Arizona Department of Transportation

Environmental Planning

Air Quality Technical Report

I-10, I-17 to S.R. 202L (I-10 Broadway Curve) Improvement Project

Federal Project No. NH-010-C(220)T
ADOT Project No. 010 MA 150 F0072 01D

September 2019

March 2020 (revised)

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Arizona Department of Transportation pursuant to 23 United States Code 327 and a Memorandum of Understanding dated April 16, 2019 and executed by the Federal Highway Administration and Arizona Department of Transportation.

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EXECUTIVE SUMMARY

This Air Quality Technical Report supports the I-10, I-17 (Split) to SR 202L (Santan) improvement (I-10 Broadway Curve) project. The report evaluates the project's potential air quality impacts within the study area. This includes an analysis of whether the project would cause or contribute to a new localized exceedance of carbon monoxide (CO) or particulate matter (PM_{10}) ambient air quality standards or increase the frequency or severity of any existing exceedance. According to this analysis, the project is not predicted to cause or exacerbate a violation of any National Ambient Air Quality Standards (NAAQS). A qualitative PM_{10} assessment and a quantitative CO modeling analysis is required for this project. The modeled CO build alternative concentrations were demonstrated to be below the CO NAAQS. The project does not interfere with any transportation control measures in Phoenix-Mesa region's State Implementation Plans (SIPs) for PM_{10}, CO, or Ozone NAAQS. A quantitative analysis also predicted to have no measurable effect on mobile source air toxic (MSAT) or greenhouse gas (GHG) emissions.

1.0 *INTRODUCTION*

This Air Quality Technical Report has been prepared in support of the (I-10 Broadway Curve) project in Maricopa County, Arizona. The air quality analysis was performed based on traffic data presented in the Traffic Operations Analysis (WSP, 2019). The air quality analysis and the Traffic Report are consistent with the most recent Maricopa Association of Governments (MAG) January 2019 Conformity modeling performed for the Air Quality Conformity Analysis.

2.0 *PROJECT DESCRIPTION*

The Arizona Department of Transportation (ADOT) is preparing an Environmental Assessment (EA) document for proposed improvements to a segment of Interstate 10 (I-10) from the I-10/I-17 (Split) Traffic Interchange (TI) (Milepost [MP] 149.5) to the Loop 202 (SR202L) Santan Freeway (MP 160.9) and the segment of State Route (SR) 143 from Broadway Road (MP 000.25-) north to just south of the south bank of the Salt River (MP 001.3), and US60 (Superstition Freeway) from I-10 (MP 172.0) east to Hardy Drive (MP 173.0) within the cities of Phoenix, Tempe, and Chandler, and the Town of Guadalupe, Maricopa County, Arizona. The EA will be completed in accordance with the National Environmental Policy Act (NEPA) and other regulatory requirements.

The study area of the proposed I-10 improvements serves the growing communities in the South and East Valley, downtown Phoenix metropolitan area, and other major employment centers. Traffic demand is causing the I-10 corridor and adjacent local arterial street system to become increasingly congested during the morning and evening peak travel periods. Future traffic volume projections indicate the congestion will continue to worsen, causing further travel delays and increased travel times for those using the I-10 corridor. The purpose of this proposed project is to improve travel time reliability and regional mobility, and address congestion on I-10 while maintaining local and multimodal access.

Improvements to this segment of I-10 have been considered over the past 30 years in the following transportation studies:

- *Interstate 10 Corridor Refinement Study (1988)*
- *I-10 Corridor Improvement Study (2007)*
- *Spine Corridor Study (2014)*
- *Interstate 10 Near Term Improvements Study (2014)*

Each of these previous studies systematically approached the development of viable improvement concepts and alternative options, through interdisciplinary team dialogues that included ADOT, FHWA, MAG, and agency stakeholders, as well as input obtained through public outreach.

The project will evaluate a build and no-build alternative for the improvements in this study area. The no-build alternative will be evaluated to provide a baseline comparison for the build alternative. If selected, the build alternative improvements would consist of widening and restriping I-10 within the project limits to add general-purpose (GP) lanes, high-occupancy vehicle (HOV) lanes, and auxiliary (AUX) lanes; constructing collector-distributor (C-D) roads, reconstructing and improving I-10 interchanges along this segment of I-10; construction of and modifications to bridges; various drainage improvements; installing and upgrading Freeway Management System (FMS) facilities and dynamic message signs (DMS) within the project limits; and other components such as fencing, utilities, traffic markers, and lighting systems.

The proposed build alternative would require additional right-of-way (ROW) and temporary construction easements (TCE) from private land owners within the study area. Any new ROW and/or TCEs would be evaluated prior to construction.

The proposed project location is shown in Figure 1 and Figure 2.

Figure 1. Project Location

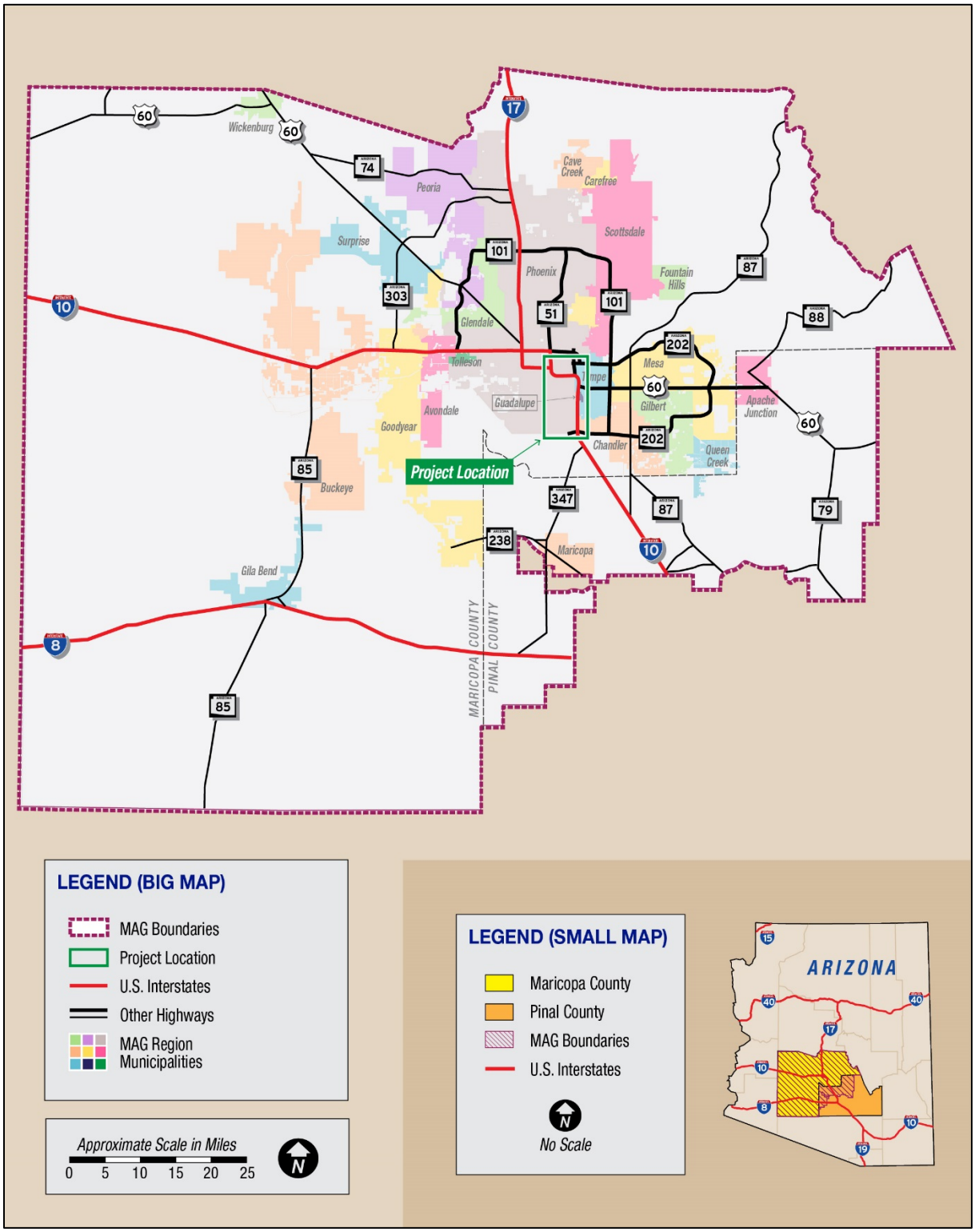


Figure 2. Study Area Limits

3.0 *REGULATIONS*

Air quality is a term used to describe the amount of air pollution the public is exposed to. "Air Pollution" is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants degrade the atmosphere by reducing visibility; they also are responsible for damaging property, reducing the productivity or vigor of crops and natural vegetation, and/or negatively affecting human and animal health. Air quality in the United States is regulated by the Federal Clean Air Act (CAA) and is administered by the United States Environmental Protection Agency (EPA).

3.1 CLEAN AIR ACT AMENDMENTS OF 1990 (CAAA)

Under the CAA, the Environmental Protection Agency (EPA) has established the NAAQS, which specify maximum concentrations for carbon monoxide (CO), particulate matter less than 10 micrometers in size (PM_{10}), $PM_{2.5}$, O_3, sulfur dioxide (SO_2), lead, and nitrogen dioxide. These pollutants are referred to as criteria pollutants.

Under the CAAA, the US Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to the State Implementation Plan (SIP). A project that uses federal funds cannot:

- Cause or contribute to any new violation of any National Ambient Air Quality Standards (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.

3.1.1 National Ambient Air Quality Standards

As required by the CAA, NAAQS have been established for six major air pollutants: carbon monoxide, nitrogen dioxide, ozone, particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide, and lead. These standards are summarized in Table 1. "Primary" standards have been established to protect the public health; "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

Brief descriptions of those criteria pollutants relevant to transportation projects (ozone, carbon monoxide, and particulate matter) are provided in the following sections.

Table 1. National Ambient Air Quality Standards

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide		primary	8-hour	9ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3-month average	0.15 $\mu g/m^3$ (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		primary and secondary	Annual	53 ppb (2)	Annual Mean
Ozone (O_3)		primary and secondary	8-hour	0.070 ppm(3)	Annual fourth-highest daily maximum 8-hour concen-tration, averaged over 3 years
Particle Pollution	$PM_{2.5}$	primary	Annual	12 $\mu g/m^3$	Annual mean, averaged over 3 years
		secondary	Annual	15 $\mu g/m^3$	Annual mean, averaged over 3 years
		primary and secondary	24-hour	35 $\mu g/m^3$	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1-hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Source: EPA, https://www.epa.gov/criteria-air-pollutants/naaqs-table

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 $\mu g/m^3$ as a calendar quarter average) also remain in effect.

(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transition to the current (2015) standards will be addressed in the implementation rule for the current standards.

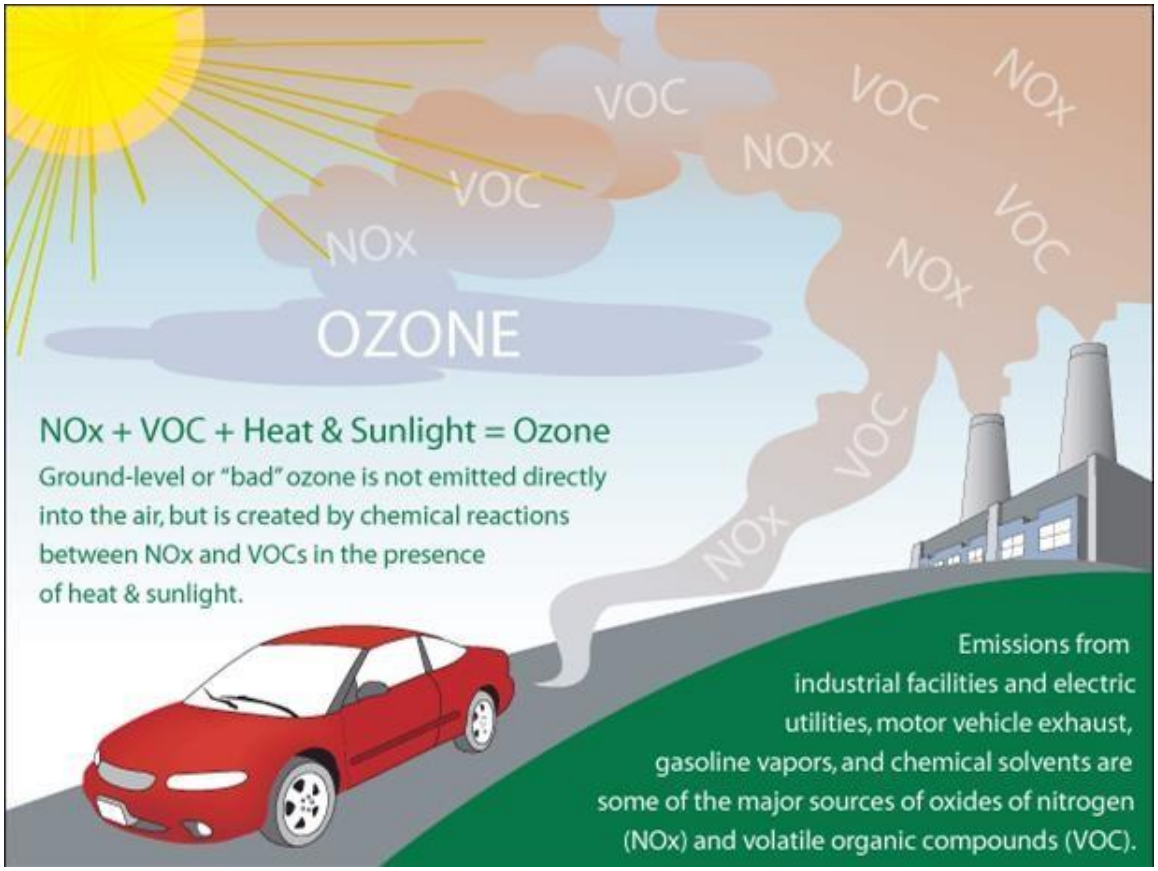
(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: 1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and 2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

3.1.1.1 Ozone

Ozone (O_3) is a colorless toxic gas. As shown in, Figure 3, O_3 is found in both the Earth's upper and lower atmospheric levels. In the upper atmosphere, O_3 is a naturally occurring gas that helps to prevent the sun's harmful ultraviolet rays from reaching the Earth. In the lower layer of the atmosphere, O_3 is human made. Although O_3 is not directly emitted, it forms in the lower atmosphere through a chemical reaction between hydrocarbons (HC), also referred to as Volatile Organic Compounds (VOC), and nitrogen oxides (NOx) emitted from industrial sources and from automobiles. HC are compounds comprised primarily of atoms of hydrogen and carbon.

Substantial O_3 formations generally require a stable atmosphere with strong sunlight; thus, high levels of O_3 are generally a concern in the summer. O_3 is the main ingredient of smog. O_3 enters the bloodstream through the respiratory system and interferes with the transfer of oxygen, depriving sensitive tissues in the heart and brain of oxygen. O_3 also damages vegetation by inhibiting its growth. The effects of changes in VOC and NOx emissions for the proposed project are examined on a regional and statewide level.

Figure 3. Ozone in the Atmosphere

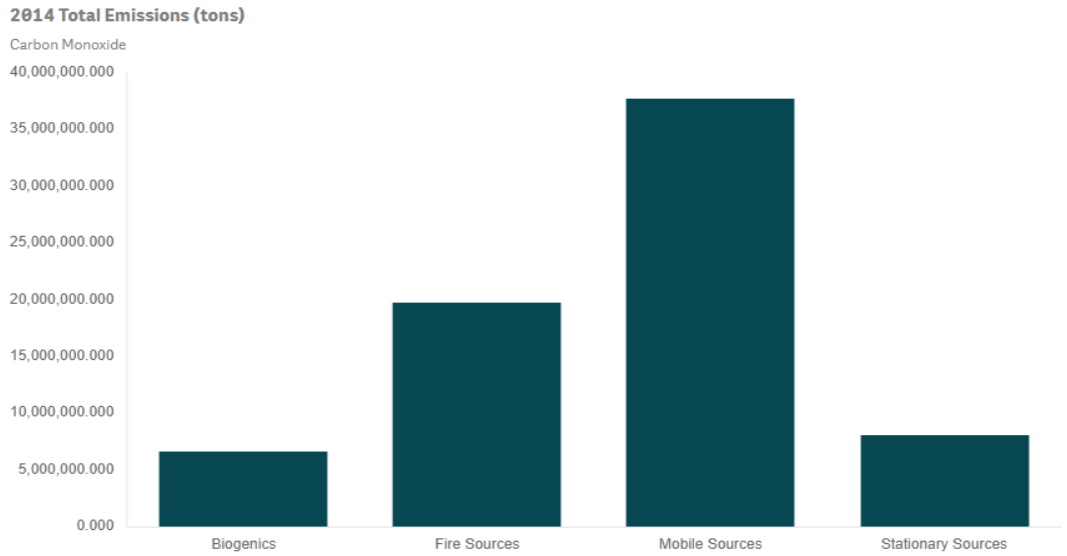


Source: EPA: https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics#wwh

3.1.1.2 Carbon Monoxide

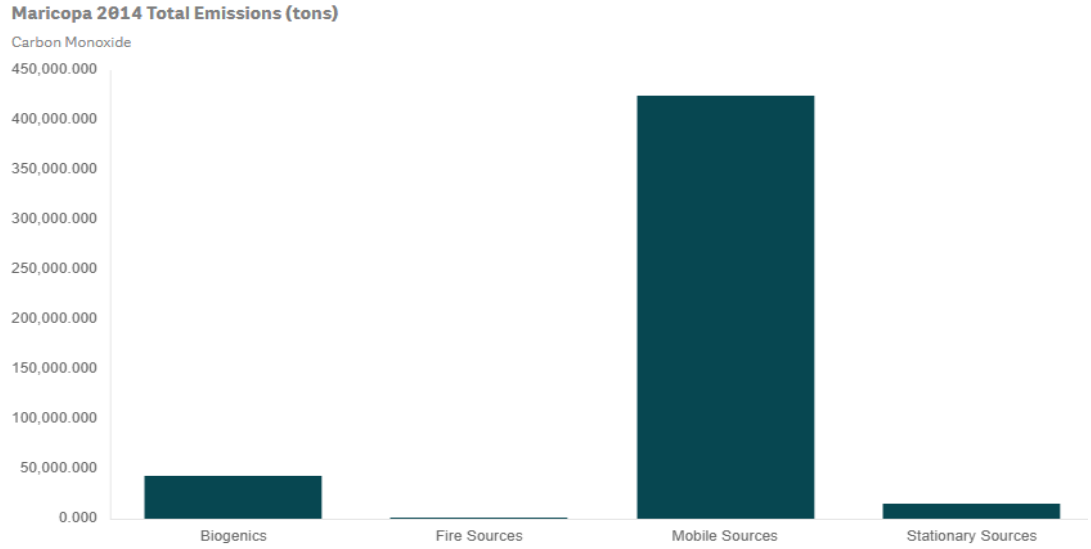
Carbon monoxide (CO) is a colorless gas that interferes with the transfer of oxygen to the brain. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. As shown in Figure 4. and **Error! Reference source not found.**, mobile sources (on-road motor vehicle exhaust) are the primary source of CO in both Maricopa County and in the U.S. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Prolonged exposure to high levels of CO can cause headaches, drowsiness, loss of equilibrium, or heart disease. CO levels are generally highest in the colder months of the year when inversion conditions (where warmer air traps colder air near the ground) are more frequent.

Figure 4. Sources of CO in the United States (2014)



Source: EPA, https://www.epa.gov/air-emissions-inventories/air-emissions-sources

Figure 5. Sources of CO in Maricopa County (2014)



Source: EPA, https://www.epa.gov/air-emissions-inventories/air-emissions-sources

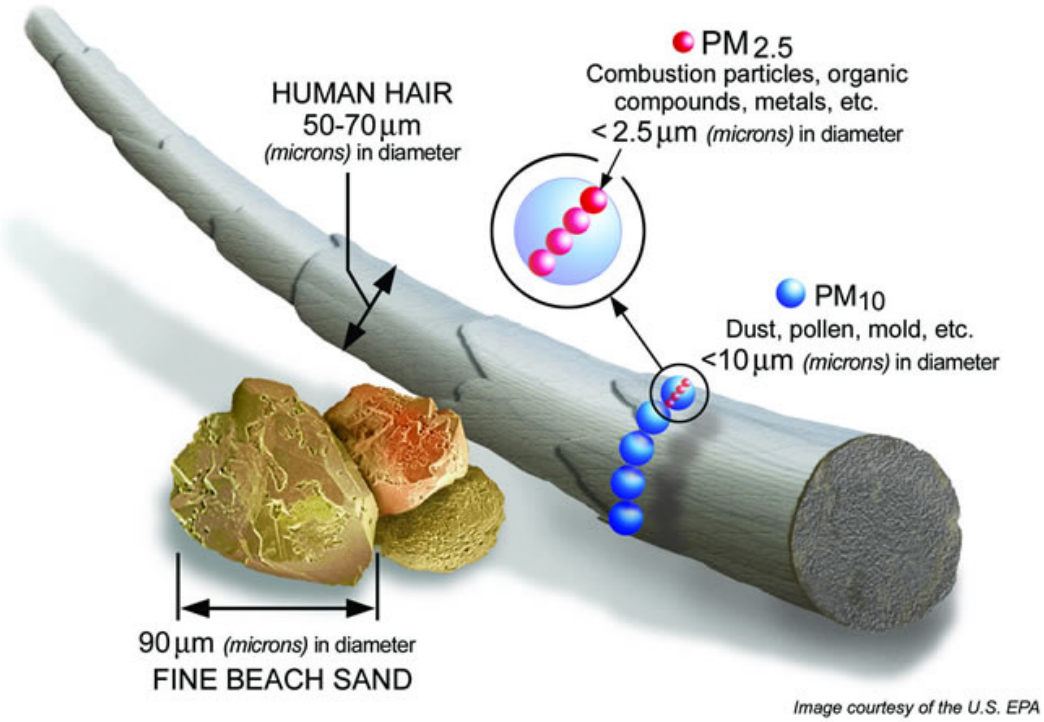
CO concentrations can vary greatly over relatively short distances. Relatively high concentrations of CO are typically found near congested intersections, along heavily used roadways carrying slow-moving traffic, and in areas where atmospheric dispersion is inhibited by urban "street canyon" conditions. Consequently, CO concentrations must be predicted on a microscale basis.

3.1.1.3 Particulate Matter

Particulate pollution is composed of solid particles or liquid droplets that are small enough to remain suspended in the air. In general, particulate pollution can include dust, soot, and smoke; these can be irritating but usually are not poisonous. Particulate pollution also can include bits of solid or liquid substances that can be highly toxic. Of particular concern are those particles that are smaller than, or equal to, 10 microns (PM_{10}) or 2.5 microns ($PM_{2.5}$) in size.

PM_{10} refers to particulate matter less than 10 microns in diameter, about one-seventh the thickness of a human hair (Figure 6). Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals.

Figure 6. Relative Particulate Matter Size



Source: EPA: https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM

Particulate matter also forms when gases emitted from motor vehicles undergo chemical reactions in the atmosphere.

Major sources of PM_{10} include motor vehicles; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Suspended particulates produce haze and reduce visibility.

Data collected through numerous nationwide studies indicate that most of the PM_{10} comes from the following:

- Fugitive dust
- Wind erosion
- Agricultural and forestry sources

A small portion of particulate matter is the product of fuel combustion processes. In the case of $PM_{2.5}$, the combustion of fossil fuels accounts for a large portion of this pollutant. The main health effect of airborne particulate matter is on the respiratory system. $PM_{2.5}$ refers to particulates that are 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur dioxide, nitrogen oxides, and volatile organic compounds. Like PM_{10}, $PM_{2.5}$ can penetrate the human respiratory system's natural defenses and damage the respiratory tract when inhaled. Whereas particles 2.5 to 10 microns in diameter tend to collect in the upper portion of the respiratory system, particles 2.5 microns or less are so tiny that they can penetrate deeper into the lungs and damage lung tissues. The effects of PM_{10} and $PM_{2.5}$ emissions from the project are examined on a localized, or microscale, basis, a regional basis, and a statewide basis.

3.1.2 Transportation Conformity Rule

Under the Clean Air Act Amendments of 1990, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the Transportation Equity Act for the 21st Century (TEA-21), and Moving Ahead for Progress in the 21st Century Act (MAP-21), proposed transportation projects must be derived from a long-range transportation plan (LRP) or regional transportation plan (RTP) 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 conformity determinations from proposed transportation plans, programs, and projects before they are approved, accepted, funded, or adopted. Federal activities may not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions towards attainment.

The conformity rule also establishes the process by which FHWA, the Federal Transit Administration (FTA), and local metropolitan planning organizations (MPOs) determine conformance of transportation plans and transportation improvement programs (TIPs)

and federally funded highway and transit projects. As part of this process, local MPOs are required under regulations promulgated in the CAA of 1990 to undertake conformity determinations on metropolitan transportation plans (MTPs) 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 MTPs. 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.

3.1.3 Interagency Consultation

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

ADOT has developed standard questionnaires for project level PM quantitative hot-spot analyses 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 June 6, 2019, ADOT provided a copy of the PM hot-spot questionnaire for interagency consultation, to the following consulting parties: EPA, FHWA, MAG, Arizona Department of Environmental Quality (ADEQ), and the Maricopa County Air Quality Department, as the local air agency in Maricopa County. The consultation period concluded on June 20, 2019, resulting in concurrence that the proposed project does not meet the criteria to be considered a Project of Air Quality Concern (POAQC).

On June 6, 2019, ADOT provided a copy of the CO hot-spot questionnaire and associated planning assumptions to the following consultation parties, for interagency consultation: EPA, FHWA, MAG, ADEQ, and the Maricopa County Air Quality Department, as the local air agency in Maricopa County. There were no comments on the methodology and assumptions, including the four intersections recommended for quantitative analysis, and on July 9, 2019, ADOT concluded interagency consultation and started project level CO modeling for transportation conformity.

Documentation of interagency correspondence, including the completed questionnaires that provide methodologies for the PM_{10} and CO, can be found in Appendix A.

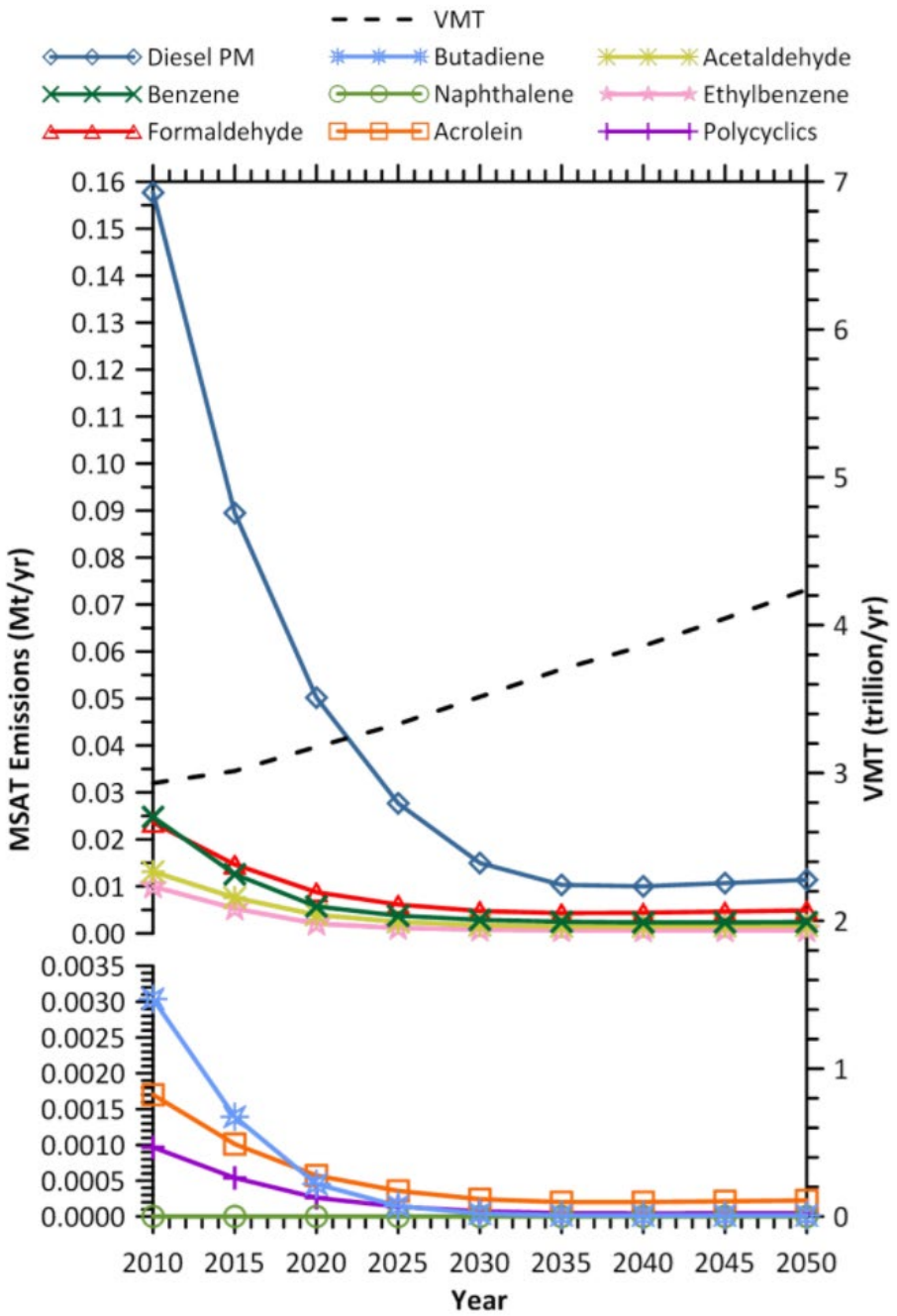
3.2 MOBILE SOURCE AIR TOXICS

In addition to the criteria pollutants for which there are NAAQS, the EPA also regulates air toxics. Toxic air pollutants are those pollutants known or suspected to cause cancer or other serious health effects. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Controlling air toxic emissions became a national priority with the passage of the CAAA of 1990, whereby Congress mandated that EPA regulate 188 air toxics, also known as hazardous air pollutants. EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/iris/). In addition, EPA identified nine compounds with significant contributions from mobile sources that are among the national- and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA) (https://www.epa.gov/national-air-toxics-assessment). These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule mentioned above requires controls that will dramatically decrease mobile source air toxic (MSAT) emissions through cleaner fuels and cleaner engines. Using EPA's MOVES2014a model, as shown in Figure 7, FHWA estimates that even if VMT increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Figure 7. National MSAT Emission Trends 2010 – 2050 For Vehicles Operating on Roadways Using EPA's MOVES2014a Model



Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors

Source: EPA MOVES2014a model runs conducted by FHWA in September 2016: https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/

3.3 GREENHOUSE GASES

Anthropogenic (human-caused) greenhouse gas (GHG) emissions contribute to climate change. CO_2 makes up the largest component of these GHG emissions. Other prominent transportation greenhouse gases include methane (CH_4) and nitrous oxide (N_2O). GHGs differ from other air pollutants evaluated in federal environmental reviews because their impacts are not localized or regional due to the rapid dispersion into the global atmosphere that is characteristic of these gases.

Many GHGs occur naturally. Water vapor is the most abundant GHG and makes up approximately two thirds of the natural greenhouse effect. However, the burning of fossil fuels and other human activities are adding to the concentration of GHGs in the atmosphere. Many GHGs remain in the atmosphere for time periods ranging from decades to centuries. GHGs trap heat in the earth's atmosphere.

To date, no national standards have been established regarding GHGs, nor has EPA established criteria or thresholds for ambient GHG emissions pursuant to its authority to establish motor vehicle emission standards for CO_2 under the CAA. However, a considerable body of scientific literature exists addressing the sources of GHG emissions and their adverse effects on climate, including reports from the Intergovernmental Panel on Climate Change, the US National Academy of Sciences, and EPA and other federal agencies. The affected environment for CO_2 and other GHG emissions is the entire planet. In addition, from a quantitative perspective, global climate change is the cumulative result of numerous and varied emissions sources (in terms of both absolute numbers and types), each of which makes a relatively small addition to global atmospheric GHG concentrations. In contrast to broad-scale actions such as those involving an entire industry sector or very large geographic areas, it is difficult to isolate and understand the GHG emissions impacts of a particular transportation project. Furthermore, no scientific methodology for attributing specific climatological changes to a particular transportation project's emissions currently exists.

4.0 EXISTING CONDITIONS

4.1 AMBIENT AIR QUALITY DATA

4.1.1 Local Meteorology

The project is located in the Phoenix metropolitan area in the south-central portion of the state. Phoenix is located in the Salt River Valley, which is surrounded by low mountain ranges. A large portion of Arizona is classified as semiarid, and long periods of time often occur with little or no precipitation. The average annual precipitation in Phoenix is 7.53 inches. The air is generally dry and clear, with low relative humidity and a high percentage of sunshine. Phoenix has a hot desert climate with long, extremely hot summers and short, mild to warm winters. Temperatures of 90 degrees Fahrenheit are reached an average of 168 days per year, and it is common to see temperatures over 100 degrees Fahrenheit (WRCC).

4.1.2 Local Monitored Air Quality

In cooperation with EPA and other governmental agencies, The Maricopa County Air Quality Department operates air quality monitoring sites and a mobile air monitoring program to measure criteria pollutants. Table 2 presents the last three years of available monitor data gathered at the closest monitoring stations to the project area. Table 2. Ambient Air Quality Monitor Data.

Pollutant		Monitor Location	Monitor Value	2015	2016	2017
Carbon Monoxide (CO) [ppm]	1-Hour	1919 W Fairmont Dr Tempe, AZ	Maximum	1.9	2.0	2.0
			2nd Maximum	1.9	2.0	2.0
			# of Exceedances	0	0	0
	8-Hour	1919 W Fairmont Dr Tempe, AZ	Maximum	1.6	1.7	1.7
			2nd Maximum	1.4	1.6	1.6
			# of Exceedances	0	0	0
Particulate Matter [ug/m^3]	PM_{10}	1645 E Roosevelt St Phoenix, AZ	Maximum 24-Hour	114	106	126
			Second Maximum	85	102	106
			# of Exceedances	0	0	0
	$PM_{2.5}$	1919 W Fairmont Dr Tempe, AZ	24-Hour 98th Percentile	17.0	17.0	21.0
			Mean Annual	7.9	7.9	8.1
Ozone (O_3) [ppm]	8-Hour	1645 E Roosevelt St Phoenix, AZ	First Highest	0.075	0.072	0.077
			Second Highest	0.075	0.071	0.076
			Third Highest	0.074	0.071	0.075
			Fourth Highest	0.071	0.070	0.071
			# of Days Standard Exceeded	5	3	8
Nitrogen Dioxide (NO_2) [ppb]		1645 E Roosevelt St Phoenix, AZ	1-Hour Maximum	63	62	66
			1-Hour Second Maximum	62	62	65
			98th Percentile	59	59	62
			Annual Mean	17.85	17.34	18.24
Sulfur Dioxide (SO_2) [ppb]		1645 E Roosevelt St Phoenix, AZ	1-Hour Maximum	9.0	8.0	9.0
			24-Hour Maximum	3.4	3.0	4.3
			# of Days Standard Exceeded	0	0	0

Sources: EPA AirData, https://www.epa.gov/outdoor-air-quality-data

4.2 ATTAINMENT STATUS

Section 107 of the 1977 CAAA requires that EPA publish a list of all geographic areas in compliance with the NAAQS, plus those not attaining the NAAQS. Areas not in NAAQS compliance are deemed nonattainment areas. Areas that have insufficient data to make a determination are deemed unclassified and are treated as attainment areas until proven otherwise. Maintenance areas are areas that were previously designated as nonattainment for a particular pollutant but have since demonstrated compliance with the NAAQS for that pollutant. An area's designation is based on data collected by the state monitoring network on a pollutant-by-pollutant basis.

The project is located in Maricopa County, Arizona. Table 3 shows the attainment status for Maricopa County. As shown in the table, EPA has classified portions of Maricopa County as a nonattainment area for PM_{10} and ozone, and a maintenance area for CO. Therefore, a project-level transportation conformity analysis is required for CO and PM_{10}. The regional transportation conformity determination is addressed in the TIP and RTP.

Table 3. Project Area Attainment Status

Pollutant	Designation	Current Standard (Year Established)	Area
Ozone (O_3)	Nonattainment	8-Hr: 70 ppb (2015)	Portions of Maricopa County and Pinal County
Fine Particulate Matter ($PM_{2.5}$) 24-Hr	Attainment	35 µg/m^3 (2012)	Maricopa County
Fine Particulate Matter ($PM_{2.5}$) Annual	Attainment	12 µg/m^3 (2012)	Maricopa County
Coarse Particulate Matter (PM_{10}) 24-Hr	Nonattainment	150 µg/m^3 (2012)	Portions of Maricopa County and Pinal County
Carbon Monoxide (CO)	Attainment/ Maintenance	1-Hr: 35 ppm 8-Hr: 9 ppm (1971)	Portions of Maricopa County
Sulfur Dioxide (SO_2)	Attainment	1-Hr: 75 ppb (2010)	Maricopa County

Source: EPA, 2018 https://www.epa.gov/green-book

The MPO for the study area, MAG, adopted the latest RTP in September 2017, and the latest amendment to the 2018-2022 FY TIP was approved in August 2019. The project is included in the RTP as project ID 40575, and in the TIP as project ID DOT21-820. The I-10 widening project is included in the regional conformity analysis; therefore, the project's associated emissions would not have an adverse effect on the ability of the MAG region to attain their applicable air quality goals. As such, no additional regional conformity analyses are required.

5.0 *ENVIRONMENTAL CONSEQUENCES*

This section describes the methods, impact criteria, and results of air quality analyses of the proposed project. The analyses use guidelines and procedures provided in applicable air quality analysis protocols from EPA and FHWA.

5.1 CO HOT-SPOT ANALYSIS

Microscale CO air quality modeling was performed using EPA guidance and interagency consultation, as described below and in Appendix A.

5.1.1 Methodology

To determine the project's impact on local CO levels, a detailed hotspot analysis was conducted at three locations within the study area: Baseline Road and I-10 Traffic Interchange (TI), Elliot Road and I-10 TI, and Broadway Road and I-10 Westbound / 52nd Street. These locations were chosen from a screening evaluation based upon overall level of service and volumes. The locations chosen underwent detailed microscale modeling using emission factors developed through the use of EPA's MOVES2014b emission factor program and dispersion modeling using EPA's CAL3QHC program.

5.1.1.1 MOVES 2014b Emissions Model

EPA's Motor Vehicle Emissions Simulator (MOVES) model version MOVES2014b was used to estimate CO emissions from the roadway segments included in the CO modeling analysis. MOVES2014b is the EPA's state-of-the-art tool for estimating emissions from highway vehicles. The model is based on analyses of millions of emission test results and considerable advances in the Agency's understanding of vehicle emissions. Compared to previous tools, MOVES2014b incorporates the latest emissions data, more sophisticated calculation algorithms, increased user flexibility, new software design, and substantial new capabilities.

MOVES2014b was used to estimate CO emissions from the roadway segments included in the CO modeling analysis. MOVES input files were provided by MAG consistent with their regional emissions analysis. MAG data was used to represent regional fuel specifications, fleet age distribution, and inspection and maintenance programs. Link-by-link traffic data was used to develop project-specific input files for each modeled link with that link's average speed and vehicle mix for each scenario analyzed: 2018, 2040 No-Build, and 2040 Build.

Specific inputs were developed according to EPA's *Using MOVES2014 in Project-Level Carbon Monoxide Analyses*. This guidance was used to develop the meteorological inputs and the vehicle mix. In cases where the roadway was not flat because of an overpass, a grade of 3% was assigned to that segment to account for higher emissions associated with reduced engine performace for vehicles going uphill. Conservative assumptions were made whenever possible to estimate the worst-case concentrations at each receptor.

5.1.1.2 CAL3QHC Dispersion Model

Mobile source models are the basic analytical tools used to estimate CO concentrations expected under given traffic, roadway geometry, and meteorological conditions. The mathematical expressions and formulations that comprise the various models attempt to describe an extremely complex physical phenomenon as closely as possible. The dispersion modeling program used in this project for estimating pollutant concentrations near roadway intersections is the CAL3QHC (Version 2.0) dispersion model developed by EPA and first released in 1992.

CAL3QHC is a Gaussian model recommended in the EPA's Guidelines for Modeling Carbon Monoxide from Roadway Intersections (EPA 1992). Gaussian models assume that the dispersion of pollutants downwind of a pollution source follow a normal distribution from the center of the pollution source.

Different emission rates occur when vehicles are stopped (i.e., idling), accelerating, decelerating, and moving at different average speeds. CAL3QHC simplifies these different emission rates into two components:

- Emissions when vehicles are stopped (i.e., idling) during the red phase of a signalized intersection
- Emissions when vehicles are in motion during the green phase of a signalized intersection

The CAL3QHC (Version 2.0) air quality dispersion model has undergone extensive testing by EPA and has been found to provide reliable estimates of inert (i.e., nonreactive) pollutant concentrations resulting from motor vehicle emissions. A complete description of the model is provided in the User's Guide to CAL3QHC (Version 2.0): A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections (Revised) (EPA 1992a).

The transport and concentration of pollutants emitted from motor vehicles are influenced by three principal meteorological factors: wind direction, wind speed, and the atmosphere's profile. The values for these parameters were chosen to maximize pollutant concentrations at each prediction site to establish a conservative, reasonable worst-case scenario. The values used for these parameters are:

- **Wind Direction**. Maximum CO concentrations normally are found when the wind is assumed to blow parallel to a roadway adjacent to the receptor location. At complex intersections, it is difficult to predict which wind angle will result in maximum concentrations. Therefore, the approximate wind angle that would result in maximum pollutant concentrations at each receptor location was used in the analysis. All wind angles from 0 to 360 degrees (in 5-degree increments) were considered.
- **Wind Speed**. The CO concentrations are greatest at low wind speeds. A conservative wind speed of one meter per second (2.2 miles per hour) was used to predict CO concentrations during peak traffic periods.

- **Profile of the Atmosphere**. A "mixing" height (the height in the atmosphere to which pollutants rise) of 1,000 meters, and neutral atmospheric stability (stability class D) conditions were used in estimating microscale CO concentrations.

One-hour average ambient CO concentrations were calculated to estimate the effect during peak-hour traffic conditions, and CO concentrations were estimated at a receptor height of 6 feet. Receptors were placed along the roads in locations where public has access, spaced 25 meters apart. Receptor locations are shown in Figure 8 through Figure 11 in Section 5.1.3.

The CO levels estimated by the model are the maximum concentrations which could be expected to occur at each air quality receptor site analyzed, given the assumed simultaneous occurrence of a number of worst-case conditions: peak-hour traffic conditions, conservative vehicular operating conditions, low wind speed, low atmospheric temperature, neutral atmospheric conditions, and maximizing wind direction.

5.1.1.3 Predicted Levels

Carbon monoxide concentrations for Existing Conditions, the future No-Build Alternative, and the future Build Alternative were predicted. Future carbon monoxide concentrations were predicted for the project's design year, which is 2040. At each receptor site, maximum one-hour carbon monoxide concentrations were calculated. The one-hour CO levels were predicted for the AM and PM peak periods. The 8-hour CO levels were predicted by applying a persistence factor of 0.7 to the 1-hour concentrations, as recommended in the EPA guidance (EPA 1992b).

5.1.1.4 Background Levels

Background levels for the study area were obtained from EPA-monitored data. The background level is the component of the total concentration that is not accounted for through the microscale modeling analysis. Background concentrations must be added to modeling results to obtain total pollutant concentrations at receptor locations. The data from the CO monitor located at 1919 Fairmont Drive in Tempe was approved during the interagency consultation process. Based on the last three years of monitoring data (2015-2017), the one-hour background of 2.0 ppm and the eight-hour background of 1.7 ppm were used for the existing and future year analyses.

5.1.1.5 Comparison to NAAQS

The results from the analysis for the existing, future No-Build, and Build Alternative were compared to the NAAQS, and to one another, to determine the impacts of the proposed project and if the project is in conformance with the guidelines set forth in the New Clean Air Act Amendments of 1990.

5.1.2 Screening Evaluation

An intersection screening analysis based on changes in level of service (LOS) and overall intersection volumes between the No-Build and Build alternatives was performed, as described in EPA guidance (EPA 1992). The intersections evaluated in the Traffic

Operations Analysis (WSP, 2019) are summarized in Table 4, full traffic memo in Appendix E.

LOS describes the quality of traffic operating conditions, ranging from A to F, and it is measured as the duration of delay that a driver experiences at a given intersection. LOS A represents free-flow movement of traffic and minimal delays to motorists. LOS F generally indicates severely congested conditions with excessive delays to motorists. Intermediate grades of B, C, D, and E reflect incremental increases in congestion. As part of the procedure for determining critical intersections outlined in the EPA guidance, those intersections at LOS D, E, or F or those that have changed to LOS D, E, or F should be considered for modeling.

