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Via Email and Certified Mail, Return Receipt Requested

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Re: Re-evaluating Completed NEPA Reviews Under Proposed Rollback of Clean Car Rules

Dear Secretary Chao, Acting Administrator Hendrickson, and Acting Administrator Wheeler:

We are writing to notify you of our concerns about how the proposed rollback of the Corporate Average Fuel Economy (“CAFE”) and carbon dioxide (“CO₂”) emissions standards for passenger cars and light trucks will nullify environmental reviews—specifically, reviews performed under the National Environmental Policy Act (“NEPA”) and the Clean Air Act (“CAA”) completed in reliance on the current standards.

The Southern Environmental Law Center is a non-partisan nonprofit organization that works throughout the Southeast to promote transportation and land use decisions that strengthen our communities, protect our natural resources, and improve our quality of life. Working with a variety of partner groups across our six-state region, we regularly engage on a variety of transportation projects. In particular, we regularly work with partner groups and client groups to

comment on and litigate regarding environmental reviews completed for transportation projects pursuant to NEPA.

Transportation projects, including new highways and highway improvements, are often subject to review under NEPA. As part of the process for reviewing environmental impacts under NEPA, agencies must consider air quality and climate change impacts likely to result from a project, including indirect impacts. *E.g. Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549-50 (8th Cir. 2003) (holding EIS insufficient with regards to climate impacts from increased coal consumption because “when the *nature* of the effect is reasonably foreseeable but its *extent* is not,” the agency cannot ignore that effect); *Sierra Club, et al. v. FERC*, 867 F.3d 1357, 1375 (D.C. Cir. 2017) (concluding that FERC should have estimated amount of power-plant carbon emissions that would result from project pipelines). When “[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts,” an agency must prepare a supplemental EIS. 40 C.F.R. § 1502.9(c)(1)(ii).

The National Highway Traffic Safety Administration’s (“NHTSA”) and Environmental Protection Agency’s (“EPA”) (collectively, “the Agencies”) proposal to reverse course on the current Clean Car Rules, which were crafted to reduce greenhouse gas emissions and increase fuel efficiency, would result in dramatic changes to projections of future greenhouse gas emissions and other air quality concerns. The current standards, which were finalized in 2012, were estimated “to save approximately 4 billion barrels of oil and to reduce GHG emissions by the equivalent of approximately 2 billion metric tons over the lifetimes of these light duty vehicles produced in MYs 2017-2025.” 77 Fed. Reg. 62,624, 62,627. By contrast, the Agencies’ current proposal would result in an *increase* in petroleum consumption of .5 million barrels *per day* by the early 2030s—in other words, a substantial *increase* in likely dirty tailpipe emissions and greenhouse gas emissions anticipated based on the current standards.¹

In recent years, transportation agencies across our region have developed NEPA documents in reliance on the current CAFE and CO₂ standards. Specifically, the NEPA documents rely on emissions projections for Mobile Source Air Toxics (“MSATs”) and climate-changing CO₂ that anticipate these future, tighter standards. Such projections note that as cars are set to become more efficient, there will be an overall reduction of emissions over time. This was the premise of the EPA’s MOVES2014 models, which have been relied upon to document future air quality impacts in many NEPA analyses. The MOVES2014 models specifically projected future car emissions levels based on the 2012 CAFE and CO₂ standards. Official Release of the MOVES2014 Motor Vehicle Emissions Model for SIPs and Transportation Conformity, 79 Fed. Reg. 60,343, 60,344 (Oct. 7, 2014). Under the Agencies’ instant proposal, the MOVES2014 models—and documents relying on the models—will be rendered obsolete and inaccurate.

¹ In NHTSA’s and EPA’s announced proposals, the Agencies call into question several assumptions upon which the current standards were based, ultimately concluding that the current standards are unreasonable and would result in increased vehicle prices, which would in turn “keep consumers in older, dirtier, and less safe vehicles.” Thus, the Agencies in essence state that regardless of the instant proposals, projections premised on current standards (and employed in numerous existing NEPA documents) are fundamentally flawed and inaccurate.

Similarly, the MOVES2014 transportation models have been used in CAA transportation conformity determinations of Regional Transportation Plans and Transportation Improvement Programs required for metropolitan areas designated as nonattainment or maintenance areas under the Act. 23 C.F.R. §§ 450.216(b), 450.322(l), 450.324, and 40 C.F.R. part 93. Transportation agencies have been using the models since 2014, and in October 2016, EPA *required* that the MOVES model be used for all transportation conformity decisions. Memorandum from E. Bondi to Division Administrators re: Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration (October 18, 2016). Thus, freezing the CAFE and CO₂ standards will also render all transportation conformity determinations performed since October 2016 and a portion of the conformity determinations performed since 2014 inaccurate and invalid. To the extent NEPA documents relied on any such conformity determinations, those NEPA analyses would similarly be invalid.

As such, if the Agencies' proposed changes to CAFE and CO₂ standards are enacted, there would be a significant change to the baseline assumptions that underpin myriad NEPA documents throughout the United States. To the extent NEPA documents state that that MSATs or CO₂ emissions will decrease over time all such statements will be incorrect if the proposed new standards are implemented. Because the changed emissions projections present "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts," supplemental EISs will likely be required for many transportation projects. *See* 40 C.F.R. § 1502.9(c)(1)(ii).

