Air Quality Technical Memorandum

Prepared for:	City of Henderson, Nevada	Project Name:	I-215 Beltway Widening Project – Pecos Road to Stephanie Street
Copy to:	Nevada Department of Transportation		
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1. Introduction

The City of Henderson (City) proposes to widen the Interstate 215 Bruce Woodbury Beltway (I-215) from Pecos Road to Stephanie Street in the City of Henderson, Clark County, Nevada. This section of I-215 freeway is one of the primary east-west freeway corridors in the Las Vegas Valley and connects the City of Henderson to the rest of the Las Vegas Valley. The I-215 Beltway Widening Project (Project) involves widening of I-215, ramp reconstruction, and local road improvements to the interchanges with I-215 at Pecos Road/St. Rose Parkway and Green Valley Parkway. The Project would also reconstruct ramps at the Valle Verde Drive and Stephanie Street interchanges. Figure 1-1 shows the Project location and study area.

The Project is being completed with funding from Clark County. However, because I-215 is within Nevada Department of Transportation (NDOT) right-of-way, an NDOT encroachment permit is required to construct the improvements. The interstate system is under the jurisdiction of the Federal Highway Administration (FHWA) providing a federal nexus to prepare an environmental document to comply with the National Environmental Policy Act of 1969 (NEPA). Thus, in compliance with NEPA, the City is preparing documentation to evaluate the potential environmental impacts of the project. This technical memorandum presents potential impacts to air quality associated with the No Action Alternative and the Preferred Alternative and identifies measures to mitigate impacts identified.

2. Project Description

I-215 serves as an important connection between the City of Henderson and the surrounding Las Vegas metropolitan area. The Pecos Road/St. Rose Parkway and Green Valley Parkway interchanges with I-215 provide access to and from the residential and commercial developments at the west edge of the City. Clark County and the City have experienced significant population growth over the last decade. Between 2010 and 2020, Clark County's population grew by over 300,000 residents (an increase of about 20 percent) and the City's population grew by over 60,000 residents (an increase of about 25 percent) (U.S. Census Bureau 2010 and 2020). The regional population is projected to continue to grow.

This segment of I-215 currently experiences congestion due to existing roadway deficiencies and the regional population growth, which has increased current traffic volumes that exceed the roadway's capacity. In addition, existing roadway deficiencies result in increased travel time and contribute to accidents. By 2050, if no improvements are made on I-215 in the Project area, severe congestion with average speeds of less than 15 miles per hour is expected in both the morning and afternoon peak periods in some areas.

The proposed Project would widen I-215 from Pecos Road to Stephanie Street, improve interchanges and ramps, and construct a pedestrian bridge over Green Valley Parkway near Village Walk Drive. The purpose of the Project is to eliminate existing roadway deficiencies and provide transportation improvements to serve existing and future traffic demand.

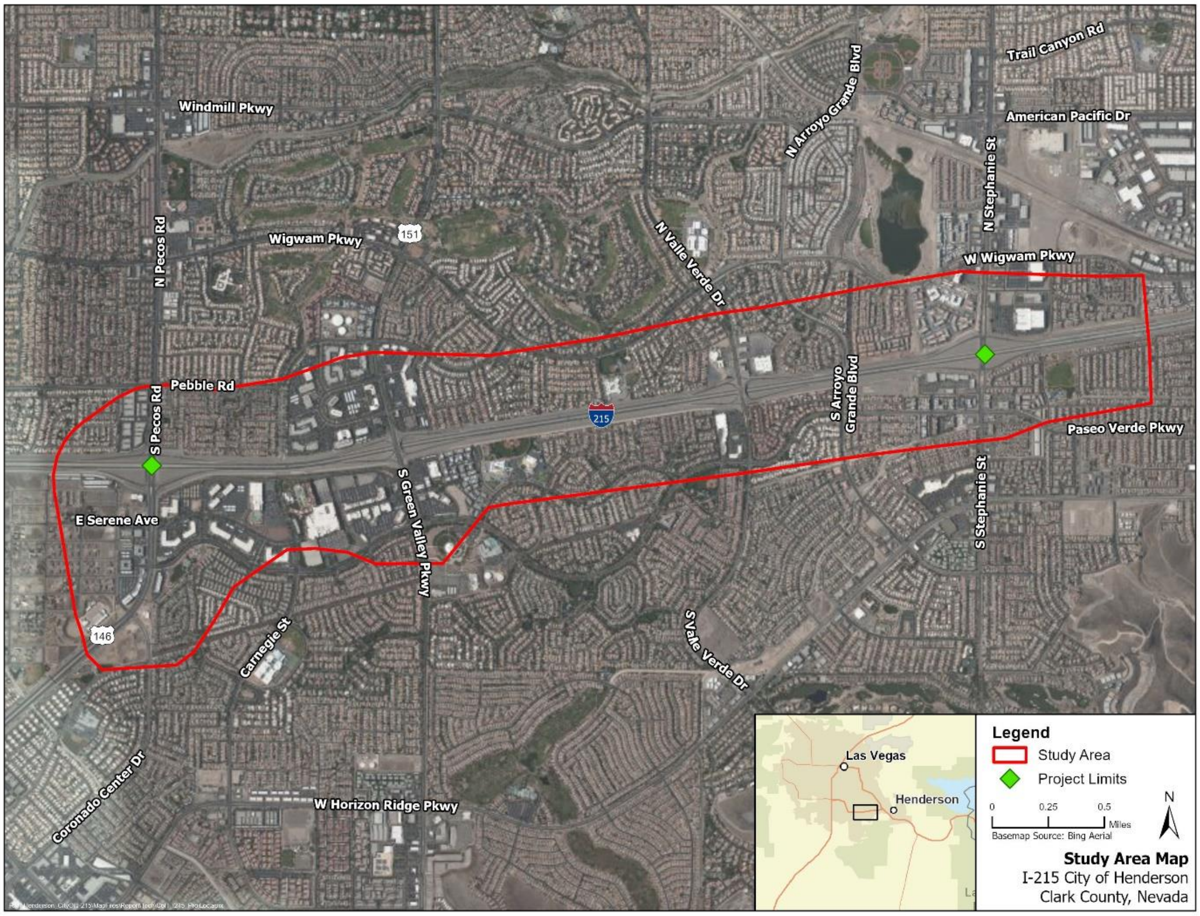

Figure 1-1. Study Area

3. Alternatives Evaluated

Two alternatives were evaluated for impacts, the No Action Alternative and the Preferred Alternative, described in Sections 3.1 and 3.2, respectively.

3.1 No Action Alternative Description

Under the No Action Alternative, none of the improvements included under the Preferred Alternative would be implemented. Only routine maintenance would be performed on I-215. Other planned transportation improvement projects in the area could still move forward. While this alternative would not fulfill the Project's purpose and need, it is included in the analysis as a baseline for comparison.

3.2 Preferred Alternative Description

The Preferred Alternative would widen I-215 with two additional through lanes in each direction (initially four lanes and at ultimate buildout, five lanes in each direction for a total of ten lanes) and an auxiliary lane between each interchange on I-215 from Pecos Road to Stephanie Street. This configuration is consistent with the improvements identified as part of the Henderson (I-11/I-515/I-215) Interchange project located adjacent to the east limit of this study. See Attachment A for a map of the Preferred Alternative.

Other improvements are described as follows:

- Pecos Road/St. Rose Parkway Interchange
  - Eastbound I-215 exit ramp: Construct additional right-turn lane to St. Rose Parkway for a total of two right-turn lanes.
  - Eastbound I-215 entrance ramp: The movement from northbound St. Rose Parkway to the entrance ramp will be free flow. This eastbound entrance ramp will have four receiving lanes: two from the northbound to eastbound movement and two from the southbound to eastbound movement Eventually, two of the four lanes will drop before merging onto the freeway as a two-lane ramp.
  - Westbound I-215 exit ramp: Widen to two lanes and construct additional left-turn lane, resulting in three left-turn lanes.
  - Along St. Rose Parkway extending to south of the St. Rose Parkway/Paseo Verde Parkway intersection: Extend the northbound outside lane to provide more capacity for vehicles turning right to the I-215 eastbound entrance ramp.
- Green Valley Parkway Interchange
  - Reconstruct interchange as a diverging diamond interchange. Does not require widening of the existing bridge.
  - Reconfigure all ramps to allow for the diverging diamond interchange.
  - Construct one extra approach lane on each exit ramp for a total of two eastbound and two westbound lanes on- and off-ramps.
  - Construct a pedestrian bridge over Green Valley Parkway near Village Walk Drive to remove the east-west at-grade crosswalks (across Green Valley Parkway), enhancing safety for vulnerable road users and improving traffic operations.
- Valle Verde Drive interchange
  - Widen off-ramps from I-215 to two lanes.
- Stephanie Street interchange
  - Widen westbound entrance ramp and eastbound exit ramps to two lanes.

Additionally, the Preferred Alternative would:

- Reconstruct bike trails affected by the Project.
- Reconstruct sound walls and storm drainage facilities, such as storm drain inlets and pipes.
- Construct other ancillary roadway improvements to improve the safety of users of I-215 such as outside shoulders, barrier rails, and retaining walls, as well as pavement markings.
- Install traffic control devices and modify bridge underdeck and ramp lighting.
- Not require any new right-of-way (ROW) along I-215 and all proposed work along I-215 would occur within existing NDOT ROW.[1]
- Not convert any existing land uses.

[1] Approximately 1.43 acres of ROW would be required along Green Valley Parkway and up to 0.26 acre of ROW along St. Rose Parkway. These are both City of Henderson streets.

4. Methods

The air quality analysis was performed for the Project based on the requirements of NEPA, the conformity provisions of the Clean Air Act (CAA) amendments, and other state and federal environmental requirements.

- The Project is subject to transportation conformity requirements. Regional conformity of the Project was demonstrated by verifying Project inclusion in the latest conforming regional transportation plan (RTP) and the federal transportation improvement program (TIP). Project-level conformity was evaluated through the hot-spot analysis for nonattainment or maintenance pollutants, including carbon monoxide (CO) and particulate matter with aerodynamic diameter equal to or less than 10 micrometers (PM_{10}) for the Project area.
- Quantitative CO hot-spot modeling was performed for the affected intersections in the Project area using the U.S. Environmental Protection Agency's (EPA's) MOVES3 emissions model and CAL3QHC air quality dispersion model to evaluate the CO levels. The analysis follows the EPA's *Guideline for Modeling Carbon Monoxide from Roadway Intersections* (EPA 1992) and *Using MOVES3 in Project-Level Carbon Monoxide Analyses* (EPA 2021b). The modeling results were used to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS).
- Potential PM_{10} hot spots were evaluated following the EPA's *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (EPA 2021a). Traffic data from the Project's traffic study were used to demonstrate that the Project would not be of air quality concern, and a quantitative PM_{10} hot-spot analysis is not needed. The analysis also followed the interagency consultation requirements to obtain concurrence on the determination.
- Mobile source air toxics (MSAT) analysis was performed for the Project following FHWA's 2023 *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents* (FHWA 2023).
- Short-term air quality impacts from Project construction were evaluated qualitatively based on construction duration, construction activities, and the implementation of emission minimization and reduction measures.
- Qualitative analysis of the greenhouse gas (GHG) impacts was performed following the applicable guidance of FHWA and the City.

