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MD 32 FROM MD 108 TO I-70

AIR QUALITY ANALYSIS TECHNICAL REPORT

April 2016

Howard County, Maryland

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

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I. INTRODUCTION

This report presents the results of a review of air quality impacts associated with proposed improvements to MD 32 from MD 108 to I-70 in Howard County, Maryland. This study is intended as an evaluation of the project level air quality impacts of the proposed improvements. This evaluation is provided to meet the requirements of the Clean Air Act (CAA) and the National Environmental Policy Act (NEPA).

In the project area, MD 32 is a principal arterial running north to south that consists of one to two lanes in both directions. Land use along the corridor of this project is a mix of commercial, institutional, low density residential, very low density residential, forest, and agriculture. The overall study area extends from the interchange of MD 32 and I-70 to the interchange of MD 32 and MD 108 for a distance of approximately 9.1 miles (**Figure 1**).

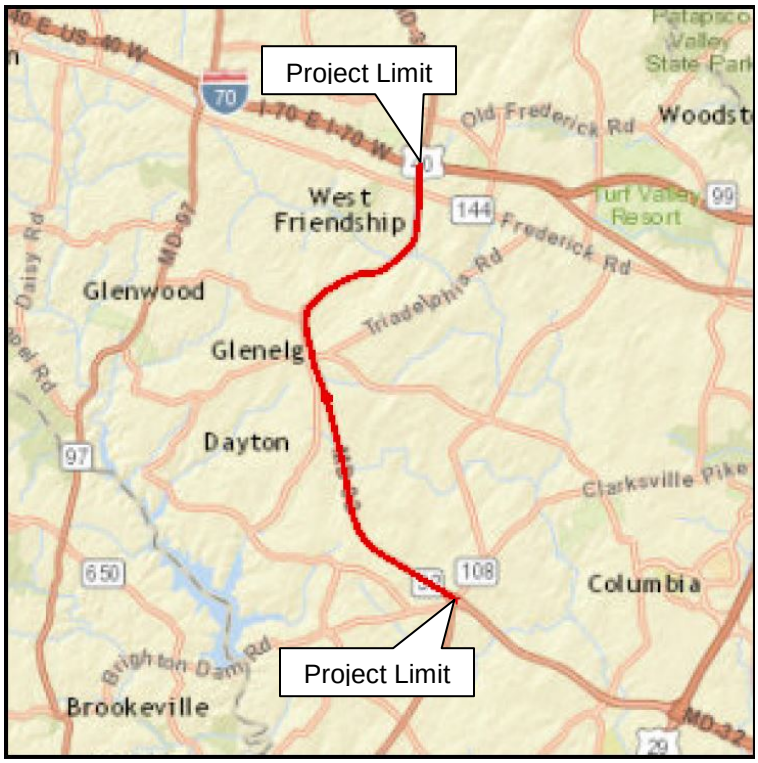


FIGURE 1 – Location Map

The purpose of the project is to improve safety and capacity along MD 32 while attempting to minimize right-of-way impacts, residential and business displacements, and environmental impacts. This will be accomplished by widening MD 32 within the project limits to accommodate a four lane divided highway. The improvements include roadway reconstruction, resurfacing, drainage, storm water management, pipe structure replacement, signing and pavement marking, landscaping, traffic barrier installation, and utility relocations. Refer to **Appendix A** for project design plans.

II. AIR QUALITY BACKGROUND

The Clean Air Act (CAA) Amendments and the Final Transportation Conformity Rule (40 CFR Parts 51 and 93) direct the U.S. Environmental Protection Agency (EPA) to implement environmental policies and regulations that will ensure acceptable levels of air quality. Both the CAA and the Final Transportation Conformity Rule apply to the proposed transportation project because it involves federal action and funding.

According to the CAA, Title I, Section 176 (c) 2, *"No federal agency may approve, accept, or fund any transportation plan, program, or project unless such plan, program, or project has been found to conform to any applicable implementation plan in effect under this chapter."* The CAA, Title I, Section 176 (c) 1, defines conformity as; *"Conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and that such activities will not:*

i. cause or contribute to any new violation of any standard in any area;
ii. increase the frequency or severity of any existing violation of any standard in any area; or
iii. delay timely attainment of any standard or any required interim emission reductions or other milestones in any area."

As required by the CAA, National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants. These pollutants, known as criteria pollutants, are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} & $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb). These national standards are summarized in **Table 1**. The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare, accounting for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

The CAA Amendments require that the EPA publish a designation list of all geographic areas in compliance with the NAAQS, as well as those areas not in compliance with the NAAQS. The designation of an area is made on a pollutant-by-pollutant basis. EPA's area designations consist of attainment, unclassified, maintenance, and nonattainment. Ambient air quality is monitored through a network of stations to determine conditions throughout the country. EPA reviews the monitoring data, designating areas where pollutant levels exceed the NAAQS as nonattainment. After a nonattainment area improves conditions to meet the standard for the corresponding pollutant, it is re-designated as a maintenance area. Typically these designations are applied to entire counties or groups of counties.

To comply with the CAA, EPA has issued proposed rules, guidance clarifications, and final rules concerning transportation conformity and pollutants for which standards have been set. Following is a summary of recent rules and clarifications:

- *Transportation Conformity Rule $PM_{2.5}$ and PM_{10} Amendments; Final Rule*, March 24, 2010;

- *Using MOVES in Project-Level Carbon Monoxide Analyses*, December 2010;
- *Transportation Conformity Rule Restructuring Amendments*, March 14, 2012;
- *Transportation Conformity Regulations, as of April 2012*;
- *National Ambient Air Quality Standards for Particulate Matter*, January 15, 2013; and
- Update to the *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*, November 2015.

EPA has only provided rules and guidance for project level analyses of CO and particulate matter ($PM_{2.5}$ and PM_{10}).

TABLE 1 - National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary/ Secondary	Primary Standards		Form
		Level	Averaging Time	
Carbon Monoxide 76 FR 54294	Primary	9 ppm	8-hour	Not to be exceeded more than once per year
		35 ppm	1-hour	
Lead 73 FR 669964	Primary and Secondary	0.15 µg/m^3	Rolling 3-Month Average	Not to be exceeded
Nitrogen Dioxide 75 FR 6464	Primary	100 ppb	1-hour	98th percentile, averaged over 3 years
	Primary and Secondary	53 ppb	Annual	Annual Mean
Particulate Matter (PM_{10}) 71 FR 61144	Primary and Secondary	150 µg/m	24-hour	Not to be exceeded more than once per year on average over 3 years
Particulate Matter ($PM_{2.5}$) 71 FR 61144	Primary	12 µg/m^3	Annual	Annual mean averaged over 3 years
	Secondary	15 µg/m^3	Annual	Annual mean averaged over 3 years
	Primary and Secondary	35 µg/m^3	24-hour	98th percentile, averaged over 3 years
Ozone 80 FR 65292	Primary and Secondary	0.070 ppm	8-hour	Annual fourth highest daily maximum 8-hour concentration, averaged over 3 years
Sulfur Dioxide 75 FR 35520	Primary	75 ppb	1-hour	Not to be exceeded more than once per year
	Secondary	0.5 ppm	3-hour	

In addition to the criteria pollutants for which there are NAAQS, EPA also regulates air toxics. Toxic air pollutants are those pollutants known or suspected to cause cancer or other serious health effects. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries). The CAA identified 188 air toxics. In 2001 EPA identified a list of 21 Mobile Source Air Toxics (MSATs), and highlighted six of these MSATs as "priority" MSAT. The EPA identified seven compounds with significant

contributions from mobile sources that are among the national and regional-scale cancer risk drivers. These seven MSATs are: acrolein; benzene; 1,3-butadiene; diesel exhaust (organic gases and diesel particulate matter); formaldehyde; naphthalene; and polycyclic organic matter.

III. ENVIRONMENTAL ANALYSIS

The MD 32 improvement project is located in Howard County, Maryland, which is part of the Baltimore, MD designated area. A portion of the area, the Baltimore Central Business District, had been nonattainment for carbon monoxide; however, this area was re-designated as a CO maintenance area on October 31, 1995. Since the project is located in Howard County, it is not considered within a CO maintenance area. The area was classified as maintenance for the 1997 $PM_{2.5}$ standard by EPA on December 16, 2014. Maryland is neither within a PM_{10} maintenance nor nonattainment area.

For regional conformity determination, states develop State Implementation Plans (SIPs) to establish a plan for attaining and maintaining the NAAQS, as required by the CAA. Proposed and existing transportation projects and programs are compiled in short term (covering approximately 2-6 years) and long term (covering approximately 20 years) plans called transportation improvement programs (TIPs) and long range plans, respectively, for urbanized areas. Urbanized areas are geographic areas with a population greater than 50,000. These urbanized areas are governed by Metropolitan Planning Organizations (MPOs). MPOs are policy-making organizations which develop the TIPs and long range plans for their respective urbanized areas. Per 40 CFR 93.115, a project must be included in a long range plan and TIP that conforms to the SIP to achieve regional conformity. This assessment includes regional conformity determination for the project.

At the project level, pollutants could possibly have localized (hot-spot) levels above the NAAQS. As outlined by 40 CFR 93.116 in the *Transportation Conformity Regulations, as of April 2012*, any highway or transit project which is proposed to receive funding assistance and/or approval through federal programs or the Federal Highway Administration (FHWA) must not *"cause or contribute to any new localized CO, PM_{10}, and/or $PM_{2.5}$ violations, increase the frequency or severity of any existing CO, PM_{10}, and/or $PM_{2.5}$ violations, or delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in CO, PM_{10}, and $PM_{2.5}$ nonattainment and maintenance areas."* To determine project level conformity, analyses must be performed for the respective pollutant set in the corresponding nonattainment or maintenance area where a project is located. To make the determination that a project is conforming, consultation in accordance with 40 CFR 93.105 is completed via the Interagency Consultation Group (ICG). The ICG for Maryland State Highway Administration (SHA) projects includes a representative from FHWA, EPA, the Maryland Department of the Environment (MDE), and the appropriate MPO. This assessment includes a project level conformity determination.

For the Baltimore, MD area, the Baltimore Regional Transportation Board (BRTB) serves as the MPO. The current long range plan, *Maximize2040: A Performance-Based Transportation Plan,* was adopted by BRTB on November 25, 2015. The latest amended TIP, covering fiscal years 2016 to 2019, was also adopted by BRTB on November 25, 2015.

IV. ENVIRONMENTAL CONSEQUENCES

1. Regional Conformity Determination

The currently approved BRTB long range transportation plan and TIP have been determined to conform to the requirements of the CAA Amendments of 1990 in accordance with 40 CFR 93.114. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. The current long range plan includes the full project (MD 32 from MD 108 to I-70) under the list of Anticipated Highway Projects with a year of operation of 2030. The long range plan is to be amended to include a break out of the full project, MD 32 from MD 108 to Linden Church, with a year of operation of 2020. The current 2016-2019 TIP includes the full project (MD 32 from MD 108 to I-70) under TIP ID 66-1405-41 with a year of operation of 2024. The MD 32 from MD 108 to Linden Church breakout is to be added to the current TIP in an amendment with a year of operation of 2020. The next TIP (2017-2020), to be approved in July of 2016, will include a second break out of the project, the remaining corridor along MD 32 from Linden Church to I-70, with a year of operation of 2021. Therefore, the project is included in a regionally conforming long range transportation plan and TIP that meet the requirements of 40 CFR 93.115.

