



Final Air Quality Technical Report

Pima Road Improvements

Prepared for:

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1. INTRODUCTION

The Salt River Pima - Maricopa Indian Community (SRP-MIC or Community) shares a western boundary with the City of Scottsdale along Pima Road, a major north-south reliever roadway for the Pima Freeway (State Route 101).

The SRP-MIC, the City of Scottsdale, the Maricopa Association of Governments (MAG), and the Federal Highway Administration (FHWA) have partnered on a large-scale project (SRP-MIC Project #20001556) to widen and upgrade Pima Road to improve the operational characteristics of the alignment to function as an arterial roadway.

Specifically, the proposed project will improve Pima Road for 4.8 miles from McDowell Road to just south of Talking Stick Way/Indian Bend Road. The improved Pima Road will include two lanes in each direction; a raised median; new curb and gutter and sidewalk improvements; bike lanes, driveway modifications; intersection turn lanes; new traffic signals, and new Americans with Disabilities (ADA) concrete sidewalk ramps.

In response to individual development needs, improvements have been previously made to the project corridor, including widening of Pima Road in some locations. Construction of the proposed project is expected to begin in December 2022 and is anticipated to last for about 30 months. The project location map is shown in Figure 1 and the project area map is shown in Figure 2, respectively.

Figure 1. Project Location Map

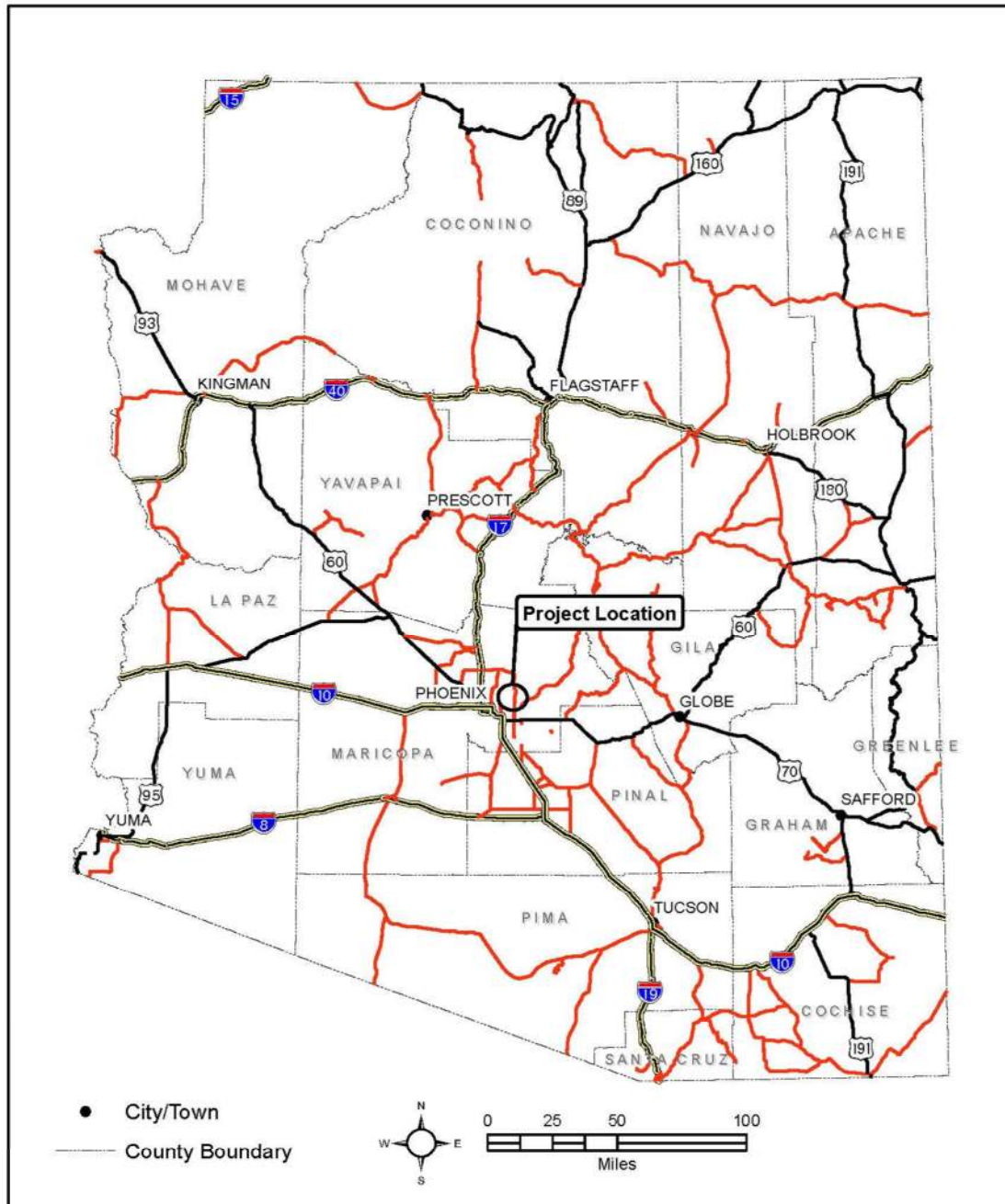
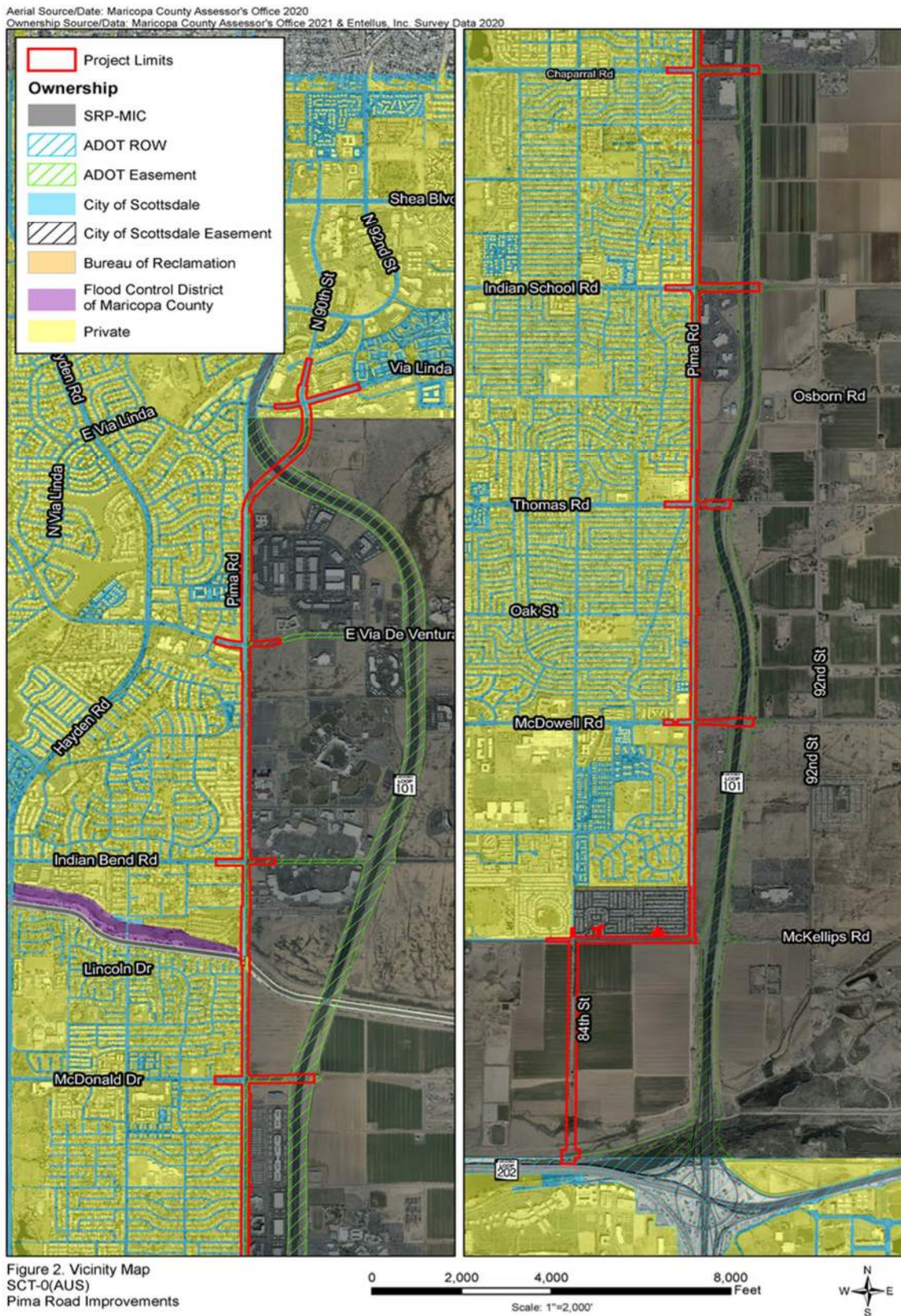


Figure 1. State Map
SCT-0(AUS)
Pima Road Improvements

Figure 2. Project Study Area



2. AFFECTED ENVIRONMENT

2.1 Regional Climate

The proposed project is located in Scottsdale, Arizona, east of Phoenix. Phoenix is located in the Salt River Valley at an elevation of about 1,100 feet. Temperatures range from very hot during summer months to mild during winter months. Many winter days reach over 70 degrees Fahrenheit (°F). The normal high temperature is over 90 °F from early May through late September, and over 100 °F from early June through late August. Annual precipitation averages about 12 inches per year (Western Regional Climate Center, 2021). A summary of average monthly temperatures and precipitation is shown in Table 1.

Table 1. Climate Data for Scottsdale, Arizona (1981-2010)				
Temperature (° F)				Precipitation (inches)
Month	Average Daily	Average Daily Maximum	Average Daily Minimum	Average
January	51.9	66.8	36.9	0.98
February	55.4	72.1	38.7	1.09
March	60.0	77.0	43.0	1.11
April	66.7	85.6	47.8	0.35
May	75.1	94.7	55.5	0.20
June	83.3	103.2	63.3	0.12
July	89.0	105.3	72.6	1.36
August	88.2	103.7	72.7	1.59
September	81.8	98.6	64.9	1.22
October	69.5	86.4	52.6	0.84
November	56.6	71.7	41.4	1.29
December	52.2	66.6	37.7	1.60
Annual	69.3	86.2	52.4	11.75
Source: Western Regional Climate Center, 2021				

2.2 National Ambient Air Quality Standards and Arizona Nonattainment Areas

The United States Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) to protect the public from air pollution. These standards include both primary and secondary standards. Primary standards protect public health, while secondary standards protect public welfare (such as protecting property and vegetation from the effects of a particular pollutant). The NAAQS (primary standards) are listed below in Table 2 and have been adopted by the state of Arizona as the ambient air quality standards for the state.

Geographic areas in which the ambient concentrations of a pollutant exceed the NAAQS are classified as nonattainment areas. Federal regulations require States to prepare State Implementation Plans (SIPs) that establish methods to bring air quality in nonattainment areas into compliance with the NAAQS and to maintain compliance. Nonattainment areas that return to compliance are called maintenance areas and may

be redesignated as attainment areas after 20 years of demonstrating compliance with no further NAAQS exceedances.

The major air pollutants of concern for transportation projects are carbon monoxide (CO), particulate matter (PM), and ozone (O₃).

