REGIONAL CONNECTORS STUDY

the heartbeat of HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

CORRIDOR CONDITIONS REPORT

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FINAL

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INTERNATIONAL

HAMPTON ROADS TPO "The Heartbeat of Hampton Roads"

Michael Baker INTERNATIONAL

Section 1: Methodology and Discussion

Introduction

As part of Phase 1 of the Hampton Roads Regional Connector Study, this Corridor Conditions Report was completed to assess the traffic operations on the existing roadway network. Phase 2 of the study will use this data to develop a microsimulation model of the existing conditions. Phase 2 will also include growing the traffic volumes to a future condition and modifying travel patterns and traffic volumes to analyze the impacts of future land use scenarios and major investment roadway projects. The Existing Corridor Conditions report is divided into three sections. The first section is this discussion and explanation of the methodology, the data set, and key findings from each analysis component of the existing conditions assessment. The second section summarizes the above items and includes graphical representations for the information on regional maps. The third section provides detailed traffic information for each interchange along the study area roadways overlaid on an aerial map.

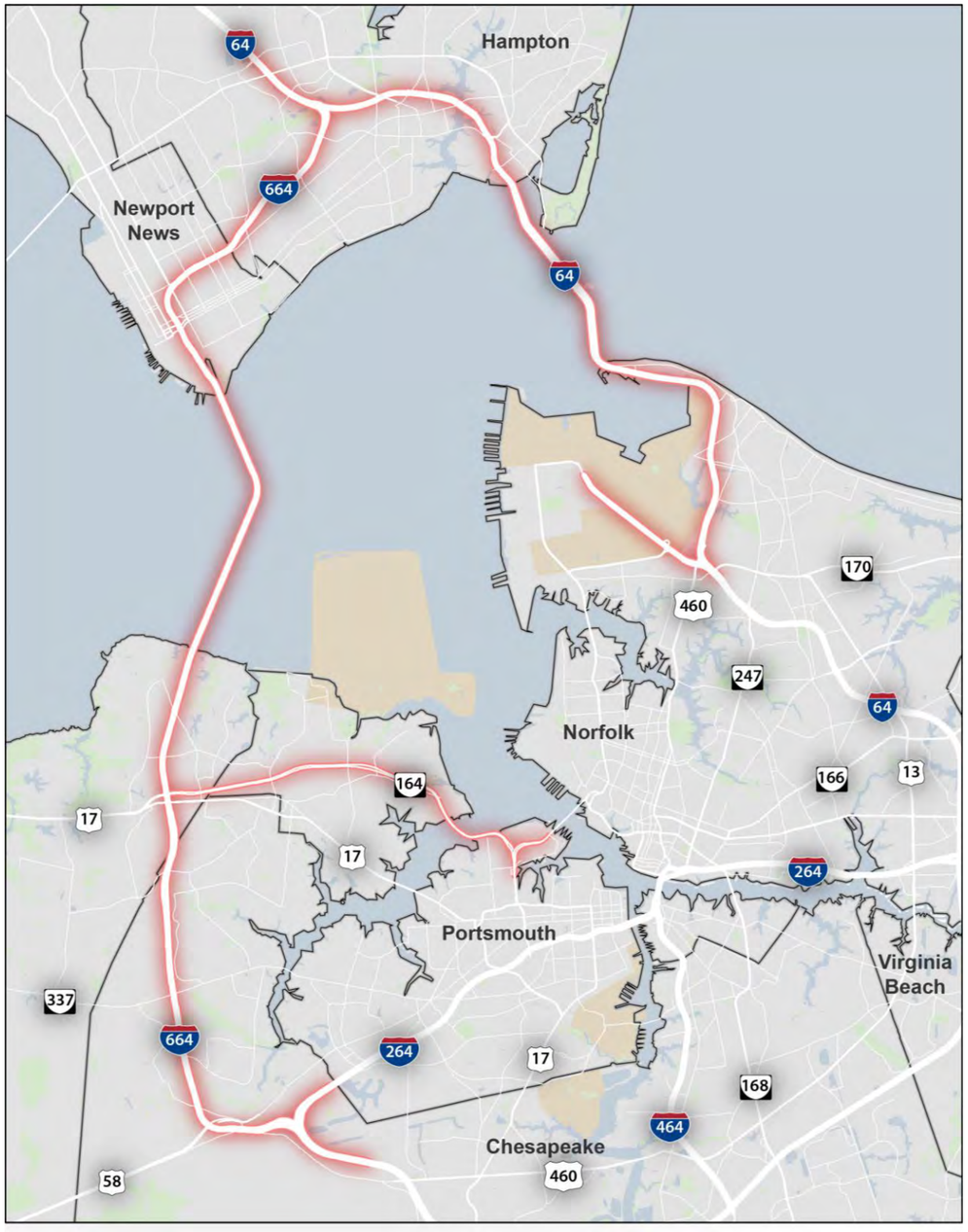
Study Area

The study area roadways for the Corridor Conditions Report includes the major existing regional highways within the Hampton Roads TPO region, specifically the I-64 corridor, the I-664 corridor, the I-564 corridor, and the VA-164 corridor; as shown in Figure 1. Understanding the traffic patterns and congestion on these limited access roadways and interchanges is a key component to evaluating the feasibility of alternatives that impact regional travel between the Peninsula and the Southside. This Corridor Conditions Report will provide detailed information for:

- Weekday AM peak hour traffic volumes
- Weekday PM peak hour traffic volumes
- Daily weekday traffic volumes
- Weekday AM peak hour travel times
- Weekday PM peak hour travel times
- Daily weekday traffic travel times
- Weekday AM peak hour vehicle distributions at interchanges
- Weekday PM peak hour vehicle distributions at interchanges
- Daily weekday vehicle distributions at interchanges
- Corridor Segment Crash Rates
- Origins of vehicles traveling to regional activity centers
- Destinations of vehicles traveling from regional activity centers

In addition to understanding the existing traffic conditions on the study area roadways, the traffic data listed above will be used to develop an accurate simulation model of existing roadway operations and driving behavior so that these characteristics can be carried forward when the simulation model is updated with future land use travel patterns and future traffic data.

Figure 1: Study Area Roadways



Methodology

Crash data was obtained through the VDOT Tableau website for the year 2017. This data includes the location of the crash, the time and weather when it occurred, the direction of travel, crash type, crash severity, as well as a brief description of the cause of the crash. Crash rates (calculated per 100 Million Vehicle Miles Traveled) were calculated for both directions of each highway segment. A regional map of crash rates is shown in Figure XX and detailed crash information for each segment are shown in the corridor segment sheets in Section 2.

The operations evaluation for the study area roadways was conducted using data from Streetlight. Streetlight is a big data source that obtains information based on GPS traces and cellphone data. The advantage of using this type of data versus typical manual data collection is twofold:

1. Manual traffic counts are only conducted for over a period of a few days and the results can vary greatly day-to-day and are subject to human error. Seasonal and/or day of the week factors must be applied to obtain average values. Alternatively, Streetlight data collection is constant and can be obtained for any day and/or any time frame. No factors need to be applied to obtain average daily or hourly volumes.

2. Manual travel times runs can only be conducted over a period of a few days and usually with only one or two vehicles making it difficult to obtain accurate data. Streetlight data comes directly from the vehicles that are on the road every day and can be averaged over any time period to obtain free-flow travel times or congested travel times.

This data source allows highly refined examinations that not only provide insights into regional travel dynamics, it will also be used to enhance the Hampton Roads Regional Travel Demand Model and the microsimulation traffic model during Phase 2 of this study.

For the Regional Connectors Study the most recent one year of data was obtained from Streetlight; August 2017 through July 2018. The traffic data presented in the following sections represents average weekday daily and peak hour volumes averaged using data for Mondays through Thursdays.

Origin/Destination Analysis

An origin/destination analysis was conducted for the major activity centers in the Hampton Roads Region. These activity centers are presented in Table 1 and include military installations, high density employment areas, tourism destinations, freight activity centers, and downtown areas.

Table 1: Major Activity Centers in Hampton Roads

Military Activiy Centers	Freight Activity Centers	Tourism Activity Centers	Downtown / Employment Areas
Langley AFB / NASA	Norfolk International Terminals	Jamestown	Newport News Shipbuilding
Naval Station Norfolk	Newport News Marine Terminal	Williamsburg	Downtown Norfolk
JEB Little Creek Navy Base	VA International Gateway Terminal	Yorktown	Oyster Point, Newport News
Oceana NAS	Portsmouth Marine Terminal	Virginia Beach Oceanfront	Downtown Portsmouth
			Virginia Beach Town Center

The origin/destination data was obtained through Streetlight for the same time frame as the traffic and travel time data: July 2017 through August 2018, Mondays through Thursdays. The data set for each activity center was divided into personal vehicles and heavy vehicles to better understand the travel patterns for freight traffic versus commuter traffic. For each activity center, there are four corresponding data sets:

- Origins for personal vehicles traveling to the activity center
- Destinations for personal vehicles leaving the activity center
- Origins for heavy vehicles traveling to the activity center
- Destinations for heavy vehicles leaving the activity center

Table 3 shows the results of the origin/destination analysis in a tabular format and Section 2 includes graphical representations of the results for military installations and freight activity centers.

The key takeaways from the origin/destination analysis include:

- For heavy vehicles leaving the study area, I-64 and Route 58 are the preferred routes.
    - The percentage of heavy vehicles using I-64 and Route 58 to leave the study area is much higher for activity centers dealing with freight movement than military activity centers
- Almost 22 percent of heavy vehicles originating from Newport News Marine Terminal exit the study area via I-64 westbound. The next highest value for exiting the study area using westbound I-64 was for Portsmouth Marine Terminal, with only four percent.
- For personal vehicles originating from military activity centers, only a small portion cross the harbor (2%-5%).

Table 3: Origin and Destinations for Major Activity Centers in Hampton Roads

Personal Vehicle Travel Trends - Streetlight Data, August 2017 - July 2018, Average Weekday (Monday - Thursday)

Origin Activity Center	Destination													
	Hampton Roads Jurisdictions										Harbor Crossing			Outside Hampton Roads
	Southampton, Franklin and Isle of Wight	Suffolk	Chesapeake	Portsmouth	Norfolk	VA Beach	Hampton and Poquoson	Newport News	York, Williamsburg and James City	Gloucester	US 17 James River Bridge	I-664 MMMBT	I-64 HRBT	Total Exiting Hampton Roads
Newport News Shipbuilding	2.27%	2.26%	2.10%	1.39%	2.12%	1.44%	16.98%	67.50%	2.64%	0.88%	3.71%	7.94%	3.02%	0.4%
Downtown Norfolk	0.37%	2.07%	11.27%	6.85%	61.19%	15.00%	1.21%	0.98%	0.43%	0.02%	0.02%	1.23%	1.41%	0.6%
Oyster Point, Newport News	0.85%	0.65%	0.76%	0.29%	0.95%	0.89%	13.74%	66.57%	13.78%	0.88%	1.18%	1.27%	1.81%	0.6%
Virginia Beach Town Center	0.14%	1.57%	6.37%	0.89%	10.92%	77.66%	0.82%	0.92%	0.27%	0.00%	0.00%	0.15%	1.94%	0.4%
Newport News Downtown	1.50%	1.41%	2.18%	1.53%	2.41%	1.82%	52.25%	29.60%	5.45%	0.60%	1.72%	5.96%	3.04%	1.3%
Hampton Downtown	0.35%	0.51%	0.76%	0.57%	2.40%	1.37%	79.11%	12.08%	2.27%	0.17%	0.43%	1.46%	3.92%	0.4%
Portsmouth Downtown	0.53%	3.46%	11.32%	60.73%	16.85%	5.15%	0.56%	0.72%	0.17%	0.00%	0.03%	1.32%	0.09%	0.5%
Colonial Williamsburg	0.02%	0.05%	0.10%	0.00%	0.15%	0.37%	0.45%	2.27%	94.84%	0.20%	0.03%	0.13%	0.50%	1.5%
Yorktown	0.14%	0.21%	0.21%	0.07%	0.35%	0.63%	2.88%	12.06%	70.83%	10.66%	0.21%	0.56%	1.05%	2.0%
Jamestown	0.21%	0.00%	0.21%	0.00%	0.82%	0.82%	0.41%	3.08%	91.38%	0.21%	0.00%	0.62%	1.64%	2.9%
Virginia Beach Oceanfront	0.05%	0.27%	1.76%	0.46%	4.02%	90.61%	0.35%	0.42%	0.71%	0.02%	0.01%	0.17%	2.12%	1.3%

Personal Vehicle Travel Trends - Streetlight Data, August 2017 - July 2018, Average Weekday (Monday - Thursday)

Destination Activity Center	Origin													
	Hampton Roads Jurisdictions										Harbor Crossing			Outside Hampton Roads
	Southampton, Franklin and Isle of Wight	Suffolk	Chesapeake	Portsmouth	Norfolk	VA Beach	Hampton and Poquoson	Newport News	York, Williamsburg and James City	Gloucester	US 17 James River Bridge	I-664 MMMBT	I-64 HRBT	Total Entering Hampton Roads
Newport News Shipbuilding	2.76%	2.61%	2.25%	1.66%	2.24%	1.80%	16.27%	65.55%	3.27%	1.04%	2.94%	6.39%	2.75%	0.5%
Downtown Norfolk	0.45%	1.87%	10.94%	6.62%	60.16%	16.14%	1.46%	1.09%	0.47%	0.02%	0.01%	0.94%	2.11%	0.8%
Oyster Point, Newport News	1.02%	0.67%	1.04%	0.34%	1.13%	1.08%	14.05%	64.61%	14.37%	1.01%	1.36%	1.55%	2.22%	0.7%
Virginia Beach Town Center	0.07%	1.60%	6.78%	0.89%	11.24%	76.60%	0.89%	1.19%	0.23%	0.00%	0.00%	0.10%	2.25%	0.5%
Newport News Downtown	1.88%	1.29%	2.12%	2.08%	2.70%	2.45%	50.57%	29.18%	6.16%	0.46%	2.05%	6.37%	3.85%	1.1%
Hampton Downtown	0.36%	0.61%	0.84%	0.58%	2.42%	1.44%	77.54%	13.08%	2.49%	0.20%	0.49%	1.76%	3.82%	1.1%
Portsmouth Downtown	0.61%	3.18%	11.74%	60.44%	16.01%	6.01%	0.44%	0.71%	0.24%	0.00%	0.03%	1.26%	0.16%	0.6%
Colonial Williamsburg	0.02%	0.07%	0.10%	0.02%	0.21%	0.36%	0.40%	2.39%	94.96%	0.15%	0.03%	0.20%	0.58%	1.3%
Yorktown	0.13%	0.13%	0.26%	0.07%	0.65%	0.78%	3.20%	13.00%	69.69%	10.65%	0.20%	0.46%	1.50%	1.4%
Jamestown	0.00%	0.00%	0.38%	0.00%	1.70%	0.76%	0.57%	3.40%	88.09%	0.57%	0.19%	0.93%	2.80%	4.5%
Virginia Beach Oceanfront	0.11%	0.24%	1.78%	0.48%	4.09%	90.32%	0.39%	0.39%	0.67%	0.03%	0.02%	0.12%	1.97%	1.5%

Heavy Vehicle Travel Trends - Streetlight Data, August 2017 - July 2018, Average Weekday (Monday - Thursday)

Origin Activity Center	Destination													
	Hampton Roads Jurisdictions										Harbor Crossing			Outside Hampton Roads
	Southampton, Franklin and Isle of Wight	Suffolk	Chesapeake	Portsmouth	Norfolk	VA Beach	Hampton and Poquoson	Newport News	York, Williamsburg and James City	Gloucester	US 17 James River Bridge	I-664 MMMBT	I-64 HRBT	Total Exiting Hampton Roads
Newport News Shipbuilding	0.67%	2.38%	3.94%	2.55%	3.23%	1.48%	10.63%	68.31%	1.80%	0.35%	2.45%	10.33%	3.08%	4.7%
Downtown Norfolk	0.73%	4.20%	12.28%	7.12%	51.81%	16.59%	1.32%	1.65%	0.63%	0.08%	0.01%	2.35%	3.29%	3.6%
Oyster Point, Newport News	1.44%	1.18%	2.68%	1.31%	3.11%	2.40%	10.94%	56.20%	12.28%	1.03%	1.85%	4.91%	6.03%	7.4%
Virginia Beach Town Center	0.48%	3.92%	7.70%	2.05%	12.98%	63.33%	2.02%	1.58%	0.84%	0.04%	0.00%	0.88%	6.72%	5.1%
Newport News Downtown	2.40%	3.70%	5.92%	6.37%	6.52%	2.92%	32.49%	19.43%	5.20%	0.32%	2.38%	22.91%	7.36%	14.7%
Hampton Downtown	1.03%	1.59%	5.06%	1.27%	6.75%	4.38%	55.56%	13.17%	4.66%	1.46%	1.21%	6.25%	14.14%	5.1%
Portsmouth Downtown	0.80%	4.37%	16.76%	52.72%	11.47%	7.76%	1.17%	1.17%	0.61%	0.10%	0.10%	3.79%	0.44%	3.1%
Colonial Williamsburg	0.38%	0.23%	0.38%	0.30%	0.80%	0.65%	1.25%	2.66%	85.82%	0.53%	0.57%	0.76%	1.85%	7.0%
Yorktown	0.19%	0.58%	1.17%	0.58%	0.78%	1.95%	3.31%	13.23%	54.86%	13.62%	0.39%	1.56%	2.93%	9.7%
Jamestown	0.20%	0.20%	0.60%	0.40%	0.60%	0.40%	0.60%	0.60%	69.84%	0.40%	0.00%	1.39%	0.80%	26.2%
Virginia Beach Oceanfront	0.28%	2.47%	5.85%	2.10%	5.49%	78.98%	0.84%	0.50%	0.96%	0.03%	0.00%	0.31%	2.83%	2.5%

Heavy Vehicle Travel Trends - Streetlight Data, August 2017 - July 2018, Average Weekday (Monday - Thursday)

Destination Activity Center	Origin													
	Hampton Roads Jurisdictions										Harbor Crossing			Outside Hampton Roads
	Southampton, Franklin and Isle of Wight	Suffolk	Chesapeake	Portsmouth	Norfolk	VA Beach	Hampton and Poquoson	Newport News	York, Williamsburg and James City	Gloucester	US 17 James River Bridge	I-664 MMMBT	I-64 HRBT	Total Entering Hampton Roads
Newport News Shipbuilding	0.87%	1.20%	3.47%	2.34%	2.55%	1.88%	11.94%	70.09%	1.30%	0.24%	2.29%	8.44%	3.01%	4.1%
Downtown Norfolk	0.43%	2.46%	10.65%	5.51%	38.86%	12.34%	1.16%	1.31%	0.60%	0.05%	1.38%	3.32%	21.58%	26.6%
Oyster Point, Newport News	1.01%	1.18%	2.86%	1.33%	2.99%	2.55%	12.83%	52.77%	13.43%	1.38%	1.51%	5.70%	5.38%	7.7%
Virginia Beach Town Center	0.28%	1.97%	12.12%	2.04%	13.47%	59.32%	0.93%	2.28%	0.79%	0.31%	0.00%	1.10%	7.48%	6.5%
Newport News Downtown	2.49%	2.85%	5.92%	7.22%	7.08%	3.50%	31.67%	20.17%	5.32%	0.59%	3.25%	21.41%	8.30%	13.2%
Hampton Downtown	0.79%	1.55%	5.48%	1.69%	6.94%	3.49%	54.00%	14.13%	5.00%	1.27%	1.66%	7.44%	12.35%	5.7%
Portsmouth Downtown	0.59%	5.39%	18.28%	48.43%	14.02%	7.87%	0.94%	1.24%	0.43%	0.03%	0.08%	3.30%	0.33%	2.8%
Colonial Williamsburg	0.23%	0.77%	0.65%	0.27%	0.88%	0.58%	2.30%	2.57%	84.00%	0.35%	0.35%	1.58%	1.54%	7.4%
Yorktown	0.18%	0.72%	0.54%	1.27%	2.35%	1.63%	4.52%	22.97%	54.07%	8.14%	0.19%	2.43%	4.31%	3.6%
Jamestown	0.20%	0.00%	0.60%	0.00%	0.80%	0.60%	1.39%	1.59%	48.71%	0.00%	0.20%	1.00%	1.00%	46.1%
Virginia Beach Oceanfront	0.15%	2.61%	6.49%	2.17%	6.21%	77.36%	0.48%	0.50%	0.89%	0.05%	0.01%	0.14%	2.97%	3.1%

Vehicle Splits at Major System Interchanges

Vehicle splits at the junctions of major highways were investigated as part of the origin/destination assessment using the same Streetlight data set as the previous sections. These splits will be used in the development of the existing conditions traffic simulation model and later in the project when developing the simulations for future conditions. The vehicle splits are shown in Section 2 for the following system-to-system interchanges:

- I-64 and I-664
- I-64 and I-564
- I-664 and VA Route 164/US Route 17
- VA Route 164 and US Route 58 (Adjacent to Mid-Town Tunnel)
- I-664 and US Route 58/US Route 460
- I-64 and I-664 and I-264

The key takeaways from the origin/destination analysis include:

- Vehicles traveling eastbound on I-64 on the Peninsula are almost twice as likely to use the I-64 Hampton Roads Bridge Tunnel than the I-664 Monitor-Merrimac Bridge Tunnel when crossing the Harbor.
- A small portion of vehicles (12 percent) traveling eastbound on I-64 exit to I-564. A majority of the vehicles (73 percent) continue on eastbound I-64
- At the Bower's Hill interchange, the split of westbound vehicles originating from I-64 or I-264 that exit to westbound Route 58/Route 460 and northbound I-664 is 43 percent and 52 percent, respectively.
- Very few vehicles use the horseshoe movement from I-264 to I-64 and vice-versa in the City of Chesapeake (27 percent from westbound I-264 and 11 percent from westbound I-64).

Travel Times

The Streetlight data set was used to develop free-flow travel times along the major highways within the study area which were compared to AM and PM peak hour travel times. The results of this analysis show the increases in travel times due to congestion during peak commuting times. The regional maps in Section 2 present a summary of the results for the major highways while the graphics in Section 3 show the detailed travel time results for interchange movements. The results presented in Section 3 show travel times for interchange movements in addition to the highway travel times and the termini on each sheet match the termini of the adjacent roadway section. This layout allows the reader to sum the travel times shown on each graphic to get the total travel time for any particular route along the study area roadways.

The key takeaways from the travel time analysis include:

- The overall peak hours of the study area are from 7:00 AM to 8:00 AM and 4:00 PM to 5:00 PM.
- The peak hours for military commuters occur before the overall peak hours for the study area.
    - The peak hours for military commuters are from 5:30 AM to 6:30 AM and 3:00 PM to 4:00 PM.
- The PM peak hour travel times are greater than the AM peak hour for most roadway segments
- The peak hour travel times for the eastbound and westbound approaches to the HRBT are over double the free flow travel times due to congestion.
- The congestion on the mainline tunnel approaches impact adjacent interchange movements.
- The approaches to the Monitor-Merrimac Bridge Tunnel are not as congested as the approaches to the HRBT, however the southbound approach does experience significant travel time increases during the PM peak hour.

Crash Rates

Crash data for 2017 was obtained from VDOT to develop crash rates for the study area roadways. This data includes detailed information about every crash in the VDOT database including the crash type, crash severity, and time of the crash. This data was used to develop crash rates for the study area roadways as well as determine possible causes of crashes at each location. A crash rate summary map for the study area roadways is included in Section 2. Detailed crash rates and causes of crashes are presented in the detailed graphics in Section 3.

The key takeaways from the crash analysis include:

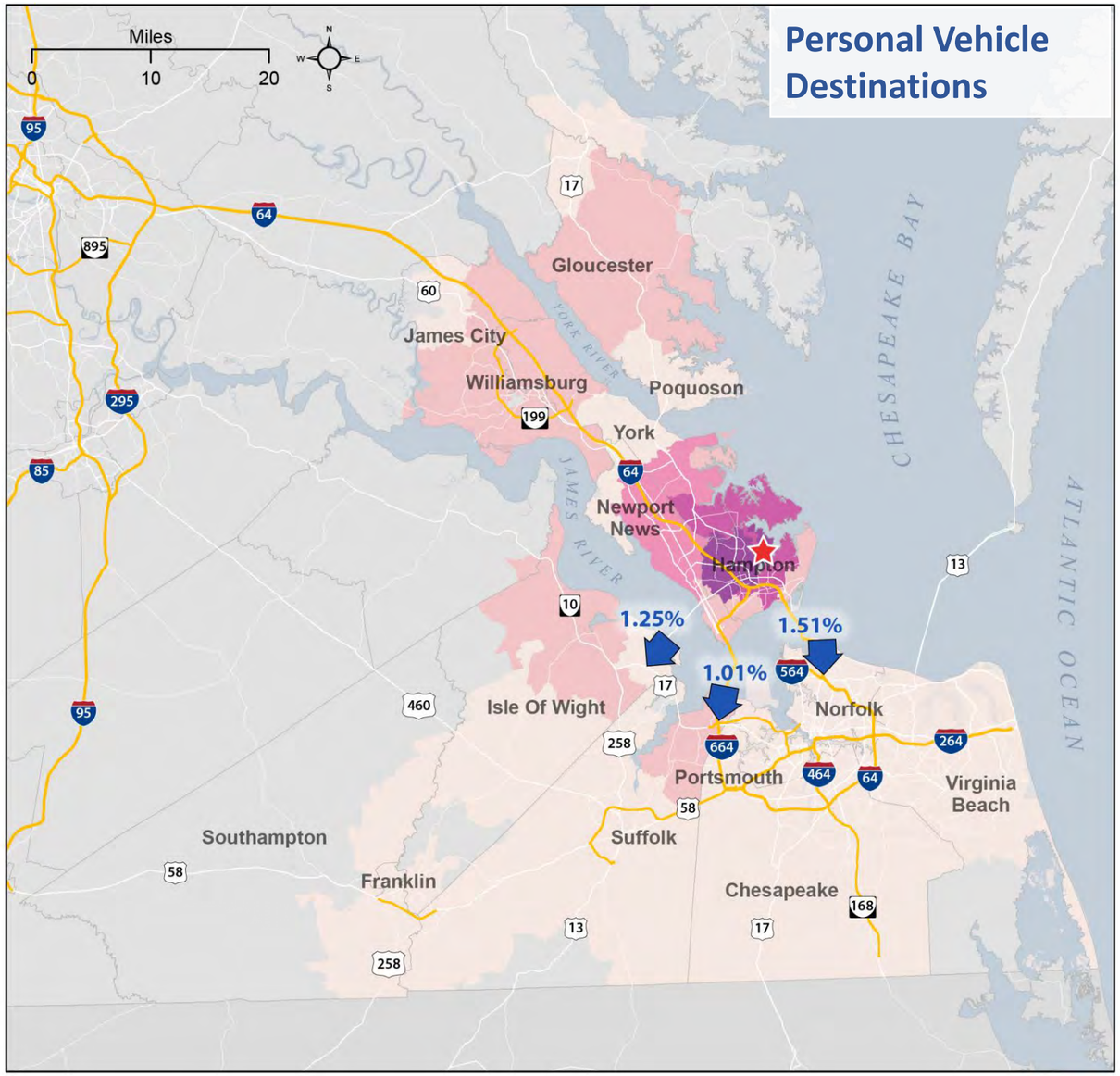
- The study area roadway segment with the highest crash rate is eastbound I-64 approaching the Hampton Roads Bridge Tunnel. The crash rate for this segment is 488 crashes per 100 million vehicle miles traveled while the statewide average for an urban interstate is 80 crashes per 100 million vehicle miles traveled.
- The second highest crash rate occurs along westbound I-64 approaching the Hampton Roads Bridge Tunnel. The crash rate for this segment is 283 crashes per 100 million vehicle miles traveled.
- The third highest crash rate is on northbound I-664 within, and just north of the Monitor-Merrimac Bridge Tunnel, with a crash rate of 272 crashes per 100 million vehicle miles traveled.
- Most of the crash types along the above-mentioned segments are rear-ends. This is typical for congested roadways with stop-and-go traffic.
- The crash severity at these locations is mostly property damage. There are less injuries and fatalities due to the slow speeds that occur when the roads are congested.