Table 4. I-10 Broadway Curve Project Intersection Screening

Intersection	Existing						2040 No Build						2040 Build					
	AM			PM			AM			PM			AM			PM		
	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume
32nd Street & I-10 EB	D	40.1	4236	D	48.5	4410	E	61.6	4991	E	63.4	5014	F	82.8	5522	F	86.5	5554
32nd Street & I-10 WB	C	25.3	3098	E	56.1	4091	D	45	3768	E	69.2	4565	D	37.5	3923	F	110.9	4778
40th Street & I-10 EB	C	28.9	3245	C	22.5	3150	C	32.5	4171	C	32.6	3649	D	51.3	4429	E	64.5	4607
40th Street & I-10 WB	D	38.4	3250	E	58.5	3419	D	47.8	3545	E	57.6	3808	F	93.4	3873	F	110.7	4108
48th Street & I-10 EB	D	54.2	4186	D	36.4	4454	-	-	-	-	-	-	-	-	-	-	-	-
Broadway Rd & 48th St	D	54.5	5519	F	112.3	6295	D	48.8	5353	F	85.3	5604	D	54.1	5395	F	81.2	5059
Broadway Rd & I-10 EB	D	50.7	3631	F	175.2	4540	E	68.7	3962	F	166.8	4818	C	22.8	3406	D	43.7	3497
Broadway Road & I-10 WB / 52nd Street	E	56.2	5211	D	43.4	5213	F	81	5881	F	126.8	6213	E	60	5262	F	262.3	5764
University Dr & SR 143	C	25.3	6093	F	82.9	6698	D	41.6	6861	F	167.5	7691	C	25.1	6331	E	58.7	7090
Baseline Rd & I-10 EB	E	59.4	6279	F	126.4	7519	F	106.9	6495	F	182.2	7757	F	94.4	6850	F	155.6	7590
Baseline Rd & I-10 WB	D	53.9	5755	E	66.7	6313	E	71.1	5683	E	79.3	6406	F	81	6018	E	68.4	6481
Elliot Road & I-10 EB	E	73.5	4052	E	71.4	4397	F	62.1	4403	E	183.5	4779	F	148.7	6232	F	367.9	7226
Elliot Road & I-10 WB	F	172.6	3905	E	66.2	4387	F	106.6	4712	E	65	5180	F	285.3	7541	F	222.7	6901
Warner Rd & I-10 EB	C	32.3	2754	F	86.4	3490	C	30.2	2772	F	103.5	3450	C	30.7	2706	F	150.7	3504
Warner Rd & I-10 WB	E	55.4	3160	C	24.5	3132	F	121.4	3259	D	40	3492	F	88.6	3423	F	87.4	3711
Priest Dr & US 60 EB	D	48.2	2518	D	36.9	3776	D	47.4	2444	D	36.5	3542	D	39.4	2601	C	34.5	3473
Priest Dr & US 60 WB	C	27.1	3617	C	25.7	4191	C	28	3599	C	23.7	4119	C	23.9	3517	C	22.8	4002
Ray Road & I-10 EB	C	31.6	5148	D	49.7	5677	C	33.1	4576	C	32.5	5270	D	38.9	4874	D	38	5725
Ray Road & I-10 WB	D	44.5	4658	D	46.6	4713	D	44.7	4625	D	38.4	4626	E	59.8	4947	D	42.4	5031

Source: WSP, 2019 from MAG Travel Demand Model (TR #1967). Shaded rows represent intersection selected for CO modeling

The intersections to be modeled were determined using the EPA guidance. The intersections with the highest volumes and longest delays were identified for the 2040 Build Alternative. The top three intersections ranked by volume are as follows:

- Baseline Road & I-10 EB
- Elliot Road & I-10 WB
- Elliot Road & I-10 EB

The top three intersections ranked by LOS and delay are as follows:

- Elliot Road & I-10 EB
- Elliot Road & I-10 WB
- Broadway Road & I-10 WB / 52nd Street

Two of the intersections are found on both groups, thus the intersection modeling analysis will be performed for the following four intersections:

- Baseline Road & I-10 EB
- Elliot Road & I-10 WB
- Elliot Road & I-10 EB
- Broadway Road & I-10 WB / 52nd Street

It is assumed that if the selected worst-case intersections do not show an exceedance of the NAAQS, none of the intersections will.

The CO Hot Spot Questionnaire and Consultation form included in Appendix A has additional details about the model setup and options that were used in this analysis. Appendix A also includes correspondence between FHWA and ADOT regarding specific modeling details that were revised as a result of the consultation. Information on the modeling files are included in Appendix B.

5.1.3 Analysis

Maximum one-hour CO levels were predicted for the existing year (2018) and design year (2040) at the locations selected for analysis. Maximum one-hour CO concentrations are shown in Table 5 and maximum eight-hour CO concentrations are shown in Table 6. The CO levels estimated by the model are the maximum concentrations that could be expected to occur at each air quality receptor site analyzed. This assumes simultaneous occurrence of a number of worst-case conditions: peak hour traffic conditions, conservative vehicular operating conditions, low wind speed, low atmospheric temperature, neutral atmospheric conditions, and maximizing wind direction.

The four intersections were included in 3 modeling sites. Elliot Road & I-10 WB and Elliot Road & I-10 EB were close enough in proximity to be included in the same modeling setup, and the results are not presented separately.

Table 5. Predicted Worst-Case One-Hour CO Concentrations (ppm)

Intersection	2018		2040			
	Existing		No Build		Build	
	AM	PM	AM	PM	AM	PM
Baseline Road & I-10	3.1	3.5	2.3	2.4	2.4	2.4
Elliot Road & I-10	2.8	2.9	2.3	2.2	2.2	2.3
Broadway Road & I-10 WB / 52nd Street	3.1	3.0	2.3	2.4	2.2	2.1
1-hour CO standard	35	35	35	35	35	35

Concentrations = modeled results + 1-hour CO background.
1-hour CO background = 2.0 ppm
Abbreviations: AM = morning; PM = evening; CO = carbon monoxide; ppm = parts per million.

Table 6. Predicted Worst-Case Eight-Hour CO Concentrations (ppm)

Intersection	2018		2040			
	Existing		No Build		Build	
	AM	PM	AM	PM	AM	PM
Baseline Road & I-10	2.47	2.75	1.91	1.98	1.98	1.98
Elliot Road & I-10	2.26	2.33	1.91	1.84	1.84	1.91
Broadway Road & I-10 WB / 52nd Street	2.47	2.40	1.91	1.98	1.84	1.77
8-hour CO standard	9	9	9	9	9	9

Concentrations = (modeled results x persistence factor [0.7]) + 8-hour CO background.
8-hour CO background = 1.7 ppm
Abbreviations: AM = morning; PM = evening; CO = carbon monoxide; ppm = parts per million

Based on the values presented in Table 5 and Table 6, the Build Alternative is not predicted to cause a violation of the NAAQS for any of the analysis years. Figure 8 throught Figure 11 show a visual representation of the model setup for each intersection, and the locations of maximum modeled concentrations are labeled.

Figure 8. Baseline Road and I-10 EB Modeled Receptors

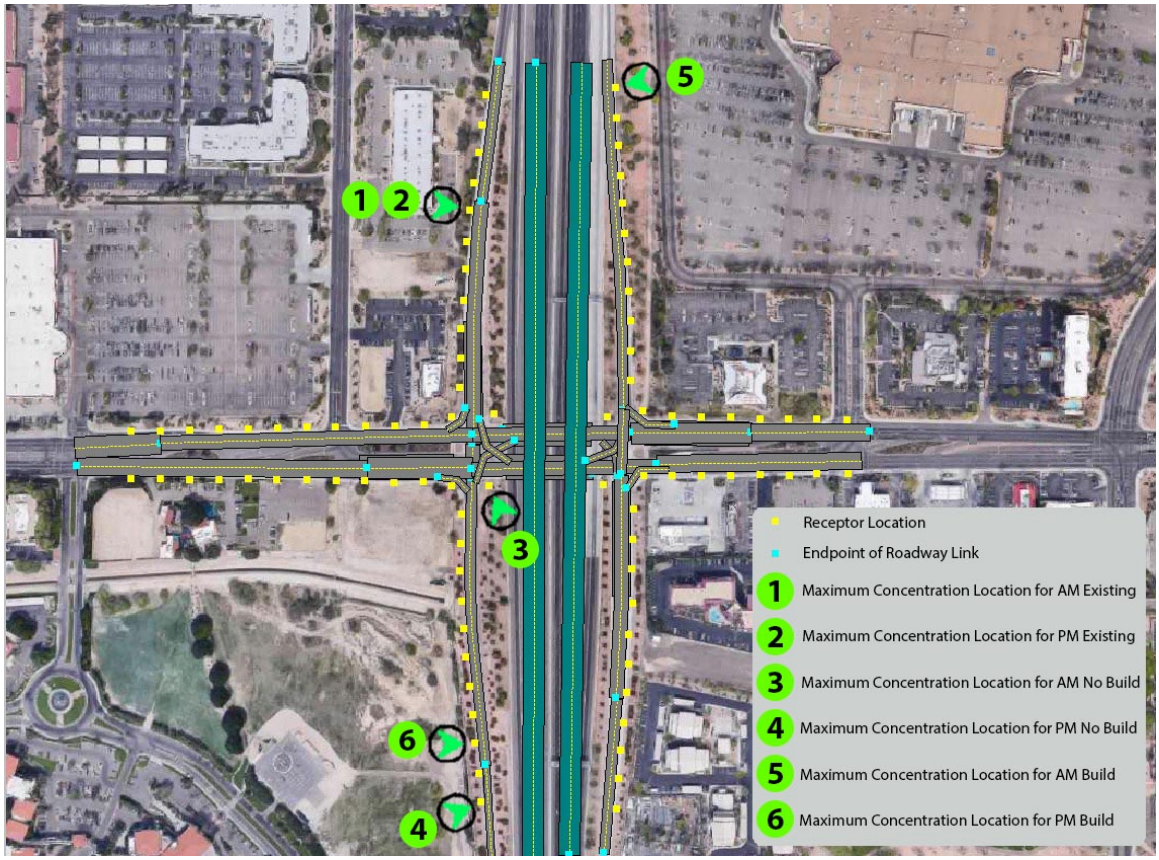


Figure 9. Elliot Road and I-10 EB and WB Modeled Receptors

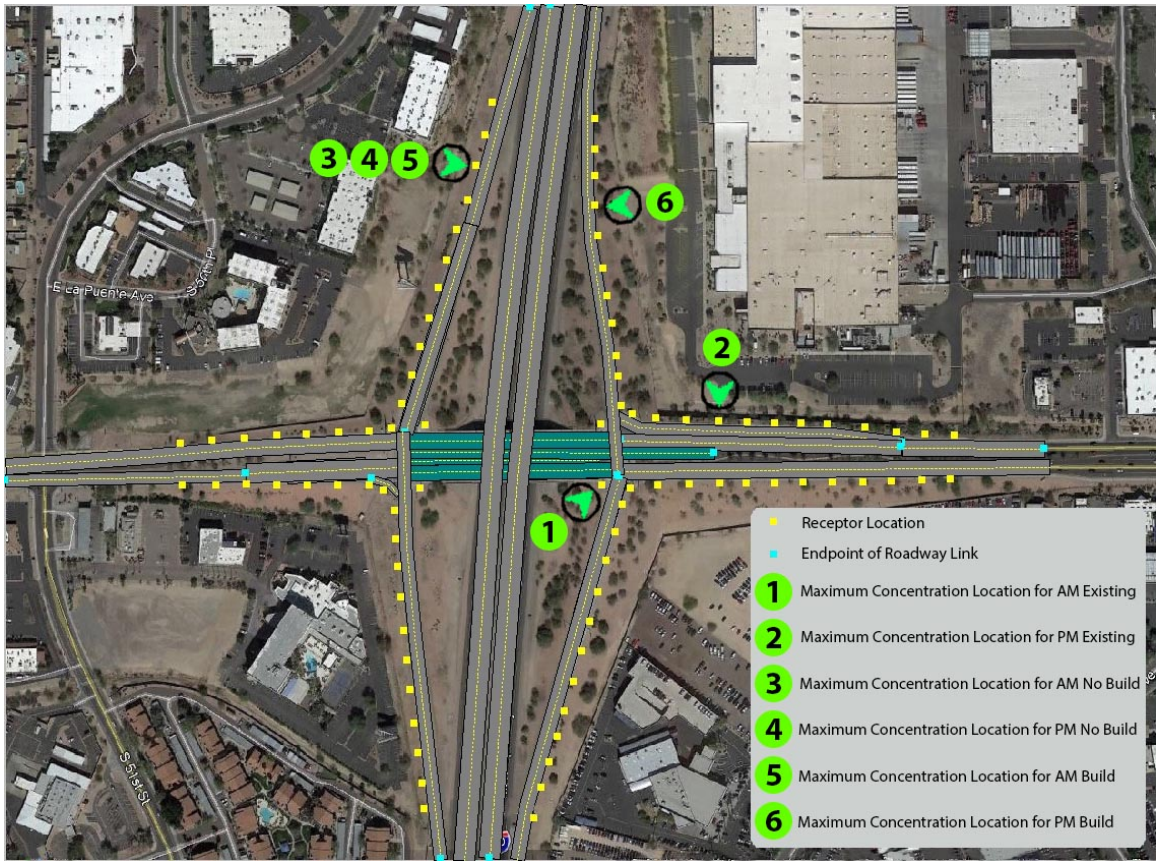


Figure 10. Broadway Road and I-10 WB Modeled Receptors (Existing and No Build Scenarios)

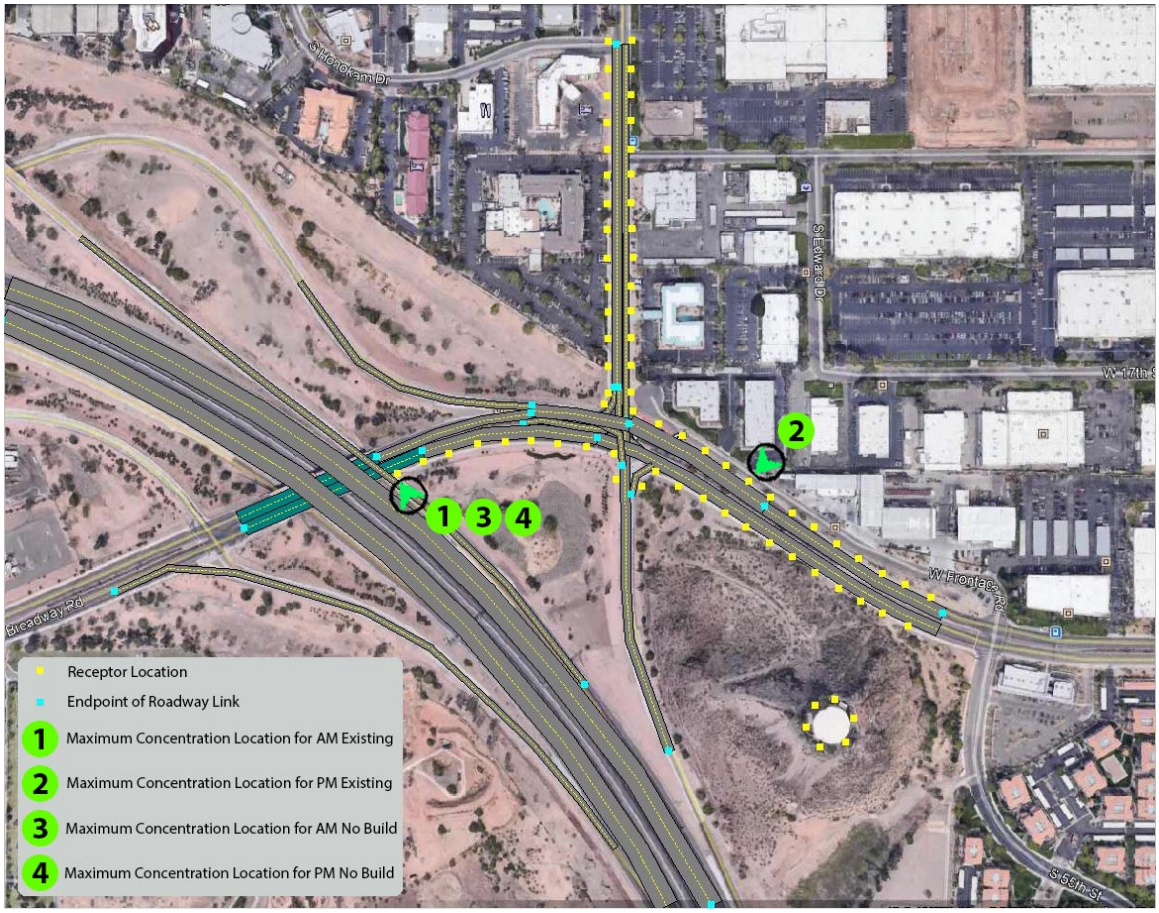
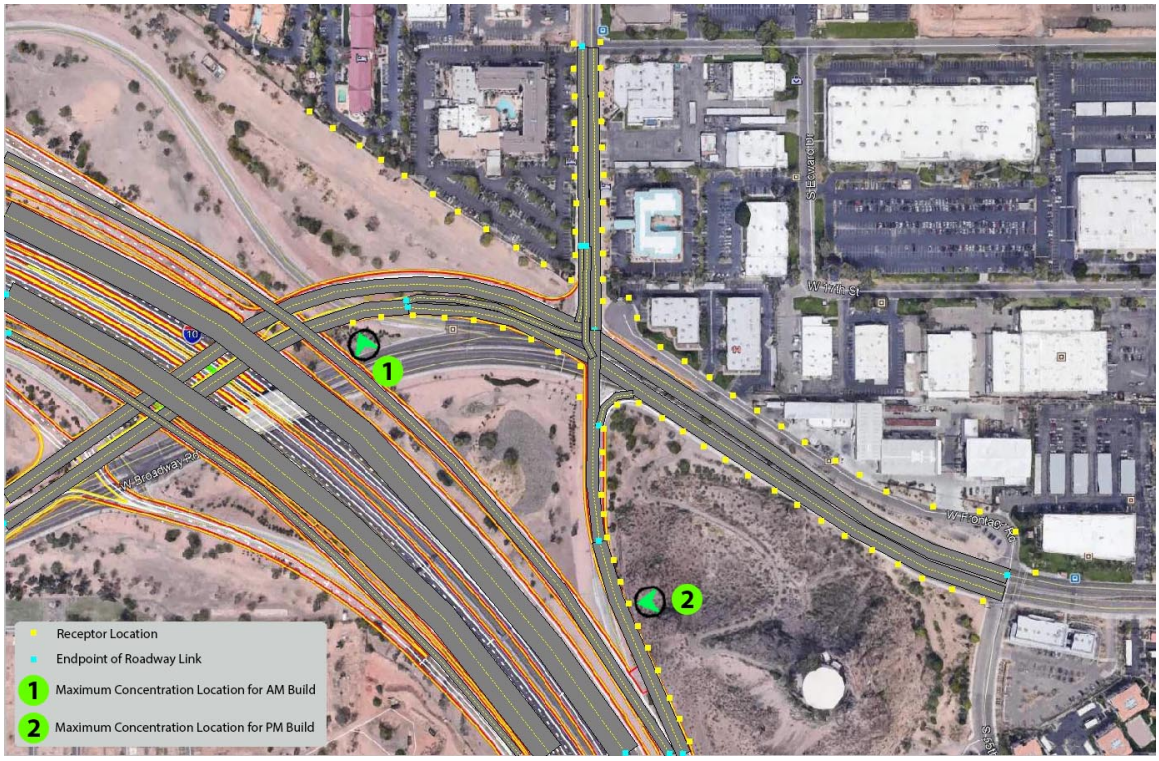


Figure 11. Broadway Road and I-10 WB Modeled Receptors (Build Scenario)



5.1.4 Project-Level Conformity

The CO hot-spot analysis demonstrates that the project is not expected to cause or contribute to an exceedance of the NAAQS. Documentation of the interagency consultation process in included in Appendix A, including specific modeling details and assumptions.

5.2 PM_{10} HOT-SPOT ANALYSIS

The study area is currently classified as a PM_{10} nonattainment area. As such, it was necessary to determine if the project is one of air quality concern, as detailed in EPA's Transportation Conformity Guidance for Quantitative Hot-Spot Analysis in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas (EPA 2015).

Project types in 40 CFR 93.123(b) requiring a quantitative analysis of local particulate emissions (hot-spots) in non-attainment or maintenance areas 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 LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS 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 PM_{10} 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 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 of severity of any existing violations, or delay the timely attainment of any National Ambient Air Quality Standards or any required emission reductions or milestones in any nonattainment or maintenance area.

Although the proposed project is an expanded highway project, it would not result in a significant increase in the number of diesel vehicles. The traffic volume projections presented in the Traffic Operations Report (WSP 2019, Appendix E) do not show an increase in the percentage of truck traffic along the corridor as a result of the project.

The difference in truck volumes at the intersections between the Build alternative and the No Build alternatve is very low. The project is expected to have minimal impacts to trucks at the intersection as shown in Table 7. The AADT and truck percentages for the Build alternative were compared to the No Build alternative at multiple locations along the project corridor, as summarized in Table 8. The truck volumes increase similarly to the total volumes, and the average percentage of trucks increases by <1% at all locations in the project area. Therefore, the increase in number of diesel vehicles due to the project is not considered significant.

This is not a project that affects a congested intersection of LOS D or will change LOS to D or greater due to a significant increase in the number of diesel trucks. The intersection operation analysis shows 17 intersections have a LOS of D, E, or F under Build conditions, but none of these intersections shows any significant increase of diesel truck volumes affecting the LOS status as addressed above.

Based on the criteria, ADOT recommended that this project is not a project of air quality concern. This recommendation was agreed upon during interagency consultation, and the project does not require a PM_{10} quantitative analysis, as documented in Appendix A.

Table 7. Truck Changes between Build and NoBuild at Intersections

#	Intersection	Existing		2040 NoBuild		2040 Build		*Build - NoBuild Difference*	
		AM Truck Volume	PM Truck Volume	AM Truck Volume	PM Truck Volume	AM Truck Volume	PM Truck Volume	*AM Truck Volume*	*PM Truck Volume*
1	32nd Street & I-10 EB	424	441	449	501	497	555	*48*	*54*
2	32nd Street & I-10 WB	341	573	377	411	392	430	*16*	*19*
3	40th Street & I-10 EB	357	567	459	474	487	507	*28*	*32*
4	40th Street & I-10 WB	293	479	355	381	387	411	*33*	*30*
5	48th Street & I-10 EB	377	579	0	0	0	0	*0*	*0*
6	Broadway Road & 48th Street	497	504	428	448	486	506	*57*	*58*
7	Broadway Road & I-10 EB	363	545	396	385	272	315	*-124*	*-71*
8	Broadway Road & I-10 WB / 52nd Street	521	730	529	559	474	576	*-56*	*17*
9	University Drive & SR 143	0	0	412	461	443	425	*32*	*-36*
10	Baseline Road & I-10 EB	251	451	325	465	343	380	*18*	*-86*
11	Baseline Road & I-10 WB	288	442	284	320	361	389	*77*	*69*
12	Elliot Road & I-10 EB	365	528	352	239	312	289	*-41*	*50*
13	Elliot Road & I-10 WB	351	614	424	414	302	345	*-122*	*-69*
14	Warner Road & I-10 EB	110	140	111	311	108	140	*-3*	*-170*
15	Warner Road & I-10 WB	158	157	130	105	137	186	*7*	*81*
16	Priest Drive & US 60 EB	227	378	269	142	260	243	*-9*	*101*
17	Priest Drive & US 60 WB	289	335	288	330	317	320	*29*	*-9*
18	Ray Road & I-10 EB	206	227	183	211	195	229	*12*	*18*
19	Ray Road & I-10 WB	186	283	231	231	247	252	*16*	*20*

Source: I-10: I-17 (Split) to Loop 202 (Santan Freeway) Traffic Operations Analysis, WSP 2019, Appendix E

Table 8. AADT and Truck Percentage Mainline

Link Endpoints		Scenario	Total AADT	% Truck	Truck AADT	Increase Truck	Increase % Truck
I-17 Split	32nd Street	2018 Existing	305,620	15%	46,833		
		2040 NoBuild	330,390	14%	46,010	4,109	<1%
		2040 Build	363,328	14%	50,119		
32nd Street	40th Street	2018 Existing	291,875	15%	42,432		
		2040 NoBuild	308,441	13%	40,934	4,763	<1%
		2040 Build	349,667	13%	45,697		
40th Street	48th Street / SR143	2018 Existing	293,240	14%	42,306		
		2040 NoBuild	305,066	13%	40,443	5,168	<1%
		2040 Build	350,142	13%	45,611		
48th Street / SR143	Broadway Road	2018 Existing	305,117	13%	40,684		
		2040 NoBuild	261,952	14%	36,050	4,739	-1%
		2040 Build	324,027	13%	40,789		
Broadway Road	US60	2018 Existing	337,194	13%	43,226		
		2040 NoBuild	338,349	12%	41,362	1,839	<1%
		2040 Build	348,034	12%	43,201		
US60	Baseline Road	2018 Existing	204,891	14%	28,996		
		2040 NoBuild	199,269	13%	26,007	-3,587	-1%
		2040 Build	191,724	12%	22,420		
Baseline Road	Elliot Road	2018 Existing	250,686	12%	31,254		
		2040 NoBuild	251,317	11%	27,109	1,076	<1%
		2040 Build	256,909	11%	28,185		
Elliot Road	Warner Road	2018 Existing	225,472	12%	26,867		
		2040 NoBuild	223,949	10%	22,578	2,950	<1%
		2040 Build	244,010	10%	25,528		
Warner Road	Ray Road	2018 Existing	209,244	12%	25,532		
		2040 NoBuild	211,281	10%	21,579	2,671	<1%
		2040 Build	231,410	10%	24,250		
		Nobuild			*33,564*		
Average		*Build*			*36,200*	*2,636*	<1%

Source: I-10: I-17 (Split) to Loop 202 (Santan Freeway) Traffic Operations Analysis, WSP 2019

5.3 CONFORMITY DETERMINATION

The project has met conformity requirements because it is included in conforming regional plans, and it is not expected to cause or contribute to an exceedance of the NAAQS.

The project is included in the region's RTP and the 2018-2022 FY TIP, both of which have been found to meet the CO, PM_{10}, and ozone conformity tests as identified by federal

conformity regulations. Therefore, the project has met the requirement of being included in the regional plans, which have been found to conform to the SIP.

A project-level conformity determination was performed by conducting a CO hotspot analysis on affected intersections in the project vicinity. Based on modeling, intersections in the project vicinity currently do not exceed the CO NAAQS and affected intersections would not create any new exceedances of the CO NAAQS. The interagency consultation process was used to determine the CO modeling methodology. Appendix A includes documentation of communications regarding the proposed modeling approach and assumptions.

A PM_{10} project-level hotspot analysis is not required for the project because it is not a project of air quality concern. The interagency consultation process was used to establish concurrence that the project is not a project of air quality concern, as documented in Appendix A. FHWA issued a conformity determination on April 22, 2020.

5.4 MSAT AND GHG NEPA ANALYSIS

5.4.1 Methodology

On February 3, 2006, FHWA released Interim Guidance on Air Toxic Analysis in NEPA Documents (FHWA 2006a). This guidance was superseded on October 18, 2016 by FHWA's Updated Interim Guidance Update on Air Toxic Analysis in NEPA Documents (FHWA 2016). The purpose of FHWA's guidance is to advise on when and how to analyze MSATs in the National Environmental Policy Act (NEPA) environmental review process for highways. This guidance is considered interim, since MSAT science is still evolving. As the science progresses, FHWA will update the guidance.

A quantitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. FHWA's Interim Guidance groups projects into the following tier categories:

1. No analysis for projects without potential for meaningful MSAT effects.
2. Qualitative analysis for projects with low potential MSAT effects.
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

Based on FHWA's recommended tiering approach, the project falls within the Tier 3 approach (i.e., for projects with a high potential for MSAT effects). In accordance with FHWA's guidance, EPA's MOVES2014b was used to calculate annual MSAT emissions for the No-Build Alternative and the Build Alternative.

Draft Guidance from the Council on Environmental Quality recommends that agencies quantify a proposed action's projected direct and reasonably foreseeable indirect GHG emissions when it is practicable to quantify them using available data and tools (CEQ 2019). Based upon consultation with FHWA, it was agreed upon that direct GHG emissions would be calculated using the MSAT study area and methodology. Indirect GHG emissions were not quantified.

5.4.1.1 MSAT Study Area

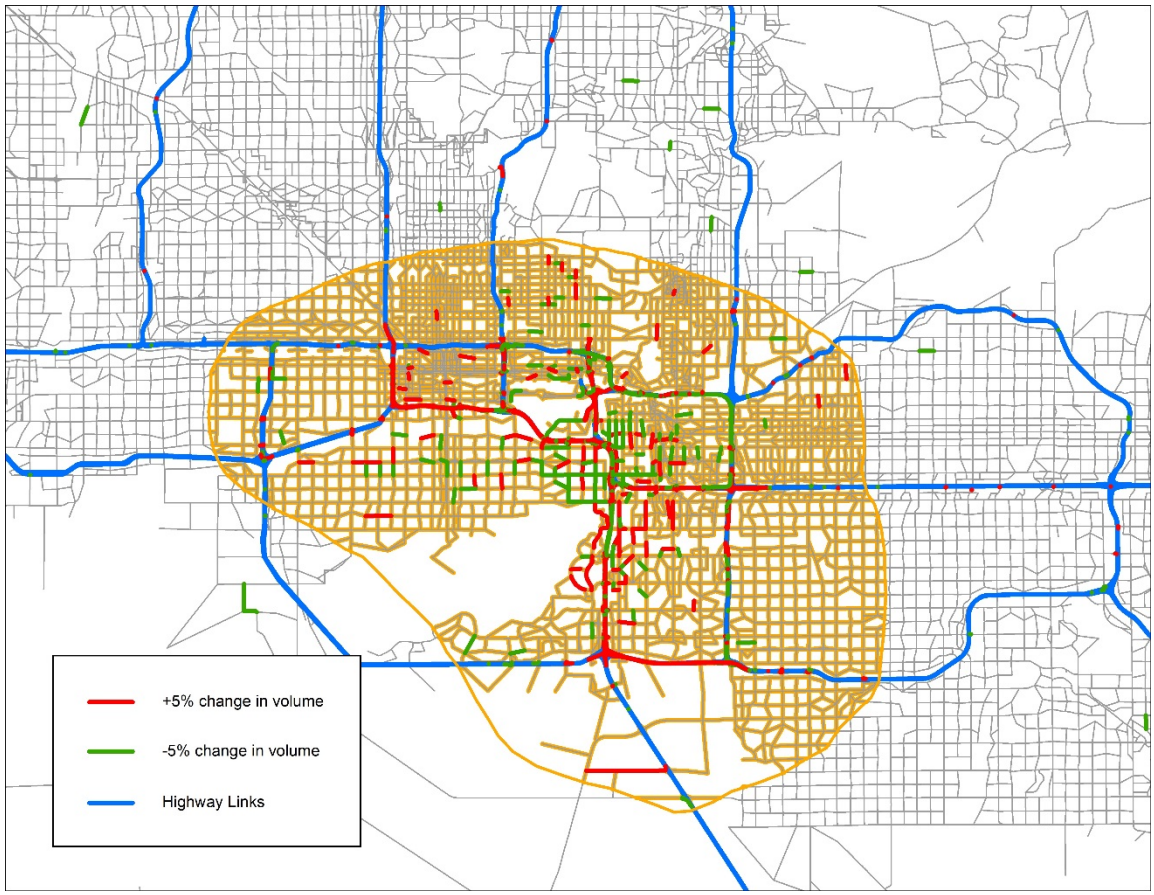
The MSAT study area was refined to focus on the portion of the study area substantially impacted by the project. FHWA recommends analyzing all segments associated with the project, plus those segments expecting meaningful changes in emissions because of the project (e.g., ± 5 percent or more).

The affected network was defined based on available project-specific information considering changes in such metrics as:

- ± 5 percent or more change in annual average daily traffic (AADT) on congested highway links
- Links with 50 or more vehicles AADT
- Project-specific knowledge and consideration of local circumstances

The study area was refined by conducting a comparison between the No-Build and Build traffic volumes for all links in the regional model. Using the recommendations described above, along with a level of judgment and local knowledge, a roadway network within a defined boundary, as shown in Figure 12, was developed. The analysis was performed using the links designated as red and green within the yellow area only.

Figure 12. Roadway Network Used to Calculate Total MSAT Emissions



Note: analysis included red and green links within the yellow boundary only

By conducting this study area screening analysis, the affected network was sized to include the project itself, nearby roadways that show meaningful changes in traffic, potential diversion routes, and the roadways in between that create a continuous network. The same affected network area was used to compute the emission burdens under all tested scenarios, including Existing Conditions and the No-Build Alternative. This allows for a "like-to-like" comparison of the total VMT and resulting pollutant emission burdens.

The project area includes major capacity-adding projects that are planned to be in operation by the analysis year 2040, under both No-Build and Build conditions. Most notably, various projects on I-10 and SR 30 will add many new links to the existing roadway network. As such, when directly comparing the pollutant burdens associated with the existing (2018) and analysis year (2040) networks, the additional VMT generated by these new projects and roadway links in 2040 should be considered.

5.4.1.2 MOVES2014b

EPA's Motor Vehicle Emissions Simulator (MOVES) model version MOVES2014b was used to estimate emissions from the MSAT network. MOVES input files were provided by MAG, consistent with their regional emissions analysis. MAG data was used to represent regional conditions, and link-by-link traffic data was used to develop project-specific input files to demonstrate the effects of the project for each scenario analyzed: 2018, 2040 No-Build, and 2040 Build. Specific MOVES inputs are described in Table 9 and Table 9.

Table 9. MOVES RunSpec Options

MOVES Tab	Model Selections
Scale	County scale Inventory calculation type
Time Span	Hourly time aggregation including all months, days, and hours
Geographic Bounds	Maricopa County
Vehicles/Equipment	All on-road vehicle and fuel type combinations
Road Type	All road types were selected, but not all were used for some scenarios
Pollutants and Processes	All MSAT pollutants and their precursors were selected Processes included running exhaust and crankcase running exhaust
Output	Output was produced by fuel type to differentiate diesel PM from PM produced by other fuel types

Table 10. MOVES County Data Manager Inputs

County Data Manager Tab	Data Source
Ramp Fraction	MAG
Source Type Population	MAG
Age Distribution	MAG
Fuel	MAG
Meteorology Data	MAG
Vehicle Type VMT	Created from project daily traffic data
Average Speed Distribution	Created from project daily traffic data
Road Type Distribution	Created from project daily traffic data

MOVES was used to estimate the total emissions from the MSAT network for each scenario. The VMT, emissions of each MSAT pollutant, and GHG emissions were presented in a table and compared with the existing and No-Build scenarios. MSAT emissions were calculated for the following MSATs, as required by FHWA:

- 1,3 Butadiene
- Acetaldehyde
- Acrolein
- Benzene
- Diesel PM
- Ethylbenzene
- Formaldehyde
- Naphthalene
- Polycyclic Organic Matter (POM)

GHG emissions are expressed in terms of carbon dioxide equivalent (CO_2e). MOVES derives CO_2e from the global warming potential of atmospheric carbon dioxide, methane, and nitrous oxide.

MSAT analyses are intended to capture the net change in emissions within an affected environment, defined as the transportation network affected by the project. The affected environment for MSATs may be different than the affected environment defined in the NEPA document for other environmental effects, such as noise or wetlands. Analyzing MSATs only within a geographically-defined "study area" will not capture the emissions effects of changes in traffic on roadways outside of that area, which is particularly important where the project creates an alternative route or diverts traffic from one roadway class to another. At the other extreme, analyzing a metropolitan area's entire roadway network will result in emissions estimates for many roadway links not affected by the project, diluting the results of the analysis.

5.4.2 Analysis

The results of this analysis for the existing conditions (2018) and design year (2040) are shown in Table 7. In the design year, regional MSAT and GHG emissions would be substantially lower under both No-Build and Build conditions, when compared to

Existing MSAT emissions. Build MSAT burdens would be 0 percent to 3 percent lower than No-Build emissions in the year 2040. Build GHG burdens would be approximately 3 percent lower than No-Build burdens in the year 2040.

Table 11. 2040 Predicted MSAT and GHG Emissions (tons/year)

Pollutant	Existing 2018	2040 No-Build Alternative		2040 Build Alternative		
		Value	% Change from Existing	Value	% Change from Existing	% Change from No-Build
MSAT Study Area Annual VMT	2,070,158,477	2,210,136,442	7%	2,188,673,958	6%	-1%
1,3-Butadiene	29.60	7.845	-73%	7.844	-73%	0%
Acetaldehyde	84.95	25.39	-70%	25.29	-70%	0%
Acrolein	5.05	1.52	-70%	1.50	-70%	-1%
Benzene	201.76	51.84	-74%	51.81	-74%	0%
Diesel Particulate Matter	52.96	6.21	-88%	6.01	-89%	-3%
Ethylbenzene	92.77	20.41	-78%	20.40	-78%	0%
Formaldehyde	68.34	17.41	-75%	17.09	-75%	-2%
Naphthalene	11.98	3.12	-74%	3.10	-74%	-1%
Polycyclic Organic Matter	4.21	0.97	-77%	0.97	-77%	0%
Total MSATs	551.61	134.72	-73%	134.00	-73%	-1%
CO_2e	1,876,505	1,434,673	-24%	1,395,626	-26%	-3%

In summary, it is projected that there would be changes in MSAT emissions in the immediate area of the project under the Build Alternative relative to the No-Build Alternative, as a result of the VMT changes associated with the project. MSAT levels could be higher in some locations than others, such as adjacent to the I-10 mainline, but current tools and science are not adequate to quantify them.

This document has provided a quantitative analysis of MSAT emissions relative to the proposed project and has acknowledged that the alternatives could increase exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain. However, available technical tools do not enable prediction of project-specific health impacts of the emission changes associated with the alternatives. Because of these limitations, the following discussion is included in accordance with the President's Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22[b]) regarding incomplete or unavailable information.

5.4.3 Information That Is Unavailable or Incomplete

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed

set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation than by any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects"[1]. Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). A number of HEI studies are summarized in Appendix D of FHWA's Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations[2] or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

[1] EPA, https://www.epa.gov/iris/
[2] HEI Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI3. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA states that with respect to diesel engine exhaust, "[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk." [4]

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA, as provided by the Clean Air Act, to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.[5]

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

[3] Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects
[4] EPA IRIS database, Diesel Engine Exhaust, Section II.C. https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0642.htm#quainhal
[5] https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/$file/07-1053-1120274.pdf

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APPENDIX A: INTERAGENCY CONSULTATION

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

Project Setting and Description

The Arizona Department of Transportation (ADOT), pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated April 16, 2019 and executed by FHWA and ADOT (84 FR 26503), is preparing an Environmental Assessment (EA) of the proposed improvements to a segment of Interstate 10 (I-10) from the I-10/I-17 (Split) Traffic Interchange (TI) (Milepost [MP] 149.5) to the Loop 202 (SR202L) Santan Freeway (MP 160.9). The proposed project would widen existing I-10 to the outside between 24th Street and Ray Road.

The existing Salt River bridge would be widened to accommodate 7 general purpose (GP) lanes and 2 high-occupancy vehicle (HOV) lanes to 32nd Street. The west end of the bridge would flare to accommodate proposed future reconstruction of the I-10/I-17 system interchange. Between 32nd Street and the I-10 system interchange with US60, I-10 would have a basic 6 GP lane and 2 HOV lane typical section, with auxiliary (AUX) lanes added between interchanges and at collector-distributor (CD) roadway connections. South of Baseline Road, two GP lanes would be added in the eastbound direction to Elliot Road (6 GP lanes and 1 HOV lane) and one GP lane in the westbound (5 GP lanes and 1 HOV lane). Between Elliot Road and Ray Road, one GP lane would be added in each direction (4 GP lanes and 1 HOV lane). HOV buffers would be eliminated throughout the project length.

The SR143, Broadway Road, and 48th Street interchanges would be reconstructed and connected to new CD roads. The eastbound CD road would begin as the direct connection from southbound SR143 to eastbound I-10 with the addition of the Broadway Road eastbound on-ramp and extending to Baseline Road, providing access to US60, I-10, and Baseline Road. The westbound CD road would run between Baseline Road and 40th Street, providing access to Broadway Road, SR143, 48th Street north, University Drive, and 40th Street. A direct HOV connection between SR143 and I-10 to and from the east would also be added.

Access to I-10 eastbound from 24th, 32nd, and 40th Streets would be maintained. SR143 southbound and the Broadway Road on-ramp would access I-10 eastbound via the proposed eastbound CD road. Traffic from University Drive would no longer access I-10 eastbound via SR143, but would continue south on 48th Street to eastbound Broadway Road to access I-10 eastbound as described above. University Drive traffic could also access I-10 eastbound from the 40th Street and 32nd Street TIs.

Baseline Road and SR143 southbound would access I-10 westbound via the proposed westbound CD road. A new ramp from US60 westbound would also connect directly to the westbound CD road. On ramps from 40th Street and Broadway Road westbound would provide direct access to I-10 westbound.

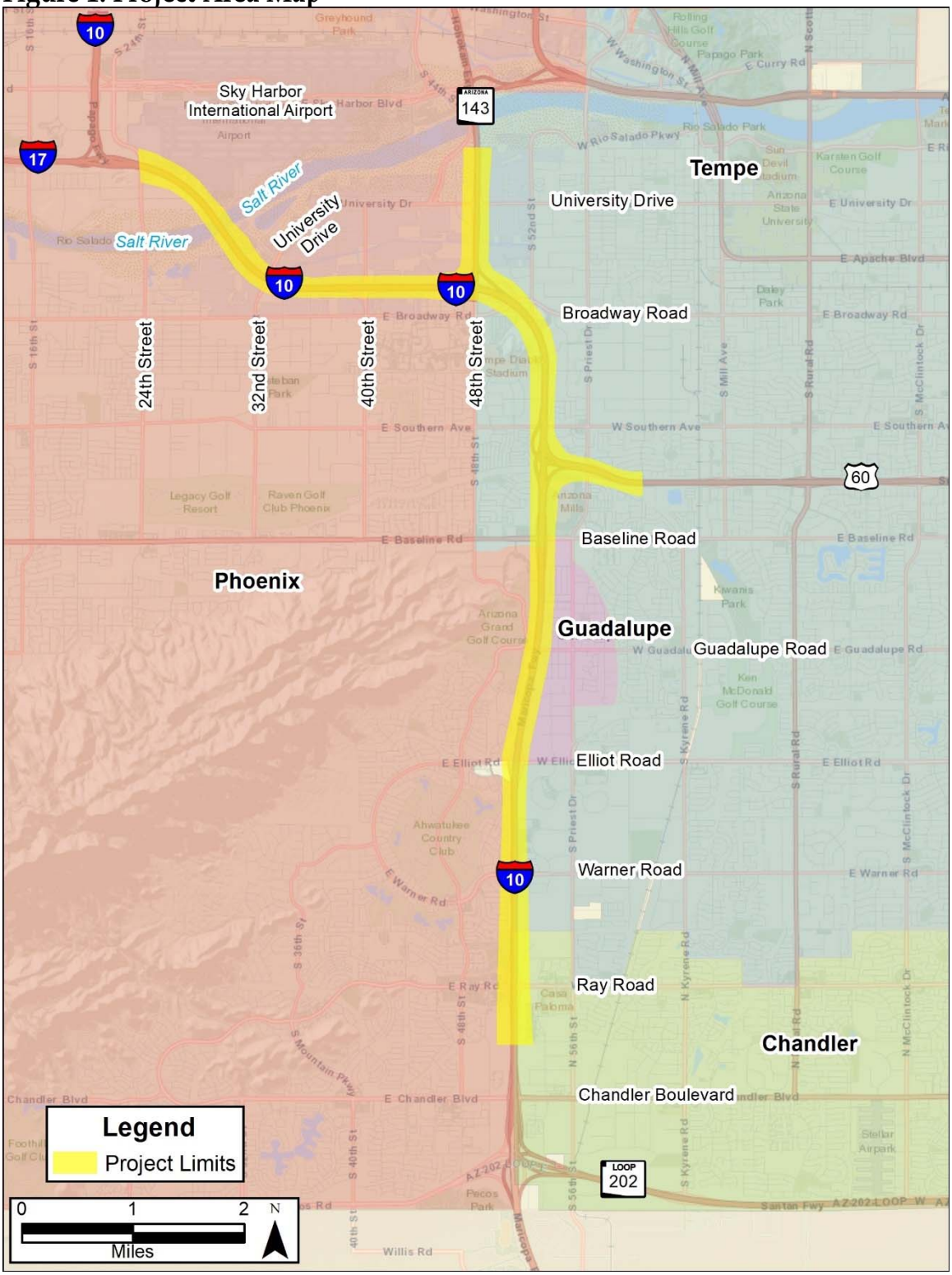
The interchanges at 40th Street and US60 would be modified. The existing loop on-ramp from 40th Street southbound to I-10 eastbound would be eliminated, and the I-10 eastbound off-ramp

to 40th Street relocated. In addition, the I-10 westbound to US60 eastbound ramp would be widened.

The goal of this proposed project is to increase the capacity of the I-10 corridor in accordance with the approved regional and local transportation plans. This project would also seek to optimize the traffic operations within the corridor for the projected Design Year 2040 traffic demand, to retain local access at existing traffic interchanges, and to minimize or mitigate impacts the improvements could have on the surrounding community. The proposed project is included in the Maricopa Association of Governments (MAG) 2040 Regional Transportation Plan (RTP). Project construction is currently planned to begin the summer of 2021, with an expected duration of 36 months.

The project is within the Phoenix carbon monoxide (CO) maintenance area. The latest conformity determination for the FY 2018-2022 MAG Transportation Improvement Program and 2040 MAG Regional Transportation Plan for the area was made by the Federal Highway Administration and Federal Transit Administration on February 7, 2019.

Figure 1. Project Area Map



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 non-attainment 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 PM_{10} 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 of 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 *PM2.5 and PM10 Hot-Spot Analyses in Project-Level Transportation Conformity Determinations for the New PM2.5 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 ≥125,000 annual average daily traffic (AADT) and truck volumes ≥10,000 diesel trucks per day (8% of total traffic).

NO - This project is not a new highway project.