Indeed, across the southeast region, transportation agencies will be required to reevaluate and redo countless NEPA documents that incorporated projections based on the 2012 standards. For example:

- *Complete 540 Toll Highway – North Carolina*: The air quality report accompanying the FEIS for this proposed toll highway relied on the 2012 rules to conclude that any possible increase in vehicle emissions resulting from the project would effectively be "offset" by emissions reductions due to more efficient vehicles in future years. The NEPA documents relied on the MOVES2014a model to reach this conclusion. This assumption is now wrong based on the Agencies' proposal, and a new analysis must be completed before the project can proceed. *See* Excerpts from Complete 540 FEIS Air Quality Report (December 2017), Attachment 1.
- *Hampton Roads Bridge Tunnel - Virginia*: The proposed \$3.3 billion expansion of I-64's high-volume Hampton Roads Bridge Tunnel is projected to increase vehicle miles traveled in its vicinity by 495.4 million miles per year. However, this project's NEPA analyses have also relied upon assumed improvements in national fuel economy standards to substantially mitigate the future emissions of greenhouse gases and other air pollutants resulting from this major expansion. Under the Agencies' proposal, these analyses would need to be redone before the project can proceed. *See* Excerpts from Hampton Roads Crossing Final SEIS (Apr. 2017), Attachment 2.

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- *I-73 Highway – South Carolina*: The recent NEPA re-evaluation conducted for this proposed \$3.8 billion interstate project to Myrtle Beach anticipated that MSATs emissions would be lower in the future due to the 2012 CAFE standards. The reevaluation also relied on the 2012 CO₂ standards integrated into the MOVES2014a model. As such, the air quality analysis relied on by the re-evaluation for I-73 will need to be revised prior to the project going forward. *See* Excerpts from I 73 South, Dillon, Marion, and Horry Counties, South Carolina, Re-Evaluation (May 2017), Attachment 3.

We urge you to consider the far-reaching implications of the Agencies' Clean Car rollback proposal and its impact on NEPA reviews. If the proposal is adopted, we request that the U.S. Department of Transportation and Federal Highway Administration issue directives to state departments of transportations, metropolitan planning organizations, regional planning organizations, and other transportation agencies to ensure that all necessary additional NEPA reviews and conformity analyses move forward, as federal law requires. Guidance and a federally-led approach will avoid the chaos and confusion of project-by-project litigation that is otherwise likely to result.

We understand that your agencies have expressed an interest in ensuring regulatory certainty. This proposal seems likely to result in the opposite outcome as hundreds of highway proposals are called into question. Nonetheless, if these proposals move forward, we urge you to implement appropriate guidance so that disruption can be kept to a minimum.

We will be happy to discuss this matter with you further at any time or answer any questions you may have.

Sincerely,



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CC (via U.S. mail and e-mail):

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Attachment 1

Excerpt from:
Complete 540 FEIS Air Quality Report
(December 2017)

The primary pollutants from motor vehicles are unburned hydrocarbons (HC), Nitrogen oxides (NO_x), CO, and particulates. HC and NO_x can combine in a complex series of reactions catalyzed by sunlight to produce photochemical oxidants such as O₃ and NO₂. Because these reactions take place over a period of several hours, maximum concentrations of photochemical oxidants are often found far downwind of the precursor sources. These pollutants are regional problems.

3. Attainment Status

The proposed project is located in Wake and Johnston Counties, which have been determined to comply with the NAAQS. The proposed project is located in an attainment area; therefore, 40 CFR Parts 51 and 93 are not applicable. The proposed project is not anticipated to create any adverse effects on the air quality of this attainment area.

4. Carbon Monoxide

Carbon monoxide is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes approximately 56 percent of all carbon emissions nationally. State and federal guidance suggests using CO predictions as the primary indicator for vehicular induced pollution. CO is sensitive to variations in temperature; emissions are twice as high in winter months as compared to summer months. CO is also sensitive to vehicle speed; emissions decrease with an increase in speed (up to 50 mph), and then increase again at higher speeds. Idling and low speeds (less than 15 mph) can produce the highest CO levels. Recent trends in air quality indicate CO levels have dramatically improved. The decline in CO concentrations is primarily due to stricter controls on automobile exhaust resulting in cleaner cars. This drop is remarkable because it is occurring while the nation's population is growing rapidly, yielding more traffic and urban sprawl.

CO regional and project-level conformity requirements in North Carolina have ended. Therefore, regional and project-level transportation conformity requirements no longer apply to CO in North Carolina. As such, project-level CO hot-spot analyses using MOVES2014 and CAL3QHC emission and dispersion models are no longer required in North Carolina as part of the NEPA/SEPA process.

5. Ozone & Oxides

Automobiles are regarded as sources of HC and NO_x. HC and NO_x emitted from cars are carried into the atmosphere where they react with sunlight to form O₃ and NO₂. Automotive emissions of HC and NO_x are expected to decrease in the future due to the continued installation and maintenance of pollution control devices on new cars. However, regarding area-wide emissions, these technological improvements may be offset by the increasing number of cars on the transportation facilities of the area.

The photochemical reactions that form O₃ and NO₂ require several hours to occur. For this reason, the peak levels of ozone generally occur ten to twenty kilometers downwind of the source of HC emissions. Urban areas as a whole are regarded as sources of HC, not individual streets and highways. The emissions of all sources in an urban area mix in the atmosphere, and, in the presence of sunlight, this mixture reacts to form O₃, NO₂, and other photochemical oxidants. The best example of this type of air pollution is the smog that forms in Los Angeles, California.