- **CO** is a colorless, odorless, and poisonous gas resulting from the incomplete combustion of carbon-based fuels. The highest CO emissions are associated with vehicles operating at slow speeds, in stop-and-go traffic, and at colder temperatures.
- **Particulate matter** generally falls into one of two categories: particulate matter with a diameter of 10 microns or less (PM₁₀) or particulate matter with a diameter of 2.5 microns or less (PM_{2.5}). The primary source of particulate matter is vehicle emissions. The principal health effects of airborne particulate matter are to the respiratory system.
- **O₃** is a secondary pollutant formed when precursor emissions, nitrogen oxides (NO_x) and volatile organic compounds (VOCs), react in the presence of sunlight. O₃ is a major component of photochemical smog. O₃ irritates the eyes and respiratory tract and increases the risk of respiratory and heart diseases.

Maricopa County is currently designated as a federal nonattainment area for O₃ and PM₁₀, and a maintenance area for CO (EPA, 2021).

Table 2. National Ambient Air Quality Standards

Pollutant	Average Time	Primary Standard	Secondary Standard
Carbon monoxide (CO)	1-hour	35 ppm	No standard
	8-hour	9 ppm	No standard
Nitrogen dioxide (NO ₂)	1-hour	0.100 ppm	No standard
	Annual	0.053 ppm	0.053 ppm
Ozone (O ₃)	1-hour ^a	0.12 ppm	0.12 ppm
	8-hour	0.070 ppm ^b	0.070 ppm
Particulate matter (PM ₁₀)	24-hour	150 µg/m ³	150 µg/m ³
Fine particulate matter (PM _{2.5})	24-hour	35 µg/m ³	35 µg/m ³
	Annual	12 µg/m ³	15 µg/m ³
Sulfur dioxide (SO ₂)	1-hour	0.075 ppm	None
	3-hour	No standard	0.5 ppm
Lead	Rolling 3-month average	0.15 µg/m ³	0.15 µg/m ³

mg/m³ – milligrams per cubic meter

µg/m³ – micrograms per cubic meter

ppm – parts per million

Notes:

^a 1-hour standard revoked June 15, 2005 in Arizona

^b based on a 3-year average of the 4th highest concentration

Source: United States Environmental Protection Agency, 2020

2.3 Regulatory Environment

The Clean Air Act (CAA) and its amendments direct the EPA to implement policies and regulations that will ensure acceptable levels of various pollutants in the ambient environment. Under the CAA, a project cannot:

- Cause or contribute to any new violation of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS in any area; or
- Delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in any area.

2.4 Transportation Conformity

Under the CAA and its amendments, proposed transportation projects must be included in a regional transportation plan (RTP) or transportation improvement program (TIP) that conforms with the state air quality plans as outlined in the State Implementation Plan (SIP). The SIP sets forth the state's strategies for achieving air quality standards. EPA's Transportation Conformity Rule requires air quality conformity determinations for proposed transportation plans, programs, and projects before they are approved, accepted, funded, or adopted.

The proposed Pima Road improvements have been included in the FY 2022-2025 MAG Transportation Improvement Program (MAG 2021) and are listed in Table 3.

Table 3. Pima Road Transportation Improvement Program Projects	
MAG Project ID	Project
28666	Pima Road – Arizona Canal to Krail Street
35489	Pima Road – Chaparral Road to Jackrabbit Trail
1242	Pima Road – Indian School Road to Chaparral
11447	Pima Road – Jackrabbit Trail to McDonald Road
11612	Pima Road – McDonald Road to Arizona Canal
14511	Pima Road – McDowell Road to Thomas Road
45153	Pima Road – Thomas Road to Indian School Road
Source: FY 2022-2025 MAG Transportation Improvement Program (Maricopa Association of Governments, December 1, 2021).	

The conformity rule also establishes the process by which FHWA, the Federal Transit Administration (FTA), and local metropolitan planning organizations (MPOs) determine conformance of RTPs and TIPs and federally-funded highway and transit projects.

As part of this process, local MPOs are required to make conformity determinations on RTPs and TIPs before they are adopted, approved, or accepted. TIPs are a subset of staged, multi-year, inter-modal programs of transportation projects covering metropolitan planning areas that are consistent with RTPs. The TIPs include a list of roadway and transit projects selected as priorities for funding by cities, county road commissions, and transit agencies. Federal projects to be completed in the near term must be included in the regional conformity analysis completed by the MPO; such projects are also usually included in the region's TIP, and therefore conform with the SIP.

For particulate matter, the 2021 MAG Conformity Analysis for the FY 2022-2025 MAG Transportation Improvement Program (FY 2022-2025 TIP) and the MOMENTUM 2050 Regional Transportation Plan (2050 RTP), concluded that PM vehicle-related emissions associated with implementation of the FY 2022-2025 TIP and the 2050 RTP for the analysis years of 2025, 2030, 2040, and 2050 are projected to be less than the approved 2012 emissions budget and the approved 2006 emissions budget. As a result, regional air quality conformity for PM has been demonstrated.

For carbon monoxide (CO), the total vehicle-related emissions associated with implementation of the FY 2022-2025 TIP and the 2050 RTP for the for the analysis years 2025, 2030, 2040, and 2050 are projected to be less than the approved 2025 emissions budget. As a result, the applicable conformity test for CO has been demonstrated.

For eight-hour ozone, the total vehicle-related volatile organic compound and nitrogen oxide emissions associated with implementation of the FY 2022-2025 TIP and 2050 RTP for the analysis year of 2023 are projected to be less than the approved 2017 emissions budgets and the VOC and NOx emissions for the analysis years of 2025, 2030, 2040, and 2050 are projected to be less than the approved 2017 emissions budgets. In addition, the total vehicle-related volatile organic compound and nitrogen oxide emissions associated with implementation of the FY 2022-2025 TIP and 2050 RTP for the analysis year of 2023 are projected to be less than the approved 2008 emissions budgets and the VOC and NOx emissions for the analysis years of 2025, 2030, 2040, and 2050 are projected to be less than the approved 2025 emissions budgets. The applicable conformity tests for eight-hour ozone are therefore satisfied.

As all requirements of the federal conformity rule have been satisfied for PM, CO and Ozone, a finding of regional conformity for the FY 2022-2025 MAG Transportation Improvement Program and the MOMENTUM 2050 Regional Transportation Plan has been demonstrated (MAG, 2021).

2.5 Interagency Consultation

Federally-funded transportation projects are required to use interagency consultation to determine the need for project-level air quality analyses and, if applicable, to consult on models and methodologies to be used in those analyses.

The Arizona Department of Transportation (ADOT) has developed standard questionnaires for determining the need for project-level PM and project-level CO hot-spot analyses. These questionnaires outline the assumptions and sources of data to be used when quantitative analyses are required.

On January 3, 2022, FHWA provided the PM hot-spot questionnaire and the CO hot-spot questionnaire to the following consulting parties for an 18-day consultation period: the EPA, the Arizona MAG, ADOT, the Arizona Department of Environmental Quality, and the Maricopa County Department of Air Quality. The consultation

period closed on January 21, 2022.

Questionnaire comments were submitted by the AZ MAG and ADOT. The AZ MAG had editorial suggestions for both the PM Hot-Spot Questionnaire and the CO Hot-Spot Questionnaire which were incorporated into revised questionnaires (included as Appendix B of this report). ADOT had comments concerning the level of detail provided in the CO Hot-Spot Questionnaire and recommended the use of MOVES3 for modeling emission rates. Additional modeling detail has been included in this technical report, as well as in the revised CO Hot-Spot Questionnaire included in Appendix B. As the project is within the grace period established by EPA before MOVES3 is required for transportation conformity, FHWA considers MOVES2014b appropriate for this project.

FHWA responded to the interagency consultation comments and submitted a revised report to the consulting parties for a second round of interagency consultation on February 16, 2022. The comment period for the second round of interagency consultation closed on March 18, 2022.

Two comments were received during the second interagency consultation period. EPA suggested using MOVES3 for modeling emission rates. As noted during initial interagency consultation, the project is within the two-year grace period before MOVES3 is required for transportation conformity and FHWA considers MOVES2014b appropriate for this project. The Maricopa County Air Quality Department noted a discrepancy in the distance to the closest CO monitor to the project area. The text in the report and Appendix B was revised based on the comment.

Interagency consultation correspondence is included in Appendix A.

In addition to interagency consultation, the report was posted to a project website (<https://www.pimaroadimprovements.com/>) for public comment. The report was posted on February 22, 2022, for a 30-day comment period closing on March 24, 2022. No public comments were received on the report.

2.6 Need for Quantitative Hot-Spot Analysis: Project of Air Quality Concern Questionnaires

To determine the need for PM and CO hot-spot analyses to demonstrate transportation conformity, questionnaires developed by ADOT were completed and submitted to FHWA for review and interagency consultation as discussed in Section 2.5, Interagency Consultation. The conclusions of each questionnaire are discussed below, and the completed questionnaires are included in Appendix B.

2.6.1 Particulate Matter

In the 2040 design year the PM Hot-Spot Questionnaire concluded that traffic volumes on Pima Road would be less than the 125,000 average annual daily traffic volume (AADT) threshold at which point EPA guidance suggests a project could potentially be a project of air quality concern. In addition, the PM Hot-Spot Questionnaire concluded that diesel-fueled truck traffic volumes on Pima Road would be less than the 10,000 AADT which EPA guidance suggests could warrant a PM hot-spot evaluation. According to the traffic study prepared for the proposed project, while traffic is expected to increase on Pima Road as a result of the project, the total truck volumes are projected to less than 700 per day in the 2040 design year (Kimley-Horn, 2020).

As there were no comments submitted proposing to consider the project as being one of air quality concern, the proposed roadway improvements on Pima Road between McDowell Road and Talking Stick Way were

determined by FHWA to not be of Air Quality Concern and would not require a PM hot-spot analysis.

2.6.2 Carbon Monoxide

Under transportation conformity requirements, a CO hot-spot evaluation is required for projects affecting intersections that are at Level of Service (LOS) D, E, or F, or that will change to LOS D, E, or F because of increased traffic volumes related to the project. In the 2040 design year the CO Hot-Spot Questionnaire demonstrated that several intersections in the project corridor would operate at LOS D, E, or F following completion of the project.

The proposed roadway improvements on Pima Road between McDowell Road and Talking Stick Way were determined to be of Air Quality Concern for CO and therefore would require a CO hot-spot analysis.

The remainder of this report discusses CO hot-spot modeling for the project.

3. CARBON MONOXIDE HOT-SPOT MODELING

Air quality modeling was conducted using EPA guidance as described below (EPA, 1992, 1995, and 2015). As described in Section 2.6.2, the focus of the hot-spot analysis is on intersections operating at LOS D, E, or F in the 2040 design year and those intersections expected to have the highest peak-hour traffic volumes (AM or PM) in the 2040 design year.

3.1 Intersection Selection

There are seven intersections within the project area on Pima Road (Figure 2). As shown in Table 4, with the exception of the Pima Road/McDowell Road intersection which operates at LOS C in 2040, all intersections operate at LOS D or worse in 2040 (Kimley-Horn & Associates, 2020).