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.*

NO - This is an expanded highway project, but there is not a significant increase in the number of diesel vehicles. The Maricopa Association of Governments (MAG) travel demand model estimates that the percentage of truck traffic along the corridor will not increase as a result of the project. The AADT and truck percent for the build alternative were compared to the no build alternative at four locations along the project corridor, as summarized in Table 1. The percent change in medium and heavy trucks ranges from a decrease of 3.98% to an increase of 1.35% with an average increase of 0.15%, and the total increase in medium and heavy trucks ranging from 3,260-8,734 with an average total of 5,568 medium and heavy trucks.

Table 1. AADT and Truck Percentage

		Scenario	Total AADT	% Truck	Truck AADT	Increase Truck	% Increase
I-17 Split	32nd Street	2018 Existing	305,620	14%	43,612		
		2040 No Build	330,389	13%	43,266	5,206	0.59%
		2040 Build	354,222	14%	48,472		
32nd Street	40th Street	2018 Existing	291,876	13%	38,581		
		2040 No Build	308,441	12%	38,104	5,894	0.82%
		2040 Build	333,906	13%	43,998		
40th Street	48th Street / SR143	2018 Existing	293,240	13%	38,381		
		2040 No Build	305,066	12%	36,783	6,972	0.24%
		2040 Build	355,762	12%	43,755		
48th Street / SR143	Broadway Road	2018 Existing	305,118	12%	36,286		
		2040 No Build	302,763	10%	30,647	8,734	0.48%
		2040 Build	371,398	11%	39,381		
Broadway Road	US60	2018 Existing	337,193	11%	38,767		
		2040 No Build	338,350	11%	36,120	3,260	-0.33%
		2040 Build	380,571	10%	39,380		
US60	Baseline Road	2018 Existing	152,396	15%	23,368		
		2040 No Build	147,191	13%	19,394	3,593	-3.98%
		2040 Build	250,001	9%	22,987		
Baseline Road	Elliot Road	2018 Existing	250,686	11%	27,860		
		2040 No Build	251,317	10%	24,112	5,729	1.02%
		2040 Build	281,067	11%	29,841		
Elliot Road	Warner Road	2018 Existing	225,472	10%	23,375		
		2040 No Build	223,949	9%	19,366	5,375	1.35%
		2040 Build	247,464	10%	24,741		
Warner Road	Ray Road	2018 Existing	209,244	11%	22,562		
		2040 Build	211,282	9%	18,507	5,347	1.19%
		2040 No Build	239,690	10%	23,854		
	Average				*32,426*	*5,568*	*0.15%*

Source: I-10: I-17 (Split) to Loop 202 (Santan Freeway) Traffic Operations Analysis, WSP 2019

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 increase traffic volumes for significant number of diesel trucks related to the project?

NO - This is not a project that affects a congested intersection of LOS D or will change LOS to D or greater which has a significant number of diesel trucks. The intersection operation analysis shows 17 intersections have a LOS of D, E, or F, and none of these intersections has a significant number of diesel trucks (Table 2), there is a slight decrease in the number of trucks in the AM peak with two intersections showing improvement in LOS in both AM and PM peak, overall the LOS isn't impacted by this project.

Table 2. 2040 LOS and Traffic Volumes

	Existing						2040 No Build						2040 Build					
	AM			PM			AM			PM			AM			PM		
Intersection	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume
32nd Street & I-10 EB	D	40.1	4236	D	48.5	4410	E	61.6	4991	E	63.4	5014	F	82.8	5522	F	86.5	5554
32nd Street & I-10 WB	C	25.3	3098	E	56.1	4091	D	45	3768	E	69.2	4565	D	37.5	3923	F	110.9	4778
40th Street & I-10 EB	C	28.9	3245	C	22.5	3150	C	32.5	4171	C	32.6	3649	D	51.3	4429	E	64.5	4607
40th Street & I-10 WB	D	38.4	3250	E	58.5	3419	D	47.8	3545	E	57.6	3808	F	93.4	3873	F	110.7	4108
48th Street & I-10 EB	D	54.2	4186	D	36.4	4454	-	-	-	-	-	-	-	-	-	-	-	-
Broadway Road & 48th Street	D	54.5	5519	F	112.3	6295	D	48.8	5353	F	85.3	5604	D	54.1	5395	F	81.2	5059
Broadway Road & I-10 EB	D	50.7	3631	F	175.2	4540	E	68.7	3962	F	166.8	4818	C	22.8	3406	D	43.7	3497
Broadway Road & I-10 WB / 52nd Street	E	56.2	5211	D	43.4	5213	F	81	5881	F	126.8	6213	E	60	5262	F	262.3	5764
University Drive & SR 143	C	25.3	6093	F	82.9	6698	D	41.6	6861	F	167.5	7691	C	25.1	6331	E	58.7	7090
Baseline Road & I-10 EB	E	59.4	6279	F	126.4	7519	F	106.9	6495	F	182.2	7757	F	94.4	6850	F	155.6	7590
Baseline Road & I-10 WB	D	53.9	5755	E	66.7	6313	E	71.1	5683	E	79.3	6406	F	81	6018	E	68.4	6481
Elliot Road & I-10 EB	E	73.5	4052	E	71.4	4397	F	62.1	4403	E	183.5	4779	F	148.7	6232	F	367.9	7226
Elliot Road & I-10 WB	F	172.6	3905	E	66.2	4387	F	106.6	4712	E	65	5180	F	285.3	7541	F	222.7	6901
Warner Road & I-10 EB	C	32.3	2754	F	86.4	3490	C	30.2	2772	F	103.5	3450	C	30.7	2706	F	150.7	3504
Warner Road & I-10 WB	E	55.4	3160	C	24.5	3132	F	121.4	3259	D	40	3492	F	88.6	3423	F	87.4	3711
Priest Drive & US 60 EB	D	48.2	2518	D	36.9	3776	D	47.4	2444	D	36.5	3542	D	39.4	2601	C	34.5	3473
Priest Drive & US 60 WB	C	27.1	3617	C	25.7	4191	C	28	3599	C	23.7	4119	C	23.9	3517	C	22.8	4002
Ray Road & I-10 EB	C	31.6	5148	D	49.7	5677	C	33.1	4576	C	32.5	5270	D	38.9	4874	D	38	5725
Ray Road & I-10 WB	D	44.5	4658	D	46.6	4713	D	44.7	4625	D	38.4	4626	E	59.8	4947	D	42.4	5031

Source: MAG Travel Demand Model (TR #1967)

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 – These facilities are not included in the project.

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 – These facilities are not included in the project.

Projects Affecting PM Sites of Violation or Possible Violation

Does the project affect locations, areas or categories of sites that are identified in the PM_{10} or $PM_{2.5}$ applicable plan or implementation plan submissions, as appropriate, as sites of violation or potential violation?

NO –Twenty-one PM_{10} monitoring stations are located in Maricopa County, four of which are located within five miles of the project footprint. None of these intersections are specifically identified in applicable plans as sites of violation potential violation.

Within the Maricopa County nonattainment area, the National Ambient Air Quality Standard has not yet been attained for PM_{10} particulate pollution. The area is classified as a Serious Area under the Clean Air Act. Consequently, the MAG 2012 Five Percent Plan for PM_{10} has been prepared to meet the requirements in Section 189(d) of the Clean Air Act and improve air quality in the Maricopa County nonattainment area. The plan is required to reduce PM_{10} emissions by at least five percent per year until the standard is attained as measured by the monitors. The plan presents a variety of control measures and projects that have been implemented to reduce PM_{10}. The plan does not identify specific locations or monitors as sites of potential violation.

POAQC Determination

The Traffic Operations Analysis does not show a significant increase in diesel truck traffic volume due to the Project. Therefore, ADOT is recommending that this project is not a project of air quality concern and does not require a PM10 quantitative analysis.

Interagency Consultation Results

On June 6th, 2019 ADOT provided a copy of this questionnaire, to the following consultation parties, EPA, FHWA, MAG, Arizona Department of Environmental Quality (ADEQ), and Maricopa County Air Quality Department as the local air agencies in Maricopa County. There were no objections to the project determination and on June 20th, 2019 ADOT concluded Interagency Consultation by notifying interested parties that this project will proceed as a project that does not require a quantitative PM10 hot-spot analysis under 40CFR 93.123(b).

Project Level CO Hot-Spot Analysis Questionnaire

Project Setting and Description

The Arizona Department of Transportation (ADOT), pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated April 16, 2019 and executed by FHWA and ADOT (84 FR 26503), is preparing an Environmental Assessment (EA) of the proposed improvements to a segment of Interstate 10 (I-10) from the I-10/I-17 (Split) Traffic Interchange (TI) (Milepost [MP] 149.5) to the Loop 202 (SR202L) Santan Freeway (MP 160.9). The proposed project would widen existing I-10 to the outside between 24th Street and Ray Road.

The existing Salt River bridge would be widened to accommodate 7 general purpose (GP) lanes and 2 high-occupancy vehicle (HOV) lanes to 32nd Street. The west end of the bridge would flare to accommodate proposed future reconstruction of the I-10/I-17 system interchange. Between 32nd Street and the I-10 system interchange with US60, I-10 would have a basic 6 GP lane and 2 HOV lane typical section, with auxiliary (AUX) lanes added between interchanges and at collector-distributor (CD) roadway connections. South of Baseline Road, two GP lanes would be added in the eastbound direction to Elliot Road (6 GP lanes and 1 HOV lane) and one GP lane in the westbound (5 GP lanes and 1 HOV lane). Between Elliot Road and Ray Road, one GP lane would be added in each direction (4 GP lanes and 1 HOV lane). HOV buffers would be eliminated throughout the project length.

The SR143, Broadway Road, and 48th Street interchanges would be reconstructed and connected to new CD roads. The eastbound CD road would begin as the direct connection from southbound SR143 to eastbound I-10 with the addition of the Broadway Road eastbound on-ramp and extending to Baseline Road, providing access to US60, I-10, and Baseline Road. The westbound CD road would run between Baseline Road and 40th Street, providing access to Broadway Road, SR143, 48th Street north, University Drive, and 40th Street. A direct HOV connection between SR143 and I-10 to and from the east would also be added.

Access to I-10 eastbound from 24th, 32nd, and 40th Streets would be maintained. SR143 southbound and the Broadway Road on-ramp would access I-10 eastbound via the proposed eastbound CD road. Traffic from University Drive would no longer access I-10 eastbound via SR143, but would continue south on 48th Street to eastbound Broadway Road to access I-10 eastbound as described above. University Drive traffic could also access I-10 eastbound from the 40th Street and 32nd Street TIs.

Baseline Road and SR143 southbound would access I-10 westbound via the proposed westbound CD road. A new ramp from US60 westbound would also connect directly to the westbound CD road. On ramps from 40th Street and Broadway Road westbound would provide direct access to I-10 westbound.

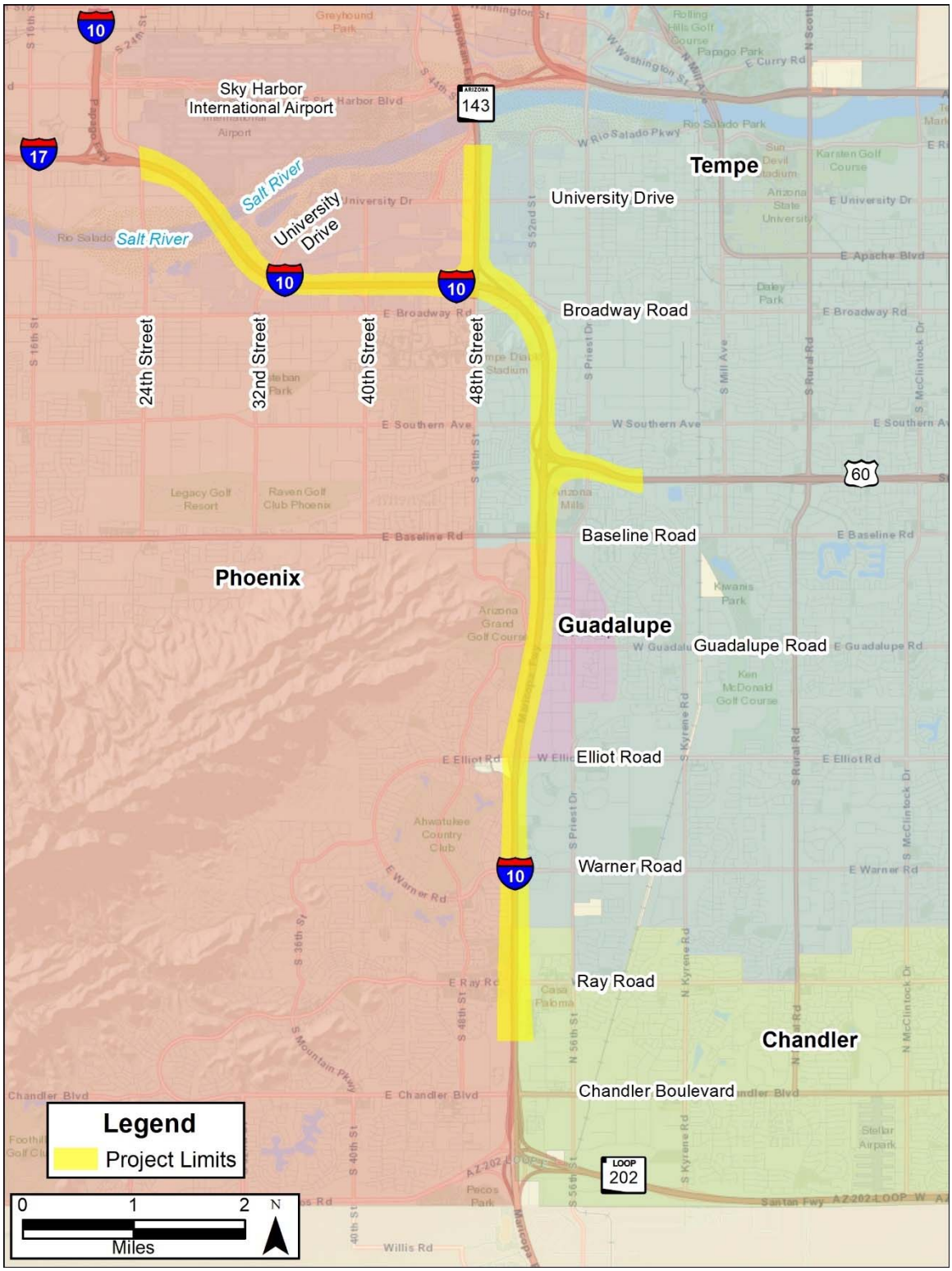
The interchanges at 40th Street and US60 would be modified. The existing loop on-ramp from 40th Street southbound to I-10 eastbound would be eliminated, and the I-10 eastbound

off-ramp to 40th Street relocated. In addition, the I-10 westbound to US60 eastbound ramp would be widened.

The goal of this proposed project is to increase the capacity of the I-10 corridor in accordance with the approved regional and local transportation plans. This project would also seek to optimize the traffic operations within the corridor for the projected Design Year 2040 traffic demand, to retain local access at existing traffic interchanges, and to minimize or mitigate impacts the improvements could have on the surrounding community. The proposed project is included in the Maricopa Association of Governments (MAG) 2040 Regional Transportation Plan (RTP). Project construction is currently planned to begin the summer of 2021, with an expected duration of 36 months.

The project is within the Phoenix carbon monoxide (CO) maintenance area. The latest conformity determination for the FY 2018-2022 MAG Transportation Improvement Program and 2040 MAG Regional Transportation Plan for the area was made by the Federal Highway Administration and Federal Transit Administration on February 7, 2019.

Figure 1. Project Area Map



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).

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. This project does not affect locations, areas or categories of sites that are identified in the MAG 2013 Carbon Monoxide Maintenance Plan for Maricopa County as sites of violation or potential violation.

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. In the project area, fifteen intersections are projected to operate at LOS D or worse in the 2040 no build scenario, and seventeen intersections are projected to operate at LOS D or worse in the 2040 build scenario (Table 1).

Table 1. 2040 LOS and Traffic Volumes

	Existing						2040 No Build						2040 Build					
	AM			PM			AM			PM			AM			PM		
Intersection	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume	LOS	Delay	Volume
32nd Street & I-10 EB	D	40.1	4236	D	48.5	4410	E	61.6	4991	E	63.4	5014	F	82.8	5522	F	86.5	5554
32nd Street & I-10 WB	C	25.3	3098	E	56.1	4091	D	45	3768	E	69.2	4565	D	37.5	3923	F	110.9	4778
40th Street & I-10 EB	C	28.9	3245	C	22.5	3150	C	32.5	4171	C	32.6	3649	D	51.3	4429	E	64.5	4607
40th Street & I-10 WB	D	38.4	3250	E	58.5	3419	D	47.8	3545	E	57.6	3808	F	93.4	3873	F	110.7	4108
48th Street & I-10 EB	D	54.2	4186	D	36.4	4454	-	-	-	-	-	-	-	-	-	-	-	-
Broadway Road & 48th Street	D	54.5	5519	F	112.3	6295	D	48.8	5353	F	85.3	5604	D	54.1	5395	F	81.2	5059
Broadway Road & I-10 EB	D	50.7	3631	F	175.2	4540	E	68.7	3962	F	166.8	4818	C	22.8	3406	D	43.7	3497
Broadway Road & I-10 WB / 52nd Street	E	56.2	5211	D	43.4	5213	F	81	5881	F	126.8	6213	E	60	5262	F	262.3	5764
University Drive & SR 143	C	25.3	6093	F	82.9	6698	D	41.6	6861	F	167.5	7691	C	25.1	6331	E	58.7	7090
Baseline Road & I-10 EB	E	59.4	6279	F	126.4	7519	F	106.9	6495	F	182.2	7757	F	94.4	6850	F	155.6	7590
Baseline Road & I-10 WB	D	53.9	5755	E	66.7	6313	E	71.1	5683	E	79.3	6406	F	81	6018	E	68.4	6481
Elliot Road & I-10 EB	E	73.5	4052	E	71.4	4397	F	62.1	4403	E	183.5	4779	F	148.7	6232	F	367.9	7226
Elliot Road & I-10 WB	F	172.6	3905	E	66.2	4387	F	106.6	4712	E	65	5180	F	285.3	7541	F	222.7	6901
Warner Road & I-10 EB	C	32.3	2754	F	86.4	3490	C	30.2	2772	F	103.5	3450	C	30.7	2706	F	150.7	3504
Warner Road & I-10 WB	E	55.4	3160	C	24.5	3132	F	121.4	3259	D	40	3492	F	88.6	3423	F	87.4	3711
Priest Drive & US 60 EB	D	48.2	2518	D	36.9	3776	D	47.4	2444	D	36.5	3542	D	39.4	2601	C	34.5	3473
Priest Drive & US 60 WB	C	27.1	3617	C	25.7	4191	C	28	3599	C	23.7	4119	C	23.9	3517	C	22.8	4002
Ray Road & I-10 EB	C	31.6	5148	D	49.7	5677	C	33.1	4576	C	32.5	5270	D	38.9	4874	D	38	5725
Ray Road & I-10 WB	D	44.5	4658	D	46.6	4713	D	44.7	4625	D	38.4	4626	E	59.8	4947	D	42.4	5031

Source: MAG Travel Demand Model (TR #1967)

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. This project does not affect one or more of the top three intersections in the carbon monoxide maintenance area with the highest traffic volumes identified in the MAG 2013 Carbon Monoxide Maintenance Plan for Maricopa County.

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 services identified in the CO applicable implementation plan?

NO. This project does not affect one or more of the top three intersections with the worst LOS in the MAG 2013 Carbon Monoxide Maintenance Plan for Maricopa County.

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.

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.
- 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 PM2.5 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.

This project requires a quantitative hot-spot analysis for carbon monoxide. The intersections to be modeled were determined using EPA's Guideline for Modeling Carbon Monoxide from Roadway Intersections (EPA, 1992). The intersections with the highest volumes and longest delays were identified for the 2040 build alternative. The top three intersections ranked by volume are as follows:

- Baseline Road & I-10 EB
- Elliot Road & I-10 WB
- Elliot Road & I-10 EB

The top three intersections ranked by LOS and delay are as follows:

- Elliot Road & I-10 EB
- Elliot Road & I-10 WB
- Broadway Road & I-10 WB / 52nd Street

Two of the intersections are found on both groups, thus the intersection modeling analysis will be performed for the following four intersections:

- Baseline Road & I-10 EB
- Elliot Road & I-10 WB
- Elliot Road & I-10 EB
- Broadway Road & I-10 WB / 52nd Street

Modeling will be performed for the AM and PM peak hour of existing 2018, no build 2040, and build 2040. It is assumed that if the selected worst-case intersections do not show an exceedance of the NAAQS, none of the intersections will. Since an interagency consultation is required for the analysis, the consultation document, including the methods, model, and assumptions, is attached.

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: https://www.fhwa.dot.gov/environment/air_quality/conformity/policy_and_guidance/cmcf_2017/tool.cfm)?

NO. This project's parameters do not fall within the acceptable range of modeling parameters for a CO Categorical Hot-spot Finding in Appendix Table 1 below.

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

Interagency Consultation Results

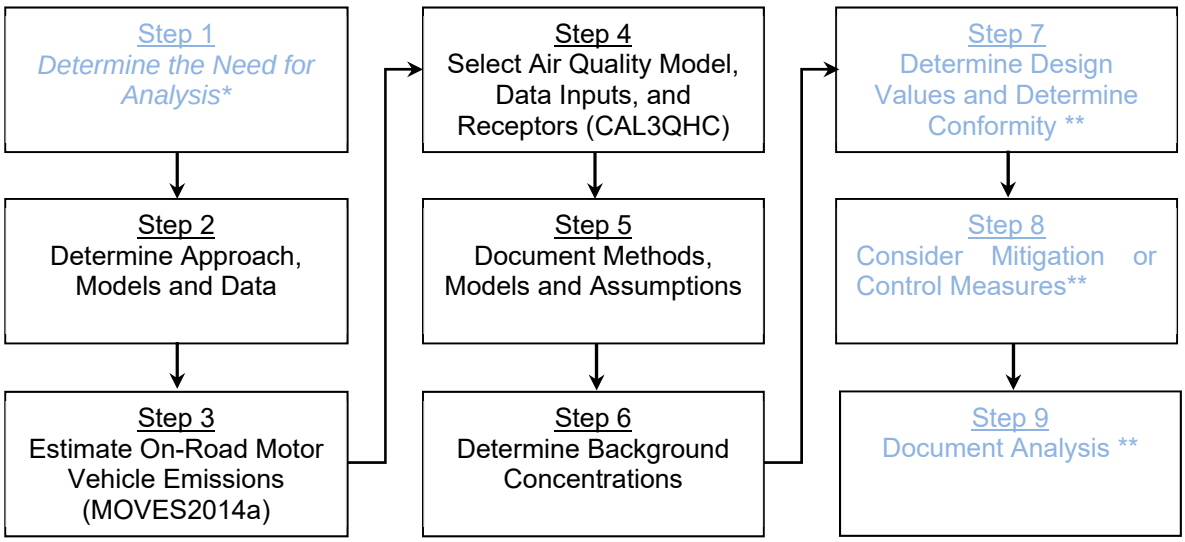
On June 6th, 2019 ADOT provided a copy of this questionnaire, to the following consultation parties, EPA, FHWA, MAG, Arizona Department of Environmental Quality(ADEQ), and Maricopa County Air Quality Department as the local air agencies in Maricopa County. There were no objections to the "Project Level CO Quantitative Hot-Spot Analysis - Consultation Document", provided below and on July 9th, 2019 ADOT concluded Interagency Consultation by notifying interested parties that this project will proceed as a project that does not require a quantitative PM10 hot-spot analysis under 40CFR 93.123(b).

Project Level CO Quantitative Hot-Spot Analysis – Consultation Document

The Arizona Department of Transportation (ADOT) developed the following consultation document for the projects of air quality concern that are funded by Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). The Purpose of this document is to describe the methods, models and assumptions used for a CO quantitative Hot-spot analysis as required in 40 CFR 93.105(c)(1)(i), 93.123, 93.116.

Completing a Carbon Monoxide (CO) Hot-Spot Analysis

The general steps required to complete a quantitative CO hot-spot analysis are outlined below and described in detail in the EPA Office of Transportation and Air Quality guidance document "Using MOVES2014 in Project-Level Carbon Monoxide Analyses" EPA-420-B-15-028, March 2015, and "Guideline for Modeling Carbon Monoxide from Roadway Intersections" EPA-454/R-92-005, November 1992.



* Described in the previous section (Air Quality Concern Questionnaire).
** These Steps will be described and documented in a final air quality analysis report.

Step 2: Determine the Approach, Models, and Data

a. Describe the project area (area substantially affected by the project, 58 FR 62212) and emission sources.
b. Determine general approach and analysis year(s) – year(s) of peak emissions during the time frame of the transportation plan (69 FR 40056).
c. Determine CO National Ambient Air Quality Standards (NAAQS) to be evaluated.
d. Select emissions and dispersion models and methods to be used.
e. Obtain project-specific data (e.g., fleet mix, peak-hour volumes and average speed).

Step 3: Estimate On-Road Motor Vehicle Emissions with MOVES2014a

a. Generate RunSpec and enter project-specific data into Project Data Manager
b. Estimate on-road motor vehicle emissions.

Step 4: Select Air Quality Model, Data Inputs, and Receptors for CAL3QHC

a. Obtain and input required site data (e.g., meteorological).
b. Input MOVES outputs (emission factors).
c. Determine number and location of receptors, roadway links, and signal timing.
d. Run air quality dispersion model and obtain concentration results.

Step 5: Document Methods, Models and Assumptions

a. Summarize the methods, models and assumptions based on Step 3 & 4 (see the example in Table 1).
b. Submit the summary document to ADOT for review.

Step 6: Determine Background Concentrations

a. Determine background concentrations from nearby and other emission sources excluding the emissions from the project itself.

Step 7: Calculate Design Values and Determine Conformity

a. Add step 5 results to background concentrations to obtain values for the Build scenario.
b. Determine if the design values allow the project to conform.

Step 8: Consider Mitigation or Control Measures

a. Consider measures to reduce emissions and redo the analysis. If mitigation measures are required for project conformity, they must be included in the applicable SIP and be enforceable.
b. Determine if the design values from allow the project to conform after implementing mitigation or control measures.

Step 9: Document Analysis

a. Determine if the project conforms or not based on the results of step 7 or step 8.

To support the conclusion that a project meets conformity under 40 CFR 93.116 and 93.123, at a minimum the documentation will include:

- *Description of proposed project, when it is expected to open, and projected travel activity data.*
- *Analysis year(s) examined and factors considering in determining year(s) of peak emissions.*
- *Emissions modeling data, model used with inputs and results, and how characterization of project links.*
- *Model inputs and results for road dust, construction emissions, and emissions from other source if needed.*
- *Air Quality modeling data, included model used, inputs and results and receptors.*
- *How background concentrations were determined.*
- *Any mitigation and control measures implemented, including public involvement or consultation if needed.*
- *How interagency and public participation requirements were met.*
- *Conclusion that the proposed project meets conformity requirements.*
- *Sources of data for modeling.*

Methods, Models and Assumptions for CO Hot-Spot Analysis

Table 1. Methods, Models and Assumptions		
Estimate On-Road Motor Vehicle Emissions (Step 3)		
MOVES2014b	**Description**	**Data Source**
Scale	*On road, Project, Inventory*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.2
Time Span	*Four unique model runs: For existing conditions, 2018, January, weekday, AM peak hour, and PM peak hour. For future conditions, 2040, January, weekday, AM peak hour, and PM peak hour.*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.3
Geographic Bounds	*Maricopa County*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.4
Vehicles Equipment	*All Fuels and Source Use Types will be selected*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.5
Road Type	*Urban Restricted and Unrestricted access*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.6
Pollutants and Processes	*CO Running Exhaust, CO Crankcase Running Exhaust*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.7
Output	*Database will be created, Grams, Miles, Distance Traveled, Population will be selected. Emissions process will be selected in the Output Emissions Detail. Emission rates for each process can be appropriately summed to calculate aggregate CO emission rates for each link.*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.10
Project Data Manager	*Database will be created and MOVES2014b templates will be created to include local project data and information provided by MAG's I/M programs, Fuel and Age Distribution data which are consistent with the regional models. Links will be based on travel speeds and roadway grades specific to project as provided by the traffic study. Link Source Type will be based on the regional fleet mix for each road type and year. Any missing information will use default MOVES2014b data. After running MOVES, the MOVES CO_CAL3QHC_EF post-processing script is run.*	See Table 2 below for details

Select Air Quality Model, Data Inputs, and Receptors (Step 4)		
CAL3QHC	**Description**	**Data Source**
Emissions Sources	*Emissions Rates in grams/mile, as described in MOVES2014b section. The free flow and queue links defined for modeling with MOVES2014b will be used as input into CAL3QHC.*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, EPA-454/R-92-005, November 1992. Section 5.2.3 of Appendix W to 40 CFR Part 51, CO screening analyses of intersection projects should use the CAL3QHC dispersion model.
Receptor Locations	*At least 3m from the roadways at a height of 1.8m, nearby occupied lot, vacant lot, sidewalks, and any locations near breathing height (1.8m) to which the general public has continuous access (See attachment for graphical representation of model setup).*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, Section 2.2
Traffic and Geometric Design	*Lane Configuration, Lane Width, Signalization, Turning Movements, Median Width, Traffic Volume, Level of Service, Grade, % of Heavy-Duty Trucks, and Peak Hour Average Approach Speed.*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, Section 4.7.4
Meteorology	*The following meteorology options will be used as recommended in the CO Guidelines: a worst-case wind speed of 1 m/s, 5-degree wind direction intervals from 0 to 355 degrees, and a mixing height of 1000 m.* *Atmospheric stability class D will be used to represent an urban area.* *A surface roughness of 108 cm will be used, representing a suburban area.*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, Section 4.7.1
Persistence Factor	*Default persistence factor of 0.7.*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, Section 4.7.2
Determine Background Concentrations (Step 6)		
Background Monitor	*The CO monitor located at 1919 W Fairmont Drive in Tempe is directly adjacent to the project corridor. Three years of monitoring data (2015--2017) show a maximum 1-hour value of 2.0 ppm and a maximum 8-hour value of 1.7 ppm. 2.0 ppm will be added to the maximum modeled hourly concentration for comparison to the NAAQS. 1.7 ppm will be added to the maximum 8-hour modeled concentration (which is the 1-hour concentration multiplied by a persistence factor of 0.7 as described above.) The same background values will be used for all analysis years.*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, Section 4.7.3 EPA Air Data Monitor Values Report

Table 2. Project Data Manager Inputs		
Input	**Level of Detail/notes**	**Data Source**
Meteorology	*Same for build and no-build scenarios. Emission factors will be developed for 8-9 am and 5-6 pm in*	MPO EPA Using MOVES2014 in Project-Level

	the month of January using the average temperature and humidity data obtained from the National Climatic Data Center (2018 existing condition-2018 averages, 2040 build/no-build - 2016-2018 averages).	Carbon Monoxide Analyses, Section 2.4.1
Age Distribution	*Same for build and no-build scenarios. Data from latest regional CO conformity analysis provided by MAG.*	MPO EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.2
Fuel	*Same for build and no-build scenarios. Data from latest regional CO conformity analysis provided by MAG.*	MPO EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.3
I/M Programs	*Same for build and no-build scenarios. Data from latest regional CO conformity analysis provided by MAG.*	MPO EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.4
Retrofit Data	*Not applicable for this project.*	Project specific modeling EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.7
Links	*Four selected intersections (Baseline Rd & I-10 EB, Elliot Rd & I-10 WB, Elliot Rd & I-10 EB, Broadway Rd & I-10 WB/52nd St) will be divided into links and each link's length (in miles), traffic volume (vehicle per hour), average speed (miles per hour) and road grade (percent) will be specified. Other roadway segments within 1000 feet of the intersection will be included. (See attachment for graphical representation of model setup)*	Project specific modeling EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.6
Link Source Types	*Source type distribution will be represented by the regional fleet for each road type and analysis year, based on data from latest regional CO conformity analysis provided by MAG.*	MPO EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.5
Link Drive Schedules, Operating Mode Distribution	*Average speed and road type will be used in the Links Importer based on project-specific modeling.*	Project specific modeling EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.8, 2.4.9
Off-Network, Hotelling	*Not applicable for this project.*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.9

Table 3. Construction Emissions *(Only if Applicable)*		
Construction Emissions	*Construction Emissions will be addressed qualitatively because construction is not expected to last longer than 5 years at any individual site. In the context of CO, this is usually excess CO emissions due to traffic delay and/or detours.*	40CFR93.123(c)(5)"Each site which is affected by construction-related activities shall be considered separately, using established "Guideline" methods." If applicable, include analysis as an Appendix to the Air Quality Report.

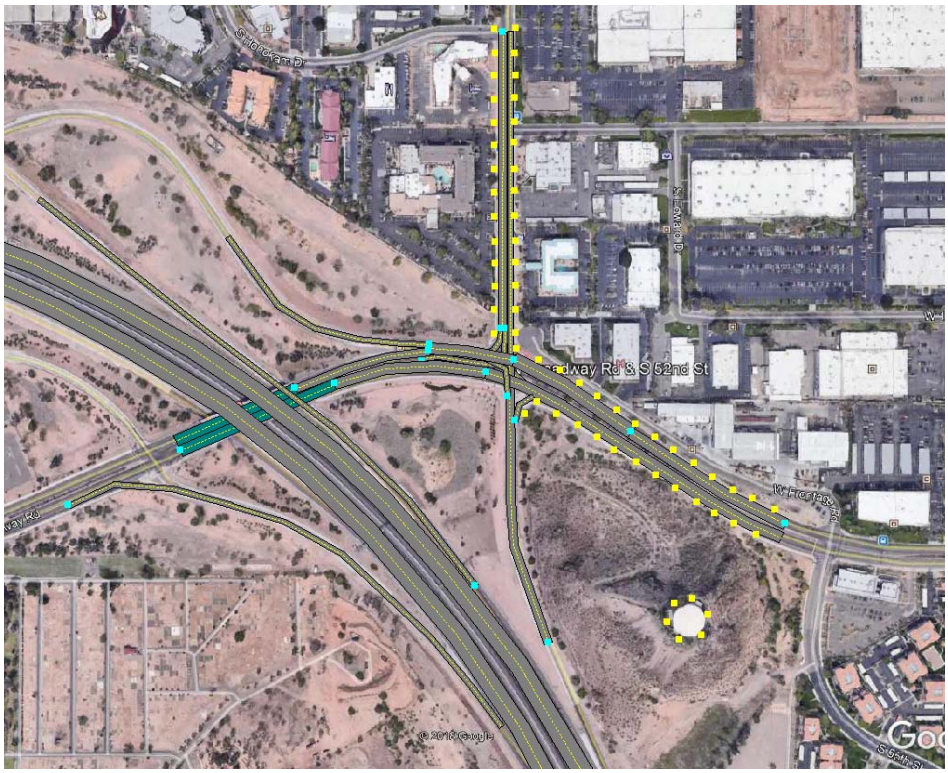
Preliminary Link Configurations and Receptor Placements for CO Hot-Spot Analysis

The following graphics present the preliminary link configurations and receptor placements for the four intersections that will be modeled as part of the CO hot-spot analysis in CAL3QHC. The following applies to all figures:

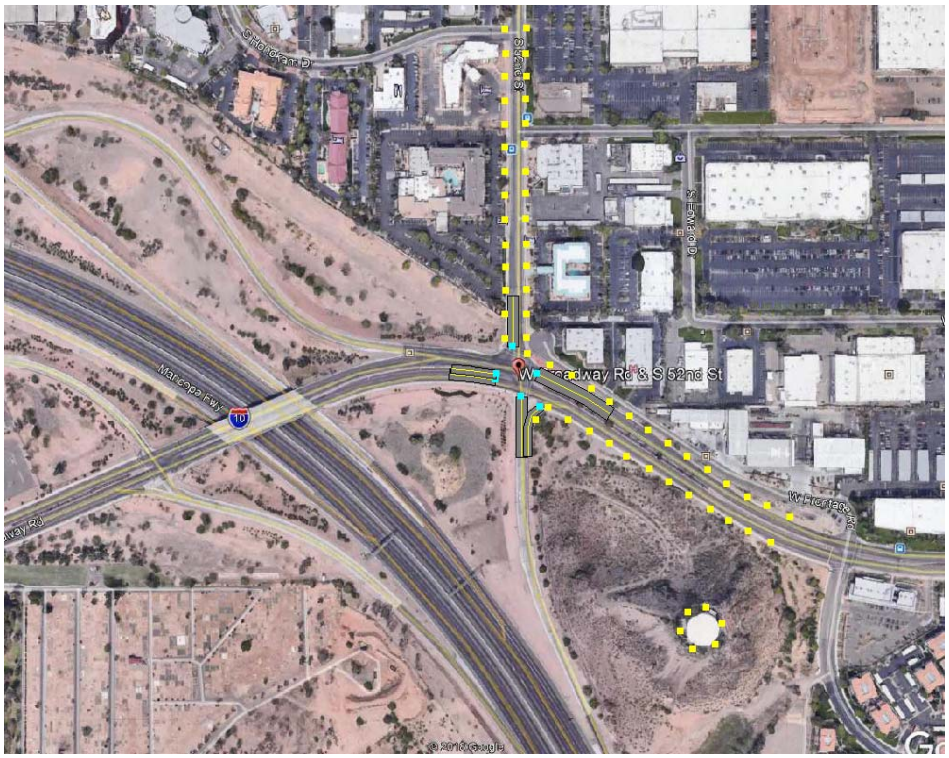
- Free flow links extend 1000 feet away from center of signalized intersection
- Graphic representation of free flow links includes 10 foot mixing zone
- Traffic activity within 1000 feet from intersections are included
- Yellow squares are receptors located 10 feet from the edge of roadway
- Receptors are spaced at 25-meter intervals outside of the mixing zone
- Receptor location coordinates will be provided by a separate file

52nd Street and West Broadway No Build/Existing

Free Flow Links:

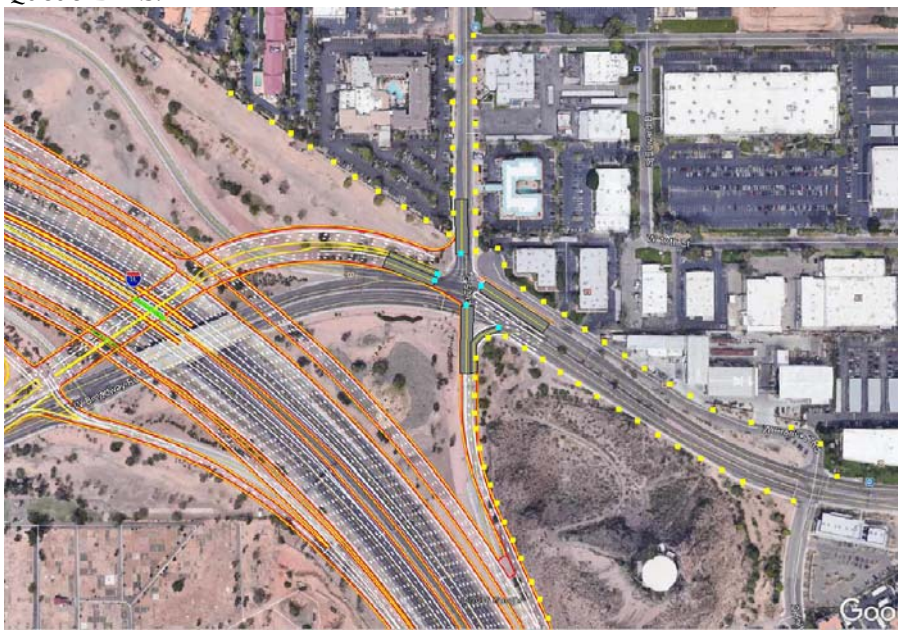


52nd Street and West Broadway
No Build/Existing Queue Links:



52nd Street and West Broadway Build Scenario
Free Flow Links:

52nd Street and West Broadway Build Scenario
Queue Links:

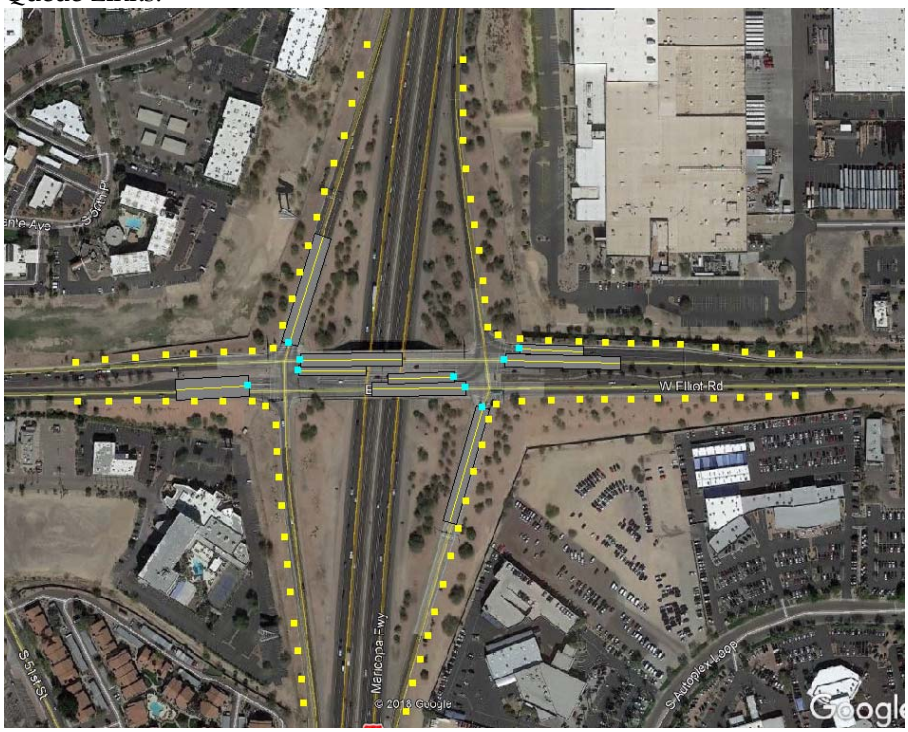


Elliot Rd at I-10 EB & WB Build and No Build Scenarios

Free Flow Links:

Elliot Rd at I-10 EB & WB Build and No Build Scenarios

Queue Links:



Baseline & I-10 Build and No Build Scenarios
Free Flow Links:

Baseline & I-10 Build and No Build Scenarios
Queue Links:

Interagency Consultation Emails

Gmail by Google

Beverly Chenausky <bchenausky@azdot.gov>

Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

1 message

Beverly Chenausky <bchenausky@azdot.gov> Tue, Jul 9, 2019 at 9:15 AM
To: Lindy Bauer <lbauer@azmag.gov>, "Wamsley.Jerry" <wamsley.jerry@epa.gov>, Johanna Kuspert - AQDX <JKuspert@mail.maricopa.gov>, Transportationconformity <transportationconformity@azdeq.gov>, "Hansen, Alan (FHWA)" <Alan.Hansen@dot.gov>, Paul O'brien <POBrien@azdot.gov>
Cc: Clifton Meek <meek.clifton@epa.gov>, Karina O'Conner <oconnor.karina@epa.gov>, ADOTAirNoise - ADOT <adotairnoise@azdot.gov>, Dean Giles <dgiles@azmag.gov>, Katie Rodriguez <krodriguez@azdot.gov>

As there are no objections or request for changes to the CO modeling assumptions provided June 6th, 2019, interagency consultation is complete. The project will commence with the CO modeling for conformity the results of this analysis will be included in the air quality report that will be developed for the Environmental Assessment scheduled to be released for public comment later this year. Additional notification will be provided when the draft analysis is available for review, any requested modeling files will be provided at that time, thank you.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

ADOT Environmental Planning

On Thu, Jun 20, 2019 at 8:42 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:

> As there are no objections to the project determination presented for PM10, interagency consultation is complete with the project identified as a project that does not require a quantitative hot-spot analysis as listed under 40 CFR 93.123(b). Please provide any additional comments on the models, methods and assumptions used for the CO Quantitative Hot-spot modeling, by **July 8, 2019.**
>
> **Beverly T. Chenausky**
> **Air & Noise Program Manager**
> MD EM02, Room 41
> 1611 W. Jackson St.
> Phoenix, AZ 85007
> 602.712.6269
> azdot.gov
>
> ADOT Environmental Planning
>
> On Thu, Jun 6, 2019 at 11:59 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:
>
> > ADOT is presenting the following project, **I-10, I-17 (Split) to SR202L (Santan),** for interagency consultation per 40 CFR 93.105 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 clearance. ADOT is requesting responses to the attached PM questionnaire within **10 business days**; 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, ADOT has determined that the project requires a quantitative hot-spot analysis only for CO, the modeling assumptions for Attached is the combined *Project Level CO Hot-Spot Analysis Questionnaire* demonstrating the need for analysis and the *Project Level CO Quantitative Hot_Sot Analysis - Consultation Document.* The Purpose of this document is to describe the methods, models and assumptions used for a quantitative hot-spot analysis as required in 40 CFR 93.105(c)(1)(i), 93.123, 93.116,
> >
> > additional information on the receptor locations is also included (as zip file). It is requested that the consulted parties provide

comments or questions on the methods, models and assumptions within **30 days,** a non-response will be interpreted as concurrence with the planning assumptions as describe in the attached CO document.

Beverly T. Chenausky
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Gmail by Google

Beverly Chenausky <bchenausky@azdot.gov>

Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

1 message

Transportationconformity - AZDEQ <transportationconformity@azdeq.gov> Mon, Jul 8, 2019 at 3:27 PM
To: Beverly Chenausky <bchenausky@azdot.gov>, Ellen Kennedy <kennedy.ellen@azdeq.gov>

Hi Beverly, our comment letter is attached. We appreciate the opportunity to review.