6. Particulate Matter & Sulfur

Automobiles are not regarded as significant sources of particulate matter (PM) and SO₂. Nationwide, highway sources account for less than seven percent of PM emissions and less than two percent of SO₂ emissions. PM and SO₂ emissions are predominantly the result of non-highway sources (e.g., industrial, commercial, and agricultural). Because emissions of PM and SO₂ from automobiles are very low, there is no reason to suspect that traffic on the proposed project will cause air quality standards for PM and SO₂ to exceed the NAAQS.

This project is within an attainment area for PM_{2.5} and PM₁₀ and does not include significant increases in diesel traffic. Therefore, no quantitative PM_{2.5} or PM₁₀ analysis is required.

7. Lead

Automobiles without catalytic converters can burn regular gasoline. The burning of regular gasoline emits lead as a result of regular gasoline containing tetraethyl lead, which is added by refineries to increase the octane rating of the fuel. Newer cars with catalytic converters burn unleaded gasoline, thereby eliminating lead emissions. Also, the United States Environmental Protection Agency (EPA) has required the reduction in the lead content of leaded gasoline. The overall average lead content of gasoline in 1974 was approximately 0.53 gram per liter. By 1989, this composite average had dropped to 0.003 gram per liter. The Clean Air Act Amendments of 1990 (CAAA) made the sale, supply, or transport of leaded gasoline or lead additives unlawful after December 31, 1995. Because of these reasons, it is not expected that traffic on the proposed project will cause the NAAQS for lead to be exceeded.

8. Mobile Source Air Toxics (MSAT)

8.1. Background

Controlling air toxic emissions became a national priority with the passage of the CAAA, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA assessed this expansive list in its rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are part of EPA's Integrated Risk Information System (IRIS).¹ In addition, EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA).² These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority MSAT, the list is subject to change and may be adjusted in consideration of future EPA rules.

8.2. Motor Vehicle Emissions Simulator (MOVES)

According to EPA, MOVES2014 is a major revision to MOVES2010 and improves upon it in many respects. MOVES2014 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activity developed since the release of MOVES2010. These new emissions data are for light-

¹ <https://www.epa.gov/iris>

² <https://www.epa.gov/national-air-toxics-assessment>

and heavy-duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES2014 also adds updated vehicle sales, population, age distribution, and vehicle miles travelled (VMT) data.

MOVES2014 incorporates the effects of three new Federal emissions standard rules not included in MOVES2010. These new standards are all expected to impact MSAT emissions and include Tier 3 emissions and fuel standards starting in 2017 (79 FR 60344), heavy-duty greenhouse gas regulations that phase in during model years 2014-2018 (79 FR 60344), and the second phase of light duty greenhouse gas regulations that phase in during model years 2017-2025 (79 FR 60344). Since the release of MOVES2014, EPA has released MOVES2014a. In the November 2015 MOVES2014a Questions and Answers Guide,³ EPA states that for on-road emissions, MOVES2014a adds new options requested by users for the input of local VMT, includes minor updates to the default fuel tables, and corrects an error in MOVES2014 brake wear emissions. The change in brake wear emissions results in small decreases in PM emissions, while emissions for other criteria pollutants remain essentially the same as MOVES2014.

Using EPA's MOVES2014a model, as shown in Figure 2, FHWA estimates that even if VMT increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Diesel PM is the dominant component of MSAT emissions, making up 50 to 70 percent of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES2014a will notice some differences in emissions compared with MOVES2010b. MOVES2014a is based on updated data on some emissions and pollutant processes compared to MOVES2010b, and also reflects the latest Federal emissions standards in place at the time of its release. In addition, MOVES2014a emissions forecasts are based on lower VMT projections than MOVES2010b, consistent with recent trends suggesting reduced nationwide VMT growth compared to historical trends.

8.3. MSAT Research

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

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

³ <https://www.epa.gov/moves/moves2014a-latest-version-motor-vehicle-emission-simulator-moves>

Attachment 2

Excerpt from:
Hampton Roads Crossing Final SEIS
(Apr. 2017)

Tunnel Assessment

The methodology and assumptions for assessing the tunnel air quality analysis were consistent with the most recent FHWA guidance: *Revised Guidelines for the Control of Carbon Monoxide (CO) Levels in Tunnels* and the methodologies developed from the Downtown Tunnel-Midtown Tunnel-Martin Luther King Freeway Extension (DT-MT-MLK) project in August, 2010. The methodology included a series of calculations using the tunnel dimensions, ventilation system data, and traffic emissions and assumptions to estimate the CO concentration inside the tunnel. According to the American Society of Heating, Refrigeration, and Air Conditioning (ASHRAE) standard, tests and operating experience have shown that when CO is adequately controlled, the other vehicle emission pollutants are likewise adequately controlled. Therefore, the analysis demonstrates that the one-hour CO NAAQS of 35 ppm along with the FHWA/EPA 15-minute exposure level of 120 ppm will be met inside the new tunnels. The analysis was conducted for the Existing, No-Build and each of the four 2040 Build Alternatives for two worst-case scenarios: 1) peak-hour conditions in order to address the worst-case scenario associated with routine peak hour traffic operations; and 2) an incident (idling) that stops traffic such as an accident or vehicle breakdown. A detailed discussion of the methodologies and assumptions used in the CO tunnel analysis is presented in Section 5 of the *HRCS Air Quality Technical Report*.

