

Candidate Segments  
for

# ROAD DIETS

in Hampton Roads

July 2018

18-04

# **HAMPTON ROADS TRANSPORTATION PLANNING ORGANIZATION**

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Christopher Hall , Hampton Roads District Engineer  
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John Reinhart, CEO/Executive Director  
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Joshua Moore – Alternate

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### **FEDERAL TRANSIT ADMINISTRATION**

Terry Garcia Crews, Region 3 Administrator

### **FEDERAL AVIATION ADMINISTRATION**

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Dean VanderLey, Captain, U.S. Navy - Alternate

Richard Wester, Captain, U.S. Coast Guard

Herbert Joliat, Colonel, Langley-Eustis

### **INVITED PARTICIPANT**

John Malbon, CTB

Stephen A. Johnsen, CTB

### **HRTPO PROJECT STAFF**

Michael S. Kimbrel

Robert B. Case, P.E., Ph.D.

Michael Long

Christopher Vaigneur

Deputy Executive Director

Chief Transportation Engineer

General Services Manager

Assistant General Services Manager

## REPORT DOCUMENTATION

### TITLE

Candidate Segments for Road Diets in  
Hampton Roads

### ORGANIZATION

Hampton Roads Transportation Planning Org.  
723 Woodlake Drive, Chesapeake, Virginia 23320  
<http://www.hrtpo.org>

### AUTHOR

Robert B. Case, PE, PhD

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### ABSTRACT

A “road diet” converts a road into a street, i.e. facilitates accessing origins and destinations along the segment, primarily by a) reducing the number of lanes which one must cross to turn left into a driveway, and b) repurposing the width of excess travel lanes typically for a central two-way left-turn lane between travel lanes, on-street parking, and/or bike lanes.

To help localities find roads to investigate for a possible road diet, HRTPO staff determined the criteria defining situations in which road diets may be desirable, and then prepared a database and maps providing information on those criteria for existing 4-lane undivided segments with suitable traffic volumes in Hampton Roads.

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Ben Camras	Chesapeake	Bob Gey	Va. Beach
Ric Lowman	Va. Beach	Garrett Morgan	Newport News
Jerry Pauley	VDOT	Jeff Raliski	Norfolk
Brian Solis	Va. Beach	John Stevenson	Norfolk
Eric Stringfield	VDOT	Wayne Wilcox	Va. Beach
Susan Wilson	Portsmouth		

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## INTRODUCTION

According to Charles Marohn, author of *Thoughts on Building Strong Towns*:

“Roads are for getting to a place. Streets are for being in a place.”<sup>1</sup>

Due to their different purposes, roads and streets should have different designs. In order to help us get places, we should design “roads” for high speeds and few access points (driveways, intersections, curb cuts). In order to help us access places when we have arrived, we should design “streets” for lower speeds and many access points.

When a facility has a road’s design—e.g. four-lanes undivided—but we want it to serve a street’s purpose—i.e. provide access to many properties along the street—that is one of the times a “road diet” may be in order.

A “road diet” converts a road into a street, i.e. facilitates accessing origins and destinations along the segment, a) by reducing the number of lanes which one must cross to turn left into a driveway, and b) by using the width of excess travel lanes for<sup>2</sup>:

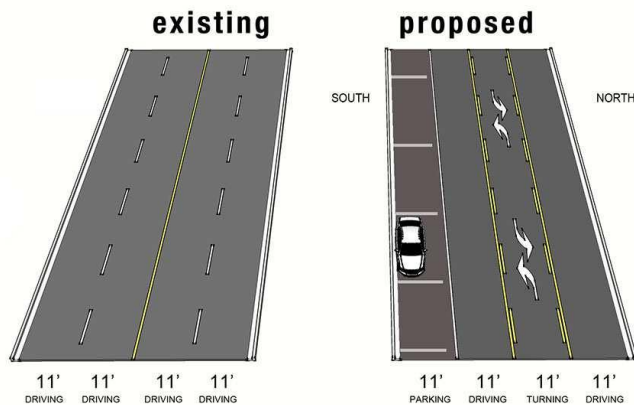
- Two-way left-turn lane between travel lanes (TWLTL)
- Raised median
- Refuge islands
- Bus pullouts or islands
- On-street parking
- Bike lanes
- Wider pedestrian area

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<sup>1</sup> <https://www.strongtowns.org/journal/2017/3/27/a-transportation-revolution>

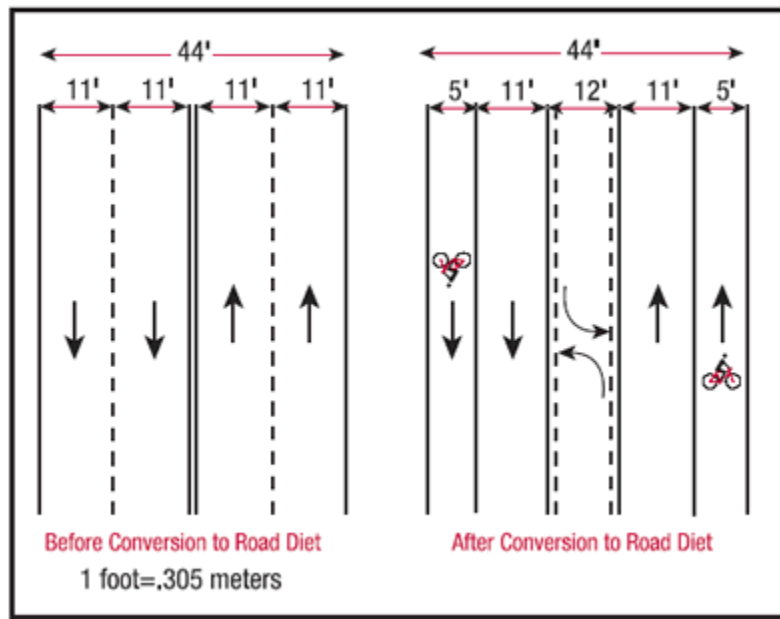
<sup>2</sup> Road Diet, Participant Notebook, FHWA Road Diet Workshop, for Transportation Training Academy, Center for Transportation Studies, U. Va., May 2016.

A typical road diet converts a 4-lane undivided road into a 2-lane street with a two-way left- turn lane (TWLTL) in the center, and on-street parking and/or bike lanes on the edges.



### Adding TWLTL and On-Street Parking

Source: Architecturra Inc.<sup>3</sup>



### Adding TWLTL and Bike Lanes

Source: FHWA<sup>4</sup>

The **purpose of this study**, therefore, is to identify candidate segments and provide data with which localities can decide if they want to further investigate applying a road diet.

<sup>3</sup> <http://windsorstar.com/news/local-news/put-riverside-drive-on-a-road-diet-say-architects>

<sup>4</sup> <https://www.fhwa.dot.gov/publications/research/safety/humanfac/04082/>

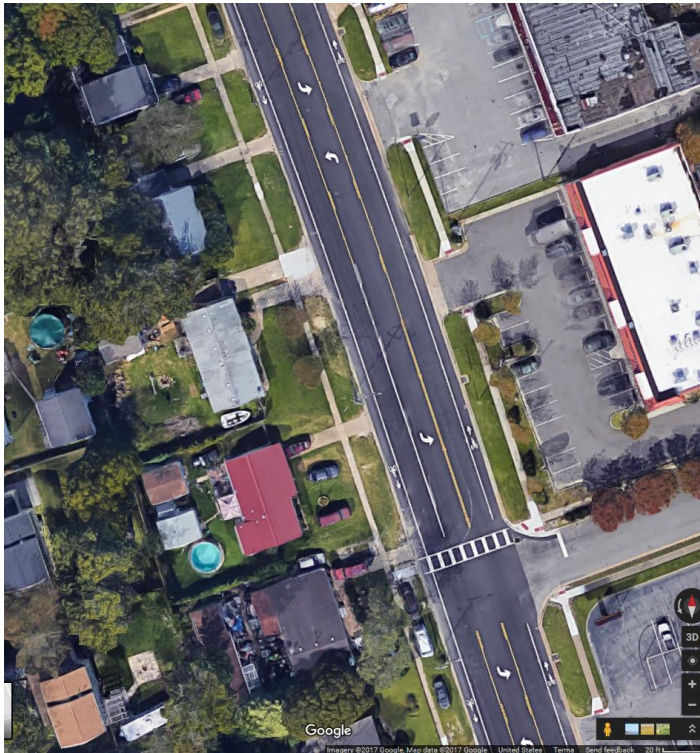


## PROS AND CONS OF ROAD DIETS

In the following sections, we review the literature for three aspects of actual road diet experiences across the country:

1. public response
2. cost, construction, and post-construction
3. measurable transportation impacts

Note that no data on local road diets were found.



**Road Diet on South Plaza Trail, Va. Beach**

Source: google maps

## Public Response

Public responses to road diets come in at least three forms:

- Survey Results
- Perceptions
- Political Actions

### Survey Results

#### *Positive Responses*

- Fourth Plain Boulevard, Vancouver WA, 2004 survey, 43 responses<sup>5</sup>
  - 84% responded that the new number of lanes is “**just right**”
  - 67% would “recommend a [similar] roadway project...to other streets...when appropriate”
- Baxter Street, Athens GA, 2004 survey, 30 responses<sup>6</sup>
  - 77% responded that the new number of lanes is “**just right**”
  - would “recommend a [similar] roadway project...to other streets...when appropriate”: 47% “yes”; 33% “maybe”; 20% “no”
- St. George Street, Toronto, likely 2004 survey, 486 responses<sup>7</sup>
  - 79% responded that the new number of lanes is “**just right**”
  - 81% would “recommend a [similar] roadway project...to other streets...when appropriate”
- Kaikorai Valley Road, Dunedin, New Zealand, 2004 survey, 82 responses<sup>8</sup>
  - 59% responded that the new number of lanes is “**just right**”
  - would “recommend a [similar] roadway project...to other streets...when appropriate”: 42% “yes”; 31% “maybe”; 27% “no”
- Lawyers Road, Reston VA, 2010 survey, unknown number of responses<sup>9</sup>
  - “74 percent agreed the Road Diet project **improved** Lawyers Road.”
- Ingersoll Avenue, Des Moines, 2010 diet, unknown survey date and responses<sup>10</sup>
  - “a majority **avored keeping** the Road Diet”

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<sup>5</sup> Road Diet Handbook: Setting Trends for Livable Streets, by Jennifer Rosales, Parsons Brinckerhoff, Second Edition, July 2007, pp. 40, 41, 44

<sup>6</sup> Road Diet Handbook, pp. 50, 51, 53

<sup>7</sup> Road Diet Handbook, pp. 68, 161, 164

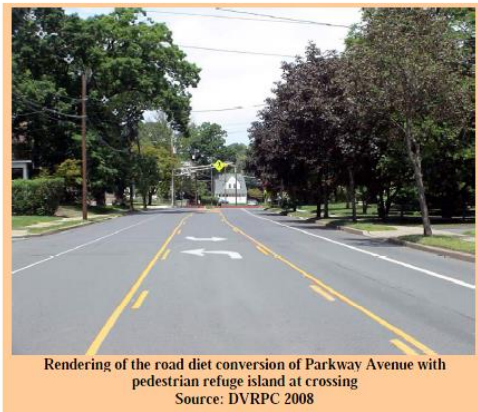
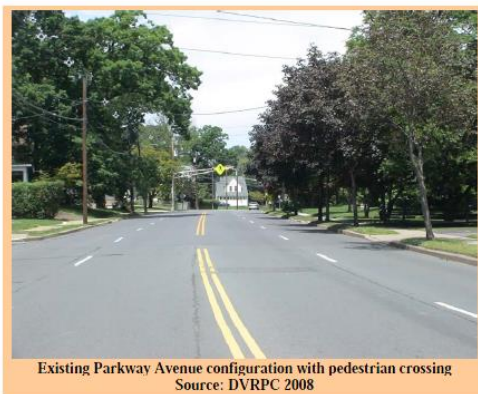
<sup>8</sup> Road Diet Handbook, pp. 78, 166, 170

<sup>9</sup> Road Diet Case Studies, p. 23

<sup>10</sup> Road Diet Case Studies, p. 29

## Negative Responses

- U.S. 18, Clear Lake IA, 2004 survey, 134 respondents<sup>11</sup>
  - 72% responded that the new **number of lanes is “not enough”**
  - 49% would **not “recommend** a [similar] roadway project...to other streets...when appropriate”
  - Note that “complementary improvements **still [remained] to be added** to the project, including improved signal timing and right turn lanes.”
- Hubbell Avenue, Des Moines: “A city study found that 87 percent of residents opposed the changes before the restriping, and 93 percent opposed them after.”<sup>12</sup>



### Parkway Avenue, Ewing Township, NJ

Source: Regional Road Diet Analysis- Feasibility Assessment, p. 41

<sup>11</sup> Road Diet Handbook, pp. 58, 63, 154, 158

<sup>12</sup> <http://www.desmoinesregister.com/story/money/business/development/2015/09/10/hubbell-ingersoll-show-challenges-bike-lanes-des-moines/32431957/>

## Perceptions

### *Positive Perceptions*

- Division Street, Grand Rapids, unknown date: “**positive** public feedback”<sup>13</sup>
- 55<sup>th</sup> Street, Chicago, unknown date: “The community expressed that the Road Diet has **benefited livability**.”<sup>14</sup>
- Franklin Boulevard, Chicago, unknown date: “Residents...felt the re-design **improved** both safety and the ability of children to bicycle to school.”<sup>15</sup>
- Dexter Avenue, Seattle, 2011 diet: “Public opinion on the Road Diet has been **favorable**, especially among bicyclists.”<sup>16</sup>

### *Negative Perceptions*

- Lincoln Avenue, San Jose: “During this last year, I have spoken regularly with Lincoln Avenue small business owners who are to a person **upset at their loss of business** due to **heavy and dangerous traffic** combined with too-little parking.”<sup>17</sup>

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<sup>13</sup> Road Diet Case Studies, p. 7

<sup>14</sup> Road Diet Case Studies, p. 11

<sup>15</sup> Road Diet Case Studies, p. 13

<sup>16</sup> Road Diet Case Studies, p. 45

<sup>17</sup> <https://katysblog.wordpress.com/2016/05/19/willow-glen-road-diet-failure/>



## Political Actions

### *Positive Political Actions*

Given the large number of road diets which exist in the U.S., positive political actions—e.g. city council votes to implement a road diet—have not been added to this document.

### *Controversies*

- Forest Park Boulevard, Fort Worth: “...200 people who signed an online **petition asking the city to stop** the road diet plan.”<sup>18</sup>
- West 38<sup>th</sup> Avenue, Wheat Ridge CO<sup>19</sup>
  - “The disagreements between those who support the current three-lane configuration and those who favor a return to four has spilled over into city council meetings and public hearings, **divided former political allies**, and even made for some tense family get-togethers.”
  - “The fundamental identity crisis in Wheat Ridge — whether it’s a **place to come to, or one to go through** — dates back to its origins 150 years ago”

### *Reversions Back to Four Lanes*

- Lake Park Boulevard, Carolina Beach NC: “A few years ago the Town had to pay lots of money to **revert Lake Park Blvd back to four lanes** after a **failed Road Diet** pattern was implemented reducing the lanes to two with a turn lane.”<sup>20</sup>
- Woodstock Avenue, Rutland VT<sup>21</sup>
  - “Last week, the citys [sic] Board of Highway Commissioners voted to end the ...road diet and **revert the road to four lanes....**”
  - “A number of business owners reported exact opposite experiences from one another, but the **tally was roughly two to one**, with 10 of the business people interviewed during a door-to-door effort Friday glad the road would go back to four lanes and only four of them saying they wished the road diet would continue.”

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<sup>18</sup> <http://www.star-telegram.com/news/traffic/your-commute/article3836967.html>

<sup>19</sup> <http://www.westword.com/news/wheat-ridge-tries-to-turn-west-38th-avenue-into-two-lanes-road-diets-9065564>

<sup>20</sup> <http://www.islandgazette.net/news-10/index.php/opinion1/editorials/item/439-editorial-one-way-traffic-on-cape-fear-blvd-bad-idea>

<sup>21</sup> <http://www.rutlandherald.com/articles/some-on-woodstock-ave-happy-to-get-off-road-diet/>

- Hubbell Avenue, Des Moines: “The city tried to put Hubbell Avenue on a road diet again in 2012, this time on a shorter section of the street and without bike lanes. It was converted to three lanes in 2013, but the city **changed it back to four lanes** less than a year later when public opposition remained strong.”<sup>22</sup>
- Murdock Avenue, Oshkosh WI: ““From a planning perspective, this makes sense,” said Kathy Propp, a member of the city's plan commission. “**I think it's worth trying.** The worst thing that could happen is we try it and in a few years we restripe it and go back to four lanes.””<sup>23</sup>
- Vista del Mar, Los Angeles<sup>24</sup>
  - “The resulting “road diet” on Vista del Mar — combined with lane reductions on other streets in the area — sparked a wave of opposition that engulfed the Westside and the South Bay. City Hall was flooded with calls. A condo association sued. And frustrated commuters began **raising money to recall** Westside Councilman Mike Bonin.”
  - “After weeks of backlash, Bonin backpedaled late Wednesday night, acknowledging in a YouTube video that “most people outright hated” the Vista del Mar changes. He apologized to drivers and said **lanes would be restored next month.**”

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<sup>22</sup> <http://www.desmoinesregister.com/story/money/business/development/2015/09/10/hubbell-ingersoll-show-challenges-bike-lanes-des-moines/32431957/>

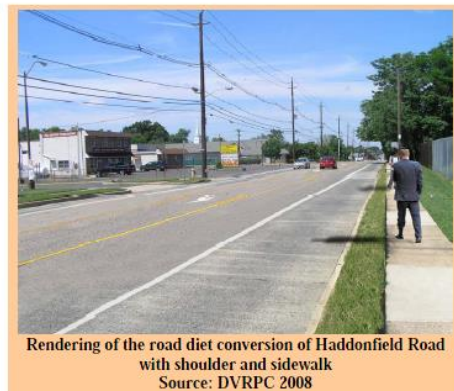
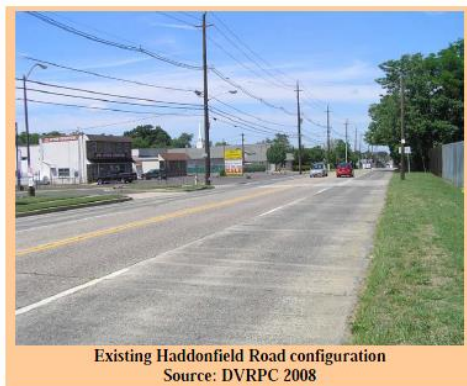
<sup>23</sup> <http://www.thenorthwestern.com/story/news/local/2015/05/13/road-diet-proposed-murdock-avenue/27276717/>

<sup>24</sup> <http://www.latimes.com/local/lanow/la-me-ln-vista-del-mar-lanes-20170726-story.html>

## Summary (public response)

Although some road diets have sparked enough complaints to be removed, it appears that the measurable benefits of most road diets (documented in following section) lead to them being **well-received by the public**. The controversies, where occurring, highlight the need for:

- **public involvement** before, during, and after implementation
- implementing road diets only **where auto volumes will permit**



### **Haddonfield Road, Pennsauken, NJ**

Source: Regional Road Diet Analysis- Feasibility Assessment, p. 88

## Cost, Construction, and Post-construction

### Cost

When considering road diets, one “plus” in their favor is **low cost**. According to Modi and McClain in ITE Journal, “These projects use low-cost materials, typically paint- and plastic-based, which allow projects to be installed...inexpensively....”<sup>25</sup> Transportation departments further reduce costs by implementing road diets during maintenance repaving, at which time new striping must be installed anyway.

Under Virginia law (title 33.2, chapter 3, section 33.2-319, below), some road diets will apparently lower the **maintenance payments** cities get from the state. Although conversion of “moving” lanes to *bicycle* lanes (or transit-only lanes) does NOT affect payments, conversion to *parking*—being omitted from the below list of conversions that, as of a 2017 change in the law, do not affect payments—apparently does lower maintenance payments.

D. Any city converting an existing moving-lane that qualifies for payments under this section to a transit-only lane after July 1, 2014, shall remain eligible for such payments but shall not receive additional funds as a result of such conversion. Any city or town converting an existing moving-lane that qualifies for payments under this section to a **bicycle-only lane** after July 1, 2014, shall remain eligible for such payments, provided that (i) the number of moving-lane-miles converted is **not more than 50 moving-lane-miles** or three percent of the city's or town's total number of moving-lane-miles on July 1, 2014, whichever is less, and (ii) prior to any such conversion, the city or town certifies that the conversion design has been assessed by a professional engineer licensed in the Commonwealth pursuant to Chapter 4 (§ 54.1-400 et seq.) of Title 54.1 and that the assessment has demonstrated that (a) the level of service of the street to be converted will not be reduced or if it will be reduced that the associated roadway network will retain adequate capacity to meet current and future mobility needs of all users and (b) the conversion has been designed in accordance with the National Association of City Transportation Officials' Urban Bikeway Design Guide. Any such city or town shall not receive additional funds as a result of such conversion to a bicycle-only lane and shall annually expend funds on road and street maintenance and operations that are at least equal to funds spent on road and street maintenance and operations in the year prior to such conversion. For purposes of this subsection, “level of service” has the meaning provided in the Transportation Research Board's Highway Capacity Manual.

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<sup>25</sup> Building on Complete Streets Momentum- From Studies to On-the-Ground Solutions, by Carrie Nielson Modi and Ryan McClain, ITE Journal, May 2017, pages 32.



## Construction

Given the above ease of construction of some road diets, departments can construct them **quickly**. Speed of construction can be particularly important concerning the public. Modi and McClain note: “Long periods of time can pass [after public engagement] ...which can kill momentum and public excitement...”<sup>26</sup> Departments can maintain public support by constructing road diets shortly following public buy-in.

## Post-construction

The ease of construction of some road diets also provides flexibility. According to ITE Journal:

“While quick build projects may last many years, iterative design is always in play and evaluation is key to demonstrate benefits and areas for improvements. Where projects do not meet their goals and expected outcomes, installations can be modified or, if needed, easily removed.”<sup>27</sup>

Unlike most transportation projects, road diets are fairly easy to **modify and even remove** where perceived and/or real outcomes dictate.

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<sup>26</sup> Building on Complete Streets Momentum, pg. 31.

<sup>27</sup> Building on Complete Streets Momentum, pg. 32.

## Measurable Transportation Impacts

### Conceptual Structure

The theory of road diets includes the following causes and effects:

- fewer lanes -> lower auto speeds -> more pleasant for pedestrians (including bus riders) and cyclists -> higher usage of alternative transportation
  - **fewer crashes**
  - **higher quality of life**
  - **better health**
- fewer lanes -> left-turns from diet street and left-turns and thru-movements from side streets cross fewer lanes (better visibility of conflicting traffic); ->
  - **fewer crashes**
- separation of turning vehicles from thru vehicles (via TWLTL) ->
  - **fewer crashes**
- bike or bus infrastructure -> higher usage of alternative transportation
  - **higher quality of life**
  - **better health**

On the other hand, if implemented inappropriately (e.g. on roads with high volumes), road diets have resulted in **excessive delays at intersections**.

Although some of the impacts of road diets are difficult to measure—e.g. additional biking and walking, and the health effects thereof—before-and-after studies have revealed the impact of implemented road diets in the following areas (reviewed individual starting on the following page):

- safety
- vehicle running speeds
- intersection delay
- bicycle usage
- walking
- bus ridership
- auto volume

## Safety

### *Positive Outcomes (increased safety)*

Case studies of **individual facilities** have measured positive impacts of road diets on safety:

- Rice Street, Ramsey County, MN, 1992: “decrease of about 18 percent in the **accident rate**”<sup>28</sup>
- High Street, Oakland CA, unknown date: “17 percent reduction in total crashes”<sup>29</sup>
- East 14<sup>th</sup> Street, San Leandro CA, unknown date: “total number of accidents...decreased by 52 percent”<sup>30</sup>
- One treatment site in Athens-Clarke County GA, 2001 report: “51.1% reduction in **crash rate** (first 6 months)”<sup>31</sup>
- One treatment site in Orlando, 2002 report: “34% reduction in **crash rate**”<sup>32</sup>
- Ocean Park Boulevard, Santa Monica, 2008: “65 percent reduction” in crashes”<sup>33</sup>
- Lawyers Road, Reston VA, 2009: “70 percent reduction in crashes”<sup>34</sup>
- Soapstone Drive, Reston VA, 2011: “crash reduction of 70 percent”<sup>35</sup>
- Ingersoll Avenue, Des Moines, 2010: “50 percent reduction in crashes”<sup>36</sup>
- Wells Avenue, Reno, 2003: 31% reduction in crashes<sup>37</sup>
- California Avenue / Mayberry Drive, Reno, 2010: 42% reduction in crashes<sup>38</sup>
- Arlington Avenue, Reno, unknown date: 46% reduction in crashes<sup>39</sup>
- Mill Street, Reno, unknown date: 43% reduction in crashes<sup>40</sup>
- Luten Avenue, Staten Island, unknown date: reduced injury crashes from 3.3 per year “before” to 2.3 per year “after”<sup>41</sup>
- Ninth Avenue, Manhattan, 2007: “58 percent decrease in injuries”<sup>42</sup>
- Empire Boulevard, Brooklyn, 2009: “crash injuries reduced by 27 percent”<sup>43</sup>

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<sup>28</sup> Converting Four-Lane Undivided Roadways, p. 9

<sup>29</sup> Converting Four-Lane Undivided Roadways, p. 10

<sup>30</sup> Converting Four-Lane Undivided Roadways, p. 10

<sup>31</sup> Road Diet Informational Guide, by Keith Knapp et al., FHWA, Nov. 2014  
[https://safety.fhwa.dot.gov/road\\_diets/info\\_guide/index.cfm](https://safety.fhwa.dot.gov/road_diets/info_guide/index.cfm), Appendix A

<sup>32</sup> Road Diet Informational Guide, Appendix A

<sup>33</sup> Road Diet Case Studies, FHWA, 2015, p. 19

<sup>34</sup> Road Diet Case Studies, p. 23

<sup>35</sup> Road Diet Case Studies, p. 25

<sup>36</sup> Road Diet Case Studies, p. 29

<sup>37</sup> Road Diet Case Studies, p. 35 [1- 85/123 = 31%]

<sup>38</sup> Road Diet Case Studies, p. 30

<sup>39</sup> Road Diet Case Studies, p. 30

<sup>40</sup> Road Diet Case Studies, p. 30

<sup>41</sup> Road Diet Case Studies, p. 37 [1- 2.3/3.3 = 30%]

<sup>42</sup> Road Diet Case Studies, p. 39

<sup>43</sup> Road Diet Case Studies, p. 41

- West Sixth Street, Brooklyn, after Nov. 2009: 24% reduction in injury crashes<sup>44</sup>
- Nickerson Street, Seattle, 2010: 23% reduction in collisions<sup>45</sup>
- Stone Way, Seattle, 2007: “injury collisions decreased by 33 percent”<sup>46</sup>
- Fourth Plain Boulevard, Vancouver WA, 2002<sup>47</sup>
  - “collisions...decreased by 52%”
  - “no reported pedestrian collisions...after implementation” compared to “two pedestrian collisions per year” prior
- Baxter Street, Athens GA, 1999: “number of crashes [was] reduced by 53%”<sup>48</sup>
- US 18, Clear Lake IA, 2003: “65% decrease in crashes per year”<sup>49</sup>
- St. George Street, Toronto, 1996<sup>50</sup>
  - “The number of collisions before the lane reduction...was about 33 per year.”
  - “the number of collisions was...reduced to about 19 collisions per year”
    - i.e. a 42% decrease in collisions
- 17<sup>th</sup> Street West, Billing MT, 1979<sup>51</sup>
  - “37 reported accidents in the 20 months before the conversion”
  - “14 [crashes] for the same time period after the conversion”
    - i.e. a 62% reduction in crashes
- US 27, Campbell County KY, 2008: “68 percent overall decrease in crashes”<sup>52</sup>
- Euclid Avenue, Fayette County KY, 2000: “56 percent overall decrease in crashes”<sup>53</sup>
- KY 1428, Floyd County KY, 2005: “55 percent overall decrease in crashes”<sup>54</sup>
- US 172, Mercer County KY, 2006: “41 percent overall decrease in crashes”<sup>55</sup>
- Flindt Drive, Storm Lake IA, 1993: “51 percent reduction in crashes”<sup>56</sup>
- US 75, Sioux Center IA, 1999: “crash reduction of about 57 percent for a period of one year.”<sup>57</sup>
- Edgewater Drive, Orlando, unknown date: “**Crash rates** decreased by 34%”<sup>58</sup>

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<sup>44</sup> Road Diet Case Studies, p. 43 [1- 21.5/28.3 = 24%]

<sup>45</sup> Road Diet Case Studies, p. 47

<sup>46</sup> Road Diet Case Studies, p. 49

<sup>47</sup> Road Diet Handbook: Setting Trends for Livable Streets, by Jennifer Rosales, Parsons Brinckerhoff, Second Edition, July 2007, p. 38

<sup>48</sup> Road Diet Handbook, p. 49

<sup>49</sup> Road Diet Handbook, p. 58

<sup>50</sup> Road Diet Handbook, p. 67

<sup>51</sup> Converting Four-Lane Undivided Roadways, p. 8

<sup>52</sup> Guidelines for Road Diet Conversions, by Nikiforos Stamatiadis et al., Kentucky Transportation Center, University of Kentucky, Nov. 2011, p. 25

<sup>53</sup> Guidelines for Road Diet Conversions, p. 25

<sup>54</sup> Guidelines for Road Diet Conversions, p. 25

<sup>55</sup> Guidelines for Road Diet conversions, p. 25

<sup>56</sup> Guidelines for the Conversion of Urban Four-Lane Undivided Roadways to Three-Lane Two-Way Left-Turn Lane Facilities, by Keith K. Knapp and Karen Giese, for Iowa Department of Transportation, April 2001, p. 18

<sup>57</sup> Guidelines for the Conversion, p. 20

<sup>58</sup> Road Diet Handbook, p. 20



- Grand River Avenue, East Lansing MI, unknown date: “Total reported accidents declined 22%”<sup>59</sup>
- Abbott Road, East Lansing MI, no date: “Total reported accidents declined by 24%”<sup>60</sup>

Unfortunately, some road diet documents simply report a positive **direction of safety change**:

- US 12, Helena MT, unknown year: “number of accidents has decreased”<sup>61</sup>
- 21<sup>st</sup> Avenue East, Duluth MN, unknown year: “improvement in safety”<sup>62</sup>
- Clay Street, Muscatine IA, unknown year: “large reduction in accidents due to the conversion”<sup>63</sup>

Studies covering **multiple facilities**—with therefore results which should be given greater weight—have also revealed positive safety impacts:

- 15 sites in Iowa: “18% reduction in the **crash rate**”<sup>64</sup>
- 30 sites in CA and WA states: “the HSIS (California and Washington) data indicate a 19 percent decrease [in total crashes]”<sup>65</sup>
- 7 sites in Minnesota: “42-43% reduction in crashes”<sup>66</sup>
- 7 sites in Genesee County Michigan: 32-39% reduction for most crash types<sup>67</sup>

### *No Significant Change*

Some studies found an insignificant change in safety:

- A study of 24 sites in Michigan revealed “9% reduction in total crashes (non-significant)”<sup>68</sup>
- A study of Cordova Street in Pasadena showed “a slight reduction in total collisions and injuries.”<sup>69</sup>
- Given that Oak Street in Dunn Loring VA “had averaged less than a single crash per year”, the fact that there were “no crashes in the first year following the project’s completion”<sup>70</sup> indicates an insignificant change in safety.

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<sup>59</sup> Road Diet Handbook, p. 23

<sup>60</sup> Road Diet Handbook, p. 22

<sup>61</sup> Converting Four-Lane Undivided Roadways, p. 8

<sup>62</sup> Converting Four-Lane Undivided Roadways, p. 8

<sup>63</sup> Converting Four-Lane Undivided Roadways, p. 9

<sup>64</sup> Road Diet Informational Guide, Appendix A

<sup>65</sup> Evaluation of Lane Reduction “Road Diet” Measures on Crashes, FHWA, Highway Safety Information System, Turner-Fairbank Highway Research Center, McLean VA, FHWA-HRT-10-053, undated , p. 4

<sup>66</sup> Road Diet Informational Guide, Appendix A

<sup>67</sup> Road Diet Case Studies, p. 5

<sup>68</sup> Road Diet Informational Guide, Appendix A

<sup>69</sup> Road Diet Case Studies, p. 17

<sup>70</sup> Road Diet Case Studies, p. 27

- Kaikorai Valley Road, Dunedin, New Zealand, 2003: “about a 10% crash reduction”<sup>71</sup>
- 12 treatment sites in CA and WA: “no reduction in **crash rate**”<sup>72</sup>
- Valencia Street, San Francisco, 1999: “No significant change occurred in number of collisions”<sup>73</sup>
- Burcham Road, East Lansing MI, no date: “No significant change in accident frequency”<sup>74</sup>

### *Negative Outcomes (decreased safety)*

Some studies showed negative safety outcomes:

- Division Street, Grand Rapids, no date:
  - Although showing a “reduction in head-on left turn (-38%), angle (-17%), and sideswipe crashes (-20%)”, a study revealed “**rear-end crashes nearly tripled** after installation”, likely a product of the resulting increase in congestion (“longer queues”, “longer travel times”).<sup>75</sup>
- US 60, Versailles (Woodford County) KY, 2008: Although “injury crashes showed a 10% reduction”, “crashes increased 88% per year”.<sup>76</sup>
  - The increase in crashes was attributed to “improper transition of the road diet terminus and access management at the same location.”<sup>77</sup>

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<sup>71</sup> Road Diet Handbook, p. 77

<sup>72</sup> Road Diet Informational Guide, Appendix A

<sup>73</sup> Road Diet Handbook, p. 18

<sup>74</sup> Road Diet Handbook, p. 20

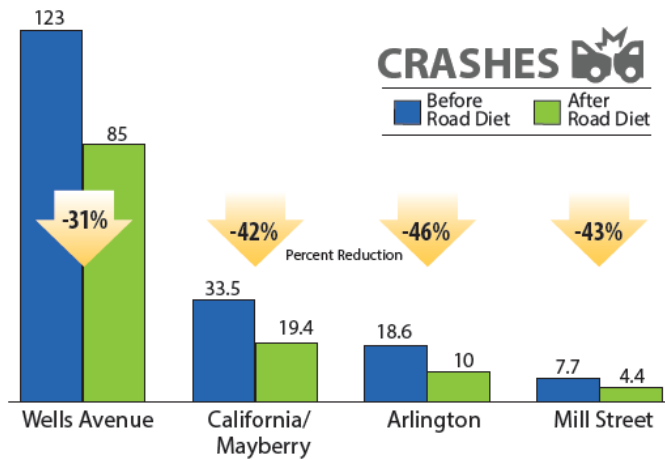
<sup>75</sup> Road Diet Case Studies, p. 7

<sup>76</sup> Guidelines for Road Diet Conversions, Appendix A, p. 8

<sup>77</sup> Guidelines for Road Diet Conversions, p. 26

## Summary

An examination of the above before/after safety data reveals that a significant positive safety outcome—**typically a 50% decrease in auto crashes**<sup>78</sup>—is the norm following road diet implementation.



## Annualized Crashes in Reno

Source: Road Diet Case Studies, p. 30

<sup>78</sup> Given that road diets often cause a reduction in traffic volume (as shown below), crash “rates” are preferable to crash “numbers” for before/after road diet analyses. Although most of the reviewed literature provides crash numbers (and not rates), the combination of—a) the moderate decrease in volume, and b) the large decrease in crashes—indicates a significant decrease in crash “rates” from road diets.

## Vehicle Running Speed

Considering speed, it is important to differentiate between a segment's *running* speed—i.e. the speed a vehicle travels between stops—and *average* speed along a segment—which reflects time spent stopped. *Average* speed is important for determining the length of time a trip will take, whereas *running* speed is important for determining safety and the comfort of others parking, turning, biking, and walking along a segment.

For streets, lowering vehicle running speeds can improve operation by reducing vehicle crash frequency and severity, and by making cyclists and pedestrians more safe and comfortable. Since roads are for traveling *long* distances between places and streets are for traveling *short* distances to access places, it is less important for streets to have the travel time benefits of high speeds.

### *Positive Outcomes (lower speed)*

- Division Street, Grand Rapids, no date: “Decreased vehicle speeds (**-1 to -4 mph**)”<sup>79</sup>
- Wells Avenue, Reno, 2003: “traffic speeds...decreased between **5 and 9 miles per hour**”<sup>80</sup>
- Luten Avenue, Staten Island, no date: “The percentage of vehicles exceeding the speed limit **decreased by 34 percent** along southbound...and **decreased 21 percent** in the northbound direction.”<sup>81</sup>
- West Sixth Street, Brooklyn, no date: “average speeds...**decreased by 8 to 12 percent**”<sup>82</sup>
- Nickerson Street, Seattle, 2010: “top end speeders [10+ mph over speed limit] have been **reduced by more than 90%**”<sup>83</sup>
- Stone Way, Seattle, 2007: “Top speeders (those traveling more than 10 mph over the speed limit) **decreased by more than 80 percent.**”<sup>84</sup>
- Fourth Plain Boulevard, Vancouver WA, 2002: “Traffic speeds...**decreased by about 18%**”<sup>85</sup>
- US 18, Clear Lake, IA, 2003<sup>86</sup>
  - “**52% reduction in aggressive speeding** [5+ mph over speed limit]”
  - “number of vehicles driving over the speed limit was **reduced by 32%**”

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<sup>79</sup> Road Diet Case Studies, p. 7

<sup>80</sup> Road Diet Case Studies, p. 35

<sup>81</sup> Road Diet Case Studies, p. 37

<sup>82</sup> Road Diet Case Studies, p. 43

<sup>83</sup> Road Diet Case Studies, p. 47

<sup>84</sup> Road Diet Case Studies, p. 49

<sup>85</sup> Road Diet Handbook, p. 39

<sup>86</sup> Road Diet Handbook, p. 58

- Kaikorai Valley Road, Dunedin, New Zealand, 2003: “Before the road diet project, approximately 21% of speeds were greater than 40 mph..., compared to **only 5% greater after the road diet.**”<sup>87</sup>
- East 14<sup>th</sup> Street, San Leandro CA, no date: “spot speeds along this roadway decreased a maximum of **three to four mph** after the conversion”<sup>88</sup>
- US 75, Sioux Center IA, 1999: “The average free-flow speed..., or the speed chosen by drivers unrestricted by congestion, was reduced from approximately **35 mph to about 32 mph.**”<sup>89</sup>
- Tacoma Street, Portland, unknown date<sup>90</sup>: % over speed limit-
  - Westbound: before 97%; after 58%
  - Eastbound: before 93%; after 70%

<b>TOP END SPEEDERS</b> <i>Percent 10+ mph over the speed limit</i>			
	Before	After	Change
Westbound	17%	1.4%	-92%
Eastbound	38%	1.5%	-96%

### Road Diet, Nickerson Street, Seattle

Source: Road Diet Case Studies, p. 47

#### *No Significant Change*

- US 61, Blue Grass IA, 1999: “The 85<sup>th</sup> percentile vehicle speeds along eastbound U.S. 61...ranged from a decrease of one mph to an increase of two miles per hour.”<sup>91</sup>

#### *Summary*

Based on the above experiences, one can expect a road diet to reduce vehicle running speeds by **a few miles per hour**, and—perhaps more importantly—reduce the amount of **excessive speeding**.

<sup>87</sup> Road Diet Handbook, p. 76

<sup>88</sup> Converting Four-Lane Undivided Roadways, p. 10

<sup>89</sup> Guidelines for the Conversion, p. 20

<sup>90</sup> Road Diet Handbook, p. 26

<sup>91</sup> Guidelines for the Conversion, p. 25

## Intersection Delay

Unlike lower running speeds, increased vehicle delay at intersections does not benefit motorists, cyclists, or pedestrians; it simply wastes time.

Although some road diet studies report modeled forecasts of intersection delay conducted to determine design and feasibility of candidate road diets, for the sake of reliability, only actual measured changes in intersection delays (i.e. from a before-and-after analysis) are included below.

### *Positive Outcomes (less intersection delay)*

No examples of a road diet reducing intersection motorist delays were encountered.

