

Board of Supervisors

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Cindy C. Shelton

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County Administrator

Infrastructure Committee Meeting AGENDA

November 7, 2018 - 1:30 pm - (Board Chambers)

Committee Members: Chairman Mark Dudenhefer, Meg Bohmke and Jack Cavalier

Agenda Item	
1.	VDOT Presentation on a Speed Study on Kings Highway and Warrenton Rd
2.	Update on FRED Bus Northern Route to Quantico and proposed Quantico Agreement
3.	Consider an engineering study to determine what actions can be taken to alleviate water from overtopping Brooke Road
4.	Discuss Options and Potential Costs for Pedestrian Access under I-95
5.	Discuss Stormwater
6.	HSIP Leeland Project and discussion of Right of Way acquisition costs
	Next IC meeting is scheduled for February 5, 2019

InfraAgenda/11.7.2018





60 MPH SPEED LIMIT ENGINEERING STUDY

Route 3 Kings Highway – Stafford County

Route 17 Warrenton Road – Stafford County

 Lynne Keenan
Residency Administrator

November 7, 2018

Why Perform An Engineering Study?

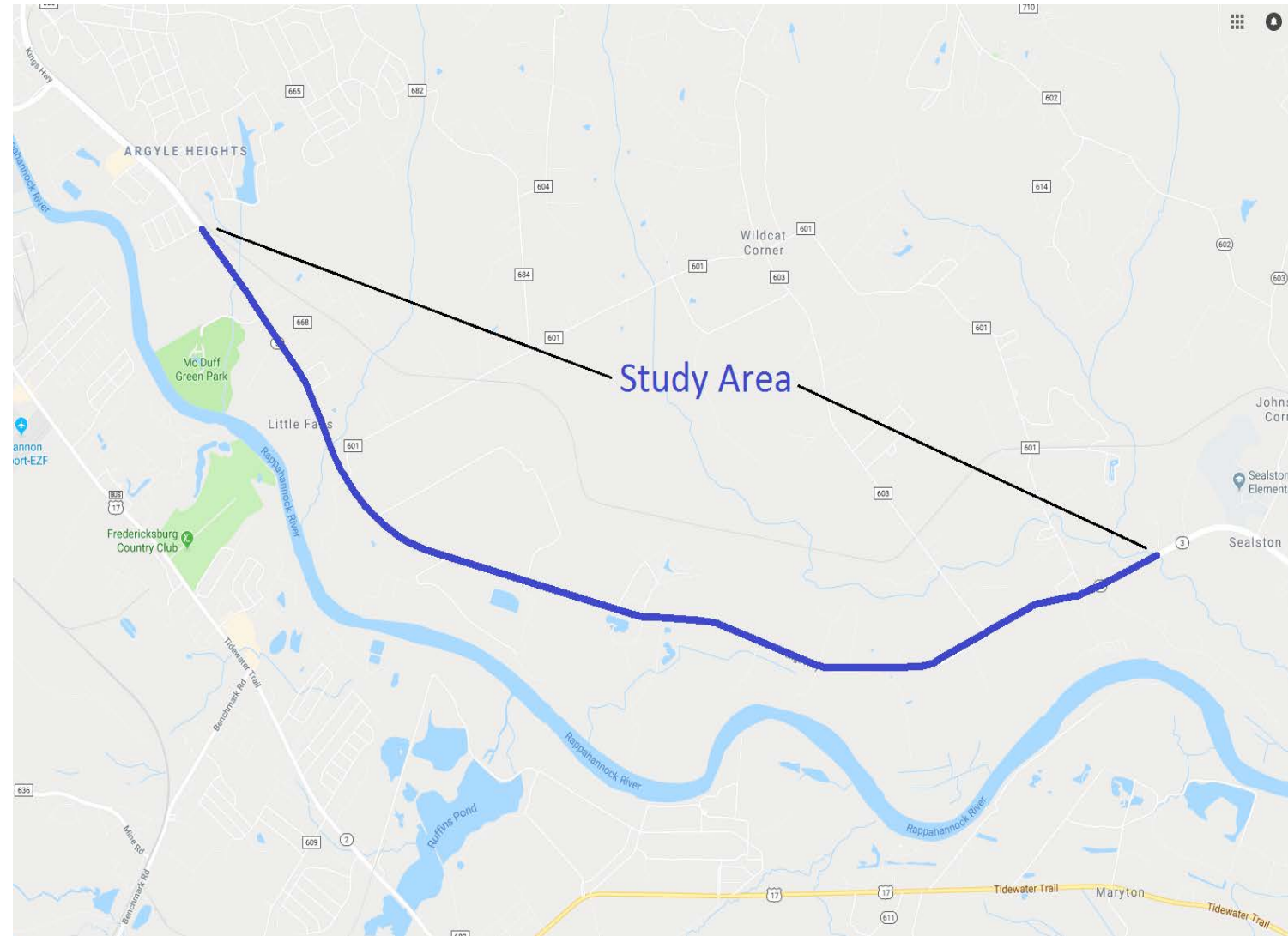
Code of Virginia § 46.2-870

- Sets the maximum general speed limit on highways
- Requires speed limits be determined by a traffic engineering study and analysis of available and appropriate accident and law enforcement data
- Amended in 2018 by General Assembly
- Expanded the routes eligible for 60 MPH speed limit
 - Non limited access, multilane, divided highways
 - US 17
 - US 301
 - US 360
 - State Route 3
 - State Route 207

Study Area #1 – Route 3

From: Route 744 Rumford Road
To: Stafford/King George
County line
Length: 5.73 miles

**Average Annual Daily Traffic =
21,000 vehicles**



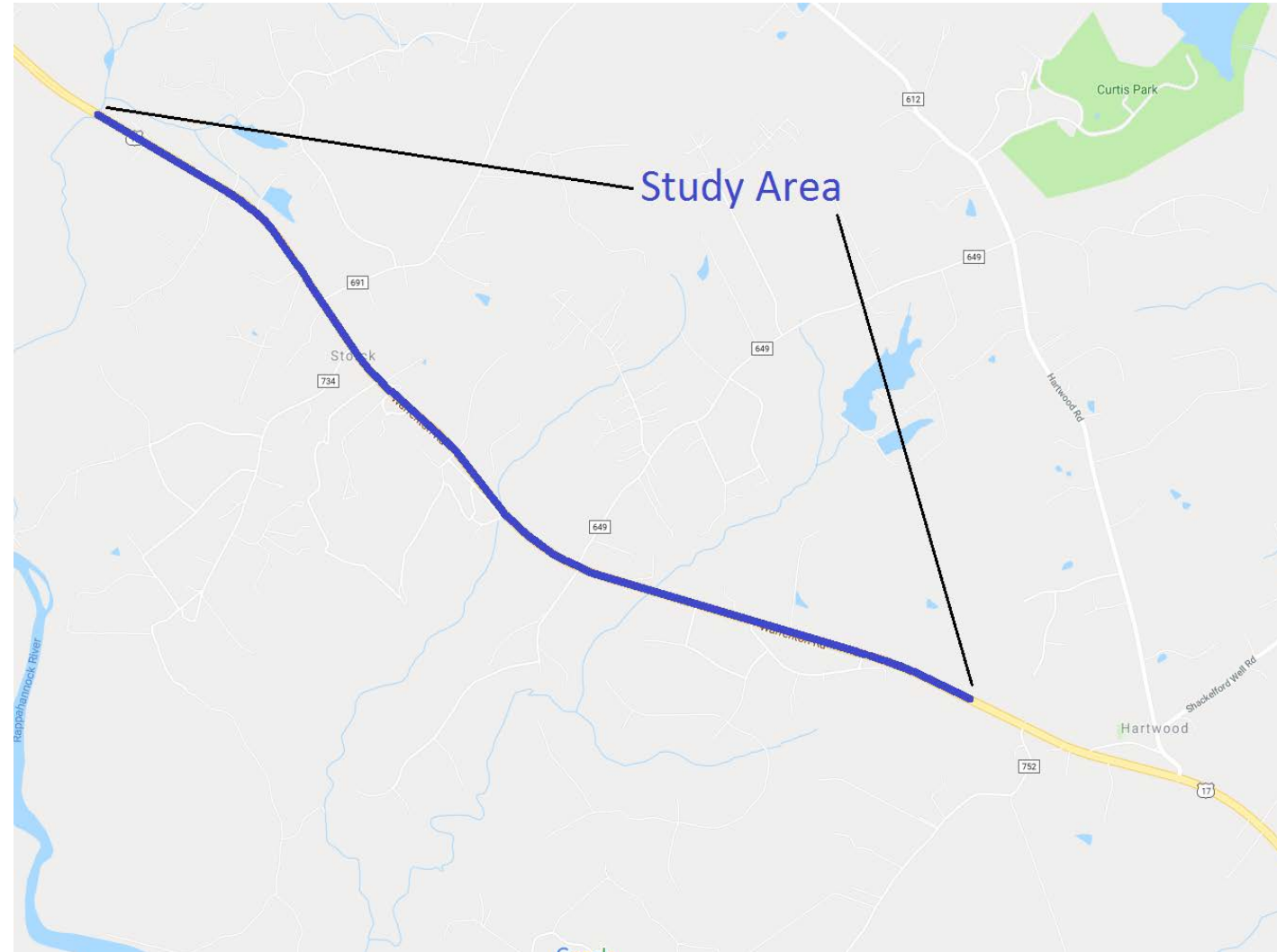
Study Area #2 – Route 17

From: 0.5 mile north of Route 705
Hartwood Church Road

To: Fauquier County line

Length: 3.74 miles

**Average Annual Daily Traffic =
21,000 vehicles**



Study Components

- **Speed data**
 - Based on speed samples
- **Road characteristics**
 - Physical roadway and traffic control devices
- **Roadside development and environment**
 - Development types and roadside environment
- **Parking practices and pedestrian activity**
 - Parking allowed/restricted, sidewalks/bike paths
- **Reported crash experience for most recent three year period**
 - Compared to statewide and district averages, types of crashes
- **Enforcement consensus**
 - State Police and Sheriff's Office support

Study Results Area #1 – Route 3

- **Speed data**
 - Majority of traffic already exceeding 60 MPH
- **Road characteristics**
 - 4 lane divided with gravel and grass shoulders with proper signs and pavement markings
 - 15 crossovers, 6 intersections, no signalized intersections, no sight distance issues
- **Roadside development and environment**
 - Mainly farmland, occasional residence and commercial business
- **Parking practices and pedestrian activity**
 - Parking not prohibited, but none observed, no ped/bike accommodations, no activity observed
- **Reported crash experience for most recent three year period**
 - Crash rate < statewide and district averages, variety of crash types
- **Enforcement consensus**
 - State Police support increased speed limit
 - Sheriff's Office had concerns between Routes 744 & 601

