

Hampton Roads Regional Travel Time Reliability Study

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HAMPTON ROADS REGIONAL TRAVEL TIME RELIABILITY STUDY

PREPARED BY:



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TITLE:

Hampton Roads Regional Travel Time Reliability Study

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ABSTRACT

In recent years, new technologies have been created that collect travel time and speed data on a continuous basis. One source of such data, provided by INRIX, has been purchased by VDOT and provided to Metropolitan Planning Organizations throughout the state.

HRTPO staff has used this archived travel time and speed data to determine roadway congestion levels throughout Hampton Roads. However, for many users of the regional roadway network, the level of consistency and dependability in travel times is just as important as the average level of congestion.

This report uses the INRIX travel time and speed data to examine the travel time reliability – defined as how much travel times vary over the course of time, as measured from day to day or across different times of the day – of the regional roadway network.

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EXECUTIVE SUMMARY

National studies have established that Hampton Roads has some of the worst roadway congestion in the country for a region of its size. However, congestion levels are not the same each day. Factors such as crashes, bad weather, special events, roadway maintenance, and other incidents can greatly increase congestion levels on any particular day.

Travel time reliability is defined as how much travel times vary over the course of time, as measured from day to day or across different times of the day. The reliability of travel times is very important for many roadway users. When catching a flight at the airport, driving to a doctors appointment, or picking up children from day care, unreliable travel times 1) force travelers to pad a trip with a cushion which wastes time, and 2) may cause travelers to unacceptably arrive at their destination late. Since the consistency and dependability of travel times is important for many users of the regional roadway network, analyzing not only the average congestion levels but also the travel time reliability of the regional roadway network is important.

This report represents the first time that the Hampton Roads Transportation Planning Organization (HRTPO) has conducted a thorough analysis of regional travel time reliability. HRTPO staff used a number of measures in this report to describe the travel time reliability of the roadway network, including the buffer index and the planning time index.

The buffer index is a measure of travel time reliability that compares the variability of travel times to average travel conditions. It represents the *extra time* that travelers must add to their average travel time to ensure that they will arrive on-time 95% of the time. The buffer index has a minimum value of zero and increases as the roadway network becomes less reliable. The buffer index is calculated using the following formula:

$$\text{Buffer Index} = \frac{95^{\text{th}} \text{ Percentile Travel Time} - \text{Average Travel Time}}{\text{Average Travel Time}}$$



Congestion Approaching the Midtown Tunnel

Photo Source: VDOT.

The planning time index measures reliability by comparing travel times during some of the most congested conditions with travel times in free-flow, uncongested conditions. The planning time index is the ratio of the 95th percentile travel time versus the travel time during free-flow conditions. The planning time index increases as the roadway network becomes more congested and less reliable and generally has a value greater than or equal to one. The planning time index is calculated using the following formula:

$$\text{Planning Time Index} = \frac{95^{\text{th}} \text{ Percentile Travel Time}}{\text{Free-Flow Travel Time}}$$

The ability to analyze the travel time reliability of the roadway network has increased in recent years, as new technologies have been created that collect travel time and speed data on a continuous basis. One source of such data, INRIX, uses probe vehicles and devices to provide real-time and historical travel time and speed data on an extensive national roadway network.

HRTPO staff obtained 2012 INRIX speed and travel time reliability data from the Regional Integrated Transportation Information System (RITIS) for this study. The data exported from RITIS includes the average speed, travel time index, buffer index, and planning time index of each roadway segment.

This data was obtained by direction for each hour during the morning (AM) peak period (defined in this study as occurring between 5:00 am and 9:00 am) and the afternoon (PM) peak period (defined as occurring between 3:00 pm and 7:00 pm). The data that was obtained represents hourly conditions for weekdays (comprising Tuesdays, Wednesdays, and Thursdays) averaged throughout the entire year of 2012. The lowest of the four hourly average speeds and the highest of the four hourly average travel time indices, buffer indices, and planning time indices that occur in each direction in each peak period are the ones published in this report.

The tables to the right show the freeway and arterial roadway segments in Hampton Roads with the highest buffer indices during each peak period. Most of the freeway segments with the highest buffer indices in Hampton Roads during both peak periods are on approaches to the Downtown Tunnel, Hampton Roads Bridge-Tunnel, Midtown Tunnel, and the High Rise Bridge. Arterial roadways with high buffer indices during both peak periods include the Midtown Tunnel and its approaches in Norfolk and Indian River Road. The approaches to the Gilmerton Bridge also have high buffer indices, particularly during the PM peak period.

The tables on the next page show the freeway and arterial roadway segments in Hampton Roads with the highest planning time indices during each peak period. Similar to the buffer index, most of the freeway segments with the highest planning time indices are the approaches to the Downtown Tunnel, Hampton Roads Bridge-Tunnel, Midtown Tunnel, and High Rise Bridge. The Midtown Tunnel and its approaches, Indian River Road, and the Gilmerton Bridge approaches also have high planning time indices during both peak periods.

AM Peak Period

JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGHEST BUFFER INDEX
HAM	I-64	RIP RAP RD	SETTLERS LANDING RD	EB	3.99
PORT	I-264	FREDERICK BLVD	DES MOINES AVE	EB	3.17
HAM	I-64	ARMISTEAD AVE	RIP RAP RD	EB	3.12
NOR	I-264	WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	WB	3.11
PORT	I-264	PORTSMOUTH BLVD	FREDERICK BLVD	EB	2.96
PORT	I-264	DES MOINES AVE	EFFINGHAM ST	EB	2.53
CHES	I-64	MILITARY HWY	I-264&664	WB	2.34
PORT	M L K FREEWAY	LONDON BLVD	WESTERN FREEWAY/MIDTOWN TUN	NB	2.17
PORT	WESTERN FWY	WEST NORFOLK RD	MLK FREEWAY/MIDTOWN TUNNEL	EB	2.17
CHES	I-64	GEORGE WASHINGTON HWY	MILITARY HWY	WB	2.13

JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGHEST BUFFER INDEX
VB	INDIAN RIVER RD	KEMPSVILLE RD	FERRELL PKWY	WB	1.20
NOR/PORT	MIDTOWN TUNNEL	MLK FWY/WESTERN FREEWAY	BRAMBLETON AVE	NB	1.10
NN	OYSTER POINT RD	CANON BLVD	I-64	WB	1.09
NOR/VB	NORTHAMPTON BLVD	I-64	DIAMOND SPRINGS RD	WB	1.07
VB	INDIAN RIVER RD	CENTERVILLE TNP	KEMPSVILLE RD	WB	1.06
HAM	MERCURY BLVD	POWER PLANT PKWY	I-64	WB	1.02
VB	INDEPENDENCE BLVD	HOLLAND RD	BAXTER RD	NB	0.95
NOR	HAMPTON BLVD	21ST ST	27TH ST	NB	0.94
VB	KEMPSVILLE RD	PROVIDENCE RD	PRINCESS ANNE RD	EB	0.93
VB	FIRST COLONIAL RD	VA BEACH BLVD	I-264	SB	0.93

PM Peak Period

JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGHEST BUFFER INDEX
HAM	I-64	RIP RAP RD	SETTLERS LANDING RD	EB	4.31
NOR	I-264	WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	WB	3.76
NOR	I-64	I-564/LITTLE CREEK RD	TIDEWATER DR	WB	3.61
NN	I-64	RTE 143 (NORTH)	YORKTOWN RD	EB	3.43
NOR	I-64	4TH VIEW AVE	BAY AVE	WB	3.28
NOR	I-64	BAY AVE	I-564/LITTLE CREEK RD	WB	3.21
CHES	I-64	GREENBRIER PKWY	BATTLEFIELD BLVD	EB	3.16
NN	I-664	23RD ST	CHESTNUT AVE	SB	3.08
CHES	I-64	BATTLEFIELD BLVD	I-464	EB	3.07
NOR	I-264	I-64	NEWTOWN RD/WCL VA. BEACH	WB	3.07

JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGHEST BUFFER INDEX
NOR	4TH VIEW ST	I-64	OCEAN VIEW AVE	WB	1.80
CHES	MILITARY HWY	BAINBRIDGE BLVD	I-464	WB	1.79
NN	JEFFERSON AVE	JAMES CITY CL	YORKTOWN RD	SB	1.46
VB	INDIAN RIVER RD	I-64	CENTERVILLE TNP	EB	1.37
NOR	BRAMBLETON AVE	HAMPTON BLVD	COLLEY AVE	WB	1.28
CHES	MILITARY HWY	I-464	CAMPOSTELLA RD	WB	1.23
NOR	HAMPTON BLVD	BRAMBLETON AVE	21ST ST	SB	1.17
NOR	HAMPTON BLVD	21ST ST	27TH ST	SB	1.12
CHES	BATTLEFIELD BLVD	VOLVO PKWY	I-64	SB	1.12
NOR	MILITARY HWY	PRIN ANNE RD/NORTHAMPTON BLV	I-64	SB	1.11

Top Ten Freeway and Arterial Segments with the Highest Buffer Index by Peak Period (2012)

Source: HRTPO analysis of INRIX data.

As part of this study, ten high profile locations throughout Hampton Roads were analyzed in further detail. These high profile corridors include:

- Downtown Tunnel
- Midtown Tunnel
- Hampton Roads Bridge-Tunnel
- Monitor-Merrimac Memorial Bridge-Tunnel
- I-64 in Chesapeake
- I-64/I-564 in Norfolk
- I-64/I-264 Interchange Area
- I-64 on the Peninsula
- Route 17 on the Peninsula
- Gilmerton Bridge

In addition to the previous weekday peak period buffer and planning time indices, a number of other delay and travel time reliability aspects are examined for these high profile corridors. These aspects include reliability by time of day, day of week, and time of year.