Mobile Source Air Toxics (MSAT)

The affected network for the MSAT analysis was developed using the Hampton Roads Travel Demand Forecast Model for each Alternative. Using the forecast model, the affected network will extend well-beyond the study area in order to capture changes in MSAT emissions due to changes in traffic volumes when comparing the No-Build to each Build Alternative condition. The affected networks for each Alternative were developed using as many of the FHWA criteria for which traffic data existed. For this analysis, the daily volume change and travel time change for congested and uncongested links was used to develop each network. Based on traffic projections for the base, opening year, and design years, the segments directly associated with the Study Area Corridors and those roadways in the affected network; where the AADT is expected to change +/- 5 percent or more and where travel time is expected to change by +/- 10 percent for the Build Alternatives compared to the No-Build Alternatives were identified. The affected network for each of the Build Alternatives is shown in Figures 4-11 through 4-18 of the *HRCS Air Quality Technical Report*. The EPA MOVES2014a model was utilized in order to obtain air toxic emissions for acrolein; benzene; 1,3-butadiene; diesel PM; formaldehyde; naphthalene; and polycyclic organic matter. Details on the traffic methodology used to develop the affected network and associated MOVES2014a inputs for each condition and Alternative are discussed in the *HRCS Air Quality Technical Report*.

Climate Change and Greenhouse Gas Emissions

GHG emissions from vehicles using roadways are a function of distance traveled (expressed as vehicle miles traveled, or VMT), vehicle speed, and road grade. GHG emissions are also generated during roadway construction and maintenance activities. VMT derived from the MSAT Affected Network for each Alternative was used to characterize the VMT changes for the GHG discussion as the links identified in the Affected Network include only roadway links that could significantly impact the project Study Area (based on FHWA criteria) and excludes roadway links not affected by the Alternatives.

VMT was not used to calculate GHG emissions for each Alternative because there is no context in which to evaluate the results. For example, there are no significance thresholds for mobile source GHG

emissions nor has the EPA or FHWA identified specific factors to consider in making a significance determination for GHG emissions. CEQ has noted that “it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions; as such direct linkage is difficult to isolate and to understand.”⁹ Accordingly, it is not useful to attempt to determine the significance of such impacts. There is a considerable amount of ongoing scientific research to improve understanding of global climate change and EPA and FHWA guidance will evolve as the science matures or if new Federal requirements are established. While the results could be used to differentiate between Alternatives, the VMT from which these emissions would be calculated serves the same purpose.

Indirect Effects

Effects of the project that would occur at a later date or are fairly distant from the project are referred to as indirect effects. Cumulative impacts are those effects that result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. Cumulative impacts are inclusive of the indirect effects. As summarized in the Environmental Consequences, the potential for indirect effects or cumulative impacts to air quality that may be attributable to this project is not expected to be significant.

Affected Environment

The Study Area Corridors are located in Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, and Suffolk, Virginia. The EPA Green Book¹⁰, which lists non-attainment, maintenance, and attainment areas, was reviewed to determine the designations for the jurisdictions within Hampton Roads in which the project is located. These include Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, and Suffolk. The EPA Green Book shows that all of the jurisdictions in the region, including those spanning the entire project corridor, are designated as being in attainment for all of the NAAQS¹¹.

Environmental Consequences

The air quality analyses for the Draft SEIS was prepared using the 2034 Hampton Roads Transportation Planning Organization (HRTPO) travel demand model, which was the latest model available at the time. The 2034 model outputs were post-processed to produce 2040 peak hour volumes for the I-64 Study Area Corridor. These 2040 peak hour volumes were then used to support the air analysis. The mobile source air toxics (MSAT) and greenhouse gas (GHG) climate change air quality analyses relied on the raw 2034 model output, which was factored up to 2040 values by globally increasing the daily and peak hour link volumes by 7 percent, and re-computing the congested speeds for each link using the model’s built-in Volume-Delay functions (VDFs). During the course of the preparation of the Final SEIS (August 8, 2016),

⁹ CEQ (2010). Draft Guidance Consideration of the Effects of Climate Change and Greenhouse Gas Emissions, 75 Federal Register 8046 (February 23, 2010) available at <http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf>

¹⁰ EPA Green Book: <https://www3.epa.gov/airquality/greenbook/faq.html>

¹¹ Effective April 6, 2015, EPA revoked the 1997 eight-hour ozone NAAQS for which the Hampton Roads region had previously been in attainment-maintenance. Therefore, the associated transportation conformity requirements that applied at the time that the FEIS was prepared no longer apply. See: <https://www.gpo.gov/fdsys/pkg/FR-2015-03-06/pdf/2015-04012.pdf>

the HRTPO released the 2040 HRTPO travel demand model. This updated model was used to update the traffic forecasts for the Preferred Alternative, including forecasts for basic HOV and HOT options.

To determine whether the air analysis should be updated for the Final SEIS to document a worst-case scenario, the Draft SEIS traffic forecasts were compared against the Final SEIS forecasts and model output. The Draft SEIS daily and peak hour volumes were higher than the revised Final SEIS volumes based on the 2040 model. Therefore, the worst-case scenario for CO, MSAT, and GHG emissions had already been analyzed during the Draft SEIS, and this finding is presented in the *Traffic, Air, and Noise Analyses Update (Appendix G)*. Likewise, the raw model output for the HOV and HOT scenarios do not indicate that traffic volumes are expected to exceed the daily and peak hour volumes already developed for the Draft SEIS. It was reasonably concluded that the Draft SEIS traffic forecasts and the corresponding air analysis represent the worst-case traffic scenario (compared to the Final SEIS), and no updated air quality analyses were deemed necessary for the Final SEIS.

The microscale analysis was conducted using the latest version of the EPA MOVES (MOVES2014a) and CAL3QHC models to estimate worst-case CO concentrations at individual receptor (i.e., receiver) locations. Peak CO concentrations resulting from the project at each location were then added to the appropriate CO background concentrations to determine the worst-case CO impacts at each location. These values were then compared to the 1-hour and 8-hour CO NAAQS to determine compliance.