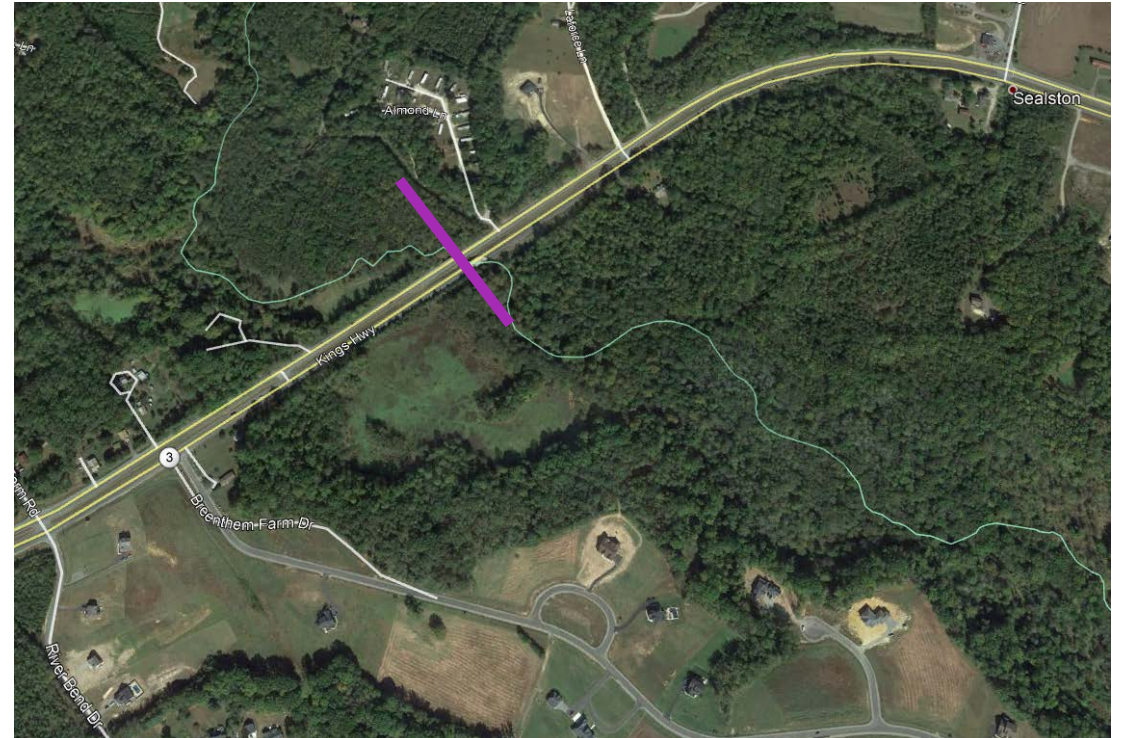
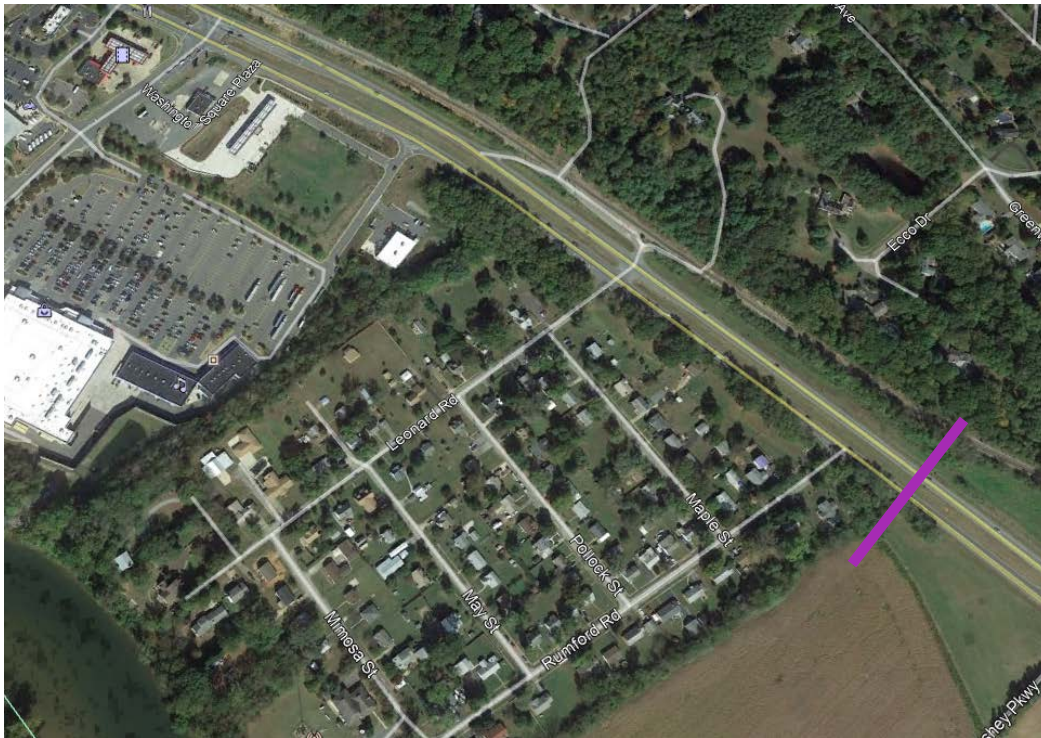
Study Results Area #2 – Route 17

- **Speed data**
 - Majority of traffic already exceeding 60 MPH
- **Road characteristics**
 - 4 lane divided with gravel and grass shoulders with proper signs and pavement markings
 - 10 crossovers, 7 intersections, no signalized intersections, no sight distance issues
- **Roadside development and environment**
 - Mainly wooded and farmland, occasional residence and commercial business
- **Parking practices and pedestrian activity**
 - Parking not prohibited, but none observed, no ped/bike accommodations, no activity observed
- **Reported crash experience for most recent three year period**
 - Crash rate < statewide and district averages, variety of crash types
- **Enforcement consensus**
 - State Police and Sheriff's Office support increased speed limit

Recommendations for Area #1 – Route 3

VDOT recommends posting the speed limit at 60 MPH

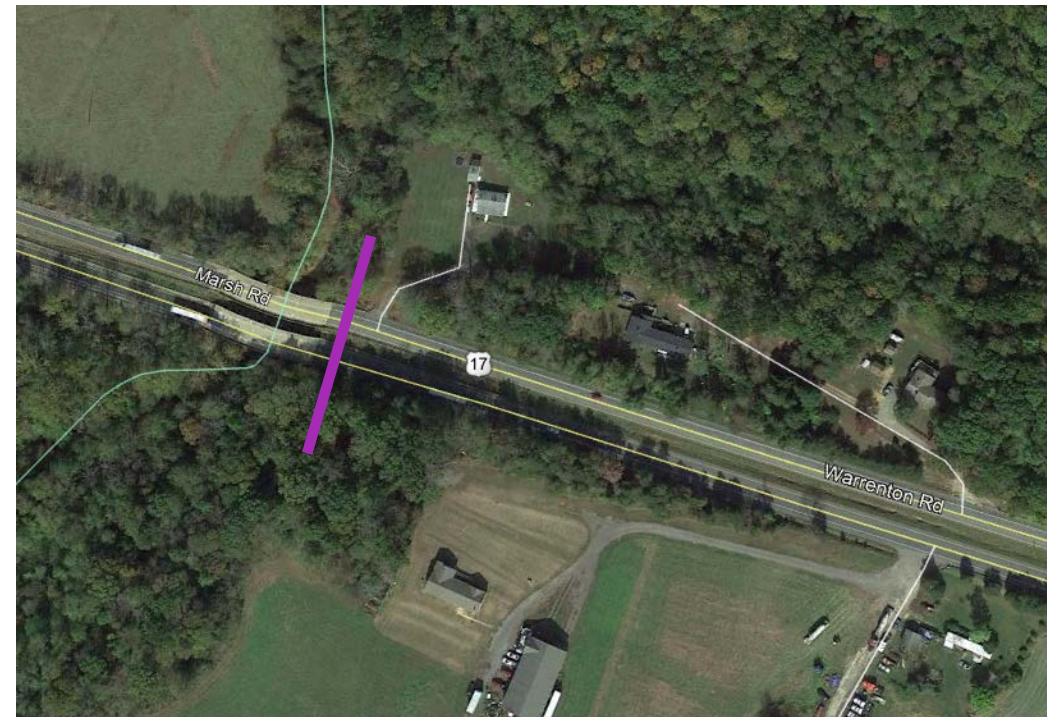
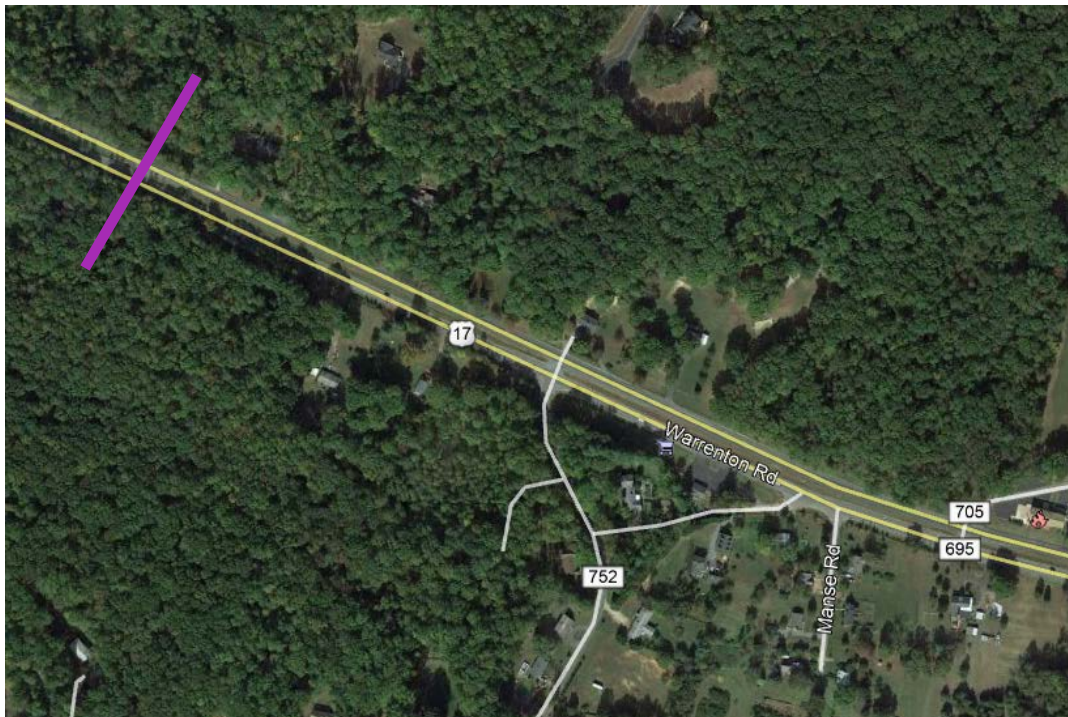
- From just east of Rumford Road where the current 45 MPH ends
- To Stafford/King George County line



Recommendations for Area #2 – Route 17

VDOT recommends posting the speed limit at 60 MPH

- From 0.5 mile north of Hartwood Church Road
- To Fauquier County line



County Support

VDOT would like a letter or resolution of support for these increases in speed limit from Stafford County

VDOT Speed Limit Study
Fredericksburg District Traffic Engineering
Date 8/13/2018

Study area:

Route #: 3
Street name: Kings Hwy.
Jurisdiction: Stafford County
From: Route 744
To: Stafford/King George County line
Length: 5.73 miles

VDOT - Traffic Engineering Fredericksburg, Virginia Assistant District Traffic Engineer

Functional Class/Volume: Urban Other Principle with 21,432 AADT in 2017.