5. Existing Conditions

5.1 Federal Regulatory Setting

5.1.1 Clean Air Act and National Ambient Air Quality Standards

Federal air quality policies are regulated through the CAA. U.S. Congress adopted the CAA in 1970 and its amendments in 1977 and 1990. Pursuant to the CAA, EPA established national air quality standards to protect public health and welfare with an adequate margin of safety. These federal standards, known as the National Ambient Air Quality Standards (NAAQS) as defined in Section 4 of this memorandum, were developed for criteria pollutants including ozone (O_3), nitrogen dioxide (NO_2), CO, PM_{10}, particulate matter less than 2.5 micrometers in aerodynamic diameter ($PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb). The NAAQS represent maximum concentrations for each pollutant to avoid specific adverse effects on human health and the environment. Two types of NAAQS have been established: primary and secondary standards. Primary standards set limits to protect public health, especially for sensitive populations such as asthmatics, children, and seniors. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, and buildings. The NAAQS are summarized in Table 5-1.

Table 5-1. National Ambient Air Quality Standards

Pollutant	Averaging Time	Primary Standards	Secondary Standards	Standard Form
O_3	8 hours	0.070 ppm	0.070 ppm[a]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
PM_{10}	24 hours	150 µg/m^3	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
$PM_{2.5}$	Annual arithmetic mean	12 µg/m^3	15 µg/m^3	Annual mean, averaged over 3 years
	24 hours	35 µg/m^3	35 µg/m^3	98th percentile, averaged over 3 years
CO	8 hours	9 ppm	—	Not to be exceeded more than once per year
	1 hour	35 ppm	—	
NO_2	Annual arithmetic mean	0.053 ppm	0.053 ppm	Annual mean
	1 hour	100 ppb	—	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
SO_2	3 hours	—	0.5 ppm	Not to be exceeded more than once per year
	1 hour	0.075 ppm[b]	—	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Pb	Calendar quarter	1.5 µg/m^3 (certain areas)	1.5 µg/m^3[c]	Not to be exceeded
	Rolling 3-month average	0.15 µg/m^3	—	

Source: EPA 2023a

[a] Final Rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) ozone standards also remain in effect in some areas.

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

[c] In areas designated nonattainment for the lead standards before 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 µg/m^3 as a calendar quarter average) also remain in effect.

Notes:

— = not applicable

µg/m^3 = microgram(s) per cubic meter

ppb = part(s) per billion (by volume)

ppm = part(s) per million (by volume)

SIP = State Implementation Plan

EPA classifies regions depending on whether the area's monitored air quality meets the NAAQS with respect to each criteria pollutant. A region that meets the air quality standard for a given pollutant is designated as being in attainment for that pollutant. If the region does not meet the air quality standard, it is designated as being in nonattainment for that pollutant. An area that was designated as nonattainment, has been redesignated to attainment, and has a federal-approved maintenance plan is in maintenance for that pollutant.

The 1977 CAA amendments required each state to develop and maintain a SIP for each criteria pollutant where a violation of the applicable NAAQS occurred. The SIP serves as a tool to avoid and minimize emissions of pollutants that would exceed ambient threshold criteria and achieve compliance with the NAAQS. In 1990, the CAA was further amended to strengthen regulation of both stationary and mobile emission sources for criteria pollutants.

5.1.2 Transportation Conformity

Transportation conformity is required under CAA Section 176(c) (42 *United States Code* 7506(c)) to ensure that federally supported highway and transit project activities are consistent with the purpose of a SIP. Conformity requirements apply only in areas designated as nonattainment and maintenance for the NAAQS. Under the conformity provisions of the CAA, no federal agency can approve or undertake a federal action or project unless it has been demonstrated to conform to the applicable SIP. Conformity to a SIP requires that a proposed project must demonstrate it would not cause a violation of any NAAQS, worsen an existing violation, or delay timely attainment of the NAAQS. EPA's transportation conformity rule (40 CFR 51.390 and Part 93) establishes the criteria and procedures for determining whether transportation activities conform to the SIP.

Demonstration of conformity with the CAA takes place on two levels for transportation projects: the regional or planning and programming level and the project level. A project must conform at both levels to be approved. At the regional level, a project must be included in a financially constrained, conforming TIP and long-range RTP. If the design concept, scope, and "open-to-traffic" schedule of a proposed transportation project are consistent with the descriptions in the conforming RTP and TIP, the proposed project meets regional conformity requirements. At the project level, a project must not cause a new local violation of the NAAQS or exacerbate an existing violation of the federal standards for CO, PM_{10}, and $PM_{2.5}$. Conformity requires hot-spot analysis at the project level if an area is in nonattainment or maintenance for CO, PM_{10}, or $PM_{2.5}$. The conformity demonstration is not required for construction-related activities that occur only during the construction phase and last 5 years or less at any individual site (40 CFR 93.123(c)(5)).

Because the Project is in an area in nonattainment for O_3 and in maintenance for CO and PM_{10}, the Project is subject to the transportation conformity requirements. Detailed methodologies for conformity demonstration are discussed in Section 6.2.1.

5.1.3 Mobile Source Air Toxics

In addition to the criteria pollutants, EPA also regulates air toxic emissions. Controlling air toxic emissions became a national priority with the passage of the CAA amendments of 1990, whereby Congress mandated that EPA regulate 188 air toxics, also known as hazardous air pollutants. EPA has assessed this expansive list in its 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 EPA's Integrated Risk Information System (IRIS) (EPA 2023b). In addition, EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from EPA's 2011 *National Air Toxics Assessment* (EPA 2014). 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 MSATs, the list is subject to change and may be adjusted in future EPA rules.

5.1.4 Greenhouse Gases

GHGs include both naturally occurring and anthropogenic gases, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide, hydro-chlorofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The gases trap the energy from the sun and help maintain the temperature of the Earth's surface, creating a process known as the greenhouse effect. The accumulation of GHGs in the atmosphere influences the long-term range of average atmospheric temperatures.

EPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in Massachusetts v. EPA (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing CAA and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Supreme Court's ruling, EPA finalized an endangerment finding in December 2009. Based on the endangerment finding, EPA and the National Highway Traffic Safety Administration (NHTSA) took coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines.

In conjunction with NHTSA, EPA issued a series of GHG emission standards for new passenger cars and light-duty vehicles starting April 2010. The most recent Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule was adopted in March 2020, which sets fuel economy and CO_2 standards that increase 1.5 percent in stringency each year for passenger cars and light trucks and cover model years 2021 through 2026 (NHTSA 2021). In October 2016, NHTSA and EPA issued a Final Rule for medium- and heavy-duty vehicles to improve fuel efficiency and reduce GHG emissions. On August 5, 2021, EPA announced plans to reduce GHG emissions and other harmful emissions from heavy-duty trucks through a series of rulemaking over the next 3 years. The first rulemaking of this plan, which is known as the Clean Trucks Plan, was signed on December 20, 2022, and focuses on reducing smog and particulate matter (Federal Register, Vol. 88 No. 15). As part of the Clean Trucks Plan, EPA intends to undertake a separate rulemaking regarding more stringent heavy-duty GHG standards in the future (i.e., heavy-duty GHG Phase 3 standards).

GHGs, climate change, and the associated effects are being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, manage GHG emissions, and mitigate climate change impacts. Upon taking office on January 20, 2021, President Biden rescinded President Trump's Executive Order (EO) 13783, Promoting Energy Independence and Economic Growth, and issued his "Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis" (EO 13990). EO 13990 calls for all federal agencies to review climate-related regulations and actions taken in the past 4 years and tasks the Council on Environmental Quality (CEQ) to update its final guidance entitled *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*, 81 *Federal Register* 51866 (August 5, 2016). On January 9, 2023, CEQ issued interim *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change* and is seeking public comment through April 10, 2023. The environmental process on this project began prior to the release of the CEQ interim guidance. The CEQ has not provided responses to comments submitted by the date of this document. Furthermore, USDOT-FHWA has not provided guidance on implementation of CEQ interim guidance from January 9, 2023.

5.2 State and Local Regulatory Setting

5.2.1 Air Quality Jurisdiction

The Clark County Division of Air Quality (CCDAQ) of the Department of Environment and Sustainability is the air pollution control agency for Clark County, Nevada. CCDAQ administers the permitting of stationary sources and oversees regulatory compliance, air quality monitoring, and Clark County air pollution control program under the Clark County Air Quality Regulations provisions. Regulations applicable to the Project include but are not limited to the following:

- Section 41: Fugitive Dust. Require reasonable precautions to abate fugitive dust from becoming airborne during construction.
- Section 45: Idling of Diesel-Powered Motor Vehicles. Limits idling of diesel vehicles to no more than 15 minutes.
- Section 94: Permitting and Dust Control for Construction Activities. Requires that a construction project must obtain a dust control permit from CCDAQ unless the project is exempt from such requirements.

5.2.2 Greenhouse Gases

Nevada's 2020 Climate Strategy

Senate Bill 254, passed in 2019, set forth the state's economywide GHG reduction goals of 28 percent below 2005 levels by 2025, 45 percent below 2005 levels by 2030, and zero or near-zero by 2050. On November 22, 2019, Governor Sisolak signed EO 2019-22 directing state agencies to develop and implement a climate strategy in Nevada. The state's *2020 Climate Strategy* (NCI 2020) was released in December 2020.

Nevada Department of Transportation's Greenhouse Gas Emission Reduction Framework

NDOT's GHG emission reduction framework is part of Nevada's Climate Strategy. "Climate Mitigation: Lead by Example" in the 2020 Climate Strategy demonstrates NDOT's commitment and leadership in GHG reduction. NDOT proposed GHG emissions reduction as a new performance measure in support of the statewide climate goals. In addition, NDOT formed the GHG Reduction Strategy Working Group and is working on the GHG Emissions Reduction Strategic Plan that identifies activities where NDOT can implement GHG emissions-reducing measures. NDOT and achieve direct control through its administration of programs or specific projects in three key areas: operations, construction, and planning (NCI 2020).

All-in Clark County - Clark County's Sustainability and Climate Action Plan, County Operations

The *Clark County Sustainability and Climate Action Plan, County Operations* (Clark County 2020) provides guidelines for how the County will promote sustainable practices and climate action within County operations. With this plan, the county aims to promote sustainable practices and climate action within the county's operations to ensure that it can continue to thrive in the face of climate change. The plan focuses on five key areas: clean and reliable energy, resilient operations, smart waste management and reduction, sustainable transportation, and water conservation and protection.