Amanda Luecker

On Thu, Jun 6, 2019 at 11:59 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:

> ADOT is presenting the following project, **I-10, I-17 (Split) to SR202L (Santan),** for interagency consultation per 40 CFR 93.105 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 clearance. ADOT is requesting responses to the attached PM questionnaire within **10 business days**; 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.
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>
> **Beverly T. Chenausky**
> **Air & Noise Program Manager**
> MD EM02, Room 41
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> Phoenix, AZ 85007
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> azdot.gov
>
> ADOT Environmental Planning

ADEQ Comment Letter to ADOT on I10 I17 to SR202L.pdf
49K

ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

Douglas A. Ducey
Governor

Misael Cabrera
Director

July 8, 2019

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007

Dear Ms. Chenausky:

We have reviewed the Arizona Department of Transportation's (ADOT) *Project Level CO Hot-Spot Analysis Questionnaire* and *Project Level CO Quantitative Hot Spot Analysis - Consultation Document* for the I-10, I-17 (Split) to SR202L (Santan) project (ADOT Project No.: 010 MA 150 F0072 01D), received by our office on June 6, 2019.

The Arizona Department of Environmental Quality (ADEQ) does not have comments on the project's air quality analysis at this time. We consider transportation planning an important part of our mission to protect and enhance public health and the environment in Arizona. As such, ADEQ looks forward to additional opportunities to consult with ADOT as this project advances.

Sincerely,

Daniel Czecholinski
Acting Air Quality Director

RE: 010-C(220); F0072 - AQ Review

1 message

Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov> Tue, May 28, 2019 at 7:33 AM
To: "bchenausky azdot.gov" <bchenausky@azdot.gov>
Cc: "Lirange, Aryan (FHWA)" <Aryan.lirange@dot.gov>

While the traffic data issue is being worked out, the following are comments in response to the info you provided below:

1. For the MSAT analysis – FHWA is available to review the additional/updated information, once it's available.
2. For the CO Hot-Spot:
    a. FHWA would like more clarity on their receptor locations and to see another map of them. A conference call on the receptor locations might be warranted after they provide an updated map of the receptor locations.
    b. ADOT must follow the 1992 CO Guideline and cannot use the average December temperature (the MPO most likely used the daily profile for December and not the December average.) In the 1992 CO Guideline Section 4.7.1 and reiterated in the 2015 'Using MOVES2014 in Project-Level Carbon Monoxide Analyses' section 2.4.1 (page 19) there are two options for meteorology regarding CO Hot-Spot modeling. Below are the 2 options that can be used:

1. The temperature and humidity corresponding to each of the ten highest nonoverlapping 8-hour CO monitoring values for the last three years should be obtained. The average 8-hour temperature and humidity for each event should be calculated and then all ten values should be averaged for use with MOVES.
2. Alternatively, the average temperature and humidity in January may be used. Meteorological data may be obtained either from the National Weather Service (NWS) or as part of a site-specific measurement program. Local universities, the Federal Aviation Administration (FAA), military stations, and state and local air agencies may also be sources of such data. The National Oceanic and Atmospheric Administration's National Climatic Data Center (NCDC; online at www.ncdc.noaa.gov) is the world's largest active archive of weather data through which years of archived data can be obtained. A data source should be selected that is representative of local meteorological conditions.

Let me know if you have any questions and/or would like to meet with the Division and the Resource Center to discuss further. Thanks, Rebecca

From: bchenausky azdot.gov
Sent: Wednesday, May 22, 2019 2:45 PM
To: Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>
Cc: Lirange, Aryan (FHWA) <Aryan.lirange@dot.gov>
Subject: Re: 010-C(220); F0072 - AQ Review

Rebecca - Do you have an estimated time of when FHWA will be providing comments for the PM10? We have a tight deadline and would like to start interagency consultation for this project. Also the answers to the earlier comments are provided below.

1. or CO, based on the traffic forecasts provided, FHWA concurs that the project requires a hot-spot analysis and does not meet the thresholds for the categorical hot-spot.

    a. Comments regarding the CO hot-spot modeling methodology:

        i. Are both the AM and PM peak rates going to be modeled with CAL3QHC? Yes, we are going to see both AM/PM peak emission factors to make sure which one is worse. Unlike other areas, sometimes PM could be worse than AM in Arizona.

        ii. (Additional comments included in the figures.) Additional receptors need to be added. To adhere to the 1992 guidance the receptors along the approach legs should be spaced 25 meters apart from each other. That should be stated here. We will add more receptors with 25 m spaces and review the locations.

        iii. Since the persistence factor is being used for the 8 hr CO concentration are both the AM peak and PM peak going to be modeled with CAL3QHC? Yes, answered above. but please let us know if you anticipate any problems for modeling both AM and PM.

        iv. The average January temperature and humidity is being used here, correct? The specific hour temperature and humidity should not be used for MOVES modeling but the average January temperature and humidity according to the guidance. Just to clarify the data from the regional CO conformity analysis should be used to obtain the average January temperature and humidity. The regional CO conformity

analysis done by MPO (MAG) used December average temperature and humidity, so we are planning to use them (will correct month in the table).

v. There are a couple of locations where receptors need to be added where there is public access. A review on google maps, for example, saw some sidewalks that were not accounted for. Answered above "ii".

2. For MSAT, based on the information provided, FHWA concurs that the project will require a quantitative MSAT analysis.

a. Please provide a pdf showing the proposed area of influence. Will provide.
b. Based on the information on page 6 of the "F0072_I-10 Broadway MSAT Project-level Analysis_FHWAReview_04012019.docx" it does not appear that enough information has been provided to determine an "area of influence." The analysis only considers volume changes of +/- 5%. We will provide a boundary of the area of influence and add more explanation.
c. Per the FHWA FAQs on conducting Quantitative MSAT Analysis (FAQs), the +/- 5% volume change should only apply to those areas of LOS D or worse. While this applies to much of I-10 in the study area, there are roads (namely SR 143 and US 60) that do not have LOS D (or worse) and therefore should be considered for volume changes of +/- 10%. Will review the options.
d. Additionally, it may be useful to see where travel times vary by more than +/-10%, to help determine the area of influence (as suggested in the FAQs). Same as above.
e. Based solely on the +/- 5% volume changes shown on page 6, it appears that some of the identified links could be considered "model noise" and would not necessarily need to be part of the area of influence (for example: the few identified links located east of Route 101, or north of Route 202). Need to verify with review of area of influence pdf. Answered above "b".

-- Let me know if you need more information, thanks.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

On Thu, May 2, 2019 at 6:49 AM Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov> wrote:

> FHWA is working on the review of the POAQC and supporting documentation.
>
> While we complete the review of the PM_{10} analysis, I wanted to send you the comments on the CO and MSAT. Our comments:
>
> 1. For CO, based on the traffic forecasts provided, FHWA concurs that the project requires a hot-spot analysis and does not meet the thresholds for the categorical hot-spot.
>
> a. Comments regarding the CO hot-spot modeling methodology:
>
> i. Are both the AM and PM peak rates going to be modeled with CAL3QHC?
>
> ii. (Additional comments included in the figures.) Additional receptors need to be added. To adhere to the 1992 guidance the receptors along the approach legs should be spaced 25 meters apart from each other. That should be stated here.
>
> iii. Since the persistence factor is being used for the 8 hr CO concentration are both the AM peak and PM peak going to be modeled with CAL3QHC?
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> v. There are a couple of locations where receptors need to be added where there is public access. A review on google maps, for example, saw some sidewalks that were not accounted for.
>
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> a. Please provide a pdf showing the proposed area of influence.

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Thanks, Rebecca

Rebecca Yedlin

Environmental Coordinator

Federal Highway Administration Arizona Division

4000 N Central Ave, Ste#1500

Phoenix, AZ 85012

602.382.8979

Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

1 message

Beverly Chenausky <bchenausky@azdot.gov> Thu, Jun 20, 2019 at 8:42 AM
To: Lindy Bauer <lbauer@azmag.gov>, "Wamsley.Jerry" <wamsley.jerry@epa.gov>, Johanna Kuspert - AQDX <JKuspert@mail.maricopa.gov>, Transportationconformity <transportationconformity@azdeq.gov>, "Hansen, Alan (FHWA)" <Alan.Hansen@dot.gov>, Paul O'brien <POBrien@azdot.gov>
Cc: Clifton Meek <meek.clifton@epa.gov>, Karina O'Conner <oconnor.karina@epa.gov>, ADOTAirNoise - ADOT <adotairnoise@azdot.gov>, Dean Giles <dgiles@azmag.gov>, Katie Rodriguez <krodriguez@azdot.gov>

As there are no objections to the project determination presented for PM10, interagency consultation is complete with the project identified as a project that does not require a quantitative hot-spot analysis as listed under 40 CFR 93.123(b). Please provide any additional comments on the models, methods and assumptions used for the CO Quantitative Hot-spot modeling, by **July 8, 2019.**

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

On Thu, Jun 6, 2019 at 11:59 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:

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> **Beverly T. Chenausky**
> **Air & Noise Program Manager**
> MD EM02, Room 41
> 1611 W. Jackson St.
> Phoenix, AZ 85007
> 602.712.6269
> azdot.gov

Gmail by Google

Beverly Chenausky <bchenausky@azdot.gov>

Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

1 message

Beverly Chenausky <bchenausky@azdot.gov> Thu, Jun 6, 2019 at 11:59 AM
To: Lindy Bauer <lbauer@azmag.gov>, "Wamsley.Jerry" <wamsley.jerry@epa.gov>, Johanna Kuspert - AQDX <JKuspert@mail.maricopa.gov>, Transportationconformity <transportationconformity@azdeq.gov>, "Hansen, Alan (FHWA)" <Alan.Hansen@dot.gov>, Paul O'brien <POBrien@azdot.gov>
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azdot.gov

ADOT Environmental Planning

3 attachments

F0072_PM10 Consultation_0662019.pdf
386K

F0072_CO Hotspot_Consultation_0606209.pdf

1951K

Receptors.zip
4K

Re: FW: 010-C(220); F0072 - AQ Review

1 message

Amy Ritz <aritz@azdot.gov> Tue, May 28, 2019 at 9:11 AM
To: "Lirange, Aryan (FHWA)" <Aryan.lirange@dot.gov>
Cc: "Thoms, Sandra" <Sandra.Thoms@wsp.com>, "Steve Mishler (MMishler@azdot.gov)" <MMishler@azdot.gov>, "Grombacher, Sam M." <Sam.Grombacher@wsp.com>, "Fly, Becky" <BECKY.FLY@wsp.com>, "bchenausky azdot.gov" <bchenausky@azdot.gov>, "Yedlin, Rebecca (FHWA)" <Rebecca.Yedlin@dot.gov>, Katie Rodriguez <krodriguez@azdot.gov>

Aryan,
Our conversations with MAG do not change the number of lanes, just the width of the lanes. The 5+1 is just Baseline to Elliot but that remains unchanged.

Amy Ritz

Project Manager

Major Projects

(602) 708-0267

aritz@azdot.gov

ADOT

On Tue, May 28, 2019 at 6:36 AM Lirange, Aryan (FHWA) <Aryan.lirange@dot.gov> wrote:

> Good Morning… I understand that there are deliberations with MAG and the project team about modifying the southern section of the project from a 5+1 to a 4+1. The graphics at the back of the traffic memo show a 5+1 and I presume the mem data tables are based on 5+1.
>
> Beverly, can you provide feedback on if and how this change to 4+1 (reduction of lanes and change in operation) would impact the analysis you are performing?
>
> *Aryan*
>
> Arizona FHWA – Senior Urban Engineer
>
> (eMail) aryan.lirange@dot.gov
>
> (602) 382 8973 | cell (602) 999 2921
>
> **From:** bchenausky azdot.gov
> **Sent:** Friday, May 24, 2019 9:50 AM
> **To:** Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>
> **Subject:** Re: 010-C(220); F0072 - AQ Review
>
> We have a final May 7, 2019 traffic memo based on Aryan's comments, as noted and attached and we already provided the Shapefiles.
>
> "Good morning everyone,

Some questions were raised about the consistency between some of the 2040 Build volumes in the MAG TDM (shapefile) and the Traffic Memo. We looked into it and found that the Traffic Memo was reporting 2040 Build volumes from a different version of the MAG TDM – the one used for the Spine Study. The numbers used for the Air Quality and Noise Analysis were the most recent ones that correlate to the provided shapefile. I have since updated the Traffic Memo to reflect the newest 2040 Build volumes which match the shapefile. An additional change you will note is in the Truck volumes. The MAG TDM shows trucks in the HOV lanes and those were not extracted and represented in the previous version of the memo. Now the number of trucks shown represents those in the GP and HOV lanes.

Additionally, Aryan Lirange from FHWA had asked about the intersection LOS table that was provided as part of the Air Quality document. I have added a sub-section of the memo to present that table (Tables 6, 7, & 8) and discuss how those results were obtained."

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

ADOT
Environmental Planning

On Thu, May 23, 2019 at 8:56 AM Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov> wrote:

> FHWA is reviewing the responses you provided below. I hope to get a response to you on those pieces by the end of next week.
>
> As for the PM10, we are still waiting for the final traffic data from the PM. We can complete our review of that piece once we receive the information requested. Thanks, Rebecca
>
> **From:** bchenausky azdot.gov
> **Sent:** Wednesday, May 22, 2019 2:45 PM
> **To:** Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>
> **Cc:** Lirange, Aryan (FHWA) <Aryan.lirange@dot.gov>
> **Subject:** Re: 010-C(220); F0072 - AQ Review
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>
> iii. Since the persistence factor is being used for the 8 hr CO concentration are both the AM peak and PM peak going to be modeled with CAL3QHC? Yes, answered above. but please let us know if you anticipate any problems for modeling both AM and PM.

APPENDIX B: CO CAL3QHC AND MOVES MODELING FILES

CO CAL3QHC and MOVES modeling files are available upon request. One MOVES runspec file is shown below:

```
<runspec version="MOVES2014b-20181203">
	<description><![CDATA[I-10, I-17 to SR202L
CO Hotspot
2018 AM]]></description>
	<models>
		<model value="ONROAD"/>
	</models>
	<modelscale value="Inv"/>
	<modeldomain value="PROJECT"/>
	<geographicselections>
		<geographicselection type="COUNTY" key="4013" description="ARIZONA -
Maricopa County"/>
	</geographicselections>
	<timespan>
		<year key="2018"/>
		<month id="1"/>
		<day id="5"/>
		<beginhour id="8"/>
		<endhour id="8"/>
		<aggregateBy key="Hour"/>
	</timespan>
	<onroadvehicleselections>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="42" sourcetypename="Transit Bus"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="62" sourcetypename="Combination Long-haul Truck"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="61" sourcetypename="Combination Short-haul Truck"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="41" sourcetypename="Intercity Bus"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="32" sourcetypename="Light Commercial Truck"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="54" sourcetypename="Motor Home"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="21" sourcetypename="Passenger Car"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="31" sourcetypename="Passenger Truck"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="51" sourcetypename="Refuse Truck"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="43" sourcetypename="School Bus"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="53" sourcetypename="Single Unit Long-haul Truck"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="52" sourcetypename="Single Unit Short-haul Truck"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="42" sourcetypename="Transit Bus"/>
		<onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="32" sourcetypename="Light Commercial Truck"/>
		<onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="21" sourcetypename="Passenger Car"/>
		<onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="31" sourcetypename="Passenger Truck"/>
		<onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="32" sourcetypename="Light Commercial Truck"/>
		<onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="21" sourcetypename="Passenger Car"/>
		<onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="31" sourcetypename="Passenger Truck"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="61" sourcetypename="Combination Short-haul Truck"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="32" sourcetypename="Light Commercial Truck"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="54" sourcetypename="Motor Home"/>
```

```
                <onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="11" sourcetypename="Motorcycle"/>
                <onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="21" sourcetypename="Passenger Car"/>
                <onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="31" sourcetypename="Passenger Truck"/>
                <onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="51" sourcetypename="Refuse Truck"/>
                <onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="43" sourcetypename="School Bus"/>
                <onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="53" sourcetypename="Single Unit Long-haul Truck"/>
                <onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="52" sourcetypename="Single Unit Short-haul Truck"/>
                <onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="42" sourcetypename="Transit Bus"/>
        </onroadvehicleselections>
        <offroadvehicleselections>
        </offroadvehicleselections>
        <offroadvehiclesccs>
        </offroadvehiclesccs>
        <roadtypes separateramps="false">
                <roadtype roadtypeid="4" roadtypename="Urban Restricted Access"
modelCombination="M1"/>
                <roadtype roadtypeid="5" roadtypename="Urban Unrestricted Access"
modelCombination="M1"/>
        </roadtypes>
        <pollutantprocessassociations>
                <pollutantprocessassociation pollutantkey="2" pollutantname="Carbon
Monoxide (CO)" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="2" pollutantname="Carbon
Monoxide (CO)" processkey="15" processname="Crankcase Running Exhaust"/>
        </pollutantprocessassociations>
        <databaseselections>
        </databaseselections>
        <internalcontrolstrategies>
<internalcontrolstrategy
classname="gov.epa.otaq.moves.master.implementation.ghg.internalcontrolstrategies.rateofp
rogress.RateOfProgressStrategy"><![CDATA[
useParameters  No

]]></internalcontrolstrategy>
        </internalcontrolstrategies>
        <inputdatabase servername="" databasename="" description=""/>
        <uncertaintyparameters uncertaintymodeenabled="false"
numberofrunspersimulation="0" numberofsimulations="0"/>
        <geographicoutputdetail description="LINK"/>
        <outputemissionsbreakdownselection>
                <modelyear selected="false"/>
                <fueltype selected="false"/>
                <fuelsubtype selected="false"/>
                <emissionprocess selected="false"/>
                <onroadoffroad selected="true"/>
                <roadtype selected="false"/>
                <sourceusetype selected="false"/>
                <movesvehicletype selected="false"/>
                <onroadscc selected="false"/>
                <estimateuncertainty selected="false" numberOfIterations="2"
keepSampledData="false" keepIterations="false"/>
                <sector selected="false"/>
                <engtechid selected="false"/>
                <hpclass selected="false"/>
                <regclassid selected="false"/>
        </outputemissionsbreakdownselection>
        <outputdatabase servername="" databasename="CO_Hotspot_2018_AM_out"
description=""/>
        <outputtimestep value="Hour"/>
        <outputvmtdata value="true"/>
        <outputsho value="false"/>
        <outputsh value="false"/>
        <outputshp value="false"/>
```

```
        <outputshidling value="false"/>
        <outputstarts value="false"/>
        <outputpopulation value="false"/>
        <scaleinputdatabase servername="localhost" databasename="co_hotspot_2018_in"
description=""/>
        <pmsize value="0"/>
        <outputfactors>
                <timefactors selected="true" units="Hours"/>
                <distancefactors selected="true" units="Miles"/>
                <massfactors selected="true" units="Grams" energyunits="Million BTU"/>
        </outputfactors>
        <savedata>

        </savedata>

        <donotexecute>

        </donotexecute>

        <generatordatabase shouldsave="false" servername="" databasename=""
description=""/>
                <donotperformfinalaggregation selected="false"/>
        <lookuptableflags scenarioid="" truncateoutput="true" truncateactivity="true"
truncatebaserates="true"/>
</runspec>
```

APPENDIX C: MSAT AND CO2E MOVES MODELING FILES AND CO2E MOVES MODELING FILES

MSAT and CO_2e MOVES modeling files are available upon request. One MOVES runspec file is shown below:

```
<runspec version="MOVES2014b-20181203">
	<description><![CDATA[Regional Emissions
2040 Build]]></description>
	<models>
		<model value="ONROAD"/>
	</models>
	<modelscale value="Inv"/>
	<modeldomain value="SINGLE"/>
	<geographicselections>
		<geographicselection type="COUNTY" key="4013" description="ARIZONA -
Maricopa County"/>
	</geographicselections>
	<timespan>
		<year key="2040"/>
		<month id="1"/>
		<month id="2"/>
		<month id="3"/>
		<month id="4"/>
		<month id="5"/>
		<month id="6"/>
		<month id="7"/>
		<month id="8"/>
		<month id="9"/>
		<month id="10"/>
		<month id="11"/>
		<month id="12"/>
		<day id="2"/>
		<day id="5"/>
		<beginhour id="1"/>
		<endhour id="24"/>
		<aggregateBy key="Hour"/>
	</timespan>
	<onroadvehicleselections>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="62" sourcetypename="Combination Long-haul Truck"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="61" sourcetypename="Combination Short-haul Truck"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="41" sourcetypename="Intercity Bus"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="32" sourcetypename="Light Commercial Truck"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="54" sourcetypename="Motor Home"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="11" sourcetypename="Motorcycle"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="21" sourcetypename="Passenger Car"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="31" sourcetypename="Passenger Truck"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="51" sourcetypename="Refuse Truck"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="43" sourcetypename="School Bus"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="53" sourcetypename="Single Unit Long-haul Truck"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="52" sourcetypename="Single Unit Short-haul Truck"/>
		<onroadvehicleselection fueltypeid="3" fueltypedesc="Compressed Natural
Gas (CNG)" sourcetypeid="42" sourcetypename="Transit Bus"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="62" sourcetypename="Combination Long-haul Truck"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="61" sourcetypename="Combination Short-haul Truck"/>
		<onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="41" sourcetypename="Intercity Bus"/>
```

```
                <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="32" sourcetypename="Light Commercial Truck"/>
                <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="54" sourcetypename="Motor Home"/>
                <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="11" sourcetypename="Motorcycle"/>
                <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="21" sourcetypename="Passenger Car"/>
                <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="31" sourcetypename="Passenger Truck"/>
                <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="51" sourcetypename="Refuse Truck"/>
                <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="43" sourcetypename="School Bus"/>
                <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="53" sourcetypename="Single Unit Long-haul Truck"/>
                <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="52" sourcetypename="Single Unit Short-haul Truck"/>
                <onroadvehicleselection fueltypeid="2" fueltypedesc="Diesel Fuel"
sourcetypeid="42" sourcetypename="Transit Bus"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="62" sourcetypename="Combination Long-haul Truck"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="61" sourcetypename="Combination Short-haul Truck"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="41" sourcetypename="Intercity Bus"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="32" sourcetypename="Light Commercial Truck"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="54" sourcetypename="Motor Home"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="11" sourcetypename="Motorcycle"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="21" sourcetypename="Passenger Car"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="31" sourcetypename="Passenger Truck"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="51" sourcetypename="Refuse Truck"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="43" sourcetypename="School Bus"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="53" sourcetypename="Single Unit Long-haul Truck"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="52" sourcetypename="Single Unit Short-haul Truck"/>
                <onroadvehicleselection fueltypeid="9" fueltypedesc="Electricity"
sourcetypeid="42" sourcetypename="Transit Bus"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="62" sourcetypename="Combination Long-haul Truck"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="61" sourcetypename="Combination Short-haul Truck"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="41" sourcetypename="Intercity Bus"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="32" sourcetypename="Light Commercial Truck"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="54" sourcetypename="Motor Home"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="11" sourcetypename="Motorcycle"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="21" sourcetypename="Passenger Car"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="31" sourcetypename="Passenger Truck"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="51" sourcetypename="Refuse Truck"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="43" sourcetypename="School Bus"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="53" sourcetypename="Single Unit Long-haul Truck"/>
                <onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="52" sourcetypename="Single Unit Short-haul Truck"/>
```

```
		<onroadvehicleselection fueltypeid="5" fueltypedesc="Ethanol (E-85)"
sourcetypeid="42" sourcetypename="Transit Bus"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="62" sourcetypename="Combination Long-haul Truck"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="61" sourcetypename="Combination Short-haul Truck"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="41" sourcetypename="Intercity Bus"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="32" sourcetypename="Light Commercial Truck"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="54" sourcetypename="Motor Home"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="11" sourcetypename="Motorcycle"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="21" sourcetypename="Passenger Car"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="31" sourcetypename="Passenger Truck"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="51" sourcetypename="Refuse Truck"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="43" sourcetypename="School Bus"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="53" sourcetypename="Single Unit Long-haul Truck"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="52" sourcetypename="Single Unit Short-haul Truck"/>
		<onroadvehicleselection fueltypeid="1" fueltypedesc="Gasoline"
sourcetypeid="42" sourcetypename="Transit Bus"/>
	</onroadvehicleselections>
	<offroadvehicleselections>
	</offroadvehicleselections>
	<offroadvehiclesccs>
	</offroadvehiclesccs>
	<roadtypes separateramps="false">
		<roadtype roadtypeid="1" roadtypename="Off-Network"
modelCombination="M1"/>
		<roadtype roadtypeid="2" roadtypename="Rural Restricted Access"
modelCombination="M1"/>
		<roadtype roadtypeid="3" roadtypename="Rural Unrestricted Access"
modelCombination="M1"/>
		<roadtype roadtypeid="4" roadtypename="Urban Restricted Access"
modelCombination="M1"/>
		<roadtype roadtypeid="5" roadtypename="Urban Unrestricted Access"
modelCombination="M1"/>
	</roadtypes>
	<pollutantprocessassociations>
		<pollutantprocessassociation pollutantkey="24" pollutantname="1,3-
Butadiene" processkey="1" processname="Running Exhaust"/>
		<pollutantprocessassociation pollutantkey="24" pollutantname="1,3-
Butadiene" processkey="2" processname="Start Exhaust"/>
		<pollutantprocessassociation pollutantkey="24" pollutantname="1,3-
Butadiene" processkey="15" processname="Crankcase Running Exhaust"/>
		<pollutantprocessassociation pollutantkey="24" pollutantname="1,3-
Butadiene" processkey="16" processname="Crankcase Start Exhaust"/>
		<pollutantprocessassociation pollutantkey="170"
pollutantname="Acenaphthene gas" processkey="1" processname="Running Exhaust"/>
		<pollutantprocessassociation pollutantkey="170"
pollutantname="Acenaphthene gas" processkey="2" processname="Start Exhaust"/>
		<pollutantprocessassociation pollutantkey="170"
pollutantname="Acenaphthene gas" processkey="15" processname="Crankcase Running
Exhaust"/>
		<pollutantprocessassociation pollutantkey="170"
pollutantname="Acenaphthene gas" processkey="16" processname="Crankcase Start Exhaust"/>
		<pollutantprocessassociation pollutantkey="70" pollutantname="Acenaphthene
particle" processkey="1" processname="Running Exhaust"/>
		<pollutantprocessassociation pollutantkey="70" pollutantname="Acenaphthene
particle" processkey="2" processname="Start Exhaust"/>
		<pollutantprocessassociation pollutantkey="70" pollutantname="Acenaphthene
particle" processkey="15" processname="Crankcase Running Exhaust"/>
		<pollutantprocessassociation pollutantkey="70" pollutantname="Acenaphthene
particle" processkey="16" processname="Crankcase Start Exhaust"/>
```

```
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pollutantname="Acenaphthylene gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="171"
pollutantname="Acenaphthylene gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="171"
pollutantname="Acenaphthylene gas" processkey="15" processname="Crankcase Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="171"
pollutantname="Acenaphthylene gas" processkey="16" processname="Crankcase Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="71"
pollutantname="Acenaphthylene particle" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="71"
pollutantname="Acenaphthylene particle" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="71"
pollutantname="Acenaphthylene particle" processkey="15" processname="Crankcase Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="71"
pollutantname="Acenaphthylene particle" processkey="16" processname="Crankcase Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="26"
pollutantname="Acetaldehyde" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="26"
pollutantname="Acetaldehyde" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="26"
pollutantname="Acetaldehyde" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="26"
pollutantname="Acetaldehyde" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="27" pollutantname="Acrolein"
processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="27" pollutantname="Acrolein"
processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="27" pollutantname="Acrolein"
processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="27" pollutantname="Acrolein"
processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="58" pollutantname="Aluminum"
processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="58" pollutantname="Aluminum"
processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="36" pollutantname="Ammonium
(NH4)" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="36" pollutantname="Ammonium
(NH4)" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="172" pollutantname="Anthracene
gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="172" pollutantname="Anthracene
gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="172" pollutantname="Anthracene
gas" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="172" pollutantname="Anthracene
gas" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="72" pollutantname="Anthracene
particle" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="72" pollutantname="Anthracene
particle" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="72" pollutantname="Anthracene
particle" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="72" pollutantname="Anthracene
particle" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="90" pollutantname="Atmospheric
CO2" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="90" pollutantname="Atmospheric
CO2" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="173"
pollutantname="Benz(a)anthracene gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="173"
pollutantname="Benz(a)anthracene gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="173"
pollutantname="Benz(a)anthracene gas" processkey="15" processname="Crankcase Running
Exhaust"/>
```

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                <pollutantprocessassociation pollutantkey="173"
pollutantname="Benz(a)anthracene gas" processkey="16" processname="Crankcase Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="73"
pollutantname="Benz(a)anthracene particle" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="73"
pollutantname="Benz(a)anthracene particle" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="73"
pollutantname="Benz(a)anthracene particle" processkey="15" processname="Crankcase Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="73"
pollutantname="Benz(a)anthracene particle" processkey="16" processname="Crankcase Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="20" pollutantname="Benzene"
processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="20" pollutantname="Benzene"
processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="20" pollutantname="Benzene"
processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="20" pollutantname="Benzene"
processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="174"
pollutantname="Benzo(a)pyrene gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="174"
pollutantname="Benzo(a)pyrene gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="174"
pollutantname="Benzo(a)pyrene gas" processkey="15" processname="Crankcase Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="174"
pollutantname="Benzo(a)pyrene gas" processkey="16" processname="Crankcase Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="74"
pollutantname="Benzo(a)pyrene particle" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="74"
pollutantname="Benzo(a)pyrene particle" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="74"
pollutantname="Benzo(a)pyrene particle" processkey="15" processname="Crankcase Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="74"
pollutantname="Benzo(a)pyrene particle" processkey="16" processname="Crankcase Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="175"
pollutantname="Benzo(b)fluoranthene gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="175"
pollutantname="Benzo(b)fluoranthene gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="175"
pollutantname="Benzo(b)fluoranthene gas" processkey="15" processname="Crankcase Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="175"
pollutantname="Benzo(b)fluoranthene gas" processkey="16" processname="Crankcase Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="75"
pollutantname="Benzo(b)fluoranthene particle" processkey="1" processname="Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="75"
pollutantname="Benzo(b)fluoranthene particle" processkey="2" processname="Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="75"
pollutantname="Benzo(b)fluoranthene particle" processkey="15" processname="Crankcase
Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="75"
pollutantname="Benzo(b)fluoranthene particle" processkey="16" processname="Crankcase
Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="176"
pollutantname="Benzo(g,h,i)perylene gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="176"
pollutantname="Benzo(g,h,i)perylene gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="176"
pollutantname="Benzo(g,h,i)perylene gas" processkey="15" processname="Crankcase Running
Exhaust"/>
```

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                <pollutantprocessassociation pollutantkey="176"
pollutantname="Benzo(g,h,i)perylene gas" processkey="16" processname="Crankcase Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="76"
pollutantname="Benzo(g,h,i)perylene particle" processkey="1" processname="Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="76"
pollutantname="Benzo(g,h,i)perylene particle" processkey="2" processname="Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="76"
pollutantname="Benzo(g,h,i)perylene particle" processkey="15" processname="Crankcase
Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="76"
pollutantname="Benzo(g,h,i)perylene particle" processkey="16" processname="Crankcase
Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="177"
pollutantname="Benzo(k)fluoranthene gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="177"
pollutantname="Benzo(k)fluoranthene gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="177"
pollutantname="Benzo(k)fluoranthene gas" processkey="15" processname="Crankcase Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="177"
pollutantname="Benzo(k)fluoranthene gas" processkey="16" processname="Crankcase Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="77"
pollutantname="Benzo(k)fluoranthene particle" processkey="1" processname="Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="77"
pollutantname="Benzo(k)fluoranthene particle" processkey="2" processname="Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="77"
pollutantname="Benzo(k)fluoranthene particle" processkey="15" processname="Crankcase
Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="77"
pollutantname="Benzo(k)fluoranthene particle" processkey="16" processname="Crankcase
Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="121" pollutantname="CMAQ5.0
Unspeciated (PMOTHR)" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="121" pollutantname="CMAQ5.0
Unspeciated (PMOTHR)" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="98" pollutantname="CO2
Equivalent" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="98" pollutantname="CO2
Equivalent" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="55" pollutantname="Calcium"
processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="55" pollutantname="Calcium"
processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="2" pollutantname="Carbon
Monoxide (CO)" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="2" pollutantname="Carbon
Monoxide (CO)" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="2" pollutantname="Carbon
Monoxide (CO)" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="2" pollutantname="Carbon
Monoxide (CO)" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="51" pollutantname="Chloride"
processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="51" pollutantname="Chloride"
processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="178" pollutantname="Chrysene
gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="178" pollutantname="Chrysene
gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="178" pollutantname="Chrysene
gas" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="178" pollutantname="Chrysene
gas" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="78" pollutantname="Chrysene
particle" processkey="1" processname="Running Exhaust"/>
```

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                <pollutantprocessassociation pollutantkey="78" pollutantname="Chrysene
particle" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="78" pollutantname="Chrysene
particle" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="78" pollutantname="Chrysene
particle" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="118" pollutantname="Composite -
NonECPM" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="118" pollutantname="Composite -
NonECPM" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="118" pollutantname="Composite -
NonECPM" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="118" pollutantname="Composite -
NonECPM" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="168"
pollutantname="Dibenzo(a,h)anthracene gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="168"
pollutantname="Dibenzo(a,h)anthracene gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="168"
pollutantname="Dibenzo(a,h)anthracene gas" processkey="15" processname="Crankcase Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="168"
pollutantname="Dibenzo(a,h)anthracene gas" processkey="16" processname="Crankcase Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="68"
pollutantname="Dibenzo(a,h)anthracene particle" processkey="1" processname="Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="68"
pollutantname="Dibenzo(a,h)anthracene particle" processkey="2" processname="Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="68"
pollutantname="Dibenzo(a,h)anthracene particle" processkey="15" processname="Crankcase
Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="68"
pollutantname="Dibenzo(a,h)anthracene particle" processkey="16" processname="Crankcase
Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="112" pollutantname="Elemental
Carbon" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="112" pollutantname="Elemental
Carbon" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="112" pollutantname="Elemental
Carbon" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="112" pollutantname="Elemental
Carbon" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="21" pollutantname="Ethanol"
processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="21" pollutantname="Ethanol"
processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="21" pollutantname="Ethanol"
processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="21" pollutantname="Ethanol"
processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="41" pollutantname="Ethyl
Benzene" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="41" pollutantname="Ethyl
Benzene" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="41" pollutantname="Ethyl
Benzene" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="41" pollutantname="Ethyl
Benzene" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="169"
pollutantname="Fluoranthene gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="169"
pollutantname="Fluoranthene gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="169"
pollutantname="Fluoranthene gas" processkey="15" processname="Crankcase Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="169"
pollutantname="Fluoranthene gas" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="69" pollutantname="Fluoranthene
particle" processkey="1" processname="Running Exhaust"/>
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                <pollutantprocessassociation pollutantkey="69" pollutantname="Fluoranthene
particle" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="69" pollutantname="Fluoranthene
particle" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="69" pollutantname="Fluoranthene
particle" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="181" pollutantname="Fluorene
gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="181" pollutantname="Fluorene
gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="181" pollutantname="Fluorene
gas" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="181" pollutantname="Fluorene
gas" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="81" pollutantname="Fluorene
particle" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="81" pollutantname="Fluorene
particle" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="81" pollutantname="Fluorene
particle" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="81" pollutantname="Fluorene
particle" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="25"
pollutantname="Formaldehyde" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="25"
pollutantname="Formaldehyde" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="25"
pollutantname="Formaldehyde" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="25"
pollutantname="Formaldehyde" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="119" pollutantname="H2O
(aerosol)" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="119" pollutantname="H2O
(aerosol)" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="119" pollutantname="H2O
(aerosol)" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="119" pollutantname="H2O
(aerosol)" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="182"
pollutantname="Indeno(1,2,3,c,d)pyrene gas" processkey="1" processname="Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="182"
pollutantname="Indeno(1,2,3,c,d)pyrene gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="182"
pollutantname="Indeno(1,2,3,c,d)pyrene gas" processkey="15" processname="Crankcase
Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="182"
pollutantname="Indeno(1,2,3,c,d)pyrene gas" processkey="16" processname="Crankcase Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="82"
pollutantname="Indeno(1,2,3,c,d)pyrene particle" processkey="1" processname="Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="82"
pollutantname="Indeno(1,2,3,c,d)pyrene particle" processkey="2" processname="Start
Exhaust"/>
                <pollutantprocessassociation pollutantkey="82"
pollutantname="Indeno(1,2,3,c,d)pyrene particle" processkey="15" processname="Crankcase
Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="82"
pollutantname="Indeno(1,2,3,c,d)pyrene particle" processkey="16" processname="Crankcase
Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="59" pollutantname="Iron"
processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="59" pollutantname="Iron"
processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="22" pollutantname="MTBE"
processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="22" pollutantname="MTBE"
processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="22" pollutantname="MTBE"
processkey="15" processname="Crankcase Running Exhaust"/>
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                <pollutantprocessassociation pollutantkey="22" pollutantname="MTBE"
processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="54" pollutantname="Magnesium"
processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="54" pollutantname="Magnesium"
processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="5" pollutantname="Methane
(CH4)" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="5" pollutantname="Methane
(CH4)" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="5" pollutantname="Methane
(CH4)" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="5" pollutantname="Methane
(CH4)" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="185" pollutantname="Naphthalene
gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="185" pollutantname="Naphthalene
gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="185" pollutantname="Naphthalene
gas" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="185" pollutantname="Naphthalene
gas" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="23" pollutantname="Naphthalene
particle" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="23" pollutantname="Naphthalene
particle" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="23" pollutantname="Naphthalene
particle" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="23" pollutantname="Naphthalene
particle" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="35" pollutantname="Nitrate
(NO3)" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="35" pollutantname="Nitrate
(NO3)" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="6" pollutantname="Nitrous Oxide
(N2O)" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="6" pollutantname="Nitrous Oxide
(N2O)" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="6" pollutantname="Nitrous Oxide
(N2O)" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="6" pollutantname="Nitrous Oxide
(N2O)" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane
Hydrocarbons" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane
Hydrocarbons" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane
Hydrocarbons" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="79" pollutantname="Non-Methane
Hydrocarbons" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="122" pollutantname="Non-carbon
Organic Matter (NCOM)" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="122" pollutantname="Non-carbon
Organic Matter (NCOM)" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="111" pollutantname="Organic
Carbon" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="111" pollutantname="Organic
Carbon" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="111" pollutantname="Organic
Carbon" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="111" pollutantname="Organic
Carbon" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="3" pollutantname="Oxides of
Nitrogen (NOx)" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="3" pollutantname="Oxides of
Nitrogen (NOx)" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="3" pollutantname="Oxides of
Nitrogen (NOx)" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="3" pollutantname="Oxides of
Nitrogen (NOx)" processkey="16" processname="Crankcase Start Exhaust"/>
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                <pollutantprocessassociation pollutantkey="183"
pollutantname="Phenanthrene gas" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="183"
pollutantname="Phenanthrene gas" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="183"
pollutantname="Phenanthrene gas" processkey="15" processname="Crankcase Running
Exhaust"/>
                <pollutantprocessassociation pollutantkey="183"
pollutantname="Phenanthrene gas" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="83" pollutantname="Phenanthrene
particle" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="83" pollutantname="Phenanthrene
particle" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="83" pollutantname="Phenanthrene
particle" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="83" pollutantname="Phenanthrene
particle" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="53" pollutantname="Potassium"
processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="53" pollutantname="Potassium"
processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="100" pollutantname="Primary
Exhaust PM10  - Total" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="100" pollutantname="Primary
Exhaust PM10  - Total" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="100" pollutantname="Primary
Exhaust PM10  - Total" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="100" pollutantname="Primary
Exhaust PM10  - Total" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="110" pollutantname="Primary
Exhaust PM2.5 - Total" processkey="1" processname="Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="110" pollutantname="Primary
Exhaust PM2.5 - Total" processkey="2" processname="Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="110" pollutantname="Primary
Exhaust PM2.5 - Total" processkey="15" processname="Crankcase Running Exhaust"/>
                <pollutantprocessassociation pollutantkey="110" pollutantname="Primary
Exhaust PM2.5 - Total" processkey="16" processname="Crankcase Start Exhaust"/>
                <pollutantprocessassociation pollutantkey="106" pollutantname="Primary
PM10 - Brakewear Particulate" processkey="9" processname="Brakewear"/>
                <pollutantprocessassociation pollutantkey="107" pollutantname="Primary
PM10 - Tirewear Particulate" processkey="10" processname="Tirewear"/>
                <pollutantprocessassociation pollutantkey="116" pollutantname="Primary
PM2.5 - Brakewear Particulate" processkey="9" processname="Brakewear"/>
                <pollutantprocessassociation pollutantkey="117" pollutantname="Primary
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APPENDIX D: PUBLIC COMMENTS ON AIR QUALITY

			APPENDIX	COMMENT RESOLUTION	
Comment #	**Report**	**Reviewer**	**Comment**	**Response** A= will make change/addressed B= needs additional information C= postponed change D=no changes made	**Response Clarification**
These comments were received during the public comment period that ended November 18, 2019					
1	Air Quality Technical Report	**EPA - CM**	Are the vehicle volumes represented in Table 4 (and Table 2 in Appendix A) truck volumes? or mixed vehicles?	A	Table 4 in the report was informational in terms of overall LOS between existing and No Build and Build for the purposes of the CO LOS triggers -using total peak volumes. Unfortunately there was an oversight in not including a specific trucks LOS table for Appendix A for the PM10 questionnaire (use of the version without trucks split out). However, the data used for the tables in the Appendix were obtained from the GIS data and traffic tables data that was provided on ShareFile during interagency consultation. We will be bringing forward the truck volumes in the LOS table and note that in the final air quality report (see attached word doc) as the purpose of Table 4 was for the CO modeling that was done for the report. We can expand on the section in the air quality report discussing the PM10 project of air quality concern instead of just referencing the attachments or traffic data for clarity on the decision in the actual report.
2	Air Quality Technical Report	**EPA - CM**	If these represent mixed traffic volumes, then what assumptions did ADOT make about truck volumes? And why is that result not significant given the degradation or no improvement of LOS at several of these intersections?;	D	Table 4 is total volume, not truck volumes as noted in (1). Traffic data was provided in interagency consultation in the Appendix A, on ShareFile with the GIS ShapeFiles and in the Traffic Memo. The truck volumes are provided by the Maricopa Association of Governments (MAG) the MPO, they have a robust truck traffic model in their regional model and have discussed those assumptions in their regional conformity analysis. ADOT does not assign truck volumes for the mainline we obtain truck volumes directly from the MPO - I can provide a point of contact from MAG to explain how they assign the truck volumes using their land use models, social economic models and trip generation assumptions? For the project level portion we obtain the traffic model data directly from MAG from the most current regional conformity modeling (GIS files provided on ShareFile) we also use the same planning assumptions for the emissions model that MAG uses when required for the project level analysis as noted in the CO/PM hot-spot guidance.

3	Air Quality Technical Report	**EPA - CM**	If these represent truck volumes only, why are these truck volumes not considered significant given the degradation or lack of improvement of LOS at several of these intersections.	A	As mentioned in (1) we will modify Table 2 in report to include truck volumes as it currently reflects total peak volumes. See Page 4 of EPA FAQ - https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UKQS.pdf There is a 2 part requirement in the hot-spot regulations pertaining to whether the project is a project of air quality concern for a roadway expansion project with congestested intersections. First, is there a "significant increase of trucks attributed to the project" and second does the significant increase in trucks occur at congested intersections (LOS D+). This project is not changing any of the design features at the intersections so there is no significant increase in trucks or LOS changes "due to the project". Case in point several California projects have very congested facilities LOS E yet don't rise to a project of air quality concern.
4	Air Quality Technical Report	**EPA - CM**	Please clarify what truck volume is considered "significant" in this instance and why that level was chosen. This is crucial to understanding ADOT's conclusion that this project does not need further PM analysis.	D	ADOT does not set "thresholds" for significance we were already cautioned away from setting thresholds by EPA/FHWA, as such we use interagency consultation to determine significance, EPA even re-clarifies that the examples in the hot-spot regulations are not thresholds for significance, only examples.
5	Air Quality Technical Report	**EPA - CM**	Tables 6-8 in the Traffic Memo include Truck %, which would be helpful to include in the table with truck volumes as well. Also, per our question #4 below, we recommend that there be a qualitative narrative provided in the document regarding the determination that none of the intersections has a significant number of diesel trucks. As you suggest, there are no set thresholds for significance, so it is important to describe the decision-making process behind your determination of significance.	A	Table 7 has been updated to be consistent with the total traffic volumes, and truck volumes presented in the final traffic memo. The table has also been revised to more clearly show the truck percentages for all scenarios, and the change in truck percentages due to the project. Text was added to Section 5.2 to more clearly explain that a change of <1% truck traffic was not considered a significant increase.
6	EA	**Public**	No public comments were received on the Air Quality Report. All comments related to air quality were general remarks on the draft EA and all responses will be included in the Final EA.	D	Informational, for public comments, refer to Appendix J-M of the Public Hearing Summary Report, for the Final EA.
7	EA	**Agency**	1. The Maricopa Association of Governments (MAG) voiced overall support for the Study and its goals, but stressed the importance of involving and informing the public if the project is built.2. The United States Army Corp of Engineers (USACE) provided feedback and guidance for potential project plans and necessary permits if the project is built. 3. The Arizona Department of Environmental Quality (ADEQ) provided a statement of no comment on the Draft EA.	D	Informational, refer to Appendix N of the Public Hearing Summary Report, for the Final EA.