Table 4. Intersection Level of Service and Traffic Volumes

Intersection	Time Period	2025 Build LOS (Delay, sec.)	2040 Build LOS (Delay, sec.)	2040 Peak-Hour Traffic Volumes
Via de Ventura/Pima Road	AM Peak	D (40)	D (53)	4,914
	PM Peak	D (42)	D (50)	6,071²
Talking Stick Way ¹ /Pima Road	AM Peak	D (47)	D (45)	3,723
	PM Peak	D (41)	D (53)	5,446
McDonald Drive/Pima Road	AM Peak	D (35)	D (41)	3,864
	PM Peak	C (33)	D (54)	4,999
Chapparal Road/Pima Road	AM Peak	D (37)	D (44)	3,939
	PM Peak	D (41)	D (52)	4,527
Indian School Road/Pima Road	AM Peak	C (23)	D (38)	4,467
	PM Peak	C (33)	E (79)	6,082
Thomas Road/Pima Road	AM Peak	C (32)	D (40)	4,331
	PM Peak	D (37)	D (45)	4,802
McDowell Road/Pima Road	AM Peak	B (14)	C (20)	3,851
	PM Peak	C (24)	C (34)	4,648

Source: Pima Road Improvements – Via De Ventura to McDowell Road: Traffic Report (Kimley-Horn, December 2020); Email from Jennifer Simpkins (Kimley-Horn) to Curt Overcast (Newton Environmental Consulting regarding 2025 LOS and Vehicle Delay (January 20, 2022).

¹ Talking Stick Way becomes Indian Bend Road west of Pima Road.

² Worst operating and highest volume intersections highlighted in bold.

As discussed in guidance, EPA has established a ranking procedure for selecting intersections that warrant CO hot-spot modeling (EPA, 1995). The intersection selection process requires ranking intersections by the worst LOS (as measured by vehicle delay in seconds) and the highest traffic volume at each intersection. The intersections meeting these criteria in the 2040 design year are highlighted in Table 4.

Adapting this process to the intersections shown in Table 4, the three highest volume intersections are:

- Indian School Road/Pima Road – 6,082 (PM Peak)
- Via de Ventura/Pima Road – 6,071 (PM Peak)
- Talking Stick Way/Pima Road – 5,446 (PM Peak)

The three worst operating intersections ranked by LOS are:

- Indian School Road/Pima Road – LOS E (79 seconds delay, PM Peak)
- McDonald Drive/Pima Road – LOS D (54 seconds delay, PM Peak)
- Talking Stick Way/Pima Road – LOS D (53 seconds delay, PM Peak)

The highest volume and worst operating intersections are all associated with the PM peak-hour. Therefore, detailed hot-spot modeling was limited to the PM peak-hour period. Two of the intersections (Indian School Road/Pima Road and Talking Stick Way/Pima Road) are in both groups. Also, while the McDonald Drive/Pima Road intersection has a slightly worse LOS (54 seconds of delay) than the Talking Stick Way/Pima Road intersection (53 seconds of delay), the Talking Stick Way/Pima Road intersection has a higher traffic volume than the McDonald Drive/Pima Road intersection.

Based on this evaluation, CO hot-spot modeling was conducted at the following three intersections in the 2025 Year of Opening and 2040 Design Year:

- Indian School Road/Pima Road (PM Peak)
- Talking Stick Way/Pima Road (PM Peak)
- Via de Ventura/Pima Road (PM Peak)

3.2 CO Hot-Spot Modeling Parameters

On January 7, 2021, EPA announced the official release of MOVES3 in the Federal Register (86 FR 1106). The Federal Register notice initiated a two-year grace period before MOVES3 will be required as the latest EPA emissions model in new regional emissions analyses and a two-year grace period before MOVES3 will be required for new hot-spot analyses for transportation conformity determinations outside of California. The two-year grace period ends on January 9, 2023. The proposed project is within the two-year grace period established by EPA; therefore, MOVES2014b was used to develop emission rates for use with the CAL3QHC dispersion model.

3.2.1 MOVES2014b Emission Rates

Peak-hour free flow emission rates in the 2025 Year of Opening and the 2040 Design Year were developed for Pima Road (45 mph), Indian School Road, Indian Bend Road, and Via de Ventura (40 mph) based on vehicle speed data included in the traffic report (Kimley-Horn & Associates, 2020). An idle emission rate (0

mph) was developed to represent vehicles stopped at each intersection. Signal timing data was derived from Synchro phase diagrams included in the traffic report.

Each dedicated travel lane (for example, through lanes and dedicated left- or right-turn lanes) was modeled as an individual link with traffic volumes derived from the traffic report. Vehicle queue links were included at each intersection with the queue link beginning at the intersection stop bar. Other input files required for MOVES2014b (for example, meteorology, age distribution, fuel, and inspection/maintenance, among others) were obtained from the most recent MAG conformity determinations and reflect the local conditions used in regional transportation conformity evaluations. MOVES2014b input and output files are included in Appendix C.

Traffic volumes on individual intersection links (approach, departure, and queue) were obtained from data included in the Traffic Report (Kimley-Horn & Associates, 2020). Link coordinates (northings and eastings) were derived from a project design file provided by Kimley-Horn & Associates to Newton Environmental Consulting. Intersection configurations showing approach, departure, and queue links, as well as CAL3QHC receptor locations are included in Appendix D.

Speed-related emission rates modeled from MOVES2014b and used in the CAL3QHC air dispersion model are shown in Table 5.

Table 5. MOVES2014b Speed-Related Emission Rates		
Vehicle Speed (miles per hour)	2025 Year of Opening	2040 Design Year
45	1.532 gpvm ¹	0.589 gpvm
40	1.447 gpvm	0.611 gpvm
Idle	5.42 gpvh ²	1.037 gpvh
¹ gpvm – grams per vehicle mile ² gpvh – grams per vehicle hour		

3.2.2 Receptor Locations

Receptors are generally located near the right-of-way line at public locations where people would reasonably be expected to have access for extended periods of time. Receptors can include sidewalk locations, bus shelters, and near intersections at crosswalk locations, among others. Receptors were modeled at a height of 5 feet above the ground to approximate an average breathing height. Twenty-eight receptors were modeled around each of the three selected intersections and are shown in Appendix D.

3.2.3 Background CO Concentrations

There are eight stations in the Phoenix metropolitan area that monitor for CO, none of which are in close proximity to Pima Road and the project area. The nearest monitors are approximately 3 to 4 miles southeast of the project area (the Mesa CO monitor), with others ranging from 11 miles to more than 40 miles west of the project area.

Table 6 reports the highest 1-hour CO concentration recorded at each monitor from 2017 to 2020 downloaded from EPA Monitor Values Reports (<https://www.epa.gov/outdoor-air-quality-data/monitor-values-report>, generated October 5, 2021). As shown in Table 6, the highest 1-hour CO concentration (5.0 ppm) was recorded at the West Phoenix station in 2018. It is worth noting that there have been no exceedances of the 1-hour CO standard (35 ppm) since 1984 and no exceedances of the 8-hour standard (9 ppm) since 1996.

To develop a background CO concentration for the CAL3QHC model, the highest 1-hour CO concentrations from 2017 to 2020 at seven of the eight monitoring stations (the Buckeye monitor was excluded due to its distance from the project area) were used to calculate an average CO concentration over the 2017 to 2020 time period. The average 1-hour CO concentration at all monitoring stations within 20 miles of Pima Road from 2017 to 2020 was 2.70 ppm and was used as the background CO concentration in the CAL3QHC input files.

Following EPA guidance, a recommended persistence factor of 0.7 was used to estimate 8-hour CO concentrations from the 1-hour concentration.

Table 6. Carbon Monoxide Monitoring (1-hour Maximum [ppm])					
Monitor	2017¹	2018	2019	2020	Distance to Pima Road/Indian School Road (approx. miles)
West Phoenix - 3847 W. Earll Drive	4.6	5.0	3.1	3.8	14.5
JLG Supersite - 4530 N. 17th Avenue	2.5	2.3	2.1	2.1	11.9
Central Phoenix - 1645 E. Roosevelt St	3.4	3.4	2.5	2.4	9.3
South Phoenix - 33 W. Tamarisk Ave	3.5	3.7	2.6	2.7	12.6
Mesa - 310 S. Brooks	2.2	2.1	1.6	3.2	6.3
West Chandler - 275 S. Ellis	1.8	2.4	1.6	1.5	14.2
Tempe - 1919 W. Fairmont Dr	2.0	2.0	1.8	3.72 ²	8.7
Buckeye - 26453 W. MC85 ³	0.8	0.8	1.7	1.0	43.3
¹ Source: United States Environmental Protection Agency AirData (2021)					
² Monitor relocated to 3248 W. Moreland in 2020					
³ Values not used in background CO calculation due to distance					

3.2.4 Other Meteorological Variables

Other variables included in the CAL3QHC model were based on recommended values from EPA guidance (EPA, 1992) and included:

- Wind Speed – 1 meter per second
- Wind Direction – Evaluate every 10 degrees of wind direction for 0 degrees to 350 degrees (36 directions)
- Stability Class – E (5) for urban areas
- Mixing Height – 1,000 meters

- Source Height – 0 meters
- Surface Roughness – Single Family Residential (108)

4. IMPACT ASSESSMENT

Each intersection was modeled based on the methodology and inputs discussed in Section 3. The background concentration added to the highest 1-hour modeled CO concentrations provide a total predicted concentration which was then compared to the NAAQS.

As shown in Table 7, the total maximum 1-hour CO concentration predicted including background was 3.1 ppm in the 2025 Year of Opening when emission rates would be greatest. In the 2040 Design Year the highest 1-hour CO concentration was 2.80 ppm due to lower emission rates in 2040 (even with higher traffic volumes).

The modeled results are similar at each intersection primarily due to similar traffic volumes and turning movements that do not differ substantially between the intersections. Modeled concentrations are below the NAAQS for both the 1-hour and 8-hour standard. The CAL3QHC model input and output files are included in Appendix E.

Table 7. Total Predicted 1- Hour (8-Hour) Carbon Monoxide Concentrations			
	2025 Year of Opening	2040 Design Year	
Intersection	1-hour (8-hour¹) (ppm)	1-hour (8-hour) (ppm)	NAAQS (ppm)
Pima Road & Indian School Road	3.0 (2.1) ²	2.8 (1.96)	35.0 (9.0)
Pima Road & Talking Stick Way	3.0 (2.1)	2.8 (1.96)	35.0 (9.0)
Pima Road & Via de Ventura	3.1(2.2)	2.8 (1.96)	35.0 (9.0)
¹ 8-hour concentration calculated with 0.7 ppm persistence factor.			
² 1-hour results include background CO concentration of 2.7 ppm.			

5. CONSTRUCTION EMISSIONS

Air quality impacts from construction can be a concern. Long-term construction projects near sensitive receptors can result in health-related issues for sensitive populations. The proposed project is not considered long-term as it will last for less than five years.

There are no ambient air quality standards specifically for construction equipment or direct mechanisms for evaluating such impacts. In addition, the estimation of emissions from construction activities are not possible until the specific construction methods and sequencing are developed for the project.