5.3 Environmental Setting

5.3.1 Topography and Climate

The Project is in Clark County, Nevada. Nevada has great climatic diversity, ranging from scorching lowland desert in the south to cool mountain forests in the north. Its varied and rugged topography, mountain ranges, and narrow valleys range in elevation from about 1,500 to more than 10,000 feet above sea level. Clark County, which lies in the Mojave Desert, has four, well-defined seasons. Summers display the classic characteristics of the desert: daily high temperatures in the lower elevations often exceed 100 degrees Fahrenheit (°F), with lows in the 70s. The summer heat usually is accompanied by low relative humidity, which might increase for several weeks during July and August in association with moist monsoonal wind flows from the south. Temperatures during the spring and fall are generally moderate. Strong winds are the most persistent weather hazard. Although winds higher than 50 miles per hour (mph) are infrequent, they often happen during vigorous storms. Winters are generally mild and pleasant. Afternoon temperatures average 60˚F, and the sky is normally clear and sunny. Snow accumulation on valley floors is rare, but higher elevations, such as the Spring Mountains, typically receive 5 to 10 feet of snowfall annually (CCDAQEM[2] 2011).

5.3.2 Attainment Status and Air Quality

The proposed Project is in Clark County within the Las Vegas Valley (Hydrographic Area [HA] 212). Currently, HA 212 is classified as in nonattainment for ozone, and in maintenance for the CO and PM_{10} NAAQS. The area is in

[2] Before March 6, 2012, CCDAQ was called the Clark County Department of Air Quality and Environmental Management (CCDAQEM).

attainment/unclassified for other criteria pollutants (EPA 2023c). The latest SIP documents for the area are the *PM_{10} Redesignation Request and Maintenance Plan* (Clark County 2012), and *Second 10-Year Carbon Monoxide Limited Maintenance Plan* (Clark County 2019). On June 4, 2018, EPA designated the Las Vegas Valley (HA 212) as a marginal nonattainment area for the 2015 ozone NAAQS, effective August 3, 2018 (83 FR 25776). On January 5, 2023, EPA issued its final rule determining that the Las Vegas Valley failed to attain the 2015 ozone NAAQS by the applicable marginal nonattainment date and reclassifying the area as a moderate nonattainment area (88 FR 775). DAQ is developing an attainment SIP to meet the planning requirements for moderate nonattainment areas.

Air quality is monitored through an air monitoring network in Clark County. The closest monitoring station near the Project is the Green Valley Station at 298 Arroyo Grande in Henderson. The Green Valley station monitors CO, PM_{10}, $PM_{2.5}$, and ozone concentrations. NO_2 concentration data were from the Jerome Mack-NCore station at 4250 Karen Avenue in Las Vegas. Table 5-2 summarizes the air quality data from 2020 through 2022.

Table 5-2. Monitored Pollutant Concentrations

Pollutant	2020	2021	2022	NAAQS
Second Max. CO (1-hour), ppm[a]	0.4	0.7	0.5	35 ppm
Second Max. CO (8-hour), ppm[a]	0.3	0.4	0.3	9 ppm
Second Max. PM_{10} (24-hour), $\mu g/m^3$[a]	134	117	340	150 $\mu g/m^3$
98th Percentile $PM_{2.5}$ (24-hour), $\mu g/m^3$[b]	19	14	14	35 $\mu g/m^3$
$PM_{2.5}$ (Annual), $\mu g/m^3$	7.1	6.2	18	12 $\mu g/m^3$
98th Percentile NO_2 (1-hour), ppb[c]	50	47	45	100 ppb
NO_2 (Annual), ppb[c]	15.24	13.87	11.67	53 ppb
4th Max. O_3 (8-hour), ppm[d]	0.071	0.072	0.067	0.070 ppm

Source: EPA 2023d

CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale. During the past 3 years, CO concentrations monitored in Las Vegas did not exceed the 1-hour and 8-hour CO NAAQS.

PM_{10} and $PM_{2.5}$ can be emitted from mobile sources and various industrial and agricultural operations, construction, re-entrained road dust, and other natural sources, such as windblown dust. The monitoring data indicate that PM_{10} and $PM_{2.5}$ concentrations exceed the 24-hour PM_{10} and PM2.5 NAAQS in 2022. However, the 3-year average concentrations remained below NAAQS for PM_{10} and $PM_{2.5}$.

O_3 is a regional pollutant. Its precursors, nitrogen oxide (NO_x) and volatile organic compounds (VOCs), are emitted from numerous stationary and mobile sources. Based on monitoring conducted from 2020 through 2022, maximum ozone concentrations exceeded the 8-hour ozone NAAQS in 2 of the last 3 years.

NO_2 is a criteria pollutant and a precursor to both O_3 and $PM_{2.5}$ pollutants. NO_2 concentrations in the region have not exceeded the NAAQS in the last 3 years.

Concentrations of SO_2 and Pb were not evaluated since historical concentrations of these pollutants are significantly below the NAAQS.

5.3.3 Mobile Source Air Toxics

Transportation projects might affect the regional or local air toxics concentrations because of the MSAT emissions from vehicles. Using EPA's MOVES3 model, as shown in Figure 5-1, FHWA estimates that even if vehicle miles traveled (VMT) increases by 31 percent from 2020 to 2060 as forecast, a combined reduction of 76 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Diesel PM is the dominant component of MSAT emissions, making up 36 to 56 percent of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES3 will notice some differences in emissions compared with MOVES2014. MOVES3 is based on updated data on some emissions and pollutant processes compared to MOVES2014, and also reflects the latest Federal emissions standards in place at the time of its release. In addition, MOVES3 emissions forecasts are based on slightly higher VMT projections than MOVES2014, consistent with nationwide VMT trends (FHWA 2023).

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

Nonetheless, air toxics concerns continue to arise on highway projects during the NEPA process. Even as the science emerges, the public and other agencies expect FHWA to address MSAT impacts in its environmental documents. FHWA, EPA, the Health Effects Institute (HEI), and others have funded and conducted research studies to more clearly define potential risks from MSAT emissions associated with highway projects. FHWA will continue to monitor the developing research in this field.

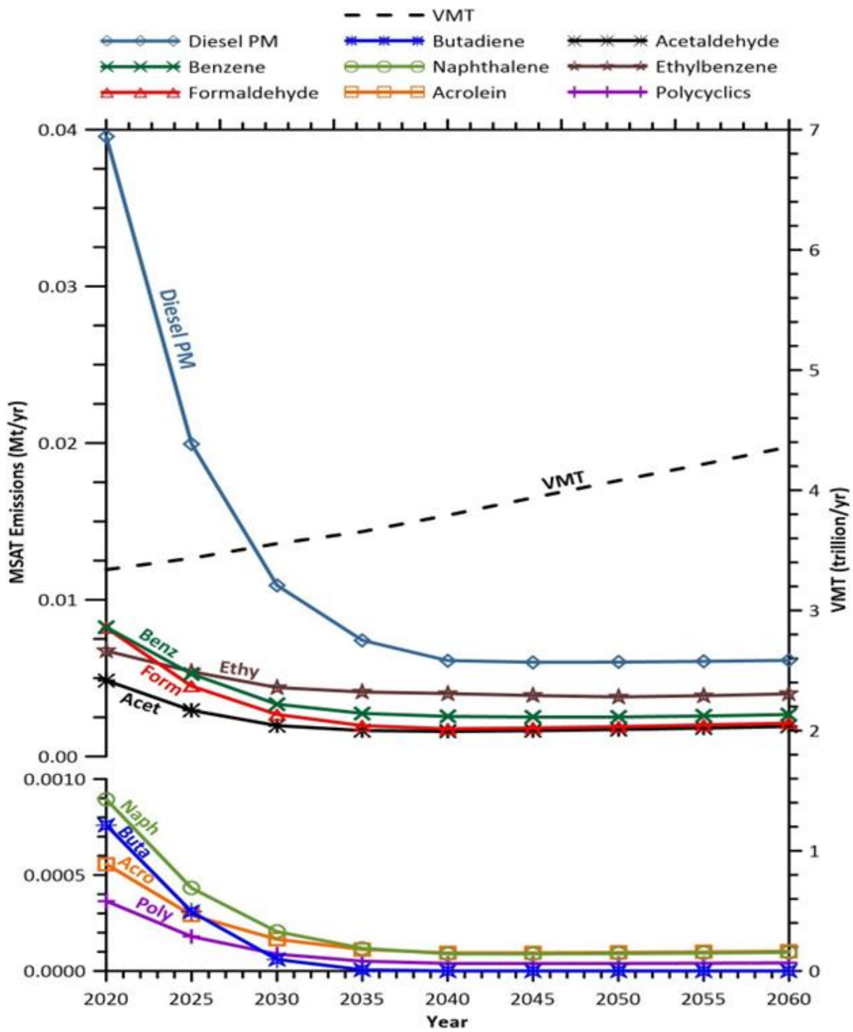

Figure 5-1. FHWA Projected National MSAT Emission Trends 2020-2060 for Vehicles Operating on Roadways

Note: Trends for specific locations may differ depending on locally derived information representing vehicle miles traveled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.
Source: EPA MOVES3 model runs conducted by FHWA in March 2021.

5.3.4 Greenhouse Gases

Each GHG's effect on global warming is a combination of the volume of its emissions and its 100-year global warming potential (GWP). GWP indicates how much a given GHG could contribute to global warming relative to how much warming would be caused by the same mass of CO_2. CH_4 and NO_x are substantially more potent than CO_2. In emissions inventories, GHG emissions typically are reported in terms of carbon dioxide equivalents (CO_2e), which are calculated as the product of the mass emitted of a given GHG and its specific GWP.

GHG emissions in Nevada peaked in 2005 when net GHG emissions totaled 49.405 million metric tons of CO_2e. Overall, net GHG emissions in 2020 were 24.4 percent below 2005 levels. In 2015, transportation exceeded electricity generation and became the state's largest sector of GHGs, mainly driven by Nevada's increasing reliance on renewable energy and lower GHG-emitting natural gas. In 2020, the statewide net GHG emissions were 37.336 million metric tons of CO_2e. The transportation sector (passenger cars, light-duty trucks, other trucks, buses, and motorcycles) accounts for about 31.9 percent of the statewide GHG emissions inventory. The electric power and industrial sectors account for 30.7 percent and 17.5 percent, respectively, of the total statewide GHG emissions inventory (NDEP 2022). The dominant GHG emitted is CO_2, primarily from fossil fuel combustion.

At the county level, activities by Clark County's residents, businesses, and visitors resulted in 29.3 million metric tons of CO_2e in 2019. Energy use from Buildings and the Industrial sector generated the majority of emissions from the region, contributing approximately 48 percent of total GHG emissions from Clark County. The Transportation sector is the second largest GHG emissions sector in Clark County and contributes 37 percent of regional emissions. This sector includes both emissions from On-Road and Off-Road transportation, which represent 23 percent and 14 percent of overall emissions, respectively (SNRPC 2021).

5.4 Sensitive Receptors

Sensitive air quality receptors include residences, schools, daycare centers, nursing homes, and hospitals. These are areas where the occupants are more susceptible to the adverse effects of exposure to air pollutants. The Project is located in urban areas in the City of Henderson. Land uses near the Project area are mostly residential, with scattered commercial and industrial land use along the Project corridor. Residential communities are located along both sides of I-215. The closest nonresidential sensitive receptors are several schools that are located next to the I-215, including the John C. Vanderburg Elementary School and Neil C. Twitchell Elementary School next to the I-215 eastbound near the Green Valley interchange, Selma F. Bartlett Elementary School next to the I-215 westbound near South Valle Verde Drive, and the Hannah Barie Brown Elementary School next to the I-215 eastbound near the South Stephanie Street.

