HAMPTON ROADS TRANSPORTATION PLANNING ORGANIZATION

CMAQ/RSTP PROJECT SELECTION PROCESS 2015

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TRANSPORTATION PLANNING ORGANIZATION

T16-01

January 2016

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REPORT DOCUMENTATION

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HRTPO CMAQ/RSTP Project Selection Process 2015

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ABSTRACT

This report summarizes the 2015 selection process for projects to be funded under the Congestion Mitigation and Air Quality Improvement Program (CMAQ) and Regional Surface Transportation Program (RSTP). As a result of the 2015 CMAQ/RSTP Project Selection Process, selected projects received allocations of CMAQ or RSTP funds for Fiscal Year 2022.

ACKNOWLEDGMENTS

This report was prepared by the Hampton Roads Transportation Planning Organization (HRTPO) in cooperation with the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Virginia Department of Transportation (VDOT), the Virginia Department of Rail and Public Transportation (DRPT), and the local jurisdictions and transit agencies within the Hampton Roads metropolitan planning area. The contents of this report reflect the views of the HRTPO. The HRTPO staff is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the FHWA, FTA, VDOT, or DRPT. This report does not constitute a standard, specification, or regulation. FHWA, FTA, VDOT, or DRPT acceptance of this report as evidence of fulfillment of the objectives of this task does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

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HAMPTON ROADS TRANSPORTATION PLANNING ORGANIZATION
CMAQ/RSTP PROJECT SELECTION PROCESS

2015

This report was included in the Unified Planning Work Program for Fiscal Year 2016, which was approved by the Board of the Hampton Roads Transportation Planning Organization on April 16, 2015.

PREPARED BY:

the heartbeat of HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

JANUARY 2016

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Section I
Executive Summary

EXECUTIVE SUMMARY

As the metropolitan planning organization (MPO) for the Hampton Roads area, the Hampton Roads Transportation Planning Organization (HRTPO) is responsible for project selection and allocation of funds under two federal funding programs – the Congestion Mitigation and Air Quality Improvement Program (CMAQ) and the Regional Surface Transportation Program (RSTP). The process used by the HRTPO to select projects to receive funds from these two programs is referred to as the CMAQ/RSTP Project Selection Process. The project selection process is conducted annually, normally beginning in July and running through December.

This report summarizes the work of selecting CMAQ and RSTP projects during the 2015 CMAQ/RSTP Project Selection Process. Selected projects received allocations of CMAQ or RSTP funds for Fiscal Year (FY) 2022.

CMAQ PROJECT SELECTION AND FUNDING ALLOCATIONS

During the November 19, 2015 meeting, the HRTPO Board approved the following action regarding CMAQ funding for FY 2022:

- Fifteen new CMAQ projects were selected to receive a total of $14.2 million in FY 2022 allocations.

The approved CMAQ projects are summarized below.

New CMAQ Projects

1. **Bus Vehicle Replacement –(ID# HR1CM) - HRT**
    - The project entails purchasing (29, 35, and 40 foot) buses to replace similar buses that have reached the end of their useful life. The new buses will have improved fuel economy and performance, lower operating costs, and lower emissions than the buses they will replace.
    - Allocated $3,349,302 in FY 2022. This should provide for the purchase of approximately eight buses and HRT will likely request additional funds in future years to complete this project.

2. **WATA Transfer Station (HUB) –(ID# WA4CM) - WATA**
    - This project entails the establishment of a transfer station at the upper end of the WATA service area in order to reduce "deadhead" and to offer a stable, safe, and practical transfer point for customers. The recommended site for the transfer station is located closest to the intersection of Rte. 199 and Rte. 60. The site has not been purchased and there is currently no address assigned for the land. The location for the proposed location is on Opportunity Way in James City County.
    - Allocated $2,500,000 in FY 2022 to fully fund the project.

3. **Norfolk System-wide Signal Controller and System Upgrade –(ID# NF1CM) - Norfolk**
    - The project entails the replacement of all traffic signal controllers at signalized intersections with modern controller equipment and software. The new controllers and

software will enhance operational capabilities and reliability, productivity for operators, and increased capabilities for operators. The enhanced Active Traffic Management system will better be able to respond to non-recurring traffic conditions such as accidents, construction, utility work, and other road-blocking and special events.

- Allocated $3,000,000 in FY 2022 to fully fund the project.

4. **Chesapeake Signal Timing and Incident Management Plans–(ID# CH1CM) - Chesapeake**
    - The project entails the installation of incident management signal timings along strategic corridors to be initiated over a single year. This project includes four coordination signal systems along three primary corridors in the City of Chesapeake. This project includes preparing standard signal timings along with several incident management corridors along the Battlefield Boulevard, Greenbrier Parkway, and Military Highway (2 systems).
    - Allocated $150,000 in FY 2022 to fully fund the project.

5. **Traffic Adaptive Corridor Implementation – (ID# VB4CM) – Virginia Beach**
    - The project entails an upgrade of the existing traffic signal system to an adaptive traffic signal system to measure traffic conditions along Indian River Road in real-time and constantly adjust the signal timing based on real-time data. The project includes improving 14 mainline intersections with a possibility of installing the system at several side street intersections. The project cost includes costs for installing hardware, software, and system integration.
    - Allocated $390,000 in FY 2022 to fully fund the project.

6. **Briarfield Sidewalk–(ID# NN2CM) – Newport News**
    - The project entails constructing a minimum 5' wide sidewalk along the south-side of Briarfield Road. The project would also add ADA compliant landings for the existing bus stops along Briarfield Road connecting the existing sidewalk at Marshall Avenue to the existing sidewalk at Chestnut Avenue. The construction of the sidewalk would promote pedestrian traffic along Briarfield Road. The project would also promote a safe pedestrian route to and from Heritage High School and An Achievable Dream High School for students.
    - Allocated $600,000 in FY 2022 to fully fund the project.

7. **Suffolk Traffic Operations Center (TOC)–(ID# SF1CM) – Suffolk**
    - To design and construct a Traffic Operation Center for the City of Suffolk at 800 Carolina Road that will house all command and control infrastructure for all ITS functions. The city recently constructed a new Public Works Operations Center that includes physical space in the building to house this center. The project will make minor modifications to the building HVAC and electrical systems to fully support this center. It will also install all ITS Equipment necessary to fully manage the city's traffic management assets and allow for communications with VDOT, other regional partners, and city emergency service staff. It will be designed and constructed in conformance with all applicable city, state and national ITS standards. The city will be contributing in-kind value of $700,000 in building cost that will house this center.

- Allocated $50,000 in FY 2022 to fully fund the first phase of the project.

8. **Bus Shelters and Pedestrian Improvements–(ID# NF2CM) – Norfolk**
    - The project entails constructing a total of 72 new bus shelters to replace damaged or old shelters that are beyond their useful life. The project includes the collection and confirmation of ridership information to confirm bus shelter locations, installation of concrete pads, ADA compliant access, appropriate street lighting, shelter fabrication and installation, trash receptacles, seating areas, bike racks, and underground utility surveys. Shelters for the Ferry system would be considered in the project as well.
    - Allocated $315,000 in FY 2022 to fully fund the project.

9. **Traffic Signal System Retiming–(ID# HM1CM) – Hampton**
    - The project entails retiming of twenty-one arterials in the City of Hampton in order to reduce vehicular travel time, delays, stops, and fuel use. The project will ultimately retime 130 traffic signals in the City with the intent of reducing delays which will in turn provide better air quality for the region.
    - Allocated $1,055,000 in FY 2022 to fully fund the project.

10. **York County-Southeast-Demonstration Routes–(ID# WA3CM) – WATA**
    - The project entails developing a route to provide a connection point between WATA's current service and Hampton Roads Transit (HRT). The new transit service would afford customers access to a variety of employment, educational, community service, and business locations. The project includes the purchase and installation of four new bus shelters and signage along the route.
    - Allocated $597,977 in FY 2022 to partially fund the first phase of the project.

11. **Suffolk Citywide Signal Timings–(ID# SF2CM) – Suffolk**
    - The project entails developing new signal timings for corridors in need of updated coordinated signal timing plans in the City of Suffolk. To obtain optimal timings, traffic data will be collected and analyzed using the latest version of Synchro software, from which improved signal timings will be developed. Once the new coordinated timings are deployed, the City will focus on updating vehicle and pedestrian clearance intervals, optimizing minimum and maximum split times, and intersection offsets for two-way vehicle progression. For isolated intersections that do not warrant full coordinated signal timing plans, an analysis of minimum and maximum times and evaluation of clearance intervals will be performed. The city's IQ Central signal system database interfaces directly with Synchro for direct system monitoring and timing plan manipulation which will be used going forward.
    - Allocated $140,000 in FY 2022 to partially fund the first phase of the project.

12. **Corridor Retiming-Kempsville Road and Newtown Area–(ID# VB1CM) – Virginia Beach**
    - The project entails improving the corridor signal timing along Kempsville Road and Newtown Road in the City of Virginia Beach. Forty-four (44) signalized intersections will be retimed to decrease traffic delay. The Kempsville project area has twenty-three (23) signalized intersections and the Newtown Road project area has twenty-one (21)

signalized intersections that will be retimed. The cost of the project includes traffic analysis, software, hardware, and signal timing adjustment.

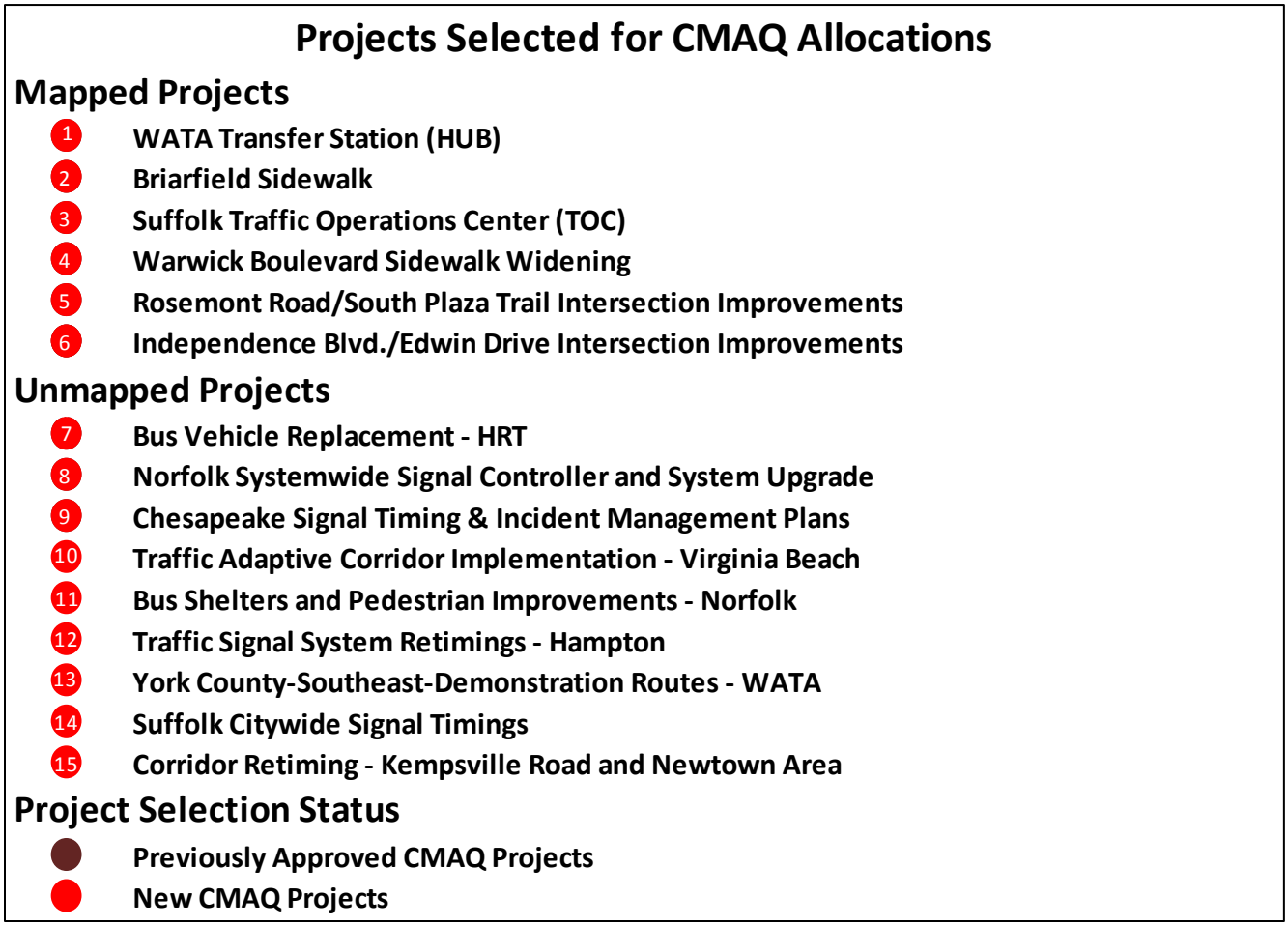
- Allocated $521,180 in FY 2022 to fully fund the project.

13. **Warwick Boulevard Sidewalk Widening–(ID# NN1CM) – Newport News**
    - The project entails constructing a minimum 8' wide sidewalk along both sides of Warwick Boulevard. The project would also add ADA compliant ramps and landings for the existing bus stops along the route as well as ADA accessible upgrades to all of the street and commercial entrance crossings. The project is located on Warwick Boulevard (both sides) from Lucas Creek Road to Atkinson Way.
    - Allocated $500,000 in FY 2022 to fully fund the project.

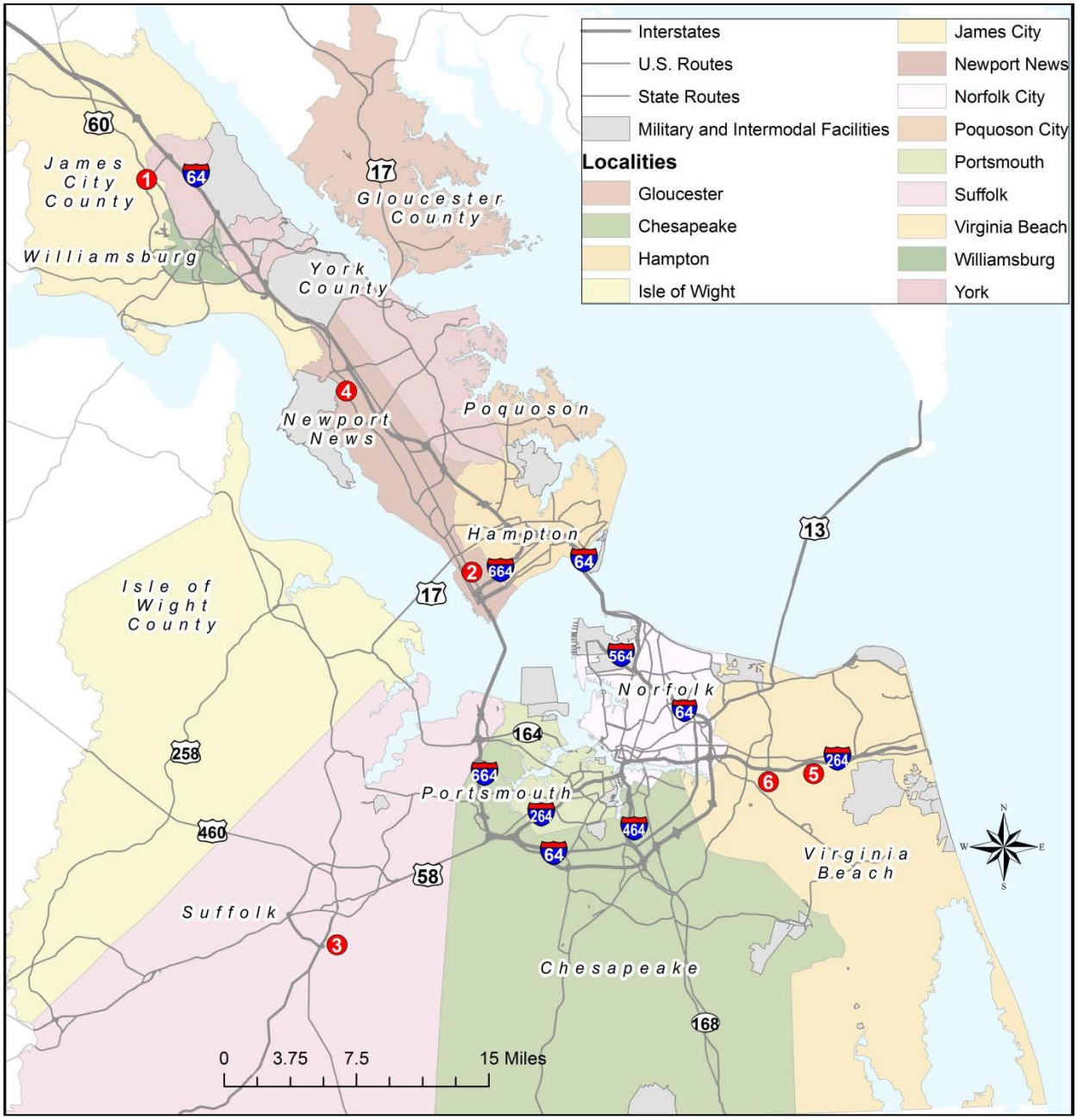
14. **Rosemont Road/South Plaza Trail Intersection Improvements–(ID# VB3CM) – Virginia Beach**
    - The project entails improving the South Plaza Trail on the west side of the intersection with Rosemont Road. Improvements include increasing the left turn lane storage and adding a dedicated right turn lane. New pavement will be constructed on the north side of South Plaza Trail and all travel lanes will be shifted north to accommodate the new right turn lane and increased left turn lane storage. Flashing yellow arrows will be added for the eastbound and westbound approaches. The project will also include tree removal, relocation of storm water structures, relocation of signs, new light poles, and signal equipment. All construction will occur within the existing right-of-way.
    - Allocated $363,000 in FY 2022 to fully fund the project.