Speed limit for study roadway: The studied section is statutory 55 mph, posted. The segment to the west is posted 45 mph and on the segment to the east, the speed limit is 55 mph beginning at the King George county line.

Origin and nature of request: Recent legislative action to increase the speed limit to 60 mph on routes that are non-limited access, multilane, divided highways.

Study results and recommendations: It is the recommendation of this report to post this section of Route 3 60 mph. This recommendation is based on the following factor(s):

- 85th percentile speeds
- Low crash and injury rates compared to District and State averages
- Test runs

Study details:

A. Speed Data:

Date, location of speed samples: August 6, 2018, approximately 2 miles east of Route 744.

85th percentile speed: 62 mph

Median speed: 59 mph

Mean speed: 59 mph

Pace speed: 54-63 mph

Date, location of speed samples: August 6, 2018, approximately 4.2 miles east of Route 744.

85th percentile speed: 64 mph

Median speed: 60 mph

Mean speed: 60 mph

Pace speed: 56-65 mph

B. Road characteristics:

Physical roadway: This segment is a four-lane, two-way, divided asphalt surface roadway. Overall pavement width is 24 feet with paved, gravel and grass shoulders that range between three and 10 feet. The terrain is rolling with no significant changes in horizontal or vertical alignment.

Traffic Control Devices: Speed limit signs, one set of 45 mph curve warning signs, raised pavement markers and guardrail. Pavement markings consist of edge lines, lane lines and turn lane designations.

C. Roadside development and environment:

This area is mainly farmland, with occasional residential and commercial entrances. There are six intersections with state roads and 15 crossovers. Medians are grass and range between 34 and 40 feet. There are no signalized intersections and no sight distance issues along this section of Route 3.

D. Parking practices and pedestrian activity:

Parking is not prohibited on the shoulders, but none was observed. There are no bike paths or sidewalks and there was no pedestrian activity observed.

E. Reported crash experience for most recent three-year period:

Crash records obtained through RNS are for the period 1-1-2015 thru 12-31-2017.

Note: Only crashes involving an injury or fatality or property damage exceeding \$1,500 are reportable and available through the Department of Motor Vehicles (DMV). Also, due to the time required for DMV to process and code reported crashes, data for the previous six (6) months may not be available.

According to our records, the total number of reported **crashes** for this section of highway is: 55

And, the total number of reported **injuries** for this section of highway is: 16

And, the total number of reported **fatalities** for this section of highway is: 1

The **crash** rate for this section of highway is: 41

The **injury** rate for this section of highway is: 20

The **fatality** rate for this section of highway is: 0.75

The statewide average for primary highways:

Crash rate: 126 per 100 million VMT.

Injury rate: 67 per 100 million VMT.

Fatality rate: 1.11 per 100 million VMT.

The district average for primary highways:

Crash rate: 129 per 100 million VMT.

Injury rate: 67 per 100 million VMT.

Fatality rate: 1.37 per 100 million VMT.

Discussion of crash experience and relevant information: There were 17 crashes in 2015: two rear-end, one angle, one head on, five sideswipe-same direction, one sideswipe-opposite direction, four fixed object-off road and three deer crashes, resulting in one severe injury and three minor injuries and \$128,000 in property damage. There were 22 crashes in 2016: four rear end, one head on, one sideswipe-same direction, one sideswipe-opposite direction, two non-collisions, 10 fixed object-off road, two deer, and one other crash, resulting in one fatality (a motorcycle eluding police was travelling in the wrong direction and struck a vehicle head on, the motorcyclist died at the scene), one severe injury, five minor injuries, four no apparent injuries and \$142,700 in property damage. There were 16 crashes in 2017: one rear end one angle, one non-collision, eight fixed object-off road, three deer and two other crashes, resulting in two minor injuries and two no apparent injuries and \$132,300 in property damage.

F. Enforcement Consensus:

This recommended change in speed limit has been discussed with First Sergeant Keith Hairston of the Virginia State Police and First Sergeant Craig Cain of the Stafford County Sheriff's Office. The local law enforcement officer had concerns with the recommendation (see below).

The State police Officer:

X Concur

Opposes

If any officer opposes, please explain: First Sergeant Cain of the Stafford Sheriff's office had concerns about crashes between Route 744 and Route 601. The First Sergeant said he would stop by the office to discuss his concerns with Mr. Farhangi, but has not done so. The area the First Sergeant was referring to had no higher number of crashes than the entire study length.

G. Additional comments:

Study Area Map**Route #:** 3**Street name:** Kings Hwy.**Jurisdiction:** Stafford County**From:** Route 744**To:** Stafford/King George County line**Length:** 5.73 miles

NOTE: map is provided for illustrative purposes and may not accurately depict the most recent roadway conditions.



VDOT Speed Limit Study
Fredericksburg District Traffic Engineering
Date 9/19/2018

Study area:

Route #: 17
Street name: Warrenton Road
Jurisdiction: Stafford County
From: 0.5 mile north of Route 705
To: Fauquier County Line
Length: 3.74 miles

VDOT - Traffic Engineering Fredericksburg, Virginia Assistant District Traffic Engineer

Functional Class/Volume: Rural Other Principle Arterial with 20652 AADT in 2017.

Speed limit for study roadway: The studied section is posted 55 mph.

Origin and nature of request: The result of recent legislative action to increase the speed limit to 60 mph on routes that are non-limited access, multilane, divided highways.

Study results and recommendations: It is the recommendation of this report to post this section of Route 17 60 mph. This recommendation is based on the following factor(s):

- 85th percentile speeds
- Low crash and injury rates
- Rural roadside nature
- Test runs

Study details:

A. Speed Data:

Date, location of speed samples: August 27, 2018, at Route 649
85th percentile speed: 64 mph
Median speed: 58 mph
Mean speed: 57 mph
Pace speed: 53-62 mph

B. Road characteristics:

Physical roadway: This segment of Route 17 is a four-lane, divided asphalt surface roadway. Overall pavement width is 22 feet with shoulders ranging between two and seven feet. Both are in fair condition. Grass medians average 30'. There are right and left turn lanes and 10 crossovers. The terrain is rolling and there are no significant changes in the horizontal alignment.

Traffic Control Devices: There are speed limit signs and intersection warning signs. All crossover signage in this area is scheduled to be upgraded. There are edge line and lane lines, turn lane designations and raised pavement markers. There are several sections of guardrail.

C. Roadside development and environment:

This area is mainly wooded and farmland with occasional residential and commercial entrances. There are seven intersections with state maintained roads. There are no signalized intersections in this studied section of Route 17.

D. Parking practices and pedestrian activity:

Parking was not prohibited on the shoulders, but none was observed. There are no bike paths or sidewalks and there was no pedestrian activity observed.

E. Reported crash experience for most recent three-year period:

Crash records obtained through RNS are for the period 1-1-2015 thru 12-31-2017.

Note: Only crashes involving an injury or fatality or property damage exceeding \$1,500 are reportable and available through the Department of Motor Vehicles (DMV). Also, due to the time required for DMV to process and code reported crashes, data for the previous six (6) months may not be available.

According to our records, the total number of reported **crashes** for this section of highway is: 31.

And, the total number of reported **injuries** for this section of highway is: 19

And, the total number of reported **fatalities** for this section of highway is: 3

The **crash** rate for this section of highway is: 39

The **injury** rate for this section of highway is: 24

The **fatality** rate for this section of highway is: 3.77

The statewide average for primary highways:

Crash rate: 126 per 100 million VMT.

Injury rate: 67 per 100 million VMT.

Fatality rate: 1.11 per 100 million VMT.

The district average for primary highways:

Crash rate: 129 per 100 million VMT.

Injury rate: 67 per 100 million VMT.

Fatality rate: 1.37 per 100 million VMT.

Discussion of crash experience and relevant information: In 2015 there were four rear-end crashes, one angle, five fixed object-off road crashes and one deer crash. There were two fatalities in 2015: #1, vehicle ran off the road, overcorrected and crossed the median, hitting a tractor trailer; #2, pavement was wet, driver lost control, struck a post and a tree. In 2016 there were four rear-end crashes, one angle, five fixed object-off road crashes and one deer crash. In

2017 there was one rear-end crash , two angle crashes, one hear-on, one sideswipe-same direction, one fixed object-in road, two deer and one “other” crash. There was one fatality in 2017: This cash occurred at night time and the pavement was wet. The vehicle was traveling southbound in the northbound direction and struck a vehicle head on. It could not be determined, in our investigation, where the vehicle entered the northbound lanes of Route 17.

F. Enforcement Consensus:

This recommended change in speed limit has been discussed with Keith Hairston of the Virginia State Police and Craig Cain of the Stafford County Sheriff’s Office. The local law enforcement officer concurs with the recommendation.