6. Impacts Assessment

This section describes impacts identified for the No Action Alternative and the Preferred Alternative.

6.1 No Action Alternative Impacts

Under the No Action Alternative, construction of the Project would not occur. The No Action Alternative would not generate new air pollutants emissions from Project construction or operation. Air quality impacts are not expected from the No Action Alternative. The No Action Alternative is used as the baseline of the air quality analysis.

6.2 Preferred Alternative Impacts

6.2.1 Long-term Impacts

The long-term operational impact analysis includes evaluating Project conformity and potential MSAT effects. The analyses show that the Project meets the transportation conformity requirements and that impacts associated with Project operation would not have a substantial adverse effect on air quality.

Transportation Conformity

The Project is in Las Vegas Valley (HA 212) in Clark County, Nevada. The area is currently designated as nonattainment for ozone and in maintenance for CO and PM_{10}. Therefore, the Project is subject to transportation conformity requirements and needs to demonstrate regional and Project-level conformity for CO and PM_{10}.

O_3 is formed through a series of reactions involving NOx and VOCs that occur in the atmosphere in the presence of sunlight. Because NOx and VOC emissions can travel hundreds of miles on air currents forming ozone far from the original emissions sources, they can affect areas far downwind (EPA 2022). Therefore, the effects of ozone and its precursors are examined on a regional or mesoscale basis and assessed in system-level planning in developing SIPs.

Regional Conformity

Transportation projects meet conformity requirements at regional level by the Project's inclusion in a federally approved RTP and TIP (a subset of projects in the RTP). The Project is in the Regional Transportation Commission of Southern Nevada's (RTCSNV's) *Access 2050: Regional Transportation Plan for Southern Nevada 2021-2050 Amendment 21-40* (Project Number CL20200152, RTCSNV 2023)) and NDOT's *Statewide Transportation Improvement Program* (*STIP)* (NDOT 2023)*. Access 2050 (2021-2050 RTP/TIP) Amendment 21-40 Transportation Conformity Report* concludes that the amendment satisfies the regional conformity requirements (RTCSNV 2023). The Project has been included in the regional modeling and was evaluated for regional impacts to demonstrate that it meets the planning and regional requirements for conformity and is consistent with local air quality planning efforts. The proposed Project listing in the RTP/TIP is in Attachment B.

Project-level Conformity

A project-level conformity determination is required for projects in nonattainment and maintenance areas for PM_{10}, $PM_{2.5}$, and CO. Because the Project is in a PM_{10} and CO maintenance area, localized PM_{10} and CO impacts were evaluated to determine if the Project would cause any new violations of the PM_{10} or CO NAAQS or increase the frequency or severity of any existing violation for these pollutants.

PM_{10} Hot-Spot Analysis

The City evaluated the Project's potential to cause localized PM_{10} impacts and concluded the Project is unlikely to cause new violations of the PM_{10} NAAQS. The evaluation followed the criteria listed in *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA 2021a). According to this guidance, the first step in the PM_{10} hot-spot evaluation is to determine if the Project is a Project of Air Quality Concern (POAQC). Projects that are not a POAQC do not require a detailed PM_{10} hot-spot analysis because, in general, they would not substantially affect ambient PM_{10} concentrations and are unlikely to cause or contribute to new or continued localized violation of the NAAQS.

EPA specified in 40 CFR 93.123(b)(1) that POAQC are certain highway and transit projects that involve significant levels of diesel vehicle traffic, such as major highway projects and projects at congested intersections that handle significant diesel traffic, or any other project that is identified in $PM_{2.5}$ or PM_{10} SIPs as a localized air quality concern. The City conducted a preliminary evaluation of the Project in accordance with the criteria below following the EPA guidance.

Criterion #1: 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.

The Project would widen I-215 from Pecos Road to Stephanie Street, improve interchanges and ramps, and construct a pedestrian bridge. Based on the traffic data, the City determined that the Project would not cause a significant increase in diesel vehicles in the study area.

A traffic analysis was performed for the Project. Figures showing the locations of freeway segments and summaries of the annual average daily traffic (AADT) and diesel truck percentages on these segments in the study area are included in Attachment C. A segment-by-segment comparison of the total vehicle AADT and diesel truck AADT on the I-215 mainline are summarized in Table 6-1.

Table 6-1. Comparisons of Diesel Truck AADT in 2050 for the No Action and Preferred Alternative

	2050 No Action Alternative			2050 Preferred Alternative			Preferred Alternative vs. No Action Alternative	
I-215 Mainline Segment	Total AADT	Truck AADT	Truck%	Total AADT	Truck AADT	Truck%	Truck AADT Increase	Truck Increase
West of Eastern Ave.	212,000	6,464	3.0%	212,000	6,464	3.0%	0	0.0%
At Easter Ave.	177,000	6,459	3.6%	177,000	6,459	3.6%	0	0.0%
Easter Ave. to St. Rose Parkway/Pecos Road	212,000	6,360	3.0%	211,000	6,435	3.0%	75	1.2%
At St. Rose Parkway/Pecos Road	191,500	6,511	3.4%	191,500	6,415	3.3%	-96	-1.5%
St. Rose Parkway/Pecos Road to Green Valley Parkway	239,000	6,453	2.7%	246,000	6,516	2.6%	63	1.0%
At Green Valley Parkway	206,500	6,394	3.1%	216,000	6,472	3.0%	78	1.2%
Green Valley Parkway to Valley Verde Drive	253,000	6,448	2.5%	253,000	6,448	2.5%	0	0.0%
At Valley Verde Drive	225,000	6,410	2.8%	225,000	6,410	2.8%	0	0.0%
Valley Verde Drive to Stephanie Street	237,000	6,515	2.7%	237,000	6,515	2.7%	0	0.0%
At Stephanie Street	195,000	6,435	3.3%	195,000	6,435	3.3%	0	0.0%
Stephanie Street to Gibson Road	219,000	6,459	2.9%	219,000	6,459	2.9%	0	0.0%
East of Gibson Road	185,000	6,470	3.5%	185,000	6,470	3.5%	0	0.0%

The Project is not expected to induce additional diesel traffic in the Project area. Overall diesel truck percentages are relatively low in the study area. Percentages of diesel trucks range from 2.6 percent to 3.6 percent of overall vehicles under No Action Alternative in 2050. The diesel truck percentages on I-215 segments of the Preferred Alternative would remain the same as the No Action Alternative.

There would be no significant increase in diesel truck traffic on I-215 in the study area. Diesel truck AADT would be higher on some freeway segments and lower on other segments, depending on how the traffic flow would be redistributed after the highway modification. However, the overall diesel traffic changes in the study area would be minimal. On I-215 mainline segments within the study area, the diesel vehicle increases under the Preferred Alternative number less than 100 trucks, or a 1.2 percent increase compared to the No Action Alternative. Therefore, the Project would not cause a significant increase in diesel vehicles in the study area.

Criterion #2: Projects affecting intersections that are at a 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 increased traffic volumes from a significant number of diesel vehicles related to the project.

The Project would reduce congestion in the study area by providing additional travel lanes and improvements to the interchanges and ramps. The added lanes would increase travel speed and reduce congestion and the idling of vehicles on the freeway and at nearby intersections. The Project would reduce the number of intersections operating at level of service (LOS) F in the study area from three under the No Action Alternative to one under the Preferred Alternative. Traffic conditions at intersections with LOS D or worse under the No Action Alternative would have similar or improved LOS/delay under the Preferred Alternative. Intersection traffic volumes, LOS, and delays during morning and afternoon peak hours for each alternative are listed in Attachment D, Peak Hour Intersection Traffic Conditions.

The diesel truck percentages I-215 range from 2.6 to 3.7 percent for both the No Action and Preferred alternatives. Diesel truck percentages on local streets and intersections are expected to be lower. The Preferred Alternative is not expected to induce additional diesel vehicle traffic into the study area; therefore, the Project would not cause significant increases in diesel vehicle traffic at LOS D, E, or F intersections.

Criterion #3: New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location.

No new bus or rail terminals would be constructed under the Project.

Criterion #4: Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location.

No bus or rail terminals would be expanded under the Project.

Criterion #5: Projects in or affecting locations, areas, or categories of sites which are identified in the PM10 or PM2.5 applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The study area was not identified in the region's PM_{10} SIP as a site of possible violation of PM_{10}.

In summary, although the Project is in a maintenance area for PM_{10}, the City determined that the Project would not be a POAQC based on the EPA criteria discussed above. Therefore, the Project is not expected to cause or contribute to new localized PM_{10} violations. The Project would meet the conformity requirements of 40 CFR 93.116 without a quantitative PM_{10} hot-spot analysis upon concurrence with this determination by the interagency consultation.

A memorandum documenting NDOT's determination will be submitted to the RTCSNV's Air Quality Interagency Consultation Group for concurrence in early 2024.

Carbon Monoxide Hot-Spot Analysis

Microscale CO modeling using EPA's MOVES3 emissions model and CAL3QHC air quality dispersion model was conducted for the Project to evaluate the CO levels at selected locations. The analysis follows the EPA's *Guideline for Modeling Carbon Monoxide from Roadway Intersections* (EPA 1992) and *Using MOVES3 in Project-Level Carbon Monoxide Analyses* (EPA 2021b). MOVES input files provided by RTCSNV were used to supplement MOVES3 default data to characterize on-road vehicle emissions specific to the study area.

Intersection Screening

Intersection screening was conducted to evaluate whether the Project would cause localized increases of CO concentrations that violate NAAQS due to traffic delay at congested intersections. The traffic conditions at the affected intersections of the Project were compared to the intersections modeled in Clark County's *CO State Implementation Plan* (Clark County 2000) and the criteria in FHWA's *2023 Carbon Monoxide Categorical CO Hot Spot Finding* (CO Categorical Finding) to determine if quantitative CO modeling is required. The CO State Implementation Plan demonstrated attainment to CO NAAQS with a peak hour volume of 6,539 vehicles per hour (vph) at the intersection of Eastern Avenue and Charleston Boulevard. LOS information was not available in the maintenance plan, and a LOS D was assumed for this intersection. Therefore, intersections with peak hour traffic volume lower than the 6,539 vph and at LOS D or better operations are not anticipated to cause violations to the

CO NAAQS. In addition, the intersections within the range of the CO Categorical Finding would not require quantitative CO modeling. Intersections that are not screened out using the county's maintenance plan and FHWA's CO Categorical Finding would trigger quantitative CO modeling.

Based on the traffic information in Attachment D, several intersections in the Project area would have traffic volumes exceeding 6,539 and would be operating at LOS E or F. Intersections with LOS F are outside of the range of the CO Categorical Finding. Therefore, the Project intersections do not meet the criteria of not needing a quantitative hot-spot modeling. CO hot-spot modeling was conducted for the following intersections for the No Action Alternative and the Preferred Alternative in 2050:

- I-215 Westbound Ramp at Pecos Road
- St. Rose Parkway at Paseo Verde Parkway
- I-215 Ramps at Green Valley Parkway

The CO modeling follows the *Guideline for Modeling Carbon Monoxide from Roadway Intersections* (EPA 1992) and EPA's *Using MOVES3 in Project-Level Carbon Monoxide Analyses* (EPA, 2021b). The modeling results were compared to the NAAQS to demonstrate that the Project would not cause violations to the CO NAAQS.

