

I-81 VIADUCT PROJECT

SECTION 6-4-4

AIR QUALITY

This section presents the assessment of potential effects of the Project on ambient air quality. The air quality analyses presented below were performed in accordance with the procedures found in the NYSDOT *TEM*, the USEPA guidance¹ on project-level analyses, and the FHWA's current guidance on Mobile Source Air Toxic (MSAT) analysis.² This section documents the assessment of potential effects on air quality from traffic pattern changes at the three and four most congested intersections in the local street network for the Viaduct and Community Grid Alternatives, respectively, as well as the mesoscale (or regional) analysis that was conducted. Potential air quality effects associated with construction activities are described.

The air quality study areas for each alternative include the network of roadways and intersections analyzed in the traffic analysis for each Project alternative, as described in **Chapter 5, Transportation and Engineering Considerations**. The USEPA MOVES2014a emissions model was used to obtain emissions factors using the fleet mix and speeds for the Project Area and applied to traffic volumes projected in the countywide network from the traffic analysis for the mesoscale analysis. The vehicle mix was derived from a representative, project-specific vehicle mix that was projected as part of the traffic analysis for this Project and further classified into vehicle types compatible with MOVES2014a, using regional data collected by NYSDOT.

The Project would not generate or divert a substantial volume of diesel vehicle traffic as compared with the No Build Alternative. Therefore, based on NYSDOT³ and USEPA¹ guidance, microscale analyses of particulate matter less than or equal to 2.5 micrometers (PM_{2.5}) and less than or equal to 10 micrometers (PM₁₀) for the Project are not required. However, a PM microscale analysis was conducted to address concerns expressed by the public regarding air quality in the vicinity of I-81.

For the local area (microscale) analysis, a review of the intersections in the Project Area (see **Figures 5-8 and 5-9**) analyzed in the traffic modeling provided initial screening and a basis for determining intersections that would experience the largest increase in traffic volumes and congestion and a potential decrease in travel speeds. Analysis sites were selected based on the traffic conditions as well as proximity to sensitive receptors. The MOVES2014a emissions model and the CAL3QHCR dispersion model were used to model concentrations at the analysis sites, as described in the following sections. Similarly, the effects of construction activity (e.g., lane closures or detours) on local traffic conditions were analyzed using this methodology.

On-site construction activity was assessed on a local level using the USEPA NONROAD emissions model and the AERMOD dispersion model to analyze concentrations at receptors near areas where demolition and other construction activities would occur. To assess the maximum potential combined

¹ USEPA. *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas*. EPA-420-B-15-084. November 2015.

² FHWA. *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents*. October 18, 2016.

³ NYSDOT. *The Environmental Manual Chapter 1.1 Section 8*. December 2012.

effects of changes in traffic and construction activities, the maximum concentrations resulting from both sources were considered.

6-4-4.1 AFFECTED ENVIRONMENT

6-4-4.1.1 NATIONAL AMBIENT AIR QUALITY STANDARDS

As required by the Clean Air Act and its Amendments of 1990 (CAA), primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone, particulate matter (both PM_{2.5} and PM₁₀), sulfur dioxide (SO₂), and lead. The primary standards represent levels that are requisite to protect the public health, including the health of sensitive populations such as asthmatics, children, and the elderly, with an adequate margin of safety. The secondary standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. The primary standards are generally either the same as the secondary standards or more restrictive. The NAAQS are presented in **Table 6-4-4-1**. In addition to the criteria pollutants discussed above, mobile source air toxics, or MSATs, are pollutants known to cause or are suspected of causing cancer or other serious health ailments. The CAA Amendments of 1990 listed 188 air toxics and addressed the need to control toxic emissions from transportation sources. USEPA identified nine compounds with substantial contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA).⁴ These compounds are 1, 3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority MSATs, the list is subject to change and may be adjusted in consideration of future USEPA rules.

6-4-4.1.2 NAAQS ATTAINMENT STATUS AND STATE IMPLEMENTATION PLANS

The CAA, as amended in 1990, defines non-attainment areas (NAA) as geographic regions that have been designated as not meeting one or more NAAQS. When an area is designated an NAA by USEPA, the state is required to develop and implement a State Implementation Plan (SIP), which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the CAA, followed by a plan for maintaining attainment status once the area is in attainment.

Onondaga County is currently in attainment for all standards of criteria pollutants. In 1993, USEPA re-designated the Syracuse area of Onondaga County as a maintenance area for CO. The 20-year CO air quality maintenance period for Onondaga County concluded on September 29, 2013. Thus, transportation/air quality conformity per §176(c) of the CAA and 40 CFR Part 93 Subpart A is not applicable to transportation projects in Onondaga County.

⁴ <https://www.epa.gov/national-air-toxics-assessment/2011-national-air-toxics-assessment>

Table 6-4-4-1
National Ambient Air Quality Standards (NAAQS)

| Pollutant | | Primary / Secondary | Averaging Time | Level | Form |
|-------------------------------------|-------------------|-----------------------|-------------------------|---------------------------|---|
| Carbon Monoxide (CO) | | primary | 8 hours | 9 ppm | Not to be exceeded more than once per year |
| | | | 1 hour | 35 ppm | |
| Lead (Pb) | | primary and secondary | Rolling 3 month average | 0.15 µg/m ³⁽¹⁾ | Not to be exceeded |
| Nitrogen Dioxide (NO ₂) | | primary | 1 hour | 100 ppb | 98th percentile of 1-hour daily maximum concentrations, averaged over 3 years |
| | | primary and secondary | 1 year | 53 ppb ⁽²⁾ | Annual Mean |
| Ozone (O ₃) | | primary and secondary | 8 hours | 0.070 ppm ⁽³⁾ | Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years |
| Particle Pollution (PM) | PM _{2.5} | primary | 1 year | 12.0 µg/m ³ | Annual mean, averaged over 3 years |
| | | secondary | 1 year | 15.0 µg/m ³ | Annual mean, averaged over 3 years |
| | | primary and secondary | 24 hours | 35 µg/m ³ | 98th percentile, averaged over 3 years |
| | PM ₁₀ | primary and secondary | 24 hours | 150 µg/m ³ | Not to be exceeded more than once per year on average over 3 years |
| Sulfur Dioxide (SO ₂) | | primary | 1 hour | 75 ppb ⁽⁴⁾ | 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years |
| | | secondary | 3 hours | 0.5 ppm | Not to be exceeded more than once per year |

Notes:

ppm – parts per million (unit of measure for gases only).

µg/m³ – micrograms per cubic meter (unit of measure for gases and particles, including lead).

All annual periods refer to calendar year.

⁽¹⁾ In areas that are designated to be in nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.

⁽²⁾ The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

⁽³⁾ The final rule was signed on October 1, 2015, effective December 28, 2015. The previous (2008) O₃ standards additionally remain in effect in some areas. Revocation of the previous (2008) O₃ standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

⁽⁴⁾ The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will also remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a SIP call under the previous SO₂ standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Sources: 40 CFR Part 50. National Primary and Secondary Ambient Air Quality Standards; USEPA.

<https://www.epa.gov/criteria-air-pollutants/naaqs-table>. Retrieved March 2021.