2. Project Level Conformity Determination

Although the project is not in a CO nonattainment or maintenance area, a qualitative CO assessment has been included. Also, because Howard County is within a maintenance area for $PM_{2.5}$, a project-specific $PM_{2.5}$ assessment has been provided.

To assist in analyzing potential project impacts to both CO and $PM_{2.5}$ levels, recent ambient air quality data from MDE air monitoring stations has been referenced. The closest MDE air monitoring station for the study area is located at the Lathrop E. Smith Environmental Education Center in Montgomery County, Maryland. Monitoring data is available at other stations, including those located at Howard University's Beltsville Laboratory (Beltsville MD), Anne Arundel County Public Works Building 7409 (Glen Burnie MD), Oldtown Fire Station (Baltimore MD), and 2500 1st Street (Washington DC). All these stations are located in EPA Region 3. Monitored ambient air quality data recorded at stations near the study area for the years 2012-2014 is presented in **Table 2** (see **Appendix B** for details).

A. Carbon Monoxide (CO) Assessment

Since the study area is not in a CO nonattainment or maintenance area, a hot-spot conformity determination in conformance with 40 CFR 93.116 is not required, and a qualitative assessment that considers local factors is provided hereinafter.

As shown in **Table 2**, the maximum 1-hour monitored CO concentration of 2.5 ppm occurred in 2012 at Site 245100040, located at the Oldtown Fire Station, in Baltimore, MD, and at Site 110010043, located at 2500 1st Street, in Washington, D.C. This concentration is 7.1 percent of the 1-hour CO NAAQS of 35.0 ppm. The maximum 8-hour monitored CO concentration of 2.1 ppm occurred in the same year at Site 245100040, which is 23.3 percent of the 8-hour NAAQS of 9.0 ppm.

A review of data provided, including traffic volume and operational analyses summarized in **Tables 3** and **4** (see **Appendix C** for details), demonstrates that while the project will increase

the traffic volumes on this segment of MD 32, it will not result in a change in vehicle mix and will improve the level of service (LOS) at five intersections within the project limits.

The project area was included in the Air Quality Analysis completed for the 2005 MD 32 Corridor Planning Study, which evaluated a corridor along MD 32 from north of the interchange with I-70/US 40 to north of the interchange with MD 108 (Clarksville Pike), and included a microscale CO analysis. An air quality screening analysis was conducted at 64 locations along the corridor to determine which locations may experience adverse air quality impacts due to the project. The maximum 1-hour and 8-hour CO levels were predicted at these receptors along the corridor. The 2005 microscale air quality analysis indicated that CO impacts would result in no violations of either the 1-hour or 8-hour NAAQS. **Table 5** summarizes the results of the receptor with the highest predicted concentrations, located at 2935 MD 32 near the intersection with Fox Chase Road (R18). This receptor predicted both the highest 1-hour and 8-hour concentrations along the corridor. The highest predicted 1-hour CO concentration was 4.8 ppm for the 2025 build conditions, which is 14 percent of the 35 ppm 1-hour CO NAAQS. The highest predicted 8-hour CO concentration along the project corridor was 2.6 ppm for the 2025 build conditions, which is 29 percent of the 9 ppm 8-hour CO NAAQS.

TABLE 2 – Monitored Ambient Air Quality Data 2012-2014

Site (ordered from closest to farthest from project limits)			**Site 240330030 Howard University Beltsville MD**			**Site 245100040 Oldtown Fire Station Baltimore MD**			**Site 110010043 2500 1st Street Washington DC**		
Year			***2012***	***2013***	***2014***	***2012***	***2013***	***2014***	***2012***	***2013***	***2014***
Carbon Monoxide (CO) [ppm]	**1-Hour**	**1st Maximum**	1.3	1	1.5	2.5	2.4	1.7	2.5	2.1	1.6
		2nd Maximum	1.2	0.9	1	2.5	2	1.6	2.4	1.4	1.6
		Actual Exceedances	0	0	0	0	0	0	0	0	0
	8-Hour	**1st Maximum**	1.2	0.9	0.9	2.1	1.6	1.3	1.9	1.2	1.5
		2nd Maximum	0.9	0.9	0.8	1.6	1.3	1	1.8	1	1.2
		Actual Exceedances	0	0	0	0	0	0	0	0	0
Site (ordered from closest to farthest from project limits)			**Site 240313001 Smith Center Montgomery County MD**			**Site 240330030 Howard University Beltsville MD**			**Site 240031003 Public Works Bldg. Glen Burnie MD**		
Year			***2012***	***2013***	***2014***	***2012***	***2013***	***2014***	***2012***	***2013***	***2014***
Particulate Matter ($PM_{2.5}$) [ug/m^3]	**Annual**	**Weighted Annual Mean**	10.3	8.1	9	11.3	9.5	9.9	10.2	9.1	9.1
	24-Hour	**98th Percentile**	23	21	20	26	22	23	23	22	23

TABLE 3 - Traffic Data: MD 32 North of MD 108

Condition	**Existing 2015**	**No-Build 2019**	**Ultimate Build 2019**	**No-Build 2030**	**Ultimate Build 2030**	**No-Build 2040**	**Ultimate Build 2040**
ADT	29,475	30,750	33,075	34,575	43,650	38,450	51,175

Percent Trucks	**Gas / Diesel**	2.62 / 7.38	2.62 / 7.38	2.62 / 7.38	2.62 / 7.38	2.62 / 7.38	2.62 / 7.38	2.62 / 7.38
	Total	10	10	10	10	10	10	10
Daily Truck Volumes	**Gas / Diesel**	773 / 2,175	806 / 2,269	867 / 2,441	906 / 2,552	1,144 / 3,221	1,007 / 2,838	1,341 / 3,777
	Total	2,948	3,075	3,308	3,458	4,365	3,845	5,118

TABLE 4 – Traffic Operation Summary

Intersection	**LOS**					
	Existing 2015		**No-Build 2030**		**Ultimate Build 2030**	
	AM	**PM**	**AM**	**PM**	**AM**	**PM**
MD 32 at I-70 WB Ramps	B	C	B	D	A	A
MD 32 at I-70 EB Ramps	C	C	C	C	A	A
MD 32 at MD 144	B	D	D	D	A	A
MD 32 at Rosemary Lane	B	B	B	D	A	A
SB MD 32 Ramps at Pfefferkorn Road	A	A	A	A	A	A
NB MD 32 Ramps at Burntwoods Road / Andrea Drive	A	A	A	A	A	A
MD 32 at SHA Dayton Shop Access	E	D	A	F	A	A
SB MD 32 Ramps at Linden Church Road	A	A	A	A	A	A
NB MD 32 Ramps at Linden Church Road	A	A	A	A	A	A
SB MD 32 Ramps at MD 108	A	A	A	A	A	A
NB MD 32 Ramps at MD 108	B	C	B	B	B	B

TABLE 5 – 2005 MD 32 Corridor Planning Study Maximum Predicted Peak CO Concentrations (ppm)

2015				**2025**			
No-Build		**Build**		**No-Build**		**Build**	
1-Hour	**8-Hour**	**1-Hour**	**8-Hour**	**1-Hour**	**8-Hour**	**1-Hour**	**8-Hour**
Receptor R18 (2935 MD 32)							
4.1	2.3	4.4	2.5	4.0	2.3	4.8	2.6

In conclusion, because the data presented in **Table 2** demonstrates maximum recently monitored CO concentrations near the project area are a percentage of the CO NAAQS, the data in **Table 3** demonstrates the improvements will not result in changes in vehicle mix relative to the no-build conditions, **Table 4** demonstrates the improvements will lead to improved LOS at five intersections within the project corridor, and **Table 5** demonstrates the improvements will result in CO concentrations that are a percentage of the NAAQS, it has been determined the project will not cause or contribute to a new violation of the CO NAAQS, increase the frequency or severity of any existing CO violation, or delay timely attainment of any CO standard or any required interim CO emission reductions or other milestones.

B. Particulate Matter ($PM_{2.5}$) Assessment

On March 10, 2006, EPA issued a final rule to address localized impacts of particulate matter: "*$PM_{2.5}$ and PM_{10} Hot-Spot Analyses in Project-Level Transportation Conformity Determinations for the New $PM_{2.5}$ and Existing PM_{10} National Ambient Air Quality Standards*" (71 FR 12468). These rule amendments require the assessment of localized air quality impacts of federally funded or approved transportation projects in PM_{10} and $PM_{2.5}$ nonattainment and maintenance areas. In November 2015 EPA issued "*Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas,*" which helps state and local agencies complete quantitative $PM_{2.5}$ and PM_{10} hot-spot analyses for project-level transportation conformity determinations of certain highway and transit projects.
Projects that require hot-spot analysis for $PM_{2.5}$ are those that are listed in 40 CFR 93.123(b)(1), which Appendix B to the December 2010 *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* defines as examples of projects of local air quality concern and include:

(i) New highway projects that have a significant number of diesel vehicles, and expanded projects that have a significant increase in the number of diesel vehicles;
(ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
(iii) New bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location;
(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and
(v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM_{10} or $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violations.

As discussed in examples outlined in the preamble to the March 10, 2006 final rule, projects of local air quality concern, 40 CFR 93.123(b)(1)(i) and (ii), have been interpreted as applying to projects that would involve a significant increase in the number of diesel transit buses and diesel trucks on the existing facility. As provided in the November 2015 guidance, Appendix B, examples of projects that are of air quality concern and, therefore, covered by 40 CFR 93.123(b)(1)(i) and (ii) include the following:

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) and 8% or more of such AADT is diesel truck traffic;
- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal;
- Expansion of an existing highway or other facility that affects a congested intersection (operated at Level-of-Service D, E, or F) that has a significant increase in the number of diesel trucks; and,
- Similar highway projects that involve a significant increase in the number of diesel transit busses and/or diesel trucks.

To assist with the ICG process, SHA has prepared the following assessment of the proposed improvements:

- This project is considered under the following paragraphs of 40 CFR 93:
    - 40 CFR 93.123(b)(1)(i), as amended, which includes *"New highway projects that have a significant number of diesel vehicles, and expanded projects that have a significant increase in the number of diesel vehicles."*
    - 40 CFR 93.123(b)(1)(ii) *Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;*

- The proposed improvements do not meet the criteria set forth in 40 CFR 93.123(b)(1)(i) to be considered a project of local air quality concern based on the following considerations:
    - The proposed project involves widening MD 32 to the west to accommodate a four lane divided highway.
    - As shown in **Table 3**, MD 32 does not carry a significant number of diesel trucks, nor will there be an increase in the percentage of diesel trucks. For the 2040 no-build conditions, the total MD 32 average daily traffic (ADT) volume north of MD 108 is 38,450 vehicles and the total average daily number of diesel trucks is 2,838 vehicles. For the 2040 ultimate build conditions, the MD 32 ADT is 51,175 and diesel truck volume is 3,777.
    - Depicted truck percentages represent the amount of light, medium and heavy truck activity along the given roadway segment. Unless predicated by significant land use changes (heavy truck generators), existing truck percentages are used as the primary factor in determining future percentages. The build condition will improve operation of the roadway, relieving system congestion, but will not necessarily induce new truck traffic origin-destination patterns (see Appendix C for details).
    - A review of the traffic data demonstrates that there will not be a "significant" increase in the number of diesel trucks from the no-build condition to the ultimate build. The build condition will improve safety and operation of the roadway, but will not necessarily induce new truck origin-destination patterns.