MOVES3 Vehicle Emission Factors

Vehicular emissions were modeled using the EPA MOVES3 vehicle emission simulation model. Vehicle emission factors were obtained for both free-flow speeds and periods of idle for the analysis year 2050. Speeds between 5 and 55 mph were used to represent free-flow speeds for the intersections based on intersection-specific average progression data to the nearest 5 mph. A speed of 0 mph was used to calculate an idle emission factor. The following regionally specific data were provided by RTCSNV and used in MOVES3 modeling:

- Inspection/maintenance programs
- Meteorological data
- Source-type hour fraction data as adopted from regionally specific VMT data

MOVES3 default data were used when the regional data were not available. A Project-level MOVES3 analysis was used to develop the emission factors for a winter morning hour (January 7:00 a.m. to 8:00 a.m.) and a summer afternoon hour (July 4:00 p.m. to 5:00 p.m.) to capture the worst-case CO emissions. Both running exhaust and crankcase running exhaust emission processes were included in calculating the emission factors.

CAL3QHC Air Dispersion Modeling

The CAL3QHC air dispersion model was used to estimate the 1-hour CO concentrations in the vicinity of the affected intersections. Vehicle turning movements at intersections used in the CAL3QHC model were obtained from the Synchro 10 outputs provided in the traffic study (Jacobs 2023).

The 8-hour CO concentrations were obtained by multiplying the highest 1-hour CO concentrations by a persistence factor of 0.7 (EPA 1992). The persistence factor accounts for the fact that over 8 hours (as distinct from a single hour), vehicle volumes would fluctuate downward from the peak hour, vehicle speeds may vary, and meteorological conditions including wind speed and wind direction would vary compared to the conservative assumptions used for the single hour.

Receptors were placed around the intersections at distances of 0, 25, and 50 meters along each approach except for the I-215 ramps at Green Valley Parkway, which were discretely added to areas of ambient air based on intersection complexity. The receptors were placed 3 meters from the edge of the roadway to ensure that they were not within the mixing zone of the travel lanes (EPA 1992). Table 6-2 summarizes the input values used in

CAL3QHC modeling. While the EPA guidance recommends using atmospheric stability class "D" for urban conditions, the CO hot-spot modeling used a more conservative stability class "E" to account for the stable conditions during inversions. The surroundings of the intersections are open spaces, industrial/commercial buildings, single-family housing, and two- to three-story apartment buildings. Surface roughness of 175 centimeters (cm) for business districts was selected for the analysis.

The I-215 Ramps at Green Valley Parkway intersections are adjacent to each other and were therefore modeled together to capture potential plume overlap from traffic between the two intersections. Results for each intersection are presented only for receptors located around each respective intersection.

Table 6-2. CO Modeling - CAL3QHC Input Parameters

Parameter	Value[a]
Surface roughness	175 cm
Wind speed	1 m/s
Stability class	E
Mixing height	1,000 m
Wind direction increment	10 degrees
Receptor height	1.8 m
Source height	0 m
Signal type	Actuated
Intersection arrival rate	Average progression

[a] Parameter values are from EPA 1992.

Notes:

m = meter(s); m/s = meter(s) per second

The background CO concentrations were added to the respective modeled 1-hour and 8-hour CO concentrations to establish the design values for each modeled intersection. The background 1-hour and 8-hour CO concentrations were obtained from the Green Valley Station at 298 Arroyo Grande. The maximum observed 1-hour and 8-hour CO background concentrations from 2019-2021 are 0.7 and 0.5 ppm, respectively, and were used as the background concentration for CO in this study.

The predicted 1-hour and 8-hour CO design value concentrations at the four selected intersections are presented in Table 6-3. The modeling results demonstrated that the CO concentrations at these intersections with the worst-case LOS and volumes under the Preferred Alternative in 2050 would not cause exceedances of the 1-hour or 8-hour CO NAAQS. Because other intersections would have better LOS and lower traffic volume than the three intersections selected for modeling, the other intersections within the study area would have lower CO concentrations than these modeled intersections. Therefore, the Project would not cause new violations of the NAAQS for CO at affected intersections within the study area.

Table 6-3. Maximum Predicted Concentrations for Worst-Case Intersections

Intersection	2050 No Action Alternative		2050 Preferred Alternative	
	1-hour	8-hour	1-hour	8-hour
	ppm	ppm	ppm	ppm
NAAQS	35	9	35	9
I-215 Westbound Ramp at Pecos Road	1.3	0.9	1.3	0.9
St. Rose Parkway at Paseo Verde Parkway	1.4	0.9	1.4	0.9
I-215 Ramps at Green Valley Parkway	1.1	0.8	1.1	0.8

Intersection	2050 No Action Alternative		2050 Preferred Alternative	
	1-hour	8-hour	1-hour	8-hour
	ppm	ppm	ppm	ppm

Note: The results presented in the table include the maximum 1-hour and 8-hour background concentrations of 0.7 and 0.5 ppm, respectively, measured from 2019 to 2021 at Green Valley Station at 298 Arroyo Grande.

Mobile Source Air Toxics

Transportation projects might affect the regional or local air toxic concentrations because of the MSAT emissions from vehicles. Potential MSAT effects from Project operation were evaluated following the FHWA memorandum titled *Updated Interim Guidance on Air Toxic Analysis in NEPA Documents* (FHWA 2023). FHWA developed a tiered approach with three categories for analyzing MSAT impacts, depending on specific project circumstances as follows:

- No analysis for projects with no potential for meaningful MSAT effects
- Qualitative analysis for projects with low potential MSAT effects
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects

Projects with no impacts generally include those that (a) qualify as a categorical exclusion under 23 CFR 771.117, (b) qualify as exempt under the CAA conformity rule under 40 CFR 93.126, and (c) are not exempt but have no meaningful impacts on traffic volumes or vehicle mix. The Project qualifies as a categorical exclusion under 23 CFR 771.117, b. Therefore, the Project is considered have no potential for meaningful MSAT effects and no analysis is needed for MSAT emissions from the Project following FHWA guidance. However, because the Project involves widening of I-215, a qualitative MSAT discussion is included in the analysis following FHWA's guidance for projects with low potential MSAT effects.

MSAT Effects Discussion

For the Project alternatives analyzed, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT of the Preferred Alternative is anticipated to be slightly higher on some of the segments compared to the No Action Alternative, based on the AADT data on I-215 as shown in Table 6-1. This increase in VMT would lead to higher MSAT emissions for the Preferred Alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to the EPA MOVES3 model, emissions of all of the priority MSAT decrease as speed increases. It is expected there would be no appreciable difference in overall MSAT emissions between the No Action and the Preferred alternatives. Also, regardless of the alternative chosen, emissions would likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 76 percent between 2020 and 2060 (FHWA 2023). Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases. The additional travel lanes contemplated as part of the Preferred Alternative would have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under the Preferred Alternative there may be localized areas where ambient concentrations of MSAT could be higher under the No Action Alternative.

The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be widened and the reconfigured ramps. However, the magnitude and duration of these potential increases compared to the No Action Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting Project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the build alternative could be higher relative to the no build alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, make regionwide MSAT significantly lower than today.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

The MSAT analysis includes a basic analysis of the likely MSAT impacts of the Project. Due to the limitations of information and methodology of the analysis, the following discussion is included in accordance with Council on Environmental Quality regulations regarding incomplete or unavailable information (40 CFR 1502.22[b]). The discussion regarding the limitations of the MSAT analysis is prototype language taken from Appendix C of *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents* (FHWA 2023).

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts caused by 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 rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

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 CAA and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA 2023b). Each report contains assessments of noncancerous 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 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* (FHWA 2023). 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 are the adverse human health effects of MSAT compounds at current environmental concentrations (HEI 2007) 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 builds on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevent 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 timeframe, given that 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.

Considerable uncertainties are 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 HEI (HEI 2007). 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. 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." (EPA 2003)

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by EPA as provided by the CAA 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 (U.S. Court of Appeals 2008).

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.

6.2.2 Short-term Impacts

Project construction would result in short-term, temporary emissions of fugitive dust and equipment-related exhaust emissions such as NO_x, CO, VOCs, SO_2, and particulate matter (PM_{10} and $PM_{2.5}$) in the study area. Construction of the Project is not expected to last longer than 5 years. Therefore, a Project-level conformity analysis is not required, and construction emissions do not need to be accounted for in a hot-spot analysis according to 40 CFR 93.123(c)(5).

Sources of fugitive dust (PM_{10} and $PM_{2.5}$) during Project construction would include disturbed surface areas at the construction site and trucks carrying uncovered loads of soil and/or debris. Fugitive dust emissions would vary daily, depending on the nature and magnitude of construction activity and local weather conditions. Dust emissions would depend on soil moisture, silt content of the soil, wind speed, and the number of equipment operating.

Exhaust emissions during construction would be generated by fuel combustion in motor vehicles and construction equipment. Construction vehicles and disruption of normal traffic flow could result in increased motor vehicle emissions in certain areas. These emissions would be temporary and limited to the immediate area surrounding the construction site.

Equipment and vehicles used for construction would comply with EPA's emissions standards for on-road vehicles and off-road construction equipment. Potential air quality impacts would be temporary and short term. Nevertheless, NDOT will require its construction contractor to comply with applicable dust control requirements in CCDAQ regulations and implement best management practices to minimize emissions from construction.

NDOT's construction contractor will be required to obtain a dust control permit from CCDAQ. NDOT will implement emission control measures to reduce construction fugitive dust emissions in accordance with applicable CCDAQ regulations and NDOT's *Standard Specifications for Road and Bridge Construction* (NDOT 2014). Typical emission control measures include but are not limited to the following:

- Use periodic watering of disturbed surface areas to minimize visible fugitive dust emissions.
- Apply nontoxic soil stabilizers according to manufacturers' specifications to inactive construction areas.
- Reduce nonessential earth-moving activity under high wind conditions.
- Take actions sufficient to prevent Project-related track-out onto paved surfaces, such as installing one or more grizzlies, gravel pads, and wash down pads adjacent to the entrance of a paved public roadway to control carry-out and track-out.
- Cover loads in haul vehicles or leave at least 6 inches of freeboard.
- Maintain the Project vehicles and equipment in good operational conditions.
- Limit vehicle and equipment idling to the extent practicable.
- Configure construction parking to minimize traffic interference on local streets.

6.3 Greenhouse Gases

6.3.1 Project Greenhouse Gas Emissions

While there is no federal requirement to address GHG emissions or climate change in NEPA documents, this section includes a discussion of GHG emissions associated with the Project. No national standards have been established regarding GHGs, nor has the EPA established criteria or thresholds for ambient GHG concentrations pursuant to its authority to establish motor vehicle emission standards for CO_2 under the CAA.

