AIR QUALITY SUPPLEMENTAL TECHNICAL REPORT

Oregon Department of Transportation

July 12, 2022

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Executive Summary

This 2022 Air Quality Supplemental Technical Report analyzes possible impacts to air quality that could result from the Revised Build Alternative for design year 2045. This analysis provides updated modeling results for existing conditions (2017) and future (2045) conditions under the No-Build Alternative and Revised Build Alternative using the updated model (Motor Vehicle Emission Estimator [MOVES3]). The area of potential impact (API) for air quality did not change and is the same as what was analyzed in the 2019 Air Quality Technical Report.

The updated mobile source air toxic (MSAT) analysis shows the Revised Build Alternative is expected to have MSAT emissions that would be the same or lower than the No-Build Alternative in 2045. The analysis shows future MSAT emissions are estimated to be substantially lower (between 72% to 100%) than the existing conditions. Compared to the No-Build Alternative, MSAT for the Revised Build Alternative would be up to 5% lower.

The burden analysis of transportation criteria pollutants shows that the Revised Build Alternative would result in criteria pollutant emissions of up to 9% lower than the No-Build Alternative because vehicles would move more efficiently (i.e., less stop-and-go traffic conditions) in the affected roadway network. Similar to MSAT emissions, transportation criteria pollutant tail pipe emissions for the Revised Build Alternative will be significantly lower than existing conditions with the exception for particulate matter emissions where tire and brake emissions dominate in the future.

Temporary construction impacts to air quality would be similar to those documented in the 2019 Air Quality Technical Report from fugitive dust and construction equipment exhaust. These emissions would not continue after Project construction is completed. Effects would be localized and would vary throughout the construction process. Control measures would be implemented to address short-term construction effects.

1.0 INTRODUCTION

The I-5 Rose Quarter Improvement Project (Project) Environmental Assessment (EA) was released in February 2019. The Federal Highway Administration (FHWA) published a Finding of No Significant Impact (FONSI) and Revised EA (REA) for the Build Alternative on November 6, 2020. Since the issuance of the FONSI, the Oregon Department of Transportation (ODOT) has made changes to the design of the proposed Build Alternative to create a Revised Build Alternative and re-evaluated the changes in the context of the FONSI/REA. At the conclusion of the re-evaluation, FHWA and ODOT agreed that the design changes require additional analyses beyond what was presented in the REA, and FHWA rescinded the FONSI on January 18, 2022. This technical report supplements the 2019 Air Quality Technical Report (ODOT 2019) with an evaluation of the air quality impacts of the Revised Build Alternative compared to the No-Build Alternative and Build Alternative.

2.0 BUILD ALTERNATIVE DESIGN CHANGES

Changes to the Build Alternative include modification to the highway cover design and changes associated with advancements in other elements of the project design, some of which require expansion of the Project Area. This section describes the highway cover design changes and design changes that resulted from advancements in project engineering. The evaluation of these changes is presented in Section 6.2 of this supplemental technical report.

2.1 DESIGN PROCESS

Through 2021, ODOT facilitated an Independent Highway Cover Assessment, as directed by the Oregon Transportation Commission, that engaged the Project's advisory committees and community members in a series of collaborative workshops to explore the design opportunities for the highway cover. The purpose of the Independent Highway Cover Assessment was to understand stakeholder goals and objectives within the Project Area, generate potential highway cover scenarios, and assess the impacts and benefits of these scenarios. The Independent Highway Cover Assessment team worked directly with local community members from the historic Albina neighborhood to understand how the highway cover design concepts might best serve the historic Albina community. The Project's Historic Albina Advisory Board (HAAB), Executive Steering Committee (ESC) and the Community Oversight Advisory Board (COAC) also provided input as part of the Independent Highway Cover Assessment process. These sessions explored potential opportunities for economic development in the Albina community and the highway cover design concepts.

In July 2021, Oregon Governor Brown convened a series of meetings with Project stakeholders and community organizations to discuss the design concepts developed in the Independent Highway Cover Assessment. In August 2021, the HAAB—as supported by the ESC and the COAC, and through the Governor-led process—recommended "Hybrid 3" as the preferred highway cover design concept (Figure 1). The Hybrid 3 highway cover design concept represents a proposed community solution to maximize developable space on a single highway cover. The Hybrid 3 highway cover design concept maintains the commitment for the Project to create opportunities for the local community to grow wealth through business ownership and long-term career prospects through the Project's Disadvantaged Business Enterprise and workforce program. Following the community and stakeholder recommendations, in September 2021, the Oregon Transportation Commission directed ODOT to advance further evaluation of the Hybrid 3 highway cover design concept, with conditions related to the Project's funding process and other technical analyses.

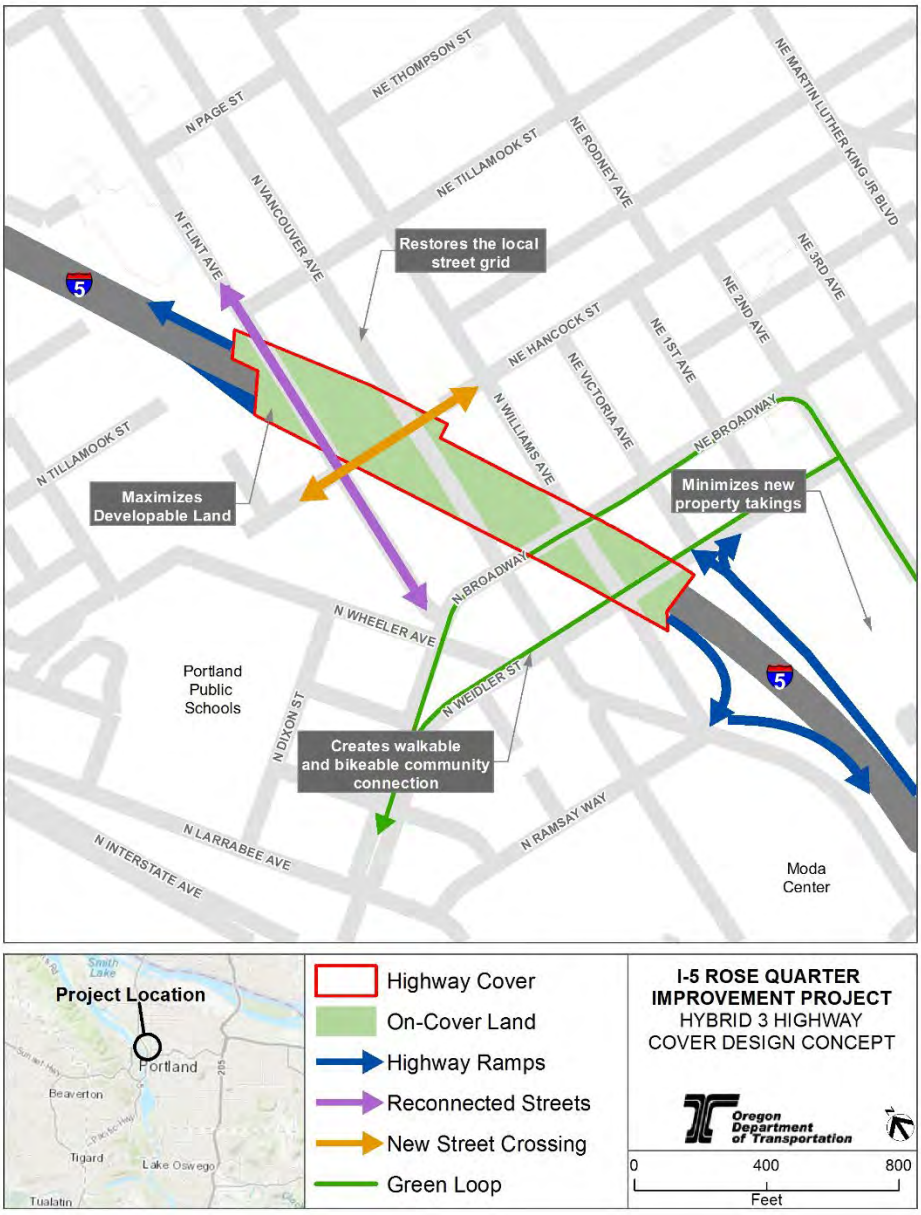
In January 2022, Governor Brown entered into a Letter of Agreement with the City of Portland, Metro, and Multnomah County that demonstrated their shared understanding and collective support for the Hybrid 3 concept as part of the Project. The Letter of Agreement specifically highlights the desire to connect the Lower Albina neighborhood, create buildable space, and enhance wealth-generating opportunities for the community, while simultaneously addressing the area's transportation needs. Additionally, the Letter of Agreement supports the development of a process to define the future development vision for what could ultimately be built on top of the highway cover upon Project completion – this process is referred to as a Community Framework Agreement. The Letter of Agreement states that the City of Portland will lead a Community Framework Agreement process and that it should be between the City of Portland, ODOT, other state agencies and local jurisdictions as necessary, with the participation of organizations that represent the Albina community and Black residents. Any future real estate or open space development on top of the cover would require executing long-term air rights and lease agreements, and that any such actions or decisions are subject at all times to applicable local, state, and federal laws including but not limited to land use and NEPA processes.

In June 2022, ODOT and the City of Portland executed an Intergovernmental Agreement (IGA), building upon the January 2022 Letter of Agreement. The IGA further states that the City will lead the future highway cover land use, programming and development processes and development of a Community Framework Agreement, in consultation with the ODOT to ensure the highway, local streets and resulting land parcels within the Project are coordinated. As such, ODOT would construct the highway cover as part of the Project and the City of Portland would lead the process to define what is ultimately built on the new land created by the Project's highway cover. In the IGA, both ODOT and the City agreed that ODOT will retain ownership of

the highway cover structure and the new developable area created on the highway cover structure upon Project completion.

The sections below describe the highway cover design changes and the design changes that resulted from advancements in project engineering and are incorporated into the Revised Build Alternative.

Figure 1 Hybrid 3 Highway Cover Design Concept



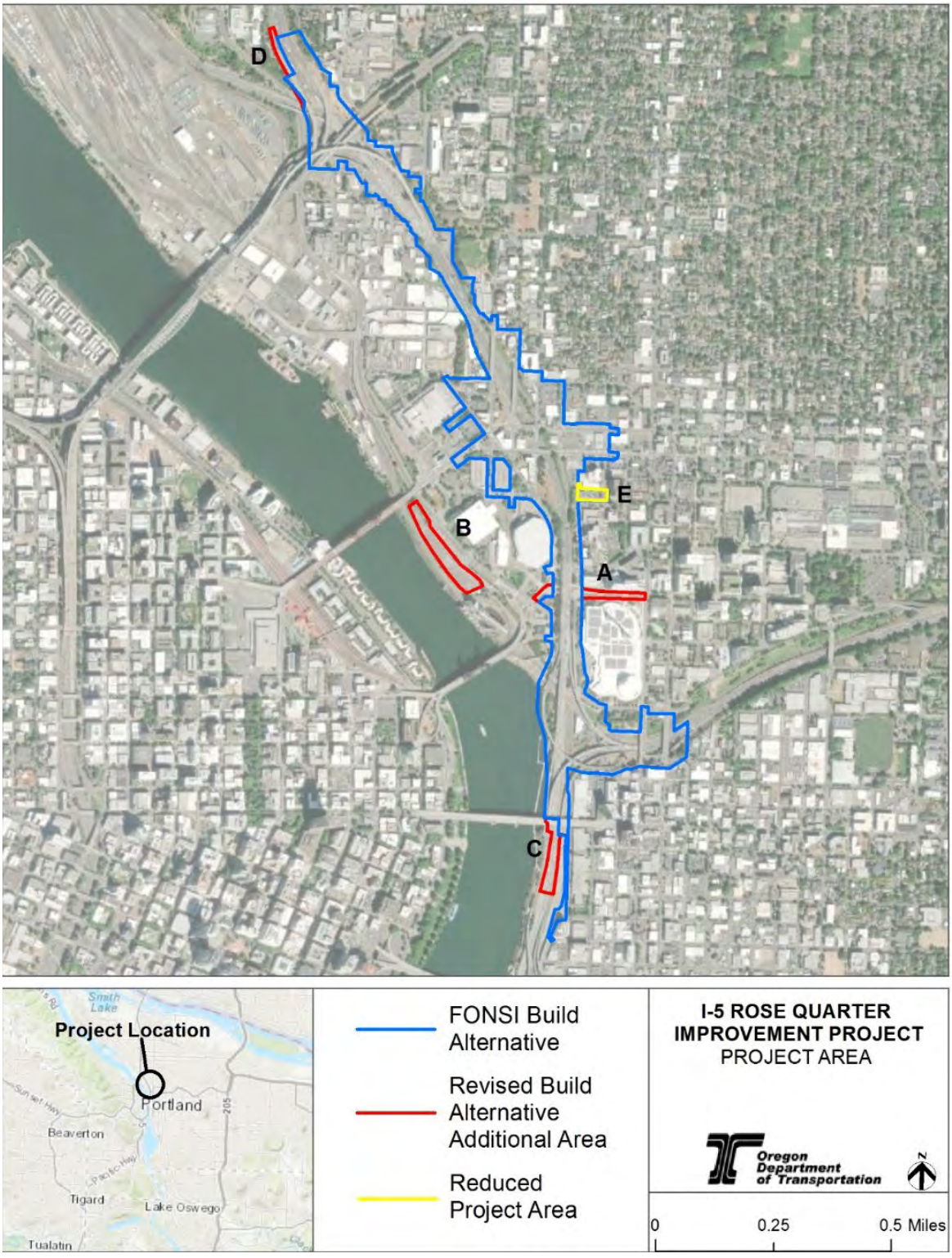
This section describes the highway cover design changes and design changes that resulted from advancements in project engineering and are incorporated into the Revised Build Alternative.

2.2 PROJECT AREA

The Project Area is defined as the area within which improvements are proposed, including where permanent modifications to adjacent parcels may occur and where potential temporary impacts from construction activities could result. As Project design information advanced, some changes required expansion of the Project Area presented in the REA and FONSI, and in one location the Project Area was reduced (Figure 2). In total, approximately 8.7 acres would be added to the Project Area. The changes are as follows, with letter references to the areas shown in Figure 2:

- A: Utility conflicts with Light Rail Transit (LRT) along NE Holladay Street between N Interstate Avenue and NE Martin Luther King Jr. Boulevard required expanding the Project Area by 1.9 acres to include additional overhead utility relocations (label A in Figure 2).
- B: An existing parking lot (known as Aegean Lot) south of N Interstate Avenue and the Broadway Bridge may be used for contractor staging during construction and is added to the Project Area (label B, Figure 2). ODOT identified this 4.3-acre construction staging area for contractor use based on its location, size, and suitability recognizing that, because of the urban setting and high-density land development in the construction area, it would be difficult for a construction contractor to find the space needed near or next to the project work areas for equipment staging, material storage, and the required co-location space for the contractor/construction personnel. This location meets all of the Project requirements: large level open space, proximity to the project work areas, and access for staging/storage of materials and equipment. Any materials stored in the area and site runoff would be subject to the same regulations as required throughout the project site.
- C: The southern end of the Project Area is expanded by 2.4 acres to include the portion of I-5 south of the Burnside Bridge proposed for a retrofit of the existing bridge rail, restriping the existing freeway, and installation of new guide signs (label C, Figure 2).
- D: At the northernmost end of the Project Area, a 1.1-acre area of ODOT right of way along the I-5 shoulders is now included in the Project Area for fiber optic conduit (label D, Figure 2).E: In one location, the Project Area was reduced by 1.0 acre. A parking lot west of the intersection of NE Clackamas Street and NE 2nd Avenue is no longer needed for the Project due to the removal of the Clackamas Bicycle and Pedestrian Crossing (label E, Figure 2).