- The proposed improvements do not meet the criteria set forth in 40 CFR 93.123(b)(1)(ii) to be considered a project of "air quality concern."
    - As shown in **Table 4**, the project will improve LOS from D, E, or F to A at four intersections within the project limits in the ultimate build condition as compared to the operation of the intersections in the no-build condition.
    - Therefore, the project does not meet the requirement that the change in LOS is caused by an increase in diesel vehicles "***related to the project***."
    - Compared to the no-build configuration, the proposed ultimate build alternative

provides benefits during both peak hours. Refer to **Appendix C** for additional information.

Based on review and analysis as discussed above, it is determined that the project will meet the Clean Air Act and 40 CFR 93.109 requirements for Fine Particulate Matter – $PM_{2.5}$. These requirements are met without a hot-spot analysis because the project has not been found to be a project of local air quality concern as outlined under 40 CFR 93.123(b)(1). The project will not cause or contribute to a new violation of the $PM_{2.5}$ NAAQS, increase the frequency or severity of any existing $PM_{2.5}$ violation, or delay timely attainment of any $PM_{2.5}$ standard or any required interim $PM_{2.5}$ emission reductions or other milestones.

3. MSAT Assessment

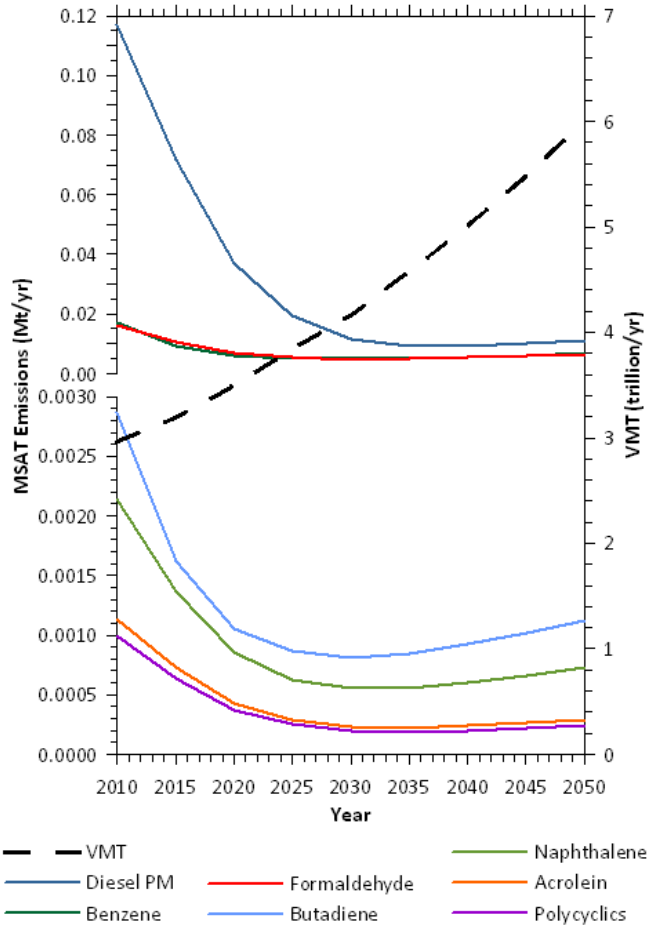
The Federal Highway Administration (FHWA) *Guidance Update on Mobile Source Air Toxic Analysis in NEPA* requires an assessment of Mobile Source Air Toxics (MSATs) under specific conditions. The EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers. These seven MSATs are: acrolein; benzene; 1,3-butadiene; diesel exhaust (organic gases and diesel particulate matter); formaldehyde; naphthalene; and polycyclic organic matter. Since the no-build and build ADT traffic are projected to be less than 140,000 as reflected in **Table 3**, the project will have low impacts on traffic volumes and vehicle mixes. Therefore in accordance with the above referenced FHWA guidance, the project would be considered a **Project with Low Potential MSAT Effects**.

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at:
www.fhwa.dot.go/environment/air_quality/air_toxics/research_and_analysis/methodology/methodology00.cfm.

For the build alternative, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the Build 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 transportation network (refer to **Table 3)**. This increase in VMT would lead to higher MSAT emissions for the build alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the

EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases (see **Figure 2**).

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.



Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.
Source: EPA MOVES2010b model runs conducted during May - June 2012 by FHWA.

FIGURE 2 - National MSAT Emission Trends 1999 – 2050 for Vehicles Operating on Roadways Using EPA's MOVES2010b Model

The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations

with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

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

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

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries.

The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

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

4. Greenhouse Gas Assessment

Maryland's Greenhouse Gas Emission Reduction Act of 2009 (GGRA) seeks a reduction in greenhouse gas (GHG) emissions of 25 percent from the 2006 baseline by 2020. The Greenhouse Gas Reduction Plan was published October 2013 and puts the State on track to achieve the 25 percent GHG reduction required by the law. The Maryland Climate Change Commission (MCCC) was signed into law by Governor Hogan in 2015. The MCCC is charged with assessing future year goals for GHG emissions in Maryland.

Currently there are no Federal requirements for consideration of GHG impacts in transportation planning, however the Maryland Department of Transportation (MDOT), recognizes that highway transportation accounts for approximately 28 percent of the GHGs in Maryland. In response to the GGRA, MDOT is exploring and implementing transportation and land use strategies to reduce GHG emissions programmatically as described in the Plan. The general GHG reduction strategies presented for the transportation sector in the Plan include: Transportation Technologies such as vehicle emission and fuel standards, on-road technologies and low emission vehicle initiatives; Public Transportation Initiatives; Pricing Initiatives; GHG Emission Impact evaluation of Major New Transportation Projects; and Bike and Pedestrian Initiatives. Initiatives outlined in the Plan also will help with restoration of the Chesapeake Bay, improving air quality and improving water quality throughout the State.

Much like environmental habitats, Maryland's transportation system is a network of interdependent elements and the interactions and synergy between each part impact the transportation system as a whole. GHG emissions from major transportation projects need to be considered as part of the planning process and recognition needs to be made that all projects may not reduce GHG emissions but as a whole the network needs to focus on reductions. Consequently project-level emissions analyses are less informative than analysis conducted at the regional, state, and national scale. EPA has not identified National Ambient Air Quality

Standards for GHGs, but has finalized standards and adopted regulations to enable the production of a new generation of clean vehicles along with implementing cleaner fuel standard regulations to achieve significant reductions of GHG emissions.

The State Highway Administration continues to strive for improved operations and system efficiency through improved operations which typically goes hand in hand with GHG reductions. System operations improvements such as improved signal timing, roundabouts, reduced vehicle idling, congestion pricing and reduction, smoothing traffic flow, eliminating bottlenecks and encouraging eco-driving are incorporated into many SHA projects. Environmental benefits and consequences are considered on all projects prior to implementation.

5. Construction Impacts

The construction phase of the proposed project has the potential to impact the local ambient air quality by generating fugitive dust through activities such as demolition and materials handling. The State Highway Administration has addressed this possibility by establishing procedures to be followed by contractors involved in site work through publishing the *Standard Specifications for Construction and Materials*. The Maryland Air and Radiation Management Administration was consulted to determine the adequacy of the specifications in terms of satisfying the requirements of the *Regulations Governing the Control of Air Pollution in the State of Maryland*. The Maryland Air and Radiation Management Administration found the specifications to be consistent with the requirements of these regulations. Therefore, during the construction period, all appropriate measures (Code of Maryland Regulations 26.11.06.03 D) would be incorporated to minimize the impact of the proposed transportation improvements on the air quality of the area. Mobile source emissions can also be minimized during construction by not permitting idling delivery trucks or other equipment during periods of unloading or other non-active use. The existing number of traffic lanes should be maintained during construction, to the maximum extent possible, and construction schedules should be planned in a manner that will not create traffic disruption and increase air pollutants. Application of these measures will ensure that the construction impact of the project is insignificant.

V. INTERAGENCY CONSULTATION GROUP / PUBLIC INVOLVEMENT

Copies of this air quality analysis were circulated to FHWA, EPA, MDE, and BRTB staff for a 15 day Interagency Consultation Group review and comment period. FHWA, EPA, MDE, and BRTB concurred that this project meets the requirements of the CAA and 40 CFR 93 without an additional quantitative hot spot analysis (**Appendix D**). FHWA requested the date the Baltimore CO maintenance area was designated be added to the report. This date has been included in section III. BRTB staff provided additional information on the project's status in the long range plan and TIP. This information was added to section IV.1. This report will be placed on SHA's website for a 15 day public review and comment period.

APPENDIX

A - PLANS

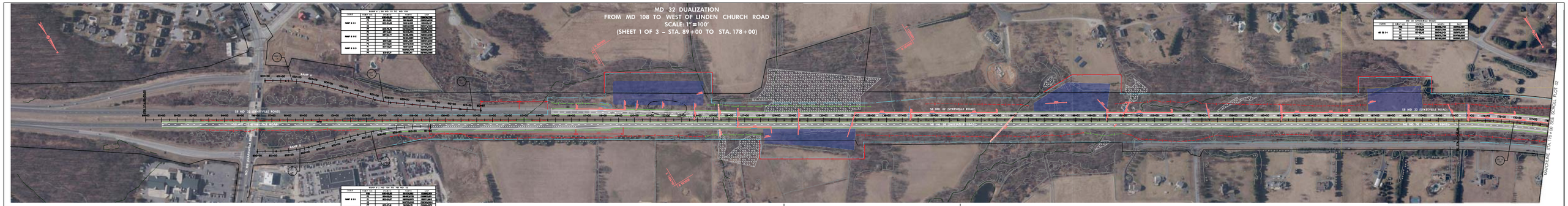
B - MONITORED AMBIENT AIR QUALITY DATA 2012-2014

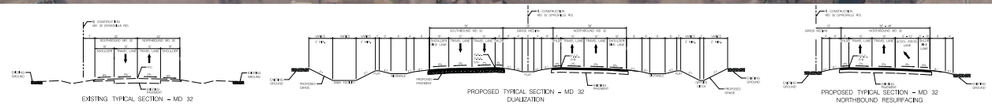
C - TRAFFIC DATA

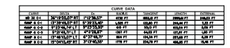
D - INTERAGENCY CONSULTATION GROUP COORDINATION

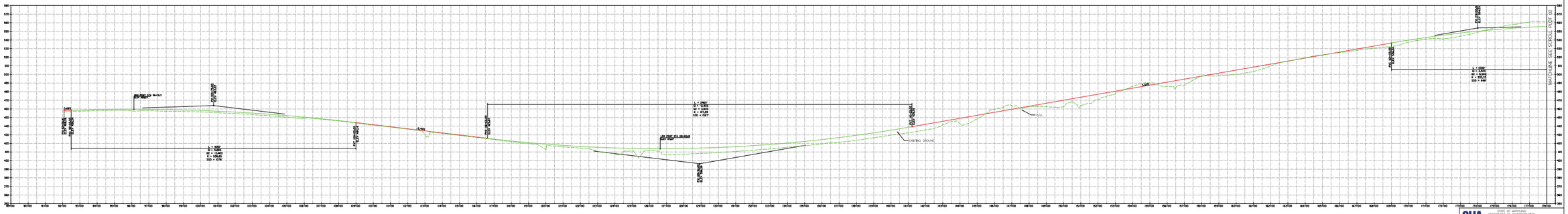
APPENDIX A - PLANS

MD 32 DUALIZATION
FROM MD 108 TO WEST OF LINDEN CHURCH ROAD
SCALE: 1"=100'
(SHEET 1 OF 3 – STA. 89+00 TO STA. 178+00)









