that does not require Air Quality Report for NEPA EA/EIS use this Questionnaire to add additional justification to satisfy (ii)

Hot-Spot Determination

Under the 2050 Build Alternative, the Jackrabbit Trail TI and all intersections on Jackrabbit Trail from north of Van Buren Street to south of McDowell Road operate at LOS C or better in the AM and PM peak hours. Carbon monoxide monitor values from the Buckeye, Arizona monitor demonstrate low CO concentrations in the area. Based on this evaluation the proposed project is does not require CO hot-spot modeling.

Categorical Hot-Spot Finding Results: I-10 WB Ramps & Jackrabbit Trail (AM Peak-Hour)

Federal Highway Administration (FHWA) 2023 Carbon Monoxide (CO) Categorical Hot-Spot Finding: Spreadsheet Tools Results Reset

Parameter	Description	Acceptable Range	Input
Analysis Year	The year when peak emissions are expected from the project when considered with background.	≥ 2022	2030
Area Type - use drop down to select	An urban area has a population of 5,000 or greater within the FHWA adjusted urban area boundary. All other areas are rural.	Urban or Rural	Urban
Road Grade (%)	The maximum grade along the approach, as measured from the stop line to a point 100 feet before the stop line along a line parallel to the direction of travel. Enter the maximum grade among the four	≤6	1
Truck Percent (%)	The percentage of the total traffic volume that is made up of single unit and combination trucks. Enter the highest truck percentage from all links at the project intersection.	≤20	13
Temperature (°F)	Section 4.7.1 of EPA's 1992 CO Guideline allows two methods: 1) temperature corresponding to each of the ten highest non-overlapping 8-hour CO monitoring values for the last 3 years, or 2) average January temperature.	≤ 70	56.9
Speed (mph)	The average speed approaching the intersection during the peak hour. All intersection approaches must be within the acceptable range.	15-45	25
Peak Hour Approach Volume (veh/hr)	The volume approaching the intersection during the peak hour. Enter the maximum among the four approaches.	≤ 2640	1030
Peak Hour Level-of-Service (LOS) - use drop down to select	During the peak hour, the letter representing the quality of service for the entire intersection measured on an A-F scale, with LOS A representing the best operating conditions from the traveler's perspective and LOS F the worst.	A-E	C
Intersection Angle (degrees)	Enter the smallest angle between the two cross-streets of the intersection (90 degrees is perpendicular).	≥ 75	90
Number of through lanes (one direction) - use drop down to select	The number of lanes approaching the intersection available for vehicles traveling through the intersection without turning. Enter the maximum among the four approaches.	≤ 4	3
Number of left turn lanes (one direction) - use drop down to select	The number of lanes approaching the intersection that are designated for use only by vehicles making left turns. Enter the maximum among the four approaches.	≤ 2	2
Lane Width (feet)	The lateral distance between stripes for a single lane. Enter the minimum among all lanes at the intersection.	≥ 10	12
Median Width (feet)	The width of the area in the middle of a roadway separating opposing traffic flows.	Any (≥ 0)	3
Persistence Factor	The factor used to calculate 8-hour concentration estimates from 1-hour concentration estimates, as determined by following Section 4.7.2 of EPA's 1992 CO Guideline.	0-1.0	0.86

Parameters that Vary by Scenario	Description	Acceptable Range (varies based on previous inputs)	Input
1-Hour Avg. CO Background Concentration (ppm)	1-hour average concentration in the project area due to other local sources, determined in most cases from local monitoring data as described in Section 4.7.3 of EPA's 1992 CO	≤ 29.8	1.8
8-Hour Avg. CO Background Concentration (ppm)	8-hour average concentration in the project area due to other local sources, determined in most cases from local monitoring data as described in Section 4.7.3 of EPA's 1992 CO Guideline.	≤ 4.528	0.7

Output			
Scenario	Area Type	Roadway Contribution: 1-Hour CO Concentration (PPM)	Roadway Contribution: 8-Hour CO Concentration (PPM)
High Grade High Truck	Urban	3.7	3.182