The results of the 1-hour and 8-hour CO hot-spot analysis for the worst-case interchange locations is presented in **Table 3-23** for the Existing, Interim, Design Year Build, and No-Build conditions.

Table 3-23: Modeling Results for the Worst-Case Interchanges

Intersection / Interchange	Averaging Period	2015 ^{1,2}		2028 ^{1,2}		2040 ^{1,2}		NAAQS (ppm)
		Base (No-Build)	No-Build Alternative	Build Alternative	No-Build Alternative	Build Alternative		
		Peak (ppm)	Peak (ppm)	Peak (ppm)	Peak (ppm)	Peak (ppm)		
I-64 and I-664 (northern Termini)	1-Hour	11.5 (4)	3.7 (4)	6.5 (4)	3.0 (4)	4.6 (4)	35	
	8-Hour	8.2 (4)	2.4 (4)	4.5 (4)	1.9 (4)	3.1 (4)	9	
I-564 and Route 460 and I-64	1-Hour	10.7 (13)	3.8 (9)	6.2 (13)	3.1 (9)	4.4 (13)	35	
	8-Hour	7.6 (13)	2.5 (9)	4.3 (13)	1.9 (9)	2.9 (13)	9	
I-64 and Route 167 Lasalle Ave	1-Hour	8.0 (9)	3.0 (10)	4.8 (6)	2.6 (13)	3.6 (5)	35	
	8-Hour	5.6 (9)	1.9 (10)	3.2 (6)	1.6 (13)	2.3 (5)	9	
I-664 and West Military Hwy	1-Hour	10.3 (1)	3.5 (13)	5.9 (1)	2.9 (13)	4.2 (1)	35	
	8-Hour	7.3 (1)	2.2 (13)	4.0 (1)	1.8 (13)	2.8 (1)	9	
I-664 and I-64 (southern Termini)	1-Hour	8.9 (4)	3.6 (4)	5.4 (4)	3.1 (4)	3.9 (2)	35	
	8-Hour	6.3 (4)	2.3 (4)	3.7 (4)	1.9 (4)	2.5 (2)	9	

Notes:

1. Number in parenthesis represents the modeled receptor number of maximum modeled concentration from CAL3QHC. Please refer to Figures 4.5 through 4-9.
2. Modeled concentrations includes 1-hour Background Value of 2.0 ppm and 8-hour background value of 1.1 ppm

The highest 1-hour predicted concentrations for the base, opening and design year build and no-build conditions were 11.5 ppm, 6.5 ppm and 4.6 ppm, respectively. The maximum 1-hour concentration for all base and future build and no-build conditions was predicted to occur at the I-64 and I-664 (Northern Termini) interchange. However, all predicted peak 1-hour CO concentrations are well below the 1-hour CO NAAQS of 35 ppm.

The highest 8-hour concentrations for the base, opening and design year build and no-build conditions were 8.2 ppm, 4.5 ppm and 3.1 ppm, respectively. Similar to the peak 1-hour concentrations, the maximum 8-hour CO concentration was also predicted to occur at the I-64 and I-664 (Northern Termini) interchange for the base and future build and no-build conditions. However, all predicted peak 8-hour CO concentrations are also below the 8-hour CO NAAQS standard of 9 ppm.

These results demonstrate that the worst-case interchanges for each existing, build and no-Build Alternative using very conservative assumptions would not cause or contribute to a violation of the CO NAAQS within the study corridor, and thereby satisfies all NEPA and CAA requirements pertaining to CO.

Tunnel Carbon Monoxide

Included in the air quality evaluation is the addition of new tunnels. A series of new tunnels are proposed along the I-64, I-564 Connector, and I-664 Study Area Corridors.

The ventilation system within the proposed tunnels would be designed consistent with the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) Handbook, Chapter 15, Enclosed Vehicular Facilities - Tunnels¹². The ventilation system design is based on controlling the level of emissions to acceptable concentrations inside the tunnel during normal operations, along with the capacity to remove smoke and gases during emergencies. The design assures the personal safety of both the traveling public, as well as highway/emergency workers. Further, the air quality within the tunnel would be consistent with normal ventilation air quantities as stated in the above referenced ASHRAE standard.

The results of the analysis show that CO levels in the tunnels are estimated to be below the one-hour CO NAAQS of 35 ppm and below the 15-minute FHWA/EPA guideline level of 120 ppm for both the peak hour and incident (idling) condition for all the Alternatives including the Build and No-Build conditions. The Existing and No-Build condition only includes the existing eastbound and westbound HRBT tunnels along I-64. The estimated worst-case CO concentration for the peak hour condition for the Existing condition is 24.0 ppm which is 20 percent of the FHWA/EPA guideline level and 68 percent of the CO NAAQS. The estimated worst-case CO concentration for the idling conditions is 11.1 ppm which is 9 percent of the FHWA/EPA guideline level and 32 percent of the CO NAAQS. Similarly, the estimated worst-case CO concentration for the peak hour condition for the No-Build condition is 12.4 ppm which is 10.3 percent of the FHWA/EPA guideline level and 35 percent of the CO NAAQS. The estimated worst-case CO concentration for the idling condition is 3.0 ppm which is 3 percent of the FHWA/EPA guideline level and 9 percent of the CO NAAQS.