15. **Independence Blvd./Edwin Drive Intersection Improvements–(ID# VB2CM) – Virginia Beach**
    - The project entails improving the intersection of Independence Boulevard and Edwin Drive by adding a second westbound left turn lane on Edwin Drive, and increasing the westbound right turn lane storage length on Edwin Drive. All proposed work will be constructed within City-owned right-of-way. Improvements will include reconstruction of medians, 2 new mast arm poles, pedestrian pushbuttons, new fence, new sidewalk, new curb ramp, asphalt trail, and light poles. The project will also include new pavement line markings and adjustments to signal timing on Edwin Drive.
    - Allocated $647,000 in FY 2022 to fully fund the project.

Map 1 | *Projects Selected for CMAQ Allocations*



Map 1 | Projects Selected for CMAQ Allocations



RSTP PROJECT SELECTION AND FUNDING ALLOCATIONS

During the November 19, 2015 meeting, the HRTPO Board approved the following actions regarding RSTP funding for FY 2022:

- Seven new RSTP projects were selected to receive a total of $25.8 million in FY 2022 allocations.
- The HRT TRAFFIX Program received an FY 2022 allocation of $1 million.

The approved RSTP projects are summarized below.

Allocations to Previously Approved RSTP Projects

1. **TRAFFIX - (UPC# T1404) – HRT**
   - This project entails the continued funding of this transportation demand management (TDM) program.
   - Allocated $1,000,000 in FY 2022 RSTP funds.

New RSTP Projects

1. **Elbow Road Extended-Phase 2 - (ID# VB1RS) – Virginia Beach**
   - The project entails construction of Elbow Road from Indian River Road to Dam Neck Road at the amphitheater. Construction will include widening Elbow Road from a two-lane roadway to a four-lane divided highway within a 125-ft right-of-way. The typical section features a sidewalk, shared-use path, landscaping, and aesthetic design elements. In addition, the existing sub-standard Elbow Road Bridge will be replaced.
   - Allocated $13,612,795 in FY 2022 RSTP funds to partially fund the construction phase of the project. The remaining balance to complete the project funding request is $40,379,675. The city will likely request additional funds in future years to help complete this project.

2. **Port of Virginia – Norfolk International Terminals Master Plan (ID# VP1RS) – VPA**
   - The project entails creating a master plan to provide a blue print for opportunities to increase the efficiency and operations of freight through Hampton Roads. The master plan will evaluate the internal coordination and data provided to trucks to assess external traffic congestion conditions prior to leaving the main terminal. It will assess the technology available to integrate freight movers internal to the Port with external intelligent transportation systems (ITS) and to identify key congestion points and decrease delays for freight movements for interregional and non-regional trips.
   - Allocated $150,000 in FY 2022 RSTP funds to fully fund the project.

3. **Spieghts Spillway Bridge Replacement(ID# SF3RS) - Suffolk**
   - The project entails replacing the narrow and structurally deficient bridge located on Turlington Road. The structure is anticipated to be reconstructed in its' existing location. Due to the narrowness of the existing structure, the new structure is intended to be widened to provide a safer transverse of the waterway and possibly to accommodate alternate modes of travel (ie pedestrians and/or bicycles). No right of way acquisition is anticipated for this project.
   - Allocated $1,350,000 in FY 2022 RSTP funds to fully fund the project.

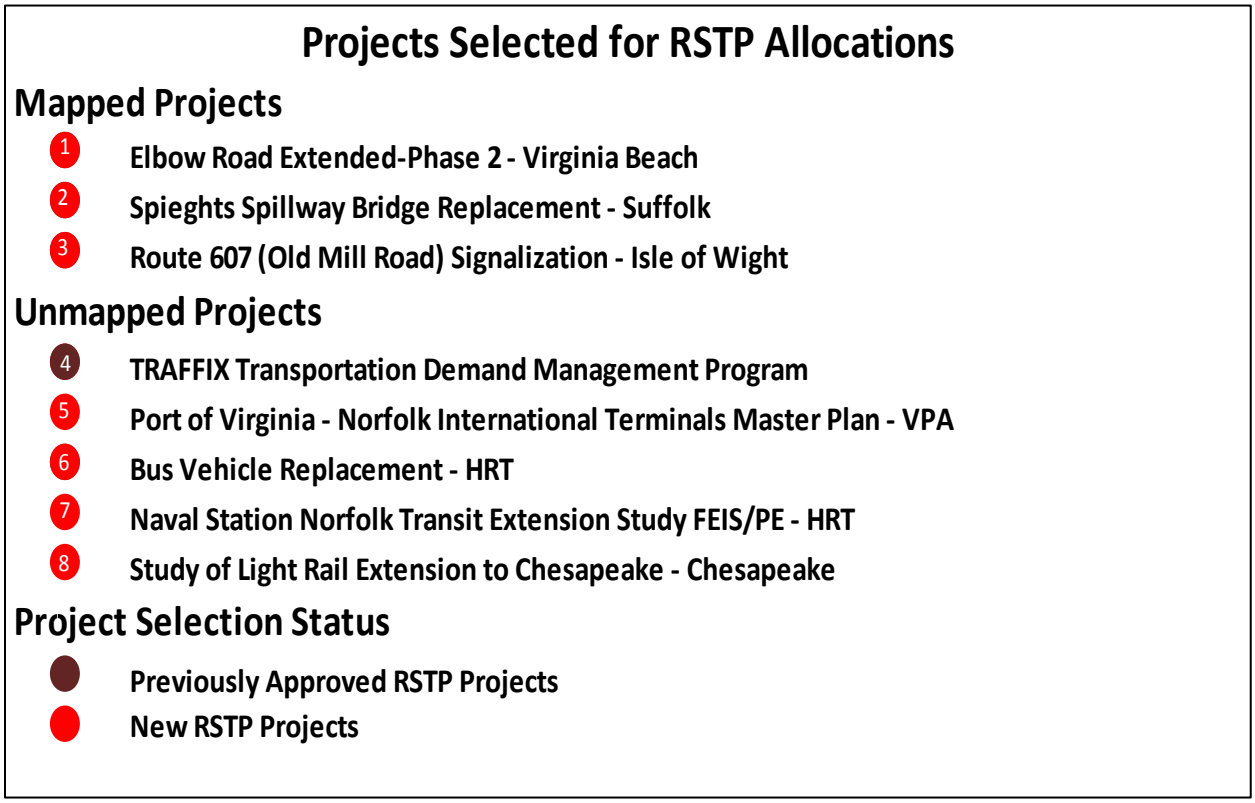
4. **Route 607 (Old Mill Road) Signalization (ID#IW2RS) – Isle of Wight**
   - The project entails installing a traffic signal at the existing intersection of Route 607 (Old Mill Road) and Route 460 (Windsor Blvd). This project proposal would include only construction (installation) of the signal. The County is funding PE, R/W, and Utilities through a CIP FY 15 commitment.
   - Allocated $257,728 in FY 2022 RSTP funds to fully fund the project.

5. **Bus Vehicle Replacement - (ID# HT6RS) – HRT**
   - The project entails purchasing (29, 35, and 40 foot) buses to replace similar buses that have reached the end of their useful life. The new buses will have improved fuel economy and performance, lower operating costs, and lower emissions than the buses they will replace.
   - Allocated $2,432,027 in FY 2022 RSTP funds. This should provide for the purchase of approximately 6 buses and HRT will likely request additional funds in future years to complete this project.

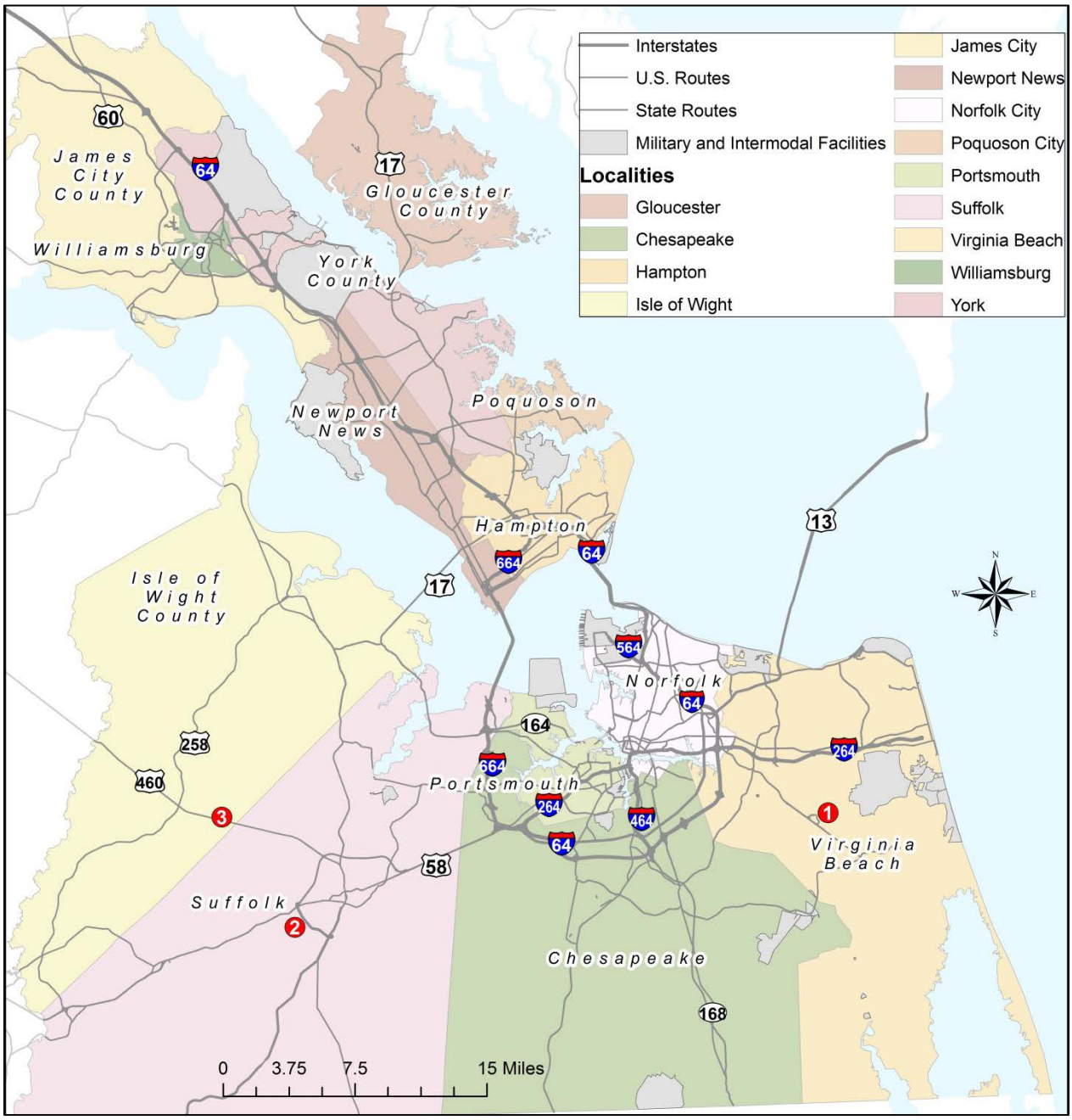
6. **Naval Station Norfolk (NSN) Transit Extension Study FEIS/PE (ID# HT1RS) – HRT**
   - The project entails the commencement of a study to implement fixed guideway transit (such as light rail transit [LRT] or bus rapid transit [BRT]) to connect the Tide LRT system to NSN on an alignment to be determined as a result of the study process. The funding includes an FEIS and 30% design of the project.
   - Allocated $6,000,000 in FY 2022 RSTP funds. This will provide 50% of the funding required for the project. The remaining balance to complete the project is $6,000,000 and HRT will likely request additional funds in future years to complete this project.

7. **Study of Light Rail Extension to Chesapeake (ID# CH1RS) – Chesapeake**
   - The project entails the commencement of a study to examine the proposed extension to connect the existing Tide Light Rail System alignment in the City of Norfolk to the Greenbrier Area of Chesapeake. The Greenbrier Transit Extension Study examines a range of alternatives and alignments in order to identify and compare the benefits, costs, and impacts of fixed guideway alternatives for the corridor. A purpose and need statement will be prepared in order to establish the problems to be addressed in the corridor, serve as a basis for the development of the goals/objectives and evaluation measures, and provide a framework for determining which alignment alternatives should be considered.
   - Allocated $2,000,000 in FY 2022 RSTP funds to fully fund the project.

Map 2 | *Projects Selected for RSTP Allocations*



Map 3 **|** ***Projects Selected for RSTP Allocations***



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Section II
Background

INTRODUCTION

The Hampton Roads Transportation Planning Organization (HRTPO) is the metropolitan planning organization (MPO) for the Hampton Roads region of Virginia. As such, it is a federally mandated transportation policy board comprised of representatives from local, state, and federal governments, transit agencies, and other stakeholders and is responsible for transportation planning and programming for the Hampton Roads metropolitan planning area (MPA). The MPA is comprised of the cities of Chesapeake, Hampton, Newport News, Norfolk Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the counties of Isle of Wight, James City, and York; and a portion of Gloucester County. Among its functions, the HRTPO is responsible for project selection and allocation of funds under two federal programs – the Congestion Mitigation and Air Quality Improvement Program (CMAQ) and the Regional Surface Transportation Program (RSTP).

The CMAQ program provides federal funding to states and localities for transportation projects and programs that help improve air quality and reduce traffic congestion. This funding is intended for areas designated by the U.S. Environmental Protection Agency (EPA) as nonattainment or maintenance areas with regard to the National Ambient Air Quality Standards (NAAQS). A *nonattainment area* is one that does not meet the NAAQS for one or more pollutant. A *maintenance area* is one that was originally designated a nonattainment area, but later met the NAAQS. Hampton Roads has been designated as an attainment area for the current ozone standard and as a maintenance area for the previous standard.

The Surface Transportation Program (STP) provides federal funding that may be used by states and localities for a wide range of highway and transit projects. Regional Surface Transportation Program (RSTP) funds are STP funds that are apportioned to specific regions within a state.

This report summarizes the work of selecting CMAQ and RSTP projects during the CMAQ/RSTP Project Selection Process of 2015. Projects selected received allocations of CMAQ or RSTP funds for FY 2022.

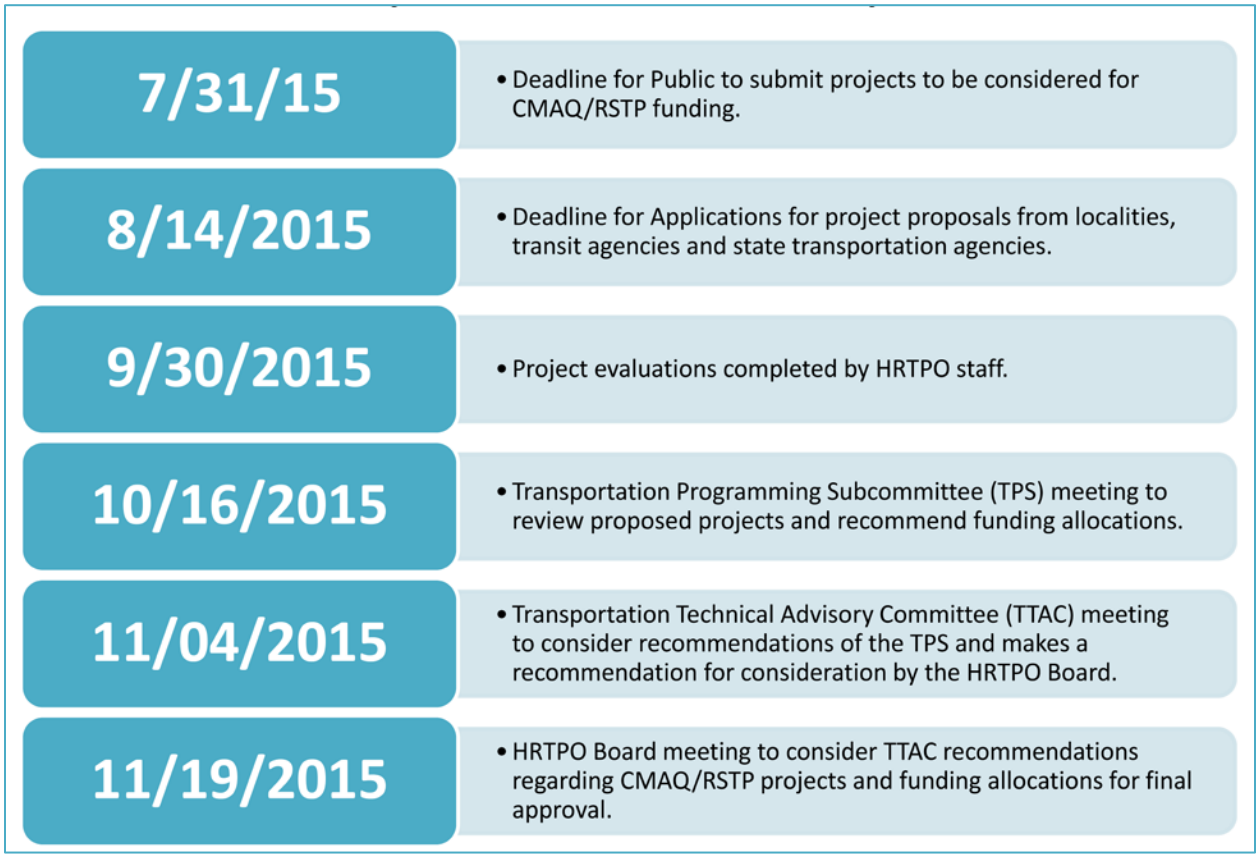
ELIGIBLE RECIPIENTS

Eligible recipients of CMAQ and RSTP funds in Hampton Roads include the localities within the MPA, Hampton Roads Transit (HRT), the Williamsburg Area Transit Authority (WATA), state transportation agencies, and the HRTPO.