Prepared By:	Curt Overcast, Newton Environmental Consults, LLC (03/29/24)
Project Name:	Interstate 10 and Jackrabbit Trail Traffic Interchange
Intersection Name:	I-10 WB Ramps & Jackrabbit Trail (AM Peak-Hour)

Categorical Hot-Spot Finding Results: I-10 EB Ramps & Jackrabbit Trail (PM Peak-Hour)

Federal Highway Administration (FHWA) 2023 Carbon Monoxide (CO) Categorical Hot-Spot Finding: Spreadsheet Tools Results Reset

Parameter	Description	Acceptable Range	Input
Analysis Year	The year when peak emissions are expected from the project when considered with background.	≥ 2022	2030
Area Type - use drop down to select	An urban area has a population of 5,000 or greater within the FHWA adjusted urban area boundary. All other areas are rural.	Urban or Rural	Urban
Road Grade (%)	The maximum grade along the approach, as measured from the stop line to a point 100 feet before the stop line along a line parallel to the direction of travel. Enter the maximum grade among the four	≤6	1
Truck Percent (%)	The percentage of the total traffic volume that is made up of single unit and combination trucks. Enter the highest truck percentage from all links at the project intersection.	≤20	13
Temperature (°F)	Section 4.7.1 of EPA's 1992 CO Guideline allows two methods: 1) temperature corresponding to each of the ten highest non-overlapping 8-hour CO monitoring values for the last 3 years, or 2) average January temperature.	≤ 70	56.9
Speed (mph)	The average speed approaching the intersection during the peak hour. All intersection approaches must be within the acceptable range.	15-45	25
Peak Hour Approach Volume (veh/hr)	The volume approaching the intersection during the peak hour. Enter the maximum among the four approaches.	≤ 2640	1236
Peak Hour Level-of-Service (LOS) - use drop down to select	During the peak hour, the letter representing the quality of service for the entire intersection measured on an A-F scale, with LOS A representing the best operating conditions from the traveler's perspective and LOS F the worst.	A-E	C
Intersection Angle (degrees)	Enter the smallest angle between the two cross-streets of the intersection (90 degrees is perpendicular).	≥ 75	90
Number of through lanes (one direction) - use drop down to select	The number of lanes approaching the intersection available for vehicles traveling through the intersection without turning. Enter the maximum among the four approaches.	≤ 4	3
Number of left turn lanes (one direction) - use drop down to select	The number of lanes approaching the intersection that are designated for use only by vehicles making left turns. Enter the maximum among the four approaches.	≤ 2	2
Lane Width (feet)	The lateral distance between stripes for a single lane. Enter the minimum among all lanes at the intersection.	≥ 10	12
Median Width (feet)	The width of the area in the middle of a roadway separating opposing traffic flows.	Any (≥ 0)	3
Persistence Factor	The factor used to calculate 8-hour concentration estimates from 1-hour concentration estimates, as determined by following Section 4.7.2 of EPA's 1992 CO Guideline.	0-1.0	0.86

Parameters that Vary by Scenario	Description	Acceptable Range (varies based on previous inputs)	Input
1-Hour Avg. CO Background Concentration (ppm)	1-hour average concentration in the project area due to other local sources, determined in most cases from local monitoring data as described in Section 4.7.3 of EPA's 1992 CO	≤ 29.8	1.8
8-Hour Avg. CO Background Concentration (ppm)	8-hour average concentration in the project area due to other local sources, determined in most cases from local monitoring data as described in Section 4.7.3 of EPA's 1992 CO Guideline.	≤ 4.528	0.7

Output			
Scenario	Area Type	Roadway Contribution: 1-Hour CO Concentration (PPM)	Roadway Contribution: 8-Hour CO Concentration (PPM)
High Grade High Truck	Urban	3.7	3.182

Prepared By:	Curt Overcast, Newton Environmental Consults, LLC (03/29/24)
Project Name:	Interstate 10 and Jackrabbit Trail Traffic Interchange
Intersection Name:	I-10 EB Ramps & Jackrabbit Trail (PM Peak-Hour)