For the peak hour condition for the Build Alternatives, the estimated worst-case CO concentration is 10.5 ppm (Alternative C I-664 Northbound) and is 30 percent of the CO NAAQS and 9 percent of the FHWA/EPA guideline level. For the incident idling condition, the estimated worst-case CO concentration

¹² 2015 ASHRAE Handbook -- HVAC Applications: Chapter 15, Enclosed Vehicular Facilities (SI)

is 7.0 ppm (Alternative C I-664 and I-564 Bus Only) and is 20 percent of the CO NAAQS and 6 percent of the FHWA/EPA guideline level.

The calculations include the one-hour CO ambient background level of 2.1 ppm, which was assumed to exist in the tunnel ventilation supply air.

Particulate Matter

The Study Area Corridors are located in the Hampton Roads Area which is designated by EPA as attainment for the coarse particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}) NAAQS; therefore, transportation conformity requirements pertaining to particulate matter do not apply for this study. Regardless, the latest 3-year (2012-2014) monitoring data reported by the VDEQ for the Hampton monitor site show that the 24-hour and annual PM_{2.5} background concentrations in the Study Area Corridors are 17 micrograms per cubic meter (ug/m³) and 7.5 ug/m³, respectively, which are both well below the respective PM_{2.5} NAAQS of 35ug/m³ and 12 ug/m³.

Mobile Source Air Toxics

A quantitative MSAT analysis was conducted consistent with the guidance developed by FHWA. These include the 2012 Interim Guidance Update mentioned earlier, and the FHWA preliminary guidance for addressing a quantitative MSAT analysis using MOVES titled "Quick-start Guide for Using MOVES for a NEPA Analysis" along with training material developed by FHWA that provided detailed direction on the preparation of quantitative MSAT analyses. FHWA issued updated guidance for MSAT analyses in late 2016, as previously referenced. The updated guidance makes no material changes to the modeling approach, with the exception of the addition of two pollutants (acetaldehyde and ethylbenzene) to the list of MSATs to be assessed. The new guidance shows how emissions of these pollutants are expected to decline over the next few decades, with the same general downward trend applying for the two added pollutants.

The results of the quantitative MSAT analysis are presented in **Table 3-24**. Changes in emissions compared to the No-Build for the 2028 and 2040 condition and between the Build and base year are presented in **Table 3-25**. These tables show that all of the MSAT emissions are expected to increase slightly for the Build Alternative scenario when compared to the No-Build condition for 2028 and 2040. In addition, all MSAT pollutant emissions are expected to significantly decline in the opening and design years when compared to existing conditions. The downward trend in emissions is a result of technological improvements, i.e., more stringent vehicle emission and fuel quality standards coupled with ongoing fleet turnover, and is achieved despite increased VMT in this period.

In all cases, the magnitude of the MSAT emissions is small in the opening and design years and significantly lower than in the base year. Due to the small magnitude of projected MSAT emissions, the increase observed in 2028 and 2040 from the No-Build to the Build scenarios are not considered significant, especially when considering that emissions from all MSATs are expected to be significantly lower in future years than in the base year. The two new pollutants (acetaldehyde and ethylbenzene) added to FHWA's 2016 updated guidance were not included in the quantitative analysis. However, because the trends of these two pollutants over time closely resemble the trends for benzene and formaldehyde, the foregoing conclusions for the MSAT pollutants analyzed would also apply to acetaldehyde and ethylbenzene. Overall, the results of the MSAT analysis are consistent with national MSAT emission trends predicted by FHWA. No meaningful increases in MSATs have been identified and

are not expected to cause an adverse effect on human health as a result of any of the Build Alternatives in future years.

Table 3-24: Projected Annual MSAT Emissions in tons per year (TPY) on “Affected Network”

Year	Alternative	Annual Vehicle Millions of Miles Traveled (AVMT)	Acrolein (TPY)	Benzene (TPY)	1,3 Butadiene (TPY)	Diesel PM (TPY)	Formaldehyde (TPY)	Naphthalene (TPY)	Polycyclic Organic Matter (TPY)
2015 Base Year	Existing Alternative A	2,428.1	0.544	10.15	1.190	36.30	8.52	1.04	0.450
	Existing Alternative B	3,645.0	0.835	15.42	1.820	55.30	13.03	1.58	0.687
	Existing Alternative C	4,111.2	0.891	16.83	1.970	58.24	13.97	1.70	0.737
	Existing Alternative D	4,571.8	0.989	18.71	2.189	64.62	15.51	1.89	0.820
2028 Opening Year	Alternative A	3,564.9	0.196	4.05	0.049	8.94	3.66	0.373	0.154
	No-Build	3,492.8	0.187	4.04	0.046	8.42	3.50	0.360	0.152
	Alternative B	4,459.2	0.239	5.08	0.059	10.82	4.48	0.459	0.191
	No-Build	4,288.9	0.225	4.94	0.055	10.05	4.22	0.435	0.184
	Alternative C	5,274.1	0.275	6.00	0.068	12.36	5.16	0.531	0.223
	No-Build	5,064.6	0.274	5.67	0.067	12.00	5.00	0.528	0.212
	Alternative D	5,775.6	0.317	6.46	0.079	14.74	5.94	0.602	0.245
No-Build	5,519.9	0.289	6.27	0.071	13.01	5.43	0.557	0.233	
2040 Design Year	Alternative A	3,236.3	0.104	1.88	0.006	4.17	2.23	0.199	0.070
	No-Build	3,112.1	0.095	1.81	0.005	3.78	2.04	0.184	0.068
	Alternative B	4,859.9	0.145	2.82	0.008	5.71	3.10	0.281	0.105
	No-Build	4,647.8	0.139	2.70	0.008	5.49	2.97	0.269	0.100
	Alternative C	5,619.7	0.166	3.28	0.009	6.54	3.56	0.323	0.123
	No-Build	5,328.3	0.160	3.06	0.009	6.33	3.42	0.309	0.113
	Alternative D	6,385.6	0.189	3.67	0.010	7.46	4.04	0.366	0.136
	No-Build	5,972.6	0.183	3.45	0.010	7.29	3.91	0.352	0.129