Figure 2 Previous and Current Project Area.



2.3 I-5 MAINLINE IMPROVEMENTS CHANGES

The Build Alternative included relocation of the I-5 southbound on-ramp at N Wheeler Avenue to N/NE Weidler Street at N Williams Avenue via the new Weidler/Broadway/Ramsay highway cover, construction of auxiliary lanes and full shoulders (12 feet in width) on I-5 between I-405 and I-84 in both directions, and associated improvements to I-5 through the Project Area. The Revised Build Alternative includes the following changes to those elements of the Build Alternative:

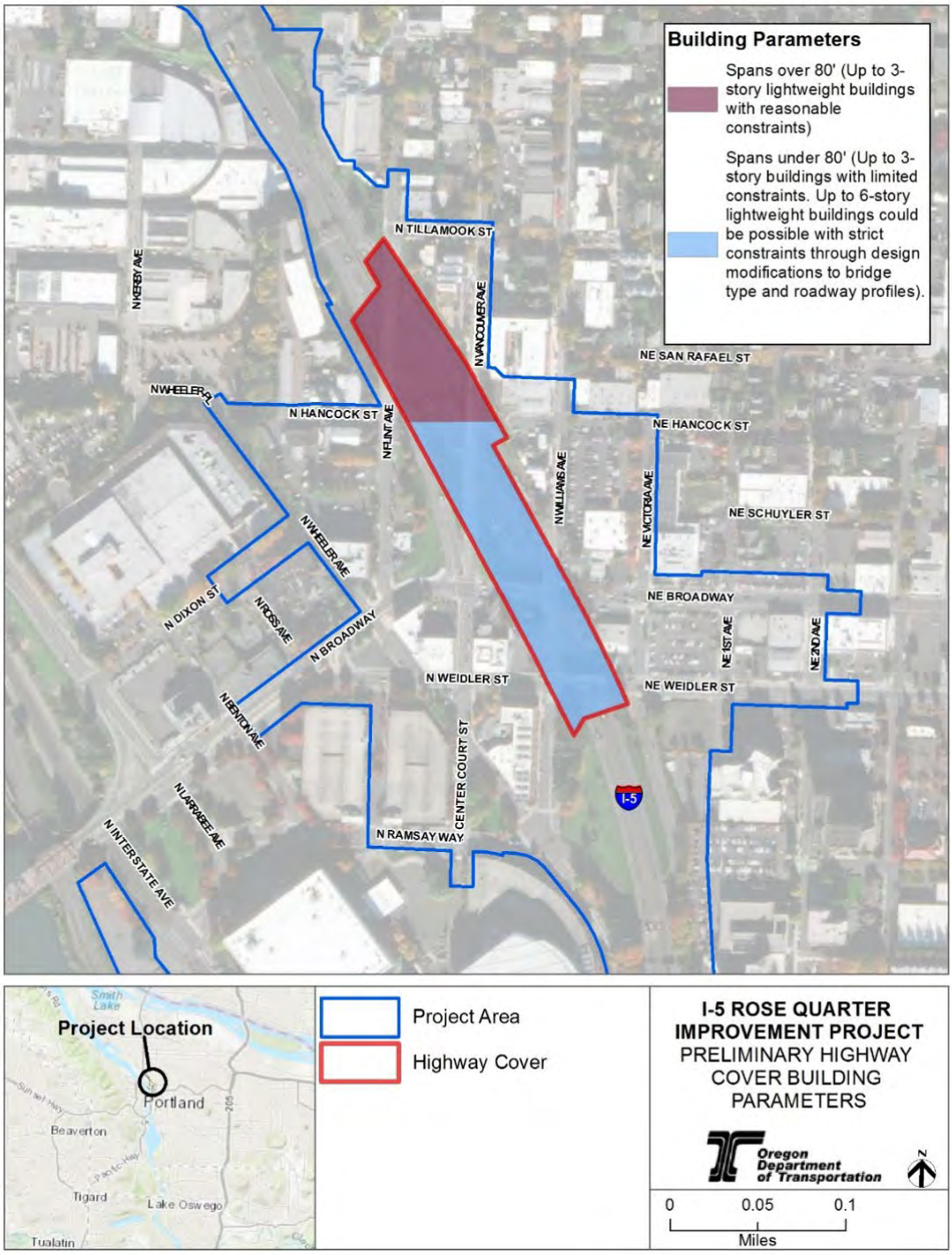
- Move the I-5 southbound exit ramp termini from N Broadway to N Williams Avenue at NE Wheeler Avenue.
- Reduce the freeway median shoulder through the entire Project Area, from 12 feet to 8 feet (4 to 5 feet within highway cover). The outside shoulder width of 12 feet remains unchanged.
- Relocate Noise Wall 24 from N Commercial Avenue near Harriet Tubman Middle School to attach to Walls 1 and 2 along the east edge of I-5.
- Keep the I-5 southbound entrance ramp from NE Wheeler Avenue/N Williams Avenue/ N Ramsay Way on the existing alignment rather than relocate it to parallel N Williams Avenue.
- On I-5 south of the Burnside Bridge: retrofit existing bridge rail, restripe freeway in both the northbound and southbound directions, and install new guide signs on an existing sign structure in the southbound direction.

2.4 HIGHWAY COVER CHANGES

The Build Alternative included the construction of two highway cover structures over I-5 for roadway crossings and other purposes. The Revised Build Alternative , based on Hybrid 3 (see Figure 1), includes the following changes to the highway covers:

- Provide one continuous highway cover over I-5 rather than separate covers at the existing N Flint Avenue, NE Weidler Street, NE Broadway, N Williams Avenue, and the N Vancouver Avenue overcrossings.
- Expand the limits of the highway cover by approximately 35 feet to the west, and approximately 400 feet to the north.
- Design and construct the highway cover to accommodate multi-story buildings. Due to span length and site constraints, design would constrain building size, location, type, and use on portions of the cover (Figure 3). Generally, buildings up to three stories could be accommodated throughout the highway cover. Buildings of up to six stories could be accommodated where span lengths are shorter than 80 feet with strict design constraints.

Figure 3 Building Parameters on the Cover



Future development on the highway cover would follow a community process according to the City-led Community Framework Agreement, as described in Section 2.1. ODOT anticipates this process could continue past completion of cover construction.

As part of the Project, ODOT anticipates programming interim uses on the highway cover for the time period between Project completion and when the City-led development process would be implemented. Upon Project completion, the added surface space created by the highway cover over I-5 could provide an opportunity for new and modern bicycle facilities, making the area more connected, walkable and bike friendly. It could also provide opportunity for various potential types of public spaces, to be precisely determined during the Project's final design phase and through robust community engagement, consisting of one or more of the following types of uses:

- Landscaped areas for active and passing recreation and/or to provide a buffer, backdrop and visual comfort, such as gardens, lawns or planter beds.
- Plazas and hardscaped open space for active and passive recreation, such as courts, plazas, splash pads, picnic areas, and community gathering spaces.
- Interpretive signage, historical markers, landmarks and other areas of historical recognition and narrative such as art pieces and other historical signage/kiosks and pavement focused on the historic Albina community.
- Temporary and lightweight vertical features to support episodic, mobile commercial activities such as a food market shed, eating pavilion, food carts, or picnic venues.

These features may be removed upon implementation of the development determined by the community process or may be incorporated into that development.

2.5 RELATED LOCAL SYSTEM MULTIMODAL IMPROVEMENTS CHANGES

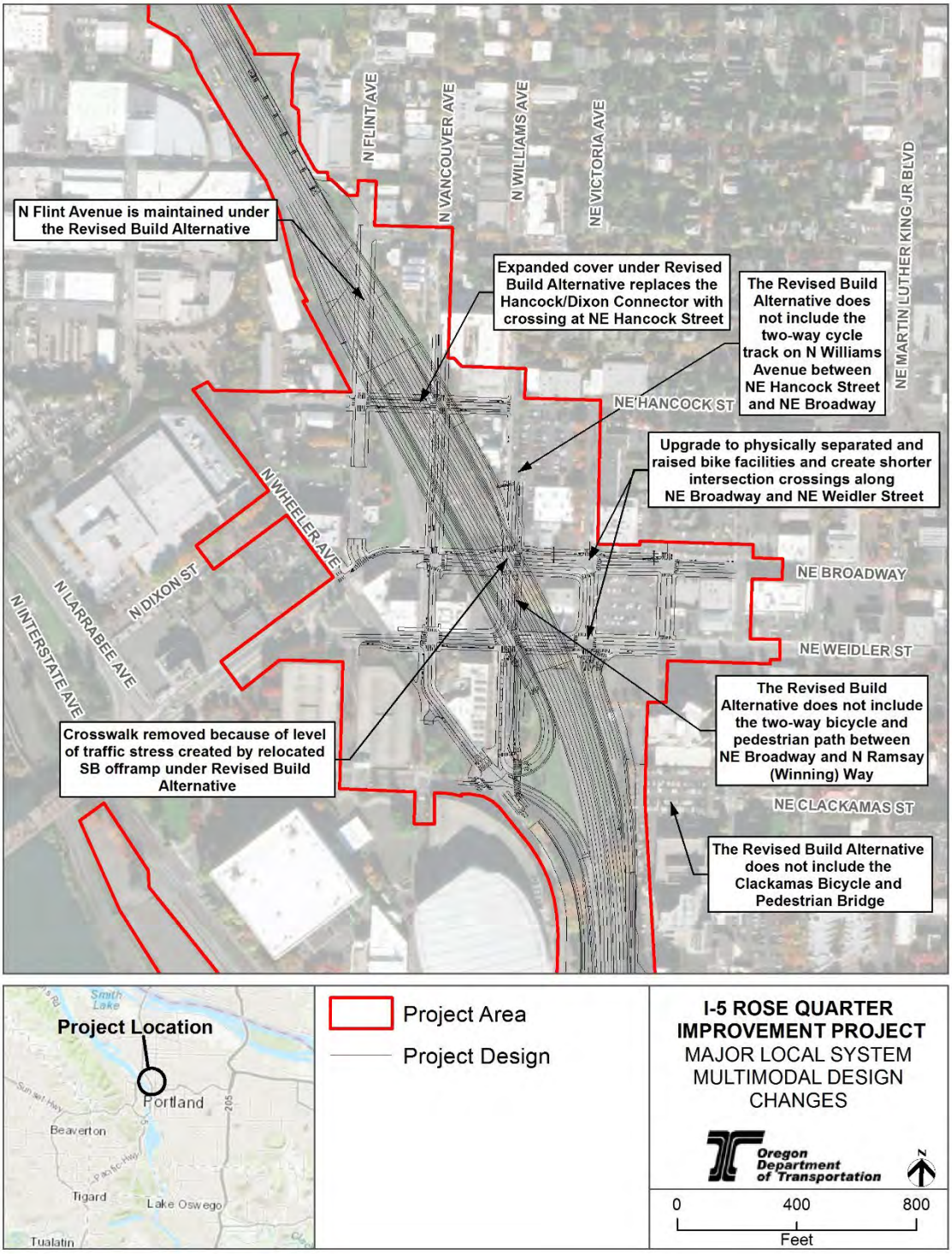
The Build Alternative included construction of a new bicycle and pedestrian bridge over I-5 at NE Clackamas Street and other local street improvements. The Revised Build Alternative includes the following changes to these improvements to accommodate the Hybrid 3 design concept and related changes in traffic patterns (see Figure 4 below):

- Remove the Clackamas Bicycle and Pedestrian Crossing from the Build Alternative.
- Construct wider sidewalks and bike lanes at sidewalk level and physically separated from the roadway with a curb and provide protected bike signal phases at multiple intersections along NE Broadway and NE Weidler Street.
- Connect N Flint Avenue across I-5 from NE Tillamook Street to N Hancock Street and terminate it at N Broadway.
- Remove the NE Hancock Street overcrossing of I-5 from N Williams Avenue to N Dixon Street as proposed in the Build Alternative. NE Hancock Street would be extended across I-5

and reconnect to NE Hancock Street west of N Flint Avenue as part of the expanded highway cover.

- Remove the two-way cycle track on N Williams Avenue between NE Hancock Street and NE Broadway and a two-way bicycle and pedestrian path between NE Broadway and N Ramsay Way from the design and instead convert the on-road bike lane to a protected bike lane, with a transition to the existing on-road bike lane south at or near NE Hancock Street.
- Close the crosswalk across NE Broadway on the west side of N Williams Avenue and the crosswalk across N Williams north of N Weidler Street.

Figure 4 Major Local System Multimodal Design Changes



3.0 REGULATORY FRAMEWORK

The regulatory framework is the same as described in the 2019 Air Quality Technical Report with some updates. Most recently, the Climate Protection Program went into effect at the end of 2021 and will improve the carbon intensities of Oregon's transportation fuels, which will reduce criteria pollutant and MSAT emissions[1]. This analysis does not reflect those improvements because they are new and not yet incorporated in the United States Environmental Protection Agency (EPA) Motor Vehicle Emissions Simulator (MOVES) model. Therefore, the emission reductions presented for the Revised Build Alternative could be lower once the program goes into effect.

4.0 METHODOLOGY AND DATA SOURCES

The methodology and data sources are the same as those described in the 2019 Air Quality Technical Report with three exceptions. First, traffic data for the Revised Build Alternative used in this supplemental air quality analysis (Appendix A) was developed consistent with the methods described in Section 4 of the 2019 Air Quality Technical Report. Second, the EPA MOVES has been updated since publication of the 2019 Air Quality Technical Report. Specifically, the previous version of MOVES (MOVES2014a) used in the 2019 Air Quality Technical Report has been updated and the latest MOVES version (MOVES3.0.3, abbreviated as MOVES3) was used in this analysis to evaluate pollutant emissions for existing conditions, the Revised Build Alternative, and the No-Build Alternative. Third, the burden analysis in this report includes MSAT as well as transportation criteria pollutants, which were not included in the 2019 Air Quality Technical Report. Criteria pollutant emissions estimates include the precursors for ozone, volatile organic compounds and oxides of nitrogen (VOC and NO_X), particulate matter (10-microns or smaller [PM_{10}] and 2.5 microns or smaller [$PM_{2.5}$] inclusive of break wear and tire wear), and carbon monoxide (CO). Consistent with the 2019 Air Quality Technical Report, the MOVES3 model was run for analysis years 2017 (existing conditions) and 2045 (No-Build Alternative and Revised Build Alternative). The processes selected in the modeling were done per EPA guidance.