These comments were discussed after the public comment period through formal meetings requested by FHWA on November 18, 2019 refer to the attached January 14, 2020 agenda.					
8	Air Quality Technical Report	**FHWA**	Our resource center provided comments regarding the location of the receptors and specifically as related to the pedestrian locations. In the report that was sent, it is not clear that these comments were addressed. It would be helpful to have information, such as a graphic, that shows the receptor locations so the resolution of this comment can be confirmed;	A	Receptor locations were revised based on the original comment. Receptors were all placed with 25-meter spacing. Additional receptors were added to the SW quadrant of the intersection of 52nd St and West Broadway to account for a sidewalk on the south side of Broadway. Results in Table 5 and Table 6 were updated accordingly. The air quality technical report has been revised to now include figures that clearly show these receptor locations, as well as the locations of maximum modeled concentration.
9	Air Quality Technical Report	**FHWA**	We had also commented about the traffic data used in the model, specifically that it appears that the AQ model was run prior to the final traffic engineering report. We look for the traffic data in the model to be the same as the traffic data that is being used for the development of the project, so we are looking for documentation that confirms that the traffic data for the model and project development are the same	A	The traffic data used for the AQ analysis is based on the same data that is described in the final traffic report. All modeling files that are dated prior to May 7, 2019, were reviewed for consistency with data presented in Final Traffic Operations Analysis memo. Table 4 footnote was revised to show that the source of data was the May 2019 Traffic Operations Analysis. Text was added to the end of section 5.1.2 to inform the reader that FHWA comments were received and incorporated, as shown in Appendix A. Table 7 was revised to reflect the data presented in the final traffic report dated May 7, 2019.
10	Air Quality Technical Report	**FHWA**	Finally on consultation, we are aware that the EPA submitted comments regarding the truck traffic volumes on some of the intersections and we would like to see confirmation from EPA that their comments have been addressed and also believe that this interagency air quality exchange is documented and transparent.	A	See EPA Comment Matrix

These comments were discussed in the February 14, 2020 meeting, see the attached agenda					
11	Air Quality Technical Report	**FHWA**	Please explain why the average January temperature is not being used for MOVES modeling as called for in the EPA CO Hot-Spot Guidance?	A	As stated in the EPA documents *Guideline for Modeling Carbon Monoxide from Roadway Intersections* (1992) and *Using MOVES2014 in Project-Level Carbon Monoxide Analyses* (2015) the average January temperature and humidity may be used when developing carbon monoxide emission rates. The air quality analysis included an evaluation for AM peak and PM peak hour conditions. In order to capture the differences between AM peak hour and PM peak hour emission rates, an average temperature and humidity value was calculated for each hour of the day for the month of January based on hourly meteorological data from Phoenix Sky Harbor International Airport obtained from NOAA.
12	Air Quality Technical Report	**FHWA**	Please explain why the 2018 and 2040 meteorology data used for the MOVES modeling are different?	A	The 2018 and 2040 meteorology data used for MOVES modeling is different because the averages were calculated differently for each analysis year. For each analysis year, the meteorological data used in MOVES were the average temperature and humidity for each hour in January. The 2018 meteorological input data used in MOVES was the average of hourly data from Phoenix Sky Harbor International Airport for January 2018. This most accurately depicts conditions in the base year of 2018. The 2040 meteorological input data used in MOVES was the average of hourly data from Phoenix Sky Harbor International Airport for January 2016, January 2017, and January 2018. This represents average conditions for a future year. The comment included a table that showed a missing temperature value for hour 7 in 2018. This value is included in the MOVES input database “co_hotspot_2018_in” as 50.94.
13	Air Quality Technical Report	**FHWA**	It does not appear that the CO Hot-Spot Guidance for the Link Source Type inputs are being followed. Please explain the how the Link Source Type inputs were determined?	A	Intersection data by turning movement was obtained from the Synchro traffic analysis model. The user may enter values for truck percentage at intersection approaches, which are primarily used to determine saturation flow rate. Neither the Synchro model nor the Maricopa Association of Governments (MAG) data used as a basis for this model include details to disaggregate the vehicle mix to the 13 classifications required by MOVES. In the absence of vehicle mix data by turning movement for this project, the traffic analysis team used the second method listed in Section 2.4.5 of Using MOVES2014 in Project-Level Carbon Monoxide Analyses (EPA 2015): source type distribution consistent with the road type used in the latest regional emissions analysis. This distribution was developed using the source type population data included in the MAG regional emissions model. The same distribution was used for all roadways in the CO analysis, regardless of road type, because that level of data was not available. This source type distribution does not correspond to the truck percentages presented in the May 9th Technical Memorandum because the volumes and percentages in the memorandum were specific to I-10, and do not necessarily reflect the percentages of vehicles using the interchanges.

14	Air Quality Technical Report	**FHWA**	Are there going to be sidewalks on the Baseline Road underpass of I-10 in the build scenario? If so, receptors should be placed in locations shown by the red arrows below.	D	Yes, there will be sidewalks on Baseline Road where it crosses over I-10. Receptors were not included because the air quality analysis team considered the sections between the ramps and the mainline acted as medians. In Guideline for Modeling Carbon Monoxide from Roadway Intersections (EPA 1992), Section 2.2 provides criteria for siting intersection receptors. On page 2-3, median strips of roadways are listed as an example of unreasonable receptor sites.
15	Air Quality Technical Report	**FHWA**	Are there going to be sidewalks on the Elliott Road overpass of I-10 in the build scenario? If so, receptors should be placed in locations shown by the red arrows below.	A	Yes, there will be sidewalks on Elliott Road where it crosses over I-10. Receptors were not included because the air quality analysis team considered the sections between the ramps and the mainline acted as medians. In Guideline for Modeling Carbon Monoxide from Roadway Intersections (EPA 1992), Section 2.2 provides criteria for siting intersection receptors. On page 2-3, median strips of roadways are listed as an example of unreasonable receptor sites.
16	Air Quality Technical Report	**FHWA**	The GIS receptor shapefiles in the ‘Receptor GIS Layers’ folder shared with FHWA doesn’t appear to match with the images shared in the ADOT ‘Summary’ document for the Broadway Road and I-10 interchange.	A	The GIS shapefile previously provided was not correct. A number of receptors that were included in the CAL3QHCR model were missing. A new shapefile has been provided that includes all modeled receptors. Coordinates for modeled receptors can also be found in the CAL3QHC input and output files in the UTM coordinate system.

EPA COMMENTS

RE: Questions regarding the Air Quality Technical Report for I-10 Broadway Curve

1 message

meek, clifton <meek.clifton@epa.gov> Mon, Nov 18, 2019 at 5:22 PM
To: Beverly Chenausky <bchenausky@azdot.gov>
Cc: "Wamsley, Jerry" <Wamsley.Jerry@epa.gov>, "Katie Rodriguez (KRodriguez@azdot.gov)" <KRodriguez@azdot.gov>

Hi Beverly-

Thank you for your thorough response. I believe your suggestions below to include the table with truck volumes as well as a narrative of the PM10 decision process will greatly improve the clarity of the final Air Quality technical report. Tables 6-8 in the Traffic Memo include Truck %, which would be helpful to include in the table with truck volumes as well. Also, per our question #4 below, we recommend that there be a qualitative narrative provided in the document regarding the determination that none of the intersections has a significant number of diesel trucks. As you suggest, there are no set thresholds for significance, so it is important to describe the decision-making process behind your determination of significance.

Please let me know if you have any questions regarding our comments above, or if you would like to discuss them in further detail.

Thanks,

Clifton

Clifton Meek, Life Scientist

U.S. EPA, Region 9

Environmental Review Branch - Transportation Team

75 Hawthorne Street, TIP-2

San Francisco, CA 94105

phone: 415-972-3370

meek.clifton@epa.gov

From: Beverly Chenausky <bchenausky@azdot.gov>
Sent: Tuesday, November 05, 2019 11:15 AM
To: meek, clifton <meek.clifton@epa.gov>
Cc: Wamsley, Jerry <Wamsley.Jerry@epa.gov>; Katie Rodriguez (KRodriguez@azdot.gov) <KRodriguez@azdot.gov>
Subject: Re: Questions regarding the Air Quality Technical Report for I-10 Broadway Curve

Clifton -

Since this is a draft version of the report we can add clarification as needed and include modified table(s) that were provided in another form, either with GIS files or the supplement traffic memo. I have noticed that EPA has not downloaded any of the files currently on our ShareFile yet, however several of the traffic questions are in the traffic memo see Table 6 through 8 (reattaching) or in the files provided on ShareFile. For the final air quality report we will include the supporting traffic data in the Appendixes. I have responded directly to your comments below in red, let me know if this answers your questions. I am also including the table with the truck volumes included in the intersection LOS that we will be adding to the Air Quality Report (word doc), we will also add more description of PM10 in the report instead of referencing the Appendix.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

On Fri, Nov 1, 2019 at 12:05 PM meek, clifton <meek.clifton@epa.gov> wrote:

> Hi Beverly-
>
> We have a few clarifying questions on the Air Quality Technical Report for the I-10 Broadway Curve that we're hoping you can answer before the close of the comment period on Nov 18.
>
> The traffic volumes represented in table 4 (also Table 2, Appendix A) are not labeled or differentiated as to truck volume or combined and total vehicle volume; hence, there is some confusion about whether or not the truck volumes are significant given the intersection LOS reported. Though not labeled, Table 2 in Appendix A would lead one to believe that these are truck volumes and that they are not considered significant. With this is mind, we have the following questions:
>
> (1) Are the vehicle volumes represented in Table 4 (and Table 2 in Appendix A) truck volumes? or mixed vehicles?

See Traffic Memo Attached. Table 4 in the report was informational in terms of overall LOS between existing and No Build and Build for the purposes of the CO LOS triggers -using total peak volumes. Unfortunately there was an oversight in not including a specific trucks LOS table for Appendix A for the PM10 questionnaire (use of the version without trucks split out). However, the data used for the tables in the Appendix were obtained from the GIS data and traffic tables data that was provided on ShareFile during interagency consultation. We will be bringing forward the truck volumes in the LOS table and note that in the final air quality report (see attached word doc) as the purpose of Table 4 was for the CO modeling that was done for the report. We can expand on the section in the air quality report discussing the PM10 project of air quality concern instead of just referencing the attachments or traffic data for clarity on the decision in the actual report.

> (2) If these represent mixed traffic volumes, then what assumptions did ADOT make about truck volumes? And why is that result not significant given the degradation or no improvement of LOS at several of these intersections?; or

Table 4 is total volume, not truck volumes as noted in (1). Traffic data was provided in interagency consultation in the Appendix A, on ShareFile with the GIS ShapeFiles and in the Traffic Memo. The truck volumes are provided by the Maricopa Association of Governments (MAG) the MPO, they have a robust truck traffic model in their regional model and have discussed those assumptions in their regional conformity analysis. ADOT does not assign truck volumes for the mainline we obtain truck volumes directly from the MPO - I can provide a point of contact from MAG to explain how they assign the truck volumes using their land use models, social economic models and trip generation assumptions? For the project level portion we obtain the traffic model data directly from MAG from the most current regional conformity modeling (GIS files provided on ShareFile) we also use the same planning assumptions for the emissions model that MAG uses when required for the project level analysis as noted in the CO/PM hot-spot guidance.

> (3) If these represent truck volumes only, why are these truck volumes not considered significant given the degradation or lack of improvement of LOS at several of these intersections.

As mentioned in (1) we will modify Table 2 in report to include truck volumes as it currently reflects total peak volumes.

See Page 4 of EPA FAQ - https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UKQS.pdf

There is a 2 part requirement in the hot-spot regulations pertaining to whether the project is a project of air quality concern for a roadway expansion project with congestested intersections. First, is there a "significant increase of trucks attributed to the project" and second does

the significant increase in trucks occur at congested intersections (LOS D+). This project is not changing any of the design features at the intersections so there is no significant increase in trucks or LOS changes "due to the project". Case in point several California projects have very congested facilities

LOS E yet don't rise to a project of air quality concern.

> (4) Please clarify what truck volume is considered "significant" in this instance and why that level was chosen. This is crucial to understanding ADOT's conclusion that this project does not need further PM analysis.

- ADOT does not set "thresholds" for significance we were already cautioned away from setting thresholds by EPA/FHWA, as such we use interagency consultation to determine significance, EPA even re-clarifies that the examples in the hot-spot regulations are not thresholds for significance, only examples.

> Thanks,
>
> Clifton
>
> ---
>
> Clifton Meek, Life Scientist
>
> U.S. EPA, Region 9
>
> Environmental Review Branch - Transportation Team
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> 75 Hawthorne Street, TIP-2
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> phone: 415-972-3370
>
> meek.clifton@epa.gov
>
> **From:** Beverly Chenausky <bchenausky@azdot.gov>
> **Sent:** Friday, October 04, 2019 2:22 PM
> **To:** Lindy Bauer <lbauer@azmag.gov>; Wamsley, Jerry <Wamsley.Jerry@epa.gov>; Johanna Kuspert - AQDX <JKuspert@mail.maricopa.gov>; Transportationconformity <transportationconformity@azdeq.gov>; Hansen, Alan (FHWA) <Alan.Hansen@dot.gov>; Paul O'brien <POBrien@azdot.gov>
> **Cc:** meek, clifton <meek.clifton@epa.gov>; OConnor, Karina <OConnor.Karina@epa.gov>; ADOTAirNoise - ADOT <adotairnoise@azdot.gov>; Dean Giles <dgiles@azmag.gov>; Amy Ritz <aritz@azdot.gov>; tshin@mag.maricopa.gov; Katie Rodriguez <krodriguez@azdot.gov>
> **Subject:** Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region
>
> The draft air quality report and associated environmental assessment has been published on the project website (best viewed with Chrome):
>
> https://azdot.gov/planning/transportation-studies/interstate-10-broadway-curve-interstate-17-split-loop-202-santan
>
> A public hearing will be held on Thursday, October 24, 2019 from 5:00 p.m. – 8:00 p.m. at the DoubleTree by Hilton Phoenix-Tempe Conference Center located at 2100 South Priest Drive in Tempe. The public review and comment period extends from **Oct. 4 through Nov. 18, 2019**.
>
> Please submit any comments on the air quality report or the environmental assessment through the following options (see the attached newspaper advertisement):
>
> Online: Online(link is external)
>
> Email: BroadwayCurve@azdot.gov(link sends e-mail)
>
> Phone: 602.501.5505

Mail: I-10 Broadway Curve Study
c/o ADOT Communications
1655 W. Jackson St. MD 126F
Phoenix, AZ 85007

The associated air quality modeling files for this project will be made available via ShareFile, if you have not registered or used ADOT's ShareFile before the instructions are attached, if you do not receive a separate notification from ShareFile please let me know (check spam for noreply@sf-notifications.com).

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

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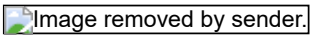
On Tue, Jul 9, 2019 at 9:15 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:

> As there are no objections or request for changes to the CO modeling assumptions provided June 6th, 2019, interagency consultation is complete. The project will commence with the CO modeling for conformity the results of this analysis will be included in the air quality report that will be developed for the Environmental Assessment scheduled to be released for public comment later this year. Additional notification will be provided when the draft analysis is available for review, any requested modeling files will be provided at that time, thank you.
>
> **Beverly T. Chenausky**
> **Air & Noise Program Manager**
> MD EM02, Room 41
> 1611 W. Jackson St.
> Phoenix, AZ 85007
> 602.712.6269
> azdot.gov
>
> Image removed by sender.
>
> On Thu, Jun 20, 2019 at 8:42 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:
>
> > As there are no objections to the project determination presented for PM10, interagency consultation is complete with the project identified as a project that does not require a quantitative hot-spot analysis as listed under 40 CFR 93.123(b). Please provide any additional comments on the models, methods and assumptions used for the CO Quantitative Hot-spot modeling, by **July 8, 2019.**
> >
> > **Beverly T. Chenausky**
> > **Air & Noise Program Manager**
> > MD EM02, Room 41
> > 1611 W. Jackson St.
> > Phoenix, AZ 85007
> > 602.712.6269
> > azdot.gov
> >
> > Image removed by sender.
> >
> > On Thu, Jun 6, 2019 at 11:59 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:

ADOT is presenting the following project, **I-10, I-17 (Split) to SR202L (Santan)**, for interagency consultation per 40 CFR 93.105 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 clearance. ADOT is requesting responses to the attached PM questionnaire within **10 business days**; 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, ADOT has determined that the project requires a quantitative hot-spot analysis only for CO, the modeling assumptions for Attached is the combined *Project Level CO Hot-Spot Analysis Questionnaire* demonstrating the need for analysis and the *Project Level CO Quantitative Hot_Sot Analysis - Consultation Document.* The Purpose of this document is to describe the methods, models and assumptions used for a quantitative hot-spot analysis as required in 40 CFR 93.105(c)(1)(i), 93.123, 93.116, additional information on the receptor locations is also included (as zip file). It is requested that the consulted parties provide comments or questions on the methods, models and assumptions within **30 days,** a non-response will be interpreted as concurrence with the planning assumptions as describe in the attached CO document.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov



FHWA COMMENTS

Gmail by Google

Beverly Chenausky <bchenausky@azdot.gov>

RE: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

1 message

Hansen, Alan (FHWA) <Alan.Hansen@dot.gov> Mon, Dec 2, 2019 at 3:08 PM
To: "bchenausky azdot.gov" <bchenausky@azdot.gov>
Cc: Paul O'Brien <POBrien@azdot.gov>, Carmelo Acevedo <cacevedo@azdot.gov>, "rsamour@azdot.gov" <rsamour@azdot.gov>, "Lirange, Aryan (FHWA)" <Aryan.lirange@dot.gov>, "Yedlin, Rebecca (FHWA)" <Rebecca.Yedlin@dot.gov>, "Sarhan, Anthony (FHWA)" <Anthony.Sarhan@dot.gov>, Katie Rodriguez <krodriguez@azdot.gov>, Amy Ritz <aritz@azdot.gov>, "Elsken, Jennifer (FHWA)" <jennifer.elsken@dot.gov>

Hi Beverly,

In trying to help the discussion when we finally do meet, we want to share our specific concerns so everyone will be in a better position to discuss them. They are as follows:

- Our resource center provided comments regarding the location of the receptors and specifically as related to the pedestrian locations. In the report that was sent, it is not clear that these comments were addressed. It would be helpful to have information, such as a graphic, that shows the receptor locations so the resolution of this comment can be confirmed;
- We had also commented about the traffic data used in the model, specifically that it appears that the AQ model was run prior to the final traffic engineering report. We look for the traffic data in the model to be the same as the traffic data that is being used for the development of the project, so we are looking for documentation that confirms that the traffic data for the model and project development are the same;
- Finally on consultation, we are aware that the EPA submitted comments regarding the truck traffic volumes on some of the intersections and we would like to see confirmation from EPA that their comments have been addressed and also believe that this interagency air quality exchange is documented and transparent.

These are the concerns that we have with the AQ analysis on this project and would like to have these comments addressed prior to the request for a project level air quality conforming determination being submitted to FHWA. We are still looking for a date for a meeting. Thank you,

Alan R. Hansen

Team Leader – PEARC

4000 N. Central Ave.

Suite 1500

Phoenix, AZ 85012-3500

(602) 382-8964

From: bchenausky azdot.gov
Sent: Monday, November 18, 2019 3:12 PM
To: Hansen, Alan (FHWA) <Alan.Hansen@dot.gov>
Cc: Paul O'Brien <POBrien@azdot.gov>; Carmelo Acevedo <cacevedo@azdot.gov>; rsamour@azdot.gov; Lirange, Aryan (FHWA) <Aryan.lirange@dot.gov>; Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>; Sarhan, Anthony (FHWA) <Anthony.Sarhan@dot.gov>; Katie Rodriguez <krodriguez@azdot.gov>; Amy Ritz <aritz@azdot.gov>; Claggett, Michael (FHWA) <Michael.Claggett@dot.gov>
Subject: Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

Alan,

I have attached a summary of all the responses during May/June as emails were sent between various people at different times during the project review. Note that the final changes were incorporated into the documents that went out for interagency consultation on June 6th, as highlighted below, addressing all the comments provided by FHWA from May. Given ADOT does not know what information was already provided to the Resource Center staff and that the project has now moved passed consultation with a formal air quality report and modeling, any meeting topics should be based on the October 4th Version of the air quality report posted on our website and the actual modeling that occurred uploaded to ShareFile. Please provide me a few dates that FHWA staff will be available for a meeting with the project team at ADOT to discuss any needed changes to the draft air quality report and/or the associated modeling for the final version of the air quality report.

Beverly Chenausky <bchenausky@azdot.gov> Thu, Jun 6, 11:59 AM

to Lindy, Wamsley.Jerry, Johanna, Transportationconformity, Alan, Paul, Clifton, Karina, ADOTAirNoise, Dean, Katie

ADOT is presenting the following project, **I-10, I-17 (Split) to SR202L (Santan),** for interagency consultation per 40 CFR 93.105 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 clearance. ADOT is requesting responses to the attached PM questionnaire within **10 business days**; 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.

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1611 W. Jackson St.
Phoenix, AZ 85007
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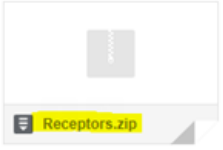
azdot.gov
ADOT Environmental Planning

3 Attachments



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ADOT Environmental Planning

On Mon, Nov 18, 2019 at 7:22 AM Hansen, Alan (FHWA) <Alan.Hansen@dot.gov> wrote:

> In reviewing this submittal, the division and resource center have determined that FHWA resource center comments from May have still not been addressed. This was also noted in the FHWA response to the POAQC sent in June. FHWA believes that it would be best to meet and discuss the resolution of comments with the entire team including the development team who we are copying on this email.
>
> Alan R. Hansen
>
> Team Leader – PEARC
>
> 4000 N. Central Ave.
>
> Suite 1500
>
> Phoenix, AZ 85012-3500
>
> (602) 382-8964
>
> **From:** bchenausky azdot.gov
> **Sent:** Friday, October 4, 2019 2:22 PM
> **To:** LBauer azmag.gov <LBauer@azmag.gov>; Wamsley.Jerry <wamsley.jerry@epa.gov>; Johanna Kuspert - AQDX <JKuspert@mail.maricopa.gov>; Transportationconformity <transportationconformity@azdeq.gov>; Hansen, Alan (FHWA) <Alan.Hansen@dot.gov>; Paul O'brien <POBrien@azdot.gov>

Cc: Clifton Meek <meek.clifton@epa.gov>; Karina O'Conner <oconnor.karina@epa.gov>; ADOTAirNoise - ADOT <adotairnoise@azdot.gov>; Dean Giles <dgiles@azmag.gov>; Amy Ritz <aritz@azdot.gov>; tshin@mag.maricopa.gov; Katie Rodriguez <krodriguez@azdot.gov>
Subject: Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

The draft air quality report and associated environmental assessment has been published on the project website (best viewed with Chrome):

https://azdot.gov/planning/transportation-studies/interstate-10-broadway-curve-interstate-17-split-loop-202-santan

A public hearing will be held on Thursday, October 24, 2019 from 5:00 p.m. – 8:00 p.m. at the DoubleTree by Hilton Phoenix-Tempe Conference Center located at 2100 South Priest Drive in Tempe. The public review and comment period extends from **Oct. 4 through Nov. 18, 2019**.

Please submit any comments on the air quality report or the environmental assessment through the following options (see the attached newspaper advertisement):

Online: Online(link is external)

Email: BroadwayCurve@azdot.gov(link sends e-mail)

Phone: 602.501.5505

Mail: I-10 Broadway Curve Study
c/o ADOT Communications
1655 W. Jackson St. MD 126F
Phoenix, AZ 85007

The associated air quality modeling files for this project will be made available via ShareFile, if you have not registered or used ADOT's ShareFile before the instructions are attached, if you do not receive a separate notification from ShareFile please let me know (check spam for noreply@sf-notifications.com).

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

On Tue, Jul 9, 2019 at 9:15 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:

> As there are no objections or request for changes to the CO modeling assumptions provided June 6th, 2019, interagency consultation is complete. The project will commence with the CO modeling for conformity the results of this analysis will be included in the air quality report that will be developed for the Environmental Assessment scheduled to be released for public comment later this year. Additional notification will be provided when the draft analysis is available for review, any requested modeling files will be provided at that time, thank you.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

On Thu, Jun 20, 2019 at 8:42 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:

> As there are no objections to the project determination presented for PM10, interagency consultation is complete with the project identified as a project that does not require a quantitative hot-spot analysis as listed under 40 CFR 93.123(b). Please provide any additional comments on the models, methods and assumptions used for the CO Quantitative Hot-spot modeling, by **July 8, 2019.**

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

On Thu, Jun 6, 2019 at 11:59 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:

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>
> Additionally, ADOT has determined that the project requires a quantitative hot-spot analysis only for CO, the modeling assumptions for Attached is the combined *Project Level CO Hot-Spot Analysis Questionnaire* demonstrating the need for analysis and the *Project Level CO Quantitative Hot_Sot Analysis - Consultation Document.* The Purpose of this document is to describe the methods, models and assumptions used for a quantitative hot-spot analysis as required in 40 CFR 93.105(c)(1)(i), 93.123, 93.116, additional information on the receptor locations is also included (as zip file). It is requested that the consulted parties provide comments or questions on the methods, models and assumptions within **30 days,** a non-response will be interpreted as concurrence with the planning assumptions as describe in the attached CO document.
>
> **Beverly T. Chenausky**
> **Air & Noise Program Manager**
> MD EM02, Room 41
> 1611 W. Jackson St.
> Phoenix, AZ 85007
> 602.712.6269
> azdot.gov
>
> 
>

RE: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

1 message

Hansen, Alan (FHWA) <Alan.Hansen@dot.gov> Mon, Dec 30, 2019 at 9:24 AM
To: "bchenausky azdot.gov" <bchenausky@azdot.gov>
Cc: Paul O'Brien <POBrien@azdot.gov>, Carmelo Acevedo <cacevedo@azdot.gov>, "rsamour@azdot.gov" <rsamour@azdot.gov>, "Lirange, Aryan (FHWA)" <Aryan.lirange@dot.gov>, "Yedlin, Rebecca (FHWA)" <Rebecca.Yedlin@dot.gov>, "Sarhan, Anthony (FHWA)" <Anthony.Sarhan@dot.gov>, Katie Rodriguez <krodriguez@azdot.gov>, Amy Ritz <aritz@azdot.gov>, "Claggett, Michael (FHWA)" <Michael.Claggett@dot.gov>

Hi Beverly,

I got your voicemail. For the week of Jan 13-17, the best times for FHWA are:

Jan 13 7-10:30am

Jan 14 9-10:30am

Jan 15 noon-3pm

I don't think we will be able to get everyone but those are our best times.

Alan R. Hansen

Team Leader – PEARC

4000 N. Central Ave.

Suite 1500

Phoenix, AZ 85012-3500

(602) 382-8964

From: bchenausky azdot.gov
Sent: Friday, November 22, 2019 9:49 AM
To: Hansen, Alan (FHWA) <Alan.Hansen@dot.gov>
Cc: Paul O'Brien <POBrien@azdot.gov>; Carmelo Acevedo <cacevedo@azdot.gov>; rsamour@azdot.gov; Lirange, Aryan (FHWA) <Aryan.lirange@dot.gov>; Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>; Sarhan, Anthony (FHWA) <Anthony.Sarhan@dot.gov>; Katie Rodriguez <krodriguez@azdot.gov>; Amy Ritz <aritz@azdot.gov>; Claggett, Michael (FHWA) <Michael.Claggett@dot.gov>
Subject: Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

Alan,

Several conflicts occur for the date suggested, I would suggest getting with your staff for the month of December or setting up a doodle poll for availability.

Beverly T. Chenausky
Air & Noise Program Manager
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1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

ADOT Environmental Planning

On Thu, Nov 21, 2019 at 3:26 PM Hansen, Alan (FHWA) <Alan.Hansen@dot.gov> wrote:

Hi Beverly,

Times are getting difficult due to travel and holidays, but it looks like the morning of 11/26 is open for us.

Alan R. Hansen

Team Leader – PEARC

4000 N. Central Ave.

Suite 1500

Phoenix, AZ 85012-3500

(602) 382-8964

From: bchenausky azdot.gov
Sent: Monday, November 18, 2019 3:12 PM
To: Hansen, Alan (FHWA) <Alan.Hansen@dot.gov>
Cc: Paul O'Brien <POBrien@azdot.gov>; Carmelo Acevedo <cacevedo@azdot.gov>; rsamour@azdot.gov; Lirange, Aryan (FHWA) <Aryan.lirange@dot.gov>; Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>; Sarhan, Anthony (FHWA) <Anthony.Sarhan@dot.gov>; Katie Rodriguez <krodriguez@azdot.gov>; Amy Ritz <aritz@azdot.gov>; Claggett, Michael (FHWA) <Michael.Claggett@dot.gov>
Subject: Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

Alan,

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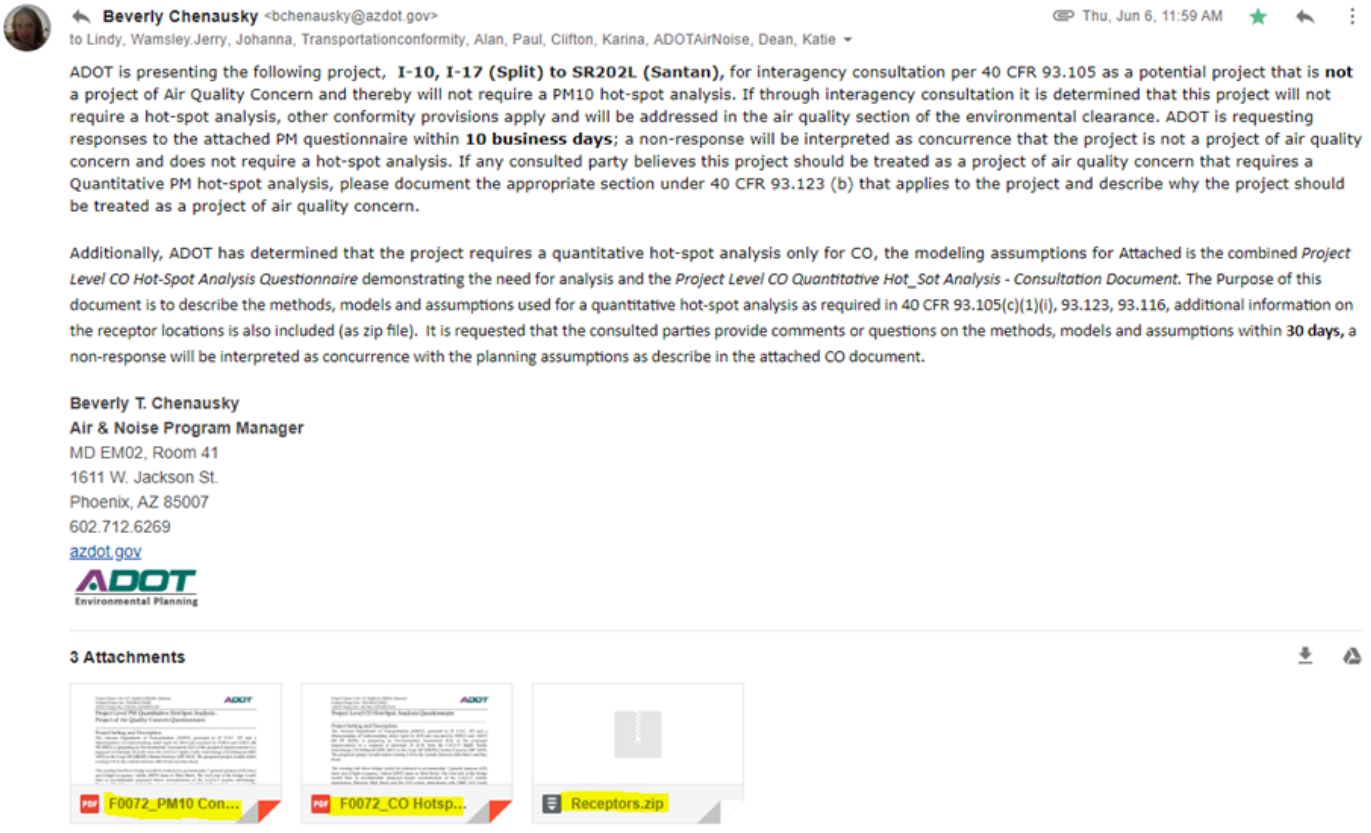

Beverly Chenausky <bchenausky@azdot.gov> Thu, Jun 6, 11:59 AM

to Lindy, Wamsley.Jerry, Johanna, Transportationconformity, Alan, Paul, Clifton, Karina, ADOTAirNoise, Dean, Katie

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Phoenix, AZ 85007
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azdot.gov
ADOT Environmental Planning

3 Attachments

F0072_PM10 Con... F0072_CO Hotsp... Receptors.zip

F0072; I-10, I-17 Split to SR 202L (Broadway Curve)

Air Quality Discussion

January 14, 2020

1611 W Jackson Street, Phoenix, AZ 85007 (Slide Rock Small Conference Room)

1. Air Quality Consultation Timeline

06/06/2019	ADOT provided zip file of receptor locations, combined "Project Level CO Hot-Spot Analysis Questionnaire" Project Level CO Quantitative Hot-Spot Analysis - Consultation Document" and the "Project Level PM Quantitative Hot-Spot Analysis - Project of Air Quality Concern Questionnaire" for interagency consultation. (This included the comments for changes from FHWA's last email May 28th, 2019).
06/20/2019	10 day period for PM10 Consultation period concluded with no comments or objections to the PM10 document, a reminder to provide comments on CO by July 8th provided to interagency consultation agencies.
07/09/2019	30 day CO Consultation period concluded with no suggested changes or comments on the planning assumptions, models or receptors included in CO consultation document. ADEQ only agency to include letter noting no comments. ADOT noted in correspondence that modeling would begin on this day.
10/04/2019	ADOT provided notice of the availability to provide comments on the EA, and Draft Air Quality report through November 18th. The air quality modeling files were provided via ShareFile to review and the Draft Technical Report was made available on project website.
10/24/2019	ADOT held public hearing for Draft EA; materials presented included a presentation, boards, comment forms, and other materials. Presentation included slide requesting public comments on Draft EA and associated technical reports.
11/01/2019	EPA asked ADOT for clarification on the draft air quality technical report; ADOT responded to the email on November 5th, 2019 that the comments were received and would be addressed.
11/18/2019	Close of the public comment period for Draft EA. All comments included in matrix attached. FHWA requests a coordination meeting to for air quality regarding coordination prior to 06/06/2019.
12/02/2019	Specific comments on the draft air quality report were provided by FHWA with request for meeting to discuss.

2. Agency and Public Comments received for Draft EA/Air Quality Technical Report (Refer to Matrix)

3. Next Steps
   - Air Quality Conformity Submittal – January 31st, 2020
   - Final EA/FONSI – February 2020

ADOT

Gmail by Google

Beverly Chenausky <bchenausky@azdot.gov>

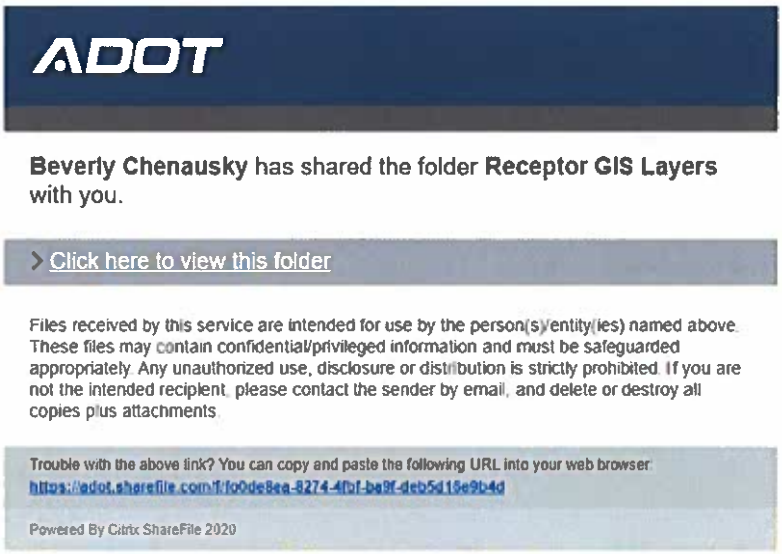
Re: Beverly Chenausky has shared the folder 'F0072 I10 Near Term Improvements' with you.

1 message

Beverly Chenausky <bchenausky@azdot.gov> Thu, Feb 6, 2020 at 11:20 AM
To: "Oesterling, Leigh (FHWA)" <Leigh.Oesterling@dot.gov>
Cc: "Noel, George (FHWA)" <George.Noel@dot.gov>, "Hansen, Alan (FHWA)" <Alan.Hansen@dot.gov>, "Yedlin, Rebecca (FHWA)" <Rebecca.Yedlin@dot.gov>, "Elsken, Jennifer (FHWA)" <jennifer.elsken@dot.gov>, Paul O'brien <POBrien@azdot.gov>, Joonwon Joo <jjoo@azdot.gov>, Amy Ritz <aritz@azdot.gov>, Aryan Lirange <aryan.lirange@dot.gov>, Robert Samour <rsamour@azdot.gov>, Katie Rodriguez <krodriguez@azdot.gov>

The corrected GIS files have been added to ShareFile a notification should have been sent, let me know if you have any issues obtaining the information. Also, there was mention of comments being submitted in October that ADOT did not receive prior, can that information be sent to me or confirmation that these comments are all the comments that will be provided?

---------- Forwarded message ---------
From: **Beverly Chenausky** <mail@sf-notifications.com>
Date: Thu, Feb 6, 2020 at 11:07 AM
Subject: Beverly Chenausky has shared the folder 'Receptor GIS Layers' with you
To: <jjoo@azdot.gov>



Beverly T. Chenausky
Air & Noise Program Manager
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1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

ADOT Environmental Planning

On Tue, Feb 4, 2020 at 2:36 PM Beverly Chenausky <bchenausky@azdot.gov> wrote:

Leigh & George -

1. **Please explain why the average January temperature is not being used for MOVES modeling as called for in the EPA CO Hot-Spot Guidance?**

   - The 2018 data were obtained from the average hourly January 2018 values (31 days) and for 2040, the average January values were obtained from the latest 3 years (2016-2018). They were acquired from Local Climatological Data at NOAA.

2. **Please explain why the 2018 and 2040 meteorology data used for the MOVES modeling are different?**

4. **Receptor Questions and Comments**

GIS Receptor Shapefile Comment

- GIS Receptor Shapefile Comment - The summary document summarizes what will be included in the revised report Figure 10 is the correct receptor image and will be included in the report with those changes (the draft Air Quality report did not include the images directly the report). It appears the prior Broadway GIS file was uploaded to ShareFile instead of the updated receptors, we will send the correct one shortly.

Baseline Road and I-10 EB Modeled Receptors Questions, Elliott Road and I-10 EB and WB Modeled Receptors Questions

- We did not include additional receptors for the Baseline Road and Elliott Road underpass/overpass locations and such corrections were not specifically mentioned prior to modeling when we recirculated the receptor locations for consultation. If additional modeling is requested for the few additional receptors along Baseline and Elliot, I would have to have a larger discussion with the project team on the overall schedule.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

ADOT
Environmental Planning

On Mon, Feb 3, 2020 at 12:53 PM Oesterling, Leigh (FHWA) <Leigh.Oesterling@dot.gov> wrote:

> Hi Beverly,
>
> Just wanted to let you know that we have provided comments on the provided modeling files to the Division Office, who will coordinate the FHWA response.
>
> Thank you,
>
> Leigh
>
> **Leigh Oesterling**
>
> Air Quality Specialist
>
> Environment, Air Quality and Realty Team
>
> Federal Highway Administration Resource Center
>
> Phone: (614) 601-3273
>
> leigh.oesterling@dot.gov
>
> www.fhwa.dot.gov/resourcecenter
>
> -
>
> Federal Highway Administration RESOURCE CENTER 20 YEARS OF SERVICE

From: bchenausky azdot.gov <bchenausky@azdot.gov>
Sent: Thursday, January 30, 2020 11:17 AM
To: Oesterling, Leigh (FHWA) <Leigh.Oesterling@dot.gov>
Cc: Noel, George (FHWA) <George.Noel@dot.gov>
Subject: Re: Beverly Chenausky has shared the folder 'F0072 I10 Near Term Improvements' with you.

Federal Highway Administration RESOURCE CENTER 20 YEARS OF SERVICE

From: mail@sf-notifications.com <mail@sf-notifications.com>
Sent: Friday, January 17, 2020 7:07 PM
To: Oesterling, Leigh (FHWA) <Leigh.Oesterling@dot.gov>
Subject: Beverly Chenausky has shared the folder 'F0072 I10 Near Term Improvements' with you.

ADOT

Beverly Chenausky has shared the folder **F0072 I10 Near Term Improvements** with you.

Note From Beverly:

I've added you to a folder.

Uploading the modeling files that were provided during public review period as 90 days past and the files were remove. As request the receptors were provided in GIS format more details a re in the summary document - let us know if you need anything else.

To access this folder, you must first activate your account and set your personal password.

Click here to activate your account and view this folder

Trouble with the above link? You can copy and paste the following URL into your web browser:
https://adot.sharefile.com/f/fo3776f5-ec18-4ebb-8427-31f561efb793?a=66906ab023b69854

F0072; I-10, I-17 Split to SR 202L (Broadway Curve)

Air Quality Comment Resolution Meeting

February 14, 2020

1611 W Jackson Street, Phoenix, AZ 85007 (Slide Rock Small Conference Room)

1. Air Quality Interagency Consultation Timeline

06/06/2019	ADOT provided zip file of receptor locations, combined "Project Level CO Hot-Spot Analysis Questionnaire" Project Level CO Quantitative Hot-Spot Analysis - Consultation Document" and the "Project Level PM Quantitative Hot-Spot Analysis - Project of Air Quality Concern Questionnaire" for interagency consultation. (This included the comments for changes from FHWA's last email May 28th, 2019).
06/20/2019	10 day period for PM10 Consultation period concluded with no comments or objections to the PM10 document, a reminder to provide comments on CO by July 8th provided to interagency consultation agencies.
07/09/2019	30 day CO Consultation period concluded with no suggested changes or comments on the planning assumptions, models or receptors included in CO consultation document. ADEQ only agency to include letter noting no comments. ADOT noted in correspondence that modeling would begin on this day.
10/04/2019	ADOT provided notice of the availability to provide comments on the EA, and Draft Air Quality report through November 18th. The air quality modeling files were provided via ShareFile to review and the Draft Technical Report was made available on project website.
10/24/2019	ADOT held public hearing for Draft EA; materials presented included a presentation, boards, comment forms, and other materials. Presentation included slide requesting public comments on Draft EA and associated technical reports.
11/01/2019	EPA asked ADOT for clarification on the draft air quality technical report; ADOT responded to the email on November 5th, 2019 that the comments were received and would be addressed.
11/18/2019	Close of the public comment period for Draft EA. All comments included in matrix attached. FHWA requests a coordination meeting to for air quality regarding coordination prior to 06/06/2019.
12/02/2019	Specific comments on the draft air quality report were provided by FHWA with request for meeting to discuss.

2. FHWA Resource Center Comments Received – February 2020
   - February 3rd, 2020 comments from FHWA Resource Center (submitted by FHWA AZ Division)
   - February 6th, 2020 comments from FHWA Resource Center (submitted by FHWA AZ Division)

3. Next Steps
   - Air Quality Conformity Submittal
   - Final EA/FONSI – February 2020

ADOT

Gmail by Google

Beverly Chenausky <bchenausky@azdot.gov>

I-10 Broadway Curve AQ Conformity - Follow-Up

1 message

Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov> Wed, Feb 19, 2020 at 2:55 PM
To: "bchenausky azdot.gov" <bchenausky@azdot.gov>
Cc: "Hansen, Alan (FHWA)" <Alan.Hansen@dot.gov>, "Lirange, Aryan (FHWA)" <Aryan.lirange@dot.gov>

Hey Beverly.

Just wanted to follow-up and let you know that FHWA had our internal conversation and we don't have any additional comments or feedback for you.

We look forward to receiving and reviewing your work plan. Thanks, Rebecca

Rebecca Yedlin

Environmental Coordinator

Federal Highway Administration Arizona Division

4000 N Central Ave, Ste#1500

Phoenix, AZ 85012

602.382.8979

Methodology Changes Requested During Public Review for the Project Level CO Quantitative Hot-Spot Analyses

The Arizona Department of Transportation (ADOT) received comments to make changes to the Air Quality Draft Technical Report (Report) during the public review period, ending November 18, 2019. The Report will be revised to add clarification to the data tables, to add the receptor locations with map images, and to include details in interagency consultation documents in the Report directly. Additionally, a request was made to modify the CO modeling to use the screening approach to the temperature/humidity in the MOVES model and to use a "worst case" approach for the truck percentages, instead of relying on the regional conformity assumptions. These adjusted modeling assumptions are provided below and any changes to the modeled CO concentrations will be modified in both the Report and the Environmental Assessment. The modified Final Air Quality Technical Report will be submitted to FHWA for a conformity determination and made available on the project website at the time ADOT approves the Finding of No Significant Impact (FONSI). ADOT also utilizes the govdelivery system to notify users of any changes to documents for projects currently under environmental study.

The Purpose of this document is to describe the changes to update modeling, from what was modeled for the September 2019 Air Quality Report. The revised methods, models and assumptions used for a CO quantitative Hot-spot analysis as required in 40 CFR 93.105(c)(1)(i), 93.123, 93.116, with changes provided below in blue. Refer to the following Appendix for responses to all comment(s) received on the Report.