While emissions from construction activities cannot be quantified, they can be mitigated by employing a number of Best Management Practices (BMPs) including, but not limited to the following:

- Cover, wet, compact, or use chemical stabilization binding agent, to control dust and excavated materials at construction sites
- Use wind barriers and wind screens to prevent spreading of dust from the site
- Have a wheel wash station and/or crushed stone apron at egress/ingress areas to prevent dirt being tracked onto streets
- Use vacuum-powered street sweepers to remove dirt tracked onto streets
- Cover all dump trucks leaving sites to prevent dirt from spilling onto streets
- Minimize disturbed areas—particularly in winter
- Prohibit unnecessary idling of construction equipment
- Locate construction diesel engines as far away as possible from residential areas
- Locate staging areas as far away as possible from residential areas
- Require heavy construction equipment to use the cleanest available engines or be retrofitted with diesel particulate control technology
- Use alternatives to diesel engines and/or diesel fuels, such as biodiesel, liquefied natural gas, or compressed natural gas, fuel cells, and electric engines, if applicable
- Install engine pre-heater devices to eliminate unnecessary idling for wintertime construction
- Prohibit tampering with equipment to increase horsepower or to defeat an emission control device's effectiveness
- Require construction vehicle engines to be properly tuned and maintained
- Use construction vehicles and equipment with the minimum practical engine size for the intended job

6. CONFORMITY DISCUSSION

An Air Quality Technical Report has been completed for the Pima Road Improvements project. The proposed Pima Road Improvement projects are included in the FY 2022-2025 MAG Transportation Improvement Program (Table 3) and the most recent regional air quality conformity analysis has concluded that CO emissions associated with the FY 2022-2025 TIP and 2050 RTP for the analysis years 2025, 2035, and 2040 are less than the approved 2025 emissions budget and that the applicable conformity test for CO has been demonstrated (MAG 2020). Regional air quality conformity has been demonstrated.

Hot-spot modeling was conducted at three intersections in the project area to evaluate the potential for CO hot-spots due to deficient LOS in the 2025 Year of Opening and the 2040 Design Year. CAL3QHC modeling results were below the NAAQS for CO for both the 1-hour and 8-hour standards at all modeled intersections.

The proposed project is not predicted to cause or contribute to new localized CO violations, increase the frequency or severity of existing violations, or delay timely attainment of the NAAQS in the Maricopa County CO maintenance area.

7. REFERENCES

Kimley-Horn & Associates, 2020. Pima Road Improvements – Via de Ventura to McDowell Road: Traffic Report.

Maricopa Association of Governments, 2021. Conformity Analysis for the FY 2022-2025 MAG Transportation Improvement Program and the MOMENTUM 2050 Regional Transportation Plan.

Maricopa Association of Governments, 2021. FY 2022 – 2025 MAG Transportation Improvement Program (TIP).

United States Department of Transportation (Federal Highway Administration [FHWA]), 1993. Air Quality Analysis for NEPA Documents – A Discussion Paper. Washington, D.C.

United States Environmental Protection Agency, 1992. Guideline for Modeling Carbon Monoxide From Roadway Intersections.

United States Environmental Protection Agency, 1995. User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections (Revised).

United States Environmental Protection Agency, 2015. Using MOVES2014 in Project-Level Carbon Monoxide Analyses.

United States Environmental Protection Agency, Accessed in 2020. National Ambient Air Quality Standards (NAAQS). <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

United States Environmental Protection Agency, 2021. Arizona Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants.

https://www3.epa.gov/airquality/urbanair/sipstatus/reports/az_area, accessed November 18, 2021.

Western Regional Climate Center. 1981-2010 Monthly Climate Summary, 2022.

<https://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?az7661>, accessed January 11, 2022.

Appendix A – Interagency Consultation

From: Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>

Sent: Monday, January 3, 2022 11:02 AM

To: L.Bauer [azmag.gov](mailto:LBauer@azmag.gov) <LBauer@azmag.gov>; Wamsley, Jerry <wamsley.jerry@epa.gov>; jkuspert@mail.maricopa.gov; Transportationconformity <transportationconformity@azdeq.gov>; bchenausky azdot.gov <bchenausky@azdot.gov>

Cc: Simpkins, Jennifer <Jennifer.Simpkins@kimley-horn.com>; Meek, Clifton <meek.clifton@epa.gov>; Karina O'Conner <oconnor.karina@epa.gov>; Dean Giles <dgiles@azmag.gov>

Subject: Interagency Consultation to Determine Project of AQ Concern in MAG Region - Pima Road Project Questionnaires for CO and PM

The Federal Highway Administration (FHWA) is providing the attached PM questionnaire for the Pima Road project (SCT-0(AUS)) for interagency consultation as a potential project that is **not** a project of Air Quality Concern and thereby will not require a PM10 hot-spot analysis. If through interagency consultation it is determined that this project will not require a hot-spot analysis, other conformity provisions apply and will be addressed in the air quality section of the environmental decision document. FHWA is requesting responses to the attached PM questionnaire **by January 21, 2022**; a non-response will be interpreted as concurrence that the project is not a project of air quality concern and does not require a hot-spot analysis. If any consulted party believes this project should be treated as a project of air quality concern that requires a Quantitative PM hot-spot analysis, please document the appropriate section under 40 CFR 93.123(b) that applies to the project and describe why the project should be treated as a project of air quality concern.

Additionally, FHWA determined that the project requires a quantitative hot-spot analysis for CO. The need for the analysis is demonstrated in the attached Project-level CO Hot-Spot Questionnaire. The document also describes the methods, models and assumptions used for a quantitative hot-spot analysis as required in 40 CFR 93.105(c)(1)(i), 93.123, and 93.116. It is requested that the consulted parties provide comments or questions on the methods, models and assumptions **by January 21, 2022**, a non-response will be interpreted as concurrence with the planning assumptions as described in the attached CO document. The CO hot-spot analysis will be submitted to the agencies through interagency consultation once completed.

If you have any questions or concerns, please let me know. Thanks, Rebecca

Rebecca Yedlin

Environmental Program Manager

Federal Highway Administration Arizona Division

4000 N Central Ave, Ste#1500

Phoenix, AZ 85012

602.382.8979

2 attachments

 **SCT-0(AUS) Pima Road CO Questionnaire_122121_Final (rev).pdf**
2124K

 **SCT-0(AUS) Pima Road PM Questionnaire_122121_Final(rev).pdf**
2002K

From: Beverly Chenausky <bchenausky@azdot.gov>

Sent: Wednesday, January 19, 2022 12:21 PM

To: Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>

Subject: Re: Interagency Consultation to Determine Project of AQ Concern in MAG Region - Pima Road Project Questionnaires for CO and PM

CAUTION: This email originated from outside of the Department of Transportation (DOT). Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Rebecca - ADOT concurs that this project is not a project of air quality concern for PM10, overall this project will improve congestion and appears not to be affecting intersections by increasing traffic volumes in a manner that degrades LOS at the intersections.

There isn't a lot of detail on the modeling for the CO hot-spot; details not provided include, the month used in modeling, where the receptors are placed, what background level (value) will be used, the details on temperature, humidity and other meteorological data missing. Although there is reference to using MAG data for most of the MOVES data, the current approved regional conformity model uses MOVES3. To be consistent with the latest planning assumptions the hot-spot modeling should use MOVES3, regardless of the grace period, as MAG started using MOVES3 back in June 2021. Additionally, given that MOVES3 is the current model in place for this region any new CO hot-spot modeling should also follow the updated MOVES3 CO Hot-spot guidelines issued by EPA, "Using MOVES3 in Project-Level Carbon Monoxide Analyses" (December 2021, EPA-420-B-21-047).

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02
205 South 17th Avenue
Phoenix, AZ 85007
C: 480.390.3417
azdot.gov

From: Dean Giles <DGiles@azmag.gov>

Sent: Friday, January 21, 2022 2:38 PM

To: Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>

Cc: Taejoo Shin <TShin@azmag.gov>

Subject: RE: Interagency Consultation to Determine Project of AQ Concern in MAG Region - Pima Road Project Questionnaires for CO and PM

CAUTION: This email originated from outside of the Department of Transportation (DOT). Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Hello Rebecca,

Thank you for the opportunity to review the Pima Road Project Questionnaires for CO and PM. We have some minor comments:

Project Level CO Hot-Spot Analysis Questionnaire:

1. On Page 3, second paragraph, suggest revising the sentence to reflect that the project is included in the currently conforming FY 2022-2025 MAG Transportation Improvement Program and MOMENTUM 2050 Regional Transportation Plan.
2. On Page 4, Table 1, According to the Highway Capacity Manual, the Level of Service (LOS) B is the average control delay in the range of 10 to 20 seconds/vehicle for signalized intersections. The McDowell Road/Pima Road AM Peak for the 2040 No-Build and Build cases may need to be corrected from LOS C (20) to LOS B (20).
3. On Page 5, under Projects Affecting Intersections with the Worst Level of Services, the Thomas Road & Gilbert Road should read Thomas Road & 27th Avenue, and Germann Road & Gilbert Avenue should read Germann Road & Gilbert Road.
4. On Page 5, last paragraph, suggest revising the sentence as follows: It should be noted the MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area, approved by EPA effective April 4, 2016, demonstrates maintenance of the standard through 2025.
5. On Page 7, Table 1, suggest revising the parameter name from "Maximum grade on cross street for the" to "Maximum grade on cross street for the intersection (%)."

For the Project Level PM Quantitative Hot-Spot Analysis – Project of Air Quality Concern Questionnaire:

6. Comments 1 and 2 above also apply to this report.

Thank you.

Dean

3/21/22, 11:14 AM

Gmail - FW: Interagency Consultation - Pima Rd Project AQ Report

To: Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>

Subject: FW: Interagency Consultation - Pima Rd Project AQ Report

CAUTION: This email originated from outside of the Department of Transportation (DOT). Do not click on links or open attachments unless you recognize the sender and know the content.

Hi Rebecca!

Ron Pope reviewed this project and he agrees that the project does not require a PM hot-spot analysis. He also has the following comment:

"In the CO modeling description I have only one minor comment which I'm not even sure is worth mentioning: in Appendix B, page 11 (page 32 of the PDF) they state that the nearest CO monitor is to the west of Pima Road (I believe they are referring to Eastwood as the nearest site). The Mesa CO monitor is actually closer, being 3-4 miles to the southeast of the southern portion project area. I don't think this error makes any difference to the results because they said that they used 7 of the 8 monitors, excluding Buckeye, in the Maricopa County to average the CO concentration for modeling."

Thanks.



Johanna M. Kuspert • Policy Advisor

Maricopa County Air Quality Department

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Maricopa.gov/AQ | CleanAirMakeMore.com

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Help us improve by letting us know how we're doing!

Take Our Survey

From: Ron Pope (AQD) <Ron.Pope@Maricopa.gov>

Sent: Tuesday, March 1, 2022 5:02 PM

To: Johanna Kuspert (AQD) <Johanna.Kuspert@Maricopa.gov>; Ira Domskey (AQD) <Ira.Domskey@Maricopa.gov>

Cc: Kimberly Butler (AQD) <Kimberly.Butler@Maricopa.gov>; Kristi Beck (AQD) <Kristi.Beck@Maricopa.gov>

Subject: RE: Interagency Consultation - Pima Rd Project AQ Report

Hi Johanna,

I have reviewed this and I agree that the project does not require a PM hot-spot analysis.

In the CO modeling description I have only one minor comment which I'm not even sure is worth mentioning: in Appendix B, page 11 (page 32 of the PDF) they state that the nearest CO monitor is to the west of Pima Road (I believe they are referring to Eastwood as the nearest site). The Mesa CO monitor is actually closer, being 3-4 miles to the southeast of the southern portion project area. I don't think this error makes any difference to the results because they said that they used 7 of the 8 monitors, excluding Buckeye, in the Maricopa County to average the CO concentration for modeling.