6-4-4.1.3 EXISTING CONDITIONS

Existing conditions are characterized using pollutant levels measured at area monitoring stations. Concentrations of relevant regulated pollutants at stations closest to the Project Area are shown in **Table 6-4-4-2**. These values are used to project background conditions in the Project Area and are consistent with the background conditions used in the future conditions analyses (see below). As shown in the table, the monitored levels do not exceed the NAAQS.

Table 6-4-4-2
Representative Monitored Ambient Air Quality Data

| Pollutant | Monitoring Station Name/Location | Units | Averaging Period | Concentration | NAAQS |
|---|----------------------------------|-------------------|----------------------|---------------|-------|
| CO | Rochester Near Road, Monroe | ppm | 1-hour | 1.6 | 35 |
| | | | 8-hour | 0.7 | 9 |
| SO ₂ | East Syracuse, Onondaga | ppb | 1-hour ¹ | 2.33 | 75 |
| | | | 3-hour ² | 10.2 | 500 |
| PM ₁₀ | Rochester 2, Monroe | µg/m ³ | 24-hour | 33.0 | 150 |
| PM _{2.5} | East Syracuse, Onondaga | µg/m ³ | 24-hour ³ | 13.5 | 35 |
| | | | Annual | 5.6 | 12 |
| NO ₂ | Buffalo, Erie | ppb | 1-hour ⁴ | 49.20 | 100 |
| | | | Annual | 9.81 | 53 |
| Lead | Rochester 2, Monroe | µg/m ³ | 3-month | 0.004 | 0.15 |
| Ozone | East Syracuse, Onondaga | ppm | 8-hour | 0.065 | 0.070 |
| Notes: 1. The 1-hour value is based on a three-year average (2016-2018) of the 99th percentile of daily maximum 1-hour average concentrations. USEPA replaced the 24-hr and the annual standards with the 1-hour standard. 2. The 3-hour value is based on the maximum 3-hour average concentration in 2011-2012, the latest years of reported 3-hour concentrations. 3. The 24-hour value is based on a three-year average (2016-2018) of the 98th percentile of 24-hour average concentrations. 4. The 1-hour value is based on a three-year average (2016-2018) of the 98th percentile of daily maximum 1-hour average concentrations. Source: NYSDEC, New York State Ambient Air Quality Report (2014-2018). | | | | | |

6-4-4.2 NO BUILD ALTERNATIVE

Under the No Build Alternative, I-81 would remain with routine maintenance and ongoing repairs. Emissions would continue to be emitted from existing sources, including on-road emissions in the Project Area. Construction emissions associated with the Project would not occur, but emissions associated with maintenance of aging roadway facilities would continue. An assessment of the No Build Alternative was performed for comparison with the Viaduct and Community Grid Alternatives. The results of the assessment of the No Build Alternative as compared with the Viaduct Alternative and Community Grid Alternative are presented in **Tables 6-4-4-4 through 6-4-4-7** and **Tables 6-4-4-9 through 6-4-4-12**, respectively.

6-4-4.3 ENVIRONMENTAL CONSEQUENCES OF THE VIADUCT ALTERNATIVE

6-4-4.3.1 PERMANENT/OPERATIONAL EFFECTS

Microscale Analysis

Carbon Monoxide (CO) Microscale Analysis

A screening was conducted using TEM procedures to determine if a CO microscale analysis is warranted for the Viaduct Alternative. The screening analysis was based on the Level of Service (LOS), traffic volumes, and average travel speed for the AM and PM peak periods for all intersections analyzed in the traffic modeling for the Viaduct Alternative. For locations that are expected to operate at LOS D or worse and would experience an increase of traffic volume of more than 10 percent or a decrease of average travel speed of more than 20 percent, a volume threshold screening was conducted. Screening was based on emission factors developed from the MOVES2014a emissions model compared against the applicable criterion. Based on the screening, it was determined that a microscale air quality analysis for CO is not warranted. For a detailed technical discussion of the screening, see **Appendix G**.

Particulate Matter (PM) Microscale Analysis

The Viaduct Alternative would not generate or divert substantial volumes of diesel vehicle traffic as compared with the No Build Alternative. Therefore, based on NYSDOT⁵ and USEPA⁶ guidance, a PM microscale analysis for the Viaduct Alternative is not required. However, to address concerns expressed from the public regarding PM air quality in the vicinity of I-81, a PM microscale analysis was performed using the USEPA emissions model MOVES2014a and dispersion model CAL3QHCR. Three sites within the study area were selected for analysis based on projected traffic conditions, the introduction of new/modified roadways, and the proximity to sensitive receptors (as described in **Chapter 5, Transportation and Engineering Considerations**). The height of the new viaduct was considered in the modeling, and multiple receptors were modeled at each of the selected sites. Receptors were placed along the approach and departure links as well as roadway segments at regularly spaced intervals. To capture the maximum potential concentration, a smaller interval was used in areas immediately adjacent to the analyzed intersection. For locations farther away, an increased interval was used. Due to the presence of elevated roadways, receptors were also placed at elevated residential receiver locations (e.g., second story windows).

A critical analysis year was determined based on the emissions strength calculated from applying the emission factors generated from MOVES2014a with the corresponding average speed and vehicle mix to the volumes at selected sites. The years that were evaluated were 2026 (the analysis year for project completion) and 2056 (30 years after the project's completion). It was determined that the analysis year of 2026 provides a more conservative estimate of PM concentrations for decision making and therefore was selected as the critical analysis year.

⁵ NYSDOT. The Environmental Manual Chapter 1.1 Section 8. December 2012.

⁶ USEPA. *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas*. EPA-420-B-15-084. November 2015.

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At the analysis locations, PM concentrations would be below the NAAQS (see **Table 6-4-4-3**). At Site 3, the difference between concentrations for PM₁₀ and PM_{2.5} would increase by, at most, 11.8 percent when compared to concentrations predicted under the No Build Alternative. Due to improved speeds at Site 1, concentrations are projected to remain constant or decrease when compared with the No Build Alternative. For a detailed technical discussion on the methodology and results of the analysis, see **Appendix G**.

Table 6-4-4-3
PM_{2.5} and PM₁₀ Maximum Concentrations at Analysis Sites (µg/m³)

| Analysis Site | Pollutant | Averaging Period | Background Concentration | No Build Total Concentration | Viaduct Alternative Total Concentration | Percent Change | NAAQS |
|---|-------------------|------------------|--------------------------|------------------------------|---|----------------|-------|
| Site 1: Crouse Avenue and Burnet Avenue to Crouse Avenue and Erie Boulevard | PM ₁₀ | 24-Hour | 33.0 | 43.0 | 40.5 | -5.9% | 150 |
| | PM _{2.5} | 24-Hour | 13.5 | 14.5 | 14.4 | -1.1% | 35 |
| | | Annual | 5.6 | 5.9 | 5.9 | 0.0% | 12 |
| Site 2: N. West Street and W. Genesee Street | PM ₁₀ | 24-Hour | 33.0 | 42.7 | 42.0 | -1.6% | 150 |
| | PM _{2.5} | 24-Hour | 13.5 | 14.8 | 14.9 | 1.1% | 35 |
| | | Annual | 5.6 | 6.3 | 6.0 | -4.2% | 12 |
| Site 3: Almond Street and Harrison Street | PM ₁₀ | 24-Hour | 33.0 | 82.7 | 92.4 | 11.8% | 150 |
| | PM _{2.5} | 24-Hour | 13.5 | 16.7 | 17.6 | 5.1% | 35 |
| | | Annual | 5.6 | 6.6 | 7.3 | 10.3% | 12 |
| Notes: PM ₁₀ background concentration was based on 2016-2018 data at the Rochester 2 monitoring station. PM _{2.5} background concentrations for 24-hour and annual PM _{2.5} were based on 2016-2018 data at the East Syracuse monitoring station. Concentrations are based on the projected roadway conditions in the 2026 analysis year as a reasonable representative for the estimated time of completion. | | | | | | | |

As shown, at each of the analysis sites, PM concentrations would be below the NAAQS, and would not be substantially different from concentrations projected under the No Build Alternative, as the background concentrations were the dominant component in the total concentrations. Therefore, the Viaduct Alternative would not adversely affect PM concentrations in these areas.