GHGs are different from other air pollutants evaluated in federal environmental reviews because their impacts are not localized or regional due to their rapid dispersion into the global atmosphere, which is a characteristic of these gases. The environment for CO_2 and other GHG emissions is the planet. In addition, from a quantitative perspective, fluctuations in global climate are the cumulative result of numerous and varied parameters, which may include emission sources (in terms of both absolute numbers and types). Each emission source may make a relatively small contribution to global atmospheric GHG concentrations. However, it is not meaningful or useful to attempt to translate those relatively small emission differences into climate outcomes (for example, temperature changes, drought/flooding severity). At this time, there is no scientific methodology for attributing specific climatological changes to emissions from a particular transportation project. The GHG impact analysis of the Project follows the general NEPA guideline and may be updated when applicable guidance on evaluating GHGs impacts becomes available from CEQ, EPA, or FHWA.

Under NEPA, the detailed environmental analysis focuses on issues that are significant and meaningful to decision-making.[3] NDOT has concluded, based on the nature of GHG emissions and the exceedingly small potential GHG impacts of the Project, that GHG emissions from proposed actions will not result in "reasonably foreseeable significant adverse impacts on the human environment" (40 CFR 1502.21(a)). The GHG emissions from the Preferred Alternative would be temporary and minimized during Project construction and would be similar to the No Action Alternative during operation. Therefore, the GHG emissions from the Project would not play a meaningful role in determining the environmentally preferable alternative or selecting the Preferred Alternative. More detailed information on GHG emissions "is not essential to a reasoned choice among reasonable alternatives" (40 CFR 1502.21(b)) or to make a decision in the best overall public interest based on a balanced

[3] Refer to 40 CFR 1500.1(b), 1500.2(b), 1500.4(g), and 1501.7.

consideration of transportation, economic, social, and environmental needs and impacts (23 CFR 771.105(b)). For these reasons, no alternatives-level GHG analysis has been performed for the Project.

GHG emissions would be produced at different levels throughout the Project's construction phase; their frequency and occurrence can be reduced through plans and specifications innovations and better traffic management during the construction phase. Reducing idling times reduces harmful emissions from passenger cars and diesel-powered construction vehicles. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

Even though Project-level mitigation measures would not substantially impact global GHG emissions because of the exceedingly small amount of GHG emissions involved, emission control measures such as limiting vehicle idling time and keeping equipment in good operational condition would have the effect of reducing GHG emissions. These measures are part of a programwide effort by FHWA to adopt practical means to avoid and minimize environmental impacts in accordance with 40 CFR 1505.2(c).

6.3.2 Greenhouse Gas Summary

This document does not incorporate an analysis of the GHG emissions or climate change effects of the Project because the potential change in GHG emissions is very small in the context of the affected environment. Because of the insignificance of the GHG impacts, those impacts would not be meaningful to a decision on the environmentally preferable alternative or a choice among alternatives. The emission reduction measures for Project construction described in Section 6.2.2, such as limiting equipment and vehicle idling time, represent practical Project-level measures that might help reduce GHG emissions on an incremental basis and could contribute in the long term to a meaningful cumulative reduction when considered across the federal-aid highway program.

7. Mitigation Measures

Based on the analysis discussed in Section 6.2.1, Long-term Impacts, and Section 6.2.2, Short-term Impacts, the Project meets transportation conformity requirements, and it is not expected to cause substantial adverse effects on air quality during construction and operation. The Project would comply with applicable CCDAQ regulations to minimize fugitive dust emissions by implementing the best management practice program and also would comply with the requirements of the *Standard Specifications for Road and Bridge Construction* (NDOT 2014). Additional mitigation measures are only required for projects determined to have substantial adverse impacts. Because the Project does not have adverse impacts, additional mitigation measures beyond what is included in the best management practices and what is required by state and regional regulatory requirements are not required.

8. References

Clark County. 2000. *Carbon Monoxide State Implementation Plan*, Appendix E, Supplemental Technical Support Documentation.

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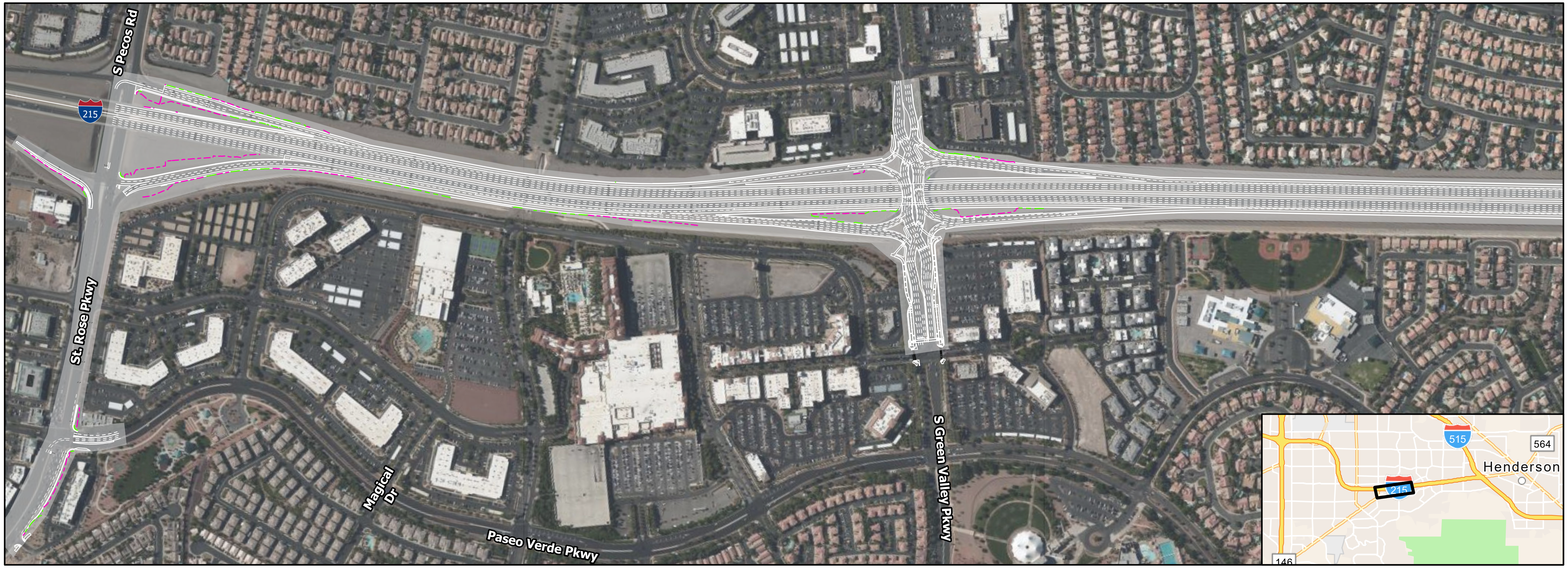
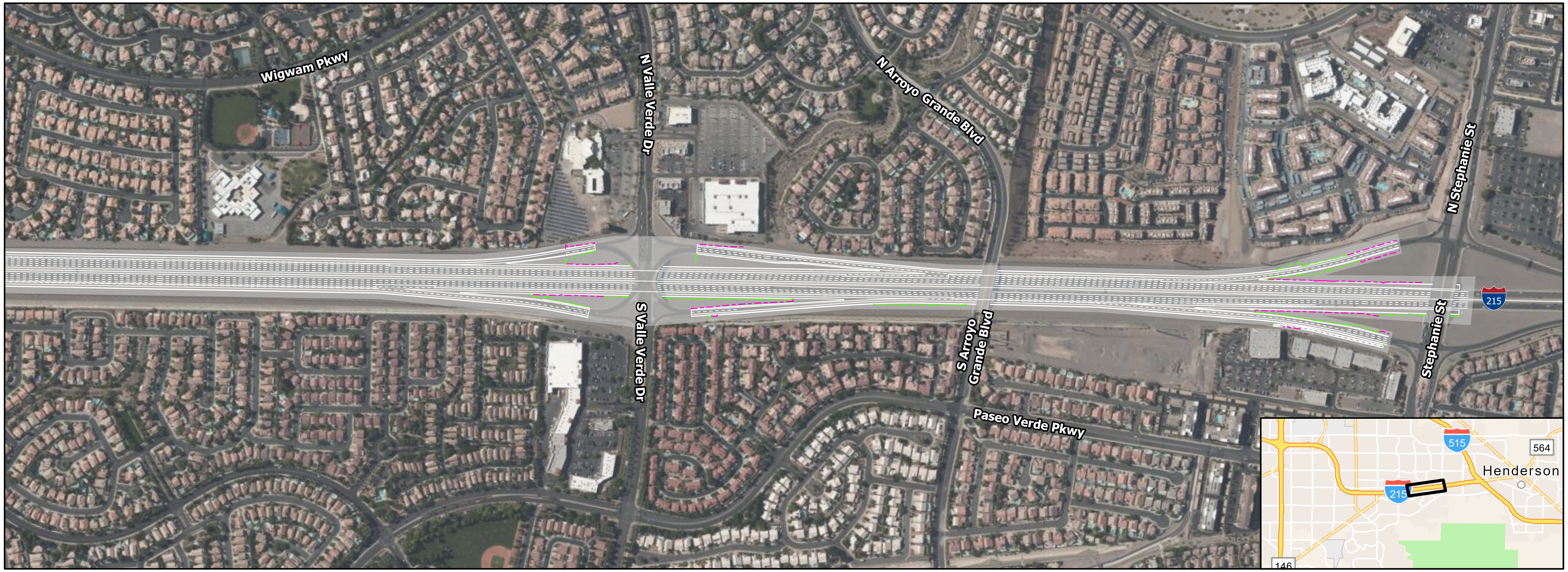
Attachment A
Map of Preferred Alternative





Legend

- Proposed Roadway
- Proposed Cut
- Proposed Fill

N

0 500 1,000 Feet

Basemap Source: Bing Aerial

Preferred Alternative

I-215 City of Henderson

Clark County, Nevada

Attachment B
Proposed Project Listing in Regional Transportation Plan and Transportation Improvement Program

access 2050

Enhancing Mobility for Southern Nevada Residents

REGIONAL TRANSPORTATION PLAN for SOUTHERN NEVADA

2021 - 2050

AMENDMENT 21-40

CL20200152 (Ver 2) 21-40 STATUS In Progress - Programmed LOCAL

Name: Clark County 215, Pecos to Stephanie Widening

Scope: Widening from 3 to 5 lanes with interchange/ramp modifications at Pecos Road, Green Valley Parkway, Valle Verde Drive, Stephanie Street and installation of a pedestrian bridge at Green Valley Parkway.