Hot-Spot Determination

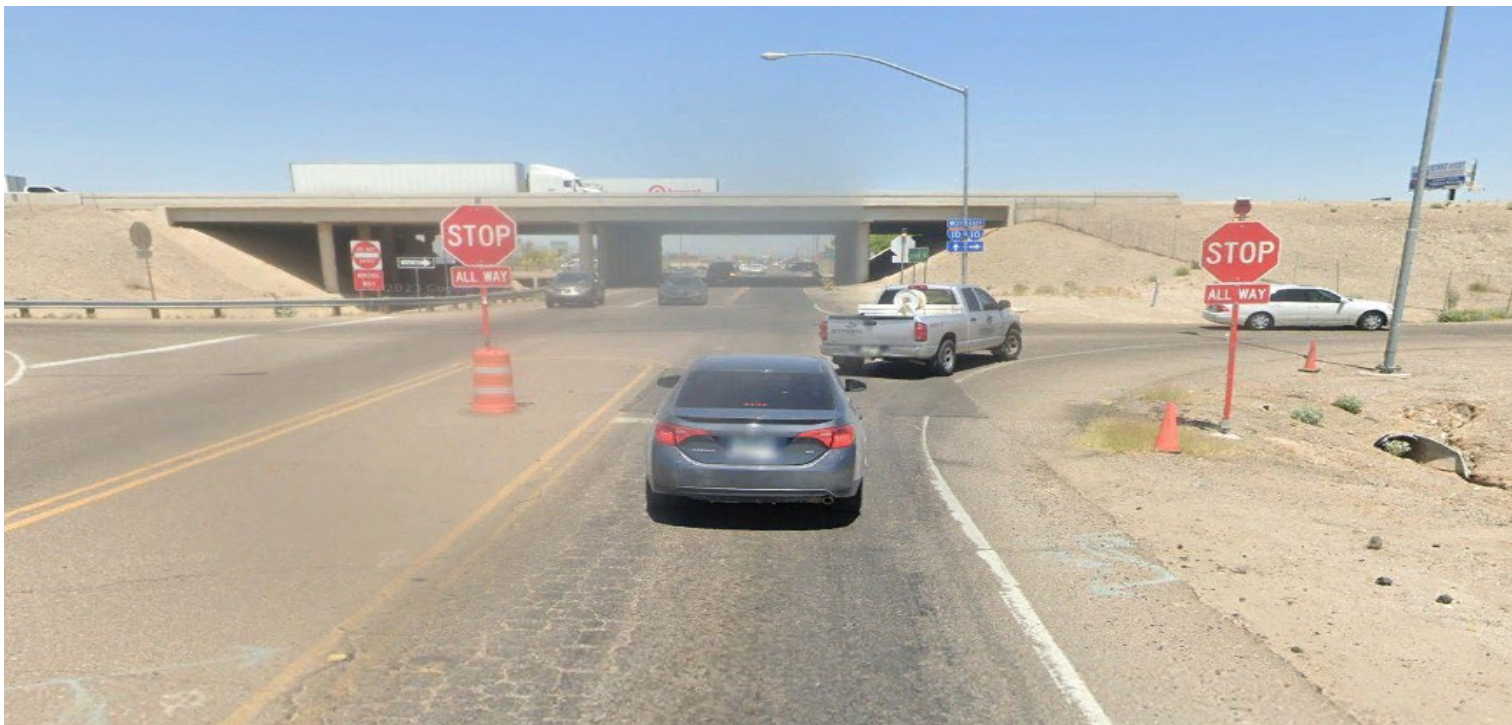
Under the 2050 Build Alternative, the Jackrabbit Trail TI and all intersections on Jackrabbit Trail from north of Van Buren Street to south of McDowell Road operate at LOS C or better in the AM and PM peak hours. Carbon monoxide monitor values from the Buckeye, Arizona monitor demonstrate low CO concentrations in the area. Based on this evaluation the proposed project is does not require CO hot-spot modeling, the Programmatic Hot-Spot finding is being utilized for the existing congested intersections, refer to Attachment A.