Among these high profile corridors, certain locations rank at the top of these delay and travel time reliability measures. The Downtown Tunnel and Hampton Roads Bridge-Tunnel generally have the highest travel time index, buffer index, and planning time index among the high profile corridors depending on the time of the day, week, and year. I-64 on the Peninsula ranks atop these high profile corridors in these delay and reliability measures on Fridays and Saturdays, particularly in summer.

The travel time reliability data in this report will help improve HRTPO's transportation planning efforts. Travel time reliability data will be used in future HRTPO transportation planning efforts, including the Project Prioritization Process and Congestion Management Process.

AM Peak Period

Freeway Segments	JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGHEST PLANNING TIME INDEX
	PORT	I-264	FREDERICK BLVD	DES MOINES AVE	EB	9.20
	HAM	I-64	RIP RAP RD	SETTLERS LANDING RD	EB	7.34
	PORT	I-264	DES MOINES AVE	EFFINGHAM ST	EB	6.36
	PORT	M L K FREEWAY	LONDON BLVD	WESTERN FREEWAY/MIDTOWN TUN	NB	5.74
	NOR	I-264	WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	WB	5.41
	NOR	I-264/BERKLEY BRIDGE	I-464	WATERSIDE/CITY HALL/TIDEWATER	WB	5.35
	PORT	I-264	PORTSMOUTH BLVD	FREDERICK BLVD	EB	4.89
	CHES	I-64	GEORGE WASHINGTON HWY	MILITARY HWY	WB	4.81
	HAM	I-64	SETTLERS LANDING RD	MALLORY ST	EB	4.64
	PORT	WESTERN FWY	WEST NORFOLK RD	MLK FREEWAY/MIDTOWN TUNNEL	EB	4.36

Arterial Segments	JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGHEST PLANNING TIME INDEX
	NOR/PORT	MIDTOWN TUNNEL	MLK FWY/WESTERN FREEWAY	BRAMBLETON AVE	NB	3.32
	VB	INDIAN RIVER RD	KEMPSVILLE RD	FERRELL PKWY	WB	3.32
	VB	INDEPENDENCE BLVD	HOLLAND RD	BAXTER RD	NB	3.13
	NOR/VB	NORTHAMPTON BLVD	I-64	DIAMOND SPRINGS RD	WB	2.86
	VB	KEMPSVILLE RD	PROVIDENCE RD	PRINCESS ANNE RD	EB	2.80
	VB	INDIAN RIVER RD	CENTERVILLE TNPK	KEMPSVILLE RD	WB	2.56
	CHES	MILITARY HWY/GILMERTON BRIDGE	CANAL DR	BAINBRIDGE BLVD	EB	2.54
	VB	WITCHDUCK RD	I-264	VA BEACH BLVD	SB	2.41
	VB	INDIAN RIVER RD	MILITARY HWY	PROVIDENCE RD	WB	2.39
	HAM	MERCURY BLVD	POWER PLANT PKWY	I-64	WB	2.35

PM Peak Period

Freeway Segments	JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGHEST PLANNING TIME INDEX
	NOR	I-264	WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	WB	10.54
	NOR	I-64	4TH VIEW AVE	BAY AVE	WB	7.69
	NOR	I-64	BAY AVE	I-564/LITTLE CREEK RD	WB	6.96
	HAM	I-64	RIP RAP RD	SETTLERS LANDING RD	EB	6.69
	NOR	I-264	BRAMBLETON AVE	BALLENTEINE BLVD	WB	6.61
	CHES	I-64	BATTLEFIELD BLVD	I-464	EB	6.52
	NOR	I-264/BERKLEY BRIDGE	I-464	WATERSIDE/CITY HALL/TIDEWATER	WB	6.45
	PORT	I-264	DES MOINES AVE	EFFINGHAM ST	EB	5.84
	NN	I-664	TERMINAL AVE	23RD ST	SB	5.80
	NOR	I-64	I-564/LITTLE CREEK RD	TIDEWATER DR	WB	5.39

Arterial Segments	JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGHEST PLANNING TIME INDEX
	NOR	4TH VIEW ST	I-64	OCEAN VIEW AVE	WB	5.19
	CHES	MILITARY HWY	BAINBRIDGE BLVD	I-464	WB	4.50
	VB	INDIAN RIVER RD	I-64	CENTERVILLE TNPK	EB	4.37
	NOR	HAMPTON BLVD	BRAMBLETON AVE	21ST ST	SB	3.94
	VB	INDIAN RIVER RD	CENTERVILLE TNPK	KEMPSVILLE RD	EB	3.87
	VB	WITCHDUCK RD	PRINCESS ANNE RD	I-264	SB	3.56
	NOR	BRAMBLETON AVE	HAMPTON BLVD	COLLEY AVE	WB	3.27
	CHES	MILITARY HWY	I-464	CAMPOSTELLA RD	WB	3.26
	VB	INDIAN RIVER RD	KEMPSVILLE RD	FERRELL PKWY	WB	3.00
	NOR	MILITARY HWY	PRIN ANNE RD/NORTHAMPTON BLVD	I-64	SB	2.99

Top Ten Freeway and Arterial Segments with the Highest Planning Time Index by Peak Period (2012)

Source: HRTPO analysis of INRIX data.

INTRODUCTION

National studies have established that Hampton Roads has some of the worst roadway congestion in the country for a region of its size. Backups are common, particularly at the region's bridges and tunnels. Most travelers in Hampton Roads are accustomed to this congestion — particularly commuters that deal with the region's major bottlenecks on a daily basis — and budget additional time for their trips to account for this congestion.

However, congestion levels are not the same each day (**Figure 1**). Although planners and engineers often report roadway congestion levels in terms of average or typical conditions, in many cases daily congestion levels vary greatly from the average (**Figure 2**). Factors such as crashes, bad weather, special events, roadway maintenance, and other types of incidents can greatly increase the level of congestion on any particular day.



Figure 1 - Eastbound Hampton Roads Bridge-Tunnel Approach
4:30 pm, Monday 4/1/2013 (left) and Tuesday 4/2/2013 (right)

Source: VDOT.

The reliability of travel times is very important for roadway users for different reasons. For many commuters, arriving on time to work is required. For travelers catching a flight at the airport, driving to a doctors appointment, or picking up children from day care, arriving at their destination on time is critically important. For many companies, goods must arrive on time or it will negatively impact their

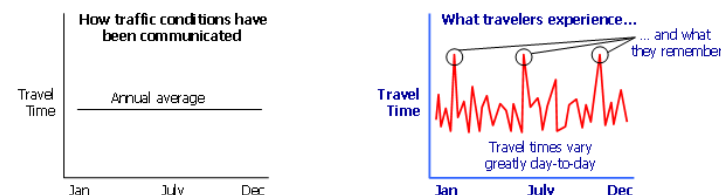


Figure 2 - Average Versus Daily Travel Times

Source: FHWA.

businesses, and shippers could lose business due to late deliveries. For transit systems, keeping buses on schedule is critical to maintaining ridership levels and keeping customer satisfaction levels high.

Travel time reliability is defined as how much travel times vary over the course of time, as measured from day to day or across different times of the day. Since the consistency and dependability of travel times is important for so many users of the regional roadway network, analyzing not only the average congestion levels but also the travel time reliability of the regional roadway network is important.

In addition, certain projects can significantly improve travel time reliability, even if they only marginally improve congestion levels. One example is ramp metering. According to research done for the Minnesota Department of Transportation¹, turning off freeway ramp meters for a period of time led to a 22 percent decrease in average travel speeds on that segment of freeway, but led to a 91 percent decrease in travel time reliability.

The ability to analyze the travel time reliability of the roadway network has increased in recent years, as new technologies have been

¹ *Twin Cities Ramp Meter Evaluation*, Cambridge Systematics, February 2001.

created that collect travel time and speed data on a continuous basis. One source of such data, INRIX, uses probe vehicles and devices to provide real-time and historical travel time and speed data on an extensive national roadway network.

The purpose of this study is to determine travel time reliability on the Hampton Roads roadway network using data collected by INRIX in 2012. This report represents the first time that the Hampton Roads Transportation Planning Organization (HRTPO) has conducted a thorough analysis of regional travel time reliability. This report is broken down into the following sections:

- **Delay and Travel Time Reliability Measures** – Provides the definitions of terms used to measure levels of typical delay and travel time reliability.
- **Data Collection and Analysis** – Explains how HRTPO staff obtained travel time reliability data from INRIX and the Regional Integrated Transportation Information System (RITIS), and how HRTPO staff analyzed this data.
- **Analysis Results** – Documents how travel time reliability in Hampton Roads compares to other metropolitan areas, the travel time reliability by roadway segment, and the reliability of high profile corridors throughout the region.
- **Conclusions/Next Steps**

The results of the travel time reliability data analyzed in this report will be used by HRTPO in the Congestion Management Process (CMP), and used in the project selection process in the Long Range Transportation Plan (LRTP) and the Transportation Improvement Program (TIP).



Congestion Approaching the Westbound Hampton Roads Bridge-Tunnel

Photo Source: VDOT.

DELAY AND TRAVEL TIME RELIABILITY MEASURES

A number of measures have been created to measure the level of typical delay and travel time reliability of the roadway network. The measures used in this study include:

Measures of Typical Delay

- Travel Time
- Travel Time Index

Measures of Travel Time Reliability

- Buffer Time
- Buffer Index

Combined Measures

- Planning Time
- Planning Time Index

Each of these delay and reliability measures is defined below, and the relationship between many of these measures is shown in **Figure 3** on page 5.

