AIR QUALITY CONFORMITY DETERMINATION OF THE 2013 CONSTRAINED LONG RANGE PLAN AND THE FY2013-2018 TRANSPORTATION IMPROVEMENT PROGRAM FOR THE WASHINGTON METROPOLITAN REGION

July 17, 2013

The preparation of this report was financially aided through grants from the District of Columbia Department of Transportation, the Maryland Department of Transportation, the Virginia Department of Rail & Public Transportation, the Virginia Department of Transportation, the U.S. Department of Transportation, the Federal Highway Administration, and the Federal Transit Administration.

NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD
METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS

ABSTRACT

TITLE: Air Quality Conformity Determination of the 2013 Constrained Long Range Plan and the FY2013-2018 Transportation Improvement Program for the Washington Metropolitan Region

DATE: July 17, 2013

AGENCY: The Metropolitan Washington Council of Governments is the regional planning organization of the Washington area's major local governments. COG works on finding solutions to regional problems, especially those related to regional growth, transportation, housing, human services, and the environment.

ABSTRACT: This report documents an updated assessment of the 2013 Constrained Long Range Plan (CLRP) with respect to air quality conformity requirements under the 1990 Clean Air Act Amendments. The assessment used criteria and procedures contained in the Environmental Protection Agency (EPA)'s final conformity rule, published in the November 24, 1993 Federal Register, with subsequent amendments and additional federal guidance published by the Environmental Protection Agency (EPA) and by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). The assessment is a responsibility of the National Capital Region Transportation Planning Board (TPB).

The report presents an overview of the conformity requirements contained in the legislation and subsequent guidance, and documents the technical procedures used in the analysis including travel demand forecasting, emissions calculation procedures and impacts of transportation emission reduction measures. The analysis demonstrates that mobile source emissions for each analysis year of the long range plan, adhere to all carbon monoxide, ozone season volatile organic compound and nitrogen oxide, and fine particle ($PM_{2.5}$) pollutants (direct $PM_{2.5}$ and precursor nitrogen oxide) emissions budgets established by the Metropolitan Washington Air Quality Committee (MWAQC), which are either approved or under review by the EPA. Additionally, the "action scenario" (forecast year) emissions for fine particles are not greater than the base year 2002 emissions, thus satisfying the requirement for pollutants without an established budget. These results provide a basis for a determination of conformity of the 2013 CLRP and FY2013-2018 TIP.

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EXECUTIVE SUMMARY

This report documents the air quality conformity assessment of the 2013 Constrained Long Range Plan (CLRP) and FY2013-2018 Transportation Improvement Program (TIP) as carried out under the regulations contained in the Environmental Protection Agency's final rule, published in the November 24, 1993 *Federal Register,* with subsequent amendments and additional federal guidance published by the Environmental Protection Agency (EPA), the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA). The process involved consultation with affected agencies such as the EPA, the FHWA, the FTA, and the Metropolitan Washington Air Quality Committee (MWAQC), as well as with the public. The assessment is a responsibility of the National Capital Region Transportation Planning Board.

The following summarizes the pollutants included in this assessment:

- **Ozone Season Volatile Organic Compounds (VOC) and Nitrogen Oxides (NOx).** On May 21, 2012 EPA designated the Washington, DC-MD–VA region as 'marginal' nonattainment for the 2008 ozone National Ambient Air Quality Standards (NAAQS). Until new mobile budgets are developed, the region must adhere to those currently approved by EPA under the 1997 standard. The current budgets for VOC and NOx were submitted to the EPA by the Metropolitan Washington Air Quality Committee (MWAQC) in 2007, as part of an 8-hour ozone SIP, responding to the 1997 Ozone Standard. On February 7, 2013 EPA found adequate the 2009 Attainment and 2010 Contingency budgets included in this SIP. The budgets are 66.5 tons/day of Volatile Organic Compounds (VOC) and 146.1 tons/day of Nitrogen Oxides (NOx) for the 2009 Attainment Plan and 144.3 tons/day of NOx for the 2010 Contingency Plan.

- **Fine Particles ($PM_{2.5}$).** On December 17, 2004 EPA designated the Washington, DC-MD-VA region as nonattainment for the 1997 Fine Particles Standard. On January 12, 2009, EPA determined that the region had attained the 1997 $PM_{2.5}$ NAAQS and issued a clean data determination for the area. On May 22, 2013 MWAQC approved a $PM_{2.5}$ Resignation Request and Maintenance Plan for the Washington region. This Maintenance Plan includes forecast year mobile budgets for direct $PM_{2.5}$ and Precursor NOx. Until these mobile budgets are found adequate or are approved by EPA, the region will assess conformity based on a test that shows emissions in forecast year scenarios are no greater than those in a 2002 base.

- **Wintertime Carbon Monoxide (CO).** The region is in maintenance for mobile source wintertime CO, and is required to show that pollutants do not exceed the approved budget of 1671.5 tons/day.

Emissions estimates for all pollutants were developed for 2015, 2017, 2020, 2025, 2030, and 2040 forecast years, using both network analysis and off-line emissions assessment. The results show that the 2013 CLRP and FY2013-2018 TIP demonstrate adherence to relevant mobile source emissions budgets for all forecast years, and that forecast year fine particles pollutants emissions are not greater than the base year 2002 emissions. This analysis provides a basis for a determination of conformity for the 2013 CLRP and FY2013-2018 TIP.

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1. Transportation Conformity Regulations as of April 2012 EPA–420-B-12-013, EPA April 2012.

2. Transportation Planning Board Consultation Procedures With Respect to Transportation Conformity Regulations Governing TPB Plans and Programs, May 20, 1998, NCRTPB/MWCOG.

3. Revised Carbon Monoxide Maintenance Plan and Revised 1990 Carbon Monoxide Base Year Emissions Inventory for the WASHINGTON DC-MD-VA MAINTENANCE AREA, prepared by Metropolitan Washington Council of Governments for the District of Columbia Department of Health, Maryland Department of the Environment and the Virginia Department of Environmental Quality on the behalf of the Metropolitan Washington Air Quality Committee, February 19, 2004

4. Air Quality Conformity Assessment - Maryland Department of Transportation / District of Columbia Department of Public Works Amendments to 1999 Constrained Long Range Plan and FY2000-2005 Transportation Improvement Program, July 19, 2000, TPB.

5. Calibration Report for the TPB Travel Forecasting Model, Version 2.3, on the 3722-Zone Area System. Final Report. Washington DC: National Capital Region Transportation Planning Board, January 20, 2012.
http://www.mwcog.org/transportation/activities/models/documentation.asp

6. User's Guide for the TPB Travel Forecasting Model Version 2.3, Build 38, on the 3722-Zone Area System. Final Report. Washington DC: National Capital Region Transportation Planning Board, January 20, 2012.

7. "HOT Lane Modeling Process of MWCOG/TPB", Technical memorandum from Jinchul (JC) Park to files. April 26, 2010 (Updated October 21, and October 12, 2012).

8. Round 8.2 Cooperative Forecasting: Population and Household Forecasts to 2040 by Traffic Analysis Zone. 2013.

9. Round 8.2 Cooperative Forecasting: Employment Forecasts to 2040 by Traffic Analysis Zone. 2013.

10. "Developing Land Use Input Files for the Version 2.3 Travel Model Using Round 8.2 Cooperative Forecasts, the CTPP-based Employment Adjustment Factors, and Linear Interpolation", Technical Memorandum from Hamid Humeida –
April 3, 2013.

11. "Round 8.2 Cooperative Forecasts-Based Exogenous Travel Files", Technical Memorandum from Ronald Milone – April 8, 2013.

12. Federal Register, Volume 78 Issue 98 (May 21, 2013), Table III, page 29842

13. Participation Plan, December 19, 2007, TPB.

LIST OF ACRONYMS

AWDT	Average Weekday Traffic
BMC	Baltimore Metropolitan Council
CAAA	Clean Air Act Amendments of 1990
CAC	Citizens Advisory Committee
CLRP	Constrained Long Range Plan
CMAQ	Congestion Mitigation & Air Quality
CO	Carbon Monoxide
DC DOT	District of Columbia Department of Transportation
DTP	(COG's) Department of Transportation Planning
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HOV	High Occupancy Vehicle
I/M	Inspection and Maintenance
LOV	Low Occupancy Vehicle
MDOT	Maryland Department of Transportation
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MWAQC	Metropolitan Washington Air Quality Committee
MWCOG	Metropolitan Washington Council of Governments
NAAQS	National Ambient Air Quality Standards
NOx	Nitrogen Oxides
$PM_{2.5}$	Fine Particles
PNR	Park and Ride Lot
SIP	State Implementation Plan
TAZ	Transportation Analysis Zone
TCM	Transportation Control Measure
TERM	Transportation Emission Reduction Measure
T/D	Tons Per Day
TIP	Transportation Improvement Program
TPB	Transportation Planning Board
US DOT	United States Department of Transportation
US EPA	United States Environmental Protection Agency
VDOT	Virginia Department of Transportation
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
WMATA	Washington Metropolitan Area Transit Authority

TPB R1-2014
July 17, 2013

NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD
777 North Capitol Street, N.E.
Washington, D.C. 20002

RESOLUTION FINDING THAT THE 2013 CONSTRAINED LONG RANGE PLAN AND FY2013-2018 TRANSPORTATION IMPROVEMENT PROGRAM CONFORM WITH THE REQUIREMENTS OF THE CLEAN AIR ACT AMENDMENTS OF 1990

WHEREAS, the National Capital Region Transportation Planning Board (TPB) has been designated by the Governors of Maryland and Virginia and the Mayor of the District of Columbia as the Metropolitan Planning Organization (MPO) for the Washington Metropolitan Area; and

WHEREAS, the U.S. Environmental Protection Agency (EPA), in conjunction with the U.S. Department of Transportation (DOT), under the Clean Air Act Amendments of 1990 (CAAA), issued on November 24, 1993 "Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act," and, over the years, subsequently amended these regulations and provided additional guidance, which taken together provide the specific criteria for TPB to make a determination of conformity of its financially Constrained Long Range Transportation Plan (CLRP) and Transportation Improvement Program (TIP) with the state implementation plans (SIPs) for air quality attainment within the Metropolitan Washington non-attainment area; and

WHEREAS, a work program was developed to address all procedures and requirements, including public and interagency consultation, and the work program was released for public comment on January 11 and approved by the TPB at its February 20, 2013 meeting; and

WHEREAS, on February 20, 2013, the TPB approved the projects submitted for inclusion in the air quality conformity assessment for the 2013 CLRP and FY2013-2018 TIP; and

WHEREAS, in each year's update of the CLRP since 2000, the TPB has explicitly accounted for the funding uncertainties affecting the Metrorail system capacity and levels of service beyond 2005 by constraining transit ridership to or through the core area; and

WHEREAS, after accounting for the "Metro Matters" commitments for Metro's near-term funding and the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) legislation and state matching, the current analysis includes the transit ridership constraint to or through the core area at 2020 ridership levels for 2025, 2030 and 2040 and

WHEREAS, on June 13, 2013, the draft results of the Air Quality Conformity Determination of the 2013 CLRP and the FY2013-2018 TIP were released for a 30-day public comment period and inter-agency review, and on July 17, 2013 the TPB accepted recommended responses to comments received for inclusion in the air quality conformity assessment for the 2013 CLRP and FY 2013-2018 TIP, the 2013 CLRP, and FY 2013-2018 TIP; and

WHEREAS, the analysis reported in *Air Quality Conformity Determination of the 2013 Constrained Long Range Plan and the FY2013-2018 Transportation Improvement Program for the Washington Metropolitan Region*, dated July 17, 2013, demonstrates adherence to all mobile source emissions budgets for volatile organic compounds, nitrogen oxides, and carbon monoxide, and demonstrates that PM2.5 emissions meet the requirement that such emissions are not greater than 2002 levels, meets all regulatory, planning and interagency consultation requirements, and therefore provides the basis for a finding of conformity of the plan with the requirements of the CAAA; and

NOW, THEREFORE, BE IT RESOLVED THAT THE NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD determines that the 2013 Constrained Long Range Plan and the FY2013-2018 Transportation Improvement Program conform to all requirements of the Clean Air Act Amendments of 1990.

Adopted by the Transportation Planning Board at its regular meeting on July 17, 2013

Metropolitan Washington Air Quality Committee

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July 10, 2013

Honorable Scott K. York, Chair
National Capital Region Transportation Planning Board
777 North Capitol Street, NE
Washington, D.C. 20002

Dear Chair York:

Thank you for providing an opportunity to the Metropolitan Washington Air Quality Committee (MWAQC) to comment on the amended Air Quality Conformity Update for the 2013 Constrained Long Range Plan (CLRP) and the FY2013-2018 Transportation Improvement Program (TIP). MWAQC has reviewed the draft amended Air Quality Conformity assessment and concurs that the transportation-sector emissions associated with the proposed transportation plans meet the approved motor vehicle emissions budgets (MVEBs) for the old 1997 8-hour ozone standard (84 ppb), in addition to meeting the approved motor vehicle emissions budgets for the carbon monoxide standard, the interim base year 2002 emissions tests for the annual fine particulate matter ($PM_{2.5}$) standard, as well as the PM2.5 and precursor NOx motor vehicle emissions budgets that were recently submitted to the EPA but have not yet been approved.

As noted in our March 15, 2013 comment letter to the National Capital Region Transportation Planning Board (TPB), the region is now working toward meeting a new more stringent 2008 ozone standard of 75 ppb, for which the region is designated as marginal nonattainment. The recently adopted 2014 work program for MWAQC includes a new work task to prepare a Reasonable Further Progress (RFP) plan to meet the 2008 ozone standard as expeditiously as practicable. MWAQC will need the support and consultation with TPB to examine emissions from the transportation sector and to identify new cost-effective strategies and opportunities to reduce emissions. MWAQC notes that while the deadline for meeting this 75 ppb standard is 2015, compliance with the standard will be based on air pollution levels beginning in the 2013 ozone season.

Note also that EPA has initiated a process to review the new 2008 ozone standard and may propose in the next year to make it even more stringent. Ambient data from the region's air quality monitors shows 8-hour ozone design value concentrations are now at 87 ppb. With current air quality levels significantly above the 2008 ozone standard, the region continues to face a challenge in meeting new lower clean air standards. Continued progress is therefore needed to reduce emissions across all sectors to achieve lower ozone concentrations.

MWAQC is encouraged to learn that the region is actually achieving reductions in VMT/capita, and that in recent years VMT has not been increasing even with an increase in population and employment. We urge TPB's continued investment in public transit, ride-sharing, and transit-oriented development to continue to mitigate future growth in vehicle emissions.

MWAQC also continues to emphasize the need for new federal emission control programs such as Tier 3 to reduce emissions from future fleets. Further, we strongly urge TPB to maintain its commitments to Transportation Emission Reduction Measures and other emission reduction measures. All of these efforts are essential to meet the 2008 ozone standard and potentially more stringent ozone and fine particle standards expected in the future.

Thank you again for the opportunity to comment on the draft conformity analysis.

Sincerely,

Hon. Leta Mach, Chair
Metropolitan Washington Air Quality Committee

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The Honorable Scott K. York, Chair
National Capital Region Transportation Planning Board
777 North Capitol Street, NE
Washington, DC 20002

July 12,2013

Dear Chair York

The purpose of this letter is to provide comments on the Air Quality Conformity Assessment for the 2013 Constrained Long Range Plan (CLRP) and the FY2013-2018 Transportation Improvement Program (TIP).

We applaud the Transportation Planning Board (TPB) for its continuing efforts to be creative and innovative in identifying and implementing programs to meet the area's mobility needs, to protect public health and help improve air quality. At the same time, we are very concerned over the need to better communicate the challenges the region faces in meeting the health-based standards for ground level ozone. The 2008 standard is very stringent and calls for significant improvements in air quality starting during the summer of 2013.

The budgets used in the current conformity process were set for the old 1997 ozone standard. There is cUlTently no conformity budget for the new ozone standard. Preliminary technical analysis completed by the Ozone Transport Commission (OTC) indicates that significant additional emission reductions from stationary, area and mobile sources will be needed to meet the new ozone standard. This work suggests that mobile source emissions of nitrogen oxide (NOx) in the Washington area **will** need to be reduced to levels in the 45 to 50 tons per day (tpd) range for the region to record clean air. Under the Clean Air Act, the Washington area has a 2015 attainment date for this new standard, which means the area's monitors need to measure clean air **in** 2013, 2014 and 2015. The projected NOx emissions in 2015 from the current conformity analysis are 87.9 tpd.

The challenge faced by the region to meet the new standard and protect health is significant. We continue to encourage the TPB to work with the Metropolitan Washington Air Quality Committee to surmount this challenge.

Sincerely,

George S. (Tad) Aburn, Jf. Director
Air & Radiation Management Administration.

I. INTRODUCTION

The Washington region is currently designated nonattainment for the federal health standards for ozone and fine particles ($PM_{2.5}$), and is a maintenance area for Wintertime Carbon Monoxide (CO). Clean air legislation in 1977 mandated that a metropolitan planning organization may not approve any transportation project that did not conform to the approved state implementation plan (SIP) for the attainment of clean air standards. This established the responsibility on the part of COG/TPB to review transportation plans and programs and affirm that they conform to air quality state implementation plans for the region.

This requirement means that TPB plans, programs, and projects must be consistent with clean air objectives. In the 1990 Clean Air Act Amendments, conformity to an implementation plan is defined 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. In addition, Federal activities may not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emission reductions towards attainment.

II. CONFORMITY REGULATIONS

Background

On November 15, 1990 President Bush signed into law the Clean Air Act Amendments (CAAA) of 1990. The CAAA establishes standards and procedures for reducing human and environmental exposure to a range of pollutants generated by industry and transportation. The law allows EPA to define the boundaries of "nonattainment" areas for various pollutants. These are geographic areas whose air quality does not meet Federal air quality standards. The law also established nonattainment area classifications ranked according to the severity of the area's air pollution problem. These classifications are marginal, moderate, serious, severe, and extreme. EPA assigns each nonattainment area one of these categories, thus triggering various requirements the area must comply with in order to meet a particular standard. The Washington region is currently designated nonattainment for the federal health standards for ozone and fine particles ($PM_{2.5}$).

The concept of transportation conformity was introduced in the Clean Air Act (CAA) of 1977, which included a provision to ensure that Federal funding and approval go to those transportation activities that are consistent with air quality goals. These goals are set in each state's air quality implementation plan (SIP). Conformity requirements were made substantially more rigorous in the CAA Amendments of 1990. The transportation conformity regulations (Reference 1) that detail implementation of the CAA requirements were first issued in the November 24, 1993 *Federal Register*, and have been amended several times, most recently on March 14, 2012. The regulations establish the criteria and procedures for transportation agencies to demonstrate that air pollutant emissions from metropolitan Transportation Plans, Transportation Improvement Programs (TIPs), and projects funded or approved by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA) are consistent with ("conform to") the State's air quality goals in the SIP.

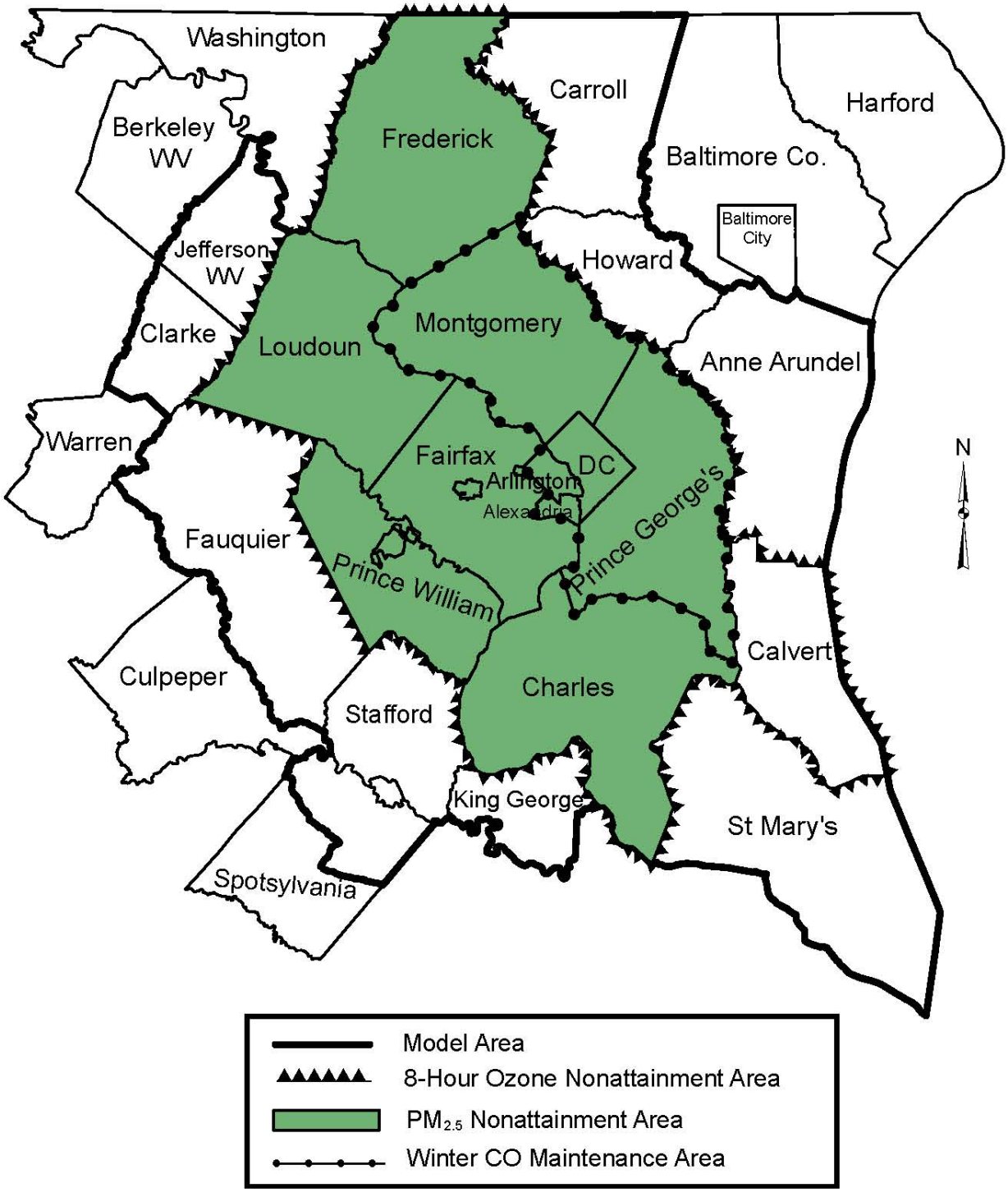
Consultation

The conformity regulations require that Metropolitan Planning Organizations (MPOs) make Transportation Plans, TIPs, and conformity determinations available to the public, and accept and respond to public comment. The Transportation Planning Board (TPB) staff went through a lengthy process involving EPA and state and local air quality agencies to develop the region's transportation and air quality conformity consultation procedures. These procedures have been organized into a report, Transportation Planning Board Consultation Procedures with Respect to Transportation Conformity Regulations Governing TPB Plans and Programs (Reference 2). They were adopted by the Board initially on September 21, 1994 and subsequently updated in response to EPA's August 15, 1997 amendments, and formally adopted by the TPB on May 20, 1998. The procedures seek early involvement of the air agencies in the transportation planning process through concurrent mailings to the TPB and consultation agencies of all material relevant to transportation conformity, including announcements of work sessions and public forums in which the materials will be discussed.

III. POLLUTANTS

The Washington Metropolitan Region is currently designated as nonattainment for ozone and fine particles ($PM_{2.5}$) pollutants. While EPA has issued a Clean Data Determination for both ozone (1997 National Ambient Air Quality Standards- NAAQS) and fine particles pollutants, the region still must adhere to approved mobile budgets until new budgets are set. New budgets could be set, either as part of a redesignation request (as is underway for fine particles pollutants), or as part of updated NAAQS in the future. The region is designated as a maintenance area for wintertime carbon monoxide (CO). The geography of the nonattainment area varies by pollutant. The map in Exhibit 1 outlines the boundaries of the each pollutant's nonattainment area.

EXHIBIT 1
Washington, D.C.- Maryland - Virginia
Planning Areas



Ozone Season Pollutants

On May 21, 2012 EPA designated the Washington, DC-MD–VA region as 'marginal' nonattainment for the 2008 ozone National Ambient Air Quality Standards (NAAQS). Until new mobile budgets are developed, the region must adhere to those currently approved by EPA under the old 1997 standard. The currently approved budgets for Volatile Organic Compounds (VOC) and Nitrogen Oxides (NOx) were submitted to the EPA by the Metropolitan Washington Air Quality Committee (MWAQC) in 2007, as part of an 8-hour ozone SIP, responding to the 1997 Ozone Standard. On February 7, 2013 EPA found adequate the 2009 Attainment and 2010 Contingency budgets included in this SIP. The budgets are 66.5 tons/day of VOC and 146.1 tons/day of NOx for the 2009 Attainment Plan and 144.3 tons/day of NOx for the 2010 Contingency Plan.

Fine Particles Pollutants

On December 17, 2004 the Environmental Protection Agency (EPA) designated 224 counties, as well as the District of Columbia, that exceeded the health-based standards for fine particles ($PM_{2.5}$) as nonattainment areas. $PM_{2.5}$ standards refer to particulate matter less than or equal to 2.5 micrometers in diameter. The Washington, DC-MD-VA area was designated nonattainment for $PM_{2.5}$ (see Exhibit 1 for area).

On January 12, 2009, EPA determined that the region had attained the 1997 $PM_{2.5}$ NAAQS and issued a clean data determination for the area. On May 22, 2013 MWAQC approved a $PM_{2.5}$ Resignation Request and Maintenance Plan for the Washington region. This Maintenance Plan includes forecast year mobile budgets for direct $PM_{2.5}$ and Precursor NOx. Until these mobile budgets are found adequate or are approved by EPA, the region will assess conformity based on a test that shows emissions in forecast year scenarios are no greater than those in a 2002 base.

Wintertime Carbon Monoxide

The Metropolitan Washington DC-MD-VA region attained the federal carbon monoxide standard in the 1990s and submitted a CO maintenance plan covering the 1996-2007 period. EPA approved this maintenance plan effective March 16, 1996. The region was required to submit a second maintenance plan within eight years of its redesignation as an attainment area. This revised plan (Reference 3) was completed on February 19, 2004, and provides for attainment of the CO standard in the Washington DC-MD-VA attainment area through March 16, 2016. As a maintenance area, the region is required to show that pollutants do not exceed the approved mobile budget of 1671.5 tons/day.

IV. TECHNICAL APPROACH

In developing the work program for this year's conformity assessment, contained as Appendix A of this report, staff identified latest planning assumptions and modeling techniques, and considered requirements of the conformity regulations, as well as requirements associated with, and comments received upon, past conformity analyses. Staff presented the work program to regional technical and policy committees starting in January 2013. Staff also coordinated the draft work program with EPA, FHWA, FTA and the state and local air management agencies through the TPB consultation procedures. This scope was adopted by the TPB on February 20th, 2013.

Exhibit 2 summarizes the key technical components of this conformity analysis.

EXHIBIT 2
Summary of Technical Approach

	Ozone	Wintertime CO	$PM_{2.5}$
Pollutant:	VOC, NOx	CO	Direct Particles, Precursor NOx
Conformity Test:	Budget Test: Using 2009 attainment and 2010 contingency budgets found adequate by EPA in February 2013. All budgets were set using Mobile6 emissions model and submitted to EPA in 2007.	Budget Test: Using mobile budgets established with the Wintertime CO maintenance plan. All budgets set using Mobile6 emissions model and submitted to EPA in 2007.	Reductions From Base (2002 inventory) Test & Budget Test; With no approved budgets, reduction from base test was used; if EPA approves the PM maintenance plan budgets, those budgets must be used.
Mobile Emissions Model:	MOVES 2010a		
Vehicle Fleet Data:	2011 Vehicle Registration Data (VIN) For All Jurisdictions		
Network Inputs:	Regionally Significant Projects		
Land Activity:	Round 8.2 Cooperative Forecasts		
Travel Demand Model	Version 2.3.52		
Modeled Area	3722 Traffic Analysis (TAZ) System		
Analysis Years	2015, 2017, 2020, 2025, 2030, 2040		

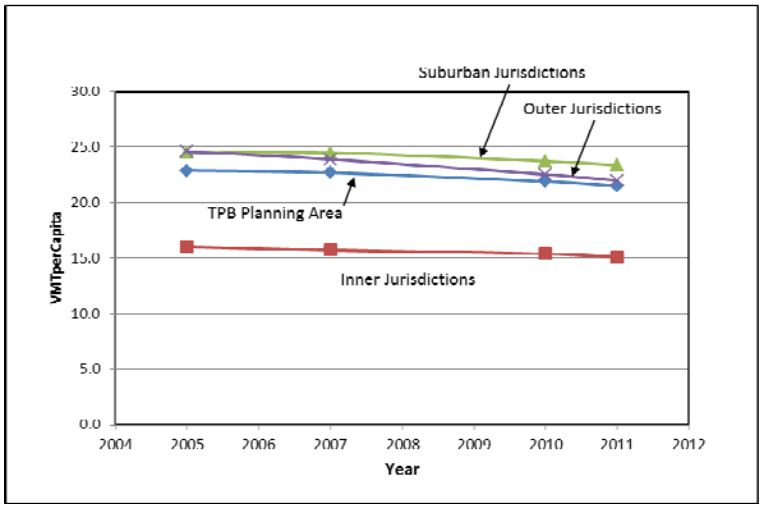
Technical work activities for the 2013 CLRP and FY2013-2018 TIP included the preparation of travel demand forecasts (Vehicle Mile Traveled and trip data) and emissions inventories (daily ozone season VOC and NOx emissions, yearly direct $PM_{2.5}$ and $PM_{2.5}$ precursor NOx emissions, and daily wintertime CO emissions) for each of the specified analysis years (2015, 2017, 2020, 2025, 2030, and 2040). The emissions inventories address a primary conformity assessment criterion to demonstrate that the plan adheres to established mobile source emissions budgets for ozone season and wintertime CO pollutants. The inventories also allow the baseline (2002) vs. action (forecast year) comparison for the $PM_{2.5}$ pollutants which have no approved mobile budgets.

V. TRAVEL FORECASTS

Travel Model

The preparation of travel forecasts for each of the conformity alternatives was carried out using the Version 2.3.52 travel modeling process. A 2012 review of travel data showed a changing trend in driving habits. Both national and regional data show a steady decrease in driving per capita since 2007. Nationally, vehicle miles traveled (VMT) and VMT per capita have dropped steadily for the past few years. Regionally, VMT has remained steady, but population grew, resulting in a decline in average daily driving per person. Exhibit 3 shows the decline in regional VMT per capita between 2005 and 2011.

EXHIBIT 3
VMT Per Capita (Daily) for the TPB Planning Area



Jurisdiction:	Year			
	2005	2007	2010	2011
Inner Jurisdictions	16.0	15.7	15.4	15.1
Suburban Jurisdictions	24.5	24.5	23.7	23.4
Outer Jurisdictions	24.6	23.9	22.5	22.0
Grand Total	22.9	22.7	21.9	21.5

Legend:
Inner Jurisdictions:
DC, Arlington, Alexandria

Suburban Jurisdictions:
Montgomery, Prince George's, Fairfax

Outer Jurisdictions:
Loudoun, Prince William, Frederick, Charles

Source: VDOT, MDOT, DDOT HPMS Data & Round 8.2 Cooperative Forecasts

Fortunately, this recent trend in declining miles per capita coincided with a validation of the regional travel model. Using 2010 data including traffic counts, Metrorail electronic counts, the American Community Survey, and the Geographically Focused Household Travel Survey, staff validated the model and implemented updates. Updates included an increase in non-motorized trip shares in dense mixed use areas with a concurrent decrease in motorized trip shares,

refined highway network facility type coding, additional time penalties on Potomac River bridges, and other minor technical adjustments. This model validation improved performance, with a better match between estimated-to-observed VMT, estimated-to-observed traffic volumes, and estimated-to-observed Metrorail trips. Each change to the model, such as those done for this validation, is referred to as a new "build" of the travel model. This work resulted in build 52 of the Version 2.3 Travel Model, also known as Version 2.3.52. More details about the Version 2.3.52 model are documented in Appendix D of this report.

As part of the technical methods originally employed in 2000, transit capacity constraint procedures, constraining trips to and through the regional core at 2020 levels, were applied to better relate transit forecast levels with transit carrying ability. These procedures are documented in the Version 2.3 travel model Calibration Report (Reference 5) and User's Guide (Reference 6).

As in recent years' analyses, in addition to existing toll facilities, the 2013 CLRP and FY2013-2018 TIP includes portions of the Virginia beltway and I-95 in Virginia as managed facilities, with time-of-day tolls used to ensure that a high level of service is maintained throughout the day. The Version 2.3 travel model Calibration Report (Reference 5) and a HOT Lanes Modeling memo (Reference 7) document these procedures.

Network Development

Work on this task began last winter with the request for project inputs to the 2013 CLRP and FY2013-2018 TIP. All project submissions were reviewed and organized by DTP staff into transportation networks for appropriate forecast years, according to the project's completion date as estimated by the programming agency. The TPB approved the final project inputs at its February meeting.

These projects, summarized by state, agency, project characteristics and completion date are contained as Appendix B to this report. The list contains transit, highway, and HOV/HOT projects. Each project submission was reviewed and, where appropriate, coded highway and transit networks. In many cases the project inputs could not be coded into a regional network since such projects did not involve changes in capacity (e.g., transit operating assistance, highway rehabilitation, bridge reconstruction) or were too small to show up at the regional level (e.g., intersection improvements, improvements to a facility which is not contained in the regional networks). Exhibit 4 presents mileage summaries for the highway system, according to LOV and HOV/HOT lane miles, and for the rail transit system.

The COG modeled area includes counties outside the non-attainment areas to enable better simulation results within the non-attainment areas. Project inputs from these outer counties are provided by their respective MPOs, state DOTs, or county DOTs, and are coded, when appropriate, into the highway and transit networks. While travel demand estimates include all counties in the modeled area, emissions estimates are only tabulated for the defined nonattainment area for each pollutant.

EXHIBIT 4
RAIL AND ROAD MILES

(modeled area)

	LOV LANE MILES TOTAL	HOV/HOT LANE MILES TOTAL	METRORAIL MILES TOTAL	MD/DC* NON-METRO RAIL MILES TOTAL	VA** NON-METRO RAIL MILES TOTAL
2015	23,234	310	119	127	90
2017	23,347	316	131	139	95
2020	23,750	316	131	154	97
2025	24,163	360	131	154	97
2030	24,275	391	131	154	97
2040	24,445	406	131	154	97

* Includes MARC and Purple Line Transitway in Maryland and Anacostia, H St., & Benning Rd. Street Cars in the District of Columbia

** Includes VRE and Arlington Streetcar (Columbia Pike & Route 1 Corridor)

VDOT Alternatives

The Virginia Department of Transportation (VDOT) requested that three alternatives for a western Dulles airport access facility, as well as a "no-build" alternative, be included in this air quality conformity analysis. A description of the alternatives is included in Appendix B. These alternatives are currently undergoing a NEPA review as part of an Environmental Assessment (EA). Only one of these alternatives will be selected for the final EA document seeking federal approval. The results of each alternative were included in information that went out for public comment in June for the conformity analysis. Originally the Commonwealth Transportation Board (CTB) was expected to select an alternative before the TPB adopted the conformity analysis and CLRP and TIP in July, but the CTB's decision was delayed. Therefore, the VDOT "no-build" alternative was selected for inclusion in the CLRP and TIP at the time of the TPB adoption in July. The travel demand and emissions summaries include all alternatives.

Land Activity

The COG Board approved the draft Round 8.2 Cooperative Forecasts for use in the air quality conformity analysis of the 2013 CLRP and FY2013-2018 TIP in February, 2013. The forecasts reflect both the small area land use distributions throughout the Washington region, and also the latest planning assumptions for areas that are outside the Washington region. The Round 8.2 Forecasts reflect 2010 Census data and take into account the current economic slow-down. Exhibit 5 presents Round 8.2 household data (Reference 8) for each of the years in the conformity assessment. Exhibit 6 presents similar data for the employment assumptions (Reference 9). The employment data reflect census adjustments (References 10 & 11).

EXHIBIT 5

HOUSEHOLD DATA

TPB PLANNING AREA:	2015	2017	2020	2025	2030	2040
D.C.	287617	291838	298115	309979	318252	339889
MONTGOMERY	377524	385296	396955	414873	434767	460161
PR.GEORGES	323364	328583	336404	348604	359878	379317
ARLINGTON	105692	108296	112211	117332	121383	128605
ALEXANDRIA	72306	74175	76978	81352	84717	94890
FAIRFAX	412183	419165	429673	455610	478867	523521
LOUDOUN	120272	126427	135648	149208	157333	165274
PR. WILLIAM	166083	172975	183321	197890	210450	229944
FREDERICK	87387	89490	92640	100227	107580	119457
CHARLES	57528	60235	64299	70833	75847	85901
SUBTOTAL	2,009,956	2,056,480	2,126,244	2,245,908	2,349,074	2,526,959
ADDITIONAL COUNTIES:						
HOWARD	117700	120864	125600	132182	135486	137773
ANNE ARUNDEL	210888	213647	217782	223822	229371	234332
CALVERT	34298	34991	36027	37374	38348	40301
CARROLL	65691	67260	69614	73417	76111	81464
FREDERICKSBURG (VA) &N. SPOTSYLVANIA	47742	49894	53122	57878	62604	69306
CLARKE&JEFFERSON	29378	30455	32064	34783	37347	42371
FAUQUIER	25337	25981	26954	28616	30272	33801
K. GEORGE	9,808	10379	11237	12808	14366	17142
ST. MARY'S	44443	46408	49352	53960	58143	66509
STAFFORD	49673	52815	57533	65473	73367	87670
SUBTOTAL	634,958	652,694	679,285	720,313	755,415	810,669
TOTAL	2,644,914	2,709,174	2,805,529	2,966,221	3,104,489	3,337,628

SOURCE:

- MWCOG Round 8.2 Cooperative Forecasts
- BMC Round 7-C Cooperative Forecasts
- George Washington Regional Commission / Federicksburg Area MPO February 2013
  TAZ Refinements of the January 2012 GWRC/FAMPO Long-Range Transportation Plan
  Update Control Estimates and Forecasts for City of Fredericksburg, King George, Spotsylvania and Stafford Counties
- Tri-County Council for Southern Maryland data for Calvert, Charles and St. Mary's
- COG/TPB Staff used Virginia Employment Commission Population Projections, February 2013 for Clark and Fauquier
- COG/TPB Staff used West Virginia University Population Projections, February 2013 for Jefferson County

EXHIBIT 6

EMPLOYMENT DATA

TPB PLANNING AREA:	2015	2017	2020	2025	2030	2040
D.C.	812947	834060	865726	902631	929641	982647
MONTGOMERY	531993	544960	564419	598807	635257	715143
PR.GEORGES	356958	365324	377879	403134	427514	497652
ARLINGTON	247460	258989	276281	292078	303044	308830
ALEXANDRIA	110248	112872	116812	131152	149552	167598
FAIRFAX	697250	721152	757079	809537	854343	920979
LOUDOUN	162772	176679	197577	225893	251675	283246
PR. WILLIAM	163423	172538	186215	207340	230047	278151
FREDERICK	99386	101182	103862	107266	109755	114907
CHARLES	68439	69758	71731	74731	77537	83138
SUBTOTAL	3,250,876	3,357,514	3,517,581	3,752,569	3,968,365	4,352,291
ADDITIONAL COUNTIES:						
HOWARD	181143	186679	194977	209723	221168	231902
ANNE ARUNDEL	309853	317528	329042	345027	358320	370904
CALVERT	41059	42422	44457	46258	47159	48955
CARROLL	69619	70099	70813	71629	72456	74090
FREDERICKSBURG (VA) &N. SPOTSYLVANIA	78759	81609	85881	92897	99865	116175
CLARKE & JEFFERSON	27533	28329	29530	31348	33052	36300
FAUQUIER	29270	30016	31135	33071	34996	39086
K. GEORGE	17804	18433	19377	20947	22490	25747
ST. MARY'S	64083	65350	67268	70093	71969	75862
STAFFORD	52681	54970	58399	64304	70170	84159
SUBTOTAL	871,804	895,435	930,879	985,297	1,031,645	1,103,180
TOTAL	4,122,680	4,252,949	4,448,460	4,737,866	5,000,010	5,455,471

SOURCE:
- MWCOG Round 8.2 Cooperative Forecasts
- BMC Round 7-C Cooperative Forecasts
- George Washington Regional Commission / Federicksburg Area MPO February 2013
  TAZ Refinements of the January 2012 GWRC/FAMPO Long-Range Transportation Plan
  Update Control Estimates and Forecasts for City of Fredericksburg, King George, Spotsylvania and Stafford Counties
- Tri-County Council for Southern Maryland data for Calvert, Charles and St. Mary's
- COG/TPB Staff used West Virginia University population projections, February 2013 for Clark and Fauquier Counties
- COG/TPB Staff used West Virginia University population projections, February 2013 for Jefferson County

NOTE: Includes Census Adjustment

Travel Summaries

After coding the networks, staff executed the travel forecasting process using the Version 2.3.52 model. Transit fares include the latest assumptions for all coded transit service and reflect policies such as price differentials for those who use SmarTrip versus those who use paper fare cards or cash. Transit capacity constraint procedures, according to which 2020 constrains later years, were used for the 2025, 2030, and 2040 forecast years. Summary mode choice results are shown in Exhibit 7. VMT summaries are shown in Exhibit 8. While regional VMT is expected to increase over time, this year's travel model changes resulted in a slower VMT growth than in past years.

EXHIBIT 7A

2013 CLRP AND FY2013-2018 TIP AIR QUALITY CONFORMITY
DAILY REGIONAL HOME BASED WORK PURPOSE MODE ANALYSIS BY YEAR
(Based on Mode Choice Output - 4th Iteration)

YEAR	HBW MOTORIZED PERSON	TOTAL HBW AUTO PSN	HBW SINGLE OCCUPANT AUTO PSN	HBW MULTIPLE OCCUPANT AUTO PSN	TOTAL HBW AUTO DRV	HBW CAR OCC.	HBW TRANSIT	HBW TRANSIT (%)
2002	3,416,996	2,691,684	2,298,111	393,573	2,474,699	1.09	725,312	21.23%
2015	3,991,403	3,139,108	2,672,649	466,459	2,880,919	1.09	852,295	21.35%
2017	4,072,173	3,183,981	2,707,010	476,971	2,919,200	1.09	888,192	21.81%
2020	4,206,702	3,268,489	2,754,610	513,879	2,972,474	1.10	938,214	22.30%
2025 VDOT "NO BUILD"	4,435,805	3,451,290	2,893,843	557,447	3,127,607	1.10	984,515	22.19%
2025 VDOT ALT A	4,435,744	3,450,972	2,895,367	555,606	3,128,452	1.10	984,771	22.20%
2025 VDOT ALT B	4,435,774	3,450,953	2,895,177	555,777	3,128,405	1.10	984,821	22.20%
2025 VDOT ALT C	4,435,759	3,450,797	2,894,504	556,293	3,127,826	1.10	984,962	22.21%
2030 VDOT "NO BUILD"	4,627,228	3,611,804	3,000,104	611,700	3,250,872	1.11	1,015,424	21.94%
2030 VDOT ALT A	4,627,201	3,611,508	3,001,631	609,877	3,251,955	1.11	1,015,693	21.95%
2030 VDOT ALT B	4,627,173	3,611,714	3,001,778	609,936	3,252,158	1.11	1,015,460	21.95%
2030 VDOT ALT C	4,627,173	3,611,557	3,001,254	610,303	3,251,689	1.11	1,015,616	21.95%
2040 VDOT "NO BUILD"	4,956,998	3,873,884	3,211,008	662,877	3,481,409	1.11	1,083,113	21.85%
2040 VDOT ALT A	4,957,013	3,874,134	3,213,446	660,688	3,483,348	1.11	1,082,879	21.85%
2040 VDOT ALT B	4,956,880	3,874,035	3,213,242	660,793	3,483,230	1.11	1,082,845	21.85%
2040 VDOT ALT C	4,956,972	3,874,159	3,212,576	661,583	3,482,700	1.11	1,082,813	21.84%

EXHIBIT 7B

2013 CLRP AND FY2013-2018 TIP AIR QUALITY CONFORMITY
DAILY REGIONAL ANALYSIS BY YEAR FOR ALL TRIP PURPOSES
(Based on Mode Choice Output - 4th Iteration)

YEAR	TOTAL MOTORIZED PERSON	TOTAL AUTO PSN	SINGLE OCCUPANT AUTO PSN	MULTIPLE OCCUPANT AUTO PSN	TOTAL AUTO DRV	TOTAL CAR OCC.	TOTAL TRANSIT	TRANSIT (%)
2002	16,937,717	15,845,227	8,292,091	7,553,136	11,348,559	1.40	1,092,489	6.45%
2015	19,291,737	18,096,941	9,347,198	8,749,743	12,871,960	1.41	1,194,796	6.19%
2017	19,612,811	18,359,471	9,441,976	8,917,496	13,030,686	1.41	1,253,340	6.39%
2020	20,186,537	18,859,072	9,638,686	9,220,387	13,335,516	1.41	1,327,465	6.58%
2025 VDOT "NO BUILD"	21,162,877	19,773,378	10,042,125	9,731,253	13,935,348	1.42	1,389,499	6.57%
2025 VDOT ALT A	21,162,670	19,773,008	10,042,955	9,730,054	13,935,813	1.42	1,389,662	6.57%
2025 VDOT ALT B	21,162,703	19,773,229	10,042,946	9,730,282	13,936,119	1.42	1,389,474	6.57%
2025 VDOT ALT C	21,162,681	19,772,721	10,040,821	9,731,900	13,934,267	1.42	1,389,960	6.57%
2030 VDOT "NO BUILD"	21,961,351	20,524,224	10,362,291	10,161,933	14,417,431	1.42	1,437,128	6.54%
2030 VDOT ALT A	21,961,148	20,523,788	10,362,784	10,161,004	14,417,911	1.42	1,437,360	6.55%
2030 VDOT ALT B	21,961,121	20,524,157	10,363,010	10,161,147	14,418,176	1.42	1,436,965	6.54%
2030 VDOT ALT C	21,961,125	20,523,871	10,361,919	10,161,952	14,417,011	1.42	1,437,254	6.54%
2040 VDOT "NO BUILD"	23,270,499	21,738,673	10,886,584	10,852,088	15,204,759	1.43	1,531,826	6.58%
2040 VDOT ALT A	23,270,277	21,738,311	10,887,935	10,850,375	15,205,721	1.43	1,531,967	6.58%
2040 VDOT ALT B	23,269,673	21,737,800	10,887,177	10,850,622	15,204,883	1.43	1,531,873	6.58%
2040 VDOT ALT C	23,270,325	21,738,471	10,886,946	10,851,526	15,204,764	1.43	1,531,854	6.58%

*Note: Starting in 2020, all HOV facilities are HOV3+

Notes:
Motorized Person Trips, Transit %, Total Auto PSN, Auto Driver, SOV APSN, Car Occupancy, and HOV APSN from i4_mc_nl_summary.txt / i4_mc_nl_consummary.txt

EXHIBIT 8

2013 CLRP / FY2013-2018 TIP AIR QUALITY CONFORMITY
MODELED AREA TRIPS AND VEHICLE MILES TRAVELED
AVERAGE WEEKDAY TRAFFIC (AAWDT)
(Based on Final Iteration)

YEAR	WORK AND NON-WORK AUTO DRV	TRUCKS (Med + Hvy)	MISC + THRU TRIPS	COMMERCIAL VEHICLES	TOTAL VEH. TRIPS	TOTAL VMT
2002	12,189,746	656,922	724,160	1,252,029	14,822,857	149,388,892
2015	13,858,784	710,823	872,589	1,363,630	16,805,826	166,771,876
2017	14,048,172	725,467	899,227	1,395,494	17,068,360	169,941,688
2020	14,401,029	748,139	939,404	1,444,004	17,532,576	174,980,240
2025 VDOT "NO BUILD"	15,082,433	783,636	1,003,346	1,517,398	18,386,813	185,034,036
2025 VDOT ALT A	15,082,878	783,648	1,003,345	1,517,341	18,387,212	185,141,267
2025 VDOT ALT B	15,083,205	783,642	1,003,345	1,517,368	18,387,560	185,166,881
2025 VDOT ALT C	15,081,340	783,642	1,003,345	1,517,280	18,385,607	185,161,089
2030 VDOT "NO BUILD"	15,654,225	815,352	1,063,863	1,582,364	19,115,804	193,832,401
2030 VDOT ALT A	15,654,626	815,259	1,063,864	1,582,160	19,115,909	193,970,670
2030 VDOT ALT B	15,654,903	815,283	1,063,864	1,582,199	19,116,249	193,948,316
2030 VDOT ALT C	15,653,758	815,338	1,063,864	1,582,312	19,115,272	193,931,784
2040 VDOT "NO BUILD"	16,547,874	869,732	1,171,493	1,700,786	20,289,885	206,511,384
2040 VDOT ALT A	16,548,793	869,649	1,171,493	1,700,852	20,290,787	206,564,393
2040 VDOT ALT B	16,547,932	869,670	1,171,493	1,700,921	20,290,016	206,604,343
2040 VDOT ALT C	16,547,858	869,730	1,171,492	1,700,886	20,289,966	206,588,625

VI. EMISSIONS

MOVES

MOVES (MOtor Vehicle Emissions Simulator) is a computer program designed by the US Environmental Protection Agency (EPA) to estimate air pollution emissions from on-road mobile sources. Officially released in 2010, the MOVES model version, MOVES2010, replaced the previous on-road emissions model, MOBILE6.2. MOVES2010a, a subsequent release of the program, was used in this analysis. This is the first time that MOVES has been used for this region's conformity analysis.

A task force was formed to provide guidance on the transition from MOBILE6.2 to MOVES. Staff from both transportation and environmental agencies served on the task force. During 18 monthly meetings between August 2009 and January 2011, the MOVES Task Force accomplished the following: (1) approved the use of local input data in the MOVES County Data Manager instead of EPA default values, a decision that was based on a series of sensitivity tests evaluating the appropriateness of using local data; (2) approved the county level as the appropriate level of disaggregation in the MOVES County Data Manager, a decision that was based on a series of sensitivity tests evaluating the appropriateness of the domain (reflecting state level) versus the county (jurisdictional level); and (3) selected the Inventory Approach as opposed to the Emissions Rate approach as the preferred method of developing mobile emissions inventories for Air Quality Conformity Determinations.

MOVES Inputs

Input data from ten broad categories were used in the MOVES County Manager in order to generate the mobile emissions inventories for each analysis year. Five of these categories are travel-related (i.e., derived from the regional travel demand model), and five of these are obtained either directly from state agencies (i.e. air agencies and Department of Motor Vehicles), or developed based on actual meteorological data. Exhibit 9 summarizes these categories, and indicates the methodology used to develop these data.

EXHIBIT 9

Local Input Data Categories

No	Data Category	Data Table Name	Locality	Methodology
1	Age Distribution	**sourceTypeAgeDistribution**	County	based on VIN
2	Average Speed Distribution	**avgSpeedDistribution**	County	based on travel demand model's post-processor outputs + school bus / refuse truck data from Fairfax Co. + transit bus from WMATA
3	Road Type Distribution	**roadTypeDistribution**	County	based on travel demand model's post-processor outputs
4	Source Type Population	**sourceTypeYear**	County	based on CLRP Vehicle Projection & VIN
5	Vehicle Type VMT	**HPMSVTypeYear**	County	based on TDM's post-processor otuputs
		monthVMTFraction	Region	based on Regional Data
		dayVMTFraction	Region	based on Regional Data
		hourVMTFraction	Region	based on Regional Data
6	Ramp Fraction	**roadType**	Region	8% of the urban / rural restricted access roads
7	Fuel	**FuelSupply**	State	from state air agency (state-wide data)
8		**FuelFormulation**	State	from state air agency (state-wide data)
9	I/M Programs	**IMCoverage**	State	from state air agency (state-wide data)
10	Meteorology Data	**zoneMonthHour**	Region	from DEP (region-wide data; by Season)

Age Distribution and Source Type Population refer to vehicle fleet characteristics, and are developed using regional vehicle registration (VIN) data. Age Distribution refers to the age of the vehicle fleet by vehicle type. For Age Distribution, registered vehicles are divided into 13 vehicle classes and 31 age categories in a series of steps, using a commercial decoding software program and an EPA-developed converter. Source Type Population refers to the specific types of vehicles in the fleet. For Source Type Population the vehicle-type percentages from the 2011 VIN data is used for all future analysis years. The population is grown for each forecast year, and then is converted into 13 vehicle types using a population mapping table included in EPA's technical guidance.

Average Speed Distribution is average vehicle speeds stratified by vehicle type, road type, time of day, and type of day (i.e. weekday vs. weekend). Average vehicle speed data are used to derive Vehicle Hours of Travel (VHT). Speed data from the travel demand model are stratified, using a post processor, into hourly VHT for each jurisdiction by 3 vehicle types, 4 road types, and 16 speed bins. VHT distribution for trash trucks, school buses, and transit buses is derived using locally observed data.

Road Type Distribution is the percentage of VMT allocated to each road type by vehicle type. The VMT by road type is stratified into 13 vehicle types and 4 road types.