The State police Officer:

X Concurs
Opposes

If any officer opposes, please explain:

G. Additional comments:

Study Area Map

Route #: 17

Street name: Warrenton Road

Jurisdiction: Stafford County

From: 0.5 mile north of Route 705

To: Fauquier County Line

Length: 3.74 miles

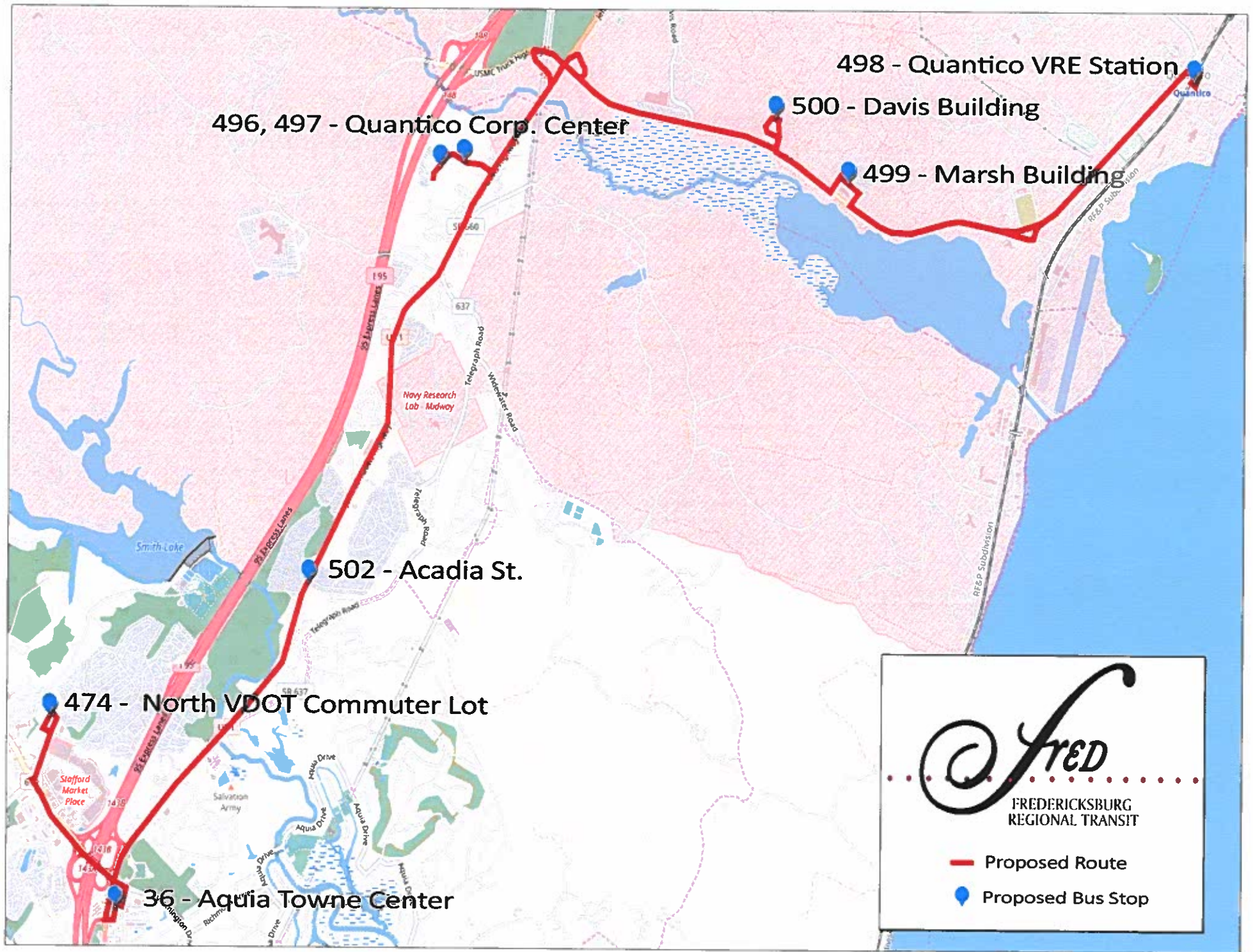
NOTE: map is provided for illustrative purposes and may not accurately depict the most recent roadway conditions.



New FRED Bus Route to Quantico VRE Station and Proposed Joint Service Agreement

November 7, 2018

- Staff was requested to investigate the prospect of establishing a new bus route along Route 1 north of Garrisonville Road in the fall of 2017.
- The proposed bus route would extend from the Staffordboro Commuter Parking Lot to Quantico Corporate Center to the Quantico VRE station, with a few stops in between along Route 1 (see attached proposed route map).
- The proposed route would serve both commuter and local users connecting them with the Quantico VRE station as well as PRTC's OmniLink service stop at that VRE station.
- With the current FY2019 funding provided for this new route, FRED transit is able to provide two roundtrips of service in the morning and two roundtrips of service in the evening (see attached proposed bus service schedule).
- The proposed service schedule is planned to get riders to the VRE 302 train (5:40 AM departure) and the VRE 312 train (7:41 AM departure) in the morning, and pick up riders from the VRE 303 train (4:15 PM arrival) and the VRE 311 train (6:20 PM arrival).
- In late August, the Commander of Marine Corps Base Quantico granted FRED transit, per memorandum of agreement (please see attached), to enter the base through the Russell Road gate and make various stops on base at major employment buildings, i.e. Marsh Center and Davis Building.
- The Base has requested all passengers have valid photo identification (ID) issued by a state, federal, or foreign government to enter the base as well as ridership data during a six month "test" period.
- Staff is recommending this item go to the full Board to authorize the County Administrator to sign the memorandum of agreement between Marine Corps Base Quantico and FREDericksburg Regional Transit.



VRE - North Stafford to Quantico VRE FEEDER BUS SERVICE
Effective: TBD

AM VRE SERVICE			
Stop #	Location	Train - 302	Train - 312
36	Aquia Towne Center	4:45 AM	6:35 AM
474	North Commuter Lot	4:53 AM	6:43 AM
502	Acadia St.	5:03 AM	6:53 AM
496	Quantico Corp. Center	5:11 AM	7:01 AM
497	Quantico Corp. Center	5:13 AM	7:02 AM
498	VRE Station	5:25 AM	7:15 AM
	Bus Departure	5:35 AM	7:25 AM
	VRE Train Arrival	5:40 AM	7:41 AM
499	Marsh Building	5:45 AM	7:35 AM
500	Davis Building	5:49 AM	7:39 AM
496	Quantico Corp. Center	5:57 AM	7:47 AM
497	Quantico Corp. Center	5:59 AM	7:49 AM
502	Acadia St.	6:07 AM	7:57 AM
474	North Commuter Lot	6:17 AM	8:07 AM
36	Aquia Towne Center	6:25 AM	8:15 AM

PM VRE SERVICE			
Stop #	Location	Train - 303	Train - 311
36	Aquia Towne Center		5:15 PM
474	North Commuter Lot		5:23 PM
502	Acadia St.		5:33 PM
496	Quantico Corp. Center		5:41 PM
497	Quantico Corp. Center		5:43 PM
498	VRE Station	4:05 PM	5:55 PM
	Bus Departure	4:25 PM	6:30 PM
	VRE Train Arrival	4:15 PM	6:20 PM
499	Marsh Building	4:35 PM	6:40 PM
500	Davis Building	4:39 PM	6:44 PM
496	Quantico Corp. Center	4:47 PM	6:52 PM
497	Quantico Corp. Center	4:49 PM	6:54 PM
502	Acadia St.	4:57 PM	7:02 PM
474	North Commuter Lot	5:07 PM	7:12 PM
36	Aquia Towne Center	5:15 PM	7:20 PM

BOLD TEXT INDICATES A TIME POINT.

Routes Operate Monday-Friday, except Holidays

Trains Serviced: 302 (5:40am), 312 (7:41am), 303 (4:15pm), 311 (6:20pm)

Note: Traffic, weather and other causes may delay times or cancellations.



UNITED STATES MARINE CORPS
MARINE CORPS INSTALLATIONS NATIONAL CAPITAL REGION
MARINE CORPS BASE QUANTICO
3250 CATLIN AVENUE
QUANTICO VIRGINIA 22134 5001

IN REPLY REFER TO:

1420

B 013

MEMORANDUM OF AGREEMENT
BETWEEN
MARINE CORPS INSTALLATIONS NATIONAL CAPITAL REGION
MARINE CORPS BASE QUANTICO, QUANTICO VIRGINIA
AND
TRANSPORTATION DIVISION, STAFFORD COUNTY, VIRGINIA
AND
FREDERICKSBURG REGIONAL TRANSIT, STAFFORD COUNTY,
FREDERICKSBURG, VIRGINIA

Subj: REGIONAL BUS SERVICE PARTNERSHIP

Ref: (a) DoDI 4000.19, Support Agreements, 25 April 2013.
(b) MCBO 5530.1, Access Control Policy, 11 March 2011.
(c) 10 U.S.C. 2679

1. Purpose

a. This is a Memorandum of Agreement (MOA) between Marine Corps Installations National Capital Region Marine Corps Base Quantico (MCINCR-MCBQ), Quantico, Virginia and Transportation Division, Stafford County, Virginia (STAFFORD COUNTY) and Fredericksburg Regional Transit, Stafford County, Fredericksburg, VA (FREDBUS). When referred to collectively, the MCINCR-MCBQ, STAFFORD COUNTY and FREDBUS are referred to as the "Parties".

b. This MOA establishes the working arrangements and responsibilities of the Parties for MCINCR-MCBQ to provide base access for a bus route pilot program for MCINCR-MCBQ employees and commuters who utilize the Quantico VRE Station.

2. Background. Stafford County has received requests for service north of Route 610, with connections to the Potomac and Rappahannock Transportation Commission (PRTC) Routes in Prince William County. The I-95 Transit/TDM Study identified a significant need for service between north Stafford (630 and 610) and Quantico.

3. Authority. This MOA is entered into under the provisions of 10 U.S.C. 2679.

4. Scope. This MOA is limited to MCINCR-MCBQ, STAFFORD COUNTY, FREDBUS, and does not empower either party to act on behalf of the other with regard to any contract or representation as to any other matter.

5. Personnel. Each Party is responsible for all costs of its personnel, including pay and benefits, support, and travel. Each Party is responsible for supervision and management of its personnel.

6. Responsibilities of the Parties.

a. Under the terms of this MOA, Commander, MCINCR-MCBQ agrees to:

1. Allow FREDBUS to access the base utilizing the Russell Road gate with up to 4 buses entering the installation during the morning hours (0500-1200) and up to 4 buses entering during the afternoon hours (1200-1800).

2. Allow FREDBUS to stop and drop off/pick up passengers on base property near the Quantico VRE station, Marsh Center and Davis Building.

3. Provide FREDBUS with procedures to request placing of signs at bus stops aboard the installation.

4. Provide Office of Strategic Communication (COMMSTRAT) information as required and when requested by FREDBUS to include internal coverage within the command, appropriate responses to media inquiry, community relations, and planning on matters of mutual concern. Provide assistance in responding to the public's right to know.