The affected roadway network used in the modeling is the same as was used in the 2019 Air Quality Technical Report (see Figure 5 of this report) because the links that meet the FHWA criterion for the affected network for the Revised Build Alternative are the same as those for the Build Alternative. Differences in traffic data associated with the Revised Build Alternative

[1] *https://www.oregon.gov/deq/rulemaking/Pages/rghgcr2021.aspx*

are identified in the traffic analysis for the Project (see Traffic Analysis Supplemental Technical Report). Revised Build Alternative vehicle miles traveled (VMT) and speed input data were updated to reflect the revised traffic analysis and included in the model. The VMT and speeds for existing conditions and No-Build Alternative are unchanged relative to what was analyzed in the 2019 Air Quality Technical Report. The inputs in the MOVES3 run specifications (runspecs) and County Data Manager are the same as those used in the 2019 Air Quality Technical Report except that additional processes were selected in the run spec for criteria pollutants and the two county data inputs were updated with the new traffic data (Table 1 and Table 2).

The run specs for each analysis year are as follows:

- Existing Conditions (2017)
  - I5RQ_CRITERIA_2017.mrs
  - I5RQ_DPM_2017_All_Rds.mrs
  - I5RQ_STD_2017_All_Rds.mrs
  - I5RQ_ZEV_2017_All_Rds.mrs
- No Build Alternative (2045)
  - I5RQ_CRITERIA_2045NB.mrs
  - I5RQ_DPM_2045NB_All_Rds.mrs
  - I5RQ_STD_2045NB_All_Rds.mrs
  - I5RQ_ZEV_2045NB_All_Rds.mrs
- Revised Build Alternative (2045)
  - I5RQ_CRITERIA_2045BD_H3.mrs
  - I5RQ_DPM_2045BD_H3_All_Rds.mrs
  - I5RQ_STD_2045BD_H3_All_Rds.mrs
  - I5RQ_ZEV_2045BD_H3_All_Rds.mrs

See Appendix A for additional detail on traffic used in this analysis.

Table 1 MOVES3 Runspec Selections

INPUT NAME	SELECTION
Scale	County
Calculation Type	Inventory
Time Spans	Analysis Years: 2017-existing, 2045-design year Time Aggregation: All hours, weekdays
Months of Analysis	January, April, July, October
Region	County
Geographic Bounds	Oregon, Multnomah County
Vehicles/Equipment	Diesel Fuel: combination long-haul truck, combination short-haul truck, light commercial truck, passenger car, passenger truck, single unit long-haul truck, single unit short-haul truck Ethanol (E-85): light commercial truck, passenger car, passenger truck Gasoline: combination short-haul truck, light commercial truck, passenger car, passenger truck, single unit long-haul truck, single unit-short-haul truck Electric vehicles
Road Types	Urban restricted (highway), urban unrestricted (surface streets) Rural restricted, rural unrestricted, and off-network inputs were excluded from MSAT runs. These roadways were included in criteria pollutant runs but have no VMT associated with them since MOVES3 requires their inclusion for criteria pollutant run.
Processes	MSAT: running exhaust, crankcase running exhaust, evaporative permeation, and evaporative fuel leaks. Criteria pollutants: running exhaust, crankcase running exhaust, brakewear, tirewear, start exhaust and crankcase start exhaust
Pollutants	MSAT: Acetaldehyde, acrolein, benzene, 1,3-butadiene, DPM as primary exhaust PM10, ethylbenzene, formaldehyde, naphthalene (gas and particulate), POM as 30 specific polycyclic aromatic hydrocarbons per FHWA guidance Criteria pollutants: CO, NOx, PM10, PM2.5, and VOC
Input Data Sets	Oregon Low Emitting Vehicles
Output	Units: grams, million Btu, miles Activity: distance traveled By: day, county, pollutant and road type

Notes: Btu = British thermal unit; DPM = diesel particulate matter; FHWA = Federal Highway Administration; MSAT = Mobile Source Air Toxics; MOVES = Mobile Vehicle Emission Simulator; PM10 = coarse particulate matter; POM = polycyclic organic matter

Table 2 MOVES3 County Data Manager Inputs

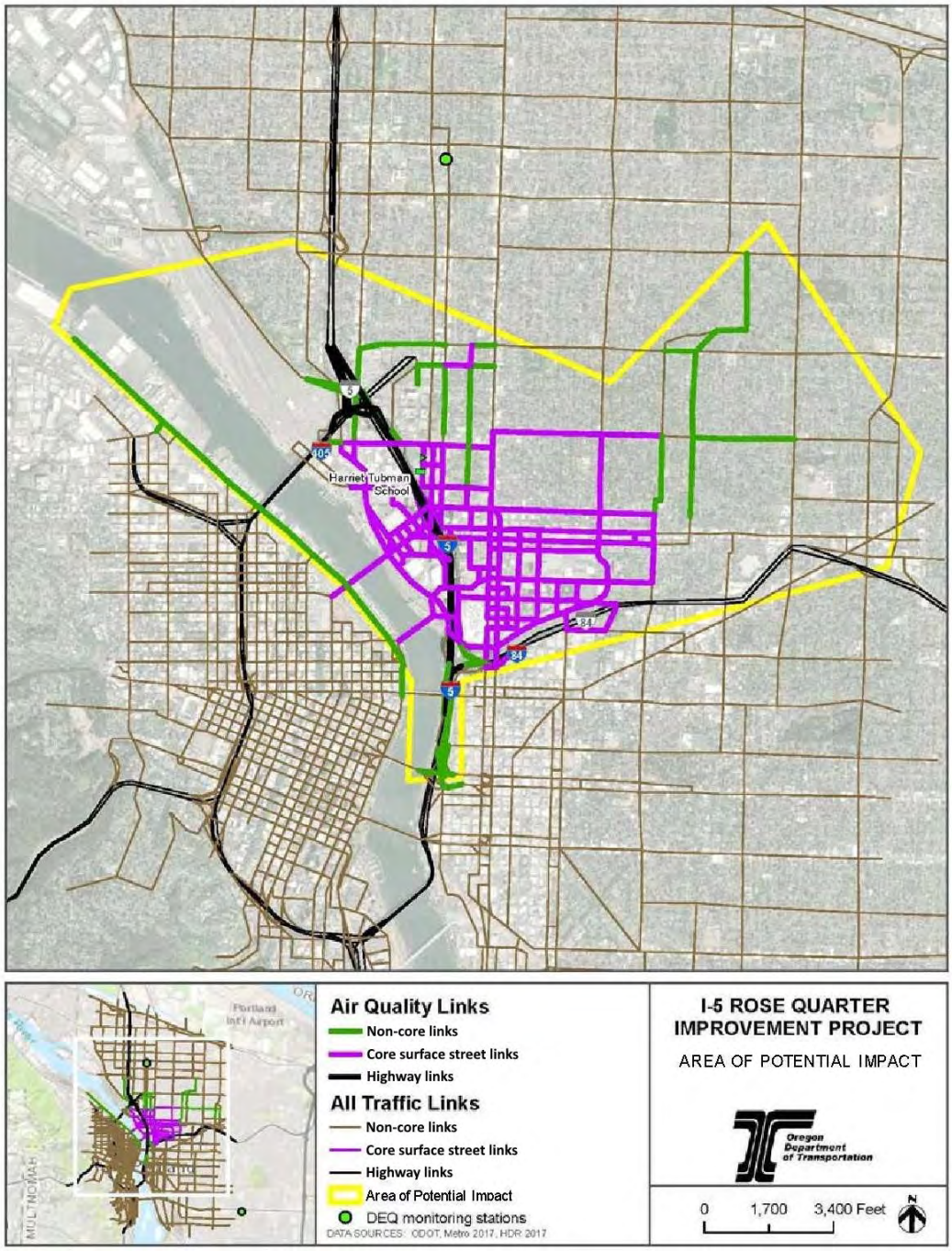
INPUT DATABASE TYPE	DATA SOURCE	ZIP FILE FOLDER	SOURCE FILE NAME
Vehicle Type VMT	Input files provided by Metro, except VMT file was developed for the project for each year and case analyzed	2017 Rev 2045 NB Rev 2045 BD Rev	VMT.xls
I/M Program	MOVES3 default	2017 Rev 2045 NB Rev 2045 BD Rev	IM_Prog_Defaults.xls
Road Type Distribution	Input files provided by Metro	2017 Rev 2045 NB Rev 2045 BD Rev	RdTypeDist.xls
Source Type Distribution	Input files provided by Metro	2017 Rev 2045 NB Rev 2045 BD Rev	SrcTypeAgeDist.xls
Average Speed Distribution	Developed for Project by year, road type and vehicle type for four daily periods for each case	2017 Rev 2045 NB Rev 2045 BD Rev	AveSpdDist.xls
Fuel	MOVES3 Defaults adjusted for Bio-diesel, existing 2017 Fuel Type 9 added, 2045 Fuel Types 3 and 9 added	2017 Rev 2045 NB Rev 2045 BD Rev	Fuel.xls Fuel_ZEV.xls (for ZEV runs only)
Meteorological Data	MOVES3 default	2017 Rev 2045 NB Rev 2045 BD Rev	Met.xls

Notes: I/M = inspection and maintenance; HPMS = High Performance Monitoring System; YEAR = 2017 or 2045
All input data remain unchanged relative to what was used in the 2019 Air Quality Technical Report except for the HPMS and speed data that are specific to the Revised Build Alternative. Files provided by Metro were for MOVES2014a/b and were updated using MOVES3 conversion tool.

4.1 AREA OF POTENTIAL IMPACT

The API is the same as the API that was used in the 2019 Air Quality Technical Report and is shown here as Figure 5.

Figure 5 Area of Potential Impact



4.2 CRITERIA POLLUTANTS

While not included in the 2019 Air Quality Technical Report, this report includes the evaluation of transportation criteria pollutants to better understand the air quality impacts of the Revised Build Alternative.

5.0 AFFECTED ENVIRONMENT

Oregon Department of Environmental Quality (DEQ) monitoring data from 2018 to 2020 show the ozone National Ambient Air Quality Standards (NAAQS) has been violated. At this time, the violations do not trigger a new nonattainment area. The reassignment to nonattainment only occurs when a new standard is published by EPA and the most recent monitoring data is reviewed for violations. The ozone standard is currently under review. Otherwise, the affected environment is unchanged and is consistent with the discussion in Section 5 of the 2019 Air Quality Technical Report. As noted above, this 2022 Air Quality Supplemental Technical Report includes MSAT and criteria pollutants for 2017 to represent existing conditions. Tailpipe criteria pollutant and MSAT emissions from the MOVES3 model for 2017 are provided in Table 3 and Table 4, respectively. Table 4 also provides a comparison between the 2019 Air Quality Technical Report existing conditions MSAT analysis and the updated analysis using MOVES3.

Table 3 2017 Existing Conditions Criteria Pollutant Emissions (tons per year)

POLLUTANT	EMISSIONS (TPY)
CO	3,416.20
NO_X	649.39
PM_{10}	75.80*
$PM_{2.5}$	22.47*
VOC	85.34

*Note: * includes brake wear and tire wear.*

Table 4 2017 Existing Conditions MSAT Emissions (tons per year)

POLLUTANT	EXISTING CONDITIONS USING MOVES2014A (2019 TECH REPORT)	EXISTING CONDITIONS USING MOVES3	PERCENT CHANGE EXISTING CONDITIONS VS. EXISTING CONDITIONS 2019 TECH REPORT
Diesel Particulate Matter (DPM)	12.825	12.858	0%
Acetaldehyde	1.521	1.393	9%
Acrolein	0.181	0.163	11%
Benzene	2.816	2.722	3%
1,3-Butadiene	0.299	0.294	2%
Ethylbenzene	1.601	1.53	5%
Formaldehyde	2.637	2.534	4%
Naphthalene	0.312	0.3	4%
Poly Organic Matter (POM)	0.134	0.145	-8%

6.0 ENVIRONMENTAL CONSEQUENCES

This section discusses the air quality of the No-Build Alternative and the Revised Build Alternative.

6.1 NO-BUILD ALTERNATIVE

The MSAT emissions of the No-Build Alternative are updated from the emissions reported in the 2019 Air Quality Technical Report based on updated MOVES3 modeling. Additionally, transportation criteria pollutant emissions are calculated for the No-Build Alternative, which was not part of the analysis in the 2019 Air Quality Technical Report.

6.1.1 Direct Impacts

No-Build Alternative criteria pollutant and MSAT emissions in 2045 are summarized in Table 5 and Table 6, respectively. MSAT emissions are compared to the results presented in the 2019 Air Quality Technical Report to demonstrate how the updated model influences the results. MSAT emissions for the No-Build Alternative reported in the 2019 Air Quality Technical Report are greater than the MSAT emissions determined for this report, except for benzene and ethylbenzene. The changes can be attributed to the updated MOVES3 model and some of the data in the input database (i.e., fuels and IM program). Note that criteria pollutants were not evaluated in the 2019 Air Quality Technical Report.

Table 5 2045 Design Year No-Build Criteria Pollutant Emissions (tons per year)

POLLUTANT	NO-BUILD ALTERNATIVE 2045
CO	1,152.15
NO_X	279.22
PM_{10}	82.04
$PM_{2.5}$	13.12
VOC	11.82

Table 6 2045 Design Year No-Build Alternative MSAT Emissions (tons per year)

POLLUTANT	NO-BUILD ALTERNATIVE USING MOVES2014A (2019 TECH REPORT)	NO-BUILD ALTERNATIVE USING MOVES3	PERCENT CHANGE NO-BUILD ALTERNATIVE VS. NO-BUILD ALTERNATIVE 2019 TECH REPORT
DPM	2.389	2.046	-14%
Acetaldehyde	0.381	0.275	-28%
Acrolein	0.052	0.024	-54%
Benzene	0.35	0.401	15%
1,3-Butadiene	0.004	0	-100%
Ethylbenzene	0.411	0.45	9%
Formaldehyde	1.145	0.256	-78%
Naphthalene	0.089	0.016	-82%
POM	0.019	0.007	-63%

6.1.2 Indirect Impacts

There would be no change to indirect impacts compared to the impacts that were documented in the 2019 Air Quality Technical Report.

6.2 REVISED BUILD ALTERNATIVE

Air quality analysis of the Revised Build Alternative, including a comparison to the analysis of the Build Alternative in the 2019 Air Quality Technical Report, are described in this section.

6.2.1 Direct and Indirect Impacts

The Revised Build Alternative criteria pollutant and MSAT emissions are summarized in Table 7 and Table 8, respectively.

Compared to the No-Build Alternative, emissions of criteria pollutants would be equal or less under the Revised Build Alternative for all pollutants because roadway speeds would be improved with the Project and vehicles stuck in traffic generally emit more pollution than vehicles running more efficiently at posted speeds (EPA 2014). PM10 and PM2.5 emissions

decrease less than other criteria pollutants in the future since tirewear and brakewear would dominate these emissions even for more efficient vehicles.