PROJECT SELECTION PROCESS

The process for obtaining CMAQ or RSTP funding for transportation projects is a competitive one. According to the CMAQ/RSTP Project Selection Process that has been approved by the HRTPO Board, all project proposals are analyzed by the HRTPO staff using a specific set of evaluation criteria. The proposed projects are then ranked based on the results of the analyses. All proposed projects must be consistent with the current HRTPO Long-Range Transportation Plan (LRTP). The LRTP is a financially-constrained transportation plan for the Hampton Roads MPA. The LRTP has a planning horizon of at least 20 years.

2015 CMAQ/RSTP Project Selection Process Steps and Deadlines



PUBLIC PARTICIPATION

The general public was invited to submit project ideas for possible CMAQ or RSTP funding. A public notice soliciting CMAQ and RSTP project ideas from the public was posted on June 10, 2015. A special CMAQ/RSTP Project Idea Form was provided for use by the public and posted on the HRTPO website. The deadline for submission of project ideas from the public was July 31, 2015. Project ideas submitted by the public are reviewed by HRTPO staff and then forwarded to the appropriate locality or agency for consideration as a possible project proposal. Five project ideas were received from the public as a result of this invitation. (See Appendix C)

In addition to the invitation for public involvement at the beginning of the process, all of the meetings associated with the CMAQ/RSTP Project Selection Process – meetings of the Transportation Programming Subcommittee (TPS), Transportation Technical Advisory Committee (TTAC), and HRTPO Board - were public meetings that included an opportunity for public comment at the beginning of each meeting. No public comments regarding the project selection process were received, orally or in writing, during any of those meetings.

Section III
CMAQ Project Selection

CMAQ PROJECT SELECTION

In Hampton Roads, projects are selected for funding with Congestion Mitigation and Air Quality Improvement Program (CMAQ) funds based on the amount of air quality improvement expected per dollar spent. This is analyzed in terms of reductions in the emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx), which are precursors of ozone. The air quality aspect of the CMAQ analysis allows all types of CMAQ projects to be compared against one another.

The original analysis policies and procedures were developed in December 1992 after the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA). Over the years since 1992 the policies and procedures have been reviewed and revised. Details on the policies, procedures, and analysis methodologies used for CMAQ project selection are included in the ***Guide to the HRTPO CMAQ and RSTP Project Selection Process***, which may be accessed on the HRTPO website at http://www.hrtpo.org/page/cmaq-and-rstp/.

To help insure that all of the necessary information is included with each project proposal, and to provide some uniformity to the way that project information is submitted, the HRTPO staff developed application forms to be used when submitting CMAQ project proposals. The various ***CMAQ Candidate Project Application Forms*** may be accessed on the HRTPO website at http://www.hrtpo.org/page/cmaq-and-rstp/.

Prior to considering new projects to receive CMAQ allocations, the status of previously approved projects is reviewed to determine whether additional funding is required to allow for the completion of a project or project phase. The review of previously approved projects also includes determining whether those projects are progressing on schedule or whether funds should be:

1. Reallocated to correspond with updated phase schedules, or
2. Reallocated to other projects.

During the 2015 project selection process, no requests were made for additional funding for previously approved CMAQ projects.

Table 1 shows all of the new projects proposed for CMAQ funding during the project selection process of 2015. As shown in the table, 21 candidate projects, with a total request of over $117 million, were submitted. The total request for FY 2022 funding was $31.7 million.

Table 2 shows the scoring and ranking of the 21 candidate projects. As shown in the table, each project was scored and ranked based on its cost-effectiveness at reducing VOC and NOx emissions. The ranks for VOC and NOx reduction were summed to produce the composite ranking. The detailed evaluation and scoring worksheets for each of the CMAQ candidate projects are included in **Appendix A.**

Table 3 shows the new projects that were ultimately approved by the HRTPO Board on November 19, 2015 to receive CMAQ allocations in fiscal year 2022. It should be noted that the total CMAQ funding expected to be available for FY 2022, including the 20 percent state match, is approximately $14 million.

Table 1 | 2015 CMAQ New Candidate Projects

Number	Code	Applicant	Project Name	Total Cost	Total CMAQ Request	Total FY-22 Request
1	CH1CM	Chesapeake	Chesapeake Signal Timing & Incident Management Plans	$ 150,000	$ 150,000	$150,000
2	CH2CM	Chesapeake	Freeman Avenue/Norfolk-Portsmouth Beltline Railroad Overpass	$ 21,007,550	$ 21,007,550	$ 5,500,000
3	CH4CM	Chesapeake	Battlefield Blvd/Kempsville Rd/Great Bridge Blvd Intersection Improvements	$ 8,700,000	$ 8,700,000	$ 1,500,000
4	HM1CM	Hampton	Traffic Signal System Retimings	$ 1,055,000	$ 1,055,000	$ 1,055,000
5	HT1CM	HRT	Bus Vehicle Replacement	$ 78,603,532	$ 52,593,034	$ 5,781,329
6	JC1CM	James City Co	Longhill Road/Olde Towne Intersection Improvements	$ 3,015,500	$ 3,015,500	$ 825,000
7	NN1CM	Newport News	Warwick Boulevard Sidewalk Widening	$ 500,000	$ 500,000	$ 500,000
8	NN2CM	Newport News	Briarfield Sidewalk	$ 600,000	$ 600,000	$ 600,000
9	NF1CM	Norfolk	Norfolk Systemwide Signal Controller and System Upgrade	$ 3,000,000	$ 3,000,000	$ 3,000,000
10	NF2CM	Norfolk	Bus Shelters and Pedestrian Improvements	$ 700,000	$ 700,000	$ 315,000
11	SF1CM	Suffolk	Suffolk TOC	$ 2,750,000	$ 2,050,000	$ 50,000
12	SF2CM	Suffolk	Suffolk Citywide Signal Timings	$ 370,000	$ 370,000	$ 140,000
13	SF3CM	Suffolk	Rte 626 Reconstruction (Shoulders Hill Road)	$ 17,500,000	$ 15,000,000	$ 5,000,000
14	VB1CM	Virginia Beach	Corridor Retiming - Kempsville Road and Newtown Area	$ 521,180	$ 521,180	$ 521,180
15	VB2CM	Virginia Beach	Independence Blvd/Edwin Dr Intersection Improvements	$ 647,000	$ 647,000	$ 647,000
16	VB3CM	Virginia Beach	Rosemont Road/South Plaza Trail Intersection Improvements	$ 363,000	$ 363,000	$ 363,000
17	VB4CM	Virginia Beach	Traffic Adaptive Corridor Implementation	$ 390,000	$ 390,000	$ 390,000
18	WA1CM	WATA	Four (4) Bus Expansion	$ 1,793,772	$ 1,793,772	$ 1,793,772
19	WA2CM	WATA	Upper York County/New Kent Connector - Demonstration Route	$ 1,308,555	$ 1,308,555	$ 516,164
20	WA3CM	WATA	York County - Southeast - Demonstration Route	$ 1,564,817	$ 1,564,817	$ 597,977
21	WA4CM	WATA	WATA Transfer Station (HUB)	$ 2,500,000	$ 2,500,000	$ 2,500,000
Total				$ 147,039,906	$ 117,829,408	$31,745,422

Table 2 | 2015 CMAQ New Candidate Projects in Ranked Order

					Cost-Effectiveness		Rankings		
#	ID	Jurisdiction	Project Description	Rank	VOC	NOx	VOC	NOx	Composite
1	*HR1CM	HRT	Bus Vehicle Replacement	1	$95,737	$46,467	2	1	3
2	*WA4CM	WATA	WATA Transfer Station (HUB)	2	$73,690	$61,486	1	3	4
3	*NF1CM	Norfolk	Norfolk Systemwide Signal Controller and System Upgrade	3	$235,853	$54,428	3	2	5
4	CH1CM	Chesapeake	Chesapeake Signal Timing & Incident Management Plans	4	$608,422	$140,405	4	4	8
5	VB4CM	Virginia Beach	Traffic Adaptive Corridor Implementation	5	$787,999	$181,846	5	5	10
6	NN2CM	Newport News	Briarfield Sidewalk	6	$1,041,466	$313,287	6	6	12
7	*SF1CM	Suffolk	Suffolk TOC	7	$1,459,270	$336,755	9	7	16
8	NF2CM	Norfolk	Bus Shelters and Pedestrian Improvements	7	$1,264,960	$380,516	7	9	16
9	HM1CM	Hampton	Traffic Signal System Retimings	9	$1,511,937	$348,909	10	8	18
10	*WA3CM	WATA	York County - Southeast - Demonstration Route	10	$1,310,911	$1,137,893	8	12	20
11	SF2CM	Suffolk	Suffolk Citywide Signal Timings	11	$2,050,619	$473,220	11	10	21
12	VB1CM	Virginia Beach	Corridor Retiming - Kempsville Road and Newtown Area	12	$3,306,838	$763,117	12	11	23
13	NN1CM	Newport News	Warwick Boulevard Sidewalk Widening	13	$6,787,274	$2,041,700	13	13	26
14	VB3CM	Virginia Beach	Rosemont Road/South Plaza Trail Intersection Improvements	14	$16,368,146	$3,777,264	14	14	28
15	VB2CM	Virginia Beach	Independence Blvd/Edwin Dr Intersection Improvements	15	$18,372,260	$4,239,752	15	15	30
16	CH2CM	Chesapeake	Freeman Avenue/Norfolk-Portsmouth Beltline Railroad Overpass	16	$32,938,224	$7,601,129	17	16	33
17	*JC1CM	James City Co	Longhill Road/Olde Towne Intersection Improvements	17	$33,436,768	$7,716,177	18	17	35
18	*WA2CM	WATA	Upper York County/New Kent Connector - Demonstration Route	18	$27,166,011	Negative	16	20	36
19	CH4CM	Chesapeake	Battlefield Blvd/Kempsville Rd/Great Bridge Blvd Intersection Improvements	19	$61,262,303	$14,137,455	19	18	37
20	*SF3CM	Suffolk	Rte 626 Reconstruction (Shoulders Hill Road)	20	$178,076,459	$41,094,567	20	19	39
21	*WA1CM	WATA	Four (4) Bus Expansion	21	Negative	Negative	21	21	42

[1]The Composite Score is computed as follows:
First, projects are evaluated for their estimated impacts on the reduction of VOC's and NOx.
Second, projects are sorted in ascending order based on the Cost/Benefit for VOC reduction and numbered sequentially. Lower numbers are better.
Third, projects are sorted in ascending order based on the Cost/Benefit for NOx reduction and numbered sequentially. Lower numbers are better.
Finally, the sequential numbers for VOC reduction and NOx reduction are added together to produce the Composite Score. Lower numbers are better.
The Cost-Effectiveness figures represent $/ton of pollutants (NOx, VOC) removed based on the annualized cost of the project.

Table 3 | FY -2022 Allocations to New CMAQ Projects

ID/UPC#	Jurisdiction	Project Description	Proposed Allocation FY-22	Balance to Complete
New CMAQ Projects with FY-22 Allocations				
HR1CM	HRT	Bus Vehicle Replacement	$3,349,302	$46,811,705
WA4CM	WATA	WATA Transfer Station (HUB)	$2,500,000	$0
NF1CM	Norfolk	Norfolk Systemwide Signal Controller and System Upgrade	$3,000,000	$0
CH1CM	Chesapeake	Chesapeake Signal Timing & Incident Management Plans	$150,000	$0
VB4CM	Virginia Beach	Traffic Adaptive Corridor Implementation	$390,000	$0
NN2CM	Newport News	Briarfield Sidewalk	$600,000	$0
SF1CM	Suffolk	Suffolk TOC	$50,000	$2,000,000
NF2CM	Norfolk	Bus Shelters and Pedestrian Improvements	$315,000	$385,000
HM1CM	Hampton	Traffic Signal System Retimings	$1,055,000	$0
WA3CM	WATA	York County - Southeast - Demonstration Routes	$597,977	$966,840
SF2CM	Suffolk	Suffolk Citywide Signal Timings	$140,000	$230,000
VB1CM	Virginia Beach	Corridor Retiming - Kempsville Road and Newtown Area	$521,180	$0
NN1CM	Newport News	Warwick Boulevard Sidewalk Widening	$500,000	$0
VB3CM	Virginia Beach	Rosemont Road/South Plaza Trail Intersection Improvements	$363,000	$0
VB2CM	Virginia Beach	Independence Blvd./Edwin Drive Intersection Improvements	$647,000	$0
		Total	$14,178,459	

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Section IV
RSTP Project Selection

RSTP PROJECT SELECTION

Projects selected for funding with Regional Surface Transportation Program (RSTP) funds must meet certain criteria originally developed in 1992 and reviewed and revised since. Details on the policies, procedures, and analysis methodologies used for RSTP project selection are included in the ***Guide to the HRTPO CMAQ and RSTP Project Selection Process***, which may be accessed on the HRTPO website at http://www.hrtpo.org/page/cmaq-and-rstp/.

To help insure that all of the necessary information is included with each project proposal, and to provide some uniformity to the way that project information is submitted, HRTPO staff developed application forms to be used when submitting RSTP project proposals. The various ***RSTP Candidate Project Application Forms*** may be accessed on the HRTPO website at http://www.hrtpo.org/page/cmaq-and-rstp/.

Prior to considering new projects to receive RSTP allocations, the status of previously approved projects is reviewed to determine whether additional funding is required to allow for the completion of a project or project phase. The review of previously approved projects also includes determining whether those projects are progressing on schedule or whether funds should be:

1. Reallocated to correspond with updated phase schedules, or
2. Reallocated to other projects.

After addressing the needs of previously approved RSTP projects, new candidate projects to receive available RSTP funding were considered. **Table 4** shows all of the new projects proposed for RSTP funding during the project selection process in 2015. As shown in the table, 36 candidate projects, with a total request of $365 million, were submitted.

The analysis of RSTP project proposals is more qualitative in nature than the CMAQ analysis. Unlike the CMAQ analysis, RSTP projects must be placed into categories and only projects within the same category can be compared against one another. For this reason, a predetermination must be made with regard to the proportions of available funds that will be allocated to highway versus non-highway projects. **Table 5** shows the scoring and ranking of the 36 candidate projects. The detailed evaluation and scoring worksheets for each of the newly selected RSTP projects are included in **Appendix B.**

Table 6 shows the seven new projects and one previously approved project that were ultimately approved by the HRTPO Board on November 19, 2015 to receive RSTP funding allocations in FY 2022. The total RSTP funding expected to be available for FY 2022, including the 20 percent state match, is approximately $26.8 million.