Mesoscale Analysis

A mesoscale emissions analysis for CO, VOC, NO_x, and PM was conducted in accordance with NYSDOT's *TEM* using the USEPA mobile source emissions model, MOVES2014a (the model in effect at the time of the analysis), and the results of the regional traffic modeling conducted for the Viaduct Alternative. The study area used in the regional traffic modeling, as described in **Chapter 5, Transportation and Engineering Considerations**, was also used as the study area for the mesoscale analysis. The modeled roadways consist of the area where a shift in local traffic using alternate routes could occur as a result of the reconstruction of the I-81 viaduct. The modeled traffic network extents are shown in **Figure 1 of Appendix C-2**. Like the microscale analysis, the mesoscale analysis was conducted for 2026 and 2056. The mesoscale analysis used estimated annual vehicle miles traveled (VMT) by vehicle type and speed-based emission rates by link that were specific to each alternative. For detailed technical information on the analysis methodology, see **Appendix G**.

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The projected VMT and the mesoscale emissions associated with traffic conditions under the Viaduct Alternative are shown in **Table 6-4-4-4**. As described in **Chapter 5, Transportation and Engineering Considerations**, traffic volumes in the Viaduct Alternative would be higher on I-81 compared with the No Build Alternative because additional traffic would be attracted to the improved highway that would result from the Viaduct Alternative. Shifts in traffic volumes would occur between local streets and parallel highway segments, due to the operational improvements, new interconnected ramps between routes, and changes to existing ramps.

Compared with the No Build Alternative, regional emissions would decrease under the Viaduct Alternative for all criteria pollutants analyzed (**Table 6-4-4-4**). The changes in emissions between the No Build and the Viaduct Alternatives are driven by three inputs—slight increases in annual VMT, changes to traffic conditions between the alternatives (i.e., travel speed and vehicle classification) on individual road segments, and the analysis year (which would determine fleet-wide average per vehicle-mile emission rates for both alternatives). For all analysis years, the improvements in travel speed and the predicted shift in traffic between roadway and the associated traffic conditions would result in a percent decrease in annual emissions between the No Build and Viaduct Alternatives much larger than the percent increase in VMT. These emissions would be area wide. Total emissions in 2056 would also be substantially lower than emissions in earlier years due to continued turnover of the fleet to lower emissions vehicles.

Table 6-4-4-4

Criteria Pollutant Emissions in the No Build and Viaduct Alternatives

| Analysis Year | Alternative | Annual VMT | Tons per Year | | | | |
|---------------|-------------|----------------------|-------------------|------------------|-----------------|------------------|-------------------|
| | | | CO | NO _x | VOC | PM ₁₀ | PM _{2.5} |
| 2026 | No Build | 3,796,753,177 | 12,033.6 | 1,746.5 | 340.2 | 95.6 | 255.3 |
| | Viaduct | 3,798,038,105 | 10,892.9 | 1,576.0 | 280.6 | 79.8 | 190.4 |
| | Difference | 1,284,928 (0.03%) | -1,140.6 (-9%) | -170.6 (-10%) | -59.6 (-18%) | -15.8 (-17%) | -64.9 (-25%) |
| 2056 | No Build | 3,988,571,639 | 3,873.2 | 352.9 | 113.7 | 33.0 | 193.0 |
| | Viaduct | 3,997,227,337 | 3,576.7 | 306.4 | 90.5 | 24.3 | 133.3 |
| | Difference | 8,655,698 (0.22%) | -296.5 (-8%) | -46.5 (-13%) | -23.2 (-20%) | -8.7 (-26%) | -59.7 (-31%) |

MSAT Analysis

According to FHWA's MSAT guidance,⁷ design-year annual average daily traffic (AADT) projections less than 140,000 to 150,000 are considered to have low potential for MSAT effects and require qualitative assessment. The overall increase in traffic volumes with completion of the Viaduct Alternative would not be substantial, with modest additional traffic on I-81 and a decrease in traffic on some local streets and parallel routes. However, the highest forecasted AADT in the study area for the Viaduct Alternative is 99,533 (see **Appendix C-4, Attachment C**; I-81: Segment 11), which is

⁷ FHWA. *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents*. October 18, 2016.

well below the FHWA criteria for a quantitative analysis. Therefore, a qualitative assessment was conducted.

MSAT emissions would be proportional to the VMT of the No Build and Viaduct Alternatives for a given year when variables such as fleet mix remain similar. Since the estimated VMT under the No Build and Viaduct Alternatives varies by less than 1 percent for both the 2026 and 2056 analysis years as shown in **Table 6-4-4-5**, there would be no appreciable difference in overall MSAT emissions between the alternatives in either analysis year. In locations where traffic volumes are predicted to increase or where new, expanded, or elevated roadway sections would be located closer to nearby residences, schools, and businesses, there may be localized areas of increased ambient concentrations of MSATs. The Viaduct Alternative would locate roadway segments closer to sensitive receptors adjacent to the segment of southbound I-81 between the entrance ramp from I-690 and Harrison Street when compared to the No Build Alternative. Under both alternatives, future MSAT emissions are expected to be substantially lower than under existing conditions due to implementation of USEPA's vehicle and fuel regulations.

Table 6-4-4-5
Annual VMT in the No Build and Viaduct Alternatives

| Analysis Year | Alternative | Annual VMT |
|---------------|-------------|----------------------|
| 2026 | No Build | 3,796,753,177 |
| | Viaduct | 3,798,038,105 |
| | Difference | 1,284,928 (0.03%) |
| 2056 | No Build | 3,988,571,639 |
| | Viaduct | 3,997,227,337 |
| | Difference | 8,655,698 (0.22%) |

In general, data are not sufficient to predict the project-specific health impacts due to changes in MSAT emissions. To determine the potential for adverse health effects, multiple levels of modeling must be performed (emissions, dispersion, exposure, etc.) with each subsequent model building on the predictions and assumptions of the previous model. Furthermore, 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.⁹ Due to the limitations in the methodologies for forecasting health impacts, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. FHWA's MSAT guidance and **Appendix G** of this FEIS provide additional discussion of incomplete or unavailable information for project-specific MSAT health impacts analysis.

⁹ Health Effects Institute. Special Report 16, <https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects>.