Table 8 presents the MSAT emissions for Revised Build Alternative (2045) compared to the Existing Conditions (2017) and No-Build Alternative (2045). For MSAT under the Revised Build Alternative, total emissions would be the same or lower for all pollutants when compared to the No-Build Alternative. Table 9 summarizes the MSAT emissions by roadway type and accompanying VMT. Overall only emissions for benzene and ethylbenzene would increase under the Revised Build Alternative, and this increase is associated with the slight decrease VMT on surface streets and the MOVE3 model; however, emissions of these MSAT pollutants are less on I-5 relative to the No-Build Alternative since the Revised Build Alternative adds an aux lane to I-5 and vehicles would move more efficiently on I-5. All other MSAT emissions would be lower in the Revised Build Alternative on both road types. Table 10 provides a summary of VMT by roadway type and vehicle type.

Compared to the Build Alternative in the 2019 Air Quality Technical Report, the Revised Build Alternative MSAT emissions would be lower for all pollutants except benzene and ethylbenzene which are slightly higher (Table 11). Benzene would have the greatest difference, with Revised Build Alternative emissions 14 percent higher than the Build Alternative. These differences can be attributed to the updated algorithms within MOVES3 compared to MOVES2014a, revised inputs to the input database (i.e., fuels and IM program), and updated traffic data for the Revised Build Alternative (2045).

The MSAT emissions reported in this document represent the latest approach to predicting MSAT emissions for roadway projects such as this one; however, MSAT analysis is an evolving topic. Appendix B provides additional information on MSAT emissions as an evolving topic. Appendix C provides more detail on the MSAT emissions for the Project. These documents are included in this report to provide context to the analysis of MSAT emissions.

The discussions and conclusions in Section 6.2 of the 2019 Air Quality Technical Report for construction related emissions, CO analysis, and the Harriet Tubman Middle School are unchanged for the Revised Build Alternative.

6.2.2 Indirect Impacts

There would be no change to indirect impacts compared to the impacts that were documented in the 2019 Air Quality Technical Report.

Table 7 Comparison of Criteria Pollutant Emissions by Analysis Year/Alternative

Pollutant	EMISSIONS (TONS PER YEAR)			PERCENT CHANGE (%)		
	Existing 2017	No-Build Alternative 2045	Revised Build Alternative 2045	Existing 2017 to No-Build Alternative 2045	Existing 2017 to Revised Build Alternative 2045	No-Build Alternative 2045 to Revised Build Alternative 2045
CO	3,416.20	1,152.15	1,152.59	-66%	-66%	0%
NO_X	649.39	279.22	253.78	-57%	-61%	-9%
PM_{10}*	75.80	82.04	77.37	8%	2%	-6%
$PM_{2.5}$*	22.47	13.12	12.47	-42%	-45%	-5%
VOC	85.34	11.82	11.48	-86%	-87%	-3%

*Note: *includes tirewear and brakewear*

Table 8 Comparison of MSAT Emissions by Analysis Year/Condition using MOVES3

POLLUTANT	EMISSIONS (TONS PER YEAR)			PERCENT CHANGE (%)		
	Existing 2017	No-Build Alternative 2045	Revised Build Alternative 2045	Existing 2017 vs. No-Build Alternative 2045	Existing 2017 vs. Revised Build Alternative 2045	No-Build Alternative 2045 vs. Revised Build Alternative 2045
DPM	12.825	2.046	1.935	-84%	-85%	-5%
Acetaldehyde	1.521	0.275	0.262	-82%	-83%	-5%
Acrolein	0.181	0.024	0.023	-87%	-87%	-4%
Benzene	2.816	0.401	0.400	-86%	-86%	0%
1,3-Butadiene	0.299	0.000	0.000	-100%	-100%	N/A
Ethylbenzene	1.601	0.450	0.446	-72%	-72%	-1%
Formaldehyde	2.637	0.256	0.248	-90%	-91%	-3%
Naphthalene	0.312	0.016	0.016	-95%	-95%	0%
POM	0.134	0.007	0.007	-95%	-95%	0%

Table 9 Comparison of MSAT Emissions by Analysis Year/Condition/Road Type using MOVES3

Condition/ Alternative	Road Type*	VMT	Emissions (tons per Year) DPM	Acetaldehyde	Acrolein	Benzene	1,3-Butadiene	Ethylbenzene	Formaldehyde	Naphthalene	POM
Existing 2017	Urban Unrestricted	114,458,250	4.128	0.754	0.081	1.762	0.179	0.996	1.247	0.155	0.065
	Urban Restricted	92,094,773	8.696	0.767	0.100	1.054	0.121	0.605	1.390	0.157	0.069
No-Build Alternative 2045	Urban Unrestricted	128,530,975	0.500	0.089	0.008	0.238	0.000	0.249	0.105	0.009	0.004
	Urban Restricted	95,261,267	1.546	0.186	0.016	0.163	0.000	0.202	0.151	0.008	0.003
Revised Build Alternative	Urban Unrestricted	127,917,728	0.436	0.088	0.008	0.261	0.000	0.274	0.108	0.009	0.004
	Urban Restricted	101,036,039	1.499	0.173	0.015	0.139	0.000	0.172	0.139	0.007	0.003

*Note: *Urban Unrestricted are surface streets and Urban Restricted is the highway.*

Table 10 VMT Summary

Condition/ Alternative	Road Type	Total VMT	VMT by Vehicle Type		
			Passenger Vehicles	Medium Trucks	Heavy Trucks
Existing 2017	Urban Unrestricted	114,458,250	112,525,160	815,634	1,117,456
	Urban Restricted	92,094,773	84,374,618	1,988,474	5,731,681
No-Build Alternative 2045	Urban Unrestricted	128,530,975	125,041,465	1,505,567	1,983,943
	Urban Restricted	95,261,267	82,396,003	3,416,118	9,449,147
Revised Build Alternative	Urban Unrestricted	127,917,728	124,571,789	1,464,573	1,881,366
	Urban Restricted	101,036,039	87,142,562	3,704,338	10,189,138

Table 11 2045 Design Year Revised Build Alternative MSAT Emissions (tons per year) Compared to the Build Alternative

POLLUTANT	REVISED-BUILD ALTERNATIVE USING MOVES3	BUILD ALTERNATIVE USING MOVES2014A (2019 TECH REPORT)	PERCENT CHANGE REVISED BUILD ALTERNATIVE VS. BUILD ALTERNATIVE 2019 TECH REPORT
DPM	1.935	2.304	-16%
Acetaldehyde	0.262	0.360	-27%
Acrolein	0.023	0.049	-53%
Benzene	0.400	0.351	14%
1,3-Butadiene	0.000	0.004	-100%
Ethylbenzene	0.446	0.398	12%
Formaldehyde	0.248	1.077	-77%
Naphthalene	0.016	0.084	-81%
POM	0.007	0.019	-64%

6.3 CUMULATIVE EFFECTS

The discussions and conclusions in Section 6.3 of the 2019 Air Quality Technical Report for cumulative effects are unchanged for the Revised Build Alternative.

6.4 CONCLUSION

The 2045 MSAT emissions of the Revised Build Alternative would the same or lower than the No-Build Alternative.

Overall, the results of the MSAT analysis are consistent with those reported in the 2019 Air Quality Technical Report and with national MSAT emission trends predicted by FHWA MSAT emissions would be lower under the Revised Build Alternative (2045) for all pollutants relative to the Existing Conditions (2017) and, therefore, would not cause an adverse effect on human health.

As discussed above, technical shortcomings of emissions models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project at this time. While it is possible that localized increases in MSAT emissions may

occur as a result of a project developed from this study, emissions will likely be lower than present levels in the design year of a project as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Although local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures, 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.

Transportation criteria pollutants, in 2045 under the Revised Build Alternative would be lower than the No-Build Alternative (see Table 7). This is because under the No-Build Alternative vehicles would experience more stop and go traffic than under the Revised Build Alternative.

7.0 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

Avoidance, minimization, and mitigation measures would be the same as those described in the 2019 Air Quality Technical Report.

8.0 PREPARERS

NAME	DISCIPLINE	EDUCATION	YEARS OF EXPERIENCE
Scott Noel	Air Quality and Climate Change	• B.A. Geography and Environmental Planning	22
Phil DeVita	Air Quality and Climate Change	• B.S. Meteorology • M.S. Environmental Studies	33
Dillon Tannler	Air Quality and Climate Change	• B.S. Economic, Environmental Policy, & Management	11

9.0 REFERENCES

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Appendix A Vehicle Miles Traveled

Table A-1

Project VMT Summary and HPMS Projection

I-5 Rose Quarter Improvement Project

HPMSVTypeID	Vehicle Type	Vehicle Type Description	Total Average Annual Vehicle Miles Traveled per RoadType (veh-miles/yr)			Annual Growth Rate [a] (%)	
			2015	2040 No Build	2040 Build	No Build	2040 Build
25	Auto	Passenger, truck, light commercial truck	196,167,900	205,515,221	209,040,245	0.19	0.25
50	Medium Truck	refuse truck, single unit short haul truck, long haul truck, motor home	2,693,664	4,451,285	4,636,851	2.03	2.20
60	Heavy Truck	Combination short haul truck, combination long haul truck	6,602,996	10,433,416	10,915,946	1.85	2.03

HPMSVTypeID	Vehicle Type	Vehicle Type Description	Projected Average Annual Vehicle Miles Traveled [1] (veh-miles/yr)		
			2017	2045 No Build	2045 Build
25	Auto	Passenger, truck, light commercial truck	196,899,778	207,437,468	211,714,351
50	Medium Truck	refuse truck, single unit short haul truck, long haul truck, motor home	2,804,108	4,921,684	5,168,911
60	Heavy Truck	Combination short haul truck, combination long haul truck	6,849,137	11,433,089	12,070,505

HPMS = Highway Performance Monitoring System

Notes:

(a) Annual growth rate (%) = ({{2040 scenario vehicle miles traveled (veh-miles/yr)} / {2015 vehicle miles traveled (veh-miles/yr)}}^[1 / {number of years between start and end value (yr)}] - 1) x (100)

Number of years between start and end value (yr) = 25

References:

(1) Value represents future value based on annual growth rate. 2017 value assumes No Build annual growth rate.

Table A-2
Average Annual Vehicle Miles Traveled Summary
I-5 Rose Quarter Improvement Project

Roadtype [1]	Area ID [2]	Auto			Medium Truck			Heavy Truck		
		2015	2040 No Build	2040 Build	2015	2040 No Build	2040 Build	2015	2040 No Build	2040 Build
Average Annual Vehicle Miles Traveled (veh-miles/yr) [3]										
5	1 & 2	112,106,903	123,882,752	122,998,357	783,509	1,361,669	1,313,818	1,077,298	1,810,473	1,701,411
4	3	84,060,997	81,632,469	86,041,888	1,910,155	3,089,616	3,323,033	5,525,699	8,622,943	9,214,535
Total		**196,167,900**	**205,515,221**	**209,040,245**	**2,693,664**	**4,451,285**	**4,636,851**	**6,602,996**	**10,433,416**	**10,915,946**
RoadType Distribution [a]										
5	1 & 2	0.57148	0.60279	0.58840	0.29087	0.30590	0.28334	0.16315	0.17353	0.15586
4	3	0.42852	0.39721	0.41160	0.70913	0.69410	0.71666	0.83685	0.82647	0.84414
Total		**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

Link_ID [2]	Area ID [2]	Average Annual Vehicle Miles Traveled (veh-miles/yr)								
		Auto			Medium Truck			Heavy Truck		
		2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]
Total		**196,167,900**	**205,515,221**	**209,040,245**	**2,693,664**	**4,451,285**	**4,636,851**	**6,602,996**	**10,433,416**	**10,915,946**
10408.10410	3	1,608,373	1,526,175	1,617,607	38,252	64,204	69,496	106,726	179,325	193,377
10408.15686	3	1,267,755	1,233,335	1,433,647	24,163	39,895	39,384	45,735	69,533	72,599
10409.10408	3	6,514,849	5,211,215	5,664,983	146,803	205,787	218,234	380,257	528,411	567,867
10410.15685	1	1,040,104	1,243,117	1,254,323	31,354	67,708	75,154	67,197	133,736	145,672
10467.16189	2	375,512	448,366	271,560	7,191	15,403	7,373	4,161	13,980	5,110
10468.14368	2	573,671	782,560	827,565	5,986	10,074	10,476	4,818	5,037	5,512
10469.10470	3	7,813,884	6,675,303	6,638,000	193,560	242,871	274,699	539,215	630,501	699,413
10470.15748	3	4,231,847	3,444,323	3,450,856	123,845	148,446	169,360	366,789	411,611	462,455
10471.10472	3	9,188,291	5,395,467	5,900,882	202,356	189,691	206,919	558,085	498,298	539,726
10472.10468	3	1,047,149	917,939	1,003,677	22,922	32,339	35,369	63,474	84,790	91,944
10728.10729	2	469,536	376,060	392,339	621	621	621	1,022	1,095	767
10728.10791	2	47,085	58,875	59,605	0	0	0	0	0	0
10791.10728	2	35,588	38,216	42,340	0	0	0	0	0	0
10729.10789	2	24,857	16,717	17,593	0	0	0	0	0	0
10789.10729	2	58,145	52,305	53,838	0	0	0	0	0	0
10729.31668	2	294,482	244,441	254,259	475	475	548	475	548	548
10731.10733	2	326,018	382,739	351,568	73	402	73	73	402	73
10733.10731	2	532,572	596,958	584,584	475	475	548	475	621	621
10731.14376	2	658,132	737,191	722,591	475	548	548	475	621	694
14376.10731	2	402,851	473,004	434,387	73	402	402	146	402	475
10734.10741	2	105,230	122,786	120,450	0	0	0	73	0	0
10741.10734	2	167,389	184,544	178,230	402	402	402	1,205	402	402
31668.10734	2	824,572	683,353	711,969	1,022	1,095	1,424	2,227	2,044	2,044
10736.10737	2	724,051	667,768	644,663	2,227	1,825	1,898	3,431	2,373	2,373
10736.10738	2	28,288	30,332	30,295	0	0	0	0	0	0
10738.10736	2	60,444	82,089	65,956	329	402	402	0	0	0
10737.10993	2	4,015	13,031	10,184	0	0	0	0	0	0
10993.10737	2	54,641	35,989	33,909	402	402	329	0	0	0
10737.10992	2	852,458	761,135	735,731	2,701	3,030	2,701	3,431	2,373	2,373
10738.10739	2	69,788	72,015	72,051	0	402	402	0	0	0
10739.10738	2	89,316	109,829	92,637	329	402	402	0	0	0
10740.10789	2	618,748	644,554	661,672	803	1,278	876	1,278	1,278	803
10741.10740	2	416,356	433,912	444,680	475	803	803	803	803	475
10741.10781	2	90,812	107,091	103,697	0	0	0	73	0	0
10781.10741	2	153,921	189,691	187,318	0	402	402	329	73	73
10770.14399	1	67,708	58,473	65,846	0	0	0	329	0	329
10770.16316	1	341,458	271,560	283,569	548	621	621	1,095	1,241	1,643
10773.10985	1	66,321	69,898	66,722	0	73	0	73	73	73
10985.10773	1	21,353	39,384	43,326	0	0	0	0	0	0
10777.10778	1	85,812	1,497	0	0	0	0	0	0	0
14400.10778	1	241,010	217,723	224,621	402	475	475	475	876	876
10781.10793	2	347,298	235,717	227,724	402	402	73	876	73	73
10793.10781	2	529,834	380,330	378,907	803	475	548	1,205	1,022	1,022
10782.10783	2	317,660	367,081	384,637	1,278	1,752	1,825	0	0	0
10783.10782	2	640,502	712,407	711,203	2,081	4,964	5,110	146	73	73
10783.11003	2	41,720	54,130	61,138	0	73	0	0	0	0
11003.10783	2	97,054	83,220	84,607	0	329	329	0	0	0

