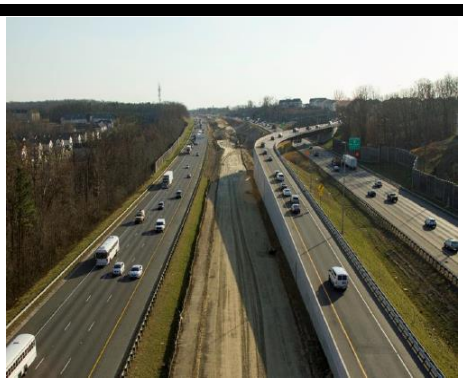

Fredericksburg, Virginia Eight-Hour Ozone Maintenance Area

Transportation Conformity Analysis

FY 18-21 Transportation Improvement Program and 2045 Long Range Transportation Plan

FINAL REPORT

Prepared by: Virginia Department of Transportation

August 2018

VDOT
Virginia Department of Transportation

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Acronym List

BHP-hr	Brake-horsepower-hour
BPR	Bureau of Public Roads
BRT	Bus Rapid Transit
CAA	United States Clean Air Act, as amended
CFR	Code of Federal Regulations
DOT	United States Department of Transportation
EPA	United States Environmental Protection Agency
FAMPO	Fredericksburg Area Metropolitan Planning Organization
FHWA	Federal Highway Administration
FR	Federal Register
FTA	Federal Transit Administration
FY	Fiscal Year
g	grams
GWAQC	George Washington Air Quality Committee
GWRC	George Washington Regional Commission
HCM	Highway Capacity Manual
HDDE	Heavy-Duty Diesel Engine
HDDV	Heavy-Duty Diesel Vehicle
HPMS	Highway Performance Monitoring System
I/M	Vehicle Emission Inspection and Maintenance Program
LRTP	Long Range Transportation Plan
LRT	Light Rail Transit
MPO	Metropolitan Planning Organization
MVEB	Motor Vehicle Emissions Budget
NAAQS	National Ambient Air Quality Standards
NLEV	National Low Emission Vehicle Program
NO_X	Nitrogen Oxides
PRTC	Potomac and Rappahannock Transportation Commission
psi	Pounds per square inch
RFG	Reformulated Gasoline
RVP	Reid Vapor Pressure
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SPS	Statewide Planning System
SIP	State Implementation Plan (for air quality)
STIP	State Transportation Improvement Program
TAZ	Traffic Analysis Zone
TCM	Transportation Control Measure
TIP	Transportation Improvement Program
TSD	Technical Support Document (for SIPs or SIP revisions)
V/C	Volume-to-Capacity (Ratio)
VDEQ	Virginia Department of Environmental Quality
VDOT	Virginia Department of Transportation
VDMV	Virginia Department of Motor Vehicles
VDRPT	Virginia Department of Rail and Public Transportation
VEC	Virginia Employment Commission
VHT	Vehicle Hours of Travel
VMT	Vehicle Miles of Travel
VOC	Volatile Organic Compounds
VRS	Vapor Recovery System
VRE	Virginia Railway Express

Executive Summary

In compliance with the federal transportation conformity rule (40 CFR Parts 51 and 93) and the corresponding state conformity regulation (9 VAC 5-151), this report presents the air quality conformity assessment for the Fredericksburg Area Metropolitan Planning Organization (FAMPO) financially constrained fiscal year 2018 - 2021 Transportation Improvement Program (FY 18-21 TIP) and 2045 Long Range Transportation Plan (LRTP) .

The conformity demonstration applies to the Fredericksburg, Virginia region that was previously designated as being in nonattainment with the 1997 eight-hour ozone national ambient air quality standard (NAAQS), and includes the jurisdictions of Stafford County, Spotsylvania County and the City of Fredericksburg. This region was subsequently re-designated to attainment with the 1997 eight-hour ozone NAAQS (70 FR 76165), effective January 23, 2006. The re-designated area was made subject to the concurrently-approved Fredericksburg Area 1997 Eight-Hour Ozone NAAQS Maintenance Plan at that time.

On May 21, 2012, EPA finalized a rule (77 FR 30088: Air Quality Designations for the 2008 Ozone National Ambient Air Quality Standards) that designated the Fredericksburg region as in attainment for the 2008 eight-hour ozone standard and revoked the 1997 eight-hour ozone NAAQS for purposes of transportation conformity. The attainment designation with the 2008 eight-hour ozone NAAQS became effective July 20, 2012, and the revocation of the 1997 eight-hour ozone NAAQS for transportation conformity purposes became effective on July 20, 2013.

On March 6, 2015, EPA published an additional final rulemaking in the Federal Register on the "Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements", for which the summary stated in part that: "*Other issues also addressed in this final rule are the revocation of the 1997 ozone NAAQS and anti-backsliding requirements that apply when the 1997 ozone NAAQS are revoked*." The revocation (effective April 6, 2015) again effectively eliminated conformity requirements associated with the 1997 eight-hour ozone NAAQS for many areas across the nation, including the Fredericksburg region.

However, on February 16, 2018, the United States Court of Appeals for the District of Columbia Circuit ruled that the revocation of the 1997 eight-hour ozone NAAQS does not waive transportation conformity requirements in areas that were in "maintenance" with that standard and subsequently designated attainment for the more stringent 2008 eight-hour ozone standard[1]. Areas such as these were referred to as "orphan maintenance areas," and the court ruling applies to 82 regions nationwide, including to the Fredericksburg region.

On April 23, 2018, FHWA issued "*Interim Guidance on Conformity Requirements for the 1997 Ozone NAAQS*" that stated in part:

> *"New Metropolitan Long Range Plan and Transportation Improvement Programs (TIP), updates and amendments that include the addition of a project that is not exempt from transportation conformity may not proceed until transportation conformity with the 1997 ozone NAAQS is determined. Exempt projects*

[1] https://www.cadc.uscourts.gov/internet/opinions.nsf/217B6778AE3EC89C8525823600532AE0/$file/15-1115-1718293.pdf.

> *are listed in 40 CFR 93.126 and 93.127. Administrative modifications to Metropolitan Plans and TIPs may proceed because, by definition in 23 CFR 450.104, those actions do not require a conformity determination…*"

This conformity determination is being conducted in response to the aforementioned court ruling and FHWA/FTA guidance, as it applies to the former Fredericksburg eight-hour ozone Maintenance Area (Fredericksburg Maintenance Area).

As indicated in Table ES-1, this conformity determination meets all applicable requirements of the federal transportation conformity rule. A recommendation for a finding of conformity for the LRTP and TIP is therefore made, but is conditional upon any further and separate review as may be required by the US DOT for the fiscal constraint criterion consistent with Section 93.108 of the federal conformity rule and the requirements of federal planning regulations specified at 23 CFR Part 450.

Table ES-1: Conformity Criteria Summary*

Section	Criteria	Demonstrated for the:	
		LRTP	TIP
93.108	Fiscal constraint	Yes**	Yes**
93.110	Latest planning assumptions	Yes	Yes
93.111	Latest emissions model	Yes	Yes
93.112	Consultation	Yes	Yes
93.113(b) & (c)	TCMs	na***	na***
93.118	Emissions Budget	Yes	Yes

* *As specified in the federal conformity rule at 40 CFR 93.109, "Table 1 – Conformity Criteria", with the addition of fiscal constraint as required in Section 93.108.*

** *As indicated by FAMPO approval of the conformity project lists, 2045 LRTP, FY 18-21 TIP, and documented with those reports, and subject to federal review consistent with 23 CFR Part 450 as referenced in Section 93.108.*

*** *The applicable implementation (maintenance) plan for the Fredericksburg region does not include transportation control measures (TCMs), and therefore they are not required for the conformity analysis or determination. See 70 FR 76165, effective January 23, 2006.*

The criteria listed in Table ES-1 are reviewed in turn below. Key sections of the main report are referenced where supporting documentation for the demonstration may be found.

- Section 93.108: This section states: "*Transportation plans and TIPs must be fiscally constrained consistent with [US Dept. of Transportation] DOT's planning regulations at 23 CFR Part 450 in order to be found in conformity*." The MPO documents fiscal constraint with the development of the LRTP and TIP, and includes specific sections or chapters addressing cost estimates and financial constraint. For the purposes of this conformity demonstration, therefore, fiscal constraint is indicated by MPO approval of the conformity project list for the FY 18-21 TIP and 2045 LRTP, and the documentation provided with those plans and programs.

  A recommendation for a finding of conformity is therefore made, but is conditional upon any further and separate review as may be required by the US DOT for the fiscal constraint

criterion consistent with Section 93.108 of the federal conformity rule as well as requirements of federal planning regulations specified at 23 CFR Part 450.

- *§93.110 Criteria and procedures: Latest planning assumptions:*
  - 93.110(a) Latest Planning Assumptions: This section requires that: "*the conformity determination … must be based upon the most recent planning assumptions in force at the time the conformity analysis begins...*"

    In general, the latest available and approved population and employment forecasts for 2045 by Traffic Analysis Zone (TAZ) were employed with the regional travel demand network model (Cube) to generate the traffic volume and vehicle-miles-traveled (VMT) forecasts applied in this conformity analysis. Regional roadway and transit networks were updated as appropriate using the Plan and Program project lists, which were subjected to interagency consultation as described below. Emission controls assumed for the analysis were consistent with those specified in the applicable implementation (maintenance) plan revision.

    All of the latest planning assumptions and other aspects of the conformity analysis were reviewed by the FAMPO Interagency Consultation Group (ICG) at the beginning of the conformity analysis process, as documented in the chapter on consultation and in Appendix C. Additional details are provided below.

  - 93.110 (b) Socioeconomic Forecasts: This section requires that "*Assumptions must be derived from the estimates of current and future population, employment, travel, and congestion most recently developed by the MPO or other agency authorized to make such estimates and approved by the MPO*". Further, Section 93.122(b) (1) (ii) requires that "*Land use, population, employment, and other network-based travel model assumptions must be documented and based on the best available information*". Section 93.122(b) (1) (iii) adds that "*Scenarios of land development and use must be consistent with the future transportation system alternatives for which emissions are being estimated*."

    As documented in the main report, the socioeconomic forecasts for 2045 (including interim years and sub-allocations as appropriate) represent the latest projections available and approved for use with the FAMPO 2045 LRTP.

  - 93.110(c) and (d) Transit: These sections respectively require that "*The conformity determination for each transportation plan and TIP must discuss how transit operating policies (including fares and service levels) and assumed transit ridership has changed since the previous conformity determination*" and "*The conformity determination must include reasonable assumptions about transit service and increases in transit fares and road and bridge tolls over time*".

    Transit operating policies (including fares and service levels) and modeling for transit (ridership) have not changed significantly since the previous conformity determination. Transit service is included in future networks for the region. While future transit ridership is effectively determined in the course of modeling for the conformity analysis, details on current transit operating policies including fares and service levels may be found on the Fredericksburg Regional Transit (FRED) and

website[2]. Transit service is also addressed in supporting documentation for the LRTP and associated modeling.

- 93.110(e) Transportation Control Measures (TCMs) and Other Measures: This section requires that "*The conformity determination must use the latest existing information regarding the effectiveness of the TCMs [transportation control measures] and other implementation plan measures which have already been implemented*."

  The Fredericksburg Area 1997 8-Hour Ozone NAAQS Maintenance Plan (Fredericksburg Area Maintenance Plan) does not include transportation control measures (TCMs). TCMs are therefore not included in the conformity analysis. Accordingly, credit for TCMs was not applied in this analysis. See 70 FR 76165, effective January 23, 2006.

- *§93.111 Criteria and procedures: Latest emissions model [3]:*
  - On October 7th, 2014, EPA officially released the next generation Motor Vehicle Emission Simulator (MOVES2014a) model for use in SIP development and regional conformity applications[4].
  - The selection of latest emission model for the conformity analysis was considered by the FAMPO ICG at the beginning of the conformity analysis process, as documented in the chapter on consultation (Chapter 3) and in Appendix C. The consensus of the FAMPO ICG was to use the MOVES2014a model for this analysis.

- *§93.112 Criteria and procedures: Consultation. "Until the implementation plan revision required by §51.390 of this chapter is fully approved by EPA, the conformity determination must be made according to §93.105 (a) (2) and (e) and the requirements of 23 CFR Part 450."* The Conformity SIP required by §51.390 was approved by EPA and published in the Federal Register on November 20, 2009 (See 73 FR 223 with an effective date of January 19, 2010). The consultation requirements in the conformity SIP are generally consistent with the Federal Transportation Conformity Rule, although it also requires consultation with the Lead Planning Organization (LPO) established pursuant to Section 174 of the federal Clean Air Act as amended (CAA). The George Washington Regional Air Quality Committee (GWAQC) is the designated LPO for the region. Involvement of the VDEQ staff representative for that Committee in the local inter-agency consultation process for conformity is considered to fulfill that requirement.

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2 See http://www.ridefred.com .

3 Federal Conformity Rule, 40 CFR 93.111 *Criteria and Procedures: Latest Emissions Model* http://edocket.access.gpo.gov/cfr_2009/julqtr/40cfr93.111.htm

4 US EPA, 79 FR 9917, [FRL–9917–26–OAR], *Official Release of the MOVES2014 Motor Vehicle Emissions Model for Emissions Inventories in SIPs and Transportation Conformity*, Notice of Availability, October 7th, 2014. Available at: https://www.gpo.gov/fdsys/pkg/FR-2014-10-07/pdf/2014-23258.pdf For additional information, see:

- EPA website for MOVES: https://www.epa.gov/moves/moves2014a-latest-version-motor-vehicle-emission-simulator-moves
- US EPA, *Policy Guidance on the Use of MOVES2014 for State Implementation Plan Development, Transportation Conformity, and Other Purposes*, EPA-420-B-14-008 July, 2014. Direct link: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100K4EB.txt

- The consultation procedures employed follow the requirements outlined in § 93.105(a) (2) and (e), 9 VAC 5-151, and the requirements of 23 CFR Part 450. The consultation conducted for this conformity analysis is documented in detail in Chapter 3 with meeting and related materials including minutes copied in Appendix C. That consultation is summarized below:

- As noted in Chapter 3, documentation of the consultation conducted including the FAMPO ICG membership list, meeting agenda and presentation materials, schedule, handouts, and minutes is provided in Appendix C. An opportunity for public input was provided at the FAMPO ICG meeting that initiated the conformity analysis process at which the conformity methodology, schedule and project lists were presented. Project lists as finalized following consultation are presented in Appendix D.

- Further, the consultation conducted for this conformity analysis followed the FAMPO-approved Interagency Consultation Group Procedures.

- Public review of the conformity analysis was conducted following the procedures presented in the FAMPO "*Public Participation Plan*" (PPP)[5] and included a 14 day public review period. No comments were received.

- *§93.113 Criteria and procedures: Timely implementation of TCMs. "The transportation plan, TIP… must provide for the timely implementation of TCMs from the applicable implementation plan"*… Paragraph (b) identifies specific requirements for plans, and paragraph (c) for TIPs.

  - TCMs were not included in the Fredericksburg Area Maintenance Plan, so this criteria may therefore be considered as not applicable or as satisfied without further action.

- *§93.118 - Criteria and procedures: Motor vehicle emissions budget.*
  (a) "The transportation plan, TIP… must be consistent with the motor vehicle emissions budget(s) specified in the applicable implementation plan… This criterion is satisfied if it is demonstrated that emissions of the pollutants … are less than or equal to the motor vehicle emissions budget(s)…"
  (b) "Consistency with the motor vehicle emissions budget(s) must be demonstrated for each year for which the applicable … implementation plan specifically establishes motor vehicle emissions budget(s), for the attainment year (if it is within the timeframe of the transportation plan), for the last year of the transportation plan's forecast period, and for any intermediate years as necessary so that the years for which consistency is demonstrated are no more than ten years apart… "
  (c) "Consistency with the motor vehicle emissions budget(s) must be demonstrated for each pollutant… for which the area is in nonattainment or maintenance…and for which the applicable implementation plan … establishes a motor vehicle emissions budget."
  (d) "Consistency with the motor vehicle emission budget(s) must be demonstrated by including emissions from the entire transportation system… "

[5] FAMPO, *Public Participation Plan*, May 2017
https://www.fampo.gwregion.org/wp-content/uploads/2017-adopted-public-participation-plan-final.pdf

- The applicable implementation plan is the Fredericksburg Area Maintenance Plan, which was approved and made effective by EPA as of January 23, 2006 and revised as of December 20, 2012, which established motor vehicle emission budgets (MVEBs) for volatile organic compounds (VOC) and nitrogen oxides (NO_x) for the years 2009 and 2015.

  As documented above, total VOC and NO_x emissions associated with the regional transportation system as planned and programmed in the FAMPO FY 18-21 TIP and 2045 LRTP for all analysis years have been modeled and demonstrated to be consistent with (i.e., less than) the motor vehicle emission budgets established in the Fredericksburg Area Maintenance Plan for those pollutants for all years modeled.

  The years selected for analysis are consistent with the requirements of this section of the conformity rule. The Fredericksburg Area Maintenance Plan specifies MVEBs for 2015, and years for which MVEBs are established are required to be analyzed, unless conformity is initiated in a year outside of the budget year. Since this conformity analysis is being conducted outside of the year of the 2015 budget, the year 2021 was selected as the first analysis year by the FAMPO ICG as it is representative of a year in the timeframe of the TIP. Additionally, the conformity rule requires modeling for the last year of the transportation plan (2045), and that years modeled be no more than ten years apart. To meet the latter requirement, the years 2025 and 2035 were selected for analysis. The motor vehicle emissions budget criterion is therefore met.

  Applicable budgets and the selection of years for modeling are reviewed in Chapters 1 and 2.

Other related requirements that were not specifically included as criteria in "Table ES1 - Conformity Criteria" (Section 93.109) are reviewed below:

- *§93.122 – Procedures for determining regional transportation-related emissions.*

  - All applicable requirements of this section were met, as documented in Chapter 2, including:

    (a) (1) all regionally significant projects included in the FAMPO FY 18-21 TIP and 2045 LRTP were included in the regional emissions analysis…; (6) ambient temperatures used in the conformity analysis are consistent with those used to establish the emission budget in the applicable implementation plan (and, similarly, relative humidity data and average barometric pressure as applied are consistent); and (7) reasonable methods were applied to estimate VMT on off-network roadways,

    (b) (1) A regional network model was applied. Land use, population, employment and other assumptions were documented and based on the best available information. Assumed land use development is consistent with the future transportation system. A capacity sensitive assignment methodology was applied, and (via the post-processor) emission estimates are based on speeds derived from final assigned volumes. Zonal travel impedances are in reasonable agreement with the final assigned volumes. The model is reasonably sensitive to changes in times, costs and other factors affecting travel choices; (2) reasonable methods were applied to estimate traffic speeds sensitive to estimated volumes on each roadway segment; (3) The network model was reconciled to HPMS data for the base year.

- *§93.126 & §93.127 - Certain types of projects (such as safety projects, transit projects, and intersection improvements) that do not have adverse emission impacts are exempt from being included in the regional emissions analysis and will not be stopped in the absence of conforming LRTP or TIP:*

    - All projects that are exempt under the federal conformity rule and would not typically be included in the regional network model were not included in the regional emissions analysis.

Amendments to the conformity rule include those made on August 7 and November 14, 1995, August 15, 1997 as well more recent amendments including the July 1, 2004 final conformity rule (69 FR 40004) that addresses conformity for the new ozone and $PM_{2.5}$ air quality standards and the March 1999 court decision, the May 6, 2005 final conformity rule (70 FR 31354) that addresses $PM_{2.5}$ precursors, the March 10, 2006 final conformity rule (71 FR 12468) that addresses $PM_{2.5}$ and PM_{10} hot-spot analyses, and the January 24, 2008 final conformity rule (73 FR 4420) that addresses the provisions contained in SAFETEA-LU. On March 24, 2010 an update to the transportation conformity regulations was issued by EPA promulgating revisions to the transportation conformity rule to address the 2006 24-hour PM2.5 NAAQS, revocation of the annual PM10 NAAQS, and a court remand concerning hot-spot analyses in PM2.5, PM10 and CO areas. On March 14, 2012 EPA published the transportation conformity rule restructuring amendments (77 FR 14979). The amendments restructure sections 40 CFR 93.109 and 40 CFR 93.119 so that the existing rules requirements apply to areas under any future new or revised NAAQS.

This conformity analysis also complies with additional federal guidance published jointly by the EPA and the U.S. DOT dated February 2006, by EPA on May 14, 1999, and by FHWA and FTA on June 14, 1999.

Table ES-2 summarizes the emissions test results for the Fredericksburg Maintenance Area for the eight-hour ozone NAAQS for each year evaluated. For this area, the projected emissions for NO_x and VOC, both precursors to ozone formation, are less than MVEBs established in the Fredericksburg Area Maintenance Plan for all years tested. The emission tests therefore are passed as required in the federal conformity rule.

Additionally, for reference, Chapter 1 provides a review of applicable federal, state and local regulatory requirements, including those relating to the Fredericksburg Area Maintenance Plan.