### *No Significant Change*

- 17<sup>th</sup> Street West, Billings MT, 1979: “**no significant increase** in delay”<sup>92</sup>
- Cordova Street, Pasadena, 2010: “**no changes** to pedestrian or vehicular levels of service”<sup>93</sup>
- Wells Avenue, Reno, 2003: “**no change** to the road’s level of service”; “speculates that this is likely due to the...exclusive left-turn lanes at signalized intersections.”<sup>94</sup>

### *Negative Outcomes (more intersection delay)*

- Euclid Avenue, Fayette County KY, 2000: “The travel time studies conducted showed **some congestion issues** with an average travel speed of 12 mph during the PM peak period.”<sup>95</sup>
- Division Street, Grand Rapids, unknown date<sup>96</sup>:
  - “Northbound [**PM queues**] **increased** from 81 feet before to 180 feet after”
  - “average increase of 19 to 52 **seconds [to travel]** through corridor”<sup>97</sup>
- US 75, Sioux Center IA, 1999: “**travel times** along U.S. 75...increased during the morning and evening peak travel periods from about 50 seconds to 68 seconds.”<sup>98</sup>

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<sup>92</sup> Converting Four-Lane Undivided Roadways, p. 8

<sup>93</sup> Road Diet Case Studies, p. 17

<sup>94</sup> Road Diet Case Studies, p. 35

<sup>95</sup> Guidelines for Road Diet Conversions, p. 25

<sup>96</sup> Road Diet Case Studies, p. 7

<sup>97</sup> Given that vehicle speeds decreased 1 to 4 mph, travel time increase is apparently due to intersection delay.

<sup>98</sup> Guidelines for the Conversion, pp. 19 and 20

## Summary

The fact that all three of the above road diets with a significant *increase* in delay—Euclid Avenue (15,900 vpd), Division Street (15,000 vpd), and US75 (14,500 vpd)—have approximately 15,000 vpd<sup>99</sup> indicates **the risk of implementing road diets on facilities with 15,000+ volume**. (Note that 15k is considered the maximum volume for a road diet by Pasadena.)<sup>100</sup>



**Alabama Street, Indianapolis, by Rundell Ernstberger Assoc. LLC**

Source: Road Diet Case Studies, p. 50

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<sup>99</sup> Guidelines for Road Diet Conversions, p. 25; Road Diet Case Studies, p. 6; Guidelines for the Conversion, p. 19

<sup>100</sup> Road Diet, Participant Notebook, FHWA Road Diet Workshop, for Transportation Training Academy, Center for Transportation Studies, U. Va., May 2016, p. 2-2



## Bicycle Usage

### *Positive Outcomes (higher bicycle usage)*

- Seventh Street, Los Angeles, 2011: “bicycle use in the corridor **tripled**”<sup>101</sup>
- Division Street, Grand Rapids, unknown date: “Increased pedestrian/bicycle flow **(+13% PM, +57% off-peak, and -14% AM)**”<sup>102</sup>
- Stone Way, Seattle, 2007: “volume of bicyclists **increased 35 percent** from 2007 to 2010”<sup>103</sup>
- Valencia Street, San Francisco, 1999: “Bicycle usage **increased 144%**...during the PM peak hour.”<sup>104</sup>
- Fell Street, San Francisco, 2003<sup>105</sup>
  - “Number of cyclists **increased by about 40%.**”
  - “Number of cyclists on the sidewalk...decreased by 80%.
- Polk Street, San Francisco, 2000<sup>106</sup>: Bicycle usage increased-
  - “**by 41%** in the AM peak hour”
  - “**by 28%** in the PM peak hour”
- Edgewater Drive, Orlando, unknown date: “Bicycle volume **increased by 30%.**”<sup>107</sup>

### *No Significant Change*

- Baxter Street, Athens GA, 1999: “Bicycle lane usage after conversion was low, about 20 bikes per day.”<sup>108</sup> (Although no ‘before’ data was reported, it is assumed that before-project bike usage was also low.)

### *Summary*

Based on the above findings, it appears that an increase of approximately **30% in bicycle volume** can be expected when implementing a road diet with bike lanes.

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<sup>101</sup> Road Diet Case Studies, p. 21

<sup>102</sup> Road Diet Case Studies, p. 7

<sup>103</sup> Road Diet Case Studies, p. 49

<sup>104</sup> Road Diet Handbook, p. 18

<sup>105</sup> Road Diet Handbook, p. 18

<sup>106</sup> Road Diet Handbook, p. 18

<sup>107</sup> Road Diet Handbook, p. 20

<sup>108</sup> Road Diet Handbook, p. 49

## Walking

### *Positive Outcomes (higher walking)*

- Edgewater Drive, Orlando, unknown date: “Pedestrian volume increased by 23%.”<sup>109</sup>

### *Summary*

Although, given the scarcity of pedestrian data for road diets, it is currently **not possible** to know the impact of road diets on walking, **one expects** the lower vehicle running speeds and fewer lanes to cross associated with road diets to increase the safety and comfort—and therefore the amount—of walking.



**Pedestrian Refuge, Luten Avenue, Staten Island, by NYCDOT**

Source: Road Diet Case Studies, p. 36

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<sup>109</sup> Road Diet Handbook, p. 20

## Bus Ridership

### *Positive Outcomes (higher bus ridership)*

- Dexter Avenue, Seattle, 2011: “moving several bus stops to in-lane, creating bus bulbs”, “bus ridership has increased by 30 percent between 2010 and 2013”<sup>110</sup>

Note that Dexter Avenue differs from most road diets in that it has no center TWLTL (as shown below), and therefore has room for bus stop islands.



**Bus Stop Islands in Dexter Avenue, Seattle**

Source: Google Maps, accessed 30 Aug 2017

### *Summary*

Bus ridership impact being missing from the reviewed case studies of typical road diets (4 lanes converted to 2 lanes plus TWLTL), the impact of typical road diets **on transit usage is unclear**. However, 1) the Dexter Avenue experience (although only one example) **shows promise** for conversions with bus stop islands, and 2) the lower vehicle running speeds and fewer lanes to cross associated with road diets increases the safety and comfort of walking and therefore are expected to increase the usage of buses (which requires walking).

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<sup>110</sup> Road Diet Case Studies, p. 45

## Auto Volume

All other things being equal (e.g. environmental impacts), high numbers of transportation trips are desirable for the social and commercial interaction transportation enables. High *auto* volumes on a street, however, can reduce the overall safety and pleasantness of a street. Therefore, the lowering of traffic volumes on a street—if accompanied by a matching increase in usage of other modes on that street, and/or a matching shift of thru vehicle trips to a more appropriate facility; i.e. if neither reducing the number of visits to businesses on the subject street, nor shifting vehicle trips to inappropriate facilities—may be considered desirable.

### *Positive Outcomes (significantly lower auto volume)*

- Division Street, Grand Rapids, no date: “**15,000 vehicles per day**”; “Decreased volumes (**-18% to -29%**)”;<sup>111</sup>
- Ocean Park Boulevard, Santa Monica, 2008: “**23,000 vehicles per day**”; “Volumes...decreased by approximately **3,000-4,500 vehicles per day** after the conversion.”<sup>112</sup>
- US 27, Campbell County KY, 2008: “reduction in the ADT (**from 10,600 vpd to 7,410 vpd**)”<sup>113</sup>
- Valencia Street, San Francisco, 1999: “Motor vehicle traffic **decreased by 10%**, from **22,000 to 20,000 ADT**.”<sup>114</sup>
- Wells Avenue, Reno, 2003: “approximate **10 percent drop** in traffic volume”<sup>115</sup>
- Main Street, Santa Monica CA, no date<sup>116</sup>
  - **20,000 ADT before**
  - **18,000 ADT after**
- Edgewater Drive, Orlando, unknown date: “Traffic volumes...**decreased by 12%**”<sup>117</sup>
- Delridge Way, Seattle, 1988<sup>118</sup>:
  - **18,612 before**
  - **14,661 after**

Note that most of these roadways (for which road diets significantly lowered auto volumes), had **more than 15,000 vpd prior to the road diet**.

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<sup>111</sup> Road Diet Case Studies, pp. 6, 7

<sup>112</sup> Road Diet Case Studies, pp. 18, 19

<sup>113</sup> Guidelines for Road Diet Conversions, p. 25

<sup>114</sup> Road Diet Handbook, p. 18

<sup>115</sup> Road Diet Case Studies, p. 35

<sup>116</sup> Road Diet, Participant Notebook, p. 2-3

<sup>117</sup> Road Diet Handbook, p. 20

<sup>118</sup> Road Diet Handbook, p. 30

### *No Significant Change*

- Ingersoll Avenue, Des Moines, 2010: “traffic volumes **did not decrease**”<sup>119</sup>
- Nickerson Street, Seattle, 2010: “a **1 percent decrease** in traffic volumes”<sup>120</sup>
- Electric Avenue, Lewistown PA, no date<sup>121</sup>
  - 13,000 ADT before
  - 14,500 ADT after
- Burcham Road, East Lansing MI, no date<sup>122</sup>
  - 11-14,000 ADT before
  - 11-14,000 ADT after
- Grand River Avenue, East Lansing MI, no date<sup>123</sup>
  - 23,000 ADT before
  - 23,000 ADT after
- Abbott Road, East Lansing MI, no date: “**no change** in ADT”<sup>124</sup>
- St. George Street, Toronto, 1996: “ADT was about 7,300 vehicles in 1994 and about 7,400 vehicles in 2003”<sup>125</sup>
- Baxter Street, Athens GA, 1999: “traffic diversion...totaled **about 4%**”<sup>126</sup>
- Kaikorai Valley Road, Dunedin, New Zealand, 2003<sup>127</sup>
  - 8,600-9,800 ADT before
  - 10,000 ADT after
- East 14<sup>th</sup> Street, San Leandro CA, no date<sup>128</sup>
  - “16,000 to 19,300 vpd before”
  - “14,000 to 19,300 vpd after”
- KY 1428, Floyd County KY, 2005: “from 15,939 vpd in 2005 to 16,139 vpd in 2009”<sup>129</sup>
- US 172, Mercer County KY, 2006: “2002 (12,600 vpd) and 2009 (11,300 vpd)”<sup>130</sup>
- US 60, Versailles KY, 2008: “In 2005, the volume was 10,900 vehicles per day and in 2009 11,000 vehicles per day.”<sup>131</sup>
- Tacoma Street, Portland, unknown date: ADT **decreased 6%**<sup>132</sup>

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<sup>119</sup> Road Diet Case Studies, p. 29

<sup>120</sup> Road Diet Case Studies, p. 47

<sup>121</sup> Road Diet, Participant Notebook, p. 2-3

<sup>122</sup> Road Diet, Participant Notebook, p. 2-3

<sup>123</sup> Road Diet, Participant Notebook, p. 2-3

<sup>124</sup> Road Diet Handbook, p. 22

<sup>125</sup> Road Diet Handbook, p. 68

<sup>126</sup> Road Diet Handbook, p. 49

<sup>127</sup> Road Diet Handbook, p. 78

<sup>128</sup> Converting Four-Lane Undivided Roadways, p. 10; no change to higher volume (19,300)

<sup>129</sup> Guidelines for Road Diet Conversions, p. 25

<sup>130</sup> Guidelines for Road Diet Conversions, p. 26

<sup>131</sup> Guidelines for Road Diet Conversions, Appendix A, p. 8

Seattle examples of **no significant change** in auto volume<sup>133</sup>

- Eastlake Avenue, Seattle, 1987
  - 15,562 before (1986)
  - 14,960 after (1988)
- Dexter Avenue, Seattle, 1991
  - 13,606 before (1990)
  - 14,949 after (1996, i.e. six years later)
- Government Way / Gilman Avenue, Seattle, 1991
  - 12,916 before (1990)
  - 14,286 after (1994)
- 8<sup>th</sup> Avenue, Seattle, 1994
  - 10,549 before (1993)
  - 12,328 after (1999, i.e. six years later)
- Martin Luther King Jr. Way, Seattle, 1994
  - 12,336 before (1993)
  - 13,340 after (1999, i.e. six years later)
- Madison Street, Seattle, 1994
  - 16,969 before (1993)
  - 17,848 after (1999)
- California Avenue, Seattle, 1994
  - 15,469 before (1993)
  - 14,466 after (1995)
- 24<sup>th</sup> Street, Seattle, 1995
  - 9,727 before (1994)
  - 9,752 after (1999)
- 12<sup>th</sup> Avenue, Seattle, 1995
  - 11,751 before (1994)
  - 12,144 after (1999)
- Greenwood Avenue, Seattle, 1995
  - 11,872 before (1994)
  - 12,427 after (1995)
- Alaskan Way / Marginal Way, Seattle, 1997
  - 10,206 before (1994)
  - 10,904 after (1998)
- Beacon Avenue, Seattle, 2002
  - 11,323 before (1998)
  - 10,602 after (2003)

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<sup>132</sup> Road Diet Handbook, p. 26

<sup>133</sup> Road Diet Handbook, p. 30

### *Summary(auto volume)*

The above data shows that diets on roads with **more than 15,000 vpd tend to reduce auto volumes**, whereas diets on roads with **less than 15,000 vpd do not tend to affect auto volumes**. It appears that the increased intersection delay of road diets implemented on facilities with more than 15,000 vpd (as shown in an earlier section) causes this reduction in auto volumes on high-volume facilities. Although this decrease in auto volumes may be desirable for the comfort and safety of street users (that desirability subject to examination of the modal and spatial shifts discussed at the beginning of this section), this **volume-reduction benefit is likely out-weighed by the disbenefit of delays** associated with road diets implemented on facilities with more than 15,000 vpd pre-diet.

## Summary (measurable impacts)

Although results vary by measure of effectiveness, road diets—if implemented on roads with **less than 15,000 vpd**—typically have **good results**:

- safety
  - typically a **50% decrease in auto crashes**
- vehicle running speeds
  - typically reduce vehicle running speeds by **a few miles per hour**, and reduce the amount of excessive speeding
- intersection delay
  - the road diets with a significant increase in delay had approximately 15,000 vpd, indicating the danger of road diets on roadways with **15k+ volume**
- bicycle usage
  - an increase of approximately **30% in bicycle volume** can be expected when implementing a road diet with bike lanes
- walking
  - given the scarcity of pedestrian data for road diets, it is currently not possible to know the impact of road diets on walking, but lower auto speeds and fewer lanes to cross **benefit pedestrians**
- bus ridership
  - based on the scarcity of data, the impact of typical road diets on transit usage is unclear, but bus **riders usually walk** to begin/finish their trips
- auto volume
  - the excessive intersection delay of road diets implemented on roads with **more than 15,000 vpd** causes a reduction in auto volumes



## CANDIDATE SEGMENTS FOR ROAD DIETS IN HAMPTON ROADS

Based on the above introduction and pros and cons of road diets:

- a road diet is *possible*:
  - for segments having a **4-lane, undivided** cross-section
- a road diet *can be expected to*:
  - increase **safety**
  - increase **cycling, bus transit, and walking**
  - improve **access to street land uses** (via fewer lanes to cross, on-street parking)
- a road diet is *not advisable*:
  - for segments having **more than 15,000 vpd**

Therefore, a road diet is *desirable*:

- for segments with a **high crash** rate, **or**
- for segments along which localities wish to **accommodate cycling, bus transit, and walking** (e.g. gaps in alt-transportation network, low-income areas, etc.), **or**
- for “roads” which localities wish to convert to “streets” to improve access to **street-oriented land uses** (e.g. townhouses, apartments, and shops on street)

Consequently, to help localities find locations to investigate for a possible road diet, staff prepared 1) a database, 2) maps, and 3) observations concerning the above issues for existing **4-lane undivided** segments with **less than 12,500 vpd**<sup>134</sup>. The database contains:

- existing cross-section type
- segment length
- average annual daily traffic (AADT)
- **crash history and rate**

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<sup>134</sup> The 12,500 vpd level was chosen in order to avoid the problems found above for road diets on segments with approximately 15,000 vpd.

## TABLE 1 Candidate Road Diet Segments- type, length, volume, crashes

Source: HRTPO staff compilation of data from Google Maps (type, length), VDOT (volume, crashes)

[see following pages for multi-page table]

Note: Assuming that, for intersection capacity, a lane reduction would likely not be made at the intersections at the *ends* of a road-diet segment (and that, even if a lane reduction *were* made at the ending intersections, such reduction would affect only one approach), HRTPO staff excluded crashes at the intersections at the ends of the subject segments in the database.

Key: double-digit crash rates

### Abbreviations:

"AADT"	average annual daily traffic
"VMT"	vehicle miles traveled
"4LU"	4-lanes undivided
"TWLTL"	two-way left-turn lane
"OWLTL"	one-way left-turn lane

Locality	Name	From	To	Existing Cross- Section	Existing Separation Directions	Length, ft	AADT			Fatal Crashes (2012- 2016)	Injury Crashes (2012- 2016)	Crashes (PDO) (2012- 2016)	Total Crashes (2012- 2016)	Crash Rate	
							AADT (2012- 2016) sum	AADT (2016) sum	VMT (2012- 2016) sum					VMT (2012- 2016) per million	
Ches/Ports	Churchland Blvd (Ches.)	Towne Point Rd	Ches/Ports line	4LU	TWLT	500	12,000	20,463,000	0	3	3	6	1,937,784	see below	
Ches/Ports	Churchland Blvd (Portsm.)	Ches/Ports line	W Norfolk Rd	4LU	TWLT	500	13,000	22,655,000	0	1	4	5	2,145,360	see below	
Ches/Ports	Churchland Blvd (Portsm.)	W Norfolk Rd	Tyre Neck Rd	4LU	TWLT	600	9,900	16,078,700	0	4	4	8	1,827,125	see below	
Ches/Ports	Churchland Blvd (Portsm.)	Tyre Neck Rd	High St	4LU	TWLT	1,500	9,300	16,625,900	0	2	5	7	4,723,267	see below	
Ches/Ports	Churchland Blvd	Towne Point Rd	High St	4LU	TWLT	3,100	see above	see above	0	10	16	26	10,633,536	2	
Chesapeake	22nd St	Liberty St	Berkley Ave Ext	4LU	no TWLTL	2,200	5,800	10,012,000	0	0	3	3	4,171,667	1	
Chesapeake	Bainbridge Blvd	Pointdexter St	Post Ave	4LU	no TWLTL	3,700	9,200	15,748,200	0	17	12	29	11,035,670	3	
Chesapeake	Bainbridge Blvd	Godwin Ave	Chapin Rd	4LU	no TWLTL	4,200	11,000	18,817,700	0	11	11	22	14,968,625	1	
Chesapeake	Churchland Blvd	Towne Point Rd	Ches/Ports line	see Ches/Ports above											
Chesapeake	Great Bridge Blvd	Fernwood Farms Rd	River Walk Pkwy	4LU	TWLT	1,700	12,000	21,924,000	0	8	9	17	7,058,864	2	
Chesapeake	Johnstown Rd	Battlefield Blvd	Allen Dr	4LU	no TWLTL	2,800	3,500	6,029,100	0	13	19	32	3,197,250	10	
Chesapeake	Liberty St	Campostella Rd	Old Atlantic Ave	4LU	no TWLTL	1,800	4,500	7,892,800	1	4	1	6	2,690,727	see below	
Chesapeake	Liberty St	Old Atlantic Ave	Pointdexter St	4LU	no TWLTL	2,100	7,200	12,387,200	0	4	0	4	4,926,727	see below	
Chesapeake	Liberty St	Campostella Rd	Pointdexter St	4LU	no TWLTL	3,900	see above	see above	1	8	1	10	7,617,455	1	
Chesapeake	Military Hwy, South	Rotunda Ave	Mid Atl Leasing Corp	4LU	no TWLTL	2,000	8,500	14,067,900	0	1	1	2	5,328,750	0	
Chesapeake	Old Atlantic Ave	Atlantic Ave	Liberty St	4LU	no TWLTL	1,500	4,700	8,002,300	0	0	1	1	2,273,381	0	
Chesapeake	Poplar Hill Rd	Churchland Blvd	Western Branch Blvd	4LU	TWLT	1,300	12,000	20,097,000	0	2	5	7	4,948,125	1	
Chesapeake	Sparrow Rd	Indian River Shp Cntr	Providence Rd	4LU	no TWLTL	4,000	8,558	15,618,350	0	13	8	21	11,832,083	see below	
Chesapeake	Sparrow Rd	Providence Rd	Military Hwy	4LU	no TWLTL	1,200	4,929	8,995,425	0	5	3	8	2,044,415	see below	
Chesapeake	Sparrow Rd	Indian River Shp Cntr	Military Hwy	4LU	no TWLTL	5,200	see above	see above	0	18	11	29	13,876,498	2	
Franklin	2nd Ave	East St	Blackwater River Br	4LU	no TWLTL	850	7,000	14,103,700	0	0	1	1	2,270,482	0	
Gloucester	Fox Centre Pkwy	W Main St	Starbucks	4LU	TWLT	1,000	2,442	4,456,650	0	0	0	0	844,063	0	
Gloucester	Waltons Ln	W Main St	Home Depot	4LU	no TWLTL	600	10,770	19,655,250	0	1	3	4	2,233,551	2	
Hamp/NN	39th St (NN)	Marshall Ave	Hamp/NN corp. limit	4LU	no TWLTL	4,500	8,600	13,666,200	0	18	21	39	11,647,330	see below	
Hamp/NN	Pembroke Ave (Hamp)	Hamp/NN corp. limit	Greenlawn Ave	4LU	no TWLTL	1,200	8,200	14,398,200	1	3	5	9	3,272,318	see below	
Hamp/NN	39th St / Pembroke Ave	Marshall Ave	Greenlawn Ave	4LU	no TWLTL	5,700	see above	see above	1	21	26	48	14,919,648	3	
Hamp/NN	Newmarket Dr (Hamp)	Mercury Blvd	Hamp/NN corp. limit	4LU	no TWLTL	700	7,387	13,481,275	0	7	7	14	1,787,290	see below	
Hamp/NN	Marshall Ave (NN)	Hamp/NN corp. limit	74th Street	4LU	no TWLTL	1,800	5,142	9,384,150	0	19	5	24	3,199,142	see below	
Hamp/NN	Newmkt Dr / Marshall Ave	Mercury Blvd	74th Street	4LU	no TWLTL	2,500	see above	see above	0	26	12	38	4,986,432	8	
Hampton	Aberdeen Rd	Mercury Blvd	Todds Ln	4LU	no TWLTL	1,000	11,000	18,418,000	0	10	8	18	3,488,258	5	

Locality	Name	From	To	Existing Cross- Section	Existing Separation Directions	Length, ft	AADT				Fatal Crashes		Injury Crashes		Only (PDO) Crashes		Total Crashes		Total Crash Rate	
							AADT		(2012- 2016) sum	(2012- 2016) sum	(2012- 2016) sum	(2012- 2016) sum	(2012- 2016) sum	(2012- 2016) sum	(2012- 2016) sum	(2012- 2016) sum	(2012- 2016) sum	(2012- 2016) sum	(2012- 2016) per million VMT	(2012- 2016) per million VMT
Hampton	Big Bethel Rd	Todds Ln	Roberta Dr	4LU	no TWLTL	1,500	10,586	19,319,450	0	2	5	7	5,488,480	1						
Hampton	Briarfield Rd	Addison Ct	Town Park Dr	4LU	no TWLTL	5,500	11,000	19,002,000	0	23	30	53	19,793,750	3						
Hampton	Cunningham Dr	Enfield Dr	Mercury Blvd	4LU	no TWLTL	3,500	9,100	17,830,800	0	23	22	45	11,819,659	4						
Hampton	Kecoughtan Rd	Claremont Ave	Powhatan Pkwy	4LU	no TWLTL	4,100	4,800	8,660,400	1	16	19	36	6,724,932	see below						
Hampton	Kecoughtan Rd	Powhatan Pkwy	LaSalle Ave	4LU	no TWLTL	5,300	6,600	10,926,000	0	26	15	41	10,967,386	see below						
Hampton	Kecoughtan Rd	LaSalle Ave	Southampton Ave	4LU	OWLTLs	3,300	8,000	14,214,400	0	14	19	33	8,884,000	see below						
Hampton	Kecoughtan Rd	Southampton Ave	Victoria Blvd	4LU	no TWLTL	2,200	8,000	14,214,400	0	10	8	18	5,922,667	see below						
Hampton	Kecoughtan Rd	Victoria Blvd	Settlers Landing Rd	4LU	no TWLTL	1,600	10,000	17,686,000	0	8	9	17	5,359,394	see below						
Hampton	Kecoughtan Rd	Claremont Ave	Settlers Landing Rd	4LU	see above	16,500	see above	see above	1	74	70	145	37,858,379	4						
Hampton	McNair Dr	Mellon St	Old Pt Comfort Marina	4LU	no TWLTL	1,900	2,500	4,562,500	0	0	0	0	1,641,809	0						
Hampton	Mercury Blvd	Pembroke Ave	Halifax Ave	4LU	no TWLTL	1,200	11,000	18,126,000	0	22	8	30	4,119,545	7						
Hampton	Mercury Blvd	Old Buckroe Rd	Mallory St	4LU	no TWLTL	1,900	11,000	18,126,000	0	35	29	64	6,522,614	see below						
Hampton	Mercury Blvd	Mallory St	Mellon St	4LU	no TWLTL	4,300	2,600	4,131,000	0	9	22	31	3,364,261	see below						
Hampton	Mercury Blvd	Old Buckroe Rd	Mellon St	4LU	no TWLTL	6,200	see above	see above	0	44	51	95	9,886,875	10						
Hampton	Newmarket Dr	Mercury Blvd	Hamp/NN corp. limit	see Hamp/NN above																
Hampton	Pembroke Ave	Hamp/NN corp. limit	Greenlawn Ave	see Hamp/NN above																
Hampton	Pembroke Ave	Mercury Blvd	Woodland Rd	4LU	no TWLTL	1,000	10,000	20,097,000	0	11	17	28	3,806,250	see below						
Hampton	Pembroke Ave	Woodland Rd	Old Buckroe Rd	4LU	no TWLTL	5,800	11,000	21,192,000	1	84	71	156	23,279,091	see below						
Hampton	Pembroke Ave	Mercury Blvd	Old Buckroe Rd	4LU	no TWLTL	6,800	see above	see above	1	95	88	184	27,085,341	7						
Hampton	Pembroke Ave	Old Aberdeen Rd	Powhatan Pkwy	4LU	no TWLTL	5,800	8,400	16,296,400	1	42	34	77	17,901,348	see below						
Hampton	Pembroke Ave	Powhatan Pkwy	Settlers Landing Rd	4LU	no TWLTL	7,300	9,300	17,940,800	1	49	47	97	24,804,515	see below						
Hampton	Pembroke Ave	Settlers Landing Rd	LaSalle Ave	4LU	no TWLTL	900	9,700	18,526,200	0	23	22	45	3,157,875	see below						
Hampton	Pembroke Ave	LaSalle Ave	Armistead Ave	4LU	no TWLTL	3,800	7,900	15,823,400	0	44	41	85	11,388,053	see below						
Hampton	Pembroke Ave	Armistead Ave	King St	4LU	no TWLTL	1,400	8,300	16,333,500	0	13	15	28	4,330,852	see below						
Hampton	Pembroke Ave	Old Aberdeen Rd	King St	4LU	no TWLTL	19,200	see above	see above	2	171	159	332	61,582,644	5						
Hampton	Pine Chapel Rd	Pwr Plt shopping entr.	Coliseum Dr	4LU	TWLTL	1,900	9,891	18,051,075	0	3	2	5	6,495,652	see below						
Hampton	Pine Chapel Rd	Coliseum Dr	Saville Row	4LU	no TWLTL	1,200	5,326	9,719,950	0	4	3	7	2,209,080	see below						
Hampton	Pine Chapel Rd	Pwr Plt shopping entr.	Saville Row	4LU	see above	3,100	see above	see above	0	7	5	12	8,704,732	1						
Hampton	Queen St	Pine Chapel Baptist Ch.	Allison Sutton Dr	4LU	OWLTLs	2,700	10,000	18,563,000	0	10	10	20	9,492,443	see below						
Hampton	Queen St	Allison Sutton Dr	Michigan Dr	4LU	no TWLTL	3,500	10,000	18,563,000	0	16	22	38	12,305,019	see below						
Hampton	Queen St	Pine Chapel Baptist Ch.	Michigan Dr	4LU	see above	6,200	see above	see above	0	26	32	58	21,797,462	3						
Hampton	Woodland Rd	Pembroke Ave	Foxhill Rd	4LU	no TWLTL	9,600	9,100	15,457,100	0	42	41	83	28,103,818	3						
JCC/York	Merrimac Trail	I-64 exit 243B	I-64 exit 247	4LU	no TWLTL	15,800	11,000	18,233,600	0	21	23	44	54,562,667	1						

Locality	Name	From	To	Existing Cross- Section	Existing Separation Between Directions	Length, ft	Property Damage					Crash Rate (2012- 2016), per million VMT																						
							AADT (2012- 2016, sum)	Fatal Crashes (2012- 2016)	Injury Crashes (2012- 2016)	Only (PDO) Crashes (2012- 2016)	Total Crashes (2012- 2016)																							
James City	Merrimac Trail	I-64 exit 243B	I-64 exit 247	see ICC/York above	4LU TWLTL	6,200	8,500	14,506,400	0	10	8	18	17,034,030	1																				
James City	Pochontas Trail	Ft Magruder Hotel	Rte 199																															
Newport News	23rd St	Huntington Ave	West Ave	see Hamp/NN above	4LU no TWLTL	1,100	3,083	5,626,475	0	1	0	1	1,172,182	1																				
Newport News	39th St (NN)	Marshall Ave	Hamp/NN corp. limit																															
Newport News	City Center Blvd	Mid Atlantic Fasteners	Canon Blvd	4LU no TWLTL	4LU no TWLTL	1,900	7,359	13,430,175	0	5	8	13	4,832,828	see below																				
Newport News	City Center Blvd	Canon Blvd	Rock Landing Dr												4LU no TWLTL	1,900	2,500	4,562,500	0	6	7	13	1,641,809	see below										
Newport News	City Center Blvd	Mid Atlantic Fasteners	Rock Landing Dr																						4LU no TWLTL	3,800	see above	see above	0	11	15	26	6,474,637	4
Newport News	Denbigh Blvd	Catalina Dr	Lucas Creek Rd	4LU no TWLTL	2,600	8,909	16,258,925	0	5	7	12	8,006,289	1																					
Newport News	Marshall Ave	41st St	39th St	see Hamp/NN above	4LU no TWLTL	500	5,834	10,647,050	0	3	2	5	1,008,243	see below																				
Newport News	Marshall Ave	39th St	CSX railroad												4LU no TWLTL	500	4,460	8,139,500	0	5	3	8	770,786	see below										
Newport News	Marshall Ave	41st St	CSX railroad																						4LU no TWLTL	1,000	see above	see above	0	8	5	13	1,779,029	7
Newport News	Marshall Ave	Hamp/NN corp. limit	74th Street												4LU no TWLTL	2,600	8,909	16,258,925	0	5	7	12	8,006,289	1										
Newport News	River Rd	Mercury Blvd	75th St	see Hamp/NN above	4LU no TWLTL	1,000	5,678	10,362,350	0	1	5	6	1,962,566	3																				
Newport News	Thimble Shoals Blvd	Diligence Dr	J Clyde Morris Blvd												4LU no TWLTL	1,900	7,700	14,616,100	0	6	7	13	5,259,581	2										
Norfolk	Azalea Garden Rd	Kevin Dr	Norview Ave	4LU no TWLTL	4LU no TWLTL	2,200	12,000	20,828,000	0	2	8	10	8,678,333	see below																				
Norfolk	Azalea Garden Rd	Norview Ave	Little Creek Rd												4LU no TWLTL	7,000	12,000	20,828,000	1	9	13	23	27,612,879	see below										
Norfolk	Azalea Garden Rd	Kevin Dr	Little Creek Rd																						4LU no TWLTL	9,200	see above	see above	1	11	21	33	36,291,212	1
Norfolk	Colonial Ave	23rd St	27th St	4LU no TWLTL	4LU no TWLTL	1,100	5,672	10,351,400	0	11	12	23	2,156,542	11																				
Norfolk	Diven St	Terminal Blvd	Little Creek Rd												4LU no TWLTL	1,200	5,000	9,125,000	0	4	1	5	2,073,864	2										
Norfolk	Glenrock Rd	Virginia Beach Blvd	Poplar Hall Dr																						4LU no TWLTL	2,100	4,954	9,041,050	0	12	16	28	3,595,872	8
Norfolk	Poplar Hall Dr	Virginia Beach Blvd	Glenrock Rd																															
Norfolk	Princess Anne Rd	Church St	Wide St	4LU OWLTLs	4LU TWLTL	400	11,000	21,193,000	0	1	5	6	1,605,530	see below																				
Norfolk	Princess Anne Rd	Wide St	Tidewater Dr												4LU TWLTL	1,100	11,000	21,193,000	0	1	0	1	4,415,208	see below										
Norfolk	Princess Anne Rd	Church St	Tidewater Dr																						4LU see above	1,500	11,000	21,193,000	0	2	5	7	6,020,739	1
Norfolk	Robin Hood Rd	Walmer Ave	Ellsmere Ave	4LU no TWLTL	4LU no TWLTL	1,800	8,900	14,360,700	0	4	1	5	4,895,693	see below																				
Norfolk	Robin Hood Rd	Ellsmere Ave	I-64 EB Off-Ramp												4LU no TWLTL	700	12,000	18,490,300	0	0	2	2	2,451,366	see below										
Norfolk	Robin Hood Rd	Walmer Ave	I-64 EB Off-Ramp																						4LU no TWLTL	2,500	see above	see above	0	4	3	7	7,347,059	1
Norfolk	Robin Hood Rd	Walmer Ave	I-64 EB Off-Ramp																															
Norfolk	Sewells Point Rd	Azalea Garden Rd	Chesapeake Blvd	4LU TWLTL	4LU TWLTL	7,100	12,000	21,924,000	0	53	42	95	29,481,136	3																				
Norfolk	Sewells Point Rd	Widgeon Rd	Little Creek Rd												4LU no TWLTL	5,200	7,500	13,702,600	0	18	17	35	13,494,985	3										

Locality	Name	From	To	Existing Cross- Section	Existing Separation Between Directions	Length, ft	Property Damage					Crash Rate (2012- 2016), per million VMT		
							AADT (2012- 2016, sum)	Fatal Crashes (2012- 2016)	Injury Crashes (2012- 2016)	Only Crashes (2012- 2016)	Total Crashes (2012- 2016)			
Poquoson	Wythe Creek Rd	Storage World	Hudgins Rd	4LU	TWTLT	3,000	12,000	21,924,000	0	20	49	69	12,456,818	see below
	Wythe Creek Rd	Hudgins Rd	Wainwright Dr	4LU	TWTLT	2,600	7,700	14,068,000	0	4	7	11	6,927,424	see below
	Wythe Creek Rd	Storage World	Wainwright Dr	4LU	TWTLT	5,600	see above	see above	0	24	56	80	19,384,242	4
Portsmouth	Chautauqua Ave	Bayview Blvd	Detroit St	4LU	no TWLTL	2,100	1,091	1,991,075	0	1	0	1	791,905	1
	Churchland Blvd	Ches/Ports line	High St	see Ches/Ports above										
Portsmouth	County St	Godwin St	Elm Ave	4LU	no TWLTL	700	2,200	8,072,900	0	2	2	4	1,070,271	see below
Portsmouth	County St	Elm Ave	Effingham St	4LU	no TWLTL	1,700	4,200	8,257,800	0	1	3	4	2,658,761	see below
Portsmouth	County St	Godwin St	Effingham St	4LU	no TWLTL	2,400	see above	see above	0	3	5	8	3,729,032	2
Portsmouth	County St	Crawford St	Court St	4LU	no TWLTL	800	3,373	6,155,725	0	0	1	1	932,686	1
	Court St / Port Centre Pkwy	Wavy St	Portsmouth Blvd	4LU	no TWLTL	2,700	6,400	14,761,000	1	8	12	21	7,548,239	3
Portsmouth	Court St	High St	County St	4LU	no TWLTL	600	5,400	12,860,900	0	6	6	12	1,461,466	see below
	Court St	County St	Bart St	4LU	no TWLTL	600	6,400	13,884,400	0	2	7	9	1,577,773	see below
	Court St	High St	Bart St	4LU	no TWLTL	1,200	see above	see above	0	8	13	21	3,039,239	7
Portsmouth	Crawford St	London St	North St	4LU	OWLTLs	500	2,500	4,604,000	0	0	0	0	435,985	0
	Elm Ave	Summit Ave	Geo. Washington Hwy	4LU	no TWLTL	1,200	6,700	10,011,000	0	4	6	10	2,275,227	4
Portsmouth	Elm Ave	High St	County St	4LU	no TWLTL	600	11,000	17,832,300	0	3	5	8	2,026,398	see below
	Elm Ave	County St	South St	4LU	no TWLTL	1,000	9,700	18,013,800	0	5	6	11	3,411,705	see below
	Elm Ave	High St	South St	4LU	no TWLTL	1,600	see above	see above	0	8	11	19	5,438,102	3
Portsmouth	Elmhurst Lane	CSX R/R @ Garwood Ave	Airline Blvd	4LU	no TWLTL	1,300	3,600	6,358,600	0	3	5	8	1,565,564	see below
	Elmhurst Lane	Airline Blvd	Portsmouth Blvd	4LU	no TWLTL	5,300	6,900	11,838,900	0	9	12	21	11,883,744	see below
	Elmhurst Lane	CSX R/R @ Garwood Ave	Portsmouth Blvd	4LU	no TWLTL	6,600	see above	see above	0	12	17	29	13,449,309	2
Portsmouth	Garwood Ave	Greenwood Dr	Elmhurst Ln	4LU	no TWLTL	900	2,881	5,257,825	0	0	0	0	896,220	0
	High St	Chestnut St	Elm Ave	4LU	no TWLTL	1,300	11,000	18,965,500	0	2	1	3	4,669,536	1
	High St	Douglas Ave	Florida Ave	4LU	TWLT	400	11,000	19,732,000	0	1	0	1	1,494,848	1
	High St	Virginia Ave	MLK Freeway	4LU	no TWLTL	1,200	12,000	20,828,000	0	18	8	26	4,733,636	5
Portsmouth	Portsmouth Blvd	Deep Creek Blvd	Frederick Blvd	4LU	no TWLTL	900	7,600	11,949,600	0	19	8	27	2,036,864	see below
	Portsmouth Blvd	Frederick Blvd	Elm Ave	4LU	no TWLTL	4,100	9,000	15,713,500	0	23	19	42	12,201,771	see below
	Portsmouth Blvd	Elm Ave	Effingham St	4LU	no TWLTL	1,800	5,600	10,743,300	0	22	18	40	3,662,489	see below
	Portsmouth Blvd	Effingham St	Green St	4LU	no TWLTL	400	4,100	7,454,400	1	8	7	16	564,727	see below
	Portsmouth Blvd	Deep Creek Blvd	Green St	4LU	no TWLTL	7,200	see above	see above	1	72	52	125	18,465,850	7
Portsmouth	Twin Pines Rd	Hofflers Creek Pkwy	Willow Breeze Dr	4LU	no TWLTL	1,400	9,500	16,370,500	0	1	2	3	4,340,663	1
Portsmouth	West Norfolk Rd	Cedar Ln	River Pointe Pkwy	4LU	no TWLTL	6,800	3,800	7,819,000	0	6	1	7	10,069,924	1