Table 4 | 2015 RSTP New Candidate Projects

Number	Code	Applicant	Project Name	Total Cost	Total RSTP Request	Total FY-22 Request
Highway:						
Roadway Widening, New Facilities, HOV Lanes, Intersection Improvements						
1	IW1RS	Isle of Wight Cty.	Route 258 SOUTH Widening	$ 26,130,000	$ 1,500,000	$ 1,500,000
2	IW2RS	Isle of Wight Cty.	Route 607 (Old Mill Road) Signalization	$ 382,728	$ 257,728	$ 257,728
3	JC1RS	James City Cty.	Longhill Road/Olde Towne Intersection Improvements	$ 3,015,000	$ 3,015,000	$ 825,000
4	JC2RS	James City Cty.	Longhill Road Widening - Westbound Lanes	$ 8,979,600	$ 8,979,600	$ 637,000
5	JC3RS	James City Cty.	Longhill Road Widening - Eastbound Lanes	$ 8,358,100	$ 8,358,100	$ 672,000
6	JC4RS	James City Cty.	Longhill Road/Williamsburg Plantation Road Roundabout	$ 4,020,100	$ 4,020,100	$ 332,000
7	NN1RS	Newport News	Jefferson Avenue Widening - Kings Ridge Drive to Industrial Park Drive	$ 25,000,000	$ 16,000,000	$ 16,000,000
8	NF5RS	Norfolk	I-64/Northhampton Interchange Ramp Modifications	$ 6,000,000	$ 6,000,000	$ 1,000,000
9	SF2RS	Suffolk	Rte 626 Reconstruction (Shoulders Hill Road)	$ 17,500,000	$ 15,000,000	$ 5,000,000
10	VB1RS	Virginia Beach	Elbow Road Extended - Phase 2	$ 75,399,035	$ 53,992,470	$ 44,910,738
11	VB2RS	Virginia Beach	Indian River Road - Phase 7	$ 86,761,892	$ 78,028,817	$ 23,928,466
Corridor Operational Improvements						
12	CH3RS	Chesapeake	George Washington Highway (US 17) Corridor Improvements	$ 28,000,000	$ 28,000,000	$ 9,000,000
13	CH2RS	Chesapeake	Mount Pleasant Phase 1 Corridor Improvements	$ 30,000,000	$ 30,000,000	$ 8,000,000
14	NF3RS	Norfolk	Llewellyn Avenue Street Improvements	$ 2,000,000	$ 2,000,000	$ 1,600,000
Bridge Replacement						
15	NF1RS	Norfolk	Berkley Avenue Bridge Rehabilitation	$ 4,000,000	$ 4,000,000	$ 4,000,000
16	NF2RS	Norfolk	Hampton Boulevard Bridge Rehabilitation	$ 6,000,000	$ 6,000,000	$ 6,000,000
17	NF4RS	Norfolk	Military Highway (NBL) "Wayside Bridge" Rehabilitation	$ 2,500,000	$ 2,500,000	$ 2,500,000
18	SF3RS	Suffolk	Spieghts Spillway Bridge Replacement	$ 1,500,000	$ 1,350,000	$ 1,350,000
19	SF4RS	Suffolk	Lake Meade Bridge Replacement	$ 2,300,000	$ 1,850,000	$ 1,850,000
Alternatives Analysis and Feasiblilty Studies						
20	CH4RS	Chesapeake	Mt. Pleasant Road/Great Bridge By-Pass Interchange Modification Study	$ 200,000	$ 200,000	$ 200,000
21	VP1RS	VPA	Port of Virginia - Norfolk International Terminals Master Plan	$ 150,000	$ 150,000	$ 150,000
Intelligent Transportation Systems Projects						
22	NF6RS	Norfolk	Norfolk Systemwide Signal Controller and System Upgrade	$ 3,000,000	$ 3,000,000	$ 3,000,000
23	SF1RS	Suffolk	Suffolk TOC	$ 2,750,000	$ 2,000,000	$ 50,000
24	VB3RS	Virginia Beach	Travel Time Display on Dynamic Message Sign (DMS)	$ 197,500	$ 197,500	$ 197,500
Non-Highway:						
New or Expanded Service, Passenger Facilities, HS/intercity/& light rail, Station Development, Vehicle Upgrades etc.						
25	WA2RS	WATA	Upper York County/New Kent Connector - Demonstration Route	$ 1,308,555	$ 1,308,555	$ 516,164
26	WA3RS	WATA	York County - Southeast - Demonstration Route	$ 1,564,817	$ 1,564,817	$ 597,977
27	WA4RS	WATA	Transit Bus Pull-Outs	$ 345,300	$ 345,300	$ 345,300
28	WA5RS	WATA	WATA Transfer Station (HUB)	$ 2,500,000	$ 2,500,000	$ 2,500,000
29	HT2RS	HRT	Passenger Amenity Program	$ 1,200,000	$ 1,200,000	$ 200,000
Vehicle Replacement/Purchase						
30	WA1RS	WATA	Four(4) Bus Purchase Expansion	$ 1,793,772	$ 1,793,772	$ 1,793,772
31	HT6RS	HRT	Bus Vehicle Replacement	$ 78,603,532	$ 52,593,034	$ 5,781,329
Other Transit						
32	HT4RS	HRT	Farebox Upgrades - Incorporation of Alternative Fare Media Technology	$ 2,579,500	$ 2,579,500	$ 2,462,250
33	HT5RS	HRT	Ticket Vending Machine (TVM) II Replacement	$ 819,100	$ 819,100	$ 819,100
Alternatives Analysis and Feasiblilty Studies						
34	CH1RS	Chesapeake	Study of light rail extension to Chesapeake	$ 2,000,000	$ 2,000,000	$ 2,000,000
35	HT1RS	HRT	Naval Station Norfolk Transit Extension Study FEIS/PE	$ 12,000,000	$ 12,000,000	$ 12,000,000
36	HT3RS	HRT	Planning and Engineering of Fixed Guideway Transit System in Hampton and Newport News	$ 10,000,000	$ 10,000,000	$ 10,000,000
		TOTALS		**$ 458,858,531**	**$ 365,103,393**	**$ 171,976,324**

Table 5 | 2015 RSTP Candidate Projects in Ranked Order

Number	Code	Applicant	Project Name	Score (Max = 100)
Highway:				
Roadway Widening, New Facilities, HOV Lanes, Intersection Improvements				
1	VB1RS	Virginia Beach	Elbow Road Extended - Phase 2	**82.0**
2	JC2RS	James City Cty.	Longhill Road Widening - Westbound Lanes	**71.0**
3	JC3RS	James City Cty.	Longhill Road Widening - Eastbound Lanes	**71.0**
4	IW1RS	Isle of Wight Cty.	Route 258 SOUTH Widening	**69.0**
5	IW2RS	Isle of Wight Cty.	Route 607 (Old Mill Road) Signalization	**67.0**
6	NN1RS	Newport News	Jefferson Avenue Widening - Kings Ridge Drive to Industrial Park Drive	**66.0**
7	JC4RS	James City Cty.	Longhill Road/Williamsburg Plantation Road Roundabout	**64.0**
8	NF5RS	Norfolk	I-64/Northhampton Interchange Ramp Modifications	**63.0**
9	SF2RS	Suffolk	Rte 626 Reconstruction (Shoulders Hill Road)	**63.0**
10	JC1RS	James City Cty.	Longhill Road/Olde Towne Intersection Improvements	**58.0**
11	VB2RS	Virginia Beach	Indian River Road - Phase 7	**53.0**
Corridor Operational Improvements				
12	CH3RS	Chesapeake	George Washington Highway (US 17) Corridor Improvements	**72.0**
13	CH2RS	Chesapeake	Mount Pleasant Phase 1 Corridor Improvements	**67.0**
14	NF3RS	Norfolk	Llewellyn Avenue Street Improvements	**57.0**
Bridge Replacement				
15	SF3RS	Suffolk	Spieghts Spillway Bridge Replacement	**75.0**
16	NF2RS	Norfolk	Hampton Boulevard Bridge Rehabilitation	**70.0**
17	NF1RS	Norfolk	Berkley Avenue Bridge Rehabilitation	**58.0**
18	SF4RS	Suffolk	Lake Meade Bridge Replacement	**58.0**
19	NF4RS	Norfolk	Military Highway (NBL) "Wayside Bridge" Rehabilitation	**48.0**
Alternatives Analysis and Feasiblilty Studies				
20	VP1RS	VPA	Port of Virginia - Norfolk International Terminals Master Plan	**77.0**
21	CH4RS	Chesapeake	Mt. Pleasant Road/Great Bridge By-Pass Interchange Modification Study	**53.0**
Intelligent Transportation Systems Projects				
22	SF1RS	Suffolk	Suffolk TOC	**75.0**
23	NF6RS	Norfolk	Norfolk Systemwide Signal Controller and System Upgrade	**61.0**
24	VB3RS	Virginia Beach	Travel Time Display on Dynamic Message Sign (DMS)	**50.0**
Non-Highway:				
New or Expanded Service, Passenger Facilities, HS/intercity/& light rail, Station Development, Vehicle Upgrades etc.				
25	WA3RS	WATA	York County - Southeast - Demonstration Route	**72.0**
26	WA2RS	WATA	Upper York County/New Kent Connector - Demonstration Route	**71.0**
27	WA5RS	WATA	WATA Transfer Station (HUB)	**55.0**
28	HT2RS	HRT	Passenger Amenity Program	**37.0**
29	WA4RS	WATA	Transit Bus Pull-Outs	**10.0**
Vehicle Replacement/Purchase				
30	HT6RS	HRT	Bus Vehicle Replacement	**90.0**
31	WA1RS	WATA	Four(4) Bus Purchase Expansion	**45.0**
Other Transit				
32	HT4RS	HRT	Farebox Upgrades - Incorporation of Alternative Fare Media Technology	**63.0**
33	HT5RS	HRT	Ticket Vending Machine (TVM) II Replacement	**56.0**
Alternatives Analysis and Feasiblilty Studies				
34	HT1RS	HRT	Naval Station Norfolk Transit Extension Study FEIS/PE	**80.0**
35	CH1RS	Chesapeake	Study of light rail extension to Chesapeake	**78.0**
36	HT3RS	HRT	Planning and Engineering of Fixed Guideway Transit System in Hampton and Newport News	**68.0**

Table 6 | FY 2022 Allocations to New and Previously Approved RSTP Projects

ID/UPC#	Jurisdiction	Project Description	Proposed Allocation FY-22	Balance to Complete
Previously Approved Projects				
T1404	HRT	TRAFFIX Program	$1,000,000	$0
Highway Projects				
VB1RS	Virginia Beach	Elbow Road Extended - Phase 2	$13,612,795	$40,379,675
VP1RS	VPA	Port of Virginia - Norfolk International Terminals Master Plan	$150,000	$0
SF3RS	Suffolk	Spieghts Spillway Bridge Replacement	$1,350,000	$0
IW2RS	Isle of Wight Cty.	Route 607 (Old Mill Road) Signalization	$257,728	$0
Non-Highway Projects				
HT6RS	HRT	Bus Vehicle Replacement	$2,432,027	$46,811,705
HT1RS	HRT	Naval Station Norfolk Transit Extension Study FEIS/PE	$6,000,000	$6,000,000
CH1RS	Chesapeake	Study of Light Rail Extension to Chesapeake	$2,000,000	$0
		Total	$26,802,550	

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Section V
Appendices

APPENDIX A

CMAQ Project Evaluation Worksheets

CONGESTION MITIGATION AND AIR QUALITY

CITYWIDE SIGNAL SYSTEM

JURISDICTION: Chesapeake
PROJECT NAME: **Chesapeake Signal Timing & Incident Management Plans**
LOCATION: 3 Primary Corridors in Chesapeak - Battlefield Blvd, Greenbrier Pkwy, & Military Highway
DESCRIPTION: Signal timing on 3 corridors including 39 intersections in 4 systems.
DATE: 8/14/2015 (1)
PROJECT COST: $150,000

1 - EMISSIONS REDUCTION

		Low Volume Intersections	Medium Volume Intersections	High Volume Intersections	Total Intersections
	veh / pm pk hr:	Less than 2,690	2,690 to 5,900	More than 5,900	
Number of Intersections (1):		19	16	3	38 (A)
	multiplied by:	2,690	5,900	9,500	veh / pm pk hr (2)
	multiplied by:	10.7	10.7	10.7	sec/veh (2)
	divided by:	3,600	3,600	3,600	sec/hr
	divided by:	0.17	0.17	0.17	delay factor (3)
Change in Vehicle Delay:		894	1,650	498	hrs/day

Total Change in Vehicle Delay (sum of 3 col's above): 3,042 hrs/day

Type	Emissions Factor, g/hr (4)	Change in Veh Delay, hr/day (above)	Emissions Reduction, g/day (5)	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr	Emissions Reduction, kg/yr
VOC	0.147	3,042	447	0.4	250	112
NOx	0.637	3,042	1,938	1.9	250	484

2 - COST EFFECTIVENESS

Total Cost: $150,000 (from above)
Useful Life, years: 2 (2)
Annual Cost: $75,000

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Conversion Factor, kg/ton	Cost Effectiveness, $/ton
VOC	$75,000	112	$670.81	907	**$608,422**
NOx	$75,000	484	$154.80	907	**$140,405**

Notes:
(1) From application
(2) As previously assumed
(3) Portion of daily delay represented by peak hour
Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, June 1997.
(4) Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle.
(5) Emission Factor * Change in Vehicle Delay
(A) From application: Missing data for 1 intersection.

CONGESTION MITIGATION AND AIR QUALITY

OTHER

JURISDICTION:	Chesapeake
PROJECT NAME:	**Freeman Avenue/ Norfolk-Portsmouth Beltline Railroad Overpass**
LOCATION:	At-grade railroad crossing on Freeman Ave at Norfolk-Portsmouth Beltline (NPBL)
DESCRIPTION:	Remove existing at-grade crossing and replace with an overpass bridge
DATE:	8/15/2015 [1]
PROJECT COST:	$21,007,550

1 - EMISSIONS REDUCTION

Vehicle Volume (ADT)	5,000	/1440	3.47	vehicles per minute
Train Crossings per day	20		69.44	vehicles delayed per train [3]
Average Obstruction per train (min)	20		10	average vehicle delay (mins) [6]

Arterial	Number of Vehicles Delayed [4]	Avg Delay Before (s/veh)	Avg Delay After (s/veh)	Delay Savings (s/veh)	Delay Savings (s/day)	Delay Savings (hr/day)
Freeman Avenue						
Freeman Avenue at Norfolk-Portsmouth Beltline Railroad Crossing	1389	600	0	600	833,333	231
				Total Delay Savings		231 hr/day

Type	Emissions Factor, g/hr [2]	Change in Veh Delay, hr/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr [3]	Emissions Reduction, kg/yr
VOC	0.147	231	34	0.0	250	9
NOx	0.637	231	147	0.1	250	37

2 - COST EFFECTIVENESS

Total Cost:	$21,007,550
Useful Life, years:	68 [5]
Annual Cost:	$308,935

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Cost Effectiveness, $/ton
VOC	$308,935	9	$36,316	**$32,938,224**
NOx	$308,935	37	$8,381	**$7,601,129**

[1] From application

[2] Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle.

[3] Average Obstruction per train (minutes) * Vehicles per minute

[4] Vehicles delayed per train * number of train crossings per day

[5] Avg. life of bridges at time of replacement,Regional Bridge Study pg. 55, HRTPO, November 2012

[6] Avg. of 20 minute maximum delay and 0 minute minimum delay; (AVG 20,0)

CONGESTION MITIGATION AND AIR QUALITY

HIGHWAY PROJECTS - INTERSECTION GEOMETRY

JURISDICTION: Chesapeak

PROJECT NAME: **Battlefield Blvd/Kempsville Rd/Great Bridge Blvd Intersection Improvements**

LOCATION: Along Great Bridge Blvd from the Chesapeake Expressway off-ramp to the intersection at Battlefield Blvd.

DESCRIPTION: This project entails improvements to the intersection of Battlefield Blvd, Kempsville Rd, and Great Bridge Blvd that will add an additional eastbound lane along Great Bridge Blvd. Adding the additional lane will require relocating the existing utilities along the south side of Great Bridge Blvd and reconstructing the four private driveways that intersect the road. The existing channelized right turn lane will at Battlefield Blvd will also be redesigned to improve the visibility for the right turning traffic.

DATE: 8/14/2015 (1)

PROJECT COST: $8,700,000

1 - REDUCED AUTO EMISSIONS

Weekday PM Peak Hour

Intersection Delay Before Project		78	sec/veh (1)
Intersection Delay After Project		45	sec/veh (1)
Change In Intersection Delay		33.0	sec/veh, pk hr
Total Vehicles During Peak Hour		6,500	veh/hr (1)
	divided by	3,600	sec/hr
Change In Intersection Delay		59.6	veh hr's, pk hr
	divided by	17%	pk hr delay factor(2)
Change In Intersection Delay		350.5	hours/day

Type	Emissions Factor, g/hr (3)	Delay Change, hr/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, weekdays/yr	Emissions Reduction, kg/yr
VOC	0.147	350.5	52	0.052	250	12.9
NOx	0.637	350.5	223	0.223	250	55.8

2 - COST EFFECTIVENESS

Total Cost:	$8,700,000	(from above)
Useful life, years:	10 (4)	
Annual Cost:	$870,000	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effective-ness, $/kg	Conversion Factor, kg/ton	Cost Effective-ness, $/ton
VOC	$870,000	12.9	$67,544	907	**$61,262,303**
NOx	$870,000	55.8	$15,587	907	**$14,137,455**

Notes:

(1) From application

(2) pk hr delay factor = pk hr delay / daily delay;
Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, Page 8, June 1997.

(3) Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle.

(4) As previously assumed.

CONGESTION MITIGATION AND AIR QUALITY

CITYWIDE SIGNAL SYSTEM

JURISDICTION: Hampton
PROJECT NAME: **Traffic Signal System Retimings**
LOCATION: Citywide
DESCRIPTION: Citywide signal timing including 130 intersections in 31 systems.
DATE: 8/12/2015 (1)
PROJECT COST: $1,055,000

1 - EMISSIONS REDUCTION

		Low Volume Intersections	Medium Volume Intersections	High Volume Intersections	Total Intersections
	veh / pm pk hr:	Less than 2,690	2,690 to 5,900	More than 5,900	
Number of Intersections (1):		90	36	4	130
	multiplied by:	2,690	5,900	9,500	veh / pm pk hr (2)
	multiplied by:	10.7	10.7	10.7	sec/veh (2)
	divided by:	3,600	3,600	3,600	sec/hr
	divided by:	0.17	0.17	0.17	delay factor (3)
Change in Vehicle Delay:		4,233	3,714	664	hrs/day

Total Change in Vehicle Delay (sum of 3 col's above): 8,611 hrs/day

Type	Emissions Factor, g/hr (4)	Change in Veh Delay, hr/day (above)	Emissions Reduction, g/day (5)	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr	Emissions Reduction, kg/yr
VOC	0.147	8,611	1,266	1.3	250	316
NOx	0.637	8,611	5,485	5.5	250	1,371

2 - COST EFFECTIVENESS

Total Cost: $1,055,000 (from above)
Useful Life, years: 2 (2)
Annual Cost: $527,500

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Conversion Factor, kg/ton	Cost Effectiveness, $/ton
VOC	$527,500	316	$1,666.97	907	**$1,511,937**
NOx	$527,500	1,371	$384.68	907	**$348,909**

Notes:

(1) From application

(2) As previously assumed

(3) Portion of daily delay represented by peak hour
Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, June 1997.

(4) Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle.