Attachment A

Supporting Documentation for FHWA 2023 Carbon Monoxide (CO) Categorical Hot-Spot Finding

- **Analysis Year [The year when peak emissions are expected from the project when considered with background]**
The FY2022 – FY2025 TIP estimates the proposed project would be in use by 2030. Therefore, 2030 was used as the year of peak emissions in the hot-spot tool.
- **Area Type [An urban area has a population of 5,000 or greater within the FHWA adjusted urban area boundary. All other areas are rural]**
The proposed project is located within the City of Buckeye. The 2022 census bureau population of Buckeye was about 105,500 (<https://www.census.gov/quickfacts/fact/table/buckeyecityarizona/PST045222#PST045222>, accessed March 29, 2024); therefore, the urban area type was used in the hot-spot tool.
- **Road Grade (%) [The maximum grade along the approach, as measured from the stop line to a point 100 feet before the stop line along a line parallel to the direction of travel. Enter the maximum grade among the four approaches]**
Images of the I-10/Jackrabbit Trail EB and WB ramp intersections are shown below. The topography surrounding each intersection is flat. To be conservative a 1% grade was used in the hot-spot tool.

I-10/Jackrabbit Trail EB Ramps



I-10/Jackrabbit Trail WB Ramps



- **Truck Percent (%) [The percentage of the total traffic volume that is made up of single unit and combination trucks. Enter the highest truck percentage from all links at the project intersection]**

The truck percentage used in the hot-spot tool of 13% was derived from Table 7.3 (Air Quality Report Daily Traffic Volumes and Truck Percentages) of the *Draft Final Design Concept Report: Interstate 10 and Jackrabbit Trail Traffic Interchange, Appendix F* (Kimley Horn, March 2024) shown below.

Table 7.3 – Air Quality Report Daily Traffic Volumes and Truck Percentages

	2022 Existing	2050 No-Build	2050 Build	Difference (2050 Build vs. No-Build)
Jackrabbit Trail North of I-10				
Total ADT	12,781	34,882	36,003	1,121
Truck ADT	1,662	4,535	4,680	145
Truck %	13%	13%	13%	0%
Jackrabbit Trail South of I-10				
Total ADT	13,822	24,174	31,000	6,826
Truck ADT	968	1,692	2,170	478
Truck %	7%	7%	7%	0%
Jackrabbit Trail & WB I-10 Off Ramp				
Total ADT	7,046	12,062	13,120	1,058
Truck ADT	916	1,568	1,706	138
Truck %	13%	13%	13%	0%
Jackrabbit Trail & WB I-10 On Ramp				
Total ADT	1,976	10,005	6,952	-3,053
Truck ADT	257	1,300	904	-396
Truck %	13%	13%	13%	0%
Jackrabbit Trail & EB I-10 Off Ramp				
Total ADT	1,918	8,731	6,397	-2,334
Truck ADT	250	1,135	832	-303
Truck %	13%	13%	13%	0%
Jackrabbit Trail & EB I-10 On Ramp				
Total ADT	6,787	11,692	13,081	1,389
Truck ADT	882	1,520	1,700	180
Truck %	13%	13%	13%	0%

- **Temperature (°F) [Section 4.7.1 of EPA's 1992 CO Guideline allows two methods: 1) temperature corresponding to each of the ten highest non-overlapping 8-hour CO monitoring values for the last 3 years, or 2) average January temperature]**

Average January temperatures were derived from National Weather Service data as shown below ([Annual and Monthly Record data for Phoenix \(weather.gov\)](https://www.weather.gov/Phoenix/annual-monthly-record)). An average January temperature of 56.9 °F was used in the hot-spot tool.

Climate Data for Phoenix, Arizona (2000-2023)				
Month	Temperature (°F)			Precipitation (inches) Average
	Average Daily	Average Daily Maximum	Average Daily Minimum	
January	56.9	68.0	45.8	0.72