Methods, Models and Assumptions for CO Hot-Spot Analysis

Table 1. Methods, Models and Assumptions		
Estimate On-Road Motor Vehicle Emissions (Step 3)		
MOVES2014b	**Description**	**Data Source**
Scale	*On road, Project, Inventory*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.2
Time Span	*Four unique model runs: For existing conditions, 2018, January, weekday, AM peak hour, and PM peak hour. For future conditions, 2040, January, weekday, AM peak hour, and PM peak hour.*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.3
Geographic Bounds	*Maricopa County*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.4
Vehicles Equipment	*All Fuels and Source Use Types will be selected*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.5

Road Type	*Urban Restricted and Unrestricted access*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.6
Pollutants and Processes	*CO Running Exhaust, CO Crankcase Running Exhaust*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.7
Output	*Database will be created, Grams, Miles, Distance Traveled, Population will be selected. Emissions process will be selected in the Output Emissions Detail. Emission rates for each process can be appropriately summed to calculate aggregate CO emission rates for each link.*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.3.10
Project Data Manager	*Database will be created and MOVES2014b templates will be created to include local project data and information provided by MAG's I/M programs, Fuel, and Age Distribution, ~~Meteorology~~ data which are consistent with the regional models. Links will be based on travel speeds and roadway grades specific to project as provided by the traffic study. Link Source Type will be derived from a combination of project data and~~based on the regional fleet mix for each road type and year. Meteorological data will be derived from historical hourly data from Phoenix International Airport. Any missing information will use default MOVES2014b data. After running MOVES, the MOVES CO_CAL3QHC_EF post-processing script is run.*	See Table 2 below for details
Select Air Quality Model, Data Inputs, and Receptors (Step 4)		
CAL3QHC	**Description**	**Data Source**
Emissions Sources	*Emissions Rates in grams/mile, as described in MOVES2014b section. The free flow and queue links defined for modeling with MOVES2014b will be used as input into CAL3QHC.*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, EPA-454/R-92-005, November 1992. Section 5.2.3 of Appendix W to 40 CFR Part 51, CO screening analyses of intersection projects should use the CAL3QHC dispersion model.
Receptor Locations	*At least 3m from the roadways at a height of 1.8m, nearby occupied lot, vacant lot, sidewalks, and any locations near breathing height (1.8m) to which the general public has continuous access (See attachment for graphical representation of model setup).*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, Section 2.2
Traffic and Geometric Design	*Lane Configuration, Lane Width, Signalization, Turning Movements, Median Width, Traffic Volume, Level of Service, Grade, % of Heavy-Duty Trucks, and Peak Hour Average Approach Speed.*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, Section 4.7.4

Meteorology	*The following meteorology options will be used as recommended in the CO Guidelines: a worst-case wind speed of 1 m/s, 5-degree wind direction intervals from 0 to 355 degrees, and a mixing height of 1000 m.* *Atmospheric stability class D will be used to represent an urban area.* *A surface roughness of 108 cm will be used, representing a suburban area.*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, Section 4.7.1
Persistence Factor	*Default persistence factor of 0.7.*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, Section 4.7.2
Determine Background Concentrations (Step 6)		
Background Monitor	*The CO monitor located at 1919 W Fairmont Drive in Tempe is directly adjacent to the project corridor. Three years of monitoring data (2015--2017) show a maximum 1-hour value of 2.0 ppm and a maximum 8-hour value of 1.7 ppm. 2.0 ppm will be added to the maximum modeled hourly concentration for comparison to the NAAQS. 1.7 ppm will be added to the maximum 8-hour modeled concentration (which is the 1-hour concentration multiplied by a persistence factor of 0.7 as described above.) The same background values will be used for all analysis years.*	1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, Section 4.7.3 EPA Air Data Monitor Values Report

Table 2. Project Data Manager Inputs		
Input	**Level of Detail/notes**	**Data Source**
Meteorology	*The average temperature and humidity in January will be used, according to the EPA guidance. Three years of hourly meteorological data were~~was~~ obtained for Phoenix International Airport. The average temperature and humidity were determined by averaging all hourly temperature values for January 2016, 2017, and 2018 and averaging all hourly relative humidity values for January 2016, 2017, and 2018. The average temperature of 57.05 degrees F and the average relative humidity of 46.28% were used in all MOVES runs, regardless of analysis year or time of day. ~~A single value Same for build and no-build scenarios. Emission factors will be developed for 8 am and 5 pm in the month of January using 12-month temperature and humidity data provided by MAG.~~*	~~MPO~~NOAA EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.1, 1992 Guideline for Modeling Carbon Monoxide from Roadway Intersections, Screening Analyses of Roadway Intersections,
Age Distribution	*Same for build and no-build scenarios. Data from latest regional CO conformity analysis provided by MAG.*	MPO EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.2
Fuel	*Same for build and no-build scenarios. Data from*	MPO

	latest regional CO conformity analysis provided by MAG.	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.3
I/M Programs	*Same for build and no-build scenarios. Data from latest regional CO conformity analysis provided by MAG.*	MPO EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.4
Retrofit Data	*Not applicable for this project.*	Project specific modeling EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.7
Links	*Four selected intersections (Baseline Rd & I-10 EB, Elliot Rd & I-10 WB, Elliot Rd & I-10 EB, Broadway Rd & I-10 WB/52nd St) will be divided into links and each link's length (in miles), traffic volume (vehicle per hour), average speed (miles per hour) and road grade (percent) will be specified. Other roadway segments within 1000 feet of the intersection will be included. (See attachment for graphical representation of model setup)*	Project specific modeling EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.6
Link Source Types	*Source type distribution will be determined using a combination of project data and regional fleet information from the ~~represented by the regional fleet for each road type and analysis year, based on data from~~ latest regional CO conformity analysis provided by MAG. The Traffic Operation Analysis demonstrates that ~~will be used to determine~~ the worst case truck percentage at ~~each~~any of the analyzed intersection for ~~each~~any scenario is 14%. The regional MAG data will be used to distribute the 14% among vehicle types 32-62, and to distribute the remaining 86% to vehicle types 11, 21, and 31.~~assign the distribution of each vehicle type.~~*	MPO I-10 Broadway Curve Traffic Operations Analysis (WSP 2019) EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.5
Link Drive Schedules, Operating Mode Distribution	*Average speed and road type will be used in the Links Importer based on project-specific modeling.*	Project specific modeling EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.8, 2.4.9
Off-Network, Hotelling	*Not applicable for this project.*	EPA Using MOVES2014 in Project-Level Carbon Monoxide Analyses, Section 2.4.9

Table 3. Construction Emissions *(Only if Applicable)*		
Construction Emissions	*Construction Emissions will be addressed qualitatively because construction is not expected to last longer than 5 years at any individual site. In the context of CO, this is usually excess CO emissions due to traffic delay and/or detours.*	40CFR93.123(c)(5)"Each site which is affected by construction-related activities shall be considered separately, using established "Guideline" methods." If applicable, include analysis as an Appendix to the Air Quality Report.

~~Preliminary~~ Revised Link Configuration for CO Hot-Spot Analysis

The following graphics present the preliminary link configurations for the four intersections that will be modeled as part of the CO hot-spot analysis in CAL3QHC. The following applies to all figures:

- Free flow links extend 1000 feet away from center of signalized intersection
- Graphic representation of free flow links includes 10 foot mixing zone
- Traffic activity within 1000 feet from intersections are included
- Yellow squares are receptors located 10 feet from the edge of roadway
- Receptors are spaced at 25-meter intervals outside of the mixing zone
- ~~Receptor location coordinates will be provided by a separate file~~ Revised receptor locations are provided in Figure 1 – Figure 8

~~52nd Street and West Broadway No Build/Existing~~
~~Free Flow Links:~~

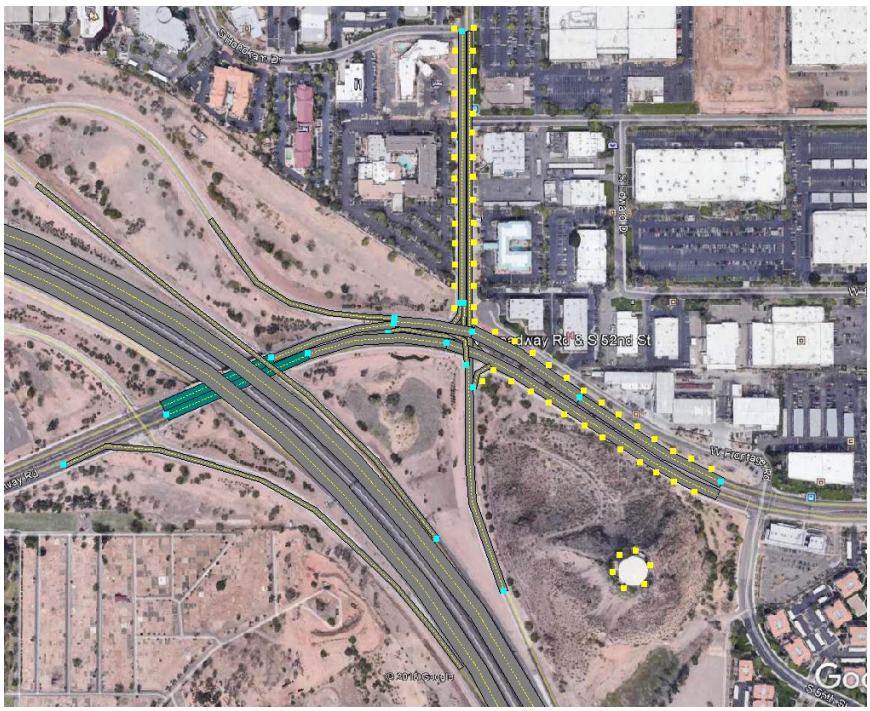
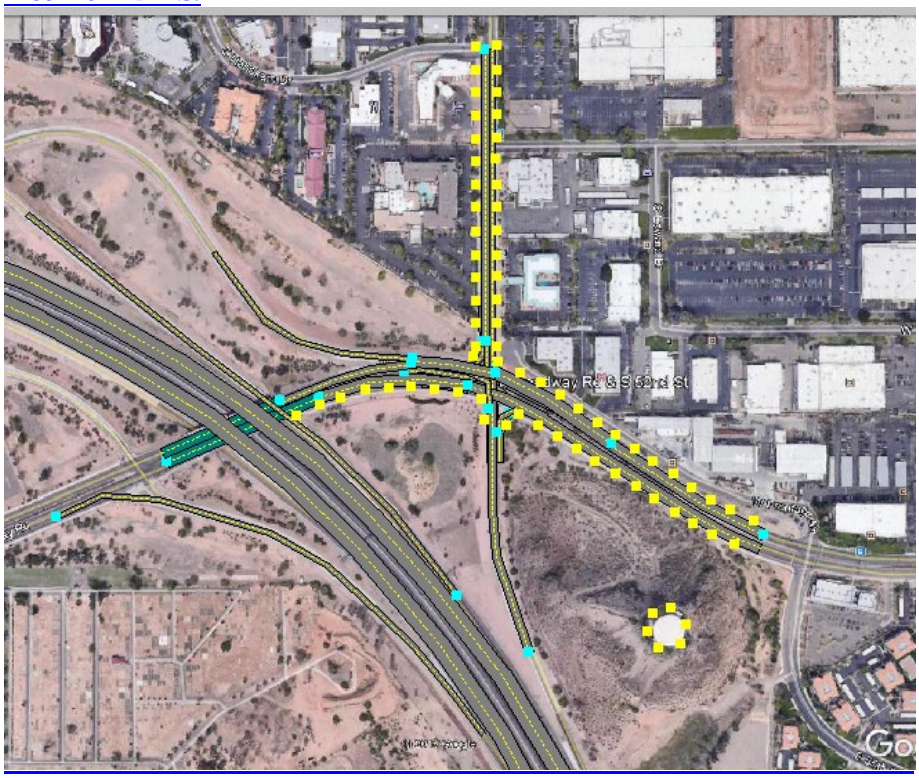


Figure 1: Revised 52nd Street and West Broadway No Build/Existing
Free Flow Links:



~~**52nd Street and West Broadway No Build/Existing**~~
~~Queue Links:~~

Figure 2: Revised 52nd Street and West Broadway No Build/Existing
Queue Links:

~~**52nd Street and West Broadway Build Scenario**~~
~~Free Flow Links:~~

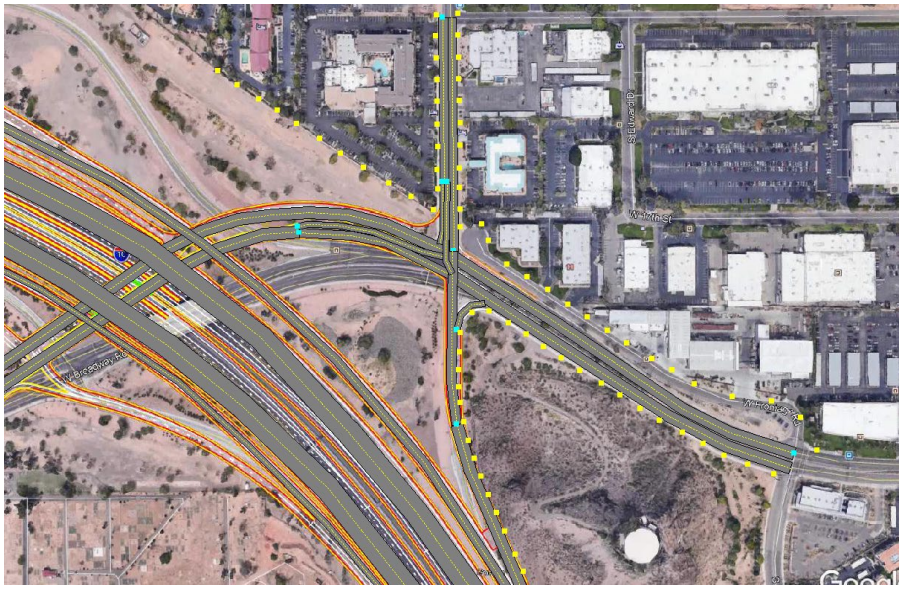
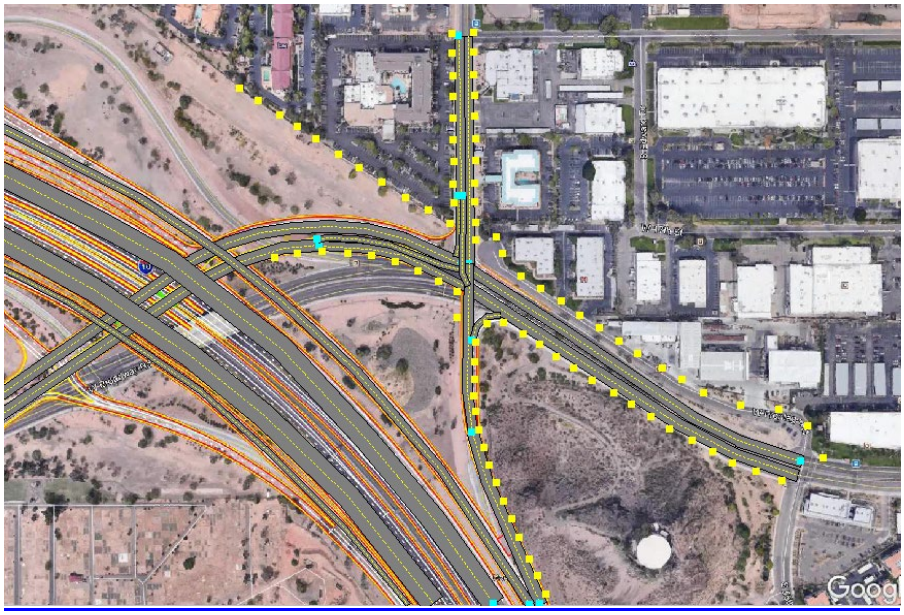


Figure 3: Revised 52nd Street and West Broadway Build Scenario
Free Flow Links:



~~**52nd Street and West Broadway Build Scenario**~~
~~Queue Links:~~

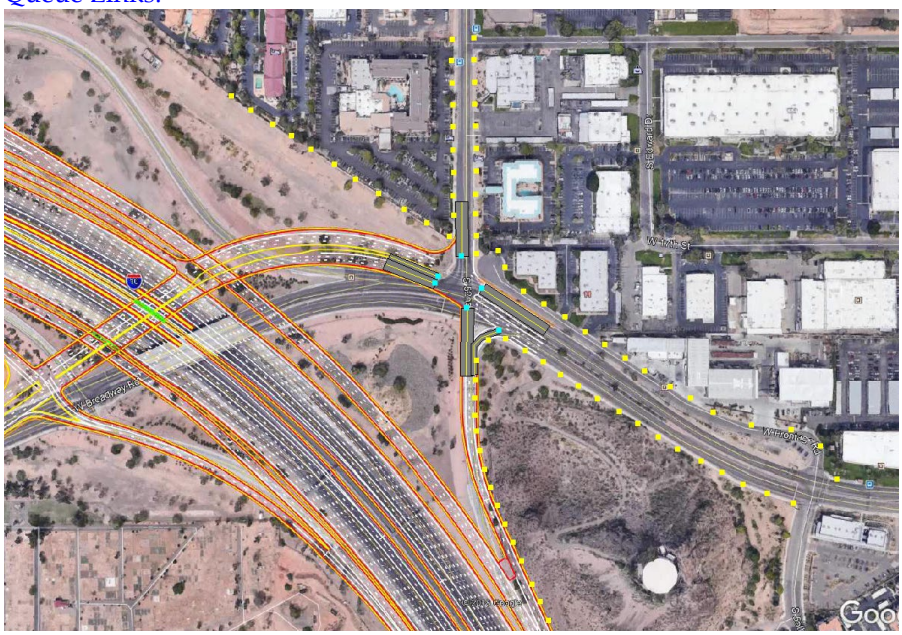
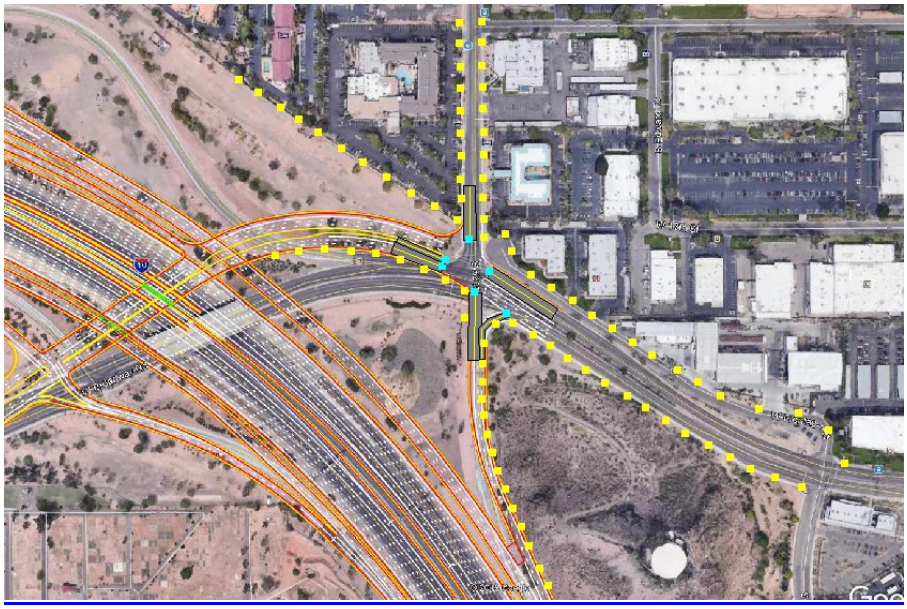
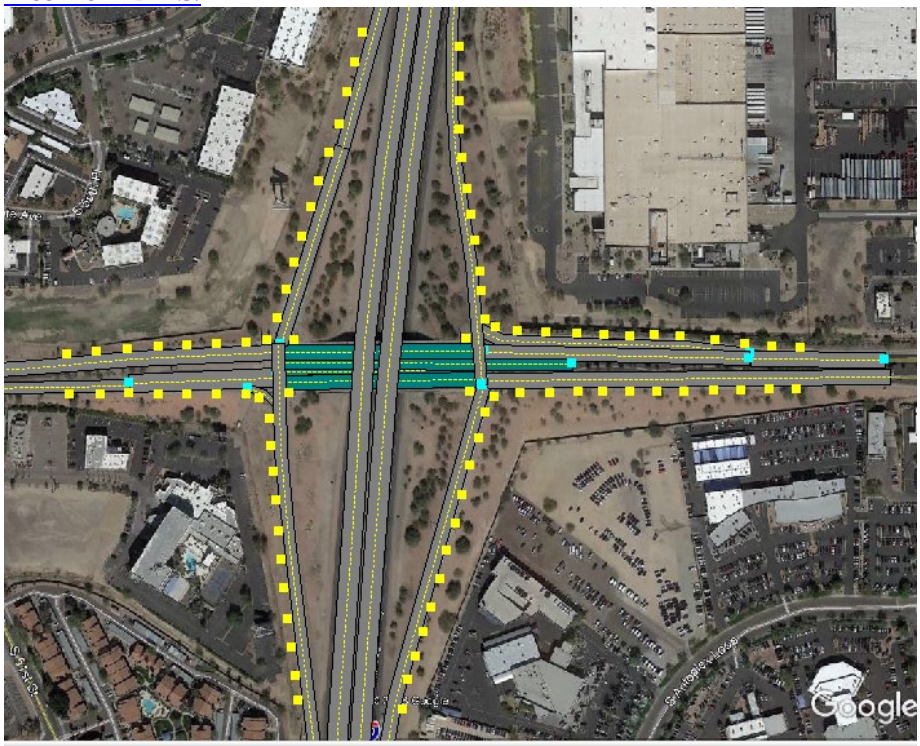


Figure 4: Revised 52nd Street and West Broadway Build Scenario
Queue Links:



~~**Elliot Rd at I-10 EB & WB Build and No Build Scenarios**~~
~~Free Flow Links:~~

Figure 5: Revised Elliot Rd at I-10 EB & WB Build and No Build Scenarios
Free Flow Links:



~~**Elliot Rd at I-10 EB & WB Build and No Build Scenarios**~~
~~Queue Links:~~

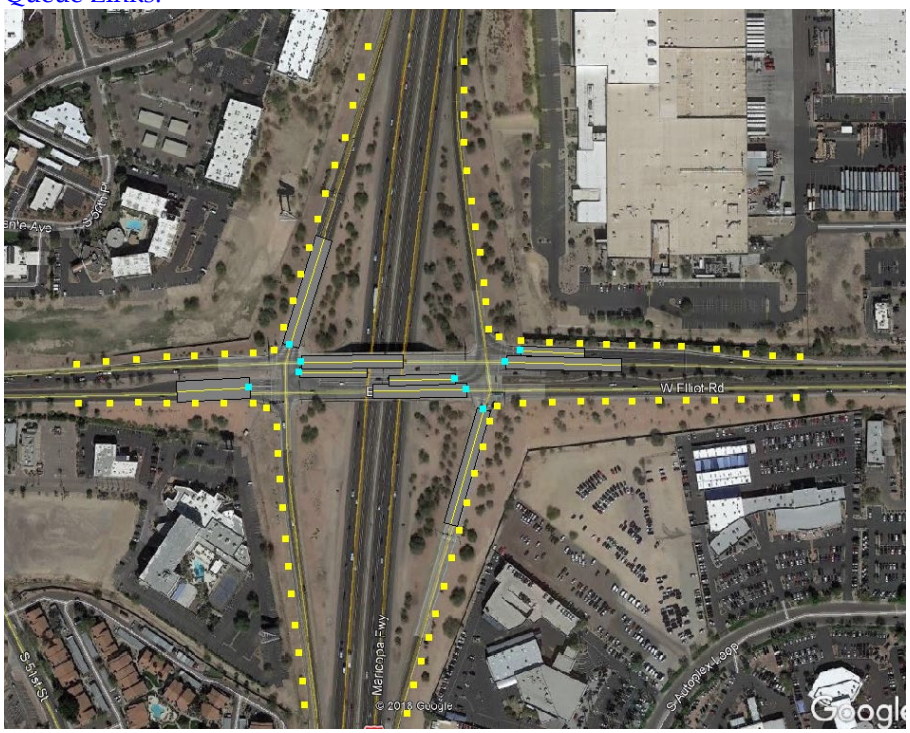
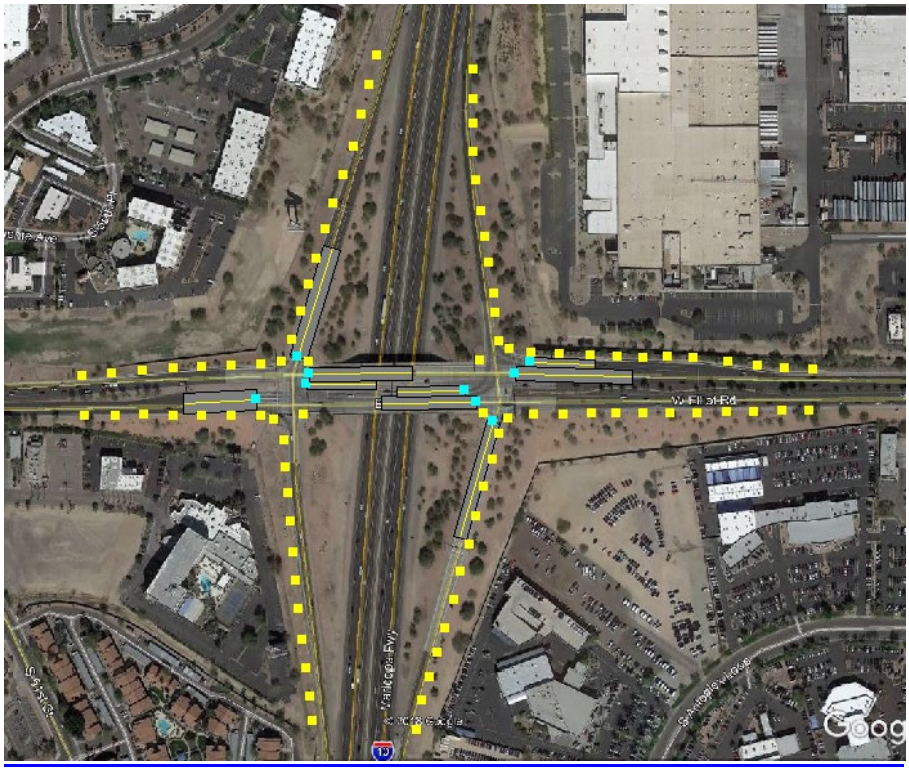


Figure 6: Revised Elliot Rd at I-10 EB & WB Build and No Build Scenarios
Queue Links:



~~**Baseline & I-10 Build and No Build Scenarios**~~
~~Free Flow Links:~~

Figure 7: Revised Baseline & I-10 Build and No Build Scenarios
Free Flow Links:

~~**Baseline & I-10 Build and No Build Scenarios**~~
~~Queue Links:~~

Figure 8: Revised Baseline & I-10 Build and No Build Scenarios
Queue Links:

APPENDIX

COMMENTS RECIEVED

Appendix

			APPENDIX	COMMENT RESOLUTION	
Comment #	**Report**	**Reviewer**	**Comment**	**Response** A= will make change/addressed B= needs additional information C= postponed change D=no changes made	**Response Clarification**
These comments were received during the public comment period that ended November 18, 2019					
1	Air Quality Technical Report	**EPA - CM**	Are the vehicle volumes represented in Table 4 (and Table 2 in Appendix A) truck volumes? or mixed vehicles?	A	Table 4 in the report was informational in terms of overall LOS between existing and No Build and Build for the purposes of the CO LOS triggers -using total peak volumes. Unfortunately there was an oversight in not including a specific trucks LOS table for Appendix A for the PM10 questionnaire (use of the version without trucks split out). However, the data used for the tables in the Appendix were obtained from the GIS data and traffic tables data that was provided on ShareFile during interagency consultation. We will be bringing forward the truck volumes in the LOS table and note that in the final air quality report (see attached word doc) as the purpose of Table 4 was for the CO modeling that was done for the report. We can expand on the section in the air quality report discussing the PM10 project of air quality concern instead of just referencing the attachments or traffic data for clarity on the decision in the actual report.
2	Air Quality Technical Report	**EPA - CM**	If these represent mixed traffic volumes, then what assumptions did ADOT make about truck volumes? And why is that result not significant given the degradation or no improvement of LOS at several of these intersections?;	D	Table 4 is total volume, not truck volumes as noted in (1). Traffic data was provided in interagency consultation in the Appendix A, on ShareFile with the GIS ShapeFiles and in the Traffic Memo. The truck volumes are provided by the Maricopa Association of Governments (MAG) the MPO, they have a robust truck traffic model in their regional model and have discussed those assumptions in their regional conformity analysis. ADOT does not assign truck volumes for the mainline we obtain truck volumes directly from the MPO - I can provide a point of contact from MAG to explain how they assign the truck volumes using their land use models, social economic models and trip generation assumptions? For the project level portion we obtain the traffic model data directly from MAG from the most current regional conformity modeling (GIS files provided on ShareFile) we also use the same planning assumptions for the emissions model that MAG uses when required for the project level analysis as noted in the CO/PM hot-spot guidance.

3	Air Quality Technical Report	**EPA - CM**	If these represent truck volumes only, why are these truck volumes not considered significant given the degradation or lack of improvement of LOS at several of these intersections.	A	As mentioned in (1) we will modify Table 2 in report to include truck volumes as it currently reflects total peak volumes. See Page 4 of EPA FAQ - https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UKQS.pdf There is a 2 part requirement in the hot-spot regulations pertaining to whether the project is a project of air quality concern for a roadway expansion project with congestested intersections. First, is there a "significant increase of trucks attributed to the project" and second does the significant increase in trucks occur at congested intersections (LOS D+). This project is not changing any of the design features at the intersections so there is no significant increase in trucks or LOS changes "due to the project". Case in point several California projects have very congested facilities LOS E yet don't rise to a project of air quality concern.
4	Air Quality Technical Report	**EPA - CM**	Please clarify what truck volume is considered "significant" in this instance and why that level was chosen. This is crucial to understanding ADOT's conclusion that this project does not need further PM analysis.	D	ADOT does not set "thresholds" for significance we were already cautioned away from setting thresholds by EPA/FHWA, as such we use interagency consultation to determine significance, EPA even re-clarifies that the examples in the hot-spot regulations are not thresholds for significance, only examples.
5	Air Quality Technical Report	**EPA - CM**	Tables 6-8 in the Traffic Memo include Truck %, which would be helpful to include in the table with truck volumes as well. Also, per our question #4 below, we recommend that there be a qualitative narrative provided in the document regarding the determination that none of the intersections has a significant number of diesel trucks. As you suggest, there are no set thresholds for significance, so it is important to describe the decision-making process behind your determination of significance.	A	Table 7 has been updated to be consistent with the total traffic volumes, and truck volumes presented in the final traffic memo. The table has also been revised to more clearly show the truck percentages for all scenarios, and the change in truck percentages due to the project. Text was added to Section 5.2 to more clearly explain that a change of <1% truck traffic was not considered a significant increase.
6	EA	**Public**	No public comments were received on the Air Quality Report. All comments related to air quality were general remarks on the draft EA and all responses will be included in the Final EA.	D	Informational, for public comments, refer to Appendix J-M of the Public Hearing Summary Report, for the Final EA.
7	EA	**Agency**	1. The Maricopa Association of Governments (MAG) voiced overall support for the Study and its goals, but stressed the importance of involving and informing the public if the project is built.2. The United States Army Corp of Engineers (USACE) provided feedback and guidance for potential project plans and necessary permits if the project is built. 3. The Arizona Department of Environmental Quality (ADEQ) provided a statement of no comment on the Draft EA.	D	Informational, refer to Appendix N of the Public Hearing Summary Report, for the Final EA.

These comments were discussed after the public comment period through formal meetings requested by FHWA on November 18, 2019 refer to the attached January 14, 2020 agenda.					
8	Air Quality Technical Report	**FHWA**	Our resource center provided comments regarding the location of the receptors and specifically as related to the pedestrian locations. In the report that was sent, it is not clear that these comments were addressed. It would be helpful to have information, such as a graphic, that shows the receptor locations so the resolution of this comment can be confirmed;	A	Receptor locations were revised based on the original comment. Receptors were all placed with 25-meter spacing. Additional receptors were added to the SW quadrant of the intersection of 52nd St and West Broadway to account for a sidewalk on the south side of Broadway. Results in Table 5 and Table 6 were updated accordingly. The air quality technical report has been revised to now include figures that clearly show these receptor locations, as well as the locations of maximum modeled concentration.
9	Air Quality Technical Report	**FHWA**	We had also commented about the traffic data used in the model, specifically that it appears that the AQ model was run prior to the final traffic engineering report. We look for the traffic data in the model to be the same as the traffic data that is being used for the development of the project, so we are looking for documentation that confirms that the traffic data for the model and project development are the same	A	The traffic data used for the AQ analysis is based on the same data that is described in the final traffic report. All modeling files that are dated prior to May 7, 2019, were reviewed for consistency with data presented in Final Traffic Operations Analysis memo. Table 4 footnote was revised to show that the source of data was the May 2019 Traffic Operations Analysis. Text was added to the end of section 5.1.2 to inform the reader that FHWA comments were received and incorporated, as shown in Appendix A. Table 7 was revised to reflect the data presented in the final traffic report dated May 7, 2019.
10	Air Quality Technical Report	**FHWA**	Finally on consultation, we are aware that the EPA submitted comments regarding the truck traffic volumes on some of the intersections and we would like to see confirmation from EPA that their comments have been addressed and also believe that this interagency air quality exchange is documented and transparent.	A	See EPA Comment Matrix

These comments were discussed in the February 14, 2020 meeting, see the attached agenda					
11	Air Quality Technical Report	**FHWA**	Please explain why the average January temperature is not being used for MOVES modeling as called for in the EPA CO Hot-Spot Guidance?	A	As stated in the EPA documents *Guideline for Modeling Carbon Monoxide from Roadway Intersections* (1992) and *Using MOVES2014 in Project-Level Carbon Monoxide Analyses* (2015) the average January temperature and humidity may be used when developing carbon monoxide emission rates. The air quality analysis included an evaluation for AM peak and PM peak hour conditions. In order to capture the differences between AM peak hour and PM peak hour emission rates, an average temperature and humidity value was calculated for each hour of the day for the month of January based on hourly meteorological data from Phoenix Sky Harbor International Airport obtained from NOAA.
12	Air Quality Technical Report	**FHWA**	Please explain why the 2018 and 2040 meteorology data used for the MOVES modeling are different?	A	The 2018 and 2040 meteorology data used for MOVES modeling is different because the averages were calculated differently for each analysis year. For each analysis year, the meteorological data used in MOVES were the average temperature and humidity for each hour in January. The 2018 meteorological input data used in MOVES was the average of hourly data from Phoenix Sky Harbor International Airport for January 2018. This most accurately depicts conditions in the base year of 2018. The 2040 meteorological input data used in MOVES was the average of hourly data from Phoenix Sky Harbor International Airport for January 2016, January 2017, and January 2018. This represents average conditions for a future year. The comment included a table that showed a missing temperature value for hour 7 in 2018. This value is included in the MOVES input database “co_hotspot_2018_in” as 50.94.
13	Air Quality Technical Report	**FHWA**	It does not appear that the CO Hot-Spot Guidance for the Link Source Type inputs are being followed. Please explain the how the Link Source Type inputs were determined?	A	Intersection data by turning movement was obtained from the Synchro traffic analysis model. The user may enter values for truck percentage at intersection approaches, which are primarily used to determine saturation flow rate. Neither the Synchro model nor the Maricopa Association of Governments (MAG) data used as a basis for this model include details to disaggregate the vehicle mix to the 13 classifications required by MOVES. In the absence of vehicle mix data by turning movement for this project, the traffic analysis team used the second method listed in Section 2.4.5 of Using MOVES2014 in Project-Level Carbon Monoxide Analyses (EPA 2015): source type distribution consistent with the road type used in the latest regional emissions analysis. This distribution was developed using the source type population data included in the MAG regional emissions model. The same distribution was used for all roadways in the CO analysis, regardless of road type, because that level of data was not available. This source type distribution does not correspond to the truck percentages presented in the May 9th Technical Memorandum because the volumes and percentages in the memorandum were specific to I-10, and do not necessarily reflect the percentages of vehicles using the interchanges.

14	Air Quality Technical Report	**FHWA**	Are there going to be sidewalks on the Baseline Road underpass of I-10 in the build scenario? If so, receptors should be placed in locations shown by the red arrows below.	D	Yes, there will be sidewalks on Baseline Road where it crosses over I-10. Receptors were not included because the air quality analysis team considered the sections between the ramps and the mainline acted as medians. In Guideline for Modeling Carbon Monoxide from Roadway Intersections (EPA 1992), Section 2.2 provides criteria for siting intersection receptors. On page 2-3, median strips of roadways are listed as an example of unreasonable receptor sites.
15	Air Quality Technical Report	**FHWA**	Are there going to be sidewalks on the Elliott Road overpass of I-10 in the build scenario? If so, receptors should be placed in locations shown by the red arrows below.	A	Yes, there will be sidewalks on Elliott Road where it crosses over I-10. Receptors were not included because the air quality analysis team considered the sections between the ramps and the mainline acted as medians. In Guideline for Modeling Carbon Monoxide from Roadway Intersections (EPA 1992), Section 2.2 provides criteria for siting intersection receptors. On page 2-3, median strips of roadways are listed as an example of unreasonable receptor sites.
16	Air Quality Technical Report	**FHWA**	The GIS receptor shapefiles in the ‘Receptor GIS Layers’ folder shared with FHWA doesn’t appear to match with the images shared in the ADOT ‘Summary’ document for the Broadway Road and I-10 interchange.	A	The GIS shapefile previously provided was not correct. A number of receptors that were included in the CAL3QHCR model were missing. A new shapefile has been provided that includes all modeled receptors. Coordinates for modeled receptors can also be found in the CAL3QHC input and output files in the UTM coordinate system.

EPA COMMENTS

RE: Questions regarding the Air Quality Technical Report for I-10 Broadway Curve

1 message

meek, clifton <meek.clifton@epa.gov> Mon, Nov 18, 2019 at 5:22 PM
To: Beverly Chenausky <bchenausky@azdot.gov>
Cc: "Wamsley, Jerry" <Wamsley.Jerry@epa.gov>, "Katie Rodriguez (KRodriguez@azdot.gov)" <KRodriguez@azdot.gov>

Hi Beverly-

Thank you for your thorough response. I believe your suggestions below to include the table with truck volumes as well as a narrative of the PM10 decision process will greatly improve the clarity of the final Air Quality technical report. Tables 6-8 in the Traffic Memo include Truck %, which would be helpful to include in the table with truck volumes as well. Also, per our question #4 below, we recommend that there be a qualitative narrative provided in the document regarding the determination that none of the intersections has a significant number of diesel trucks. As you suggest, there are no set thresholds for significance, so it is important to describe the decision-making process behind your determination of significance.

Please let me know if you have any questions regarding our comments above, or if you would like to discuss them in further detail.

Thanks,

Clifton

Clifton Meek, Life Scientist

U.S. EPA, Region 9

Environmental Review Branch - Transportation Team

75 Hawthorne Street, TIP-2

San Francisco, CA 94105

phone: 415-972-3370

meek.clifton@epa.gov

From: Beverly Chenausky <bchenausky@azdot.gov>
Sent: Tuesday, November 05, 2019 11:15 AM
To: meek, clifton <meek.clifton@epa.gov>
Cc: Wamsley, Jerry <Wamsley.Jerry@epa.gov>; Katie Rodriguez (KRodriguez@azdot.gov) <KRodriguez@azdot.gov>
Subject: Re: Questions regarding the Air Quality Technical Report for I-10 Broadway Curve

Clifton -

Since this is a draft version of the report we can add clarification as needed and include modified table(s) that were provided in another form, either with GIS files or the supplement traffic memo. I have noticed that EPA has not downloaded any of the files currently on our ShareFile yet, however several of the traffic questions are in the traffic memo see Table 6 through 8 (reattaching) or in the files provided on ShareFile. For the final air quality report we will include the supporting traffic data in the Appendixes. I have responded directly to your comments below in red, let me know if this answers your questions. I am also including the table with the truck volumes included in the intersection LOS that we will be adding to the Air Quality Report (word doc), we will also add more description of PM10 in the report instead of referencing the Appendix.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

On Fri, Nov 1, 2019 at 12:05 PM meek, clifton <meek.clifton@epa.gov> wrote:

> Hi Beverly-
>
> We have a few clarifying questions on the Air Quality Technical Report for the I-10 Broadway Curve that we're hoping you can answer before the close of the comment period on Nov 18.
>
> The traffic volumes represented in table 4 (also Table 2, Appendix A) are not labeled or differentiated as to truck volume or combined and total vehicle volume; hence, there is some confusion about whether or not the truck volumes are significant given the intersection LOS reported. Though not labeled, Table 2 in Appendix A would lead one to believe that these are truck volumes and that they are not considered significant. With this is mind, we have the following questions:
>
> (1) Are the vehicle volumes represented in Table 4 (and Table 2 in Appendix A) truck volumes? or mixed vehicles?

See Traffic Memo Attached. Table 4 in the report was informational in terms of overall LOS between existing and No Build and Build for the purposes of the CO LOS triggers -using total peak volumes. Unfortunately there was an oversight in not including a specific trucks LOS table for Appendix A for the PM10 questionnaire (use of the version without trucks split out). However, the data used for the tables in the Appendix were obtained from the GIS data and traffic tables data that was provided on ShareFile during interagency consultation. We will be bringing forward the truck volumes in the LOS table and note that in the final air quality report (see attached word doc) as the purpose of Table 4 was for the CO modeling that was done for the report. We can expand on the section in the air quality report discussing the PM10 project of air quality concern instead of just referencing the attachments or traffic data for clarity on the decision in the actual report.

> (2) If these represent mixed traffic volumes, then what assumptions did ADOT make about truck volumes? And why is that result not significant given the degradation or no improvement of LOS at several of these intersections?; or

Table 4 is total volume, not truck volumes as noted in (1). Traffic data was provided in interagency consultation in the Appendix A, on ShareFile with the GIS ShapeFiles and in the Traffic Memo. The truck volumes are provided by the Maricopa Association of Governments (MAG) the MPO, they have a robust truck traffic model in their regional model and have discussed those assumptions in their regional conformity analysis. ADOT does not assign truck volumes for the mainline we obtain truck volumes directly from the MPO - I can provide a point of contact from MAG to explain how they assign the truck volumes using their land use models, social economic models and trip generation assumptions? For the project level portion we obtain the traffic model data directly from MAG from the most current regional conformity modeling (GIS files provided on ShareFile) we also use the same planning assumptions for the emissions model that MAG uses when required for the project level analysis as noted in the CO/PM hot-spot guidance.

> (3) If these represent truck volumes only, why are these truck volumes not considered significant given the degradation or lack of improvement of LOS at several of these intersections.

As mentioned in (1) we will modify Table 2 in report to include truck volumes as it currently reflects total peak volumes.

See Page 4 of EPA FAQ - https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UKQS.pdf

There is a 2 part requirement in the hot-spot regulations pertaining to whether the project is a project of air quality concern for a roadway expansion project with congestested intersections. First, is there a "significant increase of trucks attributed to the project" and second does

the significant increase in trucks occur at congested intersections (LOS D+). This project is not changing any of the design features at the intersections so there is no significant increase in trucks or LOS changes "due to the project". Case in point several California projects have very congested facilities

LOS E yet don't rise to a project of air quality concern.

> (4) Please clarify what truck volume is considered "significant" in this instance and why that level was chosen. This is crucial to understanding ADOT's conclusion that this project does not need further PM analysis.

- ADOT does not set "thresholds" for significance we were already cautioned away from setting thresholds by EPA/FHWA, as such we use interagency consultation to determine significance, EPA even re-clarifies that the examples in the hot-spot regulations are not thresholds for significance, only examples.

> Thanks,
>
> Clifton
>
> ---
>
> Clifton Meek, Life Scientist
>
> U.S. EPA, Region 9
>
> Environmental Review Branch - Transportation Team
>
> 75 Hawthorne Street, TIP-2
>
> San Francisco, CA 94105
>
> phone: 415-972-3370
>
> meek.clifton@epa.gov
>
> **From:** Beverly Chenausky <bchenausky@azdot.gov>
> **Sent:** Friday, October 04, 2019 2:22 PM
> **To:** Lindy Bauer <lbauer@azmag.gov>; Wamsley, Jerry <Wamsley.Jerry@epa.gov>; Johanna Kuspert - AQDX <JKuspert@mail.maricopa.gov>; Transportationconformity <transportationconformity@azdeq.gov>; Hansen, Alan (FHWA) <Alan.Hansen@dot.gov>; Paul O'brien <POBrien@azdot.gov>
> **Cc:** meek, clifton <meek.clifton@epa.gov>; OConnor, Karina <OConnor.Karina@epa.gov>; ADOTAirNoise - ADOT <adotairnoise@azdot.gov>; Dean Giles <dgiles@azmag.gov>; Amy Ritz <aritz@azdot.gov>; tshin@mag.maricopa.gov; Katie Rodriguez <krodriguez@azdot.gov>
> **Subject:** Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region
>
> The draft air quality report and associated environmental assessment has been published on the project website (best viewed with Chrome):
>
> https://azdot.gov/planning/transportation-studies/interstate-10-broadway-curve-interstate-17-split-loop-202-santan
>
> A public hearing will be held on Thursday, October 24, 2019 from 5:00 p.m. – 8:00 p.m. at the DoubleTree by Hilton Phoenix-Tempe Conference Center located at 2100 South Priest Drive in Tempe. The public review and comment period extends from **Oct. 4 through Nov. 18, 2019**.
>
> Please submit any comments on the air quality report or the environmental assessment through the following options (see the attached newspaper advertisement):
>
> Online: Online(link is external)
>
> Email: BroadwayCurve@azdot.gov(link sends e-mail)
>
> Phone: 602.501.5505

Mail: I-10 Broadway Curve Study
c/o ADOT Communications
1655 W. Jackson St. MD 126F
Phoenix, AZ 85007

The associated air quality modeling files for this project will be made available via ShareFile, if you have not registered or used ADOT's ShareFile before the instructions are attached, if you do not receive a separate notification from ShareFile please let me know (check spam for noreply@sf-notifications.com).

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

Image removed by sender.