Table ES-2: Conformity (Emission Budget) Tests

Year		Regional Emissions *(tons per day)*	
		NO_x	**VOC**
2021	**First Analysis Year**		
	LRTP/TIP Forecast:	6.341	3.585
	Budget:	12.993	7.334
	Conformity Test:	PASSED	PASSED
2025	**Interim Year**		
	LRTP/TIP Forecast:	4.591	3.129
	Budget:	12.993	7.334
	Conformity Test:	PASSED	PASSED
2035	**Interim Year**		
	LRTP/TIP Forecast:	2.856	2.224
	Budget:	12.993	7.334
	Conformity Test:	PASSED	PASSED
2045	**LRTP Horizon Year**		
	LRTP/TIP Forecast:	2.901	2.305
	Budget:	12.993	7.334
	Conformity Test:	PASSED	PASSED

Chapter 1: Introduction and Overview

This report documents the procedures and results of the transportation conformity analysis in the Fredericksburg, Virginia 1997 Eight-Hour Ozone Maintenance Area for the Fredericksburg Area Metropolitan Planning Organization (FAMPO) fiscal year 2018-2021 Transportation Improvement Program (FY 18-21 TIP) and 2045 Long Range Transportation Plan (LRTP).

FAMPO serves as the forum for cooperative transportation decision-making for the area and, in this capacity, lead the development of the LRTP and TIP, in consultation and coordination with the Virginia Department of Transportation (VDOT) and other public and private stakeholders, as appropriate. The George Washington Regional Commission (GWRC) serves as staff for the FAMPO. VDOT, working with FAMPO and in consultation and coordination with other agencies and public and private stakeholders, as appropriate, leads the development of the requisite conformity analyses.

The report is organized as follows:

Chapter 1 (this chapter) provides an overview of applicable federal, state and local regulatory requirements and guidance, focusing on transportation conformity but also including a brief review of local air quality designations and related air quality plan development.

Chapter 2 provides a detailed review of the modeling methodology and assumptions as applied in the conformity analysis.

Chapter 3 summarizes the consultation process and results, which begins before the conformity (technical) analysis is initiated with inter-agency review of the methods, assumptions, schedule and project lists to be analyzed and concludes with MPO approval of the draft conformity analysis and subsequent review and approval by the US DOT in consultation with the US EPA.

Chapter 4 documents the results of the conformity analysis, supporting a recommendation for a finding of conformity for the FAMPO FY 18-21 TIP and 2045 LRTP.

Transportation Conformity

Federal, state and local requirements addressing transportation conformity apply for specified air quality nonattainment and maintenance areas in the Commonwealth of Virginia. These requirements originate from Section 176(c) of the Clean Air Act (CAA) as amended, which requires that federal agencies and MPOs not approve any transportation project, program, or plan that does not conform with an approved State Implementation Plan (SIP) for air quality.

On November 24, 1993, in keeping with CAA requirements, the U.S. Environmental Protection Agency (EPA) promulgated a rule (40 CFR Part 51, Subpart T) establishing "criteria and procedures for determining conformity to state and federal implementation plans of transportation plans, programs, and projects funded or approved under Title 23 U.S.C. or the Federal Transit Act." The final rule for transportation conformity became effective on December 27, 1993.

EPA and the U.S. DOT have subsequently finalized a number of amendments to the federal conformity rule. Several sections of the amended rule have also been modified and/or remanded due to court rulings. This conformity analysis meets the requirements of the conformity rule as amended to date by such actions.

This includes amendments made on August 7 and November 14, 1995, August 15, 1997 as well as more recent amendments including the July 1, 2004 final conformity rule (69 FR 40004) that addresses conformity for the new ozone and $PM_{2.5}$ air quality standards and the March 1999 court decision, the May 6, 2005 final conformity rule (70 FR 31354) that addresses $PM_{2.5}$ precursors, the March 10, 2006 final conformity rule (71 FR 12468) that addresses $PM_{2.5}$ and PM_{10} hot-spot analyses, and the January 24, 2008 final conformity rule (73 FR 4420) that addresses the provisions contained in SAFETEA-LU. On March 24, 2010 an update to the transportation conformity regulations was issued by EPA promulgating revisions to the transportation conformity rule to address the 2006 24-hour $PM_{2.5}$ NAAQS, revocation of the annual PM_{10} NAAQS, and a court remand concerning hot-spot analyses in $PM_{2.5}$, PM_{10} and CO areas. On March 14, 2012 EPA published the transportation conformity rule restructuring amendments (77 FR 14979) that restructured sections 40 CFR 93.109 and 40 CFR 93.119 so that the existing rule requirements may apply to areas under any future new or revised NAAQS.

The assessment also complies with additional federal guidance published jointly by the EPA and the US Department of Transportation (USDOT) dated February 2006, by EPA on May 14, 1999, and by FHWA and FTA on June 14, 1999.

The federal transportation conformity rule ensures conformity to a SIP's purpose of: (1) eliminating or reducing the number and severity of violations of NAAQS and (2) attaining these standards. It also ensures that neither a transportation system as a whole nor an individual project will cause or contribute to new air quality violations or will increase the frequency or severity of existing violations.

Under the federal conformity rule, MPOs, state departments of transportation and the FHWA along with the FTA are responsible for conformity determinations for: (1) LRTPs, (2) TIPs, (3) transportation projects that receive federal funding or require FHWA or FTA approval, and (4) regionally significant non-federal projects, if these actions occur in areas that have been designated by EPA as nonattainment or maintenance areas for any of the criteria pollutants.

The assessment also complies with the corresponding state conformity regulations specified at 9 VAC 5-151, also known as the Conformity SIP. The Conformity SIP was approved by EPA and published in the Federal Register on November 20, 2009. See 73 FR 223, effective January 19, 2010.

Transportation Conformity Rule Criteria

Section 93.109 of the federal transportation conformity rule lists specific criteria required for conformity demonstrations for transportation plans, programs and projects. An excerpt showing the criteria specific to plans and programs is provided below. The criteria and how each are met in this conformity analysis are reviewed in Chapter 4. A brief summary of each of the criteria is provided below:

- §93.110 requires that conformity determinations be based upon the latest planning assumptions in force at the time of the determination.

- §93.111 requires that the latest emissions model available be used for the conformity analysis.

Table 1-1: Excerpt from 40 CFR 93.109 ("Table 1 - Conformity Criteria") of the Federal Transportation Conformity Rule

All Actions at all times:	
§93.110	Latest planning assumptions
§93.111	Latest emissions model
§93.112	Consultation
Transportation Plan:	
§93.113(b)	TCMs
§93.118 and/or §93.119	Emissions budget and/or Interim emissions
TIP:	
§93.113(c)	TCMs
§93.118 and/or §93.119	Emissions budget and/or Interim emissions

- §93.112 requires that the conformity determination be made in accordance with the specified consultation procedures. These procedures include: (1) providing reasonable opportunity for consultation with state air agencies, local air quality and transportation agencies, DOT, and EPA (§93.105(a)(2)), and (2) establishing a proactive public involvement process that provides an opportunity for public review and comment prior to taking formal action on a conformity determination (§93.105(e)). Consultation requirements are reviewed in more detail in Chapter 3.

- §93.113 details the steps necessary to demonstrate that the LRTP provides for the timely implementation of transportation control measures (TCMs) and is not interfering with their implementation.

- §93.118 requires the LRTP and TIP be consistent with the motor vehicle emission budget in the applicable SIP. Since emission budgets have been established for the Fredericksburg area, as reviewed later in this chapter, the emission budget tests are applicable (and the Section 93.119 interim tests are not required.)

  For reference, section 93.118(b)(1)(ii) indicates that "*Emissions in years for which no motor vehicle emission budget(s) are specifically established must be less than or equal to the motor vehicle emissions budget(s) established for the most recent prior year. …*"

Additional requirements include or provide:

- §93.122 addresses "*procedures for determining regional transportation-related emissions*". It requires that all regionally significant projects included in the LRTP or TIP be included in the regional emissions analysis, and includes specific requirements for the conduct of both transportation and emission modeling. The applicable modeling requirements of this section are summarized with the conformity demonstration in Chapter 4.

- §93.126 & §93.127 allow certain types of projects (such as safety projects) that do not have adverse emissions impacts to be exempt from being included in the regional emissions analysis.

For reference, the federal rule also specifies related requirements apply for project-level determinations:

- §93.114 requires a currently conforming plan and TIP at the time of project approval.

- §93.115 requires projects to be from a conforming transportation plan and program.

Requirements for consultation are detailed in §93.105 of the federal transportation conformity rule and the Conformity SIP. Consultation requirements and processes are reviewed in detail in Chapter 3.

Air Quality Designation Status for the Fredericksburg Region

The Fredericksburg Maintenance Area, which includes the jurisdictions of Stafford County, Spotsylvania County, and the City of Fredericksburg that were previously designated nonattainment for the 1997 eight-hour ozone standard, is currently in attainment with all of the NAAQS, which are summarized in Table 1-2. The following paragraphs summarize the recent history of air quality designation status in the area.

Table 1-2: National Ambient Air Quality Standards*

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3 month average	0.15 µg/m³ (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	primary	1 year	12.0 µg/m³	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m³	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m³	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

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

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

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

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

(*Source USEPA https://www.epa.gov/criteria-air-pollutants/naaqs-table accessed 07/05/18)

On June 15, 2004, EPA classified the localities of the City of Fredericksburg, Spotsylvania County, and Stafford County as a Moderate Eight-hour Ozone Nonattainment area (56 FR 56694). Prior to this date, Stafford county was part of the Northern Virginia 1-hour Ozone Nonattainment area, while the City of Fredericksburg and Spotsylvania County were in attainment with the ozone NAAQS.

On January 23, 2006, the Fredericksburg 1997 Eight-hour Ozone Nonattainment area was officially redesignated as an Eight-hour Ozone Maintenance Area (70 FR 76165). At that time, a SIP revision, the Fredericksburg Area Maintenance Plan, was approved that outlined how the region would continue to attain the eight-hour ozone NAAQS for the next ten years. Included in the Fredericksburg Area Maintenance Plan are MVEBs to be used in all future conformity determinations. Table 1-3 presents the MVEBs, excerpted from the final rule.

On March 12, 2008 the EPA lowered the 8-hour ozone standard from 0.08 to 0.075 ppm, which had an effective date of May 27, 2008 (see 73 FR 16436). In May 2008, states, environmental groups and industry groups filed petitions with the D.C. Circuit Court of Appeals for review of the 2008 ozone standards. In March 2009, the court granted EPA's request to stay the litigation so the new administration could review the standards and determine whether they should be reconsidered.

On January 6, 2010, EPA proposed to strengthen the NAAQS for ground-level ozone. EPA was proposing to strengthen the 8-hour "primary" ozone standard, designed to protect public health, to a level within the range of 0.060-0.070 parts per million (ppm). EPA was also proposing to establish a distinct cumulative, seasonal "secondary" standard, designed to protect sensitive vegetation and ecosystems, including forests, parks, wildlife refuges and wilderness areas. Following a public hearing and comment period EPA was planning to issue final standards by August 31, 2010.

On September 2, 2011 EPA withdrew its reconsideration of the 2008 ozone standard and instead began moving forward on implementation of the 2008 ozone standard.

On February 14, 2012, EPA proposed a rule (77 FR 8197: Implementing the 2008 National Ambient Air Quality Standards for Ozone: Proposed Nonattainment Area Classifications Approach and Attainment Deadlines.) that would take a necessary step to implement the 2008 NAAQS for ground-level ozone. Under this rule EPA also proposed to revoke the 1997 ozone standards one year after designations for the 2008 standards are effective for purposes of transportation conformity.

On May 21, 2012, EPA finalized a rule (77 FR 30088: Air Quality Designations for the 2008 Ozone National Ambient Air Quality Standards) that designated the Fredericksburg region as in attainment for the 2008 ozone standard and revoked the 1997 ozone NAAQS for purposes of transportation conformity. The attainment designation with the 2008 ozone standard became effective July 20, 2012, and the revocation of the 1997 ozone standard for transportation conformity purposes became effective on July 20, 2013.

After the initial release of MOVES2010, FAMPO utilized the grace period to evaluate the impact that MOVES2010 would have on emissions estimates prior to its required use in regional emissions analyses. FAMPO found that, with all traffic inputs remaining the same, MOVES2010 produced significantly higher emissions estimates for NO_x, and also found that the regional emissions estimates were significantly higher than the MVEBs contained in the Fredericksburg Area Maintenance Plan that were created using the previous mobile model,

MOBILE6.2. As a result, FAMPO worked with the Virginia Department of Environmental Quality (VDEQ) and the FAMPO Interagency Consultation Group (ICG) to update the NO_x MVEBs in the Fredericksburg Area Maintenance Plan using the new (at the time) MOVES2010a model.

VDEQ submitted an updated Fredericksburg Area Maintenance Plan to EPA on September 26, 2011. EPA issued a Federal Register (FR) notice on August 6, 2012, that proposed approval of the Maintenance Plan revision and the updated NO_x MVEBs, and subsequently issued a final approval on December 20, 2012. Table 1-3 below displays the MVEBs that come from the approved revision to the Fredericksburg Area Maintenance Plan.

Table 1-3: Fredericksburg Area Motor Vehicle Emission Budgets

Budget Year	VOC (tons/day)	NOx (tons/day)
2015	7.334	12.933

Note that, while Table 1-3 displays units of tons per day, the methodology presented in the Technical Support Document for the Fredericksburg Area Maintenance Plan indicates the "day" selected to represent an average ozone season weekday. Also, for compliance with the federal conformity rule (Section 93.122, procedures for determining regional emissions), modeling for conformity analyses to meet the budgets specified in the Fredericksburg Area Maintenance Plan would need to be consistent with certain key inputs, such as temperature profiles, as applied in the emission factor modeling. The modeling methodology and inputs for this conformity analysis are presented in the next chapter.

On March 6, 2015, EPA published a final rule in the Federal Register on the "Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements", for which the summary stated in part that: "*Other issues also addressed in this final rule are the revocation of the 1997 ozone NAAQS and anti-backsliding requirements that apply when the 1997 ozone NAAQS are revoked*." The rulemaking became effective on April 6, 2015, and this included the revocation of transportation conformity requirements for the Fredericksburg Maintenance Area.

On February 16, 2018, however, a court decision regarding the 2015 revocation by EPA of the 1997 ozone NAAQS effectively reinstated conformity requirements for that NAAQS across the nation[6]. On April 23, 2018, FHWA issued "*Interim Guidance on Conformity Requirements for the 1997 Ozone NAAQS*" that stated in part (on page 1) the following:

> "*The U.S. Court of Appeals for the D.C. Circuit recently issued a decision in South Coast Air Quality Management District v. EPA, No. 15-1115, which struck down portions of the 2008*

[6] On February 16, 2018, a DC Circuit Court of Appeals decision (No. 15-1115, South Coast Air Quality Management District, Petitioner v. Environmental Protection Agency, et al., Respondents) addressed the 2015 revocation by EPA of the 1997 ozone NAAQS and reinstated associated conformity requirements. EPA has since submitted a petition for rehearing, to which the court has not responded as of the time of preparation of this analysis. Unless and until there are further court decisions changing federal conformity requirements associated with the previously revoked 1997 ozone NAAQS, this analysis is proceeding assuming they are in effect. See: https://www.cadc.uscourts.gov/internet/opinions.nsf/217B6778AE3EC89C8525823600532AE0/$file/15-1115-1718293.pdf

> *Ozone NAAQS SIP Requirements Rule concerning the ozone National Ambient Air Quality Standards (NAAQS). These portions of the 2008 Ozone NAAQS SIP Requirements Rule addressed implementation requirements for the 2008 ozone NAAQS as well as the anti-backsliding requirements associated with the revocation of the 1997 ozone NAAQS. The impact of the decision addresses two groups of ozone areas described in the decision:*
>
> *Areas that were maintenance areas for the 1997 ozone NAAQS at the time of revocation and are designated as attainment for the 2008 Ozone NAAQS. These areas have not been required to make transportation conformity determinations for any ozone NAAQS since the 1997 ozone NAAQS were revoked in April 2015 by EPA's Rule…"*

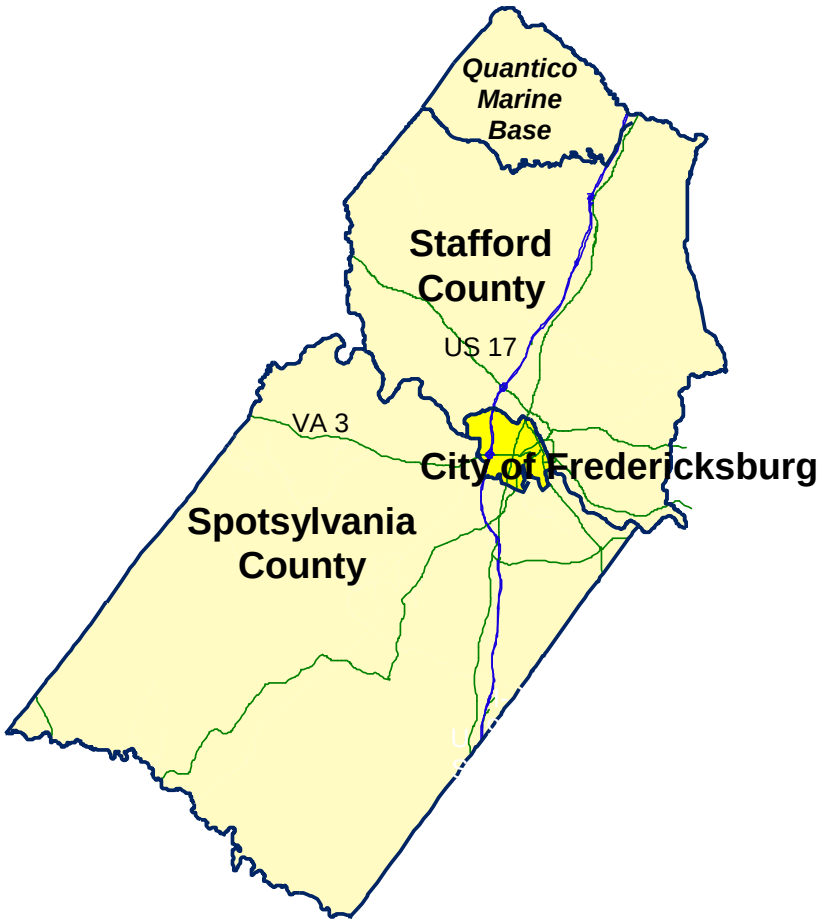
On page 2 of the FHWA Interim Guidance:

> "*New Metropolitan Long Range Plan and Transportation Improvement Programs (TIP), updates and amendments that include the addition of a project that is not exempt from transportation conformity may not proceed until transportation conformity with the 1997 ozone NAAQS is determined. Exempt projects are listed in 40 CFR 93.126 and 93.127. Administrative modifications to Metropolitan Plans and TIPs may proceed because, by definition in 23 CFR 450.104, those actions do not require a conformity determination…*"

As the Fredericksburg area is one of the many areas across the nation that were in maintenance for the 1997 ozone NAAQS at the time of its revocation and are in attainment of the subsequent 2008 ozone NAAQS, it is subject to the court ruling. Transportation plans and programs therefore must again meet conformity requirements for the 1997 ozone NAAQS.

For reference, the geographical area represented in the Fredericksburg Area Maintenance Plan is presented in Figure 1-1. The area includes Stafford County, Spotsylvania County and the City of Fredericksburg.

Figure 1-1: Maintenance Area for the 8-Hour Ozone Standard



Chapter 2: Modeling Methodology and Assumptions

This chapter presents an overview of the modeling approach including key input data and assumptions as applied for the regional conformity analysis for the FAMPO FY 18-21 TIP and 2045 LRTP.

General Emission Calculation Methodology

Emission forecasts for the Fredericksburg Maintenance Area were developed using a traditional four-step transportation planning model (CUBE Voyager) and the latest EPA approved emission factor model (MOVES2014a) to generate emissions forecasts.