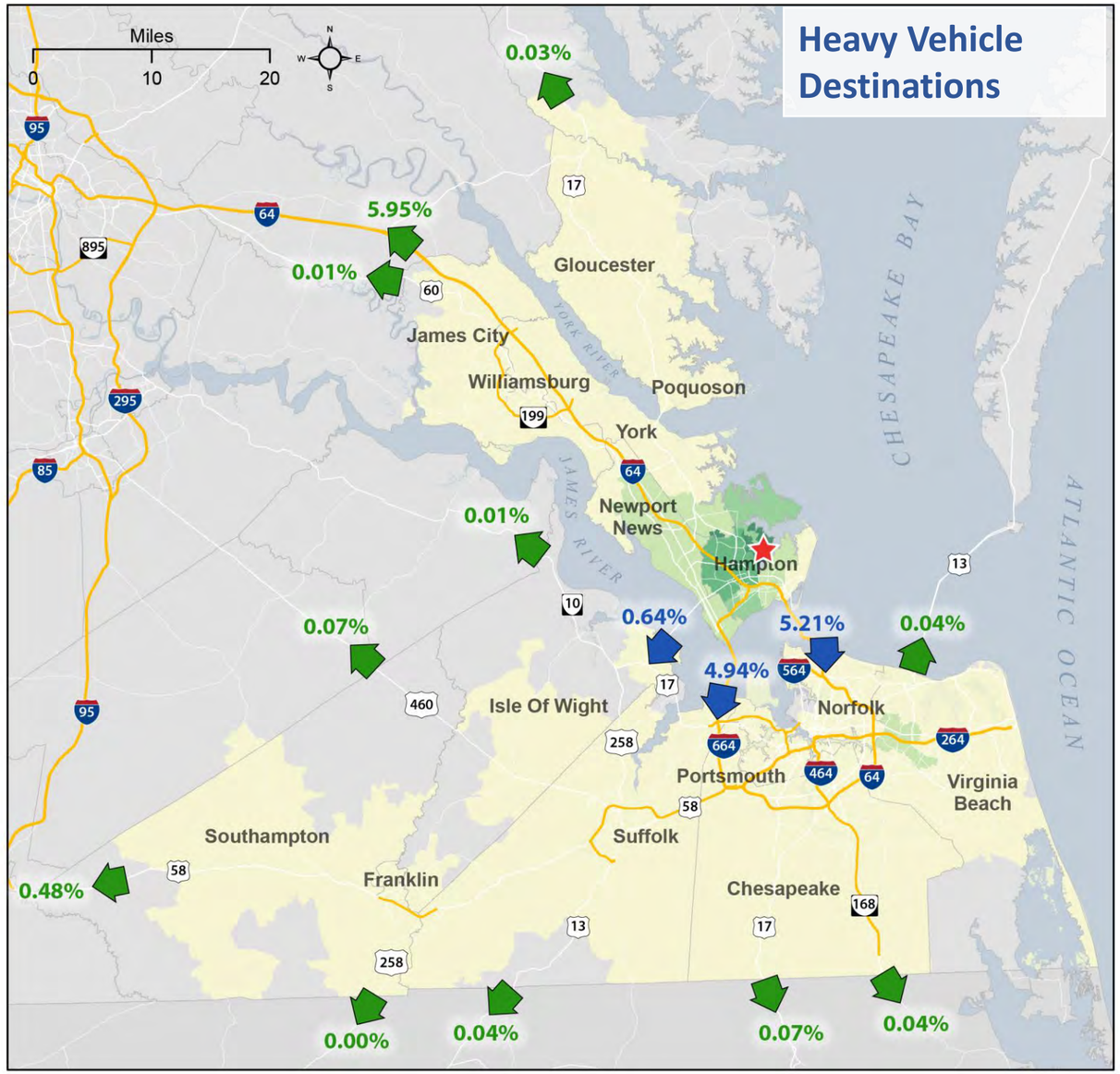
Traffic Volumes

The Streetlight data set was also used to obtain traffic volumes for roadways within the study area. Traffic volumes were developed for the mainline of each facility along with the volumes for the ramp movements at each interchange. The detailed graphics in Section 3 include average annual weekday daily volumes as well as AM and PM peak hour volumes. It is important to note that the traffic volumes show average vehicle counts for Monday through Thursday for the time frame of the data; August 2017 through July 2018. The volumes do not represent inherent demand. There were no seasonal adjustment or other factors applied to the data set.

Section 2: Regional Analysis Results

Destinations for Vehicles Originating from Langley AFB / NASA





Personal Vehicle Destinations

0% 36%

Origin

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Destinations

0% 33%

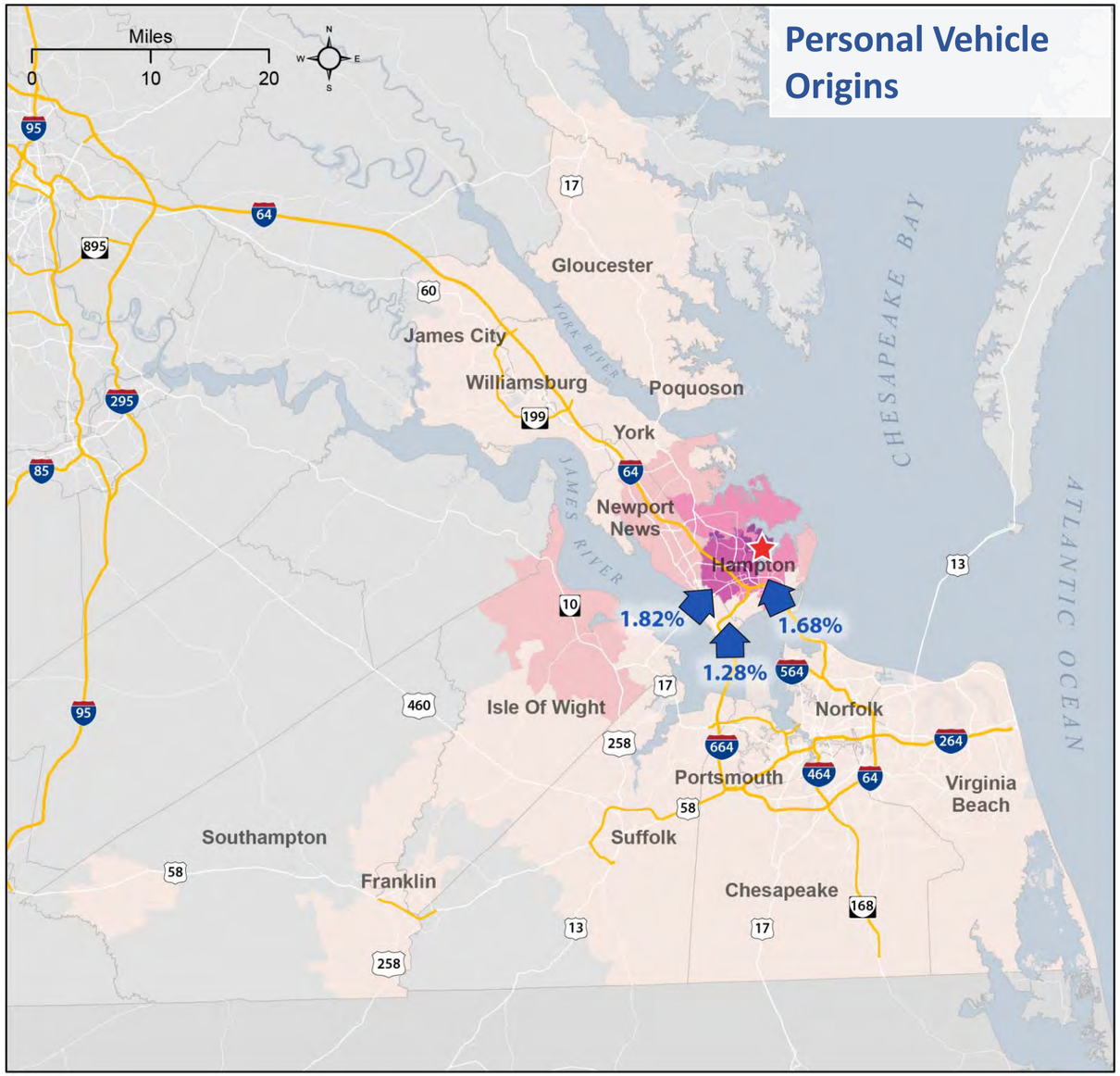
Origin

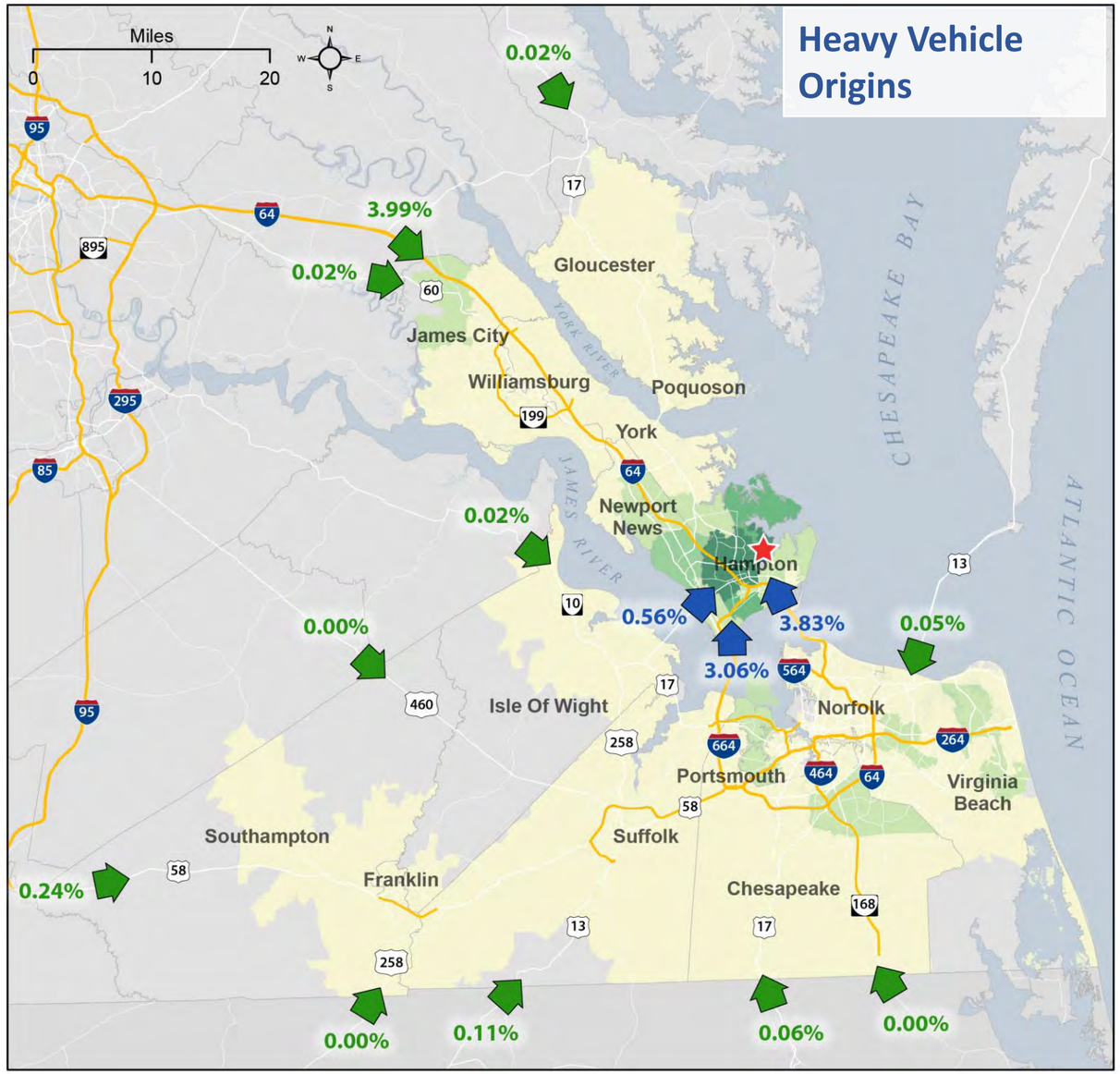
Percent Heavy Vehicles Exiting Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Origins for Vehicles Destined to Langley AFB / NASA





Personal Vehicle Origins

0% — 35%

Destination

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Origins

0% — 35%

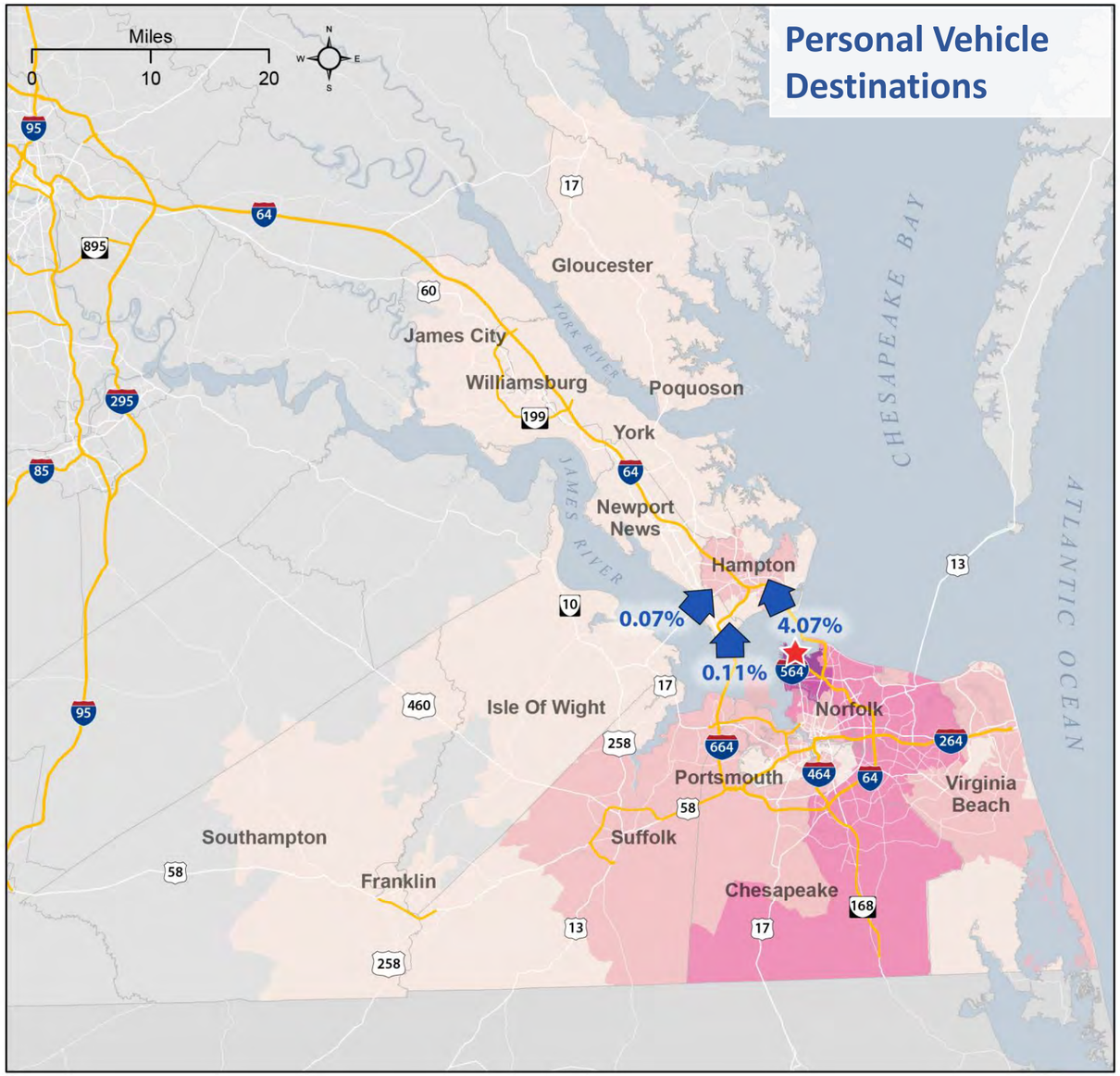
Destination

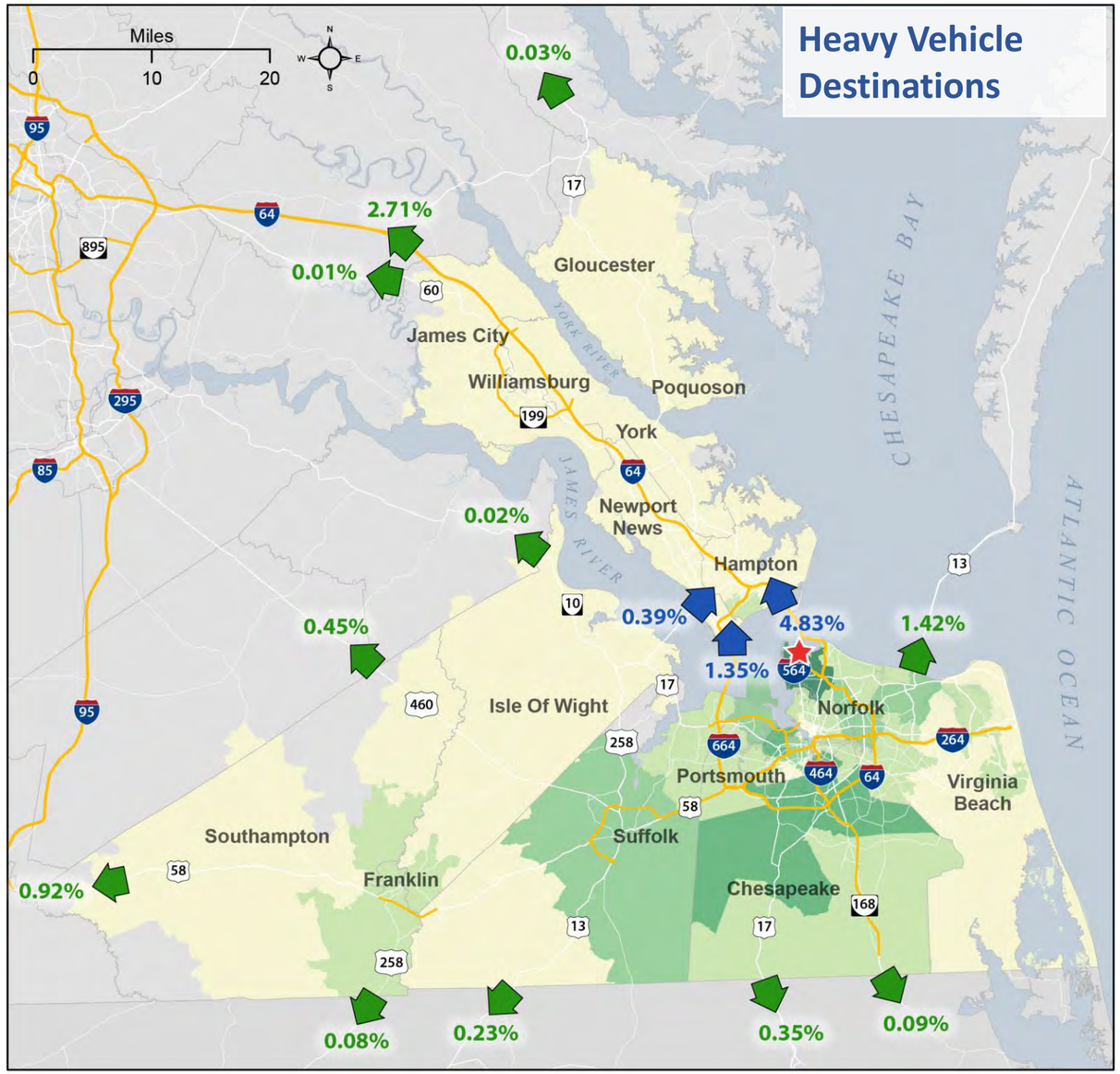
Percent Heavy Vehicles Entering Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Destinations for Vehicles Originating from Naval Station Norfolk





Personal Vehicle Destinations

0% 40%

Origin

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Destinations

0% 31%

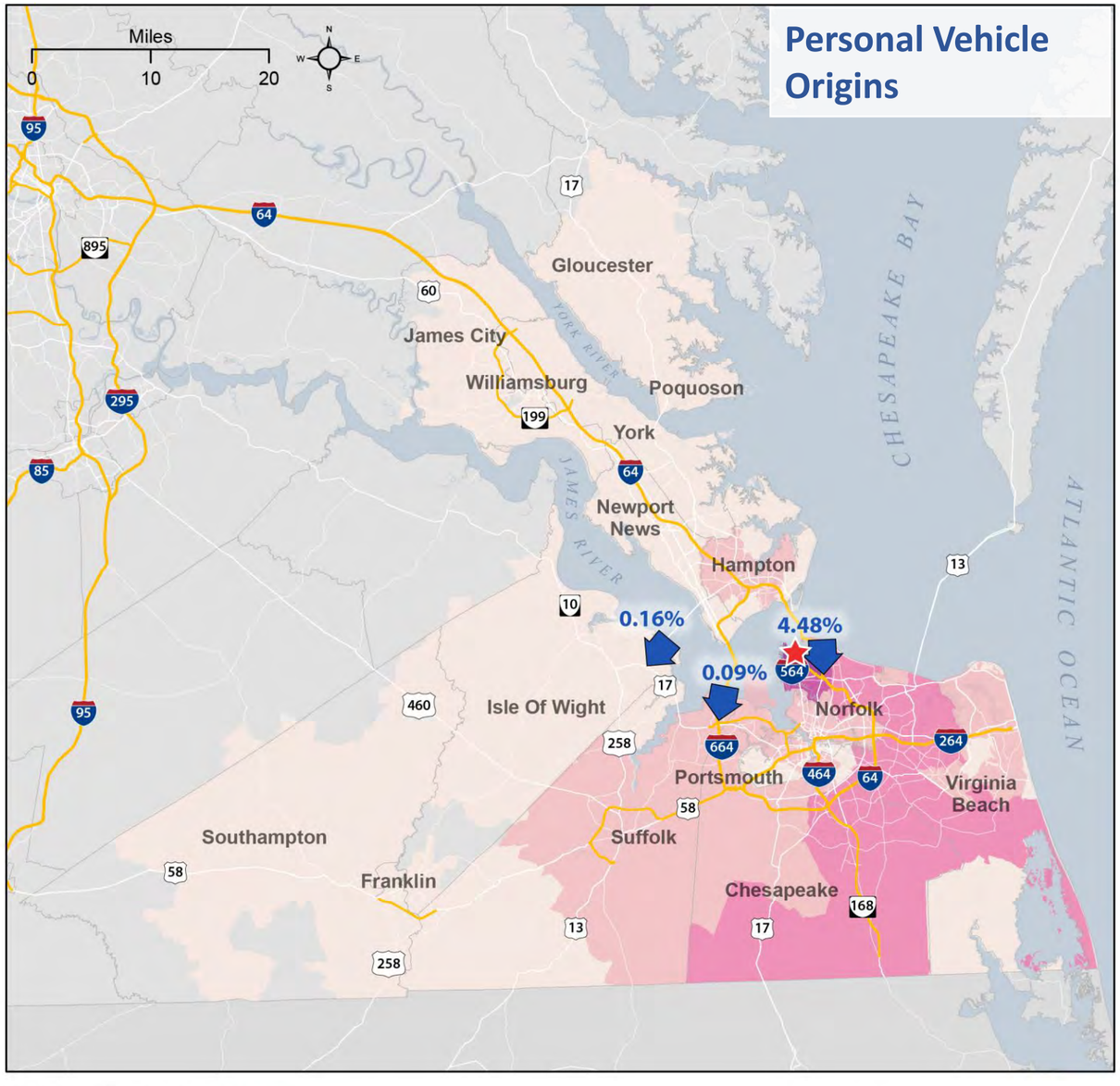
Origin

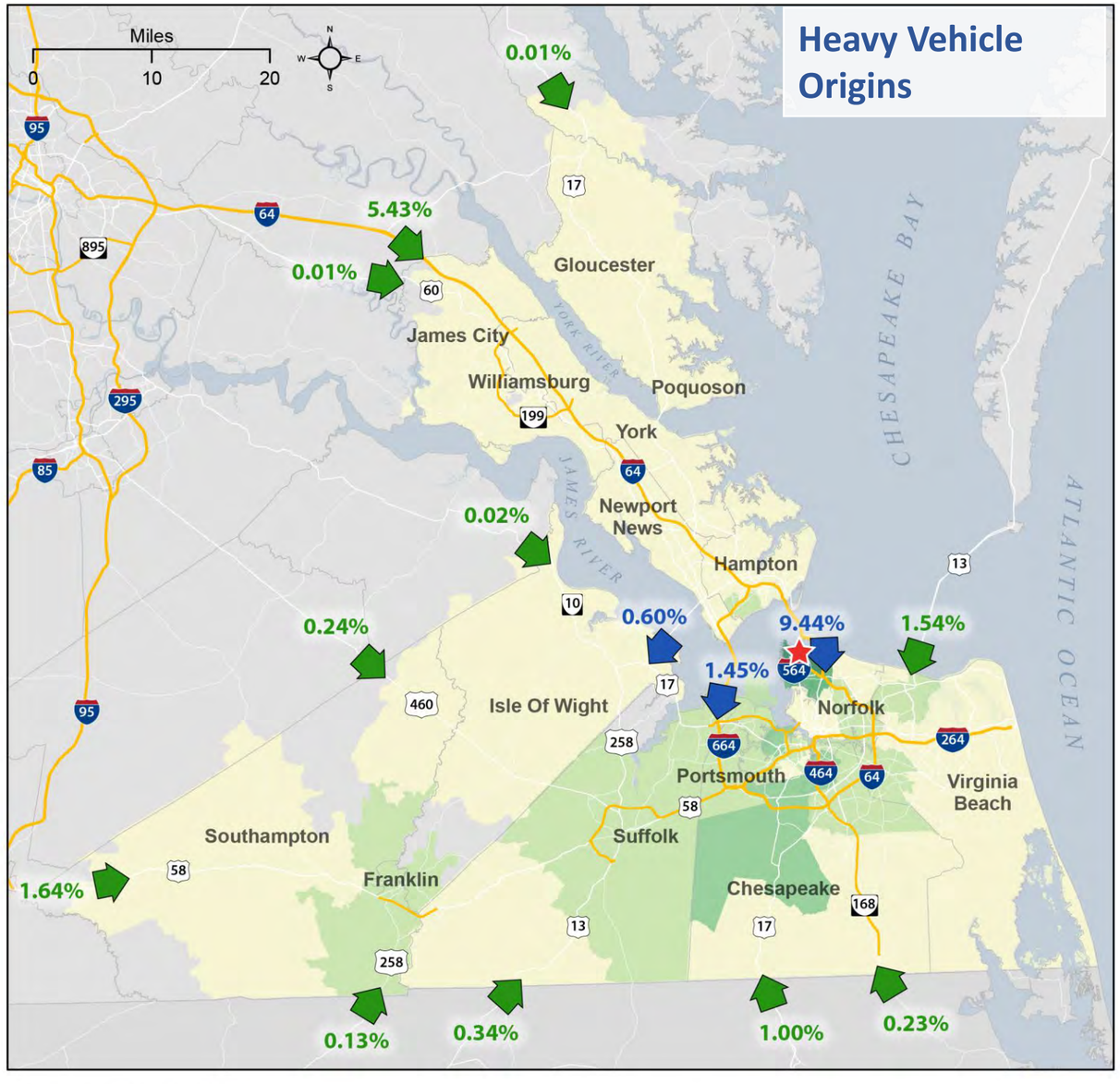
Percent Heavy Vehicles Exiting Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Origins for Vehicles Destined to Naval Station Norfolk