The average annual weekday VMT by six HPMS vehicle types from the travel demand model is fed into the EPA-provided annual VMT converter with local monthly adjustment factors and weekend-day adjustment factors. The converter develops annual VMT in six HPMS vehicle types as required for MOVES and provides two additional outputs, "monthVMTfraction" and "dayVMTfraction". The local "hourlyVMTfraction" is also provided as part of the annual VMT input**.**

With the MOVES model, local data is used to provide bus VMT estimates. Local bus VMT is substituted for heavy duty vehicle VMT from the travel model. With the MOVES model, auto access to transit VMT is added to the travel model VMT. In order to develop auto access VMT, TPB staff gathered capacity information for current and future parking lots. Parking lot capacities were kept constant through all forecast years because a lack of quality historic data is not currently available to develop future growth trends. However, in subsequent conformity analyses this assumption may change if reliable data become available. A regional average home-to-transit travel distance of 4.5 miles was assumed for most parking lots. This assumption was based on findings from Commuter Connections surveys and a 2012 Geographically Focused Travel Survey. An average home-to-transit travel distance of 7.5 miles was used for certain parking lots where longer commuting distances apply. The parking capacity was multiplied by twice the average travel distance to provide auto access to transit VMT.

Ramp Fraction is the percentage of driving time on ramps by road type. Local data indicate that ramp time represents 8 percent of VHT. This, coincidentally, is the same as the national default value.

Appendix E includes a detailed description of how the MOVES inputs were developed. TPB staff developed the travel-related MOVES inputs based on the regional travel demand model (Version 2.3.52). COG's Department of Environmental Programs (DEP) staff provided inputs related to Fuel Supply and Formulation and Inspection and Maintenance (I/M) programs, as well as Meteorology Data. Fuel and I/M program data were supplied directly from DC, Maryland, and Virginia's air agencies in MOVES ready formats. Meteorology data were developed by DEP staff and supplied as hourly records of temperature and relative humidity in MOVES format.

Mobile Emissions Inventories

Ozone Season

The emissions results for ozone season pollutants are summarized in Exhibits 10 and 11, and indicate total VOC and NOx emissions for each analysis year. Reductions through time reflect the impact of the cleaner fuel / fleet and related programs. The emissions are shown in relation to the approved mobile budget for each pollutant.

$PM_{2.5}$

Direct $PM_{2.5}$ and precursor NOx emissions totals are shown in Exhibits 12 and 13. The emissions reductions through time are largely attributable to Tier II vehicle standards, cleaner fuels, and the heavy duty engine rule. The forecast year emissions are shown relative to the 2002 emissions. Mobile budgets, developed for the Fine Particles Maintenance Plan, are included at this time for informational purposes only.

Wintertime CO

Wintertime CO emissions are shown in Exhibit 14. The emissions are shown in relation to the mobile budget in the Wintertime CO Maintenance Plan.

2013 CLRP Emissions Inventories vs. Budgets

Exhibits 10-14 display net emissions for each forecast year. The charts show that emissions are within the mobile budgets for ozone season and Wintertime CO pollutants, and are not greater than 2002 levels for fine particles pollutants, for all forecast years.

Exhibit 10
AIR QUALITY CONFORMITY
2013 CLRP & FY2013-2018 TIP
Ozone Season VOC Emissions

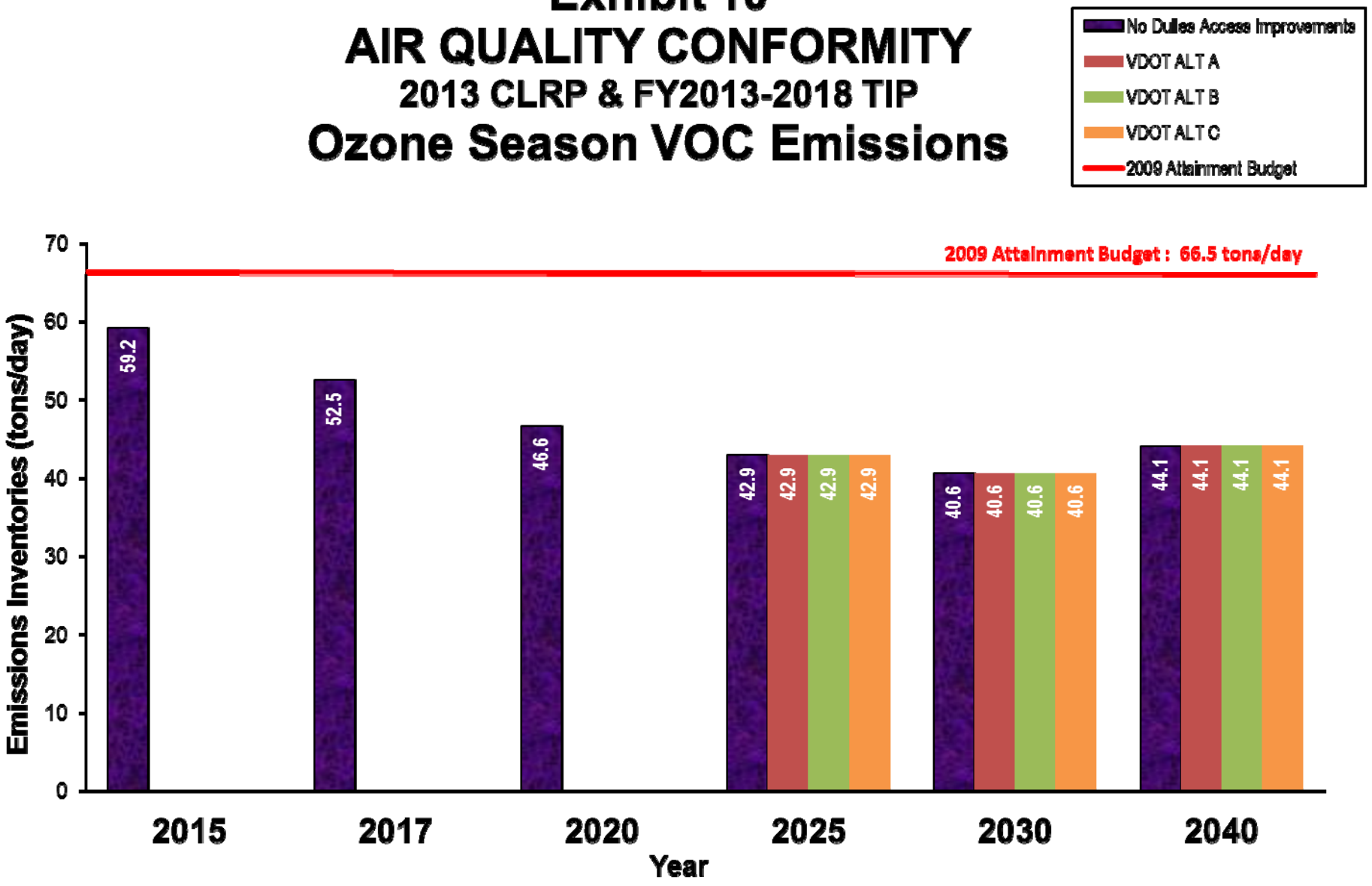


Exhibit 11
AIR QUALITY CONFORMITY
2013 CLRP & FY2013-2018 TIP
Ozone Season NOx Emissions

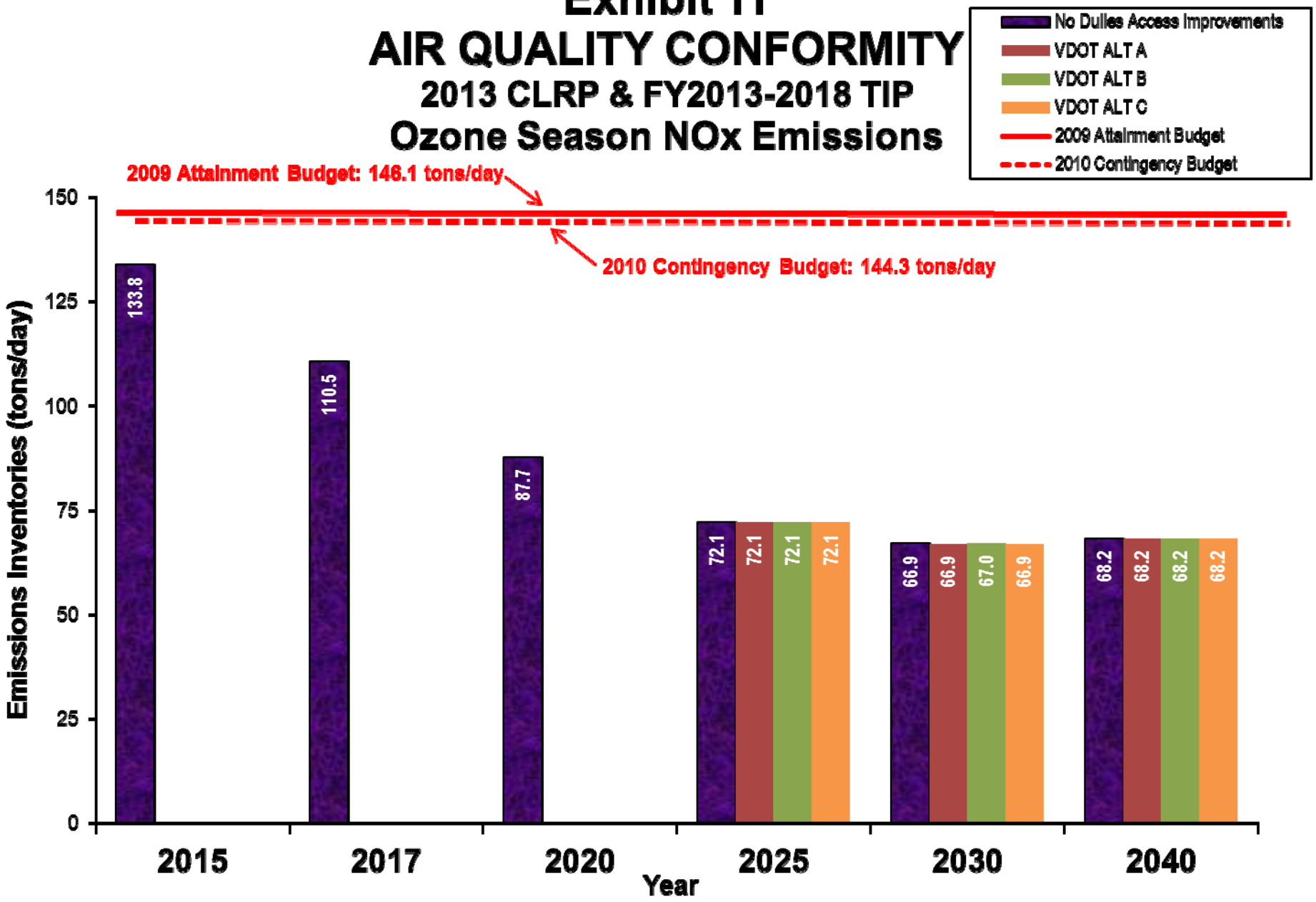
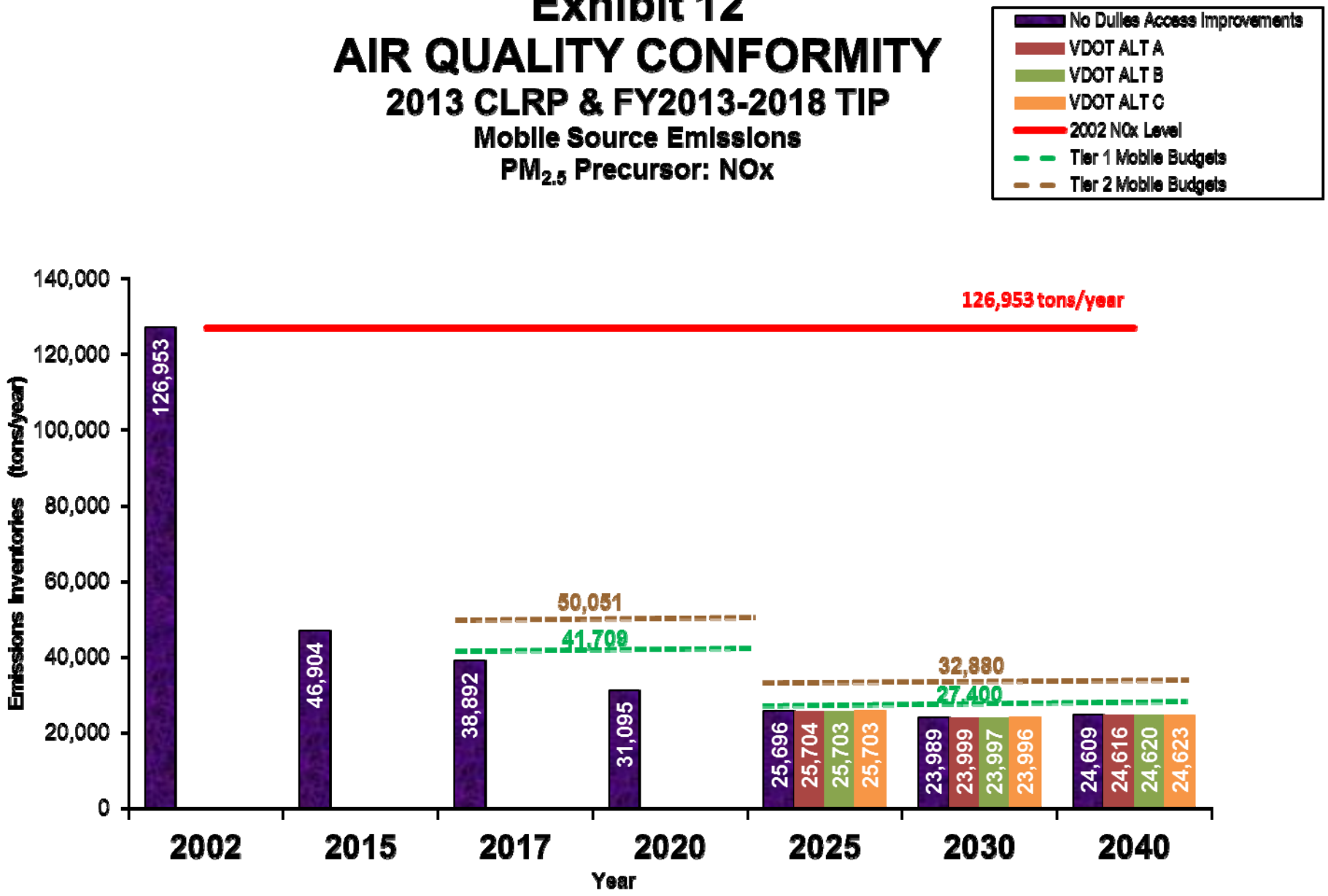
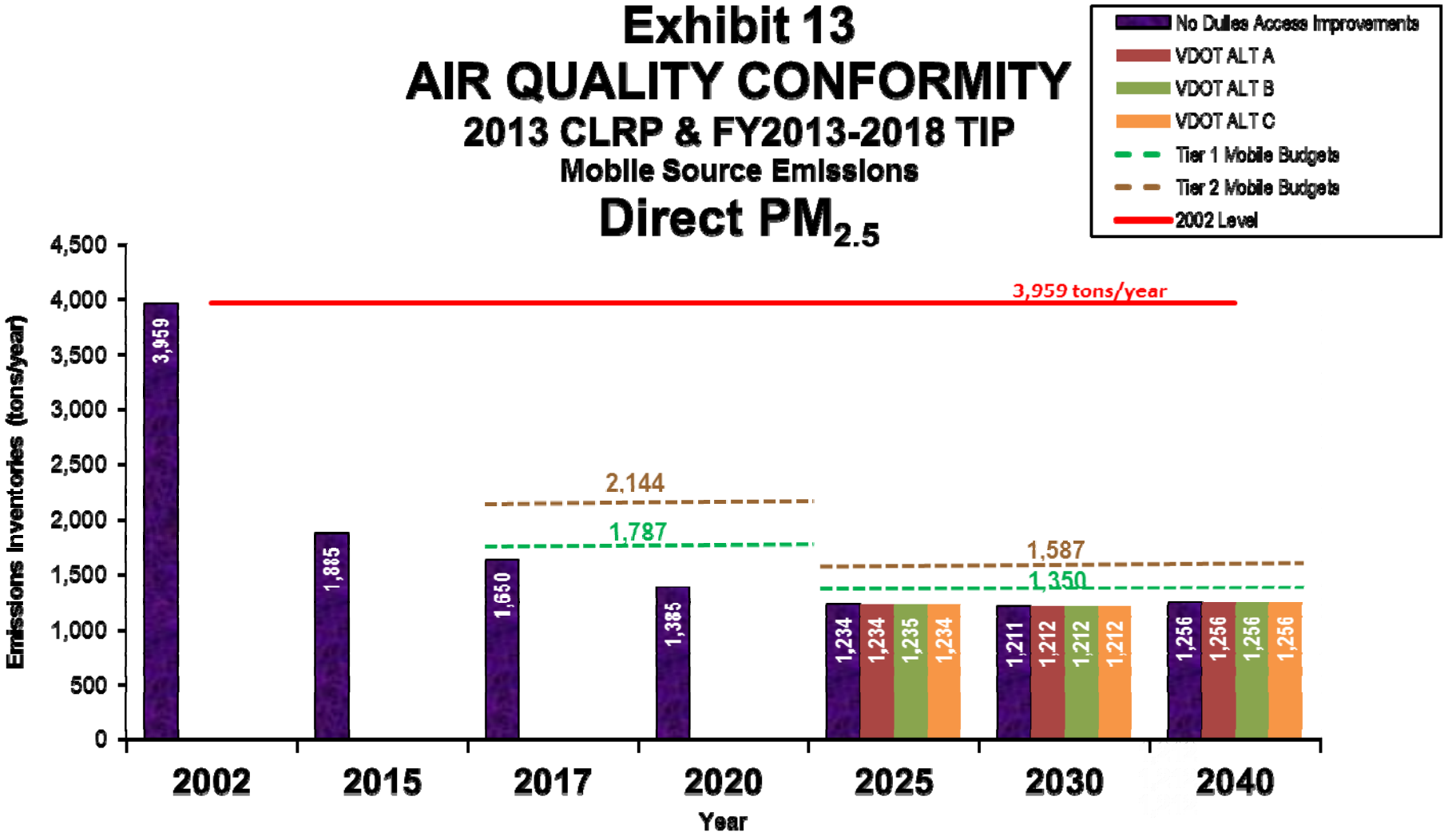


Exhibit 12
AIR QUALITY CONFORMITY
2013 CLRP & FY2013-2018 TIP
Mobile Source Emissions
$PM_{2.5}$ Precursor: NOx



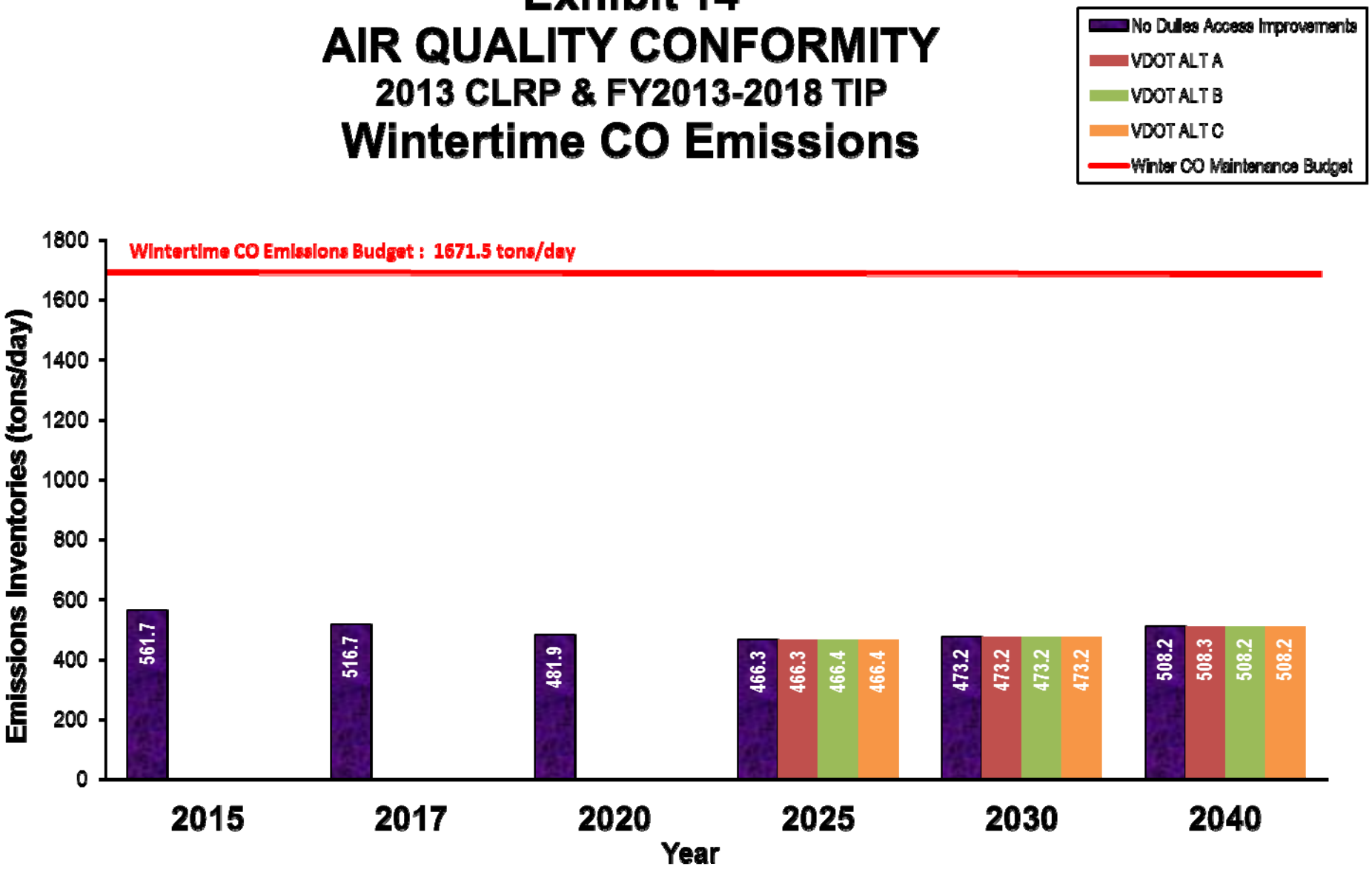
NOTE: MWAQC approved a $PM_{2.5}$ Maintenance Plan on 5/22/2013. The Plan contains mobile budgets for years 2017 and 2025, which are shown in this graph for informational purposes only. When they are approved by EPA they will be used for conformity. In the meantime, without approved mobile budgets, it is required that Forecast Year emissions do not exceed Base Year 2002 emissions.

Exhibit 13
AIR QUALITY CONFORMITY
2013 CLRP & FY2013-2018 TIP
Mobile Source Emissions
Direct $PM_{2.5}$



NOTE: MWAQC approved a $PM_{2.5}$ Maintenance Plan on 5/22/2013. The Plan contains mobile budgets for years 2017 and 2025, which are shown in this graph for informational purposes only. When they are approved by EPA they will be used for conformity. In the meantime, without approved mobile budgets, it is required that Forecast Year emissions do not exceed Base Year 2002 emissions.

Exhibit 14
AIR QUALITY CONFORMITY
2013 CLRP & FY2013-2018 TIP
Wintertime CO Emissions



TERMs

Transportation Emission Reduction Measures (TERMs) are strategies or actions that the TPB can employ to offset increases in emissions from mobile sources. TERMs are generally intended to reduce either the number of vehicle trips (VT), vehicle miles traveled (VMT), or both. These strategies may include ridesharing and telecommuting programs, improved transit and bicycling facilities, clean fuel vehicle programs or other possible actions.

In past conformity analyses, TERMs have been listed in a summary table showing the emission reduction benefits of each project, as well as the project's implementation status. With the recalibration of the travel demand model to 2010 conditions, the vast majority of TERMs from past conformity analyses have been captured in the baseline and may no longer be used to offset future emissions. Creditable TERMs were reanalyzed using emissions rates generated in a post-processing environment using MOVES outputs from the conformity analysis. This approach ensured consistency of assumptions, inputs, and methodologies with conformity. Only projects put into place after 2010, or projects with improvements since 2010, were included in this analysis.

TERMs analyzed for the 2013 CLRP and FY2013-2018 TIP conformity analysis were grouped into four broad categories. Each category consisted of a grouping of several similar and related activities:

- TPB Commuter Connections Program
- Regional Incident Management Program
- Pedestrian Facilities Expansions & Enhancements
- Freeform Carpooling (Slug Lots)

Exhibit 15 lists the emission reduction potential of these TERMs, by pollutant, for each analysis year. The benefits of these projects are not included in the emissions totals in this report, but are available, if necessary, to offset future growth in mobile emissions. Appendix F contains detailed information about the updated TERMs analysis.

Looking Ahead

While TERMs offer some emissions benefits, other more substantial benefits are anticipated from federal-level programs currently under development. EPA recently proposed Tier 3 Motor Vehicle Emission and Fuel Standards, which would reduce both tailpipe and evaporative emissions from cars and trucks. Reductions in emissions of NO_X, VOC, $PM_{2.5}$ and air toxics expected as a result of these standards are projected to lead to significant decreases in ambient concentrations of ozone, $PM_{2.5}$, and air toxics. EPA estimates reductions of 8% NOx, 3% VOC, and .1% $PM_{2.5}$ to on-road inventories by 2017, and reductions of 28% NOx, 23% VOC, and 10% $PM_{2.5}$ to on-road inventories by 2030 (Reference 12). These significant reductions will lead to air quality improvements that are important both for maintaining current NAAQS and for addressing future air quality standards.

EXHIBIT 15

2013 CLRP
TRANSPORTATION EMISSIONS REDUCTION MEASURES
SUMMARY TABLE

EMISSIONS REDUCTIONS					
Years/Pollutants	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**
	(tons/day)	(tons/day)	(tons/year)	(tons/year)	(tons/day)
2015	0.17	0.27	0.43	10.65	3.75
2017	0.19	0.28	0.37	8.75	4.41
2020	0.23	0.28	0.31	6.88	5.43
2025	0.29	0.32	0.27	5.53	7.35
2030	0.34	0.38	0.26	5.04	9.53
2040	0.54	0.56	0.27	5.08	14.95

NOTE: Benefits from these TERMs are not included in the emissions totals in this conformity analysis.

Transportation Control Measures (TCMs)

Section 93.113 of the conformity regulations requires the timely implementation of TCMs. All adopted TCMs for this region were included in the 1-Hour Ozone SIP and the 8-Hour Ozone SIP. The 1-Hour Ozone SIP was adopted by MWAQC on February 19, 2004 and the mobile budgets were found adequate by EPA in December, 2003. The 8-Hour Ozone SIP was adopted by MWAQC on May 23, 2007, and replaced the 1-Hour Ozone SIP when EPA found the Reasonable Further Progress (RFP) mobile budgets adequate for use in conformity in September, 2009. All TCMs included in these SIPs were implemented, as documented in Appendix G of this report.

VII. CONFORMITY ASSESSMENT - CRITERIA AND PROCEDURES

EPA's conformity regulations identify criteria and procedures for the determination of conformity. These regulations vary according to pollutants and to different actions being considered and according to the time period and the area's standing with EPA in terms of meeting SIP milestone requirements. The March 14, 2012 amendments to EPA's regulations represent the current transportation conformity requirements. The following sections indicate: (1) the appropriate sections of the regulations which must be adhered to in this conformity analysis, and (2) the manner in which the regulations have been met.

Conformity Criteria

This section identifies the criteria (sections of the regulations) which the CLRP must meet in order to conform to current implementation plans in the District of Columbia, Maryland and Virginia. Exhibit 16 lists all sections of the regulations relevant at this time to assessment of the 2013 CLRP and FY2013-2018 TIP. The following discussion indicates the manner in which each criterion was met.

Sec. 93.110 Criteria and procedures: Latest planning assumptions.

The conformity assessment is based upon the most current planning assumptions available for the Washington region. Round 8.2 Cooperative Forecasts were approved for use in the conformity analysis of the 2013 CLRP and FY2013-2018 TIP. These forecasts were developed and reviewed with an explicit perspective on transportation and land use interaction.

Travel demand modeling methods incorporating the latest travel time refinements were used in this study. Other refinements include development and use of a comprehensive set of transit and HOV networks. As with previous conformity analyses, transit fares are modeled explicitly in the modal choice process. The analysis includes actual fares for the base year simulation, with forecast year fares based on current (March 2013) fares with increases through time as a function of increases in the consumer price index.

Base year fares are modeled to reflect the WMATA tariff and other actual charges levied by each transit provider; the updated fare tariffs provided the basis for future analysis years. Transit operating policies, such as hours and frequency of service, are updated annually and modeled explicitly to reflect actual conditions in the peak and off-peak hours. The overall travel demand modeling process is continually monitored and refined as new data become available.

Exhibit 16

Conformity Criteria

All Actions at all times:

Sec. 93.110	Latest planning assumptions.
Sec. 93.111	Latest emissions model.
Sec. 93.112	Consultation.

Transportation Plan:

Sec. 93.113(b)	TCMs.
Sec. 93.118 and/or	Emissions budget and /or Interim
Sec. 93.119	emissions.

TIP:

Sec. 93.113(c)	TCMs.
Sec. 93.118 and/or	Emissions budget and /or Interim
Sec. 93.119	emissions.

Project (From a Conforming Plan and TIP):

Sec. 93.114	Currently conforming plan and TIP.
Sec. 93.115	Project from a conforming plan and TIP.
Sec. 93.116	CO, PM_{10}, and $PM_{2.5}$ hot spots.
Sec. 93.117	PM_{10} and $PM_{2.5}$ control measures.

Project (Not From a Conforming Plan and TIP):

Sec. 93.113(d)	TCMs.
Sec. 93.114	Currently conforming plan and TIP.
Sec. 93.116	CO, PM_{10}, and $PM_{2.5}$ hot spots.
Sec. 93.117	PM_{10} and $PM_{2.5}$ control measures.
Sec. 93.118 and/or	Emissions budget and/or Interim
Sec. 93.119	emissions

Sec. 93.111 Criteria and procedures: Latest emissions model.

The current analysis used MOVES2010a, the latest emission factor model specified by EPA for use in preparation of state implementation plans and conformity assessments.

Sec. 93.112 Criteria and procedures: Consultation.

The TPB offers many opportunities for public comment. Since the initial consultation procedures were developed, TPB has expanded the opportunity for public involvement through a series of initiatives. Examples include: the public comment period at the start of each TPB meeting; regular public forums and workshops on major topics; a monthly newsletter; and the institution of the Citizens Advisory Committee. Details relating to public involvement for this conformity analysis are included as Appendix C of this document. General information is summarized in a report called the TPB Participation Plan (Reference 13). Exhibit 17 lists the schedule for public involvement/consultation opportunities associated with the conformity analysis of the 2013 CLRP and FY2013-2018 TIP.

Sec. 93.113 Criteria and procedures: Timely implementation of TCMs.

Transportation Control Measures were included in both the 1-Hour Ozone SIP, the 8-Hour Ozone SIP, and the $PM_{2.5}$ SIP. Documentation regarding the implementation of each project is included as Appendix G of this document.

Sec. 93.114 Criteria and procedures: Currently conforming transportation plan and TIP.

There is a currently conforming plan and program in the Washington region. This current conformity analysis is designed to update and supersede the (conforming) 2012 CLRP, adopted by the TPB in March, 2013.

Sec. 93.115 Criteria and procedures: Projects from a plan and TIP.

All projects advanced for implementation will come from a conforming plan and program.

Sec. 93.116 Criteria and procedures: Localized CO and PM_{10} violations (hot spots).

Any project advanced in the current TIP must first have met this criterion as an element of its environmental study. (The Washington area is now in attainment for both carbon monoxide and PM_{10}.)

EXHIBIT 17

Schedule for the 2013 Financially Constrained Long-Range Transportation Plan (CLRP) and the FY2013-2018 Transportation Improvement Program (TIP)

*September 19, 2012	TPB is Briefed on Draft Call for Projects
*October 17, 2012	TPB Releases Final Call for Projects - Transportation Agencies Begin Submitting Project Information through On-Line Database
December 14, 2012	**DEADLINE:** Transportation Agencies Complete On-Line Submission of Draft Project Inputs.
January 11, 2013	Technical Committee Reviews Draft CLRP & TIP Project Submissions and Draft Scope of Work for the Air Quality Conformity Assessment
January 17, 2013	CLRP & TIP Project Submissions and Draft Scope of Work Released for Public Comment
*January 23, 2013	TPB is Briefed on Project Submissions and Draft Scope of Work
February 16, 2013	Public Comment Period Ends
*February 20, 2013	TPB Reviews Public Comments and is asked to Approve Project Submissions and Draft Scope of Work
May 3, 2013	DEADLINE: Transportation Agencies Finalize Congestion Management Documentation Forms (where needed) and CLRP & TIP Forms[1]. (Submissions must not impact conformity inputs; note that the deadline for changes affecting conformity inputs was February 20, 2013).
June 13, 2013	Draft CLRP & TIP and Conformity Assessment Released for Public Comment at Citizens Advisory Committee (CAC)
*June 19, 2013	TPB Briefed on the Draft CLRP & TIP and Conformity Assessment
July 13, 2013	Public Comment Period Ends
*July 17, 2013	TPB Reviews Public Comments and Responses to Comments, and is Presented the Draft CLRP & TIP and Conformity Assessment for Adoption

*TPB Meeting

[1] By this date, the CLRP forms must include information on the Planning Factors, Environmental Mitigation, Congestion Management Information, and Intelligent Transportation Systems; separate Congestion Management Documentation Forms (where needed) must also be finalized.

Sec. 93.117 Criteria and procedures: Compliance with PM_{10} and $PM_{2.5}$ control measures.

The Washington area is in attainment for PM_{10}. Prior to the region attaining the 1997 $PM_{2.5}$ NAAQS, a SIP for the Washington nonattainment area was developed and submitted to EPA in April, 2008. That SIP was never approved. After attaining the 1997 $PM_{2.5}$ NAAQS MWAQC approved a $PM_{2.5}$ Resignation Request and Maintenance Plan for the Washington region. Those documents were submitted to EPA.

93.118 Motor vehicle emissions budget

As discussed in earlier in this report, this analysis includes use of the existing budgets developed as part of the 8-hour ozone SIP. Total VOC, NOx, and CO emissions for all plan milestone analysis years are within their respective emissions budgets.

Sec. 93.119 Criteria and procedures: Interim emissions in areas without motor vehicle budgets

The forecast year $PM_{2.5}$ pollutant emissions are below those of the 2002 base year.

NOTE: See EPA's conformity regulations for the full text associated with each section's requirements.

VIII. FINDINGS

The analytical results described above provide a basis, in relation to US EPA conformity regulations, for a determination of conformity of the year 2013 Constrained Long Range Plan and FY2013-2018 Transportation Improvement Program for The Washington Metropolitan Region, with requirements of the Clean Air Act Amendments of 1990.

APPENDIX A

Scope of Work

AIR QUALITY CONFORMITY ASSESSMENT: 2013 CONSTRAINED LONG RANGE PLAN AND THE FY2013-2018 TRANSPORTATION IMPROVEMENT PROGRAM

SCOPE OF WORK

I. INTRODUCTION

Projects solicited for the 2013 Constrained Long Range Plan (CLRP) and FY2013-2018 Transportation Improvement Program (TIP) are scheduled to be finalized at the February 20, 2013 TPB meeting. This scope of work reflects the tasks and schedule designed for the air quality conformity assessment leading to adoption of the plan on July 17, 2013. This work effort addresses requirements associated with attainment of the ozone standards (volatile organic compounds (VOC) and nitrogen oxides (NOx) as ozone precursor pollutants), and fine particles ($PM_{2.5}$) standards (direct particles and precursor NOx), as well as maintenance of the wintertime carbon monoxide (CO) standard.

The plan must meet air quality conformity regulations: (1) as originally published by the Environmental Protection Agency (EPA) in the November 24, 1993 Federal Register, and (2) as subsequently amended, most recently on March 14, 2012, and (3) as detailed in periodic FHWA / FTA and EPA guidance. These regulations specify both technical criteria and consultation procedures to follow in performing the assessment.

This scope of work provides a context in which to perform the conformity analyses and presents an outline of the work tasks required to address all regulations currently applicable.

II. REQUIREMENTS AND APPROACH

A. **Criteria** (See Exhibit 1)

As described in the 1990 Clean Air Act Amendments, conformity is demonstrated if transportation plans and programs:

1. Are consistent with most recent estimates of mobile source emissions,

2. Provide expeditious implementation of TCMs, and

3. Contribute to annual emissions reductions.

Assessment criteria for ozone, CO, and $PM_{2.5}$ are discussed below.

Ozone season pollutants will be assessed by comparing the "action" scenarios to the most recently approved 8-hour ozone area VOC and NOx mobile emissions budgets. The 2009 Attainment and 2010 Contingency budgets were deemed adequate for use in conformity by EPA in February 2013. These budgets were submitted to EPA by the Metropolitan Washington Air Quality Committee (MWAQC) in 2007 as part of the 8-hour ozone State Implementation Plan (SIP).

The region is in maintenance for mobile source wintertime CO and, as in prior conformity assessments, is required to show that pollutant levels do not exceed the approved budget.

$PM_{2.5}$ pollutants will be assessed both by comparing the "action" scenarios to a 2002 base, and by comparing the pollutant levels to the budgets in the proposed $PM_{2.5}$ Maintenance Plan. $PM_{2.5}$ emissions will be inventoried for yearly totals (instead of on a daily basis as performed for Ozone and CO).

B. Approach (See Table 1 – Summary of Technical Approach)

As in the past, this analysis will include use of the Version 2.3 travel demand model with the 3722 TAZ area system. Changes include the use of updated Cooperative Forecasts, Round 8.2, and the use of the MOVES emissions model.

In addition to the elements below, explicit inputs include: a summary list of major policy and technical input assumptions, shown as Attachment A; and all transportation network elements which were finalized at the February 20, 2013 TPB meeting.

TABLE 1 – Summary of Technical Approach

	Ozone	Wintertime CO	$PM_{2.5}$
Pollutant:	VOC, NOx	CO	Direct particles, Precursor NOx
Mobile Model: NEW!	MOVES 2010a	MOVES 2010a	MOVES 2010a
Conformity Test:	Budget Test: Using mobile budgets most recently approved by EPA. 2009 attainment and 2010 contingency budgets found adequate for use in conformity by EPA in Feb. 2013. All budgets were set using Mobile6 emissions model and submitted to EPA in 2007.	Budget Test: Using mobile budgets established with the Wintertime CO maintenance plan. All budgets set using Mobile6 emissions model and submitted to EPA in 2007.	Reductions From Base (2002 inventory) Test & Budget Test; With no approved budgets, reduction from base test will be needed; if EPA approves the PM maintenance plan budgets, those budgets must be used.
Emissions Analysis Time-frame:	Daily	Daily	Annual
Vehicle Fleet Data:	2011 vehicle registration data for all jurisdictions		
Geography:	8-hour ozone non-attainment area	DC, Arl., Alex., Mont., Pr. Geo.	8-hr. area less Calvert County
Network Inputs:	Regionally significant projects		
Land Activity:	NEW! Round 8.2		
Modeled Area:	3722 TAZ SYSTEM		
Travel Demand Model:	Version 2.3		

III. CONSULTATION

1. Execute TPB consultation procedures (as outlined in the consultation procedures report adopted by the TPB on May 20, 1998).

2. Participate in meetings of MWAQC, its Technical Advisory Committee and its Conformity Subcommittee to discuss the scope of work activities, TERM development process, and other elements as needed; discuss at TPB meetings or forums, as needed, the following milestones:

   - CLRP & TIP Call for Projects
   - Scope of work
   - TERM proposals
   - Project submissions: documentation and comments
   - Analysis of TERMs, list of mitigation measures
   - Conformity assessment: documentation and comments
   - Process: comments and responses

IV. WORK TASKS

1. Receive project inputs from programming agencies and organize into conformity documentation listings (endorsement of financially constrained project submissions scheduled for February 20, 2013)

   - Project type, limits, NEPA approval, etc.
   - Phasing with respect to forecast years
   - Transit operating parameters, e.g. schedules, service, fares
   - Action scenarios

2. Review and Update Land Activity files to reflect Round 8.2 Cooperative Forecasts

   - Households by auto ownership, population and employment
   - Zonal data files

3. Prepare forecast year highway, HOV, and transit networks

   - Develop 2015, 2017, 2020, 2025, 2030, & 2040 highway networks
   - Prepare 2015, 2017, 2020, 2025, 2030, & 2040 transit network input files
   - Update transit fares and highway tolls, as necessary

4. Prepare 2015 travel and emissions estimates

   - Execute travel demand modeling
   - Calculate emissions (daily for ozone season VOC and NOx for ozone standard requirements; daily for winter CO; yearly for $PM_{2.5}$ direct particles and precursor NOx)

5. Prepare 2017 travel and emissions estimates

   - Tasks as in year 2015 analysis

6. Prepare 2025 travel and emissions estimates

   - Tasks as in year 2017 analysis
   - Apply "transit constraint" using 2020 levels

7. Prepare 2030 travel and emissions estimates

   - Tasks as in year 2025 analysis, including transit constraint

8. Prepare 2040 travel and emissions estimates

   - Tasks as in year 2030 analysis, including transit constraint

9. Prepare 2020 travel estimates for transit constraint

10. VDOT Dulles Access Alternatives

    - Modify 2025, 2030, 2040 highway networks
    - Execute travel demand modeling for 2025, 2030, 2040
    - Calculate emissions for 2025, 2030, 2040

11. Identify extent to which plan provides for expeditious implementation of TCMs contained in ozone state implementation plans and emissions mitigation requirements of previous CLRP & TIP commitments (TERMs)

    - Staff will request updated status reports on TERMs from the implementing agencies
    - Staff will review these reports as they are received and update the TERM tracking sheet that was included in the December 19, 2012 air quality conformity report
    - The status reports and the updated TERM tracking sheet will be included in the air quality conformity report.

12. Analyze results of above technical analysis

    - Reductions from 1990 (ozone season VOC and NOx and winter CO) and 2002 base ($PM_{2.5}$)
    - 8-hour ozone season VOC and NOx budgets, direct $PM_{2.5}$ and precursor NOx budgets, and winter CO emissions budgets
    - With oversight from the Technical Committee and the TPB, identify and recommend additional measures should the plan or program fail any test and incorporate measures into the plan

13. Assess conformity and document results in a report

    - Document methods
    - Draft conformity report
    - Forward to technical committees, policy committees
    - Make available for public and interagency consultation
    - Receive comments
    - Address comments and present to TPB for action
    - Finalize report and forward to FHWA, FTA and EPA

V. SCHEDULE

The schedule for the execution of these work activities is shown in Exhibit 2. The time line shows completion of the analytical tasks, preparation of a draft report, public and interagency review, response to comments and action by the TPB on July 17, 2013.

Exhibit 1

Conformity Criteria

All Actions at all times:

Sec. 93.110	Latest planning assumptions.
Sec. 93.111	Latest emissions model.
Sec. 93.112	Consultation.

Transportation Plan:

Sec. 93.113(b)	TCMs.
Sec. 93.118 and/or	Emissions budget and /or Interim
Sec. 93.119	emissions.

TIP:

Sec. 93.113(c)	TCMs.
Sec. 93.118 and/or	Emissions budget and /or Interim
Sec. 93.119	emissions.

Project (From a Conforming Plan and TIP):

Sec. 93.114	Currently conforming plan and TIP.
Sec. 93.115	Project from a conforming plan and TIP.
Sec. 93.116	CO, PM_{10}, and $PM_{2.5}$ hot spots.
Sec. 93.117	PM_{10} and $PM_{2.5}$ control measures.

Project (Not From a Conforming Plan and TIP):

Sec. 93.113(d)	TCMs.
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Sec. 93.116	CO, PM_{10}, and $PM_{2.5}$ hot spots.
Sec. 93.117	PM_{10} and $PM_{2.5}$ control measures.
Sec. 93.118 and/or	Emissions budget and/or Interim
Sec. 93.119	emissions

Sec. 93.110 Criteria and procedures: Latest planning assumptions.

The conformity determination must be based upon the most recent planning assumptions in force at the time of the conformity determination.

Sec. 93.111 Criteria and procedures: Latest emissions model.

The conformity determination must be based on the latest emission estimation model available.

Sec. 93.112 Criteria and procedures: Consultation.

Conformity must be determined according to the consultation procedures in this subpart and in the applicable implementation plan, and according to the public involvement procedures established in compliance with 23 CFR part 450.

Sec. 93.113 Criteria and procedures: Timely implementation of TCMs.

The transportation plan, TIP, or any FHWA/FTA project which is not from a conforming plan and TIP must provide for the timely implementation of TCMs from the applicable implementation plan.

Sec. 93.114 Criteria and procedures: Currently conforming transportation plan and TIP.

There must be a currently conforming transportation plan and currently conforming TIP at the time of project approval.

Sec. 93.115 Criteria and procedures: Projects from a plan and TIP.

The project must come from a conforming plan and program.

Sec. 93.116 Criteria and procedures: Localized CO, PM_{10}, and $PM_{2.5}$ violations (hot spots).

The FHWA/FTA project must not cause or contribute to any new localized CO, PM_{10}, and/or $PM_{2.5}$ violations or increase the frequency or severity of any existing CO, PM_{10}, and /or $PM_{2.5}$ violations in CO, PM_{10}, and $PM_{2.5}$ nonattainment and maintenance areas.

Sec. 93.117 Criteria and procedures: Compliance with PM_{10} and $PM_{2.5}$ control measures.

The FHWA/FTA project must comply with PM_{10} and $PM_{2.5}$ control measures in the applicable implementation plan.

Sec. 93.118 Criteria and procedures: Motor vehicle emissions budget

The transportation plan, TIP, and projects must be consistent with the motor vehicle emissions budget(s).

Sec. 93.119 Criteria and procedures: Interim emissions in areas without motor vehicle budgets

The FHWA/FTA project must satisfy the interim emissions test(s).

NOTE: See EPA's conformity regulations for the full text associated with each section's requirements.

Schedule for the 2013 Financially Constrained Long-Range Transportation Plan (CLRP) and the FY2013-2018 Transportation Improvement Program (TIP)

*September 19, 2012	TPB is Briefed on Draft Call for Projects
*October 17, 2012	TPB Releases Final Call for Projects - Transportation Agencies Begin Submitting Project Information through On-Line Database
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May 3, 2013	DEADLINE: Transportation Agencies Finalize Congestion Management Documentation Forms (where needed) and CLRP & TIP Forms[1]. (Submissions must not impact conformity inputs; note that the deadline for changes affecting conformity inputs was February 20, 2013).
June 13, 2013	Draft CLRP & TIP and Conformity Assessment Released for Public Comment at Citizens Advisory Committee (CAC)
*June 19, 2013	TPB Briefed on the Draft CLRP & TIP and Conformity Assessment
July 13, 2013	Public Comment Period Ends
*July 17, 2013	TPB Reviews Public Comments and Responses to Comments, and is Presented the Draft CLRP & TIP and Conformity Assessment for Adoption

*TPB Meeting

[1] By this date, the CLRP forms must include information on the Planning Factors, Environmental Mitigation, Congestion Management Information, and Intelligent Transportation Systems; separate Congestion Management Documentation Forms (where needed) must also be finalized.

WORK SCOPE ATTACHMENT A

POLICY AND TECHNICAL INPUT ASSUMPTIONS
AIR QUALITY CONFORMITY ANALYSIS OF 2011 CLRP

1. Land Activity

- Round 8.2 Cooperative Forecasts

2. Policy and Project Inputs

- Highway, HOV, and transit projects and operating parameters
- Financially constrained project submissions to be advanced by the TPB on 2/20/2013

3. Travel Demand Modeling Methods

- Version 2.3 Travel Model
- All HOV facilities at HOV-3 in 2020 & beyond
- Transit "capacity constraint" procedures (2020 constrains later years)

4. Emissions Model and Inputs

- MOVES2010a emissions model
- 2011 Vehicle Registration Data (VIN)

5. Conformity Assessment Criteria

- Emissions budgets for ozone precursors, $PM_{2.5}$ pollutants, and wintertime CO
- Analysis years: 2015, 2017, 2025, 2030, & 2040

APPENDIX B

Project Inputs

(significant changes & project input table)

Key to the Air Quality Conformity Table:

COLUMN 1:

Agency - identification of submitting agency

COLUMN 2:

Project ID - project identification number (for reference purposes)

COLUMN 3:

Type of improvement - defined as follows:

Construct	=	build a new facility
Widen	=	increase the number of lanes on an existing facility
Upgrade	=	improve the facility type of a roadway
Relocate	=	construct an existing facility on a new right-of-way
Reconstruct	=	modify an existing facility with no capacity increase i.e., shoulder paving, geometric improvements
Rehabilitate	=	repair existing structures - no capacity increase
Study	=	to review alternative transportation improvements- project planning or preliminary engineering only

COLUMN 4:

Facility - name of facility to be studied or improved

COLUMNS 5 and 6:

From and To - limits of the project

COLUMN 7:

Facility Type - defined as follows:

1 = Interstate
2 = Major Arterial
3 = Minor Arterial
4 = Collector
5 = Expressway or Freeway with at-grade intersections

If a facility is being upgraded, the old facility type is in the "from" column, and the new facility type is in the "to" column. If the facility is not being upgraded, the "from" and "to" columns are the same.

COLUMN 8:

Number of Lanes - same explanation of "from" and "to " columns as above

COLUMN 9:

Currently under construction or right-of-way acquired? -

"yes"	=	the facility is currently under construction and/or right-of-way has been acquired
"no"	=	the facility is not currently under construction and right-of-way has not been acquired
"completed"	=	the facility is open for use

COLUMN 10:

Project Completion Date or Status - date project will be open for use.
"not coded" indicates that project is not included in the conformity analysis

COLUMN 11:

TIP ID – Transportation Improvement Program identification number
Where available (for reference purposes)

NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD
777 North Capitol Street, N.E., Suite 300, Washington, D.C. 20002-4290 (202) 962-3310 Fax: (202) 962-3202 TDD: (202) 962-3213

MEMORANDUM

February 14, 2013

To: Transportation Planning Board

From: Ronald F. Kirby
Director, Department of
Transportation Planning

Re: Proposed Significant Additions and Changes to the 2013 Constrained Long-Range Plan and FY 2013-2018 Transportation Improvement Program (TIP) for Air Quality Conformity Analysis

On January 17, 2013 the Transportation Planning Board (TPB) released the draft project submissions for the 2013 Update to the National Capital Region's Financially Constrained Long-Range Transportation Plan (CLRP) and the FY 2013-2018 Transportation Improvement Program (TIP) for public comment. The 30-day public comment period ends at midnight on Saturday, February 16, 2013. Interested parties may submit their comments online at www.mwcog.org/transportation/public/, by phone at (202) 962-3262 or TDD: (202) 962-3213, or in person at the TPB meeting on February 20.

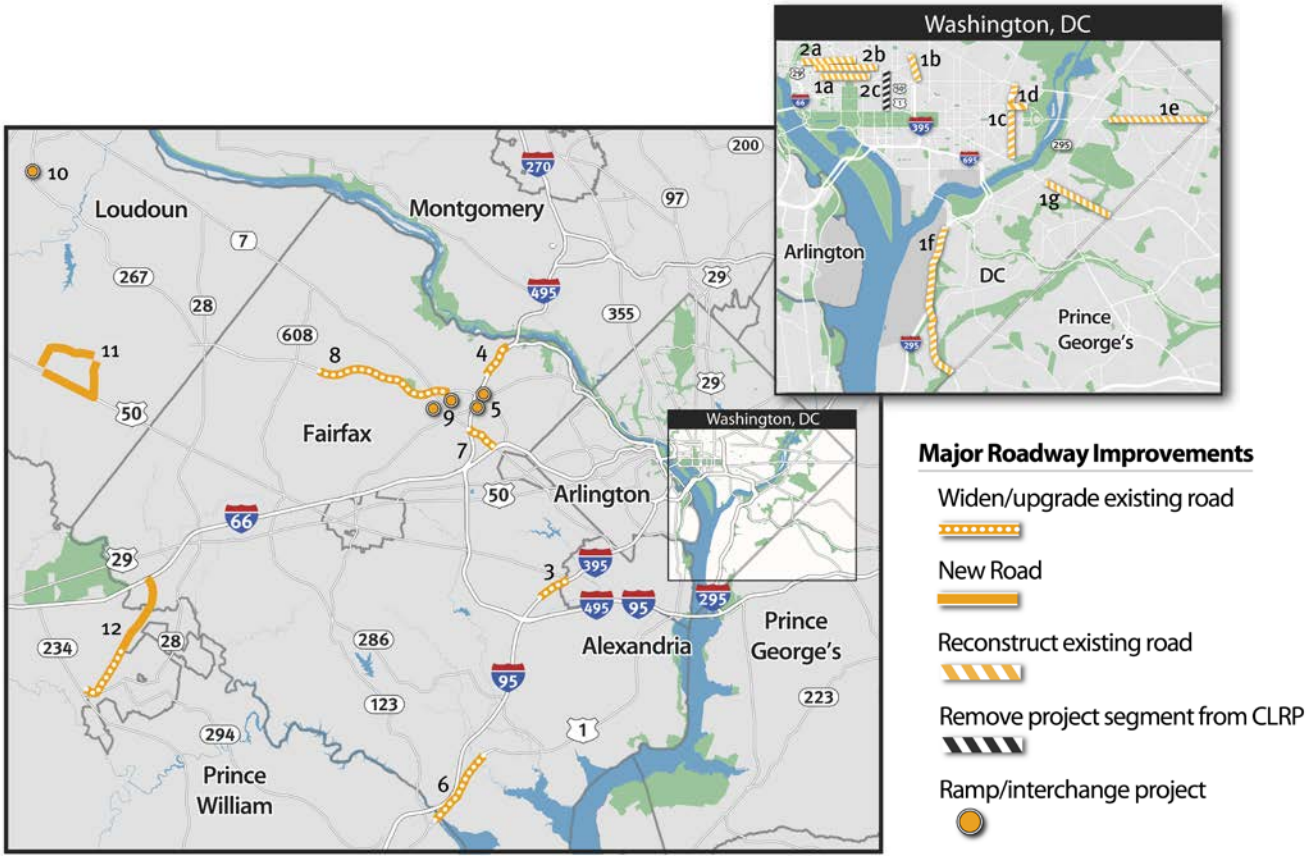
Information on the project submissions is presented in two pieces. First, in this memo, is a list of proposed significant additions and changes to the 2012 CLRP. These include new projects and changes to existing projects. This summary covers changes only to those projects that are considered to be regionally significant, i.e., interstates, principal arterials and some minor arterials. The second piece is a complete listing of all proposed projects and changes titled, "2013 CLRP and FY 2013-2018 TIP Air Quality Conformity Inputs." This document is available for review online at http://www.mwcog.org/clrp/resources/.