Ronald Pope, PhD • Atmospheric Scientist

Maricopa County Air Quality Department

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Help us improve by letting us know how we're doing!

Take Our Survey

3/18/22, 3:17 PM

Gmail - FW: Interagency Consultation - Pima Rd Project AQ Report



Curt Overcast <estreetcmo@gmail.com>

FW: Interagency Consultation - Pima Rd Project AQ Report

Simpkins, Jennifer <Jennifer.Simpkins@kimley-horn.com>

Fri, Mar 18, 2022 at 9:53 AM

To: Angie Newton <angie@newtonec.com>, Curt Overcast <estreetcmo@gmail.com>

FYI

From: Stauffer, Panah <Stauffer.Panah@epa.gov>

Sent: Friday, March 18, 2022 8:34 AM

To: rebecca.yedlin@dot.gov; kjuspert@mail.maricopa.gov; Transportationconformity <transportationconformity@azdeq.gov>; bchenausky azdot.gov <bchenausky@azdot.gov>; tfrankquist@azmag.gov

Cc: Simpkins, Jennifer <Jennifer.Simpkins@kimley-horn.com>; Meek, Clifton <meek.clifton@epa.gov>; OConnor, Karina <OConnor.Karina@epa.gov>; Dean Giles <DGiles@azmag.gov>; Lee, Anita <Lee.Anita@epa.gov>

Subject: RE: Interagency Consultation - Pima Rd Project AQ Report

You don't often get email from stauffer.panah@epa.gov. Learn why this is important

Hi Rebecca,

Thank you for the opportunity to review the packet for the Pima Road project. I have no comments on the document. It might be helpful to use MOVES3 going forward, even if the grace period is ongoing, but that's just a thought.

Thank you again,

Panah

Panah Stauffer (she/her)

Air Planning Office (ARD-2) | US EPA Region 9 | San Francisco, CA

stauffer.panah@epa.gov

[Quoted text hidden]

Appendix B – PM and CO Project of Air Quality Concern Questionnaires

Project Level CO Hot-Spot Analysis Questionnaire

Project Setting and Description

The Salt River Pima - Maricopa Indian Community (SRP-MIC), in coordination with the Federal Highway Administration (FHWA), the lead Federal Agency, and the City of Scottsdale, is proposing a street and drainage improvement project.

The project, which is comprised of roadway improvements and regional drainage improvements, is located along Pima Road from about 0.1 mile north of Via Linda to McKellips Road, along McKellips Road from the Pima Road alignment to the 84th Street alignment, and along the 84th Street alignment to the Salt River. The project is located on SRP-MIC, City of Scottsdale, Arizona Department of Transportation (ADOT), Bureau of Reclamation, Flood Control District of Maricopa County (FCDMC), and privately-owned land.

The existing Pima Road from McDowell Road to Via Linda is a scalloped street with roadway sections varying from a two-lane street without a median to a four-lane street with a raised curbed median island.

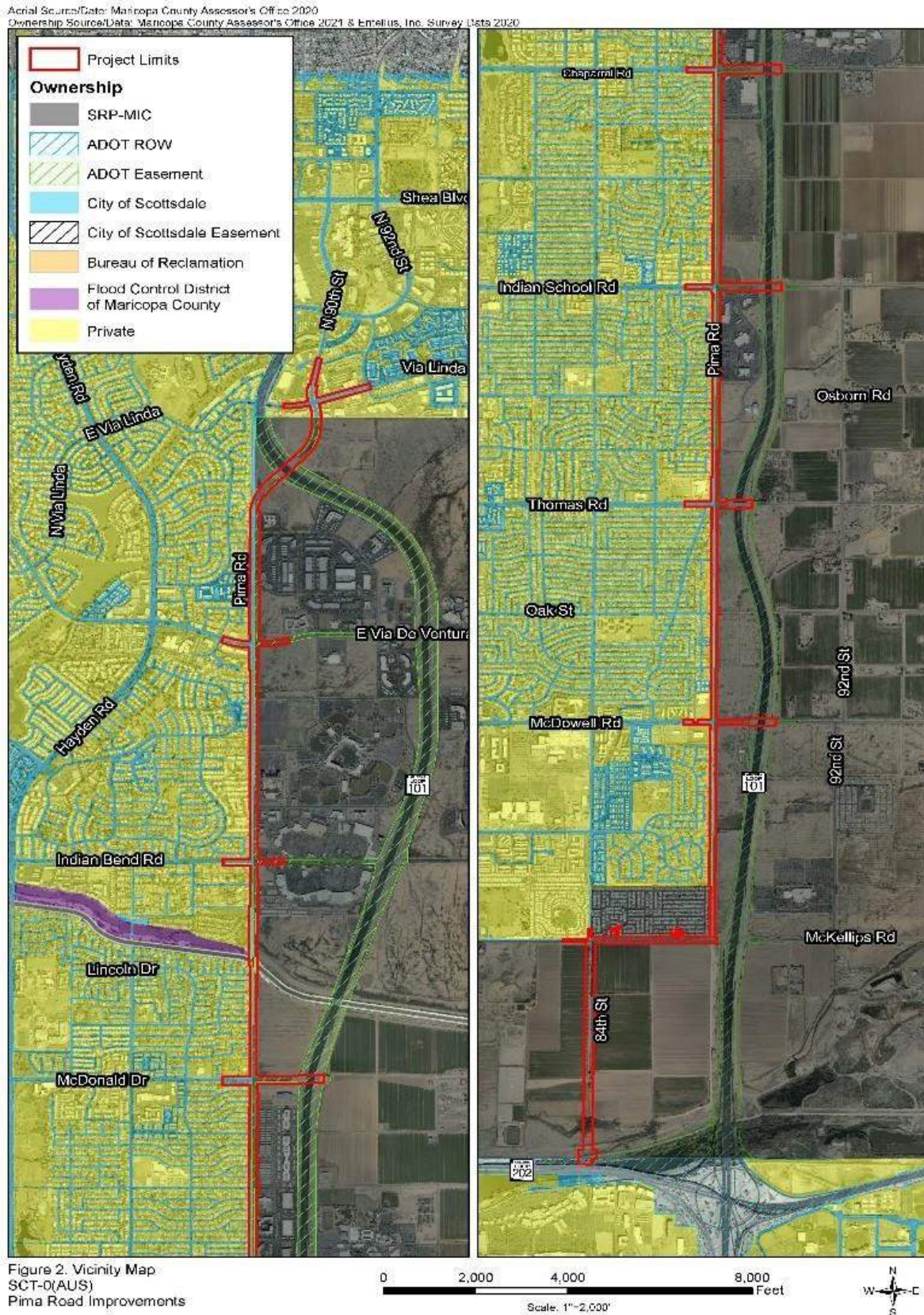
The purpose of this project is to provide multi-modal transportation improvements and add to the capacity of Pima Road to enhance regional mobility and complement the Pima Freeway (SR 101) freeway system, along with completing major regional drainage improvements associated with Granite Reef Wash Watershed Improvements.

The proposed project includes the following roadway improvements:

- Widen Pima Road from McDowell Road to 0.1 mile south of Talking Stick Way (4.8 miles) to include two thru lanes in each direction, auxiliary lanes, bicycle lanes, a raised median, new curb, gutter, and sidewalk (on the east side of Pima Road), driveway modifications, and new Americans with Disabilities Act (ADA) sidewalk ramps at all intersections and driveway crossings
- Reconstruct and widen the roadway, construct auxiliary lanes, replace existing and install new traffic signals and associated equipment, construct sidewalk ramps, construct crosswalks and other aesthetic improvements at the McDowell Road, Thomas Road, Indian School Road, Chaparral Road, McDonald Drive, Talking Stick Way intersections

Project Name: Pima Road Improvements
Federal Project No.: SCT-0 (AUS)

The proposed project is shown in Figure 1, below.



The proposed project is located in the Maricopa County CO Maintenance Area and the entire project (including the segment subject to this CO Questionnaire) is included in the currently conforming FY 2022 - 2025 MAG Transportation Improvement Program (FY 2022 - 2025 TIP) and MOMENTUM 2050 Regional Transportation Plan (2050 RTP).

The air quality conformity evaluation for the Maricopa County CO maintenance area conducted by MAG for the FY 2022 - 2025 TIP concluded that the county had met the conformity requirements of the EPA Transportation Conformity Rule (MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area (MAG, March 2013)). In addition, all air quality conformity determinations since 2013 have met all transportation conformity requirements for CO. Construction is estimated to begin in December 2022 and the construction duration is anticipated to be approximately 30 months.

Project Assessment – Part A

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 non-attainment or maintenance areas, which include:

- i) Projects in or affecting locations, areas, 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 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 93.123(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 to 40 CFR 93.116(a) and the consultation requirements of 40 CFR 93.105(c)(1)(i).

The CO maintenance plan currently in effect for Maricopa County 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 violations of the 1-hour CO standard (35 parts per million [ppm] since 1984 and no violations of the 8-hour standard (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.

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 Area (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 1, under the 2020 Existing, 2040 No Build, and 2040 Build scenarios, several intersections operate at LOS E or LOS F in the AM and/or PM peak hour. Vehicle delay under the 2040 No Build scenario ranges from 62 seconds (Chapparal Road/Pima Road in the AM peak hour) to 214 seconds (Indian School Road/Pima Road in the PM peak).

Table 1. Intersection Level of Service Summary				
Intersection		2020 Existing LOS (Delay, sec.)	2040 No-Build LOS (Delay, sec.)	2040 Build LOS (Delay, sec.)
Via de Ventura/Pima Road	AM Peak	E (56)	E (69)	D (53)
	PM Peak	E (58)	F (133)	D (50)
Talking Stick Way/Pima Road	AM Peak	D (47)	D (47)	D (45)
	PM Peak	D (42)	F (82)	D (53)
McDonald Drive/Pima Road	AM Peak	C (32)	D (41)	D (41)
	PM Peak	D (38)	F (82)	D (54)
Chapparal Road/Pima Road	AM Peak	D (42)	E (62)	D (44)
	PM Peak	D (43)	F (96)	D (52)
Indian School Road/Pima Road	AM Peak	C (24)	E (77)	D (38)
	PM Peak	D (38)	F (214)	E (79)
Thomas Road/Pima Road	AM Peak	C (32)	D (52)	D (40)
	PM Peak	E (56)	F (161)	D (45)
McDowell Road/Pima Road	AM Peak	B (13)	B (20)	B (20)
	PM Peak	C (28)	C (30)	C (34)

Source: Pima Road Improvements – Via De Ventura to McDowell Road: Traffic Report (Kimley-Horn, December 2020)
Values in Red – greater than acceptable LOS D

In the 2040 Build scenario five intersections would operate at LOS D and one intersection would operate at LOS E (in the PM Peak and LOS D in the AM Peak), however vehicle delay is improved over the 2040 No Build scenario. Vehicle delay is lower at all intersections under the 2040 Build scenario than under the 2040 No Build scenario.

As noted above, there have been no violations of the 1-hour CO standard (35 parts per million [ppm]) since 1984 and no violations of the 8-hour standard (9 ppm) since 1996 even as the region has grown substantially over the intervening years, adding more traffic to local roads. In addition, there has been a continuous downward trend in measured CO concentrations over time and the region continues to meet CO emission standards.