Personal Vehicle Origins

0% 39%

Destination

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Origins

0% 30%

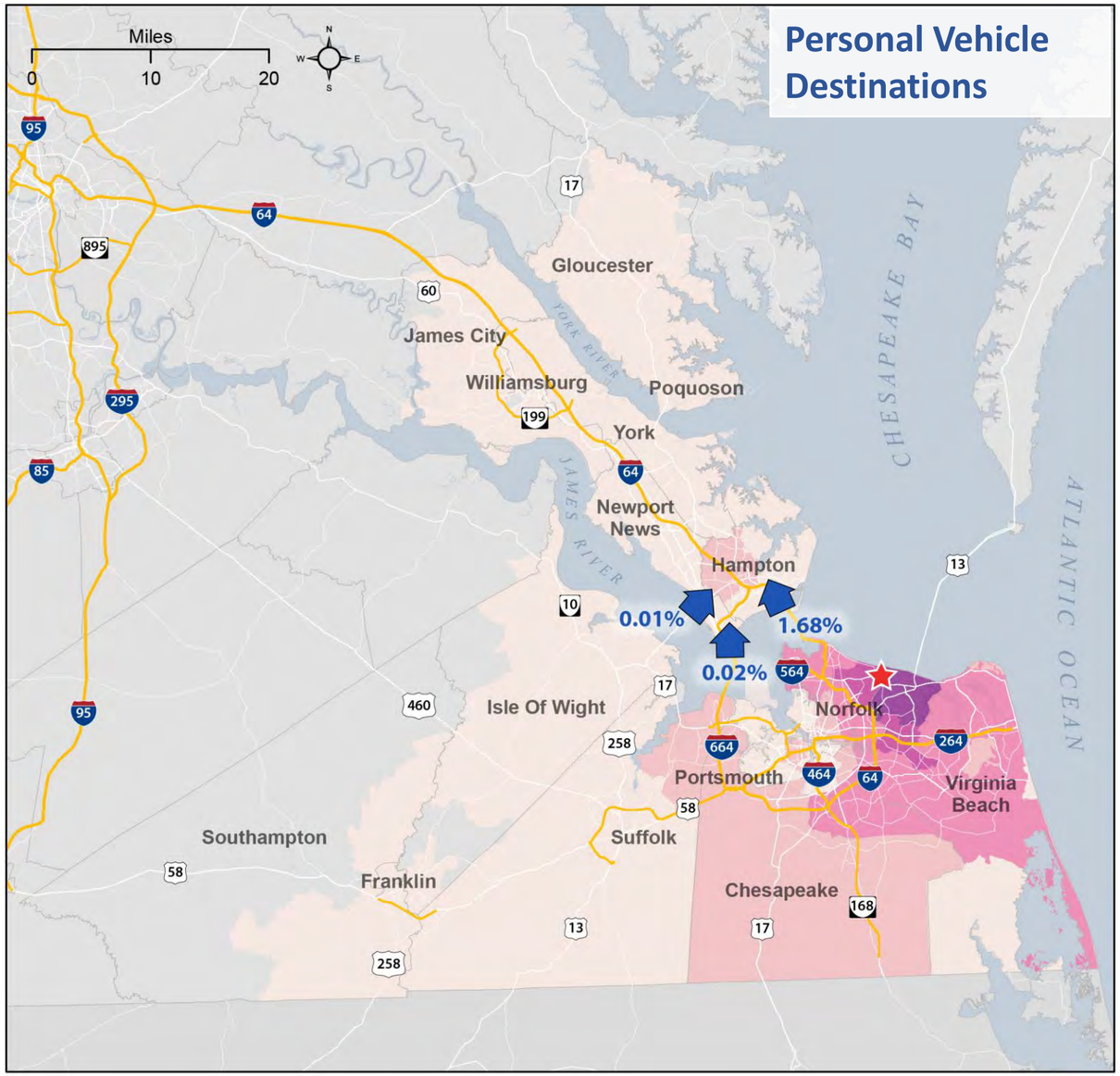
Destination

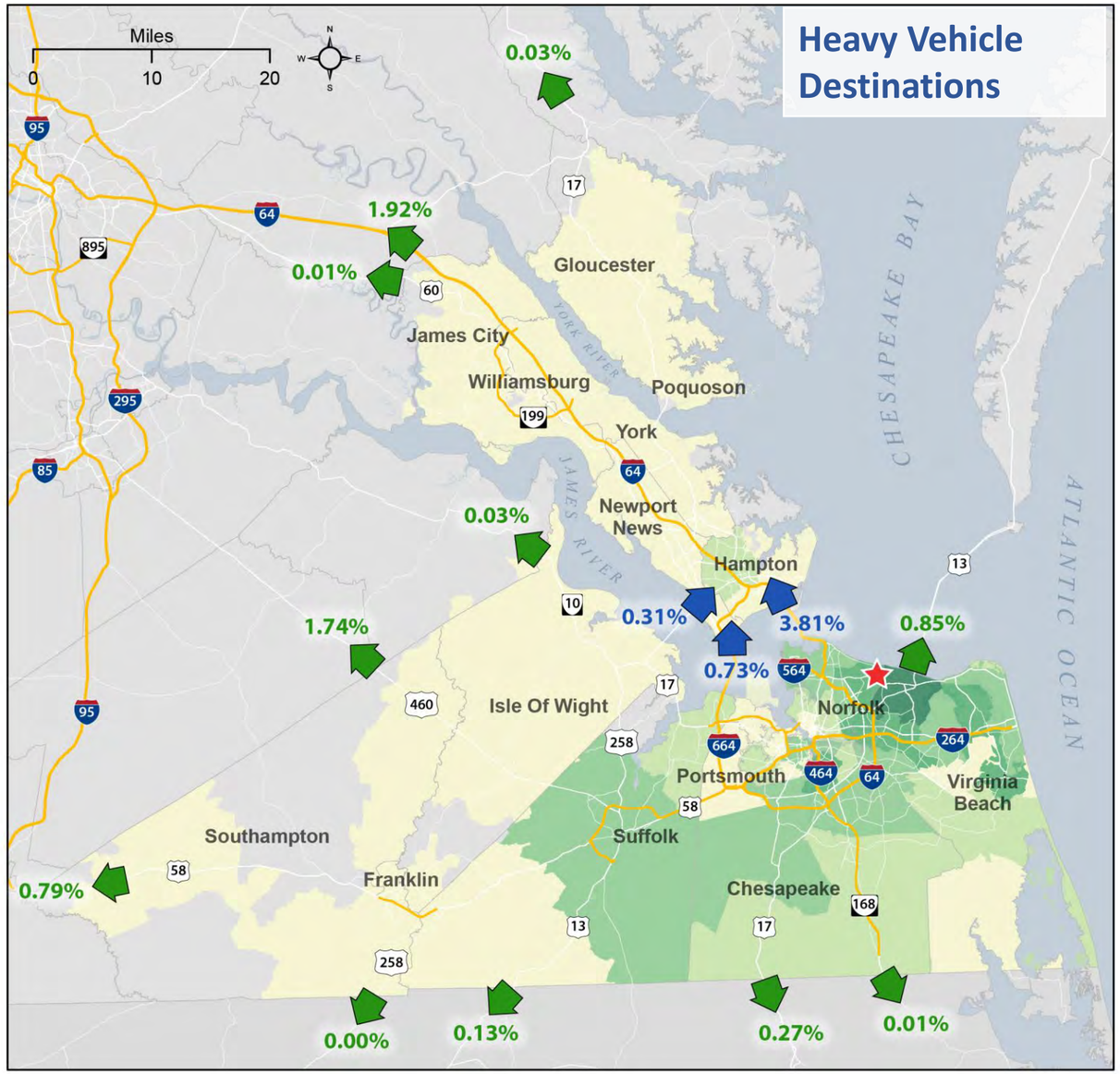
Percent Heavy Vehicles Entering Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Destinations for Vehicles Originating from JEB Little Creek Navy Base





Personal Vehicle Destinations

0% 31%

Origin

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Destinations

0% 29%

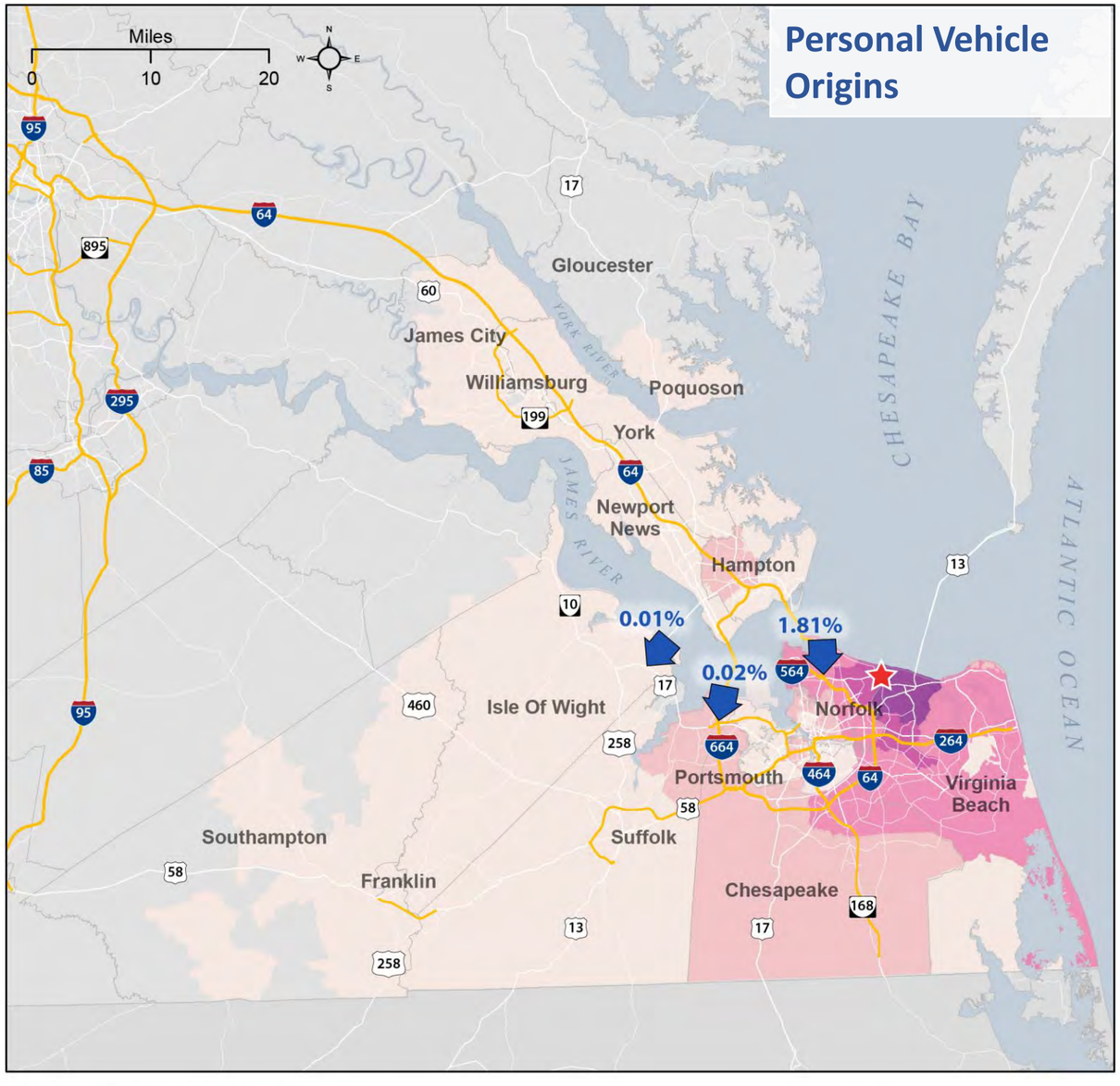
Origin

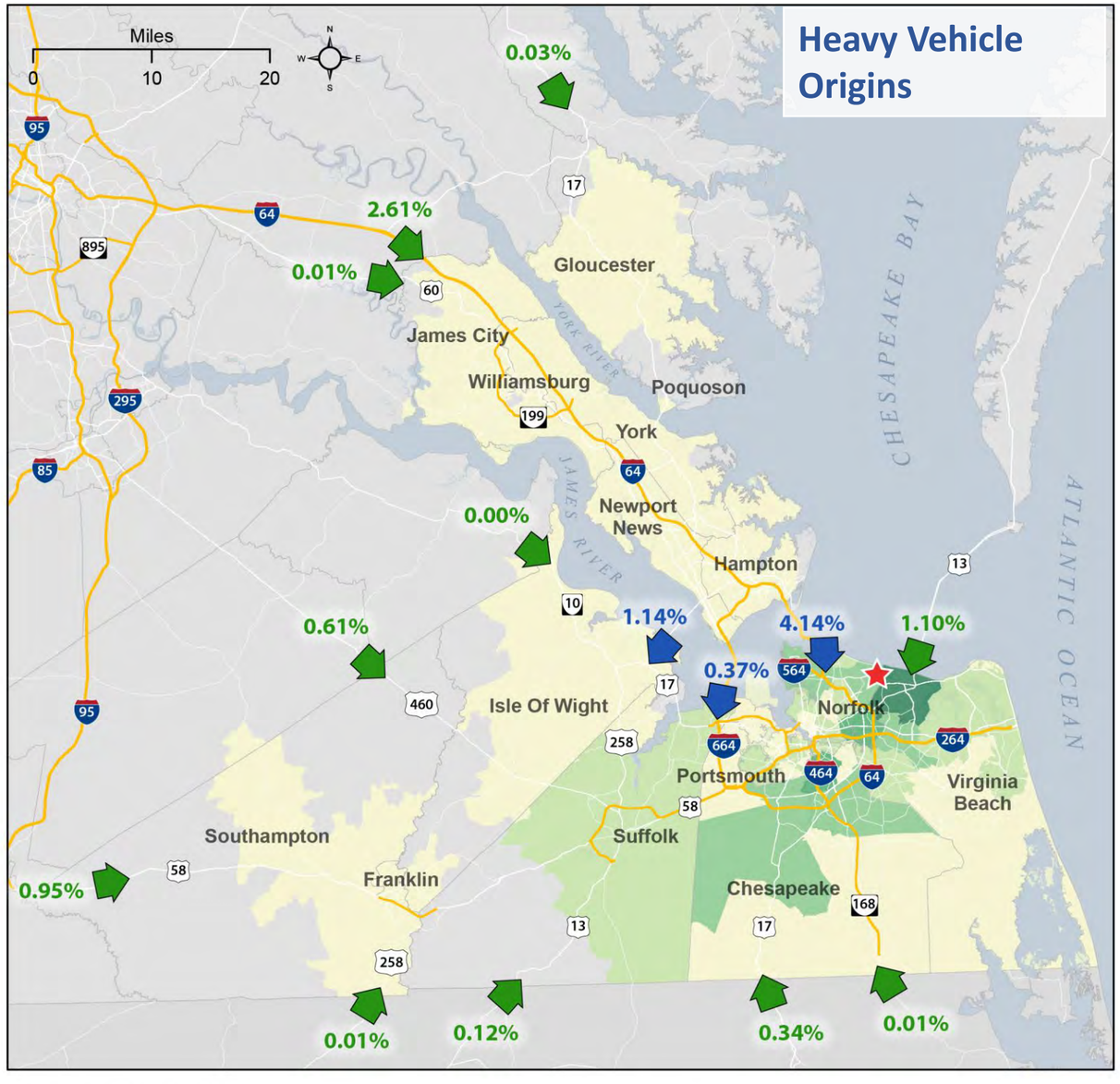
Percent Heavy Vehicles Exiting Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Origins for Vehicles Destined to JEB Little Creek Navy Base





Personal Vehicle Origins

0% 30%

Destination

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Origins

0% 30%

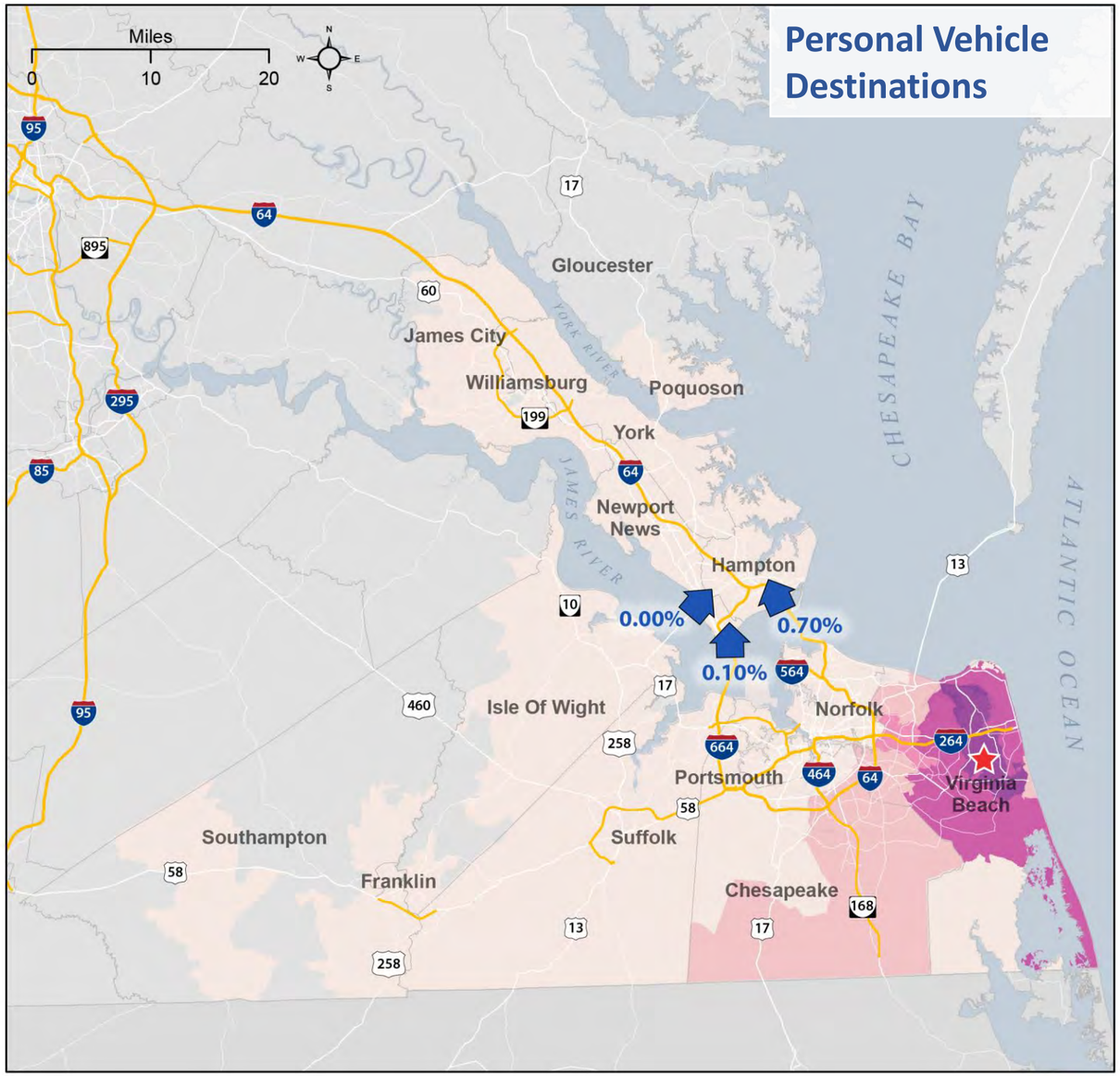
Destination

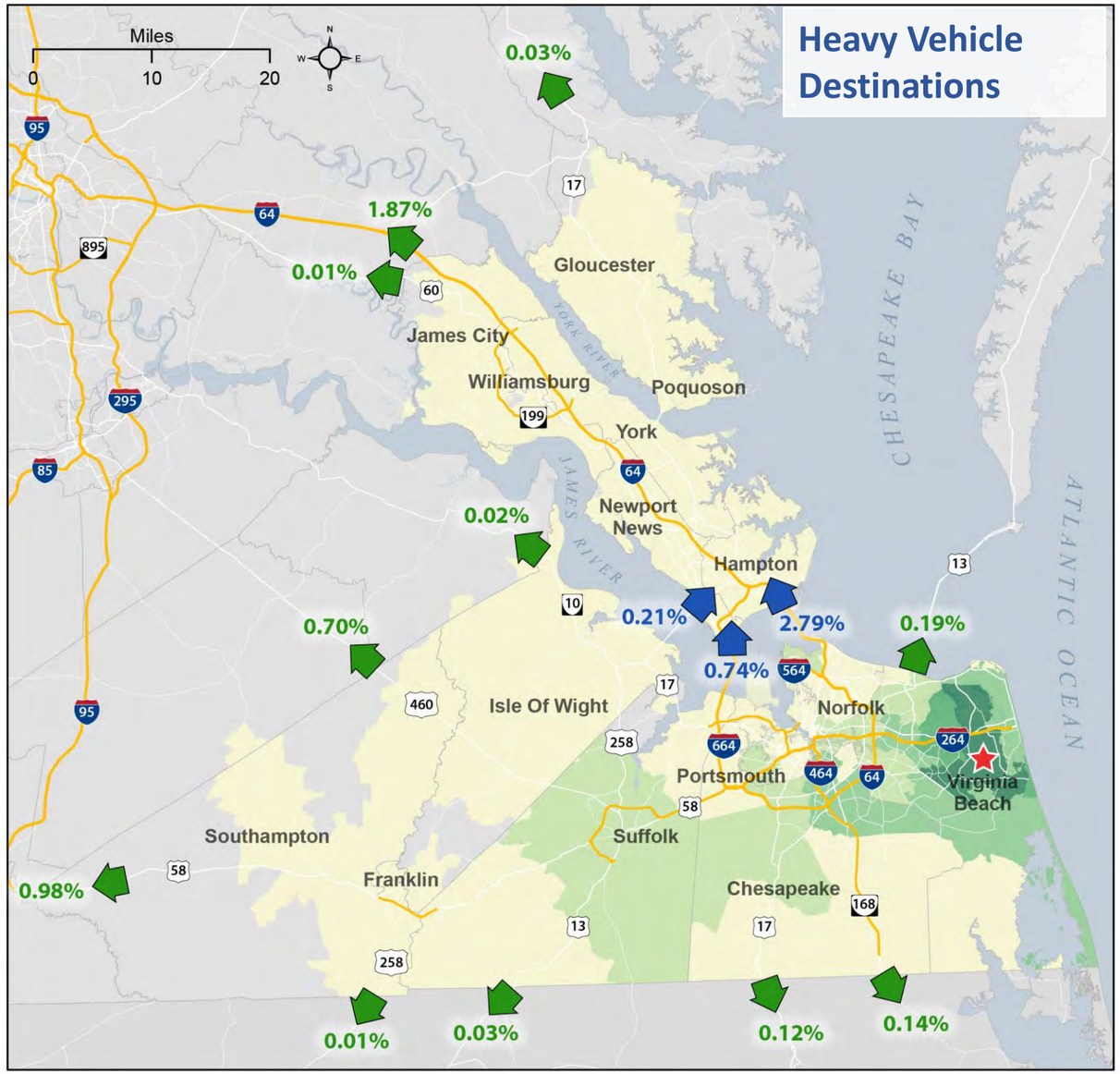
Percent Heavy Vehicles Entering Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Destinations for Vehicles Originating from Oceana NAS





Personal Vehicle Destinations

0% — 26%

Origin

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Destinations

0% — 22%

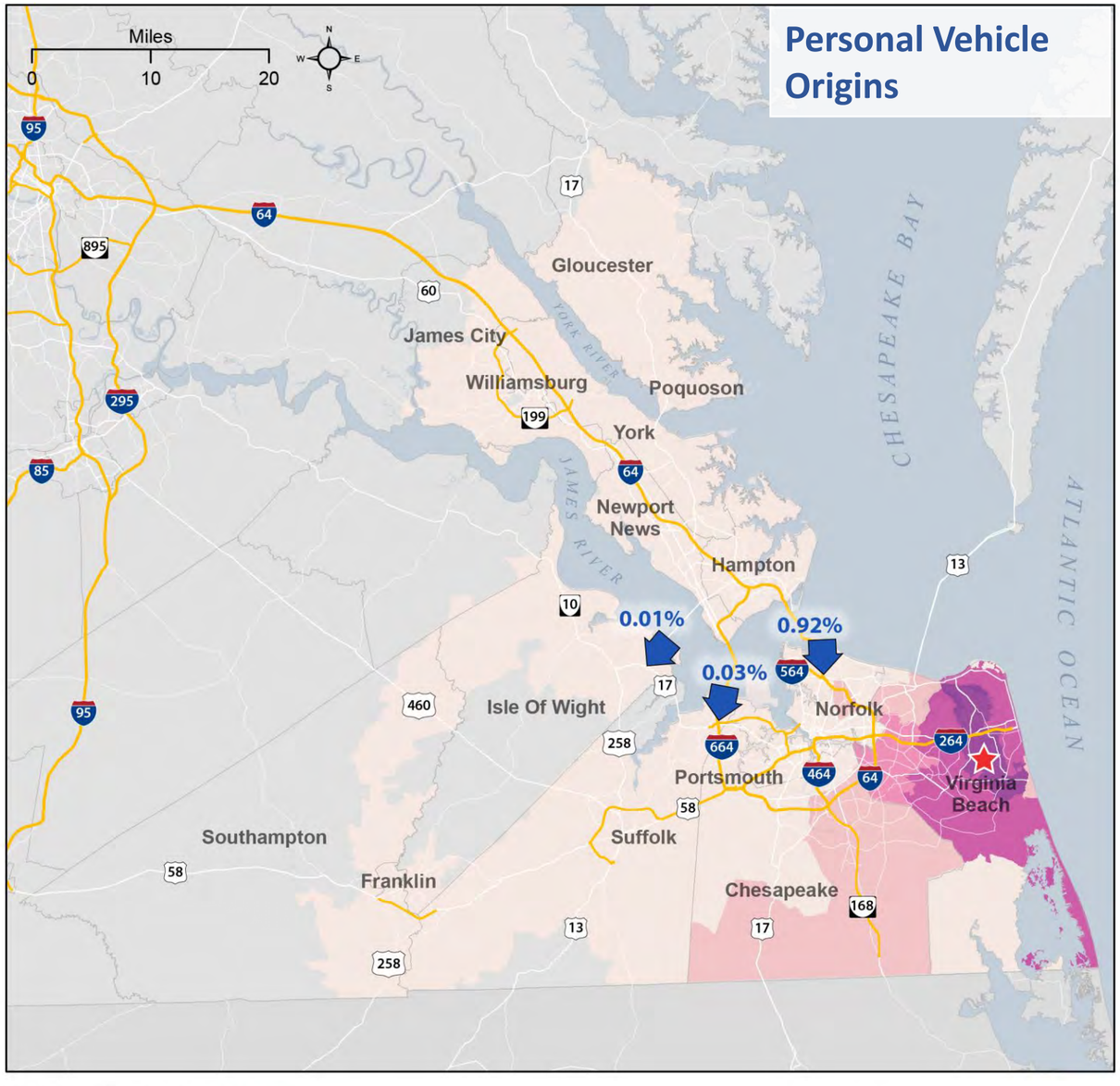
Origin

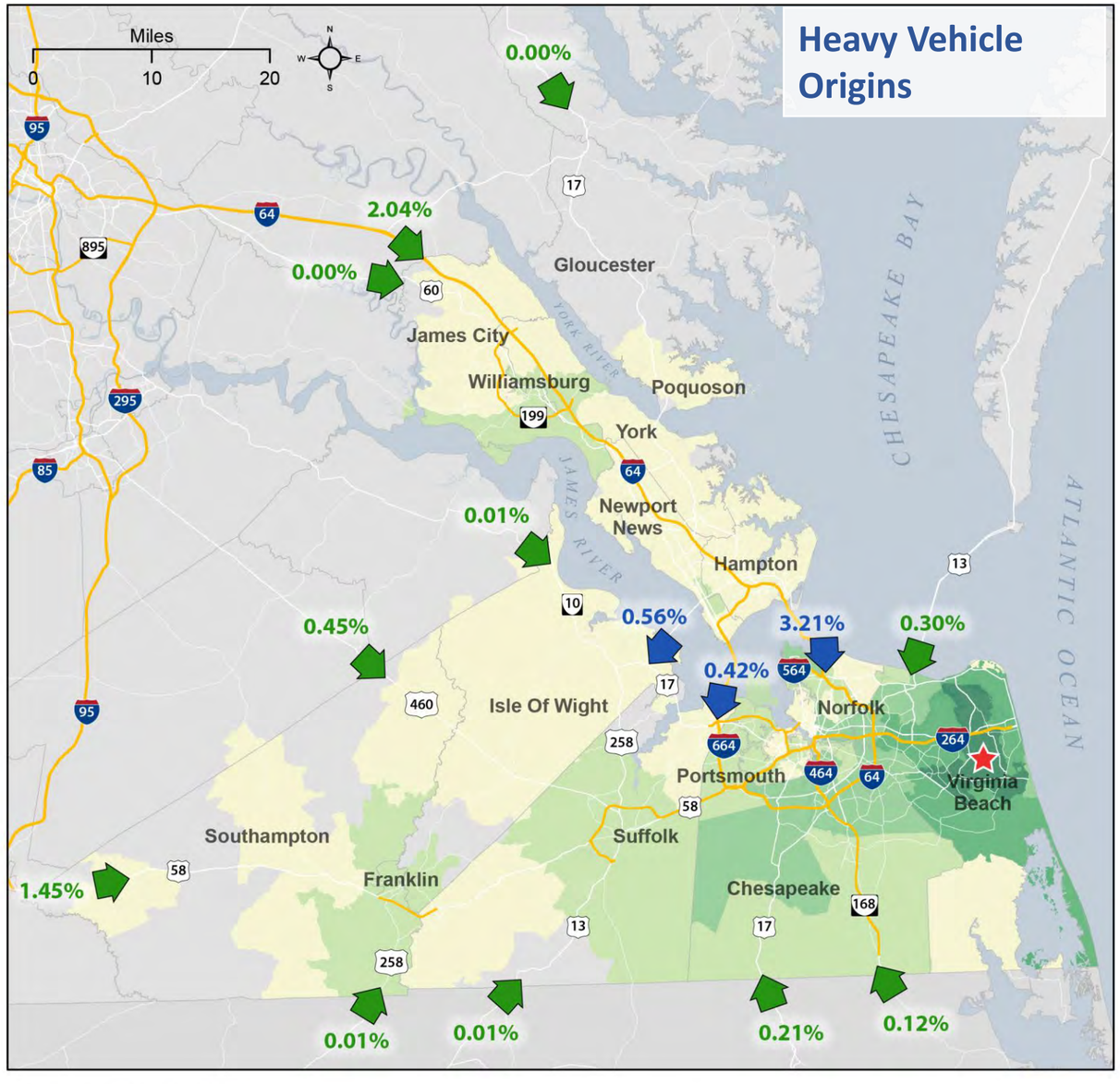
Percent Heavy Vehicles Exiting Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Origins for Vehicles Destined to Oceana NAS