5. Provide timely notification of destructive weather and hazardous conditions weather alerts. COMMSTRAT provides alerts via local news media, social web sites and telephone hotline. Allow FREDBUS access to the Mass Notification System in order to provide FREDBUS with base operating status updates.

6. Allow FREDBUS to register required personnel in DBIDS for installation access control purposes.

b. Under the terms of this MOA, STAFFORD COUNTY AND FREDBUS agrees to:

1. Ensure required personnel are enrolled in DBIDS for installation access control purposes.

2. Observe all traffic laws aboard the installation. Traffic laws (including, but not limited to speeding and driving while intoxicated) and other laws are strictly enforced aboard the Base. The U.S. Magistrate's Court in Alexandria, Virginia, will process offenders without DoD affiliation for all traffic and criminal offenses. Additionally, the U. S. Magistrate's Court will process military or DoD-affiliated persons for serious traffic related offenses (i.e., driving while intoxicated, reckless driving, etc.). Use of cell phones while driving is not permitted without a hands-free device.

3. Share ridership data with the installation pertaining to quantity of riders dropped off/picked up at each location and bus schedules.

4. Request approval for all signage through MCINCR-MCBQ G-F Facilities Operations Officer at (703) 432-1330.

5. Provide a FREDBUS Public Affairs POC to coordinate matters concerning FREDBUS, when required. FREDBUS POC will notify COMMSTRAT Office of serious incidents involving FREDBUS personnel for awareness and coordination, as required. When required, provide subject matter experts to help develop FREDBUS plans, respond to media inquiry, and assist with preparing articles on FREDBUS programs and personnel.

6. Comply with destructive weather and hazardous conditions weather alert status directives provided by MCINCR-MCBQ.

7. Comply with MCINCR-MCBQ directives relating to safety. Comply with all Federal, State, and local regulations pertaining to safety.

7. Other Terms and Conditions.

a. All FREDBUS equipment, passengers and belongings are subject to search, etc.

b. Acceptable identification required to enter a federal facility (REAL ID). All drivers and adult passengers are required to have in their possession a valid photo identification (ID) issued by a state, federal, or foreign government to enter MCB Quantico. Proper photo ID includes but is not limited to an armed forces ID, state driver's license,

U.S. or foreign passport, etc. Personnel without proper photo ID may be denied entry to the Base.

c. FREDBUS will not deviate from approved route unless directed by installation law enforcement.

8. Financial Details. This MOA is to be at "No Cost" to MCINCR-MCBQ and does not authorize or require any expenditure of MCBQ funds.

9. Points of Contact. The following points of contact (POC) will be used by the Parties to communicate in the implementation and administration of this MOA. Each Party may change its POC upon reasonable notice to the other Party.

a. MCINCR-MCBQ POC is John Kiersma, (703) 784-2453, john.kiersma@usmc.mil, Marine Corps Base Installations National Capital Region Marine Corps Base Quantico (B 09), 3250 Catlin Avenue, Quantico, VA 22134-5001.

b. STAFFORD COUNTY TRANSPORTATION DIVISION POC is Joey Hess, (540) 658-4611, jhess@co.stafford.va.us, Public Works Department, 1300 Courthouse Rd, Stafford, VA 22555-0339

c. FREDBUS POC is Rodney J. White, (540) 372-1222 EXT 704, rjwhite@fredericksburgva.gov, FREDericksburg Regional Transit, 1400 Jefferson Davis Highway, Fredericksburg, VA 22401

10. Modifications

a. This MOA may only be modified by the written agreement of the Parties, duly signed by their authorized representatives.

b. Neither STAFFORD COUNTY, FREDBUS nor any MCINCR-MCBQ office below that of the Commander, MCINCR-MCBQ may expand the support, services and/or facilities utilization as stated herein without first receiving written authorization from the Commander, MCINCR-MCBQ or above, and without notifying the Support Agreements Manager.

11. Disputes. Any disputes relating to this MOA will, subject to any applicable Federal laws and regulations, Executive Orders, DoD, Department of the Navy (DON), USMC directives or instructions, be resolved by consultations between the Parties in accordance with Reference (a).

12. Transferability. This MOA is not transferable except with the written consent of the Parties.

13. Entire Agreement. It is expressly understood and agreed that this MOA embodies the entire agreement between the Parties.

14. Review. This MOA will be reviewed triennially on or around the anniversary of its effective date.

15. Termination of MOA. Either party may terminate this MOA upon 30-days written notice to the other party. However, the Commander, MCINCR-MCBQ, has the right to terminate this MOA for any reason deemed necessary. If this MOA should be so terminated, STAFFORD COUNTY and FREDBUS will not have any action or recourse against MCINCR-MCBQ, the USMC, the (DON), the DoD, and all agencies and instrumentalities of these organizations.

16. Effective Date. This MOA enters into effect upon the date of the last signature.

17. Expiration Date. This MOA expires five (5) years from the date of the last signature.

WENDY. L. KIMBALL
Director of Public
Transit
FREDericksburg Regional
Transit

THOMAS C. FOLEY
County Administrator
Stafford County,
Virginia

W. C. BENTLEY III
Colonel, U.S. Marine
Corps
Commander

Flooding - Brooke Road (Route 608) – Initial Reconnaissance Summary

11/07/18

Project Scope – Identification of issues and options to address periodic flooding of road

Subject Area – Approximately 8,000 feet from east of Millwood Road (Route X) to Sentinel Ridge Lane

Issues

- Flooding of road from adjacent Accokeek Creek (Swamp) due to tidal/rainfall events with contributing stormwater from adjacent developed and vacant properties on north side of road.
- Perennial stream east of Crestwood Lane and other perennial and intermittent flows to roadside ditches
- Poorly constructed/maintained roadside ditches on north side of road (full of sediment - undersized/inadequate)
- Limited topographical relief (fall) for road culvert outfalls draining to south (culverts deteriorated and full of sediment – adjacent floodplain same grade as pipes)
- Public Safety concerns and general inconvenience due to lack of alternative routes

Project Status

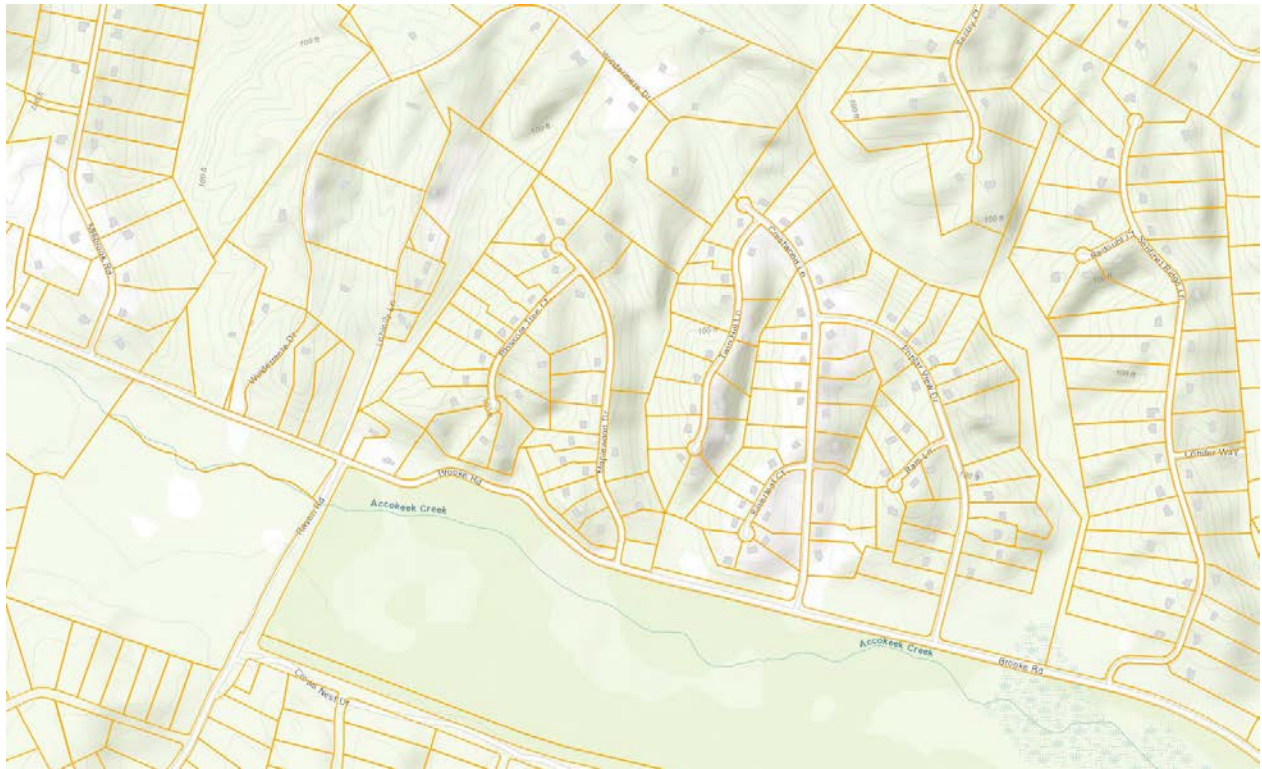
- No current plans to address issues – no current funding plan (e.g. Not in 6 Year Secondary Road Improvement Plan or County CIP)
- Regional Hazard Mitigation Plan notes periodic road closures – no recommendations for improvement

Options

- Hydrologic/Hydraulic Analysis - Estimated cost of \$30,000. This would be used to make recommendations for future improvements (additional costs would be incurred for construction of improvements)
- Tail Ditch/Outfall Improvement – VDOT has committed to Winter/Spring 2018/2019 cleaning of existing roadside ditches, road culverts and tail ditches
- Install Upslope (North Side of Road) BMP's (e.g. Retention/Detention ponds – High Costs/Complexity – Low/Minimal Benefit?)
- Elevate Road (High Cost/Complexity – Longer Term Solution)

Brooke Road (Route 608) – Project Area/Vicinity Map

Millbrook Road (Route 2100) – Sentinel Ridge Lane (Private)



Brooke Road (Route 608) – Typical Road Culvert Outlets



Brooke Road Flooding Issues



Brooke Road – Crestwood Lane Intersection
Standing Water & Paved Swale-Ditch Maintenance Needs



Raven Road Intersection
Culvert Repair



Random Outfall (Made its Own Path)

Potential Pedestrian/Bicycle Path Along Existing Courthouse Road

As a part of the Route 630 Interchange project, the underpass connecting Courthouse Road will be removed. The Board has asked staff to consider options to provide pedestrian access under I-95 to allow easy access for our citizens. The most cost effective means would be a culvert/tunnel. Staff has worked with VDOT to identify their requirements. VDOT has stated they would allow these improvements, but feel it should have been requested earlier in the process and will not participate in the costs.