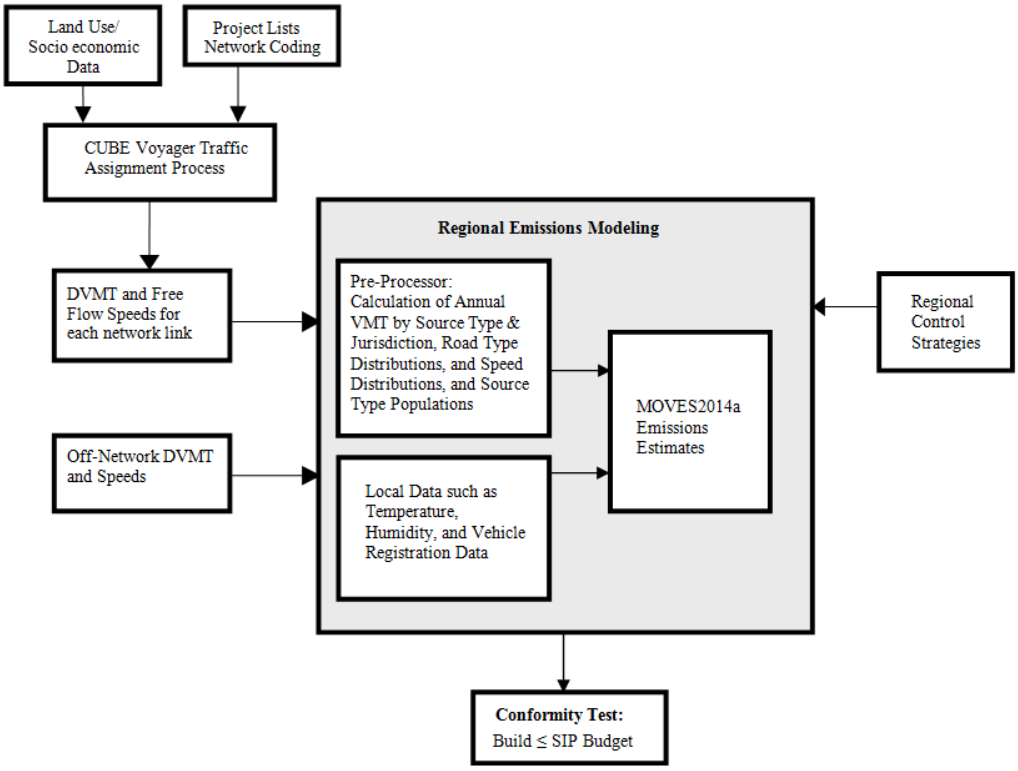
Figure 2-1 below summarizes the key steps in the development of regional emission forecasts for the conformity analysis. The process begins with development of forecasts for traffic volumes on the regional transportation network, for which key inputs include the latest available socioeconomic forecasts (including population and employment) and LRTP and TIP project lists. Traffic forecast volumes and annual average weekday vehicle miles traveled for all conformity analysis years (2021, 2025, 2035, and 2045) were developed with a standard four-step travel demand model developed and maintained by VDOT.

The travel model networks include all functionally classified roadways: interstates, freeways, expressways, principal arterials, minor arterials, and many collector streets as specified in the TIP and LRTP for the FAMPO Maintenance Area. In addition, a small number of local streets necessary to maintain roadway network connectivity are also coded. For each conformity analysis year (2021, 2025, 2035 and 2045), estimates of socio-economic growth were prepared, significant highway and transit projects were coded, and model runs were performed. The networks are developed for each conformity analysis year selected to meet specific requirements of the transportation conformity rule. The selection of years to be analyzed is based on federal conformity regulation requirements and must include years for which MVEBs are specified in the applicable maintenance plan, which was reviewed in the previous chapter.

Traffic operating on local and collector roadways are developed “off-network” since many of these roadways are too small to be included in the regional transportation demand model networks. Current estimates of VMT for these facilities are obtained from highway performance monitoring system (HPMS) data prepared by the VDOT Traffic Engineering Division and are grown to the future analysis years by applying appropriate weekday and monthly adjustment factors, and annual growth factors based on the anticipated growth in auto ownership as reflected in the 2045 LRTP socio-economic data approved by FAMPO.

The network and off-network daily VMT is then combined and converted to annual VMT by jurisdiction and source type prior to being input into the MOVES2014a model for emissions processing. A number of additional traffic and meteorological data inputs are developed for incorporation into the MOVES2014a model which are described in detail below. Emission tests as described in the previous chapter are then applied to demonstrate regional transportation conformity.

Figure 2-1: Transportation Conformity Analysis Process



The remainder of this Chapter provides additional detail on the various models, methods, and assumptions used in the development of the regional emissions analysis that was prepared for this conformity analysis.

The modeling results for this conformity analysis are presented in Chapter 4.

Analysis Years and MVEBs

Table 2-1 presents the MVEBs as specified in the Fredericksburg Area Maintenance Plan as well as the years selected for modeling for this conformity analysis. Previously applicable MVEBs established for the 1-hour ozone standard were superseded by these MVEBs.

Table 2-1: Analysis Years and MVEBs

Year	Regional Emission Budgets *(tons per ozone season weekday)*	
	NOx	**VOC**
2015*	12.933	7.334
2021	12.933	7.334
2025	12.933	7.334
2035	12.933	7.334
2045	12.933	7.334

** Budgets specified in 77 FR 75386, effective December 20, 2012*

The years selected for analysis are consistent with the requirements of Section 93.118 of the conformity rule. The Fredericksburg Area Maintenance Plan specifies a MVEB for 2015, and years for which MVEBs are established are required in the conformity rule to be analyzed, unless conformity is initiated in a year outside of the budget year. Since this conformity analysis is being conducted outside of the years for which the MVEBs were established, the year 2021 was selected as the first analysis year by the FAMPO ICG as it is representative of a year in the timeframe of the TIP. Additionally, the conformity rule requires modeling for the last year of the transportation plan (2045), and that years modeled be no more than ten years apart. To meet the latter requirement, the years 2025 and 2035 were selected.

Note section 93.118 the conformity rule requires budgets be established “for the most recent prior year” to apply for years for which budgets have not been “specifically established”. For this analysis, the 2015 budgets as listed above are also applicable for the analysis years of 2021, 2025, 2035, and 2045.

Transportation Demand Forecasting – FAMPO Version 3.1 Model

The FAMPO travel demand model used to support the FY 18-21 TIP and 2045 LRTP air quality conformity process is the FAMPO Version 3.1 model that operates on the CUBE Voyager modeling platform consisting of two primary software programs: CUBE Base and CUBE Voyager. CUBE Base is used to develop a model’s organizational structure using the CUBE Catalog format and for editing files including transportation networks. CUBE Voyager, is the successor to TP+ and MINUTP, and provides the engine that actually runs the CUBE Voyager model. Over the course of the past few years, VDOT has moved all the travel demand models within Virginia from older platforms, e.g., MINUTP, into the new CUBE Voyager format. Using this new modeling platform, technical staff at VDOT have developed and maintain a regional travel demand model for the FAMPO study area. The model is a four-step travel demand model that includes trip generation, trip distribution, mode split and traffic assignment. The model

includes feedback between highway assignment and trip distribution. The model covers the entire GWRC planning area which includes both the FAMPO and the Fredericksburg 8-hour ozone maintenance areas in their entirety. The jurisdictions included in the model include Stafford County, Spotsylvania County, City of Fredericksburg, King George County, and Caroline County. The CITILABS model has been validated against 2015 traffic volumes, land use, demographics, and other socio-economic factors. The validated model was then used to develop future year traffic models and volume estimates.

Highway and transit system data are coded by the model developers to create a representation of the regional transportation network. Highway network attributes include highway features such as number of lanes, capacity per lane, and speed. Travel time and cost data are calculated from the transportation network for use in subsequent model steps.

Trip making activity is estimated during the trip generation and trip distribution steps. Trip generation uses summary information from each traffic analysis zone (TAZ) to compute the number of trips produced in and attracted to each TAZ. The summary information includes number of households, total population, group-quarters population, retail and non-retail employment, and number of automobiles available to households. These socio-economic data are prepared by GWRC and compiled for use in the model. Trips are generated by purpose (home to work, home to non-work locations, and non-home trips). Commercial vehicle activity is accounted for through the non-home trip purpose. Trips that start or end outside the Fredericksburg region, as well as trips that simply pass through the region, are treated as separate trip purposes. These external trips were estimated from traffic counts observed at major exit stations in the year 2015 and then expanded for future years using growth trend estimates of traffic at the external stations.

The trip distribution step joins the production and attraction end of each trip using factors designed to reproduce observed traffic volumes and trip times in the base year. The trip distribution step uses a standard gravity model, with different factors for each trip purpose. The FAMPO model was designed to use feedback from the highway assignment into trip distribution to better approximate observed traffic conditions (and, in the future years, to better estimate the differential effects of additional trips and transportation facilities). The feedback takes into account the effect of congestion on route choice, since the most commonly chosen route to a destination will depend on whether or not a particular route is congested or free-flowing, and the level of congestion in turn depends on what route travelers are most inclined to choose.

Trip tables from trip distribution, along with network-based travel time and cost data, are input to the mode split step to estimate trip tables by trip purpose, travel period (peak or off-peak) and mode. The mode split step uses a nested logit model to allocate trips between single occupant vehicle, high occupancy 2 vehicle, and high occupancy 3+ vehicles for automobiles and for the Virginia Rail Express (VRE) based on differences in time and cost among the modes. The FAMPO version 3.1 model also can determine paying vs. non-paying users of the existing and planned I-95 Express lanes within the Fredericksburg region so that off-model analysis of this planned HOT lane project is no longer necessary. The final trip tables by mode and purpose are assembled for assignment to the highway and transit networks.

During the highway assignment step, trips between each zone pair are loaded onto the highway network and balanced with congestion effects. Highway assignment uses a capacity restraint formula that limits how many trips can be assigned to each roadway link based on its practical capacity. During assignment, routes are assembled between each zone pair based on the

shortest routes under congested conditions. A feedback loop prior to the final assignment adjusts the trip distribution to account for the effect of congestion on travelers' likely choice of destination, so the number of trips between zones may be altered due to congestion in addition to the actual routes taken.

In transit assignment, trips are assigned to the most efficient transit route available, taking into account waiting time, travel time, transfers required, and fare. Transit assignment is based on the best route, and does not have a capacity restraint or congestion balancing component.

The output of the highway assignment process is a network file that includes forecast weekday traffic volumes on each roadway segment, as well as an estimate of congested travel speed. That file is referred to as a "loaded network".

This overall modeling process is applied for each analysis year. Key inputs to the network model are reviewed below.

Socioeconomic Forecasts

The GWRC provided the socioeconomic data to be used in the transportation model. The GWRC and the member governments in the counties of Spotsylvania, Stafford, King George, and Caroline as well as the city of Fredericksburg developed a distribution of the regional population and employment projections to TAZs used in the transportation model. The counties of King George and Caroline are not part of the FAMPO Maintenance Area, but provided socioeconomic data, as they are part of the modeled region.

To estimate population and employment numbers, documentation from the 2010 US Census as well as the Virginia Employment Commission (VEC) was collected. Projections for 2045 were estimated starting with the compilation of 2015 figures in the FAMPO area, and then a regionally collaborated estimate of figures for 2045 was developed. The forecasted numbers were prepared under the guidance of the member governments and approved by FAMPO.

The average household size and the number of autos for the year 2045 were estimated from the 2010 Census using growth rates derived from historical trends and anticipated growth within the region.

Table 2-2 presents the socioeconomic forecast totals for the jurisdictions that lie within the Fredericksburg Maintenance Area. This data was used to develop the travel demand modeling forecasts for this conformity analysis.

Table 2-2: Socioeconomic Forecasts

Year	Fredericksburg Maintenance Area Totals*			
	Households	Population	Employment	Automobiles
2021	126,049	355,548	155,735	248,317
2025	143,095	394,324	166,573	281,897
2035	177,426	478,534	194,591	349,529
2045	209,045	556,186	231,921	411,819

**This summary is based on the data approved by the FAMPO.*

Project Lists & Regional Network Development

A project list was generated to develop the transportation networks by analysis year, and to identify projects that are regionally significant (or otherwise subject to transportation conformity analysis). All projects occurring on roadway segments bearing a Federal Functional Classification were coded, provided that the nature of the project was amenable to network coding. In general, changes were coded for new facilities, road widenings that increase the number of through travel lanes and new interchanges on limited access facilities. Turn lanes and at-grade intersection improvements were not included in the model network; as such improvements are not amenable to modeling at a regional scale.

This conformity analysis was performed on the FAMPO FY 18-21 TIP and 2045 LRTP. Consistent with the requirements of the transportation conformity rule, regional emission analyses were performed for 2021, 2025, 2035 and 2045. The CUBE voyager transportation networks for each analysis year include all regionally significant projects included in the FAMPO FY 18-21 TIP and 2045 LRTP, and coded into the appropriate year based on anticipated construction completion dates. Where possible, completion dates reflect estimates included in the TIP project descriptions or in VDOT's six-year plan. For future projects, completion dates were determined by adding three years to the anticipated project start date when more specific anticipated completion dates were unavailable.

The modeled network for each analysis year reflects the travel conditions expected to be in place during that analysis year. For example, the 2021 network includes existing roadways as well as projects listed in the FAMPO FY 18-21 TIP and 2045 LRTP that are anticipated to be complete by 2021. Subsequent networks include existing networks plus completed projects from earlier analysis years. Thus, the 2025 network includes all the 2021 projects plus additional projects expected to be complete by 2025.

Appendix D presents the final project lists used to develop the TIP and LRTP networks, including the first analysis year for all regionally significant projects.

Travel Demand Forecast Model Output

The FAMPO travel demand model generates estimates of VMT for all major roadway classes (minor arterial and above). Collector and local roadway VMT are obtained from HPMS data and grown to the appropriate analysis year through off-model procedures. The final assigned volumes from the FAMPO transportation model are extracted from the loaded network that is computed during the highway assignment step. Vehicle miles traveled are computed within the model by multiplying the volume estimated for each network link by the length of the link. The pre-processor uses the loaded network volumes and capacities, along with other relevant travel information such as number of lanes, free flow speed, and link length to calculate congested speeds for each link in the travel demand model output. The VMT and congested speed results are then used to develop a variety of required inputs (described below) to MOVES2014a that is used to calculate the regional mobile emissions estimates.

The roadway capacity per lane, which is used for capacity restraint in the travel demand model, is extracted from the model network, and is used along with traffic volumes and number of lanes to compute congested roadway speeds in the pre-processor.

Off-Line Analyses

Some transportation projects that have a potentially significant impact on regional air quality cannot be coded into the transportation modeling network. These are categorized as "off-line projects" and are analyzed using a variety of methodologies that include elasticity/pivot-point analysis and the use of traffic engineering principles to estimate their traffic and emission impacts.

Off-line analysis can also include Congestion Mitigation and Air Quality (CMAQ) funded projects such as van pools, transit bus replacements, and park-and-ride lots. Since additional air quality credits were not needed to demonstrate conformity for the FAMPO FY 18-21 TIP and 2045 LRTP, they were not applied in the regional emissions analysis.

Emissions Forecasting (US EPA MOVES2014a Mobile Model)

MOVES2014a is the latest version of the MOVES emissions modeling software application developed and required by EPA for use in conformity determinations and the development of SIPs and associated revisions. The model was designed to be used to develop estimates of historic, current and future emissions for area-wide (e.g., regional) on-road motor vehicle fleets. MOVES2014a can calculate in-use fleet average emissions estimates for:

- Criteria pollutants: hydrocarbons, carbon monoxide, nitrogen oxides, exhaust particulate, hazardous air pollutants (HAP), and carbon dioxide.
- Gas, diesel, and natural gas-fueled cars, trucks, buses and motorcycles.
- Calendar years between 1999 and 2050.

The process of estimating on-road mobile source emissions using MOVES2014a requires the input of motor vehicle and traffic related information such as vehicle miles traveled (VMT), vehicle populations, age distributions of registered vehicles, vehicle speeds, fuel specifications, and mobile control programs such as inspection and maintenance programs. MOVES2014a estimates pollutant emissions for the collection of inputs supplied.

For this analysis, both national default data and region-specific inputs were used with MOVES2014a to determine mobile source emissions estimates for this analysis. The effects of reformulated gasoline (RFG) and an Inspection and Maintenance (I/M) program were modeled in Stafford County for all analysis years, as Virginia regulations require RFG and I/M in Stafford dating back to its inclusion in the Northern Virginia 1-hour Ozone Nonattainment Area. Fredericksburg City and Spotsylvania County were modeled with conventional gasoline. Additional input data applied for this analysis that are specific to the Fredericksburg Maintenance Area include jurisdiction-specific registration distributions, source type populations by vehicle type, road type VMT fractions by vehicle source type and roadway type, average congested speed distributions for each jurisdiction and roadway type, ozone season monthly and weekday adjustment factors by source type and roadway type, and hourly temperatures and relative humidity values consistent with the Fredericksburg Area Maintenance Plan.

Key MOVES2014a input data for the Fredericksburg 8-Hour Ozone Maintenance area are summarized below, and a sample run specification file in included in Appendix B. For context, to the extent feasible and appropriate, MOVES model inputs were taken from or otherwise made consistent with those applied in the most recent (2014) EPA National Emission Inventory (NEI), which were based on inputs provided by VDEQ.

Table 2-3: MOVES2014a Input Summary

Parameter	**MOVES Input**
Scale	County/Inventory
Time Spans	Years: First analysis year 2021, LRTP horizon year 2045, and interim years 2025 & 2035 (both less than ten years from all other analysis years). Month, Day & Hour: July, Weekday, all hours (00:00-00:59 to 23:00-23:59)
Geographic Bounds	All applicable jurisdictions (Fredericksburg city, Spotsylvania county, and Stafford county, each individually modeled for each modeling year)
Vehicle Type VMT	FAMPO TDM forecast of VMT by link for each jurisdiction and analysis year, and 2016 HPMS VMT data for each jurisdiction for collector and local roadways, grown as appropriate for each analysis year. Month and day VMT Fractions were taken from the VDOT report "Traffic Data for the 2014 Periodic Emissions Inventory" (November 2015), and applied as appropriate.
Hotelling	MOVES Defaults
I/M Programs	Stafford county only
Retrofit Data	MOVES Defaults
Ramp Fraction	MOVES Defaults
Road Type Distribution	Derived from FAMPO TDM forecasts and HPMS VMT data (for collector and local roadways projected to each modeling year) for each modeling year & jurisdiction.
Source (Vehicle) Type Population	Projected using annual average growth rates for each modeling year based on auto growth taken from FAMPO's socioeconomic data.
Starts	MOVES Defaults
Age (Vehicle Registration) Distribution	2014 age distributions were provided by VDEQ for each jurisdiction.
Average Speed Distribution	Derived from FAMPO TDM forecasts and HPMS VMT data (for collector and local roadways projected to each modeling year) for each modeling year

Parameter	MOVES Input
	& jurisdiction.
Fuels	MOVES Defaults
Meteorology Data	Data for July as specified in the Fredericksburg Area Maintenance Plan
Vehicles/Equipment	Consistent with those specified in the VDEQ 2014 NEI Inputs for all Fredericksburg area jurisdictions
Road Types	All
Pollutants and Processes	*NOx*: Running, Start & Extended Idle Exhaust, Crankcase Running, Start & Extended Idle Exhaust , and Auxiliary Power Equipment *VOC*: As with NOx, plus Evaporative Fuel Permeation, Fuel Vapor Venting, and Fuel Leaks.
Output	Units: pounds, BTUs, and miles Activity: distance travelled

Emission Control Programs

Table 2-4 lists emission control programs in effect for the Fredericksburg Maintenance Area as incorporated into the MOVES2014a model. The locality-specific input parameters are consistent with the approved Fredericksburg Area Maintenance Plan and are based on the latest planning assumptions.

The programs include:

- Reformulated gasoline (RFG), and gasoline Reid Vapor Pressure (RVP): RFG was modeled for Stafford County, whereas Fredericksburg City and Spotsylvania County were modeled with conventional gasoline. Where applicable, RFG benefits were modeled for all analysis years after 1996, consistent with Virginia regulations requiring RFG. Fuel supply and formulation data for the Fredericksburg region were provided by the Virginia Department of Environmental Quality.

  RFG Phase 2, which is currently in effect, has a summertime Reid vapor pressure (RVP) of approximately 6.8 pounds per square inch (PSI). For the County of Spotsylvania and the City of Fredericksburg, the summertime RVP of conventional gasoline was taken as approximately 8.4 PSI.

- 2007 Heavy Duty Diesel Vehicle (HDDV): The 2007 Heavy Duty Diesel Vehicle (HDDV) program including the implementation of ultra-low sulfur diesel was specified for the emission factor modeling for the conformity analysis. From the regulatory announcement[7]:

  New Standards for Heavy-Duty Highway Engines and Vehicles
  [EPA is] finalizing a PM emissions standard for new heavy-duty engines of 0.01 grams per brake-horsepower-hour (g/bhp-hr), to take full effect for diesels in the 2007 model year. [EPA is] also finalizing standards for NOx and non-methane hydrocarbons (NMHC) of 0.20 g/bhp-hr and 0.14 g/bhp-hr, respectively. These NOx and NMHC standards will be phased in together between 2007

[7] EPA Office of Transportation and Air Quality, December 2000, "Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements", EPA420-F-00-057.

and 2010, for diesel engines. The phase-in will be on a percent of-sales basis: 50 percent from 2007 to 2009 and 100 percent in 2010. Gasoline engines will be subject to these standards based on a phase in requiring 50 percent compliance in the 2008 model year and 100 percent compliance in the 2009 model year.

The program includes flexibility provisions to facilitate the transition to the new standards and to encourage the early introduction of clean technologies, and adjustments to various testing and compliance requirements to address differences between the new technologies and existing engine based technologies.

New Standards for Diesel Fuel
Refiners will be required to start producing diesel fuel for use in highway vehicles with a sulfur content of no more than 15 parts per million (ppm), beginning June 1, 2006. At the terminal level, highway diesel fuel sold as low sulfur fuel will be required to meet the 15 ppm sulfur standard as of July 15, 2006. For retail stations and fleets, highway diesel fuel sold as low sulfur fuel must meet the 15 ppm sulfur standard by September 1, 2006.