Personal Vehicle Origins

0% 26%

Destination

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Origins

0% 25%

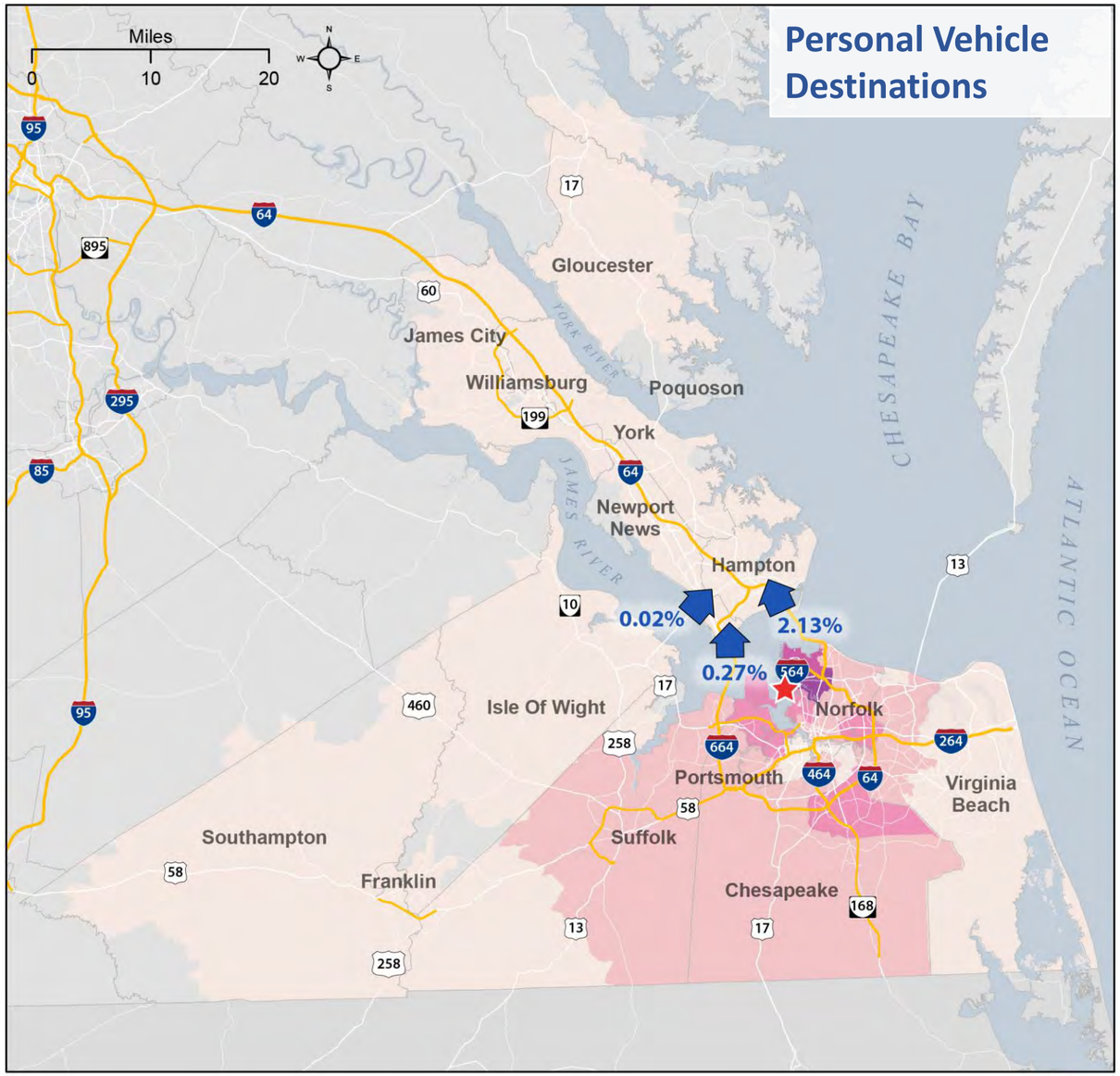
Destination

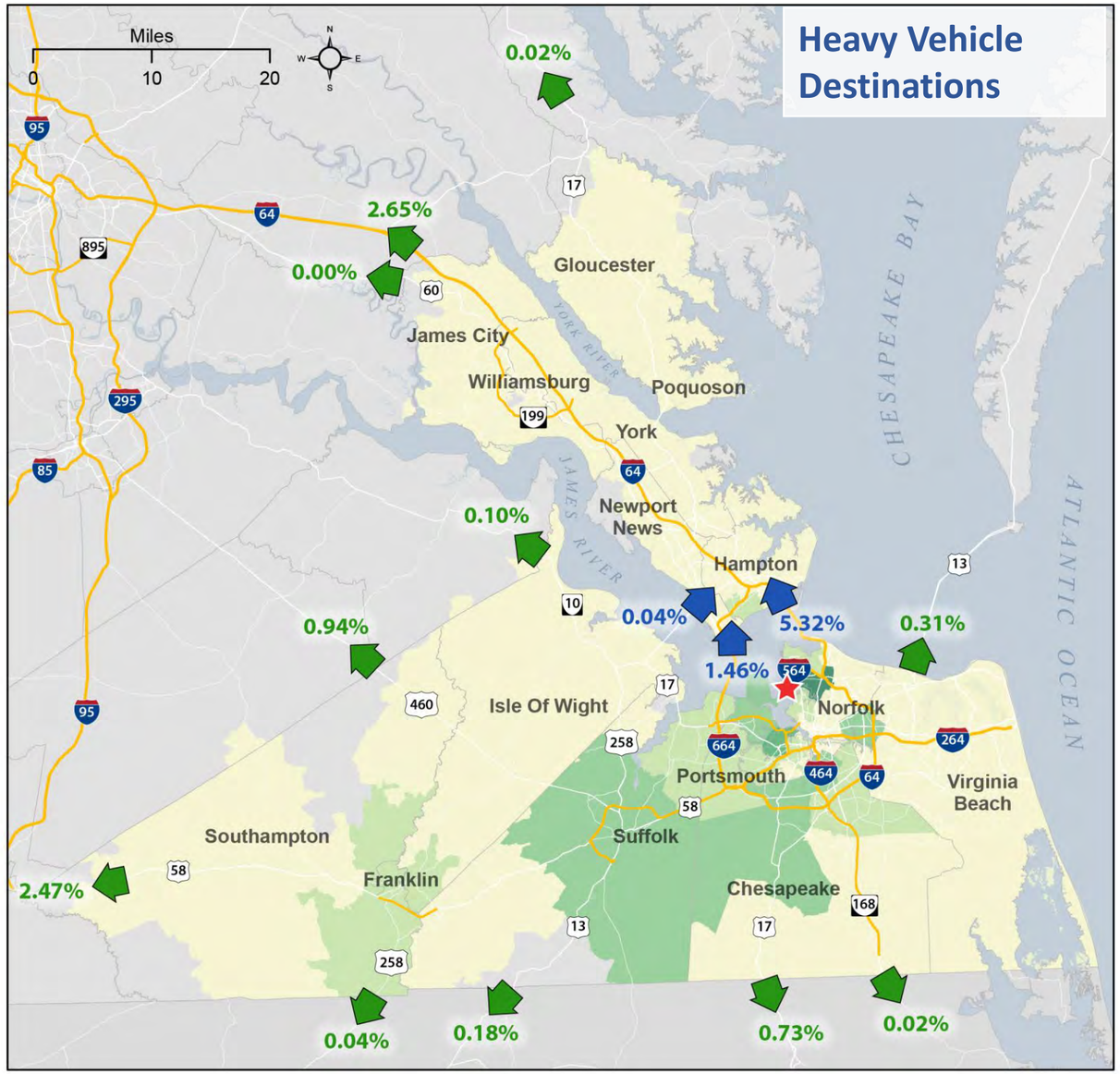
Percent Heavy Vehicles Entering Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Destinations for Vehicles Originating from Norfolk International Terminals





Personal Vehicle Destinations

0% 52%

Origin

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Destinations

0% 44%

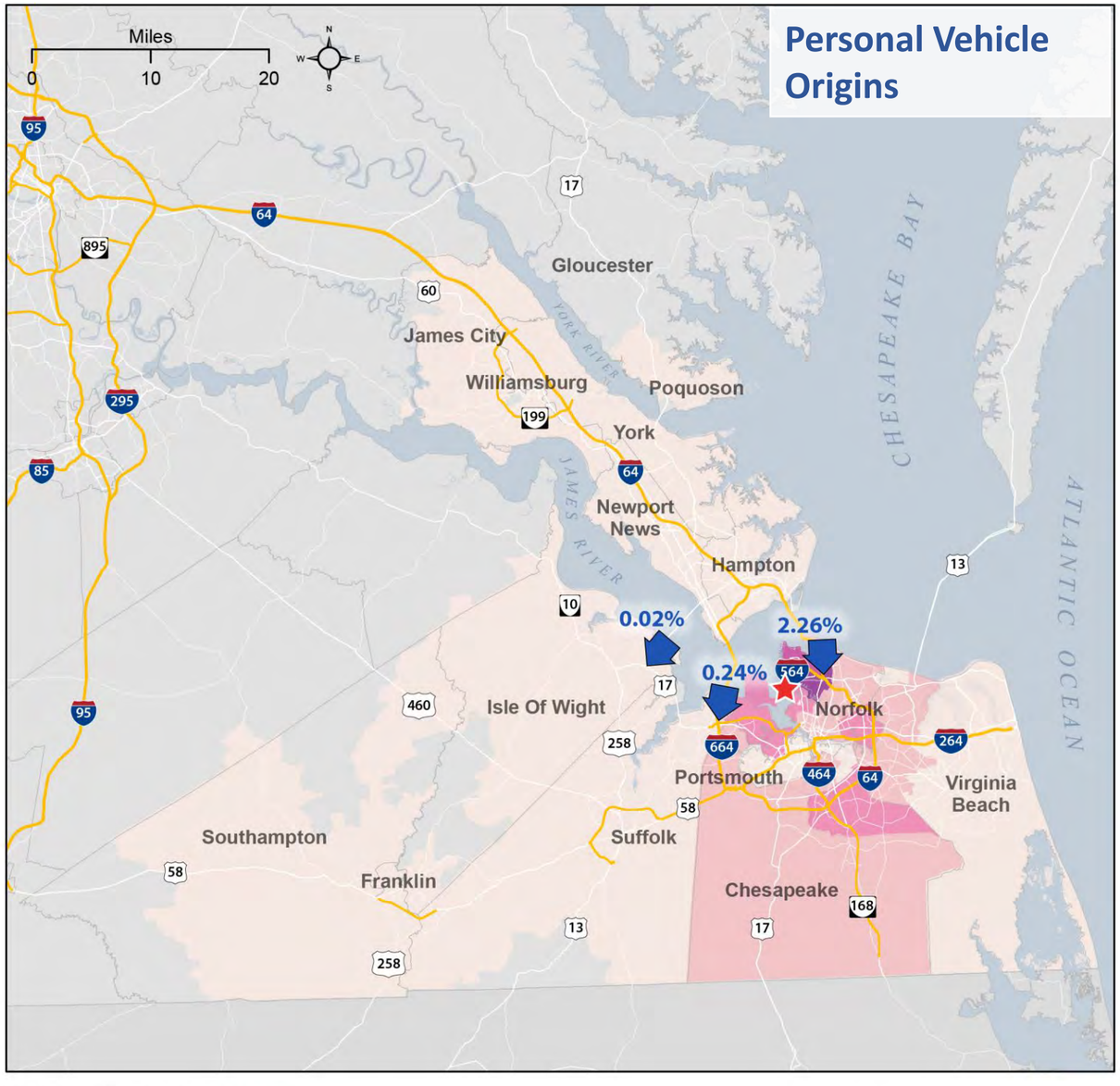
Origin

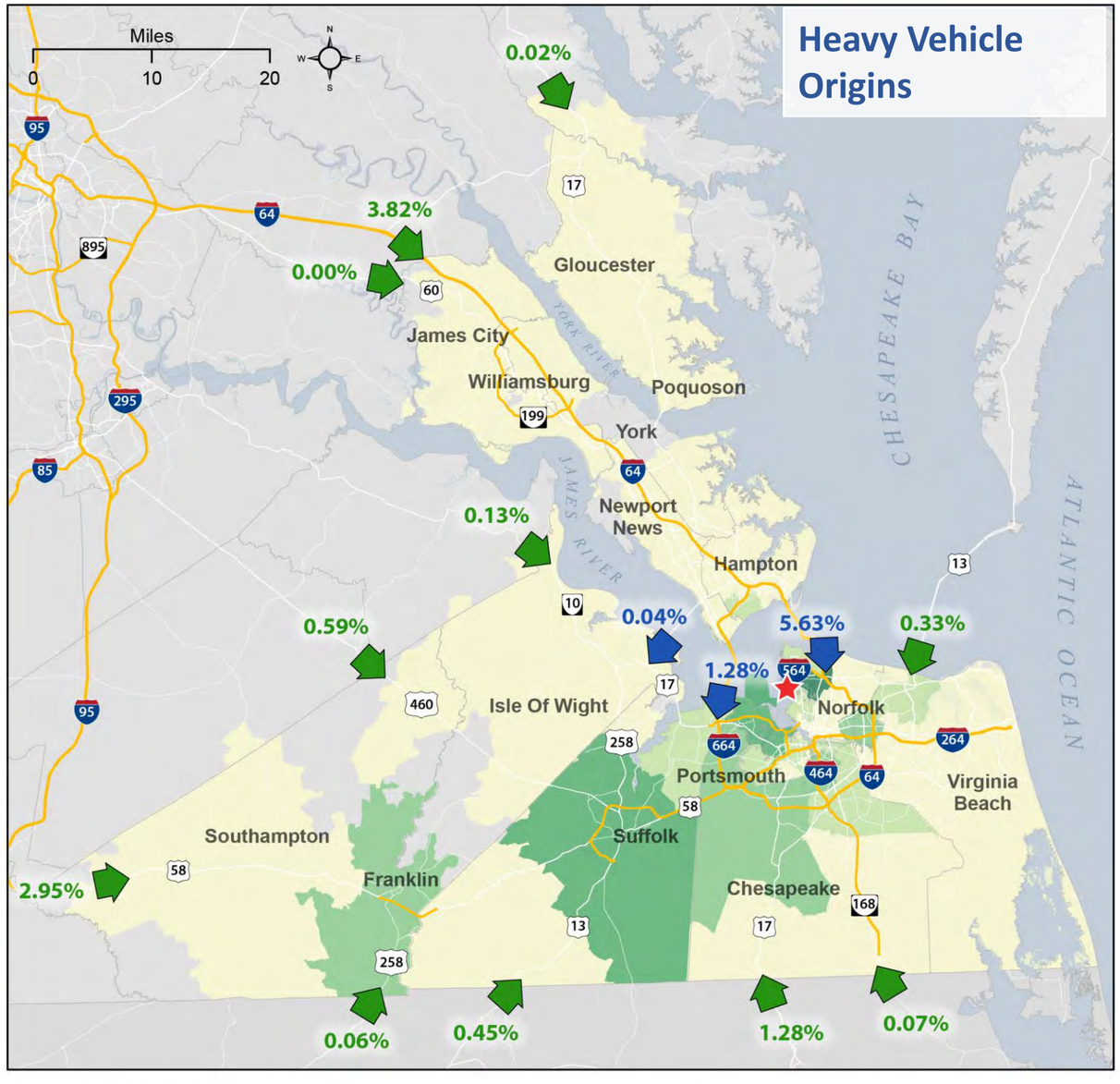
Percent Heavy Vehicles Exiting Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Origins for Vehicles Destined to Norfolk International Terminal





Personal Vehicle Origins

0% 52%

Destination

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Origins

0% 51%

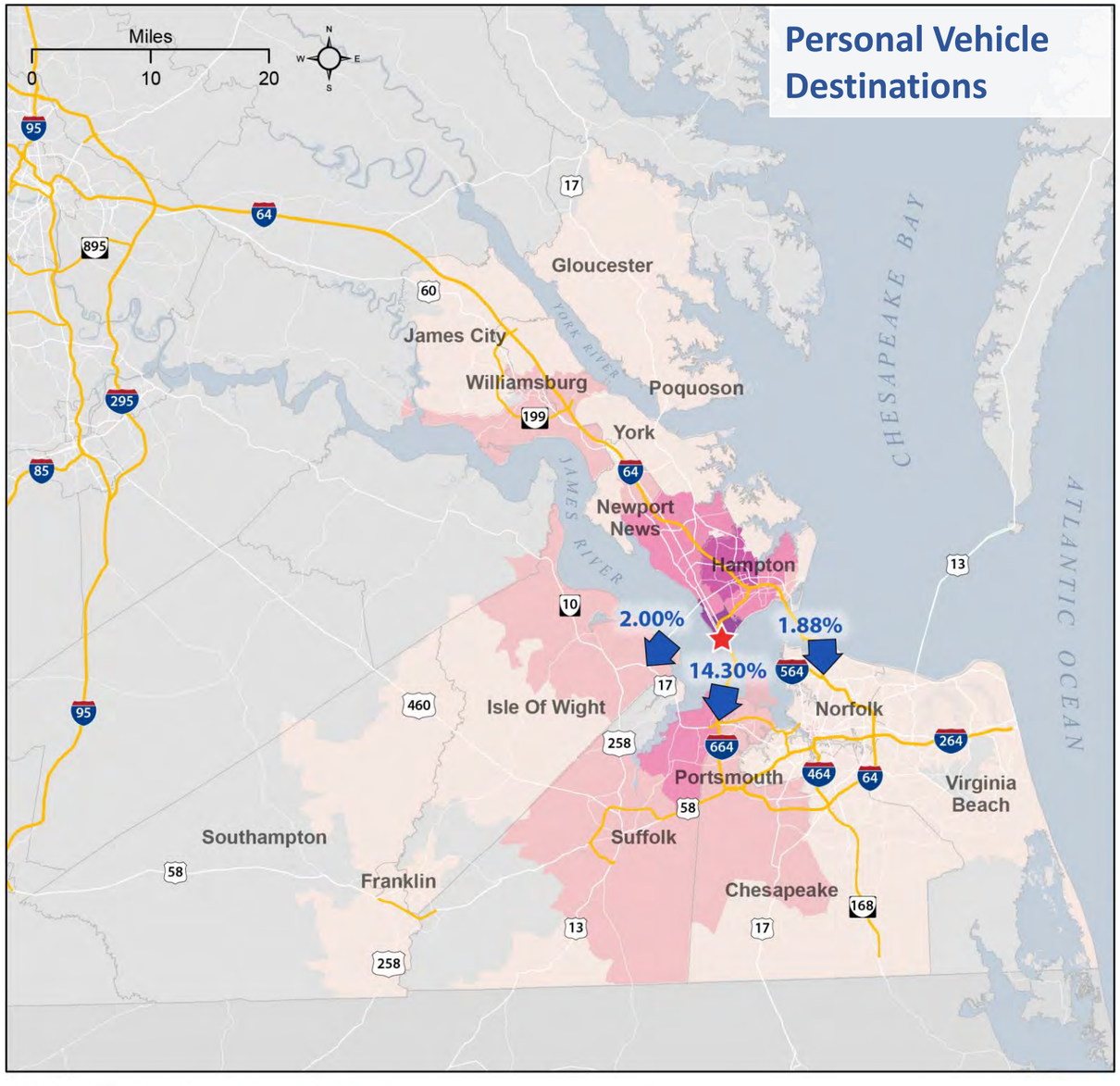
Destination

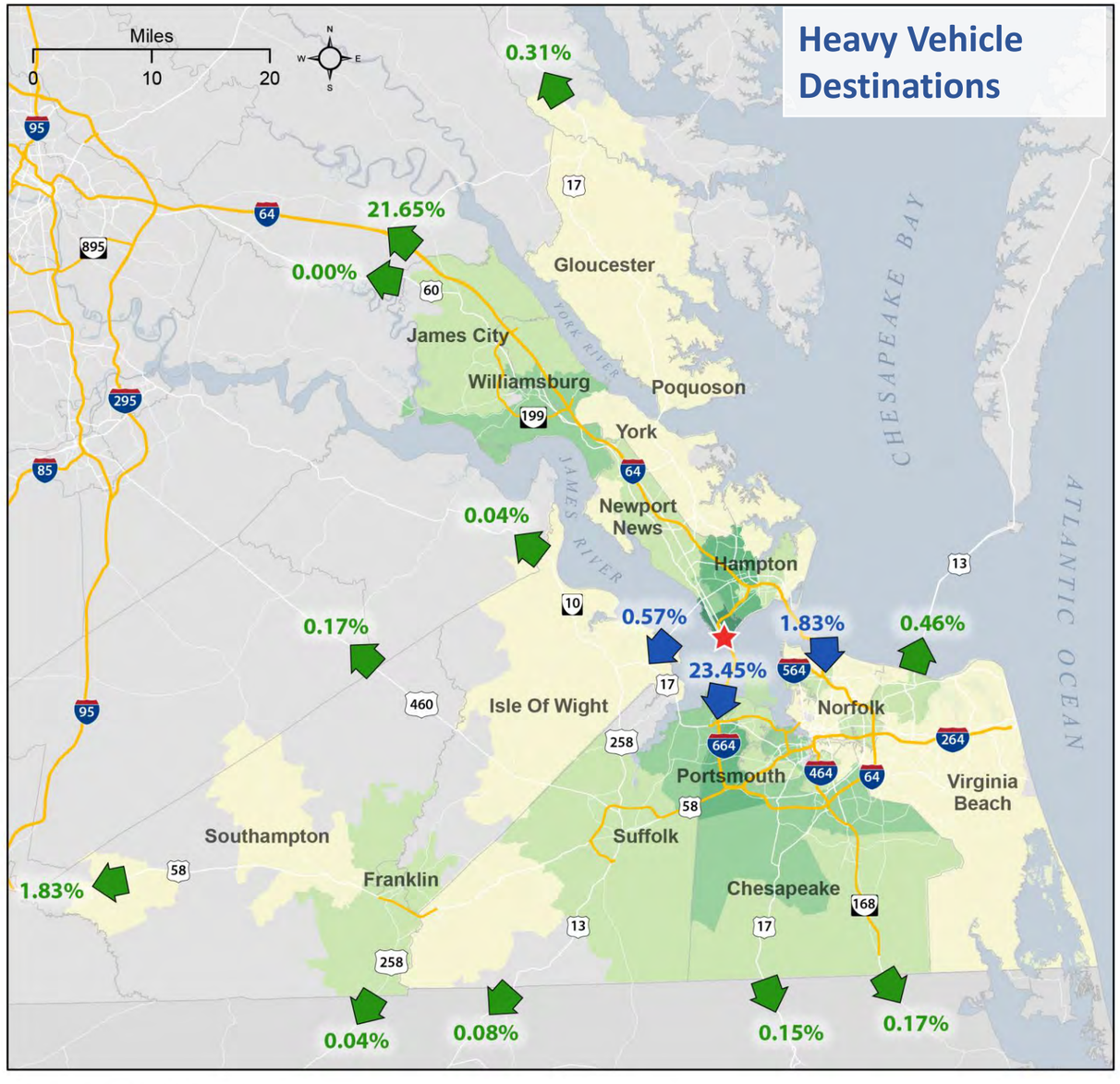
Percent Heavy Vehicles Entering Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Destinations for Vehicles Originating from Newport News Marine Terminal





Personal Vehicle Destinations

0% — 37%

Origin

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Destinations

0% — 32%

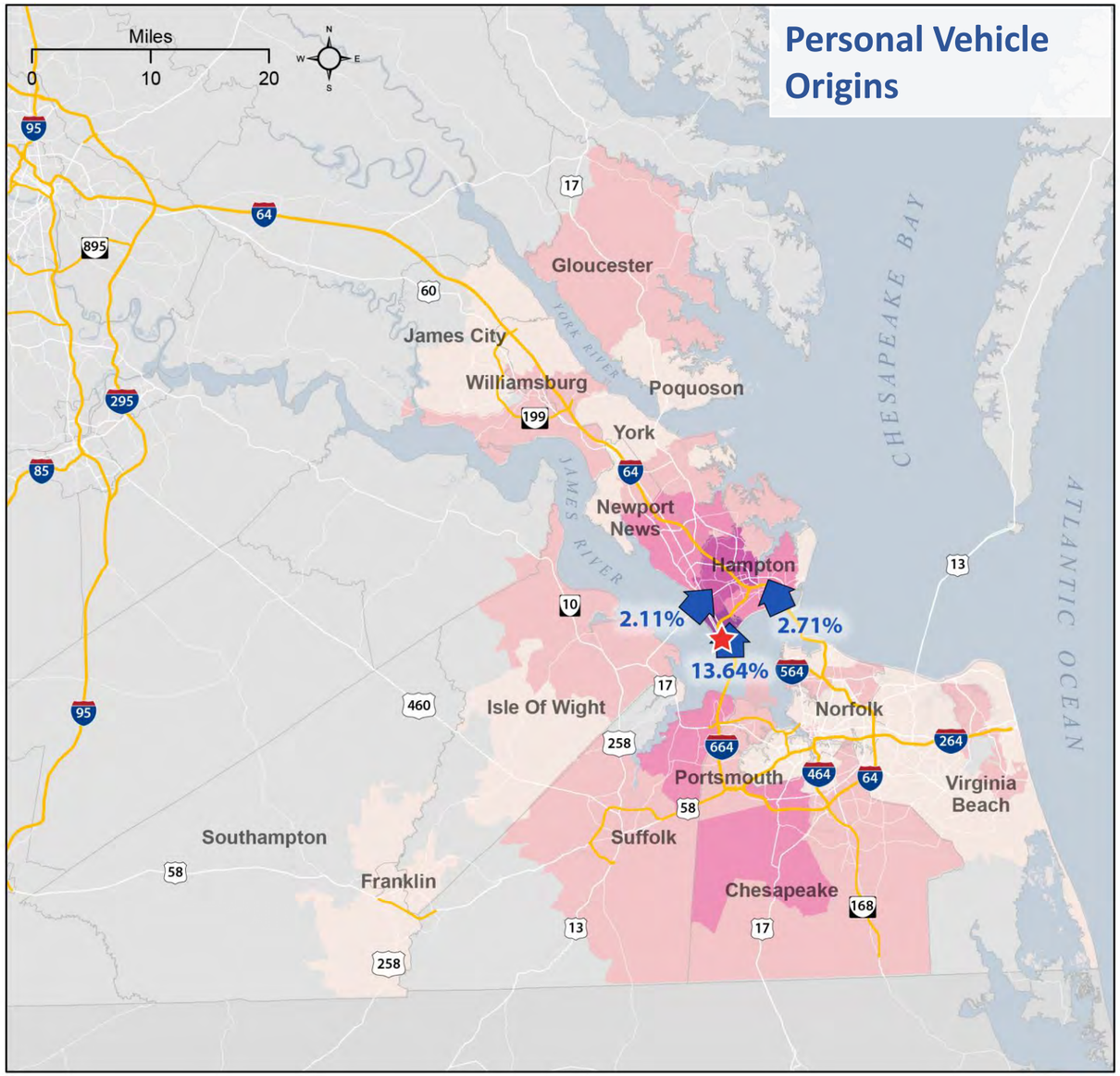
Origin

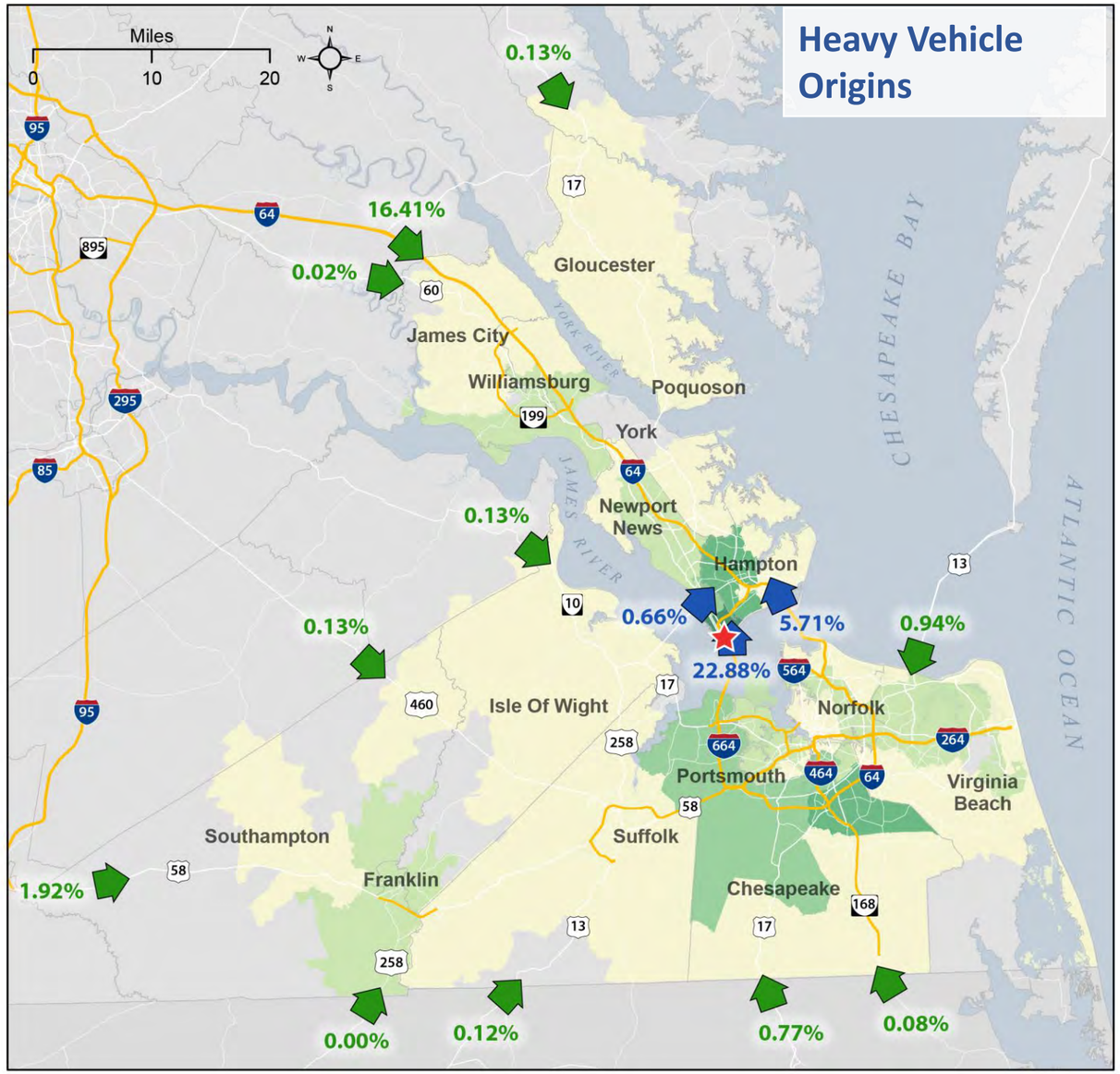
Percent Heavy Vehicles Exiting Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Origins for Vehicles Destined to Newport News Marine Terminal