Locality	Name	From	To	Existing Cross- Section	Existing Separation Between Directions	Length, ft	Property Damage					Total Crash Rate (2012- 2016), per million VMT		
							AADT (2012- 2016 sum)	Fatal Crashes (2012- 2016)	Injury Crashes (2012- 2016)	Only (PDO) Crashes (2012- 2016)	Total Crashes (2012- 2016)		VMT (2012- 2016, sum)	
Portsmouth	Western Branch Blvd	Rodman Ave	Halifax Ave	4LU	no TWLTL	400	5,051	9,218,075	0	0	0	0	698,339	0
Suffolk	Carolina Rd	SW Suffolk Bypass	Obici Industrial Blvd	4LU	no TWLTL	1,900	11,000	19,732,000	1	22	7	30	7,100,530	see below
Suffolk	Carolina Rd	Obici Industrial Blvd	Fayette St	4LU	TWTL	6,000	11,000	19,732,000	0	24	25	49	22,422,727	see below
Suffolk	Carolina Rd	SW Suffolk Bypass	Fayette St	4LU	see above	7,900	see above	see above	1	46	32	79	29,523,258	3
Suffolk	Pruden Blvd	Autumn Care of Suffolk	Godwin Blvd	4LU	no TWLTL	3,900	11,000	18,343,600	0	23	12	35	13,549,250	3
Va. Beach	19th St	Birdneck Rd	Pavilion Dr	4LU	TWTL	500	3,542	6,464,150	0	0	1	1	612,135	see below
Va. Beach	19th St	Pavilion Dr	Parks Ave	4LU	no TWLTL	2,200	3,542	6,464,150	0	1	7	8	2,693,396	see below
Va. Beach	19th St	Birdneck Rd	Parks Ave	4LU	see above	2,700	see above	see above	0	1	8	9	3,305,531	3
Va. Beach	19th St	Parks Ave	Artic Ave	CIP project 9,100,000										38
Va. Beach	19th St	Artic Ave	Atlantic Ave	4LU	no TWLTL	900	4,014	7,325,550	0	18	30	48	1,248,673	
Va. Beach	Dorset Ave	Va. Beach Blvd	Cleveland St	4LU	no TWLTL	700	3,027	5,524,275	0	0	3	3	732,385	see below
Va. Beach	Euclid Rd	Cleveland St	Southern Blvd	4LU	no TWLTL	400	4,758	8,683,350	0	0	2	2	657,830	see below
Va. Beach	Dorset Ave / Euclid Rd	Va. Beach Blvd	Southern Blvd	4LU	no TWLTL	1,100	see above	see above	0	0	5	5	1,390,214	4
Va. Beach	First Court Rd	Pleasure House Rd	Hook Ln	4LU	no TWLTL	2,100	7,553	13,784,225	0	2	8	10	5,482,362	2
Va. Beach	Pleasure House Rd	Thoroughgood Square	Northampton Blvd	4LU	no TWLTL	800	11,962	21,830,650	0	4	5	9	3,307,674	3
Va. Beach	Potters Rd	Lynnhaven Pkwy	Cheltenham Dr	4LU	no TWLTL	3,300	7,161	13,068,825	0	2	9	11	8,168,016	see below
Va. Beach	Potters Rd	Cheltenham Dr	Fair Lady Rd	4LU	no TWLTL	1,500	6,619	12,079,675	0	1	1	2	3,431,726	see below
Va. Beach	Potters Rd	Lynnhaven Pkwy	Fair Lady Rd	4LU	no TWLTL	4,800	see above	see above	0	3	10	13	11,599,741	1
Va. Beach	Virginia Beach Blvd	Birch Lake Rd	Washington Ave	4LU	OWLTLs	2,200	12,000	20,828,000	0	23	8	31	8,678,333	see below
Va. Beach	Virginia Beach Blvd	Washington Ave	Atlantic Ave	4LU	no TWLTL	3,700	12,000	20,828,000	1	50	65	116	14,595,379	see below
Va. Beach	Virginia Beach Blvd	Birch Lake Rd	Atlantic Ave	4LU	see above	5,900	see above	see above	1	73	73	147	23,273,712	6
Williamsburg	Capitol Landing Rd	Bypass Rd	Maynard Dr	4LU	no TWLTL	2,300	6,900	12,021,600	0	8	6	14	5,236,682	3
Williamsburg	Jamestown Rd	Rte 199	John Tyler Ln	4LU	no TWLTL	1,300	8,500	16,371,500	0	3	2	5	4,030,862	see below
Williamsburg	Jamestown Rd	John Tyler Ln	College Creek	4LU	no TWLTL	3,100	9,000	18,161,500	0	3	4	7	10,663,002	see below
Williamsburg	Jamestown Rd	Rte 199	College Creek	4LU	no TWLTL	4,400	see above	see above	0	6	6	12	14,693,864	1
York	Alexander Lee Pkwy	Warwick Ct	Stafford Ct	4LU	no TWLTL	1,500	827	1,509,275	0	0	0	0	428,771	0
York	Merrimac Trail	I-64 exit 243B	I-64 exit 247	see JCC/York above										

## Maps and Observations of Candidate Segments

In order to cover all the criteria indicated above as necessary for helping localities find locations to investigate for a possible road diet, in addition to preparing the above database, HRTPO staff also prepared maps and observations of the subject existing **4-lane undivided** segments with **less than 12,500 vpd**<sup>135</sup>, providing information as follows:

- **crashes**
- **bike/ped facilities** in vicinity
- nearby people who **bike, bus, or walk to work**
- existing **bus routes**
- existing or potential **street-oriented land use**

The median crash rate for the subject 77 segments being 2.5 crashes per million VMT, crash rates are classified as follows:

- 0-5     low
- 5-10   moderate
- 10+    high

### Chesapeake

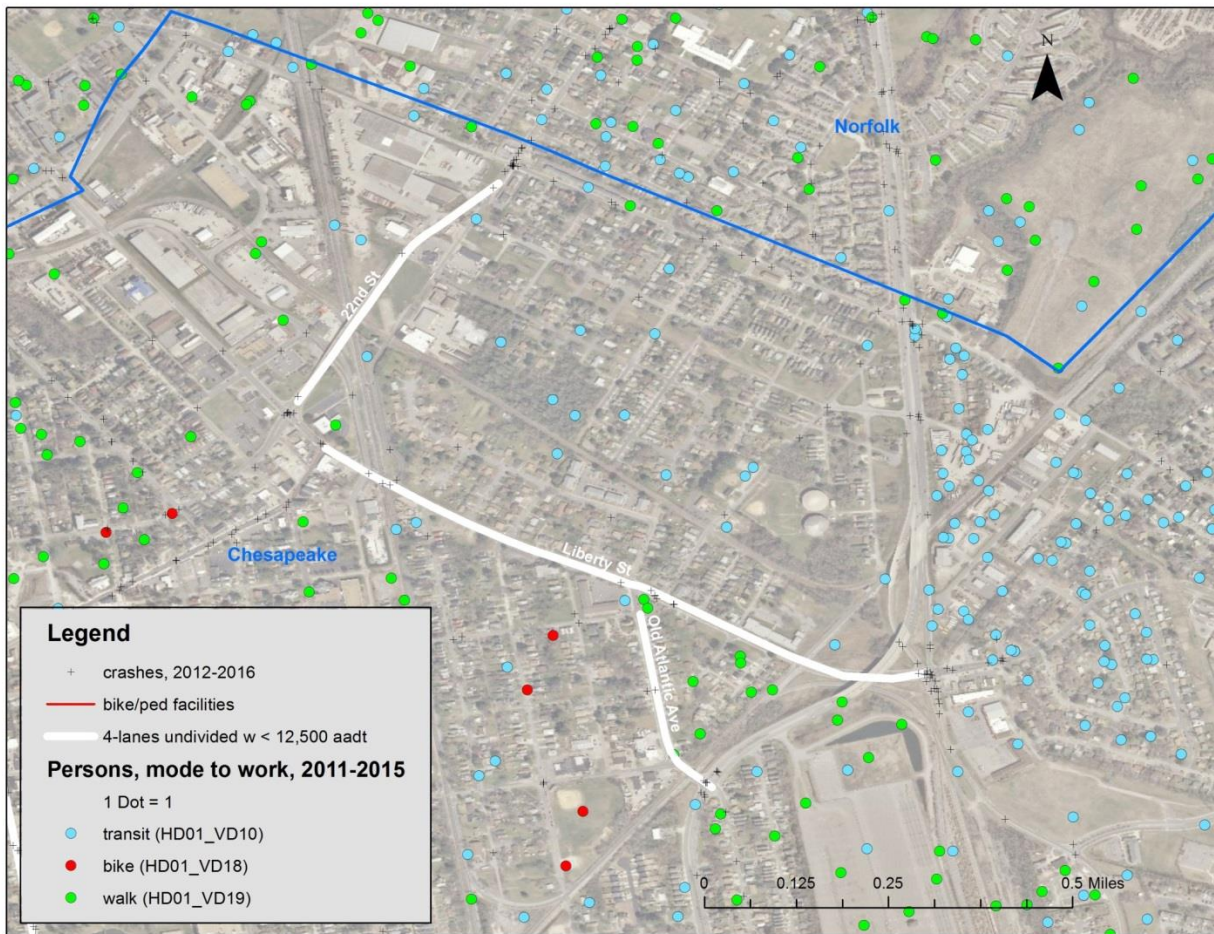
[see following pages for maps]

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<sup>135</sup> The 12,500 vpd level was chosen in order to avoid the problems found above for road diets on segments with approximately 15,000 vpd.



## Chesapeake

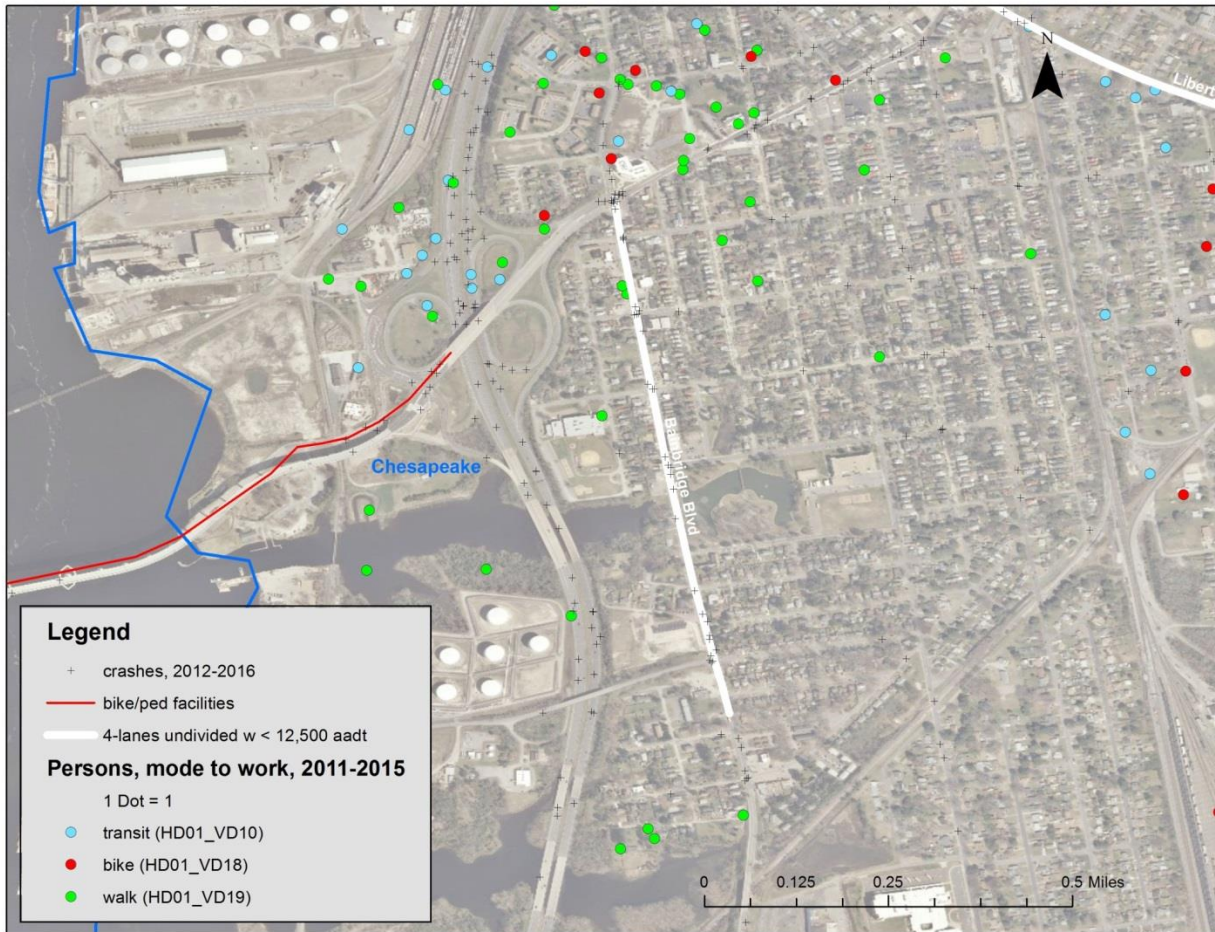


### 22<sup>nd</sup> St, from Liberty St to Berkley Ave Ext

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### 22<sup>nd</sup> St, from Liberty St to Berkley Ave Ext

- low crash rate (1 per million VMT)
- no bike/ped facilities in vicinity
- some alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (much of this segment is elevated)



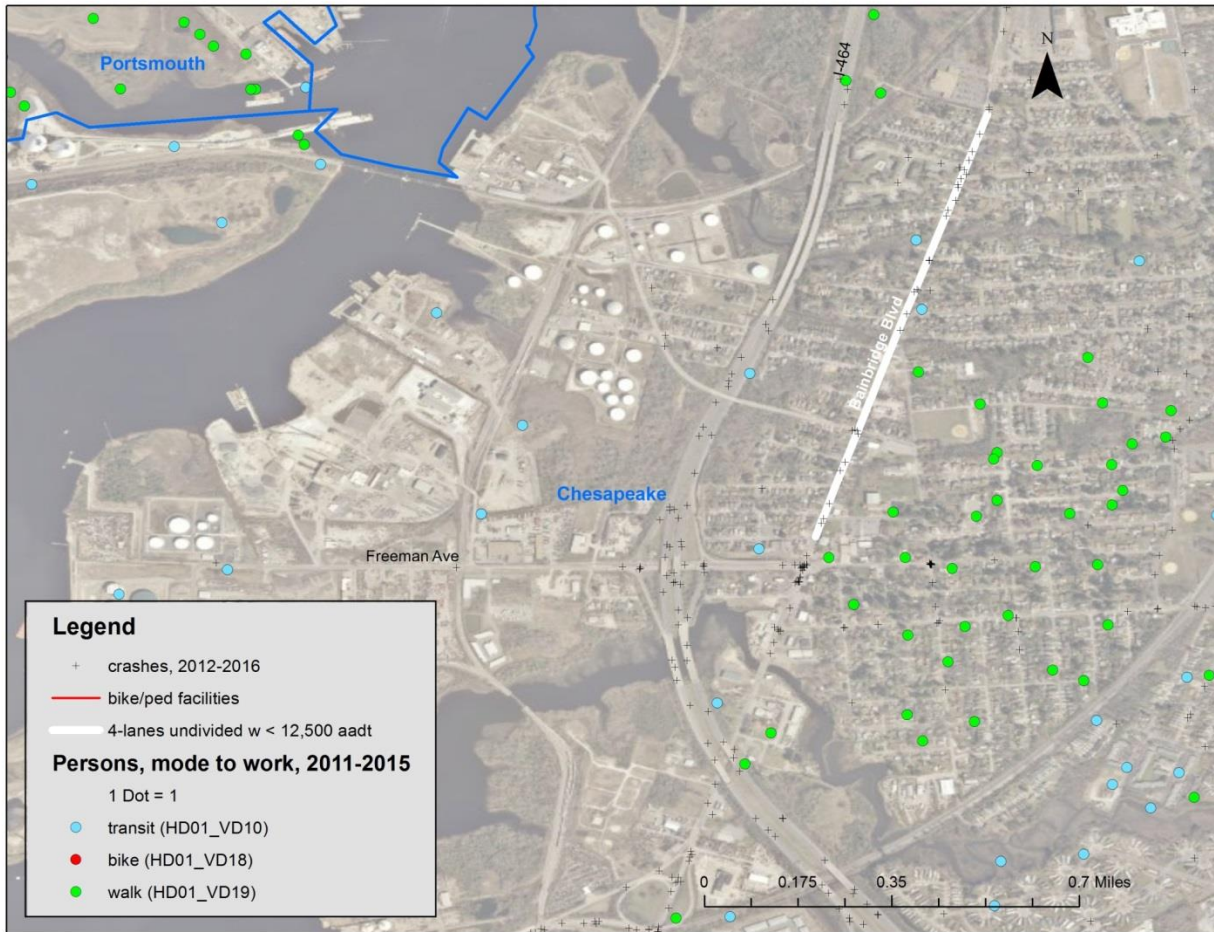
## Bainbridge Blvd, from Poindexter St to Post Ave

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

### Bainbridge Blvd, from Poindexter St to Post Ave

- low crash rate (3 per million VMT)
- bike/ped facility on nearby Jordan Bridge
- some alternative transportation commuters living nearby
- existing bus route
- existing residential street-oriented land use (existing small residential lots), existing commercial street-oriented land use (existing businesses on street), and potential for more street-oriented land use (some vacant land)



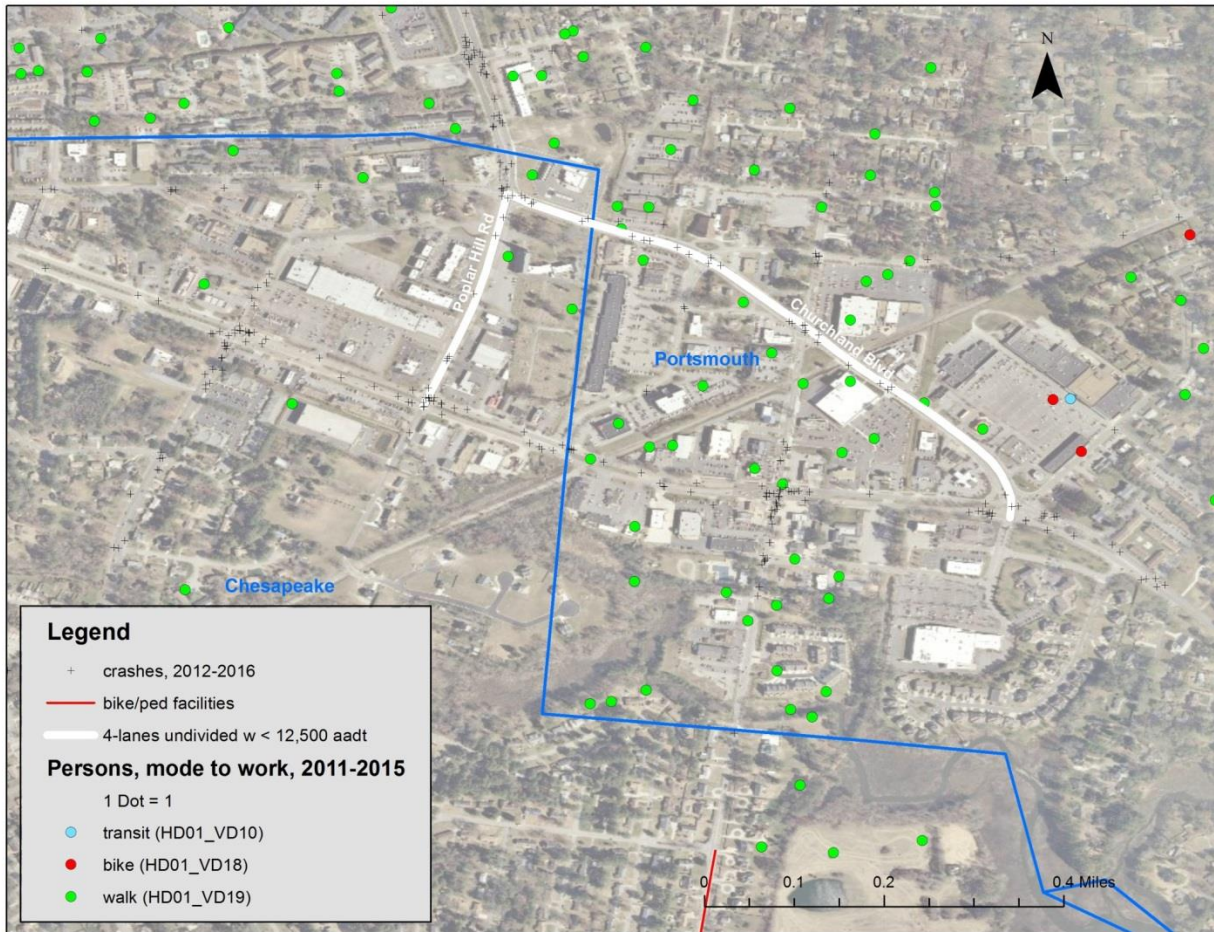


### Bainbridge Blvd, from Godwin Ave to Chapin Rd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Bainbridge Blvd, from Godwin Ave to Chapin Rd

- low crash rate (1 per million VMT)
- no nearby bike/ped facilities
- some alternative transportation commuters living nearby
- existing bus route
- southern half: existing residential street-oriented land use (existing small residential lots), and existing and potential commercial street-oriented land use (existing businesses on street, some vacant land)



### Churchland Blvd, from Poplar Hill Rd to Ches./Portsmouth Corp Limit

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Churchland Blvd, from Poplar Hill Rd to Ches./Portsmouth Corp Limit

- low crash rate (2 per million VMT, whole segment Chesapeake and Portsmouth)
- no nearby bike/ped facilities (planned South Hampton Roads Trail nearby)
- few alternative transportation commuters living nearby
- existing bus route
- low potential for street-oriented land use along Chesapeake section (existing parking-lot-oriented land uses)





### Great Bridge Blvd, from Fernwood Farms Rd to River Walk Pkwy

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Great Bridge Blvd, from Fernwood Farms Rd to River Walk Pkwy

- low crash rate (2 per million VMT)
- no nearby bike/ped facilities
- very few alternative transportation commuters living nearby
- no existing bus route
- potential for street-oriented land use (vacant land)



## Johnstown Rd, from Battlefield Blvd to Allen Dr

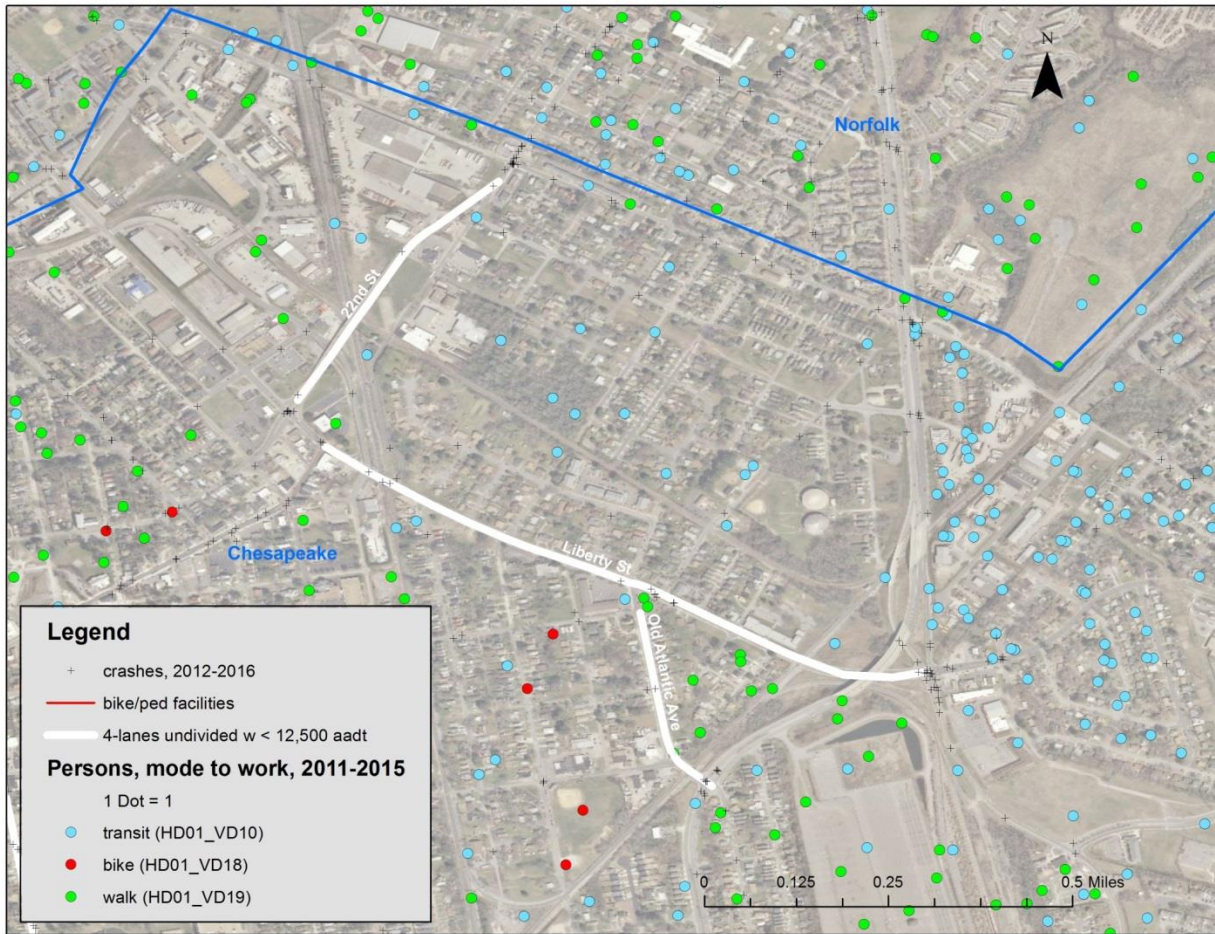
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

### Johnstown Rd, from Battlefield Blvd to Allen Dr

- high crash rate (10 per million VMT), particularly near shopping
- existing bike lanes on Johnstown Rd
- very few alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (existing large-lot<sup>136</sup> residences and parking-lot-oriented businesses)

<sup>136</sup> i.e. having room for parking on the lot, as opposed to needed street parking





### Liberty St, from Poindexter St to Campostella Rd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Liberty St, from Poindexter St to Campostella Rd

- low crash rate (1 per million VMT)
- no bike/ped facilities in vicinity
- some alternative transportation commuters living nearby, many at eastern end
- existing bus route
- some potential for street-oriented land use (vacant land)



### **Military Highway, South, from Rotunda Ave to Mid Atlantic Leasing Corp**

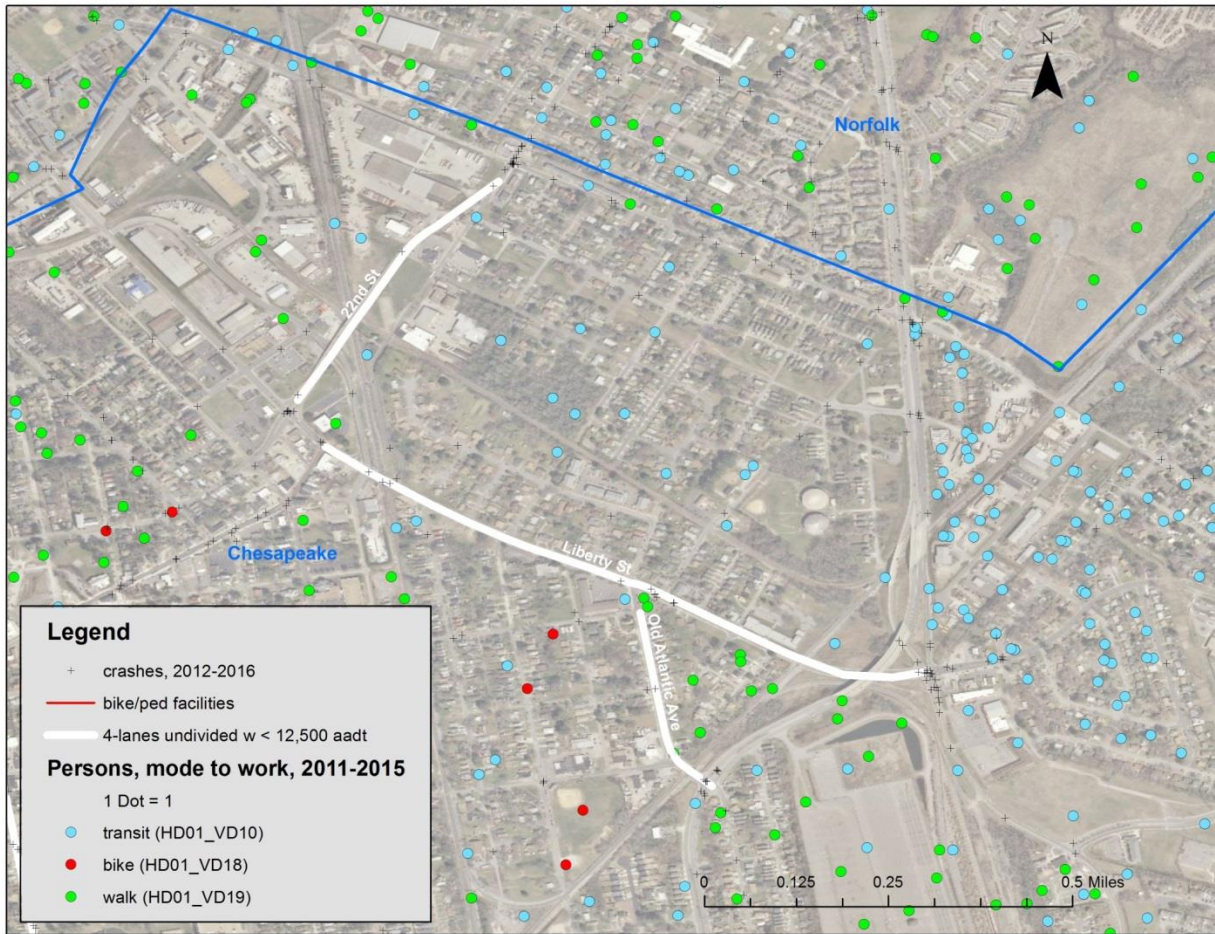
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### **Military Highway, South, from Rotunda Ave to Mid Atlantic Leasing Corp**

- low crash rate (0 per million VMT)
- no existing bike/ped facilities in vicinity
- no alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (industrial area)

In addition, VDOT notes that this segment may be inappropriate for a road diet due to high level of truck traffic.



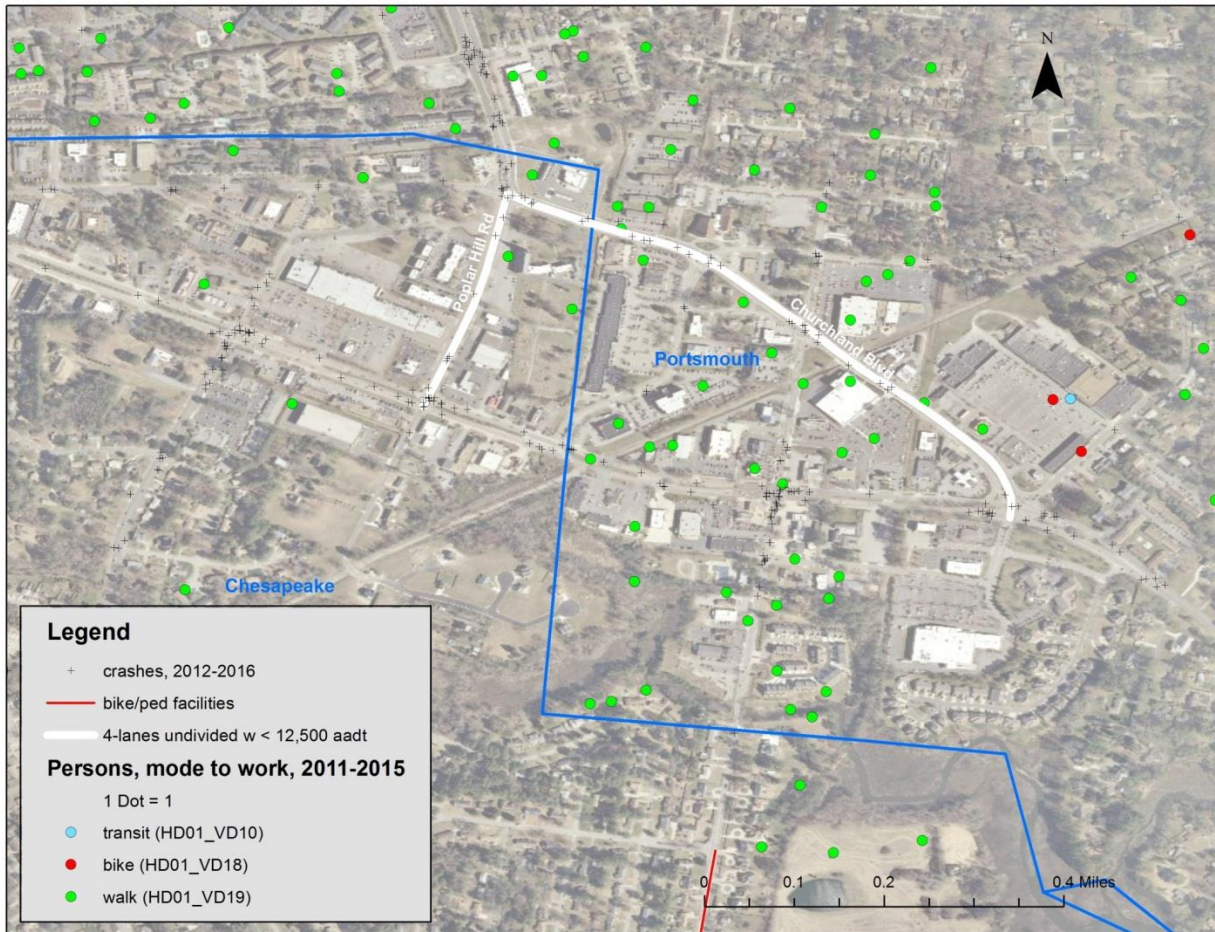


### Old Atlantic Ave, from Liberty St to Atlantic Ave

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Old Atlantic Ave, from Liberty St to Atlantic Ave

- low crash rate (0 per million VMT)
- no bike/ped facilities in vicinity
- some alternative transportation commuters living nearby
- existing bus route
- existing residential street-oriented land use (small residential lots), and some potential for commercial street-oriented land use (vacant land)



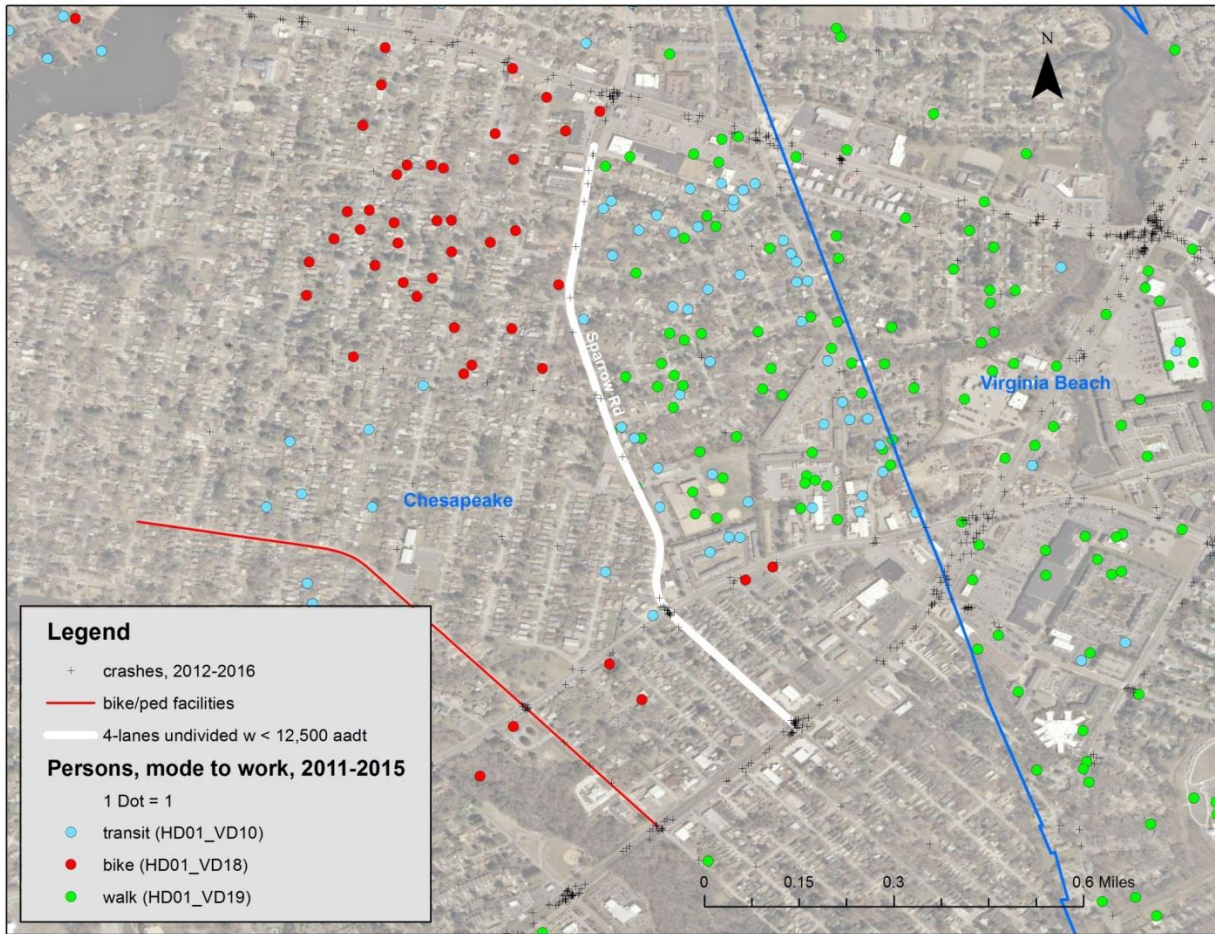
### Poplar Hill Rd, from Churchland Blvd to Western Branch Blvd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Poplar Hill Rd, from Churchland Blvd to Western Branch Blvd

- low crash rate (1 per million VMT)
- no nearby bike/ped facilities (planned South Hampton Roads Trail nearby)
- some alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented uses)





### Sparrow Rd, from Indian River Shopping Center to Military Hwy

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Sparrow Rd, from Indian River Shopping Center to Military Hwy

- low crash rate (2 per million VMT)
- bike lanes in nearby Rokeby Ave
- many alternative transportation commuters living nearby
- no existing bus route
- existing street-oriented land use (small residential lots) along southern section

## Franklin



### **2<sup>nd</sup> Ave, from East St to Blackwater River Bridge**

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

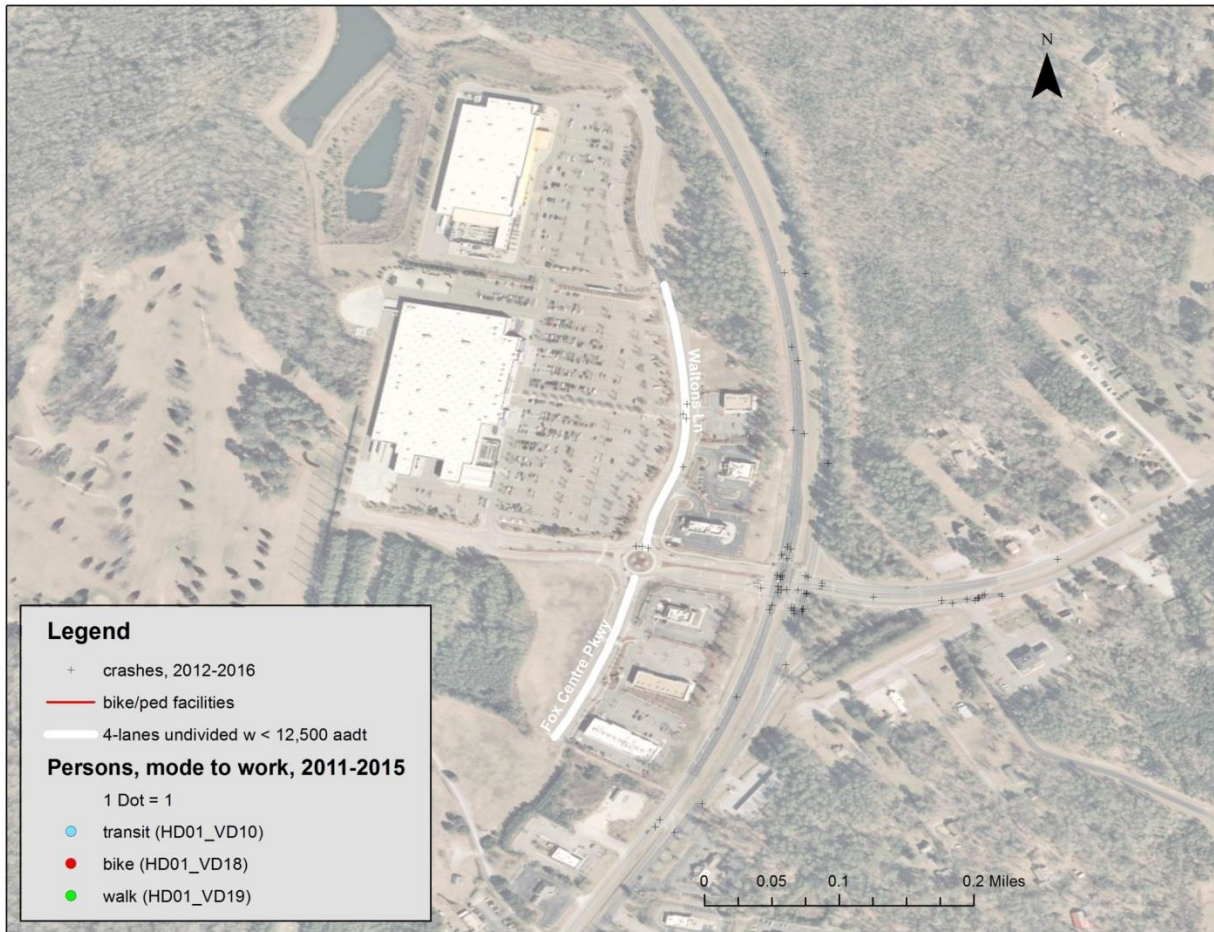
#### 2nd Ave, from East St to Blackwater River Bridge

- low crash rate (0 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- no existing bus route
- some potential for street-oriented land use (vacant land)

VDOT notes that this segment may be inappropriate for a road diet due to high level of truck traffic.