JACOBS
Jacobs Engineering Group Inc.
100 N. Charles Street
Tower Two, Suite 1600
Baltimore, Maryland 21201
410.625.7690 - Fax: 410.625.6277
www.jacobs.com

DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
HIGHWAY DESIGN DIVISION

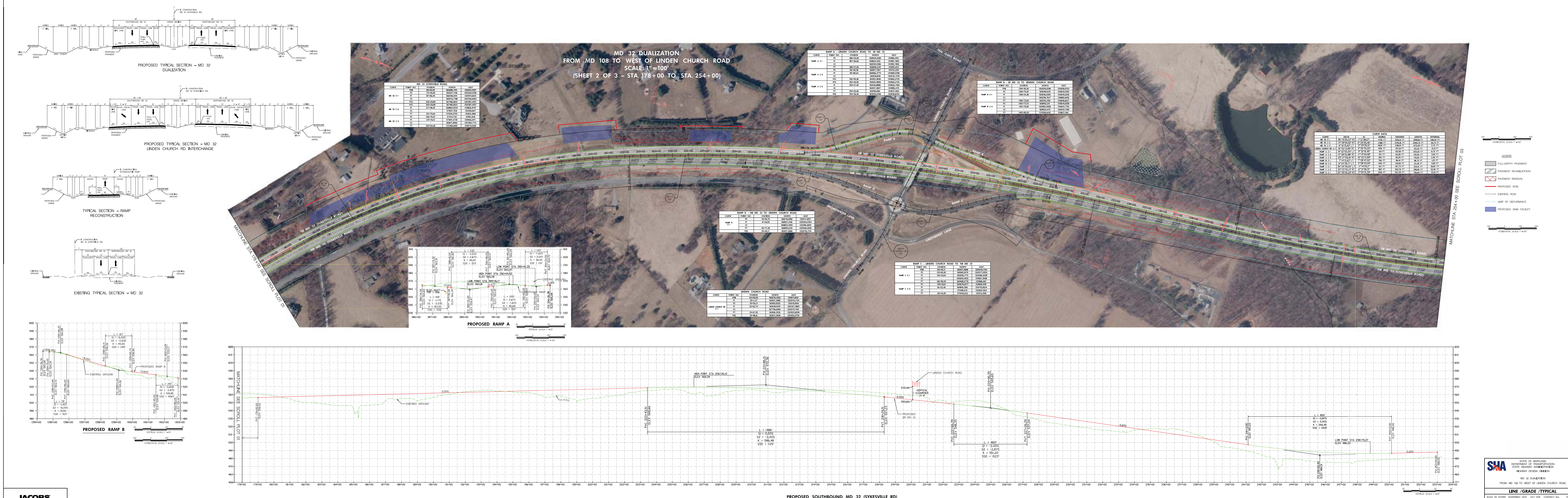
MD 32 DUALIZATION
FROM MD 108 TO WEST OF LINDEN CHURCH ROAD

LINE /GRADE /TYPICAL

ROAD NO. (SYSTEM) CONTRACT NO. (LOCAL)

DESIGNED BY ____ DRAWN ____
CHECKED BY ____ CHECKED ____
QUALITY CK ____ HORIZONTAL SCALE 1" = 50'
PLOTTED ____ VERTICAL SCALE 1" = 10'

DRAWING NO. ____ SHEET NO. ____ OF ____ SHEET NO. 01 OF 03



DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

JACOBS
Jacobs Engineering Group Inc.
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www.Jacobs.com

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
HIGHWAY DESIGN DIVISION

MD 32 DUALIZATION
FROM MD 108 TO WEST OF LINDEN CHURCH ROAD

LINE /GRADE /TYPICAL

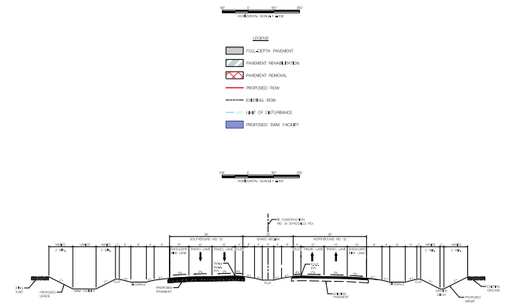
SCALE AS SHOWN ADVERTISED DATE JULY 2016 CONTRACT NO. HO141A21

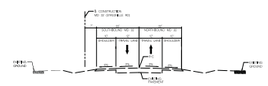
DESIGNED BY	N.J.F.	COUNTY	HOWARD
DRAWN BY	S.L.M.	LOGMILE	
CHECKED BY	S.A.S.	HORIZONTAL SCALE	1" = 100'
F.A.P. NO.	SEE TITLE SHEET	VERTICAL SCALE	1" = 20'

DRAWING NO. LGT – 02 OF 03 SHEET NO. 02 OF 03

PLOTTED: Thursday, February 11, 2016 AT 09:49 AM
FILE: c:\pwdata\jb-nferrar\jd0800309\pLGT-0002_MD32-SCROLL.dgn

MD 32 DUALIZATION
FROM MD 108 TO WEST OF LINDEN CHURCH ROAD
SCALE: 1" =100'
(SHEET 3 OF 3 – STA. 254+00 TO STA. 280+00)





DATUM: NAD 83/91 Horizontal
NAVD 88 Vertical

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SHA
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
HIGHWAY DESIGN DIVISION

MD 32 DUALIZATION
FROM MD 108 TO WEST OF LINDEN CHURCH ROAD

LINE /GRADE /TYPICAL

DESIGNED BY	DMG	COUNTY	HOWARD
DRAWN BY	DMG	LOG NO.	
CHECKED BY	DMG	FEDERAL ROAD NO.	
SUBMITTED	08 JULY 2020	CONTROL NO.	
DRAWING NO.	LOT # 32	OF	32
		SHEET NO.	32 OF 32

APPENDIX B - MONITORED AMBIENT AIR QUALITY DATA 2012-2014

Monitor Values Report

Geographic Area: District of Columbia
Pollutant: CO
Year: 2012
Exceptional Events: Included (if any)

Obs	First Max 8hr	Second Max 8hr	Days 8hr Max >STD	First Max 1hr	Second Max 1hr	Days 1hr Max >STD	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
8712	2	1.9	0	2.5	2.2	0	None	1	110010023	Verizon Phone Co.2055 L St. N.W.	Washington	District of Columbia	DC	03
8444	2.8	2.5	0	2.9	2.9	0	None	1	110010041	420 34th Street N.E.,Washington, Dc 20019	Washington	District of Columbia	DC	03
5238	1.9	1.8	0	2.5	2.4	0	None	1	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03

Get detailed information about this report, including column descriptions, at http://www.epa.gov/airquality/airdata/ad_about_reports.html#mon

AirData reports are produced from a direct query of the AQS Data Mart. The data represent the best and most recent information available to EPA from state agencies. However, some values may be absent due to incomplete reporting, and some values may change due to quality assurance activities. The AQS database is updated daily by state, local, and tribal organizations who own and submit the data. Please contact the appropriate air quality monitoring agency to report any data problems. <http://www.epa.gov/airquality/airdata/ad_contacts.html>

Readers are cautioned not to rank order geographic areas based on AirData reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of the air quality for an entire county or urban area.

This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 1, 2016

Monitor Values Report

Geographic Area: Maryland
Pollutant: CO
Year: 2012
Exceptional Events: Included (if any)

Obs	First Max 8hr	Second Max 8hr	Days 8hr Max >STD	First Max 1hr	Second Max 1hr	Days 1hr Max >STD	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
8485	1.6	1.6	0	2.3	2.1	0	None	1	240053001	600 Dorsey Avenue	Essex	Baltimore	MD	03
5921	0.3	0.3	0	0.3	0.3	0	None	1	240190004	University Of Maryland For Environmental And Estuarine Studies	Not in a City	Dorchester	MD	03
8182	0.4	0.4	0	1.8	0.8	0	None	1	240230002	Piney Run, Frostburg Reservoir, Finzel	Grantsville	Garrett	MD	03
8571	1.2	0.9	0	1.3	1.2	0	None	1	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
8626	2.1	1.6	0	2.5	2.5	0	None	1	245100040	Oldtown Fire Station, 1100 Hillen Street	Baltimore	Baltimore (City)	MD	03

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: January 20, 2016

Monitor Values Report

Geographic Area: District of Columbia
Pollutant: CO
Year: 2013
Exceptional Events: Included (if any)

Obs	First Max 8hr	Second Max 8hr	Days 8hr Max >STD	First Max 1hr	Second Max 1hr	Days 1hr Max >STD	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
7663	2.8	2.5	0	5.8	4.4	0	None	1	110010023	Verizon Phone Co.2055 L St. N.W.	Washington	District of Columbia	DC	03
8373	1.9	1.9	0	2.3	2.2	0	None	1	110010041	420 34th Street N.E.,Washington, Dc 20019	Washington	District of Columbia	DC	03
7715	1.2	1	0	2.1	1.4	0	None	1	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 1, 2016

Monitor Values Report

Geographic Area: Maryland
Pollutant: CO
Year: 2013
Exceptional Events: Included (if any)

Obs	First Max 8hr	Second Max 8hr	Days 8hr Max >STD	First Max 1hr	Second Max 1hr	Days 1hr Max >STD	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
8716	1.6	1.4	0	2.4	2.2	0	None	1	240053001	600 Dorsey Avenue	Essex	Baltimore	MD	03
8477	0.3	0.3	0	1	0.4	0	None	1	240190004	University Of Maryland For Environmental And Estuarine Studies	Not in a City	Dorchester	MD	03
8626	0.3	0.3	0	0.5	0.4	0	None	1	240230002	Piney Run, Frostburg Reservoir, Finzel	Grantsville	Garrett	MD	03
8689	0.9	0.9	0	1	0.9	0	None	1	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
8359	1.6	1.3	0	2.4	2	0	None	1	245100040	Oldtown Fire Station, 1100 Hillen Street	Baltimore	Baltimore (City)	MD	03

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This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: January 20, 2016

Monitor Values Report

Geographic Area: District of Columbia
Pollutant: CO
Year: 2014
Exceptional Events: Included (if any)

Obs	First Max 8hr	Second Max 8hr	Days 8hr Max >STD	First Max 1hr	Second Max 1hr	Days 1hr Max >STD	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
8514	1.6	1.5	0	2.1	2	0	None	1	110010023	Verizon Phone Co.2055 L St. N.W.	Washington	District of Columbia	DC	03
2006	2.2	2	0	2.5	2.5	0	None	1	110010041	420 34th Street N.E.,Washington, Dc 20019	Washington	District of Columbia	DC	03
8623	1.5	1.2	0	1.6	1.6	0	None	1	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03

Get detailed information about this report, including column descriptions, at http://www.epa.gov/airquality/airdata/ad_about_reports.html#mon

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This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 1, 2016

Monitor Values Report

Geographic Area: Maryland
Pollutant: CO
Year: 2014
Exceptional Events: Included (if any)

Obs	First Max 8hr	Second Max 8hr	Days 8hr Max >STD	First Max 1hr	Second Max 1hr	Days 1hr Max >STD	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
8460	1.4	1.3	0	2.4	1.8	0	None	1	240053001	600 Dorsey Avenue	Essex	Baltimore	MD	03
8196	0.4	0.3	0	0.4	0.4	0	None	1	240190004	University Of Maryland For Environmental And Estuarine Studies	Not in a City	Dorchester	MD	03
8104	0.3	0.3	0	0.4	0.3	0	None	1	240230002	Piney Run, Frostburg Reservoir, Finzel	Grantsville	Garrett	MD	03
6248	0.9	0.8	0	1.1	0.9	0	None	1	240270006	Interstate 95 South Welocme Center	North Laurel	Howard	MD	03
6989	0.9	0.8	0	1.5	1	0	None	1	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
8533	1.3	1	0	1.7	1.6	0	None	1	245100040	Oldtown Fire Station, 1100 Hillen Street	Baltimore	Baltimore (City)	MD	03

Get detailed information about this report, including column descriptions, at http://www.epa.gov/airquality/airdata/ad_about_reports.html#mon

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Readers are cautioned not to rank order geographic areas based on AirData reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of the air quality for an entire county or urban area.