Table 2 shows the Annual Average Daily traffic volumes at various locations on Pima Road.

Table 2. Annual Average Daily Volumes			
	2020 Existing	2040 No- Build	2040 Build
North of McDowell Road	5,000	10,400	16,800
North of Thomas Road	7,000	14,800	21,100
North of Indian School Road	9,000	9,600	13,700
North of Chapparral Road	10,000	18,700	25,400
South of Indian Bend Road	12,000	23,200	32,100

Source: Pima Road Improvements - Via De Ventura To McDowell Road: Traffic Report (Kimley-Horn, December 2020)

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 highest traffic volumes identified in the CO applicable implementation plan?

NO - There are 7 intersections within the project limits as shown in Figure 1 and Table 1. The MAG 2013 *Carbon Monoxide Maintenance Plan for the Maricopa County Area, March 2013* states that the top 3 intersections closest to the project with the highest traffic volumes or the most congestion are:

- Priest Drive & Southern Avenue (6.5 miles from McDowell Road/Pima Road)
- 16th Street & Camelback Road (9.7 miles from McDowell Road/Pima Road)
- 7th Avenue & Van Buren Street (11 miles from McDowell Road/Pima Road)

Projects Affecting Intersections with the Worst Level of Services

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

NO - There are 7 intersections within the project limits as shown in Figure 1 and Table 1. The MAG 2013 *Carbon Monoxide Maintenance Plan for the Maricopa County Area, March 2013* states that the top 3 intersections closest to the project with the highest traffic volumes or the most congestion are:

- 107th Avenue & Grand Avenue
- Thomas Road & 27th Avenue
- Germann Road & Gilbert Road

It should be noted that modeling conducted for the *MAG 2013 Carbon Monoxide Maintenance Plan for the Maricopa County Area*, approved by EPA effective April 4, 2016, demonstrates 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, the highest 1-hour modeled CO concentration at the six highest intersections identified in the maintenance plan was 0.5 ppm (the 1-hour NAAQS is 35 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 (the 8-hour NAAQS is 9 ppm).

Based on improved fuel standards and other technological improvements in vehicle operating efficiencies since 2013, it is reasonable to assume that the intersections on Pima Road between McDowell Road and Talking Stick Way would not exceed the CO NAAQS of 35 ppm (1-hour) or 9 ppm (8-hour).

Project Assessment – Part B

The following questionnaire is used to compare the proposed project to a list of the project types in 40 CFR 93.126 and 40 CFR 93.128 which are exempt from the requirement to determine conformity:

Exempt Projects in the CO maintenance Area

Is this one of the exempt projects listed – Safety, Mass Transit, Air Quality and Others in Table 2 of 40 CFR 93.126 or a traffic signal synchronization project described in 40 CFR 93.128?

NO - This project is not exempt under Table 2 of 40 CFR 93.126 and is not a traffic signal synchronization project as described in 40 CFR 93.128; therefore, this project is not exempt.

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 and “No” to the question in the Project Assessment – Part B,**

- A quantitative CO hot-spot analysis is required under 40 CFR 93.123(a)(1).
- 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 and circulated through interagency consultation for review and comments for 10 days prior to commencing any modeling activities.

[NOTE: See Attachment A following this questionnaire]

- Check if the project fits the condition of the CO Categorical Hot-Spot Finding.

☐ **If answered “No” to all of the questions in the Project Assessment – Part A and “No” to the question in the Project Assessment – Part B,**

- A qualitative CO hot-spot analysis is required under 40 CFR 93.123(a)(2).
- The demonstrations required by 40 CFR 93.116 Localized CO, PM₁₀, and PM_{2.5} violations (hot-spots) may be based on either: (i) Quantitative methods that represent reasonable and common professional practice; 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.

☐ **Regardless of the questions in the Project Assessment – Part A, if “Yes” to the question in the Project Assessment – Part B,**

- No CO hot-spot analysis is required.

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

Do the project’s parameters fall within the acceptable range of modeled parameters (Use the table in the appendix, “Table 1: Project Parameters and Acceptable Ranges for CO Categorical Hot-Spot Finding” or enter the project information into FHWA’s web-based tool:

NO – The use of the CO Hot-Spot finding is not applicable to this project.

Appendix

Table 1: Project Parameters and Acceptable Ranges for CO Categorical Hot-Spot Finding for Urban Intersection

Parameter	Acceptable Range
Analysis year	Greater than or equal to 2017
Angle of cross streets for intersection (degrees)	90
Maximum grade for the intersection (%)	Less than or equal to 2
Maximum grade on cross street for the intersection (%)	0
Number of through lanes	Less than or equal to 4
Number of left turn lanes	Less than or equal to 2
Lane width (ft)	12
Median width (ft)	0
Peak hour average approach speed (mph)	Greater than or equal to 25
Peak hour approach volume (vph)	Less than or equal to 2640
Peak hour Level of Service	A through E
Ambient temperature (°F)	Greater than or equal to -10
Heavy-duty trucks (%)	Greater than or equal to 5
1-hour background CO concentrations (ppm)	Less than or equal to 32.6

Project Name: Pima Road Improvements
Federal Project No.: SCT-0 (AUS)

8-hour background CO concentrations (ppm)	Less than or equal to 7.3
Persistence factor	Less than or equal to 0.7

☐ **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 us 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 us this report to satisfy option (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)

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)

Attachment A
40 CFR Part 51, Appendix W

**Applicable Air Quality Models, Data Bases, and Relevant Requirements
for Carbon Monoxide (CO) Hot-Spot Modeling**

This attachment outlines the approach that will be used to evaluate potential CO hot-spots on Pima Road. The most recent revision to 40 CFR Part 51, Appendix W (82 FR 5192, January 17, 2017) retained the CAL3QHC air quality dispersion model as the acceptable screening level model for assessing potential CO hot-spots.

Sources To Be Used in CO Hot-Spot Modeling

Agency guidance documents (including modeling recommendations) and technical resources that will be used in conducting the hot-spot modeling for the propose project will include:

- Pima Road Improvements – Via de Ventura to McDowell Road: Traffic Report [the Kimley-Horn Report] (Kimley-Horn, December 2020)
- User’s Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections (Revised) [1995 EPA Guidance] (EPA, September 1995)
- Guideline for Modeling Carbon Monoxide From Roadway Intersections [1992 EPA Guidance] (EPA, November 1992)
- Using MOVES2014 in Project-Level Carbon Monoxide Analyses [2015 MOVES2014 Guidance] (EPA, March 2015)

Intersection Selection

As discussed in the 1995 EPA Guidance document, EPA has established a ranking procedure for selecting intersections that warrant CO hot-spot modeling. The intersection selection process requires ranking intersections by both level of service (LOS) and traffic volume. The 2040 design year traffic volumes will be obtained from the Kimley-Horn Report. The EPA ranking procedure will be adapted to the intersections on Pima Road to select those intersections for detailed hot-spot modeling.

CO Hot-Spot Modeling Parameters

MOVES2014b will be used to develop emission rates for use with the CAL3QHC dispersion model.

On January 7, 2021, EPA announced the official release of MOVES3 in the Federal Register (86 FR 1106). The Federal Register notice initiated a two-year grace period before MOVES3 will be required as the latest EPA emissions model in new regional emissions analyses and a two-year grace period before MOVES3 will be required for new hot-spot analyses for transportation conformity determinations outside of California. The two-year grace period ends on January 9, 2023. The proposed project is within the two-year grace period established by EPA; therefore, MOVES2014b will be used to develop emission rates for use with the CAL3QHC dispersion model.

MOVES2014b Emission Rates

Peak-hour free flow emission rates will be developed for Pima Road (45 mph) and for those intersections selected for detailed hot-spot modeling. As discussed in the 2015 MOVES2014b Guidance, free-flow emission rates will be used for approach and departure links in CAL3QHC. Idle emission rates (0 mph) rates will be used for queue links (that is, traffic stopped at signalized intersections) in CAL3QHC.

Traffic volumes on individual intersection links (approach, departure, and queue) will be obtained from data included in the Kimley-Horn Report. Link coordinates (northings and eastings) will be derived from a project design file provided by Kimley-Horn.

Other data input files required for MOVES2014b (for example, meteorology, age distribution, fuel, and inspection/maintenance, among others) will be obtained from the Maricopa Association of Governments (MAG) to reflect most recent local conditions used in regional transportation emissions analyses. Carbon monoxide modeling will be conducted under wintertime conditions (January 7:00 to 8:00 AM with a temperature of 57.6° and a relative humidity of 45.6) when CO emissions are likely to be the highest.

CAL3QHC Dispersion Modeling

Dispersion modeling with CAL3QHC will use guidelines and recommendations outlined in the 1992 and 1995 EPA Guidance documents.

Receptor Siting

At each intersection selected for modeling, receptors will be sited as specified in the 1995 EPA Guidance; that is, at least 10 feet from each of the traveled roadways on both sides of the road and at distances of at least 80 feet and 165 feet from the intersection corner. In addition, receptors will be located near the right-of-way line at public locations where people would reasonably be expected to have access for extended periods of time. Receptors can include sidewalk locations, bus shelters, and near intersections at crosswalk locations, among others. Receptors will be located based on a design file provided by the traffic consultant. As discussed in EPA guidance, receptors will be modeled at a representative breathing height of 5 feet.

Background CO Concentrations

There are eight monitoring stations in the Phoenix metropolitan area that monitor CO, none of which are in reasonably close proximity to Pima Road and the project area. The nearest monitors are approximately 3 to 4 miles southeast of the project area (the Mesa CO monitor) with others ranging from 11 miles to more than 40 miles west of the project area.

To develop a background CO concentration, EPA Monitor Values Reports for the years 2017 to 2020 were downloaded and the highest 1-hour CO concentration at seven of the eight stations was used to calculate an average CO concentration over the 2017 to 2020 time period (the Buckeye, Arizona monitor was excluded due to its distance from the project area). The average 1-hour CO concentration at all monitoring stations within 20 miles of the project area from 2017 to 2020 was 2.70 ppm and will be used as the background CO concentration for CAL3QHC modeling. Following EPA guidance, a persistence factor of 0.7 will be used to estimate 8-hour CO concentrations from the 1-hour concentration.

Other Ambient Conditions

Other inputs required for CAL3QHC modeling such as wind speed, wind direction, atmospheric stability class, mixing height, and surface roughness will be as suggested in the 1995 Guidance.

Project Level PM Quantitative Hot-Spot Analysis - Project of Air Quality Concern Questionnaire

Project Setting and Description

The Salt River Pima - Maricopa Indian Community (SRP-MIC), in coordination with the Federal Highway Administration (FHWA), the lead Federal Agency, and the City of Scottsdale, is proposing a street and drainage improvement project.

The project, which is comprised of roadway improvements and regional drainage improvements, is located on Pima Road from about 0.1 mile north of Via Linda to McKellips Road, along McKellips Road from the Pima Road alignment to the 84th Street alignment, and along the 84th Street alignment to the Salt River. The project is located on SRP-MIC, City of Scottsdale, Arizona Department of Transportation (ADOT), Bureau of Reclamation, Flood Control District of Maricopa County (FCDMC), and privately-owned land.