Personal Vehicle Origins

0% 40%

Destination

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Origins

0% 35%

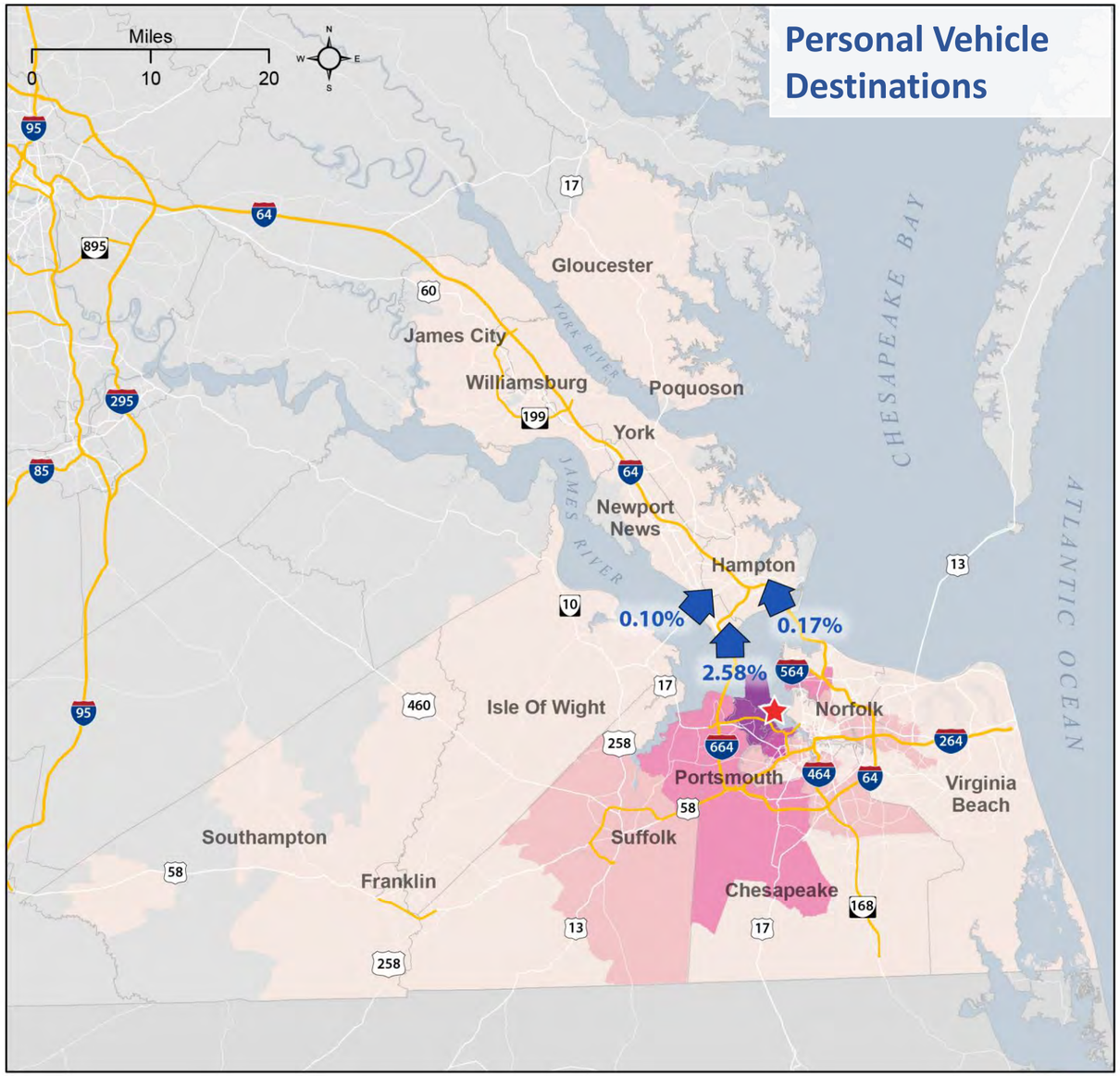
Destination

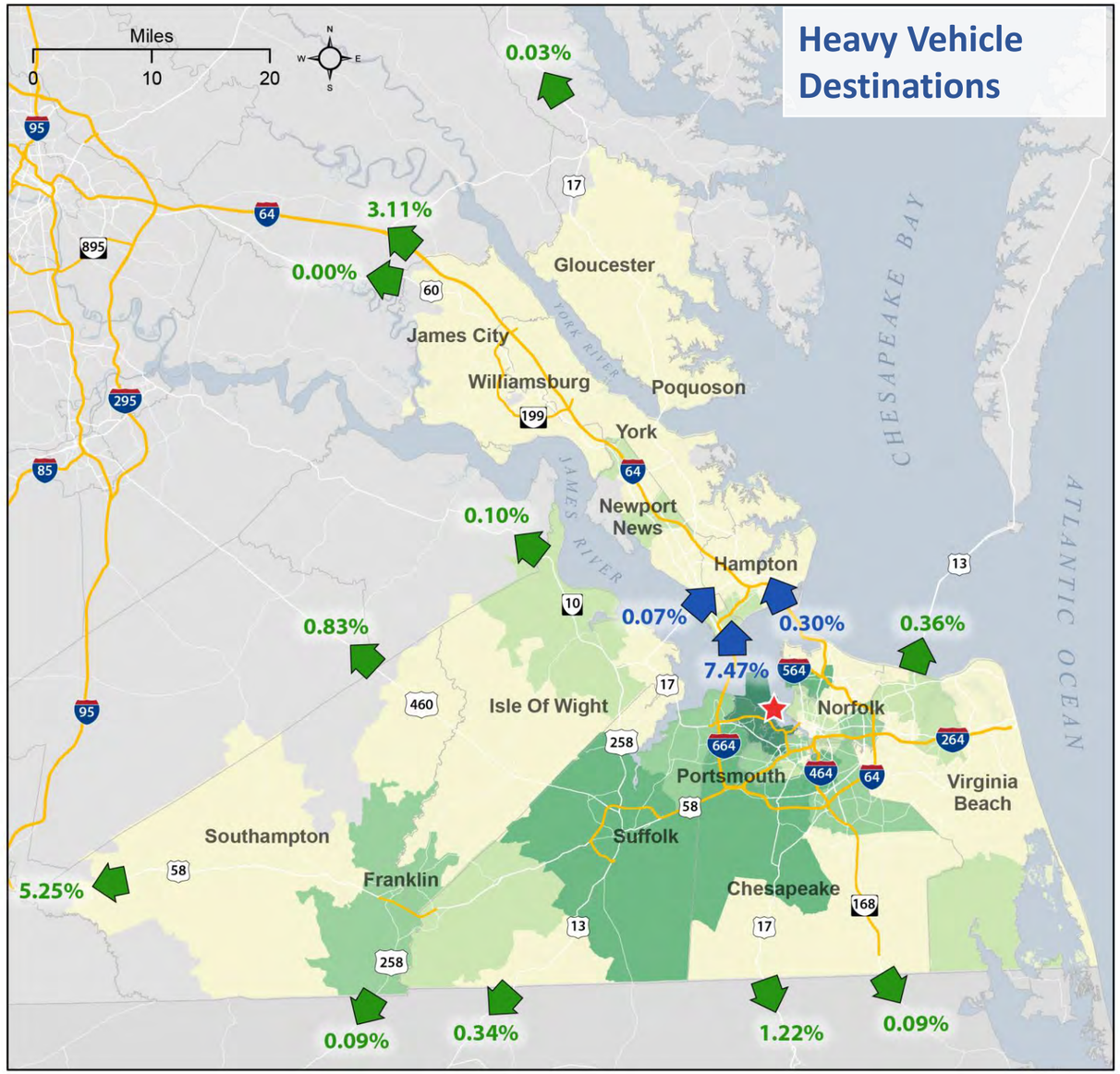
Percent Heavy Vehicles Entering Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Destinations for Vehicles Originating from Virginia International Gateway Terminal





Personal Vehicle Destinations

0% — 46%

Origin

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Destinations

0% — 17%

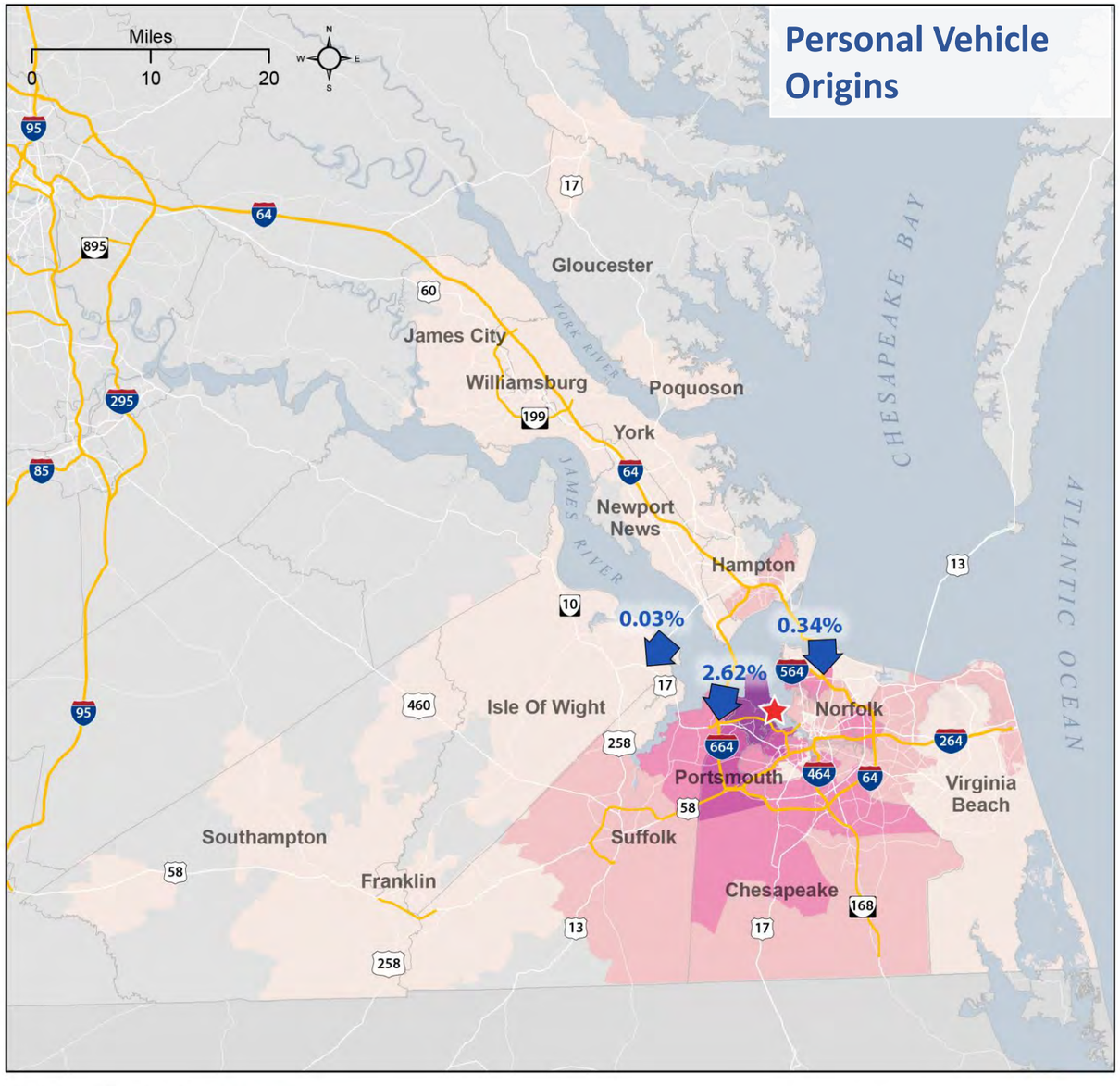
Origin

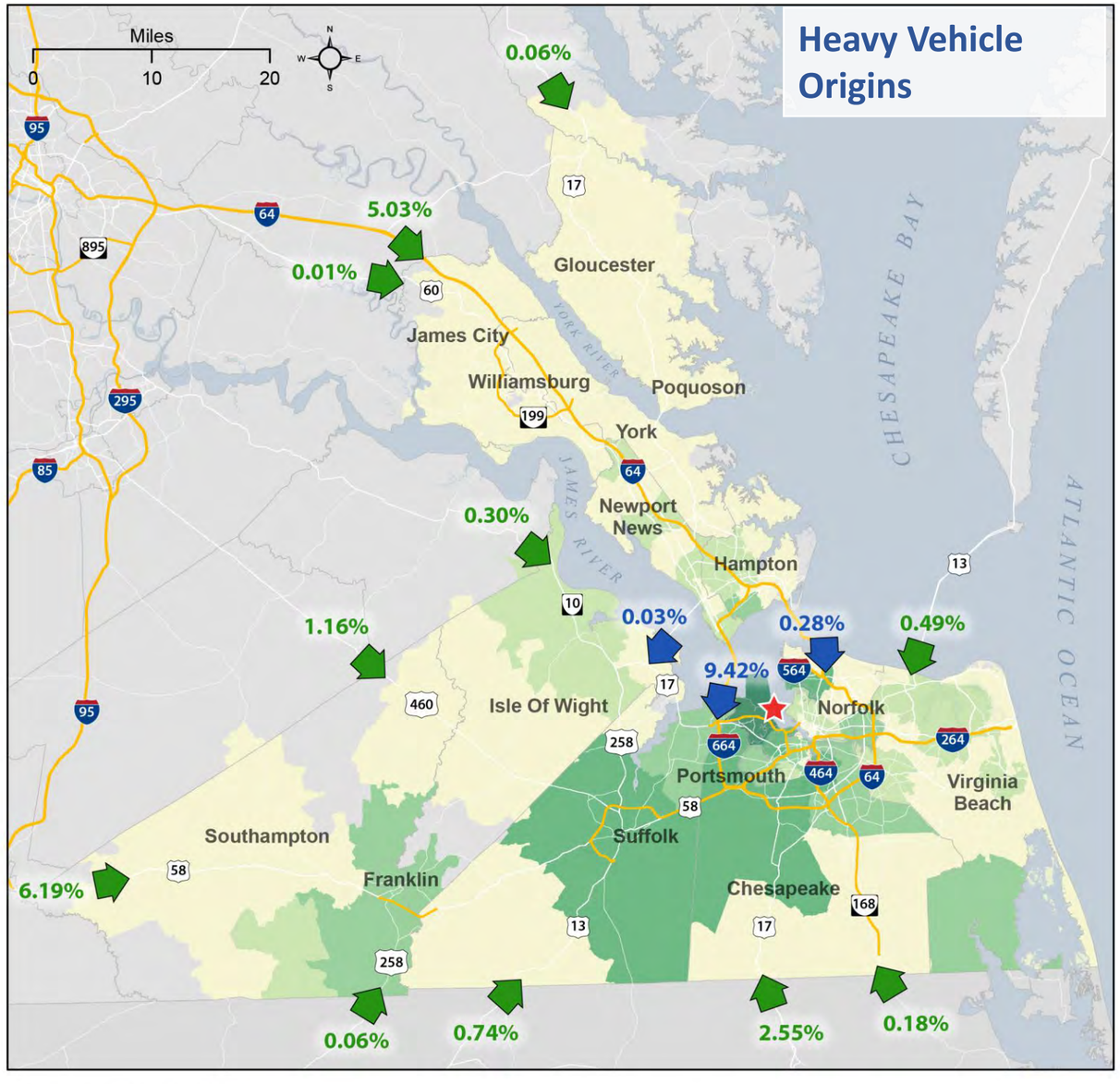
Percent Heavy Vehicles Exiting Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Origins for Vehicles Destined to Virginia International Gateway Terminal





Personal Vehicle Origins

0% 48%

Destination

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Origins

0% 17%

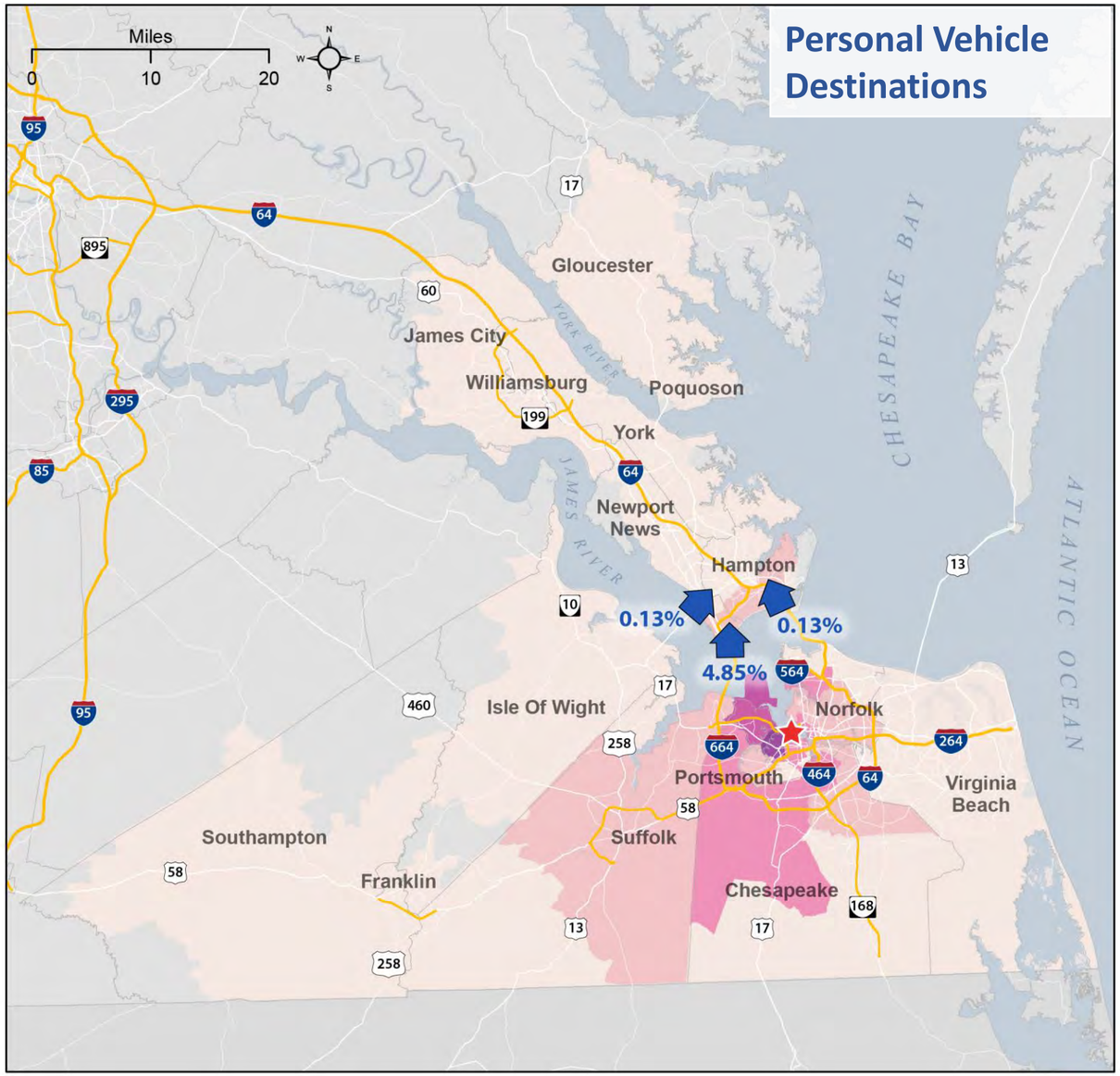
Destination

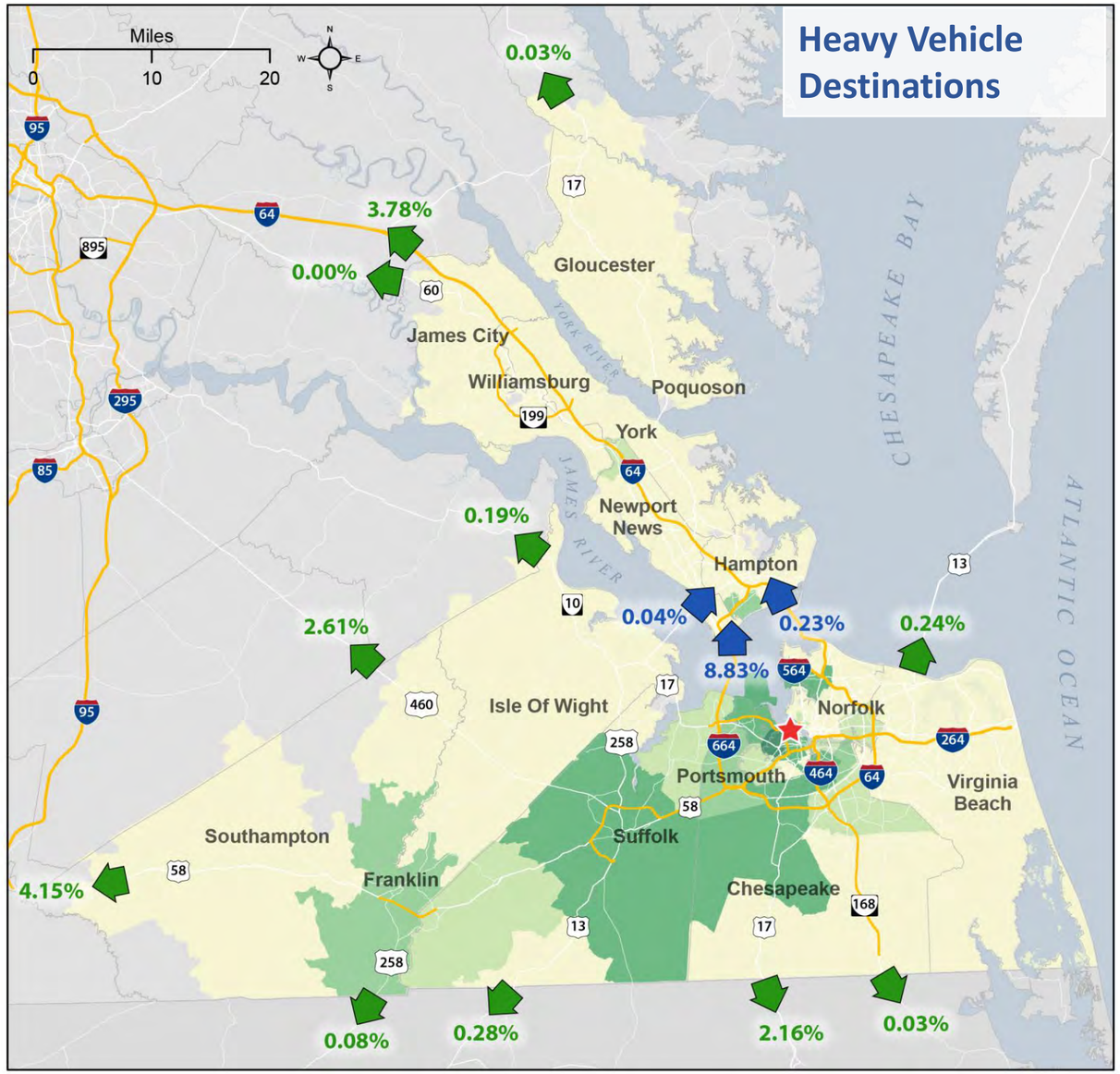
Percent Heavy Vehicles Entering Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Destinations for Vehicles Originating from Portsmouth Marine Terminal





Personal Vehicle Destinations

0% — 33%

Origin

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Destinations

0% — 29%

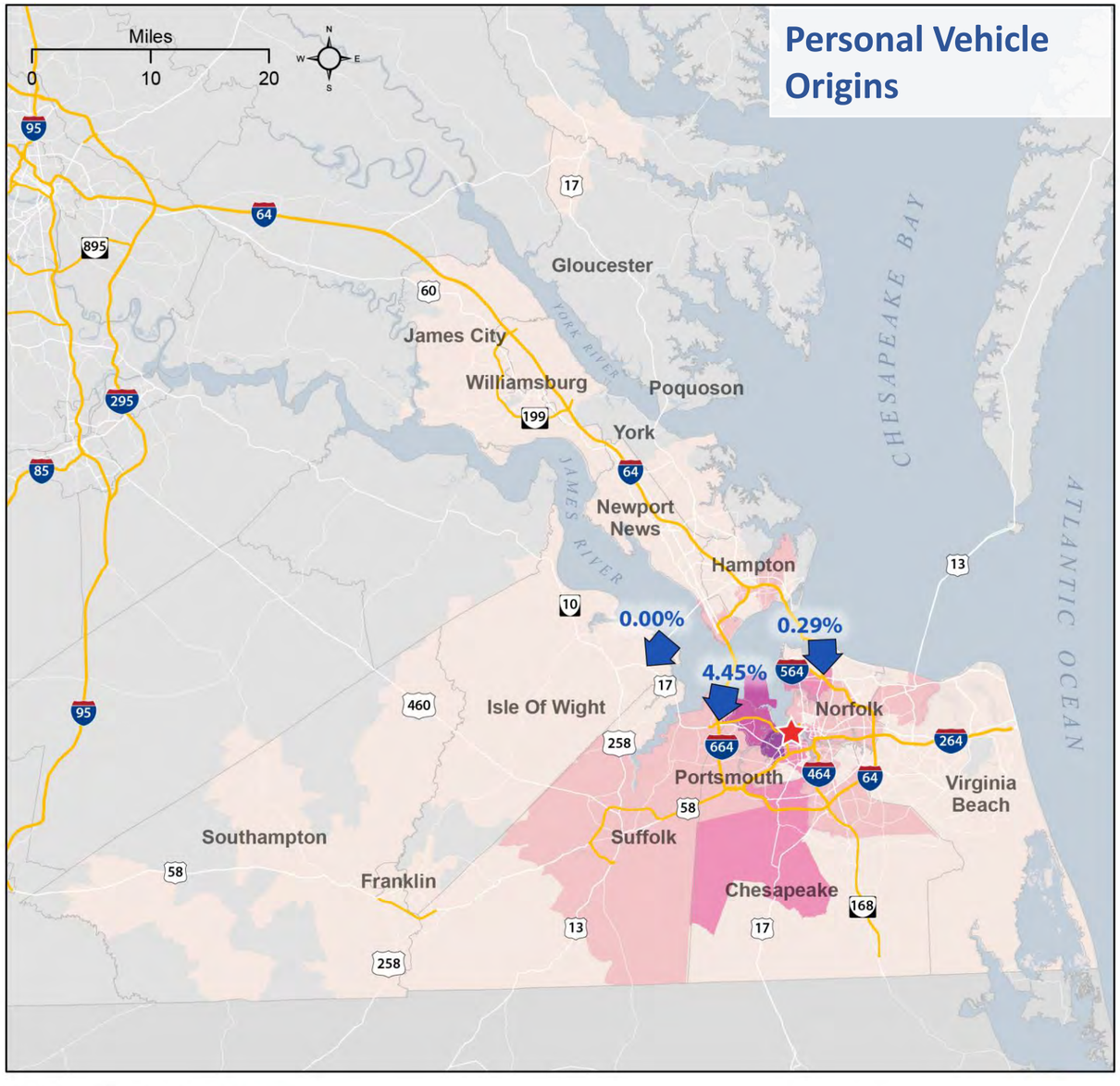
Origin

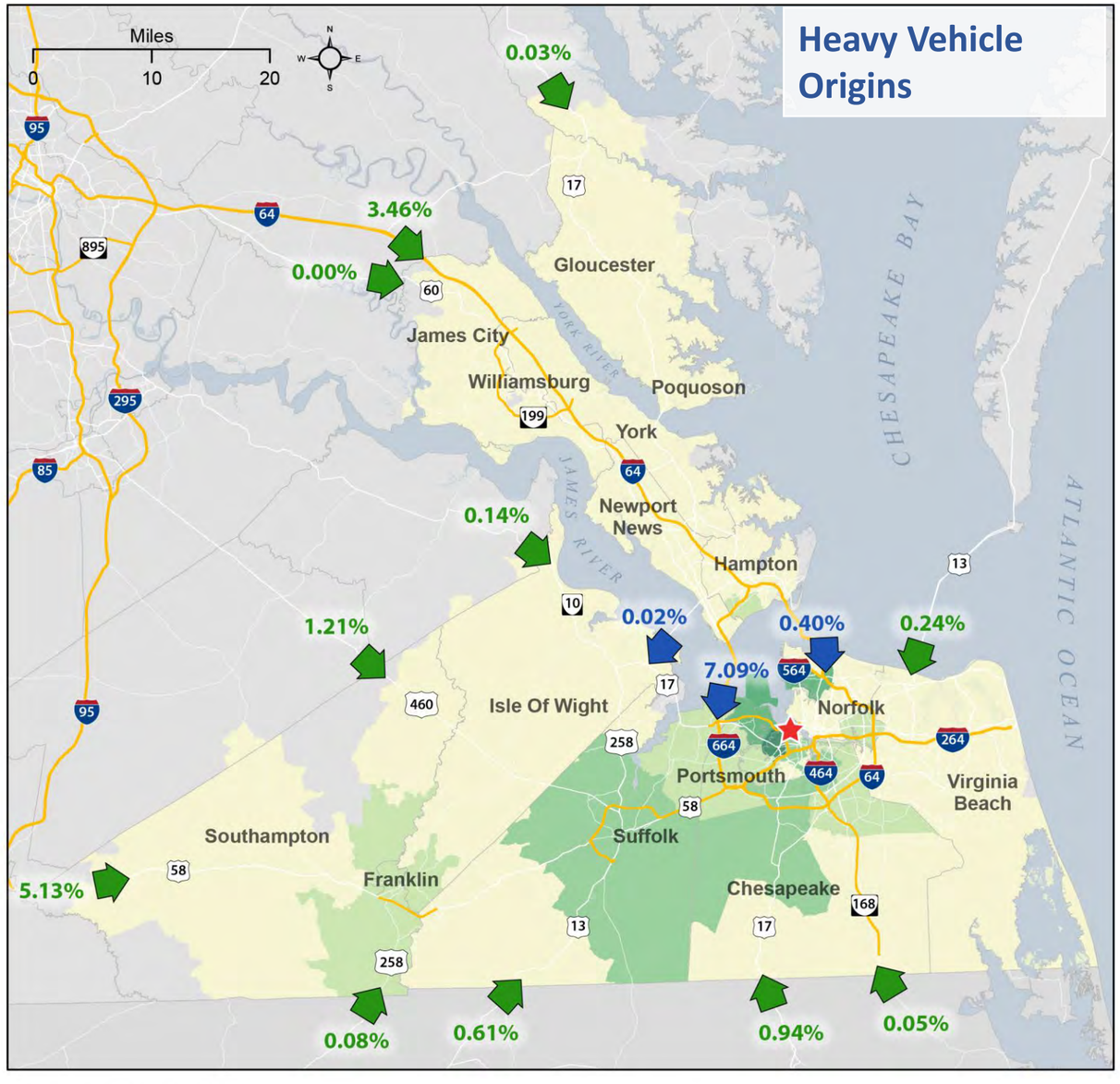
Percent Heavy Vehicles Exiting Hampton Roads