Source: National Weather Service, 2023

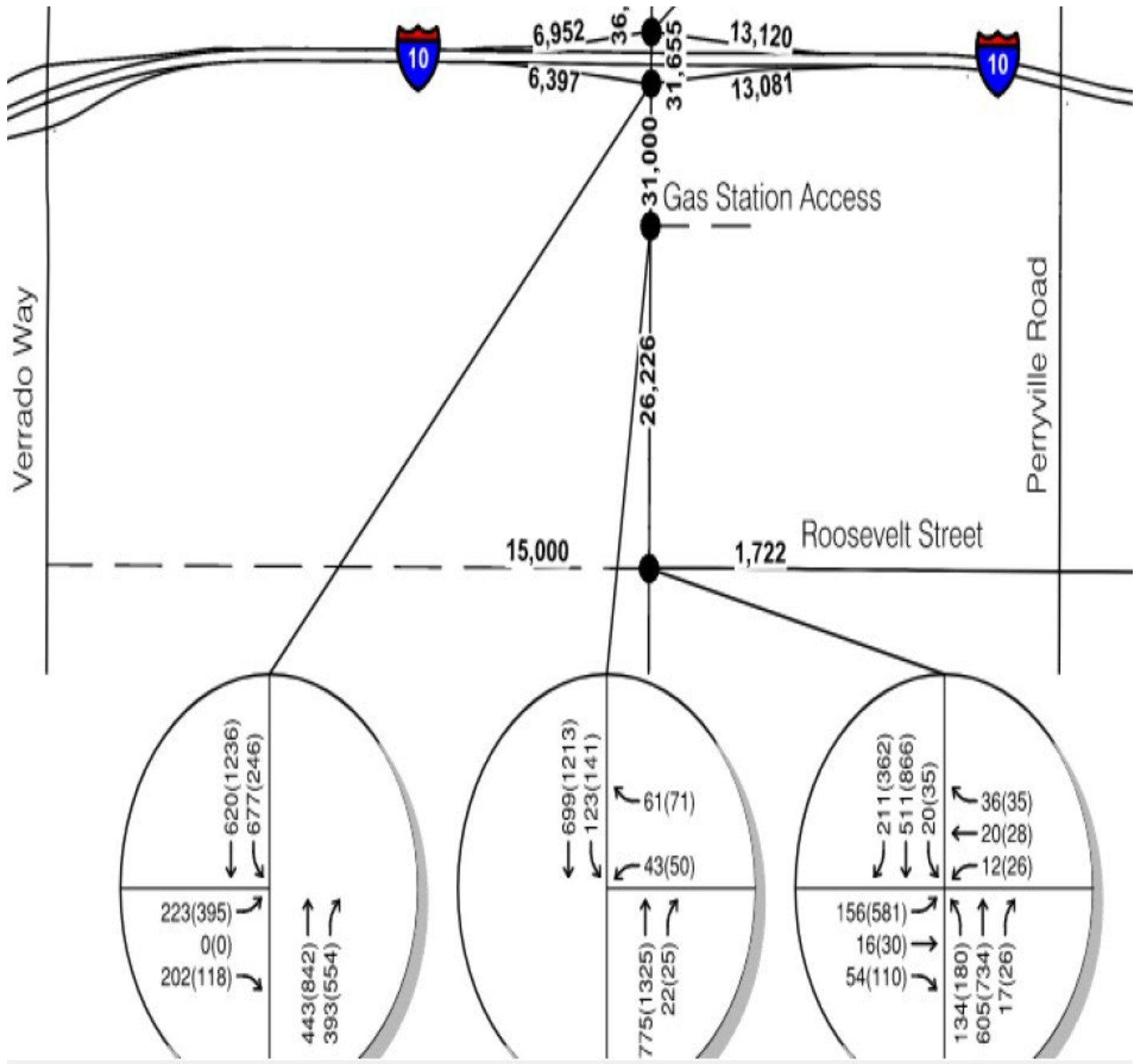
- **Speed (mph) [The average speed approaching the intersection during the peak hour. All intersection approaches must be within the acceptable range]**

The posted speed limit on Jackrabbit Trail is 35 mph. The average speed during the peak hour would likely be lower due to higher traffic volumes approaching the I-10/Jackrabbit Trail EB and WB intersections. To be conservative, a speed limit of 25 mph was used in the hot-spot tool evaluation.