This program includes a combination of flexibilities available to refiners to ensure a smooth transition to low sulfur highway diesel fuel.

Table 2-4: Emission Control Programs

	2021	2025	2035	2045
Reformulated Gasoline	Stafford Only	Stafford Only	Stafford Only	Stafford Only
I/M Program	Stafford Only	Stafford Only	Stafford Only	Stafford Only
Early NLEV Implementation	Yes	Yes	Yes	Yes
2007 HDDV Standard	Yes	Yes	Yes	Yes
TIER 2/Low Sulfur Gasoline	Yes	Yes	Yes	Yes
TIER 3	Yes	Yes	Yes	Yes

- National Low Emission Vehicle (NLEV) program: The early implementation of the NLEV program was specified in the emission factor modeling for the conformity analysis. The NLEV program, finalized by EPA in March 1998, implemented cleaner light-duty gasoline vehicles beginning in model year 1999.

- Tier 2 Vehicle Emission Standards: EPA Tier 2 vehicle emission standards implementation beginning with the 2004 model year was specified for the modeling for the conformity analysis. Gasoline sulfur levels as required for the Tier 2 standards were incorporated into the modeling. From the supplementary information included with the final Tier 2 rule[8]:

[8] 65 FR 6698-6822, February 10, 2000, "40 CFR Parts 80, 85, and 86, Control of Air Pollution From New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements; Final Rule".

Highlights of the Tier2/Gasoline Sulfur Program

For cars, and light trucks, and larger passenger vehicles, the program will—

- o *Starting in 2004, through a phase in, apply for the first time the same set of emission standards covering passenger cars, light trucks, and large SUVs and passenger vehicles. …*
- o *Introduce a new category of vehicles, "medium-duty passenger vehicles," thus bringing larger passenger vans and SUVs into the Tier 2 program.*
- o *During the phase-in, apply interim fleet emission average standards that match or are more stringent than current federal and California "LEV I" (Low-Emission Vehicle, Phase I) standards.*
- o *Apply the same standards to vehicles operated on any fuel.*
- o *Allow auto manufacturers to comply with the very stringent new standards in a flexible way while ensuring that the needed environmental benefits occur.*
- o *Build on the recent technology improvements resulting from the successful National Low-Emission Vehicles (NLEV) program and improve the performance of these vehicles through lower sulfur gasoline.*
- o *Set more stringent particulate matter standards.*
- o *Set more stringent evaporative emission standards.*

For commercial gasoline, the program will—

- o *Significantly reduce average gasoline sulfur levels nationwide as early as 2000, and was fully phased in by 2006. Refiners will generally add refining equipment to remove sulfur in their refining processes. Importers of gasoline will be required to import and market only gasoline meeting the sulfur limits.*

…

- o *Enable the new Tier 2 vehicles to meet the emission standards by greatly reducing the degradation of vehicle emission control performance from sulfur in gasoline. Lower sulfur gasoline also appears to be necessary for the introduction of advanced technologies that promise higher fuel economy but are very susceptible to sulfur poisoning (for example, gasoline direct injection engines).*
- o *Reduce emissions from NLEV vehicles and other vehicles already on the road.*

Tier 3 Vehicle Emission Standards: Excerpted from the March 2014 EPA fact sheet [9]:

"EPA Sets Tier 3 Motor Vehicle Emission and Fuel Standards

- o *The U.S. Environmental Protection Agency (EPA) is finalizing an important rule designed to reduce air pollution from passenger cars and trucks. Starting in 2017, Tier 3 sets new vehicle emissions standards and lowers the sulfur content of gasoline, considering the vehicle and its fuel as an integrated system.*
- o
- o *The Tier 3 vehicle standards reduce both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavyduty vehicles.*

- o *The Tier 3 gasoline sulfur standard will make emission control systems more effective for both existing and new vehicles, and will enable more stringent vehicle emissions standards. Removing sulfur allows the vehicle's catalyst to work more efficiently. Lower sulfur gasoline also facilitates the development of some lower-cost technologies to improve fuel economy and reduce green- house gas (GHG) emissions, which reduces gasoline consumption and saves consumers money.*

- o *The tailpipe standards include different phase-in schedules that vary by vehicle class but generally phase in between model years 2017 and 2025. In addition to the gradual phase-in*

[9] https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-control-air-pollution-motor-vehicles-tier- 3 Direct link: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100HVZV.PDF?Dockey=P100HVZV.PDF

> *schedules, other flexibilities include credits for early compliance and the ability to offset some higher-emitting vehicles with extra-clean models."*

Consistent with modeling presented in the Technical Support Document for the Fredericksburg Area Maintenance Plan, an inspection and maintenance (I/M) program was included in the modeling for this analysis for Stafford County only. MOVES2014a inputs for the Stafford I/M program were provided by the Virginia Department of Environmental Quality.

Ambient Conditions

Table 2-5 presents average hourly ambient temperature and relative humidity data as excerpted from the Technical Support Document for the Fredericksburg Area Maintenance Plan. The meteorological data applied in the MOVES2014a modeling for this conformity analysis is consistent with the Technical Support Document.

Table 2-5: Ambient Conditions - Ozone Season

Time (EDT)	Temperature (F)	Relative Humidity (%)
12:00 AM	73.94	71.9
1:00 AM	72.68	73.9
2:00 AM	72.14	74.0
3:00 AM	71.06	75.7
4:00 AM	70.16	78.0
5:00 AM	69.26	78.8
6:00 AM	68.36	79.9
7:00 AM	69.44	80.2
8:00 AM	73.40	72.3
9:00 AM	78.80	63.8
10:00 AM	85.46	52.1
11:00 AM	89.60	46.6
12:00 PM	92.84	41.5
1:00 PM	94.28	38.5
2:00 PM	95.54	36.2
3:00 PM	95.00	38.6
4:00 PM	96.08	35.8
5:00 PM	95.18	35.5
6:00 PM	94.10	37.3
7:00 PM	91.94	41.1
8:00 PM	87.26	51.1
9:00 PM	81.86	60.2
10:00 PM	79.52	62.8
11:00 PM	77.36	67.7

Source: Commonwealth of Virginia, Department of Environmental Quality, "Technical Support Document for the Update to the Fredericksburg Area 1997 8-Hour Ozone Maintenance Plan: NOx Motor Vehicle Emission Budget Revisions based on MOVES2010a, Final," September 19th, 2011.

MOVES Vehicle and Road Types

The on-road mobile source emissions estimates include emissions produced by the operation of highway motor vehicles that are registered for use on public roadways and that burn gasoline, diesel, or compressed natural gas fuel. This conformity analysis included all classes of vehicles from motorcycles to heavy-duty tractor trailers operating on roads ranging from rural access roads to interstate highways. Table 2-5 shows each of the 13 FHWA vehicle types, and the mapping that was applied for conversion into the 5 vehicle classes and 13 vehicle types

required by MOVES2014a.

Table 2-6: MOVES Vehicle Types

Table 2 MOVES Source Types and HPMS Vehicle Types[19]			
Source Type ID	Source Types	HPMS Vehicle Type ID	HPMS Vehicle Type
11	Motorcycle	10	Motorcycles
21	Passenger Car	25	Light Duty Vehicles - Short and Long Wheelbase
31	Passenger Truck		
32	Light Commercial Truck		
41	Intercity Bus	40	Buses
42	Transit Bus		
43	School Bus		
51	Refuse Truck	50	Single Unit Trucks
52	Single Unit Short-haul Truck		
53	Single Unit Long-haul Truck		
54	Motor Home		
61	Combination Short-haul Truck	60	Combination Trucks
62	Combination Long-haul Truck		

Source: Excerpted from US EPA, "MOVES2014 and MOVES2014a Technical Guidance: Using MOVES to Prepare Emission Inventories for State Implementation Plans and Transportation Conformity", EPA-420-B-15-093, November 2015

Table 2-7 shows each of roadway types present in MOVES2014a. Included are road types that represent urban and rural driving on roads with both restricted and unrestricted vehicle access. Restricted access road types are usually used to model freeways and interstates, and ramps are considered part of restricted access road types. The "off-network" road type is used to model start and/or extended idle processes that do not occur on the roadway network, and all road types are included to model evaporative emission processes.

Table 2-7: MOVES Road Types

Road Type ID	Road Type Name
1	Off-Network
2	Rural Restricted Access
3	Rural Unrestricted Access
4	Urban Restricted Access
5	Urban Unrestricted Access

Vehicle Miles Traveled (VMT)

Annual VMT by HPMS vehicle class is required as an input to MOVES2014a, and the appropriate data was created by utilizing the relational database capabilities of Microsoft Access and by running a series of queries to format the input data as required by MOVES2014a. As described above and for each conformity analysis year, a regional travel demand model (TDM) was used to develop the network VMT estimates for each arterial and

larger roadway in the FAMPO Maintenance Area. The network VMT was provided by the TDM in units of annual average weekday VMT, and was converted to average annual VMT (AADVMT) by dividing by the appropriate weekday adjustment factor and multiplying by 365. The off-network VMT for local and collector roadways was obtained from VDOT Traffic Engineering HPMS data (as AADVMT) for 2016 and subsequently grown to each future analysis year by applying the appropriate annual VMT growth rate (described below).

The network and off-network AADVMT by jurisdiction and FHWA road type were then combined in a table and subsequently apportioned into the appropriate MOVES vehicle class by utilizing the FHWA vehicle type apportionments obtained from the VDOT Traffic Engineering 2016 report titled "*1236 - DVMT by Physical Jurisdiction by Federal Functional Class by Federal Vehicle Class All Roads; Towns Combined into Counties*." The resulting annual VMT was then summed by jurisdiction and MOVES vehicle class for input into MOVES2014a.

MOVES Road Type Distributions

The fraction of VMT by road type varies from area to area and can have a significant effect on overall emissions from on-road mobile sources. For each source type, a jurisdictionally-specific road type distribution was created that contains the distribution of VMT for each road type (e.g., the fraction of passenger car VMT on each of the MOVES road types). The VMT fractions that were created for use in this analysis were based on current local traffic data and are therefore consistent with the most recent information used for transportation planning.

The jurisdictionally-specific road type distributions were created in Microsoft Access by running a series of queries to format the input data as required by MOVES2014a. The basic process first involves converting the link-level weekday VMT provided by each respective TDM output file into weekday summertime VMT by applying the appropriate monthly adjustment factor (described below). This was done to maintain consistency with the MVEBs contained in the Fredericksburg Area Maintenance Plan. Similarly, the off-network AADVMT for local and collector roadways was grown to each future analysis year and also adjusted to represent weekday summertime VMT. The network and off-network DVMT was then combined in a table for each jurisdictionally-specific MOVES road type and source type, and the appropriate road type distributions were computed and formatted for input into MOVES2014a.

MOVES Speed Type Distributions

Vehicle power, speed, and acceleration have a significant effect on vehicle emissions. At the County scale, MOVES models those emission effects by using a distribution of vehicle hour traveled (VHT) by average speed. MOVES in turn uses the speed distribution to select specific drive cycles, and MOVES then uses these drive cycles to calculate operating mode distributions. The operating mode distributions in turn determine the calculated emissions rates that are used in the regional emissions analysis.

For the development of regional conformity analyses, where activity is averaged over a wide variety of driving patterns, a local speed distribution by road type and source type is necessary. MOVES requires a speed distribution in VHT in 16 speed bins, by each road type, source type, and hour of the day included in the analysis.

Average speed, as defined for use in MOVES, is the distance traveled (in miles) divided by the time (in hours). This is not the same as the instantaneous velocity of vehicles or the nominal

speed limit on the roadway link. The MOVES definition of speed includes all operation of vehicles including intersections and other obstacles to travel which may result in stopping and idling. As a result, average speeds, as used in MOVES, will tend to be less than nominal speed limits for individual roadway links.

The recommended approach for estimating average speeds is to post-process the output from a travel demand network model. In most transportation models, speed is estimated primarily to allocate travel across the roadway network. Speed is used as a measure of impedance to travel rather than as a prediction of accurate travel times. For this reason, speed results from most travel demand models must be adjusted to properly estimate actual average speeds.

For this analysis, TDM link-level speeds were post-processed using accepted transportation engineering methods based on the 2000 Highway Capacity Manual (HCM) and National Cooperative Highway Research Program (NCHRP) Report 387. The post-processor estimates congested speeds using standard Bureau of Public Roads (BPR) formulae that are based upon free flow speeds, volumes and capacity. Free flow speed is the speed at which a vehicle on the roadway segment would travel given no conflict with other traffic, i.e., no congestion. As traffic volumes increase and the carrying capacity of the roadway is reached (i.e. congestion increases), average speeds decrease. The free flow speeds used are consistent with those used in the CUBE Voyager model.

The formulae developed by the BPR to describe the relationship between congested speeds and roadway free flow speeds, volumes and capacities are applied in transportation models as standard practice. This analysis used two forms of the BPR equation. The first is for non-signalized roadway segments:

$$speed\ \ for\ unsignalized\ \ facilities = \frac{corridor\ \ free\ flow\ speed}{1 + 0.2(volume\ /\ capacity)^{10}}$$

The second is for signalized roadway segments, defined as signalized facilities on which traffic signals are spaced two miles or less apart:

$$speed\ \ for\ signalized\ \ facilities = \frac{corridor\ \ free\ \ flow\ speed}{1 + 0.05(volume\ /\ capacity)^{10}}$$

Speed is entered in MOVES as a distribution (of vehicle hours of travel) rather than a single value, since the use of a distribution provides more accurate emissions estimates than that of a single average speed. The speed type distributions by jurisdiction were created by utilizing the relational database capabilities of Microsoft Access and by running a series of queries to format the input data as required by MOVES2014a. The basic process first involves converting the link-level weekday VMT provided by each respective TDM output file into weekday summertime VMT for consistency with the MVEBs contained in the Fredericksburg Area Maintenance Plan. Congested speeds and VHT were then calculated for each link using the appropriate BPR equation noted above.

Similarly, the off-network AADVMT for local and collector roadways was grown to each future analysis year and adjusted to represent weekday summertime VMT. Speeds on local and

collector roadways were obtained from VDOT's Statewide Planning System (SPS) database or from established EPA defaults (e.g., 12.9 mph for urban local roadways), and VHT was subsequently calculated. The network and off-network DVMT, speeds, and VHT were then combined in a table within Microsoft Access for each roadway, and speed type distributions for each jurisdiction were then computed and formatted for input into MOVES2014a.

Source Type Populations

Source type (vehicle type) population is used by MOVES to calculate start, extended idle and evaporative emissions. Start and evaporative emissions depend more on how long a vehicle is parked than how many miles it is driven. In MOVES, start and resting evaporative emissions are related to the population of vehicles in an area. Chained trips may involve multiple starts with relatively low VMT. Because vehicle population directly determines start, extended idle and evaporative emission, users must develop local data for this input. MOVES categorizes vehicles into 13 source types, which are subsets of five HPMS vehicle types in MOVES, as shown in Table 2-6 above.

Source type population data for input into MOVES was developed by the VDEQ in support of the preparation of the federally-required 2014 Periodic Emission Inventory ("2014 PEI"). The data were derived from detailed vehicle identification number (VIN) data for the appropriate jurisdictions in the Commonwealth. The 2014 source type population data was then summed by jurisdiction and MOVES vehicle type, and then grown to each future analysis year by applying the appropriate annual VMT growth rate (further described below).

Monthly, Daily, and Hourly VMT Fractions

The network vehicle activity estimates were forecast through the CUBE voyager model, and are reported as vehicle miles traveled (VMT). As previously noted, the roadway network representing the transportation conditions for each analysis year forms the basis for the estimation of highway volumes. The model produces VMT estimates that correspond to average annualized weekday traffic (AAWDT). The AAWDT then needs to be adjusted to represent ozone-season weekday conditions to be consistent with the MVEBs contained in the Fredericksburg Area Maintenance Plan.

Table 2-8 presents average ozone season monthly adjustment factors for the Fredericksburg Maintenance Area. The adjustment factors were applied to the forecast annualized VMT within MOVES to more accurately account for observed summertime traffic levels, and are based upon HPMS data for 2014 as presented in "*Traffic Data for the 2014 Periodic Emissions Inventory* (VDOT, 2015). The tabulated factors were obtained as the average for the values reported for May through September (i.e., the ozone season) for the Fredericksburg Maintenance Area, and are input into MOVES2014a as representing July.

Table 2-8: Monthly VMT Fractions

HPMS Vehicle Class	HPMS Vehicle Class Name	Ozone Season Factor
10	Motorcycles	0.13084
25	Light Duty Vehicles	0.09227
40	Buses	0.08851
50	Single Unit Trucks	0.09268
60	Combination Trucks	0.08531

Source: VDOT, 2015, "Traffic Data for the 2014 Periodic Emissions Inventory"

Table 2-9 presents the weekday VMT fractions that were used in this analysis. The weekday fractions were obtained from the document titled ""*Traffic Data for the 2014 Periodic Emissions Inventory* (VDOT, 2015), and are presented for each HPMS vehicle class within the Fredericksburg Maintenance Area. The corresponding weekend fractions can be obtained by subtracting the weekday fraction from one.

This analysis used the default hourly VMT fractions contained within the MOVES2014a database.

Table 2-9: Weekday VMT Fractions

HPMS Vehicle Class	MOVES Road Type			
	2 - Rural Restricted	3- Rural Unrestricted	4 - Urban Restricted	5 - Urban Unrestricted
10	0.60980	0.55541	0.65516	0.58618
25	0.64275	0.70520	0.67025	0.72583
40	0.79272	0.85679	0.80069	0.87553
50	0.80985	0.86472	0.82759	0.88057
60	0.84401	0.86945	0.84232	0.87397

** Five-day averages. The corresponding weekend fractions may be obtained as one minus the weekday fraction.*

Annual VMT Growth Rates

Forecasts are required for VMT for local and collector roadways that are not captured by the regional network model. The required forecasts are obtained by applying expected average annual growth rates for traffic on these facilities to specific base year data for the area.

For this analysis, the base year VMT data for local and collector roadways were obtained from the VDOT 2016 HPMS database. The growth rates were obtained from the annual average growth rates for auto ownership in the Fredericksburg Maintenance Area, and are based on the socioeconomic forecasts approved by FAMPO for auto ownership as reported in Table 2-2.

Table 2-10 presents the annual growth rates for local and collector roadways for the Fredericksburg Maintenance Area. These annual growth rates were also applied to the 2014 source type population data to development source type populations appropriate for each conformity analysis year.

Table 2-10: Annual Growth Rates

Jurisdiction	Annual Growth Rate*
Fredericksburg	1.014246
Stafford	1.022497
Spotsylvania	1.028423

***Based on forecasted growth in auto ownership between 2021 and 2045*

Chapter 3: Consultation

In addition to detailed requirements specified in the federal conformity rule for consultation on conformity analyses, related state and local requirements apply. Consultation conducted for conformity purposes is generally in addition to that conducted in the development of the FAMPO FY 18-21 TIP and 2045 LRTP (and any respective amendments or updates). This section documents applicable regulatory requirements for consultation related to conformity analyses and that conducted for this analysis to meet those requirements.

Consultation Requirements and Processes

Federal conformity rule requirements address both interagency and public consultation. Section 93.112 *(Criteria and procedures: Consultation)* requires that: *"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. Until the implementation plan revision required by §51.390 of this chapter is fully approved by EPA, the conformity determination must be made according to §93.105 (a)(2) and (e) and the requirements of 23 CFR Part 450."*

In response to the requirements of Section 51.390, the "Virginia Regulation for Transportation Conformity" (9 VAC 5-151)[10] was passed into state law in 2007. The Conformity SIP required by §51.390 was approved by EPA and published in the Federal Register on November 20, 2009 (See 73 FR 223 with an effective date of January 19th, 2010). The consultation requirements in the conformity SIP are generally consistent with the Federal Transportation Conformity Rule, although it also requires consultation with the Lead Planning Organization (LPO) established pursuant to Section 174 of the federal Clean Air Act as amended (CAA). The George Washington Air Quality Committee (GWAQC) is the designated LPO for the region. Although not specifically listed in the current (2004) FAMPO ICG procedures, but consistent with the new Virginia Regulation for Transportation Conformity, a representative of the designated Lead Planning Organization (LPO) for the region is also invited to participate in inter-agency consultation on conformity issues.

Section 93.105(a)(2) requires that: *"Before EPA approves the conformity implementation plan revision required by §51.390 of this chapter, MPOs and State departments of transportation must provide reasonable opportunity for consultation with State air agencies, local air quality and transportation agencies, DOT and EPA, including consultation on the issues described in paragraph (c)(1) of this section, before making conformity determinations."*

The referenced Section 93.105(c)[(1)] requires that: *"Interagency consultation procedures shall also include the following specific process: (1) A process involving the MPO, State and local air quality planning agencies, State and local transportation agencies, EPA and DOT for the following:*

> *(i) Evaluating and choosing a model (or models) and associated methods and assumptions to be used in hot-spot analyses and regional emissions analyses;*
>
> *(ii) Determining which minor arterials and other transportation projects should be considered*

[10] See https://law.lis.virginia.gov/admincode/title9/agency5/chapter151/.