6-4-4.3.2 CONSTRUCTION EFFECTS

Emissions from on-site construction equipment, on-road construction-related vehicles, diverted traffic during construction, and dust-generating construction activities have the potential to affect air quality, which is discussed in this section. Recognizing the potential air quality effects of construction activities, NYSDOT has identified construction mitigation commitments, which include not only its standard specifications but also measures identified specifically for this project based on its proximity to sensitive land uses. These measures are shown in **Table 4-7** and are highlighted below.

Construction of the Viaduct Alternative is anticipated to take seven years to complete. An analysis was conducted to assess the effects of on-site construction activities on the surrounding community. Based on the CO screening methodologies used for the operational traffic analysis, it was determined that a microscale air quality analysis for CO is not warranted. However, to address concerns expressed by the public regarding PM air quality in the vicinity of I-81 during construction, a microscale detour traffic analysis was conducted. Traffic would be disrupted during the construction period, but detours/diversions are not expected to last more than three weeks in any one location (see **Chapter 4, Construction Means and Methods**). Therefore, in accordance with the NYSDOT's *TEM*, a mesoscale emissions analysis for construction traffic detours/diversions is not warranted.

On-Site Construction Activity

In general, much of the heavy equipment used in construction is powered by diesel engines that have the potential to produce relatively high PM emissions. Fugitive dust generated by construction activities is also a source of PM. In addition, gasoline engines produce relatively high levels of CO. Since USEPA mandates the use of ultra-low-sulfur diesel (ULSD) fuel for all highway and non-road diesel engines,¹⁰ SO₂ emitted from the Project's construction activities would be negligible. Therefore, the three primary air pollutants of concern for construction activities are PM₁₀, PM_{2.5}, and CO.

The MLK, Jr. East area was selected for the on-site air quality analysis because of the proximity of construction activities to several sensitive receptor locations there, including the Dr. King Elementary School, the State University of New York College of Environmental Science and Forestry, the Tucker Missionary Baptist Church, and residential buildings. As construction at other locations would have similar or less proximity to sensitive uses or there are fewer sensitive uses present in those areas, this location represents a reasonable, worst-case scenario for the analysis. The dispersion analysis included modeling of the worst-case annual and short-term (i.e., 24-hour, 8-hour, and 1-hour) averaging periods. Other areas in the Project corridor were not modeled, but are discussed qualitatively, based on the reasonable worst-case analysis results.

The following are the key factors and assumptions used for this analysis:

- **Engine Emissions:** The sizes, types, and number of units of construction equipment were estimated based on the construction activity schedule anticipated for the Project (see **Chapter 4, Construction Means and Methods**). Emission factors for CO, PM₁₀, and PM_{2.5} from on-site construction engines were developed using the USEPA NONROAD2008 emission model

¹⁰ USEPA required a major reduction in the sulfur content of diesel fuel intended for use in locomotive, marine, and non-road engines and equipment, including construction equipment. As of 2015, the diesel fuel produced by all large refiners, small refiners, and importers must be ULSD fuel. Levels in non-road diesel fuel are limited to a maximum of 15 parts per million.

(NONROAD).¹¹ Emission rates from truck engines were developed using the MOVES2014a emission model.

- **On-site Fugitive Dust:** In addition to engine emissions, fugitive dust emissions from operations (e.g., excavation and transferring of excavated materials into dump trucks) were calculated based on USEPA procedures in AP-42 Table 13.2.3-1.¹² In accordance with NYSDOT specifications meant to minimize and otherwise mitigate the adverse effects of construction activities on the community, the Contractor would be required to develop a dust control plan and implement it during construction (see **Table 4-7 of Chapter 4, Construction Means and Methods**). The plan could include such measures as requiring trucks that are hauling loose material to be equipped with tight-fitting tailgates and have their loads securely covered prior to leaving the Project site and the use of water sprays for demolition, excavation, and transfer of soils to ensure that materials would be dampened as necessary to avoid the suspension of dust into the air. These measures would effectively reduce PM emissions from dust-generating construction activities.
- **Dispersion Modeling:** Potential effects from construction sources were evaluated using the USEPA/AMS AERMOD, a refined dispersion model. AERMOD is a state-of-the-art dispersion model, applicable to rural and urban areas, flat and complex terrains, surface and elevated releases, and multiple sources (including point, area, and volume sources). AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain and includes updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and handling of terrain interactions.
- **Source Simulation:** As discussed above, the MLK, Jr. East area was selected for the on-site air quality analysis because of the proximity of construction activities (including both demolition of the existing I-81 roadway and construction of the highway) to several sensitive receptor locations. For short-term model scenarios (predicting concentration averages for periods of 24 hours or less), all stationary sources, such as cranes and pile hammers, which idle in a single location while unloading, were simulated as point sources. Point sources were conservatively modeled at a single location throughout the year to capture the maximum potential short-term concentrations. Other engines, such as excavators and loaders that would move around the site on any given day, were simulated as area sources. For periods of eight hours or less, it was assumed that all engines would be active simultaneously. All sources are anticipated to move around the site throughout the year and were therefore simulated as area sources in the annual analysis. Sources were assumed to be operating during a typical eight-hour construction workday (i.e., from 7:00 AM to 3:00 PM) in the dispersion model, consistent with the assumption presented in **Chapter 4, Construction Means and Methods**.
- **Meteorological Data:** The meteorological data set consisted of five consecutive years of latest available meteorological data: surface data collected at the nearest representative National Weather

¹¹ <https://www.epa.gov/moves/nonroad-model-nonroad-engines-equipment-and-vehicles> "NONROAD2008 has been incorporated into MOVES2014 and MOVES2014a. USEPA recommends using MOVES2014a if you are having problems installing or using NONROAD2008 on newer operating systems."

¹² USEPA Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, Section 1.3, Table 1.3-1.

Service Station (Syracuse Hancock International Airport) from 2011 to 2015 and concurrent upper air data collected at Albany, NY, the nearest upper air monitoring station. The meteorological data provide hour-by-hour wind speeds and directions, stability states, and temperature inversion elevation over the five-year period. These data were processed using the USEPA AERMET program to develop data in a format that could be readily processed by the AERMOD model.

- **Background Concentrations:** To estimate the maximum expected total pollutant concentrations, the calculated concentrations from the construction emission sources were added to a background value that accounts for existing pollutant concentrations from other sources. The background levels are based on concentrations monitored at the nearest ambient air monitoring stations (see **Table 6-4-4-2**).
- **Receptor Locations:** Receptors were placed at locations that would be publicly accessible, at residential and other sensitive uses, such as schools, at both ground-level and elevated locations (e.g., windows of residences). In addition, a ground-level receptor grid extending one kilometer from the construction sources was established to enable extrapolation of concentrations throughout the study area at locations more distant from construction activities.
- **Analysis Year:** The highest emissions were predicted for Year 2 of construction when demolition, superstructure, and earthworks activities were initially projected to overlap. There would be an increasing percentage of in-use newer and cleaner vehicles and engines for construction in future years. Year 2 reflects conditions in 2018. Construction would occur later than 2018, but emissions factors for 2018 are higher than later years so using 2018 for Year 2 of construction is conservative.