The regionally significant additions and changes proposed to the 2013 CLRP include nine new projects (or groups of projects), an update on a set of Bike Lane pilot projects in the District of Columbia, a change to the Capital Beltway HOT Lanes project, and one study in Virginia. The following pages provide further detail on these projects.

When the summary of significant additions and changes to the 2013 CLRP was released for public comment on January 17 it included a change to an existing project titled "Change of I-495, Capital Beltway Auxiliary Lanes Project Limits" which would remove

the southernmost planned segment (between Heming Avenue and one mile east of the I-95/I-395/I-495 interchange) of a series of auxiliary lanes on either side of the Beltway from Georgetown Pike to east of the I-95/I-395/I-495 interchange. This item was listed by mistake and has been removed from the summary of significant additions and changes. That segment of auxiliary lanes is moving ahead as planned with completion scheduled for 2013.

The TPB is scheduled to approve the project submissions and the Air Quality Conformity Scope of Work at its meeting on February 20. After approval, these projects will be included in the Air Quality Conformity Analysis of the 2013 CLRP and FY 2013-2018 TIP. This process takes several months and is done to ensure that the proposed projects do not prevent the region from meeting its air quality improvement goals in the decades ahead. Once the conformity modeling process is complete, the projects along with the results of the Conformity Analysis will be released for a final 30-day comment period, currently scheduled for June 13 through July 13, 2013.



DISTRICT OF COLUMBIA

1. Lane Reductions and Reconfigurations – C St. NE, East Capitol St., I St. NW, New Jersey Ave. NW, Pennsylvania Ave. SE, South Capitol St., 17th St. NE and SE
2. Bike Lane Pilot Projects – 9th St. NW, L St. NW, and M St. NW

VIRGINIA

3. Widen I-395 Southbound between Duke St. and Edsall Rd.
4. Widening of Northern Segment of I-495, Capital Beltway HOT Lanes
5. I-495, Capital Beltway Ramps at Dulles Airport Access Highway and Dulles Toll Rd.
6. Widen US 1, Jefferson Davis Highway from Lorton Rd. to Annapolis Way
7. Widen VA 7, Leesburg Pike from I-495 to I-66
8. Construct Collector-Distributor Roads along Dulles Toll Rd. between VA 684, Spring Hill Rd. and VA 828, Wiehle Ave.
9. Construct Dulles Toll Road Ramps in Tysons
10. Construct Dulles Greenway Ramp in Leesburg
11. ~~Alt. A: Construct Dulles Air Cargo, Passenger and Metro Access Highway~~
    ~~Alt. B: Construct New Limited Access US 50 and VA 606, Loudoun County Parkway~~
    ~~Alt. C: Loudoun County Countywide Transportation Plan Alignment~~
    Alt. D: No Action (2012 CLRP Baseline)
12. Study VA 28, Manassas Bypass from VA 234, Sudley Rd. to I-66

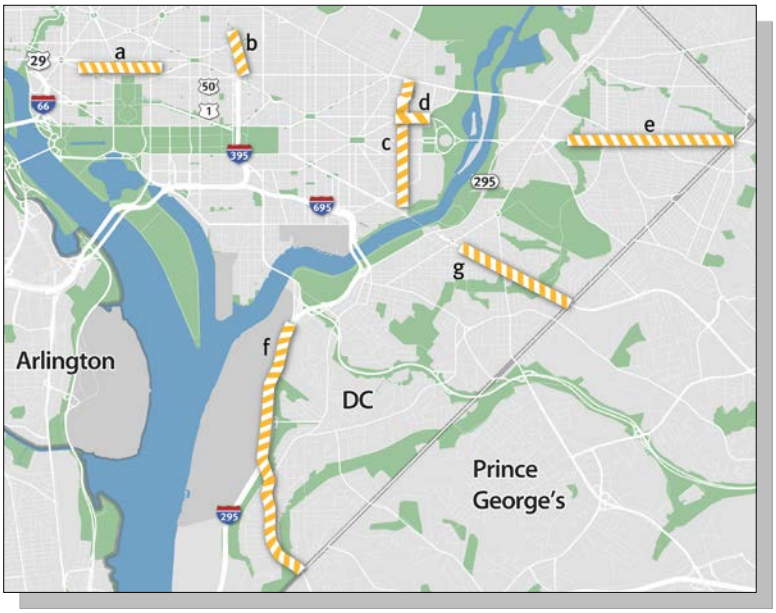
MARYLAND

13. Change in Project Cost for the Corridor Cities Transitway (not mapped)
14. Change in Project Cost for the Purple Line (not mapped)

DISTRICT OF COLUMBIA PROJECTS

1. Lane Reductions and Reconfigurations

DDOT is proposing a number of federally and locally funded projects that will make changes to the number and direction of travel lanes in selected locations, as described in the following:



a) **I St. NW Peak Period Bus-Only Lanes 13th St. NW to Pennsylvania Ave. NW**
I St. NW is one-way, running westbound between 13th St. NW and Pennsylvania Ave. NW. Parking restrictions are in effect on both sides of the street during morning and evening peak periods, allowing for five lanes of traffic. This project proposes to use one of those five lanes as a bus-only lane during the peak periods. Complete: 2013. Cost: $500,000.

b) **New Jersey Ave. NW from H St. NW to N St. NW**
Reconstruct New Jersey Ave. NW from four lanes, one-way northbound to two lanes in each direction. Complete: 2015. Cost: $7.5 million.

c) **17th St. NE/SE from Benning Ave. NE to Potomac Ave. SE**
Reconstruct 17th St. NE/SE from two lanes southbound to one lane southbound. Complete: 2013. Cost $1.95 million.

d) **C St. NE from 16th St. NE to Oklahoma Ave. NE**
Implement traffic-calming measures by removing one of two travel lanes in each direction. Complete: 2013. Cost: $4.5 million.

e) **East Capitol St. from 40th St. to Southern Ave.**
Implement pedestrian safety and traffic operations improvements and remove one of three travel lanes in each direction.
Complete: 2015. Cost: $5 million.

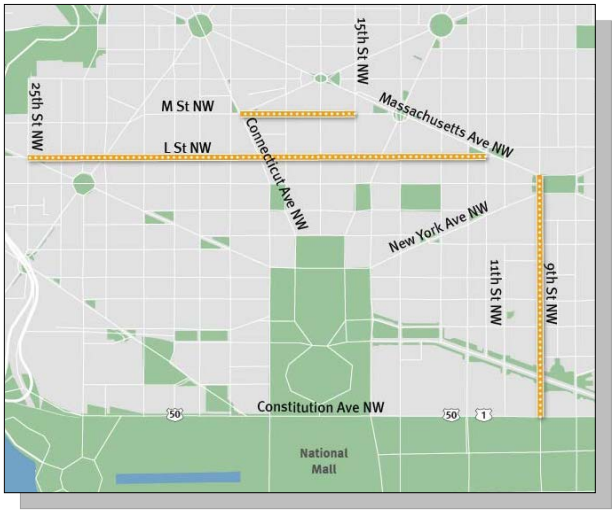
f) **South Capitol St. from Firth Sterling Ave. SE to Southern Ave. SE**
Design and construct a paved bicycle and pedestrian trail along South Capitol St. and reduce the number of lanes from 5 to 4. Complete: 2015. Cost $5 million.

g) **Pennsylvania Ave. SE from 27th St. SE to Southern Ave. SE**
As a part of the Pennsylvania Avenue Great Streets Project, a median was installed reducing the number of lanes from 5 to 4. Completed in 2011.

See the project descriptions in Attachment A for more information.

2. Bike Lane Pilot Studies

In 2010, DDOT submitted five bike lane projects for inclusion in the CLRP as pilot studies. Two of these projects – 15th St. NW from Constitution Ave. NW to W St. NW and Pennsylvania Ave. NW from 3rd St. NW to 14th St. NW – were completed in 2010. The 15th St. Bike Lane removed one vehicle lane, while the Pennsylvania Ave. Bike Lanes did not remove any vehicle lanes. This year, DDOT is updating the status of the remaining pilot projects as follows:



a. L St. from 11th St. NW to ~~25th St. NW~~ New Hampshire Ave. NW – completed 2012, one travel lane removed
b. M St. from 15th St. NW to ~~29th St. NW~~ 25th St. NW – complete in 2013, one travel lane removed
c. 9th St. NW from Constitution Ave. NW to K St. NW – project withdrawn

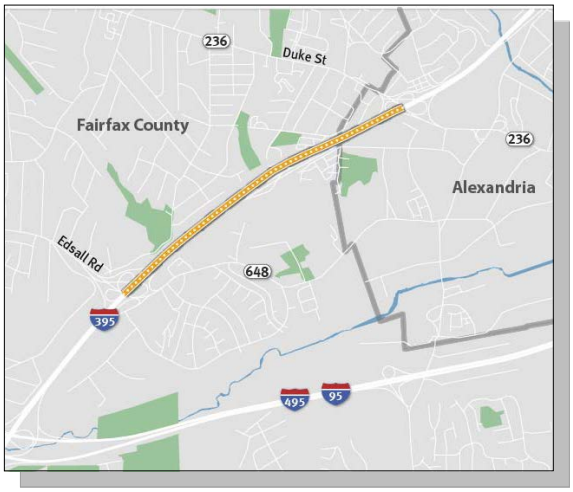
NORTHERN VIRGINIA PROJECTS

3. Widen I-395, Shirley Memorial Highway – Southbound from Duke St. to Edsall Rd.

Add a fourth lane to southbound I-395 between Duke St. and Edsall Rd.

Complete: 2018
Length: 1.5 miles
Cost: $58.5 million
Funding: Federal, State, Other

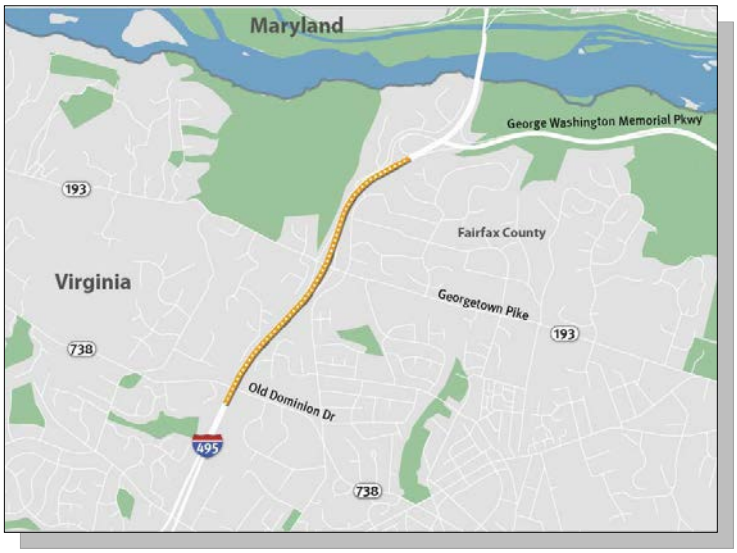
See the project description in Attachment A for more information.



4. Widen I-495, Capital Beltway HOT Lanes from South of the George Washington Parkway to South of Old Dominion Dr.

The CLRP includes the construction of a system of HOT Lanes on I-495. The segment of HOT Lanes between south of the George Washington Pkwy and south of Old Dominion Dr. was planned to be two lanes wide. VDOT proposes to make this segment four lanes wide.

Complete: 2015
Length: 1.5 miles
Cost: $75 million
Funding: Private



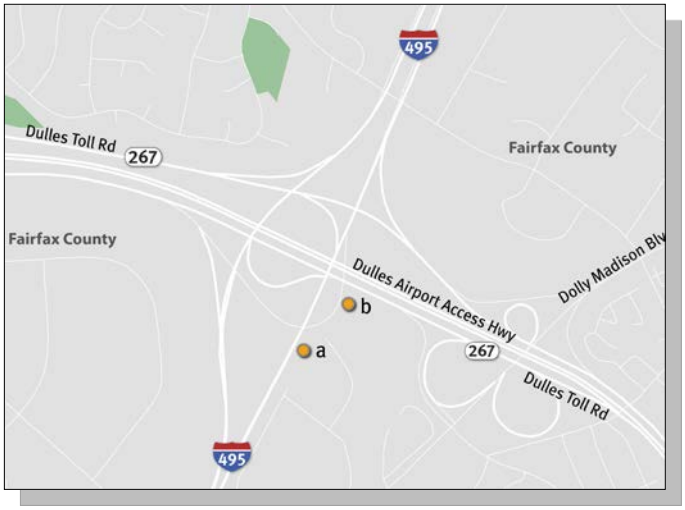
5. Construct and Improve I-495, Capital Beltway Ramps at Dulles Airport Access Highway and Dulles Toll Road

a. Construct a new ramp connecting the northbound general purpose lanes on I-495 to the inner lanes of westbound Dulles Airport Access Highway

Complete: 2030
Length: 0.8 mile
Cost: $7 million
Funding: Federal, State, Private…

b. Widen the ramp connecting eastbound Dulles Toll Road to the northbound general purpose lanes on I-495 from one to two lanes.

Complete: 2030
Length: 0.7 mile
Cost: $10 million
Funding: Federal, State, Private…



See the project description in Attachment A for more information.

6. Widen US 1, Jefferson Davis Highway from Lorton Rd. to Annapolis Way

Widen US 1 from 4 to 6 lanes within the project limits.

Complete:	2035
Length:	3.5 miles
Cost:	$125 million
Funding:	Federal, State, Local

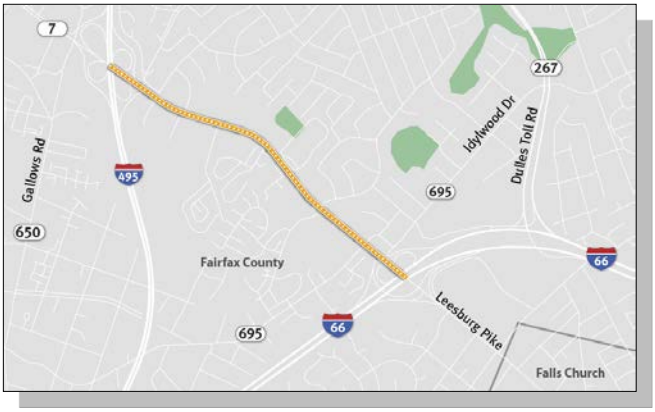
See the project description in Attachment A for more information.

7. Widen VA 7, Leesburg Pike from I-495 to I-66

Widen VA 7 from 4 to 6 lanes within the project limits.

Complete:	2035
Length:	1.3 miles
Cost:	$71 million
Funding:	Federal, State, Local,

See the project description in Attachment A for more information.



8. Construct Collector-Distributor Roads Parallel to Dulles Toll Road between VA 684, Spring Hill Rd. and VA 828, Wiehle Ave.

Construct new, two-lane collector-distributor roads on either side of the Dulles Toll Rd. eastbound and westbound between VA 684 and VA 828. These new facilities will allow for additional closely-spaced interchanges to be constructed in Tysons.

Complete:	2036, 2037
Length:	6 miles
Cost:	$186 million
Funding:	Federal, Local, Private, Bonds

See the project description in Attachment A for more information.

9. Dulles Toll Road Ramps in Tysons at Boone Blvd., and Greensboro Dr.

a. Construct a ramp to and from the Dulles Toll Rd. to the new Boone Blvd. extension at Ashgrove Lane.

Complete: 2037
Cost: $79 million
Funding: Federal, State, Private, Bonds

b. Construct a ramp to and from the Dulles Toll Rd. to the new Greensboro Dr. extension at Tyco Rd.

Complete: 2036
Cost: $28 million
Funding: Federal, State, Private, Bonds

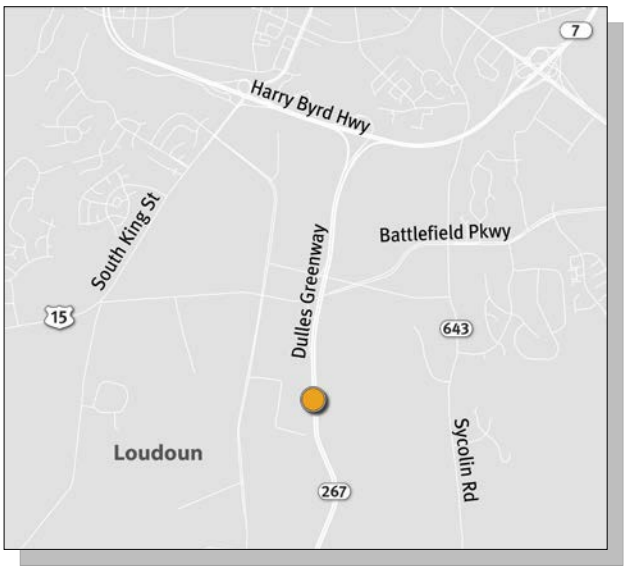
See the project descriptions in Attachment A for more information.

10. Dulles Greenway Ramp at (planned) Hawling Farm Blvd. near Leesburg

Construct a new egress ramp from the Dulles Greenway to the planned Hawling Farm Blvd.

Complete: 2015
Cost: $850,000
Funding: Private

See the project description in Attachment A for more information.



11. Improved Access to Dulles Airport

Four alternatives were considered for improving access to the western side of Dulles Airport. Each alternative was examined during the TPB's air quality conformity analysis. Virginia's Commonwealth Transportation Board will not have selected a locally-preferred alternative in time for the TPB to approve the CLRP on July 17, 2013 so VDOT has requested that the "No Action" scenario be included for approval at this time.

a. ~~Dulles Air Cargo, Passenger and Metro Access Highway from US 50, John Mosby Highway to VA 606, Loudoun County Parkway~~

~~Construct a new four-lane facility (on a six-lane right of way) between the intersection of the planned Tri-County Parkway at US 50 and the Loudoun County Parkway at the western end of the Dulles Airport grounds first heading north, then east just south of Broad Run.~~

~~Complete: 2025~~
~~Length: 3 miles~~
~~Cost: $153 million~~
~~Funding: Federal, State, Local, Private, Bonds, Other~~

b. ~~Construct new Limited Access Routes along US 50 and VA 606~~

~~Construct a new, grade-separated, 4-lane limited access facility along US 50 (within existing right-of-way) between the planned Tri-County Parkway and the Loudoun County Parkway (VA 606). Also construct a new, at-grade, 4-lane limited access Loudoun County Parkway between the new grade-separated US 50 and 1.5 miles north of that interchange.~~

~~Complete: 2025~~
~~Length: 4 miles~~
~~Cost: $813 million~~
~~Funding: Federal, State, Local, Private, Bonds, Other~~

c. ~~Widen and Upgrade US 50 and VA 606 to Limited Access Facilities~~

~~Widen and upgrade US 50 to a 6-lane limited access facility from the planned Tri-County Parkway to VA 606. Widen and upgrade VA 606 to an 8-lane limited access facility from US 50 to 1.5 miles north, and a 6-lane limited access facility from 1.5 miles north of US 50 to the Dulles Greenway.~~

~~Complete: 2025~~
~~Length: 4 miles~~
~~Cost: $268 million~~
~~Funding: Federal, State, Local, Private, Bonds, Other~~

d. No Action (2012 CLRP Baseline)

12. VA 28 Manassas Bypass Study from VA 234 to I-66

Study a proposed 4 to 6 lane bypass from the intersection of VA 234, Sudley Rd. and VA 411, Godwin Drive through Prince William and Fairfax Counties. This project is proposed as a study and will not be included in the air quality conformity analysis of the CLRP.

Complete: 2018
Length: 6 miles
Cost: $500,000
Funding: Federal, State, Local

See the project description in Attachment A for more information.

SUBURBAN MARYLAND PROJECTS

13. Change Project Cost of the Corridor Cities Transitway

Complete: 2020
Length: 14 miles
Cost: ~~$1.2 billion~~ $828 million (Phase 1: $545 million, Phase 2: $283 million)

14. Change Project Cost of the Purple Line

Complete: 2020
Length: 16 miles
Cost: ~~$1.79 billion~~ $2.245 billion
Funding: Federal, State, Local

2013 CLRP FY2013-2018 TIP AIR QUALITY CONFORMITY INPUTS

(Transit)

Agency	Project ID	Improv.	Facility	From	To	Under Const. or ROW acquired?	Complt. Date or Status	TIP ID
Washington Metropolitan Area Transit Authority								
WMATA		Modify	Revised Metrorail Operating Plan				2011	
WMATA		Modify	Revised Metrorail Operating Plan				2015	
WMATA		Modify	Silver Line Corridor Bus Service				2013	
WMATA		Implement	U Street / Garfield bus improvements				2011	
WMATA		Implement	Greenbelt / Twinbrook bus improvements				2012	
WMATA		Implement	East-West Highway (Prince George's County) improvements				2012	
WMATA		Implement	Anacostia / Congress Heights bus improvements				2012	
WMATA		Implement	Little River Turnpike / Duke Street bus improvements				2015 ~~2012~~	
WMATA		Implement	University Boulevard / East-West Highway bus improvements				2013	
WMATA		Implement	Rhode Island Avenue (DC) bus improvements				2013	
WMATA		Implement	Eastover / Addison bus improvements				2014	
WMATA		Implement	North Capitol Street bus improvements				2015	
District of Columbia								
DDOT		Construct	DC Streetcar - Anacostia Initial Line Segment (AILS)	Firth Sterling and S. Capitol St. SE	Howard Rd. and MLK Jr. Ave. SE		2014 ~~2012~~	6031
DDOT		Construct	Anacostia DC Streetcar Extension	Howard Rd and MLK Jr. Ave SE	Good Hope Rd. and MLK Jr. Ave. SE		2016	5753
DDOT		Construct	H St. / Benning Rd Streetcar	Union Station	Oklahoma Ave., NE		2014 ~~2013~~	

NOTE: Shaded areas represent changes since the 2012 CLRP

2013 CLRP FY2013-2018 TIP AIR QUALITY CONFORMITY INPUTS

(Transit)

Agency	Project ID	Improv.	Facility	From	To	Under Const. or ROW acquired?	Complt. Date or Status	TIP ID
DDOT		Implement	H St. Bus Lane- peak only	17th St. , NW	New York Ave., NW		2013	6086
DDOT		Construct	Benning Rd. Streetcar	Oklahoma Ave., NE	45th St. / Benning Rd. Metro		2016	5754
DDOT		Study	Union Station/Georgetown Waterfront Streetcar	Union Station	Georgetown Waterfront		not coded	5755
DDOT		Study	K St. Streetcar	Mt. Vernon Sq./9th St. NW	Wisconsin Ave.		not coded	
DDOT		Operational Improvements	Pennsylvania Rapid Bus (Operation Enhancements)	Archives Navy Memorial Metro Station	Naylor Road Metrorail Station		2013 ~~2011~~	
DDOT		Reconstruct	K St. Transitway	Mt. Vernon Sq./7th St. NW	Wash.Circle / 23rd St. NW		2015	3505
DDOT		Implement	16th St. Bus Priority Improvements (TIGER Grant)				by 2016	
DDOT		Implement	Georgia Ave Bus Priority Improvements				by 2016	
DDOT		Implement	H St./ Benning Rd. Bus Priority Improvements (TIGER Grant)	16th St. NW	Capitol Heights Metro Station		by 2016	
DDOT		Implement	Wisconsin Ave. Bus Priority Improvements (TIGER Grant)	Friendship Heights Metro Station	Naylor Road Metrorail Station		by 2016	
DDOT		Implement	Theodore Roosevelt Bridge to K St. Bus Priority Improvements (TIGER Grant)				by 2016	
DDOT		Implement	14th St. Bus Priority Improvements (TIGER Grant)				by 2016	
DDOT		Study	North/South Streetcar Line Feasability Study ~~Georgia Ave. Streetcar~~	Takoma Park Station ~~U Street/Florida Ave NW~~	Buzzard Point ~~New Hampshire Ave. NW~~		not coded	
DDOT		Study	Capitol Hill/8th Street Streetcar	H St. NE	M St. SE		not coded	

NOTE: Shaded areas represent changes since the 2012 CLRP

2013 CLRP FY2013-2018 TIP AIR QUALITY CONFORMITY INPUTS

(Transit)

Agency	Project ID	Improv.	Facility	From	To	Under Const. or ROW acquired?	Complt. Date or Status	TIP ID
DDOT		Study	M St. SE Streetcar	11th St. Bridge/MLK Ave. SE	Buzzard Point/SW Waterfront		not coded	
DDOT		Study	14th St. NW Streetcar	K St. NW	U St. NW		not coded	
DDOT		Study	DC Circulator Expansion	Phase 1 Routes			not coded	6103
DDOT		Implement	DC Circulator	National Mall Area Route			2013	6104
Maryland								
MTA		Construct	Purple Line Transitway	Bethesda	New Carrollton	No	2020	2795
MTA		Construct	Silver Spring Transit Center	Phase II		Yes	2011	
MTA		Construct	Corridor Cities BRT ~~Transitway~~	Shady Grove	COMSAT		2020	3468
MTA		Construct	Southern MD Commuter Bus Initiative	Park-and-Ride lots and increase bus service	Waldorf, Dunkirk, Charlotte Hall	2010		
MTA		Construct	Takoma/ Langley Park Transit Center	Intersection New Hampshire Ave and University Blvd.	Takoma / Langley Park	No	2011	
		Implement	Addison Rd. Transit Improvements (TIGER Grant)	near Seat Pleasant	Southern Ave. Metro Station		by 2016	
		Implement	US 1 (MD) Bus Priority Improvements (TIGER Grant)				by 2016	
Montgomery County								
Mont.Co.	MCT7	Construct	Olney Transit Center	adjacent to or north of MD 108		No	2015	
Mont.Co.		Construct	University Blvd Bus Enhancement	Kensington	Silver Spring	No	2020	
Mont.Co.		Study	Veirs Mill Road BRT	Rockville	Wheaton	No	not coded	
MDSHA		Study	MD 97 (Georgia Avenue) Busway	Glenmont	Olney		not coded	5999
Mont.Co.	MCT22	Construct	Veirs Mill Road Bus Enhancement	Rockville	Wheaton	No	2020	

NOTE: Shaded areas represent changes since the 2012 CLRP

2013 CLRP FY2013-2018 TIP AIR QUALITY CONFORMITY INPUTS

(Transit)

Agency	Project ID	Improv.	Facility	From	To	Under Const. or ROW acquired?	Complt. Date or Status	TIP ID
Virginia								
VDOT		Widen	US 1 (bus/right-turn lanes)	VA 235 North	SCL Alexandria (I-95 Capital Beltway)	No	2035	
Arlington Co.		Construct	Crystal City / Potomac Yard Busway (2-lane)	Vicinity of Glebe Rd. Ext.-City/County line	Crystal City Metro Station	ROW acquired	2013	5900
Arlington Co.		Construct	Route 1 Corridor Streetcar	Vicinity of Glebe Rd. Ext.-City/County line	Pentagon City Metro Station		2019	
Alex.		Construct	Potomac Yard Transit Bus lanes (2 lanes)	Four Mile Run	Braddock Rd.	Yes ~~No~~	2014 ~~2013~~	
Alex.		Study	Route 1 Corridor Streetcar Conversion	Four Mile Run	Braddock Rd.		not coded	
Alex.		Construct	Metro Station (Proposed)	@ Potomac Yards		No	2017	5927
VDOT		Construct	Columbia Pike Streetcar	Skyline Center	Pentagon City	No	2017	5409
VDOT		Construct	Transit Center (Bradlee Shopping Center)	King St. and Braddock Rd.		No	2014	
VDOT		Construct	Transit Center (Seven Corners)	Seven Corners Shopping Center		Yes	2012	
VDOT		Construct	Park-and-Ride Lot	Wiehle Ave. Parking Garage	@ Reston East Park-and-Ride Lot	Yes	2013	
VDOT		Construct	Park-and-Ride Lot	Springfield CBD	vic. I-95 & Old Keene Mill Road	No	2015	
VDOT		Relocate/ Construct	Park-and-Ride Lot (Leesburg)	Relocate to vic. of Leesburg Bypass and / or the Dulles	700 Spaces	Yes	2010	
VDOT		Construct	Lease Commuter Parking Spaces at Lowes Island	Leesburg			2013	4216
VDOT		Construct	Park-and-Ride Lot	Purcellville	100 Space Park & Ride Lot		2015	
VDOT		Implement	Loudoun County Commuter Bus Service.	Town of Leesburg -Harrison St & Catoctin Circle	400 Space Park & Ride Lot	Yes	2010	
VDOT		Construct	Park-and-Ride Lot	Dulles Town Center	300 Spaces	Proffered	2015	

NOTE: Shaded areas represent changes since the 2012 CLRP

2013 CLRP FY2013-2018 TIP AIR QUALITY CONFORMITY INPUTS

(Transit)

Agency	Project ID	Improv.	Facility	From	To	Under Const. or ROW acquired?	Complt. Date or Status	TIP ID
VDOT		Construct	Park-and-Ride Lot	US 50 at Stone Ridge	150 Spaces	Proffered	2015	
VDOT		Construct	Park-and-Ride Lot	US 50 Dulles at East Gate	200 Spaces	Yes	2025	
VDOT		Construct	Park-and-Ride Lot	VA 234 (vicinity of I-66)	at Cushing Road	No	2013~~2011~~	
VDOT		Construct	Park & Ride Facility	Round Hill	75 Spaces	ROW acquired	2015	
VDOT		Construct	Park & Ride Facility	Brambleton	100 space expansion	No	2015	
VDOT		Construct	Park & Ride Facility	Arcola Center	300 Spaces	Proffer	2015	
VDOT		Construct	Park-and-Ride Lot	at EPG		No	2015	
VDOT		Construct	Park-and-Ride Lot	Telegraph Rd.	400-500 spaces		2013	5928
FAMPO		Construct	Park-and-Ride Lot	Staffordboro Blvd. (Stafford Co.)	1,000 spaces	ROW acquired	2015	
FAMPO		Construct	Park-and-Ride Lot	Gordon Rd. (Spotsylvania Co)	800 spaces	ROW acquired	2015	
VDRPT		Construct	Dulles Corridor Metrorail	East Falls Church Metrorail Station	Wiehle Ave.	No	2013	4364
VDRPT		Construct	Dulles Corridor Metrorail	Wiehle Ave. Station	Route 772	No	2016	4272, 5901
VRE		Construct	VRE- Spotsylvania Commuter Rail Station	south of U.S. Route 17/Mills Drive and west of Crossroads Parkway		No	2014	
VRE		Construct	VRE - Cherry Hill Commuter Rail Station	Cherry Hill	Prince William County	No	2015	
VRE		Implement	VRE Service Improvements (Reduce Headways)	Fredericksburg and Manassas lines		No	2020	
VRE		Construct	VRE- 3rd Track/ Cherry Hill Commuter Rail Station	Arkendale, Stafford Co.	Powell's Creek, Prince William Co.	No	2015	
VDOT		Implement	Beltway HOT lanes transit service			No	2013	

NOTE: Shaded areas represent changes since the 2012 CLRP

2013 CLRP FY2013-2018 TIP AIR QUALITY CONFORMITY INPUTS

(Transit)

Agency	Project ID	Improv.	Facility	From	To	Under Const. or ROW acquired?	Complt. Date or Status	TIP ID
VDOT		Implement	Beltway HOT lanes transit service			No	2020	
VDOT		Implement	Beltway HOT lanes transit service			No	2030	
		Implement	VA 7 Bus Priority Improvements (TIGER Grant)	Alexandria	Tyson's Corner		by 2016	
		Implement	Van Dorn - Pentagon Rapid Bus (TIGER Grant)	Van Dorn St. Metro	Pentagon		2013	
Alex.		Construct	Van Dorn - Pentagon BRT (City Funded)	Van Dorn St. Metro	Pentagon		2016	6126
		Implement	I-95/I-395 Multimodal Improvements (TIGER Grant)				by 2016	
Alex.	New	Construct	Landmark Transit Center	Duke St. & Van Dorn		No	2023	
Alex.		Implement	DASH Bus Expansion	City-Wide			2019 ~~2012~~	
Alex.		Construct	Duke Street BRT	King Street Metro	Fairfax County Line		2022	

NOTE: Shaded areas represent changes since the 2012 CLRP

2013 CLRP FY2013-2018 TIP AIR QUALITY CONFORMITY INPUTS

(Highway and HOV)

Agency	Project ID	Improv.	Facility	From	To	Facility from	Facility to	Lanes from	Lanes to	Under Const. or ROW acquired?	Complt. Date or Status	TIP ID
District of Columbia												
DDOT	DP9A	Widen / Realign	South Capitol St. Corridor: Frederick Douglass Bridge	S. Capitol St. (east)	Potomac Ave. (west)	2	2	5	6		2015	3423
DDOT	DP9C	Construct	South Capitol St. Corridor: S. Capitol St. intersection	at Potomac Ave.							2015	3423
DDOT	DP9D	Construct	South Capitol St. Corridor: Suitland Parkway Intch.	at MLK Jr. Blvd to complete movements							2016	3423
DDOT	DI10	Downgrade	SE/SW Freeway	11th St. SE	Barney Circle/ PA Ave.	1	3				2015	
DDOT	DI7A	Reconstruct/ Widen	11th St. Bridges (2 spans)	I-295	Southeast Freeway			8	8 freeway 4 local		2013	3193
DDOT	DI7A	Construct	11th St. Bridges (2 spans)	ramp movements to/from the northbound Anacostia Freeway for each span							2013	3193
DDOT		Remove	I-395 SB exit ramp (w/ Return to L'Enfant project)	SB to the 400 block of 3rd St. NW				1	0		2013 ~~2011~~	5718
DDOT		Construct	F St. (w/ Return to L'Enfant project)	2nd St. NW	3rd St. NW			0	2		2014	5718
DDOT	DI9	Reconstruct	I-295/ Malcolm X Interchange	add above grade ramp connection from NB I-295 off ramp to new St. Elizabeth's Access Rd.							2014	5723
DDOT	DP10	Construct	St. Elizabeth's Access Rd. (along West Campus western boundary)	Firth Sterling	Malcolm X			0	3		2014	5723
DDOT	DS3	Construct	Southern Ave. SE	Branch Ave. SE	Naylor Rd. SE			0	2		2016	5758
DDOT	DP13	Reconstruct	15th St. NW- add bike lane	Constitution Ave. NW	W. St. NW			6	5	Complete	2010 ~~2011~~	
DDOT		Reduce Capacity ~~Pilot Study~~	L St. NW - add bike lane	11th St. NW	25th St. NW			4	3	Complete	2012 ~~not coded~~	
DDOT		Reduce Capacity ~~Pilot Study~~	M St. NW - add bike lane	15th St., NW	Connecticut Ave NW ~~29th St. NW~~			4	3		2013 ~~not coded~~	
~~DDOT~~		~~Pilot Study~~	~~9th St. NW - add bike lane~~	~~Constitution Ave. NW~~	~~K St. NW~~			~~5~~	4		~~not coded~~	

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						from	to	from	to			
DDOT	DP11	Reduce Capacity	Wisconsin Ave.	Garfield St.	34th St.			4/6	4		2012 ~~2011~~	
DDOT	DP12	Reduce Capacity ~~Reconstruct~~	17th St. NE/SE	Benning Rd. NE	Potomac Ave. SE			2 SB	1 SB ~~/1 NB~~		2013 ~~2012~~	
DDOT		Reduce Capacity	H St. NW **peak period** Bus-Only Lanes	17th St. NW	New York Ave. NW			5 pk	4 pk		2013 ~~2012~~	
DDOT		Reduce Capacity	I St. NW peak period Bus Only Lanes	13th St. NW	Pennsylvania Ave. NW			5 pk	4 pk		2014	
DDOT		Reduce Capacity	C St. NE	Oklahoma Ave. NE	16th St. NE			4	2		2013	5792
DDOT		Reduce Capacity	East Capitol Street	40th St.	Southern Avenue			6	4		2015	6133
DDOT		Reduce Capacity	Maryland Ave. NE	6th St. NE	15th St. NE			4	3		2014	6014
DDOT		Reconstruct-1-way to 2-way	New Jersey Ave NW	H St. NW	N St. NW						2015	
DDOT		Reduce Capacity	Pennsylvania Ave. SE	27th St. SE	Southern Avenue			5	4	Complete	2011	
DDOT		Reduce Capacity	South Capitol St.	Firth Sterling Ave.	Maryland border			5	4		2015	6114
DDOT		Reduce Capacity	Adams Mill Rd. NW	Kenyon	Klingle			3	2		2013	
DDOT		Pilot Study	4th Street SW	Pennsylvania Ave	Virginia Ave			4	3		Not Coded	
DDOT		Pilot Study	Reno Rd	36th	Tilden			4	3		Not Coded	
Maryland												
MDOT Freeway												
MDSHA	MI2q	Construct	I-270	Interchange at Watkins Mill Road Extended		1	1	8	8+2	No	2016	3044
MDSHA	MI2SHOV MI2S	Construct	I-270/US 15 Corridor	Shady Grove Metro	Biggs Ford Rd	1	1	varies		No	2030	3043
MDSHA		Reconstruct	I-270	Interchange at MD 121		1	1	1	2	No	2016	3409
MDSHA	MI4	Widen	I-70	Mt. Phillip Rd.	MD 144FA	1	1	4	6	No	2020	3540

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						from	to	from	to			
MDSHA	MI4a	Reconstruct	I-70	Interchange at Meadow Rd.	to add missing movements	1	1			No	2020	5419
MDSHA	MI1f	Construct	I-95	Contee Road Relocated w/ CD Roads		1	1	8	8+4	No	2016	3033
MDSHA	MI1k	Construct	I-95/I-495 (Capital Beltway)	Branch Avenue Metro Access		1	1	8	8	Yes	2020	3554
MDSHA	MI1p	Study	I-95/I-495 (Capital Beltway)	Interchange at Greenbelt Metro		1	1	8	8+2	No	not coded	2894
MDSHA	MP12a	Construct	Intercounty Connector	I-95	US 1	0	1	0	4	Yes	2014	3446
MDOT Primary												
MDSHA	MP10a	Reconstruct	US 1 (Baltimore Avenue)	College Avenue	Sunnyside Avenue	2	2	4	4	No	2020	3108
MDSHA	MP10b	Widen	US 1, Baltimore Avenue	Cherry Hill Road	I-95/I-495	2	2	4	6	No	2010	3492
MDSHA	MP9b	Construct	MD 2/4 at Lusby Southern Conn. Rd.	MD 765	MD 2/4 at Lusby	0	2	0	3	No	2040	5361
MDSHA	MP2c	Widen	MD 3 (Robert Crain Highway)	US 50	Anne Arundel County Line	2	2	4	6	No	2030	3045
MDSHA		Construct	MD 4 (Pennsylvania Avenue)	Interchange at Westphalia Rd		2	5	4	6	No	2020	4886
MDSA		Construct	MD 4 (Pennsylvania Avenue)	Interchange at Suitland Pkwy		2	5	4	6	No	2016	3547
MDSHA	MP3a	Upgrade/ Widen	MD 4	MD 223	I-95/I-495	2	1	4	6	No	2035	3664
MDSHA		Construct	MD 5 (Branch Avenue)	Interchange at Earnshaw/Burch Hill Roads		2	5	4	6	No	2025	
MDSHA	MP4f	Upgrade/ Widen	MD 5 (Branch Avenue)	US 301 at T.B.	North of the Capital Beltway	2	5	4	6	No	2025	3469
MDSHA		Construct	MD 5 (Branch Avenue)	Interchange at MD 373/Brandywine Road Rel.		2	5	4	6	No	2016	4882
MDSHA		Construct	MD 5 (Branch Avenue)	Interchange at Surratts Road		2	5	4	6	No	2025	
MDSHA	MP15	Construct	US 15	Interchange at Monocacy Blvd.		2	2	6	6	No	2016	4892

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						from	to	from	to			
MDSHA		Construct	US 29 (Columbia Pike)	Interchange at Musgrove/Fairland Rd.				6	6	No	2025	
MDSHA	MP5e	Study	US 29, Columbia Pike	north of MD 650	Howard County Line	2	5	6	6	No	not coded	
MDSHA		Construct	MD 75 Relocated	MD 80		0	4	0	4	No	2020	
MDSHA	FP2	Widen	MD 85 (Buckeystown Pike)	English Muffin Way	north of Grove Road	2	2	2/4	4/6	No	2020	3101
MDSHA	MP14	Reconstruct	MD 202 (Largo Town Ctr. Metro Access Improvs.)	at Brightseat Rd		2	2	6	6	No	2020	3094
MDSHA		Upgrade	MD 210 interchange improvs.	@ Livingston Rd. / Kerby Hill Rd.		2	5	6	6		2020	4879
MDSHA	MP6d	Upgrade	MD 210 (Indian Head Highway) with interchange improvements	MD 228	Capital Beltway	2	5	6	6	No	2030	3039
MDSHA	MP8e	Study	US 301	North of Mount Oak Road	US 50	2	5	4/6	6+2	No	not coded	2636
MDTA	MP18	Construct	US 301 Governor Nice Bridge	Charles County, MD	King George County, VA	2	2	2	4	No	2030	
MDSHA	MP16	Construct	US 340 Interchange	@US 340 at Jefferson Tech Park		1	1	4	4	No	2016	4891
MDOT Secondary												
MDSHA	MS33	Widen	MD 27	MD 355	A 305	2	2	4	6	No	2020	3536
MDSHA	MS2f	Widen	MD 28 (Norbeck Road) / MD 198 (Spencerville Road)	MD 97	I-95	2	2	2/4	4/6	No	2025	3476
MDSHA	MP12c	Construct	MD 97 (Brookeville Bypass)	South of Brookeville	North of Brookeville	0	2	0	2	No	2020	3106
MDSHA		Upgrade	MD 97 (Georgia Avenue)	interchange @ MD 28 (Norbeck Road)		2	2	6	6	No	2030	
MDSHA		Upgrade	MD 97 (Georgia Avenue)	interchange @ Randolph Road		2	2	6	6	No	2015	3104
MDSHA	MS32	Widen	MD 117	I-270	Great Seneca Park	2	2	2	4	No	2025	3053
MDSHA	MS34	Study	MD 121	I-270	W. Old Baltimore Rd.	3	3	4	6	No	not coded	
MDSHA	MS6b	Widen	MD 124 (Woodfield Road)	Midcounty Highway	S. of Airpark Dr.	2	2	2	6	No	2020	3057
MDSHA	MS6d	Widen	MD 124 (Woodfield Road)	N. of Fieldcrest Rd.	Warfield Road	2	2	2	6	No	2020	3057

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MDSHA		Study	MD 180/MD 351	Greenfield Dr.	Corporate Dr.					No	not coded	4897
MDSHA	MS35	Widen	MD 197 (Collington Rd.)	MD 450 Relocated	Kenhill Dr.	2	2	2	4/5	No	2025	4887
MDSHA	MS10b	Study	MD 201 (Kenilworth Ave.)	Rittenhouse Road	Pontiac St.	2	2	4	6	No	not coded	4893
MDSHA		Construct	MD 355	Montrose/Randolph Rds.	CSX RR	2	2	6	6	No	2020	
MDSHA	MS18d	Widen	MD 450 (Annapolis Road)	Stonybrook Drive	West of MD 3	2	2	2	4	No	2016	3150
MDSHA	BRAC	Reconstruct	BRAC Intersection Improvements near the National Naval Medical								2012	
Montgomery County												
Mont.Co.	MC11c	Construct	A-305 - MidCounty Highway Extended	MD 355	MD 27	0	3	0	4	No	2012	
Mont.Co.	nrs	Construct	Burtonsville Access Rd.	MD 198	School Access Rd.	0	4	0	2	No	2013	3498
Mont.Co.	nrs	Construct	Chapman Avenue	Randolph Road	Old Georgetown Road	0	3	0	2	No	2015	3282
Mont.Co.	MC5c	Widen	Father Hurley/ Ridge Rd.	I-270	existing MD 27	2	2	4	6		2010	3046
Mont.Co.	MC7a	Widen	Goshen Rd. South	South of Girard Street	1000 feet north of Warfield Road	3	3	2	4	No	2015	3049
Mont.Co.	MC43	Construct	I-4 Bridge over I-270	Century Boulevard	Milestone Center Drive	0	3	0	4	No	2015	3309
Mont.Co.	MC11a	Construct	M-83 - Midcounty Highway Extended	MD 27 (Ridge Road)	Middlebrook Road	0	2	0	4-6	No	2020	
Mont.Co.	MC11d	Construct	M-83 - Midcounty Highway Extended	Middlebrook Road	Montgomery Village Avenue	0	2	0	4-6	No	2020	
Mont.Co.	MC12f	Widen	MD 118 Ext (Grmntwn. Rd.)	MD 355	M-83/Watkins Mill Rd.	2	2	3	4	No	2020	
Mont.Co.	MC14g	Widen	Middlebrook Road Ext.	MD 355	M-83	2	2	3	4	No	2020	
Mont.Co.	MC15b	Construct	Montrose Parkway East	Eastern Limit of MD 355/Montrose Interchange	Veirs Mill Road/Parkland Road Intersection	0	2	0	4	No	2015	3703
Mont.Co.	MC42	Construct	Randolph Road	Parklawn Drive	Rock Creek Park	2	2	4	5	No	2014	
Mont.Co.	MC34	Widen	Snouffer School Rd.	MD 124 Woodfield Rd.	Centerway Road	3	3	2	4	No	2016	3062
Mont.Co.	MC23a	Construct	Watkins Mill Rd. ext.	I 270 (future interchange)	MD 355	0	2	0	6	Yes	2011	

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Mont.Co.	MC13	Construct	Woodfield Rd.(MD 124 Ext.)	1200' North of MD 108	MD 27	0	2	0	2	Yes	2011	
Mont.Co.		Construct	Executive Blvd. Ext. - East	Rockville Pike (MD 355)	Nebel St. Ext.			0	4		2020	
Mont.Co.		Construct	Executive Blvd. Ext. - West	Old Georgetown Rd.	Marinelli Rd.			0	4		2020	
Mont.Co.		Construct	Main St./Market St.	Old Georgetown Rd.	Rockville Pike (MD 355)			0	2		2020	
Mont.Co.		Construct	Old Georgetown Rd.	Old Georgetown Rd.	Nicholson Lane/TildenLane			0	6		2020	
Mont.Co.		Construct	Hoya St.	Executive Blvd.	Montrose Pkwy			0	4		2020	
Mont.Co.		Construct	Platt Ridge Dr. Ext.	Jones Bridge Rd.	Montrose Dr.			0	2		2014	5948
Mont.Co.	nrs	Construct	Century Blvd.	Current terminus south of Oxbridge Tract	Intersection with future Dorsey Mill Road	?	?	0	4		2014	5944
Prince Georges County												
PG Co.	PGS3a	Widen	Addison Road	MD 214	Walker Mill Road	3	3	2	4	Yes	2019	
PG Co.		Reconstruct	Addison Road	Sheriff Road	MD 704	4	4	2	2	Yes	2014	
PG Co.	PGS5	Construct	Allentown Road Relocated	Indian Head Highway (MD 210)	Brinkley Road	0	3	0	4	No	2025	
PG Co.	PGS73	Widen	Ardwick-Ardmore Road	MD 704	91st Ave.	4	4	2	4	Yes	2015	
PG Co.	PGP4a	Construct	Baltimore Washington Pkwy/Greenbelt Rd (MD 193)	ramp to southbound Baltimore Washington Pkwy		0	5	0	4	No	2025	
PG Co.	PGS9b	Widen	Bowie Race Track Road	Laurel-Bowie Road (MD 197)	Old Chapel Road	4	4	2	4	No	2015	
PG Co.	PGS9a	Widen	Bowie Race Track Road	Annapolis Road (MD 450)	Old Chapel Road	4	4	2	4	No	2015	
PG Co.	PGS10	Widen	Brandywine Road	north of Piscataway Road (MD 223)	Thrift Road	4	4	2	4	No	2020	
PG Co.	PGS76	Widen	Briggs Chaney Road	Montgomery County line	Old Gunpowder Road	3	3	2	4	Completed ~~Yes~~	2010	
PG Co.	PGS12	Widen	Brinkley Road	St. Barnabas Road (MD 414)	Allentown Road (MD 337)	3	3	4	6	No	2020	
PG Co.	PGS13	Construct	Brooks Drive Extended	Marlboro Pike	Rollins Avenue	0	3	0	4	No	2020	
PG Co.	PGS14	Widen	Cabin Branch Drive	Columbia Park Road	north of Sheriff Road	4	4	2	4	No	2015	
PG Co.	PGS16a	Construct	Campus Way North	Lake Arbor Way	south of Lottsford Road	0	4	0	4	No	2023	

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PG Co.	PGS16b	Construct	Campus Way North Extended	south of Lottsford Road	Evarts Drive	0	4	0	4	No	2020	
PG Co.	PGS17	Widen	Cherry Hill Road	Powder Mill Road	Baltimore Avenue (US 1)	3	3	2	4	No	2019	
PG Co.	PGS18	Widen	Church Road	Woodmore Rd. ~~Oak Grove Road~~	Central Ave. (MD 214) ~~Annapolis Road (MD 450)~~	4	4	2	4	No	2020 ~~2011~~	
PG Co.	PGS20a	Widen	Columbia Park Road	Cabin Branch Road	Columbia Terrace	4	4	2	4	No	2020	
PG Co.	PGS20b	Widen	Columbia Park Road	US 50	Cabin Branch Road	4	4	2	4	No	2020	
PG Co.	PGS21a	Widen/ Construct	Contee Road	US 1	Old Gunpowder Road	4	4	2	4	Yes	2016 ~~2014~~	3114
PG Co.	PGS22	Widen	Dangerfield Road	Cheltenham Avenue	Woodyard Road (MD 223)	4	4	2	4	No	2020	
PG Co.	PGS24a	Widen	Dower House Road	Woodyard Road (MD 223)	Foxley Road	4	4	2	4	No	2025	
PG Co.	PGS24b	Widen	Dower House Road	Foxley Road	Pennsylvania Avenue (MD 4)	4	4	2	6	No	2017	
PG Co.	PGS25	Widen	Fisher road	Brinkley Road	Holton Lane	4	4	2	4	No	2015	
PG Co.	PGS26	Construct	Forbes Boulevard Extended	south of Amtrak	Greenbelt Road (MD 193)	0	4	0	4	No	2020	
PG Co.	PGS27	Widen	Forestville Road	Allentown Road (MD 337)	Pennsylvania Avenue (MD 4)	4	4	2	4	No	2025	3123
PG Co.	PGS29	Widen	Fort Washington Road	Riverview road	Indian Head Highway (MD 210)	4	4	2	4	No	2025	
PG Co.	PGS30a	Widen	Good Luck Road	east of Kenliworth Avenue (MD 201)	Cipriano Road	4	4	2	4	No	2025	
PG Co.	PGS30b	Widen	Good Luck Road	Cipriano Road	Greenbelt Road (MD 193)	4	4	2	4	No	2025	
PG Co.	nrs	Widen	Governor Bridge Road	US301	Anne arundel County	4	4	2	4	No	2020	
PG Co.	PGS34a	Widen	Hill Road	Central Avenue (MD 214)	ML King Jr Highway (MD 704)	4	4	2	4	No	2018	3132
PG Co.	PGS34b	Construct	Hill Road	ML King Jr Highway (MD 704)	Sheriff Road	0	4	0	2	No	2015	
PG Co.	PGS88	Construct	Iverson St. Extended	Wheeler Road	19th Avenue	0	4	0	4	No	2018	
PG Co.	PGS35	Widen	Karen Boulevard	Walker Mill Road	Central Avenue (MD 214)	4	4	2	4	No	2020	
PG Co.	PGS38a	Widen	Livingston Road	Indian Head Highway (MD 210) at Eastover	Kerby Hill Rd.	4	3/4	2	4	No	2015	
PG Co.	PGS38b	Widen	Livingston Road	Piscataway Creek	Farmington Road	2	2	2	4	No	2020	