"regionally significant" for the purposes of regional emissions analysis (in addition to those functionally classified as principal arterial or higher or fixed guideway systems or extensions that offer an alternative to regional highway travel), and which projects should be considered to have a significant change in design concept and scope from the transportation plan or TIP;

(iii) Evaluating whether projects otherwise exempted from meeting the requirements of this subpart (see §93.126 and §93.127) should be treated as non-exempt in cases where potential adverse emissions impacts may exist for any reason;

(iv) Making a determination, as required by §93.113(c)(1), whether past obstacles to implementation of TCMs which are behind the schedule established in the applicable implementation plan have been identified and are being overcome, and whether State and local agencies with influence over approvals or funding for TCMs are giving maximum priority to approval or funding for TCMs. This process shall also consider whether delays in TCM implementation necessitate revisions to the applicable implementation plan to remove TCMs or substitute TCMs or other emission reduction measures;

(v) Notification of transportation plan or TIP revisions or amendments which merely add or delete exempt projects listed in §93.126 or §93.127; and

(vi) Choosing conformity tests and methodologies for isolated rural nonattainment and maintenance areas, as required by §93.109(1)(2)(iii)."

Section 93.105(e) requires that: *"Public consultation procedures. Affected agencies making conformity determinations on transportation plans, programs, and projects shall establish a proactive public involvement process which provides opportunity for public review and comment by, at a minimum, providing reasonable public access to technical and policy information considered by the agency at the beginning of the public comment period and prior to taking formal action on a conformity determination for all transportation plans and TIPs, consistent with these requirements and those of 23 CFR450.316(b). Any charges imposed for public inspection and copying should be consistent with the fee schedule contained in 49 CFR 7.43. In addition, these agencies must specifically address in writing all public comments that known plans for a regionally significant project which is not receiving FHWA or FTA funding or approval have not been properly reflected in the emissions analysis supporting a proposed conformity finding for a transportation plan or TIP. These agencies shall also provide opportunity for public involvement in conformity determinations for projects where otherwise required by law."*

In response to the requirements of 93.105(c)(1) and (e) as stated above, on August 2004 the FAMPO approved the Interagency Consultation Procedures for Fredericksburg Maintenance Area. These procedures were developed to meet the federal requirements for consultation as cited above, and included the formation of an Interagency Consultation Group comprised of representatives of federal, state and local air and transportation agencies. Table 3-1 presents the current membership of the FAMPO ICG.

Overall, MPOs are the lead agencies when developing planning work programs, LRTPs, TIPs and any revisions to the preceding documents, and associated conformity determinations. The GWRC, as the staff to FAMPO, in conjunction with VDOT as appropriate, conducts consultation in compliance with federal planning requirements:

- Provide adequate public notice of public participation activities and time for public review and comment at key decision points, including but not limited to a reasonable opportunity to comment on the proposed LRTP and TIP.
- Provide timely notice and reasonable access to information about transportation issues and processes.
- Employ visualization techniques to describe the LRTP and TIP.
- Make public information (technical information and meeting notices) available in electronically accessible formats and means, such as the World Wide Web.
- Hold any public meetings at convenient and accessible locations and times.
- Demonstrate explicit consideration and response to public input received during the development of the LRTP and TIP.
- Seek out and consider the needs of those traditionally underserved by the existing transportation systems, such as low-income and minority households, who may face challenges accessing employment and other services.
- Provide an additional opportunity for public comment if the final LRTP or TIP differs significantly from the version that was made available for public comment by the MPO and raises new material issues which interested parties could not reasonably have foreseen from the public involvement efforts.
- Coordinate with the statewide transportation planning public involvement and consultation processes.
- Periodically review the effectiveness of the procedures and strategies contained in the participation plan to ensure a full and open participation process.

Table 3-1: FAMPO Interagency Consultation Group

Agency	Designated Staff
MPO Members	
Stafford County	Joey Hess, Chair
City of Fredericksburg	Erik Nelson
County of Spotsylvania	Dan Cole (Primary), Doug Morgan (Alt)
Regional	
FAMPO	Paul Agnello
George Washington Regional Commission	Diana Utz
FRED Transit	Craig Reed (Primary*) , Rodney White (Alt) *Effective subsequent to the ICG meeting
PRTC	Charles Steigerwald
Virginia Railway Express	Sonali Soneji
State	
Dept. of Environmental Quality	Sonya Lewis-Cheatham
Dept. of Transportation (Central Office)	Jim Ponticello
Dept. of Transportation (District Office)	Stephen Haynes
Dept. of Rail & Public Transportation	Ciara Williams
Federal	
Environmental Protection Agency	Gregory Becoat
Federal Highway Administration	Ivan Rucker
Federal Transit Administration	Melissa McGill

Interagency consultation occurs through several mechanisms including:

- Regularly scheduled MPO and Technical Advisory Committee (TAC) meetings;
- Interagency Consultation Group meetings held specifically for the purpose of discussing conformity-related issues; and
- Meetings convened by VDOT and/or VDEQ at which FAMPO issues relating to conformity and/or air quality may be one of several topics discussed.

Topics discussed at ICG meetings include:

- Approval of conformity analysis methodology, including latest planning assumptions and transportation and emission models to be used in the conformity analysis;
- Approval of the emission test(s) to use for the maintenance area
- Approval of the conformity analysis schedule and process;
- Approval of the LRTP and TIP project lists for conformity analysis;
- ICG Membership updates.

The VDOT, VDRPT, VDEQ and FHWA are represented at MPO and ICG meetings. The ICG also includes representatives of the FTA and EPA.

Meeting notices and related correspondence are generally handled by email to ICG members with copies to all members of the TAC as well as other interested parties[11]. Public notices (reviewed in the next section) are handled by the FAMPO and are typically posted on the FAMPO website and also provided to the media or designated outlets for media releases.

Inter-agency consultation also occurs through other FAMPO meetings including:

- Regularly scheduled FAMPO Board meetings,
- Regularly scheduled TAC meetings, and
- Other meetings convened by the FAMPO, VDOT and/or VDEQ at which Fredericksburg Area issues relating to conformity may be one of several topics discussed.

The current version of the FAMPO "*Public Participation Plan*" (PPP), adopted May 15, 2017[12], specifies the appropriate length of the public review and comment period for various documents. Consistent with the FAMPO PPP, the conformity analysis underwent a 14 day public review period.

Consultation Record

Interagency and public consultation opportunities for the conformity analysis for the FAMPO FY 18-21 TIP and 2045 LRTP were provided at the following meetings and events:

- June 4th, 2018; FAMPO ICG meeting, at which the conformity methodology and assumptions, conformity schedule, and the conformity project list was approved. An opportunity for public comment was provided at this meeting but no comments were received.

- June 18th, 2018; FAMPO endorsed the FAMPO Technical Advisory Committee (TAC) to approve for submittal to FHWA the conformity analysis on behalf of the FAMPO Policy Committee.

- August 8th; FAMPO TAC approved the FAMPO FY 18-21 TIP and 2045 LRTP conformity analysis for public review and submittal to FHWA pending no adverse comments.

- August 9th – 23rd, 2018; public review period for the conformity determination. No comments were received during the public review period.

Copies of the above noted MPO resolutions, public notices and materials distributed in advance of the FAMPO ICG Meeting held June 4th, 2018 are provided in Appendix C. That meeting marked the beginning of the conformity analysis process and provided an opportunity for detailed review and comment on all aspects of the analysis, including the models, methods, assumptions, schedule, and conformity project list.

[11] Although not a requirement, many FAMPO member agencies are represented on the ICG by one of their TAC representatives. ICG meetings are usually coordinated with TAC meetings for convenience both in terms of meeting logistics and also for the TAC to take action as needed (e.g. for any changes to the project lists), and to help ensure a quorum.

[12] See: https://www.fampo.gwregion.org/public-participation-plan/

The attached meeting materials included the agenda, conformity analysis schedule, presentation (PowerPoint slides), and meeting minutes. The presentation addressed updates to the FAMPO ICG membership list; methodology and assumptions for the conformity analysis (including models to be applied); ICG procedures; conformity schedule and process (reflected in the list of meetings presented above); and projects lists to be used for the conformity analysis for the FAMPO FY 18-21 TIP and 2045 LRTP.

Meeting notices were distributed by email, and the distribution list included the members of the FAMPO TAC in addition to the members of the FAMPO ICG listed in Table 3-1. Draft meeting minutes and an updated conformity project list were distributed for comment to all meeting participants and invitees June 15th, 2018. Two comments were submitted by Ms. Michelle Shropshire, VDOT, which were included in the final meeting minutes. First, the estimate of project costs for the I-95 Express Lanes Fredericksburg Extension project was modified to $595 million, and this includes Design-Build costs, oversight (VDOT and concessionaire), and financing costs. Second, the project description for the I-95 Northbound Rappahannock River Crossing project was changed to read "Construct 3 CD lanes from Exit 130 to Exit 133, construct a 4th auxiliary lane from Exit 133 to Exit 136, and improve Exit 133 interchange." These changes were included in the final meeting minutes that were distributed to the FAMPO ICG on July 2nd, 2018, and are included in Appendix C.

For reference, the conformity project list for the FAMPO FY 18-21 TIP and 2045 LRTP as modeled for the conformity analysis were presented to, and approved by, the FAMPO ICG. The final version of the project list is provided in Appendix D.

Chapter 4: Conformity Demonstration & Conclusion

The results of the conformity analysis for the FAMPO FY 18-21 TIP and 2045 LRTP are presented in this chapter. The analysis was conducted to meet all applicable federal, state, and local requirements, applying the methodology and key input data and assumptions as presented in the previous chapters. With conformity so demonstrated based on the criteria specified in the federal conformity rule, including emission tests for the FAMPO FY 18-21 TIP and 2045 LRTP as well as other criteria, a finding of conformity for the TIP and LRTP is supported.

Conformity Demonstration

Emission Tests for the LRTP and TIP

Table 4-1 presents the results of the emission (budget) tests required by Section 93.118 of the federal conformity rule. MVEBs, as specified in the Fredericksburg Area Maintenance Plan, were applied for this analysis. For all years tested, the forecasts (build) emissions for NO_x and VOC are less than the applicable budgets. The conformity budget tests are therefore satisfied in this conformity determination.

Other Conformity Requirements

Section 93.109 of the federal conformity rule, and in particular "Table 1 - Conformity Criteria" as presented in that section, list criteria for demonstrating conformity. Compliance with these criteria as well as a fiscal constraint requirement also specified in the federal conformity rule is documented below for the FAMPO 2045 LRTP and FY 18-21 TIP, with applicable sections of the rule excerpted for reference:

- *§93.108 - Fiscal Constraints for transportation plans and TIPs. "Transportation Plans and TIPs must be fiscally consistent with DOT's metropolitan planning regulations at 23 CFR Part 450 in order to be found in conformity".*
    - The MPO documents fiscal constraint with the development of the LRTP and TIP, and includes specific sections or chapters addressing cost estimates and financial constraint. For the purposes of this conformity demonstration, therefore, fiscal constraint is indicated by MPO approval of the project lists for the LRTP and TIP and the documentation provided with those reports.

      Additionally, a recommendation for a finding of conformity is conditional upon any further and separate review as may be required by the US DOT for the fiscal constraint criterion consistent with Section 93.108 of the federal conformity rule as well as requirements of federal planning regulations specified at 23 CFR Part 450.

Table 4-1: Conformity (Emission Budget) Tests

Year		Regional Emissions *(tons per day)*	
		NO_x	VOC
2021	**First Analysis Year**		
	LRTP/TIP Forecast:	6.341	3.585
	Budget:	12.993	7.334
	Conformity Test:	PASSED	PASSED
2025	**Interim Year**		
	LRTP/TIP Forecast:	4.591	3.129
	Budget:	12.993	7.334
	Conformity Test:	PASSED	PASSED
2035	**Interim Year**		
	LRTP/TIP Forecast:	2.856	2.224
	Budget:	12.993	7.334
	Conformity Test:	PASSED	PASSED
2045	**LRTP Horizon Year**		
	LRTP/TIP Forecast:	2.901	2.305
	Budget:	12.993	7.334
	Conformity Test:	PASSED	PASSED

- *§93.110 Criteria and procedures: Latest planning assumptions:*
    - 93.110(a) Latest Planning Assumptions: This section requires that: "*the conformity determination … must be based upon the most recent planning assumptions in force at the time the conformity analysis begins...*"

      In general, the latest available and approved population and employment forecasts for 2045 by Traffic Analysis Zone (TAZ) were employed with the regional travel demand network model (Cube) to generate the traffic volume and vehicle-miles-traveled (VMT) forecasts applied in this conformity analysis. Regional roadway and transit networks were updated as appropriate using the conformity project list, which were subjected to interagency consultation as described below. Emission controls assumed for the analysis were consistent with those specified in the applicable implementation (maintenance) plan revision.

      All of the latest planning assumptions and other aspects of the conformity analysis were reviewed by the FAMPO ICG at the beginning of the conformity analysis process, as documented in the chapter on consultation and in Appendix C. Additional details are provided below.

    - 93.110 (b) Socioeconomic Forecasts: This section requires that "*Assumptions must be derived from the estimates of current and future population, employment, travel, and congestion most recently developed by the MPO or other agency authorized to make such estimates and approved by the MPO*". Further, Section 93.122(b)(1)(ii) requires that "*Land use, population, employment, and other network-based travel model assumptions must be documented and based on the best available information*". Section 93.122(b)(1)(iii) adds that "*Scenarios of land development and use must be consistent with the future transportation system alternatives for which emissions are being estimated*."

      As documented in the main report, the socioeconomic forecasts for 2045 (including interim years and sub-allocations as appropriate) represent the latest projections available and approved for use with the FAMPO 2045 LRTP.

    - 93.110(c) and (d) Transit: These sections respectively require that "*The conformity determination for each transportation plan and TIP must discuss how transit operating policies (including fares and service levels) and assumed transit ridership have changed since the previous conformity determination*" and "*The conformity determination must include reasonable assumptions about transit service and increases in transit fares and road and bridge tolls over time*".

      Transit operating policies (including fares and service levels) and modeling for transit (ridership) have not changed significantly since the previous conformity determination. Transit service is included in future networks for the region. While future transit ridership is effectively determined in the course of modeling for the conformity analysis, details on current transit operating policies including fares and service levels may be found on the Fredericksburg Regional Transit (FRED) and

website[13]. Transit service and fares as well as road tolls are also addressed in supporting documentation for the Plan and associated modeling.

- o 93.110(e) Transportation Control Measures (TCMs) and Other Measures: This section requires that "*The conformity determination must use the latest existing information regarding the effectiveness of the TCMs [transportation control measures] and other implementation plan measures which have already been implemented*."

  The Fredericksburg Area Maintenance Plan does not include transportation control measures (TCMs). TCMs are therefore not required for the conformity analysis or determination. Accordingly, credit for TCMs was not taken in this analysis. See *70 FR 76165, effective January 23, 2006.*

- *§93.111 Criteria and procedures: Latest emissions model:*
  - o The selection of latest emission model for the conformity analysis was considered by the FAMPO ICG at the beginning of the conformity analysis process, as documented in the chapter on consultation and in Appendix C. The consensus of the FAMPO ICG was to use the MOVES2014a model for this analysis.

- *§93.112 Criteria and procedures: Consultation. "Until the implementation plan revision required by §51.390 of this chapter is fully approved by EPA, the conformity determination must be made according to §93.105 (a)(2) and (e) and the requirements of 23 CFR part 450."* The Conformity SIP required by §51.390 was approved by EPA and published in the Federal Register on November 20, 2009 (See 73 FR 223 with an effective date of January 19, 2010). The consultation requirements in the conformity SIP are generally consistent with the Federal Transportation Conformity Rule, although it also requires consultation with the Lead Planning Organization (LPO) established pursuant to Section 174 of the federal Clean Air Act as amended (CAA). The Greater Washington Air Quality Committee is the designated LPO for the region**.** Involvement of the VDEQ staff representative for that Committee in the local inter-agency consultation process for conformity is considered to fulfill that requirement.
  - o The consultation procedures employed follow the requirements outlined in § 93.105(a)(2) and (e), 9 VAC 5-151, and the requirements of 23 CFR part 450. The consultation conducted for this conformity analysis is documented in detail in Chapter 3 with meeting and related materials including minutes copied in Appendix C. That consultation is summarized below:
  - o Documentation of the consultation conducted including the FAMPO ICG membership list, meeting agenda and presentation materials, schedule, handouts, and minutes is provided in Appendix C. An opportunity for public input was provided at the ICG meeting held at the beginning of the conformity analysis process at which the conformity methodology, schedule and project lists were presented. The conformity project list as finalized following consultation is presented in Appendix D.

[13] See www.ridefred.com.

- Further, the consultation conducted for this conformity analysis followed the approved FAMPO ICG Procedures.

- Public review of the conformity analysis was conducted following the procedures presented in the FAMPO "*Public Participation Plan*" (PPP)[14] and included a 14 day public review period. No comments were received.

- *§93.113 Criteria and procedures: Timely implementation of TCMs. "The transportation plan, TIP… must provide for the timely implementation of TCMs from the applicable implementation plan"*… Paragraph (b) identifies specific requirements for plans, and paragraph (c) for TIPs.

    - TCMs were not included in the Fredericksburg Maintenance Plan. The criteria may therefore be considered as not applicable or as satisfied without further action.

- *§93.118 - Criteria and procedures: Motor vehicle emissions budget.*
  (a) "The transportation plan, TIP… must be consistent with the motor vehicle emissions budget(s) specified in the applicable implementation plan… This criterion is satisfied if it is demonstrated that emissions of the pollutants … are less than or equal to the motor vehicle emissions budget(s)…":
  (b) "Consistency with the motor vehicle emissions budget(s) must be demonstrated for each year for which the applicable … implementation plan specifically establishes motor vehicle emissions budget(s), for the attainment year (if it is within the timeframe of the transportation plan), for the last year of the transportation plan's forecast period, and for any intermediate years as necessary so that the years for which consistency is demonstrated are no more than ten years apart… "
  (c) "Consistency with the motor vehicle emissions budget(s) must be demonstrated for each pollutant… for which the area is in nonattainment or maintenance…and for which the applicable implementation plan … establishes a motor vehicle emissions budget."
  (d) "Consistency with the motor vehicle emission budget(s) must be demonstrated by including emissions from the entire transportation system…"

    - The applicable implementation plan is the Fredericksburg Area Maintenance Plan approved and made effective by EPA as of January 23, 2006 and revised effective December 20, 2012 which established MVEBs for VOC and NO_x for the years 2009 and 2015.

    - As documented above, total VOC and NO_x emissions associated with the regional transportation system as planned and programmed in the FAMPO FY 18-21 TIP and 2045 LRTP for all analysis years have been modeled and demonstrated to be consistent with (i.e., less than) the MVEBs established in the Fredericksburg Area Maintenance Plan for those pollutants for all years modeled.

    - The years selected for analysis are consistent with the requirements of this section of the conformity rule. The Fredericksburg Area Maintenance Plan specifies MVEBs for 2015, which is a year in the past as of the date of this analysis. The FAMPO ICG agreed upon using 2021 as the first analysis year, as it is representative of a year in

[14] FAMPO, *Public Participation Plan*, May 2017
https://www.fampo.gwregion.org/wp-content/uploads/2017-adopted-public-participation-plan-final.pdf

the timeframe of the TIP. Additionally, the conformity rule requires modeling for the last year of the transportation plan (2045), and that years modeled be no more than ten years apart. To meet the latter requirement, the years 2025 and 2035 were selected. The motor vehicle emissions budget criterion is therefore met.

- Applicable MVEBs and the selection of years for modeling are reviewed in Chapters 1 and 2.

- Other related requirements that were not specifically included as criteria in "Table 1 - Conformity Criteria" (Section 93.109) are reviewed below:

- *§93.122 – Procedures for determining regional transportation-related emissions.*

  All applicable requirements of this section were met, as documented in Chapter 2, including:

  (a) (1) all regionally significant projects included in the LRTP and TIP were included in the regional emissions analysis…; (6) ambient temperatures used in the conformity analysis are consistent with those used to establish the emission budget in the applicable implementation plan (and, similarly, relative humidity data and average barometric pressure as applied are consistent); and (7) reasonable methods were applied to estimate VMT on off-network roadways,

  (b) (1) A regional network model was applied. Land use, population, employment and other assumptions were documented and based on the best available information. Assumed land use development is consistent with the future transportation system. A capacity sensitive assignment methodology was applied, and (via the post-processor) emission estimates are based on speeds derived from final assigned volumes. Zonal travel impedances are in reasonable agreement with the final assigned volumes. The model is reasonably sensitive to changes in times, costs and other factors affecting travel choices; (2) reasonable methods were applied to estimate traffic speeds sensitive to estimated volumes on each roadway segment; (3) The network model was reconciled to HPMS data for the base year.

- *§93.126 & §93.127 - Certain types of projects (such as safety projects, transit projects, and intersection improvements) that do not have adverse emission impacts are exempt from being included in the regional emissions analysis and will not be stopped in the absence of conforming LRTP or TIP:*

  All projects that are exempt under the federal conformity rule and would not typically be included in the regional network model were not included.