Table 3-25: Projected Annual MSAT Change in Emissions (Percent) on “Affected Network”

Year	Alternative	Change Annual Vehicle Millions of Miles Traveled (AVMT)	Acrolein (TPY)	Benzene (TPY)	1,3 Butadiene (TPY)	Diesel PM (TPY)	Formaldehyde (TPY)	Naphthalene (TPY)	Polycyclic Organic Matter (TPY)
2028 Opening Year	Difference (Alternative A-No-Build)	72.10	0.01	0.01	0.00	0.52	0.16	0.01	0.00
	Difference (Alternative A-Existing)	1136.8	-0.348	-6.1	-1.141	-27.36	-4.86	-0.667	-0.296
	Difference (Alternative B- No-Build)	170.30	0.01	0.14	0.00	0.77	0.26	0.02	0.01
	Difference (Alternative B-Existing)	814.2	-0.596	-10.34	-1.761	-44.48	-8.55	-1.121	-0.496
	Difference (Alternative C-No-Build)	209.50	0.00	0.33	0.00	0.36	0.16	0.00	0.01
	Difference (Alternative C-Existing)	1162.9	-0.616	-10.83	-1.902	-45.88	-8.81	-1.169	-0.514
	Difference (Alternative D-No-Build)	255.70	0.03	0.19	0.01	1.73	0.51	0.04	0.01
	Difference (Alternative D-Existing)	1203.8	-0.672	-12.25	-2.11	-49.88	-9.57	-1.288	-0.575
2040 Design Year	Difference (Alternative A-No-Build)	124.20	0.01	0.07	0.00	0.39	0.19	0.02	0.00
	Difference (Alternative A-Existing)	808.2	-0.44	-8.27	-1.184	-32.13	-6.29	-0.841	-0.38
	Difference (Alternative B-No-Build)	212.10	0.01	0.12	0.00	0.22	0.13	0.01	0.00
	Difference (Alternative B-Existing)	1214.9	-0.69	-12.6	-1.812	-49.59	-9.93	-1.299	-0.582
	Difference (Alternative C-No- Build)	291.40	0.01	0.22	0.00	0.21	0.14	0.01	0.01
	Difference (Alternative C-Existing)	1508.5	-0.725	-13.55	-1.961	-51.7	-10.41	-1.377	-0.614
	Difference (Alternative D-No-Build)	413.00	0.01	0.22	0.00	0.17	0.13	0.01	0.01
	Difference (Alternative D-Existing)	1813.8	-0.8	-15.04	-2.179	-57.16	-11.47	-1.524	-0.684

Climate Change and Greenhouse Gas (GHG) Emissions Impacts

Under the No-Build Alternative, VMT would gradually increase in the project area for each Alternative between 2015 and 2040 as employment and population in the area increases (see **Table 3-24** for VMT by Alternative). Furthermore, under the Build Alternatives, increased capacity, less congestion, and improved transit access across Hampton Roads lead to an increase in VMT relative to the No-Build Alternative. The increase is similar because the project is anticipated to shift traffic to the mainlines from

other roadways, not necessarily increase traffic on the roadways beyond the background growth between 2015 and 2040.

Under the No-Build Alternative, VMT increases on average approximately 29 percent (the increase ranges from 28 percent to 31 percent depending on Alternative) between 2015 and 2040; under the Build Alternatives, VMT would increase on average approximately 36 percent compared to 2015 levels (the increases range from 33 percent to 39 percent depending on Alternative). For perspective, the VMT increases on average 3.7 percent (range of 2 percent to 5 percent) from the No-Build to Build Alternatives in 2028 and on average 5.2 percent (range of 4 percent to 7 percent) in 2040 depending on Alternative. Nationally, the Energy Information Administration (EIA) estimates that VMT will increase by approximately 38 percent between 2012 and 2040, so the VMT increase under the Build Alternatives is still at or below the projected national rate.

While VMT will increase as a result of the project, the anticipated increase in GHGs will be mitigated by improvements in national fuel economy standards. EIA projects that vehicle energy efficiency (and thus, GHG emissions) on a per-mile basis will improve by 28 percent between 2012 and 2040. This improvement in vehicle emissions rates will help mitigate the increase in VMT for both the No-Build and Build Alternatives. Other factors related to the project would also help reduce GHG emissions relative to the No-Build Alternative. The project would reduce congestion and improve vehicle speeds by increasing regional accessibility through providing extra lanes so that motorists can more easily pass slow-moving vehicles, improve transit access across Hampton Roads waterway, dedicated transit facilities in specific locations along with Bus Rapid Transit (BRT), and converting existing lanes to transit only lanes; the safety improvements associated with the planned upgrades would produce emissions benefits by reducing vehicle delay and idling.