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: January 20, 2016

Monitor Values Report

Geographic Area: Washington-Arlington-Alexandria, DC-VA-MD-WV
Pollutant: PM2.5
Year: 2012
Exceptional Events: Included (if any)
Note: The * indicates the mean does not satisfy minimum data completeness criteria.

Obs	First Max	Second Max	Third Max	Fourth Max	98th Percentile	Weighted Annual Mean	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
331	35.5	33.8	31.6	30.8	28	9.8	None	1	110010041	420 34th Street N.E.,Washington, Dc 20019	Washington	District of Columbia	DC	03
112	31.2	27.7	24.3	22.5	24	9.8	None	1	110010042	Park Services Office 1100 Ohio Drive	Washington	District of Columbia	DC	03
360	34.1	31.9	28.4	26.1	24	9.6	None	1	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03
120	31	23.6	23.5	22	24	9.3	None	2	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03
349	37.3	37	34.7	33.8	28	11.6	Included	4	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03
356	33.1	30.2	29	25	23	10.3	None	3	240313001	Lathrop E. Smith Environmental Education Center, 5110 Meadowside Lane	Not in a City	Montgomery	MD	03
121	25	22.3	21.7	20.8	22	8.5	None	1	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
43	25	22.1	15.4	13.9	25	8.3	None	2	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
341	34.1	30.2	29.9	29.7	26	11.3	None	3	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
97	24.7	23.8	15	14.7	24	7.8*	None	1	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03
35	14.8	14.7	14.2	12.6	15	7.8*	None	2	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03

Get detailed information about this report, including column descriptions, at http://www.epa.gov/airquality/airdata/ad_about_reports.html#mon

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 1, 2016

Monitor Values Report

Geographic Area: Maryland
Pollutant: PM2.5
Year: 2012
Exceptional Events: Included (if any)

Duration Description=24 HOUR

Duration Description	Obs	First Max	Second Max	Third Max	Fourth Max	98th Percentile	Weighted Annual Mean	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
24 HOUR	119	30.1	23.4	23	21.7	23	10.2	None	1	240031003	Anne Arundel Co. Public Works Bldg. 7409 Baltimore Annapolis Blvd.	Glen Burnie	Anne Arundel	MD	03
24 HOUR	112	29.5	22.6	21.5	18.3	22	8.9	None	1	240051007	Padonia Elementary School, 9834 Greenside Drive	Cockeysville	Baltimore	MD	03
24 HOUR	41	21	18	16.8	13.7	21	9.1	None	2	240051007	Padonia Elementary School, 9834 Greenside Drive	Cockeysville	Baltimore	MD	03
24 HOUR	116	28.2	25.5	24.7	23.6	25	10.7	None	1	240053001	600 Dorsey Avenue	Essex	Baltimore	MD	03
24 HOUR	121	25	22.3	21.7	20.8	22	8.5	None	1	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
24 HOUR	43	25	22.1	15.4	13.9	25	8.3	None	2	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
24 HOUR	97	24.7	23.8	15	14.7	24	7.8	None	1	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03
24 HOUR	35	14.8	14.7	14.2	12.6	15	7.8	None	2	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03
24 HOUR	121	23.8	22.5	22.1	21.8	22	9.3	None	1	245100007	Northwest Police Station, 5271 Reistertown Road	Baltimore	Baltimore (City)	MD	03
24 HOUR	111	23.7	22.6	22.5	20	23	9.6	None	1	245100008	Baltimore City Fire Dept.-Truck Company 20; 5714 Eastern Avenue	Baltimore	Baltimore (City)	MD	03
24 HOUR	304	26.3	25.5	24.4	23.7	23	10	None	1	245100040	Oldtown Fire Station, 1100 Hillen Street	Baltimore	Baltimore (City)	MD	03

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This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: July 17, 2015

Monitor Values Report

Geographic Area: Washington-Arlington-Alexandria, DC-VA-MD-WV
Pollutant: PM2.5
Year: 2013
Exceptional Events: Included (if any)
Note: The * indicates the mean does not satisfy minimum data completeness criteria.

Obs	First Max	Second Max	Third Max	Fourth Max	98th Percentile	Weighted Annual Mean	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
355	27.6	25.8	25	24.6	23	9.3	None	1	110010041	420 34th Street N.E.,Washington, Dc 20019	Washington	District of Columbia	DC	03
126	25.7	18.7	18.6	18.1	19	8.3	None	1	110010042	Park Services Office 1100 Ohio Drive	Washington	District of Columbia	DC	03
358	27.3	26.7	25.5	24.6	22	9.1	None	1	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03
110	27.6	26	19.4	19	19	9.1	None	2	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03
350	31	29.4	28.8	27.8	26	11.6	None	4	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03
346	27.4	27.1	25.7	25.2	21	8.1	None	3	240313001	Lathrop E. Smith Environmental Education Center, 5110 Meadowside Lane	Not in a City	Montgomery	MD	03
121	22.2	20.1	18.6	17.5	19	7.8	None	1	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
32	21.7	18.5	16.4	12.7	22	8.2	None	2	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
323	27.9	26.8	25.6	24.5	21	9.5	None	3	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
106	23.5	20.4	17.2	15.5	17	7.5	None	1	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03
50	16.6	15	15	14.7	17	7.9*	None	2	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03

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This report is based on monitor-level summary statistics. Air quality standards for some pollutants (PM2.5 and Pb) allow for combining data from multiple monitors into a site-level summary statistic that can be compared to the standard. In those cases, the site-level statistics may differ from the monitor-level statistics upon which this report is based.

Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 1, 2016

Monitor Values Report

Geographic Area: Maryland
Pollutant: PM2.5
Year: 2013
Exceptional Events: Included (if any)

Duration Description=24 HOUR

Duration Description	Obs	First Max	Second Max	Third Max	Fourth Max	98th Percentile	Weighted Annual Mean	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
24 HOUR	116	30.4	26.3	22.1	20.2	22	9.1	None	1	240031003	Anne Arundel Co. Public Works Bldg. 7409 Baltimore Annapolis Blvd.	Glen Burnie	Anne Arundel	MD	03
24 HOUR	111	26.5	24.7	19.9	19.7	20	8.5	None	1	240051007	Padonia Elementary School, 9834 Greenside Drive	Cockeysville	Baltimore	MD	03
24 HOUR	53	26.9	20	17.9	17.8	20	8.5	None	2	240051007	Padonia Elementary School, 9834 Greenside Drive	Cockeysville	Baltimore	MD	03
24 HOUR	113	35.2	29.4	26.8	23.4	27	9.5	None	1	240053001	600 Dorsey Avenue	Essex	Baltimore	MD	03
24 HOUR	121	22.2	20.1	18.6	17.5	19	7.8	None	1	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
24 HOUR	32	21.7	18.5	16.4	12.7	22	8.2	None	2	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
24 HOUR	106	23.5	20.4	17.2	15.5	17	7.5	None	1	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03
24 HOUR	50	16.6	15	15	14.7	17	7.9	None	2	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03
24 HOUR	116	28.6	27	20.4	18.8	20	8.6	None	1	245100007	Northwest Police Station, 5271 Reistertown Road	Baltimore	Baltimore (City)	MD	03
24 HOUR	114	32	28.7	24.3	22.8	24	9.4	None	1	245100008	Baltimore City Fire Dept.-Truck Company 20; 5714 Eastern Avenue	Baltimore	Baltimore (City)	MD	03
24 HOUR	303	34.6	29.8	29.7	27.7	23	9.1	None	1	245100040	Oldtown Fire Station, 1100 Hillen Street	Baltimore	Baltimore (City)	MD	03

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: July 17, 2015

Monitor Values Report

Geographic Area: Washington-Arlington-Alexandria, DC-VA-MD-WV
Pollutant: PM2.5
Year: 2014
Exceptional Events: Included (if any)
Note: The * indicates the mean does not satisfy minimum data completeness criteria.

Obs	First Max	Second Max	Third Max	Fourth Max	98th Percentile	Weighted Annual Mean	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
83	30.7	24.7	23.8	20.9	25	10.2*	None	1	110010041	420 34th Street N.E.,Washington, Dc 20019	Washington	District of Columbia	DC	03
116	24.6	22.5	21.1	17.3	21	9.1	None	1	110010042	Park Services Office 1100 Ohio Drive	Washington	District of Columbia	DC	03
347	30.1	25.8	24.4	24.3	22	9.4	None	1	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03
111	24	22.5	20.2	19.1	20	9.6	None	2	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03
357	30.5	26.3	24	23.6	21	9.9	Included	4	110010043	2500 1st Street, N.W. Washington Dc	Washington	District of Columbia	DC	03
340	27.7	23.2	23	21.9	20	9	None	3	240313001	Lathrop E. Smith Environmental Education Center, 5110 Meadowside Lane	Not in a City	Montgomery	MD	03
119	22	18.1	17.4	16.2	17	7.8	None	1	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
29	13.9	13	12.9	10.7	14	6.7	None	2	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
341	26.7	26.1	26	24.8	23	9.9	None	3	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
115	20.4	17.1	15.4	14	15	7.8	None	1	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03
57	17.3	15.9	13.2	13.1	16	7.1*	None	2	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 1, 2016

Monitor Values Report

Geographic Area: Maryland
Pollutant: PM2.5
Year: 2014
Exceptional Events: Included (if any)