Conclusion and Conformity Finding

Table 4-2 presents the results of the conformity analysis for the FAMPO FY 18-21 TIP and 2045 LRTP. As indicated in the table, the FAMPO FY 18-21 TIP and 2045 LRTP meets all applicable requirements of the federal transportation conformity rule. A recommendation for a finding of conformity for the FAMPO FY 18-21 TIP and 2045 LRTP is therefore made, but is conditional upon any further and separate review as may be required by the US DOT for the fiscal constraint criterion consistent with Section 93.108 of the federal conformity rule and the requirements of federal planning regulations specified at 23 CFR Part 450.

Table 4-2: Conformity Criteria Summary*

Section	Criteria	Demonstrated for the:	
		LRTP	TIP
93.108	Fiscal constraint	Yes**	Yes**
93.110	Latest planning assumptions	Yes	Yes
93.111	Latest emissions model	Yes	Yes
93.112	Consultation	Yes	Yes
93.113(b) & (c)	TCMs	na***	na***
93.118	Emissions Budget	Yes	Yes

* *As specified in the federal conformity rule at 40 CFR 93.109, "Table 1 – Conformity Criteria", with the addition of fiscal constraint as required in Section 93.108.*

** *As indicated by MPO approval of the project list and amendments to the LRTP and TIP, and documented with those reports, and subject to federal review consistent with 23 CFR Part 450 as referenced in Section 93.108.*

******The applicable implementation (maintenance) plan for the Fredericksburg region does not include transportation control measures (TCMs), and therefore they are not required for the conformity analysis or determination (70 FR 76165, effective January 23, 2006).*

APPENDICES

Appendix A: Socioeconomic Forecast by Jurisdiction

Year 2021				
JURIS	**Households**	**Population**	**Employment**	**Autos**
City of Fredericksburg Total	10,285	27,875	40,387	20,261
Spotsylvania Co Total	53,342	156,884	55,667	105,083
Stafford Co Total	62,423	170,790	59,681	122,973
Grand Total	126,049	355,548	155,735	248,317

Year 2025				
JURIS	**Households**	**Population**	**Employment**	**Autos**
City of Fredericksburg Total	10,953	29,077	43,587	21,577
Spotsylvania Co Total	58,984	175,522	58,636	116,198
Stafford Co Total	73,158	189,725	64,350	144,121
Grand Total	143,095	394,324	166,573	281,897

Year 2035				
JURIS	**Households**	**Population**	**Employment**	**Autos**
City of Fredericksburg Total	12,516	32,507	51,056	24,657
Spotsylvania Co Total	72,974	216,794	66,290	143,759
Stafford Co Total	91,936	229,233	77,245	181,114
Grand Total	177,426	478,534	194,591	349,529

Year 2045				
JURIS	**Households**	**Population**	**Employment**	**Autos**
City of Fredericksburg Total	14,190	35,754	57,981	27,954
Spotsylvania Co Total	87,476	253,616	82,776	172,328
Stafford Co Total	107,379	266,816	91,164	211,537
Grand Total	209,045	556,186	231,921	411,819

Appendix B: MOVES 2014a Run Specification File

The Navigation Panel in MOVES is used to select a series of panels which specify the parameters used for creation of the Run Specification file. A copy of the 2021 run spec file as used in the analysis for Spotsylvania County is provided. Copies of all input files are available upon request.

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Appendix C: Consultation

This appendix includes the FAMPO Inter-Agency Consultation Group (ICG) meeting minutes and public consultation materials for the conformity analysis on the FAMPO FY 18-21 TIP and 2045 LRTP.

Attached in chronological order:

- FAMPO resolution dated May 21st, 2018, approving the FY18-21 TIP and 2045 LRTP project list for conformity and authorizing the FAMPO Technical Advisory Committee (TAC) to approve the conformity analysis for public review.

- FAMPO resolution dated June 18th, 2018, authorizing the FAMPO TAC to approve the conformity report for submittal to FHWA following the public review period.

- Presentation and meeting minutes from the June 4th, 2018 FAMPO ICG meeting, at which time the conformity methodology and assumptions, conformity schedule, project lists for the conformity analysis were approved by the FAMPO ICG. An opportunity for public input was provided at this meeting but no comments were received.

- FAMPO TAC resolution from the August 8th, 2018 FAMPO TAC meeting where the committee approved the conformity analysis for public review and submittal to FHWA pending no adverse comments received.

- Public notice for the conformity analysis which ran from August 9th – 23rd, 2018.

- E-mail from FAMPO confirming no comments were received during the public review period.

The draft FAMPO FY 18-21 TIP and 2045 LRTP project list that identified regionally significant projects and their first analysis year was distributed at the June 4th, 2018 FAMPO ICG meeting but is not reproduced here. The final version of the approved FAMPO FY 18-21 TIP and 2045 LRTP projects list is provided in Appendix D.

Fredericksburg Area Metropolitan Planning Organization

Mark Dudenhefer
Chair

Paul Agnello
FAMPO Administrator

FAMPO RESOLUTION 18-32

ENDORSING THE FISCAL YEAR 2018-2021 TRANSPORTATION IMPROVEMENT PROGRAM AND 2045 FISCALLY CONSTRAINED LONG RANGE PLAN PROJECT LIST FOR AIR QUALITY CONFORMITY ANALYSIS

WHEREAS, the U.S. Department of Transportation (USDOT) provides financial assistance to public agencies for transportation technical studies; and

WHEREAS, the USDOT requires approval of regional transportation plans and programs by the Metropolitan Planning Organization (MPO) in accordance with 23 U.S.C. part 450; and

WHEREAS, the Fredericksburg Area Metropolitan Planning Organization Policy Committee is the duly designated Metropolitan Planning Organization for the Fredericksburg Area; and

WHEREAS, the Policy Committee has considered the Fiscal Year 2018-2021 Transportation Improvement Program and 2045 Fiscally Constrained Long Range Plan Project List;

NOW, THEREFORE, BE IT RESOLVED that the Fredericksburg Area Metropolitan Planning Organization hereby endorses the Fiscal Year 2018-2021 Transportation Improvement Program and 2045 Fiscally Constrained Long Range Plan Project List for Air Quality Conformity Analysis, as seen in the attachment to this Resolution; and

BE IT FURTHER RESOLVED that the Fredericksburg Area Metropolitan Planning Organization hereby authorizes the Technical Advisory Committee to approve the draft Conformity Report for public comment on behalf of the Policy Committee.

Adopted by the Policy Committee at its meeting on May 21, 2018.

Matthew Kelly, Second Vice-Chair
Fredericksburg Area Metropolitan Planning Organization
Policy Committee

FAMPO
Fredericksburg Area Metropolitan Planning Organization

Mark Dudenhefer
Chair

Paul Agnello
FAMPO Administrator

FAMPO RESOLUTION 18-34

ENDORSING THE FAMPO TECHNICAL ADVISORY COMMITTEE TO APPROVE FOR SUBMITTAL TO FHWA THE FY 2018-2021 TIP AND 2045 LRTP AIR QUALITY CONFORMITY REPORT ON BEHALF OF THE FAMPO POLICY COMMITTEE

WHEREAS, the U.S. Department of Transportation (USDOT) provides financial assistance to public agencies for transportation technical studies; and

WHEREAS,the USDOT requires approval of regional transportation plans and programs by the Metropolitan Planning Organization (MPO) in accordance with 23 U.S.C. part 450; and

WHEREAS, the Fredericksburg Area Metropolitan Planning Organization Policy Committee is the duly designated Metropolitan Planning Organization for the Fredericksburg Area; and

WHEREAS, the Policy Committee has approved the Fiscally Constrained FY 2018-2021 Transportation Improvement Program and 2045 Long Range Plan Project List;

NOW, THEREFORE, BE IT RESOLVEDthat the Fredericksburg Area Metropolitan Planning Organization hereby authorizes the Technical Advisory Committee to approve the draft Conformity Report for public comment at its August 8th meeting on behalf of the Policy Committee; and

BE IT FURTHER RESOLVED that the Fredericksburg Area Metropolitan Planning Organization hereby authorizes the Technical Advisory Committee to approve for submittal the conformity report to the Federal Highway Administration (FHWA) on its behalf based on August 8th meeting action following the completion of the public comment period, if there is no adverse public comment received.

Adopted by the Policy Committee at its meeting on June 18, 2018.

Mark Dudenhefer, Chair
Fredericksburg Area Metropolitan Planning Organization
Policy Committee

VDOT

FAMPO REGIONAL CONFORMITY ANALYSIS FY18-21 TIP AND 2045 LRTP

Interagency Consultation Group (ICG) Meeting
George Washington Regional Commission

Jim Ponticello, VDOT Environmental

June 4, 2018

Agenda

1. Introduction & Overview
2. ICG Membership Update
3. Consultation Items
   a. Models, Methodology & Assumptions
   b. Conformity Analysis Schedule
   c. Project list for conformity analysis
4. Public Comment Period
5. Approvals & Next Steps

1. Introduction and Overview

- February 16, 2018, the US Court of Appeals for the DC Circuit ruled that, among other things, "the revocation of the 1997 NAAQS does not waive the unambiguous mandate that conformity requirements apply to orphan maintenance areas."
- April 23, 2018, FHWA/FTA issued Interim Guidance on Conformity essentially placing TIP/STIP/LRTP updates/amendments that include non-exempt projects "on hold" until conformity is demonstrated, at least until EPA provides further clarification.
- Interagency consultation is required by the Transportation Conformity Rule
  - ICG Membership specified by agency
  - FAMPO approved ICG Consultation Procedures in August 2004
- Consultation required for:
  - Models, methods, and planning assumptions
    - Consistent with the Fredericksburg 8-hour ozone maintenance plan approved by EPA on January 23rd, 2006
  - Schedule
  - Conformity project list

2. ICG Membership Update

Agency	Designated Staff
MPO Members	
Stafford County	Joey Hess, Chair
City of Fredericksburg	Erik Nelson
County of Spotsylvania	Dan Cole (Primary), Doug Morgan (Alt)
Regional	
FAMPO	Paul Agnello
George Washington Regional Commission	Diana Utz
FRED Transit	Rodney White
PRTC	Charles Steigerwald
Virginia Railway Express	Sonali Soneji
State	
Dept. of Environmental Quality	Sonya Lewis-Cheatham
Dept. of Transportation (Central Office)	Jim Ponticello
Dept. of Transportation (District Office)	Stephen Haynes
Dept. of Rail & Public Transportation	Ciara Williams
Federal	
Environmental Protection Agency	Gregory Becoat
Federal Highway Administration	Ivan Rucker
Federal Transit Administration	Melissa McGill

Fredericksburg 8-Hour Ozone Maintenance Area

3(a). Methodology: Motor Vehicle Emissions Budgets

Design Year	VOC (tons/day)	NOx (tons/day)
2015	7.334	12.933

- On September 26, 2011, DEQ submitted a 8-hour Ozone Maintenance Plan revision to EPA that updated the NOx motor vehicle emissions budget for 2015 using the MOVES model
- On December 20, 2012, EPA published approval of the NOx motor vehicle emissions budget in the Federal Register
- No transportation control measures (TCMs) were included in the Maintenance Plan

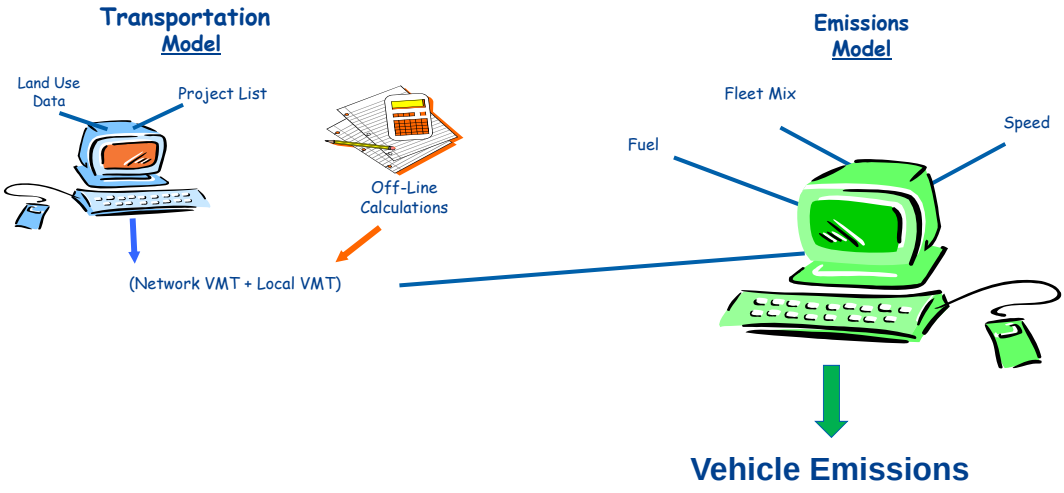
3(a). Methodology: Analysis Years

2021:
Last year of the current FY18-21 TIP (may not be needed; EPA to confirm)

2025 and 2035:
Ten-year interval limit

2045:
Horizon Year of LRTP

3(a). Regional Emissions Analysis



3(a). Socio-Economic Data Summary

Year	Fredericksburg Maintenance Area Total*			
	Households	Population	Employment	Automobiles
2021	126,049	355,548	155,735	248,317
2025	143,095	394,324	166,573	281,897
2035	177,426	478,534	194,591	349,529
2045	209,045	556,186	231,921	411,819

** As approved by FAMPO*

3(a). Models, Methods, and Assumptions

- Using EPA's latest MOVES2014a MOtor Vehicle Emissions Simulator (MOVES) model
- Meteorological Data - consistent with 1997 8-Hour Ozone Maintenance Plan
- Source Type Age Distributions
  - Based on 2014 DMV registration data
  - Provided by VDEQ and used in 2014 NEI
- Source Type Populations
  - Based on 2014 DMV registration data
  - Provided by VDEQ and used in 2014 NEI
  - Grown to future years consistent with S-E auto growth rates
- Road Type Distributions
  - Source type fractions calculated from 2016 HPMS data
  - Based on TDM output for arterials and larger roadways; HPMS for locals and collector roadways

3(a). Additional MOVES Inputs

- Speed Distributions
  - Source type fractions obtained from 2016 HPMS data
  - Based on daily TDM link congested speeds for arterials and larger roadways; HPMS and SPS for locals and collector roadways
- Fuels data obtained from VDEQ
  - RFG in Stafford; conventional gasoline in Fredericksburg and Spotsylvania
- I&M in Stafford County
- Vehicle Miles traveled (VMT)
  - TDM for arterial and larger roadways
  - HPMS for local and collector roadways, grown to future years consistent with S-E auto growth rates
- Hourly VMT Fractions - default

3(a). MOVES Weekday VMT Fractions*

HPMS Vehicle Type	MOVES Road Type			
	2 - Rural Restricted	3- Rural Unrestricted	4 - Urban Restricted	5 - Urban Unrestricted
Motorcycles	0.60980	0.55541	0.65516	0.58618
Light-Duty Vehicles	0.64275	0.70520	0.67025	0.72583
Buses	0.79272	0.85679	0.80069	0.87553
Single Unit Trucks	0.80985	0.86472	0.82759	0.88057
Combination Trucks	0.84401	0.86945	0.84232	0.87397

*Based on 2014 HPMS Data

3(a). MOVES Ozone Season VMT Fractions*

HPMS Vehicle Type	July VMT Fraction (represents ozone season)
Motorcycles	0.13084
Light-Duty Vehicles	0.09227
Buses	0.08851
Single Unit Trucks	0.09268
Combination Trucks	0.08531

*Based on 2014 HPMS Data

3(b). Conformity Analysis Schedule

Date	Task
May 21, 2018	FAMPO approves the FY18-21 TIP and 2045 LRTP fiscally-constrained project list for conformity and authorizes FAMPO TAC to approve draft conformity report for public review
June 4, 2018	Interagency Consultation Group (ICG) Conformity Kickoff Meeting on the FY 18-21 TIP and 2045 LRTP
June 15, 2018	FAMPO staff electronically delivers TDM output files to VDOT Environmental
June 18, 2018	FAMPO authorizes FAMPO TAC to approve Conformity Report for submittal to FHWA
July 31, 2018	VDOT Environmental completes emissions modeling and draft Conformity Report
August 1-6, 2018	Internal review of draft Conformity Report among VDEQ, VDOT, and FAMPO staff
August 8, 2018	FAMPO TAC approves draft Conformity Report for public comment on behalf of FAMPO, and for submittal to FHWA if no adverse comment received (special called meeting)
August 9-23, 2018	14-day public comment period
August 24, 2018	VDOT/FAMPO staff review and address public comments (if necessary)
August 27, 2018	FAMPO TAC approves Conformity Report for submittal to FHWA (special called meeting, only needed if adverse comment received)
August 28, 2018	VDOT submits e-copy of conformity analysis to FHWA; 45-day federal review period begins (may advance a few days if no adverse comment received)
September 11, 2018	VDOT to submit print copies of Conformity Report to FHWA for their records
October 12, 2018	Federal Conformity Determination received (may advance a few days if no adverse comment received)

3(c). Project Lists for Conformity Analysis

- **The conformity project list focuses on projects that are regionally significant and would normally be included in the network travel demand model**
- **Projects that are not regionally significant or are not typically modeled will not impact the conformity analysis**
- **Discussion on project list?**

4. Public Comment Period

Three minute limit on comments

5. Wrap-Up & Next Steps

APPROVALS:

- **Conformity Methodology & Assumptions**
- **Conformity Schedule**
- **Project List for Conformity Analysis**

NEXT STEPS:

- **Completion of TDM runs for appropriate analysis years**
- **Completion of emissions modeling**
- **Development of draft conformity analysis for public review scheduled to begin August 9, 2018**

Fredericksburg Area Metropolitan Planning Organization
Interagency Consultation group (ICG) Meeting
June 4, 2018

Committee Members Present:

Mr. Erik Nelson, City of Fredericksburg
Mr. Dan Cole, Spotsylvania County
Mr. Joey Hess, Stafford County
Ms. Sonya Lewis-Cheatham, DEQ
Ms. Ciara Williams, DRPT
Mr. Paul Agnello, FAMPO
Mr. Ivan Rucker, FHWA (on-line call-in)
Mr. Rodney White, FRED
Ms. Diana Utz, GWRC
Mr. Chuck Steigerwald, PRTC/VDEQ (on-line call-in)
Mr. Jim Ponticello, VDOT Central Office
Mr. Stephen Haynes, VDOT District Office
Ms. Sonali Soneji, VRE

Members Absent:

Mr. Gregory Becoat, EPA
Ms. Melissa McGill, FTA

Others in Attendance:

Ms. Doris McLeod, DEQ
Mr. Doug Morgan, Spotsylvania County
Mr. Dan Grinnell, VDOT Central Office
Ms. Susan Gardner, VDOT District Office
Ms. Michelle Shropshire, VDOT District Office
Mr. Reinaldo Germano, VRE
Mr. Chris Salzahc, VRE

George Washington Regional Commission (GWRC) Staff:

Ms. Marti Donley, FAMPO
Ms. Briana Hairfield, FAMPO
Mr. Nick Quint, FAMPO
Ms. Kari Barber, FAMPO
Mr. John Bentley, FAMPO
Mr. Colin Cate, FAMPO

Welcome

Mr. Agnello thanked everyone for attending today's meeting. Mr. Agnello introduced Ms. Briana Hairfield as a new FAMPO employee. Mr. Agnello advised this is Ms. Hairfield's first day and she will be replacing Ms. Donley who will be retiring from FAMPO on June 30th. Mr. Agnello stated FAMPO is pleased to have Ms. Hairfield on board.

Introduction & Overview

Mr. Ponticello, with the VDOT Environmental Division provided the presentation at today's ICG meeting. Mr. Ponticello stated the purpose of the meeting is to initiate a regional conformity analysis on the FY2018-2021 TIP & 2045 LRTP.

Mr. Ponticello advised that on February 16, 2018, the US Court of Appeals for the DC Circuit ruled that "the revocation of the 1997 NAAQS does not waive the unambiguous mandate that conformity requirements apply to orphan maintenance areas," and the Fredericksburg region is considered an "orphan maintenance area" as defined in the ruling. Mr. Ponticello stated that EPA filed a petition for rehearing on April 23rd, and in conjunction with that petition, FHWA/FTA issued interim guidance on conformity that essentially placed TIP/STIP/LRTP updates/ amendments/revisions for non-exempt projects "on hold" until conformity has been demonstrated, at least until EPA provides further clarification.

Mr. Ponticello said that FAMPO approved the Interagency Consultation Group (ICG) procedures in August of 2004, and advised that consultation is required for the models, methods, and planning assumptions used in the analysis, and that they be consistent with the Fredericksburg region's 8-hour ozone maintenance plan that was approved by EPA on January 23, 2006.

ICG Membership Update

Mr. Ponticello presented a slide of the current ICG membership roster, and asked if any membership representatives need to be updated. No comments or updates to ICG membership were noted. Mr. Ponticello stated the Fredericksburg 8-hour ozone maintenance area consists of the City of Fredericksburg and the Counties of Spotsylvania and Stafford.