Maximum predicted concentrations (including background) from peak construction activities under the Viaduct Alternative are presented in **Table 6-4-4-6**. As shown, total maximum concentrations from the on-site sources are predicted to be lower than the corresponding NAAQS for PM_{2.5}, PM₁₀, and CO. The modeled results for the analysis year are based on construction activities at the reasonable worst-case location in the MLK, Jr. East area where sensitive receptor locations are near on-site construction activities. Lower concentration increments from construction would be expected at other locations in the study area since activities would generally be located farther away from sensitive receptor locations.

Combined Effect

Since emissions from both on-site construction equipment and construction-related traffic diversions may contribute to concentrations concurrently at the same location, the combined effect was assessed where applicable. Roadway links were added to the construction AERMOD dispersion model alongside the on-site construction sources. Traffic conditions, volumes, and roadway locations from the mobile source analysis of construction-related traffic diversions were used for the combined modeling and were assumed to occur throughout the construction period.

As presented in **Table 6-4-4-7**, total maximum concentrations from the on-site sources and traffic diversions including background concentrations are projected to be lower than the corresponding NAAQS for PM_{2.5} and PM₁₀. Therefore, construction under the Viaduct Alternative would not result in substantial air quality effects.

Table 6-4-4-6

Maximum Predicted Pollutant Concentrations from On-Site Construction Activity for the Viaduct Alternative

| Pollutant | Averaging Period | Background | Concentration Increment from On-Site Construction Activity | Total | NAAQS |
|--|------------------|------------------------|--|------------------------|-----------------------|
| PM _{2.5} | 24-hour | 13.5 µg/m ³ | 4.9 µg/m ³ | 18.4 µg/m ³ | 35 µg/m ³ |
| | Annual | 5.6 µg/m ³ | 0.3 µg/m ³ | 5.9 µg/m ³ | 12 µg/m ³ |
| PM ₁₀ | 24-hour | 33.0 µg/m ³ | 5.2 µg/m ³ | 38.2 µg/m ³ | 150 µg/m ³ |
| CO | 1-hour | 1.6 ppm | 10.5 ppm | 12 ppm | 35 ppm |
| | 8-hour | 0.7 ppm | 2.6 ppm | 3.3 ppm | 9 ppm |
| Notes: PM ₁₀ and CO background concentrations were based on 2016-2018 data at the Rochester 2 monitoring station. PM _{2.5} background concentrations for 24-hour and annual PM _{2.5} were based on 2016-2018 data at the East Syracuse monitoring station. | | | | | |

Table 6-4-4-7

Maximum Combined Concentrations from On-Site Construction Activity and Traffic Diversions during Construction for the Viaduct Alternative (µg/m³)

| Pollutant | Averaging Period | Background | On-Site Construction Activity Contribution ¹ | Mobile Sources Contribution ¹ | Total | NAAQS |
|--|------------------|------------|---|--|-------|-------|
| PM _{2.5} | 24-hour | 13.5 | 4.9 | 1.5 | 19.9 | 35 |
| | Annual | 5.6 | 0.3 | 0.4 | 6.3 | 12 |
| PM ₁₀ | 24-hour | 33.0 | 5.2 | 8.8 | 47.0 | 150 |
| Notes: 1. The values shown are the contributions that are predicted to occur at the receptor of maximum total concentration. PM ₁₀ background concentration, 33.0 µg/m ³ , was based on 2016–2018 data at the Rochester 2 monitoring station. PM _{2.5} background concentrations for 24-hour and annual PM _{2.5} (13.5 and 5.6 µg/m ³ , respectively) were based on 2016–2018 data at the East Syracuse monitoring station. | | | | | | |

6-4-4.3.3 INDIRECT EFFECTS

As part of the Viaduct Alternative, consumption of gasoline and diesel by mobile sources and electricity would result in indirect pollutant emissions—upstream emissions associated with producing fuels, power, or materials. Direct emissions resulting from the combustion of gasoline and diesel are accounted for in the microscale and mesoscale analyses above. No direct emissions are associated with electric consumption. Indirect emissions would not be emitted from any one location (e.g., oil rig, fuel refinery, power plant, etc.), would be spread across the entire fuel distribution or energy grid, and would be located a distance from the Project Area. Therefore, adverse indirect effects associated with upstream emissions are not anticipated.

As discussed in **Section 6-2-1, Neighborhood Character**, the Viaduct Alternative represents the continuation of an existing use, and its implementation would not impede planned development or land use plans in the Project Area. Some new development may be attracted to the Northern Neighborhoods Subarea (north of I-690) associated with the Clinton Street improvements and to the

Southwest Neighborhoods Subarea (Near Westside and Downtown) associated with the removal of the West Street ramps. Both areas would experience improved access and West Street would experience increased visual connections as a result of the Viaduct Alternative. However, in the majority of the study area, the Viaduct Alternative represents the continuation of an existing use present in the No Build Alternative. In areas south of I-690, the elevated highway would continue to influence development decisions within the study area in a manner similar to the No Build Alternative.

The land parcels that could be converted from transportation to other purposes would be subject to local land use regulations. Any development in those areas is likely to be relatively small and would not induce substantial changes in air quality. Therefore, the Viaduct Alternative would not result in any further indirect air quality effects.

6-4-4.3.4 CUMULATIVE EFFECTS

The traffic data that were used in the air quality analyses accounted for traffic diversions associated with the Viaduct Alternative as well as traffic associated with known or reasonably foreseeable projects. Thus, the results of the air quality analyses reflect the traffic effects of the proposed action combined with that of reasonably foreseeable actions. No adverse cumulative effects related to air quality are anticipated as a result of the Viaduct Alternative. Furthermore, as presented in **Table 4-7** of **Chapter 4, Construction Means and Methods**, NYSDOT has developed air quality mitigation commitments to minimize the effects of construction activities on local air quality.

6-4-4.3.5 MITIGATION

The Viaduct Alternative would involve the reconstruction of highway elements and would improve traffic operational conditions on I-81, I-481, and I-690 (see **Chapter 5, Transportation and Engineering Considerations**). New and replaced signals would be designed to minimize traffic impacts with coordination through the existing centrally controlled traffic signal communication system. For intersections that are projected to operate at saturated levels, traffic mitigation measures (e.g., addition of turn lanes or signal improvements) may be introduced in the future to improve the traffic operational conditions at these intersections. Measures taken to improve traffic conditions would also result in improvements to the projected air quality conditions. No substantial permanent/operational air quality effects were identified for the Viaduct Alternative. Therefore, no additional air quality mitigation measures are warranted.

To further reduce the effects of construction activities on air quality at nearby sensitive receptor locations, NYSDOT would require the Contractor to comply with its standard construction practices. These practices, which are listed in **Table 4-7** of **Chapter 4, Construction Means and Methods**, would include an outdoor air quality monitoring program during construction, the use of ULSD fuel, development and implementation of a dust control plan, vehicle idling restrictions, the use of solar-powered electric equipment (e.g. digital signage) where practicable, utilization of construction equipment that meets Tier 4 emissions standards where appropriate and to the extent practicable, restrictions on burning materials at construction sites, and consideration of source location.