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PG Co.	PGS40a	Widen	Lottsford Road	Archer Lane	Lottsford Vista Rd. ~~Enterprise Road (MD 193)~~	3	3	2	4	No	2020 ~~2012~~	
PG Co.	PGS39b	Widen	Lottsford Vista Road	ML King Jr Highway (MD 704)	Ardwick-Ardmore Road/Relocated	4	4	2	4	No	2020	
PG Co.	PGS44b	Widen	Metzerott Road	Adelphi Road	University Boulevard (MD 193)	4	4	2	4	No	2020	
PG Co.	PGS44a	Widen	Metzerott Road	New Hampshire Avenue (MD 650)	Adelphi Road	4	4	2	4	No	2020	
	PGS45a			Atlantis/Northview Dr.	Mount Oak Road	4	4	4	6			
PG Co.	PGS89	Widen	Mt. Oak	Church Road	Mitchellville Road	3	3	2	4	complete	2011	
PG Co.	PGS46	Widen	Murkirk Road	west of Baltimore Avenue (US 1)	Odell Road	4	4	2	4	No	2020	
PG Co.	PGS47	Widen	Oak Grove and Leeland Roads	Watkins Park Road (MD 193)	Robert Crain Highway (US 301)	4	4	2	4	No	2020	
PG Co.	PGS48	Widen	Old Alexandria Ferry Road	Woodyard Road (MD 223)	Branch Avenue (MD 5)	4	4	2	4	No	2015	
PG Co.	PGS80	Construct	Old Baltimore Pike Extended	Muirkirk Road	Contee Road	0	4	0	2	Yes	2020	
PG Co.	PGS50	Widen	Old Branch Avenue	north of Piscataway Road (MD 223)	Allentown Road (MD 337)	4	4	2	4	Yes	2020	
PG Co.	PGS90	Construct	Old Fort Rd. Extended	Piscataway Road (MD 223)	Old Fort Rd	0	4	0	4	No	2020	
PG Co.	PGS51a	Widen	Old Gunpowder Road	Powder Mill Road	Greencastle Road	3	3	2	4	No	2015	5258
PG Co.	PGS52	Widen	Oxon Hill Road	Fort Foote Rd - North	MD 210	3	3	2	4	No	2015 ~~2014~~	
PG Co.		Widen	Oxon Hill Road	National Harbor Entrance	Fort Foote Rd - North	4	4	2	3	Yes	2015 ~~2013~~	
PG Co.	PGS81	Construct	Presidential Parkway	Suitland Parkway	Melwood Road	0	3	0	6	No	2025	
PG Co.	PGS54	Widen	Rhode Island Avenue	University Boulevard (MD 193)	Baltimore Avenue (US 1)	4	4	2	4	No	2016	
PG Co.	PGS55b	Widen	Ritchie Marlboro Road	White House Road	Old Marlboro Rd.	3	3	2	4		2020	
PG Co.	PGS56a	Widen	Ritchie Road/Forestville Road	Alberta Drive	MD 4 Pennsylvania Avenue	2	2	2	4	Yes	2020	
PG Co.	PGS57	Widen	Rollins Avenue	Central Avenue (MD 214)	Walker Mill Road	4	4	2	4	No	2020	
PG Co.	PGS58	Widen	Rosaryville Road	Robert Crain Highway (US 301)	Woodyard Road (MD 223)	3	3	2	4	No	2020	
PG Co.	PGS60b	Construct	Spine Road	Branch Avenue (MD 5)/US 301	Brandywine Road (MD 381)	3	3	0	4	No	2016	

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PG Co.	PGS61	Widen	Springfield Road	Lanham-Severn Road (MD 546)	Good Luck Road	4	4	2	4	No	2020	
PG Co.	PGS82	Construct	St. Joseph's Drive	MD 202	Ardwick-Ardmore Road	0	4	0	4	No	2015	
PG Co.	PGP2	Construct	Suitland Parkway	interchange at Rena/Forestville Roads		5	5	0	0	No	2025	
PG Co.	PGS62a	Widen	Suitland Road	Allentown Road (MD 337)	Suitland Parkway	3	3	2	4	No	2018	3157
PG Co.	PGS62b	Widen	Suitland Road	Suitland Parkway	Silver Hill Road (MD 458)	3	3	2	4	No	2018	3037
PG Co.	PGS63	Widen	Sunnyside Avenue	Baltimore Avenue (US 1)	Kenliworth Avenue (MD 201)	4	4	2	4	No	2020	
PG Co.	PGS64	Widen	Surratts Road	Beverly Avenue	Brandywine Road	4	4	2	4	No	2012	3159
PG Co.	PGS65	Widen	Temple Hill Road	Piscataway Road (MD 223)	St. Barnabas Road (MD 414)	3	3	2	4	No	2020	
PG Co.	PGP5a	Construct	US 50/Columbia Park Road Ramp	westbound ramp to Columbia Park Road		5	5	1	1	No	2025	
PG Co.	PGP5b	Construct	US 50/Columbia Park Road Ramp	eastbound ramp Cheverly vicinity		5	5	1	1	Complete ~~Yes~~	2003	
PG Co.	PGS67a	Widen	Van Dusen Road	Contee Road	Sandy Springs Road (MD 198)	3	3	2	4	No	2020	
PG Co.	PGS67b	Construct	Van Dusen Road Interchange	@Contee Road		0	0	0	0	No	2025	
PG Co.	PGS68	Widen	Virginia Manor Road	Muirkirk Road	Contee Road	4	4	2	4	No	2015	3165
PG Co.	PGS69a	Widen	Walker Mill Road	Silver Hill Road	I-95	3	3	2	4	No	2020	
PG Co.	PGS91	Widen	Westphalia Rd.	MD 4	Ritchie-Marlboro Rd.	4	3	2	4		2020	
PG Co.	PGS70	Widen	Wheeler Road	St. Barnabas Road (MD 414)	District of Columbia limits	2	2	2	4	No	2020	3166
PG Co.	PGS71	Widen	White House Road	Ritchie-Marlboro Road	Largo-Landover Road (MD 202)	3	3	2	6	Yes	2020	
PG Co.	PGS72	Widen	Whitfield Chapel Road	Annapolis Road (MD 450)	Ardwick-Ardmore Road	4	4	2	4	No	2020	
PG Co.	PGS40b	Construct	Woodmore Road	Enterprise Road (MD 193)	Church Road		3		4	No	2015	
PG Co.	PGS42	Widen	Woodyard Road (MD 223)	Rosaryville Road	Dower House Road	2	2	2	4	No	2020	
PG Co.	PGS42b	Construct	Woodyard Road Relocated (MD 223)	Piscataway Creek	Livingston Road	0	3	0	2	Complete ~~No~~	2010	
PG Co.	PGS42c	Widen	Woodyard Road Relocated (MD 223)	Piscataway Creek / Floral Park Rd.	Livingston Road / MD 4	3	3	2	4	No	2017	

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City of Frederick												
City of Frederick	FS2	Construct	Monocacy Blvd	Hughes Ford Rd.	Gas House Pike	0	3	0	4	Yes	2011	
Charles County												
Chas.Co.	CHS1	Widen/ Realign	Cross County Connector (Billingsly Rd.)	Middletown Rd.	MD 210	3	3	2	4		2009	
Anne Arundel County												
BMC	AA1d	Widen	I-97	US 50/301	MD 32/3	1	1	4	6		2025	
BMC	AA15a	Widen	I-295	I-195	MD 100	1	1	4	6		2015	
BMC	AA15c	Widen	I-295	I-695	I-195	1	1	4	6		2015	
BMC	AA15b	Construct	I-295 (New Interchange)	Hanover Road							2015	
BMC	AA4e	Widen	MD 3	MD 32	St. Stephen's Church Rd.	2	2	4	6		2025	
BMC	AA6e	Widen	MD 100	Howard Co. Line	I-97		5/1	4	6		2025	
BMC	AA8b	Widen	MD 175	MD 170	BW Parkway		2	4	6		2015	
BMC	AA30	Widen	MD 198	MD 32	BW Parkway	2	2	2	4		2025	
BMC	AA34a	Widen	MD 713	MD 175	Arundel Mills Boulevard		2	2	4		2025	
BMC	AA34b	Widen	MD 713	Arundel Mills Boulevard	MD 176		2	4	6		2025	
Carroll County												
BMC	CA1B	Widen	MD 140	Sullivan Road	Market St.		1	4/6	8		2025	
BMC	CA1C	reconstruct	MD 140 (w/ intchg @ MD 191)	Baltimore County Line	Kays Mill Rd.			4	4		2020	
BMC	CA2a	Widen	MD 26	MD 32	Reservoir			2	4		2015	
BMC	in base	Widen	MD 32	MD 26	Howard County Line		2	2	4		2020	
BMC	CA5	Widen	MD 97	MD 140	Pleasant Valley Rd		2	2	4		2020	
BMC	nrs	Construct	Boxwood Dr. Ext	Dogwood Dr. Terminus	MD 43 Ext.			0	2		2015	

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(Highway and HOV)

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Howard County												
BMC	HW1b	Widen	I-70	US 29	US 40	1	1	4	8 ~~6~~		2025	
BMC	HW20	Widen	US 1	MD 100	PG/ Howard Line			4	6		2025	
BMC	HW10b	Widen	US 29 NB	Seneca Dr.	Middle Patuxent River		5	4	6		2015	
BMC	HW3c	Widen	MD 32	Cedar Lane	Anne Arundel County Line		1	4/6	8		2025	
BMC	HW3d	Widen	MD 32	MD 99	Carroll County Line		2	2	4		2025	
BMC	HW3e	construct/ reconstruct	MD 32 (interchanges)	@ I-70/ @ MD 144 @							2014	
BMC	HW6d	Widen	MD 108	Woodland Rd.	1200' w. of Centennial Ln.	2	2	2	4		2014	
BMC	HW8b	Widen	MD 216	High School Access Rd.	Maple Lawn Blvd.		3	2	4		2015	
BMC	nrs	Widen	Guilford Rd.	US 1	Dorsey Run Road			2	4		2017	
BMC	HW14c	Widen	Snowden River Parkway	MD 100	Broken Land Parkway		3	4	6		2020	
Federal Lands												
Fed. Lands	FED3a	Construct	Manassas Battlefield Bypass	US 29 West of Centreville	East of Gainesville, via 234		1	0/2	4	No	2035	
Fed Lands	FED3b	Close	US 29 (Lee Hwy.) - in battlefield park	Pageland Ln.	Bridge over Bull Run		0	2/4	0	No	2035	
Fed Lands	FED3c	Close	VA 234 (Sudley Rd.)- in battlefield park	Southern Park Boundary	Northern Park Boundary ~~Sudly Springs (north of park)~~		0	2	0	No	2035	
Fed. Lands	FED2	Widen	Old Mill Rd.(future Mulligan Rd.)	US 1	VA 611 (Telegraph Rd.)	4	4	0/2	4	Yes	2014	
VIRGINIA												
VDOT Freeway												
VDOT	VI1w	Widen	I-66 HOV during peak and SOV	1.2 miles west of US 15	0.8 miles east of US 29 (Gainesville)	1	1	4	8	No	2016 ~~2018~~	5908
VDOT	VI1wa	Reconstruct	I-66 Interchange	US 15 (Haymarket)		1	1			No	2016 ~~2018~~	5930
VDOT	VI1z	Reconstruct	I-66 Interchange	@ US 29 (Gainesville)		1	1	-	-	Complete ~~Yes~~	2011 ~~2013~~	4794

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						from	to	from	to			
VDOT	VI1ab	Reconstruct	I-66 Interchange	@ I-495 (Capital Beltway)		1	1	-	-	Yes	2013	
VDOT	VI1aj	Construct	I-66 Vienna Metro Station bus ramp	EB I-66 and Saintsbury Dr.	Saintsbury Dr. and WB I-66	1	1	0	2	No	2014	4152
VDOT		Widen	I-66 EB Auxiliary Lanes	West of Gallows Road	Off Ramp I-495 SB	1	1	3+1	3+1+2	No	2030	
VDOT		Widen	I-66 WB Auxiliary Lanes	On Ramp from SB I-495	West of Gallows Road	1	1	3+1	3+1+2	No	2030	
VDOT	VI1ah	Widen	I-66 EB Auxiliary Lanes	Cedar Lane	West of Gallows Road	1	1	3+1	3+1+1	No	2030	
VDOT	VI1ai	Widen	I-66 WB Auxiliary Lanes	West of Gallows Road	Cedar Lane	1	1	3+1	3+1+1	No	2030	
VDOT	VI1af	Reconstruct	I-66 WB Operational/ Spot Improvements- extend acceleration/deceleration lanes	Washington Blvd.	Dulles Airport Access Rd. connector	1	1	3	4	No	2020	4303
VDOT	VI1ag	Reconstruct	I-66 WB Operational/ Spot Improvements	Lee Hwy. / Spout Run	Glebe Rd.	1	1	2	3	No	2020	
VDOT	VI2ka	Widen	I-95 (Wilson Bridge and approaches)	VA 241 (Telegraph Rd.)	US 1	1	1	6	12	Yes	2013	
VDOT	VI2ac	Reconstruct	I-95 Interchange	@ VA 613 (Van Dorn Street)		1	1	-	-	No	2025	
VDOT	VI2ab	Reconstruct	I-95 Interchange	@ VA 642 (Lorton Road)		1	1	-	-	No	2010	
VDOT	VI2RB	Widen	I-395 HOV Lanes ramp	exit to Eads St.		1	1	1	2	No	2014	5963
VDOT	VI2r	Widen / Revise Operations	I-395/I-95 HOV/ BUS/ HOT Lanes	Approx. 2 mi. N. of I-495	VA 294 (Prince William Pkwy)	1	1	2	3	No	2015	5963
VDOT	VI2r	Revise Operations	I-395/I-95 HOV/ BUS/ HOT Lanes	VA 294 (Prince William Parkway)	S. of VA 234 (Dumfries Rd.)	1	1	2	2	No	2015	5963
VDOT	VI2s	Construct	I-395 (Auxiliary lane)	Northbound Duke St. on ramp	Seminary Rd off ramp	1	1	3	4	No	2015	5966
VDOT		Expand	I-395 Southbound	North of Duke Street	South of Edsall Rd.	1	1	3	4	No	2018	1626
VDOT	VI2r	Construct	I-395/I-95 HOV/ BUS/ HOT Lanes	S. of VA 234 (Dumfries Rd.)	VA 610 (Garrisonville Rd.) in Stafford Co.	1	1	0	2	No	2015	5963

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						from	to	from	to			
VDOT	nrs	Construct	Boundary Chanel Drive Intersection Modifications	Boundary Chanel Drive	Old Jefferson Davis Highway (off of I-395 Boundary Chanel Inter.					No		5965
VDOT	BRAC	Construct	I-95 NB Off Ramp @ Newington	NB I-95	NB Fairfax County Parkway	1	1	0	1	No	2020	
VDOT	VI2r11	Construct	I 95: HOV / Bus / HOT Lanes Ramp: Between VA 648 (Edsall) and Turkeycock Run	NB I-395 HOV/HOT lanes	NB I-395 GP	-	1	0	1	No	2015	
VDOT	VI2r24	Construct	I 95: HOV / Bus / HOT **Reversible** Ramp:	NB HOV/Bus/HOT Lanes	VA 7100 (Fairfax Co. Pkwy) (Alban Rd.)	-	1	0	1	No	2015	5963
VDOT	VI2r24	Construct	I 95: HOV / Bus / HOT **Reversible** Ramp:	VA 7100 (Fairfax Co. Pkwy) (Alban Rd.)	SB HOV/Bus/HOT Lanes	-	1	0	1	No	2015	5963
VDOT	BRAC0004 / VI2ra	Construct	I-95 Reversible Ramp (Colocated w/ existing slip ramp from HOV to GP lanes)	NB HOV/BUS/HOT Lanes - Located N of Rte. 7100/I 95 I/C **Phase II DAR**	EPG Southern Loop Road. - AM Only	1	1	0	1	No		
VDOT	BRAC0004 / VI2rb	Construct	I-95 Reversible Ramp (Colocated w/ existing slip ramp from HOV to GP lanes)	EPG Southern Loop Road. - PM Only **Phase I DAR**	SB HOV/BUS/HOT Lanes - N of Rte. 7100/I 95 I/C	1	1	0	1	No	2013	
VDOT	BRAC0004/ VI2rc	Construct	I-95 Ramp (Colocated w/ existing slip ramp from HOV to GP lanes)	EPG Southern Loop Road. - PM Only **Phase I DAR**	NB I 95 GP Lanes	1	1	0	1	No	2013	
VDOT	VI2r31	Construct	I 95: HOV / Bus / HOT Ramp:	SB Gen Purpose Lanes to SB HOV/Bus/HOT lanes	Between US 1 & VA 123	-	1	0	1	No	2015	5963
VDOT	VI2r37	Construct	I 95: HOV / Bus / HOT Ramp:	SB Gen Purpose Lanes to SB HOV/Bus/HOT lanes	Between Opitz Blvd. and Dale Blvd.	-	1	0	1	No	2015	5963
VDOT	VI2r34	Construct	I 95: HOV / Bus / HOT Ramp:	NB HOV/Bus/HOT to Gen. use lanes	Between VA 123 (Gordon Rd.) & VA 294 (Prince William Pkwy.)	-	1	0	1	No	2015	5963
VDOT	VI2r43	Construct	I 95: HOV / Bus / HOT Ramp:	SB HOV/Bus/HOT lanes to SB Gen Purpose Lanes	Between Dumfries Rd. and Joplin Rd.	-	1	0	1	No	2015	5963
VDOT	VI2r43a	Construct	I 95: HOV / Bus / HOT Ramp:	SB Gen Purpose Lanes to SB HOV/Bus/HOT lanes	Between Dumfries Rd. and Joplin Rd.	-	1	0	1	No	2018	5963
VDOT	VI2r45a	Construct	I 95: HOV / Bus / HOT Ramp:	NB HOV/Bus/HOT lanes to NB Gen Purpose Lanes	Between Joplin Rd. and Russell Rd.	-	1	0	1	No	2018	5963

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VDOT	VI2r44	Construct	I 95: HOV / Bus / HOT Ramp:	SB HOV/BUS/HOT lanes to SB GP lanes	Between VA 619 (Joplin Rd.) and VA 610 (Garrisonville Rd.)	-	1	0	1	No	2015	5963
VDOT	VI2r45	Construct	I 95: HOV / Bus / HOT Ramp:	NB GP lanes to NB HOV/BUS/HOT Lanes	Between VA 619 (Joplin Rd.) and VA 610 (Garrisonville Rd.)	-	1	0	1	No	2015	5963
VDOT	VI2R6A	Construct	I-395 HOV Lanes Reversible Ramp	NB HOV off-ramp to Seminary Rd. & Seminary Rd. on-ramp to SB HOV		1	1	0	1	No	2015	6029
VDOT	VI4laux	Widen	I-495 NB Auxiliary Lane	North of Hemming Ave. Underpass	Off Ramp to Braddock Rd	1	1	4+2	5+2	Yes	2030	
VDOT	VI4laux	Widen	I-495 SB Auxiliary Lane	On Ramp from Braddock Rd	North of Hemming Ave. Underpass	1	1	4+2	5+2	Yes	2030	
VDOT	VI4laux	Widen	I-495 NB Auxiliary Lane	On Ramp from Braddock Rd	Off Ramp to Rte 236	1	1	4+2	5+2	Yes	2030	
VDOT	VI4laux	Widen	I-495 SB Auxiliary Lane	On Ramp from Rte 236	Off Ramp to Braddock Rd	1	1	4+2	5+2	Yes	2013	
VDOT	VI4laux	Widen	I-495 NB Auxiliary Lane	On Ramp from Rte 236	Off Ramp to Gallows Road	1	1	4+2	5+2	Yes	2030	
VDOT	VI4laux	Widen	I-495 SB Auxiliary Lane	On Ramp from Gallows Road	Off Ramp to Rte 236	1	1	4+2	5+2	Yes	2030	
VDOT	VI4laux	Widen	I-495 NB Auxiliary Lane	On Ramp from Gallows Road	Off Ramp to Route 50	1	1	4+2	6+2	Yes	2013	
VDOT	VI4laux	Widen	I-495 SB Auxiliary Lane	On Ramp from Route 50	Off Ramp to Gallows Road	1	1	4+2	5+2	Yes	2013	
VDOT	VI4laux	Widen	I-495 NB Auxiliary Lane	On Ramp from Route 50	Off Ramp to I-66	1	1	4+2	5+2		2013	
VDOT	VI4laux	Widen	I-495 NB Auxiliary Lane	On Ramp from Route 50	Off Ramp to I-66	1	1	5+2	6+2	Yes	2030	
VDOT	VI4laux	Widen	I-495 SB Auxiliary Lane	On Ramp from I-66	Off Ramp to Route 50	1	1	4+2	5+2	Yes	2013	
VDOT	VI4laux	Widen	I-495 NB	On ramp from EB I 66	Off Ramp to Rte 7	1	1	4+2	5+2	Yes	2013	
VDOT	VI4laux	Widen	I-495 SB Auxiliary Lane	On ramp from Rte 7	Off Ramp to WB I 66	1	1	4+2	5+2	Yes	2030	

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VDOT	VI4laux	Widen	I-495 NB Auxiliary Lane	On ramp from Rte 7	Off Ramp to Rte 123	1	1	4+2	5+2	Yes	2013	
VDOT	VI4laux	Widen	I-495 SB Auxiliary Lane	On ramp from Rte 123	Off Ramp to Route 7	1	1	4+2	5+2	Yes	2013	
VDOT	VI4laux	Widen	I-495 SB Auxiliary Lane	On Ramp from Rte 123	Off Ramp to Route 7	1	1	5+2	6+2	Yes	2030	
VDOT	VI4laux	Widen	I-495 NB Auxiliary Lane	On Ramp from Rte 123	Off Ramp to Rte 267	1	1	4+2	5+3	Yes	2013	
VDOT	VI4laux	Widen	I-495 SB Auxiliary Lane	On Ramp from Route 267	Off Ramp to Route 123	1	1	4+2	5+4	Yes	2013	
VDOT	VI4laux	Widen	I-495 NB Auxiliary Lane	On Ramp from Route 267	Off Ramp to Route 193	1	1	4+2	5+2	Yes	2030	
VDOT	VI4laux	Widen	I-495 SB Auxiliary Lane	On Ramp from Route 193	Off Ramp to Route 267	1	1	4+2	5+2	Yes	2030	
VDOT	VI4k	Construct	I-495 HOT	American Legion Bridge	S. of George Washington Pkwy.	1	1	8	8+2	Yes	2030	
VDOT	VI4ka	Construct	I-495 HOT Lanes	S. of George Washington Pkwy	S. of Old Dominion Dr.	1	1	8	8+4 ~~8+2~~	No	2015	
VDOT	VI4IHOT	Construct	I-495 HOT	S. of Old Dominion Dr.	Hemming Ave. Underpass	1	1	8	8+4	Yes	2013	
VDOT	VI4Ib	Construct	I-495 NB Auxiliary Lane	1 mi. east of I-95/I-395/I-495	North of Hemming Ave. Underpass	1	1	8	5+1	Yes	2013	
VDOT	VI4Ib	Construct	I-495 SB Auxiliary Lane	Hemming Ave. Underpass	1 mi. east of I-95/I-395/I-495	1	1	8	5+1	Yes	2013	
VDOT	VI2ca	Construct	I-495 access ramps (Phase VIII of I-95/394/495 Interchange)	All Movements (I-95/395 NB & SB main & HOT to/from I-495/I-95 EB & WB main & HOV lanes)		1	1	-	-	Yes	2013	
VDOT	part of VI4IHOT	Construct	I-495 HOT Lanes Interchange Phase 1 DTR	Provides SB to WB, EB to SB, & NB to WB HOV movements	@ VA 267 (Dulles Toll Road)	1	1	-	-	Yes	2013	
VDOT/ MWAA	Part V141HOTa	Relocate	I-495 Interchange Ramp (Phase 4)	Relocate I-495 Interchange Flyover Ramp (EB DAAH to NB GP)	@ VA 267 Dulloes Toll Rd)	1	1	1	1	Yes	2030	
VDOT/ MWAA	part of VI4IHOTa	Construct	I-495 HOT Lanes Interchange (Phase IV)	Provide SB HOT to EB HOV & EB DTR to NB HOT movements	@ VA 267 (Dulles Toll Road)	1	1	-	-	Yes	2030 ~~2013~~	

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VDOT/ MWAA	part of VI4IHOTa	Widen	I-495 Interchange Ramp (Phase III DTR)	Widen EB DTR ramp to 2 NB lanes	NB GP lanes	1	1	1	2	Yes	2030	
VDOT/ MWAA	part of VI4IHOTa	Construct	I-495 Interchange Ramp (Phase III DAAH)	NB GP lanes	WB Dulles Airport Access Highway (DAAH)	0	1	0	1	Yes	2030	
VDOT/ MWAA	part of VI4IHOTa	Relocate / Reconstruct	I-495 HOT Lanes Interchange Phase III DTR	Move ramps from left side to right side: NB GP lanes to WB DTR; SB GP lanes to EB DTR	@ VA 267 (Dulles Toll Road)	1	1	1	1	Yes	2013	
VDOT/ MWAA	VI4IHOTb	Construct	I-495 Interchange Ramp (Phase II, Ramp 3 DAAH	SB I-495	WB Dulles Airport Access Highway (DAAH)	0	1	0	1	Yes	2020	
VDOT		Construct	I-495 Interchange Ramp(Phase I Ramp 2 DAAH)	EB Dulles Airport Access Highway (DAAH)	NB I-495	0	1	0	1	Yes	2013	
VDOT		Construct	I-495 Interchange Ramp	EB Dulles Airport Access Highway (DAAH)	SB I-495	0	1	0	1	Yes	2013	
VDOT	part of VI4IHOT	Construct	I-495 HOT Lanes Interchange	NB to WB, SB to WB, EB to NB, and EB to SB	@ Jones Branch Connector	1	1	-	-	Yes	2013	
VDOT	part of VI4IHOT	Construct	I-495 HOT Lanes Interchange	NB to WB, SB to WB, EB to NB, and EB to SB	@ West Park Connector	1	1	-	-	Yes	2013	
VDOT	part of VI4IHOT	Construct	I-495 HOT Lanes Interchange	NB to EB, NB to WB, EB to SB, and WB to SB	@ VA 7	1	1	-	-	yes	2013	
VDOT	part of VI4IHOT	Construct	I-495 HOT Lanes Interchange	Provides SB to WB, WB to SB, EB to SB, NB to WB, ~~WB to NB~~, & EB to NB movements	@ I-66	1	1	-	-	Yes	2013	
VDOT	part of VI4IHOT	Construct	I-495 HOT Lanes Interchange	NB to EB	@ I-66	1	1	-	-	Yes	2013	
VDOT	part of VI4IHOT	Relocate	I-495 HOT Lanes Interchange	@ I-66	Left side off ramp from NB I 495 to WB I 66 relocated to combine with right side off ramp from NB I 495 to WB I 66	1	1	1	2	Yes	2013	
VDOT	part of VI4IHOT	Construct	I-495 HOT Lanes Interchange	NB to EB, NB to WB, EB to SB, and WB to SB	@ US 29	1	1	-	-	Yes	2013	
VDOT	part of VI4IHOT	Construct	I-495 HOT Lanes Interchange	EB to NB, WB to NB, SB to EB, and SB to WB	@ VA 650 (Gallows Road)	1	1	0	1	Yes	2013	

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VDOT	part of VI4IHOT	Construct	I-495 HOT Lanes Interchange	EB to NB, WB to NB, SB to EB, and SB to WB	@ VA 620 (Braddock Road)	1	1	-	-	Yes	2013	
VDOT	part of VI4IHOTa	Construct	I-495 HOT Lanes Interchange	NB to EB, NB to WB, EB to SB, and WB to SB	@ VA 620 (Braddock Road)	1	1	-	-	Yes	2013	
VDOT/private		Construct	VA 267 (Dulles Greenway) Egress Ramp	@ Hawling Farm Boulevard (Future)		0	1	0	1	No	2015	
VDOT		Construct	Rt 267 (Dulles Toll Road) Ramp	New Boone Blvd Ext. @Ashgrove		0	1	0	2	No	2037	
VDOT		Construct	Rt 267 (Dulles Toll Road) Ramp	Greensboro Dr. @ Tyco Rd		0	1	0	2	No	2036	
VDOT	MW1	Widen	Dulles Airport Access Road	Dulles Airport	VA 123	1	1	4	6	No	2017	
VDOT Primary												
VDOT	VP1ab	Widen	US 1	Joplin Rd.	Brady's Hill Road	2	2	4	6	Complete	2012	
VDOT	VP1ad	Widen	US 1	Brady's Hill Road	Cardinal Drive	2	2	4	6	No	2025	
VDOT	VP1ae	Widen	US 1	Blackburn Dr/Neabsco Mills Rd	Featherstone Road	2	2	4	6	No	2014	5490
VDOT		Widen	US 1	Featherstone Road	Mary's Way	2	2	4	6	No	2020	
VDOT	VP1p	Widen	US 1 (part of 1/123 interchange)	Mary's Way	Annapolis Way	2	2	4	6	Yes	2017	
VDOT		Widen	US 1	Annapolis Way	Lorton Road	2	2	4	6	No	2035	
VDOT	VP1a	Widen	US 1	Telegraph Rd.	VA 235 South	2	2	4	6	No	2020	
VDOT	VP1u	Widen	US 1	VA 235 South	VA 235 North	2	2	4	6	No	2025	
VDOT	nrs	Construct	VA 7 WB Truck Climbing Lane	VA 9	Business 7 West	5	1	4	5	No	2014	
VDOT	VP2ja	Widen	VA 7 Bypass	VA 7 West	US 15 South (South King St)	5	1	4	6	No	2040	
VDOT	VP2j	Widen	VA 7 Bypass	US 15 South (South King St)	VA 7/US 15 East	5	1	4	6	No	2040	

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VDOT	VP2ma		VA 7	Rolling Holly Drive	Reston Avenue			4	6	No	2015 ~~2014~~	4861
FCDOT	VP2m	Widen	VA 7	Reston Avenue	West Approach to Bridge over DTR	2	2	4	6	No	2025	
VDOT	nrs	Construct	VA 7	Bridge over Dulles Toll Road				4	6	No	2030	
VDOT	VP2L	Widen	VA 7	Dulles Toll Rd.	I-495	2	2	6	8	Yes	2014	
FCDOT		Widen	VA 7	I-495	I-66			4	6	No	2021	
VDOT	VP2b	Widen	VA 7	Seven Corners	Bailey's Crossroads	2	2	4	6	No	2025	
VDOT	nrs	Construct	VA 7/15/ Bypass	Overpass at Sycolin Road		1	1	4	4	No	2014	
VDOT	nrs	Construct	VA 7	Overpass at Lexington Drive		1	1	6	6	No	2020	
VDOT	nrs	Construct	VA 7 interchange	@ VA 659 (Belmont Ridge Rd.)		-	-	-	-	No	2017 ~~2015~~	5926
VDOT	VP4e	Widen	US 15 (James Madison Highway)	US 29	I-66	2	2	2	4	No	2040	
VDOT	nrs	Widen	US 15 (James Madison Highway)	Monroe Glen Dr.	Thoroughfare Road	3	3	4	4	No	2017	
VDOT	VP6h	Widen	VA 28	Fauquier County Line	VA 652 (Fitzwater Dr.)	3	3	2	4	No	2040 ~~2030~~	
VDOT	VP6ka	Widen	VA 28	VA 652 (Fitzwater Dr.)	VA 215 (Vint Hill Rd.) Relocated	3	3	2	4	No	2016 ~~2020~~	5700
VDOT	VP6kb	Widen	VA 28	VA 215 (Vint Hill Rd.) Relocated	VA 619 (Linton Hall Road)	3	3	2	6	No	2015 ~~2013~~	
VDOT	VP6ma	Widen	VA 28 (Nokesville Rd.)	Godwin Drive	Manassas City limits - west	3	2	4	6		2018 ~~2017~~	5923
VDOT		Widen	VA 28 (Nokesville Road)	Manassas City Limits	VA 619 Linton Hall Road	3	3	4	6	No	2025	
VDOT	VP6e	Widen/ Upgrade	VA 28 PPTA (Phase II)	I-66	VA 7	2	1	6	8	No	2025	
VDOT	VP6eb	Construct	VA 28 Interchange	@ VA 209 (Innovation Ave.)		-	-	-	-	Yes	2015	

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(Highway and HOV)

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						from	to	from	to			
VDOT	VP6ec	Construct/ Upgrade	VA 28 Intersection	at Warp Dr.		1	1	6	6	Yes	2011	
Manassas City		Study	VA 28 Manassas Bypass	VA 234 Sudley Road	I-66 Proposed Interchange						not coded	
VDOT		Construct	VA 215 (Vint Hill Road Relocated)	VA 28	Schaefer Lane	0		0	4	No	2015	
VDOT	VP7ae	Construct	US 29 Interchange	@ VA 55/VA 619		-	-	-	-	Complete	2014	
VDOT	VP7s	Widen	US 29 (add NB lane)	I-66	Entrance to Conway Robinson MSF	3	2	4	5	No	2014	
VDOT	VP7ad	Reconstruct	US 29 Bridge Little Rocky Run	0.2 Miles East of Pickwick Rd	Rte 659 Union Mill Road			4	5	No	2015	
VDOT	VP7aa	Widen	US 29	ECL City of Fairfax (vic. Nutley St.)	Espana Court	2	2	4	6	Yes	2012	
VDOT	VP7ab	Complete	US 29	Espana Court	I-495	2	2	4	6	No	2013	
VDOT	VSP57a	Construct	Route 29 (Parallel)	US 29 (Lee Highway) (near US 15)	Sommerset Crossing Drive	0	4	0	4	No	2040	
VDOT	Alternative A	Construct	Dulles Air Cargo, Passenger, Metro Access Highway (North Star alignment)	Rt 50	VA 606 (Loudoun County Parkway)	2	2	4	4	No	2025	6079
VDOT	Alternative B	Construct	New Limited Access, Grade Separated US 50	Tri-County Parkway	New Limited Access VA 606 (Loudoun County Parkway)	0	5	0	4	No	2025	6079
VDOT	Alternative B	Construct	New Limited Access VA 606 (Loudoun Co. Pkwy)	Rte. 50	1.5 mi north of Rte. 50	0	5	0	4	No	2025	6079
VDOT	VP8q	Widen	US 50	VA 659 Relocated	VA 742 (Poland Rd.)	2	2	4/5	6	No	2025	
VDOT	VP8c	Widen	US 50	VA 742 (Poland Rd.)	VA 609 (Pleasant Valley)	2	2	4/5	6	Yes	2014	4637
VDOT	VP8r	Widen	US 50	VA 609 (Pleasant Valley)	Rte 28	2	2	4/5	6	Yes	2014	4637
VDOT	VP8h	Widen	US 50	ECL City of Fairfax	Arlington County Line	2	2	4	6	No	2025	
VDOT	AR2e	Reconstruct	US 50 (Arlington Blvd.)	ARC/FFX Line	Washington Blvd.	2	2	6	6	No	2015	

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						from	to	from	to			
VDOT	AR2f	Reconstruct	US 50 (Arlington Blvd.)	Pershing Dr.	Ft. Myer Dr.	5	5	6	6	No	2015	
VDOT	VP8o	Reconstruct	US 50 Interchange	@ Courthouse Road / 10th Street		1	1	6	8	Yes	2014 ~~2013~~	
VDOT		Construct	US 50 Interchange	VA 606 (Loudoun County Parkway)		-	-	-	-	No	2025	
VDOT	VP10g	Widen	VA 123	Route 1	Annapolis Way ~~Horner Rd.~~	2	2	4	6	No	2017	
VDOT	VP10h	Widen	VA 123 (Ox Road)	Hooes Rd.	Fairfax Co. Parkway	2	2	4	6	No	2025	
VDOT	VP10f	Widen	VA 123 (Ox Road)	Fairfax Co. Parkway	Burke Center Parkway	2	2	4	6	No	2025	
VDOT	VP10r	Widen	VA 123	Burke Center Parkway	Braddock Road	2	2	4	6	No	2025	
VDOT		Widen	VA 123	VA 677 (Old Courthouse Rd)	Rt 7 (Leesburg Pike)			4	6	No	2020	
VDOT		Construct	VA 234 Bypass Interchange	Relocated Balls Ford Rd						No	2020	
VDOT		Construct	VA 234 Bypass Interchange	Dumfries Rd/Limstrong						No	2025	
VDOT	VP13a	Widen	VA 236	Pickett Road	I-395	2	2	4	6	No	2025	
VDOT		Reconstruct	VA 244/VA 27 Interchange	.03 MI North of I-395	.29 MI North of Rte 244					Yes	2015	
VDOT	VSF25aa	Convert	VA 286 (Fairfax Co Pkwy HOV)	VA 267 (Dulles Toll Road)	Sunrise Valley Dr.	5	5	6	4+2	No	2035	
VDOT	VSF25ea	Widen	VA 286 (Fairfax Co Pkwy HOV)	Sunrise Valley	Rugby Rd.	5	5	4	4+2	No	2035	
VDOT	VSF25e	Convert	VA 286 (Fairfax Co Pkwy HOV)	Rugby Rd.	US 50	5	5	6	4+2	No	2035	
VDOT	VSF25y	Convert/ Upgrade	VA 286 (Fairfax Co Pkwy HOV)	US 50	VA 7735 (Fair Lakes Pkwy)	2	5	6	4+2	No	2035	
VDOT		Widen	VA 286 (Fairfax Co Pkwy HOV)	Rugby Rd.	US 50	5	5	4	6	No	2013	
VDOT		Widen	VA 286 (Fairfax Co Pkwy HOV)	US 50	VA 7735 (Fair Lakes Pkwy)	2	2	4	6	No	2013	

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(Highway and HOV)

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						from	to	from	to			
VDOT	VSF25z	Upgrade /Widen	VA 286 (Fairfax Co Pkwy HOV)	VA 7735 (Fair Lakes Pkwy)	I-66	2	5	6	6+2	No	2035	
VDOT	VSF25g	Widen	VA 286 (Fairfax Co Pkwy)	I-66	VA 123 (Ox Road)	5	5	4	6	No	2020	
VDOT	VSF25na	Construct	VA 286 (Fairfax County Parkway) Phase 3	Donegal La. / Hooes Rd.	VA 289 (Franconia-Springfield Parkway)	0	1	0	6	Yes	2012	
VDOT	BRAC	Construct	VA 286 (Fairfax County Parkway) Interchange (Phase 3)	@ Franconia Springfield Parkway	Various movements; includes relocated Rolling Rd.	-	-	-	-	Yes	2012	
VDOT	BRAC / VSF25nb	Construct	VA 286 (Fairfax County Parkway) Interchange (Phase 4)	@ Boudinat Drive (BD)	Ramp movements: EB F.C.Pkwy. To SB BD; WB F.C.Pkwy to SB BD; NB BD to WB F.C.Pkwy.	-	-	-	-	Yes	2011	
VDOT		Construct	VA 286 Interchange	@ VA 7700 (Fair Lakes Pkwy) & Monument Dr.		2	5	4	6	Yes	2013	
VDOT	VSF39	Widen	VA 7735 (Fair Lakes Pkwy) (3rd EB Lane)	VA 286 (Fairfax County Parkway)	Fair Lakes Circle	4	4	4	5	No	2013	
VDOT	VSF26	Construct	VA 289 HOV (Franconia-Springfield Parkway)	VA 286 (Fairfax County Parkway)	VA 2677 (Frontier Drive)	5	5	-	2	No	2025	
VDOT	VSF26a	Construct	VA 289 HOV (Franconia-Springfield Parkway)	Interchange @ Neuman St.		1	1	-	-	No	2025	
VDOT	VSF26b	Upgrade	VA 289 HOV (Franconia-Springfield Parkway)	VA 638 (Rolling Rd.)	VA 617 (Backlick Rd.)	5	1	6+2	6+2	No	2025	
VDOT	VSP23d	Widen	VA 294 (Prince William Parkway)	VA 776 (Liberia Ave.)	Hoadly Rd	2	2	4	6	Yes	2040	
VDOT	VSP23e	Widen	VA 294 (Prince William Parkway)	Hoadly Rd	Old Bridge Road	2	2	4	6	Complete	2011	
VDOT	VSP23f	Widen	VA 294 (Prince William Parkway)	Old Bridge Road	Minnieville Rd	2	2	4	6	Yes	2014 ~~2015~~	5391, 5889, 6123
FCDOT		Construct	Collector-Distributor Rd Westbound (parallels Dulles Toll Rd.)	VA 684 (Spring Hill Road)	VA 828 (Wiehle Ave)	0		0	2	No	2037	
FCDOT		Construct	Collector-Distributor Rd Eastbound (parallels Dulles Toll Rd.)	VA 828 (Wiehle Ave)	VA 684 (Spring Hill Road)	0		0	2	No	2036	
VDOT	VP12o	Construct	Tri-County Parkway (CTB alignment C & D)	VA 234 @ I 66	US 50	0	5	0	4	No	2020	

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VDOT Urban												
VDOT	VU28b	Construct	Battlefield Parkway	US 15 south of Leesburg	Dulles Greenway	0	2	0	4	No	2020	
VDOT	VU28f	Construct	Battlefield Parkway	Fort Evans Road	Edwards Ferry Road	0	2	0	4	Yes	2012	
VDOT	VU30f	Widen	East Elden Street	Monroe St ~~Van Buren St.~~	Fairfax County Parkway	2	2	4	6	No	2019 ~~2016~~	
VDOT	VU52	Widen	Eisenhower Ave.	Mill Road	Holland Lane	3	3	4	4	No	2015 ~~2013~~	
VDOT	VU51a	Construct	Potomac Yard Spine Road	US Route 1	Crystal Dr.	0	4	0	4	No	2014	
VDOT	VU10b	Widen	Spring Street	Herndon Parkway East	Fairfax County Parkway	3	3	4	6	No	2020 ~~2014~~	
VDOT	VU33	Widen	Sycolin Road	VA 7/US 15 Bypass	SCL of Leesburg	3	3	2	4	No	2020	
VDOT	VU32	Widen	US 15 (South King Street)	Evergreen Mill Road	SCL of Leesburg	3	2	2	4	No	2015	
VDOT		Construct	US 15 Bypass Interchange	Edwards Ferry Rd.		2	2	-	-	No	2035	5479
VDOT	VU29	Construct	VA 123 (Chain Bridge Road)	US 50	I-66	2	2	5	6	No	2013	
VDOT	VU45	Widen	VA 234 (Dumfries Road)	South Corporate Limits	Hastings Drive	3	3	2	4	No	2018 ~~2011~~	
VDOT	VU48b	Widen	Wellington Road	Godwin Drive	VA 28 (Nokesville Road)	3	3	2	4	Yes	2010	
VDOT	VU14a	Widen	Liberia Ave.	Rt.e 28	Quarry Road	3	3	4	6	No	2017	
		Construct	Intersection Improvement	King St.	Beauregard St					No	2015	
VDOT		Construct	Ellipse	Seminary Road	Beauregard St					No	2020	
VDOT		Construct	Intersection Improvement	King/Quaker Lane	Braddock Rd					No	2014	
VDOT	nrs	Construct	Herndon Parkway (East): Transit Drop-off/Pick-Up Access to Metrorail Station	East of Rte 666/van Buren Street (@ 593 Herndon Parkway)	West of Rte 675 / Spring Street (@ 575 Herndon Parkway	2	2	4	4	No	2017	

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						from	to	from	to			
VDOT	VU54	Construct	Southern Collector Road	Rte 7 -Main St. at Rte 287	A Street(2,200) Ft N Yaxley	0	2			Yes	2014	
ARLINGTON COUNTY SECONDARY												
VDOT	AR17a	Widen	Washington Blvd.	Wilson	Kirkwood	3	3	3	4	No	2015	
FAIRFAX COUNTY SECONDARY												
VDOT	FFX2a	Construct	VA 602 (Reston Pkwy.)	VA 5320 (Sunrise Valley Dr.)	VA 606 (Baron Cameron Avenue)	2	2	4	6	No	2020	
VDOT	nrs	Reconstruct/ Widen	Rte 603 Beach Mill Road - Bridge over Nichols Branch	Rte 603 Beach Mill Road	Rte 674 Springvale Road (west of intersection)	0	0	1	1	Yes	2013	
VDOT	VSF4f	Widen	VA 611 (Furnace Road)	VA 123 (Ox Road)	VA 642 (Lorton Road)	3	3	2	4	Yes	2014	
VDOT	VSF4c	Widen	VA 611 (Telegraph Road)	VA 613 (Beulah St.)	Leaf Road North	3	3	2	4	Yes	2014	
VDOT	VSF4ca	Widen	VA 611 (Telegraph Road)	Leaf Road North	VA 635 (Hayfield Road)	3	3	2	4	No	2025	
VDOT	VSF4i	Widen	VA 611 (Telegraph Road)	VA 635 (Hayfield Road)	VA 633 (S. Kings Hwy.)	3	3	2	4	No	2025	
		Widen	VA 611 (Telegraph Road)	VA 633 (S. Kings Hwy.)	VA 613 S. Van Dorn	3	3	2	4	No	2015 ~~2025~~	
VDOT	VSF4h	Widen	VA 611 (Telegraph Road)	VA 613 S. Van Dorn	VA 644 (Franconia Road)	3	3	2	3	No	2025	
VDOT	VSF15b	Construct	VA 613 (Van Dorn Street)	@ VA 644 (Franconia Road)	interchange	0	0	0	0	No	2025	
VDOT	VSF8g	Widen	VA 620 (Braddock Rd)	VA 7100 (Fairfax Co. Pkwy.)	VA 123 (Ox Road)	3	3	4	6	No	2025	
VDOT	VSF8j	Construct/ Widen	VA 620 (New Braddock Rd.)	VA 28	US 29 @ VA 662 (Stone Rd.)	0/4	3	0/2	4	No	2025	
VDOT	BRAC	Widen	VA 638 (Rolling Rd.) NB off-ramp @ Fairfax County Pkwy.	NB Rolling Rd.	NB Fairfax County Pkwy	3	3	2	4	No	2015	5924
VDOT	VSF10a	Widen	VA 638 (Rolling Rd.)	VA 7100 (Fairfax Co. Pkwy.)	VA 644 (Old Keene Mill Rd.)	3	3	2	4	No	2020	
VDOT	VSF10c	Widen	VA 638 (Pohick Road)	US 1	I-95	3	3	2	4	No	2025	

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VDOT	VSF13d	Widen	VA 642 (Lorton Road)	VA 123 (Ox Road)	VA 600 (Silverbrook Road)	3	3	2	4	Yes	2014	
VDOT	FFX11a	Widen	VA 645 (Stringfellow Rd.)	US 50	VA 7100 (Fairfax County Parkway)	3	3	2	4	No	2020	
VDOT	VSF16g	Widen	VA 645 (Stringfellow Road)	VA 7735 (Fair Lakes Blvd.)	US 50	3	3	2	4	Yes	2015 ~~2013~~	
VDOT	VSF37	Widen	VA 650 (Gallows Road)	Gatehouse Road	Providence Forest Dr.	2	2	4	6	Yes	2025	
FCDOT		Widen	VA 650 (Gallows Road)	VA 7 (Leesburg Pike)	Rte. 699 (Prosperity Ave.)	2	2	4	6	No	2038	
VDOT	VSF33d	Widen	VA 651 (Guinea Road)	VA 620 (Braddock Road)	VA 2430 (Braeburn Road)	3	3	2	4	No	2025	
VDOT	VSF33a	Widen	VA 651 (Guinea Road)	VA 6197 (Roberts Parkway)	VA 4807 (Pommeroy Drive)	3	3	2	4	No	2025	
VDOT	FFX12a	Construct	VA 651 (New Guinea Rd.)	VA 123 (Ox Road)	Roberts Rd.	0	3	0	4	No	2025	
VDOT	VSF17b	Construct	VA 655 (Shirley Gate Road)	VA 7100 (Fairfax County Parkway)	VA 620 (Braddock Road)	0	3	0	4	No	2025	
VDOT	VSF18c	Widen	VA 657 (Centreville Road)	VA 8390 (Metrotech Dr.)	VA 668 (McLearen Road)	3	3	4	6	No	2040	
VDOT	FED2	Widen/ construct	Old Mill Rd. (Future Mulligan Rd)	US 1	VA 611 (Telegraph Road)	4	4	2	4	Yes	2014	
FCDOT		Construct	Boone Blvd Extension	VA 123 (Chain Bridge Road)	Ashgrove Lane			0	4	No	2036	
FCDOT		Construct	New Bridge /Road Crossing	Tysons Corner Center Ring Road	Old Meadow Road				4	No	2035	
FCDOT		Widen	Magarity Road	Rt 7 (Leesburg Pike)	VA 694 (Great Falls St)			2	4	No	2037	
VDOT	VSF41	Construct / Widen	Scotts Crossing Drive	Rte. 123 (Dolley Madison Blvd.)	Rte. 5062 - Jones Branch Dr.			0/2	4/4	No	2018	6080
FCDOT		Extend / Construct	Greensboro Dr. WB	Spring Hill Td.	Tyco Rd.	4	4	0	2	No	2034	
LOUDOUN COUNTY SECONDARY												
~~VDOT~~	~~VSL51~~	~~Construct~~	~~Atlantic Boulevard~~	~~VA 625 (Church Road)~~	~~VA 7~~	-	~~3~~	-	~~4~~	~~Yes~~	~~2012~~	

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VDOT	VSL1b	Widen/ Upgrade	VA 606 (Ldn Co. Pkwy)	VA 634 (Moran Rd.)	VA 621 (Evergreen Mills Rd.)	4	3	2	4	No	2020	
VDOT	VSL10c	Construct	VA 607 (Loudoun County Pkwy)	VA 606 (Old Ox Rd.) / VA 842 (Arcola Rd.)	VA 772 (Ryan Rd.)	0	3	0	4	Yes	2015	
VDOT	VSL10bb	Widen/ Upgrade	VA 607 (Loudoun County Pkwy)	W&OD Trail	Redskin Park Drive	4	3	2	6	No	2025	
VDOT	VSL10bf	Widen/ Upgrade	VA 607 (Loudoun County Pkwy)	Redskin Park Drive	Gloucester Parkway	4	3	2	4	No	2013	
VDOT	VSL10bc	Widen	VA 607 (Loudoun County Pkwy)	Redskin Park Drive	Gloucester Parkway	3	3	4	4	No	2025	
VDOT	VSL12d	Construct	VA 625 (Waxpool Rd.)	VA 2920 Faulkner Parkway	Unbridled Way	4	3	2	4	No	2013 ~~2012~~	
VDOT	VSL45	Widen/ Upgrade	VA 643 (Sycolin Road) Phase II	Leesburg Town Limits	Crosstrails Blvd.	4	3	2	4	No	2035	
VDOT	VSL4a	Study	VA 659 (Belmont Ridge Rd.) - PE ONLY	National Rec. & Park Ent.	Dulles Greenway	4	3	2	4	No	not coded	
VDOT	VSL4ab	Construct	VA 659 (Belmont Ridge Road)	Dulles Greenway	Gloucester Parkway	4	3	2	4	No	2014	
VDOT	VSL4ac	Widen	VA 659 (Belmont Ridge Road)	Dulles Greenway	VA 7	4	3	4	4 ~~6~~	No	2035	
VDOT	VSL4ad	Construct	VA 659 (Belmont Ridge Road)	VA 7	Russel Branch Parkway	4	3	2	4	No	2013 ~~2014~~	
VDOT	VSL4e	Widen/ Upgrade	VA 659 (Gum Spring Rd.)	VA 620 (Braddock Road)	US 50	4	3	2	4	Yes	2015	
VDOT	VSL4f	Widen/ Upgrade	VA 659 (Gum Spring Rd.)	Prince William County Line	VA 620 (Braddock Road)	4	3	2	4	No	2035	
VDOT	VSL50	Widen/ Upgrade	VA 773 (Fort Evans Road)	Leesburg Town Limits	Kingsport Rd.	4	3	2	4	No	2013 ~~2015~~	
VDOT	nrs	Construct	VA 868 (Davis Dr.)	VA 606 (Old Ox Road)	VA 846 (Sterling Blvd)	0	4	0	4	No	2025	
VDOT	VSL46	Construct	VA 1036 (Pacific Boulevard)	Sterling Blvd.	Gloucester Parkway	0	3	0	4	Yes	2015	
VDOT	VSL52	Construct	VA 2150 (Gloucester Pkwy)	VA 607 (Loudoun County Pkwy)	VA 1036 (Pacific Blvd.)	0	3	0	4	No	2015	
VDOT	VSL48A	Construct	Riverside Parkway	River Creek Parkway	Upper Meadow Drive			2	4	No	2013 ~~2014~~	