Travel Time

The travel time is the amount of time that it takes for travelers to drive along a segment of road at a specific time. Travel times are typically consistent during uncongested, or free-flow, conditions, but can vary greatly in congested conditions. This congestion may be referred to as typical, which is congestion that occurs on a daily basis due to limitations of the roadway network, or as atypical, which is congestion likely due to incidents such as crashes, disabled vehicles, special events, weather, etc. Regional travel time information is often



Travel Time Display

Photo Source: Wikimedia.

distributed to the public through multiple channels including radio broadcasts, changeable message signs, smartphone applications, etc.

The average travel time is used to describe typical traffic conditions. The average travel time is the ratio of the distance traveled to the average speed:

$$\text{Average Travel Time} = \frac{\text{Distance Traveled}}{\text{Average Speed}}$$

Since average travel time is often calculated using actual, continuous data sources such as INRIX, the impacts of both typical and atypical congestion is reflected in the average travel time.

Other travel time measures are used to describe the roadway network. Travel time reliability is often described using the 95th percentile travel time, which is the level where only 5% of the travel times are slower for that period. This measure, which is also referred to as the planning time, is described further on the next page.

Travel Time Index

The travel time index is a measure used to describe levels of congestion that generally reflects how travelers perceive the travel time of the roadway. The travel time index compares typical travel conditions during a particular time of day (usually the peak travel hour or period) with travel conditions during uncongested, or free-flow, conditions.

The travel time index is defined as:

$$\text{Travel Time Index} = \frac{\text{Average Travel Time}}{\text{Free-flow Travel Time}}$$

As an example, an uncongested 20-minute trip that takes an average of 24 minutes during the peak travel period would produce a travel time index of 1.20. If the trip instead takes 28 minutes during the peak period, the travel time index would be 1.40. The higher the travel time index, the more congested the roadway.

Buffer Time

The buffer time is one of the measures used to describe the travel time reliability of the roadway network. The buffer time is the extra time that travelers must add to their average travel time when planning trips to ensure that they will arrive on-time a certain percentage of the time. The 95th percentile travel time is often used when determining the buffer time, meaning travelers will only be late 5% of the time, or one out of every twenty trips.

The buffer time is defined as:

$$\text{Buffer Time} = 95^{\text{th}} \text{ percentile Travel Time} - \text{Average Travel Time}$$

Buffer Index

The buffer index uses the buffer time to measure travel time reliability compared to typical conditions. Stated another way, the buffer index compares the size of the buffer time to the average travel time. The buffer index has a minimum value of zero and increases as the roadway network becomes less reliable.

The buffer index is defined as:

$$\text{Buffer Index} = \frac{\text{Buffer Time}}{\text{Average Travel Time}}$$

As an example, a buffer index of 0.4 means that for a trip that takes an average of 20 minutes, travelers must budget an additional 40% or 8 minutes to ensure on-time arrival 95% of the time.

Planning Time

Another method of describing the reliability of the roadway network is the planning time. The planning time includes both the typical travel time and the buffer time to measure the total amount of time that travelers must budget to ensure on-time arrival 95% of the time.

The planning time is defined as:

$$\begin{aligned} \text{Planning Time} &= \text{Average Travel Time} + \text{Buffer Time} \\ &= 95^{\text{th}} \text{ percentile Travel Time} \end{aligned}$$

Planning Time Index

The planning time index measures reliability by comparing travel times during some of the most congested conditions with travel times in free-flow, uncongested conditions. The planning time index is the ratio of the 95th percentile travel time versus the travel time during free-flow conditions. This differs from the buffer index, which measures reliability compared to average travel times. As shown in **Figure 3**, the planning time index accounts for both typical delay (which is reflected in the travel time index) and atypical delay (which is reflected in the buffer index.) The planning time index increases as the roadway network becomes more congested and less reliable and generally has a value greater than or equal to one.

The planning time index is defined as:

$$\text{Planning Time Index} = \frac{\text{Planning Time}}{\text{Free-flow Travel Time}}$$

As an example, a planning time index of 1.60 means that for a trip that takes 15 minutes during free-flow conditions, travelers must budget 24 minutes for the trip to arrive on-time 95% of the time.

Relationship between Delay and Reliability Measures

As shown in the previous equations, many of the delay and travel time reliability measures are related. Figure 3 includes two graphs showing the relationship between the various delay and reliability measures used in this study. The top graph in Figure 3 shows the relationship between free-flow travel time, average travel time, buffer time, and planning time (or 95th percentile travel time). Reliability measures are also calculated in the top graph based on the travel time distribution. The bottom graph in Figure 3 shows the relationship between travel times and the travel time index, buffer index, and planning time index.

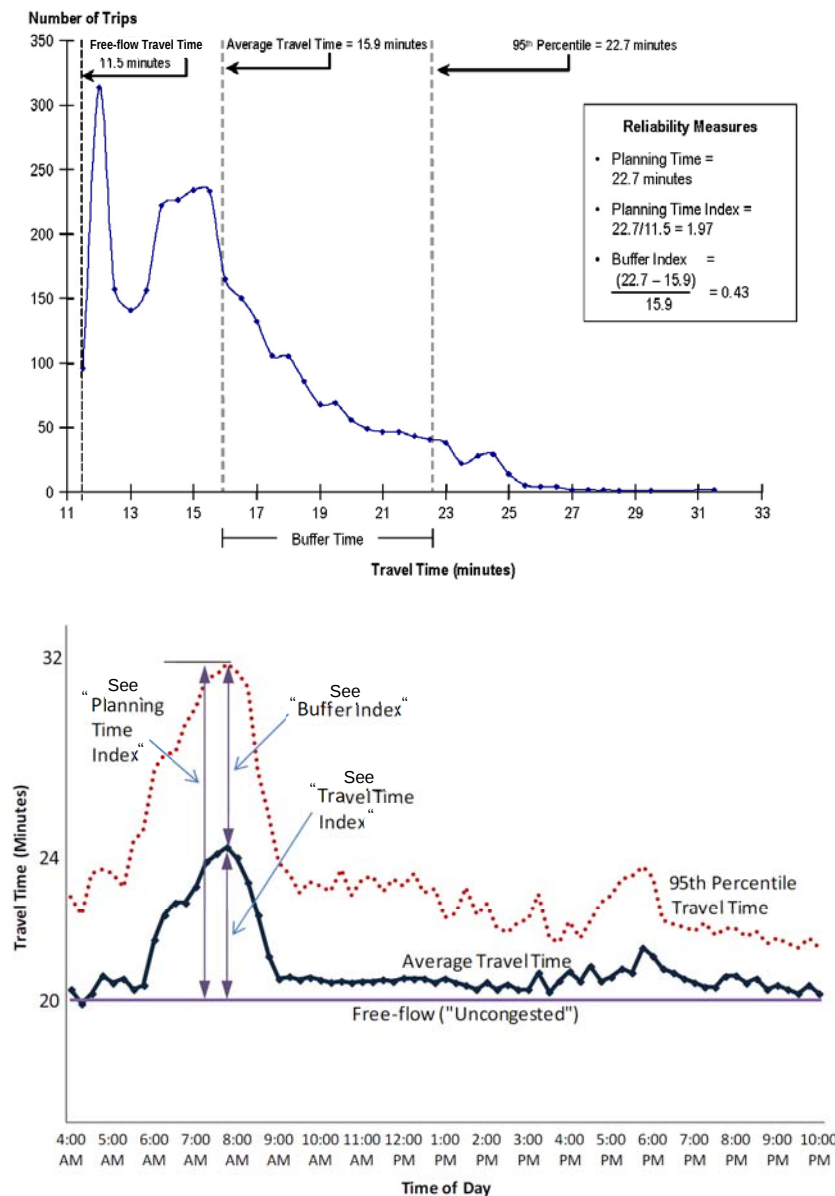


Figure 3 - Relationship between Various Delay and Reliability Measures

Source: FHWA (modified by HRTPO).

DATA COLLECTION AND ANALYSIS

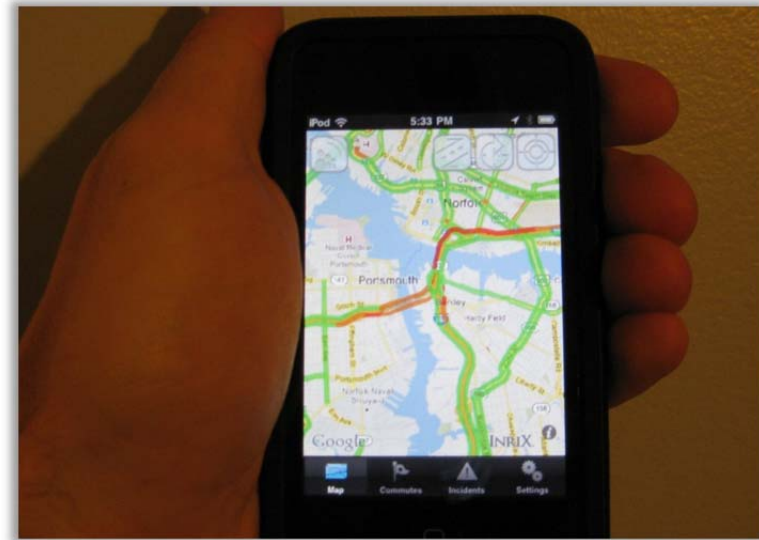
In order to accurately measure the reliability of the regional roadway network, a large scale, continuous source of travel time and speed data is needed. This was limited in past years by the technologies available, and the lack of these technologies installed on roadways off of the freeway system.

New technologies have been created in recent years that collect travel time and speed data on a continuous basis. These technologies include devices that detect Bluetooth signals in cell phones and vehicles to determine corridor speeds, cell phone applications that collect location data which vendors use to determine travel times and speeds throughout a large area, and GPS devices that can also provide this information.