(5) Emission Factor * Change in Vehicle Delay

CONGESTION MITIGATION AND AIR QUALITY

TRANSIT AND FIXED GUIDEWAY PROJECTS - VEHICLE PURCHASE/REPLACEMENT

AGENCY: Hampton Roads Transit
PROJECT NAME: **Bus Vehicle Replacement**
DESCRIPTION: Purchase 153 New Replacement Vehicles (29, 35, and 40 foot buses)
DATE: 8/15/2015 (1)
PROJECT COST: $52,593,034

Number of Vehicles Being Retired	153	vehicles(1)
Number of New Vehicles	153	vehicles(1)
Average Yearly Vehicle-Miles for Retired Vehicles	40,000	vehicle-miles(1)
Average Yearly Vehicle-Miles for New Vehicles	40,000	vehicle-miles(1)

1 - CHANGE IN VEHICLE EMISSIONS

Current Vehicles	Emissions Rate g / bhp-hr (1)	Emissions Rate g/mi (2)	VMT mi/yr/bus	Number of Vehicles	Yearly Emissions g/yr	Yearly Emissions kg/yr
VOC	1.30	6.08	40,000	153	37,226,124	37,226
NOx	2.6	12.12	40,000	153	74,165,893	74,166

New Vehicles	Emissions Rate g / bhp-hr (1)	Emissions Rate g/mi (2)	VMT mi/yr/bus	Number of Vehicles	Yearly Emissions g/yr	Yearly Emissions kg/yr
VOC	0.14	0.66	40,000	153	4,008,967	4,009
NOx	0.2	0.94	40,000	153	5,727,096	5,727

2 - EMISSIONS REDUCTION

Reduction in Emissions: VOC 33,217 kg/yr; NOx 68,439 kg/yr

3 - COST EFFECTIVENESS

Total Cost: $52,593,034 (from above)
Useful life, years: 15 (3)
Annual Cost: $3,506,202

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Cost Eff., $/Ton
VOC	$3,506,202	33,217	$105.55	**$95,737**
NOx	$3,506,202	68,439	$51.23	**$46,467**

(1) From application; given values for HC as proxy value for VOC

(2) Applying a conversion factor of 4.679 bhp-hr / mi, EPA data for Mobile6 (no conversion factor yet available for MOVES2010B model)

(3) As assumed previously

CONGESTION MITIGATION AND AIR QUALITY

HIGHWAY PROJECTS - INTERSECTION GEOMETRY

JURISDICTION: James City County

PROJECT NAME: **Longhill Road/Olde Towne Intersection Improvements**

LOCATION: Longhill Rd/Old Towne Rd Intersection

DESCRIPTION: Make improvements to the Olde Towne Rd approach to the Longhill/Olde Towne Intersection by extending the existing exclusive right turn lane by approximately 238 feet, creating an exclusive left turn lane, modifying the signal to accommodate the exclusive left turn lane and retime the intersection generally, installing a sidewalk segment of approximately 254 feet that will complete a connection to the James City County Human Services Center, and relocating above-ground power lines.

DATE: 8/14/2015 (1)

PROJECT COST: $3,015,500

1 - REDUCED AUTO EMISSIONS

Weekday PM Peak Hour

Intersection Delay Before Project		134.3	sec/veh (1)
Intersection Delay After Project		77.4	sec/veh (1)
Change In Intersection Delay		56.9	sec/veh, pk hr
Total Vehicles During Peak Hour		2,394	veh/hr (1)
	divided by	3,600	sec/hr
Change In Intersection Delay		37.8	veh hr's, pk hr
	divided by	17%	pk hr delay factor(2)
Change In Intersection Delay		222.6	hours/day

Type	Emissions Factor, g/hr (3)	Delay Change, hr/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, weekdays/yr	Emissions Reduction, kg/yr
VOC	0.147	222.6	33	0.033	250	8.2
NOx	0.637	222.6	142	0.142	250	35.4

2 - COST EFFECTIVENESS

Total Cost:	$3,015,500	(from above)
Useful life, years:	10 (4)	
Annual Cost:	$301,550	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effective-ness, $/kg	Conversion Factor, kg/ton	Cost Effective-ness, $/ton
VOC	$301,550	8.2	$36,865	907	**$33,436,768**
NOx	$301,550	35.4	$8,507	907	**$7,716,177**

Notes:

(1) From application

(2) pk hr delay factor = pk hr delay / daily delay;
Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, Page 8, June 1997.

(3) Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle.

(4) As previously assumed.

CONGESTION MITIGATION AND AIR QUALITY
BICYCLE AND PEDESTRIAN PROJECTS

JURISDICTION: Newport News
PROJECT NAME: **Warwick Boulevard Sidewalk Widening**
LOCATION: Warwick Blvd (both sides) from Lucas Creek Rd to Atkinson Way
DESCRIPTION: To construct a minimum 8' wide sidewalk along both sides of Warwick Blvd. The project would also add ADA compliant ramps and landings for the existing bus stops along the route as well as ADA accessible upgrades to all of the street and commercial entrance crossings
DATE: 8/10/2015 (on application)
PROJECT COST: $500,000

1- ESTIMATES OF VMT REDUCTIONS:

Ground counts for reasonableness check re: CMAQ Post Evaluation study [12]:

Bikeway	Bicycle Counts			Pedestrian Counts		
Sampled Bikeway	Weekday Counts	Weekend Counts	Avg. Day Estimate [1]	Weekday Counts	Weekend Counts	Avg. Day Estimate [1]
Goodwin Neck	2	4	3	0	0	0
Warwick Blvd	13	31	18	11	10	11
Col. Pkwy Conn.	34	81	47	7	5	6
Average:	16	39	**23**	6	5	**6**

Demand estimation for proposed facility re: NCHRP Report 552:

Local Bicycle Commute Share (C): 0.3% [2]
Facility Length (L): 1.52 mi. [13]

Buffer, Distance from Project	TAZ [13]	2009 Density (D), persons/ sq.mi.
0.00-0.25 mi.	1114	7,617
	1115	4,404
	1116	4,017
	Average:	5,346
0.25-0.50 mi.	1114	7,617
	1115	4,404
	1116	4,017
	1194	2,627
	1205	2,710
	Average:	4,275
0.50-1.00 mi.	1110	2,458
	1114	7,617
	1115	4,404
	1116	4,071
	1191	2,722
	1192	4,025
	1193	6,971
	1194	2627
	1205	2,710
	Average:	4,178

Buffer, Distance from Project	TAZ	2009 Density (D), persons/ sq.mi.	Area of Buffer (A), sq.mi. [6]	Residents in Buffer (R=D*A)	Existing Adult Cyclists (R*C*0.8) [3]	New Adult Cyclists [4]	Existing Adult Pedestrians [5]	New Adult Pedestrians [5]
0.00-0.25 mi.	above	5,346	0.76	4,066	10	19	2	5
0.25-0.50 mi.	above	4,275	0.76	3,251	8	9	2	2
0.50-1.00 mi.	above	4,178	1.52	6,355	15	6	4	1
				13,672	33	33	8	8

Checking reasonableness of bicycle demand estimation via comparison to ground counts:

Existing Adult Cyclists:	33	above
New Adult Cyclists:	33	above
Total Adult Cyclists:	66	
Trips, per day per cyclist:	2	trip to destination + return trip
Total Trips per Day:	133	
vs. Trips on Sampled Bikeways:	23	above

Therefore, the demand calculation results are reasonable.

Calculating VMT reduction:

	Biking	Walking	
New Users:	33	8	above
Trips, per day per user:	2	2	trip to destination + return trip
New Person Trips on Facility:	67	17	
Eliminated Person Trips by Auto:	67	17	above [7]
Occupancy of Eliminated Auto Trips:	1.25	1.25	[11]
Eliminated Vehicle Trips (Auto):	54	13	
Avg. Alt. Mode Trip Length, mi.:	2	1	[9]
Factor (for converting alt. mode trip lengths):	2	2	[10]
Avg. Eliminated Auto Trip Length, veh-mi.:	4	2	
VMT Reduction, mi:	214	27	
Total:			241 vehicle-miles

2- EMISSIONS CALCULATIONS:

Type	Emissions Factor, g/mi [5]	VMT Reduction, mi/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr	Emissions Reduction, kg/yr
VOC	0.074	241	18	0.018	250	4
NOx	0.246	241	59	0.059	250	15

3- COST EFFECTIVENESS:

Total Cost:	$500,000	above
Useful life, years:	15	as assumed in CMAQ analyses of previous years
Annual Cost:	$33,333	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effective-ness, $/kg	Con-version Factor, kg/ton	Cost Effective-ness, $/ton
VOC	$33,333	4	$7,483	907	**$6,787,274**
NOx	$33,333	15	$2,251	907	**$2,041,700**

Notes:

[1] Average Day Estimate = [(Weekday Count * 5) + (Weekend Count * 2)] / 7

[2] "A Review of 2000 Census Commute Data for Hampton Roads", HRPDC, Nov. 2005, p. 28

[3] "Low" estimate, re: NCHRP Report 552, pg. 38

[4] "New": i.e. as a result of proposed facility; New = Existing * B, where B varies by buffer: 0-0.25mi: 1.93; 0.25-0.50mi: 1.11; 0.50-1.00mi: 0.39, re: NCHRP Report 552, pg. 39

[5] Pedestrians = Cyclists / 4, based on ground counts at top of page

[6] Only areas lateral to facility are included in buffers; semi-circular areas at ends of facility are not included in buffers

[7] Assuming each new alt. mode trip eliminates an auto trip

[8] Source: VDOT, Hampton Roads average for light duty vehicles and roadway functional classes, 2011, 35mph

[9] Source: 2001 NHTS Table Designer

[10] It is assumed that the eliminated auto trips will have length lower than regular auto trips (10 miles; source [9]) and higher than regular alt. mode trips (shown above).

[11] All-trip occupancy, based on occupancies assumed in CMAQ analyses of previous years: work- 1.1; non-work- 1.3

[12] HRPDC, Feb. 2003, Appendix C

[13] From application

CONGESTION MITIGATION AND AIR QUALITY
BICYCLE AND PEDESTRIAN PROJECTS

JURISDICTION: Newport News
PROJECT NAME: **Briarfield Sidewalk**
LOCATION: Briarfield Rd from Marshall Ave to Chestnut Ave
DESCRIPTION: To construct a minimum 5' wide sidewalk along the southside of Briarfield Rd. The project would also add ADA compliant landings for the existing bus stops along Briarfield Rd. Connecting the existing sidewalk at Marshall Ave to the existing sidewalk at Chestnut Ave.
DATE: 7/15/2015 (on application)
PROJECT COST: $600,000

1- ESTIMATES OF VMT REDUCTIONS:

Facility Length (L): 0.51 mi. (2)

Demand estimation for proposed facility:

Pedestrians Only (1)

Number of HH within 1-mile radius:	7,369	(3)
Avg. HH size of driving age adults:	2.13	(4)
Driving age adults within 1-mile radius:	15,696	
Trips, per day per driving age adult:	4	
Trips per day:	62,784	
Estimated % walking mode share existing:	0.5%	(9)
Existing Adult Pedestrian trips, daily	314	
Driving age adults within 1-mile radius:	15,696	(above)
Trips, per day per driving age adult:	4	
Trips per day:	62,784	
Estimated % walking mode share after:	3.5%	(9)
Expected Adult Pedestrian trips, daily	2,197	

Calculating VMT reduction:

Additional walking trips per day:	1,883	(6)
Eliminated vehicle trip rate:	50%	(7)
Vehicle trips eliminated per day:	942	
Avg. Eliminated Auto Trip Length, veh-mi.:	2	(8)
VMT reduction, vehicle mi:	1,883	

2- EMISSIONS CALCULATIONS:

Type	Emissions Factor, g/mi (5)	VMT Reduction, mi/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr	Emissions Reduction, kg/yr
VOC	0.074	1,883	139	0.139	250	35
NOx	0.246	1,883	463	0.463	250	116

3- COST EFFECTIVENESS:

Total Cost:	$600,000	above
Useful life, years:	15	as assumed in CMAQ analyses of previous years
Annual Cost:	$40,000	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effective-ness, $/kg	Con-version Factor, kg/ton	Cost Effective-ness, $/ton
VOC	$40,000	35	$1,148	907	**$1,041,466**
NOx	$40,000	116	$345	907	**$313,287**

Notes:

(1) CMAQ application specifies that cycling is not allowed.

(2) From application.

(3) HRTPO 2009 TAZ data, 1-mile buffer of proposed facility

(4) VB-NO-NN, VA-NC MSA Persons per Driving Age per Household, HRPDC analysis of 2008-2012 ACS 5-yr estimates

(5) Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, 35mph

(6) (Expected Adult Pedestrian Trips, Daily - Existing Adult Pedestrian Trips, Daily)

(7) Assuming that only 50% of each new alt. mode trip eliminates an auto trip

(8) It is assumed that the eliminated auto trips will have length lower than regular auto trips (10 miles; source (9)) and higher than regular alt. mode trips (2 mile for bicycles, 1 mile for pedestrians Source: 2001 NHTS Table Designer).

(9) From application.

CONGESTION MITIGATION AND AIR QUALITY

CITYWIDE SIGNAL SYSTEM

JURISDICTION: Norfolk
PROJECT NAME: **Norfolk Systemwide Signal Controller and System Upgrade**
LOCATION: Citywide
DESCRIPTION: Replace all traffic signal controllers at signalized intersections with 'modern' controller equipment and software. Replace central signal system software.
DATE: 8/15/2014 (1)
PROJECT COST: $3,000,000

1 - EMISSIONS REDUCTION

		Low Volume Intersections	Medium Volume Intersections	High Volume Intersections	Total Intersections
	veh / pm pk hr:	Less than 2,690	2,690 to 5,900	More than 5,900	
Number of Intersections (1):		25	272	13	310
	multiplied by:	2,690	5,900	9,500	veh / pm pk hr (2)
	multiplied by:	10.7	10.7	10.7	sec/veh (2)
	divided by:	3,600	3,600	3,600	sec/hr
	divided by:	0.17	0.17	0.17	delay factor (3)
Change in Vehicle Delay:		1,176	28,058	2,159	hrs/day

Total Change in Vehicle Delay (sum of 3 col's above): 31,393 hrs/day

Type	Emissions Factor, g/hr (4)	Change in Veh Delay, hr/day (above)	Emissions Reduction, g/day (5)	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr	Emissions Reduction, kg/yr
VOC	0.147	31,393	4,615	4.6	250	1,154
NOx	0.637	31,393	19,997	20.0	250	4,999

2 - COST EFFECTIVENESS

Total Cost: $3,000,000 (from above)
Useful Life, years: 10 (2)
Annual Cost: $300,000

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Conversion Factor, kg/ton	Cost Effectiveness, $/ton
VOC	$300,000	1,154	$260.04	907	**$235,853**
NOx	$300,000	4,999	$60.01	907	**$54,428**

Notes:
(1) From application
(2) As previously assumed
(3) Portion of daily delay represented by peak hour
Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, June 1997.
(4) Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle.
(5) Emission Factor * Change in Vehicle Delay

CONGESTION MITIGATION AND AIR QUALITY

TRANSIT SHELTERS/FACILITIES

LOCALITY/AGCY: Norfolk
PROJECT NAME: **Bus Shelters and Pedestrian Improvements**
DESCRIPTION: Construct 72 new bus shelters to replace damaged or old bus shelters that are beyond useful life.
DATE: 8/14/2015 (on application)
PROJECT COST: $700,000

1- INCREASED BUS EMISSIONS: No Increase in Service or Emissions

2- TRAVEL REDUCTIONS:

Increase in Ridership:	208	boardings/day [1]
Vehicle Occupancy Rate (work):	1.15	persons/veh [3]
Reduction in Daily Vehicle Trips:	181	vehicles/day
Average Trip Length:	10	miles/trip [4]
Reduction in VMT:	1,809	miles/day

3- EMISSIONS REDUCTIONS:

Type	Emissions Factor, g/mi [2]	VMT Reduction, mi/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr	Emissions Reduction, kg/yr
VOC	0.074	1,809	134	0.134	250	33
NOx	0.246	1,809	445	0.445	250	111

4- COST EFFECTIVENESS:

Total Cost:	$700,000	above
Useful Life, years:	15	as assumed in previous CMAQ analyses
Annual Cost:	$46,667	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Conversion Factor, kg/ton	Cost Effectiveness, $/ton
VOC	$46,667	33	$1,395	907	**$1,264,960**
NOx	$46,667	111	$420	907	**$380,516**

Notes:

[1] From Applicant

[2] Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2011, 35mph

[3] As assumed in CMAQ analyses of previous years

[4] 2001 NHTS Table Designer

CONGESTION MITIGATION AND AIR QUALITY
OTHER - TRAFFIC OPERATIONS CENTER

JURISDICTION: Suffolk
PROJECT NAME: **Suffolk Traffic Operations Center**
LOCATION: Citywide
DESCRIPTION: TOC providing fiber optic connectivity and ITS highway management systems along corridors throughout the city to manage traffic signals, incidents and special events.
DATE: 8/15/2015 (1)
PROJECT COST: $2,050,000