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						from	to	from	to			
VDOT	VSL40F	Construct	Clairborne Parkway	Croson Lane	Ryan Road			2	4	No	2015	
VDOT	VSL53	Construct	Tall Cedars Parkway	Pinebrook Road	Gum Springs Road			0	4	No	2015	
VDOT	VSL49	Construct	Russell Branch Parkway	VA 659 (Belmont Ridge Road)	Loudoun County Parkway	0	3	0	4	Yes	2014	
PRINCE WILLIAM COUNTY SECONDARY												
VDOT	BRAC	Construct	Bypass Rd.	Russell Rd.	MDIA site entrance	0	3	0	2	Complete	2011	
VDOT	VSP59	Construct	Peaks Mill (Purcell Road east)	Route 643 (Purcell Road)	Route 294 (Prince William Parkway)	0	4	0	2	No	2035	
VDOT	VSP25b	Widen	VA 1781 (NewTelegraph Rd/Summit School Road)	Horner P & R Access Road ~~VA 849 (Caton Hill Rd.)~~	VA 640 (Minnieville Rd.)	4	4	2	4	No	2040	
VDOT		Widen	VA 1781(Telegraph Rd)	VA 849 (Caton Hill Rd)	Horner P & R Access Rd	4	4	2	4	Yes	2013	
VDOT	VSP25c	Widen	VA 1781 (Telegraph Rd.)	VA 294(Prince William Parkway)	VA 849 (Caton Hill Rd.)	4	4	2	4	No	2040	
VDOT	VSP3a	Widen/ Upgrade	VA 621 (Balls Ford Road)	VA 234 (Sudley Road)	Bethlehem Road	4	3	2	4	No	2040	
VDOT	VSP3b	Widen/ Upgrade	VA 621 (Balls Ford Road)	Bethlehem Road	VA 234 Bypass	4	3	2	4	No	2040	
VDOT	VSP5e	Widen	VA 640 (Minnieville Road)	VA 643 (Spriggs Road)	VA 234	3	3	2	4	No	2015 ~~2014~~	5392
VDOT	VSP8a	Widen	VA 643 (Purcell Rd.)	VA 234 (Dumfries Rd.)	VA 642 (Hoadly Rd.)	3	3	2	4	No	2025	5890
VDOT	VSP17b	Widen	VA 674 (Wellington Rd.)	VA 621 (Devlin Road)	VA 668 (Rixlew Lane)	3	3	2	4	No	2035	
VDOT	VSP18	Widen	VA 676 (Catharpin Rd.)	VA 55 (John Marshall Highway)	Heathcote Blvd.	3	3	2	4	No	2040	
VDOT	VSP20c	Widen/ Upgrade	VA 1392 (Rippon Boulevard Extension)	West of Wigeon Way	Rippon VRE Station	4	3	2	4	No	2040	
VDOT	VSP47d	Construct	VA 840 (University Blvd.) (nee East-West Connector)	Rt 234 Bypass ~~VA 660 (Hornbaker Rd.)~~	Sudley Manor Dr.	0	3	0	4	Yes	2014	4877
VDOT		Widen	Hornbaker Rd.	N. of its intersection with University Blvd.	Thomason Barn Rd.			2	4	Yes	2013 ~~2016~~	

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						from	to	from	to			
VDOT	VSP62	Construct	Rollins Ford Rd.	Songsparrow Dr.	VA 215 (Vint Hill Rd.)	0		0	4	Yes	2014 ~~2013~~	5366
VDOT		Widen	VA 619 (Joplin Rd Eastbound)	I-95 Ramp	US 1			2	3	No	2014	
VDOT		Widen	Fuller Road	US 1	Relocated Rt 619 (Fuller Heights Rd)			2	4	No	2014	5824
VDOT	VSP47e	Construct	University Blvd/Progress Ct	Wellington Rd	Rollins Ford Road			0	4	No	2016	
FAMPO												
	VI2rf	Construct	I 95 : HOV / Bus / HOT Lanes	Rte. 610 (Garrisonville Rd.) in Stafford County	VA 17 in Spotsylvania County (exit 126)	1	1	0	2	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	South of Telegraph Road (North of Aquia Creek)	SB GP Lanes to SB HOT Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	South of Telegraph Road (North of Aquia Creek)	NB HOT Lanes to NB GP Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	North of Garrisonville Road (south of Aquia Creek)	NB GP Lanes to NB HOT Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	Between Garrisonsville Road and Courthouse Road	SB GP Lanes to SB HOT Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	Between Garrisonsville Road and Courthouse Road	NB HOT Lanes to NB GP Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	Between Garrisonsville Road and Courthouse Road	SB HOT Lanes to SB GP Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	Between Garrisonsville Road and Courthouse Road	NB GP Lanes to NB HOT Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	South of Rt 628 (North of Stafford Regional Airport)	SB HOT Lanes to SB GP Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	South of Rt 628 (North of Stafford Regional Airport)	NB GP Lanes to NB HOT Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	(St.Co.Airport Access Rd.) and Rt 652	SB GP Lanes to SB HOT Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	(St.Co.Airport Access Rd.) and Rt 652	NB HOT Lanes to NB GP Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	(St.Co.Airport Access Rd.) and Rt 652	SB HOT Lanes to SB GP Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	(St.Co.Airport Access Rd.) and Rt 652	NB GP Lanes to NB HOT Lanes	1	1	0	1	No	2025 ~~2018~~	

NOTE: Shaded areas represent changes from the 2012 CLRP

2013 CLRP FY2013-2018 TIP AIR QUALITY CONFORMITY INPUTS

(Highway and HOV)

Agency	Project ID	Improv.	Facility	From	To	Facility from	Facility to	Lanes from	Lanes to	Under Const. or ROW acquired?	Complt. Date or Status	TIP ID
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	South of Rt 17 (North of Rappahannock River)	NB HOT Lanes to NB GP Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	Just South of Rappahannock River	SB HOT Lanes to SB GP Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	Just north of Rt 3	NB GP Lanes to NB HOT Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	Between Rt 620 and Rt 208	NB GP Lanes to NB HOT Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	Between Rt 620 and Rt 208	SB HOT Lanes to SB GP Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	Between Rt 1 and Rt 17	NB GP Lanes to NB HOT Lanes	1	1	0	1	No	2025 ~~2018~~	
		Construct	I 95 : HOV / Bus / HOT Lanes: Ramp	Between Rt 1 and Rt 17	SB HOT Lanes to SB GP Lanes	1	1	0	1	No	2025 ~~2018~~	
		Reconstruct	I-95 interchange	at Courthouse Rd. (exit #140)						No	2025	
		Upgrade	Inside I-95 shoulders for use as travel lanes in peak periods	I-95 MM 145	I-95 MM 139					No	2020	
	~~FAI1D~~	~~Reconstruct~~	~~I-95 interchange~~	~~at Mills Drive (US 17 Bypass)/Spotsylvania~~		~~1~~	~~1~~	~~0~~	~~0~~	~~No~~	~~2020~~	
	~~FAP5F~~	~~Widen~~	~~US 1~~	~~Prince William County Line~~	~~US 17(Warrenton Rd)/VA 218~~	~~2~~	~~2~~	~~4~~	~~6~~	~~No~~	~~2020~~	
		Widen	US-1	Prince William County Line	VA-637, Telegraph Rd. (Northern Intersection)			4	6	No	2025	
		Reconstruct	US-1/US-17/PR-218 Intersection							Yes	2020	
	FAP5I	Widen	US 1(Bridge Replacement)	US 17 (Butler Rd.)	Fredericksburg N. City Limit	2	2	4	6	No	2020	
	~~FAP5E~~	~~Widen~~	~~US 1~~	~~VA 620 (Harrison Road)~~	~~Spotsylvania Parkway~~	~~2~~	~~2~~	~~4~~	~~8~~	~~No~~	~~2020~~	
	~~FAP5H~~	~~Widen~~	~~US 1~~	~~Spotsylvania Parkway~~	~~VA 608 (Massaponax Church Rd)~~	~~2~~	~~2~~	~~4~~	~~6~~		~~2015~~	
	~~FAP5K~~	~~Widen~~	~~US 1 Business~~	~~South City Limit Fredericks.~~	~~Jefferson Davis Highway~~	~~2~~	~~2~~	~~2~~	~~4~~		~~2015~~	
	~~FAP5G~~	~~Widen~~	~~US 1~~	~~Rt 610~~	~~Rt 630~~	~~2~~	~~2~~	~~4~~	~~6~~	~~No~~	~~2025~~	
		~~Reconstruct~~	~~US 1 interchange~~	~~at US 17~~						~~No~~	~~2015~~	
		Widen	VA-3 (William St)	Gateway Blvd.	William St./Blue Gray Parkway			4	6	No	2030	
	FAS22	Widen	VA 3 (Spotsylvania)	Chewing Lane	VA 627 (Gordon Rd.)	2	2	4	6	Yes	2013	
	FAP6A	Widen	US 17 Bypass (Mills Dr.)	I-95	Caroline County Line ~~VA 2 (Tidewater Trail)~~	2	2	2	4	No	2030 ~~2015~~	

NOTE: Shaded areas represent changes from the 2012 CLRP

2013 CLRP FY2013-2018 TIP AIR QUALITY CONFORMITY INPUTS

(Highway and HOV)

Agency	Project ID	Improv.	Facility	From	To	Facility		Lanes		Under Const. or ROW acquired?	Complt. Date or Status	TIP ID
						from	to	from	to			
	FAP6E	Widen	US 17 Business/VA 2	SCL Frederickburg	US 17 Bypass (Mills Dr.)	2	2	2	4		2035	
	FAP6C	Widen	US 17 (Warrenton Rd.)	McLane Drive	Stafford Lakes Parkway	2	2	4	6	Yes	2020 ~~2015~~	
	FAP6D	Widen	US 17 (Warrenton Rd.)	Stafford Lakes Parkway ~~VA 654 (Berea Church Rd)~~	VA 612 (Hartwood Road)	2	2	4	6		2040 ~~2030~~	
	FAP7	Widen	VA 218 (Butler Rd)	US 1	Rd) ~~VA 218 (White Oak Rd.)~~	4	4	2	4	No	2030 ~~2025~~	
	FAS23A	Construct	VA 208 Bypass (Spotsylvania)*	.5 mi. w. of VA 1437 on VA 608 ~~West of Ta River~~	.7 mi w. of VA 606 ~~East of Po River~~	0	3	0	2	complete	2012 ~~2015~~	
	FAS40	Widen	VA 208 (Courthouse Road)	US 1 (Jefferson Davis Hwy)	VA 628 (Station Road)	3	3	4	6		2040 ~~2035~~	
FREDERICKSBURG												
	~~FAP5J~~	~~Widen~~	~~US 1 Business~~	~~Blue-Gray Parkway~~	~~South City Limit~~			~~2~~	~~4~~		~~2015~~	
	FAU1	Widen	Fall Hill Ave./ Mary Washington Blvd. Extension	Mary Wash. Blvd.	Gordon Shelton Blvd. ~~Carl D. Silver Pkwy~~			2	4		2020	
		Upgrade/ roundabout	Lafayette Blvd. (Phase 1)	Sophia St	VA-3 (Blue & Gray Parkway)					No	2025	
		Construct	Gateway Blvd. Extended	William St. (PR-3)	Fall Hill Ave (UR-3965)				4	No	2030	
STAFFORD COUNTY SECONDARY												
	FAS43	Upgrade/ Intersection	VA 606 (Ferry Rd)	VA 3 (Kings Highway)	VA 608 (Brook Rd)	4	3				2035 ~~2030~~	
	~~FAS37~~	~~Upgrade~~	~~VA 608 (Brooke Rd.)~~	~~VA 605 (New Hope Ch. Rd.)~~	~~Dead End~~	~~4~~	~~3~~			~~No~~	~~2035~~	
	FAS3c	Widen	VA 610 (Garrisonville Rd.)	VA 610 (existing 4 lane section)	VA 643	4	4	2	4	Complete	2012 ~~2015~~	
	~~FAS3F~~	~~Upgrade/ Intersection~~	~~VA 610 (Garrisonville Rd.)~~	~~VA 643 (Joshua Road)~~	~~Fauquier County Line~~	~~4~~	~~3~~				~~2035~~	
	FAS39	Widen	VA 610 (Garrisonville Rd.)	.13 miles west of VA 643 (Joshua Rd)	.42 miles east of VA 643 (Joshua Rd)	4	4	2	4	Complete	2012 ~~2015~~	
	~~FAS3e~~	~~Widen~~	~~VA 610 (Garrisonville Rd.)~~	~~VA 648 (Shelton Shop Rd.)~~	~~VA 641(Onville Rd)~~	~~4~~	~~3~~	~~5~~	~~6~~	~~No~~	~~2030~~	
	FAS3d	Widen	VA 610 (Garrisonville Rd.)	VA 641(Onville Rd)	VA 684 (Mine Rd)	4	3	4	6	Complete	2012 ~~2015~~	
	~~FAS33~~	~~upgrade~~	~~VA 616 (Poplar Rd.)~~	~~VA 652 (Truslow Rd.)~~	~~Fauquier County Line~~	~~4~~	~~3~~			~~No~~	~~2035~~	
	~~FAS34A~~	~~upgrade~~	~~VA 627 (Mountainview Rd.)~~	~~VA 648 (Stefaniga Rd.)~~	~~Centreport Pkwy.~~	~~4~~	~~3~~			~~No~~	~~2035~~	
	~~FAS34B~~	~~upgrade~~	~~VA 627~~	~~VA 616~~	~~Choptank Rd.~~	~~4~~	~~3~~			~~No~~	~~2035~~	

NOTE: Shaded areas represent changes from the 2012 CLRP

2013 CLRP FY2013-2018 TIP AIR QUALITY CONFORMITY INPUTS

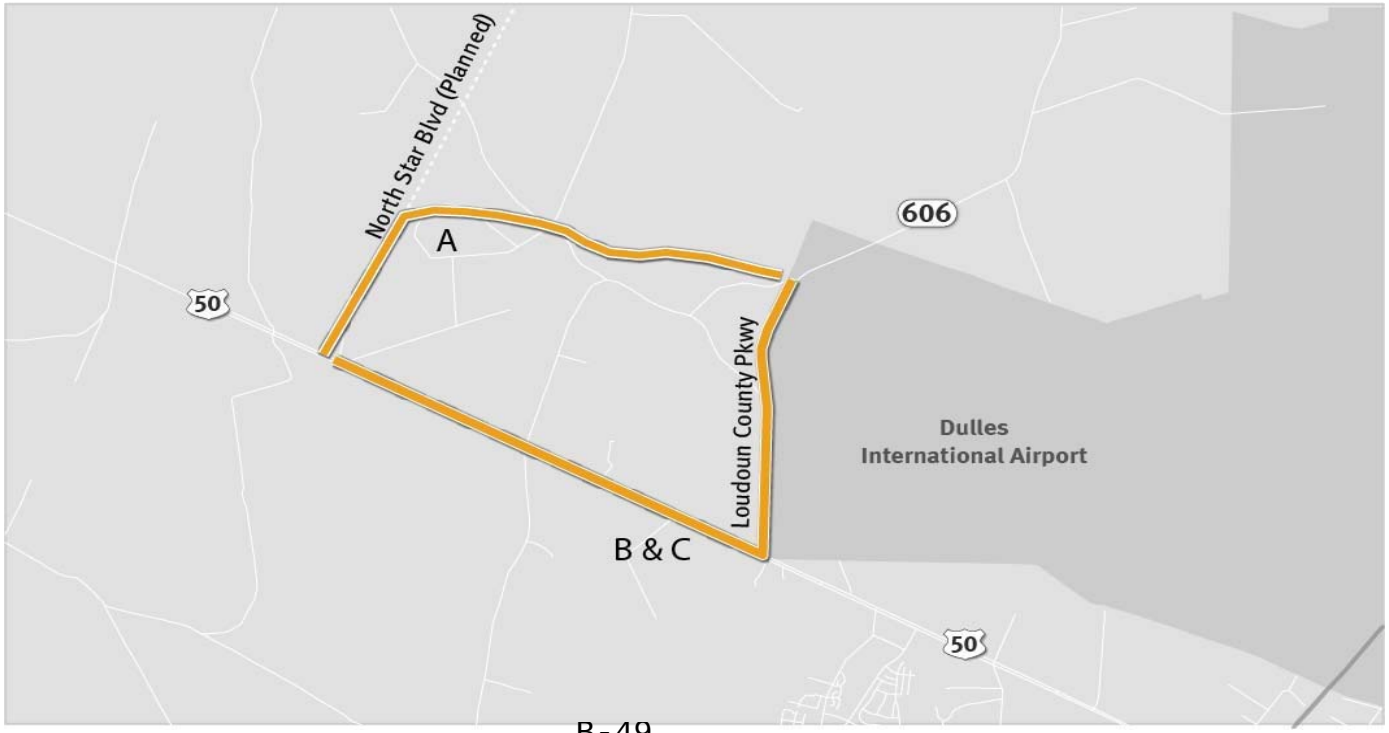
(Highway and HOV)

Agency	Project ID	Improv.	Facility	From	To	Facility		Lanes		Under Const. or ROW acquired?	Complt. Date or Status	TIP ID
						from	to	from	to			
	FAS5b	Widen	VA 630 (Courthouse Rd)	Austin Ridge Dr. ~~VA 732 (Cedar Lane)~~	VA 648 (Shelton Shop Rd)	4	4	2	4	No	2035 ~~2025~~	
	FAS41	upgrade	VA 637	Russell Rd. ~~I-95~~	US 1 via Woodstock Ln.	4	3			No	2040 ~~2035~~	
	FAS35	widen	VA 641 (Onville Rd.)	VA 610 (Garrisonville Rd.)	Quantico Base			2	4		2030	
	~~FAS42~~	~~upgrade~~	~~VA 644~~	~~VA 627~~	~~VA 610~~	~~4~~	~~3~~			~~No~~	~~2035~~	
		upgrade	VA 652 (Truslow Rd.)	US-1	VA-616 (Poplar Rd)					No	2040	
	FAS13	Widen	VA 648 (Shelton Shop Rd.)	VA 610 (Garrisonville Rd)	VA 627 (Mountainview Rd)	4	4	2	4	No	2035 ~~2025~~	
SPOTSYLVANIA COUNTY SECONDARY												
	~~FAS27~~	~~Widen~~	~~VA 608 (Massaponax Church Rd.)~~	~~VA 628 (Smith Station Rd)~~	~~I 95~~	~~3~~	~~3~~	~~2~~	~~4~~	~~No~~	~~2025~~	
	~~FAS31~~	~~Widen~~	~~VA 610 (Old Plank Rd.)~~	~~VA 627 (Gordon Rd.)~~	~~VA 612 (Catharpin Rd.)~~	~~4~~	~~4~~	~~2~~	~~4~~	~~No~~	~~2030~~	
	FAS18c	Widen	VA 620 (Harrison Rd)	VA 610 (old Plank Rd.) ~~VA 3 (Plank Road)~~	VA 627 (Gordon Rd.)	4	4	2	4		2025 ~~2015~~	
		Widen	VA-620 (Harrison Rd.)	US-1 BUS (Lafayette Blvd.)	VA-639 (Salem Church Rd.)			2	4	No	2025	
	~~FAS9b~~	~~Widen~~	~~VA 627 (Gordon Rd.)~~	~~VA 628 (Smith Station Rd)~~	~~VA 620 (Harrison Rd.)~~	~~4~~	~~4~~	~~2~~	~~4~~	~~No~~	~~2015~~	
	~~FAS9C~~	~~Widen~~	~~VA 627 (Gordon Rd.)~~	~~VA 628 (Smith Station Rd)~~	~~VA 613 (Brock Road)~~	~~4~~	~~4~~	~~2~~	~~4~~		~~2035~~	
	FAS28	Widen	VA 628 (Smith Station Rd)	VA 608 (Massaponax Church Rd.)	VA 627 (Gordon Rd.)	4	4	2	4	No	2035 ~~2025~~	
	FAS19	Widen	VA 636 (Mine Rd./ Hood Dr.)	VA 208 (Courthouse Rd.)	US 1 ~~VA 638 (Lansdowne Rd.)~~	4	4	2	4	No	2025	
	~~FAS36~~	~~Widen~~	~~VA 638 (Lansdowne Rd)~~	~~SCL Frederickburg~~	~~VA 636 (Mine Rd)~~	~~3~~	~~3~~	~~2~~	~~4~~		~~2035~~	
	FAS20b	Widen	VA 639 (Leavells Rd.)	VA 208 (Courthouse Rd.)	VA 628 (Smith Station Rd.)	4	4	2	4	Yes	2035 ~~2025~~	
	FAS20c	Widen	VA 639 (Bragg Rd.)	VA 618 (River Rd.)	VA 3	4	4	2	4	Complete	2012 ~~2015~~	
	~~FAS38~~	~~Widen~~	~~VA 674 (Chancellor Rd.)~~	~~VA 610 (Old Plank Rd)~~	~~VA 627 (Gordon Rd.)~~	~~4~~	~~4~~	~~2~~	~~4~~		~~2035~~	

NOTE: Shaded areas represent changes from the 2012 CLRP

2013 Constrained Long Range Plan
FY2013-2018 Transportation Improvement Program
VDOT Dulles Access Improvements Alternatives

	US 50	VA 606 (Loudoun County Pkwy)		Northstar Blvd.
	Northstar Blvd. To VA 606	US 50 to 1.5 miles north of US 50	1.5 miles north of US 50 to Dulles Greenway	US 50 (at Northstar Blvd.) to VA 606 (at 1.5 miles north of US 50)
Current Conditions	4/5/6 lanes, major/principal arterial	2/4 lanes, minor arterial	2 lanes, minor arterial	----------
2013 CLRP (no Dulles access improvements)	6 lanes, principal arterial	4 lanes, minor/major arterial	4 lanes, minor/major arterial	----------
2013 CLRP VDOT A	6 lanes, principal arterial	4 lanes, minor/major arterial	4 lanes, minor/major arterial	4 lanes, principal arterial
2013 CLRP VDOT B	4 lanes, limited access facility + 6 lanes, principal arterial	4 lanes, limited access facility + 4 lanes, major arterial	4 lanes, major arterial	----------
2013 CLRP VDOT C (Loudoun County Comprehensive Plan)	6 lanes, limited access facility	8 lanes, limited access facility	4 lanes, major arterial	----------



APPENDIX C

Interagency and Public Involvement Process

TPB Public Comment Procedures and Opportunities Related the Air Quality Conformity Planning Process

As described in the 2007 TPB *Participation Plan*, it is the policy of the TPB to carry out the following public involvement activities with respect to air quality conformity regulations governing TPB plans and programs.

- Ensure that the TPB follows federal requirements for public involvement, including a public comment period of at least 30 days prior to the approval of air quality conformity determinations that are part of the Financially Constrained Long-Range Transportation Plan (CLRP), Transportation Improvement Program (TIP) and other major documents, and the development and consideration of written responses to comments received.

    - Provide notification of the opportunity to comment during the public comment period through a variety of means, including:
        - Direct email notifications that the public comment period has begun;
        - Paid advertisements in local newspapers;
        - Notices in the TPB's monthly newsletter the *TPB News;*
        - Information in other publications, including the TPB *Weekly Report;*
        - Agenda items on key TPB committee's including the Citizens Advisory Committee, Access for All Advisory Committee and Technical Committee;
        - At least one formal public meeting during the development process for the TIP.

    - Comments from the public can be submitted on the TPB's web site, by email, postal mail, or in person at the beginning of TPB meetings. All comments are posted on the web site and are grouped according to whether the comment was submitted by a private citizen, a business or non-profit organization, or a government official or representative body. Comments can also be sorted according to the nature of the comment.

    - The TPB shall provide an additional opportunity for public comment, if the final CLRP or TIP differs significantly from the version that was made available for public comment by the TPB and raises new material issues which interested parties could not reasonably have foreseen from the public involvement efforts.

    - When significant written and oral comments are received on the draft CLRP and TIP (including the financial plans) as a result of the participation process in this section or the interagency consultation process required under the EPA transportation conformity regulations (40 CFR part 93), a summary, analysis, and report on the disposition of comments shall be made as part of the final metropolitan transportation plan and TIP.

- In addition to the formal public comment process described above, the following ongoing public involvement opportunities are in place and can be used to provide comment on air quality conformity determinations related to the TPB's plans and programs, and to learn about the conformity process:
    - A period of time for public comment is provided at the beginning of each TPB meeting.
    - The TPB website provides online opportunities for public comment.
    - All meetings of the TPB's committees are open to public.
    - The TPB strives to provide reasonable public access to technical and policy information through its website, distribution of paper documents, and through telephone and email communications.
    - Information about the planning process, including air quality conformity issues, is provided through a variety of ad hoc meetings and presentations that regularly occur throughout the region.

TPB Consultation and Public Comment Opportunities for the Air Quality Conformity Assessment of the 2013 CLRP and FY2013-2018 TIP

The following lists TPB consultation and public comment opportunities during the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP:

- January 11th, 2013 - TPB Technical Committee meeting presentation on inputs and scope of work for the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP;
- January 17th, 2013 - Draft scope of work and project inputs released for 30 day public comment and documents posted on web;
- January 17th, 2013 - TPB Citizen Advisory Committee (CAC) meeting presentation on inputs and scope of work for the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP;
- January 17th, 2013 - Paid advertisements posted in the Washington Post, Afro-American and El Pregonero;
- January 17th, 2013 - Public comment period announced in the TPB's monthly newsletter the ***TPB News*** and the TPB ***Weekly Report***;
- January 17th, 2013 - Monthly conformity consultation letter reference inputs and scope of work and announced public comment period for the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP;
- January 23rd , 2013 - TPB presentation on the inputs and scope of work for air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP;
- January 23rd, , 2013 - Opportunity for public comment at the TPB meeting;
- February 1st, 2013 - TPB Technical Committee updated on draft scope of work and project inputs for the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP;
- February 14th, 2013 - Monthly conformity consultation letter reference inputs and scope of work for the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP for approval at TPB meeting;
- February 20th, 2013 - TPB presentation on the inputs and scope of work for the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP for approval;
- February 20th, 2013 – Opportunity for public comment at the TPB meeting;

- June 7th, 2013 - TPB Technical Committee presentation on draft results of the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP;
- June 11th, 2013 - MWAQC Technical Advisory Committee (TAC) presentation on draft results of the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP;
- June 13th, 2013 - Draft results released for 30 day public comment and summary report posted on web;
- June 13th, 2013 - TPB CAC meeting presentation on draft results for the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP;
- June 13th, 2013 - Paid advertisement posted in the Washington Post, Afro-American and El Pregonero;
- June 13th, 2013 - Public comment period announced in the TPB's monthly newsletter the ***TPB News*** and the TPB ***Weekly Report;***
- June 13th, 2013 - Monthly conformity consultation letter referenced results and announced public comment period for the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP;
- June 19th , 2013 - TPB presentation on draft results for air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP;
- June 19th , 2013 - Opportunity for public comment at TPB meeting;
- June 28th, 2013 - TPB Technical Committee presentation on updated analysis of Transportation Emissions Reduction Measures (TERMs) for possible use in air quality conformity assessment;
- July 11th, 2013 - Monthly conformity consultation letter referenced results for the air quality conformity assessment of the 2013 CLRP and FY2013-2018 TIP for approval at TPB meeting;
- July 17th, 2013 - TPB responded to comments received during public comment period;
- July 17th, 2013 – Opportunity for public comment at TPB meeting.

Note: All TPB and TPB subcommittee meetings are open to the public

National Capital Region Transportation Planning Board

777 North Capitol Street, N.E., Suite 300, Washington, D.C. 20002-4290 (202) 962-3310 Fax: (202)962-3202

NOTE: Illustration of monthly Consultation letter

February 14, 2013

TO: Transportation Consultation Agencies
(United States Environmental Protection Agency, Federal Highway Administration, Federal Transit Administration, Metropolitan Washington Air Quality Committee, Air Quality Public Advisory Committee, and Transportation Planning Board Citizens Advisory Committee)

FROM: Ronald F. Kirby
Director, Department of
Transportation Planning

SUBJECT: Consultation with respect to TPB plans and programs

Enclosure:
1) Agenda for February 20, 2013 TPB meeting

This memo transmits the agenda for the February TPB meeting, which is relevant to TPB consultation with respect to air quality conformity. Materials associated with each agenda item are available on the TPB web site www.mwcog.org under 'Dates and Events'. As always, you are welcome to attend the TPB meetings (and/or any meetings of the TPB committees and their subcommittees). A schedule of monthly meetings is listed in the Calendar of Events in *TPB NEWS*.

The February TPB agenda items relevant for transportation conformity and consultation are identified below.

Item 7 is an action item in which the Board will be briefed on the comments received and recommended responses, and asked to approve the project submissions for inclusion in the air quality conformity assessment for the 2013 Constrained Long Range Transportation Plan (CLRP) and FY 2013-2018 Transportation Improvement Program (TIP). At the January 23 meeting, the Board was briefed on the major project changes submitted for inclusion in the air quality conformity assessment. The projects were released for a 30-day public comment period that ended February 16.

Item 8 is an action item in which the Board will be briefed on the comments received and recommended responses, and asked to approve the scope of work for the air quality conformity assessment for the 2013 CLRP and FY 2013-2018 TIP. At the January 23 meeting, the Board was briefed on the draft scope of work. The scope was released for a 30-day public comment period that ended February 16.

Item 9 is action item in which the Board will be asked to approve an amendment to the FY 2013 Unified Planning Work Program (UPWP) to include TPB staff support to facilitate and coordinate the implementation of the new Section 5310 program under MAP-21. The Board will be updated on the discussions with District of Columbia Department of Transportation (DDOT), the Maryland Transit Administration (MTA), and the Virginia Department of Rail and Public Transportation (DRPT) on the designation of a recipient to establish the new program in the Washington Region.

Item 10 is an action item in which the Board will be briefed on, and asked to approve an amendment to the FY 2013 UPWP to provide support for the implementation of the New Transportation Alternatives Program (TAP) under MAP-21 in the Washington Region. At the December meeting, the Board was briefed on the new program and the potential role of the TPB in the selection of projects under the program. MAP-21 established the TAP to fund small projects considered "alternatives" to traditional highway construction. It combines several formerly stand-alone programs, including Transportation Enhancements, Safe Routes to School, and Recreational Trails.

Item 13 is an information item in which the Board will be briefed on the draft UPWP for FY 2014 (July 1, 2013 through June 30, 2014). The Board will be asked to approve the FY 2014 UPWP at its March 20 meeting.

Item 14 is a notice item for a proposed amendment to the recent 2015 forecast year air quality conformity analysis of the 2012 CLRP and FY 2013-2018 TIP which was conducted to satisfy the redesignation requirements of the Environmental Protection Agency (EPA) 2008 Ozone National Ambient Air Quality Standards (NAAQS). After the TPB approved this new air quality conformity analysis on December 19, 2012, the EPA found adequate new mobile budgets on February 7, 2013, requiring their immediate use in air quality conformity analyses. Because this adequacy finding occurred prior to United State Department of Transportation's (USDOT) approval of the recent conformity analysis, this analysis must be amended to show that mobile emissions in the 2012 CLRP and FY 2013-2018 TIP are below the new EPA approved mobile budgets. On February 14th, the amended analysis was released for a 30-day public comment period that will end on March 16th . At the March 20th meeting, the Board will be asked to approve the amended air quality conformity assessment.

National Capital Region Transportation Planning Board

777 North Capitol Street, N.E., Suite 300, Washington, D.C. 20002-4290 (202) 962-3310 Fax: (202) 962-3202

Date: February 20, 2013
Time: 12 noon
Place: COG Board Room

AGENDA
(BEGINS PROMPTLY AT NOON)

12 noon 1. **Public Comment on TPB Procedures and Activities**
.....Chairman York

Interested members of the public will be given the opportunity to make brief comments on transportation issues under consideration by the TPB. Each speaker will be allowed up to three minutes to present his or her views. Board members will have an opportunity to ask questions of the speakers, and to engage in limited discussion. Speakers are asked to bring written copies of their remarks (65 copies) for distribution at the meeting.

12:20 pm 2. **Approval of Minutes of December 19 Meeting**
.....Chairman York
- Minutes

12:25 pm 3. **Report of Technical Committee**
..... Ms. Erickson
Chair, Technical Committee
- Technical Committee Meeting Highlights

12:30 pm 4. **Report of the Citizen Advisory Committee**
.....Mr. Still
Chair, Citizens Advisory Committee

12:40 pm 5. **Report of Steering Committee**
..... Mr. Kirby
Director, Department of
Transportation Planning (DTP)
- Steering Committee Actions
- Letters Sent/Received

12:45 pm 6. **Chair's Remarks**
.....Chairman York

ACTION ITEMS

Alternative formats of this agenda and all other meeting materials are available upon request. Email: accommodations@mwcog.org. Phone: 202-962-3300 or 202-962-3213 (TDD). Please allow seven working days for preparation of the material. Electronic versions are available at www.mwcog.org.

12:50 pm 7. **Review of Comments Received and Approval of Project Submissions for the Air Quality Conformity Assessment for the 2013 Financially Constrained Long Range Transportation Plan (CLRP) and the FY 2013-2018 Transportation Improvement Program (TIP)**

..... Mr. Kirby

At the January 23 meeting, the Board was briefed on the major project changes submitted for inclusion in the air quality conformity assessment for the 2013 CLRP and FY 2013-2018 TIP which were released for a 30-day public comment period that ended February 16. The Board will be briefed on the comments received and recommended responses, and asked to approve the project submissions for inclusion in the air quality conformity assessment for the 2013 CLRP and FY 2013-2018 TIP.

Action: Adopt Resolution R8-2013 to approve the project submissions for inclusion in the air quality conformity assessment for the 2013 CLRP and FY 2013-2018 TIP.

- Significant Changes for the 2013 CLRP
- 2013 CLRP Air Quality Conformity Analysis Inputs

1:00 pm 8. **Approval of Scope of Work for the Air Quality Conformity Assessment for the 2013 CLRP and the FY 2013-2018 TIP**

..... Ms. Posey, DTP

At the January 23 meeting, the Board was briefed on the draft scope of work for the air quality conformity assessment for the 2013 CLRP and FY 2013-2018 TIP which was released for a 30-day public comment period that ended February 16. The Board will be briefed on the comments received and recommended responses, and asked to approve the scope of work for the air quality conformity assessment for the 2013 CLRP and FY 2013-2018 TIP.

Action: Approve the enclosed scope of work for the air quality conformity assessment for the 2013 CLRP and FY 2013-2018.

- Draft Scope of Work for Air Quality Conformity Analysis of the 2013 CLRP and FY 2013-2018 TIP

1:05 pm 9. **Approval of an Amendment to the FY 2013 Unified Planning Work Program (UPWP) to Facilitate the Implementation of the New Section 5310 Enhanced Mobility Program under MAP-21 in the Washington Region**

.....Ms. Klancher, DTP

At the December meeting, the Board was briefed on how the new Section 5310 program under MAP-21 changed the three former FTA programs: Job Access and Reverse Commute, New Freedom, and Elderly and Disabled, and on potential designated recipient(s) for this program in the Washington DC-VA-MD Urbanized Area. The Board will be updated on discussions with the District of Columbia Department of Transportation (DDOT), the Maryland Transit Administration (MTA), and the Virginia Department of Rail and Public Transportation (DRPT) on the designation of a recipient to establish the new program in the Washington Region, and asked to amend the FY 2013 UPWP to include TPB staff support to facilitate and coordinate the implementation of the new program.

Action: Adopt Resolution R9-2013 to amend the FY 2013 UPWP to facilitate and coordinate the implementation of the New Section 5310 Enhanced Mobility Program under MAP-21 in the Washington Region.

- FY 2013 UPWP Amendment for New Section 5310 Enhanced Mobility Program

1:10 pm 10. **Approval of an Amendment to the FY 2013 UPWP to Provide Support for the Implementation of the New Transportation Alternatives Program under MAP-21 in the Washington Region**

.....Mr. Swanson, DTP

MAP- 21 established the Transportation Alternatives Program (TAP) to fund small projects considered "alternatives" to traditional highway construction. It combines several formerly stand-alone programs, including Transportation Enhancements, Safe Routes to School, and Recreational Trails. At the December meeting, the Board was briefed on the new program and the potential role of the TPB in the selection of projects under the program. The Board will be briefed on proposed steps to implement the program in the Washington Region, and asked to amend the FY 2013 UPWP to include TPB staff support to facilitate program implementation.

Action: Adopt Resolution R10-2013 to amend the FY 2013 UPWP to provide support for the implementation of the new Transportation Alternatives Program under MAP-21 in the Washington Region.

- FY 2013 UPWP Amendment for Transportation Alternatives Program

INFORMATION ITEMS

1:20 pm 11. **Briefing on MAP-21 Requirements for Performance Based Planning and Programming**

.....Mr. Kirby

MAP-21 calls for MPOs, state DOTs and public transportation providers to establish and use a performance-based approach to transportation decision-making to support national goals. It calls for USDOT to establish performance measures related to national goals for planning processes and for state DOTs, public transportation providers and MPOs to coordinate and establish performance targets. The Board will be briefed on the performance-based approach using performance measures and targets, on USDOT activities to establish performance measures, and on anticipated TPB responsibilities in establishing performance targets.

- MAP-21 Requirements for Performance Based Planning and Programming

1:30pm 12. **Review of Draft FY 2014 Commuter Connections Work Program (CCWP)**

.....Mr. Ramfos, DTP

The Board will be briefed on the enclosed draft CCWP for FY 2014 (July 1, 2013 through June 30, 2014). The Board will be asked to approve the FY 2014 CCWP at its March 20 meeting.

- Draft FY 2014 Commuter Connections Work Program

1:40 pm 13. **Review of the Draft FY 2014 Unified Planning Work Program (UPWP)**
..... Mr. Kirby
The Board will be briefed on the enclosed draft UPWP for FY 2014 (July 1, 2013 through June 30, 2014). The Board will be asked to approve the FY 2014 UPWP at its March 20 meeting.

- Draft FY 2014 Unified Planning Work Program

NOTICE ITEM

1:50 pm 14. **Notice of Proposed Amendment to the Additional Air Quality Conformity Analysis Conducted to Respond to the EPA Redesignation of the Washington Region under the 2008 Ozone National Ambient Air Quality Standards (NAAQS)**
..... Mr. Kirby
Notice is provided on an amendment to the recent 2015 forecast year air quality conformity analysis of the 2012 CLRP and FY2013-2018 TIP which was conducted to satisfy the redesignation requirements of the EPA 2008 Ozone National Ambient Air Quality Standards (NAAQS). After the TPB approved this new air quality conformity analysis on December 19, 2012, the EPA found adequate new mobile budgets on February 7, 2013, requiring their immediate use in air quality conformity analyses. Because this adequacy finding occurred prior to USDOT's approval of the recent conformity analysis, this analysis must be amended to show that mobile emissions in the 2012 CLRP and FY2013-2018 TIP are below the new EPA approved mobile budgets. On February 14th, the amended analysis was released for a 30-day public comment period that will end on March 16th. At the March 20th meeting, the Board will be asked to approve the amended air quality conformity assessment.

- Amendment to Dec. 19, 2012 Air Quality Conformity Update of 2012 CLRP and FY 2013-2018 TIP

1:55 pm 15. **Other Business**

2:00 pm 16. **Adjourn**

2 hours
Lunch will be available for Board members and alternates at 11:30 am

National Capital Region Transportation Planning Board

777 North Capitol Street, N.E., Suite 300, Washington, D.C. 2002-4290 (202) 962-3310 Fax: (202) 962-3202 TDD: (202) 962-3213

On Thursday, June 13, 2013 the TPB released for public comment the draft 2013 Constrained Long Range Plan (CLRP) and the related Air Quality Conformity Assessment. The 30-day public comment period will close at midnight on Saturday, July 13, 2012.

The following items are available for review and comment:

- Proposed Significant Changes for the 2013 CLRP
- 2013 Air Quality Conformity Inputs **(complete project listings)**
- Air Quality Conformity Assessment of the 2013 CLRP and FY 2013-2018 TIP **(short report)**

These materials may also be reviewed at the Metropolitan Washington Council of Governments (COG), 777 N. Capitol St. NE, Washington, DC 20002.

The CLRP shows the road, bridge, high-occupancy vehicle (HOV), transit, bicycle and pedestrian projects funded through the year 2040. The six-year TIP includes all projects, programs, and strategies that state and local transportation agencies plan to implement between 2013 and 2018. The TIP comment process is being used to obtain comments on the region's program of projects that are funded by the Federal Transit Administration (including projects funded by the Urbanized Area Formula Program) and the Federal Highway Administration. The air quality conformity analysis assesses the plan amendments and program with respect to the air quality requirements under the 1990 Clean Air Act Amendments.

These materials may also be reviewed at the Metropolitan Washington Council of Governments (COG), 777 N. Capitol St. NE, Washington, DC 20002.

Members of the public are invited to submit comments on the draft documents on-line at www.mwcog.org/tpbpubliccomment/. **Written comments can also be mailed to:**

TPB Chair Scott York,
Metropolitan Washington Council of Governments (COG),
777 N. Capitol St. NE, Suite 300
Washington, DC 20002

For additional information or for special assistance, please call (202) 962-3311 or (202) 962-3213 (TDD).

PUBLIC COMMENT PERIOD FOR THE WASHINGTON REGION'S PROPOSED SUBMISSIONS FOR THE 2013 UPDATE TO THE CONSTRAINED LONG-RANGE PLAN (CLRP), FY 2013-2018 TRANSPORTATION IMPROVEMENT PROGRAM (TIP), AND AIR QUALITY CONFORMITY ANALYSIS

The National Capital Region Transportation Planning Board (TPB) will initiate a 30-day public comment period for the proposed submissions for the 2013 update to the Constrained Long-Range Plan (CLRP) and FY2013-2018 Transportation Improvement Program (TIP), including a scope of work for the air quality conformity analysis, on January 17 at the TPB Citizen Advisory Committee (CAC) meeting. The CAC meets from 6 pm to 8 pm in the Metropolitan Washington Council of Governments (COG) first floor conference center, 777 N. Capitol St. NE, Washington, DC 20002. This public comment period will extend through Saturday February 16, 2013. The TPB is scheduled to approve these submissions at its February 20, 2013 meeting. Members of the public are invited to review these draft documents on the COG website, www.mwcog.org/transportation/. These materials may also be reviewed at the Metropolitan Washington Council of Governments (COG), 777 N. Capitol St. NE, Washington, DC 20002.

The CLRP shows the road, bridge, high-occupancy vehicle (HOV), transit, bicycle and pedestrian projects funded through the year 2040. The six-year TIP includes all projects, programs, and strategies that state and local transportation agencies plan to implement between 2013 and 2018. The air quality conformity analysis assesses the plan amendments and program with respect to the air quality requirements under the 1990 Clean Air Act Amendments.

Members of the public are invited to submit comments on the draft documents on-line at www.mwcog.org/tpbpubliccomment/. Written comments can also be mailed to TPB Chairman Scott York, Metropolitan Washington Council of Governments (COG), 777 N. Capitol St. NE, Suite 300, Washington, DC 20002.

For additional information or for special assistance, please call (202) 962-3311 or (202) 962-3213 (TDD).

PERÍODO DE COMENTARIOS PÚBLICOS
PROPUESTAS PARA LAS COMUNICACIONES DE LA REGIÓN DE WASHINGTON PARA LA ACTUALIZACIÓN DE 2013 A LA CONSTRAINED PLAN A LARGO PLAZO (CLRP), FY 2013-2018
PROGRAMA DE MEJORAMIENTO DEL TRANSPORTE (TIP), CALIDAD DEL AIRE Y ANÁLISIS DE LA CONFORMIDAD

El consejo nacional de planificación del transporte de la capital (TPB) por sus siglas en ingles, iniciará un periodo de 30 días para comentarios públicos sobre las presentaciones propuestas para la actualización en el año 2013 del plan predeterminado a largo plazo (CLRP), y el programa de mejora del transporte que comprende los años 2013-2018, incluyendo un ámbito de trabajo en el análisis de conformidad de la calidad del aire, en la reunión de 17 de enero por el comité
consultivo de ciudadanos. (CAC) por sus siglas en ingles. El comité consultivo de ciudadanos se reúne de 6:00 de la tarde a 8:00 en Metropolitan Washington Council of Government (COG) por sus siglas en ingles, en el centro de conferencias primera planta, y en la dirección 777 N Capitol St NE, Washington, DC, 2002. El periodo de comentarios públicos se extenderá hasta el sábado 16 de Febrero del año 2013. El TPB tiene previsto aprobar estas propuestas en su reunión de 20 de febrero del año 2013. El público está invitado a revisar estos documentos preliminares en el sitio Web del COG, www.mwcog.org/transportation/. Estos materiales también pueden ser examinados en Metropolitan Washington Council of Government cuya dirección es 777 N Capitol St NE, Washington DC, 20002.

El CLRP presenta los proyectos de carretera, puente, carriles de alta ocupación, transporte, bicicleta, y de peatones, financiados hasta el año 2040. El TIP de seis años incluye todos los proyectos, programas y estrategias que el estado y las agencias locales de transporte pretender llevar a cabo entre los años 2013 al 2018. El análisis de conformidad de la calidad del aire evalúa las modificaciones del plan con respecto a los requisitos de la calidad del aire para que se ajusten al Clean Air Act Amendments de 1990.

Los miembros del público están invitados a presentar sus observaciones sobre los documentos preliminares online en www.mwcog.org/tpbpubliccomment/. Los comentarios escritos también pueden ser enviados por correo a Scott York que es el presidente del consejo de TPB a la dirección 777 N Capitol St NE, Suite 300, Washington DC, 20002.

Para más información o para recibir asistencia especial, por favor llame al 202 962 3311 o al 202 962-3213 (TDD)

PUBLIC COMMENT PERIOD FOR THE WASHINGTON REGION'S PROPOSED SUBMISSIONS FOR THE 2013 UPDATE TO THE CONSTRAINED LONG-RANGE PLAN (CLRP), FY 2013-2018 TRANSPORTATION IMPROVEMENT PROGRAM (TIP), AND AIR QUALITY CONFORMITY ANALYSIS

The National Capital Region Transportation Planning Board (TPB) will initiate a 30-day public comment period for the proposed submissions for the 2013 update to the Constrained Long-Range Plan (CLRP) and FY2013-2018 Transportation Improvement Program (TIP), including a scope of work for the air quality conformity analysis, on January 17 at the TPB Citizen Advisory Committee (CAC) meeting. The CAC meets from 6 pm to 8 pm in the Metropolitan Washington Council of Governments (COG) first floor conference center, 777 N. Capitol St. NE, Washington, DC 20002. This public comment period will extend through Saturday February 16, 2013. The TPB is scheduled to approve these submissions at its February 20, 2013 meeting. Members of the public are invited to review these draft documents on the COG website, www.mwcog.org/transportation/. These materials may also be reviewed at the Metropolitan Washington Council of Governments (COG), 777 N. Capitol St. NE, Washington, DC 20002.

The CLRP shows the road, bridge, high-occupancy vehicle (HOV), transit, bicycle and pedestrian projects funded through the year 2040. The six-year TIP includes all projects, programs, and strategies that state and local transportation agencies plan to implement between 2013 and 2018. The air quality conformity analysis assesses the plan amendments and program with respect to the air quality requirements under the 1990 Clean Air Act Amendments.

Members of the public are invited to submit comments on the draft documents on-line at www.mwcog.org/tpbpubliccomment/. Written comments can also be mailed to TPB Chairman Scott York, Metropolitan Washington Council of Governments (COG), 777 N. Capitol St. NE, Suite 300, Washington, DC 20002.

For additional information or for special assistance, please call (202) 962-3311 or (202) 962-3213 (TDD).

PUBLIC COMMENT PERIOD FOR THE WASHINGTON REGION'S PROPOSED 2013 UPDATE TO THE CONSTRAINED LONG-RANGE PLAN (CLRP) AND AIR QUALITY CONFORMITY ANALYSIS

The National Capital Region Transportation Planning Board (TPB) will initiate a 30-day public comment period for the proposed 2013 update to the Constrained Long-Range Plan (CLRP) including an air quality conformity analysis, on June 13, 2013 at the TPB Citizen Advisory Committee (CAC) meeting. The CAC meets from 6 pm to 8 pm in the Metropolitan Washington Council of Governments (COG) first floor conference center, 777 N. Capitol St. NE, Washington, DC 20002. These documents are scheduled to be approved at the July 17, 2013 TPB meeting. This public comment period will extend through 6 pm Saturday July 13, 2013. Members of the public are invited to review these draft documents on the COG website, www.mwcog.org/transportation/. These materials may also be reviewed at COG.

The CLRP shows the road, bridge, high-occupancy vehicle (HOV), transit, bicycle and pedestrian projects funded through the year 2040. The air quality conformity analysis assesses the plan update with respect to the air quality requirements under the 1990 Clean Air Act Amendments.

Members of the public are invited to submit comments on the draft documents on-line at www.mwcog.org/tpbpubliccomment/. Written comments can also be mailed to TPB Chairman Scott York, Metropolitan Washington Council of Governments (COG), 777 N. Capitol St. NE, Suite 300, Washington, DC 20002.

For additional information or for special assistance, please call (202) 962-3311 or (202) 962-3213 (TDD).

PERÍODO DE COMENTARIO PÚBLICO PARA LA REGIÓN DE WASHINGTON PROPUESTO 2013 ACTUALIZACIÓN DEL PLAN DE LARGO ALCANCE CONSTRAINED (CLRP) Y CALIDAD DEL AIRE DE CONFORMIDAD ANÁLISIS

La Región de la Junta de Planificación de Transporte de la Capital Nacional (TPB) iniciará un período de comentarios públicos de 30 días para la actualización propuesto para 2013 del Plan de Largo Alcance restringida (CLRP) que incluye un análisis de conformidad de la calidad del aire, el 13 de junio de 2013 a la ciudadana TPB reunión del Comité Consultivo (CAC). El CAC se reúne 18:00-20:00 en el Consejo de Washington Metropolitano de Gobiernos (COG), el primer centro de conferencias de la planta, 777 N. Capitol St. NE, Washington, DC 20002. Estos documentos están programados para ser aprobado en la reunión de TPB, 17 de Julio 2013. Este periodo de comentarios públicos se extenderá hasta 6 pm Sábado 13 de Julio de 2013. Se invitan los miembros del público para revisar estos proyectos de documentos en el sitio web del COG, www.mwcog.org/transportation/. Estos materiales también se podrán revisar en COG.

El CLRP muestra de la carretera, puente, vehículos de alta ocupación (HOV), los proyectos de tránsito, peatones y ciclistas financiado por el año 2040. El análisis de conformidad de la calidad del aire se evalúa la actualización del plan con respecto a los requisitos de calidad del aire en las 1990 Clean Air Act Amendments.

Se invita a los miembros del público a presentar comentarios sobre los proyectos de documentos por internet
www.mwcog.org/tpbpubliccomment/
Comentarios escritos pueden ser mandados a
TPB Chairman Scott York,
Metropolitan Washington Council of Governments (COG)
77 N. Capitol St. NE, Suite 300
Washington, DC 20002.

Para obtener información adicional o asistencia especial, por favor llame, (202) 962-3311 ó (202) 962-3213 (TDD)

PUBLIC COMMENT PERIOD FOR THE WASHINGTON REGION'S PROPOSED 2013 UPDATE TO THE CONSTRAINED LONG-RANGE PLAN (CLRP) AND AIR QUALITY CONFORMITY ANALYSIS

The National Capital Region Transportation Planning Board (TPB) will initiate a 30-day public comment period for the proposed 2013 update to the Constrained Long-Range Plan (CLRP) including an air quality conformity analysis, on June 13, 2013 at the TPB Citizen Advisory Committee (CAC) meeting. The CAC meets from 6 pm to 8 pm in the Metropolitan Washington Council of Governments (COG) first floor conference center, 777 N. Capitol St. NE, Washington, DC 20002. These documents are scheduled to be approved at the July 17, 2013 TPB meeting. This public comment period will extend through 6 pm Saturday July 13, 2013. Members of the public are invited to review these draft documents on the COG website, www.mwcog.org/transportation/. These materials may also be reviewed at COG.

The CLRP shows the road, bridge, high-occupancy vehicle (HOV), transit, bicycle and pedestrian projects funded through the year 2040. The air quality conformity analysis assesses the plan update with respect to the air quality requirements under the 1990 Clean Air Act Amendments.

Members of the public are invited to submit comments on the draft documents on-line at www.mwcog.org/tpbpubliccomment/. Written comments can also be mailed to TPB Chairman Scott York, Metropolitan Washington Council of Governments (COG), 777 N. Capitol St. NE, Suite 300, Washington, DC 20002.

For additional information or for special assistance, please call (202) 962-3311 or (202) 962-3213 (TDD).

APPENDIX D

Documentation of Travel Demand Model Revalidation

Memorandum

Date: June 30, 2013

To: Files

From: Ronald Milone, COG/TPB

Re: 2010 Validation of the Version 2.3 Travel Demand Model

1. Introduction

This technical memorandum describes the 2010 TPB travel model validation that was undertaken by TPB staff during FY 2013. TPB's currently adopted travel forecasting process is known as the Version 2.3 travel demand model which is a trip-based travel model that operates on a 3,722-zone area system. The Version 2.3 model was initially calibrated using the 2007/08 Household Travel Survey.[1] Since its adoption by the TPB in November 2011, it has evolved with periodic updates. The validation effort focused on the analysis of the most recent update (or "build") of the model, known as Version 2.3.39.

A model validation is essentially a comparison between the travel model outputs and observed data, ideally observed data that is more recent than that used to support the model calibration. The comparison enables the model's overall performance to be assessed and provides an objective basis for implementing technical adjustments to the model. The Version 2.3 model validation effort resulted in several modifications to the Version 2.3.39 model. In addition to validation-related modifications, other updates were also applied to the model, including enhancements to reduce running times, enhance stability, and improve the model's internal consistency. The updated model that resulted is known as the Version 2.3.52 travel model (or Build 52 of the Version 2.3 model).

[1] *Calibration Report for the TPB Travel Forecasting Model, Version 2.3, on the 3,722-Zone Area System*. Final Report. National Capital Region Transportation Planning Board, January 20, 2012. http://www.mwcog.org/transportation/activities/models/documentation.asp.