Duration Description=24 HOUR

Duration Description	Obs	First Max	Second Max	Third Max	Fourth Max	98th Percentile	Weighted Annual Mean	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
24 HOUR	120	24.1	23	22.9	22.5	23	9.1	None	1	240031003	Anne Arundel Co. Public Works Bldg. 7409 Baltimore Annapolis Blvd.	Glen Burnie	Anne Arundel	MD	03
24 HOUR	115	23	21.4	20.8	20.6	21	8.9	None	1	240051007	Padonia Elementary School, 9834 Greenside Drive	Cockeysville	Baltimore	MD	03
24 HOUR	58	21.4	21.2	19	16.2	21	7.7	None	2	240051007	Padonia Elementary School, 9834 Greenside Drive	Cockeysville	Baltimore	MD	03
24 HOUR	110	25.9	23.3	21.6	21.3	22	9.7	None	1	240053001	600 Dorsey Avenue	Essex	Baltimore	MD	03
24 HOUR	119	22	18.1	17.4	16.2	17	7.8	None	1	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
24 HOUR	29	13.9	13	12.9	10.7	14	6.7	None	2	240330030	Howard University'S Beltsville Laboratory, 12003 Old Baltimore Pike	Beltsville	Prince George's	MD	03
24 HOUR	115	20.4	17.1	15.4	14	15	7.8	None	1	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03
24 HOUR	57	17.3	15.9	13.2	13.1	16	7.1	None	2	240338003	Pg County Equestrian Center, 14900 Pennsylvania Ave.	Greater Upper Marlboro	Prince George's	MD	03
24 HOUR	122	22.4	20.9	20.3	19.7	20	8.5	None	1	245100007	Northwest Police Station, 5271 Reistertown Road	Baltimore	Baltimore (City)	MD	03
24 HOUR	110	23.7	22.1	22	21.2	22	9.3	None	1	245100008	Baltimore City Fire Dept.-Truck Company 20; 5714 Eastern Avenue	Baltimore	Baltimore (City)	MD	03
24 HOUR	322	30.4	27.4	26.4	26.1	21	9.2	None	1	245100040	Oldtown Fire Station, 1100 Hillen Street	Baltimore	Baltimore (City)	MD	03

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: July 17, 2015

APPENDIX C - TRAFFIC DATA

MEMORANDUM

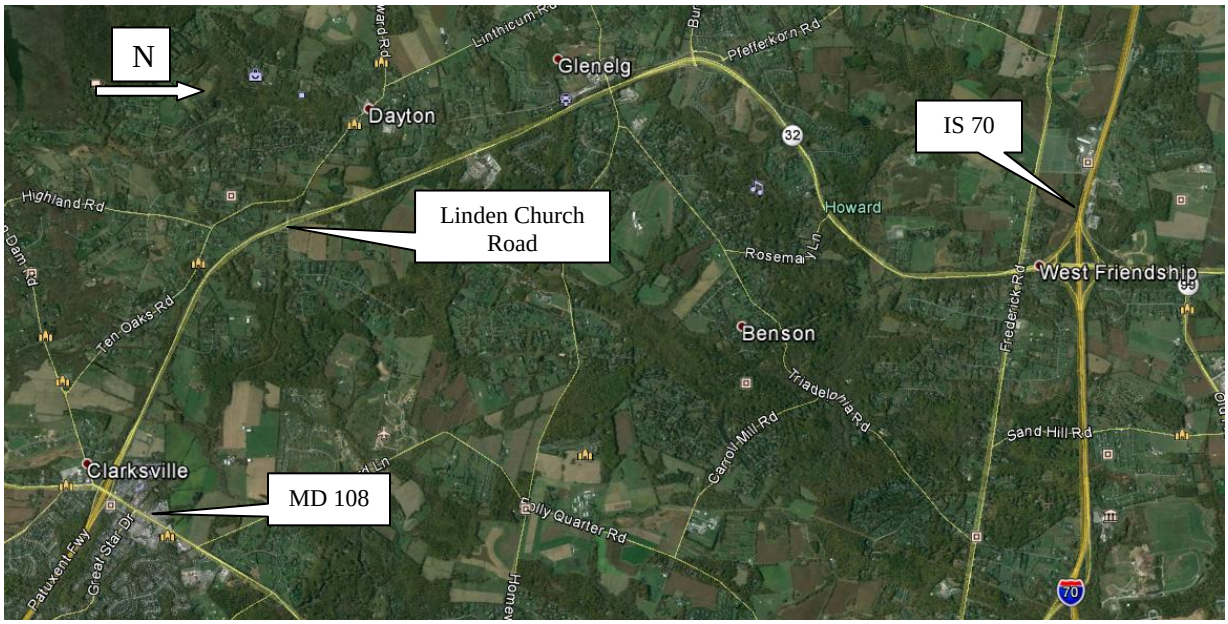
TO: Ms. Barbara Solberg, Chief
Highway Design Division
Office of Highway Development

ATTN: Ms. Yuqiong Bai
Project Manager

FROM: Lisa Shemer, Assistant Division Chief
Data Services Engineering Division
Office of Planning and Preliminary Engineering

DATE: February 18, 2016

SUBJECT: Environmental Traffic Data – Air Quality
MD 32 from MD 108 to Linden Church Road (Contract 1)
MD 32 from MD 108 to IS 70 (Contract 1+ Contract2)
Howard County
Project Number: HO212B21



In response to your request for Environmental Traffic -Air corresponding to the above Subject, we have provided data analying the following conditions:

- Contract 1: MD 32 from MD 108 to Linden Church Road
  - 2015 Existing
  - 2019 No-Build and Build
  - 2030 No- Build and Build
  - 2040 No-Build and Build

- Contract 1+ Contract 2: MD 32 from MD 108 to IS 70

  - 2019 No-Build and Build
  - 2030 No- Build and Build
  - 2040 No-Build and Build

The analysis performed along MD 32 examines each of the above conditions from MD 108 to IS 70 and supersedes previous memorandums.

MD 32 is a north-south commuter roadway connecting the I-70 corridor and northern Howard/Carroll County to the I-95 Baltimore-Washington Corridor. MD 32 is currently designated as a two-lane rural major arterial with limited facility access, a posted speed limit ranging from 50 to 55 mph. The proposed reconstruction of this segment would include expanding MD 32 to a four lane facility (two lanes per direction).

For each condition the following data is provided:

- Air Quality Traffic Data Summary Sheets

  Title Sheet Data
  Truck classification percentages by fuel type data
  Hourly percentage of total ADT for diurnal curves
  Level of Service breakpoints C/D, D/E and E/F volumes and speeds

This memorandum also includes a summary explaining a decision of no significant change in truck traffic as a result of construction for this project.

If you have any questions or concerns, please contact the writer at 410-545-5648 or Mr. Derek Gunn, DSED - Travel Forecasting and Analysis at 410-545-5642.

By: 

Marion Milton
Travel Forecasting and Analysis
Data Services Engineering Division

Attachments: Environment Traffic - Air Data Summary

Assessment of Truck Impacts

cc: Mr. Joseph Kresslien
Mr. Derek Gunn
Ms. Lisa Shemer
Ms. Christina Brandt
Ms. Jennifer Rohrer
Ms. Allison Grooms
Mr. Shawn Burnett

MD32 from MD 108 to IS 70

Ultimate Build (Contract 1 + Contract 2)

Condition:	No-Build	Ultimate Build	No-Build	Ultimate Build	No-Build	Ultimate Build
Year:	2019	2019	2030	2030	2040	2040
ADT:	30,750	33,075	34,575	43,650	38,450	51,175
DHV:	8%	8%	8%	8%	8%	8%
Directional Distribution:	73%	73%	73%	73%	73%	73%
% Trucks (ADT):	10%	10%	10%	10%	10%	10%
% Trucks (DHV):	9%	9%	9%	9%	9%	9%
Facility Type:	2 Lane Highway	Multilane Highway	2 Lane Highway	Multilane Highway	2 Lane Highway	Multilane Highway
Max LOS Reached:						
Northbound	E	B	F	C	F	E
Southbound	F	C	F	D	F	E

Condition: **2019 No Build**

Average Daily Traffic:	Light Trucks	Medium Trucks	Heavy Trucks	Total
Gasoline Powered:	0.67%	1.68%	0.27%	2.62%
Diesel Powered:	0.66%	1.68%	5.04%	7.38%
Total:	1.33%	3.36%	5.31%	10.00%

Design Hour Volume:	Light Trucks	Medium Trucks	Heavy Trucks	Total
Gasoline Powered:	0.52%	1.65%	0.23%	2.40%
Diesel Powered:	0.51%	1.64%	4.45%	6.60%
Total:	1.03%	3.29%	4.68%	9.00%

Two-Lane Highway LOS:	Vol./Hr	Mi/Hr
LOS C/D Breakpoint	277	51.7
LOS D/E Breakpoint	596	49.1
LOS E/F Breakpoint	1,489	39.1

Station ID: B2517
Location: MD 32 – 0.40 Mile North of MD 108
Date: Wednesday, Nov 18, 2015 to Thursday, Nov 19, 2015

Diurnal Curve:

Begin Hour	% of ADT
12:00 AM	0.79%
1:00 AM	0.23%
2:00 AM	0.28%
3:00 AM	0.45%
4:00 AM	1.58%
5:00 AM	5.05%
6:00 AM	7.29%
7:00 AM	7.96%
8:00 AM	7.64%
9:00 AM	6.23%
10:00 AM	4.43%
11:00 AM	4.34%
12:00 PM	4.56%
1:00 PM	5.31%
2:00 PM	6.82%
3:00 PM	6.87%
4:00 PM	6.45%
5:00 PM	6.64%
6:00 PM	6.10%
7:00 PM	4.08%
8:00 PM	2.76%
9:00 PM	2.21%
10:00 PM	1.22%
11:00 PM	0.71%
Total	100.00%

MD32 from MD 108 to IS 70

Ultimate Build (Contract 1 + Contract 2)

Condition: **2019 Build (4 Lanes)**

Average Daily Traffic:	Light Trucks	Medium Trucks	Heavy Trucks	Total
Gasoline Powered:	0.66%	1.69%	0.27%	2.62%
Diesel Powered:	0.66%	1.68%	5.04%	7.38%
Total:	1.32%	3.37%	5.31%	10.00%

Design Hour Volume:	Light Trucks	Medium Trucks	Heavy Trucks	Total
Gasoline Powered:	0.52%	1.67%	0.23%	2.42%
Diesel Powered:	0.51%	1.67%	4.40%	6.58%
Total:	1.03%	3.34%	4.63%	9.00%

	Northbound		**Southbound**	
Multilane Highway LOS:	Vol./Hr	Mi/Hr	Vol./Hr	Mi/Hr
LOS C/D Breakpoint	2,449	54.9	2,449	54.9
LOS D/E Breakpoint	3,173	52.9	3,173	52.9
LOS E/F Breakpoint	3,602	51.2	3,602	51.2

Diurnal Curve:

Begin Hour	**% of ADT**
12:00 AM	0.80%
1:00 AM	0.23%
2:00 AM	0.28%
3:00 AM	0.46%
4:00 AM	1.58%
5:00 AM	5.05%
6:00 AM	7.29%
7:00 AM	7.96%
8:00 AM	7.64%
9:00 AM	6.23%
10:00 AM	4.42%
11:00 AM	4.34%
12:00 PM	4.56%
1:00 PM	5.31%
2:00 PM	6.82%
3:00 PM	6.87%
4:00 PM	6.45%
5:00 PM	6.64%
6:00 PM	6.10%
7:00 PM	4.07%
8:00 PM	2.76%
9:00 PM	2.20%
10:00 PM	1.22%
11:00 PM	0.72%
Total	100.00%

MD32 from MD 108 to IS 70

Ultimate Build (Contract 1 + Contract 2)

Condition: **2030 No Build**

Average Daily Traffic:	Light Trucks	Medium Trucks	Heavy Trucks	Total
Gasoline Powered:	0.67%	1.68%	0.27%	2.62%
Diesel Powered:	0.66%	1.67%	5.05%	7.38%
Total:	1.33%	3.35%	5.32%	10.00%