1 - EMISSIONS REDUCTION FOR AFFECTED INTERSECTIONS

Arterial Intersection(s)	Number of Intersections	AADT (1)	Peak Hour Volume (2)	Delay Savings (s/veh)(3)	Delay Savings (s / pk hr)(4)	Delay Savings (hr/day)(5)
Bridge Road						
Bennetts Pasture to Harbour View Blvd. &	7	59,000	5,310	10.7	397,719	650
Harbour View Blvd.						
Bridge Rd. to Towne Point Rd.	5	18,000	1,620	10.7	86,670	142
Holland Road						
Manning Bridge Rd. to RTE 58 Bypass	5	88,000	7,920	10.7	423,720	692
Portsmouth Blvd.						
Pinner St. to E Washington St.	4	36,000	3,240	10.7	138,672	227
Pruden Blvd.						
Lake Prince Dr. to RTE 58 EB Off-ramp	5	38,000	3,420	10.7	182,970	299
N Main St.						
Pruden Blvd. to Suffolk Plaza Park Lot	5	25,000	2,250	10.7	120,375	197
Godwin Blvd.						
Kings Fork Rd Rte 58 Bypass	8	20,000	1,800	10.7	154,080	252
College Drive						
Lake View Pkway to Towne Point Rd.	3	18,000	1,620	10.7	52,002	85
Town Point Rd.						
Hunters Ct. to Respass Beach Rd	2	28,300	2,547	10.7	54,506	89
W Washington St.						
Lipton Tea Factory to N Main St.	5	16,900	1,521	10.7	81,374	133
N Main St./ Market St.						
W Washington St. to Prentis St.	7	23,000	2,070	10.7	155,043	253

Finney Ave.						
N Main St. to Moore Ave	2	6,800	612	10.7	13,097	21
College Drive						
Magnolia Dr. to Bridge Rd.	4	33,000	2,970	10.7	127,116	208
Carolina Rd.						
Fayette St. to Dill Rd.	3	11,000	990	10.7	31,779	52
E Washington St/White Marsh Rd.						
Pinner St. to Fire Station 3	5	14,300	1,287	10.7	68,855	113
W Constance Rd						
N Main St. to Prentis St./Pitchkittle Rd.	4	8,800	792	10.7	33,898	55
				Total Delay Savings		3,467 hr/day

Type	Emissions Factor, g/hr [6]	Change in Veh Delay, hr/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr	Emissions Reduction, kg/yr
VOC	0.147	3,467	510	0.5	250	127
NOx	0.637	3,467	2,209	2.2	250	552

2 - COST EFFECTIVENESS

Total Cost:	$2,050,000	(from above)
Useful Life, years:	10 [3]	
Annual Cost:	$205,000	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Cost Effectiveness, $/ton
VOC	$205,000	127	$1,609	**$1,459,270**
NOx	$205,000	552	$371	**$336,755**

[1] From application

[2] VDOT AADT * Regional k factor from 2014 CMP database (0.090)

[3] As assumed for corridor improvement projects

[4] Number of Signals * Peak Hr Volume * Delay Savings

[5] Delay Savings / Delay Represented by Peak Hour (.17) / 3600 s/hr
Peak Hour Delay Factor Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, 6/97

[6] VDOT, Fleet Avg Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle

CONGESTION MITIGATION AND AIR QUALITY
HIGHWAY - CORRIDOR IMPROVEMENTS

JURISDICTION: Suffolk
PROJECT NAME: **Suffolk Citywide Signal Signal Retiming**
LOCATION: Citywide
DESCRIPTION: Retime approximately 91 traffic signals citywide
DATE: 8/14/2015 (1)
PROJECT COST: $370,000

1 - EMISSIONS REDUCTION

Arterial Intersection(s)	Number of Intersections	AADT (1)	Peak Hour Volume (2)	Delay Savings	Delay Savings (s / pk hr)(4)	Delay Savings
Bridge Rd/Harbour View Blvd						
Bridge Rd.	7	30,782	2,770	10.7	207,502	339
Harbour View Blvd	5	18,000	1,620	10.7	86,670	142
Holland Rd						
Holland Rd	5	29,609	2,665	10.7	142,568	233
Portsmouth Blvd						
Portsmouth Blvd	4	19,028	1,713	10.7	73,297	120
Pruden Blvd						
Pruden Blvd	5	22,388	2,015	10.7	107,799	176
N Main St						
N Main St	5	27,000	2,430	10.7	130,005	212
Godwin Blvd						
Godwin Blvd	8	22,000	1,980	10.7	169,488	277
Towne Point Rd/College Dr						
College Dr	3	21,000	1,890	10.7	60,669	99
Hampton Roads Pkwy	2	9,468	852	10.7	18,236	30
Downtown System						
W Washington St	5	6,637	597	10.7	31,957	52
N Main St/ Market St	7	18,751	1,688	10.7	126,402	207
Finney Ave	2	27,482	2,473	10.7	52,930	86
College Dr						
College Dr	4	16,235	1,461	10.7	62,538	102
Carolina Rd						
Carolina Rd	3	10,000	900	10.7	28,890	47
E Washington St/White Marsh Rd						
E Washington St/ White Marsh Rd	5	5,632	507	10.7	27,116	44
W Constance Rd						
W Constance Rd	4	9,500	855	10.7	36,594	60

Isolated Intersections (17 Total)						
Bridge Rd/ Crittenden Rd	1	19,000	1,710	10.7	18,297	30
Nansemond Pkwy/ Shoulders Hill Rd	1	12,000	1,080	10.7	11,556	19
Nansemond Pkwy/ Wilroy Rd	1	11,000	990	10.7	10,593	17
Pruden Blvd/ Lake Meade Pkwy	1	9,600	864	10.7	9,245	15
Holland Rd/ Holland Plaza Shop	1	8,900	801	10.7	8,571	14
E Constance Rd/ Katherine St	1	15,000	1,350	10.7	14,445	24
Carolina Rd/ Turlington Rd	1	17,000	1,530	10.7	16,371	27
Wilroy Rd/ Progress RS	1	8,000	720	10.7	7,704	13
Wilroy Rd/ Rte 58 EB	1	5,000	450	10.7	4,815	8
Bennetts Pasture Rd/ Kings Hwy	1	8,300	747	10.7	7,993	13
Shoulders Hill Rd/ Bennetts Creek Park Rd	1	10,000	900	10.7	9,630	16
Carolina Rd/ Rte 13 Off Ramp	1	17,000	1,530	10.7	16,371	27
Nansemond Pkwy/ Nansemond River HS	1	7,800	702	10.7	7,511	12
Bridge Rd/ Eclipse Rd	1	15,000	1,350	10.7	14,445	24
Shoulders Hill Rd (prop.)/ Pughsville Rd (prop.)	1	10,000	900	10.7	9,630	16
S Quay Rd/ Okelly Dr	1	21,000	1,890	10.7	20,223	33
Holland Rd/ Pioneer Rd	1	25,000	2,250	10.7	24,075	39
				Total Delay Savings		2,227 hr/day

Type	Emissions Factor, g/hr [6]	Change in Veh Delay, hr/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr	Emissions Reduction, kg/yr
VOC	0.147	2,227	327	0.3	250	82
NOx	0.637	2,227	1,418	1.4	250	355

2 - COST EFFECTIVENESS

Total Cost:	$370,000	(from above)
Useful Life, years:	2 [3]	
Annual Cost:	$185,000	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Cost Effectiveness,
VOC	$185,000	82	$2,261	**$2,050,619**
NOx	$185,000	355	$522	**$473,220**

[1] From application
[2] VDOT AADT * Regional k factor from 2014 CMP database (0.090)
[3] As previously assumed
[4] Number of Signals * Peak Hr Volume * Delay Savings
[5] Delay Savings / Delay Represented by Peak Hour (.17) / 3600 s/hr
Peak Hour Delay Factor Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, 6/97
[6] VDOT, Fleet Avg Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle

CONGESTION MITIGATION AND AIR QUALITY

HIGHWAY PROJECTS - INTERSECTION GEOMETRY

JURISDICTION: Suffolk

PROJECT NAME: **Rte 626 Reconstruction (Shoulders Hill Rd)**

LOCATION: Intersection of Shoulders Hill Rd (Rte 626) and Bridge Rd (Rte 17) as Phase I of the Rte 626 Reconstruction Project

DESCRIPTION: Project will provide for the intersection improvements to include adding a left turn lane on southbound Knott's Neck Rd, extending existing dual left-turn lanes on westbound Bridge Rd, and adding a second right turn lane on northbound Shoulders Hill Rd as well as extending the second recieving lane on southbound Shoulders Hill Rd. Also, signal upgrades and pedestrian improvements would be included.

DATE: 8/13/2015 (1)

PROJECT COST: $15,000,000

1 - REDUCED AUTO EMISSIONS

Weekday PM Peak Hour

Intersection Delay Before Project		109	sec/veh (1)
Intersection Delay After Project		62	sec/veh (1)
Change In Intersection Delay		47.0	sec/veh, pk hr
Total Vehicles During Peak Hour		2,707	veh/hr (1)
	divided by	3,600	sec/hr
Change In Intersection Delay		35.3	veh hr's, pk hr
	divided by	17%	pk hr delay factor(2)
Change In Intersection Delay		207.9	hours/day

Type	Emissions Factor, g/hr (3)	Delay Change, hr/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, weekdays/yr	Emissions Reduction, kg/yr
VOC	0.147	207.9	31	0.031	250	7.6
NOx	0.637	207.9	132	0.132	250	33.1

2 - COST EFFECTIVENESS

Total Cost:	$15,000,000	(from above)
Useful life, years:	10 (4)	
Annual Cost:	$1,500,000	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effective-ness, $/kg	Conversion Factor, kg/ton	Cost Effective-ness, $/ton
VOC	$1,500,000	7.6	$196,336	907	**$178,076,459**
NOx	$1,500,000	33.1	$45,308	907	**$41,094,567**

Notes:

(1) From application

(2) pk hr delay factor = pk hr delay / daily delay;
Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, Page 8, June 1997.

(3) Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle.

(4) As previously assumed.

CONGESTION MITIGATION AND AIR QUALITY

HIGHWAY - CORRIDOR IMPROVEMENTS

JURISDICTION: Virginia Beach

PROJECT NAME: **Corridor Retiming - Kempsville Road and Newtown Area**

LOCATION: Kempsville Road and Newtown Road areas in the northwestern part of Virginia Beach, east of I-64.

DESCRIPTION: Retime approximately 44 traffic signals in specified corridors

DATE: 8/14/2015 (1)

PROJECT COST: $521,180

1 - EMISSIONS REDUCTION

Arterial Intersection(s)	Number of Intersections	AADT (1)	Peak Hour Volume (2)	Delay Savings (s/veh)(3)	Delay Savings (s / pk hr)(4)	Delay Savings (hr/day)(5)
Kempsville Road						
Glen View Dr to Princess Anne Rd	13	28,370	2,553	10.7	355,164	580
Centerville Turnpike						
Lynnhaven Pkwy to Kempsville Rd	3	13,562	1,221	10.7	39,181	64
Providence Rd						
Avalon Ave to Kempsville Rd	9	21,194	1,907	10.7	183,688	300
Weleyn Dr						
Baker Rd to Aragona Blvd	6	18,225	1,640	10.7	105,304	172
Witchduck Rd						
Clevand St. to VB Blvd	2	46,785	4,211	10.7	90,108	147
VB Blvd to Jerico Rd	3	16,915	1,522	10.7	48,867	80
Virginia Beach Blvd						
Newtown Rd to Dorset Ave	5	34,729	3,126	10.7	167,220	273
Cleveland St						
Witchduck Rd to Euclid St	2	7,519	677	10.7	14,482	24
Baker Rd						
Wesleyn Dr to Newtown Rd	3	13,159	1,184	10.7	38,016	62
Newtown Rd						
VB Blvd to Diamond Springs Rd	3	41,115	3,700	10.7	118,781	194
Diamond Springs Rd to Aragona Blvd	4	7,648	688	10.7	29,460	48
				Total Delay Savings		1,945 hr/day

Type	Emissions Factor, g/hr (6)	Change in Veh Delay, hr/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr	Emissions Reduction, kg/yr
VOC	0.147	1,945	286	0.3	250	71
NOx	0.637	1,945	1,239	1.2	250	310

2 - COST EFFECTIVENESS

Total Cost:	$521,180	(from above)
Useful Life, years:	2 [3]	
Annual Cost:	$260,590	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Cost Effectiveness, $/ton
VOC	$260,590	71	$3,646	**$3,306,838**
NOx	$260,590	310	$841	**$763,117**

[1] From application
[2] VDOT AADT * Regional k factor from 2014 CMP database (0.090)
[3] As previously assumed
[4] Number of Signals * Peak Hr Volume * Delay Savings
[5] Delay Savings / Delay Represented by Peak Hour (.17) / 3600 s/hr
Peak Hour Delay Factor Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, 6/97
[6] VDOT, Fleet Avg Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle

CONGESTION MITIGATION AND AIR QUALITY

HIGHWAY PROJECTS - INTERSECTION GEOMETRY

JURISDICTION: Virginia Beach
PROJECT NAME: **Independence Blvd/Edwin Dr Intersection Improvements**
LOCATION: Intersection of Independence Blvd. and Edwin Drive
DESCRIPTION: Improve westbound Edwin Drive from a single left turn lane to a dual left turn lane and extending the right turn storage length all within existing right-of-way.
DATE: 8/14/2015 (1)
PROJECT COST: $647,000

1 - REDUCED AUTO EMISSIONS

Weekday PM Peak Hour

Intersection Delay Before Project		42.7	sec/veh (1)
Intersection Delay After Project		35	sec/veh (1)
Change In Intersection Delay		7.7	sec/veh, pk hr
Total Vehicles During Peak Hour		6,908	veh/hr (1)
	divided by	3,600	sec/hr
Change In Intersection Delay		14.8	veh hr's, pk hr
	divided by	17%	pk hr delay factor(2)
Change In Intersection Delay		86.9	hours/day

Type	Emissions Factor, g/hr (3)	Delay Change, hr/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, weekdays/yr	Emissions Reduction, kg/yr
VOC	0.147	86.9	13	0.013	250	3.2
NOx	0.637	86.9	55	0.055	250	13.8

2 - COST EFFECTIVENESS

Total Cost:	$647,000	(from above)
Useful life, years:	10 (4)	
Annual Cost:	$64,700	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effective-ness, $/kg	Conversion Factor, kg/ton	Cost Effective-ness, $/ton
VOC	$64,700	3.2	$20,256	907	**$18,372,260**
NOx	$64,700	13.8	$4,674	907	**$4,239,752**

Notes:

(1) From application

(2) pk hr delay factor = pk hr delay / daily delay;
Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, Page 8, June 1997.

(3) Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle.

(4) As previously assumed.

CONGESTION MITIGATION AND AIR QUALITY

HIGHWAY PROJECTS - INTERSECTION GEOMETRY

JURISDICTION: Virginia Beach
PROJECT NAME: **Rosemount Road/South Plaza Trail Intersection Improvements**
LOCATION: Intersection of Rosemount Road and South Plaza Trail
DESCRIPTION: Add an eastbound right turn lane on South Plaza Trail at intersection of Rosemount Road.

DATE: 8/14/2015 (1)
PROJECT COST: $363,000

1 - REDUCED AUTO EMISSIONS

Weekday PM Peak Hour

Intersection Delay Before Project		57.9	sec/veh (1)
Intersection Delay After Project		48.7	sec/veh (1)
Change In Intersection Delay		9.2	sec/veh, pk hr
Total Vehicles During Peak Hour		3,641	veh/hr (1)
	divided by	3,600	sec/hr
Change In Intersection Delay		9.3	veh hr's, pk hr
	divided by	17%	pk hr delay factor(2)
Change In Intersection Delay		54.7	hours/day

Type	Emissions Factor, g/hr (3)	Delay Change, hr/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, weekdays/yr	Emissions Reduction, kg/yr
VOC	0.147	54.7	8	0.008	250	2.0
NOx	0.637	54.7	35	0.035	250	8.7

2 - COST EFFECTIVENESS

Total Cost:	$363,000	(from above)
Useful life, years:	10 (4)	
Annual Cost:	$36,300	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effective-ness, $/kg	Conversion Factor, kg/ton	Cost Effective-ness, $/ton
VOC	$36,300	2.0	$18,046	907	**$16,368,146**
NOx	$36,300	8.7	$4,165	907	**$3,777,264**

Notes:

(1) From application

(2) pk hr delay factor = pk hr delay / daily delay;
Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, Page 8, June 1997.

(3) Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle.

(4) As previously assumed.

CONGESTION MITIGATION AND AIR QUALITY
HIGHWAY - CORRIDOR IMPROVEMENTS

JURISDICTION: Virginia Beach
PROJECT NAME: **Traffic Adaptive Corridor Implementation**
LOCATION: Indian River Road between Military Hwy and Indian Lakes Boulevard
DESCRIPTION: Upgrade the existing traffic signal system to an adaptive traffic signal system to measure traffic conditions along Indian River Road in real time and constantly adjust the signal timing based on real-time data. The project includes improving 14 mainline intersections with a possibility of installing the system at several side street intersections. The project cost includes costs for installing hardware, software, and system integration.