One of the companies that uses these new technologies in order to collect transportation data is INRIX. Since 2006, INRIX has provided travel time and speed data on an extensive national roadway network. INRIX's primary data source is millions of GPS-enabled fleet vehicles, including taxis, airport shuttles, service vehicles, and long haul trucks. In addition, INRIX also collects data from mobile devices that have INRIX's real-time traffic application installed, traditional road sensors, and other sources.

Each of the data points collected by INRIX includes the speed, location and direction of each probe at a reported date and time. Based on this data, INRIX can determine travel speeds on large segments of the transportation network.

INRIX provides this real-time speed data, as well as historical and predictive traffic information, for over 260,000 miles of freeways and arterials throughout the nation's 100 largest metropolitan areas and nearly all of the nation's limited-access roadway network. In Hampton Roads, INRIX data is available on over 1,100 miles of roadway, including all freeways and most principal and minor



INRIX Phone App Showing Real-Time Traffic Information

Photo Source: HRTPO.

arterials. The Hampton Roads roadways with INRIX data are shown in **Maps 1 and 2** on pages 8 and 9.

The Virginia Department of Transportation (VDOT) has purchased real-time and archived travel time and speed data from INRIX. Access to this data is provided to various organizations throughout the state — including HRTPO — through the Regional Integrated Transportation Information System (RITIS).

RITIS is an automated data sharing, archiving, and distribution system that fuses together many types and sources of transportation data. RITIS distributes real-time data and tools via the internet, which provides valuable information for transportation operations personnel and public safety officials. RITIS also provides archived data and visualization tools through the Vehicle Probe Project Suite, which assists various agencies with their transportation planning efforts. In addition to the INRIX data, RITIS includes data related to incidents,

parking, weather, traffic signals, transit, and computer-aided dispatch from police and fire agencies.

RITIS is maintained by the University of Maryland's Center for Advanced Transportation Technology Laboratory (CATT Lab). More information on the Regional Integrated Transportation Information System is available on the CATT Lab's website at <http://www.cattlab.umd.edu/?portfolio=ritis>.

HRTPO staff obtained 2012 INRIX speed and travel time reliability data from RITIS for this study. Data was exported from RITIS for each Congestion Management Process (CMP) network roadway segment where INRIX data was available. In those cases where RITIS roadway segments were longer than the comparable CMP network segments, data was combined for the multiple CMP segments. The data exported from RITIS includes:

- Average Speed
- Travel Time Index
- Buffer Index
- Planning Time Index

This data was obtained by direction for each hour during the morning (AM) peak period (defined in this study as occurring between 5:00 am and 9:00 am) and the afternoon (PM) peak period (defined as occurring between 3:00 pm and 7:00 pm). The data that was obtained represents hourly conditions for weekdays (comprising Tuesdays, Wednesdays, and Thursdays) averaged throughout the entire year of 2012.

Additional data was also collected for high profile corridors throughout the region as defined later in this report. This additional data includes travel time reliability factors for a longer period of the day (each hour between 5:00 am and 9:00 pm rather than only the AM and PM peak periods), for multiple days of the week (Tuesdays-Thursdays, Fridays and Saturdays), and for both the entire year and the summer.

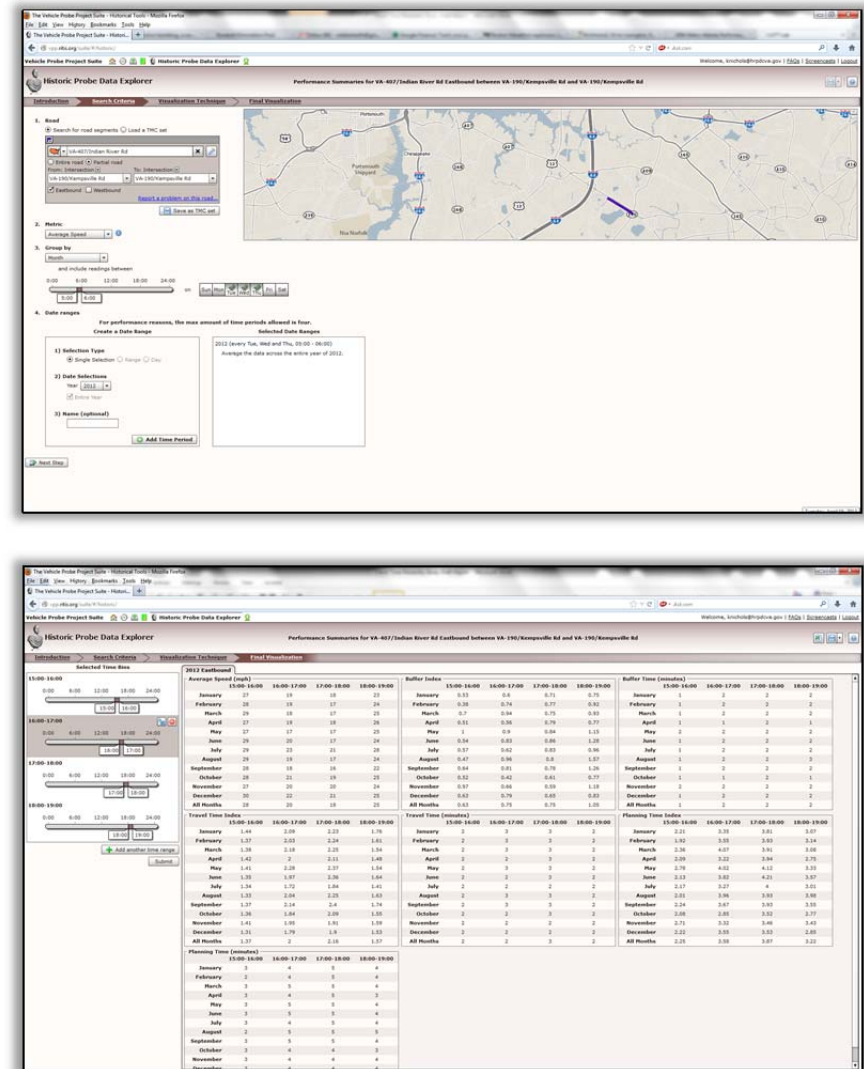
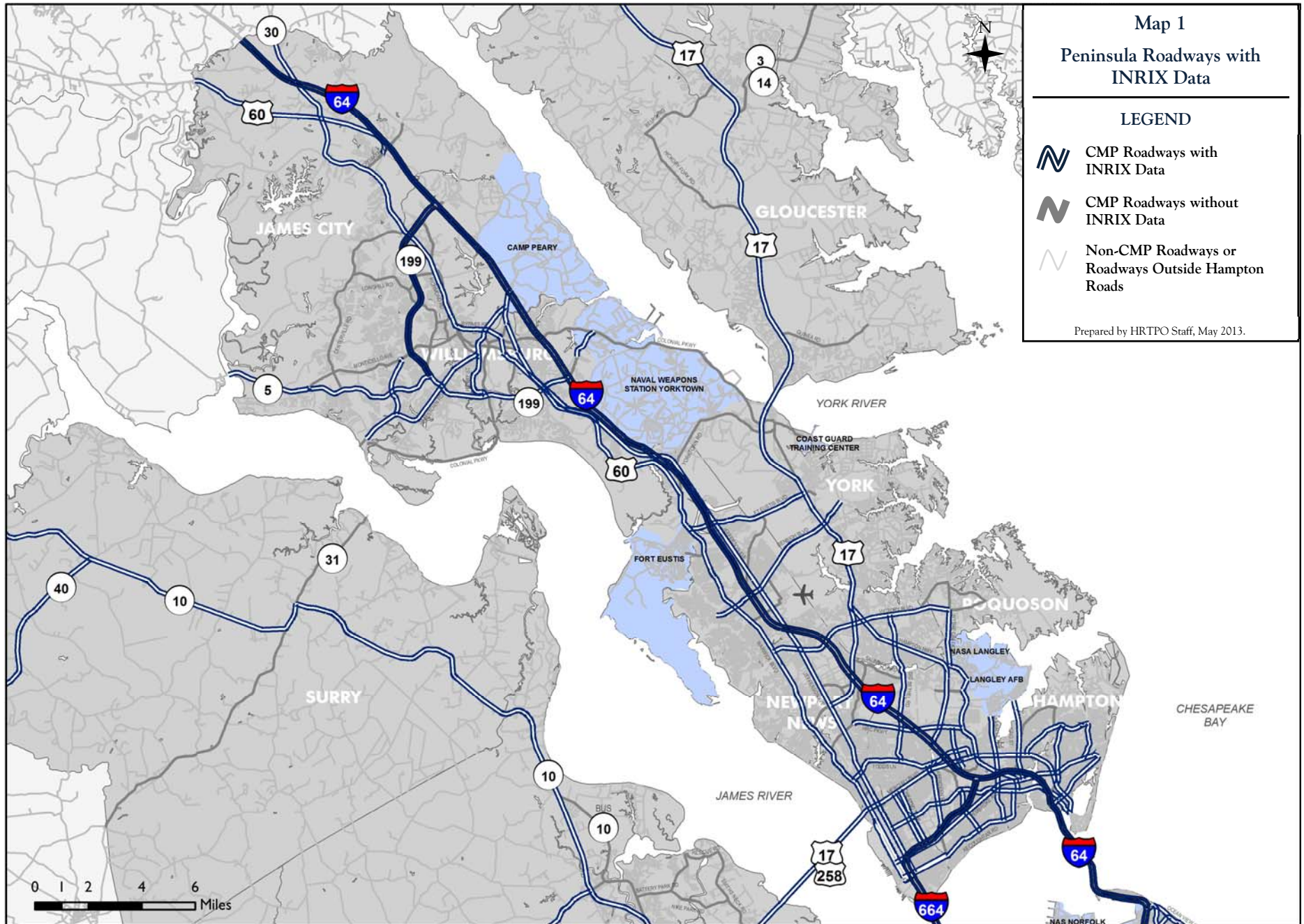
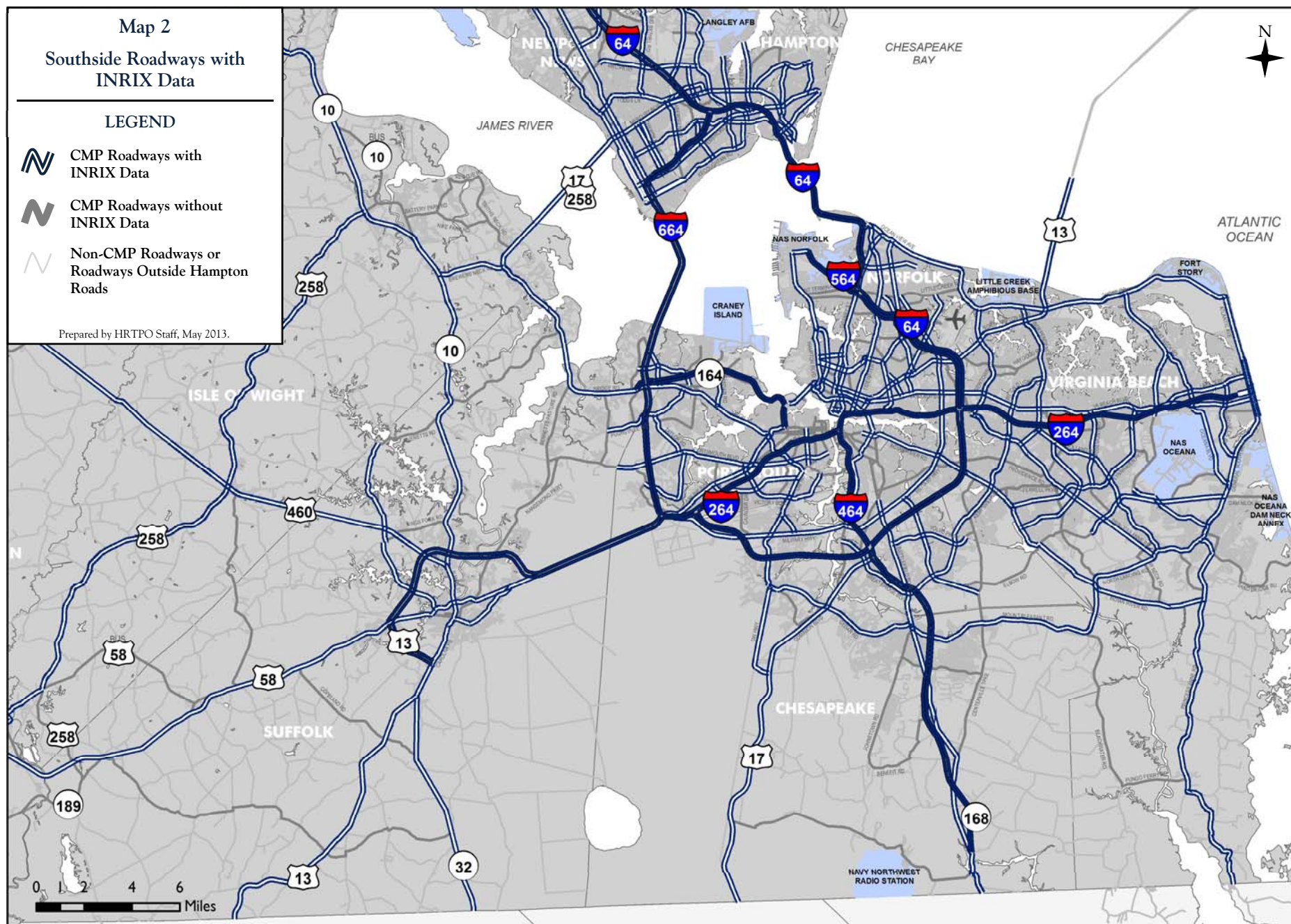