Percent Heavy Vehicles Crossing the Harbor

Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

Origins for Vehicles Destined to Portsmouth Marine Terminal





Personal Vehicle Origins

0% 31%

Destination

Percent Personal Vehicles Crossing the Harbor

Heavy Vehicle Origins

0% 30%

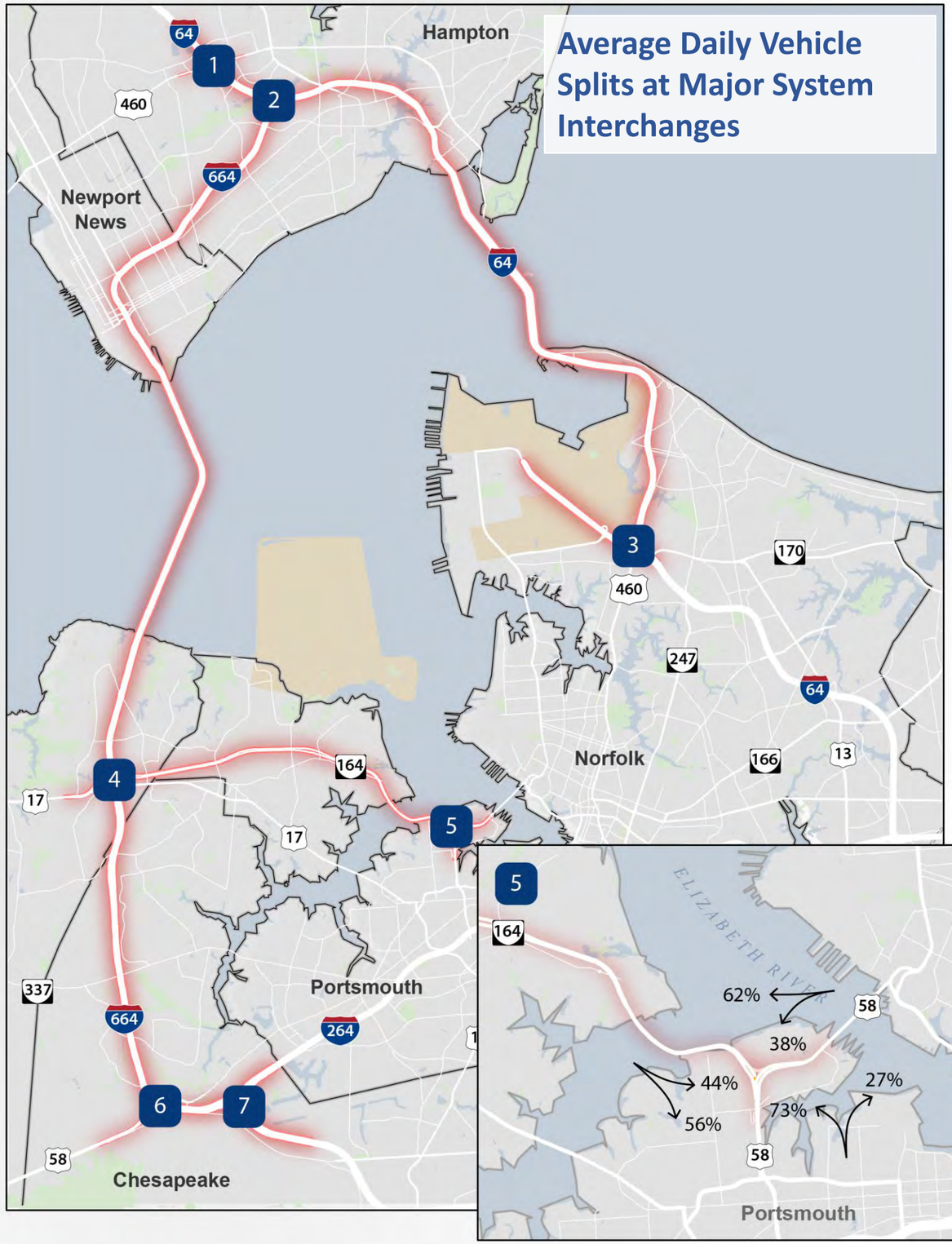
Destination

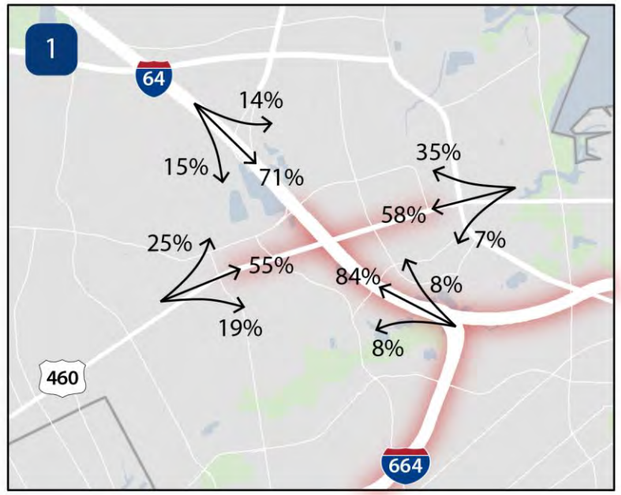
Percent Heavy Vehicles Entering Hampton Roads

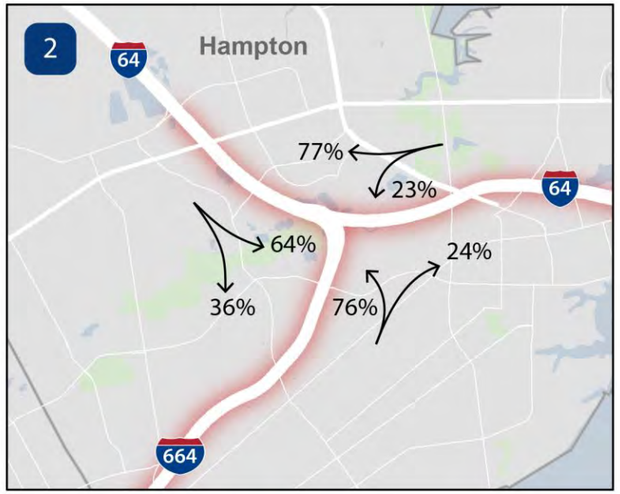
Percent Heavy Vehicles Crossing the Harbor

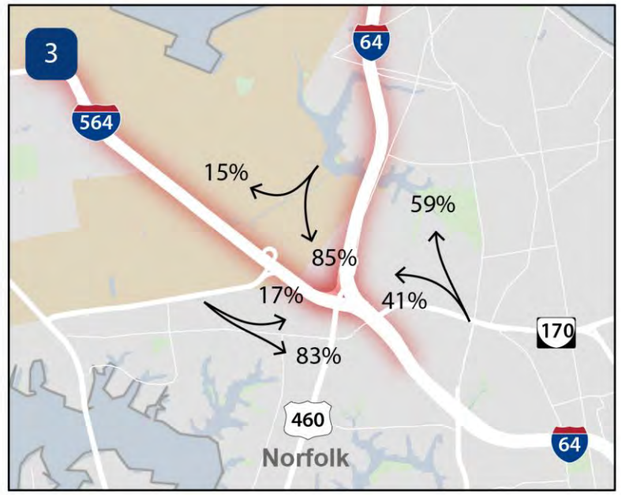
Streetlight Data, Aug. 2017- July 2018, Average Weekday (M-Th) by Zip Code

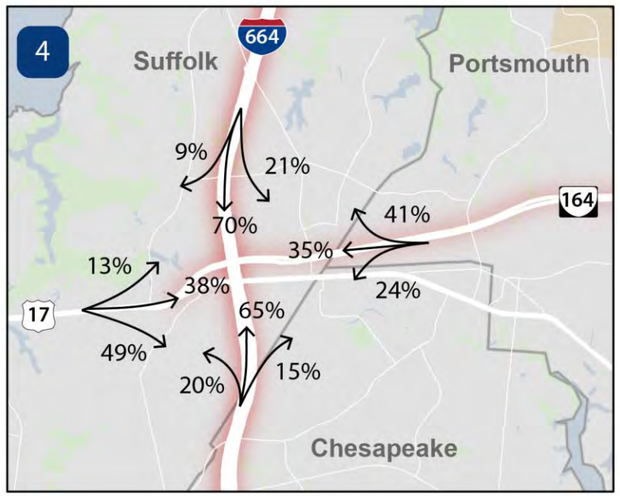
Average Daily Vehicle Splits at Major System Interchanges

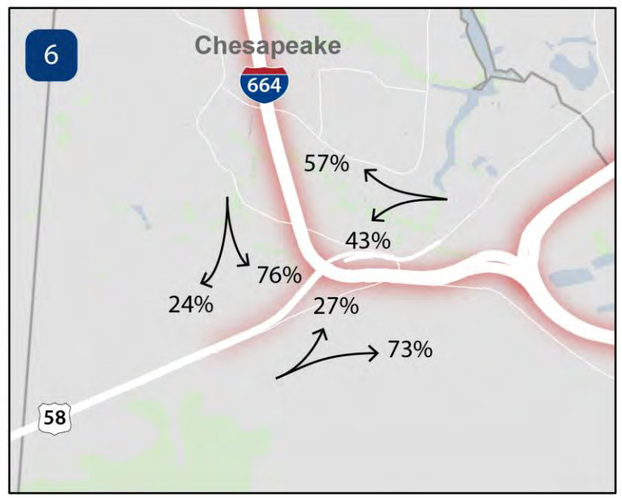


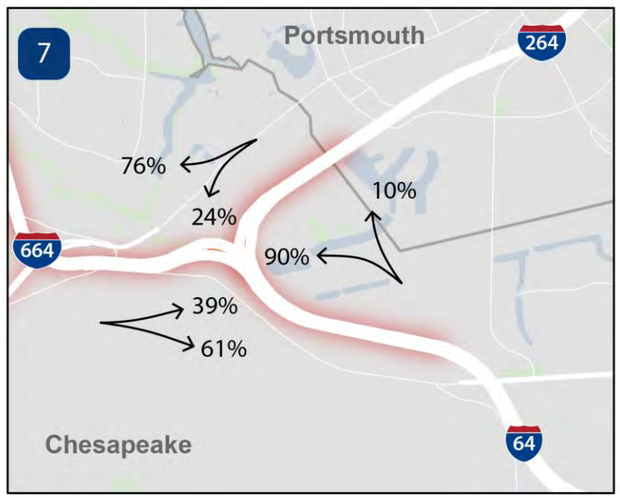




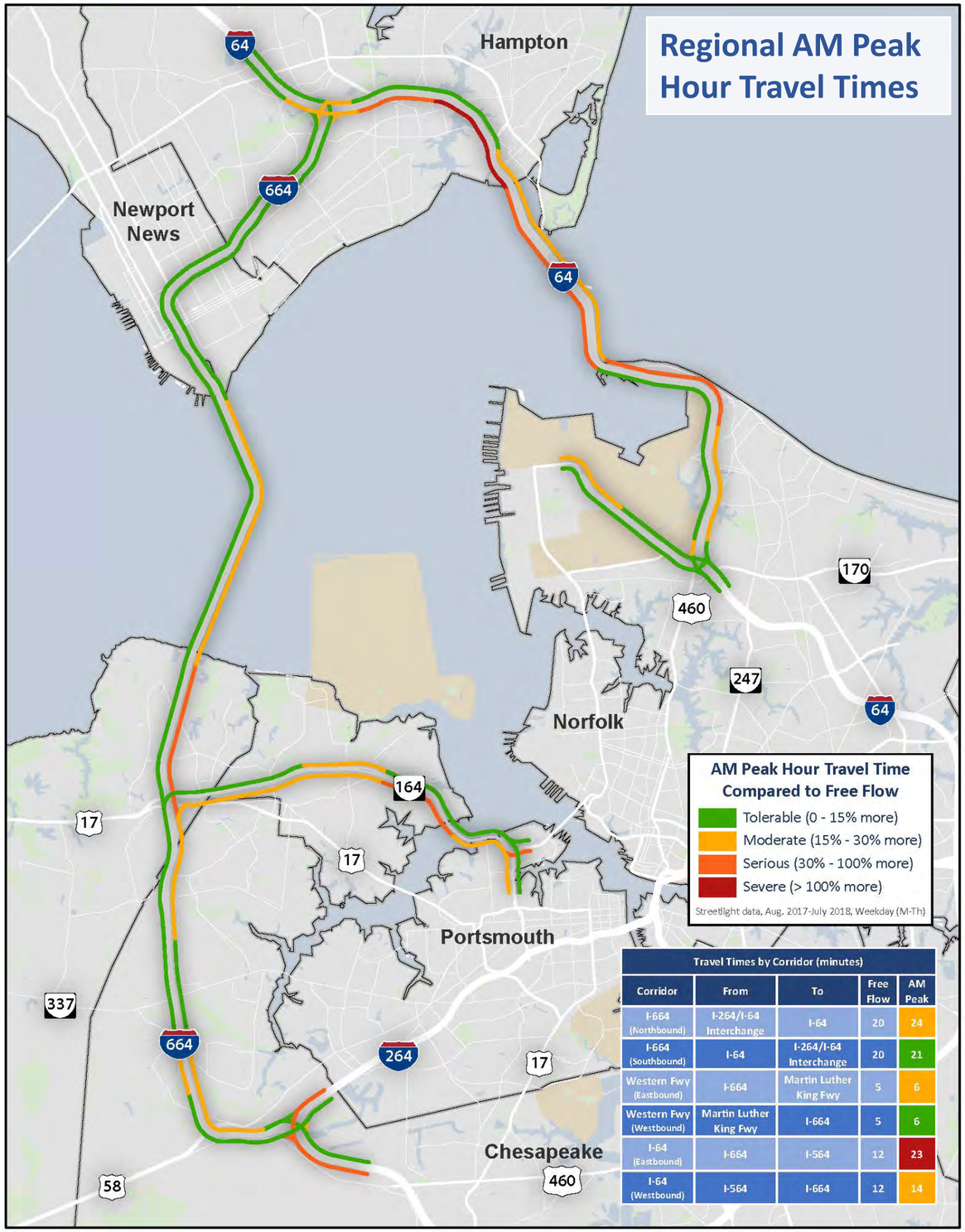








Regional AM Peak Hour Travel Times



AM Peak Hour Travel Time Compared to Free Flow

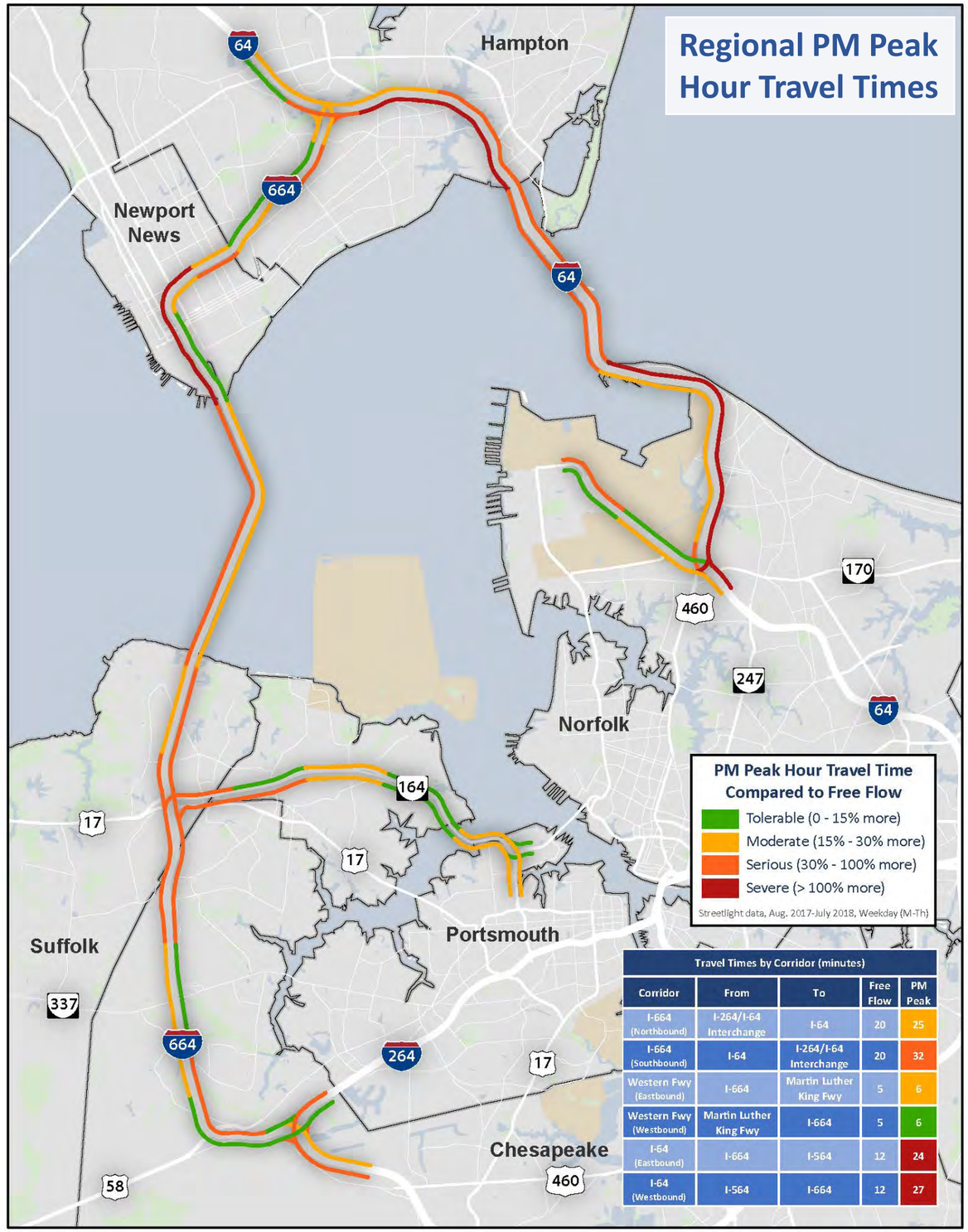
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Travel Times by Corridor (minutes)

Corridor	From	To	Free Flow	AM Peak
I-664 (Northbound)	I-264/I-64 Interchange	I-64	20	24
I-664 (Southbound)	I-64	I-264/I-64 Interchange	20	21
Western Fwy (Eastbound)	I-664	Martin Luther King Fwy	5	6
Western Fwy (Westbound)	Martin Luther King Fwy	I-664	5	6
I-64 (Eastbound)	I-664	I-564	12	23
I-64 (Westbound)	I-564	I-664	12	14

Regional PM Peak Hour Travel Times



PM Peak Hour Travel Time Compared to Free Flow

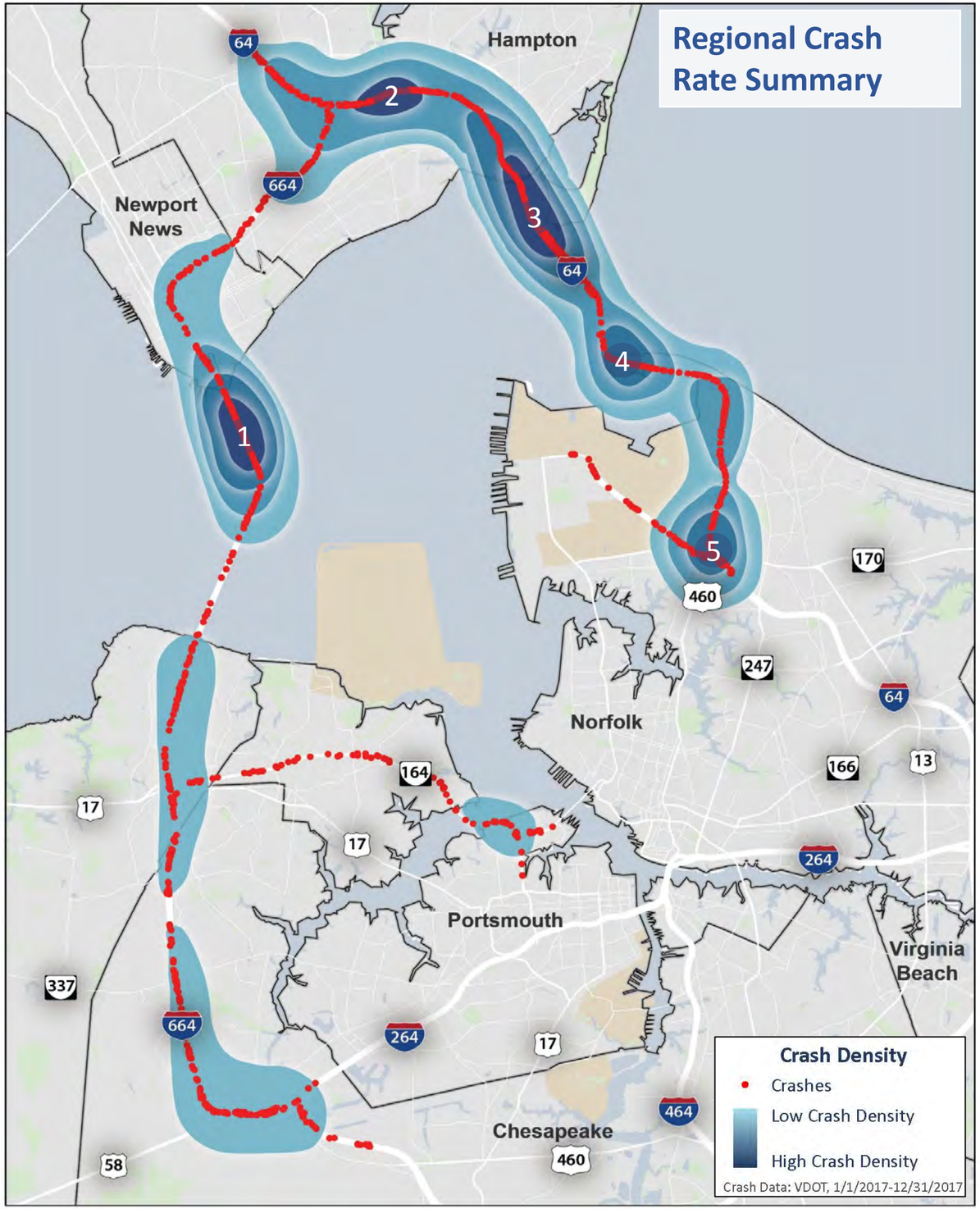
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Travel Times by Corridor (minutes)

Corridor	From	To	Free Flow	PM Peak
I-664 (Northbound)	I-264/I-64 Interchange	I-64	20	25
I-664 (Southbound)	I-64	I-264/I-64 Interchange	20	32
Western Fwy (Eastbound)	I-664	Martin Luther King Fwy	5	6
Western Fwy (Westbound)	Martin Luther King Fwy	I-664	5	6
I-64 (Eastbound)	I-664	I-564	12	24
I-64 (Westbound)	I-564	I-664	12	27

Regional Crash Rate Summary

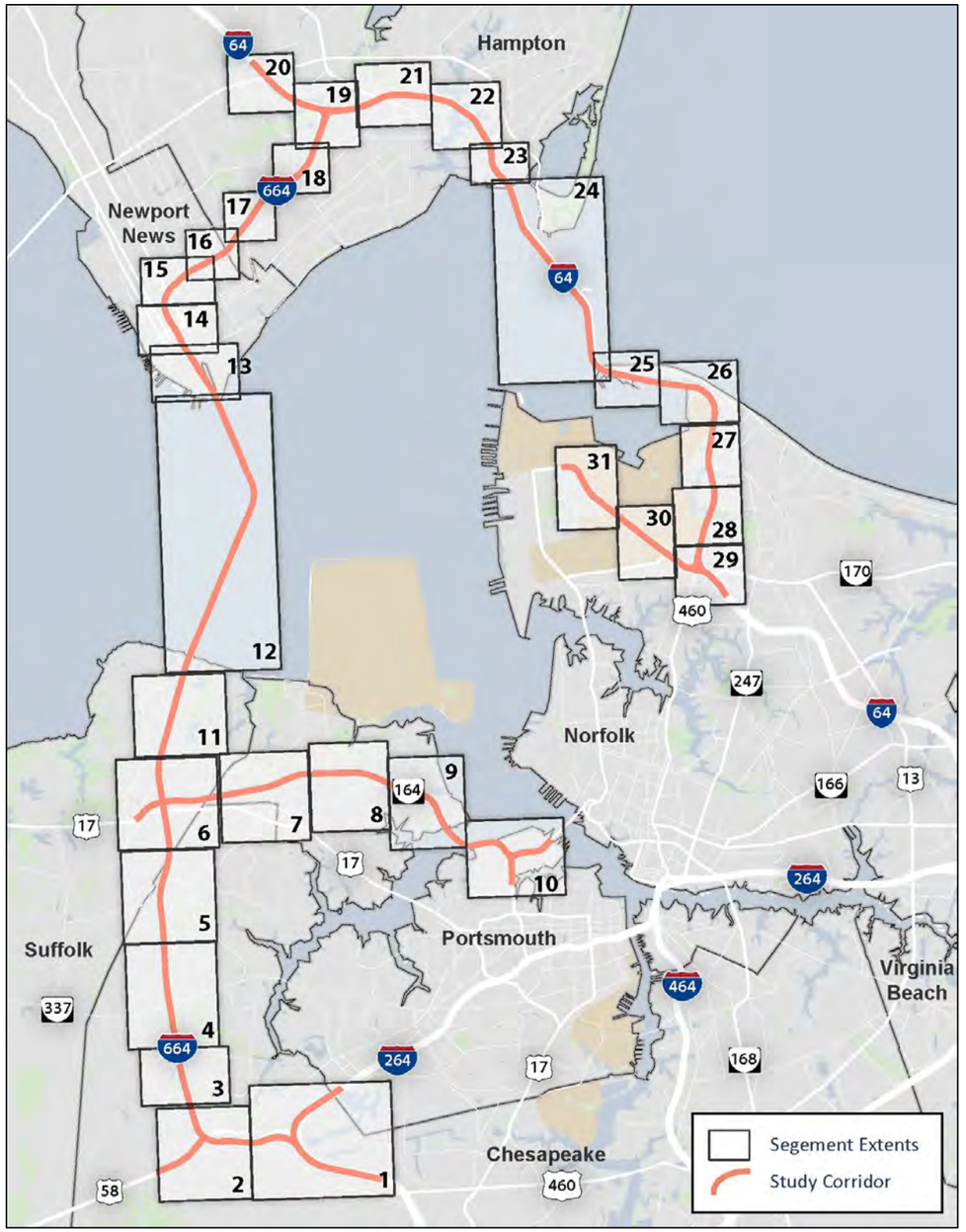


Zone	Crash Metric	I-64	
		Northbound	Southbound
1	Prevalent Time Period	12:00 - 3:00 PM	3:00 - 6:00 PM
	Predominant Crash Type	Rear End, 90%	Rear End, 87%
	Percent Injury Crashes	25%	24%
	Percent Fatal Crashes	0%	0%
2	Prevalent Time Period	3:00 - 6:00 PM	9:00 PM - 12:00 AM
	Predominant Crash Type	Fixed object/Angle, 41%	Fixed object/Angle, 70%
	Percent Injury Crashes	44%	33%
	Percent Fatal Crashes	0%	0%
3	Prevalent Time Period	3:00 - 6:00 PM	6:00 - 9:00 AM
	Predominant Crash Type	Rear End, 98%	Rear End, 87%
	Percent Injury Crashes	18%	12%
	Percent Fatal Crashes	0%	0%
4	Prevalent Time Period	6:00 - 9:00 AM	12:00 - 3:00 PM
	Predominant Crash Type	Fixed object/Angle, 89%	Rear End, 91%
	Percent Injury Crashes	0%	30%
	Percent Fatal Crashes	0%	0%
5	Prevalent Time Period	3:00 - 6:00 PM	3:00 - 6:00 PM
	Predominant Crash Type	Fixed object/Angle, 67%	Fixed object/Angle, 60%
	Percent Injury Crashes	33%	27%
	Percent Fatal Crashes	0%	0%