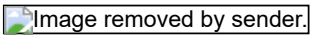
On Tue, Jul 9, 2019 at 9:15 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:

> As there are no objections or request for changes to the CO modeling assumptions provided June 6th, 2019, interagency consultation is complete. The project will commence with the CO modeling for conformity the results of this analysis will be included in the air quality report that will be developed for the Environmental Assessment scheduled to be released for public comment later this year. Additional notification will be provided when the draft analysis is available for review, any requested modeling files will be provided at that time, thank you.
>
> **Beverly T. Chenausky**
> **Air & Noise Program Manager**
> MD EM02, Room 41
> 1611 W. Jackson St.
> Phoenix, AZ 85007
> 602.712.6269
> azdot.gov
>
> Image removed by sender.
>
> On Thu, Jun 20, 2019 at 8:42 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:
>
> > As there are no objections to the project determination presented for PM10, interagency consultation is complete with the project identified as a project that does not require a quantitative hot-spot analysis as listed under 40 CFR 93.123(b). Please provide any additional comments on the models, methods and assumptions used for the CO Quantitative Hot-spot modeling, by **July 8, 2019.**
> >
> > **Beverly T. Chenausky**
> > **Air & Noise Program Manager**
> > MD EM02, Room 41
> > 1611 W. Jackson St.
> > Phoenix, AZ 85007
> > 602.712.6269
> > azdot.gov
> >
> > Image removed by sender.
> >
> > On Thu, Jun 6, 2019 at 11:59 AM Beverly Chenausky <bchenausky@azdot.gov> wrote:

ADOT is presenting the following project, **I-10, I-17 (Split) to SR202L (Santan)**, for interagency consultation per 40 CFR 93.105 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 clearance. ADOT is requesting responses to the attached PM questionnaire within **10 business days**; 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, ADOT has determined that the project requires a quantitative hot-spot analysis only for CO, the modeling assumptions for Attached is the combined *Project Level CO Hot-Spot Analysis Questionnaire* demonstrating the need for analysis and the *Project Level CO Quantitative Hot_Sot Analysis - Consultation Document.* The Purpose of this document is to describe the methods, models and assumptions used for a quantitative hot-spot analysis as required in 40 CFR 93.105(c)(1)(i), 93.123, 93.116, additional information on the receptor locations is also included (as zip file). It is requested that the consulted parties provide comments or questions on the methods, models and assumptions within **30 days,** a non-response will be interpreted as concurrence with the planning assumptions as describe in the attached CO document.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov



FHWA COMMENTS

Gmail by Google

Beverly Chenausky <bchenausky@azdot.gov>

RE: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

1 message

Hansen, Alan (FHWA) <Alan.Hansen@dot.gov> Mon, Dec 2, 2019 at 3:08 PM
To: "bchenausky azdot.gov" <bchenausky@azdot.gov>
Cc: Paul O'Brien <POBrien@azdot.gov>, Carmelo Acevedo <cacevedo@azdot.gov>, "rsamour@azdot.gov" <rsamour@azdot.gov>, "Lirange, Aryan (FHWA)" <Aryan.lirange@dot.gov>, "Yedlin, Rebecca (FHWA)" <Rebecca.Yedlin@dot.gov>, "Sarhan, Anthony (FHWA)" <Anthony.Sarhan@dot.gov>, Katie Rodriguez <krodriguez@azdot.gov>, Amy Ritz <aritz@azdot.gov>, "Elsken, Jennifer (FHWA)" <jennifer.elsken@dot.gov>

Hi Beverly,

In trying to help the discussion when we finally do meet, we want to share our specific concerns so everyone will be in a better position to discuss them. They are as follows:

- Our resource center provided comments regarding the location of the receptors and specifically as related to the pedestrian locations. In the report that was sent, it is not clear that these comments were addressed. It would be helpful to have information, such as a graphic, that shows the receptor locations so the resolution of this comment can be confirmed;
- We had also commented about the traffic data used in the model, specifically that it appears that the AQ model was run prior to the final traffic engineering report. We look for the traffic data in the model to be the same as the traffic data that is being used for the development of the project, so we are looking for documentation that confirms that the traffic data for the model and project development are the same;
- Finally on consultation, we are aware that the EPA submitted comments regarding the truck traffic volumes on some of the intersections and we would like to see confirmation from EPA that their comments have been addressed and also believe that this interagency air quality exchange is documented and transparent.

These are the concerns that we have with the AQ analysis on this project and would like to have these comments addressed prior to the request for a project level air quality conforming determination being submitted to FHWA. We are still looking for a date for a meeting. Thank you,

Alan R. Hansen

Team Leader – PEARC

4000 N. Central Ave.

Suite 1500

Phoenix, AZ 85012-3500

(602) 382-8964

From: bchenausky azdot.gov
Sent: Monday, November 18, 2019 3:12 PM
To: Hansen, Alan (FHWA) <Alan.Hansen@dot.gov>
Cc: Paul O'Brien <POBrien@azdot.gov>; Carmelo Acevedo <cacevedo@azdot.gov>; rsamour@azdot.gov; Lirange, Aryan (FHWA) <Aryan.lirange@dot.gov>; Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>; Sarhan, Anthony (FHWA) <Anthony.Sarhan@dot.gov>; Katie Rodriguez <krodriguez@azdot.gov>; Amy Ritz <aritz@azdot.gov>; Claggett, Michael (FHWA) <Michael.Claggett@dot.gov>
Subject: Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

Alan,

I have attached a summary of all the responses during May/June as emails were sent between various people at different times during the project review. Note that the final changes were incorporated into the documents that went out for interagency consultation on June 6th, as highlighted below, addressing all the comments provided by FHWA from May. Given ADOT does not know what information was already provided to the Resource Center staff and that the project has now moved passed consultation with a formal air quality report and modeling, any meeting topics should be based on the October 4th Version of the air quality report posted on our website and the actual modeling that occurred uploaded to ShareFile. Please provide me a few dates that FHWA staff will be available for a meeting with the project team at ADOT to discuss any needed changes to the draft air quality report and/or the associated modeling for the final version of the air quality report.

Beverly Chenausky <bchenausky@azdot.gov> Thu, Jun 6, 11:59 AM

to Lindy, Wamsley.Jerry, Johanna, Transportationconformity, Alan, Paul, Clifton, Karina, ADOTAirNoise, Dean, Katie

ADOT is presenting the following project, **I-10, I-17 (Split) to SR202L (Santan),** for interagency consultation per 40 CFR 93.105 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 clearance. ADOT is requesting responses to the attached PM questionnaire within **10 business days**; 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.

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Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov
ADOT Environmental Planning

3 Attachments

F0072_PM10 Con... F0072_CO Hotsp... Receptors.zip

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov
ADOT Environmental Planning

On Mon, Nov 18, 2019 at 7:22 AM Hansen, Alan (FHWA) <Alan.Hansen@dot.gov> wrote:

> In reviewing this submittal, the division and resource center have determined that FHWA resource center comments from May have still not been addressed. This was also noted in the FHWA response to the POAQC sent in June. FHWA believes that it would be best to meet and discuss the resolution of comments with the entire team including the development team who we are copying on this email.
>
> Alan R. Hansen
>
> Team Leader – PEARC
>
> 4000 N. Central Ave.
>
> Suite 1500
>
> Phoenix, AZ 85012-3500
>
> (602) 382-8964
>
> **From:** bchenausky azdot.gov
> **Sent:** Friday, October 4, 2019 2:22 PM
> **To:** LBauer azmag.gov <LBauer@azmag.gov>; Wamsley.Jerry <wamsley.jerry@epa.gov>; Johanna Kuspert - AQDX <JKuspert@mail.maricopa.gov>; Transportationconformity <transportationconformity@azdeq.gov>; Hansen, Alan (FHWA) <Alan.Hansen@dot.gov>; Paul O'brien <POBrien@azdot.gov>

Cc: Clifton Meek <meek.clifton@epa.gov>; Karina O'Conner <oconnor.karina@epa.gov>; ADOTAirNoise - ADOT <adotairnoise@azdot.gov>; Dean Giles <dgiles@azmag.gov>; Amy Ritz <aritz@azdot.gov>; tshin@mag.maricopa.gov; Katie Rodriguez <krodriguez@azdot.gov>
Subject: Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

The draft air quality report and associated environmental assessment has been published on the project website (best viewed with Chrome):

https://azdot.gov/planning/transportation-studies/interstate-10-broadway-curve-interstate-17-split-loop-202-santan

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Please submit any comments on the air quality report or the environmental assessment through the following options (see the attached newspaper advertisement):

Online: Online(link is external)

Email: BroadwayCurve@azdot.gov(link sends e-mail)

Phone: 602.501.5505

Mail: I-10 Broadway Curve Study
c/o ADOT Communications
1655 W. Jackson St. MD 126F
Phoenix, AZ 85007

The associated air quality modeling files for this project will be made available via ShareFile, if you have not registered or used ADOT's ShareFile before the instructions are attached, if you do not receive a separate notification from ShareFile please let me know (check spam for noreply@sf-notifications.com).

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
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602.712.6269
azdot.gov

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Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

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Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
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azdot.gov

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>
> **Beverly T. Chenausky**
> **Air & Noise Program Manager**
> MD EM02, Room 41
> 1611 W. Jackson St.
> Phoenix, AZ 85007
> 602.712.6269
> azdot.gov
>
> 

RE: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

1 message

Hansen, Alan (FHWA) <Alan.Hansen@dot.gov> Mon, Dec 30, 2019 at 9:24 AM
To: "bchenausky azdot.gov" <bchenausky@azdot.gov>
Cc: Paul O'Brien <POBrien@azdot.gov>, Carmelo Acevedo <cacevedo@azdot.gov>, "rsamour@azdot.gov" <rsamour@azdot.gov>, "Lirange, Aryan (FHWA)" <Aryan.lirange@dot.gov>, "Yedlin, Rebecca (FHWA)" <Rebecca.Yedlin@dot.gov>, "Sarhan, Anthony (FHWA)" <Anthony.Sarhan@dot.gov>, Katie Rodriguez <krodriguez@azdot.gov>, Amy Ritz <aritz@azdot.gov>, "Claggett, Michael (FHWA)" <Michael.Claggett@dot.gov>

Hi Beverly,

I got your voicemail. For the week of Jan 13-17, the best times for FHWA are:

Jan 13 7-10:30am

Jan 14 9-10:30am

Jan 15 noon-3pm

I don't think we will be able to get everyone but those are our best times.

Alan R. Hansen

Team Leader – PEARC

4000 N. Central Ave.

Suite 1500

Phoenix, AZ 85012-3500

(602) 382-8964

From: bchenausky azdot.gov
Sent: Friday, November 22, 2019 9:49 AM
To: Hansen, Alan (FHWA) <Alan.Hansen@dot.gov>
Cc: Paul O'Brien <POBrien@azdot.gov>; Carmelo Acevedo <cacevedo@azdot.gov>; rsamour@azdot.gov; Lirange, Aryan (FHWA) <Aryan.lirange@dot.gov>; Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>; Sarhan, Anthony (FHWA) <Anthony.Sarhan@dot.gov>; Katie Rodriguez <krodriguez@azdot.gov>; Amy Ritz <aritz@azdot.gov>; Claggett, Michael (FHWA) <Michael.Claggett@dot.gov>
Subject: Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

Alan,

Several conflicts occur for the date suggested, I would suggest getting with your staff for the month of December or setting up a doodle poll for availability.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov

ADOT Environmental Planning

On Thu, Nov 21, 2019 at 3:26 PM Hansen, Alan (FHWA) <Alan.Hansen@dot.gov> wrote:

Hi Beverly,

Times are getting difficult due to travel and holidays, but it looks like the morning of 11/26 is open for us.

Alan R. Hansen

Team Leader – PEARC

4000 N. Central Ave.

Suite 1500

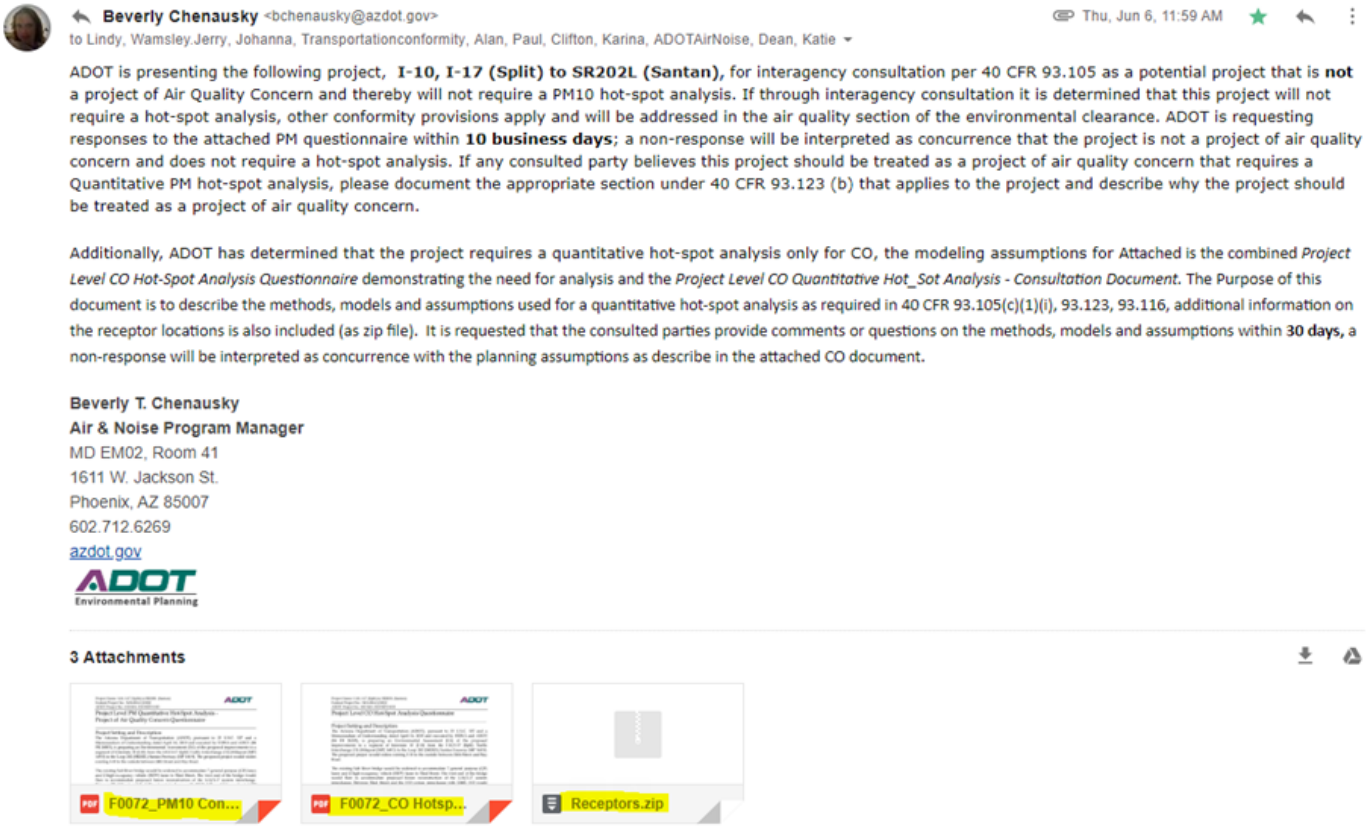
Phoenix, AZ 85012-3500

(602) 382-8964

From: bchenausky azdot.gov
Sent: Monday, November 18, 2019 3:12 PM
To: Hansen, Alan (FHWA) <Alan.Hansen@dot.gov>
Cc: Paul O'Brien <POBrien@azdot.gov>; Carmelo Acevedo <cacevedo@azdot.gov>; rsamour@azdot.gov; Lirange, Aryan (FHWA) <Aryan.lirange@dot.gov>; Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov>; Sarhan, Anthony (FHWA) <Anthony.Sarhan@dot.gov>; Katie Rodriguez <krodriguez@azdot.gov>; Amy Ritz <aritz@azdot.gov>; Claggett, Michael (FHWA) <Michael.Claggett@dot.gov>
Subject: Re: Interagency Consultation: Determining Project of Air Quality Concern in MAG Region

Alan,

I have attached a summary of all the responses during May/June as emails were sent between various people at different times during the project review. Note that the final changes were incorporated into the documents that went out for interagency consultation on June 6th, as highlighted below, addressing all the comments provided by FHWA from May. Given ADOT does not know what information was already provided to the Resource Center staff and that the project has now moved passed consultation with a formal air quality report and modeling, any meeting topics should be based on the October 4th Version of the air quality report posted on our website and the actual modeling that occurred uploaded to ShareFile. Please provide me a few dates that FHWA staff will be available for a meeting with the project team at ADOT to discuss any needed changes to the draft air quality report and/or the associated modeling for the final version of the air quality report.



Beverly Chenausky <bchenausky@azdot.gov> Thu, Jun 6, 11:59 AM

to Lindy, Wamsley.Jerry, Johanna, Transportationconformity, Alan, Paul, Clifton, Karina, ADOTAirNoise, Dean, Katie

ADOT is presenting the following project, **I-10, I-17 (Split) to SR202L (Santan),** for interagency consultation per 40 CFR 93.105 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 clearance. ADOT is requesting responses to the attached PM questionnaire within **10 business days**; 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, ADOT has determined that the project requires a quantitative hot-spot analysis only for CO, the modeling assumptions for Attached is the combined *Project Level CO Hot-Spot Analysis Questionnaire* demonstrating the need for analysis and the *Project Level CO Quantitative Hot_Sot Analysis - Consultation Document.* The Purpose of this document is to describe the methods, models and assumptions used for a quantitative hot-spot analysis as required in 40 CFR 93.105(c)(1)(i), 93.123, 93.116, additional information on the receptor locations is also included (as zip file). It is requested that the consulted parties provide comments or questions on the methods, models and assumptions within **30 days,** a non-response will be interpreted as concurrence with the planning assumptions as describe in the attached CO document.

Beverly T. Chenausky
Air & Noise Program Manager
MD EM02, Room 41
1611 W. Jackson St.
Phoenix, AZ 85007
602.712.6269
azdot.gov
ADOT Environmental Planning

3 Attachments

F0072_PM10 Con... F0072_CO Hotsp... Receptors.zip

F0072; I-10, I-17 Split to SR 202L (Broadway Curve)

Air Quality Discussion

January 14, 2020

1611 W Jackson Street, Phoenix, AZ 85007 (Slide Rock Small Conference Room)

1. Air Quality Consultation Timeline

06/06/2019	ADOT provided zip file of receptor locations, combined "Project Level CO Hot-Spot Analysis Questionnaire" Project Level CO Quantitative Hot-Spot Analysis - Consultation Document" and the "Project Level PM Quantitative Hot-Spot Analysis - Project of Air Quality Concern Questionnaire" for interagency consultation. (This included the comments for changes from FHWA's last email May 28th, 2019).
06/20/2019	10 day period for PM10 Consultation period concluded with no comments or objections to the PM10 document, a reminder to provide comments on CO by July 8th provided to interagency consultation agencies.
07/09/2019	30 day CO Consultation period concluded with no suggested changes or comments on the planning assumptions, models or receptors included in CO consultation document. ADEQ only agency to include letter noting no comments. ADOT noted in correspondence that modeling would begin on this day.
10/04/2019	ADOT provided notice of the availability to provide comments on the EA, and Draft Air Quality report through November 18th. The air quality modeling files were provided via ShareFile to review and the Draft Technical Report was made available on project website.
10/24/2019	ADOT held public hearing for Draft EA; materials presented included a presentation, boards, comment forms, and other materials. Presentation included slide requesting public comments on Draft EA and associated technical reports.
11/01/2019	EPA asked ADOT for clarification on the draft air quality technical report; ADOT responded to the email on November 5th, 2019 that the comments were received and would be addressed.
11/18/2019	Close of the public comment period for Draft EA. All comments included in matrix attached. FHWA requests a coordination meeting to for air quality regarding coordination prior to 06/06/2019.
12/02/2019	Specific comments on the draft air quality report were provided by FHWA with request for meeting to discuss.

2. Agency and Public Comments received for Draft EA/Air Quality Technical Report (Refer to Matrix)

3. Next Steps
   - Air Quality Conformity Submittal – January 31st, 2020
   - Final EA/FONSI – February 2020

ADOT

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Beverly Chenausky <bchenausky@azdot.gov>

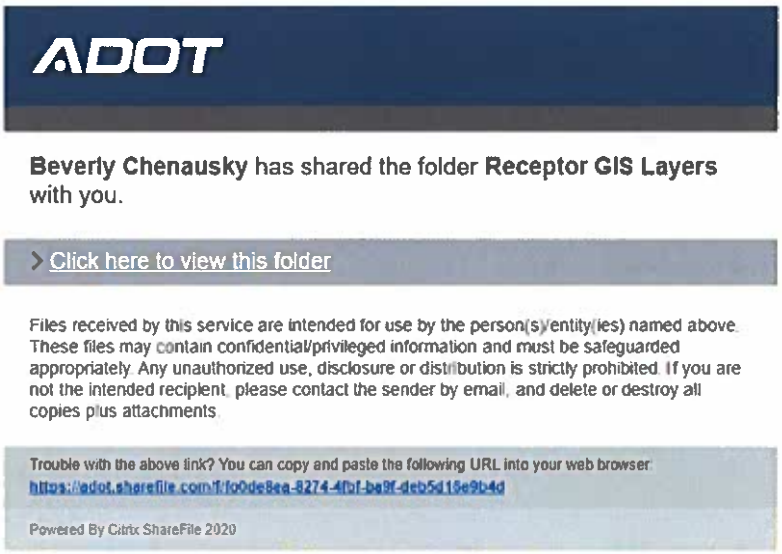
Re: Beverly Chenausky has shared the folder 'F0072 I10 Near Term Improvements' with you.

1 message

Beverly Chenausky <bchenausky@azdot.gov> Thu, Feb 6, 2020 at 11:20 AM
To: "Oesterling, Leigh (FHWA)" <Leigh.Oesterling@dot.gov>
Cc: "Noel, George (FHWA)" <George.Noel@dot.gov>, "Hansen, Alan (FHWA)" <Alan.Hansen@dot.gov>, "Yedlin, Rebecca (FHWA)" <Rebecca.Yedlin@dot.gov>, "Elsken, Jennifer (FHWA)" <jennifer.elsken@dot.gov>, Paul O'brien <POBrien@azdot.gov>, Joonwon Joo <jjoo@azdot.gov>, Amy Ritz <aritz@azdot.gov>, Aryan Lirange <aryan.lirange@dot.gov>, Robert Samour <rsamour@azdot.gov>, Katie Rodriguez <krodriguez@azdot.gov>

The corrected GIS files have been added to ShareFile a notification should have been sent, let me know if you have any issues obtaining the information. Also, there was mention of comments being submitted in October that ADOT did not receive prior, can that information be sent to me or confirmation that these comments are all the comments that will be provided?

---------- Forwarded message ---------
From: **Beverly Chenausky** <mail@sf-notifications.com>
Date: Thu, Feb 6, 2020 at 11:07 AM
Subject: Beverly Chenausky has shared the folder 'Receptor GIS Layers' with you
To: <jjoo@azdot.gov>



Beverly T. Chenausky
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ADOT Environmental Planning

On Tue, Feb 4, 2020 at 2:36 PM Beverly Chenausky <bchenausky@azdot.gov> wrote:

Leigh & George -

1. **Please explain why the average January temperature is not being used for MOVES modeling as called for in the EPA CO Hot-Spot Guidance?**

   - The 2018 data were obtained from the average hourly January 2018 values (31 days) and for 2040, the average January values were obtained from the latest 3 years (2016-2018). They were acquired from Local Climatological Data at NOAA.

2. **Please explain why the 2018 and 2040 meteorology data used for the MOVES modeling are different?**

4. **Receptor Questions and Comments**

GIS Receptor Shapefile Comment

- GIS Receptor Shapefile Comment - The summary document summarizes what will be included in the revised report Figure 10 is the correct receptor image and will be included in the report with those changes (the draft Air Quality report did not include the images directly the report). It appears the prior Broadway GIS file was uploaded to ShareFile instead of the updated receptors, we will send the correct one shortly.

Baseline Road and I-10 EB Modeled Receptors Questions, Elliott Road and I-10 EB and WB Modeled Receptors Questions

- We did not include additional receptors for the Baseline Road and Elliott Road underpass/overpass locations and such corrections were not specifically mentioned prior to modeling when we recirculated the receptor locations for consultation. If additional modeling is requested for the few additional receptors along Baseline and Elliot, I would have to have a larger discussion with the project team on the overall schedule.

Beverly T. Chenausky
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1611 W. Jackson St.
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ADOT
Environmental Planning

On Mon, Feb 3, 2020 at 12:53 PM Oesterling, Leigh (FHWA) <Leigh.Oesterling@dot.gov> wrote:

> Hi Beverly,
>
> Just wanted to let you know that we have provided comments on the provided modeling files to the Division Office, who will coordinate the FHWA response.
>
> Thank you,
>
> Leigh
>
> **Leigh Oesterling**
>
> Air Quality Specialist
>
> Environment, Air Quality and Realty Team
>
> Federal Highway Administration Resource Center
>
> Phone: (614) 601-3273
>
> leigh.oesterling@dot.gov
>
> www.fhwa.dot.gov/resourcecenter
>
> -
>
> Federal Highway Administration RESOURCE CENTER 20 YEARS OF SERVICE

From: bchenausky azdot.gov <bchenausky@azdot.gov>
Sent: Thursday, January 30, 2020 11:17 AM
To: Oesterling, Leigh (FHWA) <Leigh.Oesterling@dot.gov>
Cc: Noel, George (FHWA) <George.Noel@dot.gov>
Subject: Re: Beverly Chenausky has shared the folder 'F0072 I10 Near Term Improvements' with you.

Federal Highway Administration RESOURCE CENTER 20 YEARS OF SERVICE

From: mail@sf-notifications.com <mail@sf-notifications.com>
Sent: Friday, January 17, 2020 7:07 PM
To: Oesterling, Leigh (FHWA) <Leigh.Oesterling@dot.gov>
Subject: Beverly Chenausky has shared the folder 'F0072 I10 Near Term Improvements' with you.

ADOT

Beverly Chenausky has shared the folder **F0072 I10 Near Term Improvements** with you.

Note From Beverly:

I've added you to a folder.

Uploading the modeling files that were provided during public review period as 90 days past and the files were remove. As request the receptors were provided in GIS format more details a re in the summary document - let us know if you need anything else.

To access this folder, you must first activate your account and set your personal password.

Click here to activate your account and view this folder

Trouble with the above link? You can copy and paste the following URL into your web browser:
https://adot.sharefile.com/f/fo3776f5-ec18-4ebb-8427-31f561efb793?a=66906ab023b69854

F0072; I-10, I-17 Split to SR 202L (Broadway Curve)

Air Quality Comment Resolution Meeting

February 14, 2020

1611 W Jackson Street, Phoenix, AZ 85007 (Slide Rock Small Conference Room)

1. Air Quality Interagency Consultation Timeline

06/06/2019	ADOT provided zip file of receptor locations, combined "Project Level CO Hot-Spot Analysis Questionnaire" Project Level CO Quantitative Hot-Spot Analysis - Consultation Document" and the "Project Level PM Quantitative Hot-Spot Analysis - Project of Air Quality Concern Questionnaire" for interagency consultation. (This included the comments for changes from FHWA's last email May 28th, 2019).
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11/18/2019	Close of the public comment period for Draft EA. All comments included in matrix attached. FHWA requests a coordination meeting to for air quality regarding coordination prior to 06/06/2019.
12/02/2019	Specific comments on the draft air quality report were provided by FHWA with request for meeting to discuss.

2. FHWA Resource Center Comments Received – February 2020
   - February 3rd, 2020 comments from FHWA Resource Center (submitted by FHWA AZ Division)
   - February 6th, 2020 comments from FHWA Resource Center (submitted by FHWA AZ Division)

3. Next Steps
   - Air Quality Conformity Submittal
   - Final EA/FONSI – February 2020

ADOT

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Beverly Chenausky <bchenausky@azdot.gov>

I-10 Broadway Curve AQ Conformity - Follow-Up

1 message

Yedlin, Rebecca (FHWA) <Rebecca.Yedlin@dot.gov> Wed, Feb 19, 2020 at 2:55 PM
To: "bchenausky azdot.gov" <bchenausky@azdot.gov>
Cc: "Hansen, Alan (FHWA)" <Alan.Hansen@dot.gov>, "Lirange, Aryan (FHWA)" <Aryan.lirange@dot.gov>

Hey Beverly.

Just wanted to follow-up and let you know that FHWA had our internal conversation and we don't have any additional comments or feedback for you.

We look forward to receiving and reviewing your work plan. Thanks, Rebecca

Rebecca Yedlin

Environmental Coordinator

Federal Highway Administration Arizona Division

4000 N Central Ave, Ste#1500

Phoenix, AZ 85012

602.382.8979

APPENDIX E: TRAFFIC MEMO

Technical Memorandum

To: Amy Ritz, ADOT Project Manager
From: Sandy Thoms, WSP Traffic Lead
Date: May 7, 2019
Subject: I-10 Broadway Curve, I-17 (Split) to Loop 202 (Santan Freeway)
Traffic Operations Analysis

Introduction

The Arizona Department of Transportation (ADOT), in cooperation with the Federal Highway Administration (FHWA), is preparing an Environmental Assessment (EA) document and procurement package using the Public-Private-Partnership (P3) method for delivery of the proposed improvements to a segment of Interstate 10 (I-10) from the I-10/I-17 (Split) Traffic Interchange (TI) (MP 149.5) to the Loop 202 (SR202L) Santan Freeway (MP 160.9).

The purpose of the I-10, I-17 (Split) to SR202L (Santan) Improvement Project is to enhance operational characteristics as well as mobility of regional and local traffic.

Traffic demand is causing the I-10 corridor and adjacent local arterial street system to become increasingly congested during the morning and evening peak travel periods. Future traffic volume projections from the Maricopa Association of Governments (MAG) and other various studies indicate the congestion will continue to worsen, causing further travel delays and increased travel times for those using the I-10 corridor. Increased congestion on I-10 will cause travelers to divert their trips to other freeway corridors and the local arterial street system, causing these transportation facilities to become increasingly congested as well. Improvements to the I-10 corridor are necessary to increase the freeway capacity and help alleviate increased levels of traffic congestion on all components of the overall transportation system in the project area.

The goal of this proposed project is to increase the capacity of the I-10 corridor in accordance with the approved regional and local transportation plans. This project would also seek to optimize the traffic operations within the corridor for the projected Design Year 2040 traffic demand, to retain local access at existing traffic interchanges, and to minimize or mitigate impacts the improvements could have on the surrounding community.

Project Description

ADOT has requested WSP to provide a traffic analysis for the proposed improvements to I-10. Within the project limits, I-10 is a major freeway corridor linking the Cities of Phoenix, Tempe, and Chandler. Beyond the project limits it continues southeast as the main artery to much of southern Arizona including Tucson. I-10 currently varies between having three to six travel lanes in each direction between the I-17 Split and the SR 202L Santan freeway and also has a high-occupancy vehicle (HOV) lane in each direction through the corridor. The project study area is shown in Figure 1.

Source: Arizona Department of Transportation

Figure 1: Project Study Area

A key aspect of P3 projects is to allow for innovation in developing the project. The layout as currently proposed is described below; however, it is likely that the awarded Developer will modify various aspects of the configuration in an effort to optimize the design.

The proposed project would widen existing I-10 to the outside between 24th Street and Ray Road. The existing Salt River bridge would be widened to accommodate 7 general purpose (GP) lanes and 2 HOV lanes to 32nd Street. The west end of the bridge would flare to accommodate proposed future reconstruction of the I-10/I-17 system interchange. Between 32nd Street and the I-10 system interchange with US 60, I-10 would have a basic 6 GP lane and 2 HOV lane typical section, with auxiliary (AUX) lanes added between interchanges and at collector-distributor (CD) roadway connections. South of Baseline Road, two GP lanes would be added in the eastbound direction to Elliot Road (6 GP lanes and 1 HOV lane) and one GP lane in the westbound (5 GP lanes and 1 HOV lane). Between Elliot Road and Ray Road, one GP lane would be added in each direction (4 GP lanes and 1 HOV lane). HOV buffers would be eliminated throughout the project length.

The SR 143, Broadway Road, and 48th Street interchanges would be reconstructed and connected to new CD roads. The eastbound CD road would begin as the direct connection from southbound SR 143 to eastbound I 10 with the addition of the Broadway Road eastbound on-ramp and extending to Baseline Road, providing access to US 60, I-10, and Baseline Road. The westbound CD road would run between Baseline Road and 40th Street, providing access to Broadway Road, SR 143, 48th Street north, University Drive, and 40th Street. A direct HOV connection between SR 143 and I-10 to and from the east would also be added.

The interchanges at 40th Street and US 60 would be modified. The 40th Street westbound off-ramp would be eliminated and access from I-10 provided via the westbound CD road. The existing 40th Street southbound loop on-ramp would be eliminated and the eastbound off-ramp relocated. The westbound I-10 to eastbound US 60 ramp would be widened, and the existing westbound US60 to westbound I-10 ramp relocated to accommodate the westbound CD road and a new ramp providing access to the westbound CD road from westbound US 60.

The purpose of this technical memorandum is to document the existing (2018), future (2040) no build, and future build traffic volumes and analyze the 2040 build traffic conditions with proposed improvements. The traffic analysis results will be used by ADOT in Air Quality and Noise analyses for the project.

Methodology

Existing (2018) and future (2040) no build and build traffic volumes were provided by the Maricopa Association of Governments (MAG) from their travel demand model (TDM). The MAG TDM includes the study area planned roadway network, population, and employment forecast to estimate future traffic volumes.

Synchro 9 modeling software was used to evaluate the interchange intersections within the project limits for the 2018, 2040 No Build, and 2040 Build scenarios. *Vissim 9* microsimulation analysis software was used to evaluate I-10, US 60, and SR 143 mainlines and associated entrance and exit ramps within the project limits for the future build scenario.

Traffic Volumes

Existing, 2040 No Build, and 2040 Build traffic volumes were extracted from the MAG TDM for I-10 mainline segments and are presented in Table 1.

The volume of light, heavy, and medium trucks are presented in Table 2, Table 3, and Table 4, respectively, for the 2018, 2040 build, and 2040 no build scenarios. Table 5 shows the current and projected percentage of trucks calculated assuming medium and heavy trucks.

Table 1: I-10 Mainline Traffic Volumes

I-10 Segments		24 Hour Volume					
		WB			EB		
From	To	2018	2040 No Build	2040 Build	2018	2040 No Build	2040 Build
I-17 Split	32nd Street	158,110	170,980	187,977	147,510	159,409	175,351
32nd Street	40th Street	152,498	161,734	183,317	139,377	146,707	166,350
40th Street	48th Street / SR 143	152,072	159,445	185,097	141,168	145,621	165,045
48th Street / SR 143	Broadway Road	166,290	121,137	162,260	138,827	140,815	161,767
Broadway Road	US60	178,406	177,063	162,260	158,788	161,286	185,774
US60	Baseline Road	102,262	97,138	70,398	102,629	102,131	121,326
Baseline Road	Elliot Road	129,564	129,765	134,352	121,122	121,552	122,557
Elliot Road	Warner Road	116,553	115,598	125,415	108,919	108,351	118,595
Warner Road	Ray Road	108,323	109,008	119,291	100,921	102,273	112,119

Table 2: I-10 Mainline 24-Hour Light Trucks

From	To	Light Trucks		
		2018	2040 No Build	2040 Build
I-17 Split	32nd Street	76,389	91,726	102,426
32nd Street	40th Street	75,693	90,141	103,103
40th Street	48th Street / SR 143	74,601	88,550	102,373
48th Street / SR 143	Broadway Road	75,994	84,166	97,483
Broadway Road	US60	78,968	91,857	100,917
US60	Baseline Road	45,696	48,588	51,216
Baseline Road	Elliot Road	51,610	53,960	59,494
Elliot Road	Warner Road	48,188	50,451	57,664
Warner Road	Ray Road	44,909	47,654	54,631

Table 3: I-10 Mainline 24-Hour Medium Trucks

From	To	Medium Trucks		
		2018	2040 No Build	2040 Build
I-17 Split	32nd Street	24,039	25,177	27,667
32nd Street	40th Street	21,497	22,475	25,386
40th Street	48th Street / SR 143	21,423	22,320	25,473
48th Street / SR 143	Broadway Road	20,566	19,831	22,637
Broadway Road	US60	22,126	23,036	24,085
US60	Baseline Road	13,381	14,496	11,381
Baseline Road	Elliot Road	14,783	14,734	15,488
Elliot Road	Warner Road	12,097	12,084	13,900
Warner Road	Ray Road	11,217	11,438	13,098

Table 4: I-10 Mainline 24-Hour Heavy Trucks

From	To	Heavy Trucks		
		2018	2040 No Build	2040 Build
I-17 Split	32nd Street	22,844	20,833	22,452
32nd Street	40th Street	20,935	18,459	20,311
40th Street	48th Street / SR 143	20,883	18,123	20,138
48th Street / SR 143	Broadway Road	20,118	16,219	18,152
Broadway Road	US60	21,100	18,326	19,116
US60	Baseline Road	15,615	11,511	11,039
Baseline Road	Elliot Road	16,471	12,375	12,697
Elliot Road	Warner Road	14,770	10,494	11,628
Warner Road	Ray Road	14,315	10,141	11,152

Table 5: I-10 Mainline Truck Percentages

From	To	Truck Percentage		
		2018	2040 No Build	2040 Build
I-17 Split	32nd Street	15%	14%	14%
32nd Street	40th Street	15%	13%	13%
40th Street	48th Street / SR 143	14%	13%	13%
48th Street / SR 143	Broadway Road	13%	14%	13%
Broadway Road	US60	13%	12%	12%
US60	Baseline Road	14%	13%	12%
Baseline Road	Elliot Road	12%	11%	11%
Elliot Road	Warner Road	12%	10%	10%
Warner Road	Ray Road	12%	10%	10%

Traffic Operational Analysis

In addition to the 24-hour traffic volumes, the MAG TDM provides peak period traffic volumes which encompasses the peak 3-hour AM period and the peak 4-hour PM period. These peak period volumes were converted to peak hour volumes using conversion factors provided by MAG and were then utilized in modeling the interchange intersections using *Synchro* as well as the freeway operations using *Vissim*.

Intersection Operations

Existing traffic signal timings were obtained from ADOT and the City of Tempe for each signalized intersection within the project limits. Current intersection geometry was coded into *Synchro* along with the traffic signal timings. Separate models were developed for 2018, 2040 No Build, and 2040 Build for both the AM and PM peak hours based on the intersection geometry associated with each alternative. Intersection Level of Service (LOS) was extracted for the 2018, 2040 No Build, and 2040 Build scenarios and is summarized in Table 6, Table 7, and Table 8, respectively. The total volume of traffic entering each intersection in the peak hour is also presented in these tables along with the percentage of truck traffic anticipated based on the MAG TDM.

Table 6: Year 2018 Intersection LOS

No.	Intersection	AM				PM			
		Volume	T%	LOS	Delay	Volume	T%	LOS	Delay
1	32nd St & I-10 EB	4,236	10%	D	40.1	4,410	10%	D	48.5
2	32nd St & I-10 WB	3,098	11%	C	25.3	4,091	14%	E	56.1
3	40th St & I-10 EB	3,245	11%	C	28.9	3,150	18%	C	22.5
4	40th St & I-10 WB	3,250	9%	D	38.4	3,419	14%	E	58.5
5	48th St & I-10 EB	4,186	9%	D	54.2	4,454	13%	D	36.4
6	Broadway Rd & 48th St	5,519	9%	D	54.5	6,295	8%	F	112.3
7	Broadway Rd & I-10 EB	3,631	10%	D	50.7	4,540	12%	F	175.2
8	Broadway Rd & I-10 WB / 52nd St	5,211	10%	E	56.2	5,213	14%	D	43.4
9	University Dr & SR 143	6,093	0%	C	25.3	6,698	0%	F	82.9
10	Baseline Rd & I-10 EB	6,279	4%	E	59.4	7,519	6%	F	126.4
11	Baseline Rd & I-10 WB	5,755	5%	D	53.9	6,313	7%	E	66.7
12	Elliot Rd & I-10 EB	4,052	9%	E	73.5	4,397	12%	E	71.4
13	Elliot Rd & I-10 WB	3,905	9%	F	172.6	4,387	14%	E	66.2
14	Warner Rd & I-10 EB	2,754	4%	C	32.3	3,490	4%	F	86.4
15	Warner Rd & I-10 WB	3,160	5%	E	55.4	3,132	5%	C	24.5
16	Priest Dr & US 60 EB	2,518	9%	D	48.2	3,776	10%	D	36.9
17	Priest Dr & US 60 WB	3,617	8%	C	27.1	4,191	10%	C	25.7
18	Ray Rd & I-10 EB	5,148	4%	C	31.6	5,677	4%	D	49.7
19	Ray Rd & I-10 WB	4,658	4%	D	44.5	4,713	6%	D	46.6

Table 7: Year 2040 No Build Intersection LOS

No.	Intersection	AM				PM			
		Volume	T%	LOS	Delay	Volume	T%	LOS	Delay
1	32nd St & I-10 EB	4,991	9%	E	61.6	5,014	10%	E	63.4
2	32nd St & I-10 WB	3,768	10%	D	45	4,565	9%	E	69.2
3	40th St & I-10 EB	4,171	11%	C	32.5	3,649	13%	C	32.6
4	40th St & I-10 WB	3,545	10%	D	47.8	3,808	10%	E	57.6
5	48th St & I-10 EB	-	-	-	-	-	-	-	-
6	Broadway Rd & 48th St	5,353	8%	D	48.8	5,604	8%	F	85.3
7	Broadway Rd & I-10 EB	3,962	10%	E	68.7	4,818	8%	F	166.8
8	Broadway Rd & I-10 WB / 52nd St	5,881	9%	F	81	6,213	9%	F	126.8
9	University Dr & SR 143	6,861	6%	D	41.6	7,691	6%	F	167.5

No.	Intersection	AM				PM			
		Volume	T%	LOS	Delay	Volume	T%	LOS	Delay
10	Baseline Rd & I-10 EB	6,495	5%	F	106.9	7,757	5%	F	182.2
11	Baseline Rd & I-10 WB	5,683	5%	E	71.1	6,406	5%	E	79.3
12	Elliot Rd & I-10 EB	4,403	8%	F	62.1	4,779	8%	E	183.5
13	Elliot Rd & I-10 WB	4,712	9%	F	106.6	5,180	9%	E	65
14	Warner Rd & I-10 EB	2,772	4%	C	30.2	3,450	3%	F	103.5
15	Warner Rd & I-10 WB	3,259	4%	F	121.4	3,492	4%	D	40
16	Priest Dr & US 60 EB	2,444	11%	D	47.4	3,542	6%	D	36.5
17	Priest Dr & US 60 WB	3,599	8%	C	28	4,119	8%	C	23.7
18	Ray Rd & I-10 EB	4,576	4%	C	33.1	5,270	4%	C	32.5
19	Ray Rd & I-10 WB	4,625	5%	D	44.7	4,626	5%	D	38.4

Table 8: Year 2040 Build Intersection LOS

No.	Intersection	AM				PM			
		Volume	T%	LOS	Delay	Volume	T%	LOS	Delay
1	32nd St & I-10 EB	5,522	9%	F	82.8	5,554	10%	F	86.5
2	32nd St & I-10 WB	3,923	10%	D	37.5	4,778	9%	F	110.9
3	40th St & I-10 EB	4,429	11%	D	51.3	4,607	11%	E	64.5
4	40th St & I-10 WB	3,873	10%	F	93.4	4,108	10%	F	110.7
5	48th St & I-10 EB	-	-	-	-	-	-	-	-
6	Broadway Rd & 48th St	5,395	9%	D	54.1	5,059	10%	F	81.2
7	Broadway Rd & I-10 EB	3,406	8%	C	22.8	3,497	9%	D	43.7
8	Broadway Rd & I-10 WB / 52nd St	5,262	9%	E	60	5,764	10%	F	262.3
9	University Dr & SR 143	6,331	7%	C	25.1	7,090	6%	E	58.7
10	Baseline Rd & I-10 EB	6,850	5%	F	94.4	7,590	5%	F	155.6
11	Baseline Rd & I-10 WB	6,018	6%	F	81	6,481	6%	E	68.4
12	Elliot Rd & I-10 EB	6,232	5%	F	148.7	7,226	4%	F	367.9
13	Elliot Rd & I-10 WB	7,541	4%	F	285.3	6,901	5%	F	222.7
14	Warner Rd & I-10 EB	2,706	4%	C	30.7	3,504	4%	F	150.7
15	Warner Rd & I-10 WB	3,423	4%	F	88.6	3,711	5%	F	87.4
16	Priest Dr & US 60 EB	2,601	10%	D	39.4	3,473	7%	C	34.5
17	Priest Dr & US 60 WB	3,517	9%	C	23.9	4,002	8%	C	22.8
18	Ray Rd & I-10 EB	4,874	4%	D	38.9	5,725	4%	D	38
19	Ray Rd & I-10 WB	4,947	5%	E	59.8	5,031	5%	D	42.4

Freeway Operations

The proposed 2040 Build roadway network was developed in *Vissim 9* using the projected peak hour traffic volumes. A Bluetooth origin-destination study was conducted which provided valuable information that was used to better code the weaving maneuvers. All volumes were then balanced before being coded into *Vissim*. The balanced volumes used in the operations analysis are presented in Appendix A. Note that the currently proposed roadway configuration is displayed in these graphics, but the final configuration will likely differ if this project moves forward to construction.

Preliminary LOS results from the *Vissim* simulation are summarized in Table 9 through Table 16. These results are not final as the proposed layout continues to be adjusted as part of the P3 process to identify efficiencies which would reduce construction cost or improve traffic operations.

ADOT's Roadway Design Guidelines (RDG) indicate that LOS D or better is acceptable for this urban environment. Locations experiencing LOS E or F were evaluated on a case-by-case basis with ADOT personnel to determine what changes, if any, could improve operations. Many iterations of changes occurred, and the currently proposed layout represents the optimal balance of traffic operations and construction/land acquisition cost. In general, LOS does not meet the requirements set forth in the RDG south of Baseline Road in both directions. ADOT and MAG are currently evaluating options for providing an additional general purpose lane in this area, but a decision has yet to be made as the current programmed funding will only accommodate the widening as described in this memorandum.