Link_ID [2]	Area ID [2]	Average Annual Vehicle Miles Traveled (veh-miles/yr)								
		Auto			Medium Truck			Heavy Truck		
		2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]
10783.29052	2	48,947	58,911	61,868	0	402	402	0	0	0
29052.10783	2	81,030	98,879	100,631	0	475	475	0	0	0
10784.11004	2	114,428	165,418	173,156	402	1,278	1,278	0	0	0
11004.10784	2	156,476	140,051	181,953	803	803	949	0	0	0
10784.27630	2	414,896	387,849	377,629	1,278	2,154	1,752	1,825	2,154	1,825
10785.10794	2	229,330	252,872	258,712	0	402	402	0	0	0
10794.10785	2	116,764	212,941	218,781	0	475	475	0	0	0
10785.11053	2	108,807	174,251	185,055	329	475	475	0	0	0
11053.10785	2	258,457	323,463	316,784	475	1,205	1,205	0	0	73
10785.29052	2	121,801	148,519	150,453	402	876	876	0	0	0
29052.10785	2	73,584	88,002	92,637	329	402	475	0	0	0
10789.10791	2	534,251	513,227	527,425	803	1,132	876	803	1,132	803
10791.10792	2	244,258	215,277	215,350	402	730	402	803	1,132	475
10792.10791	2	211,919	225,497	226,994	329	402	402	402	475	475
10792.10793	2	--	403,800	407,340	--	402	402	--	73	73
10793.10792	2	--	812,855	801,102	--	803	475	--	402	402
10793.10794	2	58,181	84,242	84,680	0	0	0	0	0	0
10794.10793	2	114,501	145,380	147,387	0	0	0	0	0	0
10793.11054	2	99,864	109,062	103,624	73	0	0	402	0	0
11054.10793	2	308,243	270,903	258,347	475	402	402	475	548	548
10795.11016	2	121,582	122,604	146,548	73	73	73	0	73	73
11016.10795	2	733,541	813,330	817,564	2,628	3,504	3,723	3,906	3,322	4,161
10795.11020	2	601,630	568,159	560,677	2,154	2,628	2,847	3,030	2,373	2,811
10801.15729	3	4,109,718	3,551,779	3,571,927	71,832	132,495	120,304	220,533	394,711	353,247
10985.31267	1	60,225	76,541	69,022	0	73	73	73	475	402
10987.14371	2	339,742	347,663	195,494	5,621	6,643	5,366	2,482	1,278	475
14371.10987	2	--	--	0	--	--	0	--	--	0
10988.10989	2	34,018	75,227	56,831	0	803	402	0	329	0
10989.10988	2	31,938	32,668	30,514	0	0	0	0	0	0
10988.17270	2	483,954	486,837	539,032	1,351	2,628	3,431	1,825	2,154	2,227
10989.10990	2	479,209	453,184	450,994	1,752	2,555	2,555	2,227	2,154	1,825
10990.10992	2	535,747	486,217	489,392	2,154	2,555	2,555	2,701	2,227	2,154
10990.10993	2	691,493	677,039	695,690	2,482	2,884	2,884	2,154	2,081	1,606
10991.10988	2	405,406	448,147	475,194	1,351	3,030	3,358	1,424	2,081	1,825
10991.10990	2	405,917	375,366	389,455	1,278	1,679	1,679	2,008	1,278	1,278
10992.10995	2	594,731	502,459	500,123	2,555	2,957	2,628	2,227	1,898	1,825
10993.10738	2	607,944	608,346	615,682	1,278	2,081	1,752	2,154	2,081	1,606
10994.31975	2	524,469	539,580	541,441	1,351	1,679	1,351	2,701	2,628	2,300
31975.10994	2	549,216	515,198	542,281	1,278	1,351	1,351	2,300	2,300	2,300
10995.10991	2	313,937	304,483	330,617	548	876	876	1,022	1,022	1,022
10996.14398	2	159,907	204,035	208,087	1,752	3,541	2,555	2,555	5,147	3,504
14398.10996	2	157,936	183,230	207,941	1,095	2,117	2,774	2,044	2,884	3,395
10996.17039	2	184,946	183,230	207,941	1,424	2,117	2,774	2,373	2,884	3,395
17039.10996	2	199,363	204,035	208,087	1,752	3,541	2,555	3,030	5,147	3,504
10997.11002	2	62,817	155,308	193,888	621	3,176	3,504	1,351	4,417	5,001
11002.10997	2	126,655	109,135	127,714	1,679	1,825	2,154	3,358	1,643	2,227
10997.17039	2	186,515	589,110	559,399	2,884	9,636	10,147	4,964	10,695	11,388
17039.10997	2	196,151	544,106	678,426	2,300	10,220	12,191	4,709	15,805	17,082
10998.10997	2	--	185,238	101,251	--	2,738	2,008	--	4,088	3,687
10998.10999	2	33,471	17,484	19,272	402	73	73	876	73	146
10999.10998	2	19,309	19,966	10,804	402	329	0	803	402	0
10999.11000	2	46,501	8,906	14,819	402	0	0	1,679	0	0
11000.10999	2	55,298	47,998	26,426	876	730	402	2,336	803	402
10999.11001	2	64,386	50,443	48,764	803	548	548	1,278	1,095	1,168
11000.11001	2	261,304	364,124	363,942	1,424	5,439	3,358	876	5,074	1,825
11001.11000	2	317,441	450,374	441,358	2,336	5,037	6,169	803	3,285	4,015
11001.12080	2	2,112,657	2,484,446	2,475,430	12,301	37,632	24,893	11,096	36,318	15,148
12080.11001	2	2,223,617	2,790,425	2,734,434	15,038	31,755	38,143	5,621	20,696	25,295
11002.16171	2	376,899	365,256	455,630	4,088	6,643	8,286	7,300	10,512	11,607
16171.11002	2	495,853	256,595	299,483	6,169	3,869	5,110	8,505	4,234	5,001
11003.11011	2	1,387	10,768	3,942	0	0	0	0	0	0
11004.11005	2	393,470	459,973	430,335	1,351	2,154	1,679	1,424	2,154	1,752
11005.11006	2	39,238	19,090	18,688	0	0	0	0	0	0
11006.11005	2	24,346	13,505	14,564	0	0	0	0	0	0

Link_ID [2]	Area ID [2]	Average Annual Vehicle Miles Traveled (veh-miles/yr)								
		Auto			Medium Truck			Heavy Truck		
		2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]
11005.11008	2	386,353	463,587	434,533	1,205	2,154	1,679	1,497	2,154	1,825
11006.10784	2	323,792	333,391	316,638	949	1,351	1,278	1,424	2,154	1,825
11007.11006	2	314,338	328,099	312,805	949	1,278	1,278	1,424	1,825	1,752
11008.11007	2	15,732	54,714	26,353	0	803	475	0	0	0
11009.16182	2	185,968	150,271	110,413	3,212	2,884	2,482	1,205	475	0
11010.11003	2	108,259	143,372	137,605	475	1,278	1,278	0	0	0
11011.11012	2	54,239	116,545	119,538	0	475	475	0	0	0
11012.11011	2	36,537	45,005	44,056	0	0	0	0	0	0
11011.11053	2	64,897	90,411	87,783	0	402	402	0	0	0
11053.11011	2	27,120	59,276	61,138	0	329	329	0	0	0
11012.11013	2	273,787	374,855	375,768	1,132	2,008	2,081	2,008	1,679	1,679
11013.11012	2	132,933	171,368	171,477	0	402	402	0	73	73
11012.11017	2	--	29,638	31,135	--	0	0	--	0	0
11017.11012	2	171,660	158,702	154,176	803	803	803	1,606	1,205	1,278
11013.14909	2	150,928	189,946	187,683	475	803	803	475	876	876
14909.11013	2	98,915	99,426	95,995	0	73	73	0	73	73
11014.11015	2	20,294	21,243	21,353	0	0	0	0	0	0
11015.11014	2	34,785	38,982	37,267	0	0	0	0	0	0
11016.14909	2	117,421	118,552	114,282	0	73	73	0	73	73
14909.11016	2	179,580	226,045	223,563	475	803	803	803	876	1,205
11018.11017	2	986,851	1,011,379	985,172	4,088	5,037	5,366	5,293	4,563	5,366
11536.10552	3	1,054,047	1,016,014	967,287	10,038	21,207	21,024	24,528	52,122	52,159
11589.15848	1	405,077	564,692	545,639	4,015	9,454	8,979	5,913	14,856	13,359
31695.11589	1	364,161	537,025	522,315	3,723	8,505	8,103	5,293	13,359	12,082
11590.31695	1	450,775	582,686	576,919	3,030	8,505	8,213	4,636	13,505	12,337
27001.11599	1	89,681	91,834	94,316	694	1,168	1,278	986	1,789	1,825
11599.32136	1	225,607	360,657	357,700	1,716	5,439	5,256	2,555	8,724	7,957
12085.12087	1	417,816	790,517	800,883	8,103	24,565	23,835	11,315	39,785	38,106
15844.12085	1	116,837	142,131	138,846	1,862	3,760	3,650	3,212	5,950	5,475
12085.15862	1	31,719	35,916	32,595	402	475	329	475	1,278	1,205
14361.50017	2	130,269	158,775	168,229	0	329	329	402	402	475
50017.14361	2	117,348	83,549	66,284	0	73	0	402	475	73
14363.10987	2	412,049	484,720	219,913	6,169	10,914	5,840	2,154	4,891	475
14363.14369	2	147,716	136,328	184,909	475	475	803	1,205	1,205	1,606
14364.14363	2	405,296	386,827	436,066	3,066	5,037	7,446	2,482	2,482	2,957
14364.14365	2	392,485	407,158	397,084	4,417	6,826	5,840	2,154	5,366	4,453
14365.10409	2	1,138,983	1,105,403	1,135,917	15,330	24,273	20,732	7,483	17,630	16,243
14365.16187	2	518,337	705,326	560,458	840	767	548	402	949	548
14364.14366	2	--	--	0	--	--	0	--	--	0
14366.14364	2	112,603	126,254	159,469	3,614	6,278	7,446	475	4,344	3,906
14366.14368	2	301,417	311,491	302,841	1,278	2,263	1,935	1,278	1,679	1,205
14367.17020	2	59,787	27,813	39,785	475	402	0	402	73	0
17020.14367	2	30,733	95,995	98,988	4,818	12,045	11,753	0	0	0
14368.16185	2	123,589	192,939	228,271	2,592	3,687	3,760	2,008	2,409	2,482
14370.14363	2	105,303	161,221	--	3,030	5,475	--	876	3,212	--
14370.14369	2	81,760	71,650	0	803	2,592	0	1,205	3,723	0
14367.14371	2	--	--	--	--	--	--	--	--	--
14371.14367	2	491,655	470,303	207,393	2,081	2,154	803	2,884	1,351	475
14372.14373	2	820,228	862,349	822,418	3,833	7,337	7,483	548	1,606	73
14373.14372	2	587,577	644,554	677,112	6,461	5,804	6,132	1,643	2,081	548
14372.14487	2	200,568	221,117	232,067	2,373	1,825	2,154	548	803	73
14374.14375	2	6,132	23,689	17,995	0	0	0	0	0	0
14375.14374	2	27,813	67,160	63,401	0	402	402	0	0	0
14376.27696	2	413,618	535,273	535,236	73	402	402	402	475	475
27696.14376	2	338,538	430,043	394,054	329	475	73	73	694	475
14376.31257	2	623,676	691,894	712,845	475	949	475	876	1,497	876
31257.14376	2	423,619	556,443	593,819	146	475	402	621	949	949
14383.27515	1	144,504	184,581	166,075	0	73	0	0	146	0
27515.14383	1	147,570	261,267	259,844	0	329	402	0	329	0
14384.27697	1	157,461	230,388	228,600	0	329	73	0	329	0
27697.14384	1	154,286	162,717	145,818	0	73	0	0	146	0
14384.31661	1	65,846	54,787	41,829	0	0	0	0	0	0
31661.14384	1	35,953	35,770	32,777	0	0	0	0	0	0
14384.31671	1	214,365	227,359	221,920	0	0	0	0	0	0