The validation effort was undertaken from September 2012 through March 2013 and was overseen by the TPB Travel Forecasting Subcommittee which is the designated forum for monitoring the TPB's travel forecasting activities. A more detailed description of the validation process and results is presented below.

2. Travel Model Development and Validation

Travel model development efforts are typically comprised of three phases: estimation, calibration, and validation. The phases are undertaken sequentially in order to progressively "hone in" on a final model specification that is acceptable for forecasting. The *estimation* phase involves the use of statistical analysis techniques to develop parameters and coefficients for individual modeling steps. While most modeled coefficients are developed using data from the household travel survey, other surveys may also be used (e.g., transit on-board surveys), and some parameters may be asserted (or borrowed) where local data is missing or insufficient. The model *calibration* phase occurs after estimation has occurred and involves the adjustment of the estimated coefficients and/or constants in order to achieve a more reasonable match between the modeled outputs and "real-world" data. Calibration data usually consists of transit ridership, traffic counts, or aggregate vehicle-miles-of-travel "targets." The data used to support estimation and calibration phases of model development typically represents a common base-year condition. The estimation and calibration phases of the Version 2.3 model were conducted primarily with 2007/08 data, along with American Community Survey (ACS) data and an assortment on-board transit survey data from 2007 or 2008.

The *validation* phase occurs after estimation and calibration steps and involves comparing the calibrated model outputs against a comprehensive set of observed data. Validation data is usually more recent than that used to support the original model calibration. The validation is a demonstration of the travel model's performance with respect to current conditions and a demonstration of its ability to function as a sound forecasting tool. The results of the validation may suggest a need to refine certain parameters of the travel model. Modifications may be warranted because of misspecifications in the model that were not detected during the earlier calibration phase or because of changes in traveler behaviors that were not observed during the model calibration. Another important component of the validation phase is sensitivity analysis. This type of analysis involves the applying the model with altered input

assumptions to reflect a specific hypothetical scenario, such has expanding the capacity of a roadway segment or altering land activity for a specific location. Sensitivity analysis serves as another demonstration of the model's ability to respond logically and reasonably to input changes. TPB staff's validation effort made use of 2010 data.

While validation tests may be used to assess a wide range of travel modeling inputs and outputs, all such tests are subject to the availability of observed information. Table 1 lists the observed data that was assembled for the 2010 validation analysis.

Table 1 Validation Data Assembled

Data Source	Data Elements Assembled	Level of Analysis
2010 Census	Households and Household Population	Jurisdiction level
2010 American Community Survey (ACS)	Share of households by size and vehicles available	Jurisdiction and state level
2010/11 TPB Geographically-Focused Household Travel Survey (HTS)	Share daily trips made by mode	Geographically-focused areas
2010 HPMS reports	Vehicle-miles traveled (VMT)	Jurisdiction level
2010 HPMS traffic counts	Daily link volumes	Screenline and facility levels
2010 Metrorail faregate counts	Station Boardings	Metrorail station level

The Census data was used to check household and population inputs to the travel model at the jurisdiction level (TAZ-level data was not available). The American Community Survey data was used to evaluate the proportions of households by socio-economic dimensions (size, income, and vehicle availability levels) that are produced by the demographic sub-models. Both of these comparisons were made at the jurisdiction and state level of analysis.

TPB staff consulted Highway Performance Monitoring System (HPMS) documents published by the state DOTs to obtain observed VMT summaries by jurisdiction. The Maryland and Virginia HPMS reports were obtained off the web at the following URLs:

- http://www.virginiadot.org/info/2010_traffic_data_daily_vehicle_miles_traveled.asp
- http://www.roads.maryland.gov/oppen/Vehicle_Miles_of_Travel.pdf

The District of Columbia VMT report was obtained by TPB staff members who are currently responsible for traffic monitoring activities in that jurisdiction.[2] VMT reports at the jurisdiction level are presented as either average annual weekday traffic (AAWT) or average annual daily traffic (AADT) values. TPB uses reported AAWT values when evaluating modeled VMT. For instances where AADT figures are reported, TPB staff computes the AAWT figure based on the following conversion:

AAWT = AADT * 1.05

Traffic counts used in the validation effort were taken directly from the TPB's Regional Transportation Data Clearinghouse, which contains geo-referenced ground counts collected each year by the state DOTs. The clearinghouse yielded approximately 6,400 directional traffic counts for the year 2010. The counts were obtained from permanent traffic counters and from 48-hour tube counts at standard programmed locations. Finally, 2010 Metrorail station boardings were available from electronic faregate counts.

Unfortunately, the validation effort did not include use of observed trip table data that would ideally exist by trip purpose and mode of travel. This model's ability to replicate recent observed trip patterns is always a desired objective and a useful way for solving validation problems.

3. Recent Travel Conditions

The Version 2.3 travel model was calibrated to year-2007 conditions, a time period time when national vehicle-miles traveled (VMT) reached peak levels, about 3 trillion miles. Figure 1 shows the historical U.S. VMT and VMT per capita between 1987 and 2012.

[2] 3/4/12 email from Robert Griffiths to Ronald Milone, Re; DC HPMS VMT 2007 and 2008

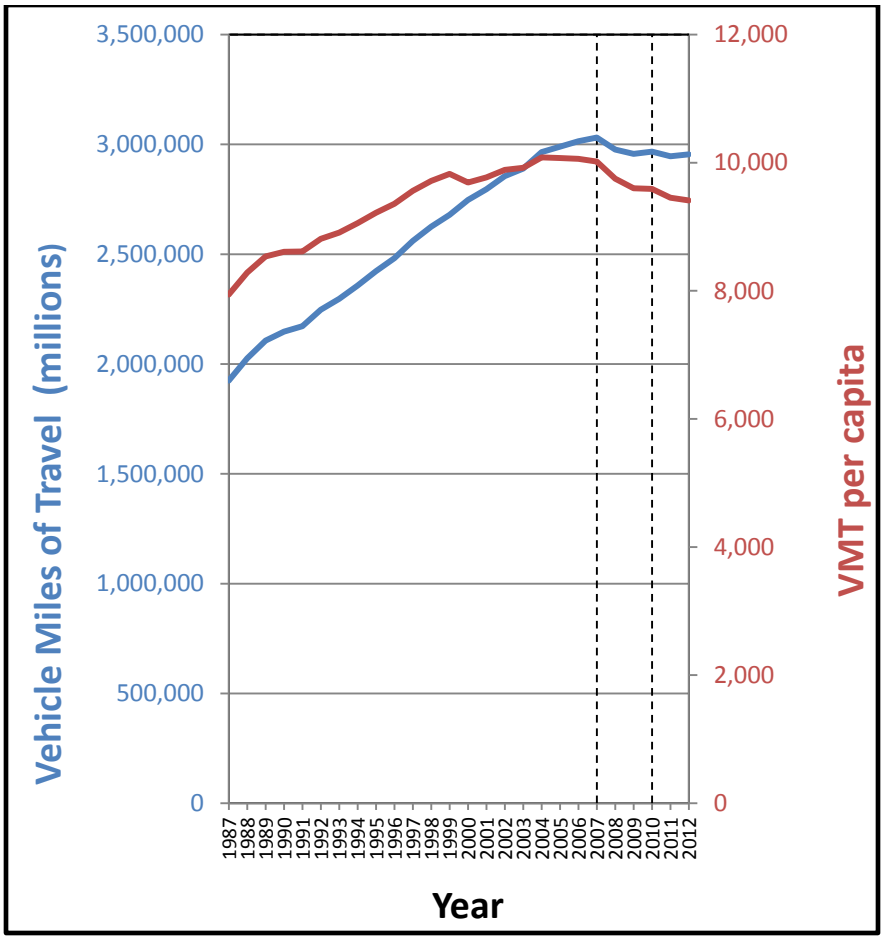


Figure 1 US Total Vehicle-Miles Travel and Vehicle-Miles per Capita

The figure indicates that both of these metrics have waned between 2007 and 2012. National VMT growth has, with a few temporary exceptions, been steady from year to year since the end of World War II, so the sustained leveling off of VMT since 2007 is unprecedented. VMT growth in the TPB planning area, shown in Figure 2, has been essentially "flat" between 2007 and 2010, despite an 11% increase in population for the modeled area (from 5,980,000 to 6,625,000).[3] This inconsistency explains the downward trend in VMT per capita shown in Figure 3.

[3] Based on 2007 Pseudo-Round 8.0 land activity and 2010 Round 8.2 Cooperative Forecasting Land Use.

Figure 2: VMT Growth in the TPB Planning Area, 2005 to 2011

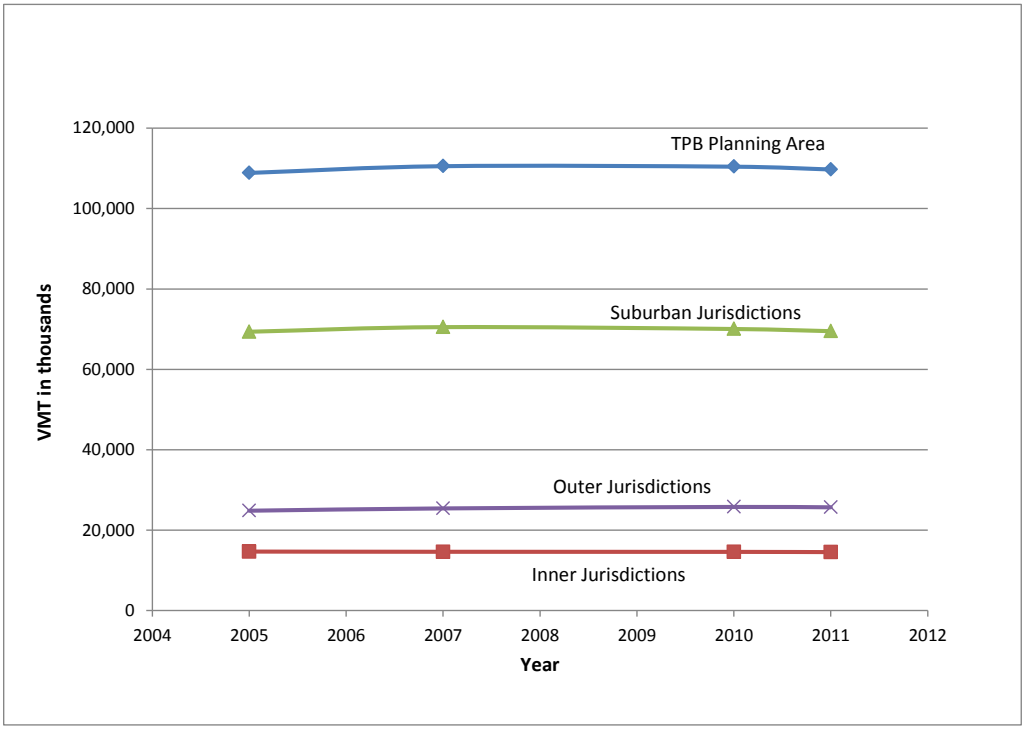
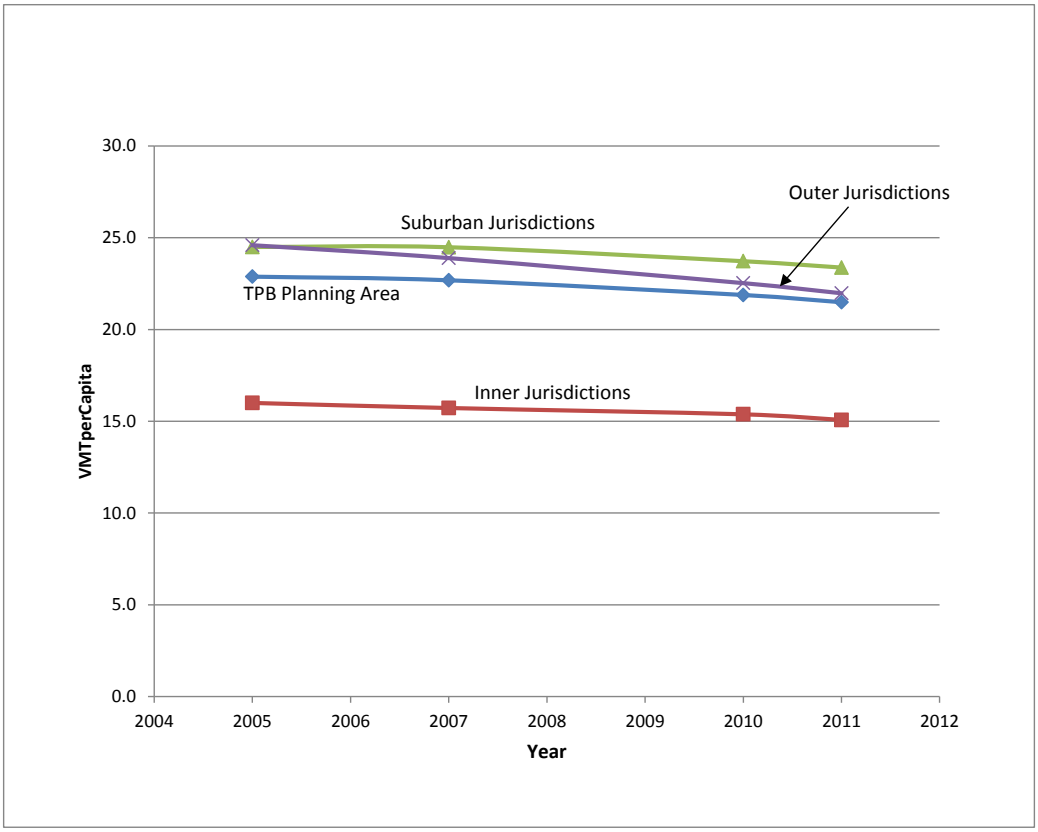


Figure 3: VMT per Capita in the TPB Planning Area, 2005 to 2011



It is not clear whether the decline in the region's VMT per capita is a short-term phenomenon or the beginning of a longer-term change in traveler behavior. Several potential causes can be suggested for the recent downturn in miles traveled per person:

- The global economic recession that began during 2008 has led to a slowing of the national economy and an overall reduction in household travel and commercial travel.
- Periods of fuel price volatility in recent years, particularly during the spring and summer of 2008 when prices spiked locally and nationally, have caused travelers to economize on discretionary travel.
- Internet-based telecommuting and communication technologies are increasingly serving as substitutes for motorized travel. Internet-based commerce is also emerging as an efficient and convenient alternative to motorized shopping trips.
- Residential location and travel preferences of the population segment aged 18-34 (also known as the "Millennials") are quite different than the older "Baby Boomers." Many of the Millennials are attracted to urbanized areas and are more inclined to use non-motorized and transit modes.

Given the recent changes in VMT growth and VMT per capita, it is evident that the TPB's 2010 validation work comes at a time when driving behavior is not following historical patterns. TPB staff will need to continue monitoring existing trends in order to gauge whether longer term changes to the travel model are warranted.

4. Validation Preparation

Prior to the validation analysis, staff spent a considerable amount of time refining the highway network, specifically revisiting facility type and lane coding, and refining centroid connections with respect to the 3,722 TAZ system.[4] During later stages of the validation, additional highway network refinements were implemented. The most prominently network update was a change in the facility type coding for freeways in the District of Columbia. TPB staff noted that the Version 2.3.39 model overestimated vehicle-miles traveled and speculated the speed and capacities associated with freeway facilities in the District were excessive with respect to actual conditions in the District. For example, sections of I-395 in

[4] Initial modifications were documented in a 9/18/12 memorandum from Meseret Seifu to files on the subject: Refinement of facility type codes in the base-year 2010 highway network.

the District are subject to posted speed limits of 40 mph, which is clearly lower than the free-flow freeway speed assumed by the model. Staff decided to code many of the freeways in or near the District as expressways as a means of more accurately reflecting actual operating conditions and for improving VMT performance.

5. Land Activity Validation

Round 8.1 is the currently adopted land activity forecast that is input to the regional travel model. The U.S. Census provides household and population information at fine levels of geography every ten years. At the time of the validation effort, 2010 Census information was available only at the jurisdiction level. Staff obtained Census data from the web,[5] and prepared a comparison of 2010 Round 8.1 households against the 2010 Census (Table 2). The table indicates reasonable agreement for most of the TPB planning members. Larger differences are noted in the Baltimore-area jurisdictions and in some of the exurban Virginia counties, where it is likely that the 2010 Census has not yet been considered in the preparation of local land use data. Overall, the comparison shown in Table 2, and graphically in Figure 4, is reasonable.

[5] American Fact Finder, http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t

Table 2: 2010 Round 8.1 and Census Households, Household Population and Household Size

	2010 Round 8.1			2010 Census			HH Diff.	Pop. Diff.	Size Diff.
Juris.	HHs	HH Pop.	HH Size	HHs	HH Pop.	HH Size	R81 - Cen	R81 - Cen	R81 - Cen
DC	266,707	561,702	2.11	266,707	561,702	2.11	0	0	0.00
Mtg	361,030	959,695	2.66	357,086	962,877	2.70	3,944	-3,182	-0.04
PGeo	304,042	844,092	2.78	304,042	844,092	2.78	0	0	0.00
Arl	98,050	204,735	2.09	98,050	204,735	2.09	0	0	0.00
Alx	68,131	138,131	2.03	68,082	138,139	2.03	49	-8	0.00
Ffx	399,514	1,075,041	2.69	405,075	1,106,770	2.73	-5,561	-31,729	-0.04
Ldn	104,583	311,139	2.98	104,583	311,139	2.98	0	0	0.00
PW	147,819	451,524	3.05	147,819	451,524	3.05	0	0	0.00
Frd	84,800	229,203	2.70	84,800	229,203	2.70	0	0	0.00
How	107,502	279,983	2.60	104,749	284,763	2.72	2,753	-4,780	-0.11
AnnAr	202,314	516,054	2.55	199,378	523,523	2.63	2,936	-7,469	-0.08
Chs	50,950	143,049	2.81	51,214	145,146	2.83	-264	-2,097	-0.03
Car	61,592	171,740	2.79	59,786	163,815	2.74	1,806	7,925	0.05
Calv	32,046	91,026	2.84	30,873	88,087	2.85	1,173	2,939	-0.01
StM	38,870	101,278	2.61	37,604	102,225	2.72	1,266	-947	-0.11
KGeo	8,370	23,257	2.78	8,376	23,283	2.78	-6	-26	0.00
Stf	41,769	125,355	3.00	41,769	125,368	3.00	0	-13	0.00
Spots_Fbrg	43,175	119,749	2.77	51,447	143,563	2.79	-8,272	-23,814	-0.02
Fau	26,871	74,194	2.76	23,658	64,814	2.74	3,213	9,380	0.02
Clk_Jeff	26,496	65,153	2.46	25,440	65,886	2.59	1,056	-733	-0.13
Total	2,474,631	6,486,100	2.62	2,470,538	6,540,654	2.65	4,093	-54,554	-0.03

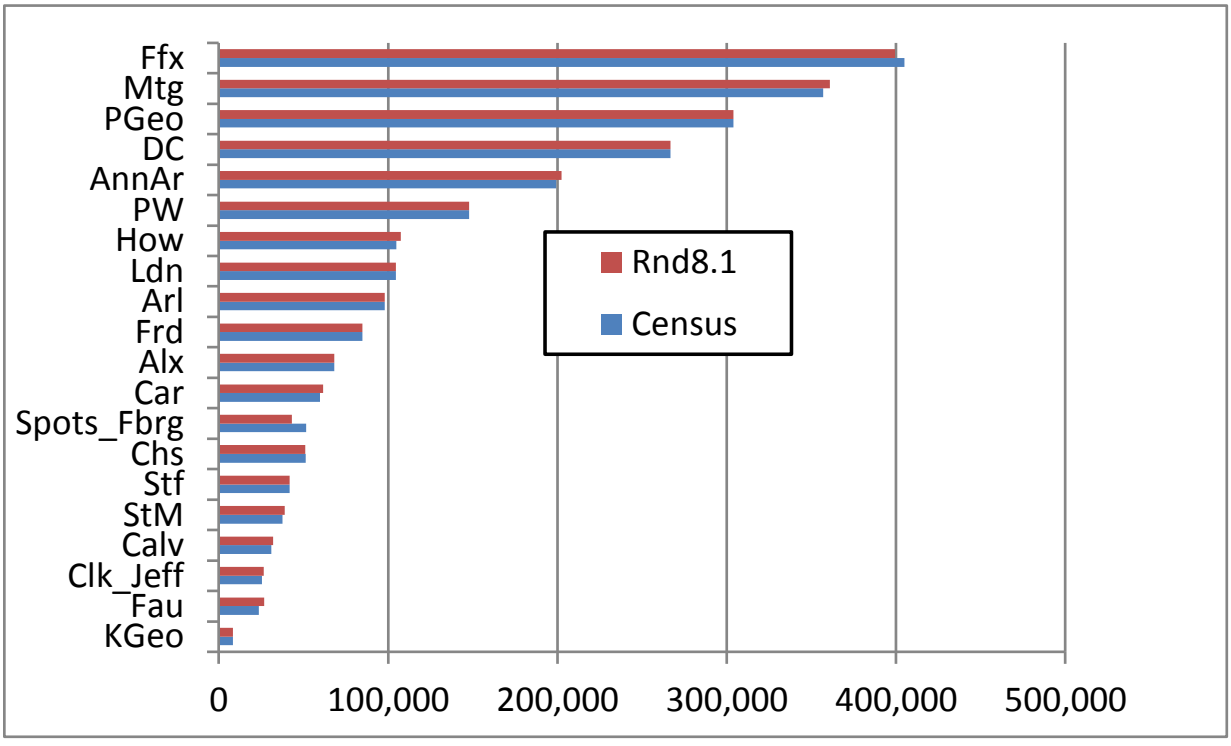


Figure 4: 2010 Households by Jurisdiction: Census vs. Round 8.1 Cooperative Forecasts

TPB staff assembled ACS data to evaluate households by size, income level, and vehicles available. Comparisons of ACS and estimated results are shown on Tables 3 through 5 and Figures 5 through 7.

The ACS is now a replacement to the Census "long form" which has been used in the past to collect detailed household, job, and commuting travel data every ten years. It is important to point out that the ACS data is developed from a continuous data collection process whereby 250,000 households are sampled each month. While this type of collection results in a constant stream of yearly data, there are a few definitional limitations:

1. Whereas the U.S. Census has historically been conducted every ten years during the spring using a substantial sampling rate (1 in 6), the ACS represents data that is collected throughout the year using a lower much lower sampling rate.
2. An implication of the ACS's lower sampling rate is that the yearly data cannot be used to supply household information at fine levels of geography. Yearly data is significant only for areas with a population of 65,000 or more. Jurisdictions with lower population levels must rely on multiple years of ACS data to ensure that the sampled information is meaningful.

Given these limitations, the regional matches shown between modeled distributions and observed ACS appear to be within reasonable tolerances.

Table 3 2010 HH Size Distribution at State Level – Estimated vs. Observed (ACS)

State	Size	1 Psn HHs	2 Psn HHs	3 Psn HHs	4+Psn HHs	Sum
DC	estimated	41.1%	30.4%	13.2%	15.3%	100.0%
	observed	48.0%	27.8%	11.9%	12.3%	100.0%
	Diff.	-6.9%	2.5%	1.3%	3.0%	
MD	estimated	23.1%	30.9%	18.2%	27.8%	100.0%
	observed	24.5%	32.0%	17.3%	26.1%	100.0%
	Diff.	-1.4%	-1.2%	0.9%	1.7%	
VA	estimated	24.4%	30.1%	17.7%	27.8%	100.0%
	observed	23.9%	31.3%	16.5%	28.2%	100.0%
	Diff.	0.5%	-1.2%	1.2%	-0.4%	
Total	estimated	25.6%	30.5%	17.5%	26.4%	100.0%
	observed	26.7%	31.3%	16.4%	25.5%	100.0%
	Diff.	-1.2%	-0.8%	1.0%	0.9%	

Table 4 2010 HH Income Distribution at State Level – Estimated vs. Observed (ACS)

State	Income	Inc. 1	Inc. 2	Inc. 3	Inc. 4	Sum
DC	Estimated	47.0%	29.1%	13.4%	10.6%	100.0%
	Observed	42.2%	27.3%	13.1%	17.4%	100.0%
	Diff.	4.8%	1.9%	0.3%	-6.9%	
MD	Estimated	26.3%	32.1%	21.2%	20.4%	100.0%
	Observed	27.8%	31.6%	20.4%	20.2%	100.0%
	Diff.	-1.5%	0.4%	0.9%	0.2%	
VA	Estimated	23.0%	30.2%	21.9%	24.9%	100.0%
	Observed	21.7%	29.0%	22.4%	26.8%	100.0%
	Diff.	1.3%	1.1%	-0.5%	-1.9%	
Total	Estimated	27.2%	31.0%	20.6%	21.1%	100.0%
	Observed	26.9%	30.2%	20.4%	22.5%	100.0%
	Diff.	0.4%	0.8%	0.2%	-1.4%	

Table 5 2010 HH Vehicle Availability Distribution at State Level – Estimated vs. Observed (ACS)

State		0 Vehs.	1 Veh.	2 Vehs.	3+ Vehs.	Sum
DC	Estimated	38.9%	39.3%	17.4%	4.3%	100.0%
	Observed	35.0%	45.3%	15.7%	4.0%	100.0%
	Diff.	3.9%	-6.0%	1.7%	0.4%	
MD	Estimated	5.0%	28.6%	40.9%	25.5%	100.0%
	Observed	6.7%	30.3%	39.1%	23.8%	100.0%
	Diff.	-1.7%	-1.7%	1.8%	1.7%	
VA	Estimated	5.2%	29.8%	40.2%	24.8%	100.0%
	Observed	4.7%	30.6%	41.0%	23.6%	100.0%
	Diff.	0.4%	-0.8%	-0.8%	1.2%	
Total	Estimated	8.7%	30.2%	38.1%	23.0%	100.0%
	Observed	8.9%	32.0%	37.4%	21.7%	100.0%
	Diff.	-0.2%	-1.7%	0.6%	1.3%	

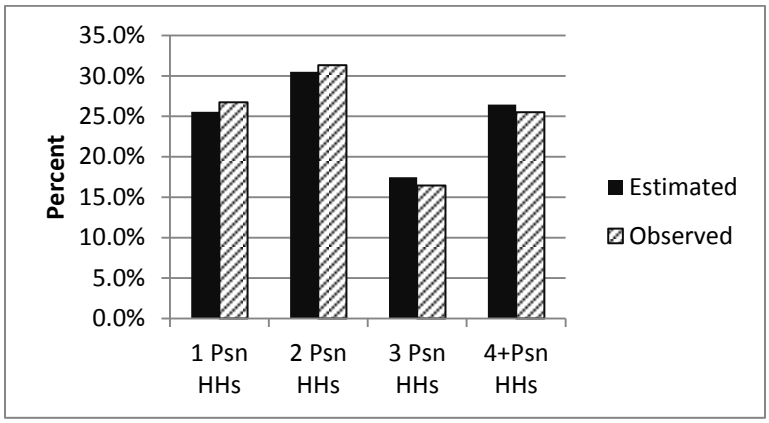


Figure 5 2010 Regional HH Size Distribution – Model vs. ACS Total

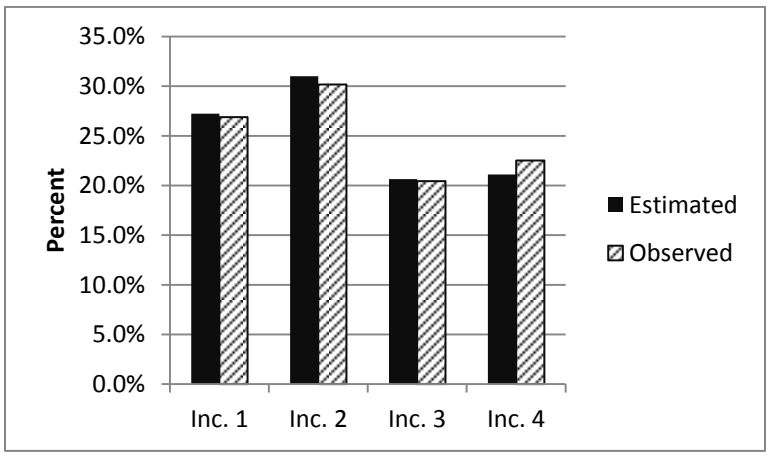


Figure 6 2010 Regional HH Income Distribution - Model vs. ACS Total

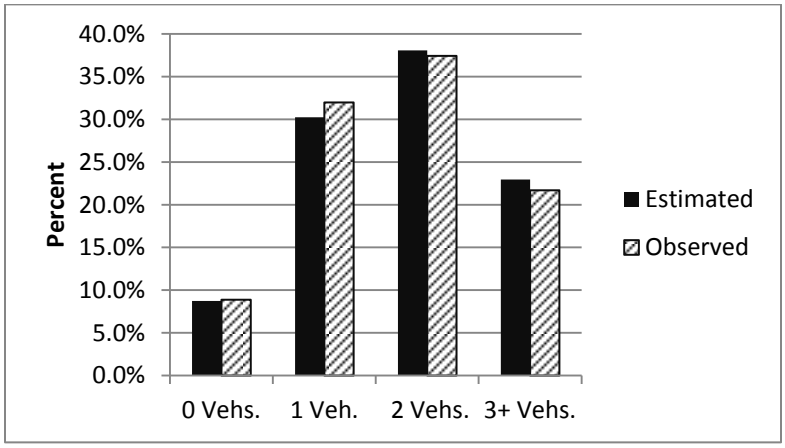


Figure 7 2010 Regional HH Vehicle Availability Distribution - Model vs. ACS Total

6. Non-Motorized Travel Validation

During the spring of 2010 and the fall of 2011, TPB staff began a special ongoing data collection program intended to supplement the TPB's household travel survey (HTS) that was collected during 2007 and 2008. The special data collection effort is known as the Geographically Focused Household Travel Surveys (GFHTS). The data collection program was initiated by the TPB and is currently intended to:

1. Permit more intensive analysis of travel behavior for a wide variety of communities in terms of physical design, land activity density, and travel options at the neighborhood level of analysis;
2. Supply regional planners with information to facilitate land use and transportation planning efforts; and
3. Build a database that permits "before and after" data analysis opportunities for locations that are undergoing major transportation improvements or major shifts in land activity patterns

TPB staff presented an overview of the data collection effort[6] and preliminary results of the surveys to the TPB in May of 2012.[7] The presentation focused on ten areas that had been thus far surveyed and analyzed. The ten areas, listed in Table 6, range in size from about 0.5 to 20 square miles.

[6] May 16, 2012 presentation to the TPB on 2011 TPB Geographically Focused Household Travel Surveys/ Initial Results (Item #9), https://www.mwcog.org/uploads/committee-documents/k11dXlle20120517145044.pdf

Table 6 Geographically-Focused Household Travel Survey Areas

	Geo-Focused Area	Jurisdiction	When Surveyed	Total HHs in Area	Land Area (Sq mi)	No. of TAZs
1	Shirlington	Arlington	Spring 2010	4,200	0.6	3
2	Crystal City Area	Arlington	Spring 2010	9,600	0.7	8
3	Columbia Pike Corridor	Arlington	Spring 2010	15,000	2.5	12
4	Frederick City	Frederick Co.	Fall 2011	26,500	19.8	22
5	Largo	Prince Geo.	Fall 2011	12,200	9.4	20
6	Logan Circle	DC	Fall 2011	23,900	1.1	17
7	Purple Line	Montgom./Prince Geo.	Fall 2011	16,100	4.9	21
8	Reston	Fairfax County	Fall 2011	15,700	8.2	19
9	White Flint	Montgomery Co.	Fall 2011	12,500	4.6	11
10	Woodbridge	Pr. William	Fall 2011	12,900	8.0	19

TPB staff reviewed the daily modal share information from the GFHTS and determined that it was a reasonable basis for assessing modeled mode shares in the ten areas. TPB staff first developed zonal equivalences for each of the focus areas surveyed. In most cases, the zonal alignments corresponded reasonably well to the surveyed boundaries. Table 6 indicates that the number of TAZs associated with the surveyed areas range from 3 to 22. In summarizing the daily mode shares from the model, staff computed shares based on home-based trip purposes only, to ensure that the modeled data reflected strictly the residents of the areas.

A comparison of observed and estimated daily trip shares by focus area is shown in Table 7. In reviewing the data numerically and graphically, the following observations were made:

- While the modeled shares did not match the observed shares perfectly, the overall share graphical patterns were quite similar for each area, within plus or minus 10%.
- Given that the Version 2.3 mode choice model is calibrated to large district-to-district interchanges, the match between estimated and observed transit shares at a sub-area level could not realistically be expected to match exactly. Nonetheless, most of the transit share differences fell within 5%, which was reasonable in the staff's view.
- Staff noted that auto and transit share differences were, in most areas, slightly over-estimated while non-motorized shares were generally under-estimated.

[7] Memorandum, dated May 9, 2012, to the TPB from Robert Griffiths, https://www.mwcog.org/uploads/committee-documents/l11dXl9c20120510093110.pdf.

- Substantial under-estimations in the non-motorized shares were noticed for the Logan Circle, Crystal City, and Purple Line focus areas (each under-estimated by about 15%). These areas are quite diverse in location, density, and socio-economic profile.
- Staff also reviewed the observed non-motorized shares by purpose (work vs. non-work) and determined that the under-estimation of non-motorized trip shares was most pronounced for non-work purposes.

Staff ultimately decided to adjust the Version 2.3 sub-models so that the estimated daily non-motorized shares aligned more closely with the GFHTS shares. The adjustment was applied to all non-work purposes and in higher-density areas (Area Types 1 and 2) which are largely inclusive of the GFHTS study areas. The adjustment to the non-motorized shares was determined using a trial-and-error method. The ultimate adjustment involved raising non-work shares by 30%. So, for example, if an existing non-motorized share for a given non-work trip was 15%, the adjusted share was increased to 19.5% (15% * 1.30).

The comparison of observed and adjusted/estimated daily trip shares by focus area is shown in Table 8. The adjusted model has improved that regional average share of non-motorized trips from -3% to 0%. The 15% under-estimation non-motorized shares noted earlier for the Logan Circle area has been reduced to about a 5%. Unfortunately the adjustment did not improve the non-motorized shares for two of the ten focus areas (Crystal City and Columbia Pike).

Table 7 Estimated and Observed Modal Shares by Focus Area – Before Model Adjustments

	Estimated Shares				Observed Shares				Difference (E-O)		
Focus Area	**Auto**	**Transit**	**NonMotr**	**Sum**	**Auto**	**Transit**	**NonMotr**	**Sum**	**Auto**	**Transit**	**NonMotr**
Logan Circle	0.29	0.21	0.50	1.00	0.20	0.15	0.65	1.00	0.09	0.05	-0.15
Crystal city	0.56	0.25	0.18	1.00	0.46	0.22	0.32	1.00	0.11	0.04	-0.14
Shirlington	0.73	0.14	0.13	1.00	0.71	0.13	0.16	1.00	0.01	0.01	-0.02
Columbia Pike	0.69	0.15	0.16	1.00	0.79	0.10	0.11	1.00	-0.10	0.04	0.05
Purple Line	0.73	0.15	0.12	1.00	0.66	0.07	0.27	1.00	0.08	0.07	-0.15
White Flint	0.79	0.11	0.10	1.00	0.72	0.08	0.20	1.00	0.07	0.03	-0.09
Largo	0.89	0.06	0.05	1.00	0.86	0.04	0.10	1.00	0.03	0.02	-0.05
Reston	0.87	0.05	0.08	1.00	0.82	0.03	0.15	1.00	0.05	0.02	-0.07
Woodbridge	0.92	0.03	0.05	1.00	0.85	0.02	0.13	1.00	0.08	0.01	-0.08
Frederick	0.93	0.01	0.05	1.00	0.86	0.02	0.12	1.00	0.08	-0.01	-0.07
Regional Average	0.86	0.07	0.07	1.00	0.84	0.06	0.10	1.00	0.02	0.00	-0.03

Table 8 Estimated and Observed Modal Shares by Focus Area – After Model Adjustments

	Estimated Shares				Observed Shares				Difference (E-O)		
Focus Area	**Auto**	**Transit**	**NonMotr**	**Sum**	**Auto**	**Transit**	**NonMotr**	**Sum**	**Auto**	**Transit**	**NonMotr**
Logan Circle	0.22	0.18	0.60	1.00	0.20	0.15	0.65	1.00	0.02	0.03	-0.05
Crystal City	0.66	0.17	0.17	1.00	0.46	0.22	0.32	1.00	0.20	-0.05	-0.15
Shirlington	0.70	0.11	0.19	1.00	0.71	0.13	0.16	1.00	-0.01	-0.02	0.03
Columbia Pike	0.65	0.12	0.22	1.00	0.79	0.10	0.11	1.00	-0.14	0.02	0.11
Purple Line	0.71	0.13	0.16	1.00	0.66	0.07	0.27	1.00	0.05	0.06	-0.11
White Flint	0.80	0.08	0.12	1.00	0.72	0.08	0.20	1.00	0.08	0.00	-0.08
Largo	0.87	0.05	0.08	1.00	0.86	0.04	0.10	1.00	0.01	0.01	-0.02
Reston	0.86	0.04	0.10	1.00	0.82	0.03	0.15	1.00	0.04	0.01	-0.05
Woodbridge	0.91	0.02	0.07	1.00	0.85	0.02	0.13	1.00	0.06	0.00	-0.06
Frederick	0.92	0.01	0.07	1.00	0.86	0.02	0.12	1.00	0.06	-0.01	-0.05
Regional Average	0.84	0.05	0.10	1.00	0.84	0.06	0.10	1.00	0.00	-0.01	0.00

7. Highway and Transit Travel Validation

Most of the validation effort focused on the investigation of model tests aimed at improving daily VMT performance at the jurisdiction level and improving screenline crossing performance of the model. The primary performance issues identified where:

1. VMT was over-estimated in the District of Columbia, the City of Alexandria and Loudoun County.
2. Traffic crossings over the Potomac River (Screenline #20) were substantially over-estimated
3. Radial highway screenline crossings within DC (screenline #2 and #4) were over-estimated
4. Several screenline crossings in the “outer ring” of the modeled study area where over-estimated

Some of these noted problems were partially resolved by the changes described above: 1) the adjustment of the non-motorized share sub-model and 2) the re-coding of freeway facility types in the District of Columbia as expressways. These changes, alone, did not result in a complete elimination of the performance issues, but they did move results in the right direction.

Staff undertook a series of sensitivity tests that focused on imposing time penalties on Potomac River bridges. The tests explored the use of time penalties on Potomac River crossings, ranging from 8 to 15 minutes. Staff also considered testing the time penalties with and without bridge-related K-factors and expanding the number of bridges to include bridge penalties (the existing screenline #20 includes only those bridges between, and including, the Capital Beltway bridges). After evaluating the tests, staff decided to use 11-minute time penalties on all screenline-20 bridges and bridges between Loudoun County and Maryland (i.e., the Point of Rocks Bridge and the Route 340 Bridge). All bridge-related K-factors used in the Version 2.3.39 model were considered duplicative and were removed. The final model specification also included a number of refinements that were not validation-related, but were used to improve the model's accuracy, stability and internal consistency. All model tests are documented in a previous memorandum.[8]

Table 9 shows a comparison of estimated and observed (HPMS) VMT at the jurisdiction level. The table shows the modeled results both before and after modeling adjustments (both the non-motorized model update and the use of bridge penalties). The match between estimated and observed VMT at the jurisdiction level should ideally be within 15%. The observed VMT is based on sampled counts collected by the state DOTs, most of which is seasonally adjusted and is therefore subject to a margin of error. The validation effort resulted in a notable improvement to estimated VMT in the District of Columbia, e.g., the estimated–to-observed (E-O) ratio has changed from 1.13 to 0.98. VMT performance in the City of Alexandria has also been improved, from an E-O ratio of 1.25 to 1.14. VMT performance at the MSA level has improved from an E-O ratio of 1.04 to 1.00. VMT performance for the modeled regional has been improved from an E-O ratio of 1.02 to 1.00.

[8] Memorandum from Mark Moran to Ronald Milone, Subject: Updates made to the COG/TPB Version 2.3 Travel Model, from Build 38 to Build 52, May 30, 2013.

Table 9 Total Estimated and Observed (HPMS) VMT by Jurisdiction

Jurisdiction	2010 Observed[1] (a)	2010 Estimate Before Adjust. (b)	2010 Estimate After Adjust (c)	Existing E/O Ratio (b/a)	Validated E/O Ratio (c/a)
District of Columbia	8,218,979	9,277,286	8,057,876	1.13	0.98
Montgomery Co., Md.	19,693,973	21,105,942	20,822,943	1.07	1.06
Prince George's Co., Md.	23,123,014	23,118,892	22,685,984	1.00	0.98
Arlington Co., Va.	4,256,249	4,529,161	3,876,314	1.06	0.91
City of Alexandria, Va.	2,122,476	2,642,544	2,414,208	1.25	1.14
Fairfax Co., Va.	27,221,807	26,320,633	25,418,571	0.97	0.93
Loudoun Co., Va.	6,212,516	6,802,826	6,906,894	1.10	1.11
Prince William Co., Va.	8,573,525	8,979,517	8,876,845	1.05	1.04
Frederick Co., Md.	7,738,356	8,630,040	8,460,471	1.12	1.09
Charles Co., Md.	3,253,562	3,129,606	3,101,335	0.96	0.95
Stafford Co., Va.	3,920,132	4,139,957	4,141,312	1.06	1.06
Calvert Co., Md	2,036,712	1,868,404	1,848,978	0.92	0.91
MSA Subtotal	116,371,301	120,544,808	116,611,731	1.04	1.00
Howard Co., Md.	10,491,370	10,400,008	10,575,990	0.99	1.01
Anne Arundel Co., Md.	14,984,795	14,578,753	14,742,784	0.97	0.98
Carroll Co., Md.	3,354,247	3,931,758	3,999,660	1.17	1.19
City of Fredericksburg, Va.	919,376	824,063	822,610	0.90	0.89
Spotsylvania Co., Va.[2]	3,303,754	2,202,562	2,212,010	0.67	0.67
Clarke Co., Va.	757,688	870,279	926,425	1.15	1.22
Jefferson Co., WVa.	1,094,762	1,245,818	1,213,570	1.14	1.11
Fauquier Co., Va.	3,331,811	3,162,081	3,187,848	0.95	0.96
King George Co., Va.	819,433	722,614	753,741	0.88	0.92
St. Mary's Co., Md.	2,192,055	2,075,399	2,050,833	0.95	0.94
Non-MSA Subtotal	41,249,289	40,013,335	40,485,471	0.97	0.98
Grand Total / Modeled Are	**157,620,591**	**160,558,143**	**157,097,202**	**1.02**	**1.00**

1- Source: County Level HPMS reports from the state DOTs; VMT does not include local facilities

2 - Observed VMT pertains to entire county; estimated VMT pertains to northern portion of county o

The screenline locations used to evaluate regional modeling performance are shown in Figure 8 and Figure 9. Screenline crossing performance is summarized in Table 10. The table includes model performance results for the pre-adjusted and post-adjusted travel model. Note that, although not shown in Table 10, the coverage of ground counts on highway links associated with screenlines is not complete. On average, only two-thirds of the links associated with each screenline include a ground

count. The table indicates notable improvements for screenlines 2, 3, 5, 6 and 20. For example, screenline 20 (Potomac River bridges within the Beltway) went from 42% overestimated to only 7% overestimated.

Table 11 and Table 12 show aggregate VMT performance based on the sampled counts on network links, by facility type and by area type. For about 6,400 directional ground counts (about 20% of all highway links), the E-O VMT ratio is 1.03. The error margins and the estimated and observed distributions by facility type and area type are quite reasonable. The percent Root Mean Square Error (%RMSE) statistics by facility type are shown in Table 13, and appear to be within reasonable tolerances.

Staff also compared estimated daily 2010 Metrorail boardings against daily faregate counts collected by WMATA. An estimated and observed plot of the station-level boardings is shown in Figure 10. The estimated boardings, shown below, are about 3% lower than the observed count. This finding is in line with staff expectations. Since the existing model does not currently include external transit trips, it is reasonable that the model would slightly under-estimate boarding counts. In fact, many of the under-estimated stations shown in Figure 10 are stations that serve a large number of external transit trips (e.g., Union Station, Smithsonian, and National Airport).

Estimated	Observed	Diff. (E-O)	% Diff.
724,021	743,396	-19,375	-3%

Figure 8 Screenline Location Map: Inside of the Capital Beltway

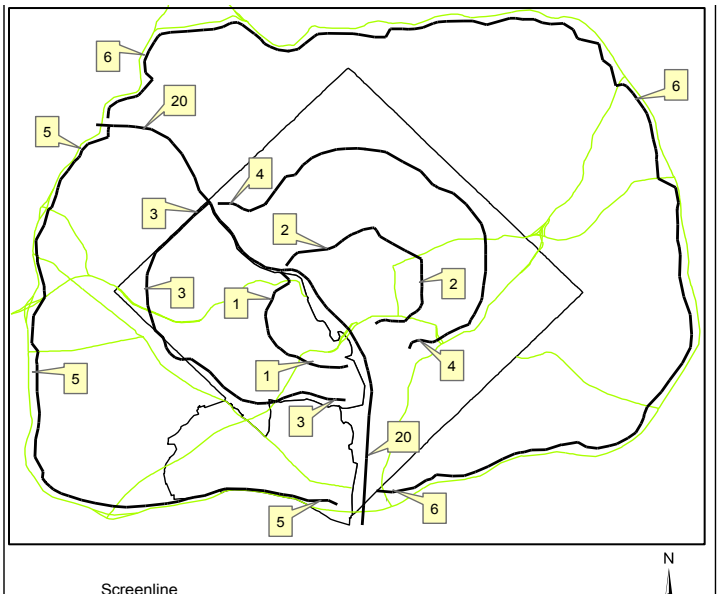


Figure 9 Screenline Location Map: Outside of the Capital Beltway

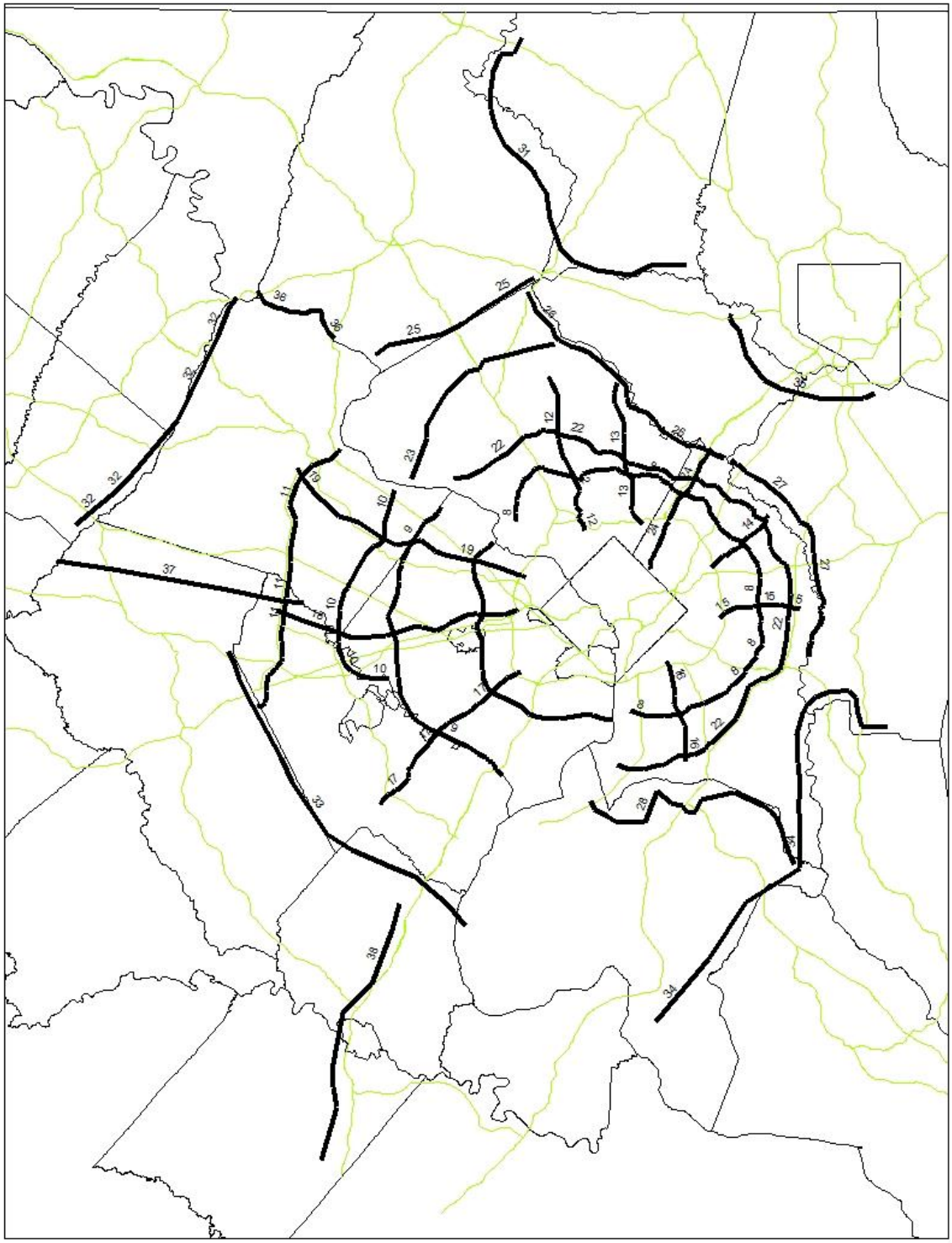


Table 10 Estimated and Observed Screenline Crossings (in thousands)

Screenline	Observed	Estimated Before Adj	Estimated After Adj.	E/O Ratio (Before)	E/O Ratio (After)
1	544	573	478	1.05	0.88
2	759	1,012	920	1.33	1.21
3	830	934	829	1.13	1.00
4	738	877	896	1.19	1.21
5	998	1,095	1,030	1.10	1.03
6	1,464	1,607	1,537	1.10	1.05
7	1,203	1,209	1,158	1.01	0.96
8	1,396	1,564	1,551	1.12	1.11
9	856	871	844	1.02	0.99
10	459	501	499	1.09	1.09
11	293	291	294	0.99	1.00
12	456	449	450	0.98	0.99
13	386	493	501	1.28	1.30
14	333	277	292	0.83	0.88
15	331	271	282	0.82	0.85
16	158	146	147	0.92	0.93
17	487	493	485	1.01	1.00
18	719	671	658	0.93	0.92
19	719	665	640	0.92	0.89
20	846	1,206	903	1.42	1.07
22	1,423	1,561	1,550	1.10	1.09
23	184	229	231	1.24	1.25
24	433	386	376	0.89	0.87
25	99	128	127	1.29	1.28
26	37	73	75	1.94	2.01
27	235	291	288	1.24	1.22
28	177	140	137	0.79	0.78
31	76	170	174	2.24	2.29
32	89	87	123	0.98	1.37
33	261	315	315	1.21	1.21
34	133	138	153	1.04	1.15
35	951	854	855	0.90	0.90
36	47	59	77	1.25	1.64
37	24	34	35	1.45	1.48
38	264	176	177	0.67	0.67
	18,409	**19,845**	**19,090**	**1.08**	**1.04**

Table 11 Estimated and Observed VMT Based on Link Counts by Facility Type

	Ground Count Coverage			VMT (Based on Count Sample)		Error		Distribution	
Facility Type	Hwy. Links	Links w/ Counts	Percent	Estimated	Observed	Diff.	Percent	Estimated	Observed
Freeway	2,489	565	22.7%	33,505,890	31,309,209	2,196,681	7.0%	49.4%	47.6%
Major Art	6,828	1,919	28.1%	16,421,719	15,966,098	455,621	2.9%	24.2%	24.3%
Minor Art	11,376	2,753	24.2%	11,657,746	11,290,670	367,076	3.3%	17.2%	17.2%
Collector	10,383	926	8.9%	1,553,639	2,319,733	-766,094	-33.0%	2.3%	3.5%
Expressway	579	203	35.1%	4,604,687	4,845,147	-240,460	-5.0%	6.8%	7.4%
Ramp	744	2	0.3%	23,045	31,223	-8,178	-26.2%	0.0%	0.0%
Total	32,399	6,368	19.7%	67,766,726	65,762,080	2,004,646	3.0%	100.0%	100.0%

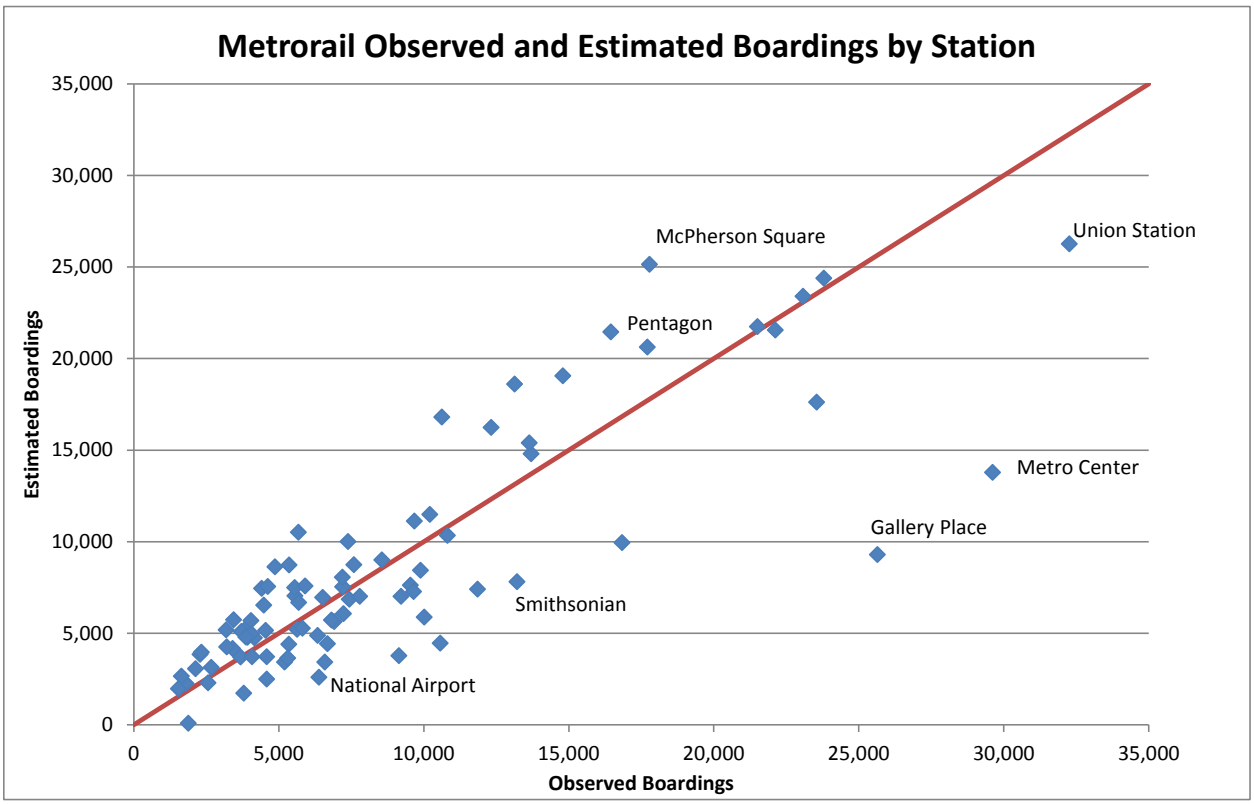
Table 12 Estimated and Observed VMT Based on Link Counts by Area Type

	Ground Count Coverage			VMT		Error		Distribution	
Area Type	Hwy. Links	Links w/ Counts	Percent	Estimated	Observed	Diff.	Percent	Estimated	Observed
AT 1 (CBD)	3,456	513	14.8%	1,563,501	1,564,198	-697	0.0%	2.3%	2.4%
AT 2	7,824	1,364	17.4%	8,898,107	9,476,093	-577,986	-6.1%	13.1%	14.4%
AT 3	5,712	1,261	22.1%	16,081,372	16,579,275	-497,903	-3.0%	23.7%	25.2%
AT 4	4,127	867	21.0%	8,690,653	8,719,430	-28,777	-0.3%	12.8%	13.3%
AT 5	5,231	1,144	21.9%	17,627,473	16,259,798	1,367,675	8.4%	26.0%	24.7%
AT 6 (Exurban)	6,049	1,219	20.2%	14,905,620	13,163,285	1,742,335	13.2%	22.0%	20.0%
Total	32,399	6,368	19.7%	67,766,726	65,762,079	2,004,647	3.0%	100.0%	100.0%

Table 13 Percent Root Mean Square Error by Facility Type

Facility Type:	No. Obs	Pct_RMSE
Freeway	565	20.91
Major Art	1,919	37.93
Minor Art	2,753	50.33
Collectors	926	72.91
Expressway	203	29.4
Ramp	2	26.19
	6,368	39.56

Figure 10 2010 Estimated and Observed Daily Metrorail Boardings by Station



8. Conclusion

This memorandum has reviewed the validation process and results of the Version 2.3 Model using available 2010 data. The validation process has resulted in changes to the existing model, including modifications to increase the share of non-work, non-motorized travel and the use of time penalties imposed on Potomac River bridges. The highway network coding conventions have also been updated such that interstate-type facilities in the District of Columbia are now coded as expressways, in order to more closely represent actual operating conditions. This memorandum has also presented national and local traffic monitoring data that indicates that regional driving on a per capita basis has been decreasing in recent years. The reason for this decrease is not clear, but ongoing monitoring of VMT must continue to determine whether or not the drop in per capita driving is temporary or the beginning of a longer-term trend.