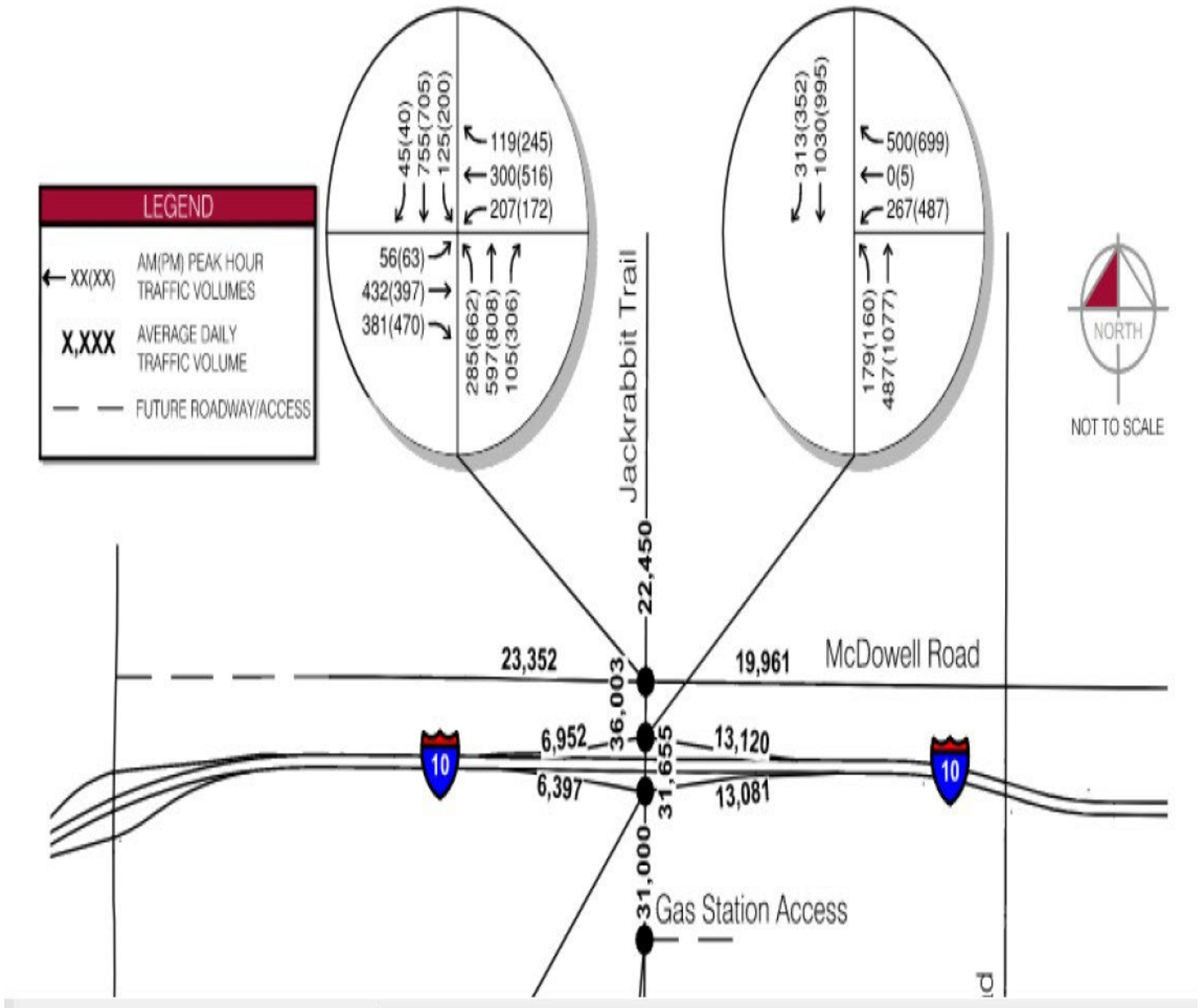
- **Peak Hour Approach Volume (veh/hr) [The volume approaching the intersection during the peak hour. Enter the maximum among the four approaches]**

The maximum peak hour approach volumes at the I-10/Jackrabbit Trail EB and WB intersections were derived from Figure 2.11 (2050 Build TDI-1L and TDI-2L Traffic Volume) of the *Draft Final Design Concept Report: Interstate 10 and Jackrabbit Trail Traffic Interchange* (Kimley Horn, March 2024) as shown in the images below. The maximum approach volume at the I-10/Jackrabbit Trail EB intersection of 1,236 vehicles per hour was used in the hot-spot tool. The maximum approach volume at the I-10/Jackrabbit Trail WB intersection of 1,030 vehicles per hour was used in the hot-spot tool.