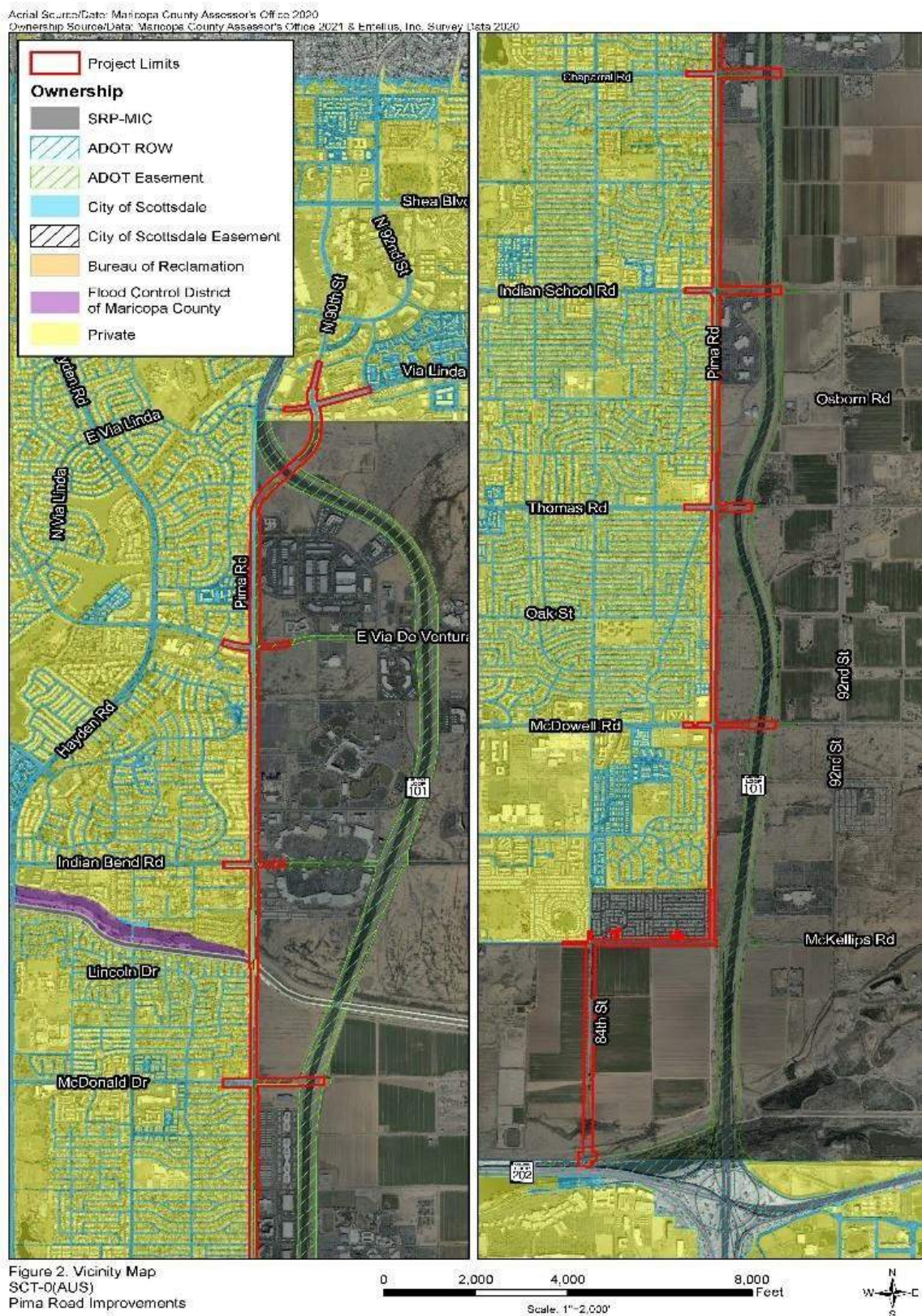
The existing Pima Road from McDowell Road to Via Linda is a scalloped street with roadway sections varying from a two-lane street without a median to a four-lane street with a raised curbed median island.

The purpose of this project is to provide multi-modal transportation improvements and add to the capacity of Pima Road to improve regional mobility and complement the Pima Freeway (SR 101) freeway system, along with completing major regional drainage improvements associated with the Granite Reef Wash Watershed Improvements project.

The proposed project includes the following roadway improvements:

- Widen Pima Road from McDowell Road to 0.1 mile south of Talking Stick Way (4.8 miles) to include two thru lanes in each direction, auxiliary lanes, bicycle lanes, a raised median, new curb, gutter, and sidewalk (on the east side of Pima Road), driveway modifications, and new Americans with Disabilities Act (ADA) sidewalk ramps at all intersections and driveway crossings.
- Reconstruct and widen the roadway, construct auxiliary lanes, replace existing and install new traffic signals and associated equipment, construct sidewalk ramps, construct crosswalks and other aesthetic improvements at the McDowell Road, Thomas Road, Indian School Road, Chaparral Road, McDonald Drive, Talking Stick Way intersections.

The proposed project is shown in Figure 1, below.



The proposed project is located in the Maricopa County PM Nonattainment Area and the entire project (including the segment subject to this PM Questionnaire) is included in the conforming FY 2022 – 2025 MAG Transportation Improvement Program and MOMENTUM 2050 Regional Transportation Plan.

The MAG Conformity Analysis for the FY 2022-2025 MAG Transportation Improvement Program (FY 2022–2025 TIP) and the MOMENTUM 2050 Regional Transportation Plan (2050 RTP (MAG 2021)) which included the proposed project, concluded that vehicle-related emissions associated with the FY 2022-2025 TIP and the 2050 RTP for the analysis years of 2025, 2035, and 2040 are projected to be less than the approved 2012 emissions budget and the approved 2006 emissions budget. As a result, air quality conformity for PM has been satisfied. Construction is estimated to begin in December 2022 and the construction duration is anticipated to be approximately 30 months.

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 to 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;” These examples will be used as the baseline for determining if the 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?

Example: total traffic volumes $\geq 125,000$ annual average daily traffic (AADT) and truck volumes $\geq 10,000$ diesel trucks per day (8% of total traffic).

NO – The proposed project is not a new highway project that has a significant number of diesel vehicles. The proposed project will result in improvements on Pima Road and at several intersections between McDowell Road and Talking Stick Way as shown below in Table 1.

Expanded Highway Capacity

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

Example: the build scenario of the expanded highway or expressway causes a significant increase in the number of diesel trucks compared with the no-build scenario, truck volumes > 8% of the total traffic.

NO – The proposed project is not an expanded highway project that has a significant number of diesel vehicles as shown in Table 1. Trucks are about 2% of total traffic, and in 2040 the total number of trucks will be less than 650 per day throughout the entire project area.

Table 1. Pima Road AADT and Truck Volumes

	2020 Existing				2040 No-Build				2040 Build				Difference (Build - No-Build)
Roadway Segment	No. of Lanes	AADT	Truck AADT	Truck (%)	No. of Lanes	AADT	Truck AADT	Truck (%)	No. of Lanes	AADT	Truck AADT	Truck (%)	
North of McDowell Road	2	5,000	100	2	2	10,400	208	2	4	16,800	336	2	128
North of Thomas Road	2	7,000	140	2	2	14,800	296	2	4	21,100	422	2	126
North of Indian School Road	2	9,000	180	2	2	9,600	192	2	4	13,700	274	2	82
North of Chapparal Road	2	10,000	200	2	2	18,700	374	2	4	25,400	508	2	134
South of Indian Bend Road	2	12,000	240	2	2	23,200	464	2	4	32,100	642	2	178

Source: Pima Road Improvements – Via de Ventura to McDowell Road: Traffic Report (Kimley-Horn, December, 2020)

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 – The proposed project would not affect a congested intersection (LOS D or greater) that has a significant number of diesel trucks or that would change to LOS D or greater resulting from a significant number of diesel trucks related to the project. Diesel-fueled trucks are expected to be about 2% of the total traffic volume on Pima Road in 2040. Intersection levels of service are shown below in Table 2.

Table 2. Intersection Level of Service Summary				
Intersection		2020 Existing LOS (Delay, sec.)	2040 No Build LOS (Delay, sec.)	2040 Build LOS (Delay, sec.)
Talking Stick Way/Pima Road	AM Peak	D (47)	D (47)	D (45)
	PM Peak	D (42)	F (82)	D (53)
McDonald Drive/Pima Road	AM Peak	C (32)	D (41)	D (41)
	PM Peak	D (38)	F (82)	D (54)
Chapparal Road/Pima Road	AM Peak	D (42)	E (62)	D (44)
	PM Peak	D (43)	F (96)	D (52)
Indian School Road/Pima Road	AM Peak	C (24)	E (77)	D (38)
	PM Peak	D (38)	F (214)	E (79)
Thomas Road/Pima Road	AM Peak	C (32)	D (52)	D (40)
	PM Peak	E (56)	F (161)	D (45)
McDowell Road/Pima Road	AM Peak	B (13)	C (20)	C (20)
	PM Peak	C (28)	C (30)	C (34)

Source: Pima Road Improvements – Via De Ventura to McDowell Road: Traffic Report (Kimley-Horn, December 2020)
Values in Red – greater than acceptable LOS D

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 new bus or rail terminals; therefore, project types (iii) and (iv) above are not addressed in the project assessment.

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.

Projects Affecting PM Sites of Violation or Possible Violation

Does the project affect locations, areas or categories of sites that are identified in the PM₁₀ or PM_{2.5} applicable plan or implementation plan submissions, as appropriate, as sites of violation or potential violation?

NO – The PM₁₀ State Implementation Plans (SIPs) does not identify any specific sites or potential sites of violation. Therefore, no specific sites or potential sites of violation are identified.

POAQC Determination

State whether the project is a Project of Air Quality Concern (POAQC) and summarize the response(s) above that support that determination. Document the relevant agencies that require interagency consultation on any input for the questionnaire from Federal, state, and local transportation and air agencies as necessary for this project per 40 CFR 93.105. This information will be included in subsequent air quality analysis and project level conformity determination reports.

In the 2040 Design Year, traffic volumes on Pima Road will be much less than the 125,000 AADT threshold at which point EPA guidance suggests a project could potentially be a project of air quality concern. While traffic overall is expected to increase on Pima Road as a result of the project, the total truck volumes are forecasted to be less than 700 per day.

Interagency consultation included the EPA, the Arizona MAG, ADOT, the Arizona Department of Environmental Quality, and the Maricopa County Department of Air Quality.