Table 9: Year 2040 Build LOS for Eastbound I-10

Location	AM Peak Hour		PM Peak Hour	
	Density	LOS	Density	LOS
Project Start to I-17 Entrance	26	D	28	D
I-17 Entrance	39	E	33	D
I-17 Entrance to 24th St Entrance	27	D	26	C
24th St Entrance	9	A	16	B
24th St Entrance to 32th St Exit	24	C	24	C
32th St Exit	13	B	8	A
32th St Exit to 32th St Entrance	24	C	25	C
32th St Entrance	11	A	13	B
32th St Entrance to 40th St Exit	29	D	33	D
40th St Exit	9	A	6	A
40th St Exit to 40th St Entrance	26	D	29	D
40th St Entrance Ramp	8	A	12	B
40th St NB Entrance to 48th St Exit	26	C	27	D
48th St Exit Ramp	19	C	8	A
48th St Exit to 143 HOV Entrance Ramp	20	C	27	D
SR143 HOV Entrance	7	A	15	B
SR143 HOV Entrance to Drop lane 9 to 8	19	C	26	C
Drop Lane to US60 HOV Exit and US60 Mainline Exit	20	C	27	D
US60 HOV Exit	14	B	19	C
US60 Mainline Exit	17	B	24	C
US60 Exit to Baseline Rd Exit	24	C	33	D
Baseline Rd Exit	11	B	13	B
Baseline Rd Exit to CD Road Entrance	20	C	35	E
CD Road Entrance	22	C	51	F
CD Road Entrance to US60 Entrance	21	C	48	F
US60 Entrance	14	B	58	F
US60 Entrance to Baseline Entrance	22	C	56	F
Baseline Rd Entrance	15	B	125	F
Baseline Rd Entrance to Elliot Rd Exit	20	C	79	F
Elliot Rd Exit Ramp	13	B	11	B
Elliot Rd Exit to Elliot Rd Entrance	19	C	105	F

I-10: I-17 (Split) to Loop 202 (Santan Freeway)

Location	AM Peak Hour		PM Peak Hour	
	Density	LOS	Density	LOS
Elliot Rd Entrance	11	B	117	F
Elliot Rd Entrance to Warner Rd Exit	22	C	45	E
Warner Rd Exit	16	B	14	B
Warner Rd Exit to Warner Rd Entrance	23	C	77	F
Warner Rd Entrance	4	A	21	C
Warner Rd Entrance to Ray Rd Exit	20	C	55	F
Ray Rd Exit	17	B	29	D
Ray Rd Exit to Ray Rd Entrance	20	C	35	E
Ray Rd Entrance	11	B	28	D
Ray Rd Entrance to HOV Rd Exit	18	C	36	E
HOV Rd Exit	3	A	3	A
HOV Rd Exit to Chandler Blvd	18	C	47	F
Chandler Blvd Exit	19	C	36	E
Chandler Blvd Exit to 202L Exit	14	B	22	C
202L Exit	12	B	18	C
202L Exit to HOV 202L Exit	13	B	17	B
HOV 202L Exit	2	A	4	A
HOV 202L Exit to End of Project	12	B	17	B

Table 10: Year 2040 Build LOS for Westbound I-10

Location	AM Peak Hour		PM Peak Hour	
	Density	LOS	Density	LOS
Project Limits to 202L HOV Ramps Entrance	57	F	22	C
HOV Rd Entrance	3	A	4	A
HOV Rd Entrance to 202L Entrance	82	F	18	B
202L Entrance Ramps	90	F	25	C
202L Entrance to Chandler Blvd Entrance	79	F	19	C
Chandler Blvd Entrance	49	F	34	D
Chandler Blvd Entrance to Ray Rd Exit Ramp	63	F	25	C
Ray Rd Exit Ramp	20	C	10	A
HOV Rd Entrance	2	A	3	A
Ray Rd Exit Ramp to Ray Rd Entrance Ramp	75	F	38	E
Ray Rd Entrance Ramp	48	F	40	E
Ray Rd Entrance Ramp to Warner Rd Exit Ramp	53	F	45	F
Warner Rd Exit Ramp	11	B	6	A
Warner Rd Exit to Warner Rd Entrance	67	F	59	F
Warner Rd Entrance Ramp	24	C	29	D
Warner Rd Entrance to Elliot Rd Exit	49	F	48	F
Elliot Rd Exit Ramp	21	C	18	B
Elliot Rd Exit to Elliot Rd Entrance	35	D	34	D
Elliot Rd Entrance Ramp	38	E	35	E
Elliot Rd Entrance Ramp to Baseline Rd Exit Ramp	33	D	32	D
Baseline Rd Exit Ramp	25	C	25	C
Baseline Rd Exit Ramp to US60 EB Exit Ramp	26	C	25	C
US60 EB Exit Ramp	21	C	22	C
US60 Exit Ramp to WB CD Road Exit	23	C	21	C

I-10: I-17 (Split) to Loop 202 (Santan Freeway)

Location	AM Peak Hour		PM Peak Hour	
	Density	LOS	Density	LOS
WB CD Road Exit	28	D	24	C
WB CD Road Exit to WB US60 Entrance	21	C	19	C
WB US60 Entrance	22	C	23	C
WB US60 Entrance HOV Entrance US60	21	C	20	C
US60 HOV Entrance	9	A	12	B
US60 HOV Entrance to SR143 HOV Exit	20	C	20	C
SR143 HOV Exit	6	A	6	A
SR143 HOV Exit to Lane Drop	20	C	20	C
SR143 HOV to Broadway Rd Entrance	20	C	26	D
Broadway Rd Entrance	19	C	56	F
Broadway Rd Entrance to CD Road Entrance	24	C	68	F
CD Road Entrance	12	B	18	C
CD Road Entrance to Lane Drop	24	C	40	E
Lane Drop to 40th St Entrance	28	D	42	E
40th St Entrance	10	A	36	E
40th St Entrance to 32th St Exit	26	C	36	E
32th St Exit	8	A	10	A
32th St Exit to Lane Drop	23	C	28	D
Lane Drop to 32th St Entrance	27	D	30	D
32th St Entrance	12	B	40	E
32th St Entrance to I-17 HOV Exit	25	C	32	D
I-17 HOV Exit	6	A	15	B
I-17 HOV Exit to 24th Street Exit	25	C	31	D
24th St Exit	8	A	7	A
24th St Exit to I-17 Exit	26	D	33	D
I-17 Exit	21	C	33	D
I-17 Exit to Project End	32	D	34	D

Table 11: Year 2040 Build LOS for Eastbound Collector-Distributor

Location	AM Peak Hour		PM Peak Hour	
	Density	LOS	Density	LOS
SR143 SB/CD Road start	15	B	18	C
Broadway Rd Entrance	8	A	20	C
Broadway Rd Entrance to Lane Drop	12	B	18	C
Lane Drop to US60 Exit	19	C	29	D
US60 Exit	8	A	16	B
US60 Exit to I-10 Exit	15	B	23	C
I-10 Exit	22	C	51	F
I-10 Exit to Baseline Rd Entrance Ramp	3	A	6	A
Baseline Rd Entrance	11	B	13	B
Baseline Rd Entrance to US60 Entrance	7	A	9	A
US60 Entrance	13	B	11	B
US60 Entrance to Baseline Rd	9	A	10	A

Table 12: Year 2040 Build LOS for Westbound Collector-Distributor

Location	AM Peak Hour		PM Peak Hour	
	Density	LOS	Density	LOS
WB I-10 Exit to Baseline Rd Entrance	22	C	23	C
Baseline Rd Entrance Ramp	29	D	30	D
Baseline Rd Entrance to US60 Exit	24	C	25	C
US60 Exit	21	C	20	C
US60 Exit to I-10 Entrance	16	B	19	C
I-10 Entrance	28	D	24	C
I-10 Entrance to Lane Drop	21	C	22	C
Lane Drop to US60 Entrance	28	D	28	D
US60 Entrance	34	D	24	C
US60 Entrance to Broadway Rd Exit	27	D	25	C
Broadway Rd Exit	29	D	25	C
Broadway Rd Exit to NB SR143 Rd Exit	21	C	19	C
NB SR143 Start	16	B	12	B
NB SR143 Start to SB SR143 Entrance	12	B	13	B
SB SR143 Entrance	20	C	28	D
SB SR143 Entrance to 40th St Exit	14	B	20	C
40th St Exit	8	A	8	A
40th St Exit to I-10 Entrance	12	B	18	C

Table 13: Year 2040 Build LOS for Northbound SR 143

Location	AM Peak Hour		PM Peak Hour	
	Density	LOS	Density	LOS
Between Broadway Rd and I-10 Entrance Loop Ramp	16	B	17	B
I-10 Entrance Loop Ramp	19	C	8	A
I-10 Entrance Loop Ramp to 48th St Lane Drop	16	B	14	B
48th St Lane Drop to University Dr Exit	26	D	24	C
University Dr Exit	16	B	8	A
48th St Slip Ramp to SR143 Entrance	37	E	42	E
I-10 WB CD-Road Entrance Ramp	17	B	15	B
HOV Entrance to SR143 Ramp from I-10 WB CD-Road	20	C	18	C
HOV Entrance	6	A	6	A
SR143 NB to University Dr Entrance (Slip Ramp&I-10 WB CD-Road)	19	C	19	C
University Dr Entrance	14	B	36	E
University Dr Entrance to Project End	22	C	28	D
Slip Ramp from I-10 WB CD-Road to University Exit	8	A	3	A

Table 14: Year 2040 Build LOS for Southbound SR 143

Location	AM Peak Hour		PM Peak Hour	
	Density	LOS	Density	LOS
Project Start to University Dr Exit	28	D	27	D
University Dr Exit	16	B	8	A
University Dr Exit to I-10 Exit and HOV Exit	21	C	27	D
SR143 to I-10 CD Road and HOV	17	B	24	C
HOV Exit	7	A	15	B
SR143 to I-10 West and 48th St	15	B	18	C
University Dr Entrance (On-Ramp)	4	A	11	A
University Dr Entrance to I-10 West Exit and 48th St	21	C	26	D
48th St SB	9	A	8	A
RT 48th St Exit Ramp toward Broadway Rd	26	D	9	A
I-10 WB Ramp	20	C	28	D
I-10 EB Ramp	19	C	24	C

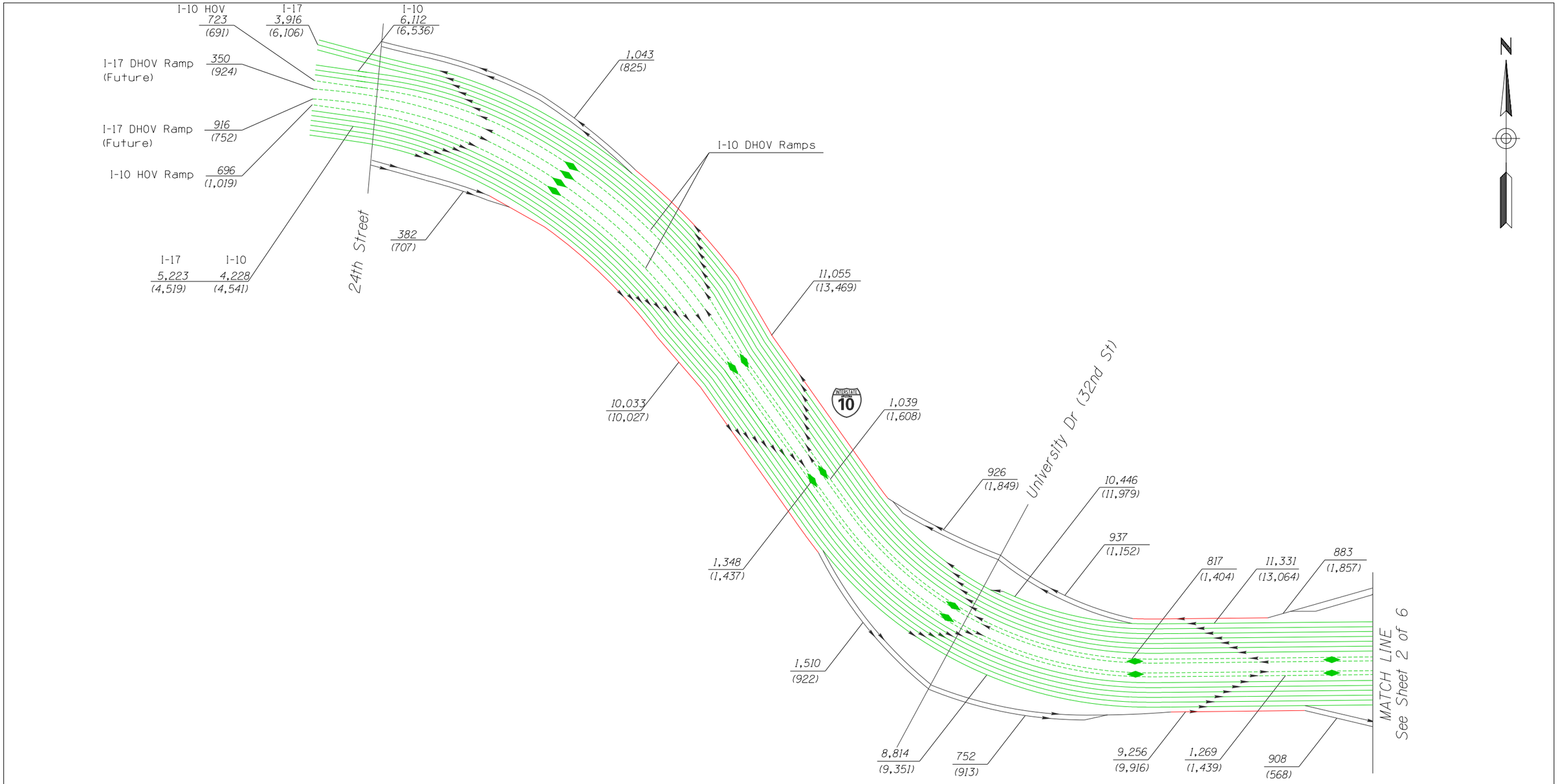
Table 15: Year 2040 Build LOS for Eastbound US 60

Location	AM Peak Hour		PM Peak Hour	
	Density	LOS	Density	LOS
I-10 EB to US60 EB Ramp (Before drop)	16	B	25	C
I-10 EB to US60 EB Ramp (After drop)	19	C	28	D
I-10 WB to US60 EB Ramp	20	C	19	C
I-10 to Priest Dr Entrance Ramp	18	B	22	C
Priest Dr Entrance Ramp	10	A	18	B
Priest Dr Entrance Ramp to End Acceleration Lane	17	B	23	C
End Acceleration Lane to Mill Ave Exit	21	C	30	D
Mill Ave Exit Ramp	21	C	26	D
Mill Ave Exit Ramp to Project Limits	21	C	30	D

Table 16: Year 2040 Build LOS for Westbound US 60

Location	AM Peak Hour		PM Peak Hour	
	Density	LOS	Density	LOS
Project Limits to Mill Ave Entrance Ramp	33	D	33	D
Mill Ave Entrance Ramp	11	A	11	A
Mill Ave Entrance Ramp to Priest Dr Exit Ramp	28	D	28	D
Priest Dr Exit Ramp	24	C	19	C
Priest Dr Exit Ramp to I-10 EB (SB) Ramp	24	C	25	C
US60 West/I-10 East (SB) Ramp	14	B	23	C
I-10 EB (SB) Ramp to WB (NB) Mainline/CD Road Split	24	C	22	C
US60 West/WB (NB) CD Roads	34	D	24	C
US60 West/I-10 West (NB) Ramp	22	C	23	C

Appendix A:
2040 Build Peak Hour Volumes



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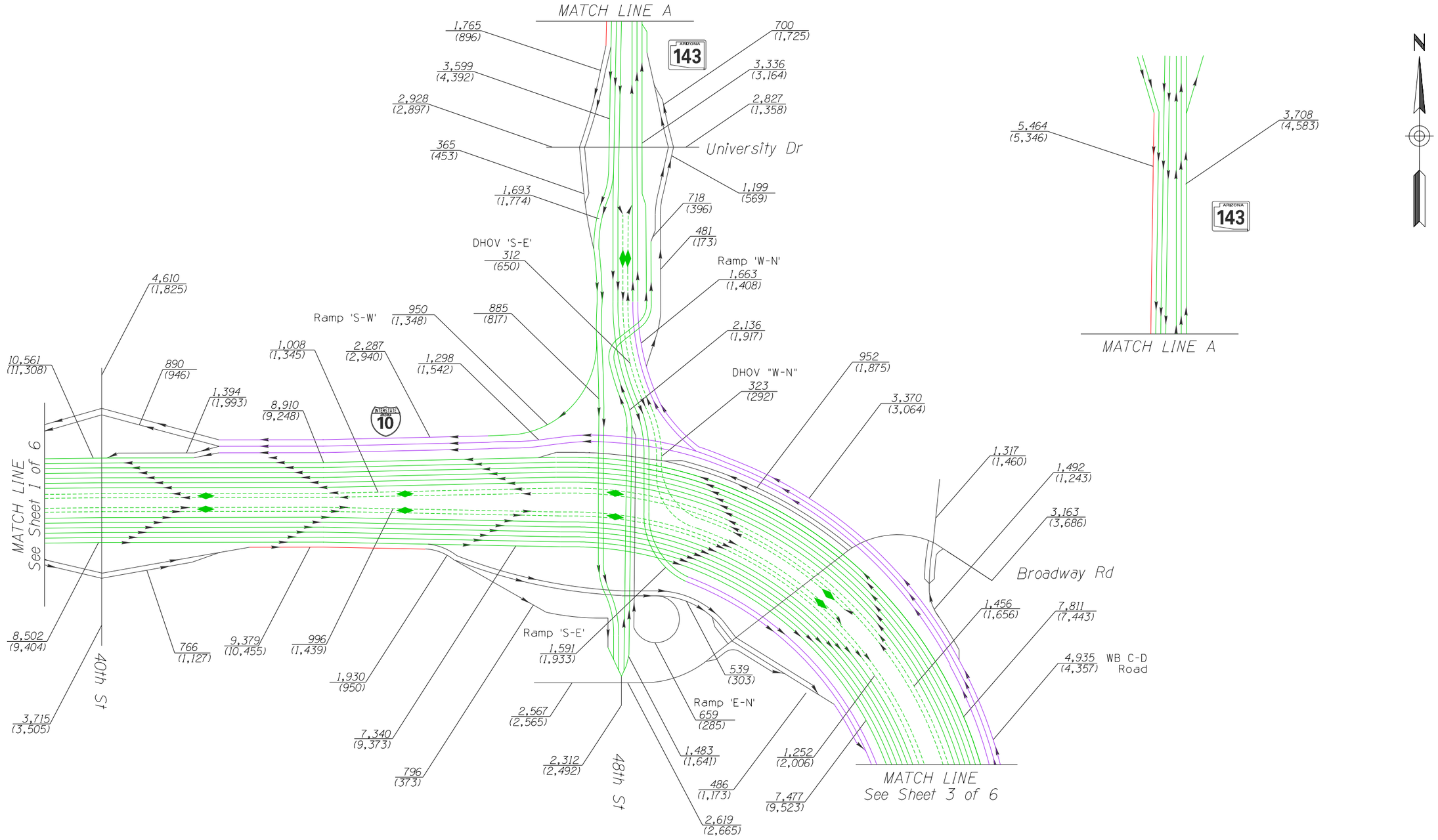
I-10 IMPROVEMENTS
2040 VOLUMES & LANE CONFIGURATION
SHEET 1 OF 6
NOT TO SCALE - SCHEMATIC ONLY

LEGEND

xxx - 2040 AM Peak Hour Volume
(xxx) - 2040 PM Peak Hour Volume
-◆- - High Occupancy Vehicle (HOV) facility

NOTES:
- Source: MAG Travel Demand Model Spine Study (December 2016).
- MAG Traffic Volumes were Post-Processed and Adjusted Based on Origin-Destination Results (2018)
- Ramp Volumes Include HOV traffic.

ADOT WSP



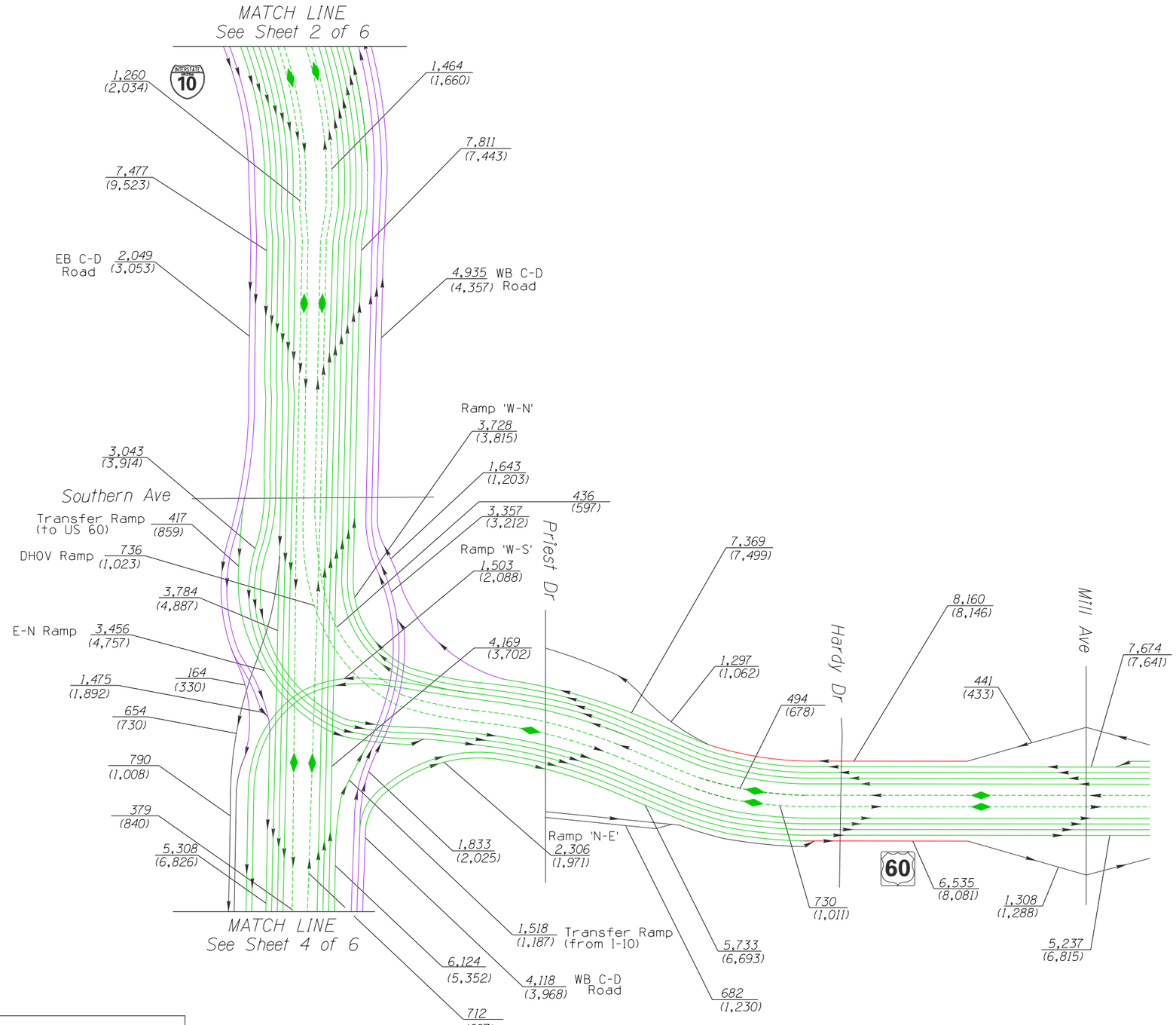
I-10 IMPROVEMENTS
2040 VOLUMES & LANE CONFIGURATION
SHEET 2 OF 6
NOT TO SCALE - SCHEMATIC ONLY

LEGEND

xxx - 2040 AM Peak Hour Volume
(xxx) - 2040 PM Peak Hour Volume
-◆- - High Occupancy Vehicle (HOV) facility

NOTES:
- Source: MAG Travel Demand Model Spine Study (December 2016).
- MAG Traffic Volumes were Post-Processed and Adjusted Based on Origin-Destination Results (2018)
- Ramp Volumes Include HOV traffic.

ADOT WSP



I-10 IMPROVEMENTS
2040 VOLUMES & LANE CONFIGURATION
SHEET 3 OF 6
NOT TO SCALE - SCHEMATIC ONLY

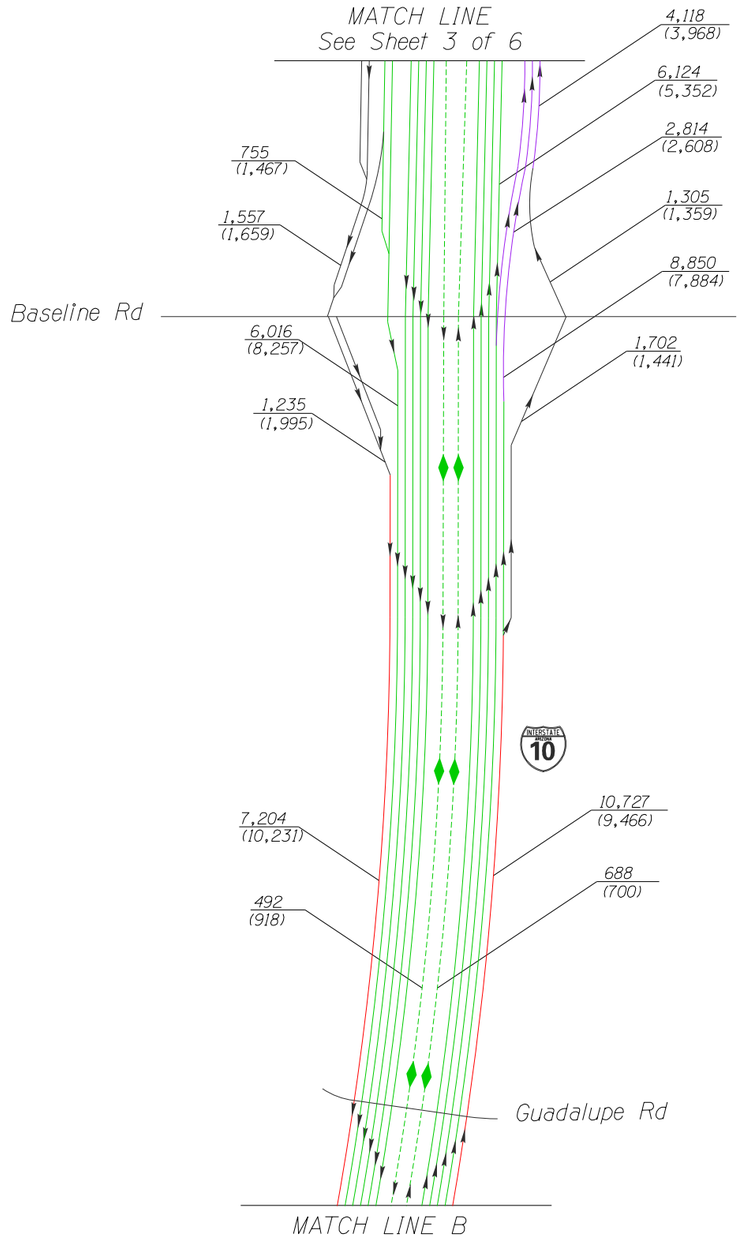
LEGEND

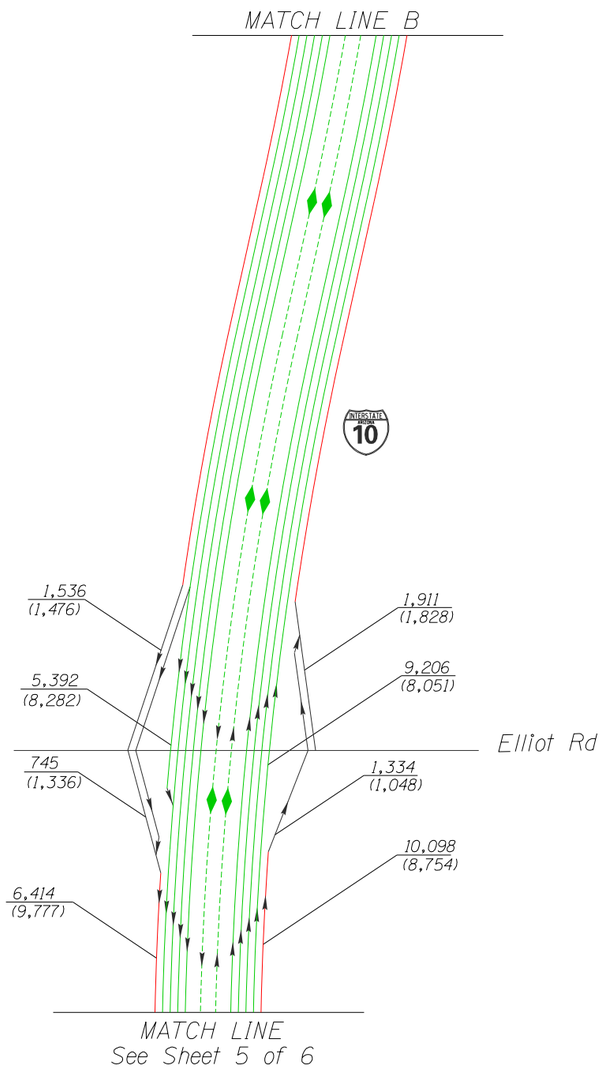
xxx - 2040 AM Peak Hour Volume
(xxx) - 2040 PM Peak Hour Volume
-◆- - High Occupancy Vehicle (HOV) facility

NOTES:

- Source: MAG Travel Demand Model Spine Study (December 2016).
- MAG Traffic Volumes were Post-Processed and Adjusted Based on Origin-Destination Results (2018)
- Ramp Volumes Include HOV traffic.

ADOT WSP





I-10 IMPROVEMENTS
2040 VOLUMES & LANE CONFIGURATION
SHEET 4 OF 6
NOT TO SCALE - SCHEMATIC ONLY

LEGEND

xxx - 2040 AM Peak Hour Volume
(xxx) - 2040 PM Peak Hour Volume
-◆- - High Occupancy Vehicle (HOV) facility

NOTES:
- Source: MAG Travel Demand Model Spine Study (December 2016).
- MAG Traffic Volumes were Post-Processed and Adjusted Based on Origin-Destination Results (2018)
- Ramp Volumes Include HOV traffic.

ADOT WSP

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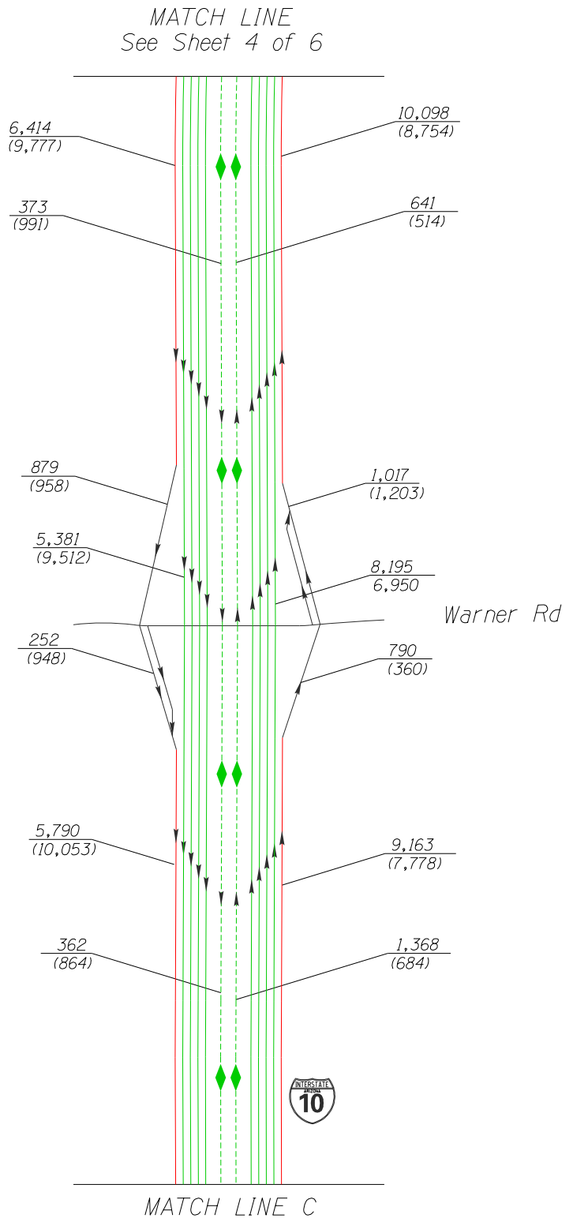
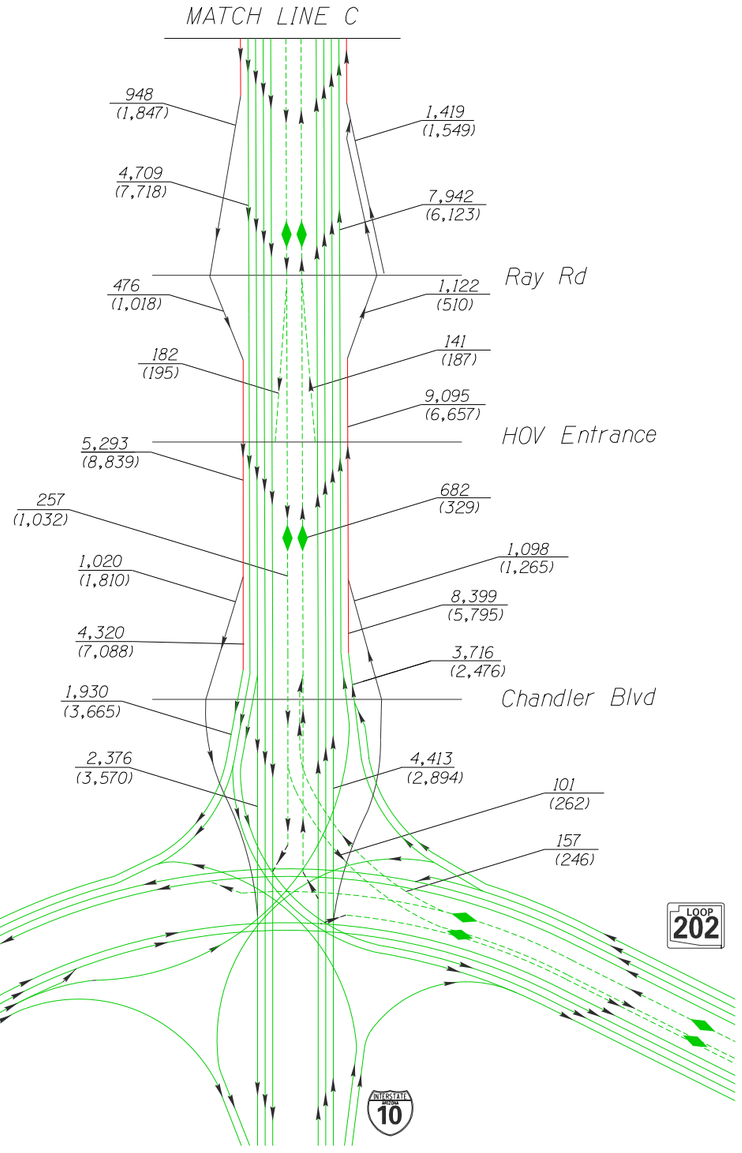




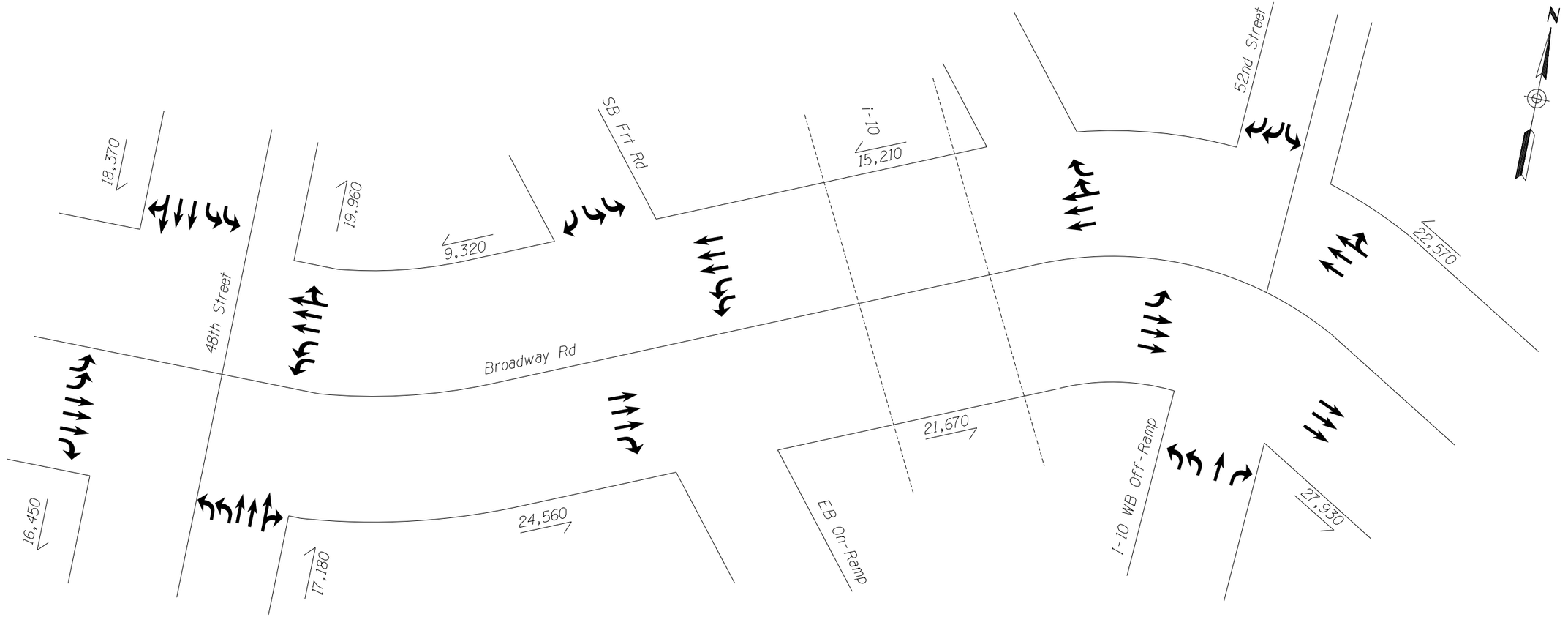
I-10 IMPROVEMENTS
2040 VOLUMES & LANE CONFIGURATION
SHEET 5 OF 6
NOT TO SCALE - SCHEMATIC ONLY

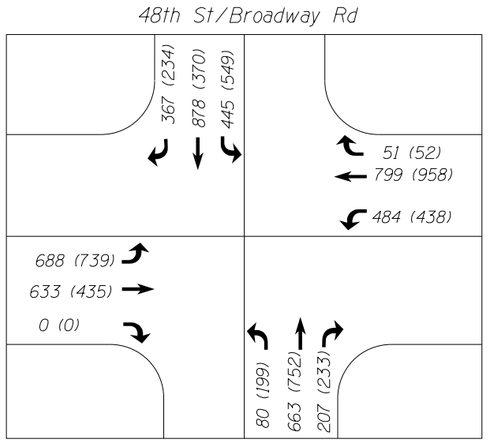
LEGEND

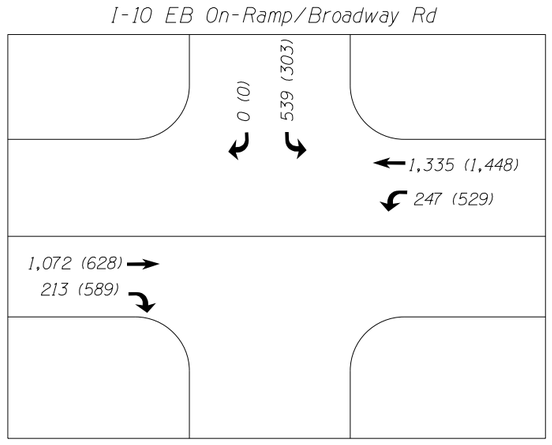
xxx - 2040 AM Peak Hour Volume
(xxx) - 2040 PM Peak Hour Volume
-◆- - High Occupancy Vehicle (HOV) facility

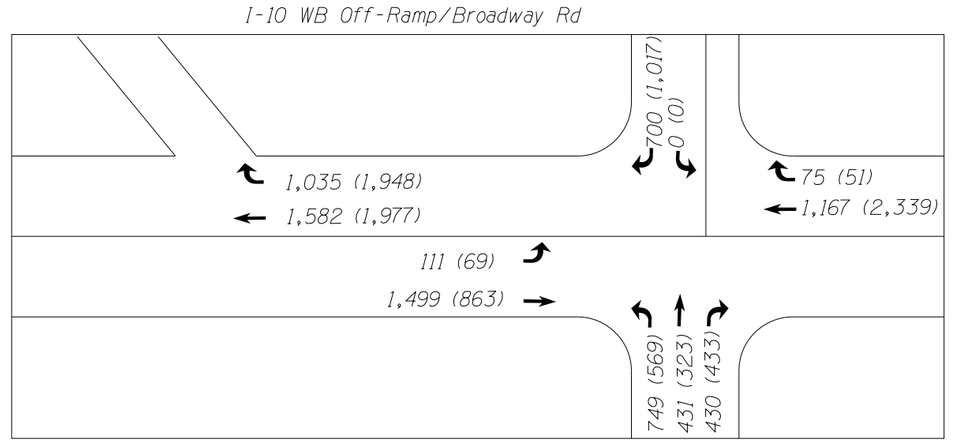
NOTES:
- Source: MAG Travel Demand Model Spine Study (December 2016).
- MAG Traffic Volumes were Post-Processed and Adjusted Based on Origin-Destination Results (2018)
- Ramp Volumes Include HOV traffic.

ADOT WSP









I-10 IMPROVEMENTS
2040 VOLUMES & LANE CONFIGURATION
SHEET 6 OF 6
NOT TO SCALE - SCHEMATIC ONLY

LEGEND

xxx - 2040 AM Peak Hour Volume
(xxx) - 2040 PM Peak Hour Volume
-◆- - High Occupancy Vehicle (HOV) facility

NOTES:
- Source: MAG Travel Demand Model Spine Study (December 2016).
- MAG Traffic Volumes were Post-Processed and Adjusted Based on Origin-Destination Results (2018)
- Ramp Volumes Include HOV traffic.

ADOT WSP

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Appendix F – FHWA Air Quality Conformity Determination

U.S. Department of Transportation
Federal Highway Administration

ARIZONA DIVISION

4000 North Central Avenue
Suite 1500
Phoenix, Arizona 85012-3500
Phone: (602) 379-3646
Fax: (602) 382-8998
http://www.fhwa.dot.gov/azdiv/index.htm

April 22, 2020

In Reply Refer To:
NH-010-C(220)T
010 MA 010 F0072 01D
I-10, I-17 (Split) to SR2020L (Santan)
Air Quality Conformity Determination

Paul O'Brien, P.E.
Environmental Planning Administrator
Environmental Planning Group
Arizona Department of Transportation
205 South 17th Avenue, MD 612E
Phoenix, Arizona 85007-3212

Dear Mr. O'Brien:

The Federal Highway Administration (FHWA) received your request dated April 16, 2020, for a project-level air quality conformity determination for the Interstate 10 (I-10), Interstate 17 (Split) to SR2020L (Santan) project [010-C(220)T, 010 MA 010 F0072 01D]. The project is located in the City of Phoenix, Town of Guadalupe, City of Tempe and the City of Chandler all within Maricopa County. The purpose of the project is to improve traffic operations and reduce congestion on I-10 and enhance regional mobility by providing additional general purpose lanes on I-10 between 40th Street and Ray Road, adding High Occupancy Vehicle (HOV) Lanes (including direct HOV connections between I-10 and SR-143) and parallel collector distributor roads. The operational improvements will include reconstruction of the traffic interchanges and bridges, including the I-10/SR-143 interchange, and the addition of bicycle and pedestrian crossings at I-10 at Alameda Road and the Western canal.

The project is located in the Maricopa Association of Governments (MAG) planning boundary, which is an area designated nonattainment for Particulate Matter (PM10) and Ozone and is designated as a maintenance area for Carbon Monoxide (CO). PM10 and CO are subject to project level conformity requirements under the National Ambient Air Quality Standards.

As stated in the Arizona Department of Transportation (ADOT) letter, the project is included in the regional conformity analysis conducted by MAG for the MAG 2040 Regional Transportation Plan and FY2020-2024 Transportation Improvement Program (TIP) which was approved on March 27, 2020. FHWA has been working with ADOT on comment resolution and changes to

the modeling data for this project culminating in a revised interagency consultation document that was sent on April 8, 2020. This project required a carbon monoxide hot-spot analysis. As required by 40 CFR 93.116 and 93.123, the carbon monoxide analysis was include in the documentation and demonstrates that the project will not increase the severity or number of existing violations. FHWA has also confirmed with EPA that their comments have been adequately addressed.

Based on our review of the air quality analysis and interagency consultation information provided by ADOT, regarding the I-10, I-17 (Split) to SR-202L (Santan) project and the scope of work, FHWA is making the determination that this project meets the air quality conformity requirements and conforms with the State Implementation Plan in accordance with 40 CFR 93. If there are any questions on this determination, please contact Alan Hansen at 602-382-8964 or alan.hansen@dot.gov.

Sincerely,

Karla S. Petty
Division Administrator

By: Alan R Hansen
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