## Gloucester



### Fox Centre Pkwy and Walton's Ln

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Fox Centre Pkwy, from W Main St to Starbucks

- low crash rate (0 per million VMT)
- no bike/ped facilities in vicinity
- no alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented uses)

#### Walton's Ln, from W Main St to Home Depot

- low crash rate (2 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented uses)

## Hampton



### **Aberdeen Rd, from Mercury Blvd to Todds Ln**

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### **Aberdeen Rd, from Mercury Blvd to Todds Ln**

- moderate crash rate (5 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- existing bus route
- potential for street-oriented land use (vacant land)

Note that VDOT has proposed a STARS III right-turn lane extension in the vicinity of this segment.





## Big Bethel Rd, from Todds Ln to Roberta Dr

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

### Big Bethel Rd, from Todds Ln to Roberta Dr

- low crash rate (1 per million VMT)
- no bike/ped facilities in vicinity
- very few alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (existing large-lot<sup>137</sup> residential)
- existing on-street parking

<sup>137</sup> i.e. having room for parking on the lot, as opposed to needed street parking



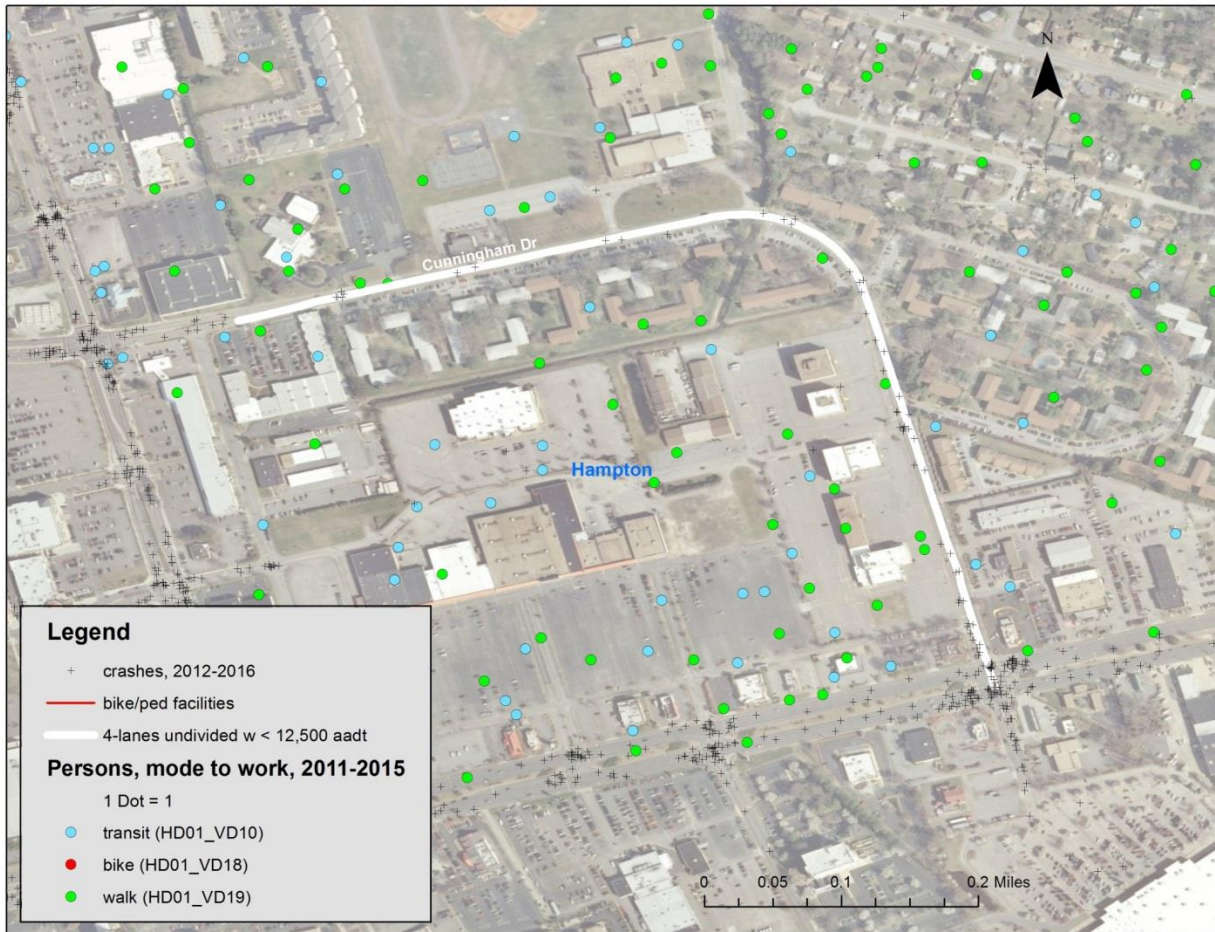
### Briarfield Rd, from Addison Ct to Town Park Dr

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Briarfield Rd, from Addison Ct to Town Park Dr

- low crash rate (3 per million VMT)
- no bike/ped facilities in vicinity
- some alternative transportation commuters living nearby
- existing bus route
- low potential for street-oriented land use (existing large-lot residences and parking-lot oriented uses (schools, church))





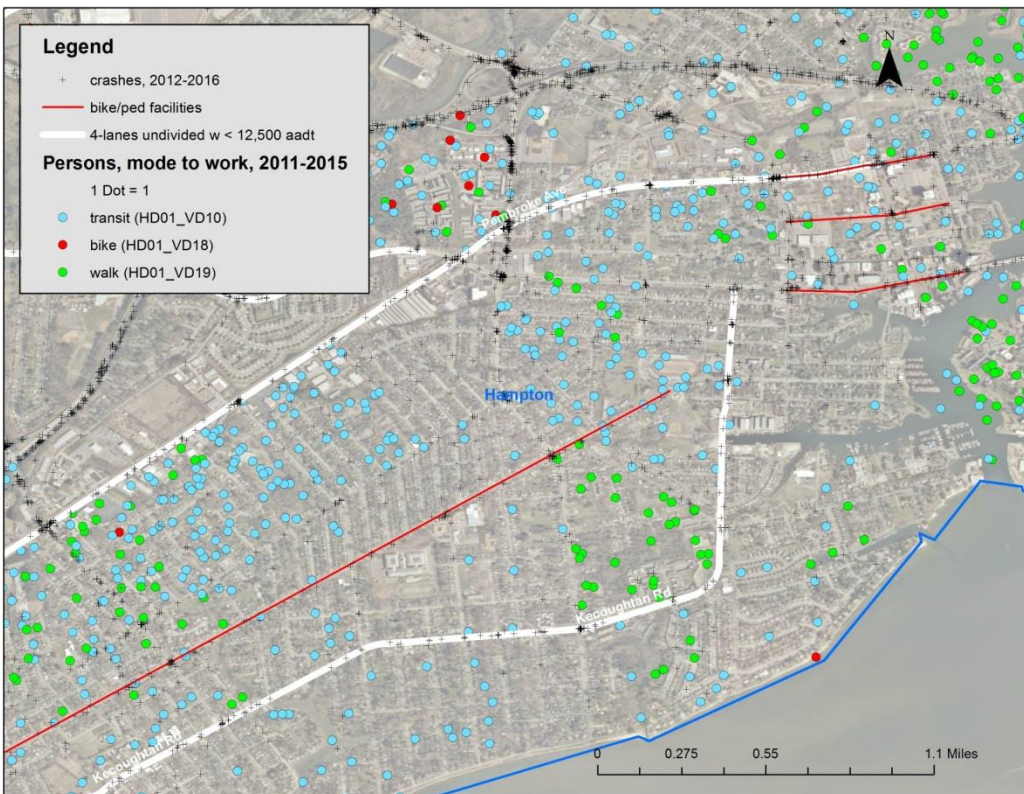
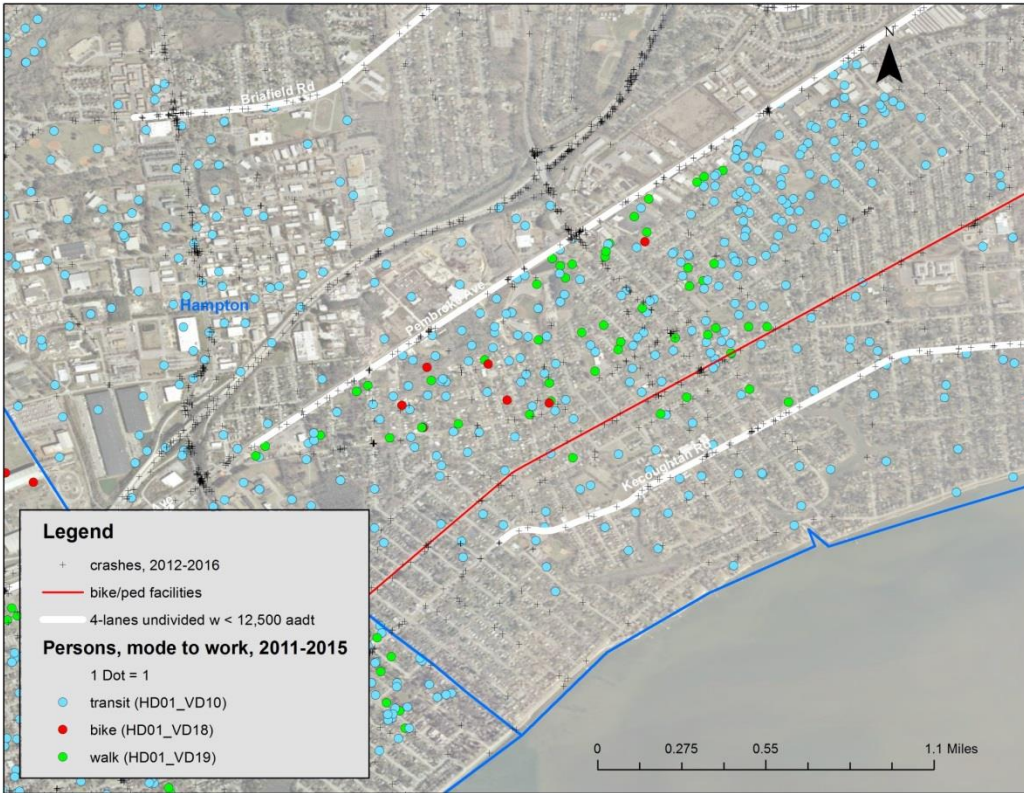
### Cunningham Dr, from Enfield Dr to Mercury Blvd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Cunningham Dr, from Enfield Dr to Mercury Blvd

- low crash rate (4 per million VMT)
- no bike/ped facilities in vicinity
- some alternative transportation commuters living nearby
- no existing bus route
- some potential for street-oriented re-development along north/south segment (apparently under-utilized parking lots)



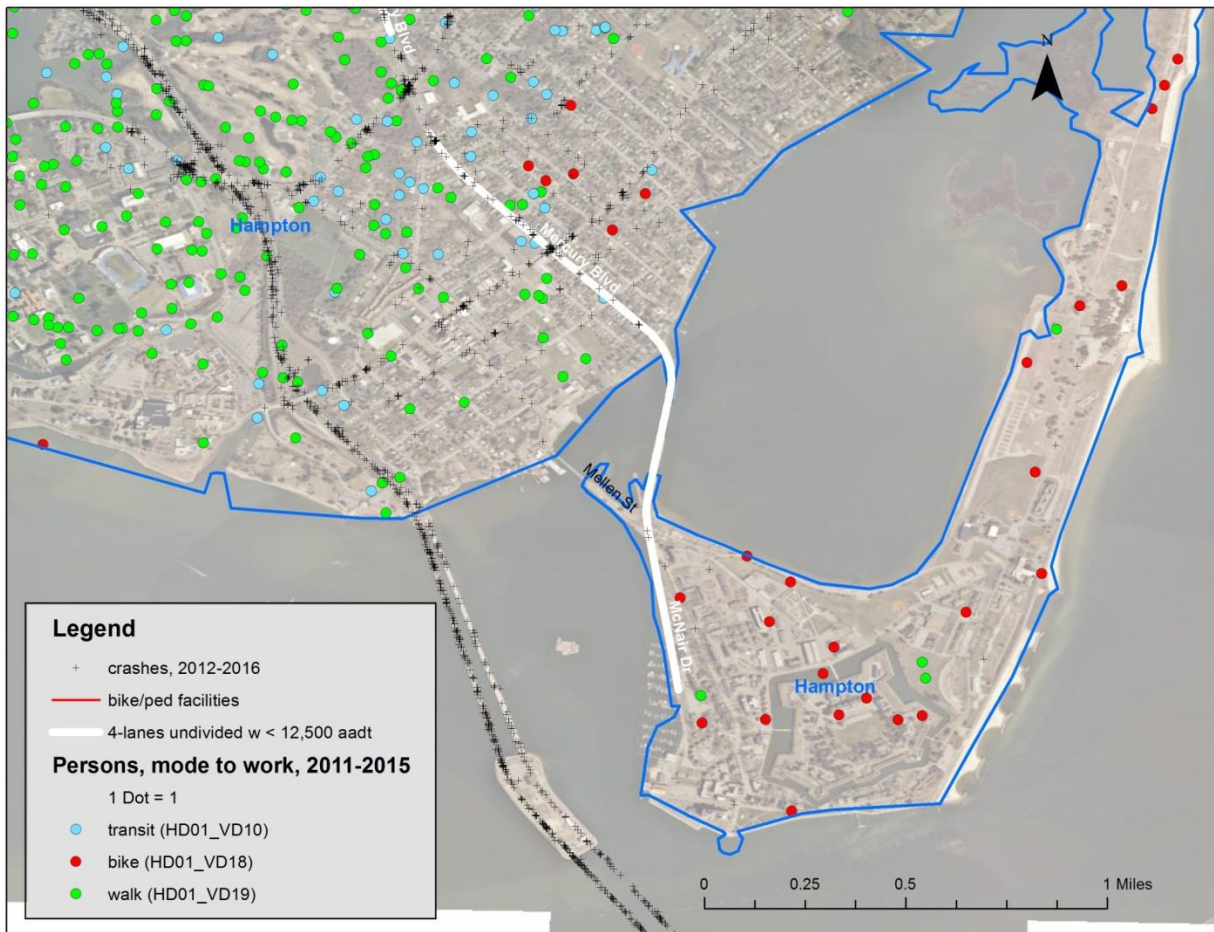


## Kecoughtan Rd, from Claremont Ave to Settlers Landing Rd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

Kecoughtan Rd, from Claremont Ave to Settlers Landing Rd (maps on previous page)

- low crash rate (4 per million VMT)
- bike/ped facility on parallel Victoria Blvd
- some alternative transportation commuters living nearby
- existing bus route
- potential for street-oriented land use (vacant land)



### McNair Dr (on Ft Monroe) and Mercury Blvd (to Ft Monroe)

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

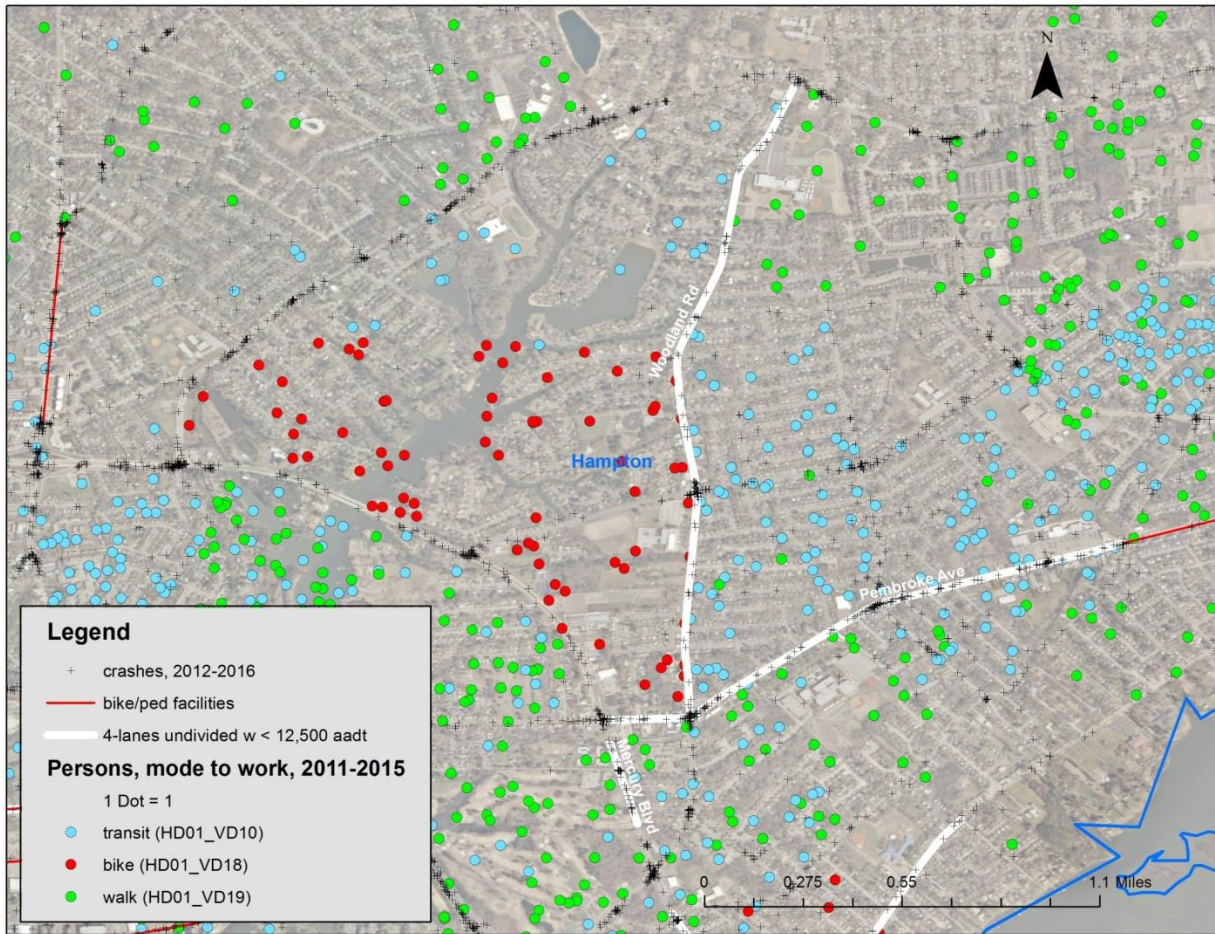
#### McNair Dr, from Mellon St to Old Pt Comfort Marina

- low crash rate (0 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- no existing bus route
- potential for street-oriented land use (vacant land on eastern side of McNair Dr)

#### Mercury Blvd, from Old Buckroe Rd to Mellon St

- high crash rate (10 per million VMT)
- no bike/ped facilities in vicinity
- some alternative transportation commuters living nearby
- no existing bus route
- west of Libby St: potential for street-oriented land use (vacant land); east of Libby St and west of Mill Creek bridge: existing street-oriented residences (small lots)





## Mercury Blvd, from Pembroke Ave to Halifax Ave

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

### Mercury Blvd, from Pembroke Ave to Halifax Ave

- moderate crash rate (7 per million VMT)
- no bike/ped facilities in vicinity
- many alternative transportation commuters living nearby
- existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented land use)



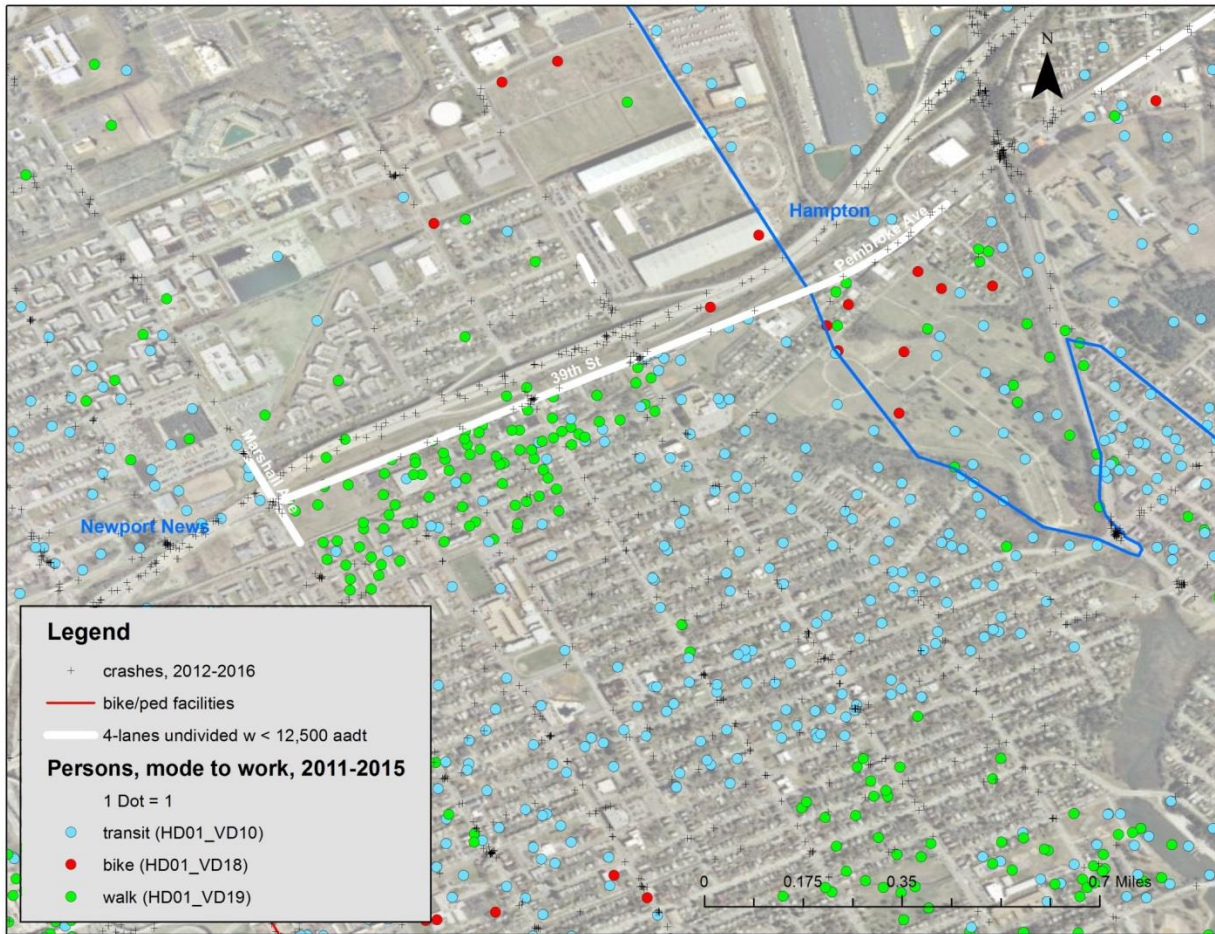
### Newmarket Dr, from Mercury Blvd to Hamp/NN Corp Limit

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Newmarket Dr, from Mercury Blvd to Hamp/NN Corp Limit

- moderate crash rate (8 per million VMT), whole segment (NN & Hampton)
- no bike/ped facilities in vicinity
- some alternative transportation commuters living nearby
- existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented land use)





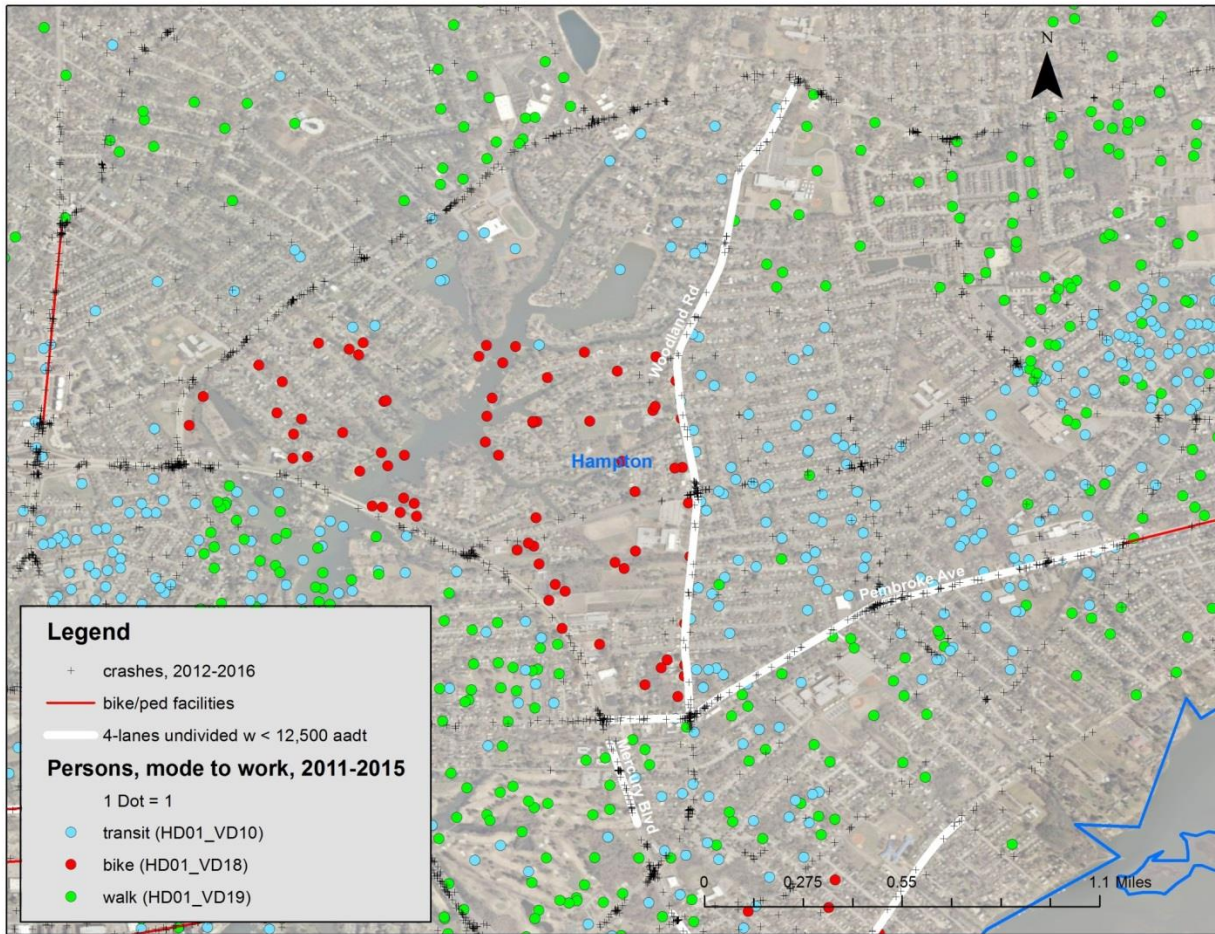
### Pembroke Ave, from Hampton/NN Corp Limit to Greenlawn Ave

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Pembroke Ave, from Hampton/NN Corp Limit to Greenlawn Ave

- low crash rate (3 per million VMT), whole segment (NN & Hampton)
- no bike/ped facilities in vicinity
- some alternative transportation commuters living nearby
- no existing bus route
- existing street-oriented businesses

Note that changes to this segment may impact access to interstate ramps and other state maintained facilities.



### Pembroke Ave, from Mercury Blvd to Old Buckroe Rd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Pembroke Ave, from Mercury Blvd to Old Buckroe Rd

- moderate crash rate (7 per million VMT)
- bike/ped facility at eastern end
- many alternative transportation commuters living nearby
- existing bus route
- east of Ford Rd: some existing street-oriented businesses and some potential for street-oriented commercial re-development of underutilized parking lots





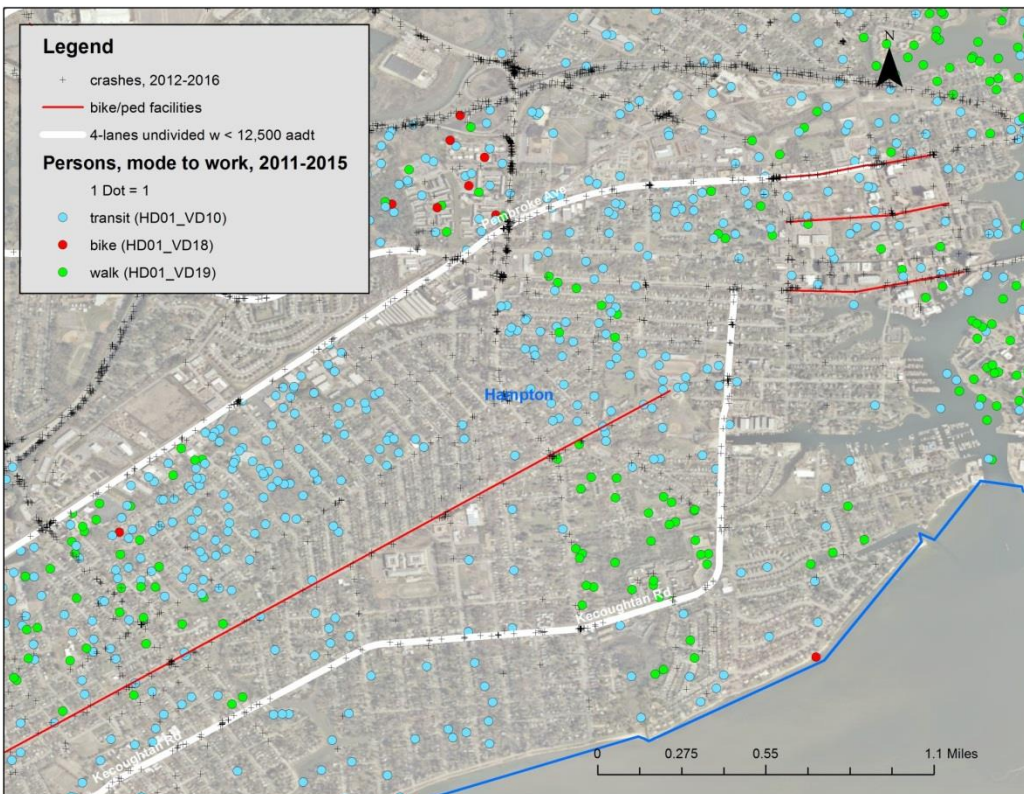
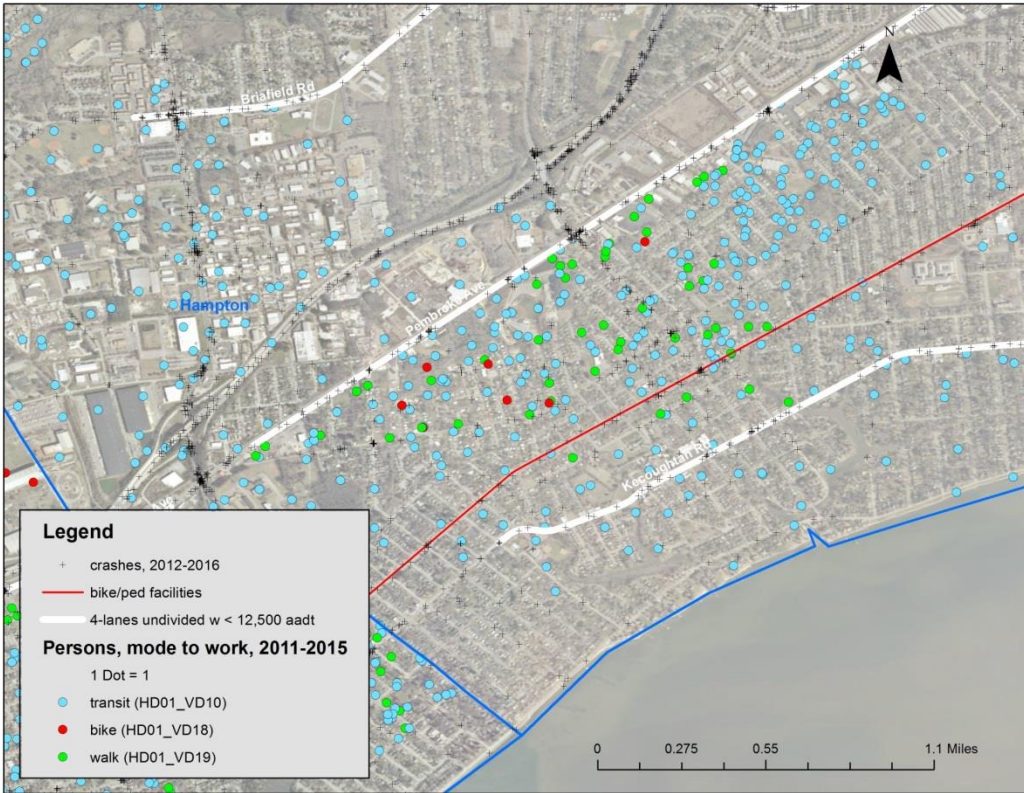
### Pine Chapel Rd, from Power Plant Shopping Center to Saville Row

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Pine Chapel Rd, from Power Plant Shopping Center to Saville Row

- low crash rate (1 per million VMT)
- no bike/ped facilities in vicinity
- no alternative transportation commuters living nearby
- existing bus route (eastern section)
- low potential for street-oriented land use: western section is elevated and eastern section dominated by coliseum, convention center, convention hotel, and other parking-lot-oriented land uses

Note that VDOT has a sidewalk and shared use path project (UPC 111016) in the vicinity of this segment.



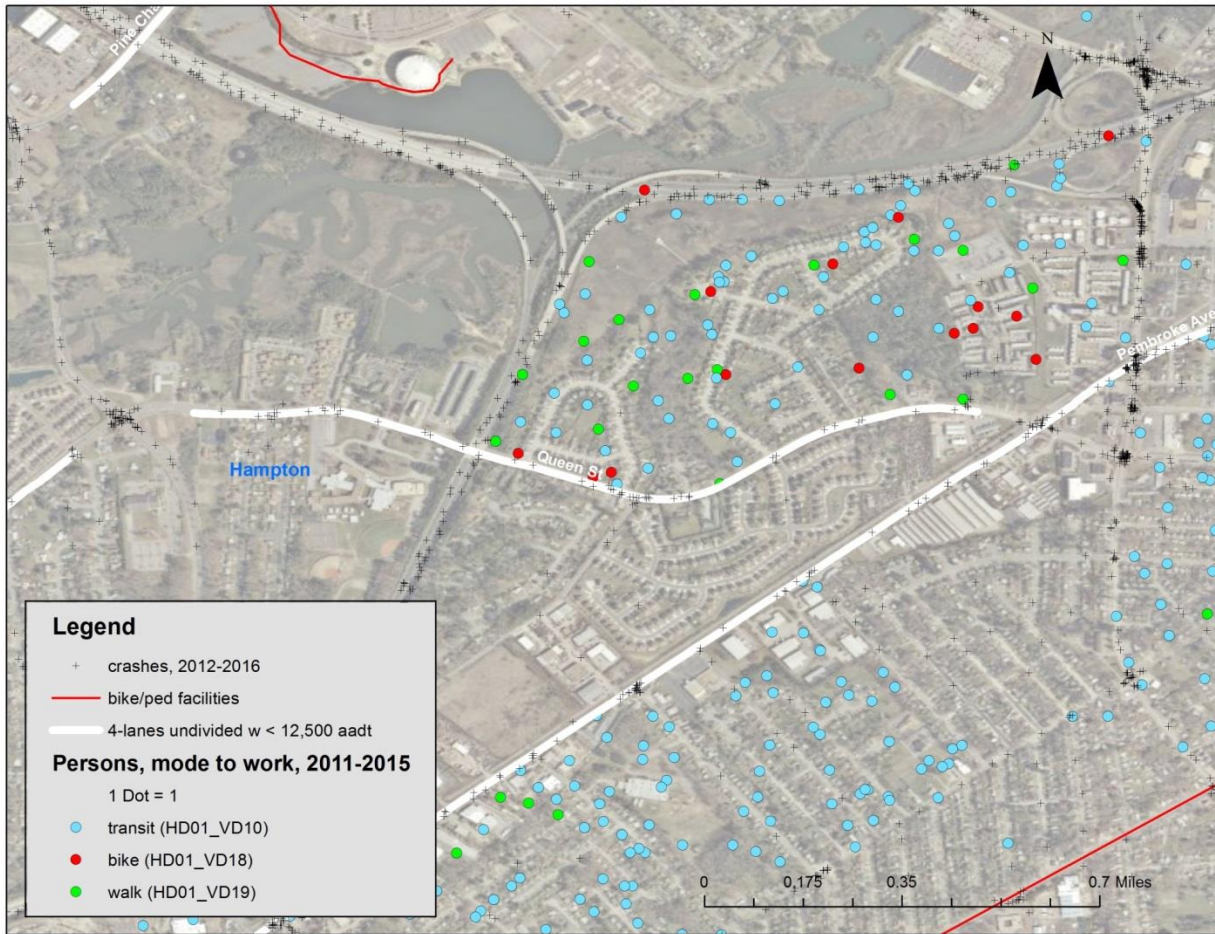
## Pembroke Ave, from Old Aberdeen Rd to King St

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

Pembroke Ave, from Old Aberdeen Rd to King St (maps on previous page)

- moderate crash rate (5 per million VMT)
- bike/ped facilities at eastern end
- many alternative transportation commuters living south of Pembroke Ave
- existing bus route along western portion
- west of Kentucky Ave and east of Armistead Ave: potential for street-oriented land use (some vacant land)



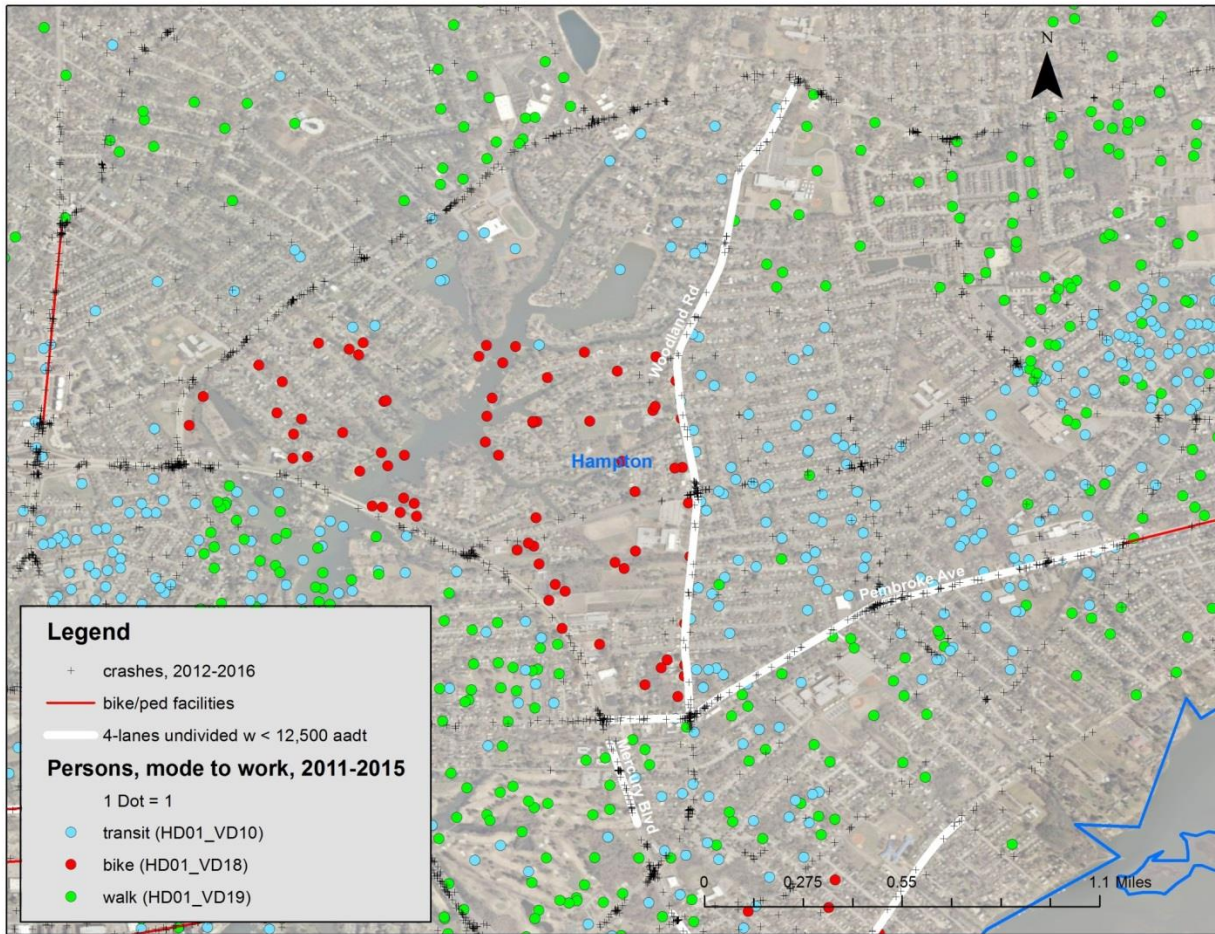


### Queen St, from Pine Chapel Baptist Church to Michigan Dr

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Queen St, from Pine Chapel Baptist Church to Michigan Dr

- low crash rate (3 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- existing bus route
- low potential for street-oriented land use (few street-oriented land uses)