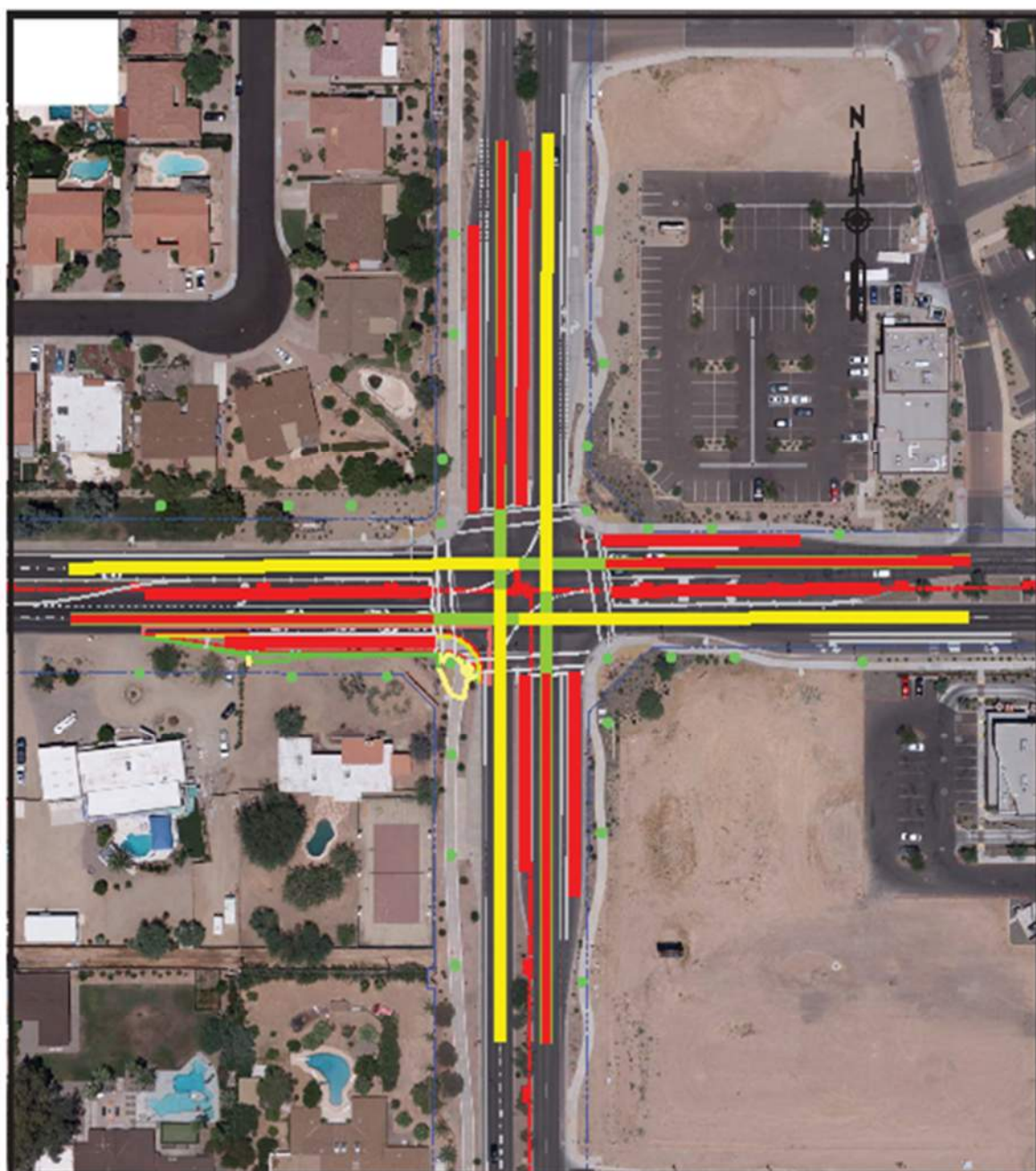
The proposed roadway improvements on Pima Road between McDowell Road and Talking Stick Way are **NOT** of Air Quality Concern and therefore will not require a PM hot-spot analysis.

**Appendix C – MOVES2014b Input and Output Files
(Submitted as zipped folder)**

Appendix D – Intersection Configurations

Pima & Indian Bend Intersection

newton
Environmental Consulting LLC

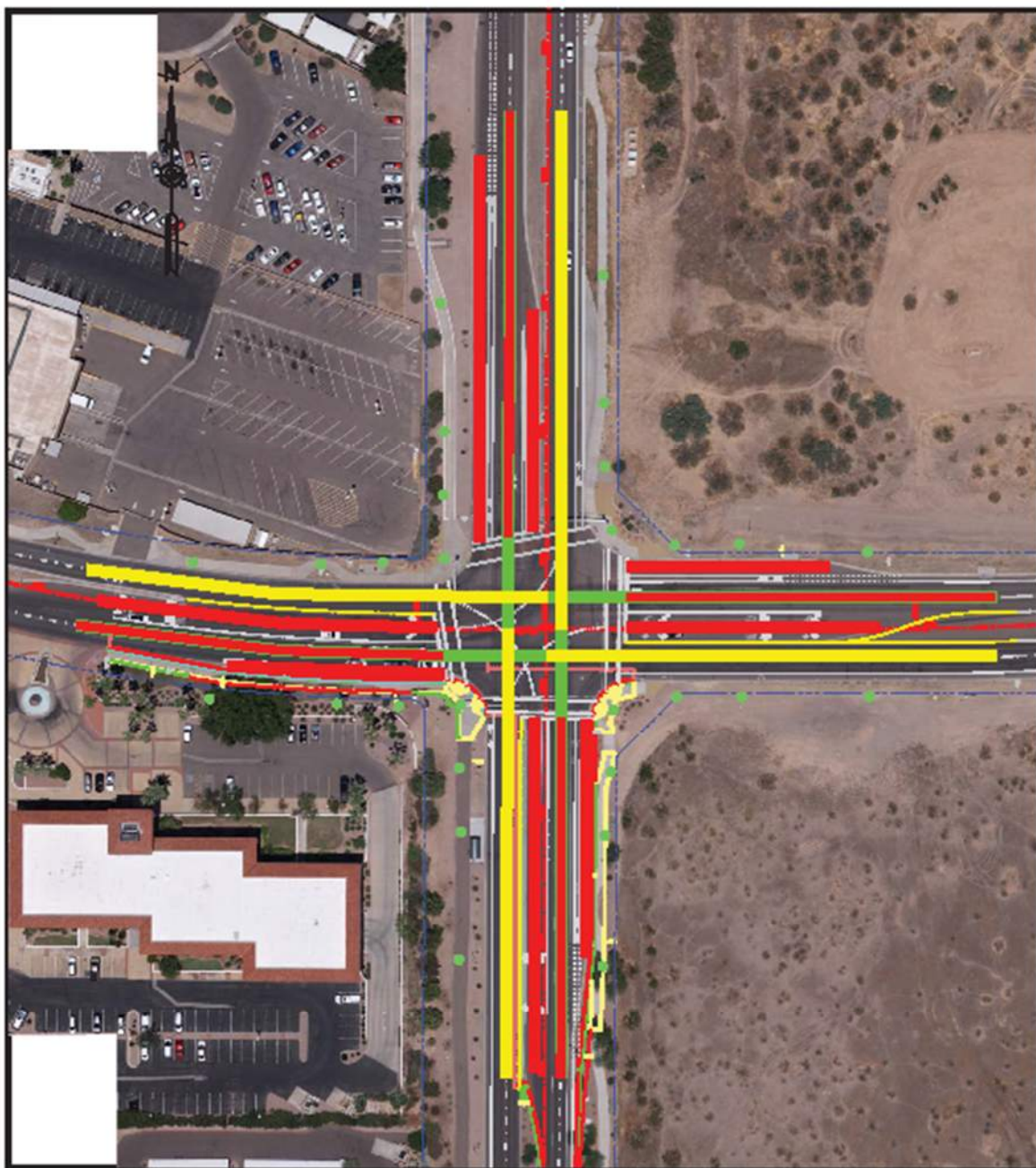


Legend

— Approach Link — Queue Link — Departure Link

Pima & Via de Ventura Intersection

newton
Environmental Consulting, LLC



Legend

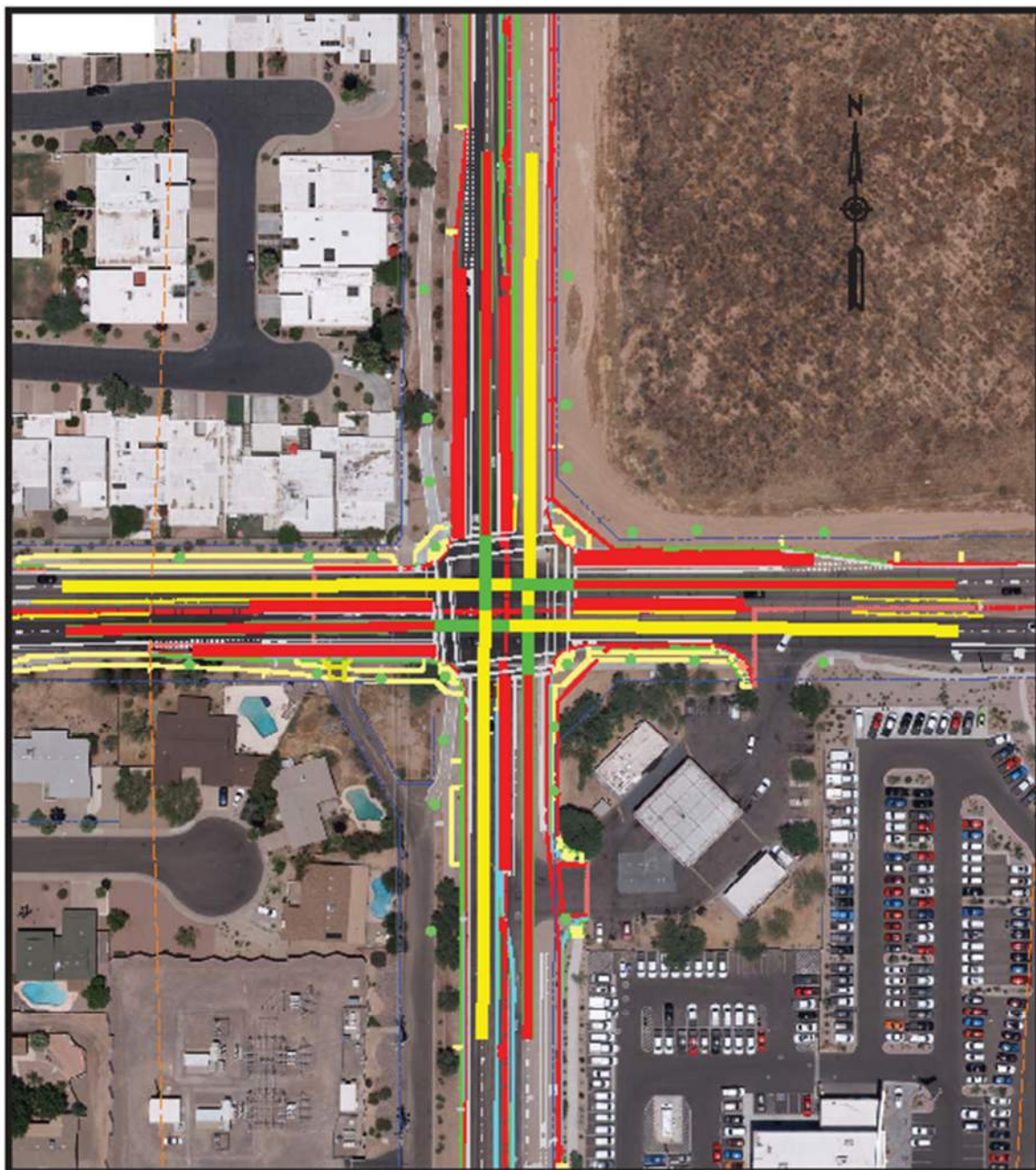
— Approach Link

— Queue Link

— Departure Link

Pima & Indian School Intersection

newton
Environmental Consulting, LLC



Legend

— Approach Link

— Queue Link

— Departure Link

Appendix E – CAL3QHC Input and Output Files
(Submitted as zipped folder)