Figure 4 – INRIX Speed and Travel Time Reliability Data in RITIS

Source: RITIS.





HRTPO staff produced a master spreadsheet for the purpose of inventorying and analyzing all of the INRIX data. This spreadsheet is referred to as the Travel Time Reliability Database throughout this report. The Travel Time Reliability Database includes the following data from 2012 for every CMP roadway segment where INRIX data is available, broken down by direction and peak period:

- **Speed** – The Travel Time Reliability Database includes the yearly average weekday speeds by direction for each of the four hours in the AM peak period (5-9 am) and the PM peak period (3-7 pm). The lowest of the four hourly average speeds that occur in each direction in each peak period are the speeds published in the maps, tables, and figures in this report.

The speeds published in this report are the same as those included in HRTPO's Volumes, Speeds, and Congestion on Major Roadways in Hampton Roads² report.

- **Travel Time Index** - The Travel Time Reliability Database includes the yearly average weekday travel time indices by direction for each of the four hours in the AM peak period and the PM peak period. The highest of the four hourly travel time indices that occur in each direction in each peak period are the ones published in this report.
- **Buffer Index** – The database also includes the yearly average weekday buffer indices by direction for each of the four hours in the AM peak period and the PM peak period. The highest of the four hourly buffer indices that occur in each direction in each peak period are published in this report.
- **Planning Time Index** – Finally, the Travel Time Reliability Database includes the yearly average weekday planning time indices by direction for each of the four hours in the AM peak

period and the PM peak period. The highest of the four hourly planning time indices that occur in each direction in each peak period are the ones published in this report.

² *Volumes, Speeds, and Congestion on Major Roadways in Hampton Roads*, HRTPO, June 2013.

ANALYSIS RESULTS

This section documents travel time reliability in Hampton Roads. Topics covered in this section include:

- **Metropolitan Areas** – The Texas Transportation Institute has published travel time reliability data for regions throughout the United States. This section examines how travel time reliability in Hampton Roads compares to other urban areas.
- **Hampton Roads Roadway Network** – This section details the travel time reliability for every roadway segment in Hampton Roads where INRIX data is collected.
- **Hampton Roads High Profile Corridors** – This section goes into further detail regarding congestion and travel time reliability at ten high profile corridors in Hampton Roads, including bridges and tunnels and other major bottlenecks.

Metropolitan Areas

The Texas Transportation Institute at Texas A&M University regularly releases a study called the Urban Mobility Report. In the Urban Mobility Report, TTI publishes the amount of time that travelers in 101 urbanized areas spend in congestion, and the costs related to this congestion. TTI published travel time reliability information for the first time in the 2012 report, using INRIX data from 2011 to produce the planning time index for the freeway system in each urbanized area.

TTI divides urbanized areas into four groups for comparison purposes: very large, large, medium, and small. Hampton Roads is grouped with 30 other urbanized areas in the large group, which are those urbanized areas with populations between one and three million people.

To measure the total travel time that should be planned for a trip on a regional level, TTI used the same definition of the planning time index — the total time that should be budgeted for a trip so that the travelers would only be late 5% of the time — as used throughout this report.

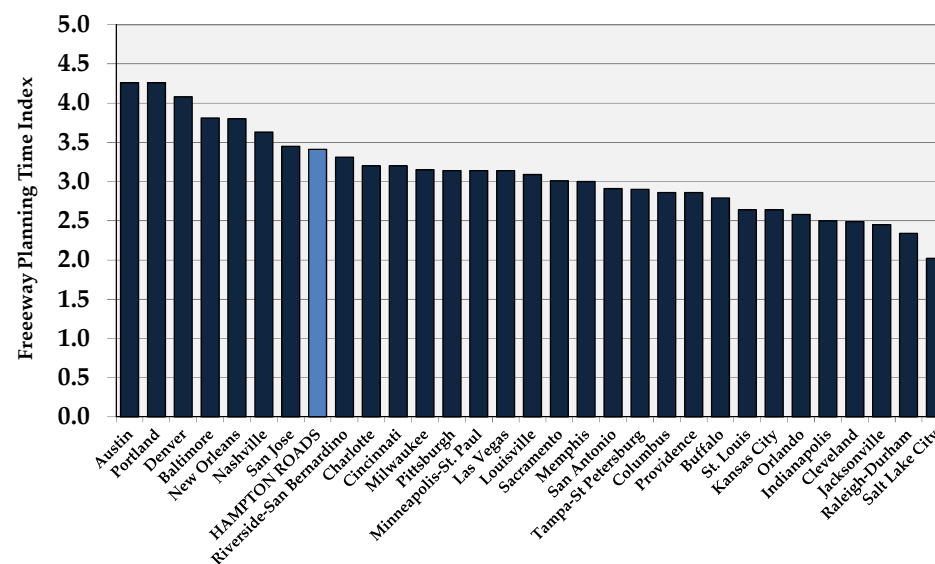


Figure 5 – Freeway Planning Time Index, Large Urbanized Areas, 2011

Data Source: Texas Transportation Institute. Includes all urbanized areas with populations between one and three million people.

According to TTI, the freeway planning time index was 3.41 in Hampton Roads in 2011. This means that for an average uncongested 20-minute trip on the freeway network, a total of 68 minutes should be allocated during peak travel periods to be on-time 95% of the time.

At 3.41, the Hampton Roads freeway planning time index ranked 26th highest among all 101 urbanized areas measured by TTI in 2011. Looking only at those 31 large urbanized areas with populations between one and three million people, Hampton Roads ranked 8th highest (**Figure 5**). By comparison, Hampton Roads ranked 10th highest among the 31 large areas in terms of regional travel time index.