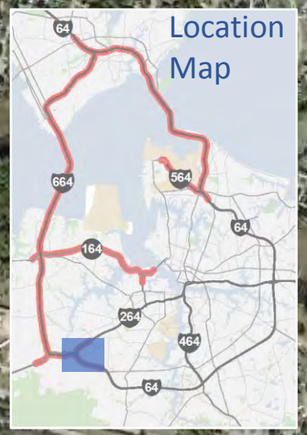
REGIONAL CONNECTORS STUDY

Section 3: Detailed Traffic Data Maps

Corridor Segment Index Map



Segment 1:
I-64/I-264/I-664 Interchange



N

3000 ft

B I-264 East

Moderate crash density at merge of ramp entering onto I-664 from I-264 due to roadway curvature. Also, due to weaving on I-664, as well as occasional queueing

C I-664 West

High localized crash rate at the exit ramp from I-664 onto I-64 – due to weaving between cars going straight onto I-264 and those turning right onto I-64.
High crash intensity is due to exceedingly short exit ramp to Military Highway

A I-64 South

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-64 South)	90,400	B	364	312	4,700
		C	3,077	3,109	42,200
B (I-264 East)	59,000	A	339	832	7,600
		C	1,349	2,470	24,200
C (I-664 West)	124,800	A	2,324	2,253	35,900
		B	3,332	959	22,500

Crash Rate	
Roadway	Crash Rate compared to State Average
I-64 WB to I-264 EB	-49.4%
I-64 WB to I-664 WB	-65.7%
I-264 WB to I-64 EB	-42.1%
I-264 WB to I-664 WB	-63.4%
I-664 EB to I-64 EB	-66.2%
I-664 EB to I-64 EB	-77.5%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

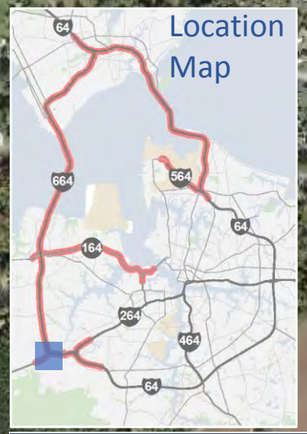
VDOT Data, Jan. 1 - Dec. 31, 2017

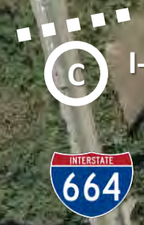
Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-64 South)	B	130	162	174
	C	117	126	142
B (I-264 East)	A	161	235	231
	C	83	83	93
C (I-664 West)	A	112	194	208
	B	78	82	83

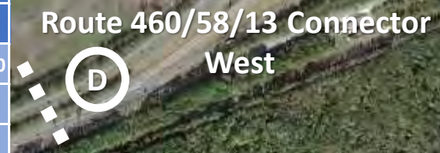
Segment 2 (sheet 1 of 2):
I-664 at Route 460/58/13 Connector





Crashes with injuries at the exit ramp from I-664 to Rt. 58, due to short ramp

Locally heavy crash rate due to short turn radius of ramp



Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	124,800	C	2,726	2,610	35,600
		D	1,511	2,598	27,400
		B	189	371	3,400
C (I-664 North)	95,700	A	3,221	1,749	31,500
		D	717	848	9,800
		B	213	289	2,100
		E	658	402	3,800
D (Route 460/58/13 Connector West)	79,000	A	2,283	1,392	25,500
		C	656	743	9,200
		B	292	299	3,200
		F	139	60	800
		E	75	68	800
F (Route 460/58/13 Connector ramps)	1,700	A	95	43	900
B (Route 460/58/13 Connector East)	15,200	C	268	284	3,700
		D	96	281	2,300
		A	57	28	500

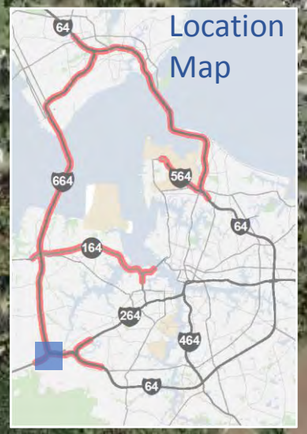
Crash Rate Compared to Statewide Average

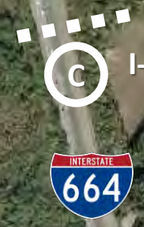
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

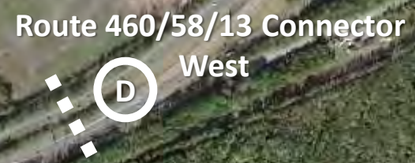
VDOT Data, Jan. 1 - Dec. 31, 2017

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	34.0%
I-664 Southbound	71.6%
Route 460/58/13 Connector Eastbound	-26.8%
Route 460/58/13 Connector Westbound	-73.4%

Segment 2 (sheet 2 of 2):
I-664 at Route 460/58/13 Connector

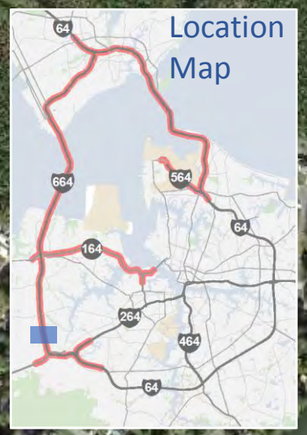






Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	C	93	107	140
	D	109	116	119
	B	44	62	58
C (I-664 North)	A	104	114	115
	D	94	98	108
	B	124	125	133
	E	122	151	153
D (Route 460/58/13 Connector West)	A	105	116	118
	C	115	138	150
	B	98	104	114
	F	71	71	73
	E	109	186	171
F (Route 460/58/13 Connector ramps)	A	63	82	111
B (Route 460/58/13 Connector East)	C	99	123	128
	D	99	121	116
	A	88	108	129

Segment 3:
I-664 at Dock Landing Road



I-664 North (C)

N

2000 ft

Dock Landing Rd West (D)

High crash rate in exit lane from I-664 to Dock Landing Rd. due to congestion during AM and PM commuting hours

Dock Landing Rd East (B)

I-664 South (A)

INTERSTATE 664

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	95,700	C	3,512	3,330	45,500
		D	84	116	1,200
		B	54	191	1,800
C (I-664 North)	94,600	A	4,085	3,076	43,200
		D	58	120	1,300
		B	31	105	1,100
D (Dock Landing Rd West)	7,400	A	311	82	1,700
		C	203	135	1,700
		B	56	73	700
B (Dock Landing Rd East)	8,500	A	413	130	2,300
		C	258	110	1,800
		D	35	65	800

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	-43.2%
I-664 Southbound	6.7%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

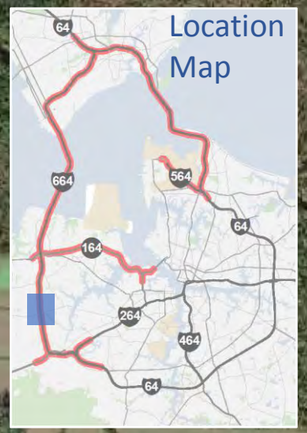
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	C	65	83	85
	D	78	128	117
	B	31	58	46
C (I-664 North)	A	67	78	83
	D	44	73	90
	B	74	116	153
D (Dock Landing Rd West)	A	86	94	131
	C	59	143	134
	B	115	154	171
B (Dock Landing Rd East)	A	61	90	77
	C	93	163	167
	D	139	217	172

Segment 4:
I-664 at Portsmouth Boulevard



Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	94,600	C	3,354	2,625	38,400
		D	223	262	2,700
		B	395	687	7,900
C (I-664 North)	92,200	A	3,457	2,687	36,500
		D	114	233	3,100
		B	145	399	4,900
D (Portsmouth Blvd West)	23,700	A	233	190	3,100
		C	378	193	3,300
		B	316	489	6,000
B (Portsmouth Blvd East)	36,300	A	485	424	6,000
		C	332	453	6,000
		D	148	528	5,500

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	-14.8%
I-664 Southbound	-54.5%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

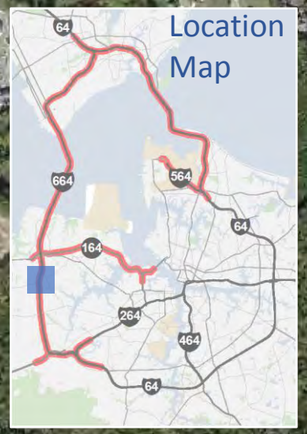
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	C	100	112	113
	D	130	130	135
	B	96	130	128
C (I-664 North)	A	100	108	125
	D	167	197	244
	B	151	195	229
D (Portsmouth Blvd West)	A	156	220	290
	C	67	91	104
	B	155	155	202
B (Portsmouth Blvd East)	A	137	170	194
	C	126	145	170
	D	147	170	194

Segment 5:
I-664 at Pughsville Road



Crashes evenly distributed around entrance and exit ramps on I-664

C I-664 North

INTERSTATE 664

Pughsville Rd East

B

Pughsville Rd West

D

A I-664 South

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	92,200	C	3,540	2,503	39,700
		D	91	249	2,100
		B	433	518	5,900
C (I-664 North)	89,700	A	2,596	2,736	35,500
		D	91	218	1,900
		B	130	493	4,300
D (Pughsville Rd West)	14,400	A	369	178	3,100
		C	160	113	1,800
		B	169	264	2,800
B (Pughsville Rd East)	28,100	A	752	405	5,900
		C	629	355	6,500
		D	150	267	2,700

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	C	107	138	148
	D	133	182	182
	B	125	147	164
C (I-664 North)	A	116	122	162
	D	92	116	145
	B	129	140	184
D (Pughsville Rd West)	A	109	109	142
	C	138	165	170
	B	134	137	162
B (Pughsville Rd East)	A	144	174	198
	C	96	106	129
	D	115	138	150

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	-37.4%
I-664 Southbound	-61.6%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

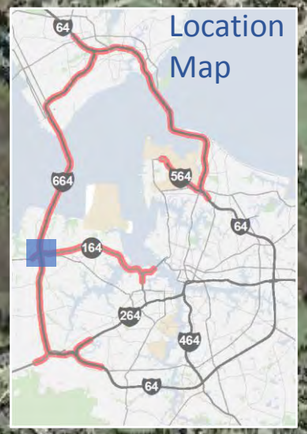
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Segment 6 (sheet 1 of 2):

I-664 at Bridge Road and Western Freeway



I-664 North

C

N

3000 ft

INTERSTATE 664

Higher than average crash rate on I-664 Northbound

Injury crashes at exit ramp from Bridge Road onto I-664 Southbound due to short ramp geometry

College Dr North

F

Western Fwy East

B

College Dr South

G

E

Bridge Rd East

Bridge Rd On-ramp to Western Fwy East

I

Bridge Rd West

H

Western Fwy/ Bridge Rd West

D

J

Bridge Rd On-ramp to I-664 South

I-664 South

A

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	53.4%
I-664 Southbound	-36.0%
Western Fwy Westbound	-43.7%
Bridge Rd Eastbound	-43.2%

Crash Rate Compared to Statewide Average

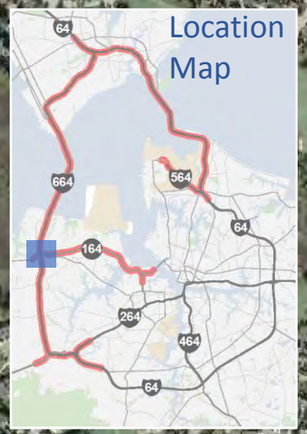
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	89,700	C	2,430	1,649	26,300
		B	526	329	5,900
		E	684	518	7,700
		D	689	474	8,100
C (I-664 North)	73,500	A	1,621	2,282	25,400
		B	593	705	7,600
		D	188	424	3,200
B (Western Fwy East)	54,500	A	444	336	5,200
		C	516	943	8,600
		D	484	825	7,400
		F	304	601	6,000
		G	118	167	1,800
D (Western Fwy/ Bridge Rd West)	40,100	A	481	587	6,900
		C	291	114	1,800
		B	514	354	5,400
		H	1,039	1,152	14,200
I (Bridge Rd On-ramp to Western Fwy East)	1,800	C	59	33	600
		B	90	92	1,200
J (Bridge Rd On-ramp to I-664 South)	11,100	A	752	830	11,100
F (College Dr North)	31,300	B	235	380	4,300
		G	572	971	10,800
G (College Dr South)	23,900	B	74	92	1,100
		F	552	819	10,200

Segment 6 (sheet 2 of 2):

I-664 at Bridge Road and Western Freeway



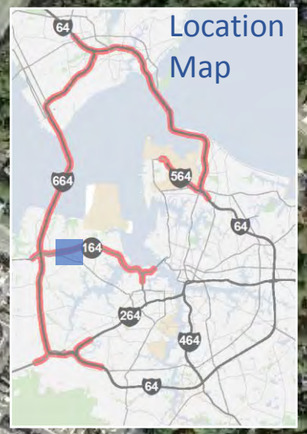
Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	C	87	114	121
	B	127	159	177
	E	80	80	94
	D	105	149	158
C (I-664 North)	A	84	90	115
	B	131	150	160
	D	102	172	161
B (Western Fwy East)	A	156	169	225
	C	114	134	133
	D	176	208	222
	F	109	109	124
	G	146	146	182
D (Western Fwy/ Bridge Rd West)	A	93	93	128
	C	132	150	224
	B	136	154	212
	H	29	37	47
I (Bridge Rd On-ramp to Western Fwy East)	C	115	133	221
	B	137	173	193
J (Bridge Rd On-ramp to I-664 South)	A	47	47	71
F (College Dr North)	B	58	83	134
	G	58	68	78
G (College Dr South)	B	122	138	255
	F	66	73	84

Peak Hour Travel Time Compared to Free Flow

- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Segment 7:
Western Freeway at Towne Point Road



N

2000 ft

Towne Point Rd North

C

High crash rate at ramp termini due to congestion at traffic signals during peak hours

Crashes evenly distributed along Western Freeway

B

Western Fwy East

D

Western Fwy West

Towne Point Rd South

A

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
D (Western Fwy West)	54,500	B	1,829	1,284	19,600
		A	151	380	3,400
		C	51	288	2,500
B (Western Fwy East)	53,400	D	1,127	2,280	20,700
		A	89	282	2,600
		C	88	329	2,900
A (Towne Point Rd South)	26,500	D	254	321	3,800
		B	497	186	3,500
		C	156	643	6,500
C (Towne Point Rd North)	27,200	D	486	271	4,500
		B	697	162	4,100
		A	478	527	6,700

Crash Rate	
Roadway	Crash Rate compared to State Average
Western Fwy Eastbound	36.4%
Western Fwy Westbound	-47.5%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

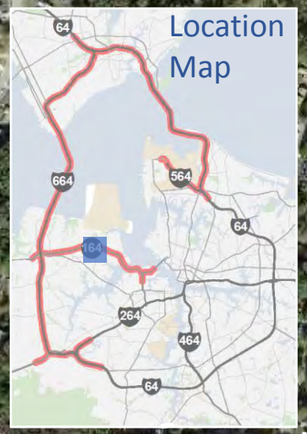
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
D (Western Fwy West)	B	77	97	106
	A	88	128	144
	C	107	175	164
B (Western Fwy East)	D	86	89	97
	A	124	142	160
	C	84	110	101
A (Towne Point Rd South)	D	133	161	174
	B	103	122	150
	C	88	110	116
C (Towne Point Rd North)	D	115	152	147
	B	107	130	156
	A	98	104	119

Segment 8:
Western Freeway at Cedar Lane



Cedar Ln North C

Coast Guard Blvd North E

Western Fwy East B

Cedar Ln South A

Low crash rate overall, some crashes happened around curved area on Western Freeway

Average Travel Time (seconds)

Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
D (Western Fwy West)	B	97	123	114
	A	72	115	99
	C	115	191	172
	E	88	114	103
B (Western Fwy East)	D	92	107	109
	A	74	161	112
	C	92	122	109
	E	38	75	53
A (Cedar Ln South)	D	88	129	117
	B	74	101	106
	C	59	70	79
	E	24	44	85
C (Cedar Ln North)	D	127	176	175
	B	92	148	137
	A	60	75	76
	E	23	49	48
E (Coast Guard Blvd North)	D	86	94	99
	B	47	69	89
	A	35	80	50
	C	20	54	35

Peak Hour Travel Time Compared to Free Flow

- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Traffic Volumes
Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
D (Western Fwy West)	53,400	B	2,033	594	22,000
		A	542	779	3,400
		C	245	230	1,300
		E	201	25	500
B (Western Fwy East)	52,300	D	1,166	2,821	20,900
		A	41	137	1,900
		C	132	82	2,100
		E	44	14	600
A (Cedar Ln South)	16,100	D	93	49	3,100
		B	535	478	2,100
		C	312	217	2,800
		E	77	8	400
C (Cedar Ln North)	12,200	D	33	24	1,500
		B	429	394	2,100
		A	186	144	2,200
		E	16	6	100
E (Coast Guard Blvd North)	3,200	D	14	23	700
		B	57	143	600
		A	7	23	200
		C	3	13	100

Crash Rate Compared to Statewide Average

- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

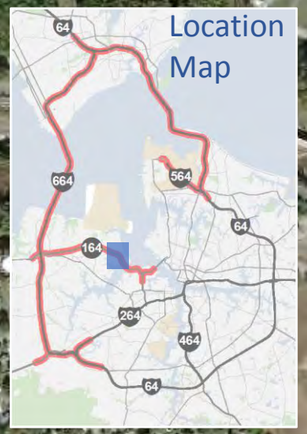
VDOT Data, Jan. 1 - Dec. 31, 2017

Crash Rate

Roadway	Crash Rate compared to State Average
Western Fwy Eastbound	-31.8%
Western Fwy Westbound	-23.3%

Segment 9:

Western Freeway at Virginia International Gateway Boulevard and West Norfolk Road



N

3000 ft

C Western Fwy West

B Virginia International Gateway Blvd North

E W Norfolk Rd West

D W Norfolk Rd East

A Western Fwy South

Crashes around entrance and exit ramps to West Norfolk Road due to ramp geometry and speed differentials between ramp and mainline vehicles

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (Western Fwy West)	C	117	156	130
	B	36	46	44
	E	117	142	117
	D	122	163	144
C (Western Fwy South)	A	125	137	131
	B	142	185	142
	E	89	110	127
	D	91	154	181
B (Virginia Int'l Gateway Blvd North)	A	39	39	43
	C	167	175	171
E (W Norfolk Rd West)	A	112	117	133
	C	96	107	116
	D	80	80	89
D (W Norfolk Rd East)	A	150	240	175
	C	110	141	138
	E	90	161	96

Peak Hour Travel Time Compared to Free Flow

- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (Western Fwy West)	52,300	C	2,989	1,544	25,800
		B	25	12	300
		E	21	46	500
		D	19	8	200
C (Western Fwy South)	57,000	A	1,284	2,887	23,800
		B	99	48	1,100
		E	74	148	1,600
		D	13	7	200
B (Virginia Int'l Gateway Blvd North)	2,900	A	14	39	400
		C	74	87	1,100
E (W Norfolk Rd West)	6,300	A	76	96	1,000
		C	506	159	3,000
		D	11	5	100
D (W Norfolk Rd East)	1,300	A	8	33	300
		C	26	22	400
		E	5	11	100

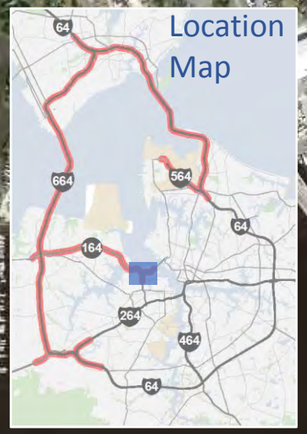
Crash Rate Compared to Statewide Average

- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

Crash Rate	
Roadway	Crash Rate compared to State Average
Western Fwy Eastbound	32.7%
Western Fwy Northbound	-20.4%

Segment 10:
Western Freeway at Martin Luther King Freeway



N

3000 ft

Cluster of crashes on curved portion of 164/Western Freeway at exit to Midtown Tunnel

C Western Fwy West

B Martin Luther King Fwy East

D Railroad Ave On-Ramp South

E Western/MLK Fwy EB Off-ramp to Cleveland

F MLK Fwy NB Off-ramp to Railroad

A Martin Luther King Fwy South

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
C (Western Fwy West)	57,000	B	1,576	657	11,300
		A	1,553	888	14,400
		E	466	267	4,600
B (Martin Luther King Fwy East)	32,500	C	263	833	6,500
		A	231	436	3,900
		E	88	156	1,900
A (Martin Luther King Fwy South)	43,200	C	977	1,940	16,700
		B	802	423	6,300
		F	157	120	1,900
D (Railroad Ave On-ramps South)	6,100	C	231	318	3,500
		B	343	129	2,600

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
C (Western Fwy West)	B	113	171	128
	A	124	153	148
	E	142	176	168
B (Martin Luther King Fwy East)	C	128	144	137
	A	88	107	103
	E	64	98	74
A (Martin Luther King Fwy South)	C	130	137	158
	B	105	125	114
	F	34	86	84
D (Railroad Ave On-ramps South)	C	165	212	208
	B	42	66	57

Crash Rate	
Roadway	Crash Rate compared to State Average
Western Fwy EB to Midtown Tunnel EB	41.2%
Western Fwy EB to MLK Fwy SB	-65.2%
Midtown Tunnel SB to Western Fwy WB	-61.5%
Midtown Tunnel SB to MLK Fwy SB	-100.0%
MLK Fwy NB to Western Fwy WB	-35.4%
MLK Fwy NB to Midtown Tunnel EB	41.2%

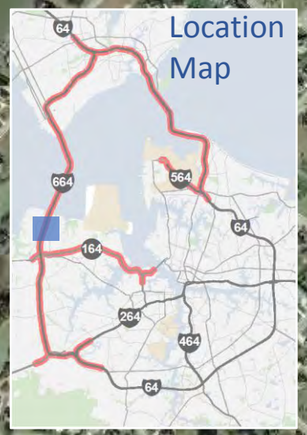
Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Segment 11:
I-664 at College Drive



I-664 North

C

INTERSTATE 664

College Dr West

D

I-664 NB has a significantly higher crash rate than SB, with fatal crashes around exit/entrance ramps

College Dr East

B

I-664 South

A

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	73,500	C	2,647	2,284	30,500
		B	479	342	4,900
		D	169	113	1,900
C (I-664 North)	70,600	A	2,158	2,367	29,100
		B	581	238	4,200
		D	143	69	1,000
B (College Dr East)	21,100	A	138	747	4,400
		C	594	363	4,800
		D	98	110	1,400
D (College Dr West)	9,400	A	107	296	2,700
		C	120	57	1,000
		B	67	111	1,400

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	53.1%
I-664 Southbound	-36.9%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

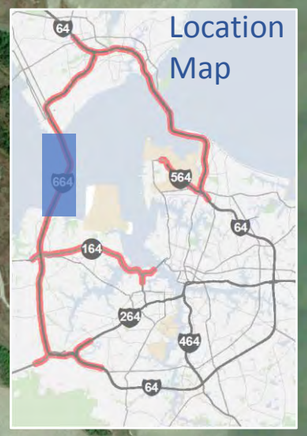
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	C	90	123	121
	B	88	100	119
	D	124	152	154
C (I-664 North)	A	85	88	101
	B	102	121	146
	D	80	80	82
B (College Dr East)	A	110	118	142
	C	103	138	159
	D	159	159	166
D (College Dr West)	A	125	159	185
	C	92	129	209
	B	114	169	215

Segment 12:
I-664 Monitor-Merrimac Memorial Bridge Tunnel



N

1 mi

I-664 North

B

Entrance/exit has several ambulatory injury probably caused by sudden change in lighting condition and congestion

Entrance/exit has several ambulatory injury probably caused by sudden change in lighting condition and congestion

High overall crash rate on bridge, including fatalities with greatest concentration at northern curved portion

Bridge entrance/exit has several ambulatory injury crashes probably caused by change in speed and context

I-664 South

A

INTERSTATE 664

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	70,600	B	3,362	2,704	36,300
B (I-664 North)	70,600	A	2,882	2,674	34,300

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	129.5%
I-664 Southbound	51.5%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

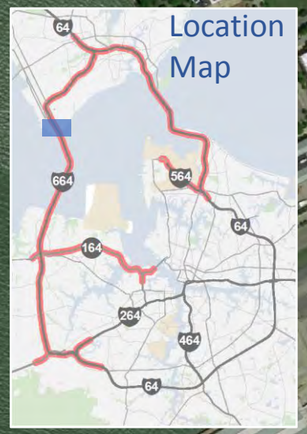
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	B	283	361	353
B (I-664 North)	A	270	284	359

Segment 13:
I-664 at Terminal Avenue and Harbor Road



I-664 North

C

INTERSTATE 664

Terminal Ave/Harbor Rd North

B

Terminal Ave/Harbor Rd South

D

Terminal Ave On-ramp to I-664 East (South)

E

I-664 South

A

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	70,600	C	3,273	2,620	35,200
		B	89	84	1,100
C (I-664 North)	69,300	A	2,818	2,064	32,400
		E	125	59	1,200
B (Terminal Ave/Harbor Rd North)	1,600	C	52	127	500
D (Terminal Ave/Harbor Rd South)	1,900	A	64	610	1,900

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	108.2%
I-664 Southbound	65.0%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

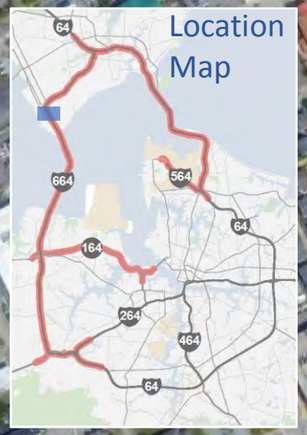
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	C	59	65	63
	B	59	79	79
C (I-664 North)	A	58	64	260
	E	34	64	164
B (Terminal Ave/Harbor Rd North)	C	31	41	43
D (Terminal Ave/Harbor Rd South)	A	20	26	56

Segment 14:
I-664 at 25th, 26th, 28th Streets



Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	69,300	C	2,887	2,627	33,200
		H	299	26	1,300
		B	138	94	1,200
C (I-664 North)	72,000	A	2,740	1,413	29,200
		H	512	224	3,100
		I	115	351	1,900
G (25th St West)	6,800	A	75	514	2,600
		C	34	458	2,600
		B	50	300	1,600
D (26th St East)	5,200	A	129	196	1,800
		C	114	160	2,000
		H	130	68	1,400
E (28th St West)	3,300	I	57	307	1,800
F (28th St East)	1,500	E	194	123	1,500

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	C	44	47	46
	H	73	116	166
	B	47	76	68
C (I-664 North)	A	45	48	251
	H	35	82	64
	I	28	55	80
G (25th St West)	A	40	58	132
	C	77	98	92
	B	82	164	111
D (26th St East)	A	70	85	122
	C	44	57	53
	H	122	167	150
E (28th St West)	I	98	142	135
F (28th St East)	E	111	145	124

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

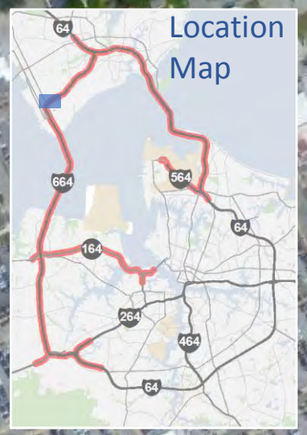
Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	59.0%
I-664 Southbound	-50.9%

Segment 15:
I-664 at 34th, 35th, 36th and Jefferson Avenue



N

1000 ft

I-664 North

C

INTERSTATE 664

Jefferson Ave West

D

Crashes evenly distributed along I-664

36th St Off-ramp

B

35th St off-ramp

F

Crashes along the entrance ramp from 34th and 35th street due to tight curvature of the ramp

34th and 35th West

E

I-664 South

A

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	72,000	C	2,120	2,641	29,000
		B	442	439	4,800
		E	474	165	4,000
C (I-664 North)	69,800	A	2,796	1,600	27,800
		E	1,040	209	6,200
E (34th/35th St West)	23,800	A	239	253	3,000
		C	189	1,430	6,800
		F	90	336	2,200
D (Jefferson Ave West)	5,000	A	332	136	3,400
		E	195	86	1,600

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	88.7%
I-664 Southbound	-14.1%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

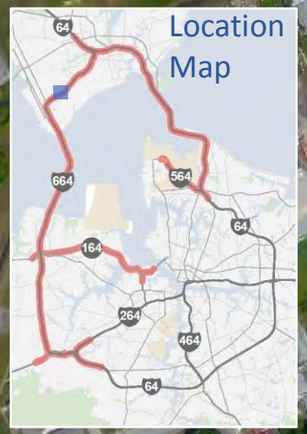
VDOT Data, Jan. 1 - Dec. 31, 2017

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	C	55	58	69
	B	24	25	33
	E	26	28	27
C (I-664 North)	A	57	65	128
	E	101	112	105
E (34th/35th St West)	A	12	17	39
	C	107	109	109
	F	62	79	70
D (Jefferson Ave West)	A	29	32	68
	E	67	67	110

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Segment 16:
I-664 at Roanoke and Chestnut Avenue



Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	69,800	C	2,192	3,909	34,100
		B	59	72	800
		D	54	85	800
C (I-664 North)	79,300	A	3,696	1,741	32,600
		E	364	286	4,100
		F	407	128	2,800
B (Roanoke Ave South)	3,400	D	59	94	1,000
		A	28	23	500
D (Roanoke Ave North)	3,800	A	91	40	700
		B	39	75	1,000
E (Chestnut Ave South)	12,600	C	196	454	3,900
		F	123	186	2,300
F (Chestnut Ave North)	8,900	C	70	211	1,600
		E	113	200	2,200