Link_ID [2]	Area ID [2]	Average Annual Vehicle Miles Traveled (veh-miles/yr)								
		Auto			Medium Truck			Heavy Truck		
		2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]
31671.14384	1	327,953	389,674	331,420	0	73	146	0	0	0
14386.14385	1	82,527	77,855	83,658	0	0	0	0	0	0
31278.14385	1	231,228	273,896	276,232	0	475	402	475	548	475
14385.31661	1	60,444	72,745	66,686	0	0	0	0	0	0
31661.14385	1	110,887	111,727	84,680	0	73	73	0	73	73
14386.14387	1	54,933	63,693	58,838	0	0	73	0	0	0
14387.14386	1	46,611	47,341	42,194	0	0	0	0	0	0
14387.14848	1	80,446	159,177	147,460	0	73	146	0	0	73
14848.14387	1	68,073	118,078	104,646	0	0	0	0	0	0
14388.31257	2	116,435	172,682	183,376	0	402	73	146	475	475
31257.14388	2	199,108	210,350	223,599	0	402	329	402	548	402
14388.50018	2	630,100	600,352	624,880	1,424	1,424	1,825	2,300	2,300	1,971
50018.14388	2	552,610	567,831	579,182	1,351	1,752	1,752	1,825	2,227	2,300
14389.27689	1	652,401	353,174	319,485	548	402	0	803	402	402
14395.14396	3	276,305	341,531	341,640	3,577	8,176	6,570	8,213	15,111	13,286
14395.15730	3	2,226,099	3,358,110	3,321,391	40,369	77,855	73,803	131,510	237,944	223,745
14396.10466	3	458,842	588,052	580,241	10,111	21,499	17,520	22,265	38,836	35,259
14397.14398	2	196,699	165,966	193,706	1,497	2,665	2,920	2,701	3,504	3,614
14398.14397	2	167,316	211,700	217,212	2,154	4,344	2,957	3,103	6,351	3,906
14397.50015	2	87,600	111,070	113,917	949	2,336	1,679	1,752	3,139	1,825
50015.14397	2	103,149	86,980	101,616	949	1,497	1,497	1,752	1,789	2,044
14398.50016	2	101,945	67,854	66,649	329	329	0	475	876	876
50016.14398	2	65,737	87,673	93,331	73	402	402	219	876	1,278
31267.14399	1	111,946	142,496	128,225	0	402	402	402	548	475
14404.14405	2	875,635	979,624	972,835	5,183	6,935	6,534	4,672	5,694	5,147
14404.15492	2	992,910	972,944	1,014,372	6,461	8,213	6,169	10,549	12,520	11,607
14405.14406	2	224,548	246,302	247,069	2,081	2,957	3,030	1,351	1,497	1,497
14406.14405	2	10,877	20,002	15,111	0	0	0	0	0	0
14406.14407	2	164,834	206,627	203,451	2,628	3,906	3,906	1,095	2,044	1,716
14407.14406	2	308,060	284,262	318,682	4,928	5,950	4,709	3,906	4,088	4,125
14406.15494	2	1,528,146	1,645,055	1,710,171	9,782	13,615	12,228	9,308	10,950	9,928
14407.14410	2	86,797	119,136	118,187	1,278	1,752	1,752	548	1,022	1,022
14410.14407	2	163,849	160,418	179,763	2,373	3,176	2,482	2,154	1,971	2,227
14408.10471	1	383,980	469,573	563,049	5,840	10,877	12,155	15,586	24,528	25,477
14408.16192	2	177,025	139,029	85,118	3,687	3,285	2,811	1,278	803	0
14409.11009	2	154,578	159,432	151,037	803	1,424	1,424	0	0	0
14409.16191	2	23,798	69,423	69,569	219	949	803	73	475	402
16191.14409	2	73	876	475	0	0	0	0	0	0
14410.16191	2	0	402	0	0	0	0	0	0	0
16191.14410	2	7,227	20,988	21,207	0	402	402	0	0	0
14441.17255	1	102,346	45,662	40,880	475	0	0	949	402	402
14446.15500	1	1,097,409	838,223	903,740	15,549	20,623	20,951	38,289	45,370	45,406
15503.14448	1	135,671	145,197	146,219	475	949	876	621	1,095	949
14486.15995	1	173,047	234,038	211,737	4,782	10,841	6,023	7,008	15,038	6,899
14487.14409	2	90,374	116,107	112,311	475	1,351	1,278	73	402	402
14487.14490	2	199,400	250,463	273,020	3,869	3,979	4,052	1,497	2,044	1,716
14490.14487	2	232,980	198,268	237,506	4,125	4,818	3,833	3,504	3,541	3,650
14488.16182	2	49,640	116,253	137,167	475	475	402	0	73	0
16182.14488	2	279,043	293,898	273,969	4,015	4,964	4,636	1,278	876	0
14488.17018	2	110,413	109,245	103,624	1,278	1,679	1,679	475	402	0
17018.14488	2	2,847	28,689	35,734	0	0	0	0	0	0
17020.14488	2	103,149	70,701	80,264	475	475	73	475	73	0
14490.14491	2	87,126	109,427	119,173	1,898	1,752	1,752	621	1,022	621
14491.14490	2	101,616	86,505	104,062	1,752	2,300	1,679	1,351	1,497	1,752
14491.17017	2	189,800	232,250	229,768	6,205	5,585	5,512	2,300	1,971	1,497
17017.14491	2	176,660	241,265	276,123	3,322	4,198	3,504	2,227	2,993	2,701
14491.17018	2	7,556	73,694	92,272	0	329	402	0	0	0
17018.14491	2	284,591	282,401	267,655	4,015	4,636	4,563	1,278	876	0
14491.17024	2	77,782	82,198	78,366	402	803	876	0	0	0
14492.15489	2	94,097	155,308	193,888	1,022	3,176	3,504	1,825	4,417	5,001
15489.14492	2	123,845	109,135	127,714	1,679	1,825	2,154	2,227	1,643	2,227
14492.16171	2	76,614	98,258	114,647	876	1,497	1,752	1,351	1,570	1,825
16171.14492	2	58,218	139,722	174,689	621	2,373	3,103	1,278	3,942	4,125
15489.15490	2	257,654	227,030	257,070	4,709	4,526	5,183	3,504	2,519	2,373

Link_ID [2]	Area ID [2]	Average Annual Vehicle Miles Traveled (veh-miles/yr)								
		Auto			Medium Truck			Heavy Truck		
		2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]
15490.15489	2	231,593	174,434	174,908	2,884	2,847	2,628	3,249	1,971	1,168
15489.15796	2	55,517	91,688	106,361	803	1,570	2,081	402	2,300	3,030
15796.15489	2	107,055	93,988	116,618	2,336	2,227	3,285	730	0	1,132
15490.17017	2	171,404	233,929	267,874	3,249	4,125	3,431	2,227	2,519	2,701
17017.15490	2	184,289	225,315	223,052	6,132	5,512	5,183	2,300	1,971	1,497
15491.15744	1	1,057,442	853,662	923,523	18,031	19,929	21,207	33,179	35,953	37,778
15491.15745	1	2,631,139	2,605,297	2,486,928	24,638	51,210	51,246	55,152	118,406	118,625
15494.14404	2	164,068	158,374	168,265	1,022	1,351	803	876	876	1,278
15496.14446	1	864,722	766,646	825,886	13,469	20,477	20,477	35,880	49,239	49,093
15496.15503	1	1,036,783	1,072,370	1,082,189	4,745	7,519	7,264	5,804	10,330	8,906
15500.16190	3	4,895,271	6,362,534	6,660,228	118,844	256,413	280,393	333,391	702,662	763,398
15501.15757	1	1,071,348	997,363	967,725	17,119	25,185	25,514	46,939	62,050	61,430
15685.15995	1	1,323,855	1,582,421	1,596,693	39,931	86,724	95,338	85,702	170,273	185,457
15686.15687	3	563,268	548,267	637,035	10,914	17,739	17,338	20,258	30,879	32,193
15687.15688	3	704,085	685,397	796,686	13,323	22,156	21,645	25,222	38,398	40,479
15688.15689	3	352,079	342,735	398,106	6,826	10,914	10,622	12,410	19,126	20,404
15689.15485	3	492,896	479,464	557,501	9,308	15,659	15,330	17,703	27,120	28,288
15729.15484	3	2,054,658	2,007,464	2,018,815	35,916	75,044	67,963	110,303	223,015	199,400
15730.14392	3	3,895,864	2,880,982	2,849,555	70,299	66,832	63,328	230,644	204,291	192,282
15744.14408	1	853,808	938,853	1,015,795	14,746	22,083	22,886	26,864	39,785	41,537
15745.15746	3	1,445,108	1,463,869	1,397,330	13,724	28,726	28,616	30,149	66,759	66,540
15746.11536	3	3,191,998	3,057,204	2,918,066	29,930	59,933	59,641	66,868	138,956	139,065
15747.11537	1	1,044,484	948,453	963,892	16,790	22,849	23,981	39,311	49,312	49,494
15748.10552	3	2,996,833	2,987,708	2,971,538	108,953	156,695	183,048	337,662	458,951	525,053
15748.15747	1	531,513	850,779	865,415	8,432	20,440	21,170	19,893	44,421	44,275
15754.14446	1	166,550	143,007	155,381	1,278	1,424	1,679	0	0	0
15754.15612	1	494,101	509,686	522,534	5,037	4,782	5,001	3,723	986	1,533
15757.15497	1	561,297	534,981	518,775	9,235	13,797	13,797	24,711	33,142	32,996
11000.15796	2	73,037	92,236	119,757	1,278	2,227	2,482	402	475	803
15796.11000	2	36,099	84,133	67,927	146	1,752	1,679	0	1,351	1,752
15848.15843	1	265,136	428,875	413,582	3,395	8,176	8,030	5,220	13,359	12,410
15843.27007	1	210,678	315,725	304,593	2,847	7,702	7,227	4,672	12,410	11,607
27007.15844	1	198,378	278,714	267,399	2,847	6,899	6,497	4,344	11,133	10,403
15995.15487	1	1,106,388	1,187,820	1,179,972	42,450	84,352	85,520	85,885	165,236	168,521
16182.17016	2	155,819	212,613	234,440	803	949	876	0	73	0
17016.16182	2	133,481	157,899	186,807	475	1,351	1,752	0	0	0
16185.14364	2	751,827	738,067	741,315	4,818	7,118	7,118	4,636	4,380	4,380
16189.14370	2	429,021	512,825	310,579	8,067	17,666	8,249	5,037	16,316	5,585
16190.10471	3	1,516,502	2,911,459	3,047,568	36,792	117,603	128,115	103,113	321,529	349,196
16192.11009	2	402,778	316,273	193,961	8,359	7,373	6,497	3,285	1,679	0
16316.50016	1	54,495	43,508	45,771	0	73	73	73	73	73
17024.14372	2	287,839	304,045	289,993	1,351	2,555	2,628	73	475	0
27515.27697	1	211,773	213,379	191,808	0	402	0	73	146	0
27697.27515	1	216,518	302,038	300,505	0	329	402	0	329	73
27689.10777	1	549,325	297,439	269,151	475	0	0	475	402	402
31975.50018	2	1,175,702	1,324,257	1,358,713	2,774	4,307	4,052	4,599	5,804	5,293
50018.31975	2	1,571,800	1,449,488	1,535,008	3,249	3,577	4,380	5,220	5,804	5,220
50015.50016	2	3,687	60,992	78,293	73	438	402	548	1,059	548
50016.50015	2	59,860	79,716	78,001	475	1,533	621	1,168	2,993	1,314
10733.10734	2	269,480	298,789	277,948	803	475	475	2,081	1,278	1,278
10734.10733	2	375,111	410,479	392,010	803	402	475	1,679	1,278	1,022
11783.65102	1	113,917	207,466	244,769	1,314	2,446	2,300	767	2,738	2,555
14361.16188	2	447,381	61,685	33,617	475	548	292	475	73	0
27690.18548	1	199,290	236,739	250,536	949	2,628	1,168	1,643	4,453	2,263
65102.27001	1	103,587	129,977	143,701	1,314	1,497	1,424	913	1,789	1,752
15925.11590	1	521,768	539,397	534,251	3,577	7,884	7,410	5,402	12,410	11,534
32136.15925	1	271,816	493,480	490,086	1,862	7,483	7,008	2,774	11,863	10,658
22003.50016	2	66,029	106,690	101,361	475	1,862	949	1,095	3,176	2,044
50016.22003	2	41,720	69,533	77,672	0	767	402	475	1,059	949
18548.22003	2	237,396	318,499	292,657	1,570	5,110	2,665	3,285	9,928	5,329
22003.18548	2	202,356	220,022	233,345	876	2,300	1,095	1,825	4,161	2,446
10986.14493	2	229,293	216,153	220,570	1,606	2,665	475	2,409	2,993	402
14493.10986	2	228,965	222,030	187,902	1,205	1,205	876	1,679	1,533	1,533
11000.14493	2	297,074	309,520	280,284	1,205	2,409	2,811	1,679	2,336	2,811

Link_ID [2]	Area ID [2]	Average Annual Vehicle Miles Traveled (veh-miles/yr)								
		Auto			Medium Truck			Heavy Truck		
		2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]
14493.11000	2	287,766	280,941	277,400	1,752	3,614	1,679	3,139	3,723	475
14368.16183	2	864,868	977,434	952,249	3,760	7,702	6,899	3,358	4,161	3,431
16183.10991	2	1,084,123	1,130,953	1,164,788	4,964	8,322	8,651	4,563	4,234	4,161
10995.16184	2	1,309,109	1,076,349	1,076,787	5,183	6,315	5,986	5,658	4,526	4,125
16184.16185	2	1,300,641	1,132,486	1,068,793	5,512	7,191	6,388	5,658	4,928	4,526
10734.31666	2	918,231	754,966	769,785	2,227	1,570	1,971	4,380	3,322	3,322
31666.10736	2	924,217	789,495	801,942	1,898	1,570	1,898	4,380	3,322	3,322
10738.10732	2	805,519	801,869	806,650	1,278	1,606	1,278	2,957	2,409	2,081
10732.10741	2	853,334	828,514	834,536	1,679	1,606	1,278	3,358	2,482	2,008
10782.60840	2	147,095	49,056	46,903	402	0	0	0	0	0
60840.10782	2	109,902	31,938	31,354	0	0	0	0	0	0
10739.60840	2	86,943	28,726	25,915	0	0	0	0	0	0
60840.10739	2	124,210	125,633	100,631	329	402	402	0	0	0
11014.25002	2	63,620	54,860	53,290	0	0	0	0	0	0
25002.11014	2	37,997	37,924	37,267	0	0	0	0	0	0
11010.25002	2	39,092	39,676	38,690	0	0	0	0	0	0
25002.11010	2	66,321	57,488	55,115	0	0	0	0	0	0
10781.95325	2	186,150	107,675	103,989	329	0	0	0	0	0
95325.10781	2	214,511	218,708	213,270	0	402	402	0	0	0
10739.95325	2	224,074	311,820	287,730	803	3,358	3,212	0	0	0
95325.10739	2	270,137	178,120	183,303	803	949	949	0	0	0
10739.95326	2	118,333	101,981	104,646	402	475	475	0	0	0
95326.10739	2	75,519	128,407	108,843	329	1,278	1,205	0	0	0
10989.95326	2	77,380	145,708	112,420	402	1,606	1,205	0	0	0
95326.10989	2	99,317	105,850	107,858	402	402	475	0	0	0
11014.60850	2	9,381	51,757	45,260	0	0	0	0	0	0
60850.11014	2	3,906	2,738	2,081	0	0	0	0	0	0
11015.25000	2	363,905	371,716	388,871	1,679	2,555	2,884	2,081	1,679	1,752
25000.11015	2	218,197	293,570	293,789	402	803	803	0	475	402
14405.25000	2	325,288	399,967	400,186	803	1,205	1,679	0	0	0
25000.14405	2	448,001	446,797	437,197	2,008	2,884	2,884	2,409	1,752	1,752
11010.62500	2	49,166	34,712	30,076	0	0	0	0	0	0
62500.11010	2	50,005	44,202	53,619	0	0	329	0	0	0
10782.62500	2	59,167	47,669	57,232	0	0	402	0	0	0
62500.10782	2	57,780	57,086	51,027	0	0	0	0	0	0
10784.25001	2	133,882	135,525	165,309	475	803	949	0	0	0
25001.10784	2	197,940	229,512	231,264	475	1,752	2,081	0	0	0
10782.29001	2	381,462	453,294	457,528	876	2,957	3,358	73	73	73
29001.10782	2	225,096	235,462	279,298	876	1,278	1,351	0	0	0
25001.29001	2	130,451	135,817	165,637	475	475	949	0	0	0
29001.25001	2	205,276	240,718	242,725	475	1,752	2,081	0	0	0
29002.11010	2	49,056	82,709	49,312	402	1,278	803	0	0	0
11007.29002	2	--	85,739	34,018	--	1,278	803	--	0	0
10993.95326	2	50,699	53,582	56,721	329	402	475	0	0	0
95326.10993	2	70,263	61,977	57,743	475	402	402	0	0	0
29001.29002	2	1,716	7,811	28,142	0	0	329	0	0	0
29002.29001	2	4,855	6,132	8,213	0	0	0	0	0	0
29002.95607	2	1,095	4,417	3,577	0	0	0	0	0	0
95607.29002	2	2,555	5,074	4,307	0	0	0	0	0	0
60850.95607	2	2,628	5,475	4,380	0	0	0	0	0	0
95607.60850	2	1,095	4,563	4,125	0	0	0	0	0	0
95326.95406	2	12,921	16,243	12,045	0	0	0	0	0	0
95406.95326	2	33,252	28,945	27,485	0	0	0	0	0	0
29001.95406	2	21,754	16,279	13,651	0	0	0	0	0	0
95406.29001	2	2,920	5,877	1,351	0	0	0	0	0	0
10467.17553	3	6,113,860	5,213,441	5,840,840	174,799	235,206	269,115	563,268	688,828	768,544
17553.20054	3	636,962	3,312,156	3,711,101	18,579	149,577	171,112	58,692	437,672	488,626
20054.10469	3	816,724	568,013	636,706	23,141	25,696	29,383	75,081	75,117	84,169
10987.27750	2	208,817	217,139	131,181	475	2,409	803	876	3,212	803
27750.14366	2	178,266	185,165	111,982	475	2,263	730	876	2,409	803
10468.20053	3	2,129,155	3,497,795	3,893,711	56,502	165,236	181,734	171,222	485,414	525,345
20053.10409	3	5,094,415	5,570,959	6,201,934	134,539	263,129	289,445	410,662	773,362	837,310
10410.95610	3	3,120,787	2,738,705	2,961,975	67,817	100,667	107,164	208,452	333,574	358,503
95610.14392	3	4,243,381	3,745,083	4,051,062	92,126	137,934	146,365	283,277	456,104	490,670