Consultation Items

i. Models, Methodology & Assumptions

Mr. Ponticello advised that it has been a number of years since a regional conformity analysis had been completed in this region. The Fredericksburg region was previously in maintenance with the 1997 8-hour ozone standard. When EPA finalized a new more stringent ozone standard in 2008, and for areas such as Fredericksburg that were found to be in attainment with the new standard, conformity requirements pertaining to 1997 8-hour ozone standard were revoked. Mr. Ponticello advised the last time a regional conformity analysis was completed in this region was in 2013, at which time the FAMPO region remained in compliance.

Mr. Ponticello stated that the purpose of today's meeting is to initiate a regional conformity determination in an expedited manner so we can avoid having delays to major transportation projects throughout the region. Mr. Ponticello stated the transportation conformity regulation requires that we consult on the models/methodologies/assumptions and project list used in the upcoming analysis, which are the main topics of discussion today.

Mr. Ponticello stated on September 26, 2011, DEQ submitted an 8-hour ozone maintenance plan revision to EPA that updated the 2015 NOx motor vehicle emissions budget by using the MOVES2010 model. On December 20, 2012, EPA published an approval of the NOx motor vehicle emissions budget (MVEB) in the Federal Register. Mr. Ponticello stated that no transportation control measures (TCMs) were included in the maintenance plan.

Mr. Ponticello advised that transportation conformity requires the region to demonstrate that the total motor vehicle emissions for all analysis years remain below the level of the MVEBs included in the 1997 8-hour ozone maintenance plan that was developed for this region and adopted in the 2004 time frame.

Mr. Ponticello then provided a general overview of the methodology and assumptions to be applied in the analysis. The traffic forecasts would be developed based on the approved project lists, using the 2045 socioeconomic data provided by GWRC and approved by FAMPO. EPA's latest emissions model, MOVES2014a, would be used to generate motor vehicle emissions estimates. Gasoline inputs will be consistent with those used by VDEQ in the development of the 2014 National Emissions Inventory (NEI). Reformulated gasoline (RFG) will be used in Stafford County and conventional gasoline will be used in the City of Fredericksburg and Spotsylvania County. An inspection and maintenance program would be included in the modeling for Stafford County, which dates back to their days as part of the Northern Virginia 1-hour ozone nonattainment area. Mr. Agnello asked if this requirement applies to only northern Stafford County or the entire county, and Mr. Ponticello confirmed it applies to the entire county.

Hourly temperature and relative humidity values would be consistent with those used in the 1997 8-Hour Ozone Maintenance Plan. Local traffic inputs needed for MOVES2014a were discussed during the presentation (attached) and include age distributions, source type populations, road type distributions, speed distributions, annual vehicle miles traveled, and monthly and daily adjustment factors to account for ozone season weekday vehicle activity. Local inputs will be based on 2014 vehicle registration data provided by the Virginia Department of Motor Vehicles, 2014 HPMS data provided by the VDOT Traffic Engineering Division and documented in "Traffic Data for the 2014 Periodic Emissions Inventory," as well as the latest TDM outputs for each analysis year that will be provided by GWRC staff.

Transportation conformity budget tests will be applied for the forecast years 2021, 2025, 2035 and 2045. These years were selected to meet specific conformity rule requirements; 2021 is a year in the timeframe of the TIP, and 2045 is the horizon year of the long range transportation plan (LRTP). The years 2025 and 2035 were selected as interim years to meet federal transportation conformity rule requirements for the years selected to be no more than ten years apart.

No comments were received on the conformity analysis methodology and assumptions.

ii. Conformity Analysis Schedule

Mr. Ponticello reviewed the Conformity Analysis schedule which is as follows:

June 15th – FAMPO staff will electronically deliver TDM output files to VDOT Environmental

June 18th – FAMPO will authorize TAC to approve Conformity Report that will be submitted to FHWA

July 31st – VDOT Environmental will complete emissions modeling and a draft of the Conformity Report

August 1st-6th – Internal review of the draft Conformity Report by VDEQ, VDOT & FAMPO staff

August 8th – Special called TAC meeting to approve draft Conformity Report for public comment period to begin

August 9th – start of 14-day public comment period

August 23rd – public comment period ends

August 24th – VDOT/FAMPO staff will review and address public comments received from August 9th through August 23rd, if necessary

August 27th – Special called TAC meeting (only if necessary) if adverse public comments were received prior to draft Conformity Report being submitted to FHWA

August 28th – VDOT will submit an e-copy of the Conformity Analysis Report to FHWA which will then result in a 45-day federal review period to begin

September 11th – VDOT will submit printed copies of Conformity Report to FHWA for their records

October 12th – Federal Conformity determination to be received to VDOT from FHWA.

iii. Project List for Conformity Analysis

The conformity project list for the FY 18-21 TIP and 2045 LRTP and were emailed to the ICG prior to the meeting, and they were also included with the agenda package and distributed at the ICG meeting. The project list includes the fiscally constrained FY 18-21 TIP and 2045 LRTP projects as approved by FAMPO, and also notes whether each project is considered to be regionally significant and, if so, it's first conformity analysis year.

Mr. Ponticello advised the conformity project list focuses on projects that are regionally significant that would normally be included within the regional travel demand model. Mr. Ponticello stated that projects that are not regionally significant may not typically be modeled and would not impact the conformity analysis. Mr. Ponticello asked that the ICG members review the projects to see if any amendments/additions need to be made.

Mr. Morgan advised that UPC #13558 which is an I-95 interchange relocation and widening project is listed as being a project in Spotsylvania County. Mr. Morgan relayed this project is actually a Stafford County project so the jurisdiction needs to be updated.

Ms. Soneji asked Mr. Agnello if the model would also include VRE projects. Mr. Agnello stated the current FAMPO TDM being utilized does not have transit capabilities; however, future models will include transit projects. Mr. Agnello stated the plan now will just include highway and bike/ped projects.

Ms. Utz asked Mr. Ponticello if the region would need to utilize VRE and Vanpool/Bus emissions credits in the analysis. Mr. Ponticello stated that he did not think the analysis would need to use these credits in order to demonstrate conformity.

Mr. Haynes stated VDOT has 2 secondary projects in Stafford County that are being considered and he is not sure whether these would need to be added to the existing project list. The 2 projects are UPC #100622 – Poplar Road improvements & UPC #107194 – Berea Church Road.

Mr. Agnello asked if the Berea Church Road project is adding additional capacity. Mr. Hess stated the project is listed as an improvement project that will take out existing curves, widen shoulders and make the road safer; however, is not going to be adding any additional lanes and is considered as a rehab/re-construction project. Mr. Ponticello stated that if the project is not adding capacity, then it would not typically be considered regionally significant.

Mr. Agnello asked if the Poplar Road project is adding additional lane capacity or just improving existing roadway with additional turn lanes. Mr. Ponticello stated he would refer to the modeling experts in the room; however, in the past additional turn lanes are also projects that are not typically included in the model. Mr. Agnello concurred that if lanes are not being added, this is not something that can be modeled by FAMPO staff.

Mr. Haynes stated that it is concurrence from the committee that the 2 projects mentioned do not need to be added to the existing project list. Mr. Ponticello stated they should still be added to the list to document that they were considered for conformity and are fiscally constrained, however they would not be noted as being regionally significant.

Mr. Haynes asked Mr. Ponticello if he was in receipt of an I-95 ramp improvement project at Exit 136 that VDOT District Office submitted last Friday afternoon. Mr. Ponticello stated the current project list in today's packet has not been updated, and he hadn't had a chance to review the email in question. Mr. Haynes asked Mr. Ponticello to follow-up as this is a Stafford County Smart Scale application that will add 2 additional turn lanes at Centreport Parkway so if not available for updating, then the project would need to be added. Mr. Agnello stated there could be Smart Scale projects selected that are not currently constrained so this project could be one of them. Until the Smart Scale application process is completed, it is not necessary for FAMPO to do anything right now regarding updates to any plans, etc. In further correspondence after the meeting, Mr. Haynes agreed the project does not need to be added at this time.

Mr. Agnello stated that after the Round 3 of the Smart Scale process is completed, a new conformity analysis may need to be completed for the next 6-year plan for FY2025. Mr. Ponticello stated that projects can be added to the TIP/LRTP for "PE only" without triggering conformity, and this could be a viable way get projects started prior to completing a subsequent conformity determination.

Mr. Agnello advised that adding new projects would also require the LRTP be updated which requires a 2-month process. Mr. Agnello stated that staff is planning to complete an update in the spring of 2019 anyway so the updates could be made at that time.

Mr. Agnello asked Mr. Ponticello if there is any chance that both Caroline & King George counties will be subject to Air Quality conformity regulations. Mr. Ponticello stated the only way this could happen is if the region monitored ozone levels in violation of the 2015 8-hour ozone standards. Mr. Ponticello stated this happening appears very unlikely as the current ozone design values are in the low 60 ppb range, whereas the 2015 8-hour ozone standard is set at 70 ppb.

Subsequent to the meeting, Ms. Michelle Shropshire submitted two comments. First, the estimate of project costs for the I-95 Express Lanes Fredericksburg Extension Project was modified to $595 million, and this includes Design-Build costs, oversight (VDOT and concessionaire), and financing costs. Second, the project description for the I-95 Northbound Rappahannock River Crossing project was changed to read "Construct 3 CD lanes from Exit 130 to Exit 133, construct a 4th auxiliary lane from Exit 133 to Exit 136, and improve Exit 133 interchange."

Public Comment Period – No public comments were received and the Public Comment period was closed.

Approvals & Next Steps

Mr. Ponticello made a motion that the ICG committee approve the conformity methodologies and assumptions as presented at today's meeting. Mr. Ponticello also added that motion to approve project list for conformity analysis, with corrections to be made as noted from committee members, also be approved.

Upon motion by Mr. Ponticello and seconded by Mr. Nelson, with all concurring, conformity methodologies/assumptions and project list was endorsed. Mr. Ponticello advised a special TAC meeting will be held on August 8th to approve final conformity assumptions and project list that would also initiate the public comment period.

Adjourn

The June 4th, 2018 ICG meeting adjourned at 9:40 a.m.

Timothy McLaughlin
Chair

Paul Agnello
FAMPO Administrator

FAMPO RESOLUTION 19-04

ENDORSING THE AIR QUALITY CONFORMITY DETERMINATION FOR THE 2045 CONSTRAINED LONG-RANGE PLAN AND FISCAL YEARS 2018-2021 TRANSPORTATION IMPROVEMENT PROGRAM

WHEREAS, FAMPO is responsible for ensuring that the federally-required metropolitan transportation planning process is carried out in the Fredericksburg Region; and

WHEREAS, the FAMPO planning area is included in an air quality maintenance area; and

WHEREAS, federal regulations (Section 93.108 of the federal conformity rule and 23 CFR part 450) require that projects identified in the Constrained Long-Range Plan (CLRP) and the Transportation Improvement Program (TIP), within a maintenance region, demonstrate conformity to all applicable air quality regulations; and

WHEREAS, the Virginia Department of Transportation (VDOT) has performed the air quality conformity analysis, demonstrating compliance of the FAMPO 2045 CLRP and the Fiscal Years 2018-2021 TIP; and

WHEREAS, with the adoption of Resolution 19-01 on July 16, 2018, the Policy Committee delegated approval of the Air Quality Conformity Report to the Technical Advisory Committee; and

WHEREAS, the public will be given the opportunity to comment on the Air Quality Conformity Report from August 9 to August 23, 2018; and

WHEREAS, if there is no adverse public comment, the report will stand approved, and if there is adverse public comment, the Technical Advisory Committee will meet to discuss on August 27, 2018;

NOW, THEREFORE, BE IT RESOLVED that the Fredericksburg Area Metropolitan Planning Organization hereby endorses the Air Quality Conformity Report for the 2045 CLRP and the Fiscal Years 2018-2021 TIP for public review, and for submission to the Federal Highway Administration for approval, if no adverse comments are received.

Adopted by the Technical Advisory Committee at its meeting on August 8, 2018.

Daniel Cole, Chair
Fredericksburg Area Metropolitan Planning Organization
Technical Advisory Committee

Commonwealth of Virginia

Grinnell, Daniel <daniel.grinnell@vdot.virginia.gov>

FW: FAMPO- Air Quality Conformity Report Released for Public Review

1 message

Paul Agnello <agnello@gwregion.org> Thu, Aug 9, 2018 at 9:11 AM
To: "Ponticello, James (VDOT)" <Jim.Ponticello@vdot.virginia.gov>, Dan Grinnell <daniel.grinnell@vdot.virginia.gov>, Stephen Haynes <stephen.haynes@vdot.virginia.gov>

FYI

From: FAMPO <hairfield@gwregion.org>
Sent: Thursday, August 09, 2018 8:58 AM
To: Paul Agnello <agnello@gwregion.org>
Subject: FAMPO- Air Quality Conformity Report Released for Public Review

FAMPO
Fredericksburg Area Metropolitan Planning Organization

Notice of Public Review & Comment Period for the Draft Transportation Conformity Analysis Report for the Fredericksburg, Virginia 8-Hour Ozone Air Quality Maintenance Area

Public Comment Period

Thursday, August 9, 2018 - Thursday, August 23, 2018

The Fredericksburg Area Metropolitan Planning Organization (FAMPO) has opened a Public Comment Period beginning Thursday, August 9, 2018 until Thursday, August 23, 2018 regarding the Transportation Conformity Analysis Report for the Fredericksburg, Virginia 8-Hour Ozone Air Quality Maintenance Area. It evaluates the impact upon air quality resulting from the implementation of the FAMPO FY2018-2021 Transportation Improvement Plan (TIP) and the FAMPO 2045 Long Range Transportation Plan (LRTP). The analysis document is available for public review by visiting the FAMPO website at http://www.fampo.gwregion.org/public-notices/ or by contacting the FAMPO office at (540)373-2890.

This document is available for review by visiting the FAMPO website or the FAMPO office. A copy can be requested by contacting the FAMPO office by email at fampo@gwregion.org, by fax at (540) 899-4808 or by calling the office at (540) 373-2890.

All comments must be received by 4:00p.m. on Thursday, August 23, 2018.

Draft Transportation Conformity Analysis Report

Ways to send your comments

- Online Comment Form
- Email: fampo@gwregion.org
- Fax: (540) 898-4800
- USPS: FAMPO, 406 Princess Anne Street, Fredericksburg, Virginia 22401

Do you need assistance?

FAMPO strives to provide reasonable accommodations and services for persons who require special assistance to participate in this public involvement opportunity. Contact the Title VI Coordinator at (540) 373-2890 for more information.

FAMPO ensures nondiscrimination in all programs and activities in accordance with Title VI of the Civil Rights Act of 1964. Public participation is solicited without regard to race, color, national origin, age, sex, religion, disability or family status. Persons who require special accommodations under the American with Disabilities Act or persons who require translation services (free of charge) should contact the GWRC/FAMPO at 540-373-2890 or fampo@gwregion.org at least four days prior to the meeting. If hearing impaired, telephone 1-800-273-7545 (TDD)

Public notice of public involvement activities and time established for public review of and comments on the LRTP will satisfy the POP requirements.

La participación pública es solicitada sin distinción de raza, color, origen nacional, edad, sexo, religión, discapacidad o su estado familiar. Las personas que requieren alojamiento especial de acuerdo con el American with Disabilities Act, o personas que requieren servicios de traducción (libre de cargo) deben comunicarse con la GWRC / FAMPO al 540-373-2890 o fampo@gwregion.org al menos dos días antes de la reunión. Personas con problemas auditivos, llama 800-273-7545 (TDD).

El aviso público de las actividades de participación pública y el tiempo establecido para la revisión y comentarios públicos al TIP cumplirán con los requerimientos del POP.

Location & Parking

406 Princess Anne Street

Fredericksburg, Virginia 22401

Parking is available at the rear of the building. Entrance to the parking lot is on Charles Street.

About

Established in 1992, the Fredericksburg Area Metropolitan Planning Organization is the federally designated Metropolitan Planning Organization (MPO) for the Fredericksburg Urbanized Area. The City of Fredericksburg and the Counties of Stafford and Spotsylvania comprise the MPO study area.

406 Princess Anne Street

Fredericksburg, Virginia 22401

540.373.2890 phone

540.899.4808 fax

fampo@gwregion.org

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Fredericksburg Area Metropolitan Planning Organization | 406 Princess Anne Street, Fredericksburg, VA 22401

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Constant Contact

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Commonwealth of Virginia

Grinnell, Daniel <daniel.grinnell@vdot.virginia.gov>

RE: FAMPO- Air Quality Conformity Report Released for Public Review

1 message

Briana Hairfield <hairfield@gwregion.org> Mon, Aug 27, 2018 at 8:31 AM
To: James Ponticello <jim.ponticello@vdot.virginia.gov>, Nicholas Quint <quint@gwregion.org>, Paul Agnello <agnello@gwregion.org>
Cc: Daniel Grinnell <daniel.grinnell@vdot.virginia.gov>, Stephen Haynes <stephen.haynes@vdot.virginia.gov>, Michelle Shropshire <michelle.shropshire@vdot.virginia.gov>

Good Morning Jim!

We did not receive any comments from the public.

Thank you,

Bri

Briana M. Hairfield

Public Involvement Coordinator

Title VI Coordinator

George Washington Regional Commission/ Fredericksburg Area MPO

A 406 Princess Anne Street, Fredericksburg, Virginia 22401

P +1.540.642.1575| **F** +1.540.899.4808

E hairfield@gwregion.org

W www.fampo.gwregion.org

From: James Ponticello <jim.ponticello@vdot.virginia.gov>
Sent: Friday, August 24, 2018 10:42 AM
To: Briana Hairfield <hairfield@gwregion.org>; Nicholas Quint <quint@gwregion.org>; Paul Agnello <agnello@gwregion.org>
Cc: Daniel Grinnell <daniel.grinnell@vdot.virginia.gov>; Stephen Haynes <stephen.haynes@vdot.virginia.gov>; Michelle Shropshire <michelle.shropshire@vdot.virginia.gov>
Subject: FW: FAMPO- Air Quality Conformity Report Released for Public Review

Appendix D:
FAMPO FY 18-21 TIP and 2045 LRTP Project List

This appendix includes final project lists included in the conformity analysis for the Fredericksburg FY18-21 TIP and 2045 LRTP.