APPENDIX E

Documentation of Mobile Source Emissions

MOBILE EMISSIONS INPUT DEVELOPMENT

TECHNICAL DOCUMENTATION

JULY 15, 2013

LIST OF REFERENCES

1. VinPOWER, Copyright: ESP Data Solutions Inc., Product version 4.0.0.16

2. RegistrationDistributionConverter_Veh16
   http://www.epa.gov/oms/models/moves/tools.htm

3. AAD VMT Calculator HPMS.XLS
   http://www.epa.gov/oms/models/moves/tools.htm

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BACKGROUND

This technical report documents how the various input categories needed for successful MOVES model runs were developed. It covers the development of both travel-related inputs, which are based on the MWCOG/TPB regional travel demand model (Version 2.3. 52), and non-travel related inputs (i.e., meteorology, fuel supply and formulation, and Inspection/Maintenance Programs), which were provided by agencies from the District of Columbia, the Commonwealth of Virginia, and the state of Maryland.

INPUT DATA DEVELOPMENT

Input data from ten broad categories were used in the MOVES County Manager in order to generate the mobile emissions inventories. The modeling sequence that was followed is graphically illustrated in Figure 1.

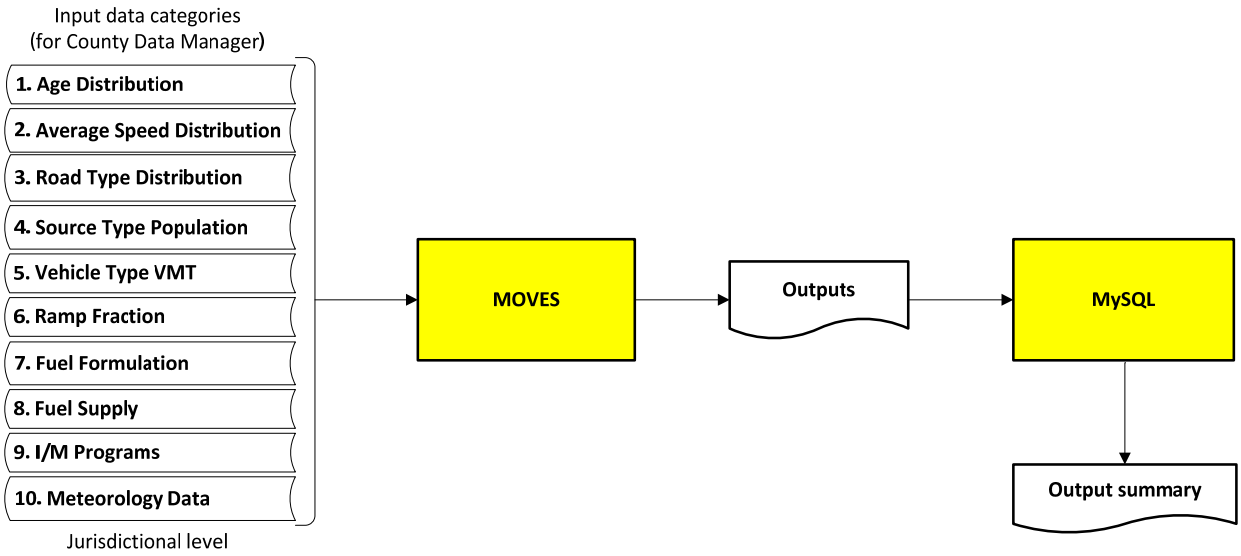

Figure 1– MOVES Modeling Process

Input data were obtained from a variety of sources (Table 1). Special emphasis was placed on the inclusion of local data – where available – instead of MOVES default values, which were derived from national data as opposed to regional/local data.

No	Data Category	Data Table Name	Locality	Methodology
1	Age Distribution	**sourceTypeAgeDistribution**	County	based on VIN
2	Average Speed Distribution	**avgSpeedDistribution**	County	based on travel demand model's post-processor outputs + school bus/refuse truck data from Fairfax Co. + transit bus from WMATA
3	Road Type Distribution	**roadTypeDistribution**	County	based on travel demand model's post-processor outputs
4	Source Type Population	**sourceTypeYear**	County	based on CLRP Vehicle Projection & VIN
5	Vehicle Type VMT	**HPMSVTypeYear**	County	based on TDM's post-processor outputs
		monthVMTFraction	Region	based on Regional Data
		dayVMTFraction	Region	based on Regional Data
		hourVMTFraction	Region	based on Regional Data
6	Ramp Fraction	**roadType**	Region	8% of the urban/rural restricted access roads
7	Fuel	**FuelSupply**	State	from state air agency (state-wide data)
8		**FuelFormulation**	State	from state air agency (state-wide data)
9	I/M Programs	**IMCoverage**	State	from state air agency (state-wide data)
10	Meteorology Data	**zoneMonthHour**	State	from DEP (region-wide data)

Table 1– MOVES Input Categories

AGE DISTRIBUTION

On a triennial basis since 2005, the Departments of Motor Vehicles (DMV) of the District of Columbia, Maryland and Virginia supplied MWCOG/TPB vehicle registration data for use in Air Quality Conformity Determinations. These databases contain a broad range of attributes of the vehicles registered in the jurisdictions of the PM2.5 Non-Attainment area.

Prior to being used as inputs in MOVES model runs, the "raw" vehicle registration data – also known as Vehicle Identification Numbers (VIN) – were decoded using a commercial decoding software program (1). Due to the structure of the decoding software program, the VIN database decoding was achieved in two steps: (1) the "raw" data was decoded to a Mobile 6.2-compatible format (vehicle populations distributions stratified in 16 vehicle classes and in 25 vehicle age categories); and (2) the Mobile 6.2-compatible vehicle population distributions were converted to a MOVES-compatible format (vehicle population distributions stratified in 13 vehicle classes and in 31 vehicle age categories) using an EPA-developed converter (2) while following the process recommended by EPA. The vehicle population mapping process is shown in greater detail in Table A1 in the Appendix of this report.

The vehicle population databases were reviewed by the MWCOG/TPB technical oversight committees and went through public comments prior to becoming approved for transportation planning applications. The 2011 VIN database was formally approved by MWCOG/TPB concurrently with the 2012 CLRP Air Quality Conformity Determination (July 2012). Since the analyses include year 2002 as one of the milestone years, year 2002 vehicle population data was also used. Such data was originally provided by the state agencies of the District of Columbia, the Commonwealth of Virginia and the state of Maryland in Mobile 6.2-format for use in Air Quality Conformity Determination analyses. This data was also converted to MOVES-compatible format for inclusion in MOVES model runs. Base year 2002 emissions inventories were based on 2002 VIN data while years' 2015, 2017, 2025, 2030 emissions inventories were based on 2011 VIN data.

AVERAGE SPEED DISTRIBUTION

The MWCOG/TPB regional travel demand model derives travel-related outputs – such as VHT -- used for Air Quality Conformity by six travel markets:

1. Light Duty Vehicles/Single Occupancy Vehicles (SOV)
2. Light Duty Vehicles/High Occupancy Vehicles (HOV2)
3. Light Duty Vehicles/High Occupancy Vehicles (HOV3+)
4. Airport Passenger Trips
5. Commercial Vehicles
6. Trucks

A custom post processor (i.e., the V2.3 Post Processor) was developed in order to account for Vehicle Hours of Travel (VHT) stratified by three major vehicle type categories: passenger vehicles, commercial vehicles and heavy duty vehicles. The conversion of the VHT totals by the six travel markets to VHT totals by the three major vehicle type categories was done as follows:

- Passenger Vehicles (PVs) = SOV + HOV2 + HOV3+ + Airport Passenger Trips
- Commercial Vehicles (CVs) = Commercial Vehicles
- Heavy Duty Vehicles (HDVs) = Trucks

For each of the three major vehicle type categories, hourly VHT distributions were derived by MOVES-compatible speed bins, by jurisdiction (i.e., county), and road type. MOVES calls for 16 speed bins along a continuous spectrum of speeds ranging from a low value of 2.5 mph to a high value of 75 mph in increments of 5 mph. MOVES also calls for four road types: restricted access facilities (i.e., freeways and expressways) in urban and rural settings and unrestricted access facilities (i.e., major/minor arterials, collectors and local roads) in urban and rural settings. Average Speed Distribution by the 16 MOVES-compatible speed bins was achieved as follows:

VHT Distribution to Restricted Facilities (all vehicle type categories):

- Weekday VHT Distribution:
  - All Day: Hourly distribution for all vehicles (as derived from the V2.3 Post Processor)
- Weekend VHT Distribution:
  - 11:00 am – 7:00 pm: Distribution across the 13 MOVES-compatible vehicle type categories reflecting the 3:00 pm hour on a weekday (as derived from the V2.3 Post Processor)
  - 7:01 pm – 10:59 am: Distribution across the 13 MOVES-compatible vehicle type categories reflecting the 12:00 am hour on a weekday (as derived from the V2.3 Post Processor)

VHT Distribution to Unrestricted Facilities (all vehicle type categories plus Intercity Bus). Refuse Trucks, School Buses and Transit Buses were accounted separately in a section that follows.

- Weekday VHT Distribution:
  - All Day: : Hourly distribution for all vehicles (as derived from the V2.3 Post Processor)

- Weekend VHT Distribution:
  - 11:00 am – 7:00 pm: Distribution across the 13 MOVES-compatible vehicle type categories reflecting the 3:00 pm hour on a weekday (as derived from the V2.3 Post Processor)
  - 7:01 pm – 10:59 am: Distribution across the 13 MOVES-compatible vehicle type categories reflecting the 12:00 am hour on a weekday (as derived from the V2.3 Post Processor)

VHT Distribution to Unrestricted Facilities of Refuse Trucks:

Refuse Trucks operate on a 3-phase cycle: Phase 1 is the period of driving from the dispatch garage to trash collection sites; Phase 2 is the period of the actual trash/recycle collection; Phase 3 is the period of driving back to transfer stations. Based on the local data provided by Fairfax County, VA, the average speed of Phase 1 and Phase 3 is within the MOVES Speed Bin 6 range, and the average speed of Phase 2 is within the MOVES Speed Bin 2.

Weekday VHT Distribution (Table 2):
- 5:00 am–5:00 pm (Trash Collection): VHT hourly distribution consists of Phases 1, 2 and 3.
- 5:00 pm–5:00 am (On Road Phase): VHT hourly distribution consists of Phase 2.

Speed Bins	Speed Range	5:00 AM - 5:00 PM	5:01 PM - 4:59 AM
1	speed < 2.5mph	0.00%	0.00%
2	2.5mph <= speed < 7.5mph	62.65%	0.00%
3	7.5mph <= speed < 12.5mph	0.00%	0.00%
4	12.5mph <= speed < 17.5mph	0.00%	0.00%
5	17.5mph <= speed <22.5mph	0.00%	0.00%
6	22.5mph <= speed < 27.5mph	37.35%	100.00%
7	27.5mph <= speed < 32.5mph	0.00%	0.00%
8	32.5mph <= speed < 37.5mph	0.00%	0.00%
9	37.5mph <= speed < 42.5mph	0.00%	0.00%
10	42.5mph <= speed < 47.5mph	0.00%	0.00%
11	47.5mph <= speed < 52.5mph	0.00%	0.00%
12	52.5mph <= speed < 57.5mph	0.00%	0.00%
13	57.5mph <= speed < 62.5mph	0.00%	0.00%
14	62.5mph <= speed < 67.5mph	0.00%	0.00%
15	67.5mph <= speed < 72.5mph	0.00%	0.00%
16	72.5mph <= speed	0.00%	0.00%

Source: Fairfax Co., VA

Table 2– VHT Distribution for Refuse Trucks (Average Weekday)

Weekend VHT Distribution:
- All Day: VHT distribution made up of Phase 1 and Phase 3 (on road phases)

VHT Distribution to Unrestricted Facilities of School Buses:

Weekday VHT Distribution:

- 6:00 am–6:00 pm: VHT distribution from Fairfax County, VA school bus speed data. (Table 3)
- 6:00 pm–6:00 am: VHT distribution of heavy duty vehicles (as derived from the V2.3 Post Processor)

Weekend VHT Distribution:

- 11:00 am–7:00 pm: VHT Distribution of heavy duty vehicles at 3:00 pm on a weekday (as derived from the V2.3 Post Processor)
- 7:00 pm – 11:00 am: VHT Distribution of heavy duty vehicles at 12:00 am on a weekday (as derived from the V2.3 Post Processor)

VHT Distribution to Unrestricted Facilities of Transit Buses

Weekday VHT Distribution (Table 4):

- 6:00 am–9:00 am: VHT distribution from WMATA's transit bus speed data of AM peak period
- 9:00 am–3:00 pm: VHT distribution from WMATA's transit bus speed data of off-peak period
- 3:00 pm – 6:00 pm: VHT distribution from WMATA's transit bus speed data of PM peak period
- 6:00pm-6:00 am: VHT distribution from WMATA's transit bus speed data of off-peak period

Weekend VHT Distribution (Table 4):

- All Day: VHT distribution from WMATA's transit bus speed data of off-peak period.

ROAD TYPE DISTRIBUTION

The Version 2.3 Post Processor accounts for VMT by three vehicle types: passenger vehicles, commercial vehicles and heavy duty vehicles. In the MOVES environment, 13 vehicle type categories are identified. The challenge was to "expand" the VMT allocations (as percentages of the total) from the three vehicle type categories to the 13 MOVES-compatible vehicle type categories. The Version 2.3 Post Processor also accounts for VMT by two facility types: restricted access facilities (i.e., freeways and expressways), and unrestricted access facilities (i.e., major/minor arterials, collectors and local roads). The VMT allocated to each of the three vehicle type categories is also stratified by the two facility types.

The VMT distribution by Vehicle Class Type and Facility Type was done as follows:

- Passenger Vehicles (PVs) VMT percentages (by facility type): From the V2.3 Post Processor applied to motorcycles, passenger cars and passenger trucks
- Commercial Vehicles (CVs) VMT percentages (by facility type): From the V2.3 Post Processor applied to light commercial trucks
- Heavy Duty Vehicles (HDVs) VMT percentages (by facility type): From the V2.3 Post Processor applied to single unit short haul and long haul trucks, and combination short and long haul trucks
- Refuse Trucks and Motor Homes: MOVES default percent value
- Local network VMT percentages – based on local data supplied by bus operators – were applied to school, transit and intercity buses

Speed Bins	Speed Range	Bus Trip 1	Bus Trip 2	Bus Trip 3	Bus Trip 4	Bus Trip 5	Bus Trip 6	Bus Trip 7	Bus Trip 8	Bus Trip 9	Bus Trip 10	Bus Trip 11	Weighted Average
1	speed < 2.5mph	35.20%	24.30%	17.58%	14.65%	7.90%	16.11%	6.65%	18.30%	25.76%	16.18%	17.67%	**19.21%**
2	2.5mph <= speed < 7.5mph	10.87%	11.57%	6.45%	11.04%	29.89%	20.20%	44.83%	11.01%	9.68%	6.49%	9.12%	**14.39%**
3	7.5mph <= speed < 12.5mph	10.90%	9.35%	12.89%	6.50%	26.31%	17.69%	3.34%	9.12%	9.52%	6.69%	8.69%	**10.92%**
4	12.5mph <= speed < 17.5mph	8.81%	9.18%	8.59%	9.45%	6.00%	11.13%	23.76%	10.12%	9.98%	8.46%	10.32%	**10.37%**
5	17.5mph <= speed <22.5mph	5.01%	10.15%	5.18%	14.04%	3.04%	5.94%	4.09%	10.36%	7.57%	9.74%	12.02%	**8.30%**
6	22.5mph <= speed < 27.5mph	8.91%	8.55%	11.62%	12.59%	6.18%	5.30%	3.54%	7.29%	7.11%	8.87%	11.73%	**8.13%**
7	27.5mph <= speed < 32.5mph	8.79%	7.97%	14.36%	11.28%	5.86%	13.33%	6.35%	9.43%	5.37%	10.06%	10.20%	**9.41%**
8	32.5mph <= speed < 37.5mph	5.33%	9.10%	5.86%	13.43%	7.62%	3.32%	6.36%	13.79%	8.68%	12.04%	6.81%	**7.81%**
9	37.5mph <= speed < 42.5mph	3.43%	6.89%	8.69%	7.02%	4.80%	3.76%	1.07%	7.94%	9.79%	13.81%	8.16%	**7.22%**
10	42.5mph <= speed < 47.5mph	1.72%	2.44%	8.79%	0.00%	2.40%	2.87%	0.00%	1.31%	5.83%	5.15%	4.75%	**3.42%**
11	47.5mph <= speed < 52.5mph	0.68%	0.00%	0.00%	0.00%	0.00%	0.36%	0.00%	0.67%	0.31%	2.27%	0.36%	**0.59%**
12	52.5mph <= speed < 57.5mph	0.34%	0.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.67%	0.41%	0.24%	0.18%	**0.23%**
13	57.5mph <= speed < 62.5mph	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**0.00%**
14	62.5mph <= speed < 67.5mph	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**0.00%**
15	67.5mph <= speed < 72.5mph	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**0.00%**
16	72.5mph <= speed	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**0.00%**

Source: Fairfax Co., VA

Table 3– VHT Distribution of School Buses (6:00 am – 6:00 pm)

avgSpeedBinID	avgBinSpeed	avgSpeedBinDesc	6:00AM-9:00AM	3:00PM-6:00PM	9:01AM-2:59PM/6:01PM-5:59AM
1	2.5	speed < 2.5mph	**9.94%**	**9.10%**	**7.92%**
2	5	2.5mph <= speed < 7.5mph	**13.79%**	**18.95%**	**14.49%**
3	10	7.5mph <= speed < 12.5mph	**34.07%**	**37.86%**	**31.36%**
4	15	12.5mph <= speed < 17.5mph	**28.52%**	**23.97%**	**29.17%**
5	20	17.5mph <= speed <22.5mph	**10.02%**	**5.92%**	**10.77%**
6	25	22.5mph <= speed < 27.5mph	**1.88%**	**1.84%**	**3.91%**
7	30	27.5mph <= speed < 32.5mph	**0.92%**	**0.85%**	**1.04%**
8	35	32.5mph <= speed < 37.5mph	**0.34%**	**0.60%**	**0.72%**
9	40	37.5mph <= speed < 42.5mph	**0.14%**	**0.50%**	**0.35%**
10	45	42.5mph <= speed < 47.5mph	**0.05%**	**0.15%**	**0.15%**
11	50	47.5mph <= speed < 52.5mph	**0.31%**	**0.28%**	**0.06%**
12	55	52.5mph <= speed < 57.5mph	**0.00%**	**0.00%**	**0.06%**
13	60	57.5mph <= speed < 62.5mph	**0.00%**	**0.00%**	**0.00%**
14	65	62.5mph <= speed < 67.5mph	**0.00%**	**0.00%**	**0.00%**
15	70	67.5mph <= speed < 72.5mph	**0.00%**	**0.00%**	**0.00%**
16	75	72.5mph <= speed	**0.00%**	**0.00%**	**0.00%**

Source: Washington Metropolitan Area Transit Authority (WMATA)

Table 4– VHT Distribution of Transit Buses

Urban versus rural percentage split factors were subsequently applied to differentiate VMT allocations between urban and rural facilities. These factors varied by jurisdiction as they were based on the latest Highway Performance Monitoring System (HPMS) VMT data provided by the three state transportation agencies. Figure 2 graphically illustrates the process that was followed to allocated VMT percentages by vehicle type class and road type in a format that is MOVES-compatible.

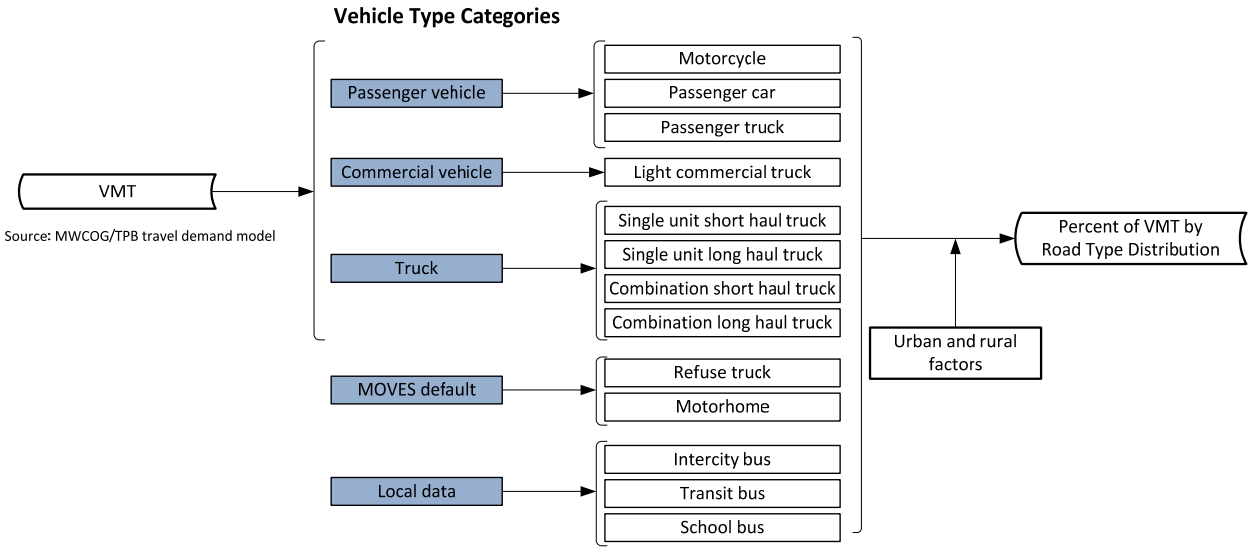

Figure 2– VMT Distribution Development Process

SOURCE TYPE POPULATION

The analysis years span a long period during which the composition, age and characteristics of the regional vehicle fleet vary considerably. Therefore, different vehicle population profiles were used as basis in the development of mobile emissions inventories. Specifically, 2002 VIN profile was used for year 2002 and 2011 VIN profile was used for years 2015, 2017, 2025, 2030 and 2040.

Each vehicle population profile reflects an actual (and unique) composition of the regional vehicle fleet at a given point in time. While modest changes in the vehicle type distributions were observed over time - reflecting the evolving consumer preferences towards passenger cars or SUVs -- substantial changes in the vehicle age distributions were observed over time, with the most recent vehicle population profile (2011 VIN) exhibiting the oldest average age. Staring with year 2002 VIN data and continuing with year 2011 VIN data, the "raw" data was decoded using a commercial decoding software program. Since the "raw" data were a 100-percent sample of the registered vehicles in the non-attainment area no further data expansion was needed.

The 2011 VIN vehicle population profile – by jurisdiction -- was projected to the analysis years using linear growth factors, unique to each jurisdiction since they were derived from local data. The projected vehicle population distributions – composition and age -- were converted to a MOVES-compatible format (i.e., 13 MOVES vehicle types) using the standard EPA-developed vehicle population mapping table (Table A1 in the Appendix section of this report). Figure 3 graphically illustrates the process.

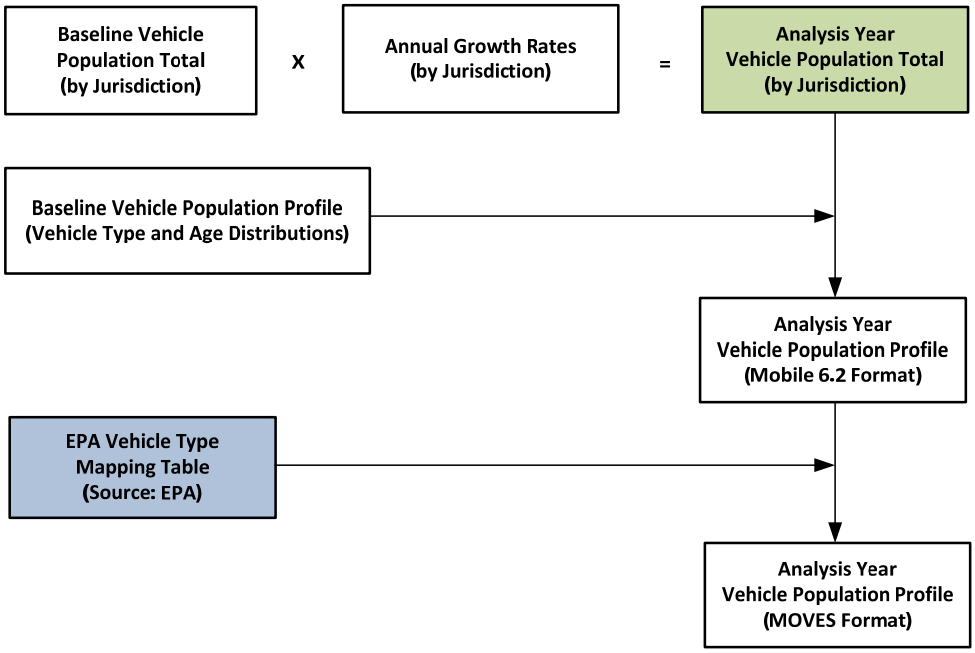

Figure 3– Source Type Population Development Process

VEHICLE TYPE VMT

MOVES requires annual VMT by six Highway Performance Monitoring System (HPMS) vehicle types instead of the 13 MOVES vehicle types. The V2.3 Post Processor produces average annual weekday VMT estimates by three vehicle types: passenger vehicles, commercial vehicles and heavy duty vehicles. Based on the VMT percent by 13 HPMS vehicle types and the vehicle registration data, average annual weekday VMT in three vehicle types from the V2.3 post processor and the local bus, VMT estimates are split into six HPMS vehicle types.

The average annual weekday VMT by six HPMS vehicle types is then fed into the EPA-provided annual VMT converter (AAD VMT Calculator HPMS.XLS) [3] with local monthly adjustment factors and weekend-day adjustment factors. The converter develops annual VMT in six HPMS vehicle types required as an input to MOVES with two additional outputs (i.e., 'monthVMTfraction' and 'dayVMTfraction'). The local "hourlyVMTfraction" is also provided as part of the annual VMT input.

RAMP FRACTION

Local data was used to estimate the local ramp fraction using a method approved by the MOVES Task Force. The locally-derived percentage is equal to 8 percent of VHT, the same as the MOVES default value.

METEOROLOGY

Meteorology data used in a conformity analysis for a particular pollutant are the same as those used in the State Implementation Plan (SIP) for each pollutant. SIPs often precede conformity analyses by several years and during the interim years the emissions estimating models could change. This is the case with the 2013 CLRP and FY2013-18 TIP Air Quality Conformity Determination. As the first conformity cycle to be conducted using MOVES, it was necessary that previously used -- MOBILE6.2-compatible -- meteorology data be converted to a MOVES-compatible format. Therefore, meteorology data that were previously used in the Ozone SIP, PM2.5 SIP, and CO Maintenance Plans, which were in MOBILE6.2 format, were converted to MOVES format. Details of the methodologies used for these conversions are described in the memorandum titled "Development of Meterorology Inputs for Existing Conformity Analyses (Ozone & PM2.5 – 1997 Standards, CO – 1971 Standard", drafted/presented to the MOVES Task Force by Sunil Kumar on July 20, 2013. The hourly temperature and relative humidity percentages – by pollutant -- are exhibited Table 5.

The applicable meteorology data are as follows:

- Ozone (VOC and NOx): Meteorology data used in the Ozone SIP (submitted to EPA in May 2007) for the 1997 ozone standard

- Direct PM2.5: In the absence of approved PM2.5 budgets, the conformity regulations allow for a test showing that forecast year PM2.5 emissions inventories do not exceed year 2002 levels. Therefore, meteorology data used for year 2002 is from the PM2.5 SIP (submitted to EPA in March 2008, but never approved) for the 1997 PM2.5 standard.

- Winter CO: Temperature data used in the CO Maintenance SIP (submitted to EPA in September 1995) is from the 1971 CO standard. Since the CO Maintenance Plan did not use relative humidity as an input, hourly relative humidity estimates were developed by MWAQC staff for use in CO conformity analyses.

	Ozone Conformity (1997 Standard)		PM2.5 Conformity (1997 Standard)						CO Conformity (1971 Standard)	
			Winter Season		Summer Season		Fall Season			
Hours	Temp (°F)	Relative Humidity (%)	Temp (°F)	Relative Humidity (%)	Temp (°F)	Relative Humidity (%)	Temp (°F)	Relative Humidity (%)	Temp (°F)	Relative Humidity (%)
12:00 am	76.7	78.1	40.6	65.0	68.0	81.1	45.0	74.9	37.3	70.5
1:00 am	75.4	80.9	39.8	66.5	67.3	82.5	44.6	75.8	36.2	70.6
2:00 am	74.9	79.5	39.0	68.0	66.6	83.5	44.1	76.8	35.3	71.6
3:00 am	74.7	79.4	38.2	69.3	66.2	84.3	43.6	78.1	34.6	72.4
4:00 am	74.2	79.3	37.6	71.0	65.8	84.7	43.2	78.1	34.1	74.4
5:00 am	73.6	81.1	37.2	72.0	65.3	85.5	42.7	79.1	33.5	74.1
6:00 am	70.7	84.0	36.9	72.4	65.7	85.1	42.4	78.9	33.0	75.0
7:00 am	74.3	76.5	37.4	71.7	67.6	81.0	42.6	78.7	33.4	76.8
8:00 am	78.6	66.7	38.9	68.2	69.9	76.0	43.9	77.1	35.9	75.1
9:00 am	82.3	59.3	41.2	63.4	72.3	70.4	46.3	71.6	39.9	71.3
10:00 am	85.5	52.9	43.4	58.1	74.5	65.1	48.8	65.8	44.0	66.9
11:00 am	88.1	48.8	45.5	54.2	76.3	60.6	50.7	60.8	47.5	61.0
12:00 pm	90.0	45.0	47.2	50.7	77.9	57.6	52.4	56.6	50.6	58.4
1:00 pm	91.2	42.1	48.6	48.1	78.9	55.2	53.6	53.9	52.3	54.6
2:00 pm	91.9	42.2	49.7	46.5	79.5	53.6	54.2	52.7	52.8	52.9
3:00 pm	92.5	43.1	50.2	45.5	79.5	53.6	54.3	52.6	53.0	51.5
4:00 pm	92.1	47.3	50.2	45.5	79.1	54.5	53.7	53.9	52.6	51.9
5:00 pm	91.0	43.6	49.3	47.1	78.4	55.9	52.0	57.2	51.4	54.9
6:00 pm	89.2	47.6	47.5	49.9	76.9	59.2	50.1	61.7	49.4	57.0
7:00 pm	86.7	52.3	45.8	53.4	74.7	64.2	48.8	65.1	46.8	60.0
8:00 pm	82.8	60.4	44.3	58.9	72.5	69.8	47.7	67.5	44.3	62.7
9:00 pm	80.3	67.2	43.1	59.4	71.2	73.5	46.9	70.4	42.0	65.3
10:00 pm	78.6	72.2	42.3	60.8	69.9	76.7	46.3	71.6	40.4	66.9
11:00 pm	77.7	74.4	41.4	63.0	68.9	79.2	45.6	73.4	38.8	67.8

Table 5– Meteorology Data (Temperatures & Relative Humidity)

FUEL SUPPLY & FORMULATION

The District of Columbia, Maryland, and Virginia provided fuel characteristics data for all analysis years in MOVES-ready format. INSPECTION/MAINTENANCE (I/M) PROGRAMS

The District of Columbia, Maryland, and Virginia provided details of I/M programs for all analysis years in MOVES-ready format.

STATE SPECIFIC CONTROL PROGRAMS

1. Early NLEV: The District of Columbia, Maryland, and Virginia adopted an Early NLEV program, which is reflected in all analysis years

2. Stage II: Varies by area as follows:

   - District of Columbia: Refueling vapor program adjustment- 0.9, Refueling spill program adjustment- 0.5 (MOVES2010a defaults)

   - Maryland: Refueling vapor program adjustment- 0.7, Refueling spill program adjustment- 0.7 (MOVES2010a Stage II database file - md_stageii)

   - Virginia:
     2017 - Refueling vapor program adjustment- 0.56, Refueling spill program adjustment- 0.56
     2020 onwards - Refueling vapor program adjustment- 0, Refueling spill program adjustment- 0

     MOVES2010a Stage II database file - va_stage2_input_update2013feb

3. CAL-LEV II/ZEV Programs: Since 2011 Maryland adopted CAL-LEV II program and as such it is reflected in all analysis years. The following auxiliary files, provided by the Maryland Department of the Environment (MDE), were used to model these programs in the Maryland jurisdictions:

   MOVES2010a Cal-Lev II Database file - md_levii;
   MOVES2010a ZEV MS-Excel file - ZEV_AVFT_MD_2010a.xls

APPENDIX

TABLE A1 - Population Mapping from MOBILE6.2 Vehicle Types to MOVES Source Types

MOBILE6.2 Vehicle		MOVES Source Type		
ID	Name	ID	Name	Fraction
1	LDGV	21	Passenger Car	1.00
2	LDGT1	31	Passenger Truck	0.78
		32	Light Commercial Truck	0.22
3	LDGT2	31	Passenger Truck	0.78
		32	Light Commercial Truck	0.22
4	LDGT3	31	Passenger Truck	0.78
		32	Light Commercial Truck	0.22
5	LDGT4	31	Passenger Truck	0.78
		32	Light Commercial Truck	0.22
6	HDGV2B	31	Passenger Truck	0.63
		32	Light Commercial Truck	0.37
7	HDGV3	31	Passenger Truck	0.63
		32	Light Commercial Truck	0.37
8	HDGV4	31	Passenger Truck	0.06
		32	Light Commercial Truck	0.94
9	HDGV5	31	Passenger Truck	0.06
		32	Light Commercial Truck	0.94
10	HDGV6	43	School Bus	0.04
		52	Single Unit Short-haul Truck	0.69
		53	Single Unit Long-haul Truck	0.03
		54	Motor Home	0.23
		61	Combination Short-haul Truck	0.01
11	HDGV7	43	School Bus	0.04
		52	Single Unit Short-haul Truck	0.69
		53	Single Unit Long-haul Truck	0.03
		54	Motor Home	0.23
		61	Combination Short-haul Truck	0.01
12	HDGV8A	52	Single Unit Short-haul Truck	0.90
		53	Single Unit Long-haul Truck	0.08
		61	Combination Short-haul Truck	0.02
13	HDGV8B	52	Single Unit Short-haul Truck	0.90
		53	Single Unit Long-haul Truck	0.08
		61	Combination Short-haul Truck	0.02
14	LDDV	21	Passenger Car	1.00

TABLE A1 - Population Mapping from MOBILE6.2 Vehicle Types to MOVES Source Types (continues)

MOBILE6.2 Vehicle Type		MOVES Source Type		
ID	Name	ID	Name	Fraction
15	LDDT12	31	Passenger Truck	0.42
		32	Light Commercial Truck	0.58
16	HDDV2B	31	Passenger Truck	0.43
		32	Light Commercial Truck	0.57
17	HDDV3	31	Passenger Truck	0.43
		32	Light Commercial Truck	0.57
18	HDDV4	31	Passenger Truck	0.10
		32	Light Commercial Truck	0.90
19	HDDV5	31	Passenger Truck	0.10
		32	Light Commercial Truck	0.90
20	HDDV6	51	Refuse Truck	0.01
		52	Single Unit Short-haul Truck	0.72
		53	Single Unit Long-haul Truck	0.06
		54	Motor Home	0.07
		61	Combination Short-haul Truck	0.11
		62	Combination Long-haul Truck	0.03
21	HDDV7	51	Refuse Truck	0.01
		52	Single Unit Short-haul Truck	0.72
		53	Single Unit Long-haul Truck	0.06
		54	Motor Home	0.07
		61	Combination Short-haul Truck	0.11
		62	Combination Long-haul Truck	0.03
22	HDDV8A	51	Refuse Truck	0.02
		52	Single Unit Short-haul Truck	0.30
		53	Single Unit Long-haul Truck	0.02
		61	Combination Short-haul Truck	0.35
		62	Combination Long-haul Truck	0.31
23	HDDV8B	51	Refuse Truck	0.02
		52	Single Unit Short-haul Truck	0.30
		53	Single Unit Long-haul Truck	0.02
		61	Combination Short-haul Truck	0.35
		62	Combination Long-haul Truck	0.31
24	MC	11	Motorcycle	1.00
25	HDGB	43	School Bus	1.00
26	HDDBT	41	Intercity Bus	0.62
		42	Transit Bus	0.38
27	HDDBS	43	School Bus	1.00
28	LDDT34	31	Passenger Truck	0.42
		32	Light Commercial Truck	0.58

APPENDIX F

TERMS

Transportation Emission Reduction Measures

TRANSPORTATION EMISSIONS REDUCTION MEASURES (TERMs) ANALYSES

for the
2013 CLRP and FY2013-2018 TIP

TECHNICAL DOCUMENTATION

July 15, 2013

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BACKGROUND

The Air Quality Conformity Determination of the 2013 CLRP and FY2013-2018 TIP was conducted – for the first time -- using the emissions estimating model MOVES in Inventory Approach while the analyses of previous cycles were conducted using MOBILE6.2. The transition to MOVES was also coupled with an update of the MWCOG/TPB regional travel demand model, which was validated to year 2010 data (i.e., traffic count data, 2010 American Community Survey, 2010 Metrorail Electronic Counts and a 2010 Geographically Focused Household Travel Survey).

These changes necessitated a complete overhaul of the Transportation Emissions Reduction Measures (TERMs), which were part of previous cycles of air quality conformity determination documentations and were featured in TERMs tracking sheets. With the regional travel demand model recently validated for year 2010 travel conditions, numerous TERMs from the tracking sheets were no longer applicable since they were accounted for in the baseline of the travel demand model. In addition, MOVES is a structurally different model compared to MOBILE6.2, and development of emissions rates for each TERM individually was no longer applicable. Finally, regional programs such as TPB Commuter Connections and a regional Incident Management program were considered integral in regional travel demand management and they were included as TERMs.

The MWCOG/TPB Commuter Connections Program has expanded considerably over time since its early days in 1999 serving a vast geographical area that extends beyond the TPB model area. It has also become an institution with a rigorous performance review process in place and a well-maintained data inventory. A regional incident management program – the Metropolitan Area Transportation Operations Coordination (MATOC) – is an umbrella organization in the region and a clearance house of real-time information sharing when significant incidents occur in the region in order for traffic congestion and secondary accidents to be mitigated. Finally, "slugging" is local phenomenon and a widespread practice of free forming carpools among commuters aiming to save travel time by traveling on the HOV lanes during peak commuting periods, and to reduce travel costs. All of the above contribute to mobile emissions reductions and they are TERMs that could be quantified using MOVES.

Consistent with the above, the TERMs of the 2013 CLRP and FY2013-2018 air quality conformity determination were grouped in four broad categories:

- TPB Commuter Connections Program
- Regional Incident Management Program
- Pedestrian Facilities Expansions & Enhancements
- Informal Carpooling Lots

The resulting emissions reductions were not needed for the 2013 CLRP and FY2013-2018 air quality conformity determination since the mobile emissions inventories were below applicable budgets. The FY2013 Air Quality Conformity Analysis will develop criteria pollutant inventories for the following years: 2015, 2017, 2020, 2025, 2030 and 2040.

TPB COMMUTER CONNECTIONS PROGRAM

Background: The TPB Commuter Connections Program currently achieves criteria pollutant emissions reductions through four TERMs: (1) Maryland and Virginia Telework; (2) Guaranteed Ride Home (GRH); (3) Employer Outreach; and (4) Mass Marketing. While the scope of each TERM evolved somewhat over time as the Commuter Connections Program grew, matured and embraced new technologies and social media, its core travel demand management (TDM) goal remained unchanged. TDM services available to the public were accounted for as a component of one TERM or another thus affecting each TERM's measured effectiveness over time. The effectiveness of the entire Commuter Connections Program was not affected by internal shifts in the scope of individual TERMs over time. In this context, measures of effectiveness of the entire program were used for the analyses that follow, not measures by individual Commuter Connections TERM.

Over time the Commuter Connections Program comprised of all or some of the following TERMs: (1) Telework Resource Center (RC); (2) Guaranteed Ride Home (GRH); (3) Expanded Telecommuting; (4) Integrated Rideshare; (5) Employer Outreach; (6) Employer Outreach – Bicycling (7) Mass Marketing; and (8) Commuter Operations Center.

The program conducts triennial audits of its effectiveness in reducing criteria pollutant emissions in the National Capital Region through the implementation of its TERMs. A broad range of measures of effectiveness are evaluated and documented in the "Transportation Emission Measure (TERM) Analysis Report", which has been published in September 1999 (audit of the FY1997-FY1999 period), March 2003 (audit of the FY2000-FY2002 period), January 2006 (audit of the FY2003-FY2005 period), January 2009 (audit of the FY2006-FY2008 period), and January 2012 (audit of the FY2009-FY2011 period). Vehicle Miles of Travel (VMT) reductions is just one of the measures of effectiveness. Although VMT reduction estimates for the Washington non-attainment area are not displayed in the published reports, such estimates were generated as part of the analyses, and they were provided by the Commuter Connections Program especially for this analysis (Table 1). The program also provided historic annual costs for implementing the TERMs (Table 2 and Figure 1). The historic annual costs were used as a basis to develop a trend line for future year annual cost projections. The trend line and its corresponding linear equation are shown in Figure 1.

Methodology: In order to derive future year VMT reduction estimates from historic data (Table 1) three methods (i.e., scenarios) were considered. The resulting forecasts are shown in Table 3:

- Scenario A: Straight line extrapolation based on historic VMT data from years 1999-2011;
- Scenario B: Straight line extrapolation based on historic VMT data from years 2005-2011; the early years were excluded as the program itself and the audit process were still evolving (Source: Commuter Connections Program);
- Scenario C: A VMT growth rate that is a consistent with the regional VMT over time; this assumption was tested using modeled regional VMT and actual regional VMT based on HPMS data provided by the three state departments of transportation.

HISTORIC VMT REDUCTION ESTIMATES FOR AIR QUALITY CONFORMITY (weekday average)					
	AUDIT 1	**AUDIT 2**	**AUDIT 3**	**AUDIT 4**	**AUDIT 5**
	Jan 1997 - Jun 1999	**Jul 1999 – Jun 2002**	**Jul 2002 – Jun 2005**	**Jul 2005 – Jun 2008**	**Jul 2008 – Jun 2011**
Telework Resource Center	1,868,294	2,255,058	2,400,894	3,853,246	4,140,556
Guaranteed Ride Home	13,069	202,058	334,088	227,428	208,346
Expanded Telecommuting	0	0	36,859	0	0
Integrated Rideshare	6,977	117,940	146,612	199.079	51,589
Employer Outreach	90,000	1,107,698	1,339,818	968,047	1,656,726
Employer Outreach– Bicycling	0	1,225	3,431	1,127	1,083
Mass Marketing	0	0	132,861	69,274	78,297
Commuter Operations Center	83,204	66,056	279,055	575,237	180,409
TOTAL	**2,061,544**	**3,750,035**	**4,673,518**	**5,893,438**	**6,316,986**

***Source**: TPB Commuter Connections Program*

Table 1– Historic VMT Reduction Estimates (weekday average)

Year	ANNUAL COSTS (actual)
1999	$2,635,967
2000	$3,209,632
2001	$3,762,289
2002	$3,571,073
2003	$3,772,859
2004	$5,894,718
2005	$4,579,142
2006	$3,666,980
2007	$5,145,108
2008	$4,756,583
2009	$4,641,646
2010	$4,474,807
2011	$4,154,216

***Source**: TPB Commuter Connections Program*

Table 2– Historic Annual Costs of the TPB Commuter Connections Program

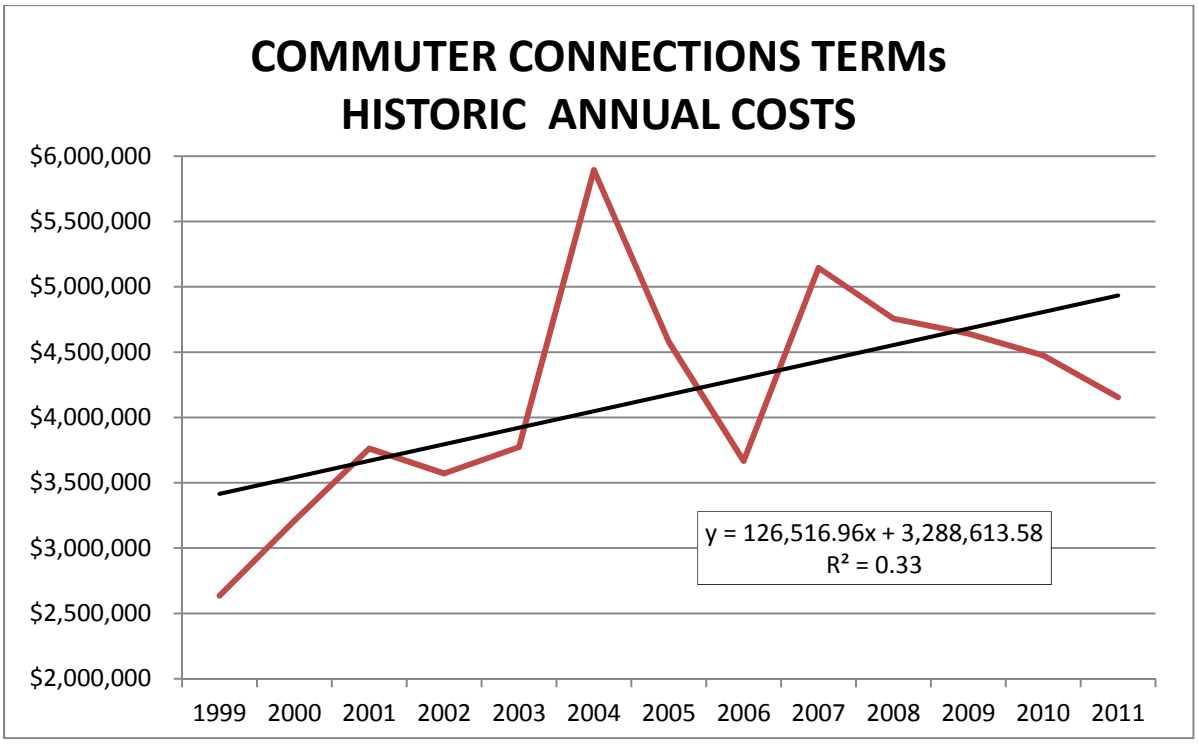

Figure 1– Historic Annual Costs of the TPB Commuter Connections Program

VMT REDUCTION ESTIMATES & PROJECTIONS (Weekday Average)							
Years	TPB Modeled Area VMT [1]	Scenario A		Scenario B		Scenario C	
		VMT Reduction Estimate	As % of the TPB Modeled Area VMT	VMT Reduction Estimate	As % of the TPB Modeled Area VMT	VMT Reduction Estimate	As % of the TPB Modeled Area VMT
1999		2,061,544		2,061,544		2,061,544	
2002	149,388,892	3,750,035	2.51%	3,750,035	2.51%	3,750,035	2.51%
2005		4,673,618		4,673,618		4,673,618	
2008	159,299,027	5,893,438	3.70%	5,893,438	3.70%	5,893,438	3.70%
2010 [2]		6,175,803		6,175,803		6,175,803	
2011	160,327,029	6,316,986	3.94%	6,316,986	3.94%	6,316,986	3.94%
2015	171,523,125	8,019,467	4.68%	7,545,277	4.40%	6,565,727	3.83%
2017	174,806,093	8,719,299	4.99%	8,093,066	4.63%	6,693,747	3.83%
2020	180,153,736	9,769,047	5.42%	8,914,750	4.95%	6,890,472	3.82%
2025		11,641,982		10,284,223		7,231,279	
2030	200,136,351	13,268,208	6.63%	11,653,697	5.82%	7,588,942	3.79%
2040	212,923,598	16,767,368	7.87%	14,392,643	6.76%	8,358,215	3.93%

Notes:

(1) Source: 2012 CLRP Air Quality Conformity Report, Exhibit 10 all vehicle types

(2) Year 2010 VMT Reduction Estimate was derived by interpolating year 2008 and 2011 VMT estimates

Table 3– VMT Reductions Estimates & Projections (Weekday Average)

The reasonableness of the growth rates derived by each scenario was assessed. In Table 3 Years 1999 through 2011 reflect historic VMT estimates while Years 2015 through 2040 reflect VMT projections. Therefore, starting with year 2015 the VMT reductions projections vary by scenario. The same concept is also graphically illustrated in Figure 2.