### Woodland Rd, from Pembroke Ave to Foxhill Rd

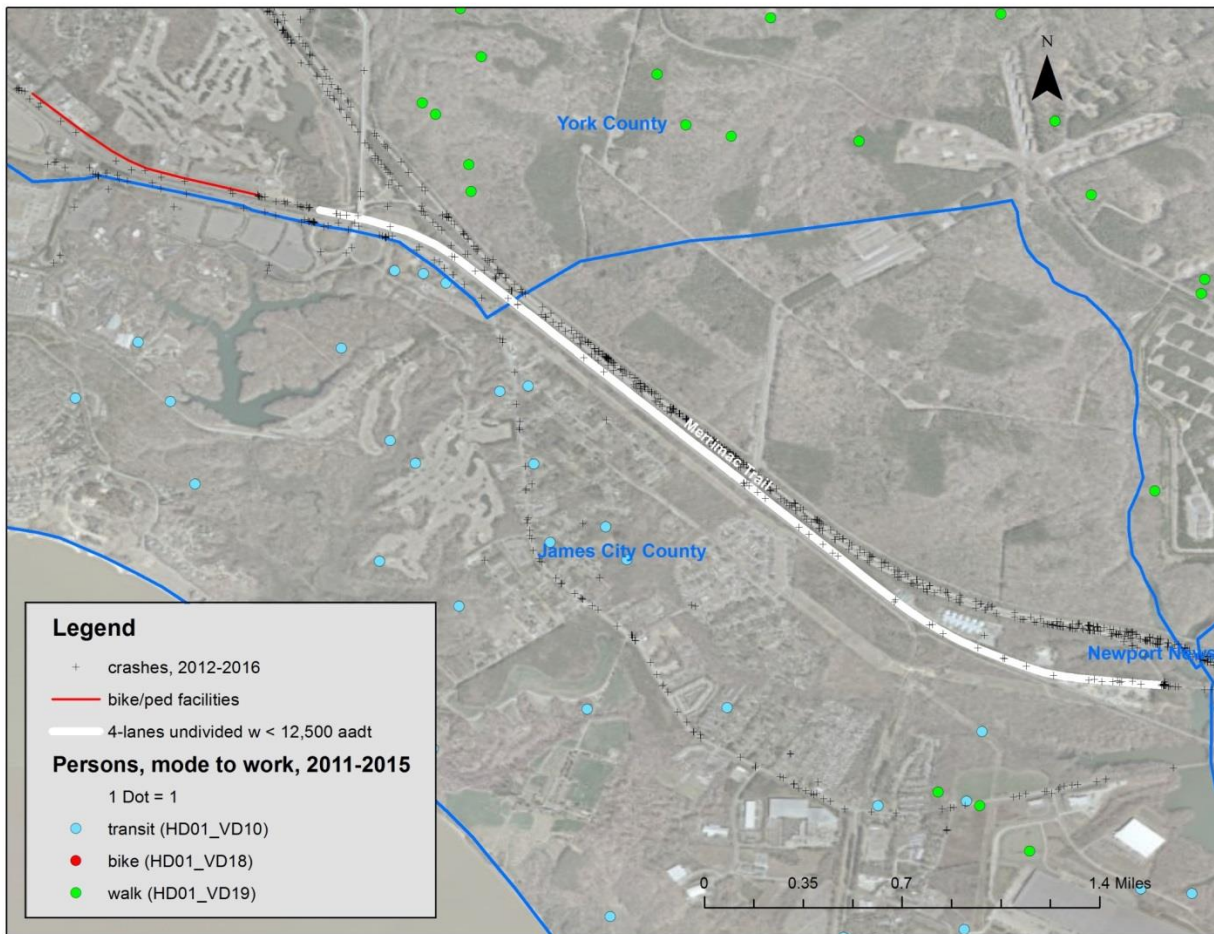
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Woodland Rd, from Pembroke Ave to Foxhill Rd

- low crash rate (3 per million VMT)
- no bike/ped facilities in vicinity
- many alternative transportation commuters living nearby
- existing bus route is commuter service (limited stops)
- low potential for street-oriented land use (houses that face street have large lots)



## James City



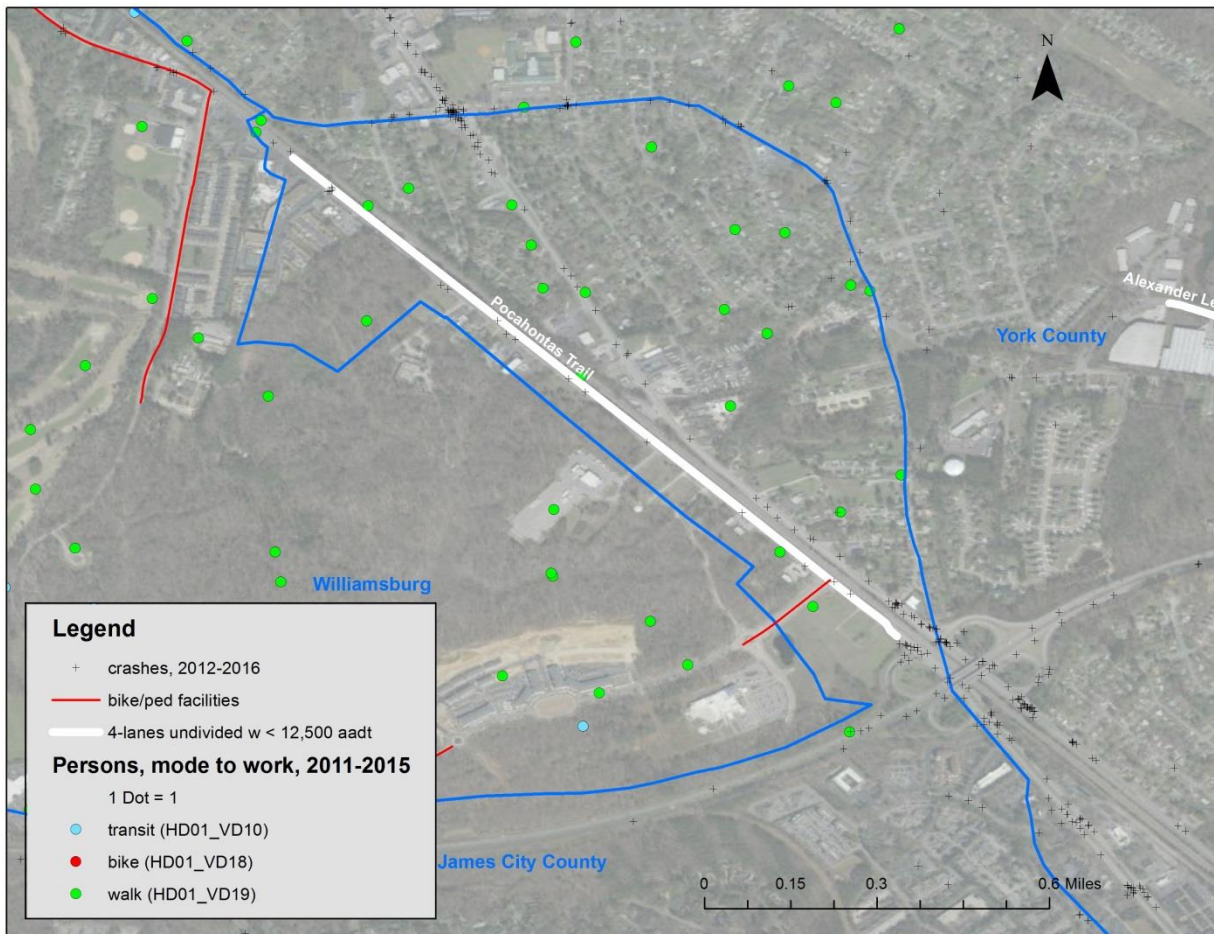
### Merrimac Trail, from York/JCC Corporate Limit to I-64 exit 247

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Merrimac Trail, from York/JCC Corporate Limit to I-64 exit 247

- low crash rate (1 per million VMT), whole segment (JCC and York County)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (railroad on one side, interstate on other)

In addition, VDOT is studying a Skiffes Creek Connector between US 60 and Merrimac Trail, which may add more truck traffic to Merrimac Trail.



### Pocahontas Trail, from Ft Magruder Hotel to Rte 199

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Pocahontas Trail, from Ft Magruder Hotel to Rte 199

- low crash rate (1 per million VMT)
- some bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- existing bus route
- southern side (railroad on northern side): potential for street-oriented land use (vacant land)

Note that changes to this segment may impact access to interstate ramps and other state maintained facilities.



## Newport News



### 23<sup>rd</sup> St, from Huntington Ave to West Ave

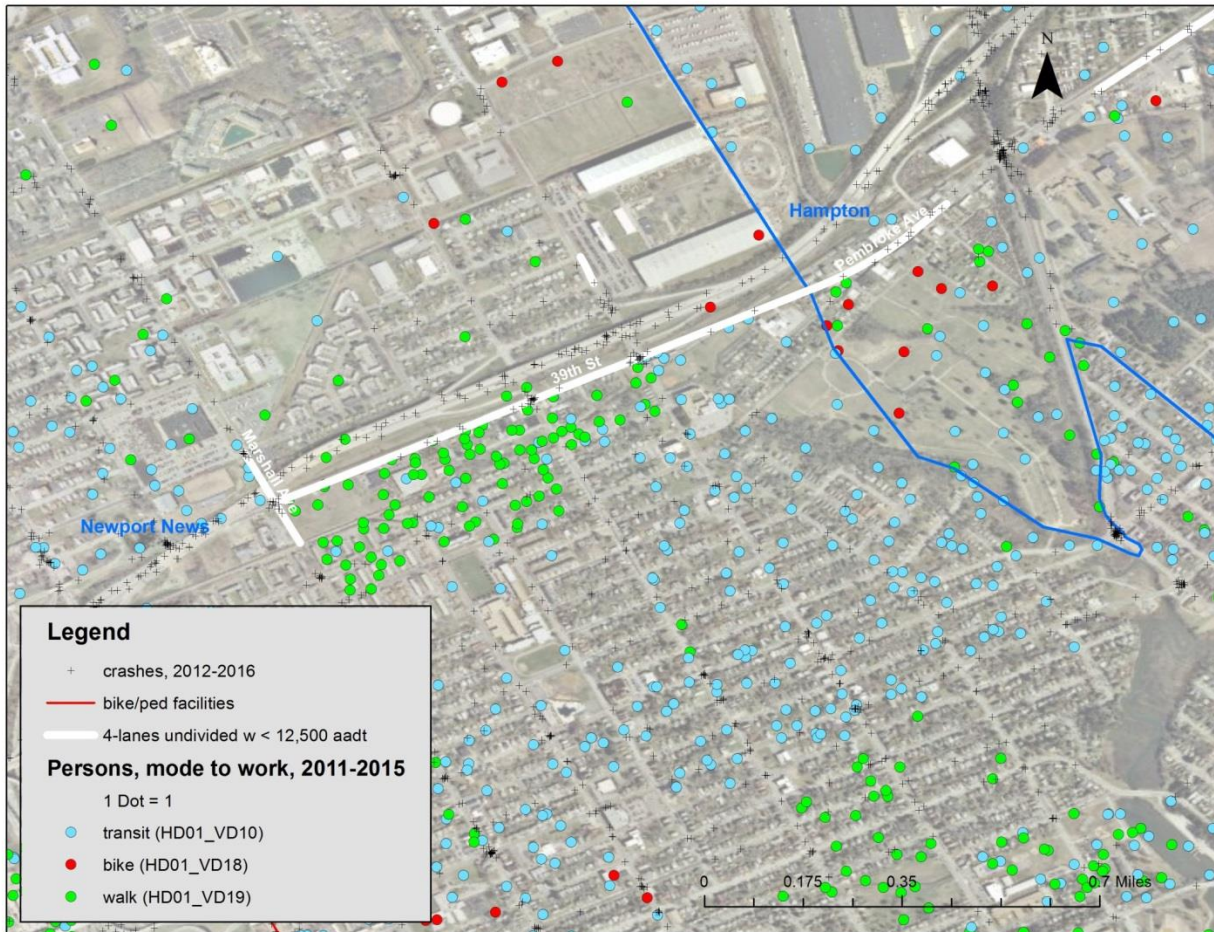
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### 23<sup>rd</sup> St, from Huntington Ave to West Ave

- low crash rate (1 per million VMT)
- no bike/ped facilities in vicinity
- some alternative transportation commuters living nearby
- existing bus route
- potential for street-oriented land use, particularly on south side (apparently underused buildings)

Note that changes to this segment may impact access to interstate ramps and other state maintained facilities.





### 39<sup>th</sup> St, from Marshall Ave to Hampton/Newport News Corp Limit

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### 39<sup>th</sup> St, from Marshall Ave to Hampton/Newport News (NN) Corporate Limit

- low crash rate (3 per million VMT), whole segment (NN and Hampton)
- no bike/ped facilities in vicinity
- many alternative transportation commuters living nearby
- no existing bus route
- existing street-oriented small-lot residences<sup>138</sup> and potential for more street-oriented land use (vacant land)

Note that changes to this segment may impact access to interstate ramps and other state maintained facilities.

<sup>138</sup> i.e. having little room for parking on the lot, and therefore needing street parking



### City Center Blvd, from Mid Atlantic Fasteners to Rock Landing Dr

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### City Center Blvd, from Mid Atlantic Fasteners to Rock Landing Dr

- low crash rate (4 per million VMT)
- many bike/ped facilities in vicinity (8' path along City Center Blvd)
- many alternative transportation commuters living nearby
- existing bus route
- low potential for street-oriented land use (existing [relatively new] parking-lot-oriented buildings and little vacant land)





## Denbigh Blvd, from Catalina Dr to Lucas Creek Rd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

### Denbigh Blvd, from Catalina Dr to Lucas Creek Rd

- low crash rate (1 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (existing large-lot residences)



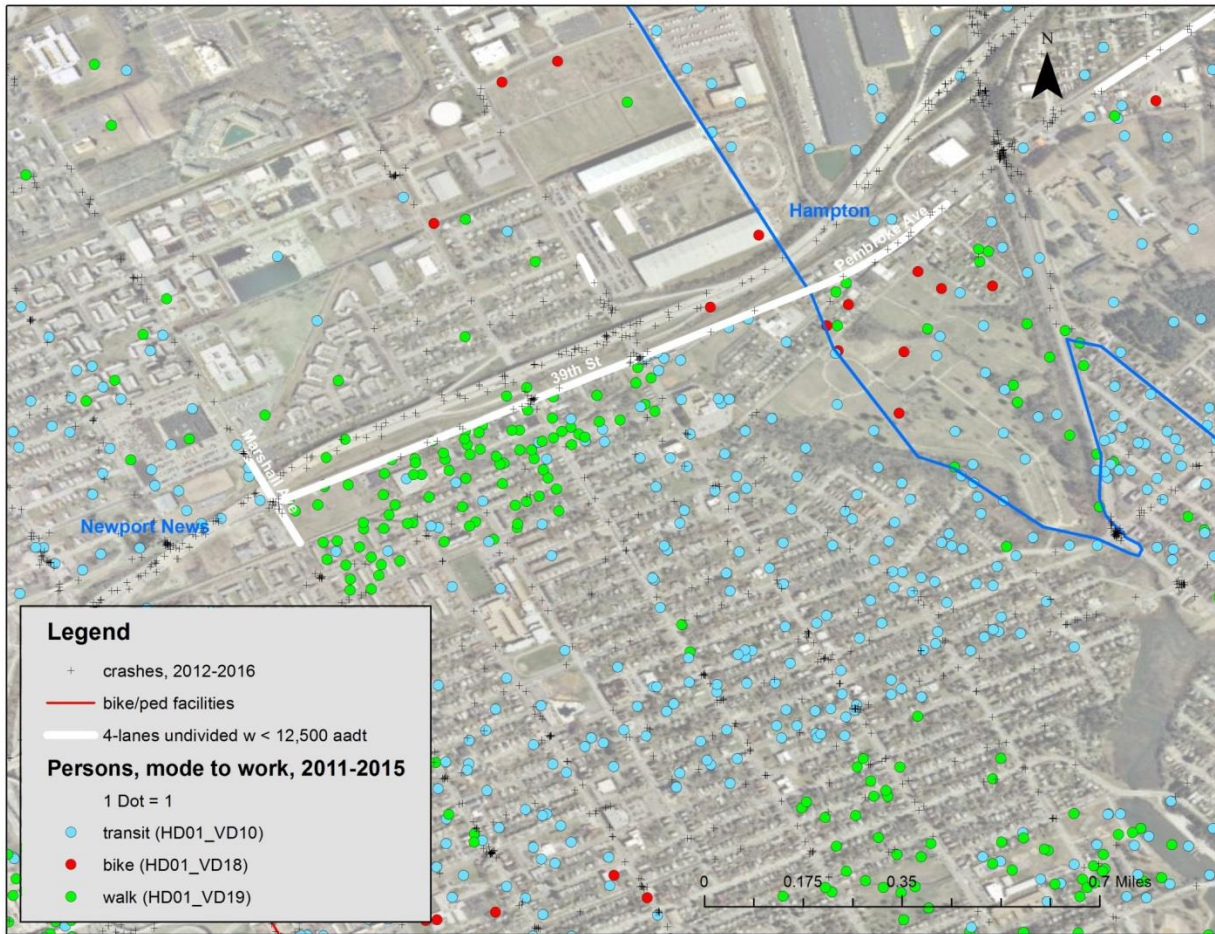
### Marshall Ave, from Hamp/NN Corp Limit to 74<sup>th</sup> St

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Marshall Ave, from Hamp/NN Corp Limit to 74th St

- moderate crash rate (8 per million VMT), whole segment (Hampton and NN)
- no bike/ped facilities in vicinity
- some alternative transportation commuters living nearby
- existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented uses)



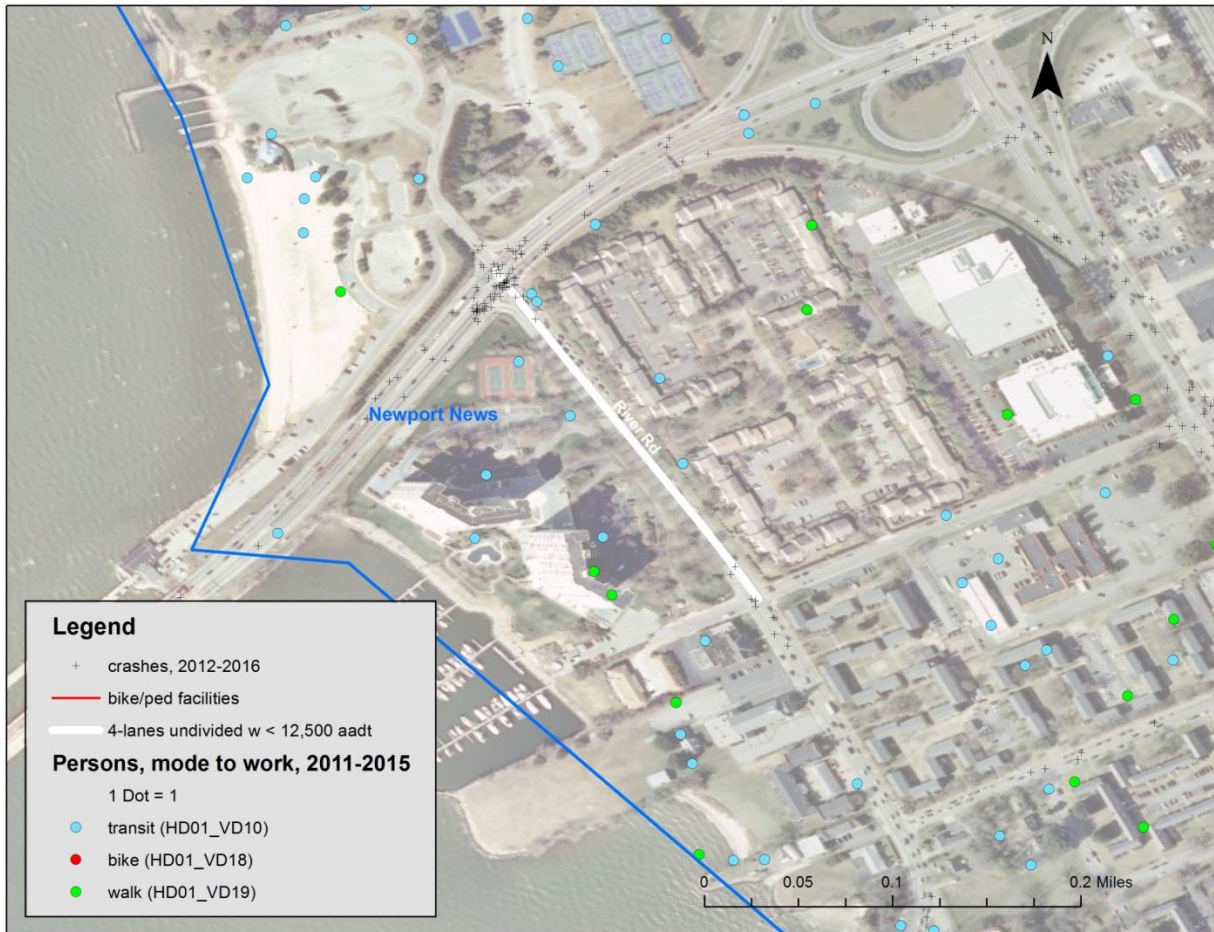


### Marshall Ave, from 41<sup>st</sup> St to CSX Railroad

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Marshall Ave, from 41<sup>st</sup> St to CSX Railroad

- moderate crash rate (7 per million VMT), whole segment (NN and Hampton)
- no bike/ped facilities in vicinity
- many alternative transportation commuters living nearby
- no existing bus route
- potential for street-oriented land use on east side between 39<sup>th</sup> Street and CSX railroad (vacant land)



### River Rd, from Mercury Blvd to 75<sup>th</sup> St

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### River Rd, from Mercury Blvd to 75th St

- low crash rate (3 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented uses)





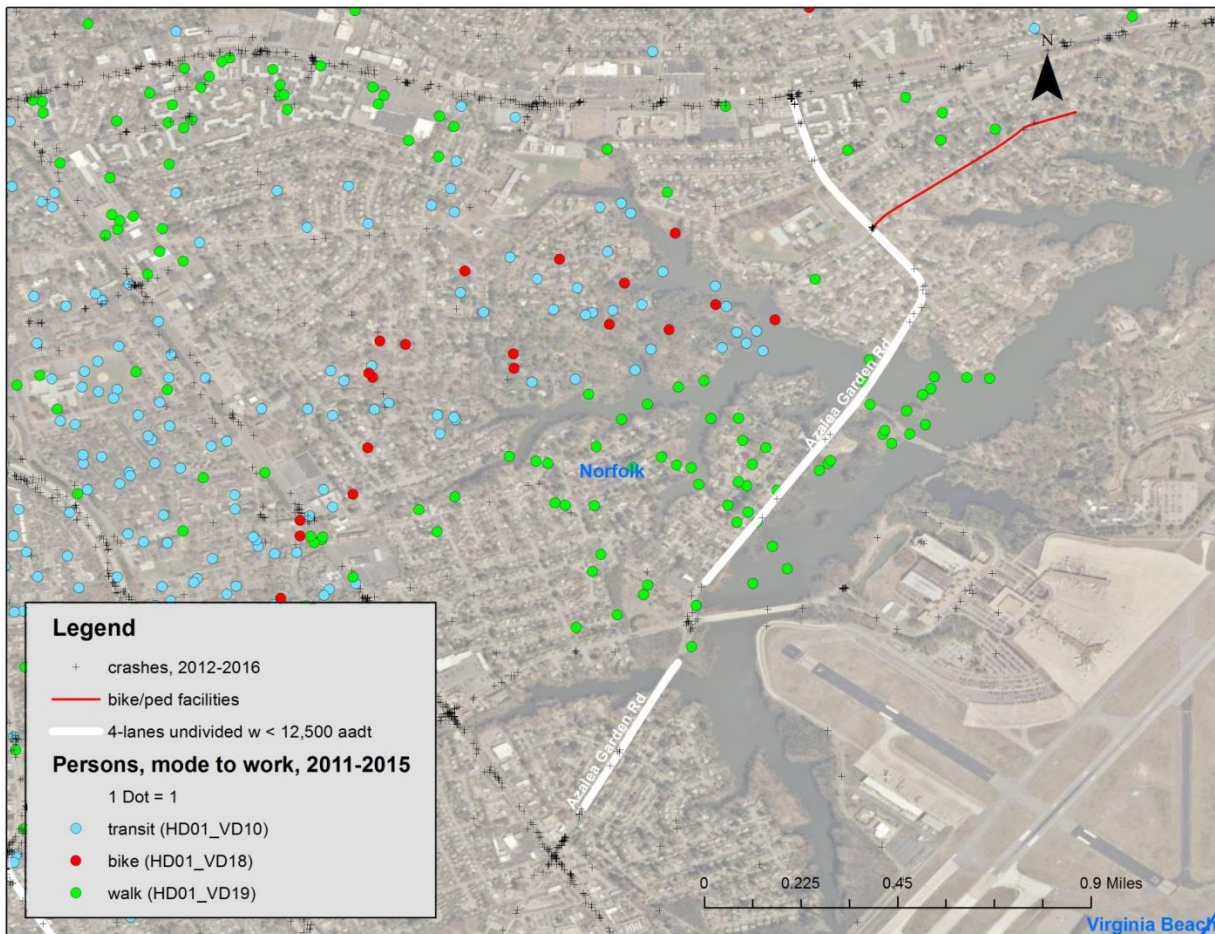
### Thimble Shoals Blvd, from Diligence Dr to J Clyde Morris Blvd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Thimble Shoals Blvd, from Diligence Dr to J Clyde Morris Blvd

- low crash rate (2 per million VMT)
- bike/ped facility along Thimble Shoals Blvd (8' path)
- very few alternative transportation commuters living nearby
- existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented uses)

## Norfolk



### Azalea Garden Rd, from Kevin Dr to Little Creek Rd

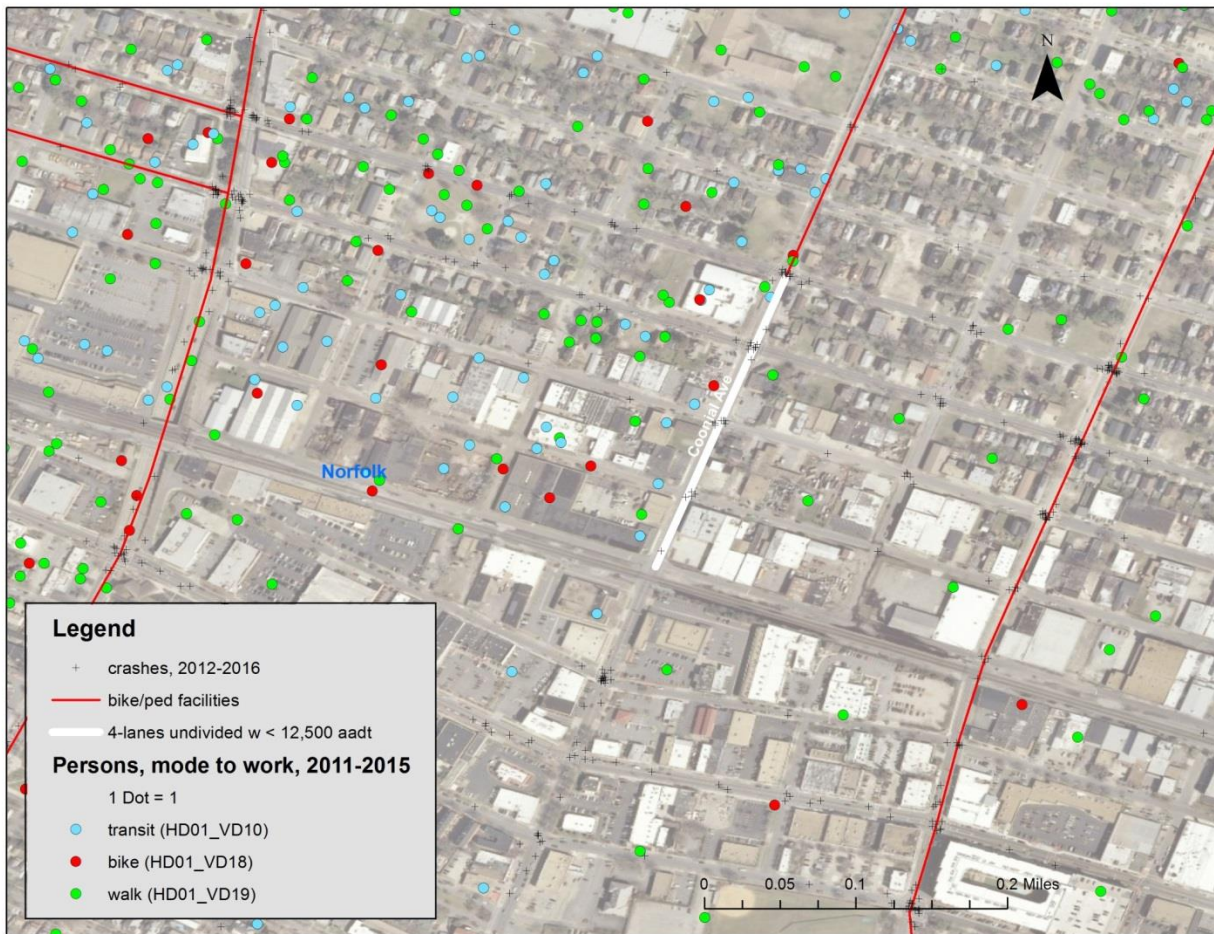
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Azalea Garden Rd, from Kevin Dr to Little Creek Rd

- low crash rate (1 per million VMT)
- bike lanes along intersecting Heutte Dr
- some alternative transportation commuters living near mid section
- no existing bus route
- low potential for street-oriented land use (existing large-lot<sup>139</sup> residences)

<sup>139</sup> i.e. having room for parking on the lot, as opposed to needed street parking



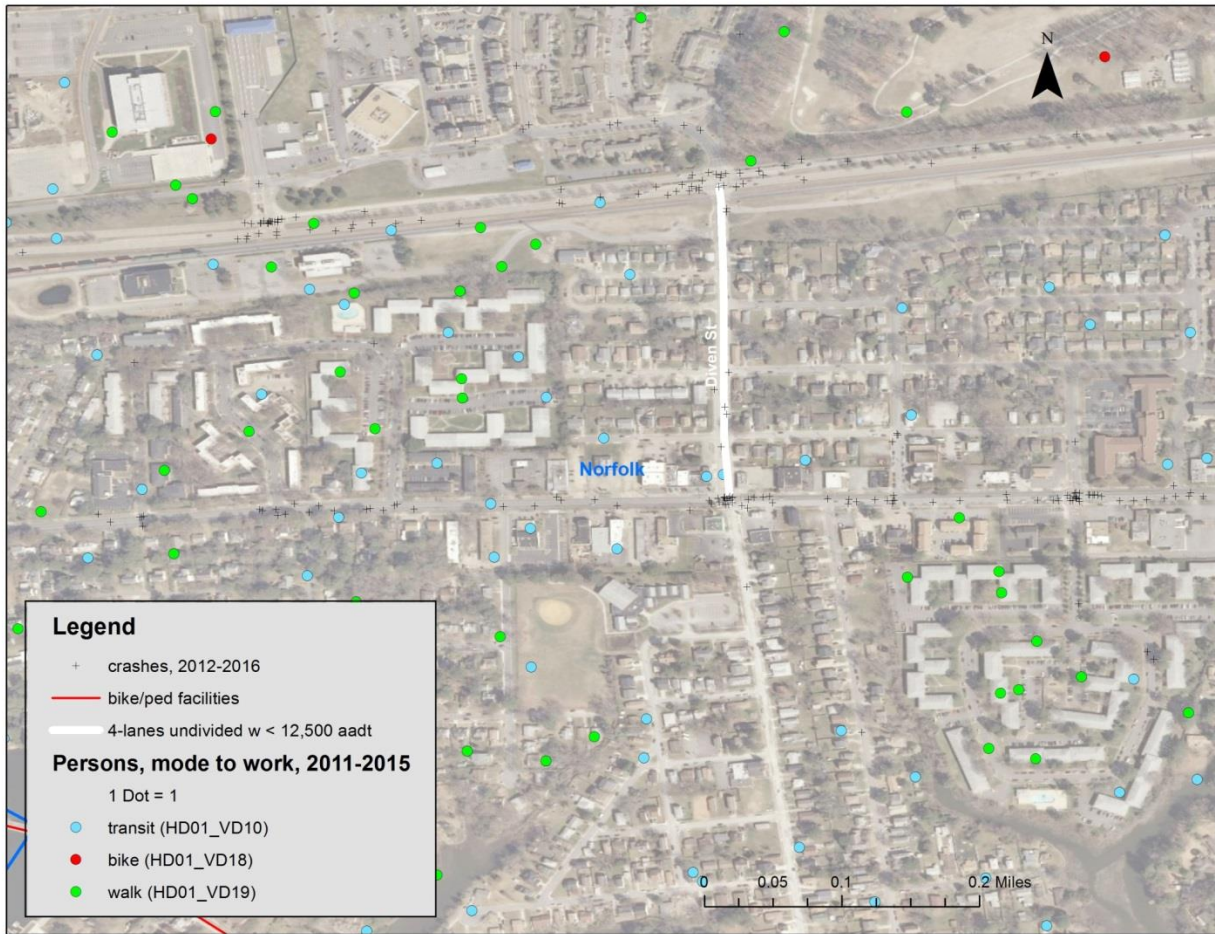


### Colonial Ave, from 23<sup>rd</sup> St to 27<sup>th</sup> St

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Colonial Ave, from 23<sup>rd</sup> St to 27<sup>th</sup> St

- high crash rate (11 per million VMT)
- bike/ped facility along Colonial Ave north of subject segment
- some alternative transportation commuters living nearby
- existing bus route
- some street-oriented businesses



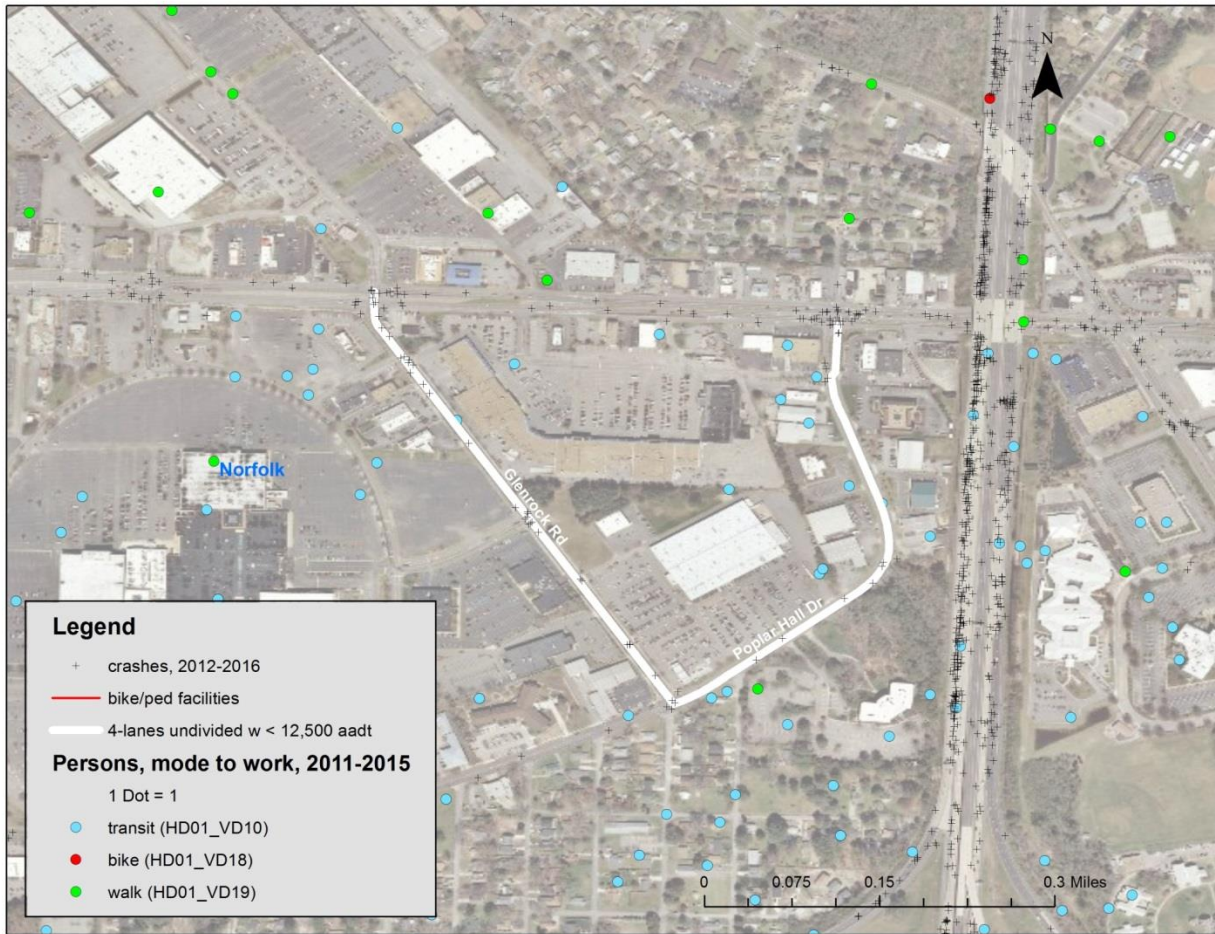
### Diven St, from Terminal Blvd to Little Creek Rd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Diven St, from Terminal Blvd to Little Creek Rd

- low crash rate (2 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- existing bus route is express (no stops)
- existing residences are oriented toward side streets



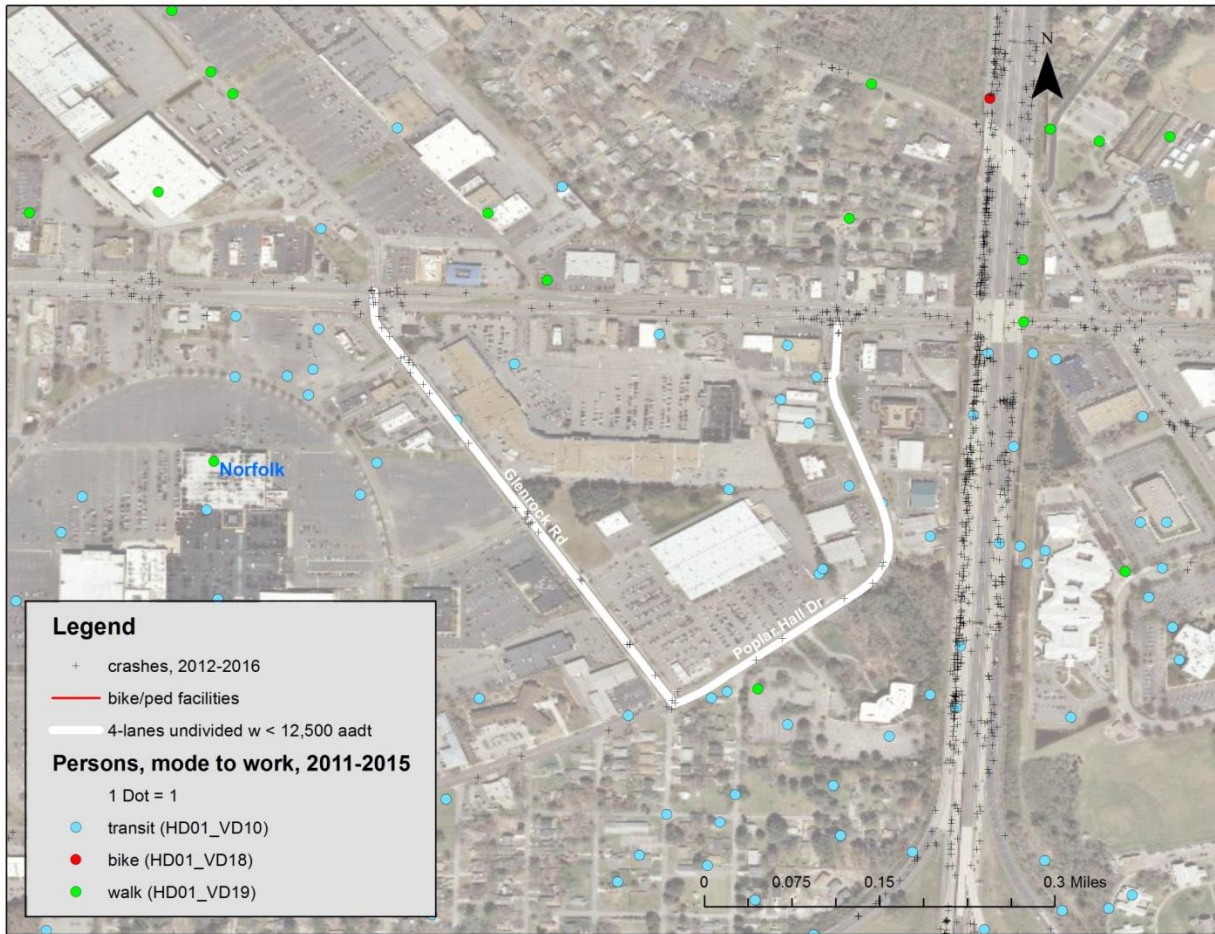


### **Glenrock Rd, from Virginia Beach Blvd to Poplar Hall Dr**

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### **Glenrock Rd, from Virginia Beach Blvd to Poplar Hall Dr**