Looking at nearby urbanized areas, the Washington D.C. area had the highest planning time index in the country in 2011 (5.72). The Richmond area had a much lower planning time index (2.22) than Hampton Roads, as did the Raleigh-Durham area (2.34).

Hampton Roads Roadway Network

HRTPO obtained INRIX travel time reliability data for over 1,100 miles of the Hampton Roads roadway network. Based on this data, travel time reliability can be calculated using the buffer index and the planning time index. Both of these measures are analyzed for the Hampton Roads roadway network in this section.

Buffer Index

The buffer index is a measure of travel time reliability that compares the variability of travel times to average travel conditions. The buffer index increases as the roadway network becomes less reliable and can have any value greater than or equal to zero. The buffer index is calculated using the following formula:

$$\text{Buffer Index} = \frac{95^{\text{th}} \text{ Percentile Travel Time} - \text{Average Travel Time}}{\text{Average Travel Time}}$$

More information on the buffer index and other travel time reliability measures is included in the Delay and Travel Time Reliability Measures section of this report.

Appendix A includes information on the buffer index for each roadway segment during both the AM peak period (defined in this study as the four hours occurring between 5:00 am and 9:00 am) and the PM peak period (defined as the four hours occurring

JURIS- DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGH PROFILE LOCATION	HIGHEST BUFFER INDEX	HIGHEST BUFFER INDEX HOUR
HAM	I-64	RIP RAP RD	SETTLERS LANDING RD	EB	HRBT	3.99	8:00
PORT	I-264	FREDERICK BLVD	DES MOINES AVE	EB	DT	3.17	7:00
HAM	I-64	ARMISTEAD AVE	RIP RAP RD	EB	HRBT	3.12	8:00
NOR	I-264	WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	WB	DT	3.11	7:00
PORT	I-264	PORTSMOUTH BLVD	FREDERICK BLVD	EB	DT	2.96	8:00
PORT	I-264	DES MOINES AVE	EFFINGHAM ST	EB	DT	2.53	6:00
CHES	I-64	MILITARY HWY	I-264&664	WB	I-64 CHES	2.34	8:00
PORT	M L K FREEWAY	LONDON BLVD	WESTERN FREEWAY/MIDTOWN TUN	NB	MT	2.17	7:00
PORT	WESTERN FWY	WEST NORFOLK RD	MLK FREEWAY/MIDTOWN TUNNEL	EB	MT	2.17	7:00
CHES	I-64	GEORGE WASHINGTON HWY	MILITARY HWY	WB	I-64 CHES	2.13	7:00
PORT	WESTERN FWY	CEDAR LN	WEST NORFOLK RD	EB	MT	2.06	7:00
CHES/NOR	I-464	POINDEXTER ST	SOUTH MAIN ST	NB	DT	1.95	8:00
HAM	I-64	I-664	ARMISTEAD AVE	EB	HRBT	1.83	7:00
HAM	I-64	SETTLERS LANDING RD	MALLORY ST	EB	HRBT	1.80	8:00
NOR	I-264/BERKLEY BRIDGE	I-464	WATERSIDE/CITY HALL/TIDEWATER	WB	DT	1.80	7:00
NN	I-64	YORKTOWN RD	FORT EUSTIS BLVD	EB	I-64 PEN	1.66	8:00
NOR	I-464	SOUTH MAIN ST	I-264	NB	DT	1.66	8:00
NN	I-64	RTE 143 (NORTH)	YORKTOWN RD	EB	I-64 PEN	1.63	8:00

Table 1 – Freeway Segments with the Highest Buffer Index – AM Peak Period (2012)

Source: HRTPO analysis of INRIX data. Includes all freeway segments with a highest buffer index of 1.50 or higher.

In the following tables, the following abbreviations are used for high profile corridors:

DT = Downtown Tunnel
 GILM = Gilmerton Bridge
 HRBT = Hampton Roads Bridge-Tunnel
 I-64 CHES = I-64 corridor in Chesapeake
 I-64/I-264 = I-64/I-264 interchange area
 I-64/I-564 = I-64/I-564 corridor in Norfolk
 I-64 PEN = I-64 corridor on the Peninsula north of Jefferson Ave
 MT = Midtown Tunnel
 MMBT = Monitor-Merrimac Memorial Bridge-Tunnel
 US17 PEN = Route 17 corridor on the Peninsula

JURIS- DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGH PROFILE LOCATION	HIGHEST BUFFER INDEX	HIGHEST BUFFER INDEX HOUR
VB	INDIAN RIVER RD	KEMPSVILLE RD	FERRELL PKWY	WB	-	1.20	7:00
NOR/PORT	MIDTOWN TUNNEL	MLK FWY/WESTERN FREEWAY	BRAMBLETON AVE	NB	MT	1.10	7:00
NN	OYSTER POINT RD	CANON BLVD	I-64	WB	-	1.09	8:00
NOR/VB	NORTHAMPTON BLVD	I-64	DIAMOND SPRINGS RD	WB	-	1.07	8:00
VB	INDIAN RIVER RD	CENTERVILLE TNPK	KEMPSVILLE RD	WB	-	1.06	7:00
HAM	MERCURY BLVD	POWER PLANT PKWY	I-64	WB	-	1.02	8:00
VB	INDEPENDENCE BLVD	HOLLAND RD	BAXTER RD	NB	-	0.95	8:00
NOR	HAMPTON BLVD	21ST ST	27TH ST	NB	-	0.94	8:00
VB	KEMPSVILLE RD	PROVIDENCE RD	PRINCESS ANNE RD	EB	-	0.93	8:00
VB	FIRST COLONIAL RD	VA BEACH BLVD	I-264	SB	-	0.93	8:00
NOR	ST PAULS BLVD	I-264 RAMP/MACARTHUR MALL	BRAMBLETON AVE	NB	-	0.83	8:00
CHES	MILITARY HWY/GILMERTON BRIDGE	CANAL DR	BAINBRIDGE BLVD	EB	GILM	0.80	8:00
YC	VICTORY BLVD	ROUTE 17	HAMPTON HWY (RTE 134)	WB	-	0.79	8:00
VB	LONDON BRIDGE RD	POTTERS RD	VA BEACH BLVD	NB	-	0.78	8:00
VB	INDIAN RIVER RD	MILITARY HWY	PROVIDENCE RD	WB	-	0.78	8:00
NOR	HAMPTON BLVD	BRAMBLETON AVE	21ST ST	SB	MT	0.76	7:00
CHES	BATTLEFIELD BLVD	VOLVO PKWY	I-64	SB	-	0.76	8:00

Table 2 – Arterial Segments with the Highest Buffer Index – AM Peak Period (2012)

Source: HRTPO analysis of INRIX data. Includes all arterial segments with a highest buffer index of 0.75 or higher.

between 3:00 pm and 7:00 pm) on weekdays in 2012. **Maps 3-6** on pages 15-18 also show the buffer index for each roadway during both peak periods. The buffer index shown is the highest of the four hourly average buffer indices that occurred in each direction, as described in the Data Collection and Analysis section of this report.

Table 1 on page 12 shows the freeway segments throughout the region with the highest buffer indices during the weekday AM peak period. A total of 18 freeway segments have a buffer index of 1.50 or higher during the AM peak period, which means these freeway segments all have 95th percentile travel times that are at least two and a half times larger than the average travel time. All 18 of these freeway segments are located at high profile locations throughout the region, which include bridges and tunnels and other major bottlenecks (as described further in the Hampton Roads High Profile Corridors section, beginning on page 26). Of these 18 freeway segments, 7 segments are on the approaches to the Downtown Tunnel, 4 segments are on the approaches to the Hampton Roads Bridge-Tunnel, and 3 segments are on the Portsmouth approaches to the Midtown Tunnel.

Table 2 on page 12 shows the arterial segments throughout the region with the highest buffer indices during the weekday AM peak period. A total of 17 arterial segments have a buffer index of 0.75 or higher during the AM peak period. The arterial segments with the highest buffer indices during the AM peak period include two segments of westbound Indian River Road, the northbound Midtown Tunnel, westbound Oyster Point Road, and westbound Northampton Boulevard approaching I-64.

JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGH PROFILE LOCATION	HIGHEST BUFFER INDEX	HIGHEST BUFFER INDEX HOUR
HAM	I-64	RIP RAP RD	SETTLERS LANDING RD	EB	HRBT	4.31	17:00
NOR	I-264	WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	WB	DT	3.76	15:00
NOR	I-64	I-564/LITTLE CREEK RD	TIDEWATER DR	WB	HRBT	3.61	17:00
NN	I-64	RTE 143 (NORTH)	YORKTOWN RD	EB	I-64 PEN	3.43	17:00
NOR	I-64	4TH VIEW AVE	BAY AVE	WB	HRBT	3.28	15:00
NOR	I-64	BAY AVE	I-564/LITTLE CREEK RD	WB	HRBT	3.21	16:00
CHES	I-64	GREENBRIER PKWY	BATTLEFIELD BLVD	EB	I-64 CHES	3.16	17:00
NN	I-664	23RD ST	CHESTNUT AVE	SB	MMMBT	3.08	16:00
CHES	I-64	BATTLEFIELD BLVD	I-464	EB	I-64 CHES	3.07	16:00
NOR	I-264	I-64	NEWTOWN RD/WCL VA. BEACH	WB	I-64/I-264	3.07	17:00
NOR	I-264	BRAMBLETON AVE	BALLENTINE BLVD	WB	DT	3.04	17:00
NN	I-64	YORKTOWN RD	FORT EUSTIS BLVD	EB	I-64 PEN	2.96	17:00
JCC/NN/YC	I-64	GROVE CONNECTOR	RTE 143 (NORTH)	EB	I-64 PEN	2.71	17:00
PORT	I-264	FREDERICK BLVD	DES MOINES AVE	EB	DT	2.71	17:00
HAM	I-64	ARMISTEAD AVE	RIP RAP RD	EB	HRBT	2.70	17:00
NN	I-664	TERMINAL AVE	23RD ST	SB	MMMBT	2.20	17:00
HAM	I-64	SETTLERS LANDING RD	MALLORY ST	EB	HRBT	2.18	17:00
CHES	I-64	MILITARY HWY	I-264&664	WB	I-64 CHES	2.09	17:00
NOR	I-64	I-564/LITTLE CREEK RD	TIDEWATER DR	EB	I-64/I-564	1.98	17:00
NOR	I-64	4TH VIEW AVE	BAY AVE	EB	-	1.95	15:00
VB	I-264	NEWTOWN RD/ECL NORFOLK	WITCHDUCK RD	WB	I-64/I-264	1.90	17:00
NOR	I-264	I-64	NEWTOWN RD/WCL VA. BEACH	EB	I-64/I-264	1.85	15:00
PORT	I-264	DES MOINES AVE	EFFINGHAM ST	EB	DT	1.80	18:00
CHES	I-64	GEORGE WASHINGTON HWY	MILITARY HWY	WB	I-64 CHES	1.77	17:00
NOR/VB	I-64	I-264	INDIAN RIVER RD	WB	I-64/I-264	1.73	17:00
NOR	I-64	OCEAN VIEW AVE	4TH VIEW AVE	WB	HRBT	1.62	18:00
NOR	I-264	MILITARY HWY	I-64	EB	I-64/I-264	1.61	17:00
NOR	I-564	INTERNATIONAL TERMINAL BLVD	I-64	SB	I-64/I-564	1.56	17:00

Table 3 – Freeway Segments with the Highest Buffer Index – PM Peak Period (2012)

Source: HRTPO analysis of INRIX data. Includes all freeway segments with a highest buffer index of 1.50 or higher.

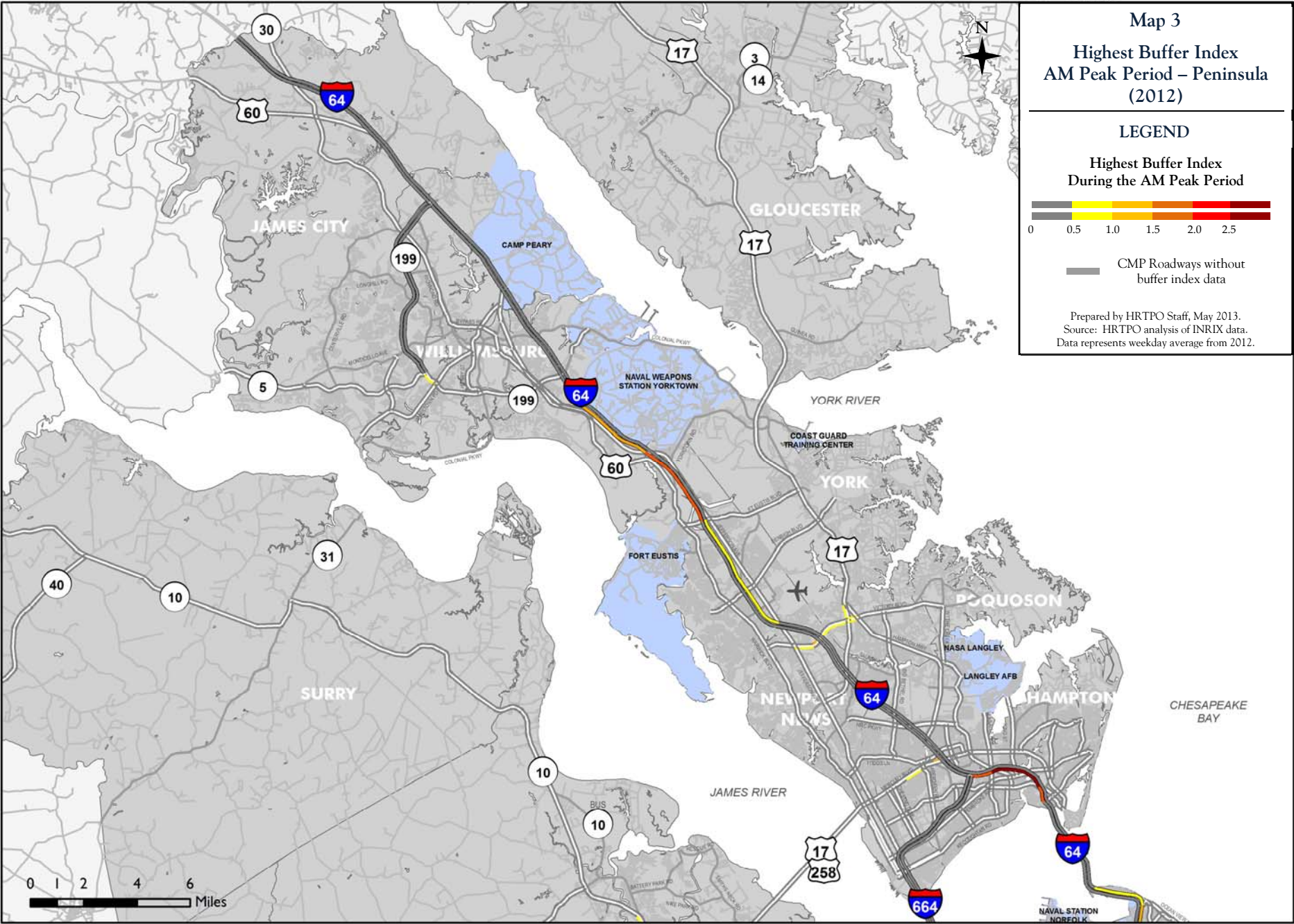
Table 3 on page 13 shows the freeway segments throughout the region with the highest buffer indices during the weekday PM peak period. A total of 28 freeway segments have a buffer index of 1.50 or higher during the PM peak period, as compared to 18 freeway segments during the AM peak period. Of these 28 segments, 7 segments are on approaches to the Hampton Roads Bridge-Tunnel, 5 segments are in the vicinity of the I-64/I-264 interchange in Norfolk, 4 segments are on approaches to the Downtown Tunnel, and 4 segments are in the I-64 corridor in Chesapeake.

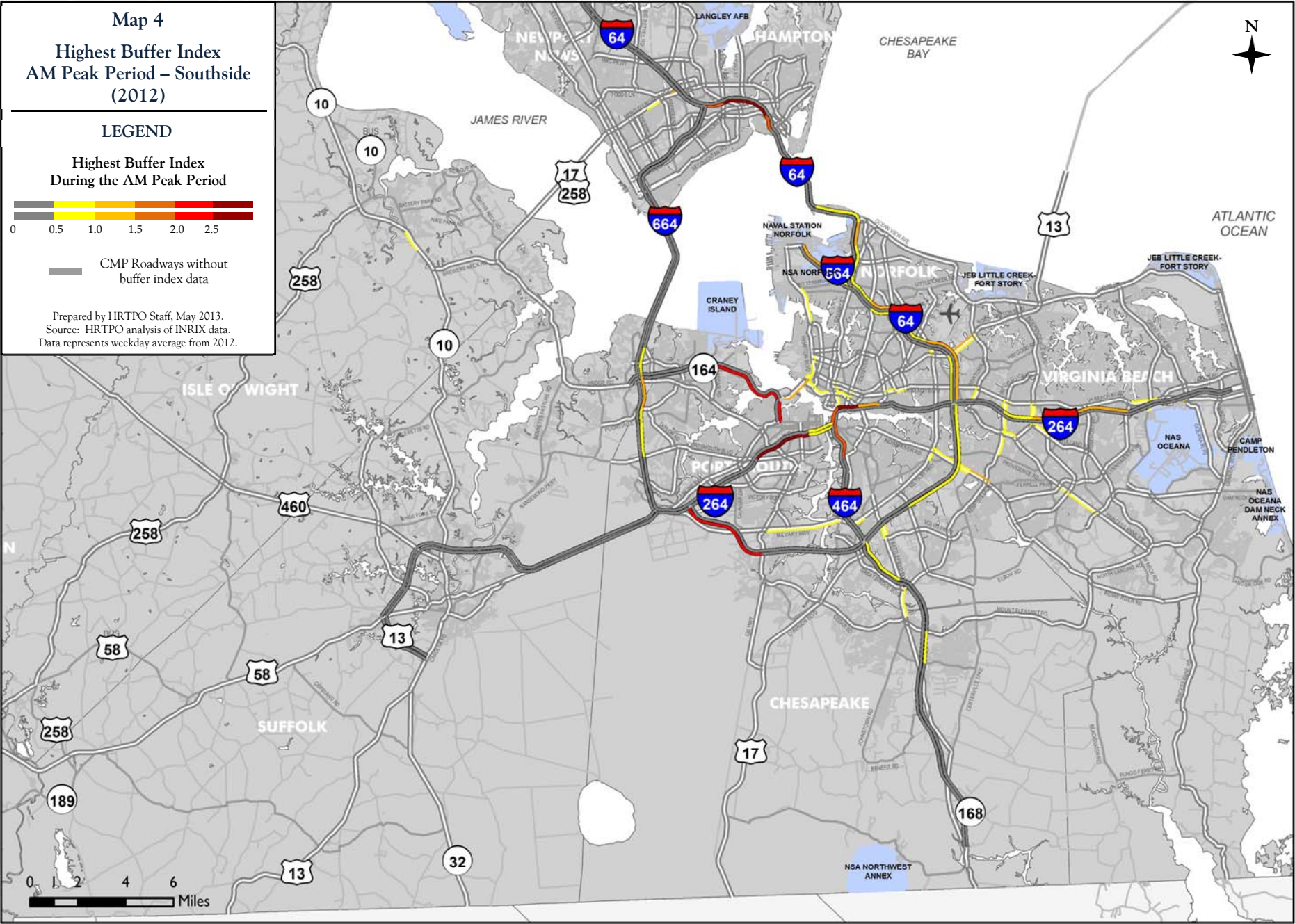
Table 4 shows the arterial segments with the highest buffer indices during the weekday PM peak period. A total of 37 arterial segments have a buffer index of 0.75 or higher during the PM peak period, as compared to 17 segments during the AM peak period. Arterial segments with the highest buffer index during the PM peak period include three segments approaching the Midtown Tunnel in Norfolk, two segments approaching the Gilmerton Bridge, Fourth View Street approaching the Hampton Roads Bridge-Tunnel, southbound Jefferson Avenue north of Yorktown Road, and eastbound Indian River Road to the east of I-64.