The average travel speed across the mainlines within the Study Area would increase on average 49.4 miles per hour (range from 41 to 55 miles per hour) under the Build Alternatives compared to 44.7 miles per hour (range from 37 to 52 miles per hour) under the No-Build. GHG emissions rates decrease with speed over the range of average speeds encountered in this corridor, although they do increase at very high speeds. Reduction of road grade also reduces energy consumption and GHG emissions. The proposed road widening under the various Build Alternatives would match existing roadway grades. Proposed grades for both mainline and interchanges at-grade and on structure range from 0 to 4 percent. EPA estimates that each 1 percent decrease in grade reduces energy consumption and GHG emissions by 7 percent, although the effect is not linear. The safety improvements associated with the proposed widening and new Elizabeth River crossings, which include better incident management capabilities, would produce emissions benefits by reducing vehicle delay and idling.

Construction and subsequent maintenance of the project would generate GHG emissions. Construction of the roadway (e.g., earth-moving activities) involves a considerable amount of energy consumption and resulting GHG emissions. Manufacturing the materials used in construction and fuel used by construction equipment also contribute to GHG emissions. Typically, construction emissions associated with a new roadway account for approximately 5 percent of the total 20-year lifetime emissions from the roadway, although this can vary widely with the extent of construction activity and the number of vehicles that use the roadway.

The addition of new roadway miles to the study area roadway network would also increase the energy and GHG emissions associated with maintaining those new roadway miles in the future. The increase in

Attachment 3

Excerpt from:

I 73 South, Dillon, Marion, and Horry
Counties, South Carolina, Re-Evaluation
(May 2017)

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.

For the Selected Alternative, the amount of MSATs emitted would be proportional to the VMT. The VMT estimated for the Selected Alternative is slightly higher than that for the No-Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the regional transportation network (refer to **Table 2.4**). This increase in VMT would lead to higher MSAT emissions for the Selected Alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the existing routes, such as U.S. 501. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to USEPA's MOVES2014 model, emissions of all of the priority MSAT decrease as speed increases. Also, emissions will likely be lower than present levels in the design year as a result of USEPA's national control programs that are projected to reduce annual MSAT emissions by over 90 percent between 2010 and 2050.⁵⁴ Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the project study area are likely to be lower in the future in nearly all cases.

The new travel lanes contemplated as part of the Selected Alternative will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, there may be localized areas where ambient concentrations of MSAT could be higher under the Selected Alternative than the No-Build Alternative. However, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, the localized level of MSAT emissions for the Selected Alternative could be higher relative to the No-Build Alternative, but this would be offset due to increases in speeds and reductions in congestion on the local road network (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

3.8.2 Greenhouse Gases and Climate Change

Greenhouse gases (GHGs) are those that trap heat in the atmosphere of the Earth, and include carbon dioxide, methane, nitrous oxide, and fluorinated gases.⁵⁵ According to the USEPA, the

⁵⁴ FHWA, Updated Interim Guidance on Mobile Source Air Toxic Analysis in USEPA Documents, http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm, October 12, 2016, (December 8, 2016).

⁵⁵ USEPA, "GHG Overview," <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>. (Last accessed 11/28/16).

most common of the GHGs is carbon dioxide (CO₂), which accounted for almost 81% of all U.S. GHG emissions due to human activities in 2014. The combustion of fossil fuels, land use changes, and some industrial processes are the main emission generators of greenhouse gases.⁵⁶ In 2014, the transportation sector was responsible for almost 27% of the CO₂ emissions in the U.S.⁵⁷ Because GHGs trap heat in the atmosphere, the outcome has been a warming of the Earth’s temperature, which has led to a change in the climate of the Earth, resulting in more extreme weather events, melting of glaciers, and sea level rise.⁵⁸

On August 2, 2016, the Council on Environmental Quality (CEQ) issued *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. While this guidance does not legally require agencies to mitigate for impacts to the climate due to GHG emissions, it does direct agencies to disclose the potential amounts of GHG being released due to the agency’s action, as well as the agency’s influence on climate change. However, this CEQ guidance was recently rescinded through the *Presidential Executive Order on Promoting Energy Independence and Economic Growth*, dated March 28, 2017.⁵⁹ Even though this guidance has been rescinded, the GHG analysis was completed prior to that date, and has been left in this re-evaluation.

GHG Analysis

For this project, the operations, fuel cycle, and construction/maintenance emissions were estimated. A GHG Analysis was completed for the Selected Alternative, and included the emissions from constructions, operations, and fuel cycle. Operations and fuel cycle emissions were determined using lookup tables from the Motor Vehicle Emission Simulator (MOVES2014a) provided by the FHWA. The results of the analysis are shown below in **Table 3.14**.

Table 3.14 Project CO₂e Emissions and Fuel Cycle Emissions	
	Selected Alternative in 2040
VMT (millions of miles, per year)	5,187,476
CO ₂ e operations emissions and fuel cycle emissions (metric tons per year)	816,533
Note: CO ₂ e Emissions Factor provided by FHWA HQ Moves Lookup Tables.	

To determine the construction and maintenance emissions over the lifespan of the project, the FHWA’s Infrastructure Carbon Estimator (ICE) Tool was used. The ICE Tool can be used to create ball park estimates of energy usage and GHG emissions for a life-cycle of a project, including construction/rehabilitation and routine maintenance. However, it should be noted that

⁵⁶ Ibid.

⁵⁷ USEPA, “Greenhouse Gas Inventory Data Explorer,” <https://www3.epa.gov/climatechange/ghgemissions/inventoryexplorer/#allsectors/allgas/econsect/current>. (Last accessed 11/28/16).

⁵⁸ USEPA, “Climate Change Basic Information,” <https://www.epa.gov/climatechange/climate-change-basic-information>. (Last accessed 11/28/16).

⁵⁹ <https://www.whitehouse.gov/the-press-office/2017/03/28/presidential-executive-order-promoting-energy-independence-and-economi-1>