- moderate crash rate (8 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- existing bus routes
- low potential for street-oriented land use (existing parking-lot-oriented uses)



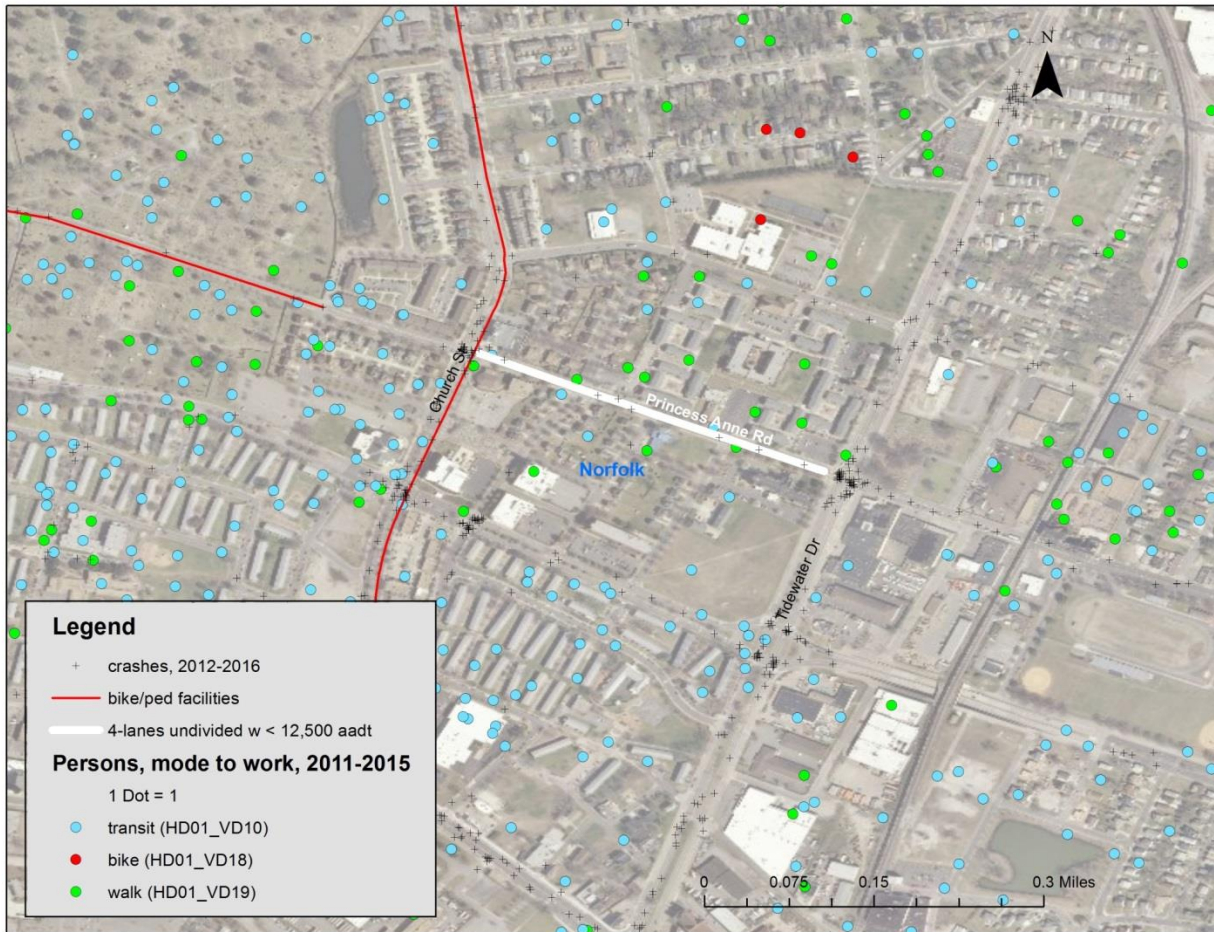
### Poplar Hall Dr, from Virginia Beach Blvd to Glenrock Rd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Poplar Hall Dr, from Virginia Beach Blvd to Glenrock Rd

- low crash rate (3 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented uses)



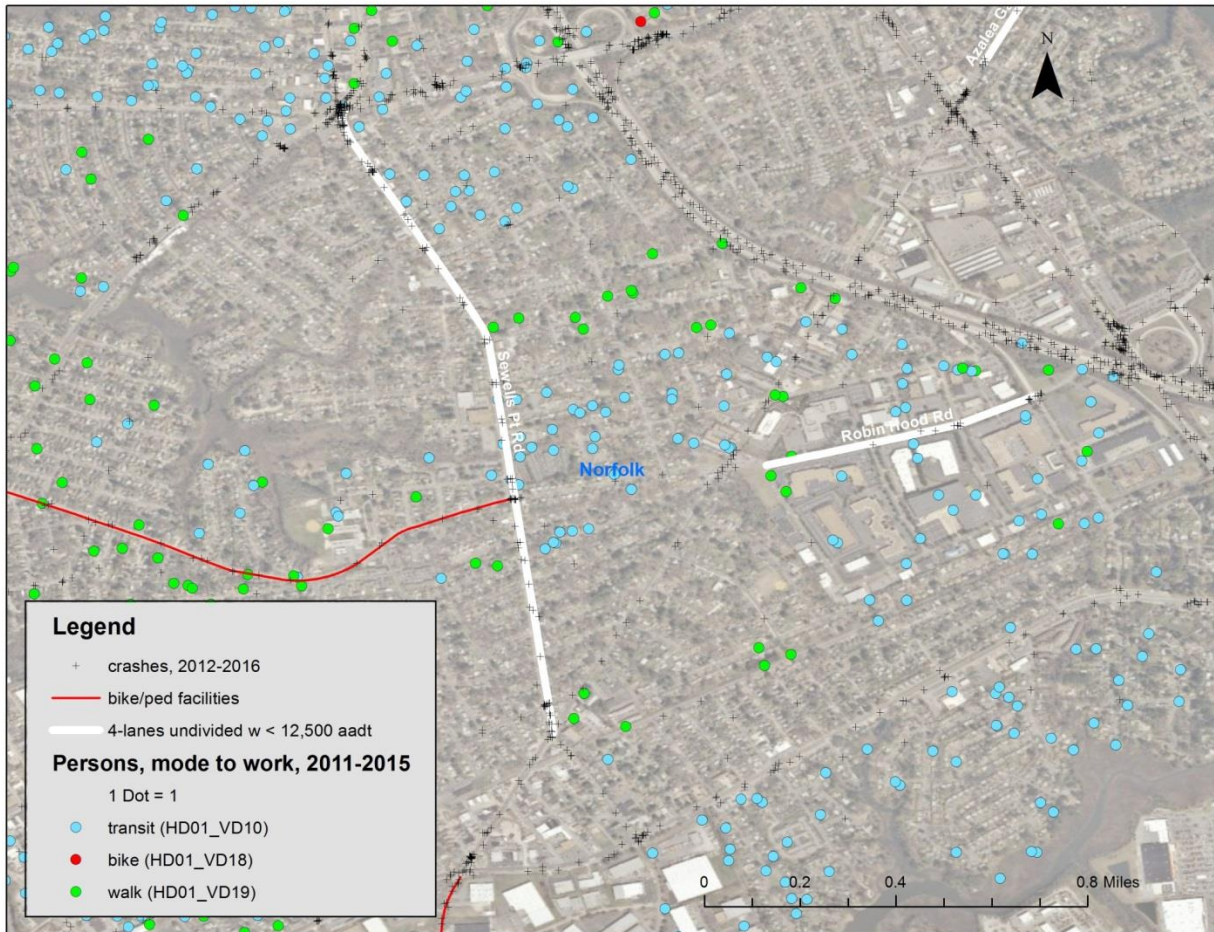


### Princess Anne Rd, from Church St to Tidewater Dr

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Princess Anne Rd, from Church St to Tidewater Dr

- low crash rate (1 per million VMT)
- bike/ped facilities nearby
- many alternative transportation commuters living nearby
- existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented uses and houses facing back or side streets)



## Robin Hood Rd and Sewells Point Rd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

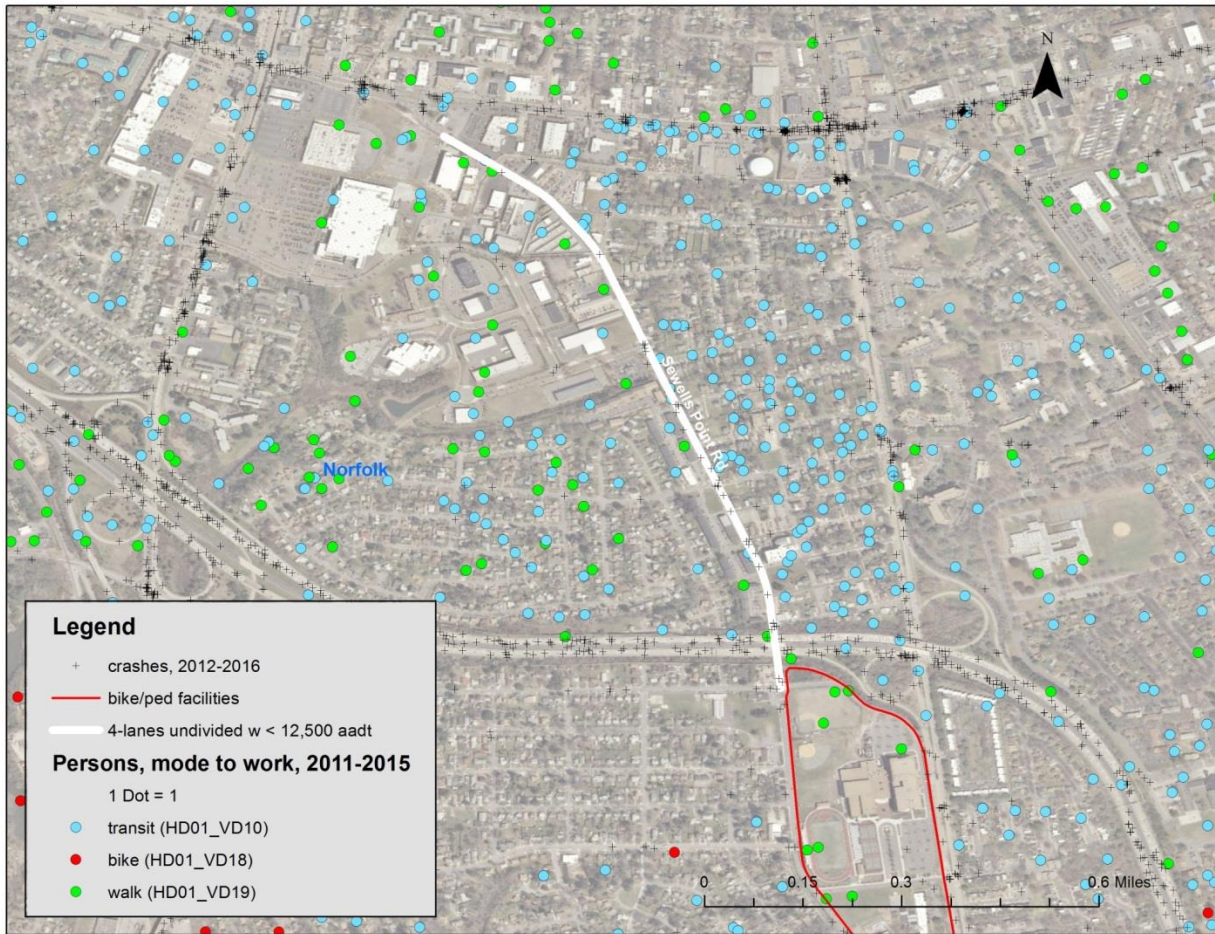
### Robin Hood Rd, from Walmer Ave to I-64 EB Off-Ramp

- low crash rate (1 per million VMT)
- bike/ped facility for Robin Hood Rd west of Sewells Point Rd
- many alternative transportation commuters living nearby
- existing bus route (#15)
- low potential for street-oriented land use (existing parking-lot-oriented uses)

### Sewells Point Rd, from Azalea Garden Rd to Chesapeake Blvd

- low crash rate (3 per million VMT)
- bike/ped facility for perpendicular Robin Hood Rd
- many alternative transportation commuters living nearby
- existing bus route (#9)
- low potential for street-oriented land use (northern section: large-lot residences; southern section: residential lots front on side streets)





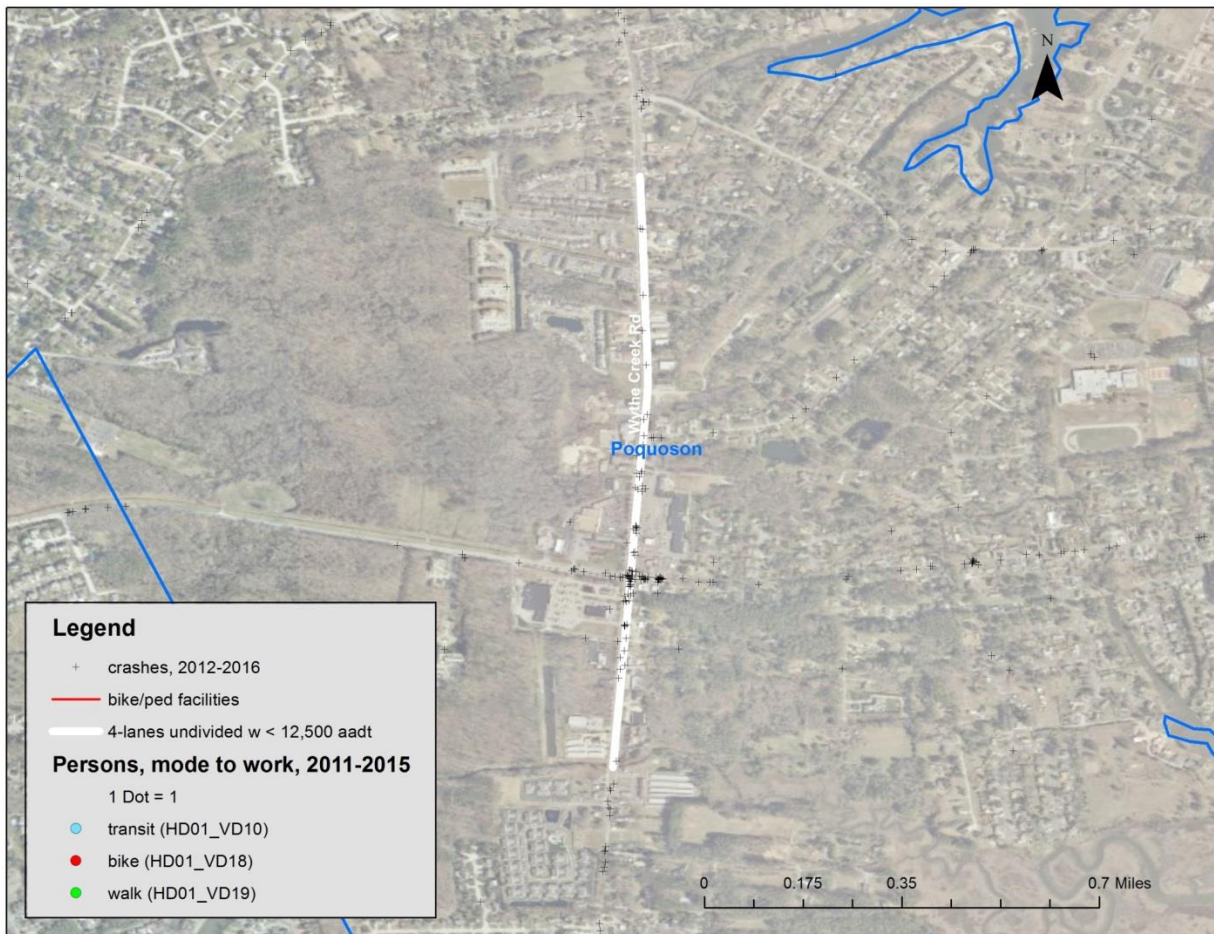
### Sewells Point Rd, from Widgeon Rd to Little Creek Rd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Sewells Point Rd, from Widgeon Rd to Little Creek Rd

- low crash rate (3 per million VMT)
- bike/ped facilities near southern end
- many alternative transportation commuters living nearby
- existing bus route (#9)
- low potential for street-oriented land use (existing parking-lot-oriented uses and residences facing side streets; however, some vacant land)

## Poquoson



### Wythe Creek Rd, from Storage World to Wainwright Dr

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Wythe Creek Rd, from Storage World to Wainwright Dr

- low crash rate (4 per million VMT)
- no bike/ped facilities in vicinity
- no alternative transportation commuters living nearby
- no existing bus route
- potential for street-oriented land use (vacant land)



## Portsmouth



### Chautauqua Ave, from Bayview Blvd to Detroit St

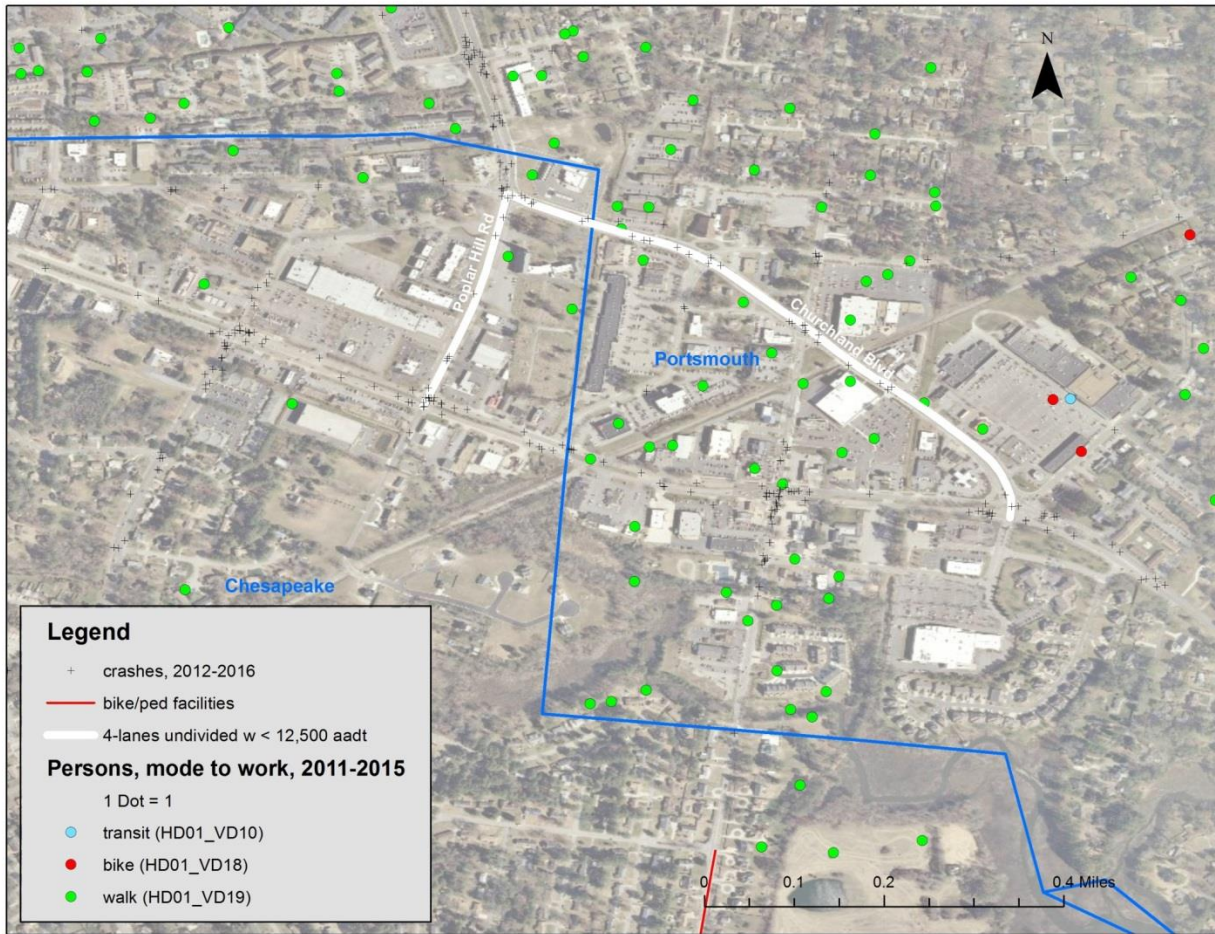
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Chautauqua Ave, from Bayview Blvd to Detroit St

- low crash rate (1 per million VMT)
- bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- no existing bus route
- existing street-oriented land use (residences with small lots<sup>140</sup>)

<sup>140</sup> higher need for on-street parking



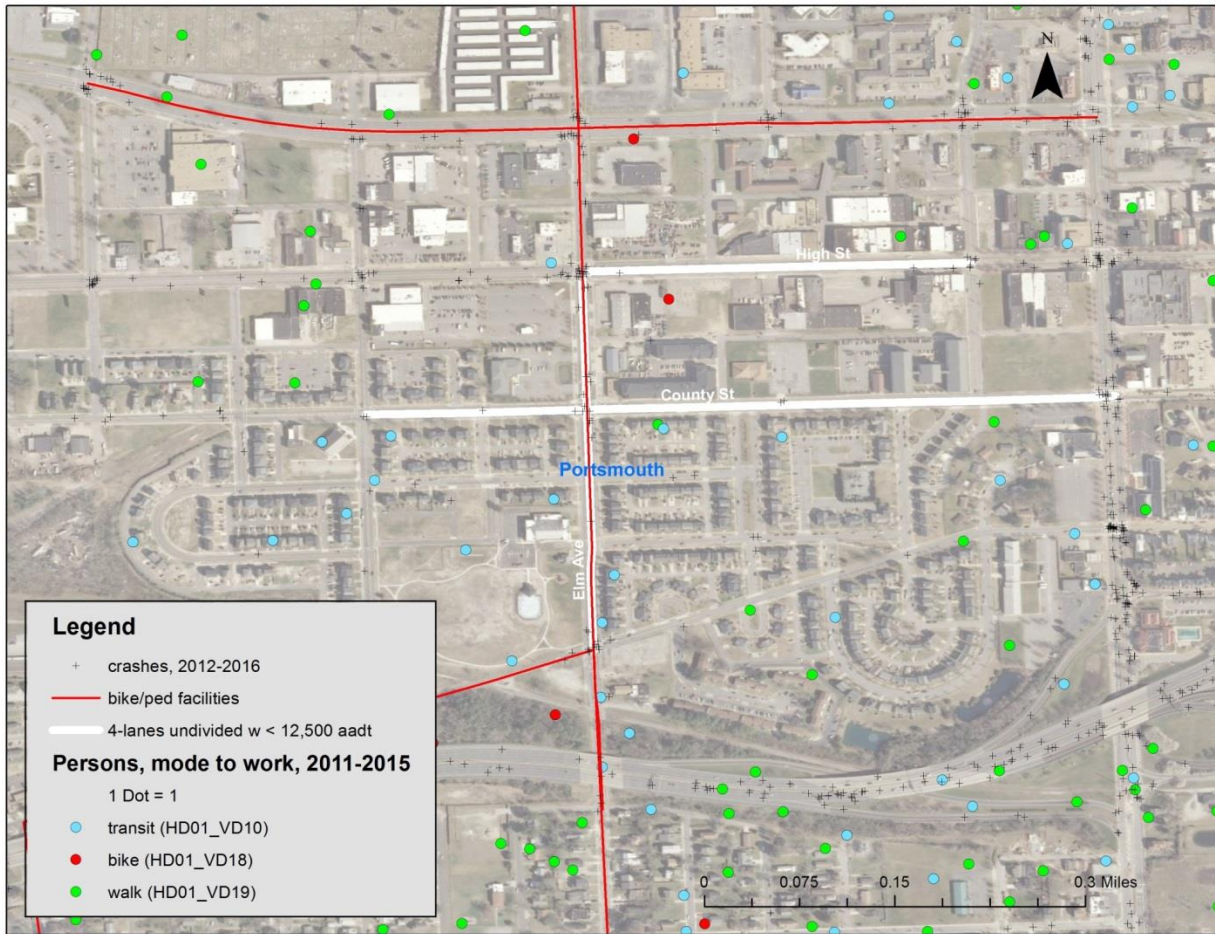


### Churchland Blvd, from Chesapeake/Portsmouth Corp Limit to High St

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Churchland Blvd, from Chesapeake/Portsmouth Corp Limit to High St

- low crash rate (2 per million VMT)
- planned South Hampton Roads Trail (SHRT) bisects this segment
- some alternative transportation commuters living nearby
- existing bus route (#47)
- low potential for street-oriented land use (existing parking-lot-oriented uses)



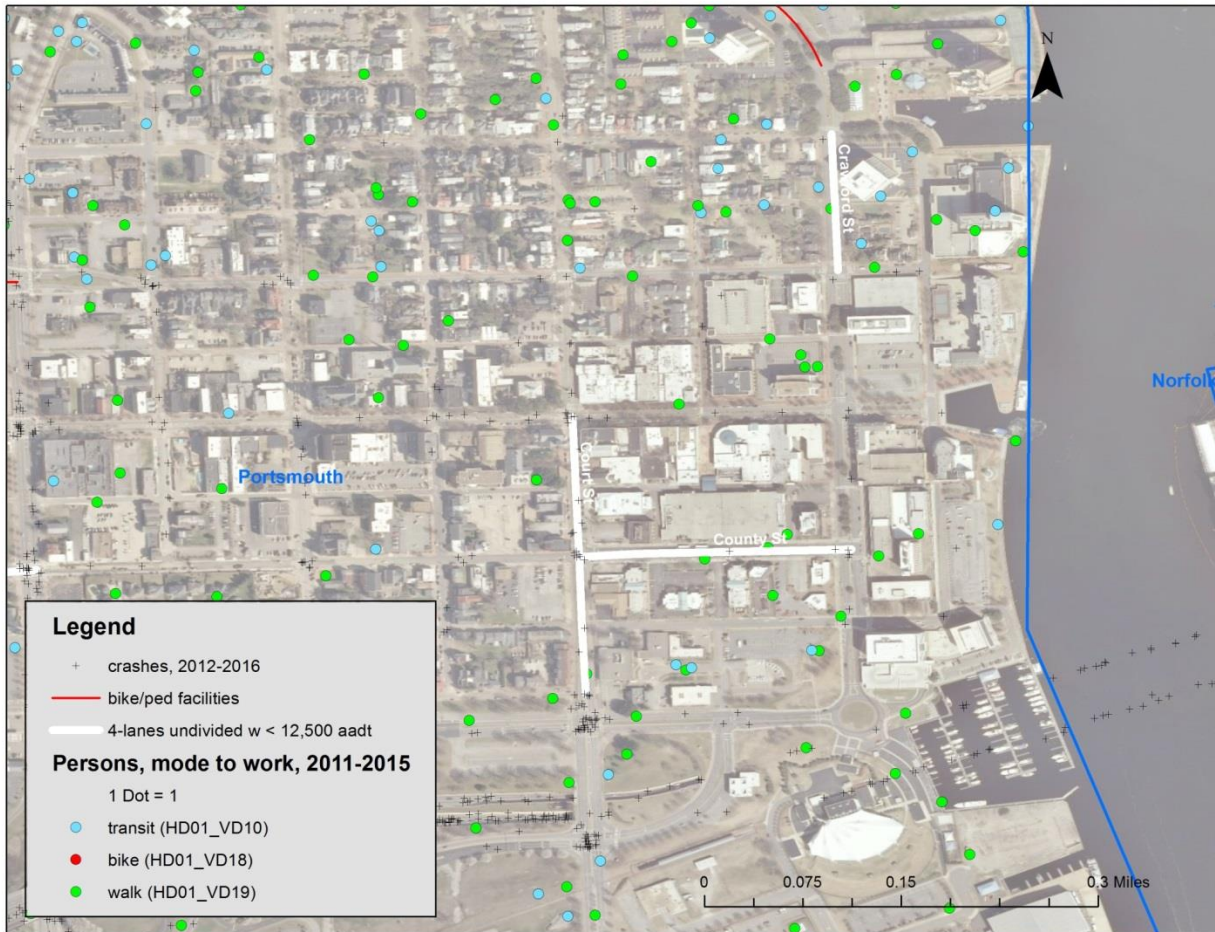
### County St, from Godwin St to Effingham St

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### County St, from Godwin St to Effingham St

- low crash rate (2 per million VMT)
- existing bike/ped facilities nearby
- few alternative transportation commuters living nearby
- no existing bus route
- existing street-oriented land use (residences with front doors facing the street, some vacant land)





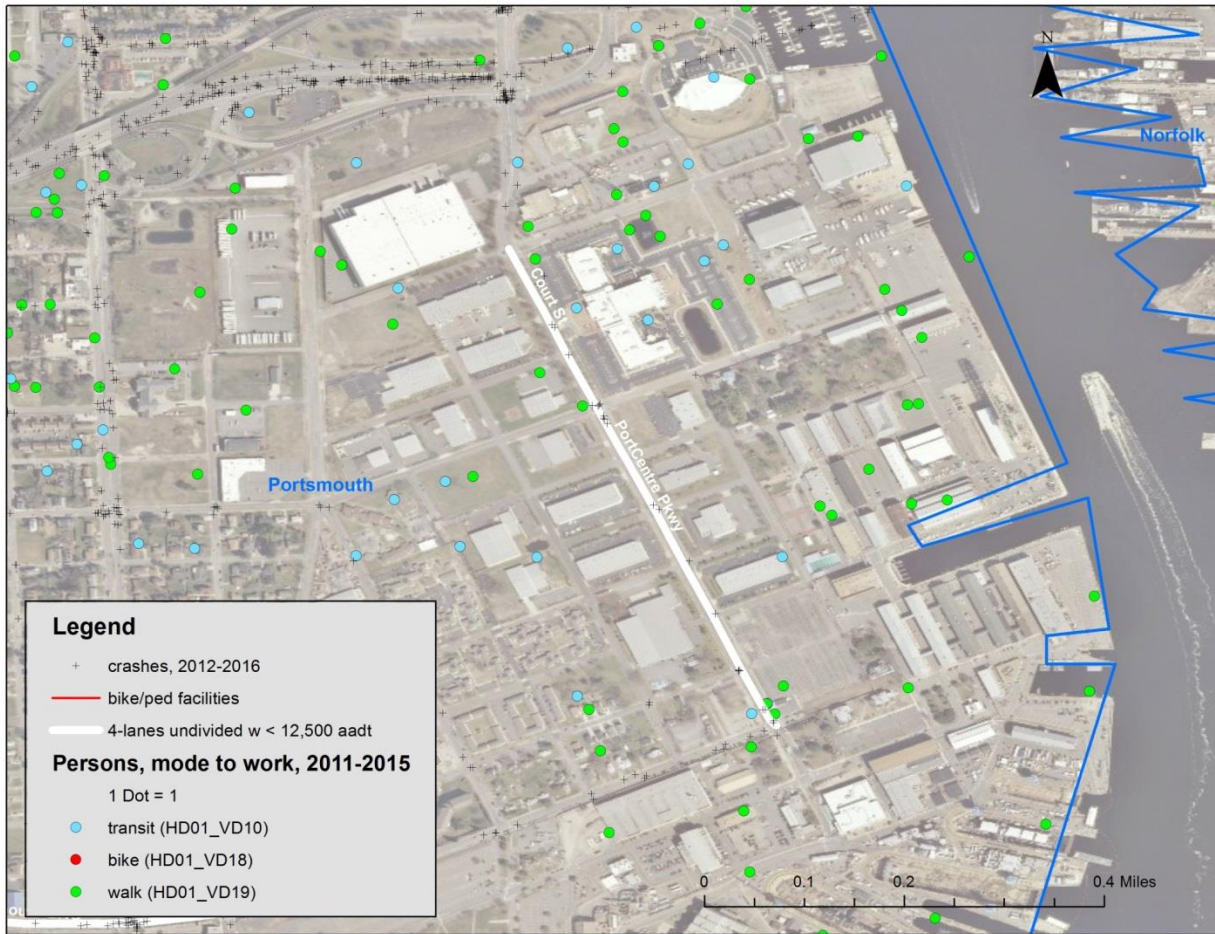
### County St, from Crawford St to Court St

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### County St, from Crawford St to Court St

- low crash rate (1 per million VMT)
- no existing bike/ped facilities nearby
- few alternative transportation commuters living nearby
- existing bus routes (41, 43, 45, 47, 50)
- low potential for street-oriented land use (existing parking-lot/deck-oriented uses)
- existing on-street parking



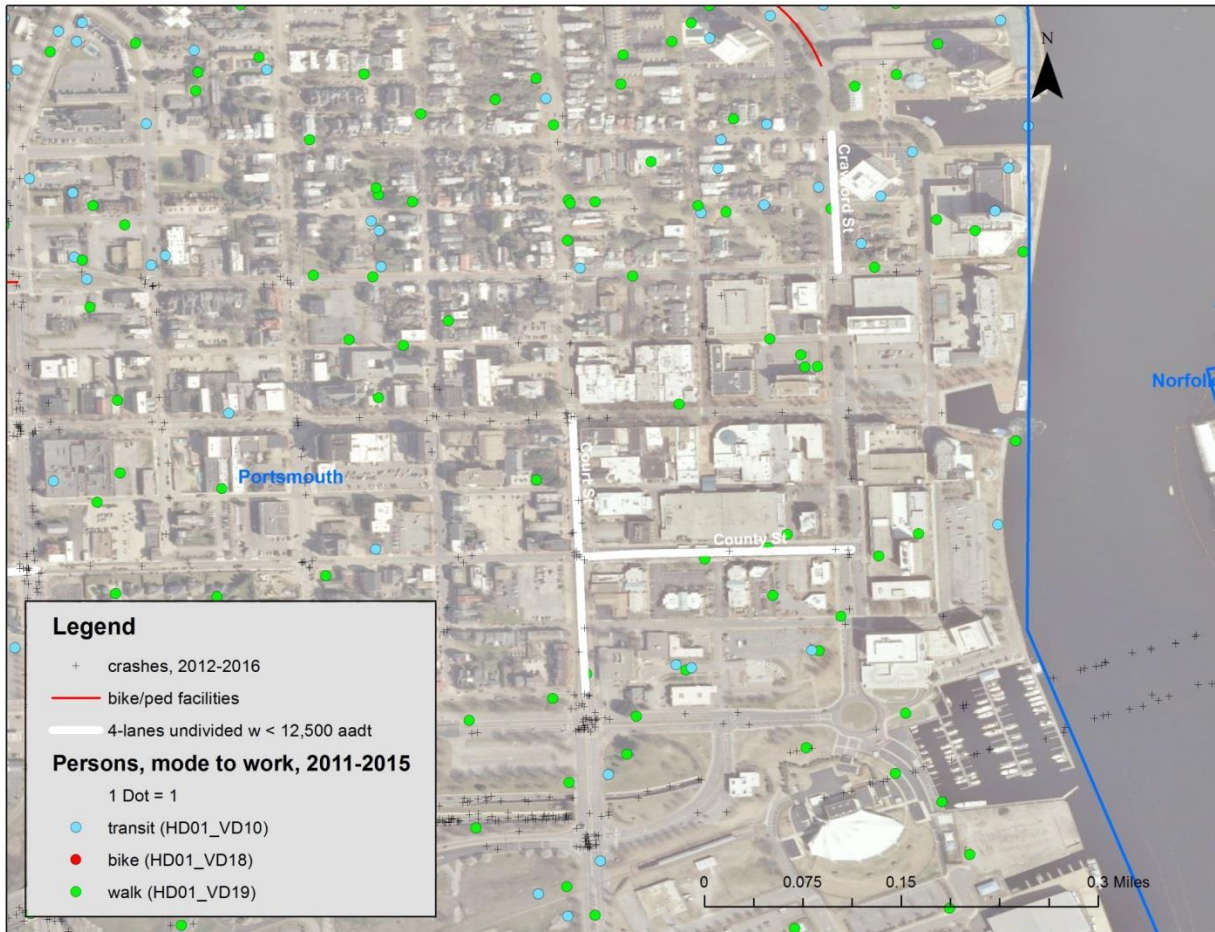


### Court St / PortCentre Pkwy, from Wavy St to Portsmouth Blvd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Court St / PortCentre Pkwy, from Wavy St to Portsmouth Blvd

- low crash rate (3 per million VMT)
- existing bike lanes along PortCentre Pkwy
- some alternative transportation commuters living nearby
- existing bus route (41)
- low potential for street-oriented land use (existing parking-lot-oriented uses)



## Court St and Crawford St

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

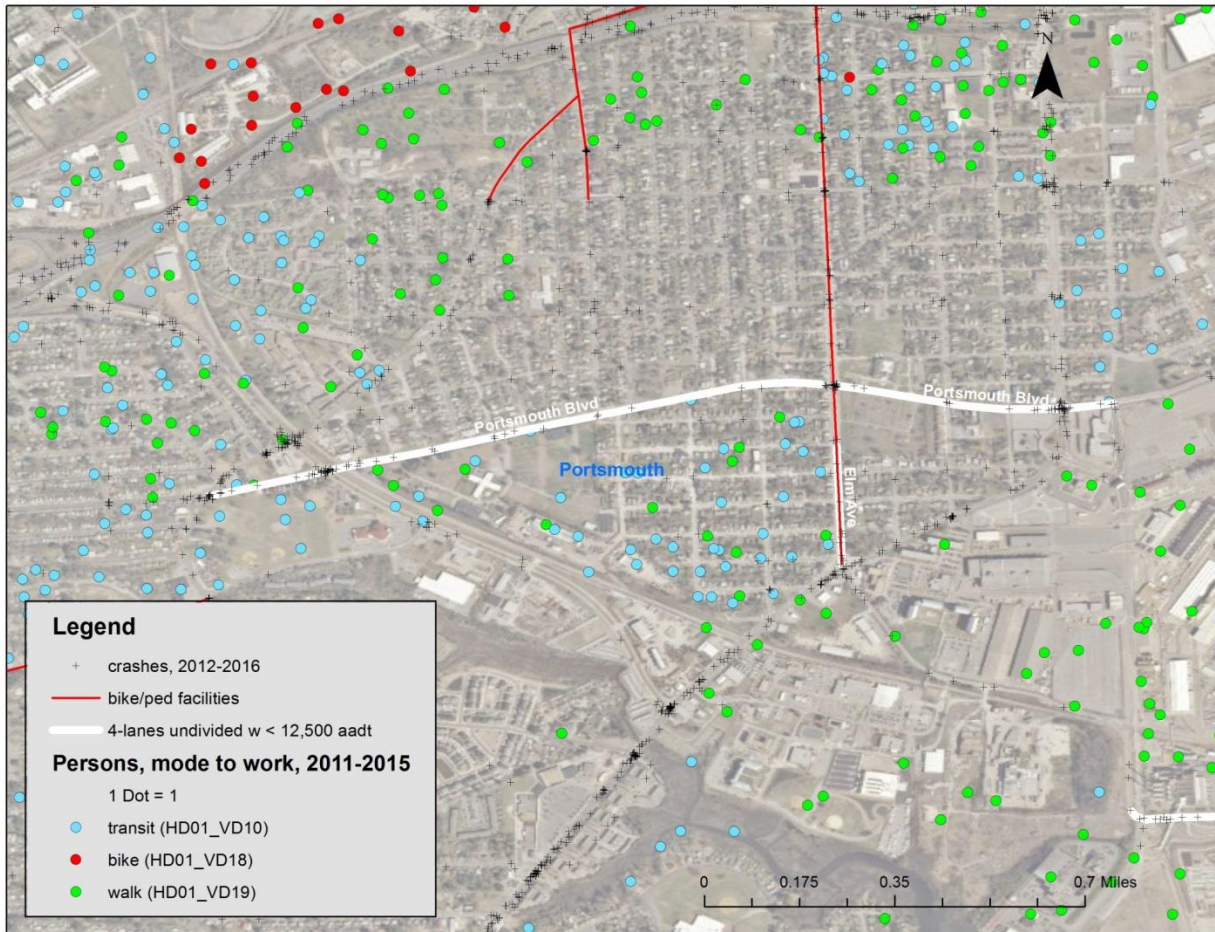
### Court St, from High St to Bart St

- moderate crash rate (7 per million VMT)
- no existing bike/ped facilities in vicinity
- some alternative transportation commuters living nearby
- existing bus routes (41, 43, 45, 47, 50)
- existing street-oriented land uses (businesses, library, etc.)
- existing on-street parking

### Crawford St, from London St to North St

- low crash rate (0 per million VMT)
- existing bike/ped facility along Crawford St north of subject segment
- some alternative transportation commuters living nearby
- no existing bus route
- existing street-oriented land use (small-lot houses facing street)