FAMPO 2045 CONSTRAINED HIGHWAY PROJECTS LIST FOR AIR QUALITY CONFORMITY											
Jurisdiction	Project	Route Number	Boundaries		UPC #	Regionally Significant	Contained in TIP	Committed Project	AQ Conformity Analysis Network Year	Improvements Description	Cost Estimate (2018 Dollars)
			From	To							
Interstate Projects											
Multi-Jurisdictional	95 Express Lanes Fredericksburg Extension	I-95	South of Rte 610	US 17		X	X	X	2025	Extend express lane to US 17 interchange (Exit 133)	$ 595,000,000
Multi-Jurisdictional	I-95 Widening	I-95	Exit 126	Exit 130		X			2035	Widen northbound and southbound I-95 from 3 to 4 lanes and reconstruct Harrison Rd Bridge	$ 96,200,000
Multi-Jurisdictional	I-95 Corridor ITS Improvements	I-95	n/a	n/a		X	X		2035	Improved ITS on I-95 and arterials	$ 10,000,000
Multi-Jurisdictional	I-95 SB Rappahannock River Crossing	I-95	1.29 Miles South of Exit 130	.31 Miles North of Truslow Road	101595 & 110595	X	X	X	2025	Construct 3 CD lanes and widen SB US 17 to SB I-95 on-ramp	$ 138,333,628
Multi-Jurisdictional	I-95 NB Rappahannock River Crossing	I-95	South of Exit 130	Exit 136	105510	X		X	2025	Construct 3 CD lanes from Exit 130 to Exit 133, construct a 4th auxilary lane from Exit 133 to Exit 136, and improve Exit 133 interchange	$ 132,000,000
Stafford County	I-95 NB Widening	I-95	Exit 133	Exit 136		X			2045	Widen from 3 to 4 lanes	$ 50,000,000
Stafford County	I-95 SB & NB Over US 17 Bridge Replacement	I-95	n/a	n/a	107140	X	X	X	2025	Replace Bridge	$ 20,421,000
Stafford County	I-95 Bridge Rehab: Aquia Creek NB/SB	I-95	n/a	n/a			X	X	N/A	Rehabilitate Bridge	$ 5,572,340
Stafford County	I-95 Bridge Rehab: Potomac Creek NB/SB	I-95	n/a	n/a			X	X	N/A	Replace Bridge	$ 2,200,000
City of Fredericksburg	I-95 Safety Improvements at Rte 3	I-95	n/a	n/a	107715	X	X	X	2021	Safety Improvements	$ 5,572,340
Spotsylvania County	I-95 Bridge Rehab: Ni River NB/SB	I-95	n/a	n/a				X	N/A	Replace Bridge	$ 2,200,000
Stafford County	I-95 Exit 133 Interchange Improvements	I-95	n/a	n/a		X			2035	Capacity and operational Improvements at various ramps	$ 25,000,000
City of Fredericksburg	NB I-95 Interchange near Celebrate VA South	I-95	n/a	n/a		X			2035	Partial interchange to and from southbound I-95 and from northbound I-95 to Carl D. Silver Pkwy	$ 40,000,000
City of Fredericksburg	NB I-95 to EB Rte 3 ramp realignment	I-95	n/a	n/a		X			2035	Shift I-95 off ramp to the west to allow more space for merging onto eastbound Rte 3	$ 5,860,000
Spotsylvania County	I-95 Exit 126 Interchange Improvements	I-95	n/a	n/a		X	X		2035	Capacity and operational Improvements at various ramps	$ 40,000,000
Spotsylvania County	I-95 Exit 118 Interchange Improvements	I-95	n/a	n/a	100829 & 105463	X	X	X	2021	Reconstruct interchange with added capacity	$ 26,167,297
Stafford County	I-95 Exit 140 Interchange Relocation and Widening	I-95	n/a	n/a	13558	X	X	X	2021	New diverging diamond interchange and widening of Courthouse Rd	$ 150,000,000
TOTAL:											$ 1,344,526,605
Other Principal Arterial Projects											
Multi-Jurisdictional	US 301 Northbound Turn Lane Extension	US-301	n/a	n/a		X		X	2021	Extend northbound US 301 right turn lane	$ 730,000
Multi-Jurisdictional	US 301 Bridge Rehabilitation	US-301	n/a	n/a		X		X	N/A	Rehabilitate bridge	$ 6,700,000
Stafford County	Safety Improvements at US 1 and Woodstock Ln and Telegraph Rd	US-1	n/a	n/a	109467	X	X	X	2025	Safety and turn lane Improvements	$ 8,800,000
Stafford County	US 1 over Chopawamsic Creek Bridge Replacement	US-1	0.26 S Russel Rd	0.25 S Russel Rd	111406	X		X	N/A	Replace Bridge	$ 7,750,000
Stafford County	Turn Lane Improvements at US 1 and Potomac Creek Dr	US-1	n/a	n/a	111753	X		X	2021	Construct left turn lane for SB US 1	$ 1,800,000
Stafford County	US 1 Bridge Replacements over Potomac Creek Dr	US-1	n/a	n/a	102936	X	X		N/A	Replace Bridge	$ 6,576,870
Stafford County	Stafford US 1 Courthouse Area Improvements	US-1	Hope Road	Courthouse Rd	103085	X	X	X	2025	Turn lane Improvements with bike/ped accommodations	$ 13,280,300
Stafford County	US 17 Business Safety Improvements	US-17	I-95	Washington Ave		X			N/A	Implement Stars Study recommendations	$ 5,113,000
Stafford County	Rte 3 over CSX RR	PR-3	n/a	n/a		X		X	N/A	Rehabilitate bridge	
Stafford County	Ferry Road (Rte 606) and Route 3 Intersection Improvements	PR-3	n/a	n/a	103084	X		X	2021	Turn lane Improvements with bike/ped accommodations	$ 11,600,000
Stafford County	Turn Lane Addition - Route 1 south at Garrisonville Rd	US-1	n/a	n/a	103082	X		X	2021	Construct additional right turn lane for Rte 1 SB	$ 1,415,592
City of Fredericksburg	Rte 3 Safety Improvements	PR-3	I-95	Dixon St		X			N/A	Implement Stars Study recommendations	$ 10,862,000

Jurisdiction	Project	Route Number	Boundaries		UPC #	Regionally Significant	Contained in TIP	Committed Project	AQ Conformity Analysis Network Year	Improvements Description	Cost Estimate (2018 Dollars)
			From	To							
City of Fredericksburg	US 1 Safety Improvements	US-1	Princess Anne St	Rte 3		X			N/A	Implement Stars Study recommendations	$ 11,600,000
City of Fredericksburg	Rte 3 Signal Optimization	PR-3	Blue and Gray Parkway	William St	100450	X	X	X	2025	Operational Improvements	$ 1,047,000
Spotsylvania County	US 17 I-95 bridge replacement and widening	US-17	US-1	Hospital Blvd	107140	X	X	X	2025	Widen to 4 lanes divided with bike/ped accommodations	$ 20,000,000
Spotsylvania County	I-95 Exit 126, US 1 SB onto Southpoint Pkwy	US-1	I-95 SB Off-Ramp	Southpoint Pkwy	110914	X	X	X	2025	Widen I-95 off-ramp and US1 Southbound	$ 14,495,000
Spotsylvania County	Harrison Rd and US 1 Intersection Improvements	US-1	n/a	n/a	51845	X	X	X	2021	Turn lane Improvements with bike/ped accommodations	$ 22,732,636
Spotsylvania County	US 17 (Mills Drive) and RT 609 Intersection Improvements	US-17	n/a	n/a	105893	X		X	2021	Intersection Improvements	$ 2,975,000
TOTAL:											$ 147,477,398
Minor Arterial Projects											
Multi-Jurisdictional	Tidewater Trail Widening	(US-17/PR-2)	Beulah Salisburty Drive	US 17 (Mills Dr)		X			2035	Widen to 4 lanes divided with bike/ped accommodations	$ 56,620,000
Stafford County	Chatham Bridge Rehabilitation	SR-3	n/a	n/a	105535 & 110822	X	X	X	2025	Rehabilitate bridge deck with bike/ped accommodations	$ 22,200,000
Stafford County	Butler Rd Improvements	SR-218	Carter St	Castle Rock Dr		X			2045	Widen from 2 to 4 lane facility with bike/ped accommodations	$ 28,225,000
City of Fredericksburg	Lafayette Blvd Intersection Improvements	US-1 BUS	Princess Anne St	Jackson Street	100439	X	X		2035	Roundabouts at Lafayette Blvd and Charles St and Lafayette Blvd and Kenmore Ave with bike/ped accommodations	$ 5,548,000
City of Fredericksburg	Lafayette Blvd Improvements/Widening	US-1 BUS	Blue & Gray Pkwy.	City Limits		X			2045	Widen to 4 lanes divided with bike/ped accomodations	$ 19,817,000
Spotsylvania County	US 17 BUS (Dixon Street) Reconstruction	US-17 BUS	Beulah Salisburty Drive	North end of bridge over Hazel Run	109459				N/A	Repave roadway	$ 292,250
Spotsylvania County	Harrison Rd Widening	SC-620	Salem Church Rd	US 1		X			2035	Widen to 4 lanes divided with bike/ped accommodations	$ 34,679,750
Spotsylvania County	US 17 BUS over Deep Run	US-17 BUS	n/a	n/a				X	N/A	Rehabilitate Bridge	
Spotsylvania County	Lafayette Blvd and Harrison Blvd Turn Lane Improvements	US-1 BUS	n/a	n/a	110913			X	N/A	Extend SB Lafayette Blvd right turn lane onto Harrison Rd	$ 1,200,000
Spotsylvania County	Rt 208 and Rt 636 Intersection Improvements	SR-208	n/a	n/a	110987			X	N/A	Intersection Improvements with bike/ped accommodations	$ 5,150,000
TOTAL:											$ 173,732,000
Collector Projects											
Multi-Jurisdictional	Lansdowne Rd Operational Improvements	UR-3952	Mine Rd	Tidewater Trail					N/A	Turn lane Improvements at Mine Rd, Shannon Dr and Tidewater Trail with bike/ped accommodations	$ 12,396,000
Stafford County	US 1 & Enon Rd Intersection Improvements	US1/Enon Rd	US1	.02 mi west of Beauregard Dr	105722				N/A	Widen to add center turn lane withturn lane Improvements at US 1	$ 10,200,000
Stafford County	Courthouse Road Widening	SC-630	Austin Ridge Dr	Ramoth Church Rd/Winding Creek Rd	4632	X	X	X	2021	Widen to 4 lanes with bike/ped accommodations	$ 35,966,920
Stafford County	Courthouse Road Widening	SC-630	Ramoth Church/Winding Creek	Shelton Shop Rd		X			2035	Widen to 4 lanes with bike/ped accommodations	$ 21,090,950
Stafford County	Shelton Shop Rd Widening (st)	SC-648	Garrisonville Road	Mountain View Road		X			2035	Widen to 4 lanes with bike/ped accommodations	$ 24,787,000
Stafford County	Eskimo Hill Road Improvements	SC-628	US-1	Potomac Run Rd					N/A	Reconstruct 2-lane road with intersection imporovments at US 1 and bike/ped accomodations	$ 13,458,800
Stafford County	Garrisonville Road Widening	SC-610	Eustace Rd	Shelton Shop Rd		X			2045	Widen to 6 lanes with sidewalk	$ 21,767,200
Stafford County	Rte 610 - Garrisonville Road - Widen to 6 Lanes - Phase 2	SC-610	Shenandoah Ln	Onville Rd	98847	X		X	2021	Widen to 6 lanes divided with sidewalks	$ 13,458,800
Spotsylvania County	Mine Road Widening	SC-636	Falcon Dr/Spotsylvania Ave	Lansdowne Rd		X			2035	Widen to 4 lanes with bike/ped accommodations	$ 13,407,135
Spotsylvania County	Germanna Point Dr Extension	SC-1029	Current Terminus	Spotsylvania Ave		X			2045	Extend 2-lane road with bike/ped accommodations	$ 27,000,000
Spotsylvania County	Old Plank Rd and Ashleigh Park Blvd Intersection Improvements	SC-610	n/a	n/a	110898			X	N/A	Widen to 4 lanes with bike/ped accommodations	$ 13,407,135
Spotsylvania County	Rt 606 (Mudd Tavern Road) Widening	SC-606	US 1	I-95	105464	X		X	2025	Widen to 4 lanes with bike/ped accommodations	$ 21,250,000
Spotsylvania County	Route 711 - Crossover Movement Conversion	SC-711	US 1	I-95	109516		X	X	N/A	Safety Improvements	$ 1,433,000
Spotsylvania County	Rte. 608 over Massaponax Creek	SC-608	n/a	n/a					N/A	Replace Culvert	

Jurisdiction	Project	Route Number	Boundaries		UPC #	Regionally Significant	Contained in TIP	Committed Project	AQ Conformity Analysis Network Year	Improvements Description	Cost Estimate (2018 Dollars)
			From	To							
Stafford County	Poplar Road Intersection Improvement	SC-616	Poplar Rd	Cedar Hill Ln	100622		X	X	2021	Reconstruct intersection to meet current standards	$ 2,021,621
Stafford County	Berea Church Road Reconstruction	SC-654	Turslow Road	Warrenton Road	107194		X	X	2025	Reconstruct roadway without added capactiy	$ 5,806,000
TOTAL:											$ 237,450,561
Local Roads Projects											
Stafford	Rte 2200 over Stream	SC-2200	n/a	n/a				X	N/A	Replace Culvert	
City of Fredericksburg	Gateway Boulevard Extension	FR-693	Rte 3	Fall Hill Ave		X			2035	New 4 Lane Divided Roadway Alignment. Include a bike/ped bridge at Rte. 3	$ 21,212,150
Spotsylvania County	Lee Hill School Dr and Old Dominion Pkwy Intersection Improvements	SC-635	n/a	n/a	110900				N/A	Safety Improvements	$ 658,000
Spotsylvania County	Bridge over I-95		0.1 mile West of I-95	0.1 mile East of I-95		X		X	2035	Bridge between Jackson Village and Alexander's Crossing developments. 4 lanes with bike/ped accommodations	$ 15,000,000
Spotsylvania County	Mt. Olive Rd over N Anna River Bridge Replacement	SC-650	.05 miles S of Hanover/Spotsy County Line	.03 miles N of Hanover/Spotsy County Line	81501		X	X	N/A	Replace Bridge	$ 2,834,580
City of Fredericksburg	Carl D. Silver Pkwy Extension		Current Terminus	Int. with Gordon W. Shelton BLVD		X			2035	Extend 4-lane divided road with bike/ped accommodations	$ 5,662,000
Spotsylvania County	Route 606 Service Road	SC-2092	Rte 606	Dan Bell Lane	111456			X	N/A	Construct service road north of Rte 606	$ 7,820,000
TOTAL:											$ 53,186,730
Bicycle and Pedestrian Projects											
Multi-Jurisdictional	Bike Share Plan Capital Costs		n/a	n/a		X			N/A	Implement bike share program in Fredericksburg area	$ 684,000
Stafford County	Courhouse Rd Sidewalk Project		Rad Oak Dr	US 1	17570, 107551, 108077, 112311		X		N/A	Construct shared-use path	$ 6,950,959
Stafford County	Onville Road Sidewalk Project		Stafford Mews Ln	Garrisonville Ln	111224			X	N/A	Construct Sidewalk	$ 550,000
Stafford County	Manning Drive Sidewalks		Belmont	Ferry Farm	17570, 107551, 108077, 112311		X		N/A	Construct shared-use path	$ 6,950,959
Stafford County	Upgrades on Leeland Road		Deacon Rd	1.03 Mi N of Deacon Road	109477		X		N/A	Construct new bike lanes	$ 3,350,000
Stafford County	Manning Drive Sidewalks		James Madison Dr	Forbes St					N/A	Construct sidewalk adjacent to Manning Dr	$ 426,000
Stafford County	Lichfield Blvd Sidewalks		Harrogate Rd	Plantation Dr					N/A	Construct sidewalk adjacent to Lichfield Blvd	$ 162,000
Stafford County	Flatford Road Sidewalks		ParkwayBlvd	Winding Creek Rd					N/A	Construct sidewalf adjacent to Flatford Rd	$ 650,000
Stafford County	Butler Road Sidewalks		Carter St	St. Clair Brooks Park					N/A	Construct sidewalk adjacent to Butler Rd	$ 530,000
Stafford County	Deacon Road Sidewalks		VDOT District Office	Leeland Rd					N/A	Construct sidewalk adjacent to Deacon Rd	$ 1,050,000
Stafford County	Crossing Improvements at Kings Highway and Cool Springs Road/Jett Drive		n/a	n/a					N/A	Construct 3 crosswalks and install pedestrian signal	$ 160,000
Stafford County	Warrenton Road (US 17 BUS) Sidewalks		I-95	US 1					N/A	Construct sidewalk adjacent to Warrenton Rd	$ 1,161,000
City of Fredericksburg	Fall Hill Ave Sidewlks		River Rd	Carl D. Silver Pkwy					N/A	Construct sidewalk adjacent to Fall Hill Ave	$ 175,000
City of Fredericksburg	Riverfront Corridor Connector		Rappahannock River Heritage Trail	Lafayette Blvd					N/A	Construct bike lanes along Sophia St and Pitt St from Lafayette Blvd to Caroline St, construct a cycle track along Caroline St from Pitt St to the RRHT, and improve intersection at Sophia and William	$ 264,000
City of Fredericksburg	VCR Trail Bridge over Blue & Gray Parkway		n/a	n/a				X	N/A	Construct bike/ped bridge over Blue & Gray Pkwy near VCR Trail	$ 5,217,000
City of Fredericksburg	Kenmore Ave Bike Improvements		Lafayette Blvd	Rappahannock Canal Path					N/A	Construct cycle track between Lafayette Blvd and William St, Sharrows between William St and Grove Ave, and shared-use path between Grove Ave and Canal Path	$ 103,000
City of Fredericksburg	East-West Bike Boulevard		Rowe St and Stafford Ave	Sophia Street					N/A	Utilize traffic calming techniques to create bike boulevard from FRED Central to Sophia St	$ 785,000
City of Fredericksburg	Idlewild Shared-Use Path		Idlewild Neighborhood	VCR Trail					N/A	Construct paved share-use path connecting Idlewild to VCR Trail	$ 62,000
City of Fredericksburg	Virginia Central Railway Trail Bridge		n/a	n/a	109574			X	N/A	Construct bike/ped bridge	$ 542,000

Jurisdiction	Project	Route Number	Boundaries		UPC #	Regionally Significant	Contained in TIP	Committed Project	AQ Conformity Analysis Network Year	Improvements Description	Cost Estimate (2018 Dollars)
			From	To							
City of Fredericksburg	Twin Lake/Kensington/Ped Counter		St Paul St	Twin Lake Dr	110932			X	N/A	Construct shared-use path	$ 1,981,550
City of Fredericksburg	Hospital Drive Shared-Use Path		Cowan Blvd	Rappahannock Canal Path					N/A	Construct shared-use path adjacent to Hospital Dr	$ 542,000
City of Fredericksburg	Downtown Fredericksburg Pedestrian Improvements		n/a	n/a	111804			X	N/A	Street light upgrades, sidewalk reconstruction, crosswalk upgrades and market square alley Improvements	$ 1,300,000
Spotsylvania County	US 1 and Spotsylvania Parkway Intersection Improvements		n/a	n/a					N/A	Construct shared-use path along Spotsylvania Pkwy, repaint 5 crosswalks and install pedestrian signal	$ 542,000
Spotsylvania County	Salem Church Road Shared-use Path and Sidewalk		Rte 3	Harrison Rd					N/A	Construct shared-use path and sidewalk along Salem Church Rd Install 3 crosswalks and pedestrian signal at Rt. 3 and Salem Church Rd	$ 288,000
Spotsylvania County	Harrison Rd and Leavells Rd/Salem Church Rd Intersection Improvements		n/a	n/a					N/A	Install 3 crosswalks and pedestrian signals. Construct shared-use path to VCR Trail	$ 520,000
Spotsylvania County	Smith Station Road Shared-Use Path		Leavells Rd	1,000 ft west of Leavells Rd					N/A	Construct shared-use path and repain crosswalks at Smith Station Rd and Spotsylvania Pkwy	$ 600,000
Spotsylvania County	Harrison Rd and Gordon Rd Intersection Improvements		n/a	n/a					N/A	Construct a shared-use path from VCR Trail to intersection. Install 3 crosswalks and a pedestrian signal	$ 700,000
Spotsylvania County	Smith Station Road Sidewalk		Spotsylvania Pkwy	Existing Sidewalk					N/A	Construct sidewalk along Smith Station Rd from existing sidewalk south of Spotsylvania Pkwy to Spotsylvania Pkwy	$ 137,000
Spotsylvania County	Spotswood Furnace Road Sidewalk		Riverbend High School	Rte 3					N/A	Construct sidewalk along Spotswood Furnace Rd	$ 69,000
Spotsylvania County	Spotsylvania Courthouse Village Streetscape - Phase II				110488				N/A	Construct sidewalks and other ped infrastructure	$ 1,118,773
TOTAL:											$ 37,571,241
GRAND TOTAL											**$ 1,993,944,535**

* Funds already programmed in FY12-15 TIP are not included in CLRP Project Allocations, See Notes Column for Programmed TIP Funds

FAMPO 2045 CONSTRAINED TRANSIT/TDM PROJECT LIST FOR AIR QUALITY CONFORMITY							
Jurisdiction	Project/Corridor	VDOT UPC #	Regionally Significant	Committed Projects	AQ Conformity Analysis Network Year	Project Description	2018 Cost Estimate
Transit Projects							
Multi-jurisdictional	New Commuter Bus Routes				N/A	Implement two new commuter bus routes from FAMPO Region to Northern Virginia and Washington D.C., with 8 total trips. Exact routes TBD	$ 17,000,000
Stafford County	Garrisonville to Quantico Bus Route				N/A	New service from Garrisonville commuter lots to Quantico	$ 2,000,000
City of Fredericksburg	Downtown Fredericksburg Circulator				N/A	New service around the Downtown Fredericksburg area	$ 400,000
Spotsylvania County	FRED Transit Lee Hill Transfer Center				N/A	Construct transfer station near Market St and Wensel Rd	$ 500,000
Stafford County	Brooke VRE Station Platforms + Ped Bridge + Ped/Bike Access	111883	X	X	N/A	Expand existing platform, construct second platform and add bike/ped accommodations	$ 23,391,019
Stafford County	Leeland Road VRE Station Platforms + Ped Bridge + Ped/Bike Access	111884	X	X	N/A	Expand existing platform, construct second platform and add bike/ped accommodations	$ 15,257,090
TDM Projects							
Multi-jurisdictional	Regional Commuter Lot Improvements				N/A	Miscellaneous commuter lot Improvements regionwide	$ 100,000
Multi-jurisdictional	GWRideConnect/TDM Assistance	103685			N/A		$ 1,295,604
Stafford County	Leeland Road VRE Station Parking Expansion	111885	X	X	N/A	Expand existing parking lot by 225 spaces	$ 5,519,179
Stafford County	New Chatham Heights Road Commuter Lot				N/A	Construct new 80-space lot on Chatham Heights Road	$ 2,100,000
Stafford County	New Route 3 East Commuter Lot				N/A	Construct new 150-space lot on Route 3 in eastern Stafford County	$ 3,000,000
Stafford County	New Warrenton Road (US 17 Bus.) Commuter Lot		X		N/A	Construct new 1000-space lot on US 17 Business near Olde Forge Drive	$ 20,000,000
Stafford County	Mine Road Commuter Lot Expansion		X		N/A	Expand existing parking lot by 400 spaces	$ 11,700,000
City of Fredericksburg	New Celebrate VA South Commuter Lot		X		N/A	Construct new 1200-space lot in Celebrate VA South	$ 20,000,000
Spotsylvania County	New Massaponax Commuter Lot		X		N/A	Construct new or expand existing lot in Massaponax area	$ 10,000,000
Total							$ 132,262,892