Design Hour Volume:	Light Trucks	Medium Trucks	Heavy Trucks	Total
Gasoline Powered:	0.53%	1.63%	0.23%	2.39%
Diesel Powered:	0.53%	1.63%	4.45%	6.61%
Total:	1.06%	3.26%	4.68%	9.00%

Two-Lane Highway LOS:	Vol./Hr	Mi/Hr
LOS C/D Breakpoint	277	57.0
LOS D/E Breakpoint	595	54.2
LOS E/F Breakpoint	1,489	44.2

Diurnal Curve:

Begin Hour	**% of ADT**
12:00 AM	0.79%
1:00 AM	0.23%
2:00 AM	0.27%
3:00 AM	0.45%
4:00 AM	1.58%
5:00 AM	5.05%
6:00 AM	7.29%
7:00 AM	7.96%
8:00 AM	7.64%
9:00 AM	6.23%
10:00 AM	4.43%
11:00 AM	4.34%
12:00 PM	4.56%
1:00 PM	5.31%
2:00 PM	6.82%
3:00 PM	6.87%
4:00 PM	6.45%
5:00 PM	6.64%
6:00 PM	6.10%
7:00 PM	4.08%
8:00 PM	2.76%
9:00 PM	2.21%
10:00 PM	1.22%
11:00 PM	0.72%
Total	100.00%

MD32 from MD 108 to IS 70

Ultimate Build (Contract 1 + Contract 2)

Condition: **2030 Build (4 Lanes)**

Average Daily Traffic:	Light Trucks	Medium Trucks	Heavy Trucks	Total
Gasoline Powered:	0.67%	1.68%	0.27%	2.62%
Diesel Powered:	0.67%	1.67%	5.04%	7.38%
Total:	1.34%	3.35%	5.31%	10.00%

Design Hour Volume:	Light Trucks	Medium Trucks	Heavy Trucks	Total
Gasoline Powered:	0.52%	1.65%	0.23%	2.40%
Diesel Powered:	0.52%	1.65%	4.43%	6.60%
Total:	1.04%	3.30%	4.66%	9.00%

	Northbound		**Southbound**	
Multilane Highway LOS:	Vol./Hr	Mi/Hr	Vol./Hr	Mi/Hr
LOS C/D Breakpoint	2,449	54.9	2,449	54.9
LOS D/E Breakpoint	3,172	52.9	3,172	52.9
LOS E/F Breakpoint	3,601	51.2	3,601	51.2

Diurnal Curve:

Begin Hour	**% of ADT**
12:00 AM	0.79%
1:00 AM	0.23%
2:00 AM	0.27%
3:00 AM	0.45%
4:00 AM	1.58%
5:00 AM	4.85%
6:00 AM	8.07%
7:00 AM	8.01%
8:00 AM	7.50%
9:00 AM	6.03%
10:00 AM	4.23%
11:00 AM	4.08%
12:00 PM	4.45%
1:00 PM	4.92%
2:00 PM	6.37%
3:00 PM	6.38%
4:00 PM	9.58%
5:00 PM	6.04%
6:00 PM	5.71%
7:00 PM	3.69%
8:00 PM	3.63%
9:00 PM	2.20%
10:00 PM	1.22%
11:00 PM	0.72%
Total	100.00%

MD32 from MD 108 to IS 70

Ultimate Build (Contract 1 + Contract 2)

Condition: **2040 No Build**

Average Daily Traffic:	Light Trucks	Medium Trucks	Heavy Trucks	Total
Gasoline Powered:	0.66%	1.69%	0.27%	2.62%
Diesel Powered:	0.65%	1.68%	5.05%	7.38%
Total:	1.31%	3.37%	5.32%	10.00%

Design Hour Volume:	Light Trucks	Medium Trucks	Heavy Trucks	Total
Gasoline Powered:	0.51%	1.66%	0.23%	2.40%
Diesel Powered:	0.51%	1.66%	4.43%	6.60%
Total:	1.02%	3.32%	4.66%	9.00%

Two-Lane Highway LOS:	Volume	Speed
LOS C/D Breakpoint	277	57.0
LOS D/E Breakpoint	596	54.2
LOS E/F Breakpoint	1,489	44.2

Diurnal Curve:

Begin Hour	**% of ADT**
12:00 AM	0.79%
1:00 AM	0.23%
2:00 AM	0.27%
3:00 AM	0.46%
4:00 AM	1.58%
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7:00 PM	4.08%
8:00 PM	2.76%
9:00 PM	2.21%
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Total	100.00%

MD32 from MD 108 to IS 70

Ultimate Build (Contract 1 + Contract 2)

Condition: **2040 Build (4 Lanes)**

Average Daily Traffic:	Light Trucks	Medium Trucks	Heavy Trucks	Total
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Diesel Powered:	0.67%	1.67%	5.04%	7.38%
Total:	1.34%	3.35%	5.31%	10.00%

Design Hour Volume:	Light Trucks	Medium Trucks	Heavy Trucks	Total
Gasoline Powered:	0.52%	1.65%	0.23%	2.40%
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Total:	1.04%	3.30%	4.66%	9.00%

	Northbound		**Southbound**	
Multilane Highway LOS:	Vol./Hr	Mi/Hr	Vol./Hr	Mi/Hr
LOS C/D Breakpoint	2,449	54.9	2,449	54.9
LOS D/E Breakpoint	3,172	52.9	3,172	52.9
LOS E/F Breakpoint	3,601	51.2	3,601	51.2

Diurnal Curve:

Begin Hour	**% of ADT**
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3:00 AM	0.45%
4:00 AM	1.58%
5:00 AM	4.85%
6:00 AM	8.07%
7:00 AM	8.01%
8:00 AM	7.50%
9:00 AM	6.03%
10:00 AM	4.23%
11:00 AM	4.08%
12:00 PM	4.45%
1:00 PM	4.92%
2:00 PM	6.37%
3:00 PM	6.38%
4:00 PM	9.58%
5:00 PM	6.04%
6:00 PM	5.71%
7:00 PM	3.69%
8:00 PM	3.63%
9:00 PM	2.20%
10:00 PM	1.22%
11:00 PM	0.72%
Total	100.00%

MD 32 from MD 108 to IS 70

Assessment of Truck Impacts

MD 32 is a north-south commuter roadway connecting the I-70 corridor and northern Howard/Carroll County to the I-95 Baltimore-Washington Corridor and points east including Fort Meade/NSA. MD 32 is currently designated as a two-lane rural major arterial with limited facility access, a posted speed limit ranging from 50 to 55 mph, and carries 10% truck traffic on an average weekday. MD 32 operates closer to a rural freeway facility during off-peak periods when truck travel most frequently occurs. All vehicles generally travel at free-flow speeds above 55 mph. Under the proposed widening to a four-lane section, the MD 32 designation is expected to be formally upgraded to a full access controlled rural freeway facility which would be more in line with current operational performance. As a result, future off-peak travel conditions are expected to remain as they are today, particularly for truck traffic.

As part of the analysis associated with the widening of MD 32, the Baltimore Metropolitan Council's travel demand forecasting model (BMC model) was used to evaluate the possibility of increased truck activity along the project corridor. The BMC model is a regional model covering Baltimore City and bordering counties. As part of BMC's cooperative forecasting process, socio-economic projections (including population, household and employment data) are provided by each jurisdiction and serve as model inputs.

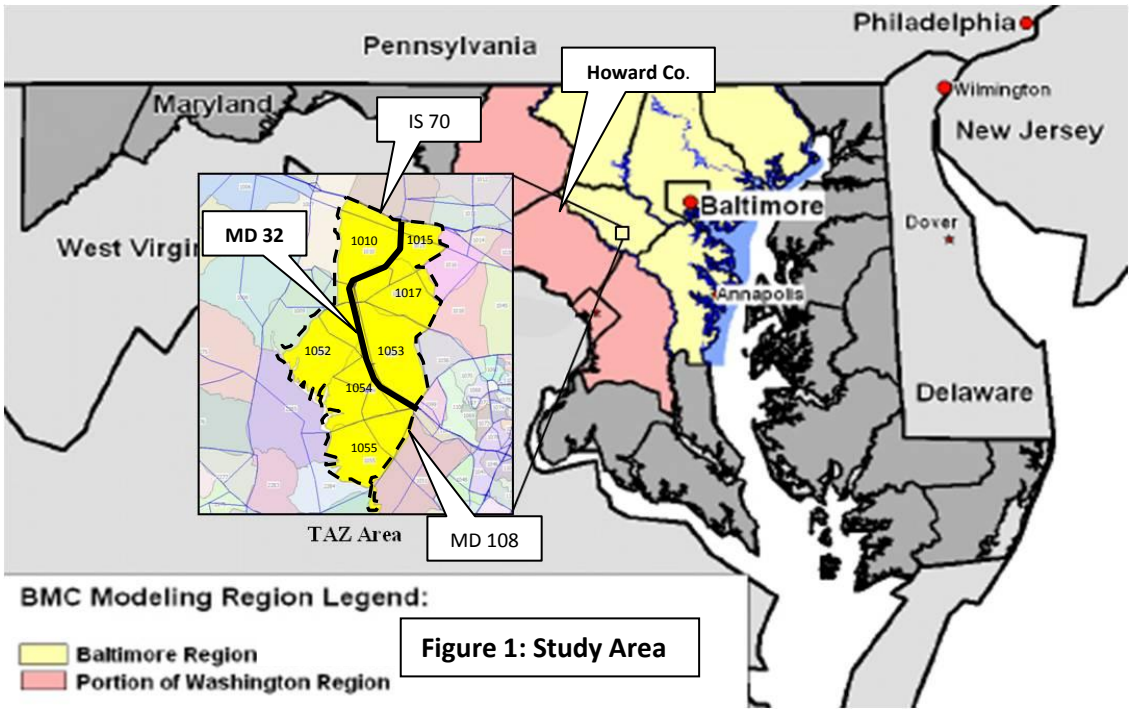

Figure 1: Study Area

Socio-economic data that influence truck presence in the project site was collected from the BMC model's Traffic Analysis Zones (TAZ) surrounding the MD 32 project site. Seven (7) TAZ areas were identified: 1010, 1015, 1017, 1052, 1053, 1054 and 1055 (see Figure1). The socioeconomic data in Table

1 are the raw values found in the BMC model. Table 1 shows a summary of the existing year (2015) and future year (2040) employment totals by employment category (Retail, Industrial, etc.) for the aggregated seven TAZs identified for the study.

In addition to the 2015 and 2040 employment totals, the net changes and percent changes over a twenty-five period are also shown. The percent change in Table 1 (approximately 17%) represents the linear percent change in each employment category in the model for the aggregated seven TAZs identified for the study.

Employment **Table 1**

(unit: Jobs)	**2015**	**2040**	**Net Change**	**%Change**
Retail	1,870	2,184	314	**16.8%**
Office	1,580	1,845	265	**16.8%**
Industrial	406	474	68	**16.7%**
Other	2,514	2,934	420	**16.7%**
Total Employment	**6,370**	**7,437**	**1,067**	**16.8%**

Table 2 shows the percentage that each category of employment represents in the total employment for the study area. Both existing year (2015) and future year (2040) and the overall change are provided. Table 2 also shows that from the existing year 2015 to the future year 2040 there are no significant shifts from one employment category to another within the MD 32 study area.