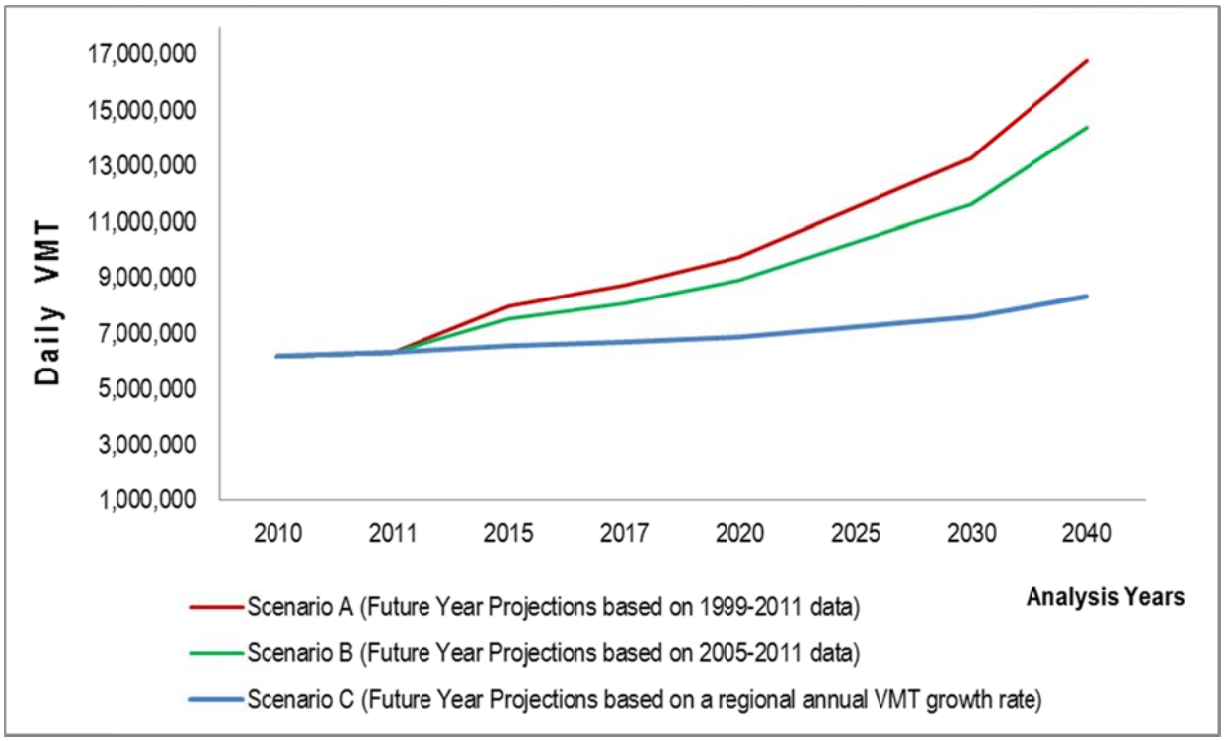

Figure 2– Daily VMT Reduction Projections (Commuter Connections Program TERMs)

According to Scenario A, future year VMT reductions will grow at the highest rate and they will comprise an ever increasing percentage of the modeled area VMT. Table 3 shows that by 2040 the projected VMT reductions due to the Commuter Connections TERMs will comprise 7.97 percent of the regional total while during the "historic years" the corresponding percentage was in the 2.51-3.94 percent range. A similar pattern was derived for Scenario B which would have yielded a 2040 VMT reduction equal to 6.76 percent of the regional total VMT. These growth patterns were considered unsustainable in the long run for the following reason: in future years the Commuter Connections Program TERMs will most likely face fewer Travel Demand Management (TDM) options available at a reasonable cost. The "low hanging fruit" has already been picked up and most likely it will become increasingly more difficult to achieve further VMT reductions at a competitive cost. Therefore, Scenarios A and B were eliminated from further consideration.

The reasonableness of Scenario C – based modeled VMT growth rates for the region -- was further tested vis-à-vis historic HPMS data from the National Capital Region (Figures 3, 4, and 5). The overall VMT in the TPB planning area as well as in the inner, outer and suburban jurisdictions during the 2005-2011 period remained essentially flat (Figure 3). While national statistics indicate that the VMT has declined nationwide, the diversified economic base of the National Capital Region enabled it to remain

flat in recent years. The flat shape of the curve was attributed to the recession, fuel price volatility, growing e-commerce, social media, telecommuting and changing attitudes of "millennials" (ages 13-30).

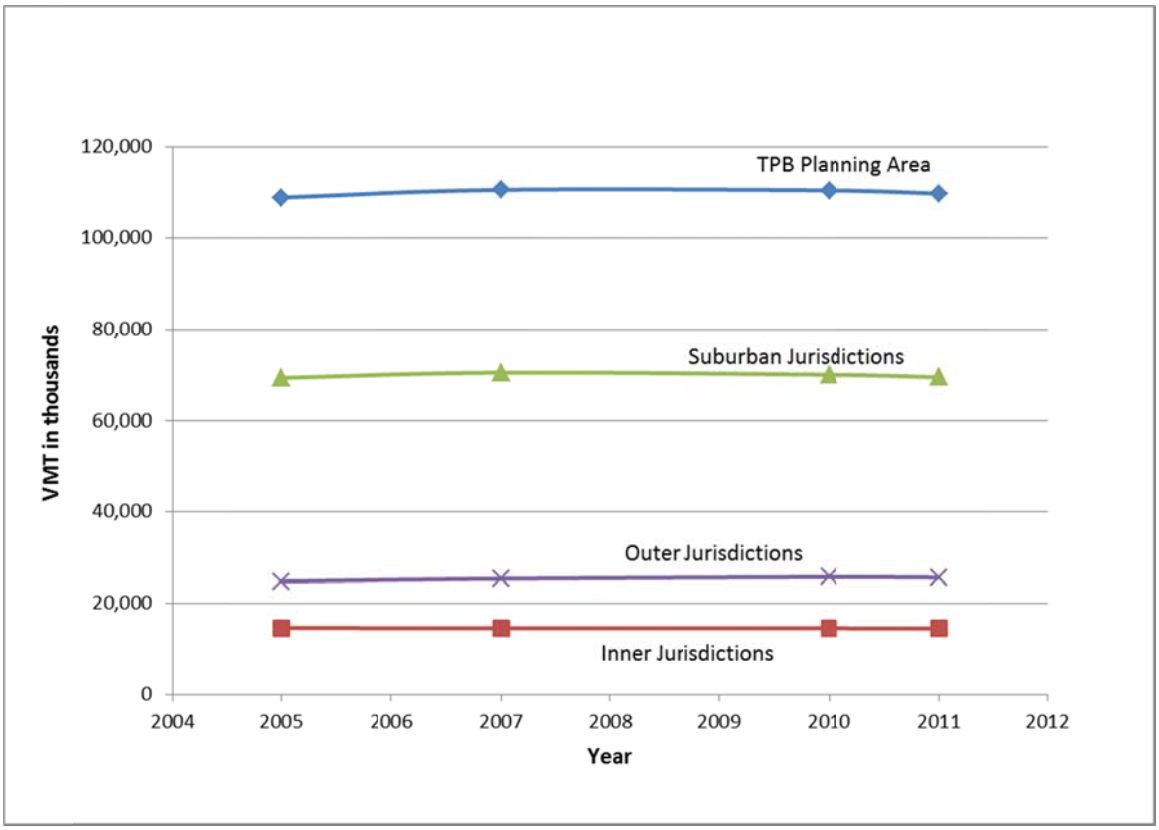

Figure 3– VMT Growth Patterns in the Capital Region

The National Capital Region has been growing in terms of population during the 2005-2011 period despite the economic recession that adversely impacted the population in other metropolitan areas (Figure 4). The reduced travel in the region – expressed as VMT per capita -- is graphically illustrated in Figure 5. It is unknown for how long these travel patterns will persist and whether the region will return to its pre-recession travel patterns and growth of the regional VMT. In light of these conditions, a modest long-term growth rate of the VMT reductions attributable to the TERMs of the Commuter Connections Program was considered reasonable and prudent. As a result, Scenario C was selected to develop future VMT reductions from the Commuter Connections Program TERMs.

The travel demand model used in the analyses was validated on 2010 traffic count data, a 2010 American Community Survey, 2010 Metrorail Electronic Counts, and a 2010 Geographically Focused Household Travel Survey. Therefore, travel parameters – including the effects of the Commuter Connections TERMs on individual and regional travel patterns -- prior to 2010 were captured by the regional travel demand model. As a result, only the effects of the incremental growth of the Commuter Connections Program – post year 2010 – were accounted for in the TERMs calculations (Table 4).

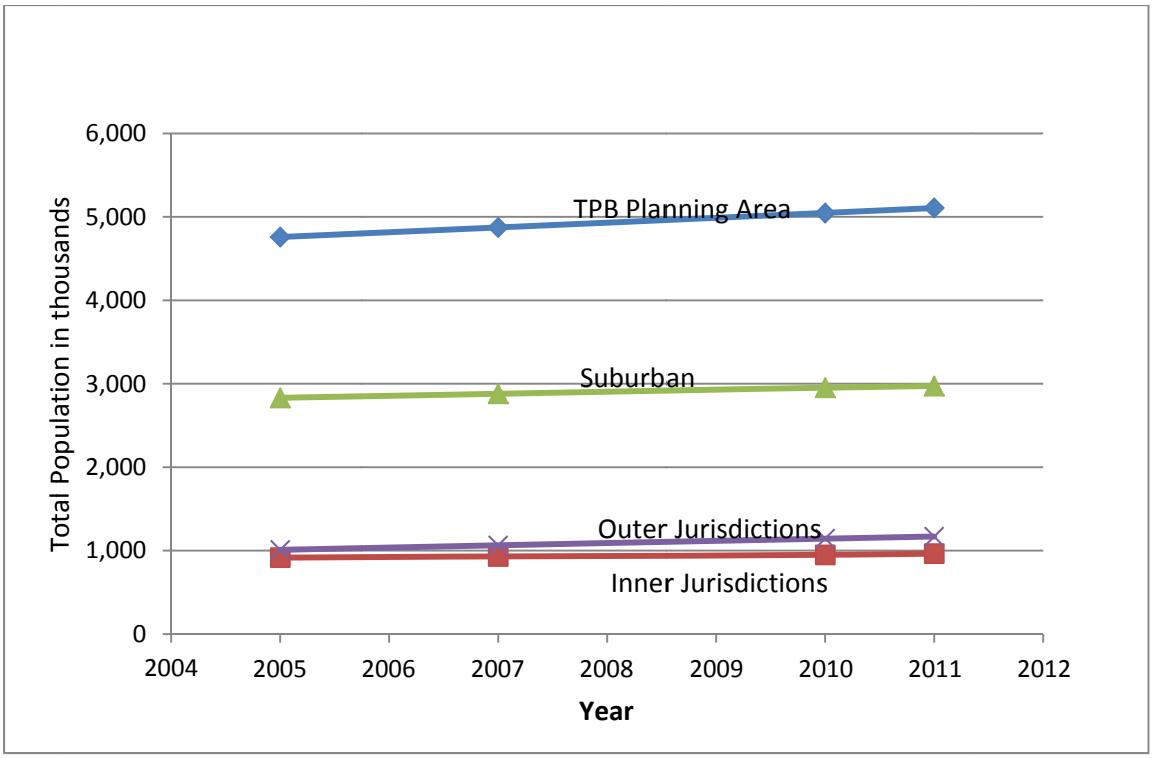

Figure 4– Population Growth Patterns in the Capital Region

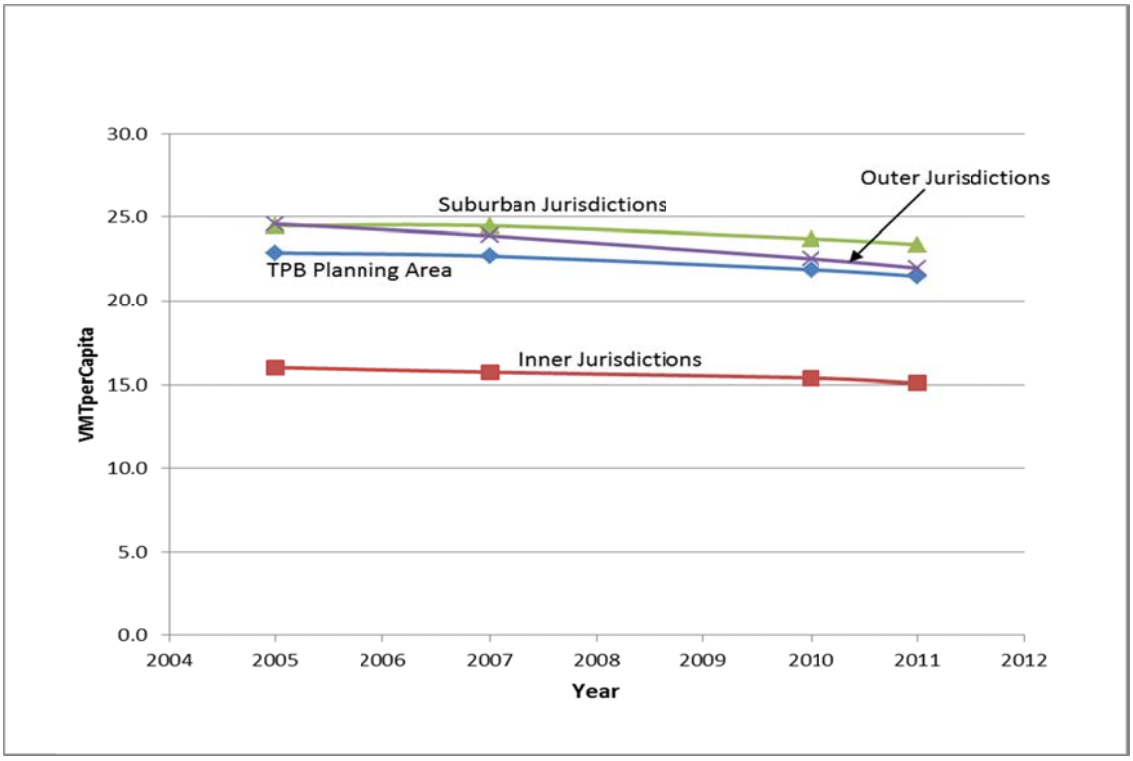

Figure 5– VMT Per Capita Growth in the Capital Region

FUTURE YEAR VMT REDUCTION PROJECTIONS (Weekday Average)	
2015	389,924
2017	517,944
2020	714,669
2025	1,055,476
2030	1,413,139
2040	2,182,412

Table 4– VMT Reductions Projections for Air Quality Conformity (Weekday Average)

Mobile emissions rates (Table 7) were derived as follows: (1) the emissions inventories by pollutant and analysis year that are attributable to passenger cars and light duty trucks were segregated from the total regional emissions that are featured in the 2013 CLRP & FY2013-18 TIP Air Quality Conformity Determination (Table 5); (2) these emissions inventories were subsequently divided by the corresponding VMT estimates (Table 6). It was necessary to derive emissions rates from a subset of the regional vehicle fleet – by excluding heavy vehicles from the analysis – because the Commuter Connections Program deals only with light-duty vehicles and inclusion of heavy duty vehicles (e.g., trucks, buses etc.) would have been unnecessary and unrealistic.

EMISSIONS INVENTORIES – COMMUTER CONNECTIONS TERMs					
Years/Pollutants	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**
	(tons/day)	(tons/day)	(tons/year)	(tons/year)	(tons/day)
2015	44.56	65.26	852.84	22,299.81	464.73
2017	39.56	53.96	829.01	18,516.89	427.47
2020	35.40	43.03	815.12	14,860.51	398.31
2025	32.68	36.10	820.55	12,516.92	384.50
2030	30.78	33.42	850.56	11,654.43	389.97
2040	33.61	34.54	915.74	12,125.30	418.73

Source: *2013 CLRP & FY2013-18 TIP Air Quality Conformity Determination*

Table 5– Emissions Inventories for Air Quality Conformity

VMT PROJECTIONS – COMMUTER CONNECTIONS TERMs					
Years/Pollutants	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**
	VMT/day	VMT/day	VMT/year	VMT/year	VMT/day
2015	115,331,656	115,331,656	37,413,450,272	37,413,450,272	54,256,095
2017	117,090,016	117,090,016	37,981,330,164	37,981,330,164	54,786,760
2020	120,084,156	120,084,156	39,052,977,516	39,052,977,516	55,765,739
2025	126,091,878	126,091,878	40,900,194,180	40,900,194,180	57,702,677
2030	131,538,467	131,538,467	42,672,889,802	42,672,889,802	59,781,286
2040	139,173,757	139,173,757	45,268,459,994	45,268,459,994	62,470,445

Source: *2013 CLRP & FY2013-18 TIP Air Quality Conformity Determination*

Table 6– VMT Projections for Air Quality Conformity

MOBILE EMISSIONS RATES – COMMUTER CONNECTIONS TERMs (grams/mile)					
Years/Pollutants	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**
2015	0.351	0.513	0.021	0.541	7.770
2017	0.307	0.418	0.020	0.442	7.078
2020	0.267	0.325	0.019	0.345	6.480
2025	0.235	0.260	0.018	0.278	6.045
2030	0.212	0.230	0.018	0.248	5.918
2040	0.219	0.225	0.018	0.243	6.081

Table 7– Emissions Rates for Air Quality Conformity

The most significant process of the drive cycle – running emissions – is accounted for by multiplying the running emissions rates by the corresponding VMT reductions (Table 8).

EMISSIONS REDUCTIONS – COMMUTER CONNECTIONS TERMs						
Years/Pollutants	**Weekday Average VMT Reduction**	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**
		(tons/day)	(tons/day)	(tons/year)	(tons/year)	(tons/day)
2015	389,924	0.151	0.221	2.222	58.102	3.340
2017	517,944	0.175	0.239	2.826	63.128	4.041
2020	714,669	0.211	0.256	3.729	67.987	5.105
2025	1,055,476	0.274	0.302	5.294	80.753	7.033
2030	1,413,139	0.331	0.359	7.042	96.486	9.218
2040	2,182,412	0.527	0.542	11.037	146.141	14.628

Table 8– Emissions Reductions – Commuter Connections Program

The ozone daily emissions reductions (Table 8) were annualized by multiplying them by 250 (i.e., the number of workdays in a calendar year) (Table 9).

EMISSIONS REDUCTIONS (ANNUALIZED) COMMUTER CONNECTIONS TERMs (tons/year)						
Years/Pollutants	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**	**All Pollutants**
2015	37.7	55.2	2.2	58.1	835.0	988.1
2017	43.7	59.7	2.8	63.1	1,010.3	1,179.7
2020	52.7	64.0	3.7	68.0	1,276.1	1,464.5
2025	68.4	75.5	5.3	80.8	1,758.3	1,988.3
2030	82.7	89.8	7.0	96.5	2,304.6	2,580.5
2040	131.8	135.4	11.0	146.1	3,657.1	4,081.4

Table 9– Annualized Emissions Reductions – Commuter Connections Program

With an understanding that all pollutants are not equally easy and cost effective to mitigate, an "order of magnitude" estimate of the costs associated with mitigating one ton of emissions of any pollutant was developed. It is acknowledged here that it is a preliminary assessment derived by dividing the projected annual costs to implement the Commuter Connections TERMs by the corresponding annual emissions reductions (all pollutants) for each analysis year (Table 10).

MEASURES OF EFFECTIVENESS - COMMUTER CONNECTIONS TERMs			
Years	**Annual Program Costs**	**Annualized Emissions Reductions (All Pollutants) (tons/year)**	**Annual Costs/Ton**
2015	$5,439,402	988.1	$5,505
2017	$5,692,436	1,179.7	$4,825
2020	$6,071,987	1,464.5	$4,146
2025	$6,704,572	1,988.3	$3,372
2030	$7,337,156	2,580.5	$2,843
2040	$8,602,326	4,081.4	$2,108

Table 10– Cost Effectiveness of the Commuter Connections TERMs

REGIONAL INCIDENT MANAGEMENT PROGRAM

Background: The Metropolitan Area Transportation Operations Coordination (MATOC) Program is an umbrella organization in the National Capital Region whose goal is to function as a clearance house of real-time information sharing when significant incidents occur. MATOC – jointly funded by the state of Maryland, the Commonwealth of Virginia and the District of Columbia -- monitors, gathers and communicates accurate and timely incident and mobility information so that transportation agencies may better coordinate their respective response activities in order to improve public safety (e.g., reduce secondary crashes), reduce travel delay and fuel consumption, and better inform the public, thus allowing individuals to make more informed travel decisions (e.g., defer/delay travel, take an alternate route or travel model).

MATOC is analyzed here as a TERM by virtue of its ability to reduce an incident timeline and to provide travelers with an earlier and regionally broader advance warning to modify their trip making in order to reduce queue buildup, traffic delay and secondary crashes. Avoidance yields cost savings in terms of mobile emissions and fuel consumption. The analysis here is based on published data, when available, and conservative assumptions. The analyses were based on the "MATOC Benefit-Cost Analysis White Paper", June 2010 authored by Sabra, Wang & Associates, Inc., on behalf of MWCOG and under the guidance of the MATOC Steering Committee.

Methodology: A technical approach was developed to calculate mobile emissions reductions based on estimated VMT savings at the queue that forms after each incident occurrence. Such VMT savings are attributable to MATOC's pivotal role in issuing advance warnings so that travelers may modify their trip

making decisions in order to reduce idling and traffic delays. The technical approach is assumption-driven, and the resulting emissions reductions are dependent on the assumptions made. They are as follows:

- Fairfax County was selected as a proxy jurisdiction representing the entire National Capital Region for having a balanced mix of restricted roadway facilities (i.e., highways and expressways) and unrestricted facilities (i.e., arterials, collectors, locals); emissions inventories and VMT estimates for this county were used in the analyses as a proxy for the region;
- Travel speeds in a typical queue after an highway/expressway incident were assumed to be in the 12.5 - 17.5 mph range;
- "…..MATOC is typically involved in approximately 20 minor incidents and one major freeway, arterial or transit incident of regional significance per month…." (Source: "MATOC Benefit-Cost Analysis White Paper", June 2010 authored by Sabra, Wang & Associates, Inc.).

Technical Approach:

Step 1: Calculate appropriate adjustment ratios for the emission rates which were derived from regional emissions inventories as part of the annual Air Quality Conformity analyses. The regional emissions inventories were developed using MOVES Inventory Approach. Therefore, the resulting emissions rates are not speed sensitive while the MATOC operations are speed sensitive.

$$Rate_{adj} = \frac{P\_Rate_e}{P\_Rate_i}$$

Where:

- P_Rate_e is derived using the MOVES Rate Approach for Fairfax County, year 2015 from the 2012 CLRP Air Quality Conformity Determination, and 12.5-17.5 mph MOVES speed bin

P_Rate_i is calculated as follows:

$$P\_Rate_i\ (grams\ per\ mile) = \frac{2015\ Total\ Emissions\ in\ Fairfax\ County, 2012\ CLRP}{2015\ Total\ VMT\ in\ Fairfax\ County, 2012\ CLRP}$$

The rate, P_Rate_i, may be calculated in advance as the 2015 Total Emissions and VMTs for 2015 were previously estimated as part of the 2012 CLRP Air Quality Conformity Determination and they are readily already available. For ozone (VOC and NOx) daily emissions the corresponding rate was 1.30.

Step 2: Calculate regional emission rates, $Rate_i$, derived from the Total Emissions in the Region (by pollutant and analysis year) divided by the corresponding VMTs from the 2013 CLRP Air Quality Conformity Analyses, as follows:

$$Rate_i\ (grams\ per\ mile) = \frac{Total\ Regional\ Emissions, by\ Analysis\ Year, 2013\ CLRP\ AQC}{Total\ Regional\ VMT, by\ Analysis\ Year, 2013\ CLRP\ AQC}$$

Step 3: Calculate emissions savings attributable to MATOC as follows:

$$Emissions\ Savings\ (grams\ per\ mile) = \ Queue\ VMT\ Savings * Rate_i * Rate_{adj}$$

Where:

- Major Incident Queue VMT Savings = 452,120 (vehicle miles)
- Minor Incident Queue VMT Savings = 19,040 (vehicle miles)

Source: "MATOC Benefit-Cost Analysis White Paper", June 2010 by Sabra, Wang & Associates, Inc.

Daily Emissions Savings (grams per mile) by Pollutant:

- *1/30 (1 major incident per month) X Emissions Savings from Major Incident +*
- *20/30 (20 minor incidents per month) X Emissions Saving from Minor Incident*

Annual Emissions Savings (grams per mile) by Pollutant:

- *12 (1 major incident per month) X Emissions Savings from Major Incident + 240 (20 minor incidents per month) X Emissions Savings from Minor Incident*

MOBILE EMISSIONS RATES – REGIONAL INCIDENT MGMT PROGRAM (grams/mile)					
Years/Pollutants	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**
2015	0.502	1.135	0.038	0.944	7.906
2017	0.438	0.923	0.033	0.771	7.198
2020	0.379	0.713	0.027	0.599	6.591
2025	0.332	0.558	0.023	0.472	6.158
2030	0.301	0.496	0.021	0.422	6.026
2040	0.308	0.477	0.021	0.407	6.184

Note:: *Based on the 2013 CLRP and FY2013-2018 TIP Air Quality Conformity Determination with an adjustment factor reflecting vehicle speeds 12.5-17.5 mph (low speeds in the vehicle queue)*

Table 11– Mobile Emissions Rates – Regional Incident Management Program

REGIONAL EMISSIONS REDUCTIONS – REGIONAL INCIDENT MGMT PROGRAM					
Years/Pollutants	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**
	(tons/day)	(tons/day)	(tons/year)	(tons/year)	(tons/day)
2015	0.02	0.03	0.42	10.40	0.24
2017	0.01	0.03	0.36	8.49	0.22
2020	0.01	0.02	0.29	6.59	0.18
2025	0.01	0.02	0.25	5.20	0.19
2030	0.01	0.02	0.23	4.65	0.18
2040	0.01	0.01	0.23	4.49	0.19

Table 12– Emissions Reductions – Regional Incident Management Program

The ozone (VOC and NOx) and Winter CO emissions estimates of Table 12 were annualized by multiplying by 365 calendar days/year (Table 13).

EMISSIONS REDUCTIONS (ANNUALIZED) – REGIONAL INCIDENT MGMT PROGRAM (tons/year)						
Years/Pollutants	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**	**All Pollutants**
2015	5.6	12.7	0.4	10.4	88.3	117.4
2017	4.9	10.3	0.4	8.5	80.4	104.5
2020	4.2	8.0	0.3	6.6	67.3	86.4
2025	3.7	6.2	0.2	5.2	68.8	84.2
2030	3.4	5.5	0.2	4.6	67.3	81.1
2040	3.4	5.3	0.2	4.5	69.1	82.6

Table 13– Annualized Emissions Reductions – Regional Incident Management Program

With an understanding that all pollutants are not equally easy and cost effective to mitigate, an "order of magnitude" estimate of the costs associated with mitigating one ton of emissions of any pollutant was developed. It is acknowledged here that it is a preliminary assessment derived by dividing the current annual operating costs of MATOC by the corresponding annual emissions reductions (all pollutants) for each analysis year (Table 14). The current annual operating budget of MATOC equal to $1,200,000 was assumed constant through year 2040.

MEASURES OF EFFECTIVENESS - REGIONAL INCIDENT MANAGEMENT PROGRAM			
Years	**Annual Program Costs**	**Annualized Emissions Reductions (All Pollutants) (tons/year)**	**Annual Costs/Ton**
2015	$1,200,000	117.4	$10,220
2017	$1,200,000	104.5	$11,488
2020	$1,200,000	86.4	$13,888
2025	$1,200,000	84.2	$14,255
2030	$1,200,000	81.1	$14,798
2040	$1,200,000	82.6	$14,534

Table 14– Cost Effectiveness of the Regional Incident Management Program

PEDESTRIAN FACILITIES EXPANSIONS & ENHANCEMENTS

Background: The FY2013-2018 Transportation Improvement Program (TIP) contains a number of pedestrian facilities expansions and enhancements (i.e., trails, bike paths and bikeways, and sidewalks), which have an inherent potential to reduce mobile emissions by enticing travelers to switch from driving to walking or biking for their home-based-work (HBW) trips. Only facilities that were built or expanded post-2010 were taken into account in the TERMs analyses as the travel demand model is calibrated on 2010 data.

Methodology: A technical approach was developed to calculate mobile emissions reductions based on estimated VMT savings from travelers choosing a non-motorized mode of travel (i.e., trails, bike paths and bikeways, and sidewalks) instead of driving for work-related purposes. It is assumption-driven, and the resulting emissions reductions are dependent on the assumptions made. This technical approach was developed by drawing material from a Caltrans/Air Resources Board analysis, dated December, 1995, which was developed by COMSIS Corporation, for FHWA & FTA, and which was previously used by MWCOG/DTP staff for TERMs analyses starting in 1993. The key assumptions are:

- Facility construction, expansions/enhancements assumed in the analyses are post-2010
- Baseline Total Length of Pedestrian Facilities (Year 2010 Base) = 634 miles *(Source: "2010 Bicycle and Pedestrian Plan for the National Capital Region* Report*", TPB, October 2010*
- VMT estimates are based only on Home-Based-Work (HBW) trips from the regional travel demand model
- Average trip length (ATL) = 3 miles *(Source: 2012 TPB Geographically Focused Household Travel Survey)*
- Non-motorized HBW trips percentage = 3% of the regional total HBW trips *(Source: 2010 TPB State of the Commute Report, June 2011)*

Technical Approach:

Step 1: Obtain baseline (Year 2010) VMT reductions from usage of the existing pedestrian facilities as a function of non-motorized HBW trips percentage, HBW trips (regional total), and average trip length, as follows:

Baseline VMT Reductions = HBW Bike Trips % x HBW Trips x ATL

Where:

- HBW Bike Trips Percentage = 3%
- HBW Trips (Year 2010) = 3,659,233
- Average Trip Length (ATL) = 3.0 miles

Step 2: Develop VMT Reductions per mile of pedestrian facilities based on Baseline (Year 2010) data as follows:

VMT Reductions (per mile) = Baseline VMT Reductions/Baseline Length of Pedestrian Facilities

Where:

- Baseline VMT Reductions = 0.03 x 3,659,233 x 3.0 = 329,330.97
- Baseline Length of Pedestrian Facilities (Regional Total Year 2010) = 634 miles
- VMT Reductions (per mile) = 329,330.97/634 = 519.45

Step 3: Apply the VMT Reductions (per mile) from Step 2 to the mileage of new or expanded pedestrian facilities included in the 2013 CLRP & FY2013-2018 TIP according to their respective implementation schedules (Table 16). Pedestrian facilities included in the 2013 CLRP & FY2013-2018 TIP without complete numerical information (i.e., project length) to allow a quantitative assessment of the resulting

emissions reductions were omitted from the analyses here. Similarly, estimated construction costs were also omitted for certain projects. For projects without a completion year it was assumed that they would be constructed by 2025. Therefore, the following pedestrian facilities expansions were assumed in the analyses:

- Year 2015: 27.95 additional lane miles
- Year 2017: 2.95 additional lane miles
- Year 2020: 8.30 additional lane miles
- Year 2025: 5.21 additional lane miles
- Years 2030 and 2040: no additional lane miles planned

Future VMT reductions due to additional lane mile additions:

- Year 2015: 27.95 miles x 519.45 = 14,519 vehicle miles
- Year 2017: 2.95 miles x 519.45 = 1,532 vehicle miles
- Year 2020: 8.30 miles x 519.45 = 4,311 vehicle miles
- Year 2025: 5.21 miles x 519.45 = 2,706 vehicle miles
- Years 2030 and 2040: no additional VMT reductions

The emissions rates from Table 7 were applied to the VMT reductions by milestone year as shown above and the resulting emissions reductions are summarized in Table 15.

EMISSIONS REDUCTIONS (ANNUALIZED) - PEDESTRIAN FACILITIES (tons/year)						
Years/Pollutants	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**	**All Pollutants**
2015	0.00	0.00	0.00	0.01	0.00	0.01
2017	0.00	0.00	0.00	0.00	0.00	0.00
2020	0.00	0.00	0.00	0.00	0.00	0.00
2025	0.00	0.00	0.00	0.00	0.00	0.00
2030	0.00	0.00	0.00	0.00	0.00	0.00
2040	0.00	0.00	0.00	0.00	0.00	0.00

Table 15– Emissions Reductions – Pedestrian Facilities

The calculated emissions reductions are nominal. Pedestrian facilities, sidewalks, bike trails and bike paths are built to serve additional urban connectivity and recreational purposes beyond serving as TERMs. The fact that they also contribute to mobile emissions reductions is a value-added attribute. Given the plurality of uses and purposes of pedestrian facilities – beyond serving as TERMs – it was not relevant to attempt to derive a preliminary "measure of effectiveness" as part of this analysis.

JURISDICTION	PROJECT CATEGORY	AGENCY	PROJECT TYPE	PROJECT_NAME	DESCRIPTION	SIZE	COST	ESTIMATED COMPLETION DATE
DC	TRAIL	DDOT	Bike/Ped	Anacostia Riverwalk Trail	This project was originally part of the Barney Circle Freeway Modification project. Approximately 16 miles of new bicycle/pedestrian trails will be constructed. Trails will be developed on both sides of the Anacostia River.	16.00	$ 60,961,000	30-Jun-12
DC	TRAIL	DDOT	Bike/Ped	Metropolitan Branch Trail	Meet multi-modal, TSM and air quality objectives. Project is also listed under CMAQ Program. 6.2 miles. The Metropolitan Branch Trail project will provide a 6.25 mile bicycle/pedestrian trail from Union Station north to the District Line along the rail	6.20	$ 12,500,000	30-Jun-09
MONTGOMERY	TRAIL	Montgomery County	Bike/Ped	Metropolitan Branch Trail	This project provides for completion of the preliminary engineering and final engineering necessary to obtain CSX and WMATA approvals for the 0.62-mile segment of this trail in Montgomery County between the end of the existing trail in Takoma Park, and th	0.62	$ 12,140,000	30-Jun-16
MONTGOMERY	TRAIL	Montgomery County	Bike/Ped	Falls Road East Side Hiker/Biker Path	This project provides funds to develop final design plans and to acquire right-of-way, and construct approximately 4 miles of an 8-foot bituminous hiker/biker path along the east side of Falls Road from River Road to Dunster Road. The path will provide p	4.00	$ 20,865	
MONTGOMERY	TRAIL	Montgomery County	Bike/Ped	MacArthur Blvd Bikeway Improvements	This project provides for bikeway improvements along 13,800' of MacArthur Boulevard, from I-495 to Oberlin Avenue. To encourage alternative modes of travel and enhance pedestrian safety, the pavement will be widened to provide 2 to 3 foot shoulders to ac	2.61	$ 8,710,000	30-Jun-13
MONTGOMERY	SIDEWALK CONSTRUCTION	Montgomery County	Bike/Ped	Bethesda CBD Streetscape	This project provides for the design and construction of pedestrian improvements to complete unfinished streetscapes along approximately 5,425 feet of streets in the Bethesda CBD as identified in the Bethesda CBD Sector Plan.	1.03	$ 10,049	
MONTGOMERY	TRAIL	Montgomery County	Bike/Ped	Main Street / Market Street BIKEWAY Construction Phase 1	This project is one of the four projects included in the White Flint District West PDF - No. 50116 for final design, construction, and land acquisition. This project provides for the construction of 1,700 feet of bikeway on Main Street / Market Street f	0.32	N/A	
MONTGOMERY	TRAIL	Montgomery County	Bike/Ped	Mathew Henson Trail	This project provides for the final design and construction of an 8-foot wide hard-surface trail within the Mathew Henson Greenway. Within the Greenway, it is to extend from Georgia Avenue to Alderton Lane, a distance of approximately 2.25 miles. Also i	2.25	$ 5,142,000	13-Mar-09
MONTGOMERY	TRAIL	Montgomery County	Bike/Ped	Needwood Road Bikepath	This project provides for the design and construction of a new 8-foot wide shared use path along the south side of Needwood Road, a distance of approximately 1.7 miles, between Deer Lake Rod and Muncaster Mill Road (MD 115) in order to provide a safe and	1.70	$ 4,200,000	30-Jun-18
MONTGOMERY	TRAIL	Montgomery County	Enhancement	Shady Grove Access Bike Path	This project provides a new 10-foot wide bike path from Shady Grove Road to Redland Road along the east side of the WMATA Metro Access Road (approximately 4,700 feet), a bikeway ramp from the new bike path to an existing bikeway on Crabbs Branch Way (appr	0.89	$ 2,740,000	03-Dec-12
MONTGOMERY	TRAILS (2)	Montgomery County	Bike/Ped	Seven Locks Bikeway & Safety Improvements	This project provides for pedestrian and bicycle improvements for dual bicycle facilities (on-road and off-road), and enhanced, continuous pedestrian facilities along Seven Locks Road from Montrose Road to Bradley Boulevard (3.3 miles), plus a bike path o	6.60	$ 27,000,000	30-Jun-18
FREDERICK	TRAIL	Frederick County	Bike/Ped	Bikeways & Trails Program - County Capital Improvement Program	Construct Phase I of Ballenger Creek Trail from Ballenger Creek Elementary to New Design Road - 2011. Phase II: Developer Funded (Westview South). Construction in 2011 Phase III: Connection of Phase I to II Funded for Design / Construction in FY2011 CIP P	N/A	$ 2,512,000	30-Jun-16
MONTGOMERY	SIDEWALK CONSTRUCTION	Montgomery County	Bike/Ped	MD 108 Sidewalk	This project provides for right-of-way acquisition and construction of a sidewalk along the south side Olney-Sandy Spring Road between Norwood Road and east of Meetinghouse Road for approximately 954', and along the east side of Norwood Road for approxima	0.18	$ 974,000	
MONTGOMERY	SIDEWALK CONSTRUCTION	Montgomery County	Bike/Ped	Greentree Road Sidewalk	This project provides approximately 6,400 linear feet of five-foot wide concrete sidewalk along the north side of Greentree Road, curb and gutter, residential sidewalk ramps, and expansion of existing drainage system from Old Georgetown Road (MD 187) to F	1.21	$ 3,486,000	30-Jun-14
FREDERICK	TRAIL	Frederick County	Bike/Ped	City of Frederick - Shared Use Path Plan	Phase II & III of Baker Park and Waterford Paths, Phase I of Rails to Trails in the East Street Corridor.	N/A	$ 7,581,000	30-Jun-14
MONTGOMERY	TRAIL	Montgomery County	Bike/Ped	Capital Crescent Trail	This project provides for the funding of the Capital Crescent trail, including the main trail from Elm Street Park in Bethesda to Silver Spring as a largely 12 foot wide hard-surface hiker-biker path, connector paths at several locations a new bridge over	N/A	$ 49,500	
MONTGOMERY	TRAIL	Montgomery County	Bike/Ped	North Bethesda Trail	This project provides for completion of the ten-foot wide hiker-biker trail, right-of-way acquisition, and construction of the missing and substandard segments of the trail already located on the alignment of the old Washington and Rockville Trolley, from	N/A	$ 1,470,000	30-Jun-05
MONTGOMERY	TRAIL	Montgomery County	Enhancement	Silver Spring Green Trail	This project provides for an urban trail along the selected Purple Line alignment along Wayne Avenue in Silver Spring. A Memorandum of Understanding will be established between the County and the Maryland Transit Administration (MTA) to incorporate the d	N/A	$ 6,334,000	30-Jun-14
FAIRFAX	TRAIL	VDOT	Bike/Ped	Herndon Trail to Dulles Rail	Construct a bike-pedestrian trail starting from the east side of the Van Buren Street/Worldgate Drive intersection, continuing in east - west direction - would connect the numerous corporate buildings (located along Herndon Parkway) to the future Herndo	N/A	$ 425,000	30-Jun-10
FAIRFAX	TRAIL	VDOT	Bike/Ped	RTE 234 - BIKE TRAIL	Bike Trail along Route 234	N/A	$ 1,161,000	30-Dec-15
FAIRFAX	TRAIL	VDOT	Bike/Ped	Springfield to Tysons Corner Trail	Construct a multi-purpose trail within the above limits.	N/A	$ 1,500,000	30-Jun-25
VA	TRAIL	VDOT	Bike/Ped	Trail Extension	Construct a multi-purpose trail within the above limits.	N/A	$ 900,000	30-Jun-25
VA	TRAIL	VDOT	Bike/Ped	Georgetown Pike Multi-use Stone Surfaced Trail		N/A	$ 495,000	
DC	TRAIL	DDOT	Bike/Ped	Klingle Trail	The scope of work is for planning, design and construction of a pedestrian and bicycle facility in the former right of way of Klingle Road with related environmental remediation. Local access for private properties in the Porter to Woodley section will b	N/A	$ 11,500,000	30-Sep-13
MONTGOMERY	TRAIL	Montgomery County	Bike/Ped	Frederick Road Bike Path	This project provides for the design, land acquisition, and construction of a new 8-foot wide hiker-biker path along the west side of Frederick Road (MD 355) between Stringtown Road and the existing hiker-biker path near Milestone Manor Lane, a distance o	N/A	$ 5,536,000	30-Jun-16
MONTGOMERY	SIDEWALK CONSTRUCTION	Montgomery County	Bike/Ped	BRAC Bicycle and Pedestrian Facilities	This project provides for the planning, design, and construction of a bikeway network and addition of pedestrian facilities surrounding the Walter Reed National Military Medical Center (WRNMMC) in Bethesda, Maryland due to Base Realignment and Closure (BR	N/A	$ 5,400	
MONTGOMERY	SIDEWALK CONSTRUCTION	Montgomery County	Bike/Ped	MD 355 Multimodal Crossing	This project provides for right-of-way negotiations, utility relocations, and the design and construction of a multimodal grade separated connection between the Walter Reed National Military Medical Center (WRNMMC) and the Medical Center Metro Rail statio	N/A	$ 69,054	30-Jun-15
MONTGOMERY	TRAIL OR SISEWALK CONSTRUCTION	Montgomery County	Transit	Bethesda Metro South Entrance	This project provides access from Elm Street west of Wisconsin Avenue to the southern end of the Bethesda Metrorail Station. The Metrorail Red Line runs below Wisconsin Avenue through Bethesda more than 120 feet below the surface, considerably deeper tha	N/A	$ 60,000,000	

Table 16– Pedestrian Facility Projects in the 2013 CLRP/FY2013-2018 TIP

INFORMAL CARPOOLING LOTS

Background: "Slugging" in the National Capital Region is a widespread phenomenon, which was born out of a need to take advantage of the availability of HOV lanes during the peak commuting periods and to save time and money. Several unofficial park and ride lots where daily "slugging" occurs were created throughout the region. Their location and functions were communicated through word-of-mouth. Over the years such facilities became widely known among commuters where freeform carpools and vanpooling are created. These carpools and vanpools reduce VMT on the regional roadway network by reducing the lengths of single-occupancy-vehicle (SOV) trips. The reduction of VMT on a regional scale was measured here as a TERM. In the same grouping of Informal Carpooling Lots were also included park-and-ride facilities that are not served by transit and where commuters meet and form carpools informally.

Methodology: Slug lots throughout the non-attainment area were inventoried in terms of their capacity and location. Information from the TPB Commuter Connections Program and input from the local jurisdictions enriched and improved the quality of the databases used in the analysis. In addition, average commute distance estimates to Park & Ride (P&R) lots in the Washington Region were obtained from the 2012 Geographically Focused Household Travel Survey and were cross-referenced with data from surveys conducted by the Commuter Connections Program State of the Commute. It was further assumed that each facility is 2/3 full on a typical workday – consistent with WMATA findings referenced in a Washington Examiner article on March 19, 2013-- which is an assumption consistent with prior TPB TERMs analyses and literature research from metropolitan areas in California.

It was assumed that these facilities will not grow in terms of their capacity in future years because: (1) reliable historic data that would have enabled the development of trend lines of future capacity expansions were not available and when available they were not considered reliable; (2) future capacity increases are rather limited as most of this type of parking facilities are located in developed areas with limited additional developable land. However, as actual data on capacities of such facilities start to become available, the flat line growth assumption may be revisited and potentially adjusted.

With input from the Commuter Connections Program and local jurisdictions, the key "slug lots" in the region were inventoried (Table 17). Depending on their location (i.e., inner versus outer suburbs) an average trip length was assigned, which is consistent with assumptions in previous air quality analyses. Emission rates of Table 7 were used because these facilities are associated with commuters (i.e., passenger cars and light duty trucks) and where heavy duty vehicles do not apply. The resulting emissions reductions are tabulated in Table 18.

	P&R Lot Capacities	Avg Trip Length	Daily VMT
FAIRFAX CO.			
AMF Centreville Lanes	31	4.5	186
Apple Federal Credit Union	12	4.5	72
Autumn Willow Park	105	4.5	630
Greenbriar Park	60	7.5	600
LOUDOUN CO.			
Ashburn Farm	20	7.5	200
Ashburn Village	40	7.5	400
Broadlands	30	4.5	180
Potomac Station	50	4.5	300
Sterling ParkShopping Center	46	7.5	460
Crossroads United Methodist Church	90	4.5	540
PRINCE WILLIAM CO.			
Montclair Commuter Lot	49	7.5	490
Harbor Drive	183	7.5	1,830
Good Shepherd United Methodist Church	58	4.5	348
Cherrydale Road	30	4.5	180
Princedale	75	4.5	450
Prince William Stadium	190	4.5	1,140
Bethel United Methodist Church	49	4.5	294
FREDERICK CO.			
Frederick Armory	125	7.5	1,250
Frederick Statium	112	4.5	672
Mount Zion East	36	4.5	216
Jefferson	105	7.5	1,050
New Market	54	4.5	324
Rosemont	44	7.5	440
Urbana (North Lot)	250	7.5	2,500
Woodsboro	23	4.5	138
PRINCE GEORGE'S CO.			
Beltway (I95 south of I-495)	100	7.5	1,000
CALVERT CO.			
Calvert Co Fairgrounds	480	4.5	2,880
Lusby	30	7.5	300
REGIONAL TOTAL			**19,070**

Table 17– Regional Informal Carpooling Lots

REGIONAL EMISSIONS REDUCTIONS – INFORMAL CARPOOLING LOTS					
Years/Pollutants	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**
	(tons/day)	(tons/day)	(tons/year)	(tons/year)	(tons/day)
2015	0.01	0.01	0.11	2.84	0.16
2017	0.01	0.01	0.10	2.32	0.15
2020	0.01	0.01	0.10	1.81	0.14
2025	0.00	0.01	0.10	1.46	0.13
2030	0.00	0.00	0.10	1.30	0.12
2040	0.00	0.00	0.10	1.28	0.13

Table 18– Emissions Reductions – Informal Carpooling Lots

Similarly to the pedestrian facilities of the previous section, "slug lots" serve a multitude of other uses and purposes beyond serving as TERMs. The fact that they also contribute to mobile emissions reductions is a value-added attribute. Given the plurality of their uses and purposes it was not pertinent to develop "measures of effectiveness" as part of this analysis.

When the emissions reductions attributable to the above four TERMs categories are combined, the yield the total emissions reductions which are tabulated in Table 19.

EMISSIONS REDUCTIONS SUMMARY TABLE

REGIONAL EMISSIONS REDUCTIONS – ALL TERMs COMBINED					
Years/Pollutants	**Ozone - VOC**	**Ozone - NOx**	**PM2.5 Direct**	**Precursor NOx**	**Winter CO**
	(tons/day)	(tons/day)	(tons/year)	(tons/year)	(tons/day)
2015	0.17	0.27	2.75	71.35	3.75
2017	0.19	0.28	3.29	73.94	4.41
2020	0.23	0.28	4.12	76.40	5.43
2025	0.29	0.32	5.64	87.41	7.35
2030	0.34	0.38	7.37	102.43	9.53
2040	0.54	0.56	11.36	151.91	14.95

Table 19– Regional Emissions Reductions – All TERMs Categories Combined

APPENDIX G

Transportation Control Measures (TCMs) Implementation

National Capital Region Transportation Planning Board

777 North Capitol Street, N.E., Suite 300, Washington, D.C. 20002-4290 (202) 962-3310 Fax: (202) 962-3202

MEMORANDUM

July 17, 2013

To: **Files**

From: **Jane A. Posey**
Senior Transportation Engineer

Subject: **TCM Reporting: All TCMs Completed**

The transportation conformity rule and the Clean Air Act require that Transportation Control Measures (TCMs) in approved State Implementation Plans (SIPs) be implemented in a timely manner according to the schedules in the SIP. If a nonattainment or maintenance area cannot determine that TCMs are meeting the timely implementation requirement, the Long Range Plan or Transportation Improvement Program does not conform.

Table 1 lists all TCMs included in the Washington DC- Maryland-Virginia Region's 1-Hour Ozone SIP (adopted by the Metropolitan Washington Air Quality Committee-- MWAQC on 2/19/04), the 8-Hour Ozone SIP (adopted by MWAQC on 5/23/07), and the $PM_{2.5}$ SIP (adopted by MWAQC on 3/7/2008). The table also references letters and emails that document the implementation of each project. These letters, which confirm that all of the TCM's in Table 1 were completed, are available on the MWCOG website at http://www.mwcog.org/transportation/activities/quality.

TABLE 1
DC-MD-VA Region State Implementation Plan
TRANSPORTATION CONTROL MEASURES (TCMs)

ID	Description	Implementation Documentation *
DC-1	Bicycle Lane in D. C. (8 miles)	9/28/10 email from Austina Casey (DDOT) to Daivamini Sivasailam (MWCOG)
DC-2	New CNG Powered Trash Trucks (2 Vehicles)	12/06/04 letter from Rick Rybeck (DDOT) to Wendy Klancher (MWCOG)
DC-3	Bicycle Racks in D.C. (150 Racks)	12/06/04 letter from Rick Rybeck (DDOT) to Wendy Klancher (MWCOG)
MD-1	Maryland Suburban Bus Replacements	7/29/03 letter from Marsha Kaiser (MDOT) to Peter Shapiro (TPB Chair)
MD-2	Transit Parking Facilities (at Lake Forest, Tulagi, Germantown)	7/29/03 letter from Marsha Kaiser (MDOT) to Peter Shapiro (TPB Chair)
MD-3	MARC Replacement/Expansion Coaches	7/29/03 letter from Marsha Kaiser (MDOT) to Peter Shapiro (TPB Chair)
MD-4	Bicycle Facilities	7/29/03 letter from Marsha Kaiser (MDOT) to Peter Shapiro (TPB Chair)
MD-5	Park and Ride Facilities (at MD5/MD205, MD210/MD 373, I-270/MD 80)	8/25/04 letter from Marsha Kaiser (MDOT) to Ron Kirby (MWCOG)
MD-6	Grosvenor Metro Garage (1300 spaces)	7/30/04 email from David Moss (Montgomery Co.) to Daivamani Sivasailam (MWCOG)
MD-7	Maryland Park & Ride Lots (at MD 210/MD 373, I-270/ MD 124, MD 2/MD 4, MD 231/ Fairgrounds, MD 117/I-270, MD 2/MD 4)	5/27/13 email from Lyn Erickson (MDOT) to Jane Posey (MWCOG) & 9/03/03 letter from Marsha Kaiser (MDOT) to Ron Kirby (MWCOG)
NV-1	Northern Virginia Districtwide Park-And-Ride Spaces (1872 spaces)	10/05/07 letter from Robert McDonald (VDOT) to Ron Kirby (MWCOG)
NV-2	Transit Access Improvements (200 VRE Parking Spaces)	10/05/07 letter from Robert McDonald (VDOT) to Ron Kirby (MWCOG)
NV-3	Purchase Of New Transit Buses (52 WMATA buses)	3/10/1998 letter from Kathleen Benton 9WMATA) to Jane Posey (MWCOG)
NV-4	Improved Pedestrian Access	10/05/07 letter from Robert McDonald (VDOT) to Ron Kirby (MWCOG)
NV-5	Construction of Bus Shelters (12 shelters)	10/05/07 letter from Robert McDonald (VDOT) to Ron Kirby (MWCOG)
NV-6	Park & Ride Spaces (3200 spaces)	10/05/07 letter from Robert McDonald (VDOT) to Ron Kirby (MWCOG)
NV-7	Bicycle Lanes/Trails in Northern Virginia (12 miles)	6/03/13 email from Cindy Engelhart (VDOT) to Jane Posey (MWCOG)
NV-8	Bicycle Lockers in Northern Virginia (100 lockers)	6/03/13 email from Cindy Engelhart (VDOT) to Jane Posey (MWCOG)
NV-9	Hybrid Light Duty Vehicles (25 vehicles)	7/22/03 letter from Anthony Griffin (Fairfax County) to Peter Shapiro (TPB Chair)
NV-10	Bicycle Trails/Lanes in Northern Virginia (29 miles)	7/11/03 letter from Ron Carlee (Arlington County) to Peter Shapiro (TPB Chair) & 7/08/03 letter from Tom Blaser (PW County) to Peter Shapiro (TPB Chair)
NV-11	Sidewalk improvements in Northern Virginia (1.5 miles)	7/08/03 letter from Robert Sisson (City of Fairfax) to Peter Shapiro (TPB Chair)
NV-12	11 New CNG Buses in place of Diesel Buses	6/14/13 letter from Dan Malouff (Arlington County) to Jane Posey (MWCOG)
WM-1	Bicycle Racks on Buses (1458 racks)	7/29/03 letter from Richard White (WMATA) to Peter Shapiro (TPB Chair)
WM-2	ULSD; CRT Filters (886 buses)	9/25/06 email from Kristin Haldeman to Daivamani Sivasailam (MWCOG)
WM-3	CNG Buses (164 buses)	7/29/03 letter from Richard White (WMATA) to Peter Shapiro (TPB Chair)

NOTE: The projects in this list include all TCMs in the 1-Hour Ozone SIP (adopted by MWAQC 2/19/04), the 8-Hour Ozone SIP (adopted by MWAQC 5/23/07), and the $PM_{2.5}$ SIP (adopted by MWAQC on 3/7/2008).

* Documentation Location: http://www.mwcog.org/transportation/activities/quality