Project Type: Interchange/Intersection **AQ:** Non-Exempt **TCM:** No **NDOT:** District 1

County: Clark **Limits:** Primary Interchange: Pecos, Secondary Interchange: Stephanie

FED FY	Revenue Source	PE	ROW	CON	OTHER	TOTAL
2022	Clark Cnty Beltway	$5,000,000	$0	$0	$0	$5,000,000
2024	Clark Cnty Beltway	$0	$0	$125,000,000	$0	$125,000,000
	2022-2026 TOTAL	**$5,000,000**	**$0**	**$125,000,000**	**$0**	**$130,000,000**
	ALL YEARS TOTAL	**$5,000,000**	**$0**	**$125,000,000**	**$0**	**$130,000,000**

MPO **RTCSNV** (N/A) Lead Agency **City of Henderson**

Previously Approved Version

CL20200152 (Ver 1) 21-07

Name: Clark County 215, Pecos to Stephanie Widening

Scope: Widening, adding 3 to 4 lanes

Project Type: Interchange/Intersection **AQ:** Non-Exempt **TCM:** No **NDOT:** District 1

County: Clark **Limits:** Primary Interchange: Pecos, Secondary Interchange: Stephanie

FED FY	Revenue Source	PE	ROW	CON	OTHER	TOTAL
2022	Clark Cnty Beltway	$0	$0	$25,000,000	$0	$25,000,000
	2022-2026 TOTAL	**$0**	**$0**	**$25,000,000**	**$0**	**$25,000,000**
	ALL YEARS TOTAL	**$5,000,000**	**$0**	**$25,000,000**	**$0**	**$30,000,000**

MPO **RTCSNV** (N/A) Lead Agency **Clark County**

Nevada DOT

2023 STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)

PROJECT OVERVIEW | **FUNDING HISTORY** | **CHANGE HISTORY**

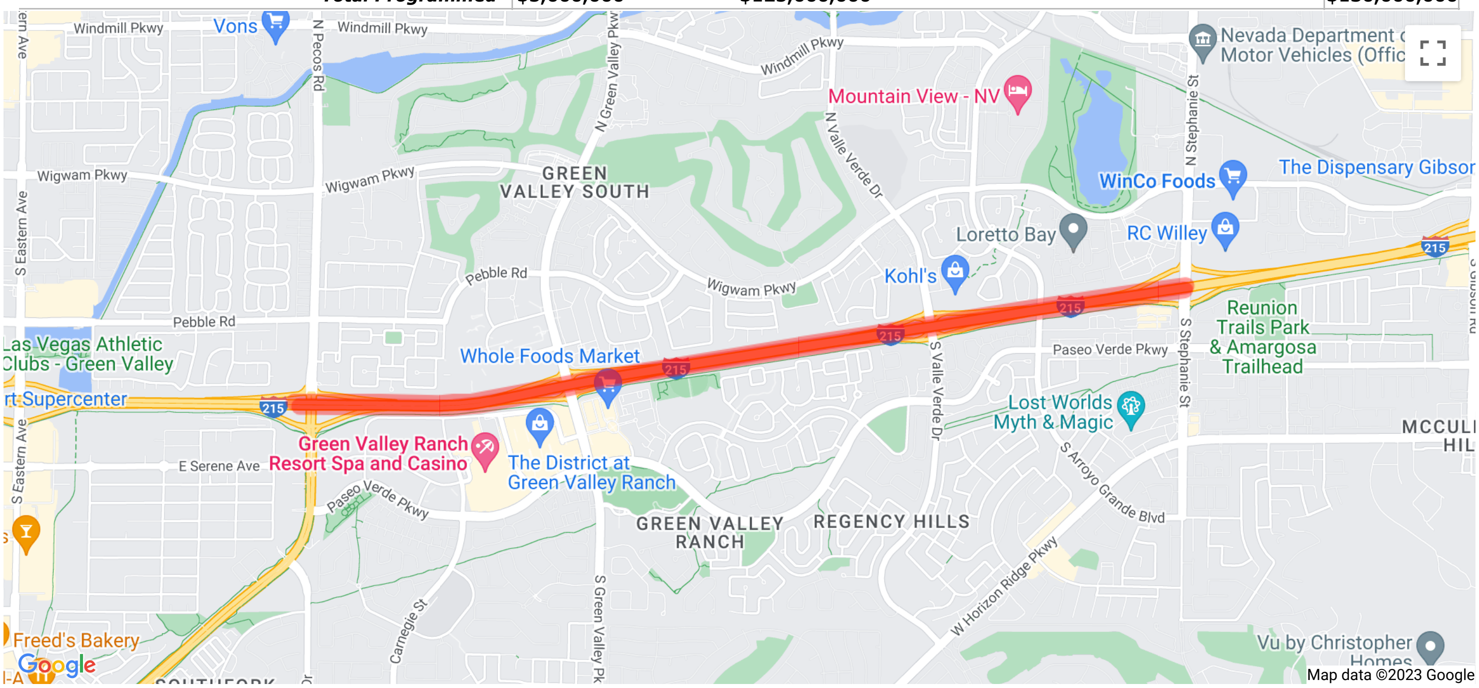
State TIP ID	CL20200152	*MPO/TIP*	RTCSNV 23-40	*Local ID*		*Total Cost*	$130,000,000
Lead Agency	City of Henderson	*Contact*	Scott Jarvis 702-267-3065	*NDOT*	District 1	*County*	CLARK
Project Type	Interchange/Intersection	*Air Quality*	Non-Exempt	*TCM*	No	*Construction*	2024 Start

Title Clark County 215, Pecos to Stephanie Widening

Limits At From Pecos To Stephanie of Distance (mile) 3 Begin: 0 End: 3

Description Widening from 3 to 5 lanes with interchange/ramp modifications at Pecos Road, Green Valley Parkway, Valle Verde Drive, Stephanie Street and installation of a pedestrian bridge at Green Valley Parkway.

Phase	Fund Source	Prior FFY	FFY2023	FFY2024	FFY2025	FFY2026	FFY2027	Future FFY	Total
PE	Clark Cnty Beltway	$5,000,000	-	-	-	-	-	-	$5,000,000
	Total Preliminary Engineering	$5,000,000	-	-	-	-	-	-	$5,000,000
CON	Clark Cnty Beltway	-	-	$125,000,000	-	-	-	-	$125,000,000
	Total Construction	-	-	$125,000,000	-	-	-	-	$125,000,000
	Total Programmed	**$5,000,000**	**-**	**$125,000,000**	**-**	**-**	**-**	**-**	**$130,000,000**



Attachment C
Summary of I-215 Mainline Annual Average Daily Traffic Conditions

Summary of I-215 Mainline AADT

West Bound

I-215 Mainline	2050 No Action			2050 Preferred Alternative		
Segment	Total AADT	Truck AADT	Truck%	Total ADT	Truck ADT	Truck%
West of Eastern Ave.	108,000	3,240	3.0%	108,000	3,240	3.0%
Easter Ave	90,500	3,258	3.6%	90,500	3,258	3.6%
Easter Ave. to St. Rose Parkway/Pecos Road	106,000	3,180	3.0%	106,000	3,180	3.0%
St. Rose Parkway/Pecos Road	95,500	3,247	3.4%	95,500	3,247	3.4%
St. Rose Parkway/Pecos Road to Green Valley Parkway	118,000	3,186	2.7%	120,000	3,240	2.7%
Green Valley Parkway	99,500	3,184	3.2%	104,000	3,224	3.1%
Green Valley Parkway to Valley Verde Drive	123,000	3,198	2.6%	123,000	3,198	2.6%
Valley Verde Drive	110,000	3,190	2.9%	110,000	3,190	2.9%
Valley Verde Drive to Stephanie Street	116,000	3,248	2.8%	116,000	3,248	2.8%
Stephanie Street	97,000	3,201	3.3%	97,000	3,201	3.3%
Stephanie Street to Gibson Road	108,000	3,240	3.0%	108,000	3,240	3.0%
East of Gibson Road	90,000	3,240	3.6%	90,000	3,240	3.6%

East Bound

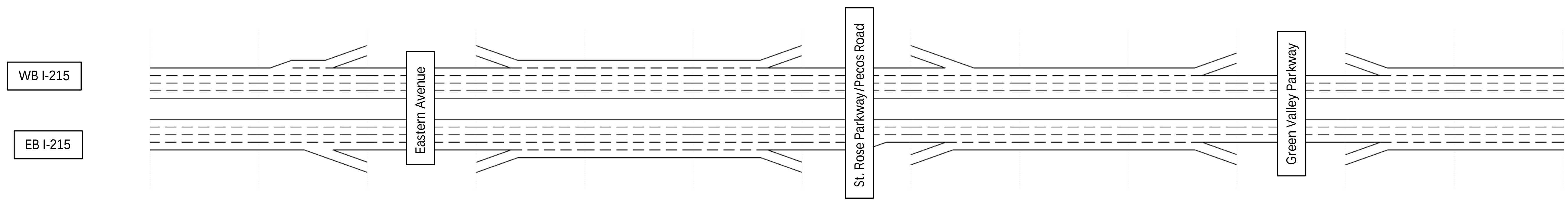
I-215 Mainline	2050 No Action			2050 Preferred Alternative		
Segment	Total AADT	Truck AADT	Truck%	Total ADT	Truck ADT	Truck%
West of Eastern Ave.	104,000	3,224	3.1%	104,000	3,224	3.10%
Easter Ave	86,500	3,201	3.7%	86,500	3,201	3.70%
Easter Ave. to St. Rose Parkway/Pecos Road	106,000	3,180	3.0%	105,000	3,255	3.10%
St. Rose Parkway/Pecos Road	96,000	3,264	3.4%	96,000	3,168	3.30%
St. Rose Parkway/Pecos Road to Green Valley Parkway	121,000	3,267	2.7%	126,000	3,276	2.60%
Green Valley Parkway	107,000	3,210	3.0%	112,000	3,248	2.90%
Green Valley Parkway to Valley Verde Drive	130,000	3,250	2.5%	130,000	3,250	2.50%
Valley Verde Drive	115,000	3,220	2.8%	115,000	3,220	2.80%
Valley Verde Drive to Stephanie Street	121,000	3,267	2.7%	121,000	3,267	2.70%
Stephanie Street	98,000	3,234	3.3%	98,000	3,234	3.30%
Stephanie Street to Gibson Road	111,000	3,219	2.9%	111,000	3,219	2.90%
East of Gibson Road	95,000	3,230	3.4%	95,000	3,230	3.40%

Total on I-215 (East and West Bound)

I-215 Mainline	2050 No Action			2050 Preferred Alternative			Preferred Alternative vs. No Action	
Segment	Total AADT	Truck AADT	Truck%	Total ADT	Truck ADT	Truck%	Truck ADT Increase	Truck Increase %
West of Eastern Ave.	212,000	6,464	3.0%	212,000	6,464	3.0%	0	0.0%
Easter Ave	177,000	6,459	3.6%	177,000	6,459	3.6%	0	0.0%
Easter Ave. to St. Rose Parkway/Pecos Road	212,000	6,360	3.0%	211,000	6,435	3.0%	75	1.2%
St. Rose Parkway/Pecos Road	191,500	6,511	3.4%	191,500	6,415	3.3%	-96	-1.5%
St. Rose Parkway/Pecos Road to Green Valley Parkway	239,000	6,453	2.7%	246,000	6,516	2.6%	63	1.0%
Green Valley Parkway	206,500	6,394	3.1%	216,000	6,472	3.0%	78	1.2%
Green Valley Parkway to Valley Verde Drive	253,000	6,448	2.5%	253,000	6,448	2.5%	0	0.0%
Valley Verde Drive	225,000	6,410	2.8%	225,000	6,410	2.8%	0	0.0%
Valley Verde Drive to Stephanie Street	237,000	6,515	2.7%	237,000	6,515	2.7%	0	0.0%
Stephanie Street	195,000	6,435	3.3%	195,000	6,435	3.3%	0	0.0%
Stephanie Street to Gibson Road	219,000	6,459	2.9%	219,000	6,459	2.9%	0	0.0%
East of Gibson Road	185,000	6,470	3.5%	185,000	6,470	3.5%	0	0.0%