Employment **Table 2**

(unit: %Jobs)	**2015**	**2040**	**Overall Change**
Retail	29.36%	29.37%	0.01%
Office	24.80%	24.81%	0.00%
Industrial	6.37%	6.37%	0.00%
Other	39.47%	39.45%	-0.01%
Total	100%	100%	0.00%

For each of the employment categories there is a relationship with truck movement in the form of transport of goods. With zero percent (0%) overall change in industrial employment which primarily supports heavy trucks for transport of bulk goods, coupled with no significant change in the other employment categories which rely on light to medium trucks for distribution of goods, we conclude that there will be no significant percentage change in the presence of trucks for this project.

From: Matthew Ewell [mailto:MEwell@sha.state.md.us]
Sent: Tuesday, February 23, 2016 1:41 PM
To: Shawn Burnett
Cc: Derek Gunn; Allison Grooms; Christina Brandt; Nicole M. Hebert; Lisa Shemer; Marion Milton; Rola Daher
Subject: RE: Howard County: MD 32 Contracts 1 and 2 - Environmental Air Traffic and Truck Percentage Summaries

Hi Shawn,

Below is the completed intersection operation table for 2015 Existing, 2030 No-Build (Contract 1 only) and 2030 Ultimate Build. We have a few operational notes:

MD 32 at MD 144, Rosemary Lane and Dayton Shop are interchanges in the Ultimate Build condition. The traffic using River Valley Chase/Parliament Place in the existing condition uses the Rosemary Lane interchange in the Ultimate Build and has the corresponding delay and LOS. At the intersections of I-70 WB and MD 144, there is significant queuing along MD 32 northbound in the PM peak not represented by the overall intersection LOS of D.

Let us know if you have any questions!

Thanks,

Matt

INTERSECTION OPERATION

Intersection		2015		2030 No-Build		2030 Ult. Build	
		AM	PM	AM	PM	AM	PM
MD 32 at I-70 WB Ramps	LOS	B	C	B	D	A	A
	Delay (sec)	17.3	29.6	16.0	37.2	5.5	7.8
MD 32 at I-70 EB Ramps	LOS	C	C	C	C	A	A
	Delay (sec)	21.0	22.6	28.8	27.6	5.0	7.1
MD 32 at MD 144	LOS	B	D	D	D	A	A
	Delay (sec)	18.0	37.9	42.3	40.3	0.4	0.7
MD 32 at Rosemary Lane	LOS	B	B	B	D	A	A

	Delay (sec)	10.5	12.0	12.1	31.3	0.1	0.1
MD 32 at River Valley Chase/ Parliament Place	LOS	A	C	B	E	-	-
	Delay (sec)	3.6	16.9	14.0	49.5	-	-
SB MD 32 ramps at Pfefferkorn Road	LOS	A	A	A	A	A	A
	Delay (sec)	1.6	4.1	2.0	4.1	1.8	1.8
NB MD 32 ramps at Burntwoods Road/ Andrea Drive	LOS	A	A	A	A	A	A
	Delay (sec)	2.3	2.7	1.3	2.6	1.0	2.6
MD 32 at SHA Dayton Shop Access	LOS	E	D	A	F	A	A
	Delay (sec)	48.7	30.9	8.2	61.7	0.1	0.1
SB MD 32 ramps at Linden Church Road	LOS	A	A	A	A	A	A
	Delay (sec)	1.8	0.9	1.4	0.8	1.3	0.8
NB MD 32 ramps at Linden Church Road	LOS	A	A	A	A	A	A
	Delay (sec)	1.1	1.4	1.0	2.6	0.9	1.9
SB MD 32 ramps at MD 108	LOS	A	A	A	A	A	A
	Delay (sec)	1.4	1.8	5.4	2.7	5.6	7.4
ND MD 32 ramps at MD 108	LOS	B	C	B	B	B	B
	Delay (sec)	17.3	21.1	14.1	19.0	13.7	19.8

Matthew B. Ewell

Consultant for the Maryland State Highway Administration

Data Services Engineering Division – Travel Forecasting and Analysis

Office of Planning and Preliminary Engineering

707 N. Calvert Street, C-503

Baltimore, MD 21202

Tel: 410-545-5650

mewell@sha.state.md.us

APPENDIX D - INTERAGENCY CONSULTATION GROUP COORDINATION

From:	Alexandra Brun -MDE-
To:	Christina Brandt
Cc:	Brian Hug -MDE-; Rudnick.Barbara@epamail.epa.gov; Becoat, gregory; Khadr, Asrah; joy.liang@dot.gov; Kevin Magerr; Sara Tomlinson; Shawn Burnett; Nicole M. Hebert
Subject:	Re: MD 32 from MD 108 to I-70 Improvement Project - Air Quality Interagency Consultation
Date:	Thursday, March 24, 2016 2:19:59 PM

Good afternoon Christina,

MDE concurs that this project meets the requirements of the Clean Air Act and 40 CFR 93 without an additional quantitative hot-spot analysis.

Thank you,

Alex

On Mon, Mar 14, 2016 at 8:13 AM, Christina Brandt <CBrandt@sha.state.md.us> wrote:

> Good Morning,
>
> Attached is the Draft Air Quality Technical Report for the MD 32 from MD 108 to I-70 project in Howard County, Maryland.
>
> SHA is requesting concurrence that this project meets the requirements of the Clean Air Act and 40 CFR 93 without an additional quantitative hot-spot analysis. The 2016-2019 TIP includes the MD 32 improvement project under ID 66-1405-41.
>
> Please review and provide concurrence/comments by March 28, 2016 . Please let me know if you have any questions.
>
> Thank you,
>
> Chrissy
>
> *Christina Brandt*
>
> Environmental Manager
>
> OPPE-Environmental Planning Division

MD State Highway Administration

707 North Calvert Street, Mail Stop C-301

Baltimore, MD 21202

Phone: 410-545-2874

E-mail: cbrandt@sha.state.md.us

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From:	joy.liang@dot.gov
To:	CBrandt@sha.state.md.us; brian.hug@maryland.gov; Rudnick.Barbara@epamail.epa.gov; becoat.gregory@epa.gov; Khadr.Asrah@epa.gov; Magerr.Kevin@epamail.epa.gov; alexandra.brun@maryland.gov; stomlinson@baltometro.org
Cc:	Shawn Burnett; Nicole M. Hebert
Subject:	RE: MD 32 from MD 108 to I-70 Improvement Project - Air Quality Interagency Consultation
Date:	Friday, March 18, 2016 2:36:52 PM
Attachments:	~WRD181.jpg image001.jpg

Hi Chrissy,

Thank you for the opportunity to review. FHWA concurs that this project meets the requirements of the CAA and 40 CFR 93 without an additional quantitative hot spot analysis.

I do have one question regarding the report: on page 4 section III – Environmental Analysis, it reads, "A portion of the area, the Baltimore Central Business District, had been nonattainment for CO,; however, this area has been re-designated as a CO maintenance area." Could we indicate when it was re-designated?

Thank you.

Joy

From: Christina Brandt [mailto:CBrandt@sha.state.md.us]
Sent: Monday, March 14, 2016 8:14 AM
To: 'Brian Hug -MDE-'; 'Rudnick.Barbara@epamail.epa.gov'; 'Becoat, gregory'; 'Khadr, Asrah'; Liang, Joy (FHWA); 'Kevin Magerr'; 'Alexandra Brun -MDE-'; 'Sara Tomlinson'
Cc: 'Shawn Burnett'; 'Nicole M. Hebert'
Subject: MD 32 from MD 108 to I-70 Improvement Project - Air Quality Interagency Consultation

Good Morning,

Attached is the Draft Air Quality Technical Report for the MD 32 from MD 108 to I-70 project in Howard County, Maryland.

SHA is requesting concurrence that this project meets the requirements of the Clean Air Act and 40 CFR 93 without an additional quantitative hot-spot analysis. The 2016-2019 TIP includes the MD 32 improvement project under ID 66-1405-41.

Please review and provide concurrence/comments by March 28, 2016 . Please let me know if you have any questions.

Thank you,

From:	Khadr, Asrah
To:	Christina Brandt; "Brian Hug -MDE-"; Rudnick, Barbara; Becoat, gregory; "joy.liang@dot.gov"; Magerr, Kevin; "Alexandra Brun -MDE-"; "Sara Tomlinson"
Cc:	Shawn Burnett; Nicole M. Hebert
Subject:	RE: MD 32 from MD 108 to I-70 Improvement Project - Air Quality Interagency Consultation
Date:	Thursday, March 24, 2016 1:19:05 PM

EPA concurs with SHA's recommendation that this project does not require a quantitative hot-spot analysis.

Asrah Khadr, Environmental Engineer, EIT
U.S. Environmental Protection Agency, Region III
Air Protection Division
Office of Air Program Planning
1650 Arch Street
Philadelphia, PA 19103
Phone: 215-814-2071

From: Christina Brandt [mailto:CBrandt@sha.state.md.us]
Sent: Monday, March 14, 2016 8:14 AM
To: 'Brian Hug -MDE-' <brian.hug@maryland.gov>; Rudnick, Barbara <Rudnick.Barbara@epa.gov>; Becoat, gregory <becoat.gregory@epa.gov>; Khadr, Asrah <Khadr.Asrah@epa.gov>; 'joy.liang@dot.gov' <joy.liang@dot.gov>; Magerr, Kevin <Magerr.Kevin@epa.gov>; 'Alexandra Brun -MDE-' <alexandra.brun@maryland.gov>; 'Sara Tomlinson' <stomlinson@baltometro.org>
Cc: 'Shawn Burnett' <sburnett@wtbco.com>; 'Nicole M. Hebert' <nhebert@wtbco.com>
Subject: MD 32 from MD 108 to I-70 Improvement Project - Air Quality Interagency Consultation

Good Morning,

Attached is the Draft Air Quality Technical Report for the MD 32 from MD 108 to I-70 project in Howard County, Maryland.

SHA is requesting concurrence that this project meets the requirements of the Clean Air Act and 40 CFR 93 without an additional quantitative hot-spot analysis. The 2016-2019 TIP includes the MD 32 improvement project under ID 66-1405-41.

Please review and provide concurrence/comments by March 28, 2016 . Please let me know if you have any questions.

Thank you,

Chrissy

From: Christina Brandt
To: Nicole M. Hebert
Subject: MD 32 AQ
Date: Friday, March 18, 2016 11:43:46 AM

Hi Nicole,

Per our discussion

- The current LRP approved 11/2015 includes the full project (MD 108 to I-70) with a year of operation of 2030
- MD 108 to Linden Church will be amended to the current TIP and long range plan (working on amendment to be approved by end of April) with a year of operation of 2020
- BMC is working on the new TIP (2017-2020)and it will include the remainder of the project (Linden to I-70) with a year of operation of 2021. That TIP will be approved in July of 2016.

Please revise the regional conformity section of the report to reflect this information. I told Sarah we would wait for everyone's concurrences and then post a revised report for public comment. I will send Sarah a copy to let her know we made the changes at that time.

Thanks!

Chrissy

Chrissy Brandt

Environmental Manager – Team Leader

OPPE-Environmental Planning Division

MD State Highway Administration

707 North Calvert Street, Baltimore, MD 21202

410-545-2874 / cbrandt@sha.state.md.us

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