I-10/Jackrabbit Trail EB Intersection



I-10/Jackrabbit Trail WB Intersection



- **Peak Hour Level-of-Service (LOS) [During the peak hour, the letter representing the quality of service for the entire intersection measured on an A-F scale, with LOS A representing the best operating conditions from the traveler's perspective and LOS F the worst]**

As shown above in Table 3 of the Consultation Document (Jackrabbit Trail Intersection Level of Service and Peak Hour Volume Summary), the I-10 WB Ramps & Jackrabbit Trail intersection operates at LOS C under the 2050 Build Alternative in the AM peak hour. The I-10 EB Ramps & Jackrabbit Trail intersection operates at LOS C under the 2050 Build Alternative in the AM peak hour.

- **Intersection Angle (degrees) (Enter the smallest angle between the two cross-streets of the intersection (90 degrees is perpendicular))**

As shown in the images above under Road Grade (%), both ramps intersect Jackrabbit Trail at an angle of 90 degrees. 90 degrees was used as the intersection angle in the hot-spot tool evaluation.

- **Number of through lanes (one direction) [The number of lanes approaching the intersection available for vehicles traveling through the intersection without turning. Enter the maximum among the four approaches]**

The proposed lane configuration at both the EB and WB ramp intersections include a maximum of three through travel lanes at each intersection.

- **Lane Width (feet) [The lateral distance between stripes for a single lane. Enter the minimum among all lanes at the intersection]**

A standard lane width of 12 feet was used in the hot-spot evaluation tool.

- **Median Width (feet) (The width of the area in the middle of a roadway separating opposing traffic flows.)**

A raised median width of 3 feet was assumed in the hot-spot evaluation tool.

- **Persistence Factor [The factor used to calculate 8-hour concentration estimates from 1-hour concentration estimates, as determined by following Section 4.7.2 of EPA's 1992 CO Guideline]**

For a separate project in Maricopa County in a more urbanized location, the Maricopa County Air Quality Department calculated a persistence factor of 0.86. To

be conservative, the higher calculated persistence factor of 0.86 was used in the hot-spot tool evaluation.

- **1-Hour Avg. CO Background Concentration (ppm) [1-hour average concentration in the project area due to other local sources, determined in most cases from local monitoring data as described in Section 4.7.3 of EPA's 1992 CO Guideline]**

8-Hour Avg. CO Background Concentration (ppm) [8-hour average concentration in the project area due to other local sources, determined in most cases from local monitoring data as described in Section 4.7.3 of EPA's 1992 CO Guideline]

As shown in the table below, the Buckeye Station is about 10.5 miles SW of Jackrabbit Trail. Over the last 3 years of available monitoring data the highest 1-hour and 8-hour CO concentrations were 1.8 ppm and 0.7 ppm, respectively.

Carbon Monoxide Monitor Near Jackrabbit Trail Project Location				
Monitor	Distance to Warner Road Project Location (miles)	2020 Maximum CO Concentration (1-hour/8-hour)	2021 Maximum CO Concentration (1-hour/8-hour)	2022 Maximum CO Concentration (1-hour/8-hour)
Buckeye Station (26453 W. Mc 85)	10.5 miles SW	1.0/0.7	1.8/0.6	1.0/0.7
Source: US EPA AirData (https://www.epa.gov/outdoor-air-quality-data/monitor-values-report , accessed March 29, 2024) Values in Red – highest 1-hour and 8-hour CO concentrations over the 2020 to 2022 timeframe Concentrations shown in parts per million (ppm)				

Output

Based on the inputs to the CO Categorical Hot-Spot Finding Tool described above, CO concentrations at each intersection were as follows:

CO Categorical Hot-Spot Tool Results		
Intersection	1-hour CO Concentration	8-hour CO Concentration
I-10 EB Ramps/Jackrabbit Trail	3.7	3.182
I-10 WB Ramps/Jackrabbit Trail	3.7	3.182

The 1-hour and 8-hour CO concentrations were less than the applicable NAAQS.