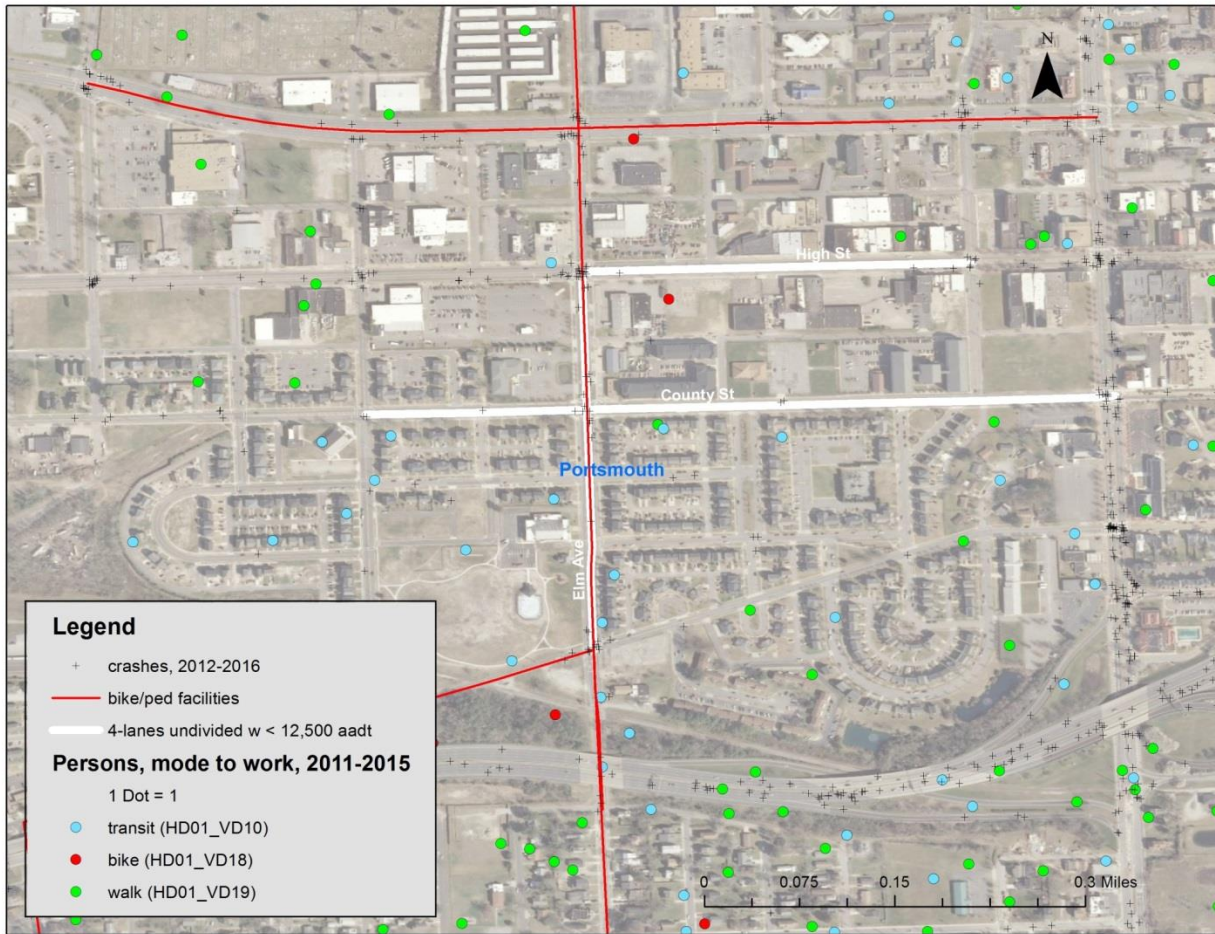
## Elm Ave, from Summit Ave to George Washington Hwy

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

### Elm Ave, from Summit Ave to George Washington Hwy

- low crash rate (4 per million VMT)
- existing bike lanes along subject segment
- many alternative transportation commuters living nearby
- no existing bus route
- existing street-oriented land uses (small-lot residences)



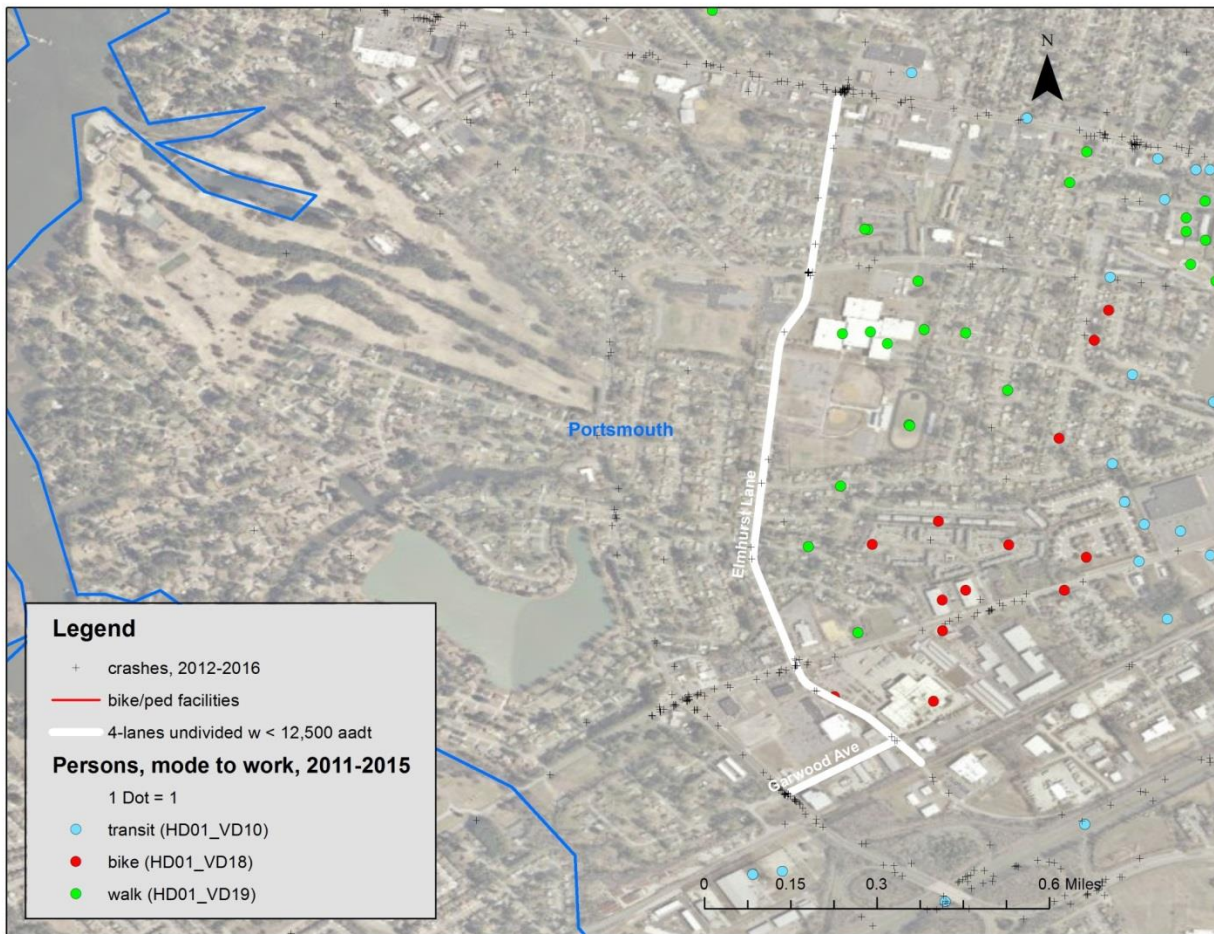


## Elm Ave, from High St to South St

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

### Elm Ave, from High St to South St

- low crash rate (3 per million VMT)
- existing signed “bike route” along subject segment (no physical facility)
- few alternative transportation commuters living nearby
- existing bus route (#50)
- existing street-oriented land uses (front doors of residences served by walkways to sidewalk/street)
- on-street parking between County St and Rutter St



## Elmhurst Lane and Garwood Ave

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

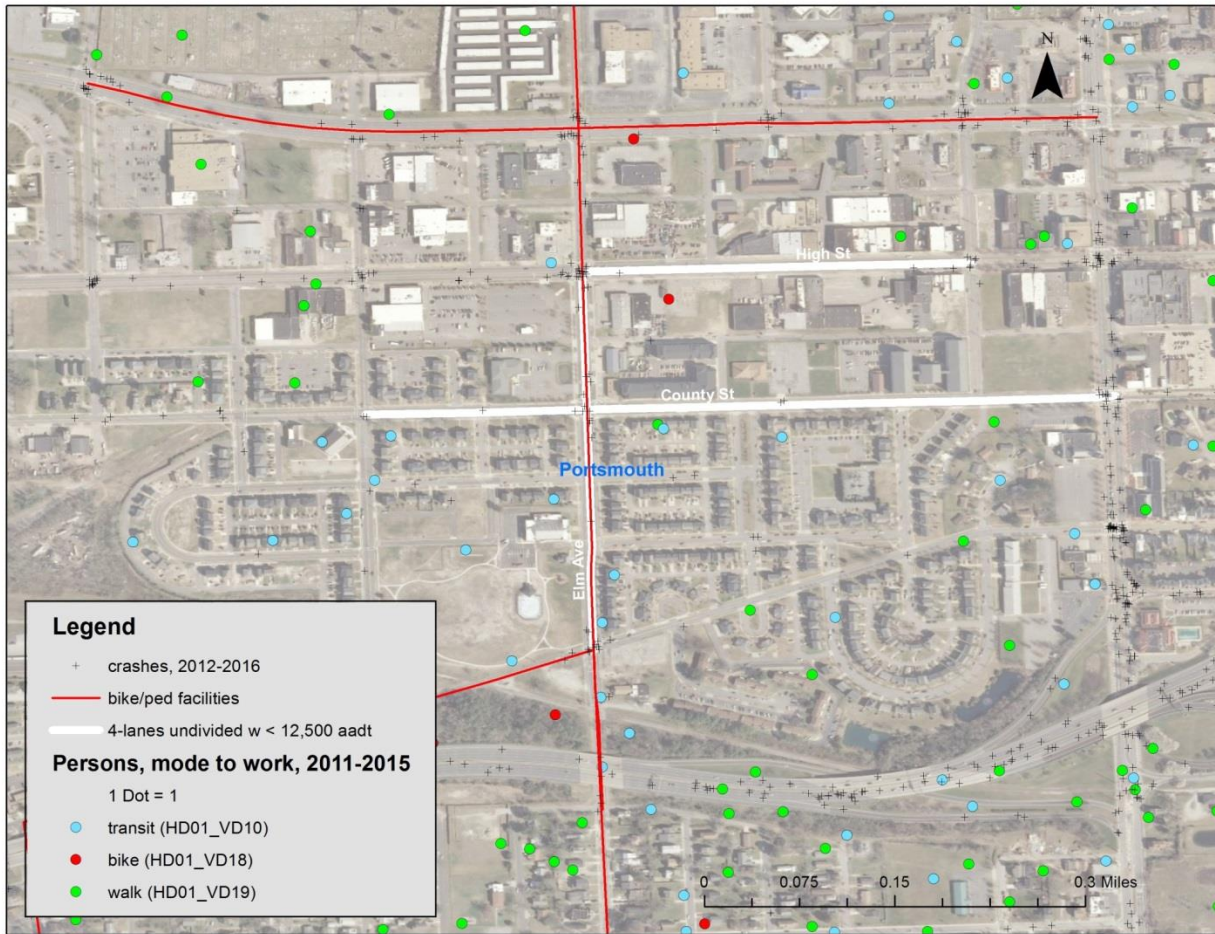
Elmhurst Lane, from CSX railroad near Garwood Ave to Portsmouth Blvd

- low crash rate (2 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land uses (existing large-lot residences and parking-lot-oriented uses)

Garwood Ave, from Greenwood Dr to Elmhurst Ln

- low crash rate (0 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- no existing bus route
- potential for street-oriented land uses (vacant land)





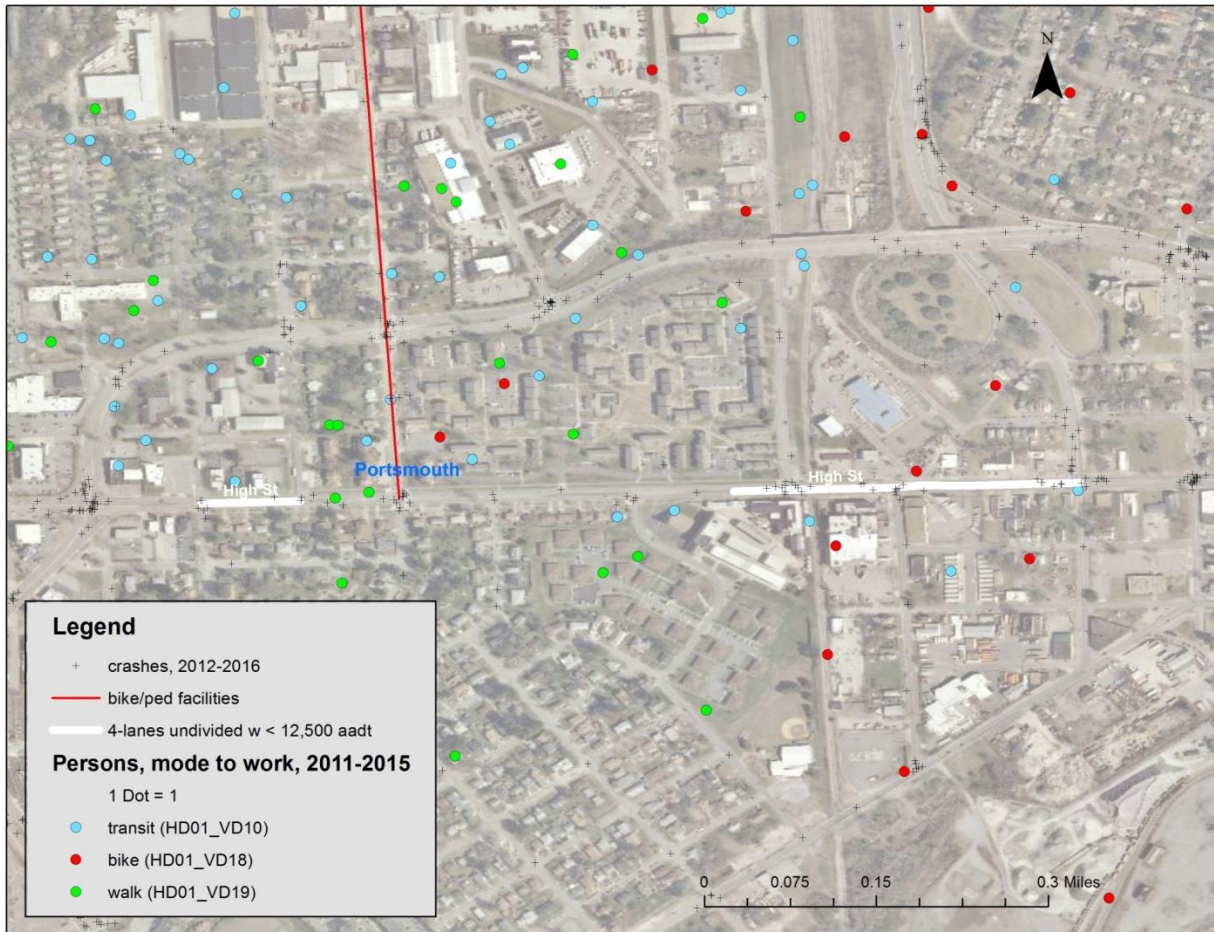
## High St, from Chestnut St to Elm Ave

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

### High St, from Chestnut St to Elm Ave

- low crash rate (1 per million VMT)
- nearby bike/ped facilities
- few alternative transportation commuters living nearby
- existing bus routes (47, 50)
- potential for street-oriented land uses (street-facing commercial buildings with limited parking)





## High St, two sections

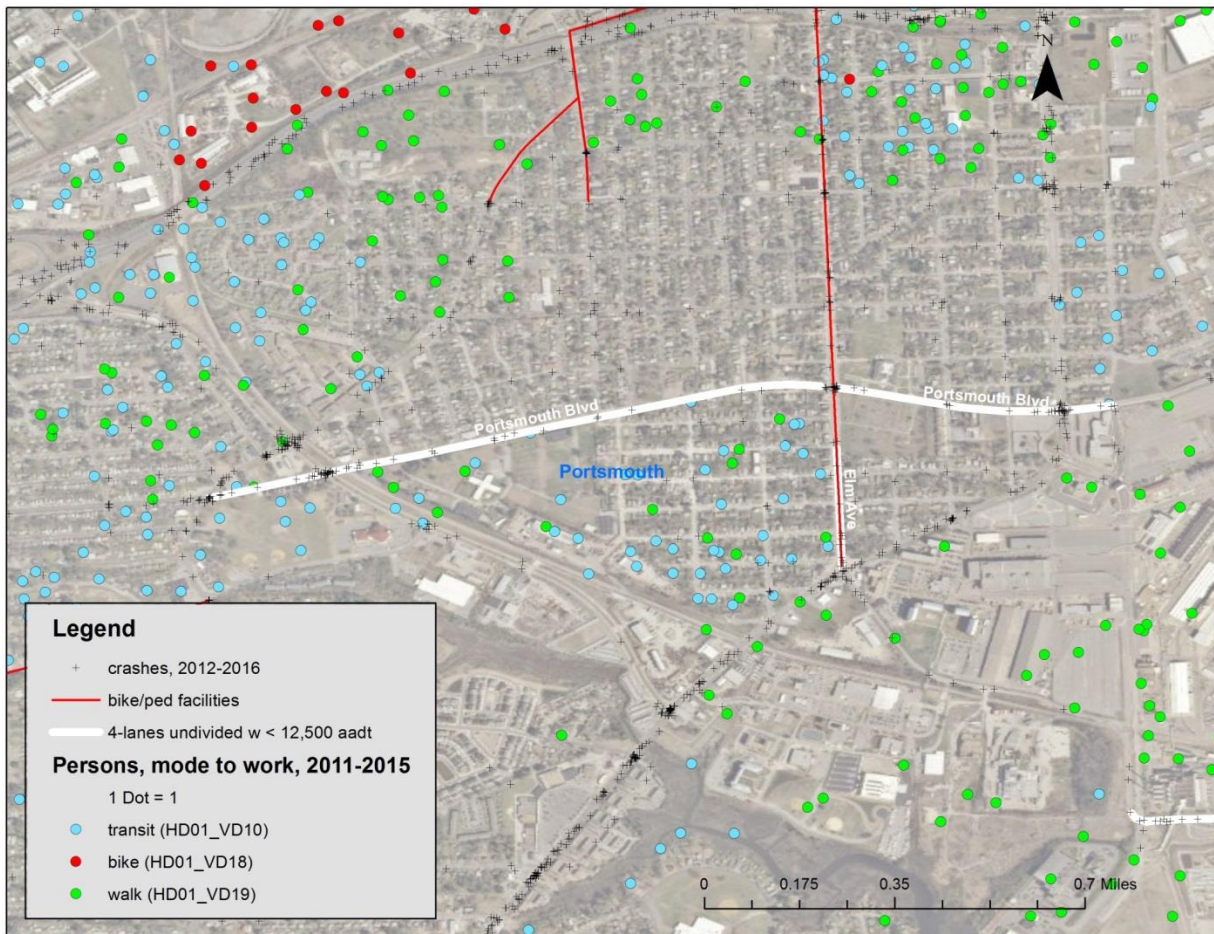
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

### High St, from Douglas Ave to Florida Ave

- low crash rate (1 per million VMT)
- nearby bike/ped facility (Mt Vernon Ave)
- few alternative transportation commuters living nearby
- existing bus routes (43, 44, 47)
- existing street-oriented land use (small-lot residences)

### High St, from Virginia Ave to MLK Freeway

- moderate crash rate (5 per million VMT)
- no nearby bike/ped facilities
- few alternative transportation commuters living nearby
- existing bus route (47)
- low potential for street-oriented land uses (existing parking-lot-oriented uses)



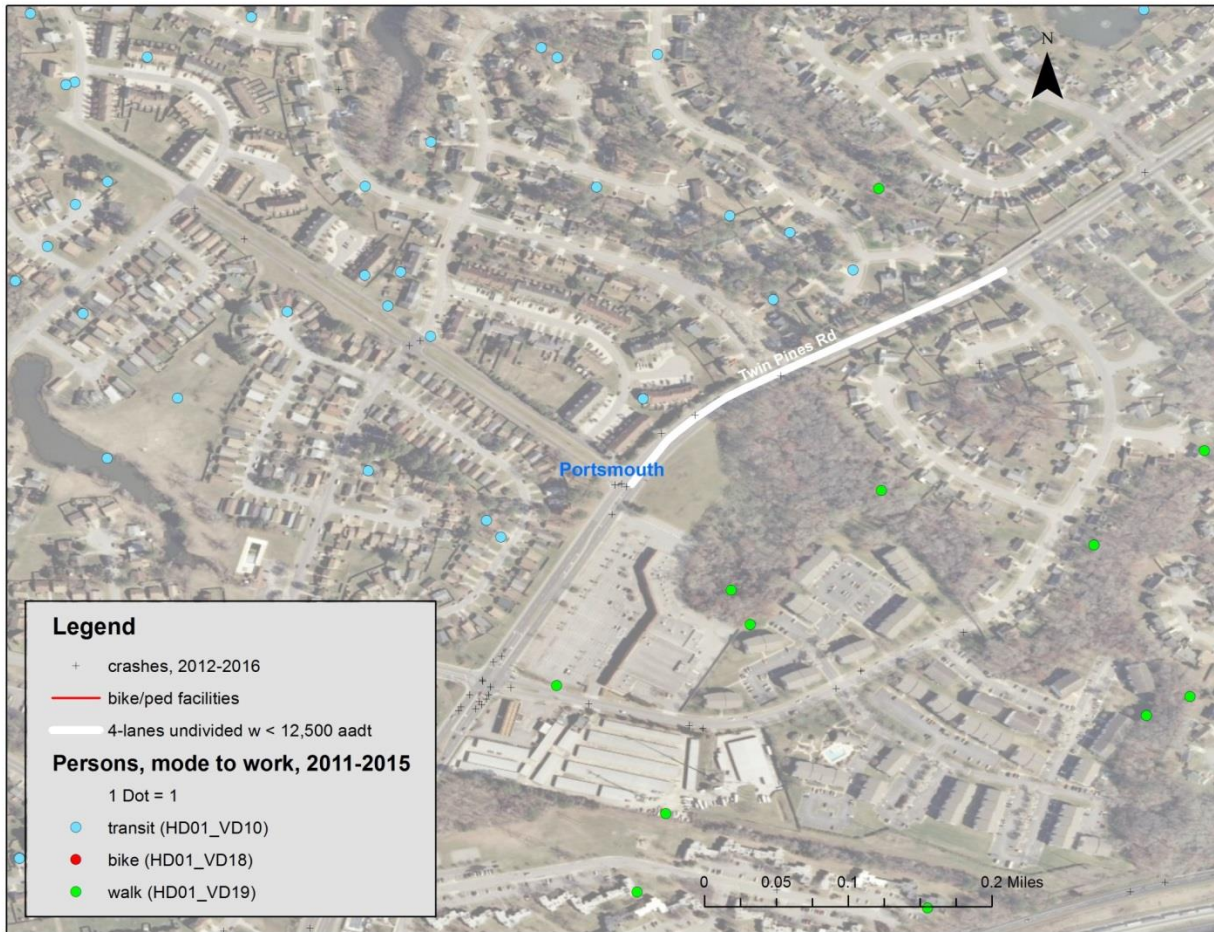
### Portsmouth Blvd, from Deep Creek Blvd to Green St

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Portsmouth Blvd, from Deep Creek Blvd to Green St

- moderate crash rate (7 per million VMT)
- bisecting bike/ped facility (Elm Ave)
- some alternative transportation commuters living nearby
- existing bus route (45)
- existing street-oriented land use (some small-lot residences), and potential street-oriented land use (vacant land)





### Twin Pines Rd, from Hofflers Creek Pkwy to Willow Breeze Dr

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Twin Pines Rd, from Hofflers Creek Pkwy to Willow Breeze Dr

- low crash rate (1 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- no existing bus route
- no existing street-oriented land use (residences served by side streets); potential street-oriented land use (vacant land)





### West Norfolk Rd, from Cedar Ln to River Pointe Pkwy

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### West Norfolk Rd, from Cedar Ln to River Pointe Pkwy

- low crash rate (1 per million VMT)
- subject road has sharrows
- few alternative transportation commuters living nearby
- no existing bus route
- existing large-lot residences (less need for potential on-street parking); potential street-oriented land use (vacant land)



### Western Branch Blvd, from Rodman Ave to Halifax Ave

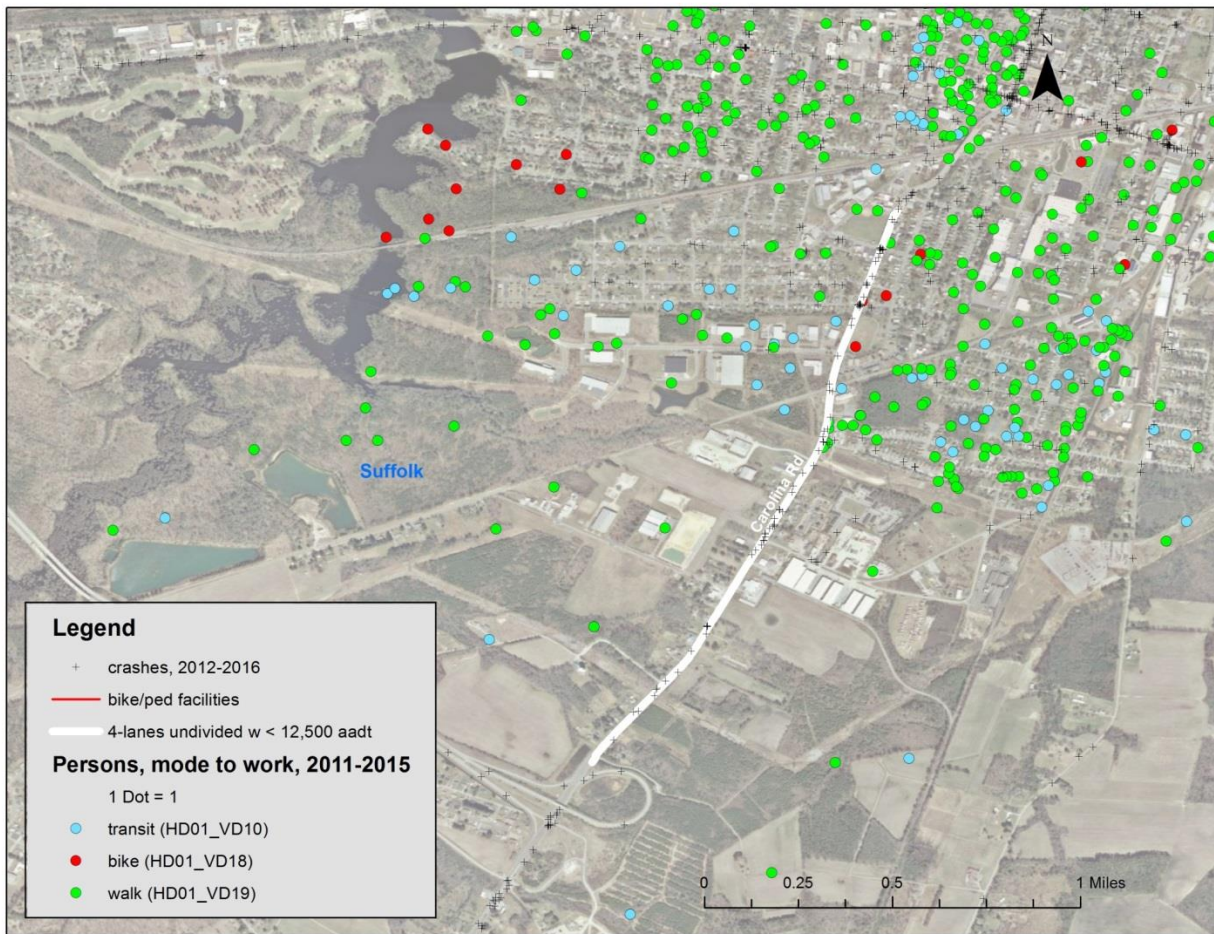
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Western Branch Blvd, from Rodman Ave to Halifax Ave

- low crash rate (0 per million VMT)
- no bike/ped facilities in vicinity
- very few alternative transportation commuters living nearby
- no existing bus route
- north side of street: no potential for street-oriented land use (shops with parking parallel to street); south side of street: some potential for street-oriented land use (vacant land)



## Suffolk



### **Carolina Rd, from SW Suffolk Bypass to Fayette St**

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Carolina Rd, from SW Suffolk Bypass to Fayette St

- low crash rate (3 per million VMT)
- no bike/ped facilities in vicinity
- many alternative transportation commuters living near northern section
- existing bus routes (orange, yellow)
- potential for street-oriented land use (vacant land)





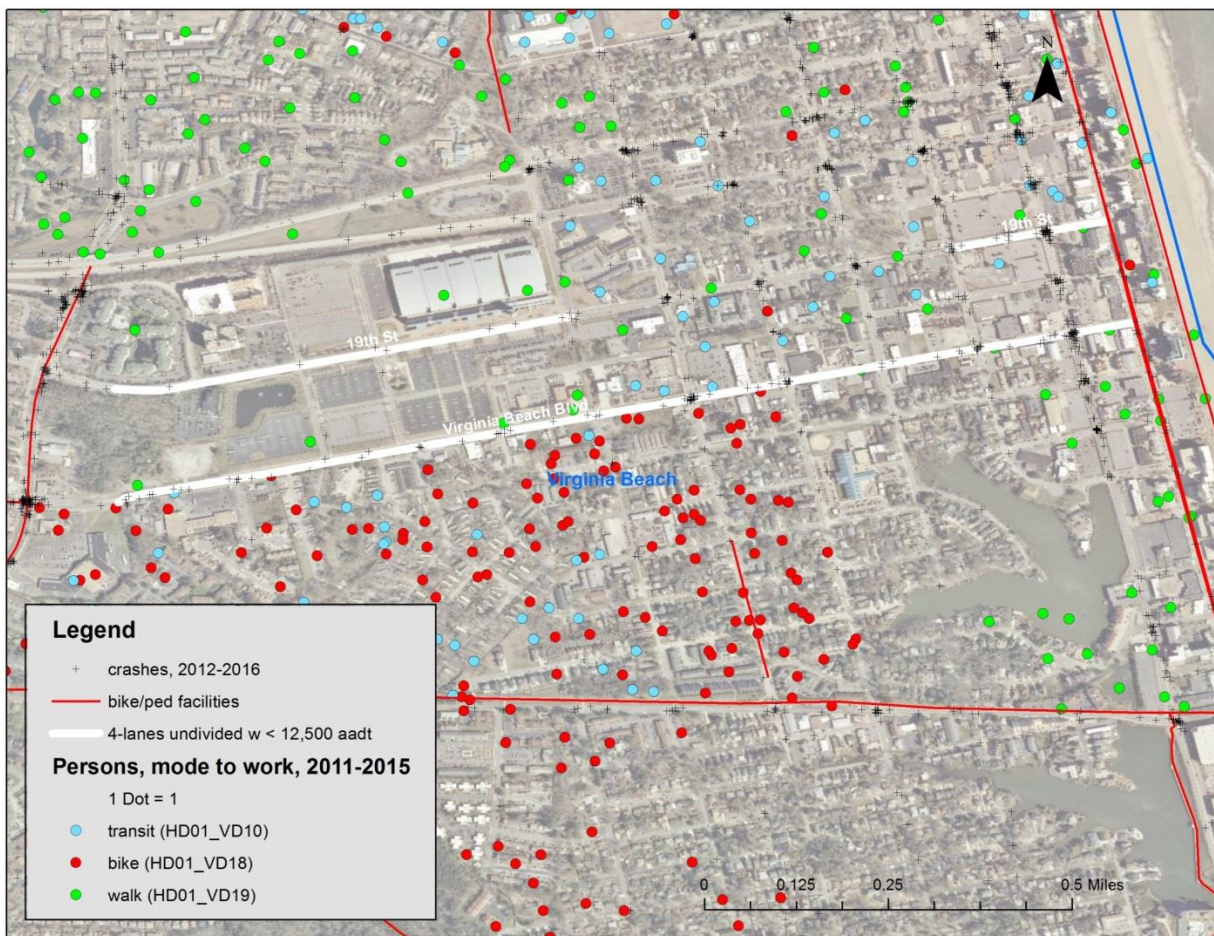
### Pruden Blvd, from Autumn Care of Suffolk to Godwin Blvd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Pruden Blvd, from Autumn Care of Suffolk to Godwin Blvd

- low crash rate (3 per million VMT)
- no bike/ped facilities in vicinity
- very few alternative transportation commuters living near northern section
- existing bus routes (green, red)
- low potential for street-oriented land use (existing parking-lot-oriented land uses)

## Va. Beach



### **19<sup>th</sup> Street**

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### **19<sup>th</sup> St, from Birdneck Rd to Parks Ave**

- low crash rate (3 per million VMT)
- bike/ped facilities in vicinity
- some alternative transportation commuters living near northern section
- no existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented land uses)

#### **19<sup>th</sup> St, from Arctic Ave to Atlantic Ave**

- very high crash rate (38 per million VMT)
- bike/ped facilities in vicinity
- some alternative transportation commuters living near northern section
- existing bus route (#32)
- potential for street-oriented land use (redevelopment of city-owned parking lots)





### **Dorset Ave / Euclid Rd, from Va. Beach Blvd to Southern Blvd**

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### **Dorset Ave / Euclid Rd, from Va. Beach Blvd to Southern Blvd**

- low crash rate (4 per million VMT)
- no bike/ped facilities in vicinity
- few alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (existing parking-lot-oriented land uses)





## First Court Rd and Pleasure House Rd

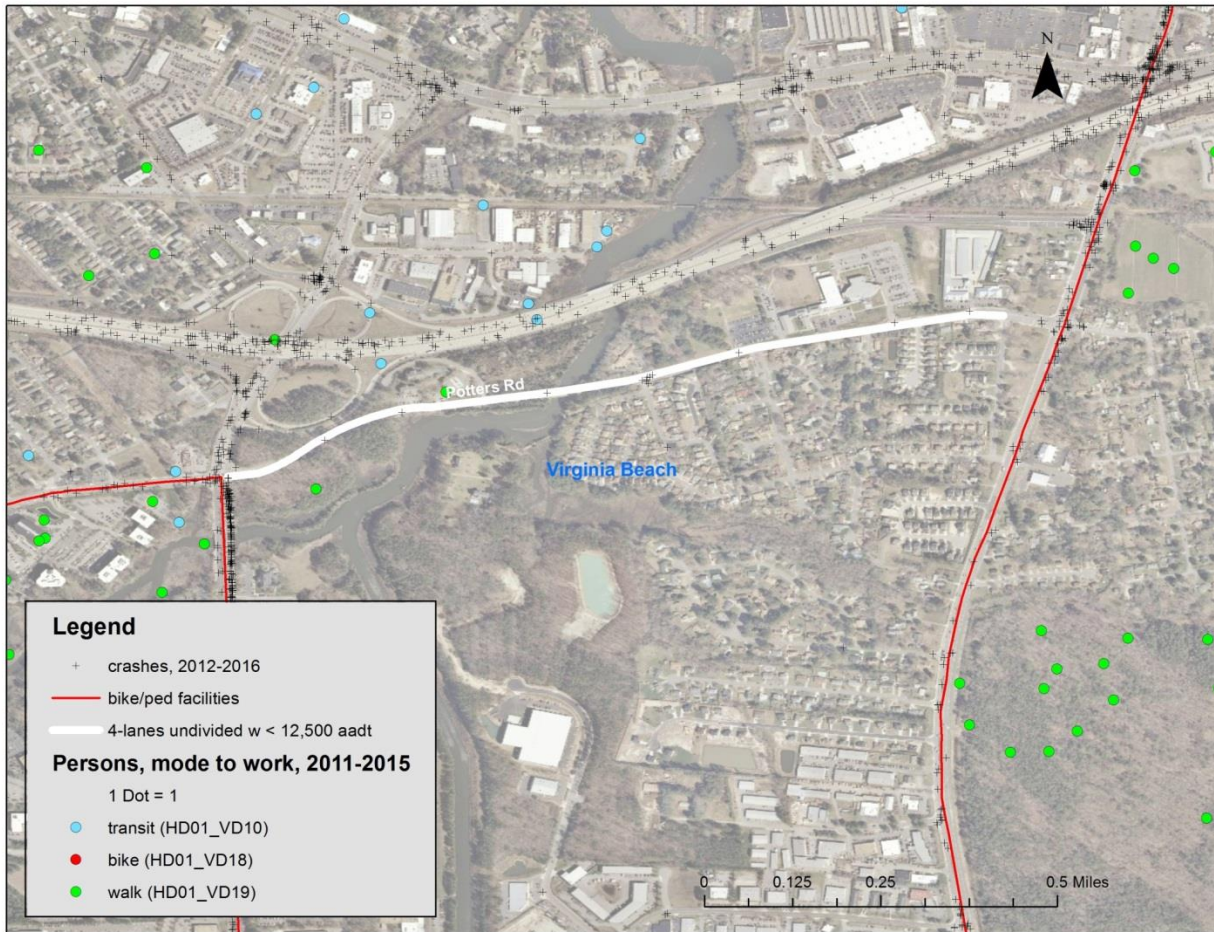
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

### First Court Rd, from Pleasure House Rd to Hook Ln

- low crash rate (2 per million VMT)
- no bike/ped facilities in vicinity
- very few alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (north side: large-lot residences [less need for potential on-street parking]; south side: residences accessed via back street)

### Pleasure House Rd, from Thoroughgood Square to Northampton Blvd

- low crash rate (3 per million VMT)
- no bike/ped facilities in vicinity
- very few alternative transportation commuters living nearby
- existing bus routes (1, 22)
- low potential for street-oriented land use (existing parking-lot-oriented uses)



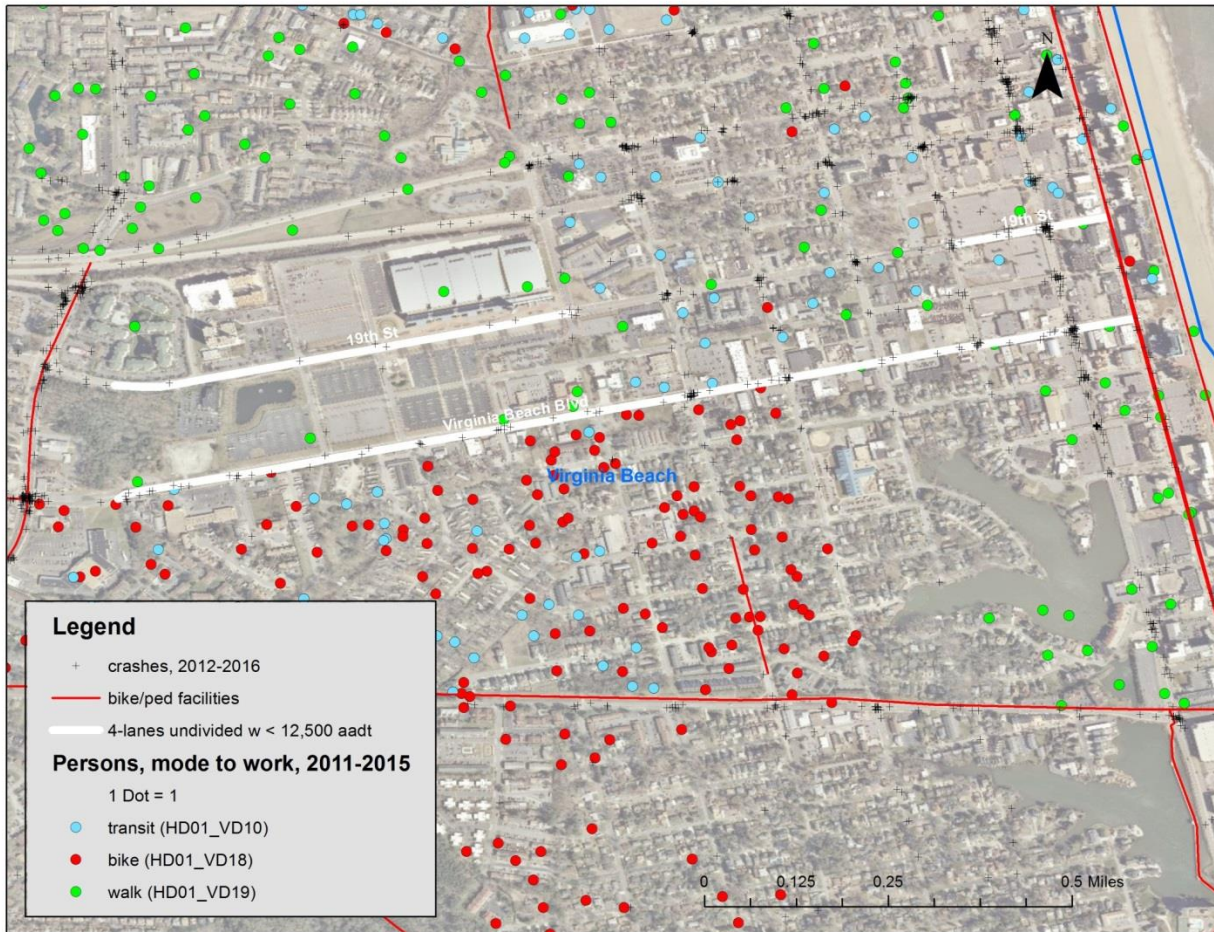
### Potters Rd, from Lynnhaven Pkwy to Fair Lady Rd