An outdoor ambient air quality monitoring program would be implemented during construction of the Project and would be overseen by NYSDOT. The program would consist of real-time particulate monitoring at a number of locations within the local community. Locations and durations would be

determined in consideration of land uses, non-Project sources of emissions, and construction phasing. One monitor would be located outdoors in the vicinity of Dr. King Elementary School when construction would be occurring near the school. Locations for other program monitors would be determined during final design.

Background particulate monitoring would be conducted as part of the program to establish and routinely verify baseline levels. During construction, real-time particulate matter data would be collected at an established interval (for example, measurements every 10 seconds and logged in 15-minute periods) and time-weighted over 24 hours for comparison to the USEPA's NAAQS. These standards are designed to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly, with an adequate margin of safety. If the data show that air quality levels are approaching a concern level (to be established during final design) that could result in an exceedance of the 24-hour NAAQS, then operational and/or mechanical deficiencies would be identified and corrected. If the data result in any particulate air quality levels that exceed the 24-hour NAAQS, then the applicable construction activities would be suspended until the deficiencies are identified and corrected.

6-4-4.4 ENVIRONMENTAL CONSEQUENCES OF THE COMMUNITY GRID ALTERNATIVE

6-4-4.4.1 PERMANENT/OPERATIONAL EFFECTS

Microscale Analysis

Carbon Monoxide (CO) Microscale Analysis

A screening analysis was conducted using *TEM* procedures to determine if a CO microscale analysis is warranted for the Community Grid Alternative. The screening analysis was based on the LOS, traffic volumes, and average travel speed for the AM and PM peak periods for all intersections analyzed in the traffic modeling for the Community Grid Alternative. For locations that are expected to operate at LOS D or worse and would experience an increase of traffic volume of more than 10 percent or a decrease of average travel speed of more than 20 percent, a volume threshold screening was conducted based on emission factors developed from using the MOVES2014a emissions model and comparing against the applicable volume threshold criterion. Based on the screening, it was determined that a microscale air quality analysis for CO is not warranted. For a detailed technical discussion on this screening, see **Appendix G**.

Particulate Matter (PM) Microscale Analysis

The Community Grid Alternative would not generate or divert substantial volumes of diesel vehicle traffic as compared with the No Build Alternative. Thus, based on NYSDOT¹³ and USEPA¹⁴ guidance, a microscale hot-spot analysis for the Community Grid Alternative is not required. However, to address concerns expressed by the public regarding PM air quality in the vicinity of I-81,

¹³ NYSDOT. The Environmental Manual Chapter 1.1 Section 8. December 2012.

¹⁴ USEPA. *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas*. EPA-420-B-15-084. November 2015.

a PM microscale analysis was performed to assess potential PM concentrations at sensitive receptors within the study area. The MOVES2014a emissions model and the CAL3QHCR dispersion model were used to estimate concentrations at receptor sites. Receptors were placed along the approach and departure links as well as roadway segments at regularly spaced intervals. To capture the maximum potential concentration, a smaller interval was used in areas immediately adjacent to the analyzed intersections. For locations farther away, an increased interval was used. Due to the presence of elevated roadways, receptors were also placed at elevated residential locations.

A critical analysis year was determined based on the emissions strength calculated from applying the emission factors generated from MOVES2014a with the corresponding average speed and vehicle mix to the volumes at selected sites. The years that were evaluated were 2026 and 2056. It was determined that the analysis of year of 2026 provides a more conservative estimate of PM concentrations for decision making and was therefore selected as the critical analysis year. For further discussion on the methodology and results of the analysis, see **Appendix G**.

Four sites within the study area (as described in **Chapter 5, Transportation and Engineering Considerations**) were selected for analysis based on projected traffic conditions, the introduction of new/modified roadways, and the proximity to sensitive receptors. The selected analysis sites and their respective PM concentrations are shown in **Table 6-4-4-8**. At the analysis locations, PM concentrations would be below the NAAQS and would not result in an increase greater than 6.6 percent from the concentrations predicted under the No Build Alternative. Background concentrations were the dominant component in the total concentrations. Maximum total concentrations were predicted to be highest at Site 3 for PM₁₀ and at Site 2 for PM_{2.5}. Furthermore, due to the shift in roadway geometry as well as the removal of the I-81 viaduct, concentrations at Site 3 are projected to decrease when compared with concentrations under the No Build Alternative. For a detailed technical discussion on the methodology and results of the analysis, see **Appendix G**.

Mesoscale Analysis

A mesoscale emissions analysis for CO, VOC, NO_x, and PM was conducted in accordance with the NYSDOT's *TEM* using the USEPA mobile source emissions model, MOVES2014a, and the results of the regional traffic modeling conducted for the Community Grid Alternative. The study area used in the regional traffic modeling, as described in **Chapter 5, Transportation and Engineering Considerations**, was also used as the study area for the mesoscale analysis. The modeled roadways consist of the area where a shift in local traffic using alternate routes could occur as a result of the reconstruction or removal of the I-81 viaduct. The modeled traffic network extents are shown in **Appendix C-2**. Similar to the microscale analysis, the mesoscale analysis was conducted for 2026 and 2056. The mesoscale analysis used estimated annual VMT by vehicle type and speed-based emission rates by link that were specific to each alternative. For detailed technical information on the analysis methodology, see **Appendix G**.

The mesoscale emissions associated with traffic conditions under the Community Grid Alternative are shown in **Table 6-4-4-9**. As described in **Chapter 5, Transportation and Engineering Considerations**, traffic volumes in the Community Grid Alternative would increase on former I-481, both north and south of I-690, and decrease on the southern spur of former I-81.

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Table 6-4-4-8
PM_{2.5} and PM₁₀ Maximum Concentrations at Analysis Sites (µg/m³)

| Analysis Site | Pollutant | Averaging Period | Background Concentration | No Build Alternative Total Concentration | Community Grid Alternative Total Concentration | Percent Change | NAAQS |
|---|-------------------|------------------|--------------------------|--|--|----------------|-------|
| Site 1: Crouse Avenue and Burnet Avenue to Crouse Avenue and Erie Boulevard | PM ₁₀ | 24-Hour | 33.0 | 43.0 | 44.7 | 3.9% | 150 |
| | PM _{2.5} | 24-Hour | 13.5 | 14.5 | 15.3 | 5.1% | 35 |
| | | Annual | 5.6 | 5.9 | 6.2 | 4.5% | 12 |
| Site 2: N. West Street and W. Genesee Street | PM ₁₀ | 24-Hour | 33.0 | 42.7 | 45.5 | 6.6% | 150 |
| | PM _{2.5} | 24-Hour | 13.5 | 14.8 | 15.4 | 4.5% | 35 |
| | | Annual | 5.6 | 6.3 | 6.1 | -2.1% | 12 |
| Site 3: Almond Street and Harrison Street | PM ₁₀ | 24-Hour | 33.0 | 82.7 | 58.6 | -29.1% | 150 |
| | PM _{2.5} | 24-Hour | 13.5 | 16.7 | 14.6 | -12.6% | 35 |
| | | Annual | 5.6 | 6.6 | 6.0 | -9.3% | 12 |
| Site 4: State Street and Erie Boulevard | PM ₁₀ | 24-Hour | 33.0 | 46.0 | 46.4 | 0.8% | 150 |
| | PM _{2.5} | 24-Hour | 13.5 | 15.5 | 15.2 | -2.2% | 35 |
| | | Annual | 5.6 | 6.2 | 6.1 | -1.1% | 12 |
| Notes: PM ₁₀ background concentration was based on 2016-2018 data at the Rochester 2 monitoring station. PM _{2.5} background concentrations for 24-hour and annual PM _{2.5} were based on 2016-2018 data at the East Syracuse monitoring station. Concentrations are based on the projected roadway conditions in the 2026 analysis year as a reasonable representative for the estimated time of completion. | | | | | | | |