Year 2050 No-Action Alternative

Year 2050 AM Demand Volume (vph)	8,360	1,330	7,030	1,180	8,210	800	7,410	1,730	9,130	1,420	7,720	1,830	9,550
Year 2050 PM Demand Volume (vph)	7,560	1,280	6,280	1,390	7,670	1,050	6,620	1,920	8,530	1,110	7,420	1,360	8,780
Year 2050 AADT (vpd)	108,000	17,000	90,500	18,000	106,000	13,500	95,500	24,500	118,000	18,500	99,500	23,500	123,000
Daily Diesel Truck Percent	3.0%		3.6%		3.0%		3.4%		2.7%		3.2%		2.6%

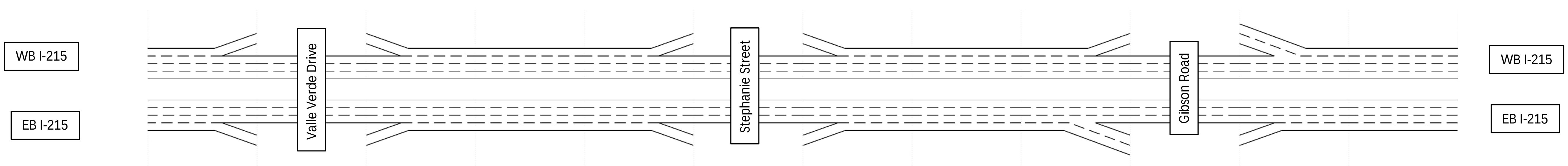


Year 2050 AM Demand Volume (vph)	6,620	1,360	5,260	1,290	6,550	750	5,800	2,160	7,960	1,350	6,610	1,000	7,610
Year 2050 PM Demand Volume (vph)	8,040	1,350	6,700	1,550	8,240	800	7,450	1,940	9,380	1,060	8,320	1,780	10,100
Year 2050 AADT (vpd)	104,000	17,500	86,500	20,000	106,000	10,500	96,000	28,000	121,000	17,500	107,000	23,000	130,000
Daily Diesel Truck Percent	3.1%		3.7%		3.0%		3.4%		2.7%		3.0%		2.5%

Legend: On/Off ramp

Year 2050 No-Action Alternative

Year 2050 AM Demand Volume (vph)	1,030	8,520	520	9,040	1,530	7,510	850	8,360	1,390	6,970	420	7,390
Year 2050 PM Demand Volume (vph)	650	8,140	670	8,800	1,810	6,990	880	7,880	1,340	6,540	450	6,990
Year 2050 AADT (vpd)	13,500	110,000	8,600	116,000	23,500	97,000	11,500	108,000	18,000	90,000	5,800	95,000
Daily Diesel Truck Percent		2.9%		2.8%		3.3%		3.0%		3.6%		3.4%



Year 2050 AM Demand Volume (vph)	560	7,050	470	7,520	1,280	6,240	750	6,990	1,150	5,830	710	6,550
Year 2050 PM Demand Volume (vph)	1,180	8,920	500	9,420	1,840	7,590	1,010	8,590	1,230	7,360	650	8,010
Year 2050 AADT (vpd)	15,000	115,000	6,400	121,000	23,500	98,000	13,000	111,000	16,000	95,000	9,100	103,000
Daily Diesel Truck Percent		2.8%		2.7%		3.3%		2.9%		3.4%		3.1%

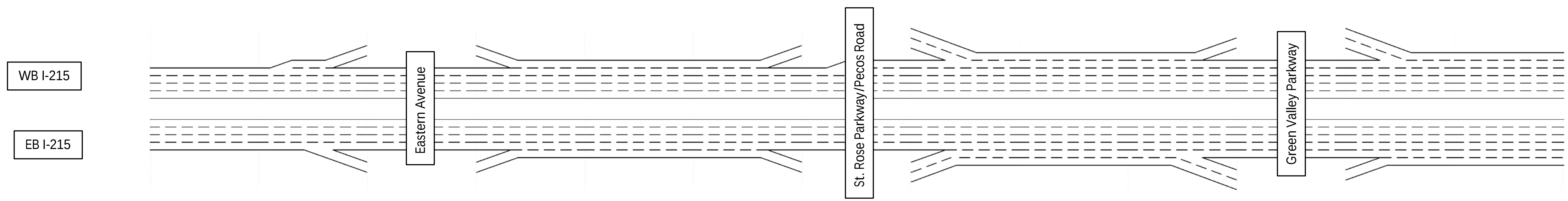
Legend: On/Off ramp

Year 2050 Build Alternative

Year 2050 AM Demand Volume (vph)	8,360	1,330	7,030	1,170	8,200	780	7,410	1,920	9,330	1,240	8,090	1,460	9,550
Year 2050 PM Demand Volume (vph)	7,560	1,280	6,280	1,320	7,600	980	6,620	2,080	8,700	1,130	7,570	1,210	8,780

Year 2050 AADT (vpd)	108,000	17,000	90,500	17,000	106,000	12,500	95,500	27,000	120,000	16,000	104,000	19,000	123,000

Daily Diesel Truck Percent	3.0%		3.6%		3.0%		3.4%		2.7%		3.1%		2.6%



Year 2050 AM Demand Volume (vph)	6,620	1,360	5,260	1,280	6,540	750	5,800	2,170	7,960	1,350	6,610	1,000	7,610
Year 2050 PM Demand Volume (vph)	8,040	1,350	6,700	1,480	8,180	710	7,470	2,290	9,760	1,080	8,680	1,420	10,100

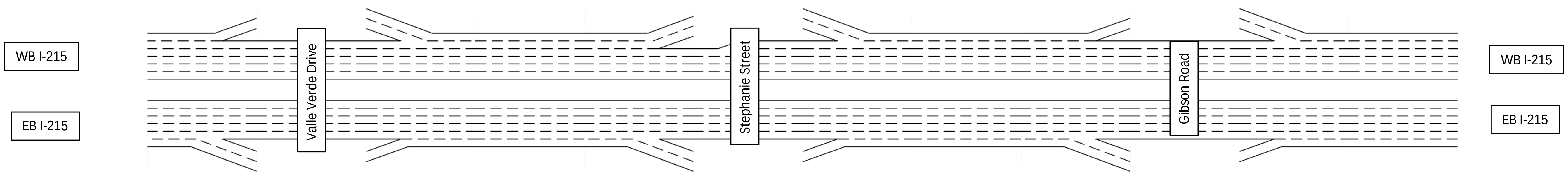
Year 2050 AADT (vpd)	104,000	17,500	86,500	19,000	105,000	9,700	96,500	29,500	126,000	17,500	112,000	18,500	130,000

Daily Diesel Truck Percent	3.1%		3.7%		3.1%		3.3%		2.6%		2.9%		2.5%

Legend: On/Off ramp

Year 2050 Build Alternative

Year 2050 AM Demand Volume (vph)	1,030	8,520	520	9,040	1,530	7,510	850	8,360	1,390	6,970	420	7,390
Year 2050 PM Demand Volume (vph)	650	8,140	670	8,800	1,810	6,990	880	7,880	1,340	6,540	450	6,990
Year 2050 AADT (vpd)	13,500	110,000	8,600	116,000	23,500	97,000	11,500	108,000	18,000	90,000	5,800	95,000
Daily Diesel Truck Percent		2.9%		2.8%		3.3%		3.0%		3.6%		3.4%



Year 2050 AM Demand Volume (vph)	560	7,050	470	7,520	1,280	6,240	750	6,990	1,150	5,830	710	6,550
Year 2050 PM Demand Volume (vph)	1,180	8,920	500	9,420	1,840	7,590	1,010	8,590	1,230	7,360	650	8,010
Year 2050 AADT (vpd)	15,000	115,000	6,400	121,000	23,500	98,000	13,000	111,000	16,000	95,000	9,100	103,000
Daily Diesel Truck Percent		2.8%		2.7%		3.3%		2.9%		3.4%		3.1%

Legend: On/Off ramp

Attachment D
Intersection Traffic Conditions

Intersection Traffic Conditions

		AM			PM		
	Intersection	**LOS**	**Delay**	**Volume**	**LOS**	**Delay**	**Volume**
2050 No Action	3. Pecos Road/Pebble Road	C	25.9	--	C	34.1	--
	4. Pecos Road/I-215 WB	C	34.4	--	F	85.4	5880
	5. Pecos Road/I-215 EB	C	26.5	--	D	42.8	7500
	6. St. Rose Parkway/Serene Avenue	--	--	--	--	--	--
	7. St. Rose Parkway/Paseo Verde Parkway	F	117.9	7050	F	145.8	8240
	10. Green Valley Parkway/Corporate Circle North	C	22.7	--	D	38.5	4090
	11. Green Valley Parkway/Corporate Circle South	--	--	--	--	--	--
	12. I-215 EB & Green Valley Parkway & I-215 WB	E	67.7	6790	F	93	7350
	121. Green Valley Parkway/I-215 WB	--	--	--	--	--	--
	13. Green Valley Parkway/Village Walk Drive	C	28.3	--	E	68	5810
	122. Green Valley Parkway	--	--	--	--	--	--
	123. Green Valley Parkway & I-215 WB	--	--	--	--	--	--
	124. I-215 EB	--	--	--	--	--	--
	125. Green Valley Parkway	--	--	--	--	--	--
	126. I-215 EB & Green Valley Parkway	--	--	--	--	--	--
2050 Preferred Alternative	3. Pecos Road/Pebble Road	C	22.4	--	C	34.3	--
	4. Pecos Road/I-215 WB	C	30.6	--	E	55.2	5980
	5. Pecos Road/I-215 EB	B	15	--	C	27.1	--
	6. St. Rose Parkway/Serene Avenue (Unsignalized)	--	--	--	--	--	--
	7. St. Rose Parkway/Paseo Verde Parkway	D	38.5	6840	F	106.6	8160
	10. Green Valley Parkway/Corporate Circle North	B	15.8	--	D	36.5	4020
	11. Green Valley Parkway/Corporate Circle South (Unsignalized)	--	--	--	--	--	--
	12. I-215 EB & Green Valley Parkway & I-215 WB	--	--	--	--	--	--
	121. Green Valley Parkway/I-215 WB	A	7.1	--	A	2.5	--
	13. Green Valley Parkway/Village Walk Drive	B	12.4	--	C	26.2	--
	122. Green Valley Parkway	B	10.7	--	B	15.4	--
	123. Green Valley Parkway & I-215 WB	B	13.2	--	E	56.2	2620
	124. I-215 EB	B	12.2	--	A	5.9	--
	125. Green Valley Parkway	B	14.3	--	D	48.1	3360
	126. I-215 EB & Green Valley Parkway	A	3.5	--	B	13.3	--