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Potters Rd, from Lynnhaven Pkwy to Fair Lady Rd

- low crash rate (1 per million VMT)
- bike/ped facilities at both ends of subject segment
- few alternative transportation commuters living nearby
- no existing bus route
- low potential for street-oriented land use (north side: parking-lot-oriented uses; south side: residences accessed via side streets)





### Virginia Beach Blvd, from Birch Lake Rd to Atlantic Ave

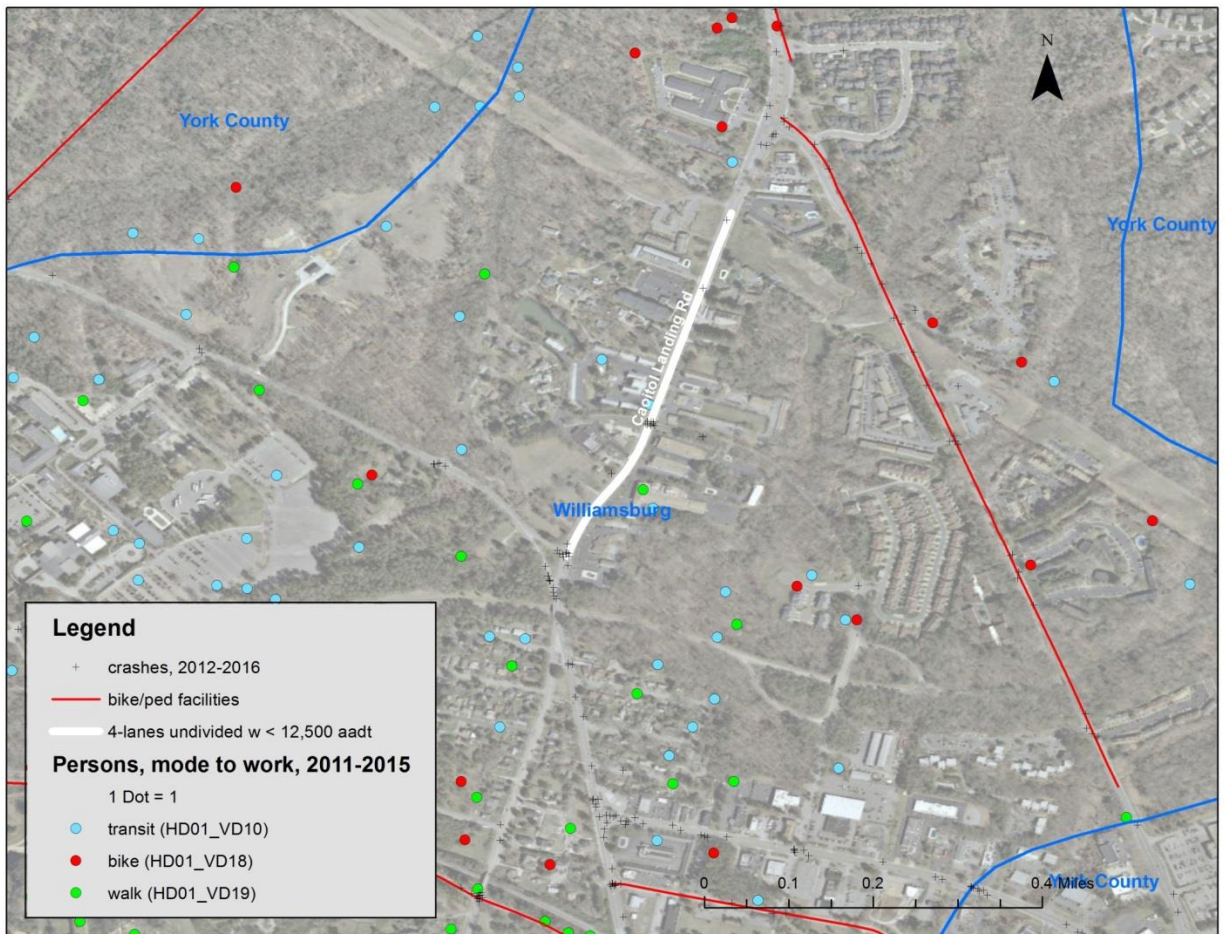
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Virginia Beach Blvd, from Birch Lake Rd to Atlantic Ave

- moderate crash rate (6 per million VMT)
- bike/ped facilities at both ends of subject segment
- many alternative transportation commuters living nearby
- existing bus route (#20)
- east of Cypress Ave: potential for street-oriented land use (existing street-oriented businesses)



## Williamsburg

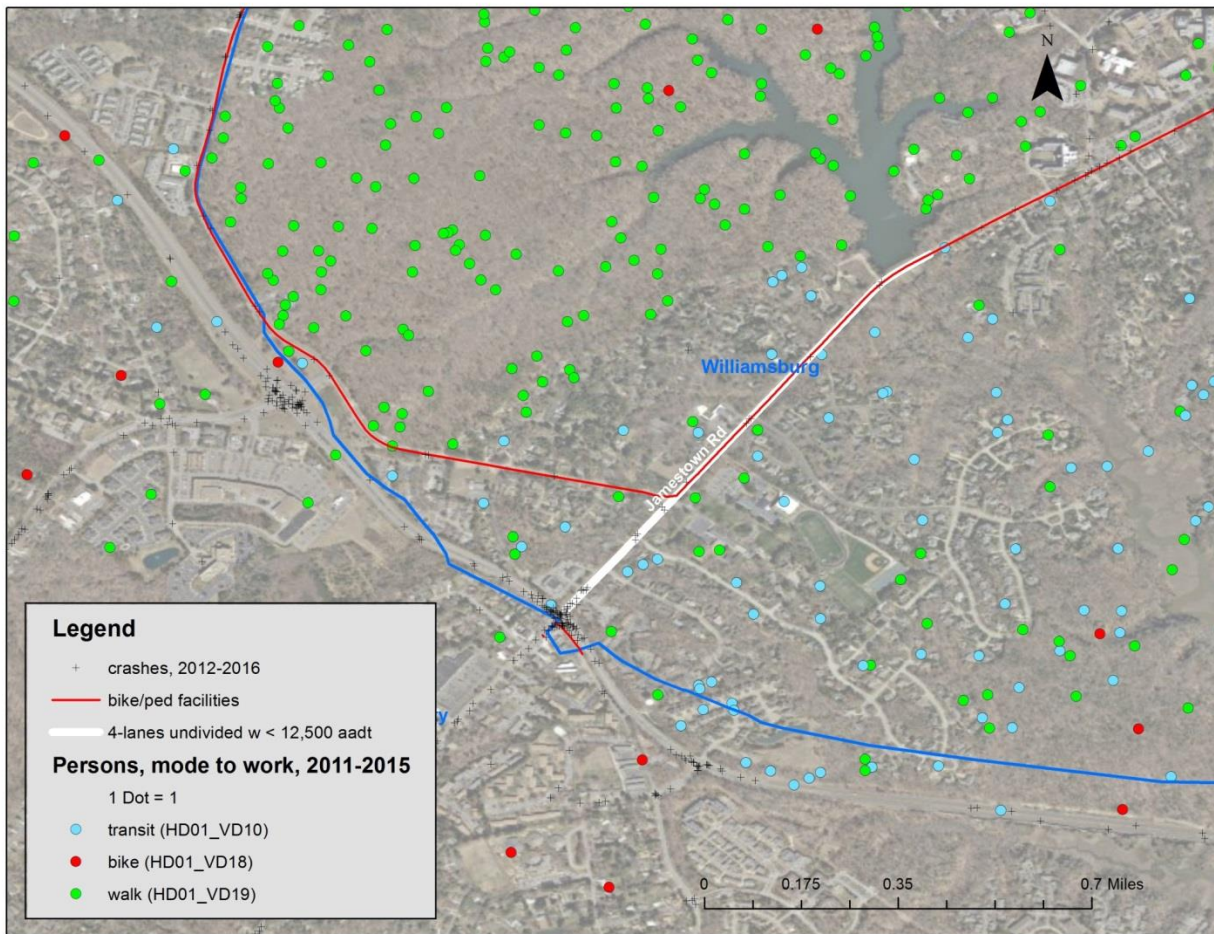


### Capitol Landing Rd, from Bypass Rd to Maynard Dr

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Capitol Landing Rd, from Bypass Rd to Maynard Dr

- low crash rate (3 per million VMT)
- bike/ped facilities nearby
- some alternative transportation commuters living nearby
- existing bus route (orange)
- potential for street-oriented land use (vacant land)



### Jamestown Rd, from Rte 199 to College Creek

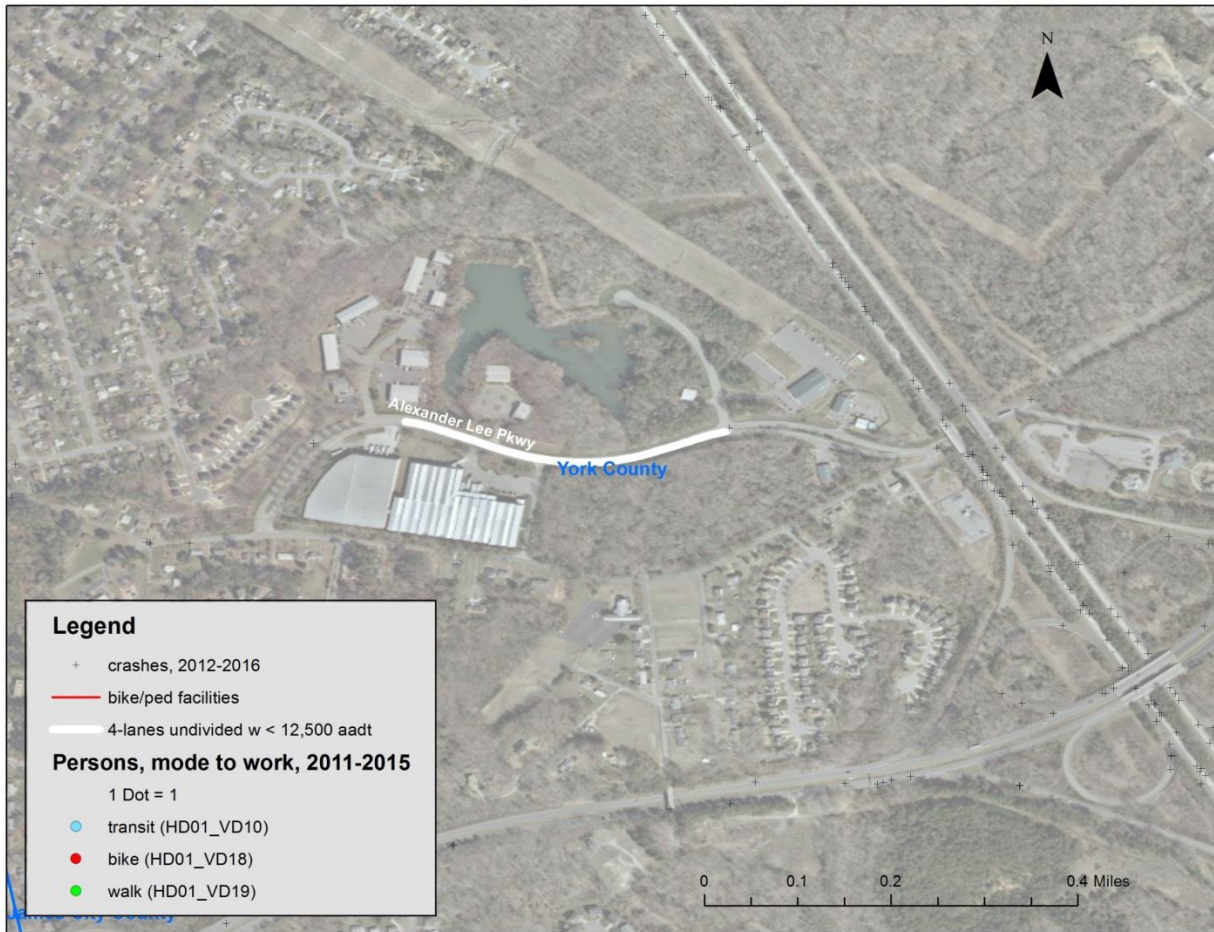
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Jamestown Rd, from Rte 199 to College Creek

- low crash rate (1 per million VMT)
- existing bike lanes on subject segment east of John Tyler Ln
- many alternative transportation commuters living nearby
- existing bus route (#6)
- low potential for street-oriented land use (residences served by side streets)



## York



### **Alexander Lee Pkwy, from Warwick Ct to Stafford Ct**

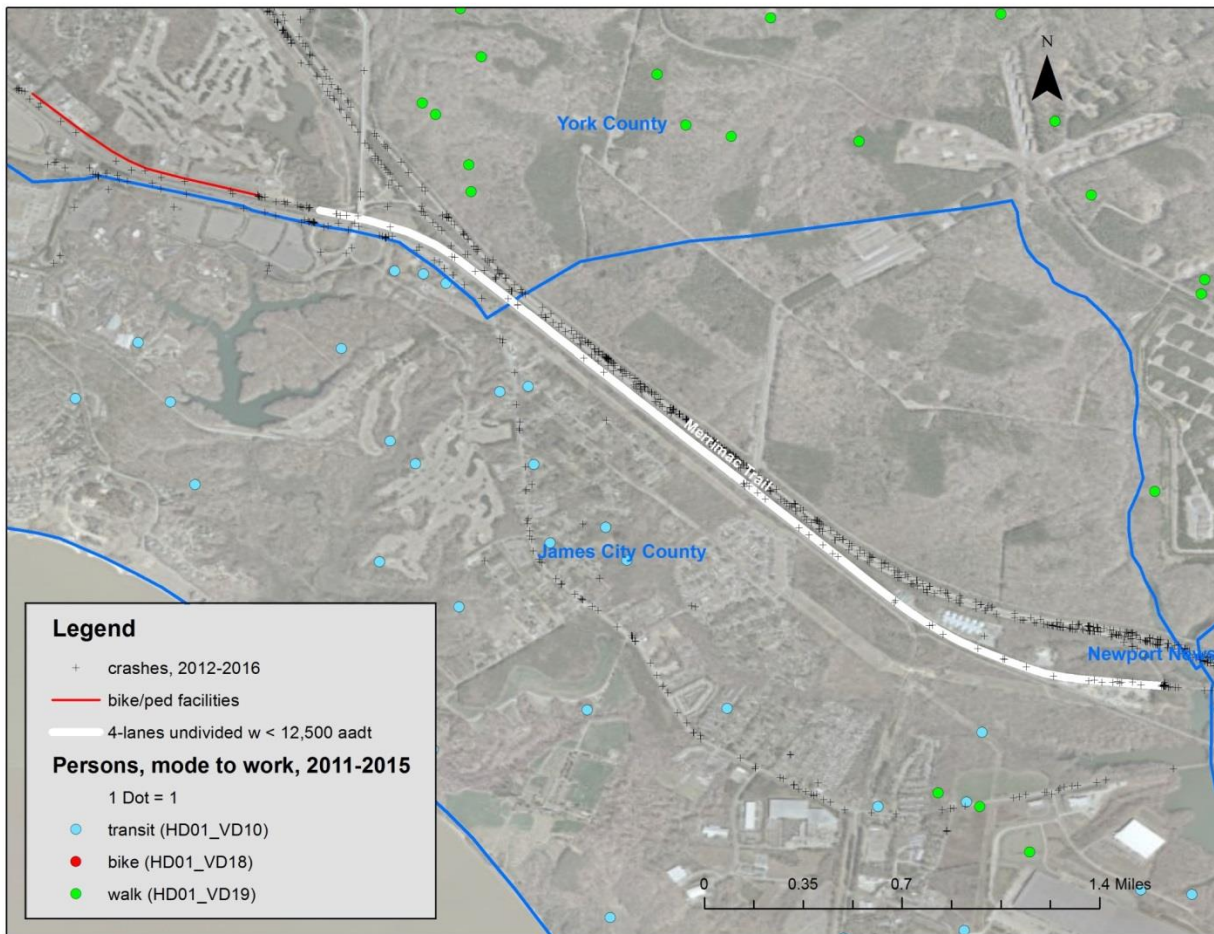
Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### Alexander Lee Pkwy, from Warwick Ct to Stafford Ct

- low crash rate (0 per million VMT)
- no bike/ped facilities nearby
- no alternative transportation commuters living nearby
- existing bus route (Orange)
- low potential for street-oriented land use (existing light-industrial area with parking-lot-oriented uses)

Note that the traffic count on this roadway is expected to increase as its industrial park becomes fully developed.





### **Merrimac Trail, from I-64 exit 243B to York/JCC Corporate Limit**

Source: HRTPO staff ESRI mapping using crashes and volumes (VDOT), cross-section (Google Maps), commuting (Census)

#### **Merrimac Trail, from I-64 exit 243B to York/JCC Corporate Limit**

- low crash rate (1 per million VMT), whole segment (JCC and York County)
- bike/ped facilities near eastern end of subject segment
- few alternative transportation commuters living nearby
- existing bus route (#11)
- low potential for street-oriented land use (thru road used as alternative to interstate)

In addition, VDOT is studying a Skiffes Creek Connector between US 60 and Merrimac Trail, which may add more truck traffic to Merrimac Trail.

Note that changes to this segment may impact access to interstate ramps and other state maintained facilities.

## HOW ROAD DIETS SCORE IN TPO PRIORITIZATION

HRTPO staff scores candidate projects for inclusion in its Long-Range Transportation Plan (LRTP) and for allocation of the funding under HRTPO purview. Concerning the LRTP, because road diets do not add capacity to the system, it is not necessary for HRTPO staff to include them in the LRTP. Concerning funding, road diets are eligible for both funding sources overseen by the HRTPO Board: Regional Surface Transportation Program (RSTP) and Congestion Mitigation and Air Quality (CMAQ).

The scoring of RSTP candidate projects depends on the type of project. Road diets, being “Highway Capacity, Accessibility and Operational Improvements” type of RSTP project, would be scored with the HRTPO Project Prioritization Tool. Under the tool, road diets could be scored under the “Active Transportation” criteria (if containing bike lanes), or under the “Highway Projects” criteria. As a Highway Project, although a road diet would not score well for reducing congestion (30 pts) or reduction in travel time (30 pts), they may score well for:

- safety (8 pts)
- cost effectiveness (15 pts)
- land use compatibility (10 pts)
- modal enhancements (5 pts)
- project viability (100 pts)
- access for high density employment areas (10 pts)
- access to tourist destinations (10 pts), and
- increased opportunity (20 pts).

CMAQ candidate projects are scored based on cost-effectiveness for reduction of pollutants. To the degree that they shift trips from auto to bike, walking, and transit; road diets reduce pollutants. Due to their low cost, road diets may score well for CMAQ funding.

## NEXT STEPS

As stated in the introduction, the purpose of this study is to identify candidate segments and provide data with which localities can decide if they want to further investigate applying a road diet. If, after reviewing the above data, a local engineer or planner finds a segment that warrants further examination for a road diet, HRTPO staff recommends conducting a “**road diet feasibility determination**” as outlined in chapter 3 of FHWA’s *Road Diet Informational Guide* (FHWA-SA-14-028, Nov. 2014).

In addition, where road diets have or will be done, localities wanting to confirm the efficacy of a particular diet may evaluate it as outlined in chapter 5 (“Determining if the Road Diet is Effective”) of FHWA’s *Road Diet Informational Guide* (FHWA-SA-14-028, Nov. 2014), or as discussed in *Road Diet Evaluation Metrics* (FHWA-SA-17-022).



## **BIBLIOGRAPHY** (alphabetically by title)

**Building on Complete Streets Momentum-** From Studies to On-the-Ground Solutions, by Carrie Nielson Modi and Ryan McClain, ITE Journal, May 2017, pages 31-35.

**Complete Streets Technical Report**, Genesee County Metropolitan Planning Commission, undated

**Converting Four-Lane Undivided Roadways to a Three-Lane Cross Section:** Factors to Consider, by Keith K. Knapp, Thomas M. Welch, and John A. Witmer, Iowa State University and Iowa Department of Transportation [employers of authors], [no date shown; latest references: 1999]

**Evaluation of Lane Reduction “Road Diet” Measures on Crashes**, FHWA, Highway Safety Information System, Turner-Fairbank Highway Research Center, McLean VA, FHWA-HRT-10-053, undated

**Guidelines for the Conversion of Urban Four-Lane Undivided Roadways to Three-Lane Two-Way Left-Turn Lane Facilities**, by Keith K. Knapp and Karen Giese, for Iowa Department of Transportation, April 2001

**Guidelines for Road Diet Conversions**, by Nikiforos Stamatiadis et al., Kentucky Transportation Center, University of Kentucky, Nov. 2011

**Regional Road Diet Analysis** – Feasibility Assessment, staff contact: Rosemarie Anderson (project manager) and Ellis Kim (transportation engineer), Delaware Valley Regional Planning Commission, Dec. 2008

**Road Diet**, Participant Notebook, FHWA Road Diet Workshop, for Transportation Training Academy, Center for Transportation Studies, U. Va., May 2016

**Road Diet Case Studies**, FHWA, 2015

**Road Diet Handbook:** Setting Trends for Livable Streets, by Jennifer Rosales, Parsons Brinckerhoff, Second Edition, July 2007

**Road Diet Informational Guide**, by Keith Knapp et al., FHWA, Nov. 2014  
[https://safety.fhwa.dot.gov/road\\_diets/info\\_guide/index.cfm](https://safety.fhwa.dot.gov/road_diets/info_guide/index.cfm)

## PUBLIC COMMENTS

### Virginia Beach

#### **RE: Road Diet study comments**

Rob Case

Sent: Thu 2/15/2018 3:04 PM  
To: 'Brian Solis'  
Cc: Mike Kimbrel

---

Brian,  
Thank you for your comments.  
See my responses/actions in **red below**.  
Rob

---

**From:** Brian Solis [mailto:BSolis@vb.gov]  
**Sent:** Tuesday, February 06, 2018 4:59 PM  
**To:** Rob Case  
**Cc:** Robert K. Gey; Richard T. Lowman; Wayne T. Wilcox; Tara D. Reel  
**Subject:** RE: Road Diet study draft

Rob,

Thanks again for the opportunity to review the draft Road Diet study.

Please consider comments from the City of Virginia Beach below. We may have a few other supplemental ones come over during the public comment period.

Looking forward to your briefing tomorrow morning.

Thanks,  
Brian



**Brian S. Solis, AICP, LEED Green Associate**  
Transportation and Transit Planning Manager  
4525 Main Street | Suite 710 | Virginia Beach, VA 23462  
bsolis@vb.gov | (O) 757.385.2907 | (F) 757.493.5439

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#### **Measurable Transportation Impacts**

It would add credibility to the report to clearly define the FHWA standards versus "conceptual structure" with regard to road diet criteria and associated case analysis.

Thank you for pointing out the omission of FHWA's guidance for "road diet feasibility determination". HRTPO staff has added a "next steps" section at the end of the study including reference to FHWA's guidance.

Also, suggest the report recommend future tracking of road diets implemented throughout Hampton Roads (particularly those recommended in this report) for FHWA criteria.

Due to the consistent benefits of road diets shown by the dozens of before-after reports summarized in the HRTPO document, HRTPO staff leaves the tracking of future local road diets to the discretion of local councils and staffs.

### **Virginia Beach section – advisory road diet candidates**

Overall, the City does not disagree that the five corridors of roadways are worth considering for road diets. However, there are varying degrees of agreement/support as outlined in the comments below.

#### **Page 104: 19<sup>th</sup> Street**

- Birdneck Rd to Parks Ave
- Arctic Ave. to Atlantic Ave

Comments: City of Virginia Beach agrees with certain segments that 19<sup>th</sup> St. is a candidate road diet project. CIP 9.100 19<sup>th</sup> St. Infrastructure Improvements is an approved CIP project moving forward to improve 19<sup>th</sup> St. from Parks Avenue to Arctic Avenue and will effectively serve as a road diet. A few slides from last year are attached which generally show the improvements.

Note: Arctic is misspelled in the draft report.

#### **Page 105: Dorset Avenue/Euclid Road from Virginia Beach Blvd. to Southern Boulevard**

Comments: Will take under advisement. The City of Virginia Beach and Commonwealth have funded CIP 2.135 Cleveland St. Phase IV in the coming 6-year cycle. As part of that work the City and its consultants are in the middle of an alignment study. We will consider the future feasibility of a road diet possibility for the Dorset/Euclid segment when we evaluate the alignment alternatives.

#### **Page 106: First Court and Pleasure House Road**

- First Court Road – Pleasure House Road to Hook Lane
- Pleasure House Road from Thoroughgood Square to Northampton Blvd.

Comments: Will take under advisement.

#### **Page 107: Potters Road – Lynnhaven Parkway to Fair Lady Road**

Comments: Agree that this road segment is a road diet candidate project. The City is considering scoping a future project for competitively obtained funding.

#### **Page 108: Virginia Beach Blvd., from Birch Lake Road to Atlantic Avenue**

Comments: There are road diet projects under design for the parallel roadways of 18<sup>th</sup> and 19<sup>th</sup> Streets. Consequently, the Virginia Beach Blvd./17<sup>th</sup> Street corridor is projected to accommodate more of the east-west motor vehicle traffic as a southern gateway to/from the Resort Oceanfront Strategic Growth Area.

Note that the study identifies ALL 4-lane undivided segments with less than 12,500 vpd as “candidates” for a road diet, regardless of the merit of implementing a road diet on a subject segment. HRTPO staff prepared the database, maps, and observations of candidates in order to inform the type of discussions you have included above. Moving ahead by further examining the merits of a particular road diet proposal, e.g. via FHWA’s “road diet feasibility determination” guidance, is solely the city’s decision.



## York County

### **RE: Road Diet Report**

Rob Case

Sent: Thu 2/15/2018 10:20 AM

To: 'Cross, Tim'

Tim,

Thank you for your comments.

See my **responses in red below**.

Rob

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**From:** Cross, Tim [<mailto:tcross@yorkcounty.gov>]

**Sent:** Monday, February 12, 2018 3:38 PM

**To:** Rob Case

**Subject:** Road Diet Report

Rob,

I looked at the Road Diet report and have to commend you on the tremendous amount of work and critical analysis that have gone into it. I have a few observations:

- Given its great width and rather low traffic volume, I can understand why Alexander Lee Parkway would seem like a good candidate for a road diet based on a desktop review. This four-lane road was built to serve the Busch Industrial Park and the heavy truck traffic that would be expected in an area like this. In fact, the parallel stretch of Penniman Road between the two termini of Alexander Lee Parkway has been designated as a NO THROUGH TRUCK route specifically to encourage those trucks to use Alexander Lee. As yet, however, the industrial park is more park than industry, with a total of 9 undeveloped parcels totaling about 50 acres, much of which is owned and aggressively marketed by the County's Economic Development Authority. The hope is that the park will eventually build out and all the extra road capacity will be actually be needed. I drive along that part of Penniman Road fairly frequently, and my observation is that most of the vehicles that currently use Alexander Lee Parkway are cars using it as a cut-through to avoid Penniman Road. Even though the route is longer in terms of mileage, there can be a minor time savings because of the higher speed limit, the width of the road, and the lack of traffic compared to Penniman Road

**Note added to text.**

- Alexander Lee Parkway is a bus route for WATA (the Orange Route), with one bus stop on this road (see route map below). Similarly, the segment of Merrimac Trail identified as a possible road diet candidate in both York and JCC also has a (one-way) WATA bus route – the new Route 11/Lackey route that we were briefed on at TTAC last week. There is just one bus stop along this stretch – the regional jail in James City County (see the second map below).

**Text revised to reflect bus routes.**

- "Pocahontas Parkway" in JCC is actually Pocahontas Trail.

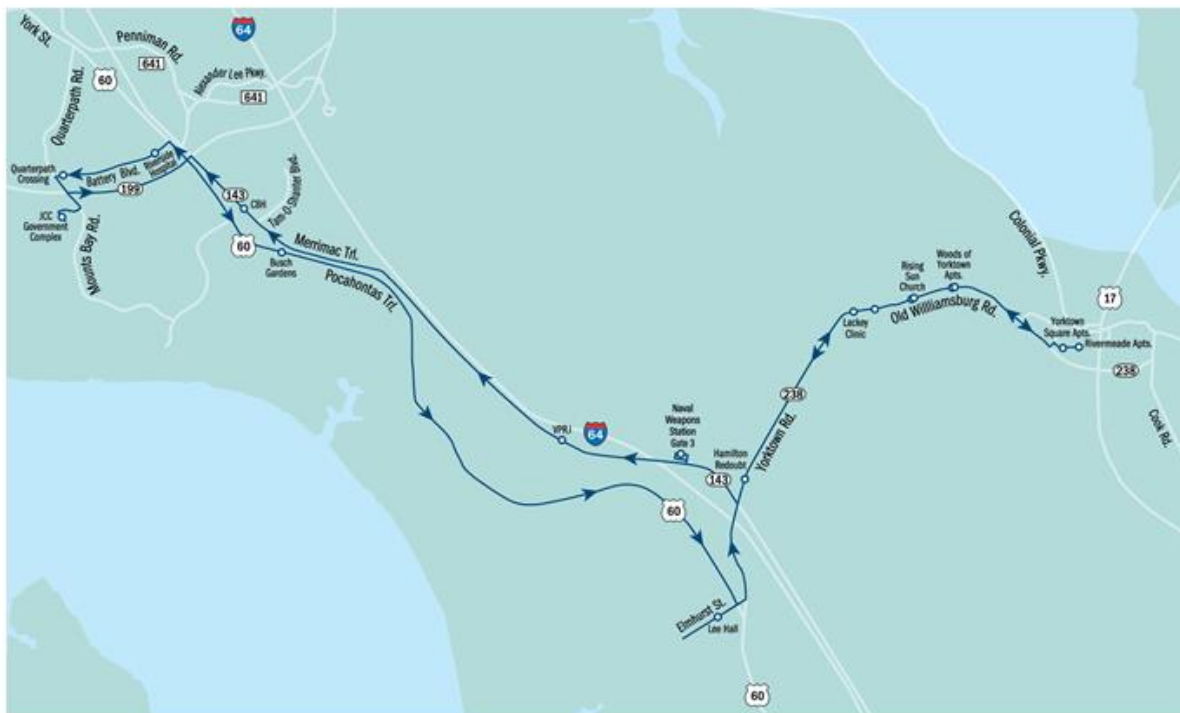
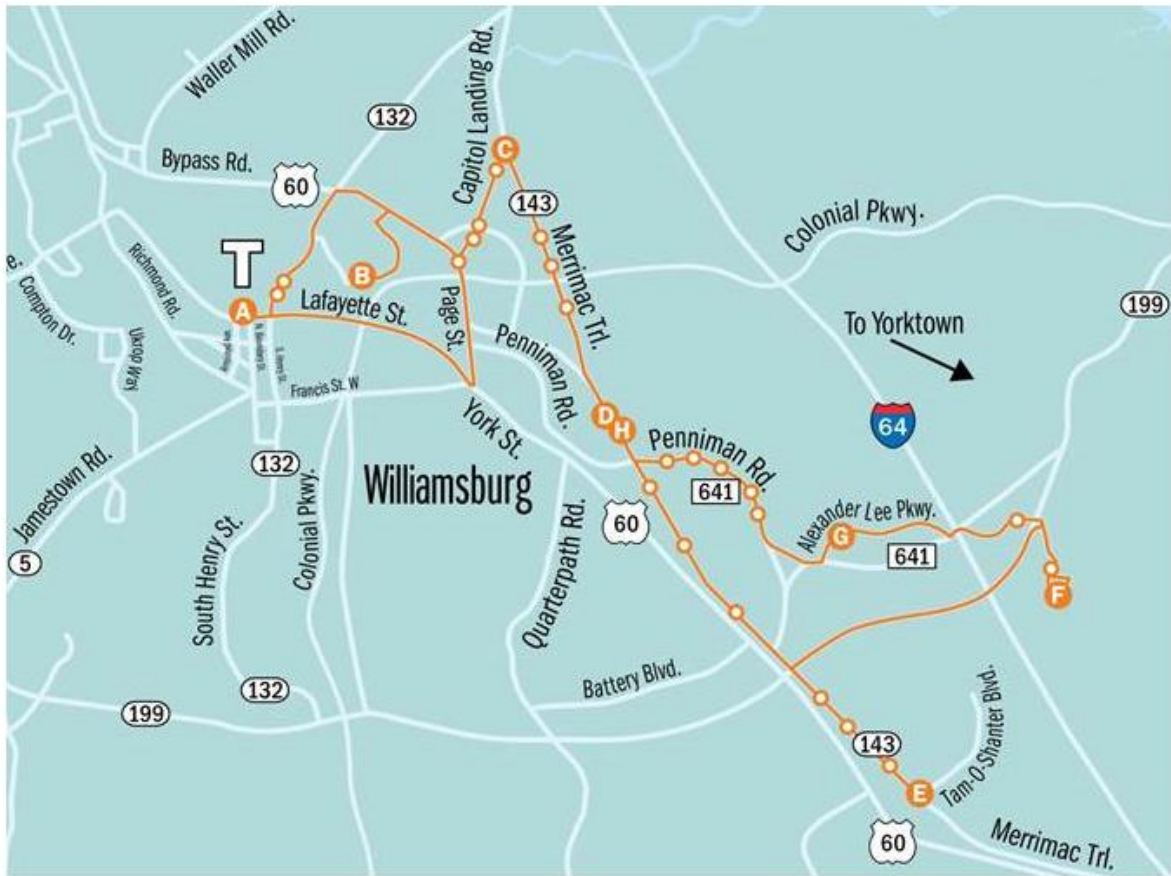
**Text, database, and map revised to reflect correct name.**

Thanks.

Tim Cross



Timothy C. Cross, AICP | Principal Planner | County of York, Virginia | P.O. Box 532 | Yorktown VA 23690 | Phone: 757.890.3496 | [tcross@yorkcounty.gov](mailto:tcross@yorkcounty.gov)





## COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION  
HAMPTON ROADS DISTRICT  
1700 NORTH MAIN STREET  
SUFFOLK, VIRGINIA 23434

February 21, 2018

Michael S. Kimbrel,  
Hampton Roads Transportation Planning Organization  
723 Woodlake Drive  
Chesapeake, Virginia 23320

Re: District Review of HRTPO Draft Transportation Studies for February 2018

- DRAFT Candidate Segments for Road Diets in Hampton Roads

Dear Mr. Kimbrel,

The Hampton Roads District Transportation Planning Office has completed a formal review of the Hampton Roads Transportation Planning Organization's (HRTPO) draft reports listed above. The primary focus of this review is to ensure consistency with federal and state program requirements as identified in federal transportation code.

The *Candidate Segments for Road Diets in Hampton Roads* study is a systematic review of lane reduction strategies, also known as road diets, implemented across America and abroad, and an analysis of their impacts on public perception, safety, vehicle speed and delay, roadway congestion, bike-pedestrian accommodations and transit usage. The study also summarizes optimal conditions for implementing road diets and recommended candidate road segments across Hampton Roads. The Hampton Roads District has reviewed the document and finds that it is consistent with state and federal MPO program requirements and will continue to coordinate and provide data with the HRTPO for subsequent updates. We do however have the following comments regarding the document:

Note added to  
"Cost" section,  
approx. pg. 12.

Although bike  
volumes may be  
higher in big  
cities, it seems  
reasonable to  
expect a similar  
percentage  
change across  
various city  
sizes.

- Please remind your readers that although the conversion of a moving lane to a bicycle-only lane is eligible for urban maintenance payments, conversion of moving lanes to parking lanes is not eligible for payment.
- Please consider using studies from metropolitan areas of similar size to Hampton Roads, some of the conclusions in the study are drawn from examples in much larger cities. For instance, a 30% increase in bicycle usage in places like Los Angeles, Seattle and San Francisco may not be true for Hampton Roads. It may also be more useful to review local road diet examples such as the Norfolk Bike Loop.

**WE KEEP VIRGINIA MOVING**



Michael S. Kimbrel  
February 21, 2018  
Page Two

Note added to  
these pages.

- The following candidate segments for lane reductions may impact access to interstate ramps and other state maintained facilities:
  - Page 61: Pembroke Avenue (Hampton/NN Corp Limit to Greenlawn Ave) Hampton
  - Page 69: Pocahontas Pkwy (Ft. Magruder Hotel to Rte. 199) James City
  - Page 70: 23<sup>rd</sup> Street (Huntington Ave to West Avenue) Newport News
  - Page 71: 39<sup>th</sup> Street (Marshall Ave to Hampton/Newport News Corp. Limit) Newport News
  - P. 112: Merrimac Trail (I-64 exit 243B to York/JCC Corporate Limit) York

Note added to  
these pages.

- The following candidate segments for lane reductions are on roadways that are currently being planned or studied for other improvements:
  - Page 52: Aberdeen Road (Mercury Blvd to Todds Lane) Hampton, STARS III right-turn lane extension
  - Page 63: Pine Chapel Road (Power Plant Shopping Center to Saville Row) Hampton, UPC 111016 Sidewalk and Shared Use Path

Note added to  
these pages.

- The following candidate segments seem inappropriate for lane reductions due to surrounding industrial uses and higher levels of truck traffic:
  - Page 46: S. Military Highway (Rotunda Ave. to Mid Atlantic Leasing Corp) Chesapeake
  - Page 50: 2<sup>nd</sup> Avenue from (East Street to Black Water River Bridge) Franklin

#### Other Issues

Yes.

- Will the final report be in the standard HRTPO Format?

"FIGURE XX"  
removed.

- Please consider adding figure numbers to pictures.

Note added  
approx. pg. 5.

- Page 9, First Paragraph: Consider revising the sentence to say, "examples of local adoption of road diets has not been included in this document."

Bullets retained.

- Page 14: Might be better to list this information on a chart.

Done.

- Page 19, Second Paragraph, Second Sentence: Consider replacing "fortunately" with "since" and "being" with "are".

Edited.

- Page 21, First Paragraph: perhaps should say "waste the time of *all road users*."

The comments identified are preliminary in nature and provided for your review or revision as deemed appropriate. Please notify Mr. Carl Jackson at 757-925-2596, should you have any questions.

Sincerely,



Eric L. Stringfield  
Hampton Roads Transportation Planning Director

## Norfolk

### RE: Road Diets

Rob Case

Sent: Wed 2/28/2018 4:13 PM

To: 'Homewood, George'

Cc: Mike Kimbrel

George,

Thank you for your comments. They improved the report.

See my **responses in red below**.

Rob



Robert B. Case, PE, PTOE, PhD

Chief Transportation Engineer

Hampton Roads Transportation Planning Organization

The Regional Building, 723 Woodlake Dr, Chesapeake, VA 23320

[rcase@hrtpo.org](mailto:rcase@hrtpo.org) | <http://www.hrtpo.org> | Phone: 757.420.8300 | Fax: 757.523.4881



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**From:** Homewood, George [<mailto:George.Homewood@norfolk.gov>]

**Sent:** Tuesday, February 27, 2018 10:31 AM

**To:** Rob Case

**Subject:** Road Diets

Rob—

Great guidebook and as you know, I am a big fan of road diets as a way to reclaim our streets for a myriad of public purposes within the communities they serve as opposed to simply sacrificing them to motor vehicle use. In any case, I enjoyed reading the study and appreciate the effort that went into it.

**Thank you for your kind words.**

I have two comments, one general and one specific:

- On page 3, you list a number of things a road diet can facilitate (one I'd suggest adding is enhanced pedestrian walkways) which leads me to wonder whether it would be worth trying to list which from those might be the appropriate uses of the reclaimed right-of-way in each of the candidate segments? **Although we left it to the localities to choose appropriate uses of reclaimed pavement width, we added "wider pedestrian area" as a possible use (approx. page 3) based on your suggestion.**
- Given VDOT's plan to build a flyover of the CSX between Routes 60 and 143 in Grove for the purpose of diverting truck traffic to 143, not sure that the identified segment of Merrimac Trail remains a good road diet candidate. **We added notes concerning the proposed Skiffes Creek Connector to the subject pages.**

Thanks again Rob for the great work.

**George M. Homewood, FAICP CFM**

**Director**