Table 6-4-4-9
Criteria Pollutant Emissions in the No Build and Community Grid Alternatives

| Analysis Year | Alternative | Annual VMT | Tons per Year | | | | |
|---------------|----------------|------------------------|--------------------|------------------|-----------------|------------------|-------------------|
| | | | CO | NO _x | VOC | PM ₁₀ | PM _{2.5} |
| 2026 | No Build | 3,796,753,177 | 12,033.6 | 1,746.5 | 340.2 | 95.6 | 255.3 |
| | Community Grid | 3,792,590,133 | 10,788.4 | 1,568.4 | 291.2 | 79.5 | 191.8 |
| | Difference | -4,163,044 (-0.11%) | -1,245.1 (-10%) | -178.1 (-10%) | -49.0 (-14%) | -16.1 (-17%) | -63.5 (-25%) |
| 2056 | No Build | 3,988,571,639 | 3,873.2 | 352.9 | 113.7 | 33.0 | 193.0 |
| | Community Grid | 3,982,887,754 | 3,595.7 | 305.4 | 92.8 | 24.8 | 137.3 |
| | Difference | -5,683,886 (-0.14%) | -277.5 (-7%) | -47.5 (-13%) | -20.9 (-18%) | -8.2 (-25%) | -55.8 (-29%) |

Compared with the No Build Alternative, the Community Grid Alternative would result in lower emissions of criteria pollutants in all analysis years (**Table 6-4-4-9**). The changes in emissions between the No Build and the Community Grid Alternatives are driven by three inputs—slight decreases in annual VMT, changes to traffic conditions between the alternatives (i.e., travel speed and vehicle classification) on individual road segments, and the analysis year (which would determine fleet-wide

average per vehicle-mile emission rates for both alternatives). For all analysis years, the Community Grid Alternative would result in decreases in VMT, and the improvements in travel speed as well as the predicted shift in traffic between roadway and the associated traffic conditions would result in decreases in annual emissions for all pollutants analyzed.

MSAT Analysis

According to FHWA's MSAT guidance,¹⁵ design-year AADT projections less than 140,000 to 150,000 are considered to have low potential for MSAT effects and qualitative assessments are recommended. The highest forecasted AADT in the study area for the Community Grid Alternative is 104,717 (see **Appendix C-4, Attachment C; I-690: Segment 5**), which is well below the FHWA criteria for a quantitative analysis. Therefore, a qualitative assessment was conducted.

MSAT emissions would be proportional to the VMT of the No Build and Community Grid Alternatives for a given year when variables such as fleet mix remain similar. Since the estimated VMT under the No Build and Community Grid Alternatives varies by approximately 0.1 percent for 2056 (see **Table 6-4-4-10**), there would be no appreciable difference in overall MSAT emissions between the No Build and Community Grid Alternatives in 2056. In locations where traffic volumes are predicted to increase or re-designed roadway sections would be located closer to nearby residences, schools, and businesses, there may be localized areas of increased ambient concentrations of MSATs. The localized increases in MSAT concentrations would likely be most pronounced along the re-designated portions of I-81 and parallel routes that traffic would be diverted onto, including the additional access to University Hill and points south of the city. Under both alternatives, future MSATs are expected to be substantially lower than existing conditions due to implementation of USEPA's vehicle and fuel regulations.

Table 6-4-4-10
Annual VMT in the No Build and Community Grid Alternatives

| Analysis Year | Alternative | Annual VMT |
|---------------|----------------|------------------------|
| 2026 | No Build | 3,796,753,177 |
| | Community Grid | 3,792,590,133 |
| | Difference | -4,163,044 (-0.11%) |
| 2056 | No Build | 3,988,571,639 |
| | Community Grid | 3,982,887,754 |
| | Difference | -5,683,886 (-0.14%) |

In general, data are not sufficient to predict the project-specific health impacts due to changes in MSAT emissions. To determine the potential for adverse health effects, multiple levels of modeling must be performed (emissions, dispersion, exposure, etc.) with each subsequent model building on the predictions and assumptions of the previous model. Furthermore, there are considerable

¹⁵ FHWA. *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents*. October 18, 2016.

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. Due to the limitations in the methodologies for forecasting health impacts, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. FHWA's MSAT guidance and **Appendix G** of this FEIS provide additional discussion of incomplete or unavailable information for project-specific MSAT health impacts analysis.

6-4-4.4.2 CONSTRUCTION EFFECTS

Emissions from on-site construction equipment, on-road construction-related vehicles, diverted traffic during construction, and dust-generating construction activities during the construction of the Community Grid Alternative have the potential to affect air quality, and therefore, the potential effects of these activities on air quality are discussed in this section. Recognizing the potential air quality effects of construction activities, NYSDOT has identified construction commitments, which include not only its standard specifications but also measures identified specifically for this project based on its proximity to sensitive land uses. These measures are shown in **Table 4-7** and are highlighted below.

Construction of the Community Grid Alternative would take six years to complete. An analysis was conducted to assess the effects of on-site construction activities on the surrounding community. Based on the CO screening methodologies used for the operational traffic analysis, it was determined that a microscale air quality analysis for CO is not warranted. However, to address concerns expressed by the public regarding PM air quality in the vicinity of I-81 during construction, a microscale detour traffic impact analysis was conducted. Traffic would be disrupted during the construction period, but any detours/diversions are not expected to last more than three weeks in any one location (see **Chapter 4, Construction Means and Methods**). Therefore, in accordance with the NYSDOT's *TEM*, a mesoscale emissions analysis for construction detour/diversions traffic is not warranted.

On-Site Construction Activity

The methodology used for the on-site construction activity analysis of the Community Grid Alternative is the same as that used for the Viaduct Alternative. Maximum predicted concentrations (including background) from peak construction activities (Phase 2B) under the Community Grid Alternative for the 2018 analysis year are presented in **Table 6-4-4-11**.

As shown, total maximum concentrations from the on-site sources are predicted to be lower than the corresponding NAAQS for PM_{2.5}, PM₁₀, and CO. The modeled results are based on construction activities in the MLK, Jr. East area where sensitive receptor locations are near on-site construction activities and would include both demolition of the existing I-81 roadway to be removed, and construction of the ramps to the remaining portion of highway to the south. The MLK, Jr. East, area was selected for the on-site air quality analysis because of the proximity of construction activities to several sensitive receptor locations, including the Dr. King Elementary School, the State University of New York College of Environmental Science and Forestry, the Tucker Missionary Baptist Church, and a number of residential buildings. This location represents a reasonable worst-case scenario for the analysis as lower concentration increments from construction would be expected in other areas since on-site construction activities would generally be farther away from sensitive receptor locations.