DATE: 8/14/2015 (1)
PROJECT COST: $390,000

1 - EMISSIONS REDUCTION

Arterial Intersection(s)	Number of Intersections	AADT (1)	Peak Hour Volume (2)	Delay Savings (s/veh)(3)	Delay Savings (s / pk hr)(4)	Delay Savings (hr/day)(5)
Indian River Road						
Military Highway to Indian Lakes Drive	14	55,448	4,990	10.7	747,550	1,221
				Total Delay Savings		1,221 hr/day

Type	Emissions Factor, g/hr (6)	Change in Veh Delay, hr/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr	Emissions Reduction, kg/yr
VOC	0.147	1,221	180	0.2	250	45
NOx	0.637	1,221	778	0.8	250	195

2 - COST EFFECTIVENESS

Total Cost:	$390,000	(from above)
Useful Life, years:	10 (3)	
Annual Cost:	$39,000	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Cost Effectiveness, $/ton
VOC	$39,000	45	$869	**$787,999**
NOx	$39,000	195	$200	**$181,846**

(1) From application
(2) VDOT AADT * Regional k factor from 2014 CMP database (0.090)
(3) As previously assumed
(4) Number of Signals * Peak Hr Volume * Delay Savings
(5) Delay Savings / Delay Represented by Peak Hour (.17) / 3600 s/hr
Peak Hour Delay Factor Source: "Cost Benefit Model for Intersection Level of Service Improvements", HRPDC, 6/97
(6) VDOT, Fleet Avg Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2021, idle

CONGESTION MITIGATION AND AIR QUALITY

TRANSIT AND FIXED GUIDEWAY PROJECTS - VEHICLE PURCHASE/REPLACEMENT

AGENCY: WATA
PROJECT NAME: **Bus Vehicle Replacement**
DESCRIPTION: Four (4) Bus Expansion
DATE: 8/14/2015 [1]
PROJECT COST: $1,793,772

Number of New Vehicles	4	vehicles[1]
Average Yearly Vehicle-Miles for New Vehicles	81,000	vehicle-miles[1]

1 - CHANGE IN VEHICLE EMISSIONS

NEW BUS EMISSIONS:

New Vehicles	Emissions Rate g / bhp-hr [1]	Emissions Rate g/mi [2]	VMT mi/yr/bus	Number of Vehicles	Yearly Emissions g/yr	Yearly Emissions kg/yr
VOC	0.14	0.66	81,000	4	212,239	212
NOx	0.2	0.94	81,000	4	303,199	303

REDUCED AUTO EMISSIONS:

Ridership Estimate:	367	boardings/day [3]
Vehicle Occupancy Rate:	1.15	persons/veh [4]
Reduction in Daily Vehicle Trips:	87	veh trips / day
Average Trip Length:	10	miles/trip [5]
Reduction in VMT:	870	miles/day

Type	Emissions Factor, g/mi [6]	VMT Reduction, mi/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, days/yr	Emissions Reduction, kg/yr
VOC	0.665	870	578	0.58	250	145
NOx	0.797	870	693	0.69	250	173

2 - EMISSIONS REDUCTION

Reduction in Emissions	VOC	-68	kg/yr
	NOx	-130	kg/yr

3 - COST EFFECTIVENESS

Total Cost:	$1,793,772	(from above)
Useful life, years:	15 [7]	
Annual Cost:	$119,585	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Cost Eff., $/Ton
VOC	$119,585	-68	-$1,767.07	**-$1,602,729**
NOx	$119,585	-130	-$920.32	**-$834,730**

[1] From application; given values for HC as proxy value for VOC

[2] Applying a conversion factor of 4.679 bhp-hr / mi, EPA data for Mobile6 (no conversion factor yet available for MOVES2010B model)

[3] From applications (WA2CM & WA3CM)

[4] 1.15 for work trips, 1.30 for non-work trips, as previously assumed

[5] Average trip length for personal vehicle trips, 2001 NHTS

[6] VDOT, Hampton Roads average for all vehicle types on minor arterials, 2011, 35mph

[7] As previously assumed

CONGESTION MITIGATION AND AIR QUALITY

TRANSIT AND FIXED GUIDEWAY PROJECTS - NEW OR EXPANDED TRANSIT SERVICE

JURISDICTION: WATA
PROJECT NAME: **Upper York County/New Kent Connector - Demonstration Route**
LOCATION: York County, James City County
DESCRIPTION: New transit service that provides service to an unserved area of James City County
DATE: 8/6/2015 (on application)
PROJECT COST: $1,308,555 (1)

1 - INCREASED BUS EMISSIONS:

Route Length (one-way):	35	mi/trip (2)
Bus Trips per day (round trips):	7	round trips / day (2)
Factor:	2	trips / round trip
Bus VMT:	490	mi/day

Type	Emissions Factor, g/mi (3)	Bus VMT, mi/day (above)	Emissions Increase, g/day	Emissions Increase, kg/day	Conversion Factor, days/yr	Emissions Increase, kg/yr
VOC	0.660	490	323	0.32	250	81
NOx	0.940	490	461	0.46	250	115

2 - REDUCED AUTO EMISSIONS:

Ridership Estimate:	66	boardings/day (2)
Vehicle Occupancy Rate:	1.15	persons/veh (4)
Reduction in Daily Vehicle Trips:	57	veh trips / day
Average Trip Length:	10	miles/trip (5)
Reduction in VMT:	574	miles/day

Type	Emissions Factor, g/mi (6)	VMT Reduction, mi/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, days/yr	Emissions Reduction, kg/yr
VOC	0.665	574	382	0.38	250	95
NOx	0.797	574	457	0.46	250	114

3- COST EFFECTIVENESS:

Project Cost:	$1,308,555	above
Project life, years:	3	(2)
Annual Cost:	$436,185	

Type	Cost, $/yr (above)	Net Emissions Reduction, kg/yr	Cost Effectiveness, $/kg	Conversion Factor, kg/ton	Cost Effectiveness, $/ton
VOC	$436,185	15	$29,952	907	**$27,166,011**
NOx	$436,185	-1	negative	907	**negative**

(1) From application
(2) From application
(3) VDOT, Hampton Roads average for Diesel Transit & Urban Buses on minor arterials, 2011, 35mph
(4) 1.15 for work trips, 1.30 for non-work trips, as previously assumed
(5) Average trip length for personal vehicle trips, 2001 NHTS
(6) VDOT, Hampton Roads average for all vehicle types on minor arterials, 2011, 35mph

CONGESTION MITIGATION AND AIR QUALITY

TRANSIT AND FIXED GUIDEWAY PROJECTS - NEW OR EXPANDED TRANSIT SERVICE

JURISDICTION: WATA
PROJECT NAME: **York County - Southeast - Demonstration Route**
LOCATION: York County
DESCRIPTION: New transit service serving an area that is currently unserved by transit with connections to HRT.
DATE: 8/14/2015 (on application)
PROJECT COST: $1,564,817 [1]

1 - INCREASED BUS EMISSIONS:

Route Length (one-way):	15	mi/trip [2]
Bus Trips per day (round trips):	15	round trips / day [2]
Factor:	2	trips / round trip
Bus VMT:	450	mi/day

Type	Emissions Factor, g/mi [3]	Bus VMT, mi/day (above)	Emissions Increase, g/day	Emissions Increase, kg/day	Conversion Factor, days/yr	Emissions Increase, kg/yr
VOC	0.660	450	297	0.30	250	74
NOx	0.940	450	423	0.42	250	106

2 - REDUCED AUTO EMISSIONS:

Ridership Estimate:	301	boardings/day [2]
Vehicle Occupancy Rate:	1.15	persons/veh [4]
Reduction in Daily Vehicle Trips:	262	veh trips / day
Average Trip Length:	10	miles/trip [5]
Reduction in VMT:	2,617	miles/day

Type	Emissions Factor, g/mi [6]	VMT Reduction, mi/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, days/yr	Emissions Reduction, kg/yr
VOC	0.665	2,617	1,741	1.74	250	435
NOx	0.797	2,617	2,086	2.09	250	522

3- COST EFFECTIVENESS:

Project Cost:	$1,564,817	above
Project life, years:	3 [2]	
Annual Cost:	$521,606	

Type	Cost, $/yr (above)	Net Emissions Reduction, kg/yr	Cost Effectiveness, $/kg	Conversion Factor, kg/ton	Cost Effectiveness, $/ton
VOC	$521,606	361	$1,445	907	**$1,310,911**
NOx	$521,606	416	$1,255	907	**$1,137,893**

[1] From application
[2] From application
[3] VDOT, Hampton Roads average for Diesel Transit & Urban Buses on minor arterials, 2011, 35mph
[4] 1.15 for work trips, 1.30 for non-work trips, as previously assumed
[5] Average trip length for personal vehicle trips, 2001 NHTS
[6] VDOT, Hampton Roads average for all vehicle types on minor arterials, 2011, 35mph

CONGESTION MITIGATION AND AIR QUALITY

TRANSIT SHELTERS/FACILITIES

LOCALITY/AGCY: WATA

PROJECT NAME: **WATA Transfer Station (HUB)**

DESCRIPTION: Establish a transfer station at the upper end of WATA's service area on Opportunity Way in James City County.

DATE: 8/6/2015 (on application)

PROJECT COST: $2,500,000

1- INCREASED BUS EMISSIONS: No Increase in Service or Emissions

2- TRAVEL REDUCTIONS:

Increase in Ridership:	1,419	boardings/day [1]
Vehicle Occupancy Rate (work):	1.15	persons/veh [3]
Reduction in Daily Vehicle Trips:	1,234	vehicles/day
Average Trip Length:	10	miles/trip [4]
Reduction in VMT:	12,339	miles/day

3- EMISSIONS REDUCTIONS:

Type	Emissions Factor, g/mi [2]	VMT Reduction, mi/day (above)	Emissions Reduction, g/day	Emissions Reduction, kg/day	Conversion Factor, wkdays/yr	Emissions Reduction, kg/yr
VOC	0.665	12,339	8,206	8.206	250	2,051
NOx	0.797	12,339	9,834	9.834	250	2,459

4- COST EFFECTIVENESS:

Total Cost:	$2,500,000	above
Useful Life, years:	15	as assumed in previous CMAQ analyses
Annual Cost:	$166,667	

Type	Cost, $/yr (above)	Emissions Reduction, kg/yr (above)	Cost Effectiveness, $/kg	Conversion Factor, kg/ton	Cost Effectiveness, $/ton
VOC	$166,667	2,051	$81	907	**$73,690**
NOx	$166,667	2,459	$68	907	**$61,486**

Notes:

[1] From Applicant

[2] Source: VDOT, Fleet Avg. Emission Factors for Hampton Roads (Based on US EPA Model MOVES2010b), 2011, 35mph

[3] As assumed in CMAQ analyses of previous years

[4] 2001 NHTS Table Designer

APPENDIX B

RSTP Project Evaluation Worksheets

Table 2: Highway- Roadway Widening, New Facility, HOV Lanes, Intersection Improvements

Applicant	Project Name (code)	Total Cost	Congestion Level (ex., fut.- 10 pts each; severe=7, moderate=3, low=0)	(0-20)	Cost-Effectiveness (lowest $/vmt = 20; highest $/vmt = 0; straight line interp)	(0-20)	System Continuity (for missing links: total completion = 20, partial completion = 10)	(0-20)	Safety (20 pts to project with highest safety improve-ments)	(0-20)	Air Quality (reduces NOx = 5; reduces HC = 5)	(0-10)	Project Readiness (detailed design and cost estimates, ready to go: 10 pts)	(0-10)	Total (0-100)
Isle of Wight Cty.	Route 258 SOUTH Widening (IW1RS)	$ 26,130,000	Current LOS: C-D Future LOS: E-F	12	Annual: ($26.13m*5%)/(5.7k*2.6mi.*338 days) = $0.261/vmt	15	Yes	5	Divide two-way traffic, Bike/ped accom., >storage and stacking capacity, access & evacuation mgmt.	20	Decreased idling and emissions at intersections	10	Community support: Yes: Detailed design and cost est.; Yes: and all approvals; No	7	**69**
Isle of Wight Cty.	Route 607 (Old Mill Road) Signalization (IW2RS)	$ 382,728	Current LOS: C Future LOS: F	10	Annual: ($.382m*5%)/(9.82k*0.25mi. *338 days) = $0.023/vmt	20	No	0	Reduced speeds along corridor, Increased opportunity for left turning freight traffic	20	Decreased idling and emissions at intersections	10	Community support: Yes: Detailed design and cost est.; Yes: and all approvals; No	7	**67**
James City Co	Longhill Road/Olde Towne Intersection Improvements (JC1RS)	$ 3,015,000	Current LOS: F Future LOS: F	20	Annual: ($3.02m*5%)/(9.6k*.05 mi.*338 days) = $0.929/vmt	3	No	0	Left/right turn lanes, Improved bike/ped facilities, reduction in stop-n-go traffic	18	Includes active transport facilities, decreased idling and emissions at intersections	10	Community support: Yes: Detailed design and cost est.; Yes: and all approvals; No	7	**58**
James City Co	Longhill Road Widening - Westbound Lanes (JC2RS)	$ 8,979,600	Current LOS: F Future LOS: F	20	Annual: ($8.98m*5%)/(21k*0.5mi *338 days) = $0.126/vmt	18	Yes	10	Improved merging movements, Improved bike/ped facilities	10	Includes active transport facilities, decreased idling and emissions at intersections	10	Community support: Yes: Detailed design and cost est.; No: and all approvals; No	3	**71**
James City Co	Longhill Road Widening - Eastbound Lanes (JC3RS)	$ 8,358,100	Current LOS: F Future LOS: F	20	Annual: ($8.36m*5%)/(16.5k*.5mi. *338 days) = $0.149/vmt	18	Yes	10	Improved merging movements, Improved access mgmt.	10	Decreased idling and emissions at intersections	10	Community support: Yes: Detailed design and cost est.; No: and all approvals; No	3	**71**
James City Co	Longhill Road/Williamsburg Plantation Road Roundabout (JC4RS)	$ 4,020,100	Current LOS: D Future LOS: F	13	Annual: ($4.02m*5%)/(18.8k*0.25mi *338 days) = $0.127/vmt	18	No	0	Reduced speeds and injury crash rates	20	Decreased idling and emissions at intersections	10	Community support: Yes: Detailed design and cost est.; No: and all approvals; No	3	**64**
Newport News	Jefferson Avenue Widening - Kings Ridge Drive to Industrial Park Drive (NN1RS)	$ 25,000,000	Current LOS: D Future LOS: C	3	Annual: ($25.0m*5%)/(28.4k*.625mi.*338 days) = $0.208/vmt	15	Yes	15	Raised median, Protected turn lanes, Lighting, ped accom.	20	Reduced congestion on segment	10	Community support: Yes: Detailed design and cost est.; No: and all approvals; No	3	**66**
Norfolk	I-64/Northhampton Interchange Ramp Modifications (NF5RS)	$ 6,000,000	Current LOS: E Future LOS: F	17	Annual: ($6.0m*5%)/(81k*0.34mi *338 days) = $0.127/vmt	18	Yes	5	Reduce dangerous queing and weaving	10	Reduced bottlenecks and emissions	10	Community support: Yes: Detailed design and cost est.; No: and all approvals; No	3	**63**
Suffolk	Rte 626 Reconstruction (Shoulders Hill Road) (SF2RS)	$ 17,500,000	Current LOS: E Future LOS: F	17	Annual: ($17.5m*5%)/(31.9k*.5mi.*338 days) = $0.162/vmt	18	Yes	5	Added and extended turn lanes: reduction of through traffic conflicts	10	Decreased idling and emissions at intersections	10	Community support: Yes: Detailed design and cost est.; No: and all approvals; No	3	**63**
Virginia Beach	Elbow Road Extended - Phase 2 (VB1RS)	$ 75,399,035	Current LOS: F Future LOS: F	20	Annual: ($75.4m*5%)/(11.5k*3.0mi *338 days) = $0.323/vmt	10	Yes	15	Widen roadway, add median, geometric improvements, straighten allignment	20	Reduced congestion on segment	10	Community support: Yes: Detailed design and cost est.; Yes: and all approvals; No	7	**82**
Virginia Beach	Indian River Road - Phase 7 (VB2RS)	$ 86,761,892	Current LOS: C Future LOS: D	3	Annual: ($86.8m*5%)/(12.5k*2.2mi.*338 days) = $0.467/vmt	5	Yes	10	Widen roadway, add median, add turn lanes	18	Reduced congestion on segment	10	Community support: Yes: Detailed design and cost est.; Yes: and all approvals; No	7	**53**

Table 3: Highway- Corridor Operational Improvements

Applicant	Project Name (code)	Total Cost	Arterial LOS (Rel. Scale-max pts to worst LOS, 0 to arterial w/ LOS C or better	(0-25)	ADT of Roadway (Existing & future ADT = 10 pts ea. -Rel. Scale - max pts to highest ADT/Lane)	(0-20)	Cost-Effectiveness (lowest $/vmt = 20; highest $/vmt = 0; straight line interp)	(0-25)	Existing Accidents (Rel Scale-max pts to project w/ highest accident rate or frequency	(0-20)	Project Readiness (detailed design and cost estimates, ready to go: 10 pts)	(0-10)	Total (0-100)
Chesapeake	George Washington Highway (US 17) Corridor Improvements (CH3RS)	$ 28,000,000	Current LOS: E-F Future LOS: F	25	Current ADT: 26,900 VPD (2014) Future ADT: 34,000 VPD (2034)	20	Annual: ($28.0m*5%)/(26.9k*1.2mi.* 338 days) = $0.128/vmt	0	86	20	Community support: Yes: Detailed design and cost est.; Yes: and all approvals; No	7	**72**
Chesapeake	Mount Pleasant Phase 1 Corridor Improvements (CH2RS)	$ 30,000,000	Current LOS: D-E Future LOS: E-F	20	Current ADT: 19,000 VPD (2014) Future ADT: 25,000 VPD (2034)	15	Annual: ($30.0m*5%)/(19.0k*0.8mi.* 338 days) = $0.292/vmt	10	65	15	Community support: Yes: Detailed design and cost est.; Yes: and all approvals; No	7	**67**
Norfolk	Llewellyn Avenue Street Improvements (NF3RS)	$ 2,000,000	Current LOS: D Future LOS: E	15	Current ADT: 12,688 VPD (2009) Future ADT: 13,000 VPD (2030)	10	Annual: ($2.0m*5%)/(12.69k*0.38mi.* 338 days) = $0.061/vmt	20	20	5	Community support: Yes: Detailed design and cost est.; Yes: and all approvals; No	7	**57**

Table 4: Highway-Bridge Rehabilitation

Applicant	Project Name (code)	Total Cost	Bridge Condition (Rel Scale-max pts to bridge w/ the worst condition)	(0-60)	ADT of Bridge (Rel Scale-max points to bridge w/ highest ADT)	(0-30)	Project Readiness (detailed design and cost estimates, ready to go: 10 pts)	(0-10)	Total (0-100)
Norfolk	Berkley Avenue Bridge Rehabilitation (NF1RS)	$ 4,000,000	79.8	25	Current ADT: 35,000 VPD (2014)	30	Community support: Yes: Detailed design and cost est.; No: and all approvals; No	3	**58**
Norfolk	Hampton Boulevard Bridge Rehabilitation (NF2RS)	$ 6,000,000	64.9	39	Current ADT: 32,000 VPD (2014)	28	Community support: Yes: Detailed design and cost est.; No: and all approvals; No	3	**70**
Norfolk	Military Highway (NBL) "Wayside Bridge" Rehabilitation (NF4RS)	$ 2,500,000	82.2	20	Current ADT: 28,195 VPD (2014)	25	Community support: Yes: Detailed design and cost est.; No: and all approvals; No	3	**48**
Suffolk	Spieghts Spillway Bridge Replacement (SF3RS)	$ 1,500,000	31.9	60	Current ADT: 9,479 VPD (2015)	12	Community support: Yes: Detailed design and cost est.; No: and all approvals; No	3	**75**
Suffolk	Lake Meade Bridge Replacement (SF4RS)	$ 2,300,000	62	40	Current ADT: 10,195 VPD (2015)	15	Community support: Yes: Detailed design and cost est.; No: and all approvals; No	3	**58**

Table 6: Transit & Fixed Guideway-New or expanded service, passenger facilities, HS/intercity/and light rail, station Dev., vehicle upgrades, etc.