Link_ID [2]	Area ID [2]	Average Annual Vehicle Miles Traveled (veh-miles/yr)								
		Auto			Medium Truck			Heavy Truck		
		2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]
14410.15815	2	132,167	181,113	178,522	2,154	3,103	2,628	1,022	1,570	1,497
15815.14410	2	231,483	191,005	220,205	3,577	4,125	3,431	3,030	2,920	2,774
14487.15815	2	247,142	204,291	235,170	3,979	4,271	3,431	3,030	2,993	2,774
15815.14487	2	141,255	193,231	191,151	2,154	3,103	2,774	1,022	1,643	1,570
10733.95690	2	69,131	78,840	48,144	73	73	73	219	73	73
95690.10733	2	44,421	112,420	118,479	73	146	475	146	621	876
95692.95698	2	7,811	30,697	10,366	0	0	0	0	0	0
95698.95692	2	7,483	44,275	65,700	0	0	329	0	0	402
95645.95646	2	3,504	5,694	1,716	0	0	0	0	0	0
95646.95645	2	5,877	7,702	2,081	0	0	0	0	0	0
16184.95698	2	87,819	120,706	149,833	0	402	329	0	402	475
95698.16184	2	10,257	33,872	10,512	0	0	0	0	0	0
16183.95645	2	125,597	185,493	25,003	475	3,066	402	0	1,205	0
95645.16183	2	65,007	90,484	24,017	402	1,205	329	0	402	0
95649.95703	2	10,330	11,279	21,718	0	0	0	0	0	0
95703.95649	2	475	9,673	10,293	0	0	0	0	0	0
95648.95704	2	1,132	11,972	11,863	0	0	0	0	0	0
95704.95648	2	1,752	5,293	14,564	0	0	0	0	0	0
31975.95666	2	120,925	105,047	119,538	0	0	657	0	0	329
95666.31975	2	4,161	43,618	71,540	0	73	73	0	402	73
11009.86301	2	27,740	42,231	36,427	329	475	475	0	0	0
86301.11008	2	40,187	71,905	63,255	329	475	803	0	0	0
17039.95623	2	18,834	77,015	60,079	0	1,022	1,022	73	2,446	2,044
95623.17039	2	54,714	87,199	113,260	475	3,723	2,081	949	7,848	4,563
17039.95624	2	28,981	32,047	32,120	1,278	2,884	2,884	4,234	6,789	6,716
95624.17039	2	32,522	35,004	35,004	1,606	2,884	2,884	4,234	6,716	6,716
11015.23594	2	229,914	310,761	319,412	475	803	803	0	475	402
23594.11015	2	464,134	494,466	509,577	1,679	2,957	3,285	2,081	1,752	1,752
11013.23594	2	144,613	193,560	195,166	475	803	803	475	475	876
23594.11013	2	103,295	145,891	148,592	0	402	475	0	73	329
11003.23594	2	110,741	72,489	78,804	402	475	475	0	0	0
23594.11003	2	51,502	55,261	56,502	0	0	0	0	0	0
11017.11011	2	104,135	146,584	145,234	402	475	803	0	0	0
11012.11054	2	322,222	281,087	268,020	475	402	402	475	548	548
11054.11012	2	104,208	113,880	107,201	73	0	0	402	0	0
14493.14507	2	31,427	41,136	43,910	0	329	402	402	803	876
14507.14493	2	20,367	29,492	27,485	0	0	0	475	0	0
10998.14507	2	15,914	10,512	11,060	0	0	0	0	0	0
14507.10998	2	16,170	53,181	58,108	0	475	475	0	1,424	1,424
14510.15796	2	2,519	42,304	17,265	73	730	402	0	803	402
15796.14510	2	4,198	47,998	61,211	0	876	475	0	1,679	1,205
14510.14511	2	10,403	22,484	67,927	0	402	475	73	1,205	1,205
14511.14510	2	0	438	0	0	0	0	0	0	0
14511.14512	2	11,425	31,281	88,002	0	475	475	73	1,205	1,278
14512.14511	2	0	840	329	0	0	0	0	0	0
14367.14512	2	0	0	0	0	0	0	0	0	0
14512.14367	2	33,580	34,712	109,683	3,942	475	475	402	1,205	1,278
14493.14510	2	12,191	32,376	60,152	0	1,132	2,409	402	329	876
14510.14493	2	9,819	14,235	14,564	146	694	1,606	0	0	0

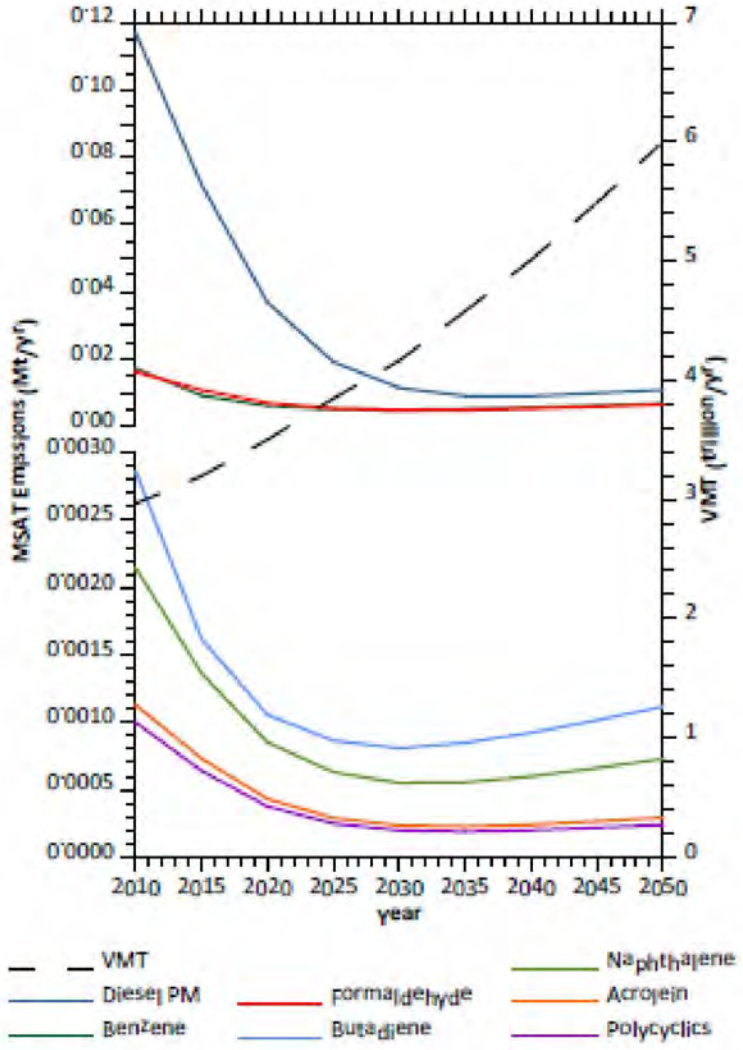
Link_ID [2]	Area ID [2]	Average Annual Vehicle Miles Traveled (veh-miles/yr)								
		Auto			Medium Truck			Heavy Truck		
		2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]
14400.18553	1	313,827	0	73	0	0	0	402	0	0
14366.10469	2	--	--	--	--	--	--	--	--	--
50017.95697	2	295,979	309,046	321,529	548	475	475	876	803	803
95697.50017	2	173,923	297,037	274,480	402	402	402	548	949	475
50018.95697	2	153,848	264,297	266,377	402	402	475	475	548	402
95697.50018	2	267,983	288,022	299,921	475	475	475	876	803	803
95688.50017	2	91,652	331,347	300,760	73	402	73	0	402	0
16187.95665	2	56,904	247,762	259,223	0	146	73	0	73	73
95665.95688	2	87,637	340,363	331,676	73	73	402	0	73	0
95689.16186	2	150,563	423,181	233,710	73	949	219	73	1,278	0
16188.95689	2	67,708	179,142	165,163	0	402	73	0	73	0
18548.95686	2	182,829	202,794	218,635	329	402	475	475	803	548
95686.18548	2	127,969	122,239	102,967	0	475	475	475	1,351	949
14361.95686	2	49,312	57,269	52,451	0	0	0	0	402	0
95686.14361	2	56,174	65,226	68,109	0	0	0	0	0	0
14375.95706	2	--	269,553	259,296	--	949	876	--	1,825	1,752
95706.11007	2	--	323,062	310,031	--	1,278	949	--	2,154	1,825
11008.95708	2	--	463,112	456,944	--	1,679	1,679	--	2,154	1,825
95708.14374	2	--	417,378	408,034	--	1,679	1,679	--	2,154	1,752
14375.95705	2	3,103	19,053	13,615	0	0	0	0	0	0
95705.14375	2	48,290	59,641	56,101	0	402	402	0	0	0
60850.95705	2	37,230	55,188	48,691	0	402	0	0	0	0
95705.60850	2	12,447	21,681	22,192	0	0	0	0	0	0
25000.95649	2	14,819	15,805	20,696	0	0	0	0	0	0
95649.25000	2	4,782	10,804	11,753	0	0	0	0	0	0
60850.95649	2	9,162	12,812	13,943	0	0	0	0	0	0
95649.60850	2	20,586	21,426	22,010	0	0	0	0	0	0
27630.95660	2	419,714	430,445	427,233	1,278	2,482	2,227	1,424	1,825	1,825
95660.10989	2	419,714	421,794	418,509	1,278	2,154	2,227	1,424	1,825	1,825
17016.95646	2	86,359	147,205	163,338	475	475	475	0	0	0
95646.17016	2	74,059	122,567	142,095	329	949	1,278	0	0	0
11004.95646	2	81,578	132,824	156,111	329	949	1,278	0	0	0
95646.11004	2	93,769	158,447	179,288	475	475	876	0	0	0
17270.95699	2	331,712	400,259	437,453	876	2,154	2,555	1,351	1,752	1,752
95699.11004	2	335,946	392,777	400,150	876	1,752	1,752	949	2,154	1,752
95690.10994	2	127,422	138,846	139,248	402	475	475	475	475	475
10992.95690	2	683,974	787,159	771,136	1,752	2,154	2,227	3,504	3,577	3,249
95691.10995	2	557,611	561,553	608,127	1,278	1,351	1,351	2,300	2,628	2,300
95692.95691	2	109,756	120,012	133,116	402	402	402	402	475	475
10994.95692	2	109,829	110,449	116,289	402	402	402	402	475	475
95700.10987	2	166,915	160,856	124,940	475	876	803	876	1,205	803
95696.95697	1	62,744	77,380	70,372	73	73	73	146	73	73
95697.95696	1	34,602	25,185	41,610	219	73	146	0	0	0
95670.95700	2	184,836	174,288	139,394	475	876	876	1,205	1,205	803
10986.95663	2	135,269	148,154	125,451	402	803	730	803	803	803
95663.95670	2	154,140	143,299	110,851	475	876	329	876	1,205	803
95664.10986	2	123,370	132,203	136,437	475	1,533	402	1,132	1,460	0
95695.95698	2	621	1,241	73	0	0	0	0	0	0
95698.95695	2	20,440	19,564	21,061	0	0	0	0	0	0
14369.95655	2	112,931	120,669	104,646	475	1,533	475	1,205	2,592	876
95655.95664	2	261,997	250,062	233,381	1,205	2,336	475	2,409	3,395	0
95669.14512	2	18,068	31,244	46,976	3,942	4,964	4,234	0	0	0
14371.95669	2	3,723	7,264	13,104	803	1,205	876	0	0	0
50015.95685	1	8,797	10,403	11,279	475	73	0	1,278	146	73
95685.50015	1	9,965	10,403	11,279	475	73	0	1,278	146	73
10733.95693	2	136,364	142,861	129,466	402	73	73	548	402	73
95693.10733	2	45,808	45,260	37,084	0	0	0	73	0	0
95690.95691	2	0	73	0	0	0	0	0	0	0
95691.95690	2	1,971	10,658	16,170	0	0	0	0	0	0
27630.95699	2	4,709	3,504	0	0	0	0	0	0	0
95699.27630	2	24,273	32,193	28,251	0	475	402	0	0	0
95645.95699	2	54,860	51,319	11,352	0	730	0	0	329	0
95699.95645	2	9,600	12,994	3,687	0	0	0	0	0	0
95672.95705	2	12,629	20,185	22,338	0	0	0	0	0	0

Link_ID [2]	Area ID [2]	Average Annual Vehicle Miles Traveled (veh-miles/yr)								
		Auto			Medium Truck			Heavy Truck		
		2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]
95705.95672	2	0	22,046	20,367	0	0	0	0	0	0
95706.95708	2	--	0	0	--	0	0	--	0	0
95708.95706	2	--	20,185	22,338	--	0	0	--	0	0
95672.95706	2	0	22,448	20,769	0	0	0	0	0	0
95706.95672	2	13,031	20,732	23,141	0	0	0	0	0	0
95703.95704	2	16,279	12,848	24,419	0	0	0	0	0	0
95704.95703	2	1,132	11,972	11,863	0	0	0	0	0	0
95703.95705	2	0	0	0	0	0	0	0	0	0