VDOT Requirements:

- Two, possible three segments of culverts/tunnels are required. One culvert under the new southbound 95 ramp to westbound 630. A second culvert under the new FedEx lanes. A third culvert would be needed in the future under the southbound 95 mainline in the event VDOT determines bridge maintenance for existing bridge exceeds cost of replacement with fill. The first two culverts would be coordinated with Shirley and Transurban. No VDOT funding available or provided through normal funding sources.
- Any culvert/underpass would need to accommodate Emergency Service vehicles and VDOT bridge inspection equipment. To meet this VDOT requirement, culverts would need to be a 16'x16' box culvert. Once design begins, a predesigned bridge could be required such as an arch or Mechanically Stabilized Earth Wall (MSE Wall). VDOT requires an analysis prior to authorizing design.
- Limited Access would need to be maintained in the area of 95 while still allowing a certain path for pedestrian/bicycle traffic. At a minimum Stafford County would have to provide the following to VDOT standards:
 - Fencing around the trail area to prevent unauthorized access inhabitation
 - Agreement between Stafford County/Commonwealth Transportation Board (CTB) agreement
 - Trail lighting (VDOT would require safety lighting minimums) Stafford would likely want to provide more lighting as per an urban park (staff assumption).
- Stafford County to pay for bi-annual inspection and any required maintenance of structures supporting the trail.

Impacts:

- Up to \$1.5M in culvert costs for all three culverts. Up to \$1M for two culverts within the next 6 months to 2 years. The third culvert would likely be within the next ten years, determined by VDOT.
- Due to the need to coordinate this project with current contractor, this would cause significant delays to Interchange Project if pursued, with significant costs, up to \$1.5M - \$2.5M. The first culvert would need to be designed immediately and incorporated into the Interchange project. The culvert design and implementation into the work would delay the SB ramp work by a minimum of 6 months. Shirley would potentially lose incentive money and be penalized for the delay. Since the culvert is requested by Stafford County, all delay costs would be attributed to Stafford County. The delays and acceptance of delay costs would have to be agreed upon prior to initiating the culvert design work.
- Auxiliary costs for fencing and lighting are required by VDOT and are estimated to be \$100k. Staff assumed significant areas of landscaping to replicate an urban park at \$100k. Additionally, traffic engineering elements would be required to separate the pedestrian/bicycle traffic from the vehicular traffic in the area of the ramp from the FedEx lanes to the VDOT parking lots on the east side of 95. This was estimated at \$50k. Additional miscellaneous elements of the urban park setting such as enhancements to the interior of the culverts, graffiti protection, drainage features/enhancements were estimated at another \$50k. After the initial implementation costs there would be maintenance and security which were estimated at \$80k - \$100k per year. These miscellaneous costs would total \$300K initial one-time costs with annual recurring costs of \$100k per year.
- Sheriff's Department noted security issues with unauthorized and continued inhabitants.

Stormwater Infrastructure Discussion 11/07/18

Stafford County has received heavy rainfalls this spring and summer which have caused significant issues for many of our residents. Supervisor Dudenhefer asked staff to bring these issues to the Committee for discussion.

Strategic Plan Initiatives

- The Board identified stormwater as an area of concern and one of their three year priorities as an issue of Healthy Growth.
- The three year priority is as follows:
 - Complete an analysis of comparative localities and develop a plan of action to address the County's stormwater challenges (results of locality research done in 2017 and presented to this Committee is attached for review)
- Over the next several months, staff will be developing work plans to address each of the three year priorities. This will include research into comparative localities as well as a history of what Stafford has considered in the past.
- The work plans will include specific milestone dates to provide updates to the Board as this plan progresses

Discussion of Specific Issues from Recent Storms

- Two specific instances have caused major damage in the Garrisonville District at the following locations
 - **355 Eustace Road** - Large Sinkhole between two single-family dwellings affecting adjacent sidewalk and heavily travelled roadway. 42" Corrugated Pipe, 150' Length, 20' ± Depth
 - Status – VDOT made repairs to immediate area; however, there are no current plans by VDOT, County or others to address eventual failure of pipe. "Cured in Place" concrete/fiberglass "Point Repairs" for various segments of pipe - \$10-12,000 each. Two segments identified as priorities, likely additional repairs may be needed.
 - **68 Blossom Wood Court** - Sinkhole between two single-family dwellings. 42" Corrugated Pipe, 100'+ Length, 10' ± Depth. Pipe Outfall to Rip-Rap Channel (30' Length) to Creek
 - Status - Sinkhole appears stable (e.g. pipe not exposed) but pipe likely to fail completely during Winter/Spring. No current plans by VDOT, County or others to address pipe failure.
- Both of these examples have the same typical issues:
 - Failed drainage structures due to age and/or poor design/maintenance.
 - Property owners looking for immediate action in situations where VDOT and/or County have no legal responsibility, but clearly an expectation by adjacent/area property owners of action/resolution by County and/or VDOT
- More information will come to the Board in the future regarding the Strategic Action Work Plans. Would the Committee like to make any recommendations for action by the Board on these specific issues discussed?

355 Eustace Road



68 Blossom Wood Court



68 Blossom Wood Court



Stormwater Drainage Locality Comparison
Infrastructure Committee
4/4/17

City of Charlottesville

- Policy: If the City determines the stormwater is coming from a public facility onto private property, or the damage causes public health or safety problems, then the City will take the drainage easement into their system and maintain the system permanently.
- Initial Cost Sharing: When a problem drainage area is taken by the City
City% / property owner%
 - High priority project (w/legal liability)= 100/0
 - High priority project (w/o legal liability)= 75//25
 - Medium priority=75/25
 - Low priority=50/50
 - Neighborhoods=50/50
- Funding is provided through a stormwater utility fee, which assess a monthly fee on all impervious surfaces. Fees are charged to commercial entities and HOAs.
- Maintenance of existing stormwater sewers – no ongoing maintenance identified.
Done on an as needed basis

City of Arlington

- Policy: Arlington county maintains all county owned properties in addition to the public storm system which is roughly defined as infrastructure that takes in public water (could be runoff from a larger neighborhood or right of way). If a problem occurs on private property from “public” runoff, the City will acquire an easement and perform the repair – taking all future responsibility
- Initial Cost Sharing: None
- Funding - annual budget of \$10.2 million. Department has 42 FTE’s (stormwater maintenance, CIP, Inspection services, and Environmental and MS4 programs).
- Maintenance of existing stormwater sewers – 365 miles of pipe that is inspected annually and maintained

Hanover County

- Policy: County only maintains infrastructure on county properties and drainage in subdivisions, everything else is up to property owners. If a public easement is on commercial property a maintenance agreement is required so the commercial property has to maintain the easement on their property.
- Initial Cost Sharing: None
- Funding - Working on a policy to determine who has to pay with regard to failing infrastructure, especially if there are outstanding maintenance agreements or the property owner was unaware of the infrastructure (old neighborhoods) They are in a similar situation to Stafford
- Maintenance of existing stormwater sewers – only on County property – same as Stafford

Spotsylvania County

- Policy: The County no longer has an MS4 requirement; therefore, they feel they have no responsibility to maintain any infrastructure (Stafford's MS4 only pertains to infrastructure on County property or easements – similar to Hanover)
- Initial Cost Sharing: No work is done on private property
- Funding - None as no responsibility exists
- Maintenance of existing stormwater sewers – there have been citizen concerns about stormwater structures; however, both VDOT and County have denied responsibility.

Rappahannock County

- Policy: The County only maintains stormwater generated on County property
- Initial Cost Sharing: No work is done on private property
- Funding - None as no responsibility exists
- Maintenance of existing stormwater sewers – there have been citizen concerns about stormwater structures; however, both VDOT and County have denied responsibility.

Fauquier County

- Policy: At the completion of construction, maintenance of stormwater management facilities becomes the responsible party or land owner's responsibility in accordance with the executed Maintenance Agreement. The County is not responsible for maintaining private stormwater management facilities. Fauquier only maintains

stormwater structures on county property (Similar to Stafford, Spotsylvania, Hanover and Rappahannock)

- Initial Cost Sharing: No work is done on private property
- Funding - None as no responsibility exists
- Maintenance of existing stormwater sewers – there have been citizen concerns about stormwater structures; however, both VDOT and County have denied responsibility.

Fairfax County

- Policy: The county maintains the public storm drainage system contained within dedicated storm drainage easements. These facilities can be found on property owned by the county or operated within an easement on land owned by others.
 - Other public facilities such as parks are maintained by that entity.
 - Stormdrainage infrastructure on private property are the responsibility of the private entity
 - Floodplain easements, which restrict certain building and other practices, do not convey any maintenance responsibilities to the county.
- Initial Cost Sharing: No work is done on private property. If a problem is deemed to be the county's responsibility it will be accepted into an easement.
- Funding - Stormwater Service District – Tax of 0.0275/\$100 of assessed value – approximately \$145 per home annually. For an annual budget of \$64 million. The service district began in 2009 at 0.01/\$100 with an annual collection of \$22 million.
- Maintenance of existing stormwater sewers – full inspections and maintenance as required.

Loudon County

- Policy: The County maintains all structures in public stormwater easements. If there is a problem, it must be dedicated in an easement, then the County will take responsibility.
- Initial Cost Sharing: No work is done on private property. If a problem is deemed to be the county's responsibility it will be accepted into an easement.
- Funding - General Fund – currently \$3.5 million annually, expected to go up to \$4.5 million
- Maintenance of existing stormwater sewers – maintained as needed.

Funding Stormwater Programs

EPA 833-F-07-012

January 2008

Executive Summary

The construction, operation and maintenance of a municipal separate storm sewer system (MS4) can involve significant expense, especially when regulatory requirements (stormwater Phase I or Phase II), flooding concerns, water quality issues (including total maximum daily loads, or TMDLs) and population growth are factored in.

This document is intended to assist local stormwater managers understand the alternatives available to fund their stormwater program. The most stable source of funding is generally the stormwater utility, so this document briefly lists the various funding alternatives then describes in more detail the three different types of stormwater utility rate structures and the basic steps involved in creating a stormwater utility.

Stormwater Funding Alternatives

There are many different mechanisms that municipalities can use to fund their stormwater programs. The two most common funding options, Property Taxes/General Fund and Stormwater Service Fees, are discussed below along with several other funding alternatives.