Applicant	Project Name (code)	Total Cost	Congestion Relief (10 pts to project w highest % removed; 0 pts to lowest)	(0-10)	Facility Usage, Daily Ridership (20 pts to highest; 0 pts to lowest)	(0-20)	Cost Effective-ness--Subsidy/ Passenger (20 pts to lowest; 0 pts to highest)	(0-20)	Air Quality (NOx reductions = 10; HC reductions = 10)	(0-20)	Coverage Area (based on population and employ-ment)	(0-20)	Project Readiness (detailed design and cost estimates, ready to go: 10 pts)	(0-10)	Total (0-100)
HRT	Passenger Amenity Program (HT2RS)	$1,200,000	N/A	0	58,000	20	5.66	10	N/A	0	N/A	0	Community support: Yes detailed design and $ est: Yes, and all approvals: No	7	**37**
WATA	Upper York County/New Kent Connector - Demonstration Route (WA2RS)	$1,308,555	<581 daily VMT	5	20,525/312 service days/ year = 66	5	2.19	15	VOC = < 27.3 lbs./day ; Nox = < 18.9 lbs./day	20	Pop = 20,031 Employment = 13,249; Factor of 1.51	19	Community support: Yes detailed design and $ est: Yes, and all approvals: No	7	**71**
WATA	York County - Southeast - Demonstration Route (WA3RS)	$1,564,817	<449 daily VMT	5	108,600/ 338 service days/ year= 321	10	2.19	15	VOC = < 11.7 lbs./day; Nox = < 8.1 lbs./day	15	Pop = 75,590 Employment = 47,622: Factor of 1.59	20	Community support: Yes detailed design and $ est: Yes, and all approvals: No	7	**72**
WATA	Transit Bus Pull-Outs (WA4RS)	$345,300	< 30 daily VMT	3	N/A	0	N/A	0	N/A	0	N/A	0	Community support: Yes detailed design and $ est: Yes, and all approvals: No	7	**10**
WATA	WATA Transfer Station (HUB) (WA5RS)	$2,500,000	< 12,339 daily VMT	10	479,662/ 338 service days/year= 1,419	17	$166,667/ 479,662= 0.35	20	Nox = < 4.95 lbs./day: VOC = < 1.49 lbs./day	5	Pop = 95,000 Employment = N/A	0	Community support: Yes detailed design and $ est: No, and all approvals: No	3	**55**

Table 7: Transit & Fixed Guideway- Vehicle Replacement/Purchase

Applicant	Project Name (code)	Total Cost	Average age of vehicles (FTA standard is 12 years)	(0-35)	Number of vehicles to replace/ total fleet	(0-10)	Emissions changes of the old and new vehicles	(0-30)	Cost Effective-ness (Cost/ Ridership)	(0-10)	Average mileage of the vehicles to be replaced (FTA Standards)	(0-15)	Total (0-100)
HRT	Bus Vehicle Replacement (HT6RS)	$78,603,532	9.4 years	35	302	10	Nox New = .20 g/bhp-hr Nox Old + 1.18-4.0 g/bhp-hr change = -.98-3.8 g/bhp-hr	30	N/A	0	600,000	15	**90**
WATA	Four(4) Bus Purchase Expansion (WA1RS)	$1,793,772	N/A	0	23	5	Nox New = .12 g/bhp-hr Nox Old + 1.18-4.0 g/bhp-hr change = -1.06-3.88g/bhp-hr	30	N/A	0	81,000	10	**45**

Table 8: Other Transit, Other Fixed Guideway and Transit ITS Projects

Applicant	Project Name (code)	Total Cost	Will the project increase service reliability?	(0-25)	Will the project improve passenger safety, comfort, and convenience?	(0-30)	Does the project improve efficiency of the transit system?	(0-10)	Does the project improve the revenue collection?	(0-25)	Does the project improve transit data collection system?	(0-10)	Total (0-100)
HRT	Farebox Upgrades - Incorporation of Alternative Fare Media Technology (HT4RS)	$2,579,500	Yes: (upgraded components allow for faster boarding	12.5	Yes: (convenience)	10	Yes	10	Yes	20	Yes	10	**62.5**
HRT	Ticket Vending Machine (TVM) II Replacement (HT5RS)	$819,100	Yes: (upgraded components allow for faster boarding	12.5	Yes: (convenience)	10	Yes	10	Yes	12.5	Yes	10	**55**

Table 9: Alternatives Analysis and Feasibility Studies

Applicant	Project Name (code)	Total Cost	1. Is the study necessary to address a major issue or to revise the Plan?	(0-25)	2. Is the study necessary to address a safety issue?	(0-15)	3. Is the study concerned with encourag-ing multi-modal transport-ation?	(0-10)	4. Does the study address the mobility or access-ibility needs of the region?	(0-20)	5. Is the study well defined in terms of purpose, design concept and scope?	(0-10)	6. Do the goals and objectives of the study show support for economic develop-ment?	(0-10)	7. Do the goals and objectives demonstrate preservation or protec-tion of the environ-ment?	(0-10)	Total (0-100)
Chesapeake	Study of light rail extension to Chesapeake (CH1RS)	$2,000,000	Yes	25	Yes	0	Yes	10	Yes	20	Yes	8	Yes	10	Yes	5	**78**
Chesapeake	Mt. Pleasant Road/Great Bridge By-Pass Interchange Modification Study (CH4RS)	$200,000	Yes	25	Yes	10	No	0	Yes	10	Yes	8	No	0	No	0	**53**
HRT	Naval Station Norfolk Transit Extension Study FEIS/PE (HT1RS)	$12,000,000	Yes	25	Yes	0	Yes	10	Yes	20	Yes	10	Yes	10	Yes	5	**80**
HRT	Planning and Engineering of Fixed Guideway Transit System in Hampton and Newport News (HT3RS)	$10,000,000	Yes	25	Yes	0	Yes	10	Yes	20	Yes	3	Yes	5	Yes	5	**68**
VPA	Port of Virginia - Norfolk International Terminals Master Plan (VP1RS)	$150,000	Yes	25	Yes	0	Yes	10	Yes	20	Yes	7	Yes	10	Yes	5	**77**

Table 11: Intelligent Transportation Systems Projects

Applicant	Project Name (code)	Total Cost	1. Will project improve flow during peak periods and special events?	(0-15)	2. Will project directly reduce number or severity of roadway accidents?	(0-25)	3. Will project improve LOS, increase capacity, or contribute to incident management?	(0-20)	4. Does the project address the mobility or accessibility needs of the region?	(0-10)	5. Does project improve linkage between operating agencies to provide traffic info to motorists?	(0-20)	6. Is this project consistent with the HRTPO Long-Range Transportation Plan?	(0-10)	Total (0-100)
Norfolk	Norfolk Systemwide Signal Controller and System Upgrade (NF6RS)	$3,000,000	Yes	15	Yes	13	Improve LOS-Yes; Inc. Cap.-Yes: Incident Mgmt.-Yes	13	Yes	10	No	0	Yes	10	**61**
Suffolk	Suffolk TOC (SF1RS)	$2,750,000	Yes	15	Yes	13	Improve LOS-Yes; Inc. Cap.-Yes: Incident Mgmt.-Yes	17	Yes	10	Yes	10	Yes	10	**75**
Virginia Beach	Travel Time Display on Dynamic Message Sign (DMS) (VB3RS)	$197,500	Yes	10	No	0	Improve LOS-Yes; Inc. Cap.-No: Incident Mgmt.-Yes	10	No	0	Yes	20	Yes	10	**50**

APPENDIX C

Public Project Ideas

To be considered for Congestion Mitigation and Air Quality (CMAQ) or Regional Surface Transportation Program (RSTP) funding, a proposed project must be included in the current HRTPO Long-Range Transportation Plan (LRTP). Please fill out one form for each project idea you are submitting. When you have completed the form, save it with a file name that includes your last name and a project name (example: Jones-Main St Bikeway.doc). Send an email message, with your project idea form(s) attached, to Michael S. Kimbrel, Principal Transportation Engineer, at mkimbrel@hrtpo.org. As an alternative, you may send your project idea form(s) to:

Michael S. Kimbrel
Principal Transportation Engineer
Hampton Roads Transportation Planning Organization
723 Woodlake Drive
Chesapeake, VA 23320

All project ideas submitted by the public will be acknowledged and forwarded to the appropriate locality, transit agency or state agency. The project ideas will be considered by those entities for possible submission as projects proposed for CMAQ or RSTP funding.

The deadline for submitting your project ideas is July 31, 2014.

CMAQ/RSTP Project Idea Form

Your Name: Andrew B. Scott, P.E. **Date:** 1/29/15

E-Mail: greatscottfamily@yahoo.com **Phone:** 757-681-4580

Project Name: Public Electric Vehicle Charging Station

Project Location (include city or county in which the project is located, street name, end points):
Virginia Department of Transportation 1700 N. Main Street, Suffolk, VA 23434

Project Description (include type of project; if CMAQ project, how will it improve air quality?):
Install a level 1 or 2 public electric vehicle charging station on State or City property to provide improved air quality by promoting the use of electric vehicles.

Additional Information (If applicable, include additional data or maps as attachments.):
I have purchased an electric vehicle and commute from Chesapeake to work in Suffolk daily. A public charging station would improve air quality by greatly increasing the daily use of the electric vehicle. A level 1 charging station can be as simple as providing an ordinary 110 volt outlet adjacent to a designated parking space; a level 2 charging station uses 220 volts. Installing a public charging station would advance our sustainability goals and improve our public image. The great majority of public charging stations do not charge a fee, but charging stations can be monetized.

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Chesapeake, VA 23320

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The deadline for submitting your project ideas is July 31, 2015.

CMAQ/RSTP Project Idea Form

Your Name: Jonathan Nye **Date:** 6/29/2015

E-Mail: jonathan@thenyefactory.com **Phone:**

Project Name: Granby Street North/South Mobility Connector

Project Location (include city or county in which the project is located, street name, end points):
Norfolk VA, Granby Street (Downtown-Waterside to Ocean View Ave)

Project Description (include type of project; if CMAQ project, how will it improve air quality?):
CMAQ, Use right most lane as a Commuter, Bus, Bike and right turn lane only. Will require a downtown bridge over Brambelton Ave Using Federal land (Ask Bryan Pennington) and V-Dot trail section north of Wards Corner under i564 (Ask Paul Forhand).

Additional Information (If applicable, include additional data or maps as attachments.):
Image Link: http://tinyurl.com/bike-bus-lane

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723 Woodlake Drive
Chesapeake, VA 23320

All project ideas submitted by the public will be acknowledged and forwarded to the appropriate locality, transit agency or state agency. The project ideas will be considered by those entities for possible submission as projects proposed for CMAQ or RSTP funding.

The deadline for submitting your project ideas is July 31, 2015.

CMAQ/RSTP Project Idea Form

Your Name: Robert Brown **Date:** 7/14/15

E-Mail: bobatp3e@hotmail.com **Phone:** 757 642 4939

Project Name: Western Connector

Project Location (include city or county in which the project is located, street name, end points):
From Route's 13, 58 and 460 at Wilroy Road, Suffolk to Pughsville Interchange at I-664.

Project Description (include type of project; if CMAQ project, how will it improve air quality?):
Limited access Six Lane Highway. Location will reduce a trip from Craney Island Port Area, West to Route 13, 58 and 460 by 5 miles. This will save millions of gallons of fuel, expedite shipping and reduce congestion on Interstate 664. 95% of this proposed route is undeveloped and should be immediately Zoned for this Project. One side of this route parallels Commonwealth Railroad which makes it excellent for a Limited Access Highway.

Additional Information (If applicable, include additional data or maps as attachments.
Included- Location Maps, satellite maps of each end of project and view in relation to NOB Norfolk.

To be considered for Congestion Mitigation and Air Quality (CMAQ) or Regional Surface Transportation Program (RSTP) funding, a proposed project must be included in the current HRTPO Long-Range Transportation Plan (LRTP). Please fill out one form for each project idea you are submitting. When you have completed the form, save it with a file name that includes your last name and a project name (example: Jones-Main St Bikeway.doc). Send an email message, with your project idea form(s) attached, to Michael S. Kimbrel, Principal Transportation Engineer, at mkimbrel@hrtpo.org. As an alternative, you may send your project idea form(s) to:

Michael S. Kimbrel
Principal Transportation Engineer
Hampton Roads Transportation Planning Organization
723 Woodlake Drive
Chesapeake, VA 23320

All project ideas submitted by the public will be acknowledged and forwarded to the appropriate locality, transit agency or state agency. The project ideas will be considered by those entities for possible submission as projects proposed for CMAQ or RSTP funding.

The deadline for submitting your project ideas is July 31, 2015.

CMAQ/RSTP Project Idea Form

Your Name: Robert Brown **Date:** 7/14/15

E-Mail: bobatp3e@hotmail.com **Phone:** 757 642 4939

Project Name: General Taylor Freeway – Segment "3" of Third Crossing

Project Location (include city or county in which the project is located, street name, end points):
From Interstate 564 in Norfolk to Route 164 Western Freeway in Portsmouth. Also realignment of Segment "1" of Third Crossing.

Project Description (include type of project; if CMAQ project, how will it improve air quality?):
General Taylor Freeway will create a complete access West from NOB Norfolk to Routes 13, 58 and 460. The realignment of Segment "1" Third Crossing will eliminate more than half of Bridge Construction over Hampton Roads Harbor and leave the North end of Craney Island Open for Future Port Development. It is completely inconsistent with reality to move traffic West over Bridges in Hampton Roads Harbor when General Taylor Freeway is a Safer and Shorter Route.

Additional Information (If applicable, include additional data or maps as attachments.):
Maps and Roadway Relocation Included.

To be considered for Congestion Mitigation and Air Quality (CMAQ) or Regional Surface Transportation Program (RSTP) funding, a proposed project must be included in the current HRTPO Long-Range Transportation Plan (LRTP). Please fill out one form for each project idea you are submitting. When you have completed the form, save it with a file name that includes your last name and a project name (example: Jones-Main St Bikeway.doc). Send an email message, with your project idea form(s) attached, to Michael S. Kimbrel, Principal Transportation Engineer, at mkimbrel@hrtpo.org. As an alternative, you may send your project idea form(s) to:

Michael S. Kimbrel
Principal Transportation Engineer
Hampton Roads Transportation Planning Organization
723 Woodlake Drive
Chesapeake, VA 23320

All project ideas submitted by the public will be acknowledged and forwarded to the appropriate locality, transit agency or state agency. The project ideas will be considered by those entities for possible submission as projects proposed for CMAQ or RSTP funding.

The deadline for submitting your project ideas is July 31, 2015.

CMAQ/RSTP Project Idea Form

Robert Brown **Date:** 7/13/15

E-Mail: bobatp3e@hotmail.com **Phone:** 757 642 4939

Project Name: Hampton Roads Flood Barrier Causeway

Project Location (include city or county in which the project is located, street name, end points):
Interstate 64 at 4th View ST. in Norfolk to Interstate 64 at Woodland Rd. Hampton, Va.

Project Description (include type of project; if CMAQ project, how will it improve air quality?):
Totally relieve congestion at HRBT (extreme carbon reduction) Provide Flood Protection For Hampton Roads Harbor. No other Transportation Project has a Cost to Value close this Project !!!

Additional Information (If applicable, include additional data or maps as attachments.):
Location Maps, media information and engineering of existing project in St.Petersburg, Russia included.