Link_ID [2]	Area ID [2]	Average Annual Vehicle Miles Traveled (veh-miles/yr)								
		Auto			Medium Truck			Heavy Truck		
		2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]	2015 [4]	2040 No Build [5]	2040 Build [6]
95705.95703	2	2,665	0	0	0	0	0	0	0	0
95686.95687	2	90,155	96,762	78,475	0	402	73	0	402	0
95687.95686	2	52,670	41,245	11,826	0	329	0	0	475	475
95688.95689	2	1,351	219	0	0	0	0	0	0	0
95689.95688	2	25,842	13,615	73	0	0	0	0	0	0
95687.95689	2	40,880	28,616	2,154	0	0	0	0	0	0
95689.95687	2	16,608	10,403	3,577	0	0	0	0	0	0
95700.95655	2	4,891	621	6,935	0	0	0	0	0	0
95655.95701	2	46,757	73,183	70,847	402	2,592	1,606	475	5,658	2,884
95701.95655	2	52,305	38,252	10,804	0	0	0	0	402	0
95667.95701	2	78,840	100,375	67,963	475	1,898	1,497	803	3,796	2,993
95701.95667	2	101,470	109,646	130,999	548	4,855	2,482	1,752	10,987	6,242
95623.95667	2	25,550	62,890	44,457	329	949	949	475	1,971	1,570
95667.95623	2	40,041	67,744	79,278	402	2,920	1,679	876	5,986	2,957
14507.95658	2	23,178	1,898	840	0	0	0	0	0	0
95658.14507	2	15,549	15,221	12,629	0	475	475	0	621	621
95658.95701	2	41,720	30,040	8,176	0	0	0	0	329	0
95701.95658	2	29,237	51,903	28,324	0	548	548	329	1,424	1,022
10986.95658	2	67,379	35,989	44,859	0	0	0	0	0	0
95658.10986	2	68,182	20,258	25,441	329	402	329	475	876	402
95664.95663	2	27,521	12,739	3,030	0	0	0	0	0	0
95647.95661	2	0	0	0	0	0	0	0	0	0
95661.95647	2	11,352	0	0	0	0	0	0	0	0
11006.95661	2	47,085	26,536	26,536	0	0	0	0	0	0
95661.11006	2	38,435	21,608	21,608	0	0	0	0	0	0
95694.95696	1	9,089	32,011	28,361	0	0	0	0	0	0
95666.95695	2	2,957	3,760	1,606	0	0	0	0	0	0
95695.95666	2	73	23,324	14,381	0	0	0	0	0	0
95666.95697	2	73	7,665	2,117	0	0	0	0	0	0
95697.95666	2	14,929	12,775	34,967	0	0	73	0	0	0
10779.95696	1	10,950	11,279	9,490	0	0	0	0	0	0
95696.10779	1	119,428	148,847	135,014	73	0	0	0	0	0
10777.95696	1	125,013	140,270	122,458	73	0	0	0	0	0
16187.95695	2	0	1,205	0	0	0	0	0	0	0
95695.16187	2	103,332	69,934	89,535	0	0	0	0	73	0
95665.95666	2	73	17,520	56,867	0	73	0	0	73	73
95666.95665	2	125,816	107,785	141,620	0	0	730	0	0	402
14405.95704	2	501,328	544,909	520,563	1,752	2,154	1,825	3,176	3,504	3,103
95704.14375	2	267,764	282,620	272,509	876	1,278	876	1,424	1,825	1,752
95648.14406	2	760,697	931,006	938,452	2,227	4,307	4,161	2,446	3,577	3,504
14374.95648	2	371,351	466,653	461,652	876	2,081	1,679	1,351	2,154	1,752
95693.27696	1	94,900	206,444	222,687	0	73	146	0	73	73
10728.95693	1	19,674	39,019	44,676	0	0	0	0	0	0
95693.10728	1	63,072	59,605	58,400	0	0	0	0	0	0
16186.95665	2	--	--	24,711	--	--	0	--	--	0
95665.16186	2	--	--	33,361	--	--	329	--	--	0
16186.95687	2	--	--	--	--	--	--	--	--	--
95687.16186	2	--	--	--	--	--	--	--	--	--
95709.14363	2	--	--	180,639	--	--	876	--	--	475
16186.95709	2	--	--	227,724	--	--	876	--	--	475
16187.95709	2	--	--	0	--	--	0	--	--	0
95709.16187	2	--	--	21,134	--	--	0	--	--	0
95701.95709	2	--	--	--	--	--	--	--	--	--
95709.95701	2	--	--	--	--	--	--	--	--	--
16183.16184	2	16,900	48,691	44,786	0	402	329	0	402	329
16184.16183	2	0	365	73	0	0	0	0	0	0
16186.14363	2	339,742	346,677	--	475	949	--	402	949	--
14369.95687	2	150,344	214,730	--	0	803	--	402	2,008	--
95687.14369	2	108,369	269,151	--	0	73	--	0	0	--
14367.14366	2	49,348	62,269	391,499	6,096	7,081	14,600	0	0	6,461
14367.10469	2	1,036,710	441,395	814,023	14,783	6,899	19,564	7,446	2,482	5,110

Appendix B MSAT Incomplete Information

Figure 1:
PROJECTED NATIONAL MSAT EMISSION TRENDS 2010 – 2050
FOR VEHICLES OPERATING ON ROADWAYS
USING EPA's MOVES2010b 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

APPENDIX C – Council on Environmental Quality (CEQ) Provisions Covering Incomplete or Unavailable Information (40 CFR 1502.22)

Sec. 1502.22 INCOMPETE OR UNAVAILABLE INFORMATION

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

(a) If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.

(b) If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:

1. a statement that such information is incomplete or unavailable;
2. a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
3. a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and
4. the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts that have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

(c) The amended regulation will be applicable to all environmental impact statements for which a Notice to Intent (40 CFR 1508.22) is published in the Federal Register on or after May 27, 1986. For environmental impact statements in progress, agencies may choose to comply with the requirements of either the original or amended regulation.

INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS

In FHWA’s view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in mobile source air toxic (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.

The Environmental Protection Agency (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" (EPA, https://www.epa.gov/iris/). 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 (HEI Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects) 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.

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 HEI (Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects). 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 (https://www.epa.gov/iris)."

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 (https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/$file/07-1053-1120274.pdf).

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.

Due to the limitations cited, a discussion such as the example provided in this Appendix (reflecting any local and project-specific circumstances), should be included regarding incomplete or unavailable information in accordance with Council on Environmental Quality (CEQ) regulations [40 CFR 1502.22(b)]. The FHWA Headquarters and Resource Center staff, Victoria Martinez (787) 771-2524, James Gavin (202) 366-1473, and Michael Claggett (505) 820-2047, are available to provide guidance and technical assistance and support.

Appendix C MSAT Analysis Results

Table C- 1
Project Summary
I-5 Rose Quarter Improvement Project

Pollutant	MOVES Pollutant ID	Emissions Estimate (tons/yr)								
		Road Type ID								
		4 (Urban Restricted)			5 (Urban Unrestricted)			Total		
		2017	2045 No Build	2045 Build	2017	2045 No Build	2045 Build	2017	2045 No Build	2045 Build
Greenhouse Gases (GHG)										
Total Gaseous Hydrocarbons	1	47.9	14.9	12.9	69.2	16.9	18.4	117	31.8	31.3
Total Energy Consumption	91	2.77	2.45	2.34	3.25	2.37	2.54	6.03	4.82	4.87
NO_x	5	6.56	2.30	2.03	9.78	2.33	2.47	16.3	4.63	4.50
N_2O	6	1.26	0.85	0.71	2.06	1.05	1.18	3.32	1.90	1.89
CO_2	90	211,780	187,999	179,062	247,389	180,282	192,963	459,169	368,281	372,025
CO_2e	98	212,317	188,309	179,323	248,244	180,654	193,375	460,561	368,963	372,698
CO_2e (Metric Tons)	98	192,611	170,831	162,679	225,203	163,886	175,427	417,814	334,718	338,106
Mobile Source Air Toxics (MSAT)										
Non-methane HC	79	41.4	12.8	11.0	59.4	14.6	16.0	101	27.3	27.0
VOC	87	43.5	13.3	11.4	61.4	15.2	16.7	105	28.5	28.1
Primary PM_{10} (DPM)	100	8.70	1.55	1.50	4.13	0.50	0.44	12.8	2.05	1.93
Primary Exhaust $PM_{2.5}$	110	8.00	1.42	1.38	3.80	0.46	0.40	11.8	1.88	1.78
Elemental Carbon	112	5.29	0.92	0.91	2.58	0.29	0.24	7.87	1.21	1.15
Organic Carbon	111	2.31	0.23	0.22	1.83	0.20	0.21	4.14	0.43	0.43
Sulfate Particulate	115	0.68	0.70	0.66	0.34	0.26	0.24	1.02	0.96	0.90
Composite - NonECPM	118	6.27	1.17	1.11	3.99	0.59	0.58	10.3	1.77	1.69
H_2O - Aerosol	119	0	0	0	0	0	0	0	0	0
Acetaldehyde	26	0.77	0.19	0.17	0.75	0.089	0.088	1.52	0.28	0.26
Acrolein	27	0.10	0.016	0.015	0.081	8.0E-03	8.0E-03	0.18	0.024	0.023
Benzene	20	1.05	0.16	0.14	1.76	0.24	0.26	2.82	0.40	0.40
1,3-Butadiene	24	0.12	0	0	0.18	0	0	0.30	0	0
Ethylbenzene	41	0.60	0.20	0.17	1.00	0.25	0.27	1.60	0.45	0.45
Formaldehyde	25	1.39	0.15	0.14	1.25	0.10	0.11	2.64	0.26	0.25
Naphthalene gas	185	0.16	7.7E-03	6.9E-03	0.15	8.7E-03	9.4E-03	0.31	0.016	0.016
Naphthalene particle	23	7.4E-05	1.6E-05	1.5E-05	1.4E-04	2.1E-05	2.3E-05	2.1E-04	3.8E-05	3.8E-05
Total Naphthalene	--	0.16	7.7E-03	6.9E-03	0.15	8.8E-03	9.4E-03	0.31	0.016	0.016
Polycyclic Organic Matter (POM)										
Total POM		0.069	3.3E-03	2.9E-03	0.065	3.9E-03	4.2E-03	0.13	7.2E-03	7.2E-03
Dibenzo(a,h)anthracene particle	68	3.7E-05	2.5E-06	2.3E-06	3.4E-05	3.4E-06	3.7E-06	7.1E-05	5.9E-06	6.0E-06
Dibenzo(a,h)anthracene gas	168	0	0	0	0	0	0	0	0	0
Fluoranthene particle	69	3.2E-03	1.7E-05	1.6E-05	1.6E-03	2.3E-05	2.5E-05	4.8E-03	4.0E-05	4.1E-05
Fluoranthene gas	169	5.0E-03	1.7E-04	1.5E-04	4.8E-03	2.2E-04	2.4E-04	9.8E-03	3.9E-04	3.9E-04
Acenaphthene particle	70	0	0	0	0	0	0	0	0	0
Acenaphthene gas	170	4.1E-03	1.7E-04	1.5E-04	3.8E-03	1.7E-04	1.9E-04	7.8E-03	3.4E-04	3.4E-04
Acenaphthylene particle	71	2.2E-05	4.6E-06	4.2E-06	4.0E-05	6.2E-06	6.8E-06	6.2E-05	1.1E-05	1.1E-05
Acenaphthylene gas	171	9.4E-03	5.3E-04	4.7E-04	0.011	7.1E-04	7.7E-04	0.020	1.2E-03	1.2E-03
Anthracene particle	72	8.4E-04	4.9E-06	4.6E-06	4.1E-04	6.5E-06	7.1E-06	1.3E-03	1.1E-05	1.2E-05
Anthracene gas	172	3.2E-03	1.1E-04	1.0E-04	3.0E-03	1.4E-04	1.5E-04	6.3E-03	2.5E-04	2.5E-04
Benz(a)anthracene particle	73	1.8E-03	4.4E-05	4.1E-05	1.1E-03	6.0E-05	6.5E-05	2.9E-03	1.0E-04	1.1E-04
Benz(a)anthracene gas	173	5.8E-04	1.7E-05	1.5E-05	5.3E-04	2.2E-05	2.3E-05	1.1E-03	3.9E-05	3.8E-05
Benzo(a)pyrene particle	74	1.1E-03	1.1E-04	9.7E-05	1.2E-03	1.5E-04	1.6E-04	2.4E-03	2.5E-04	2.6E-04
Benzo(a)pyrene gas	174	6.8E-06	7.7E-07	6.7E-07	1.2E-05	1.1E-06	1.2E-06	1.9E-05	1.9E-06	1.9E-06
Benzo(b)fluoranthene particle	75	4.3E-04	5.1E-05	4.7E-05	5.5E-04	7.2E-05	7.8E-05	9.8E-04	1.2E-04	1.3E-04
Benzo(b)fluoranthene gas	175	9.2E-05	1.0E-05	9.1E-06	1.6E-04	1.5E-05	1.7E-05	2.6E-04	2.6E-05	2.6E-05
Benzo(g,h,i)perylene particle	76	1.4E-03	2.8E-04	2.6E-04	2.6E-03	4.0E-04	4.3E-04	4.0E-03	6.8E-04	7.0E-04
Benzo(g,h,i)perylene gas	176	8.7E-06	0	0	5.9E-06	0	0	1.5E-05	0	0
Benzo(k)fluoranthene particle	77	2.8E-04	5.1E-05	4.7E-05	4.8E-04	7.2E-05	7.8E-05	7.6E-04	1.2E-04	1.3E-04
Benzo(k)fluoranthene gas	177	9.2E-05	1.0E-05	9.1E-06	1.6E-04	1.5E-05	1.7E-05	2.6E-04	2.6E-05	2.6E-05
Chrysene particle	78	1.2E-03	3.6E-05	3.3E-05	7.9E-04	5.0E-05	5.4E-05	2.0E-03	8.6E-05	8.8E-05
Chrysene gas	178	3.2E-04	1.7E-05	1.5E-05	3.7E-04	2.3E-05	2.5E-05	6.8E-04	4.0E-05	4.0E-05
Fluorene particle	81	1.4E-03	0	0	6.4E-04	0	0	2.0E-03	0	0
Fluorene gas	181	7.1E-03	3.4E-04	3.1E-04	6.8E-03	3.6E-04	3.8E-04	0.014	7.0E-04	6.9E-04
Indeno(1,2,3,c,d)pyrene particle	82	5.7E-04	1.1E-04	9.9E-05	9.9E-04	1.5E-04	1.6E-04	1.6E-03	2.6E-04	2.6E-04
Indeno(1,2,3,c,d)pyrene gas	182	0	0	0	0	0	0	0	0	0
Phenanthrene particle	83	3.4E-03	1.9E-05	1.8E-05	1.6E-03	2.3E-05	2.5E-05	5.0E-03	4.2E-05	4.3E-05
Phenanthrene gas	183	0.013	9.4E-04	8.5E-04	0.014	9.6E-04	1.0E-03	0.027	1.9E-03	1.9E-03
Pyrene particle	84	4.6E-03	1.8E-05	1.7E-05	2.2E-03	2.5E-05	2.7E-05	6.8E-03	4.3E-05	4.4E-05
Pyrene gas	184	5.9E-03	1.9E-04	1.6E-04	5.6E-03	2.5E-04	2.7E-04	0.012	4.4E-04	4.3E-04