Table 6-4-4-11

Maximum Predicted Pollutant Concentrations from On-Site Construction Activity for the Community Grid Alternative

| Pollutant | Averaging Period | Background | Concentration Increment from On-Site Construction Activity | Total | NAAQS |
|--|------------------|------------------------|--|------------------------|-----------------------|
| PM _{2.5} | 24-hour | 13.5 µg/m ³ | 4.1 µg/m ³ | 17.6 µg/m ³ | 35 µg/m ³ |
| | Annual | 5.6 µg/m ³ | 0.2 µg/m ³ | 5.8 µg/m ³ | 12 µg/m ³ |
| PM ₁₀ | 24-hour | 33.0 µg/m ³ | 4.3 µg/m ³ | 37.3 µg/m ³ | 150 µg/m ³ |
| CO | 1-hour | 1.6 ppm | 10.5 ppm | 12.1 ppm | 35 ppm |
| | 8-hour | 0.7 ppm | 2.6 ppm | 3.3 ppm | 9 ppm |
| Note: PM ₁₀ and CO background concentrations were based on 2016-2018 data at the Rochester 2 and Rochester Near Road monitoring station, respectively. PM _{2.5} background concentrations for 24-hour and annual PM _{2.5} were based on 2016-2018 data at the East Syracuse monitoring station. | | | | | |

Combined Effect

Since emissions from both on-site construction equipment and construction-related traffic diversions may contribute to concentrations concurrently, the combined effect was assessed where applicable. Roadway links were added to the construction AERMOD dispersion model alongside the on-site construction sources. Traffic conditions, volumes, and roadway locations from the mobile source analysis of construction-related traffic diversions were used for the combined modeling and were assumed to occur throughout the construction period.

As presented in **Table 6-4-4-12**, total maximum concentrations from the on-site sources and traffic diversions are projected to be lower than the corresponding NAAQS for PM_{2.5} and PM₁₀. Therefore, construction under the Community Grid Alternative would not be anticipated to result in substantial air quality impacts. Furthermore, as presented in **Table 4-7 of Chapter 4, Construction Means and Methods**, NYSDOT has developed air quality mitigation commitments to minimize the effects of construction activities on local air quality.

Table 6-4-4-12

Maximum Combined Concentrations from On-Site Construction Activity and Traffic Diversions during Construction for the Community Grid Alternative (µg/m³)

| Pollutant | Averaging Period | Background | On-Site Construction Activity Modeled Contribution ¹ | Mobile Sources Modeled Contribution ¹ | Total | NAAQS |
|--|------------------|------------|---|--|-------|-------|
| PM _{2.5} | 24-hour | 13.5 | 4.1 | 1.2 | 18.8 | 35 |
| | Annual | 5.6 | 0.2 | 0.5 | 6.3 | 12 |
| PM ₁₀ | 24-hour | 33.0 | 4.3 | 9.6 | 46.9 | 150 |
| Notes: 1. The values shown are the contributions that are predicted to occur at the receptor of maximum total concentration. PM ₁₀ background concentration, 33.0 µg/m ³ , was based on 2016–2018 data at the Rochester 2 monitoring station. PM _{2.5} background concentrations for 24-hour and annual PM _{2.5} (13.5 and 5.6 µg/m ³ , respectively) were based on 2016–2018 data at the East Syracuse monitoring station. | | | | | | |

6-4-4.4.3 INDIRECT EFFECTS

As part of the Community Grid Alternative, consumption of gasoline and diesel by mobile sources and electricity would result in indirect pollutant emissions—upstream emissions associated with producing fuels, power, or materials. Direct emissions resulting from the combustion of gasoline and diesel are accounted for in the microscale and mesoscale analyses above. No direct emissions are associated with electric consumption. Indirect emissions would not be emitted from any one particular location (e.g., oil rig, fuel refinery, power plant, etc.), would be spread across the entire fuel distribution or energy grid, and would be located a distance from the Project Area. Therefore, adverse indirect effects associated with upstream emissions are not anticipated.

As discussed in **Section 6-2-1, Neighborhood Character**, the Community Grid Alternative could result in surplus right-of-way that NYSDOT could dispose of for non-transportation use; however, new development would be subject to local land use regulations. Individual developments in these areas would be unlikely to induce substantial changes to air quality within the study area and, therefore, would not result in further indirect air quality effects.

6-4-4.4.4 CUMULATIVE EFFECTS

The traffic data that were used in the air quality analyses accounted for traffic diversions associated with the Community Grid Alternative as well as traffic associated with known or reasonably foreseeable projects. The results of the air quality analyses reflect the traffic effects of the proposed action combined with that of reasonably foreseeable actions. No adverse cumulative effects related to air quality are anticipated as a result of the Community Grid Alternative.

6-4-4.4.5 MITIGATION

The Community Grid Alternative would remove the existing I-81 viaduct between the New York, Susquehanna and Western Railway bridge (at Renwick Street) and the I-81/I-690 interchange and replace it with a street-level urban arterial roadway. As a result, traffic would be diverted onto former I-481, north and south of I-690, as well as onto local roadways. To accommodate the traffic diversions, it would be necessary to install new traffic signals or replace existing signals (see **Chapter 5, Transportation and Engineering Considerations**). New and replaced signals would be designed to minimize traffic impacts with coordination through the existing centrally controlled traffic signal communication system. For intersections that are projected to operate at saturated levels, traffic mitigation measures (e.g., addition of turn lanes or signal improvements) may be introduced in the future to improve the traffic operational conditions at these intersections. Measures taken to improve traffic conditions would also result in improvements to the projected air quality conditions. No substantial permanent/operational air quality effects were identified for the Community Grid Alternative. Therefore, no additional air quality mitigation measures are warranted.

To further reduce the effects of construction activities on air quality at nearby sensitive receptor locations, NYSDOT would require the Contractor to comply with its standard construction practices. As described in **Table 4-7 of Chapter 4, Construction Means and Methods**, these practices would include an outdoor air quality monitoring program during construction, the use of ULSD fuel, development and implementation of a dust control plan, the use of solar-powered electric equipment (e.g. digital signage) where practicable, utilization of construction equipment that meets Tier 4

emissions standards where appropriate and to the extent practicable, restrictions on burning materials at construction sites, and consideration of source location.

An outdoor ambient air quality monitoring program would be implemented during construction of the Project and would be overseen by NYSDOT. The program would consist of real-time particulate monitoring at a number of locations within the local community. Locations and durations would be determined in consideration of land uses, non-Project sources of emissions, and construction phasing. One monitor would be located outdoors in the vicinity of Dr. King Elementary School when construction would be occurring near the school. Locations for other program monitors would be determined during final design.

Background particulate monitoring would be conducted as part of the program to establish and routinely verify baseline levels. During construction, real-time particulate matter data would be collected at an established interval (for example, measurements every 10 seconds and logged in 15-minute periods) and time-weighted over 24 hours for comparison to the USEPA's NAAQS. These standards are designed to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly, with an adequate margin of safety. If the data show that air quality levels are approaching a concern level (to be established during final design) that could result in an exceedance of the 24-hour NAAQS, then operational and/or mechanical deficiencies would be identified and corrected. If the data result in any particulate air quality levels that exceed the 24-hour NAAQS, then the applicable construction activities would be suspended until the deficiencies are identified and corrected.

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