Service Fees (including stormwater utilities)

Some communities include stormwater management costs as line items within their water or sanitary sewer enterprise system budgets. Water and sanitary sewer utilities charge customers fees for services rendered. Many of these base their customer fees on metered water flow. This is often not equitable because a property's metered water flow usually bears no relationship to the stormwater runoff it generates. For example, a shopping center typically generates a significant amount of stormwater runoff from the impervious area of its buildings and parking lots, but it usually uses a relatively small amount of metered water.

Many communities are now adopting stormwater service fees by means of a stormwater utility. A stormwater utility is a sustainable funding mechanism dedicated to recover the costs of stormwater infrastructure regulatory compliance, planning, maintenance, capital improvements, and repair and replacement. Stormwater fees are charged to taxpaying and tax-exempt properties and are typically based on property area. Stormwater utilities address the shortcomings and inequities of funding stormwater management by property taxes or water/sanitary service fees. There are more than 500 stormwater utilities in operation across the country. The average quarterly fee for a single family home is \$11, which usually covers regulatory and operation and maintenance costs. Some

What is a stormwater utility?

A stormwater utility (called a *stormwater authority* in Pennsylvania) is a mechanism to fund the cost of municipal services directly related to the control and treatment of stormwater. A stormwater utility will operate similarly as an electric or water utility. The utility will be administered and funded separately from the revenues in the general fund, ensuring a dedicated revenue source for the expense of stormwater management.

communities charge as little as \$2 per quarter, while others charge more than \$40 per quarter to a single family home.

Property Taxes/General Fund

Many communities have funded stormwater management from property taxes paid into their general funds. However, there is great competition for municipal general fund dollars from other worthy municipal programs. Stormwater management improvements typically have a low priority, unless the municipality is reacting to a recent major storm or regulatory action. The total cost of stormwater management is not readily apparent when these costs are sprinkled among general fund departmental budgets. As stormwater management costs increase, general fund budgets are often not increased to meet those needs. In addition, tax-exempt properties do not support any of the cost, even though it can be shown that many of them, such as governmental properties, schools, colleges, and universities are major contributors of stormwater runoff. Finally, property taxes are based on assessed property value. The cost of stormwater service to individual properties bears no relationship to the assessed value of the property. Therefore, this method of recovering stormwater management costs might not be equitable.

Special Assessment Districts

If a stormwater construction project benefits only a portion of a municipality, it can be funded by fees assessed only to those properties within that area, which is called a *special assessment district*.

System Development Charges (SDCs)

SDCs (also known as *connection fees* or *tie-in charges*) are one-time fees commonly charged to new customers connecting to a water or sanitary sewer system to *buy into* the infrastructure that has already been built for them, to pay their fair share of the infrastructure expansion necessary to serve them, or a combination of both. The amount of the new customer's SDC is typically calculated on the basis of the potential water demand that the new customer will place on the system. Stormwater SDCs can also be developed. However, the amount of a customer's stormwater SDC is typically tied to the area of the customer's property.

Funding Stormwater Programs

Grants and Low-Interest Loans

Stormwater management grants might be available for various types of projects on a state-by-state basis.

Environmental Tax Shifting

Environmental Tax Shifting is a concept that has been proposed by the Friends of the Earth and other environmental groups to redirect tax code incentives in a direction that would support energy conservation and sustain the environment. In 2001 the Environmental League of Massachusetts published a report prepared by the Tellus Institute titled, *Environmental Tax Shifting in Massachusetts*. This report discussed two creative proposals to change state tax policy to enhance stormwater management. One was a *pay to pave* tax that would be levied “on newly-paved surfaces on a per-square foot basis.” The second was to eliminate the Massachusetts pesticide and fertilizer sales and use tax exemption. This would generate \$1.1 million in annual revenue in Massachusetts. The report stated that 28 other states also exempt pesticides and fertilizers from sales and use taxes.

Types of Stormwater Utilities

There are three basic methods that stormwater utilities use to calculate service fees. These are sometimes modified slightly to meet unique billing requirements. Impervious area is the most important factor influencing stormwater runoff and is therefore a major element in each method (source: *Establishing a Stormwater Utility in Florida*, Florida Association of Stormwater Utilities, Chapter 4, Rate Structure Fundamentals).

Equivalent Residential Unit (ERU) (Also known as the Equivalent Service Unit (ESU) method): More than 80 percent of all stormwater utilities use the ERU method. Parcels are billed on the basis of how much impervious area is on the parcel, regardless of the total area of the parcel. This method is based on the impact of a typical single family residential (SFR) home’s impervious area footprint. A representative sample of SFR parcels is reviewed to determine the impervious area of a typical SFR parcel. This amount is called one *ERU*. In most cases, all SFRs up to a defined maximum total area are billed a flat rate for one ERU. In some cases several *tiers* of SFR flat rates are established on the basis of an analysis of SFR parcels within defined total area groups. Having such a tiered-SFR, flat-rate approach improves the equitability of the bills sent to homeowners. The impervious areas of non-SFR parcels are usually individually measured. Each non-SFR impervious area is divided by the impervious area of the typical SFR parcel to determine the number of ERUs to be billed to the parcel.

Advantages

The relationship (or nexus) between impervious area and stormwater impact is relatively easy to explain to the public on the basis of you pave, you pay. The number of billable ERUs can be determined by limiting the parcel area review to

impervious area only. Because pervious area analysis is not required, this approach requires the least amount of time to determine the total number of billing units.

Disadvantages

Because the potential impact of stormwater runoff from the pervious area of a parcel is not reviewed, this method is sometimes considered to be less equitable than the Intensity of Development (ID) or Equivalent Hydraulic Area (EHA) methods because runoff-related expenses are recovered from a smaller area base. This method could still be used to charge a fee to all parcels, pervious as well as impervious, to cover expenses not related to area, such as administration and regulatory compliance.

Intensity of Development (ID): This stormwater cost allocation system is based on the percentage of impervious area relative to an entire parcel’s size. All parcels (including vacant/undeveloped) are charged a fee on the basis of their *intensity of development*, which is defined as the percentage of impervious area of the parcel. Rates are calculated for several ID categories. These ID categories are billed at a sliding scale, as shown in the table below. For example, an SFR parcel, which is categorized as *moderate development*, would pay \$0.16/month/1,000 ft² (or \$1.60 for a 10,000 ft² lot).

Category (impervious percentage range)	Rate per month per 1,000 square feet of total served area (Impervious plus pervious)
Vacant/Undeveloped (0%)	\$0.08
Light development (1% to 20%)	\$0.12
Moderate development (21% to 40%)	\$0.16
Heavy development (41% to 70%)	\$0.24
Very heavy development (71% to 100%)	\$0.32

Advantages

The ID method accounts for stormwater from the pervious portion of parcels. Therefore, it can be more equitable than the ERU method. It accounts for completely pervious parcels and therefore can allow vacant/undeveloped parcels to be billed. If a parcel’s impervious area is increased slightly because of minor construction modification, it probably would not be bounced up into the next higher ID category. This reduces the time required for staff to maintain the billable unit master file.

Disadvantages

Parcels are grouped into broad ID categories. Parcels are not billed in direct proportion to their relative stormwater discharges. This method can be more difficult to implement than the ERU method because parcel pervious areas and impervious areas need to be reviewed. It is also more complicated to explain to customers than the ERU method.

Equivalent Hydraulic Area (EHA): Parcels are billed on the basis of the combined impact of their impervious and pervious areas in generating stormwater runoff. The impervious area is charged at a much higher rate than the pervious area.

Advantages

The EHA method accounts for flow from the pervious portion of parcels. Therefore, it is often seen to be more equitable than the ERU method. It accounts for undeveloped/ vacant parcels and allows them to be billed. It is perceived to be fairer than the ID method because parcels are billed on the basis of direct measurements of pervious and impervious areas to which hydraulic response factors are applied to determine a unique EHA for such parcels.

Disadvantages

Because pervious area analysis is required in addition to impervious area, this approach requires more time to determine the total number of billing units. It is also more complicated to explain to customers than the ERU method.

Creation of a Stormwater Utility

The following are the typical steps involved in creating a stormwater utility.

Development of a Feasibility Study

The first step is to develop a study that provides the community with enough information to decide if it makes sense to proceed to implementation. The feasibility study will typically address preliminary revenue requirements (usually from current stormwater budgets), a preliminary assessment of the billing area to determine the SFR billing rate, the service fee method to use and credits to provide, the preliminary rate charge for each ERU, and the responsible party for billing. The feasibility study is then presented to municipal staff and officials to decide whether to proceed with development of the utility.

Create a Billing System

If the municipality decides after the feasibility study to continue development of a stormwater utility, a billing system is then created. This involves collecting user data, collecting parcel area data (such as ownership and impervious area for each parcel), and developing a system to bill users. The two most common stormwater billing systems are (1) a stormwater user fee with an existing water/sewer user fee bill and (2) non-ad valorem assessments. Approximately 80 percent of stormwater utilities use the first approach mainly because it is cost-effective due to the fact that an existing water and sewer billing system is already in place.

Roll Out a Public Information Program

Critical throughout the stormwater utility development process is a strong public education program. Many people are unaware of the increasing cost of stormwater management and the options to fund it. A well-funded stormwater program can help reduce flooding, improve drought conditions, create better fishing and recreation, and improve water quality. An organized public information and education effort, which typically involves the following components, is essential to the success of a stormwater utility:

- **Identifying key users and groups.** Two potential groups to target include (1) universities schools, and shopping malls that generate a significant amount of runoff and often receive high stormwater bills; and (2) tax-exempt properties, such as universities, schools and churches, that do not contribute property taxes into the general fund, which traditionally have funded stormwater management.
- **Establishing an advisory committee.** Include a cross-section of the community including representation from the university, business, nonprofits, churches, developers and shopping center owners.
- **Creating a stormwater utility Web site.** The Web site should post appropriate progress documents and develop a frequently asked questions page.
- **Preparing pamphlets and presentations.** A brochure describing the need for the stormwater utility, rate method, and projected rates should be prepared as well as an electronic presentation for use at public meetings.
- **Meeting with key user groups and the media.** Presentations to civic groups and the media should be given. One-on-one meetings with customers projected to receive the highest bills should occur.
- **Distributing information before initial billing.** The stormwater utility brochure should be sent to all customers before billing. If possible, include the customer's actual projected bill.

Adopt an Ordinance

An ordinance will provide legal authority for establishment of the utility. An example stormwater utility ordinance from Takoma Park, Maryland, is at www.takomaparkmd.gov/code/Takoma_Park_Municipal_Code/index.htm (see Title 16 Stormwater Management, Chapter 16.08 Stormwater Management Fee System).