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	-72.1%
I-664 Southbound	-14.1%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

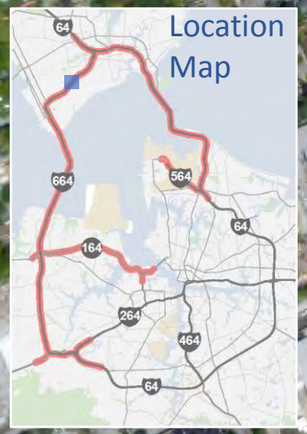
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	C	43	45	56
	B	19	21	36
	D	38	55	53
C (I-664 North)	A	50	52	60
	E	36	53	59
	F	40	50	46
B (Roanoke Ave South)	D	28	33	28
	A	18	32	55
D (Roanoke Ave North)	A	30	31	43
	B	17	34	46
E (Chestnut Ave South)	C	38	40	42
	F	21	22	26
F (Chestnut Ave North)	C	60	71	122
	E	17	24	30

Segment 17:
I-664 at Aberdeen Road



I-664 Northeast

C

INTERSTATE 664

Aberdeen Rd North

D

High crash rate at the entrance/exit on Aberdeen Road possibly due to ramp intersection geometry

Aberdeen Rd South

B

I-664 Southwest

A

Peak Hour Travel Time Compared to Free Flow

- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Crash Rate Compared to Statewide Average

- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

Average Travel Time (seconds)

Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 Southwest)	C	81	87	105
	B	32	47	76
	D	75	79	97
C (I-664 Northeast)	A	88	88	96
	B	114	145	152
	D	119	119	140
B (Aberden Rd South)	A	24	57	76
	C	104	138	146
	D	53	61	59
D (Aberden Rd North)	A	63	63	92
	C	154	164	157
	B	34	61	57

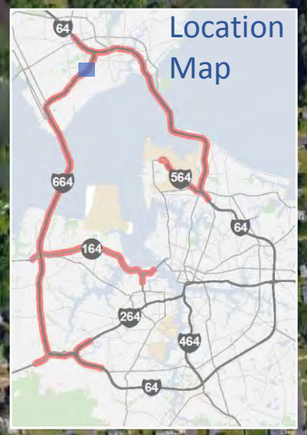
Crash Rate

Roadway	Crash Rate compared to State Average
I-664 Northbound	-0.1%
I-664 Southbound	-9.6%

Traffic Volumes
Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 Southwest)	79,300	C	2,282	4,156	36,200
		B	43	138	900
		D	148	302	2,700
C (I-664 Northeast)	81,700	A	3,947	1,873	34,800
		B	95	138	1,900
		D	353	176	3,300
B (Aberden Rd South)	16,400	A	116	46	1,000
		C	229	229	2,700
		D	288	430	4,900
D (Aberden Rd North)	22,400	A	405	236	3,700
		C	187	248	2,800
		B	208	458	5,000

Segment 18:
I-664 at Powhatan and Power Plant Parkway



N

1000 ft

I-664 North

C

Power Plant Pkwy West

D

INTERSTATE 664

High crash rate at entrance ramp from Power Plant Pkwy to I-664 potentially due to poor sightline (blocked by vegetation)

Powhatan Pkwy East

B

I-664 South

A

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 Southwest)	81,700	C	2,569	3,987	37,500
		B	57	264	1,800
		D	72	382	2,400
C (I-664 Northeast)	83,900	A	3,972	1,899	35,800
		B	275	378	4,700
		D	62	90	1,000
B (Powhatan Pkwy East)	20,800	A	116	84	1,300
		C	378	311	4,400
		D	246	351	4,300
D (Power Plant Pkwy West)	15,400	A	307	204	2,900
		C	34	37	500
		B	113	367	4,300

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 Northbound	8.1%
I-664 Southbound	-47.9%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

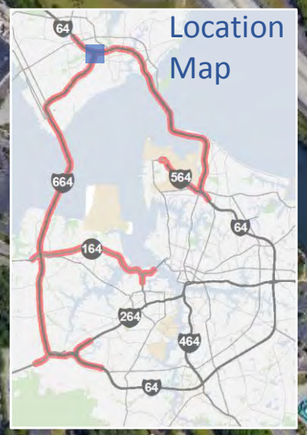
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 Southwest)	C	70	74	93
	B	46	57	58
	D	45	68	68
C (I-664 Northeast)	A	71	73	78
	B	82	96	117
	D	39	96	89
B (Powhatan Pkwy East)	A	69	78	96
	C	85	89	114
	D	51	64	63
D (Power Plant Pkwy West)	A	52	52	78
	C	74	101	116
	B	53	56	56

Segment 19:
I-64/I-664 Interchange



Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-664 South)	83,900	B	599	1,040	10,300
		C	2,381	3,296	32,100
B (I-64 East)	116,700	A	1,453	728	13,300
		C	3,255	3,052	43,900
C (I-64 West)	153,400	A	2,857	1,640	28,200
		B	3,335	2,853	49,200

N

2000 ft

I-64 West

C

INTERSTATE 64

Crashes at each entrance/exit ramp potentially due to congestion

I-64 East

B

INTERSTATE 64

INTERSTATE 664

I-664 South

A

Crash Rate	
Roadway	Crash Rate compared to State Average
I-664 NB to I-64 EB	-40.8%
I-664 NB to I-64 WB	-11.5%
I-64 WB to I-664 SB	-11.2%
I-64 WB to I-64 WB	-6.9%
I-64 EB to I-664 SB	-59.3%
I-64 EB to I-64 EB	-28.9%

Crash Rate Compared to Statewide Average

- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

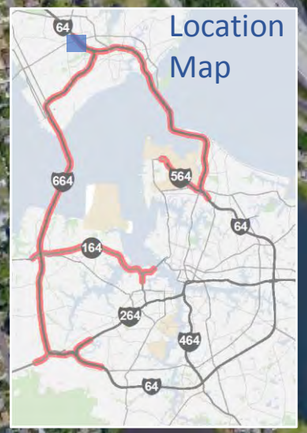
Peak Hour Travel Time Compared to Free Flow

- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-664 South)	B	63	77	85
	C	80	87	93
B (I-64 East)	A	63	80	80
	C	72	81	90
C (I-64 West)	A	73	78	90
	B	73	91	103

Segment 20:
I-64 at West Mercury Boulevard



N

2000 ft

I-64 West

D

INTERSTATE 64

Higher than normal crash rate evenly distributed along I-64

W Mercury Blvd East

C

Several crashes at exit onto Mercury Blvd, potentially due to short exit ramp

W Mercury Blvd West

A

I-64 East

B

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
B (I-64 East)	153,400	D	4,984	5,284	63,800
		A	289	515	6,000
		C	363	549	6,200
D (I-64 West)	180,400	B	5,662	3,976	67,600
		A	886	1,239	14,000
		C	870	1,260	13,500
A (W Mercury Blvd West)	77,400	B	415	362	7,200
		D	818	825	9,500
		C	1,117	1,906	20,800
C (W Mercury Blvd East)	75,000	B	115	155	2,600
		D	983	882	12,000
		A	902	1,735	19,900

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
B (I-64 East)	D	64	69	77
	A	67	100	125
	C	59	64	87
D (I-64 West)	B	67	71	76
	A	66	70	106
	C	90	93	127
A (W Mercury Blvd West)	B	65	80	104
	D	92	98	122
	C	77	77	120
C (W Mercury Blvd East)	B	97	102	108
	D	85	93	135
	A	68	77	114

Crash Rate	
Roadway	Crash Rate compared to State Average
I-64 Westbound	20.1%
I-64 Eastbound	7.3%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

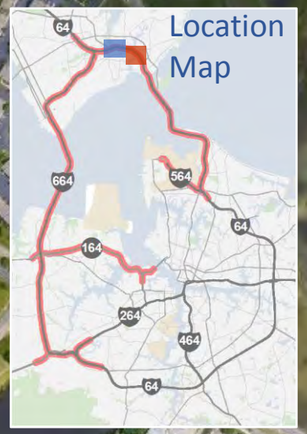
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Segment 21 (sheet 1 of 2):

I-64 at LaSalle Avenue, North Armistead Avenue and Rip Rap Road



N

2000 ft

Higher than normal crash rate evenly distributed along I-64

High crash rate due to queues from HRBT

LaSalle Ave North (A)

N Armistead Ave Northwest (E)

Rip Rap Rd North (H)

I-64 East (B)

N Armistead Ave Southeast (F)

Rip Rap Rd South (G)

I-64 West (D)

LaSalle Ave South (C)

Crash Rate	
Roadway	Crash Rate compared to State Average
I-64 Eastbound	176.2%
I-64 Westbound	-34.9%

Crash Rate Compared to Statewide Average

- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

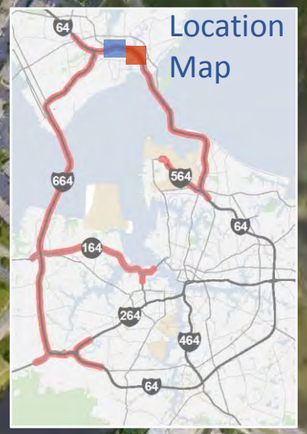
VDOT Data, Jan. 1 - Dec. 31, 2017

Traffic Volumes
Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
D (I-64 West)	116,700	B	2,063	1,908	38,400
		C	842	694	8,700
		G	474	276	3,600
		H	556	1,014	8,800
B (I-64 East)	99,400	D	3,815	3,009	46,800
		C	167	135	2,000
		A	76	50	1,000
		E	299	390	5,400
		F	31	36	500
C (LaSalle Ave South)	26,400	D	207	180	2,800
		B	68	84	1,500
		A	194	185	2,000
		E	200	317	4,100
		F	26	51	500
A (LaSalle Ave North)	11,100	D	317	159	2,500
		B	23	70	1,800
		C	77	147	1,300
		E	31	67	700
		F	13	29	300
E (N Armistead Ave Northwest)	25,800	D	100	85	1,300
		B	65	63	1,400
		C	86	279	2,900
		A	24	51	600
		F	340	351	4,400
F (N Armistead Ave Southeast)	15,400	D	245	301	3,600
		B	16	23	200
		C	13	28	300
		A	48	37	500
		E	196	420	4,800
G (Rip Rap Rd South)	9,300	H	106	240	2,200
H (Rip Rap Rd North)	14,500	G	242	208	3,500

Segment 21 (sheet 2 of 2):

I-64 at LaSalle Avenue, North Armistead Avenue and Rip Rap Road



N

2000 ft

LaSalle Ave North
A

N Armistead Ave Northwest
E

Rip Rap Rd North
H

INTERSTATE 64

I-64 East
B

N Armistead Ave Southeast
F

G

Rip Rap Rd South

I-64 West
D

LaSalle Ave South
C

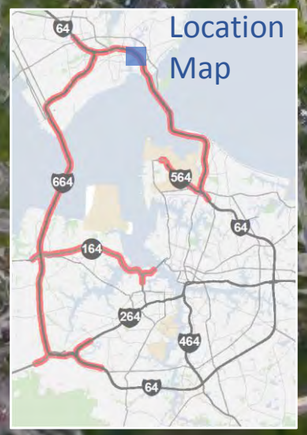
Peak Hour Travel Time Compared to Free Flow

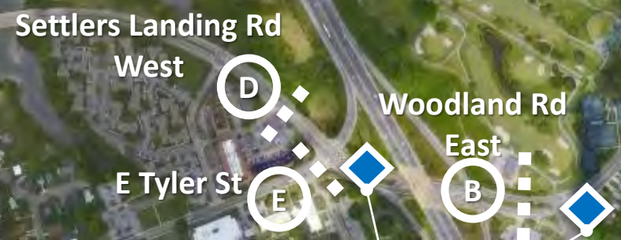
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
D (I-64 West)	B	80	150	200
	C	46	49	81
	G	78	95	157
	H	77	90	124
B (I-64 East)	D	81	92	96
	C	68	125	146
	A	81	95	153
	E	91	118	149
	F	58	114	205
C (LaSalle Ave South)	D	64	84	105
	B	77	188	236
	A	68	73	101
	E	76	107	119
	F	34	109	117
A (LaSalle Ave North)	D	59	78	97
	B	123	229	244
	C	45	81	84
	E	44	64	49
	F	29	49	91
E (N Armistead Ave Northwest)	D	29	72	130
	B	93	197	234
	C	74	81	103
	A	25	34	90
	F	46	49	74
F (N Armistead Ave Southeast)	D	57	71	102
	B	46	183	405
	C	55	125	132
	A	58	68	87
	E	49	64	61
G (Rip Rap Rd South)	H	13	17	20
H (Rip Rap Rd North)	G	13	16	21

Segment 22:
I-64 at Settlers Landing and Woodland Road





High crash rate at entrance/exit ramp of Settlers Landing Rd and I-64 possibly due to ramp geometry

Average Travel Time (seconds)

Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
C (I-64 West)	A	92	478	422
	D	133	388	480
	B	137	305	257
	E	119	319	330
A (I-64 South)	C	82	91	110
	D	39	62	74
	B	25	27	35
	E	42	109	125
D (Settlers Landing Rd West)	C	155	289	246
	A	40	136	137
	B	31	50	53
	E	4	13	16
B (Woodland Rd East)	C	102	114	138
	A	27	131	161
	D	39	48	52
	E	33	77	85
E (E Tyler St)	C	151	229	198
	A	57	136	150
	D	5	7	15
	B	25	94	68

Peak Hour Travel Time Compared to Free Flow

- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Traffic Volumes
Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
C (I-64 West)	99,400	A	1,792	1,674	35,700
		D	44	47	800
		B	188	319	4,900
		E	229	142	2,100
A (I-64 South)	93,600	C	3,029	2,717	43,900
		D	139	131	2,000
		B	113	311	3,000
		E	40	24	400
D (Settlers Landing Rd West)	15,700	C	37	90	1,000
		A	491	335	4,100
		B	282	302	3,300
		E	341	199	2,100
B (Woodland Rd East)	26,100	C	1,243	528	9,000
		A	396	192	3,500
		D	41	77	1,000
		E	67	26	400
E (E Tyler St)	10,400	C	91	292	2,000
		A	118	107	1,000
		D	41	178	1,400
		B	34	112	1,000

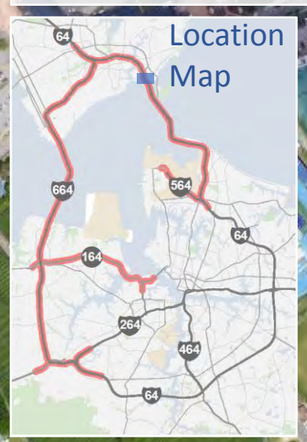
Crash Rate Compared to Statewide Average

- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

Crash Rate	
Roadway	Crash Rate compared to State Average
I-64 Westbound	-64.1%
I-64 Eastbound	157.0%

Segment 23:
I-64 at South Mallory Street



Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
C (I-64 North)	A	55	156	165
	D	45	134	141
	B	43	123	96
	E	55	106	110
A (I-64 South)	C	44	51	61
	D	91	98	153
	B	53	74	74
	E	26	44	70
D (S Mallory Street West)	C	82	150	109
	A	48	114	137
	B	26	131	72
	E	53	79	80
B (S Mallory Street East)	C	53	58	69
	A	52	132	178
	D	70	70	121
	E	53	79	80
E (Segar St South)	C	25	60	36
	A	54	156	218
	D	93	99	94
	B	2	7	15

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

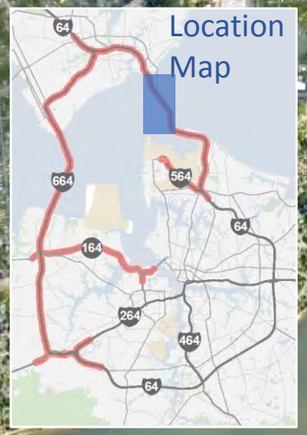
Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
C (I-64 North)	93,600	A	2,463	2,209	41,100
		D	184	38	1,000
		B	119	34	1,800
		E	32	28	400
A (I-64 South)	90,600	C	2,628	2,564	40,600
		D	3	7	100
		B	193	233	3,200
		E	53	45	600
D (S Mallory Street West)	8,300	C	503	231	4,900
		A	48	454	1,000
		B	6	42	400
		E	2	10	100
B (S Mallory Street East)	13,100	C	214	154	3,100
		A	615	324	3,500
		D	107	26	700
		E	4	21	100
E (Segar St South)	2,700	C	52	41	700
		A	80	55	500
		D	17	7	100
		B	17	23	300

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

Crash Rate	
Roadway	Crash Rate compared to State Average
I-64 Southbound	512.4%
I-64 Northbound	19.3%

Segment 24:
I-64 Hampton Roads Bridge Tunnel



N

1 mi

B

I-64 North

High overall crash rate in tunnel area with injury crashes concentrated at center of tunnel in southbound lanes – likely due to congestion

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
B (I-64 North)	90,600	A	3,207	3,042	46,100
A (I-64 South)	90,600	B	2,877	2,849	44,500

Crash Rate	
Roadway	Crash Rate compared to State Average
I-64 Southbound	151.7%
I-64 Northbound	95.0%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

INTERSTATE 64

A

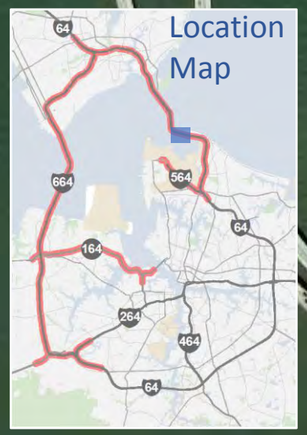
I-64 South

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
B (I-64 North)	A	236	320	341
A (I-64 South)	B	210	263	357

Segment 25:
I-64 at Bayville Street and West Ocean View Avenue



High crash rates possibly due to roadway geometry and congestion

N

1000 ft

I-64 West

D

W Ocean View Ave North

C

A

Bayville St South

INTERSTATE 64

B

I-64 East

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
D (I-64 West)	90,600	B	3,154	2,949	45,100
		A	53	93	1,000
B (I-64 East)	90,000	D	2,793	2,762	43,300
		C	79	86	1,100
A (Bayville St South)	1,500	B	31	29	500
C (W Ocean View Ave North)	2,200	D	84	87	1,200

Crash Rate	
Roadway	Crash Rate compared to State Average
I-64 Eastbound	-42.8%
I-64 Westbound	254.7%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

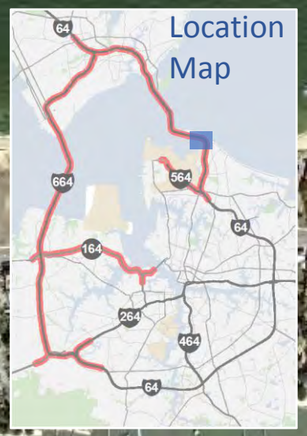
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
D (I-64 West)	B	57	63	66
	A	17	21	22
B (I-64 East)	D	56	77	139
	C	63	86	144
A (Bayville St South)	B	80	113	112
C (W Ocean View Ave North)	D	23	26	39

Segment 26:
I-64 at 4th View Street



Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
C (I-64 West)	90,000	A	2,671	2,601	39,600
		D	253	81	2,000
		B	260	297	4,000
A (I-64 South)	85,000	C	2,539	2,254	38,800
		D	49	52	600
		B	220	246	3,600
D (4th View St West)	6,200	A	48	38	600
		C	35	271	1,600
		B	28	112	900
B (4th View St East)	14,800	A	135	66	1,800
		C	299	323	4,000
		D	39	36	500

Crash Rate	
Roadway	Crash Rate compared to State Average
I-64 Eastbound	-29.9%
I-64 Northbound	68.3%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

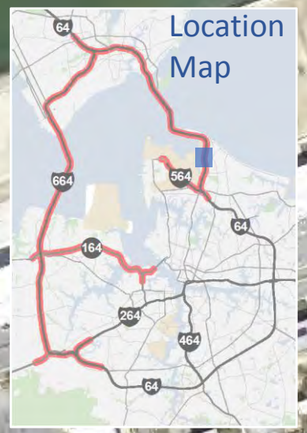
VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
C (I-64 West)	A	87	92	104
	D	78	97	108
	B	98	110	131
A (I-64 South)	C	86	116	320
	D	61	159	188
	B	39	70	113
D (4th View St West)	A	74	74	188
	C	93	143	310
	B	30	33	45
B (4th View St East)	A	50	50	83
	C	93	116	275
	D	35	37	71

Segment 27:
I-64 at West Ocean and West Bay Avenue



N

2000 ft

I-64 North

C

Crashes evenly distributed along I-64, with no obvious patterns

D

W Bay Ave West

W Ocean Ave East

B

E

W Bay Ave East

INTERSTATE 64

A

I-64 South

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
C (I-64 North)	85,000	A	2,854	2,705	42,000
A (I-64 South)	94,000	C	2,808	2,552	43,000
		D	611	131	4,400
D (W Bay Ave West)	13,800	A	209	518	4,600
		E	66	283	2,100
B (W Ocean Ave East)	2,700	D	307	180	2,700

Crash Rate	
Roadway	Crash Rate compared to State Average
I-64 Southbound	-67.7%
I-64 Northbound	24.0%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

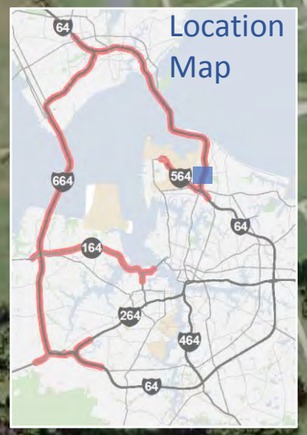
VDOT Data, Jan. 1 - Dec. 31, 2017

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
C (I-64 North)	A	78	81	95
A (I-64 South)	C	76	91	303
	D	98	98	176
D (W Bay Ave West)	A	89	108	102
	E	35	54	40
B (W Ocean Ave East)	D	50	67	52

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Segment 28:
I-64 at Granby Street On-Ramps



N

1000 ft

I-64 North (C)

INTERSTATE 64

Granby St North (E)

Relatively high crash rate evenly distributed along I-64, and a few crashes at Granby St. ramps

Patrol Rd West (D)

Granby St South (B)

I-64 South (A)

Traffic Volumes
Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
C (I-64 North)	94,000	A	3,063	3,223	46,600
A (I-64 South)	91,100	C	2,934	2,074	40,000
D (Patrol Rd West)	4,400	A	55	141	1,400
		C	5	17	200
		B	6	18	200
		E	4	16	100
B (Granby St South)	28,200	A	21	44	400
		C	448	445	6,500
		E	443	1,360	11,000
		D	295	37	2,000
E (Granby St North)	23,100	A	240	151	2,700
		C	32	146	700
		B	675	634	8,100
		D	70	10	500

Average Travel Time (seconds)

Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
C (I-64 North)	A	52	57	63
A (I-64 South)	C	45	53	208
D (Patrol Rd West)	A	26	34	38
	C	66	106	192
	B	7	7	14
	E	42	111	59
B (Granby St South)	A	31	41	31
	C	53	61	160
	E	29	33	35
	D	13	26	19
E (Granby St North)	A	42	56	62
	C	31	48	142
	B	36	39	39
	D	24	105	57

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

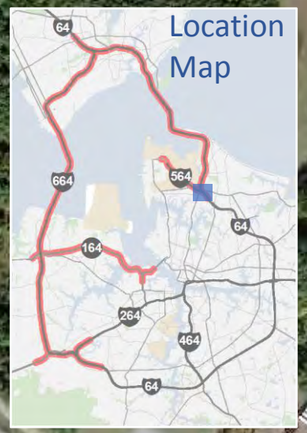
Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

Crash Rate	
Roadway	Crash Rate compared to State Average
I-64 Southbound	16.5%
I-64 Northbound	51.9%

Segment 29:
I-64/I-564/Granby Street/East Little Creek Road Interchange



N

1000 ft

C I-64 North

Granby St North

G

H

High crash density at entrance/exit between I-64 and I-564 potentially due to high volume and high speed. Crashes are also due to HRBT backups

D I-564 West

Relatively high crash rate at ramps to Little Creek potentially due to ramp geometry and poor visibility

I Granby St On-ramp to I-564 West

E I-564 Off-ramp to I-64 North and Granby St

I-564 Off-ramp to E Little Creek

F

J E Little Creek On-ramp to I-64

B I-564 Off-ramp to E Little Creek

I-64 East

A

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
C (I-64 North)	A	59	63	84
	D	56	66	74
	H	21	24	33
A (I-64 East)	C	59	64	155
	D	80	86	84
	G	80	84	114
	B	37	38	70
D (I-564 West)	A	79	82	102
	C	62	65	130
	E	13	15	23
	F	51	51	78
I (Granby Street On-ramp to I-564 West)	D	55	55	70
J (E Little Creek On-ramp to I-64 West)	A	32	46	50

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
C (I-64 North)	91,100	A	2,092	2,489	37,500
		D	762	231	6,700
		H	976	751	13,600
A (I-64 East)	142,900	C	2,761	1,680	35,100
		D	3,713	836	24,000
		G	391	454	5,200
		B	562	543	7,300
D (I-564 West)	74,400	A	873	2,861	23,300
		C	228	535	4,900
		E	317	1,215	9,700
		F	100	287	2,600
I (Granby Street On-ramp to I-564 West)	3,200	D	386	138	3,200
J (E Little Creek On-ramp to I-64 West)	10,500	A	710	927	10,500

Peak Hour Travel Time Compared to Free Flow

- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Crash Rate Compared to Statewide Average

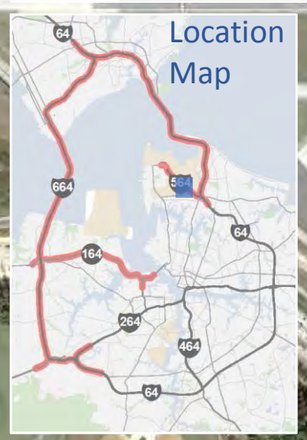
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

Crash Rate	
Roadway	Crash Rate compared to State Average
I-64 EB to I-64 EB	-30.0%
I-64 EB to I-564 WB	-100.0%
I-64 WB to I-64 WB	-32.9%
I-64 WB to I-564 WB	52.7%
I-564 EB to I-64 EB	-43.5%
I-564 EB to I-64 WB	-45.5%

Segment 30:
I-564 at Terminal Boulevard

Location Map



N

2000 ft

I-564 West

C

INTERSTATE 564

Crashes evenly distributed along I-564, with slight concentration of injury crashes at entrance/exit ramps

Terminal Blvd West

B

A

I-564 East

Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-564 East)	74,400	C	2,962	424	17,300
		B	1,899	780	16,600
C (I-564 West)	39,000	A	380	2,787	21,700
B (Terminal Ave)	35,400	A	1,138	2,112	18,800

Crash Rate	
Roadway	Crash Rate compared to State Average
I-564 Westbound	54.6%
I-564 Eastbound	39.5%

Crash Rate Compared to Statewide Average

- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

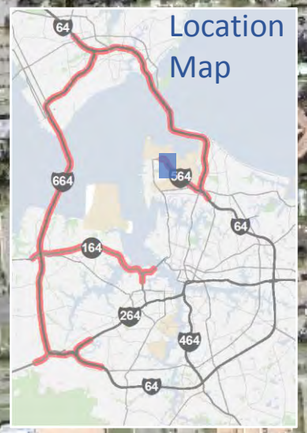
Peak Hour Travel Time Compared to Free Flow

- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-564 East)	C	121	129	127
	B	48	69	58
C (I-564 West)	A	111	117	130
B (Terminal Ave)	A	40	40	53

Segment 31:
I-564 at Admiral Taussig Boulevard



Traffic Volumes Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)					
Origin	AAWDT at Origin (Two-Way)	Destination	AM Peak (7-8 AM)	PM Peak (4-5 PM)	Daily
A (I-564 East)	39,000	C	2,005	296	11,800
		B	879	60	4,500
		D	78	68	1,000
C (Admiral Taussig Blvd)	29,500	A	134	1,408	12,100
		B	249	56	1,500
		D	62	71	1,000
B (Bainbridge Ave)	18,000	A	229	1,291	8,800
		C	92	171	2,100
		D	5	20	100
D (Bellinger Blvd)	4,900	A	17	87	800
		C	77	50	1,000
		B	138	29	1,000

Average Travel Time (seconds)				
Origin	Destination	Free Flow	AM Peak (7-8 AM)	PM Peak (4-5 PM)
A (I-564 East)	C	165	207	216
	B	144	259	152
	D	78	189	169
C (Admiral Taussig Blvd)	A	212	212	227
	B	60	132	149
	D	78	189	169
B (Bainbridge Ave)	A	120	146	155
	C	83	91	146
	D	16	217	204
D (Bellinger Blvd)	A	240	285	260
	C	105	123	195
	B	35	39	72

Crash Rate	
Roadway	Crash Rate compared to State Average
I-564 Westbound	-32.7%
I-564 Eastbound	-57.5%

Crash Rate Compared to Statewide Average
- Low (below average)
- Moderate (0-30% higher)
- High (30%+ higher)

VDOT Data, Jan. 1 - Dec. 31, 2017

Peak Hour Travel Time Compared to Free Flow
- Tolerable (0 - 15% more)
- Moderate (15% - 30% more)
- Serious (30% - 100% more)
- Severe (> 100% more)

Streetlight data, Aug. 2017-July 2018, Weekday (M-Th)