Provide Credits/Exemptions

Credits or exemptions are often built into the ordinance, and can be used to provide incentives for certain practices or relief from utility fees to certain types of land uses. Credits should be clearly described and can include installation of approved retention/detention best management practices (BMPs), installation of approved BMPs such as rainspout disconnections or porous pavers, and educational programs for employees. Exemptions are often granted for undeveloped (100 percent pervious)

Funding Stormwater Programs

land because the impervious area is usually used to calculate the rate. Other exemptions can include roads (because the municipality typically owns the roads) and parcels on waterways (which do not discharge to the municipality's storm drain system), although not all programs allow these last two exemptions.

Implementation

The first bill is the most important—many customers do not focus on the new stormwater fee until they actually receive their first bill. Customers should be notified several months in advance of the date of billing initiation and their estimated fee. A telephone hot line, e-mail service and website should be created to address questions and concerns. In addition, the municipality should be prepared to address legal challenges to its stormwater fee. The municipality should also be prepared to maintain the master account file, including developing a process for updating the billing unit data for an existing customer and for entering the data for a new customer.

Barriers to Creating a Stormwater Utility

There are typically two barriers to creating a stormwater utility: legal and political.

Legal Barriers

In EPA Region 3, all states have legal authority to establish stormwater utilities (Pennsylvania has a bill to clarify its legal authority). A summary of the current or proposed legal authority within EPA Region 3 states is presented below (cities within that state with stormwater utilities are indicated in parenthesis):

- **Delaware** (Wilmington): Chapter 40, Title 7 of the Delaware Code authorized the creation of stormwater utility districts.
- **Maryland** (Montgomery County, Takoma Park): Section 4-204(d), Environmental Article, of the Annotated Code of Maryland, authorizes municipalities to create stormwater utilities.
- **Pennsylvania** (Philadelphia—bills water customers for stormwater management according to water meter size): Pennsylvania HB88—*The Comprehensive Watershed Stormwater Act* is expected to be introduced in the fall of 2007. It requires counties to develop Comprehensive Watershed Stormwater Plans; requires municipalities to implement infrastructure improvements and recover costs from counties; authorizes counties to charge annual fees and assessments to pay for the program.
- **Virginia** (Chesapeake, Hampton, James City, Newport News, Norfolk, Portsmouth, Prince William County, Richmond, Suffolk, Virginia Beach): Section 15.1-2114 of the Virginia Code is the enabling legislation that gives local communities the authority to establish stormwater utilities.
- **West Virginia** (Fairmont, Beckley, Morgantown): The West Virginia Legislature amended sections 8-20-1 et seq. and 16-13-1 et seq. of the West Virginia Code in 2001 so as

to authorize municipalities to include the operation and management of stormwater systems as part of a municipal combined waterworks and sewerage system.

- **District of Columbia** (D.C.: Flat monthly fee for residences; others are billed on the basis of metered water flow): The District of Columbia Storm Water Permit Compliance Enterprise fund was established in 2000 by the D.C. City Council. The legislation was titled, *Storm Water Permit Compliance Amendment Act of 2000*.

Political Barriers

It usually takes at least one *champion* to help create a stormwater utility, especially in the face of local political opposition. A public information program that visually presents the inadequacies of the community's current stormwater management program, coupled with the benefits that have occurred at communities with stormwater utilities would help garner public support to offset opposition to the fee. A senior manager (city manager or county administrator, for example), or a senior elected official, such as the mayor, usually provides that steadfast leadership. It is important to explain the benefit of implementing a stormwater utility to opinion makers. Opposition from local news outlets has sometimes been able to stop the implementation of stormwater utilities (often by using inaccurate terms such as a *rain tax*). Educational materials and public meetings are necessary to show the financial benefit of stormwater utilities. When the public is clearly informed of the financial benefit to them—along with the many environmental benefits such as improved flood control, fishing, and recreation—support usually follows.

EPA Region 3 Stormwater Funding Case Studies

Wilmington, Delaware

Wilmington has a combined sewer system and used a three-step approach to establish a stormwater utility to recover costs related to stormwater management on a fair and equitable basis.

1. *Determine stormwater revenue requirements:* The city maintained a single water/sewer enterprise fund. The city's combined sewer costs were allocated to three buckets: a wholesale sewer customer, city retail sewer customers, and city stormwater customers. The annual stormwater cost came to approximately \$4.2 million—equal to approximately 43 percent of the city's total combined sewer costs.
2. *Determine stormwater billing units:* City staff reviewed several stormwater billing approaches and selected the ESU method, which would bill parcels solely on the basis of their impervious area. The city had accurate impervious area data for all SFR and multi-family residential (MFR) parcels. This SFR/MFR category comprised 75 percent of all parcels. The median impervious area of all SFR/MFR parcels was approximately 789 square feet, which was defined as one ESU. The SFR/MFR parcels were divided into four tiers to be billed at four

separate flat rates. Condominium complex impervious areas were calculated using geographic information system (GIS) data. The remaining properties' impervious areas were estimated by applying predefined stormwater coefficients to the total property area. The impervious areas of these properties were converted to ESUs. All parcels were to be billed except for city-owned parcels. The estimated total number of billable ESUs was 155,363.

3. *Calculate stormwater fees:* The annual stormwater cost was increased to include bad debt and stormwater credits, resulting in adjusted annual stormwater revenue of approximately \$5.1 million. The quarterly stormwater fee, effective January 2007, was calculated to be \$8.141 per quarter per ESU. A four-tier rate schedule, with a fixed fee for each impervious area tier, was established for all SFR/MFR parcels. For all other parcels, the quarterly stormwater charges were based on their individual ESUs. Therefore, a parcel with 7,890 square feet of impervious area would be billed for 10 ESUs, or \$81.41 per quarter.

Takoma Park, Maryland

(www.takomaparkmd.gov/publicworks/stormwater.html)

Takoma Park established a stormwater utility in July 1996. It is responsible for constructing and maintaining the stormwater system, reviewing stormwater management plans, inspection and enforcement activities, watershed planning, and water quality monitoring.

User fees are based on the amount of impervious area on a property. The annual fee for single family residences is \$48.00 and became effective on July 1, 2003. Nonresidential and multifamily parcels are charged a fee on the basis of their measured impervious area as compared to the impervious area of an average SFR parcel (i.e., the ERU method). One ERU is equal to an impervious area of 1,228 square feet. Tax-exempt parcels also pay the fee with the exception of property used for public purposes and owned by the state, county, or city agency or volunteer fire department.

Suffolk, Virginia

(www.suffolk.va.us/pub_wks/index.html)

In 2004 Suffolk spent approximately \$1.5 million from its taxpayer-supported general fund on stormwater management. In 2006 it implemented a stormwater utility, using the ERU method, at an initial rate of \$3.95 per month per ERU. In Suffolk, one ERU is equal to 3,200 square feet of impervious area and is the weighted average for both SFR and MFR parcels. The rate increased to \$5.20 per month effective July 2007. The fee is collected via property tax bills due in June and December. Schools, state, and federal developed parcels pay the fee. They are exempt only if they have a separate stormwater permit and discharge directly to a body of water not maintained by the city.

Additional Resources

National Association of Flood and Stormwater Management Agencies. *Guidance for Municipal Stormwater Funding*.

www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

University of Maryland, Environmental Finance Center.

www.efc.umd.edu

Indiana University-Purdue University Indianapolis. *An Internet Guide to Financing Stormwater Management*.

<http://stormwaterfinance.urbancenter.iupui.edu>

Natural Resources Defense Council. *Stormwater Strategies: Community Responses to Runoff Pollution*. Chapter 4: Funding and Gaining Support for Stormwater Programs.

www.nrdc.org/water/pollution/storm/chap4.asp

Florida Stormwater Association, *Establishing a Stormwater Utility in Florida*.

www.florida-stormwater.org/manual.html

Kaspersen, J. 2000. The Stormwater Utility, Will It Work in Your Community? *Stormwater* 1(1).

www.forester.net/sw_0011_utility.html

U.S. Environmental Protection Agency, Watershed Academy. *Catalog of Federal Funding Sources for Watershed Protection*.

<http://cfpub.epa.gov/fedfund>

Contacts

- U.S. EPA—Paula Estornell
estornell.paula@epa.gov
- Pennsylvania—Barry Newman
banewman@state.pa.us

NOTE: This document is not law or regulation; it provides recommendations and explanations that MS4s may consider in determining how to comply with requirements of the CWA and NPDES permit requirements.

Update on HSIP Project on Leeland Road, and Elevated Costs on Transportation Projects

HSIP Project on Leeland Road

- VDOT has a planned Highway Safety Improvement Program (HSIP) project for Leeland Road
- This project included bike/ped accommodations as well as a center lane for turns to avoid backups during peak travel periods
- VDOT has informed us that they will not be able to construct the project with a center lane due to right of way costs. VDOT has experience significant increases in right of way acquisition costs on all of their projects; therefore, the reduced scope is needed to maintain the project budget

Elevated Project Costs on Transportation Projects

- The HSIP project is a good example of what we are seeing with our project estimates
- Our Courthouse Road projects estimate has elevated from \$13.3 million at the time of the SmartScale application to a more recent VDOT estimate of \$14.9 million. We anticipate elevated project costs for our other projects as well.
- The primary reason for the escalation is due to right of way costs
- Over the last few years there have been legislative changes that have caused the legal outcomes to result in elevated compensation to owners, which has led to an increase in legal challenges of appraisals

Legislative changes

- Virginia's Constitution was amended on January 1, 2013. It declared private property to be a fundamental right and specifically enumerated that private property could not be taken "or damaged" for public uses without just compensation and that "no more private property may be taken than that which is necessary to achieve the stated purpose." You may recall that in the Mike's Diner case the owner asserted a number of jurisdictional defenses, including that the Board took more property rights than were necessary to achieve the project's purpose.
- Virginia Code Section 25.1-230.1 was then amended to provide that just compensation shall include damage to the residue of any loss in market value from lost access as well as lost profits. Again, the Mike's Diner case had a significant claim for lost profits, which would never have been compensable before the enactment of 25.1-230.1.
- Rights in inverse actions were also enlarged. SB 1153 effective 7-1-17 directs the court to reimburse a plaintiff for the costs of an inverse condemnation if a judgment is entered for the plaintiff, once again raising the compensation amounts.
- In 2017, the General Assembly also amended Va. Code Section 25.1-244 to provide that interest be paid to the owner at rate of interest under 8.01-382 (currently 6%) for any difference between the condemnation offer and final judgment.
- Also, Section 25.1-245.1 was added to allow an owner to recover costs, including the costs for up to three experts if the award at trial is 25% or more above the offer made under 25.1-204.
- **All of these issues have raised the expected costs for right of way acquisitions**