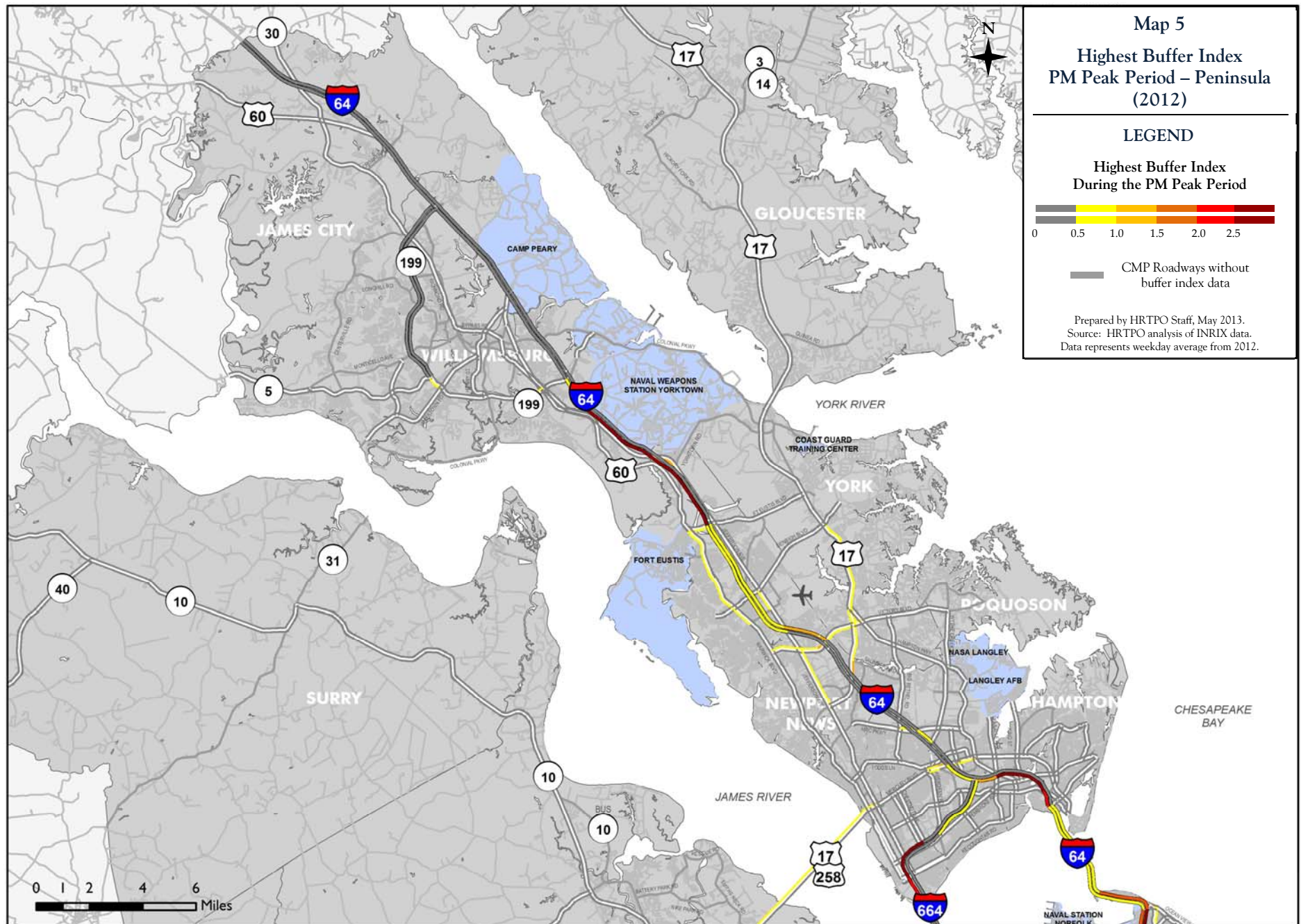
JURIS- DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGH PROFILE LOCATION	HIGHEST BUFFER INDEX	HIGHEST BUFFER INDEX HOUR
NOR	4TH VIEW ST	I-64	OCEAN VIEW AVE	WB	HRBT	1.80	16:00
CHES	MILITARY HWY	I-464	BAINBRIDGE BLVD	WB	GILM	1.79	16:00
NN	JEFFERSON AVE	JAMES CITY CL	YORKTOWN RD	SB	-	1.46	17:00
VB	INDIAN RIVER RD	I-64	CENTERVILLE TNPK	EB	-	1.37	18:00
NOR	BRAMBLETON AVE	HAMPTON BLVD	COLLEY AVE	WB	MT	1.28	15:00
CHES	MILITARY HWY	I-464	CAMPOSTELLA RD	WB	GILM	1.23	17:00
NOR	HAMPTON BLVD	BRAMBLETON AVE	21ST ST	SB	MT	1.17	15:00
NOR	HAMPTON BLVD	21ST ST	27TH ST	SB	MT	1.12	15:00
CHES	BATTLEFIELD BLVD	VOLVO PKWY	I-64	SB	-	1.12	17:00
NOR	MILITARY HWY	PRIN ANNE RD/NORTHAMPTON BLVD	I-64	SB	-	1.11	17:00
HAM	MERCURY BLVD	POWER PLANT PKWY	I-64	WB	-	1.07	16:00
VB	WITCHDUCK RD	PRINCESS ANNE RD	I-264	SB	-	1.07	17:00
VB	INDIAN RIVER RD	KEMPSVILLE RD	FERRELL PKWY	WB	-	1.06	17:00
VB	INDIAN RIVER RD	CENTERVILLE TNPK	KEMPSVILLE RD	EB	-	1.05	18:00
NN	OYSTER POINT RD	CANON BLVD	I-64	WB	-	1.03	16:00
NOR	ST PAULS BLVD	I-264 RAMP/MACARTHUR MALL	BRAMBLETON AVE	SB	DT	1.03	17:00
NN	J CLYDE MORRIS BLVD	I-64	HARPERSVILLE RD	NB	US17 PEN	1.02	17:00
NOR/PORT	MIDTOWN TUNNEL	MLK FWY/WESTERN FREEWAY	BRAMBLETON AVE	NB	MT	1.00	16:00
NOR	TIDEWATER DR	BRAMBLETON AVE	VA BEACH BLVD	SB	-	0.98	17:00
NN	OYSTER POINT RD	JEFFERSON AVE	CANON BLVD	WB	-	0.96	17:00
NOR	TIDEWATER DR	CITY HALL AVE	BRAMBLETON AVE	SB	DT	0.96	16:00
VB	INDEPENDENCE BLVD	BAXTER RD	I-264	SB	-	0.96	17:00
YC	GEORGE WASHINGTON HWY	VICTORY BLVD (RTE 171)	HAMPTON HWY (RTE 134)	NB	US17 PEN	0.95	17:00
NOR	NEWTOWN RD	KEMPSVILLE RD	I-264	SB	-	0.91	16:00
NOR/VB	NORTHAMPTON BLVD	I-64	DIAMOND SPRINGS RD	WB	-	0.85	16:00
VB	INDIAN RIVER RD	PROVIDENCE RD	I-64	EB	-	0.84	17:00
NN/YC	ROUTE 17	HARPERSVILLE RD	VICTORY BLVD (RTE 171)	NB	US17 PEN	0.83	17:00
NN	FORT EUSTIS BLVD	WARWICK BLVD	JEFFERSON AVE	EB	-	0.82	17:00
VB	MILITARY HWY	PROVIDENCE RD	INDIAN RIVER RD	NB	-	0.81	15:00
VB	WITCHDUCK RD	I-264	VA BEACH BLVD	NB	-	0.81	15:00
NOR	BRAMBLETON AVE	ST PAULS BLVD	I-264	EB	-	0.80	17:00
VB	INDEPENDENCE BLVD	I-264	VA BEACH BLVD	SB	-	0.80	17:00
CHES	BATTLEFIELD BLVD	I-64	MILITARY HWY	SB	-	0.79	17:00
VB	LONDON BRIDGE RD	POTTERS RD	VA BEACH BLVD	SB	-	0.78	16:00
HAM	MERCURY BLVD	ABERDEEN RD	POWER PLANT PKWY	EB	-	0.77	16:00
CHES	GREENBRIER PKWY	VOLVO PKWY	I-64	SB	-	0.77	17:00
NOR	TIDEWATER DR	VA BEACH BLVD	PRINCESS ANNE RD	SB	-	0.75	17:00

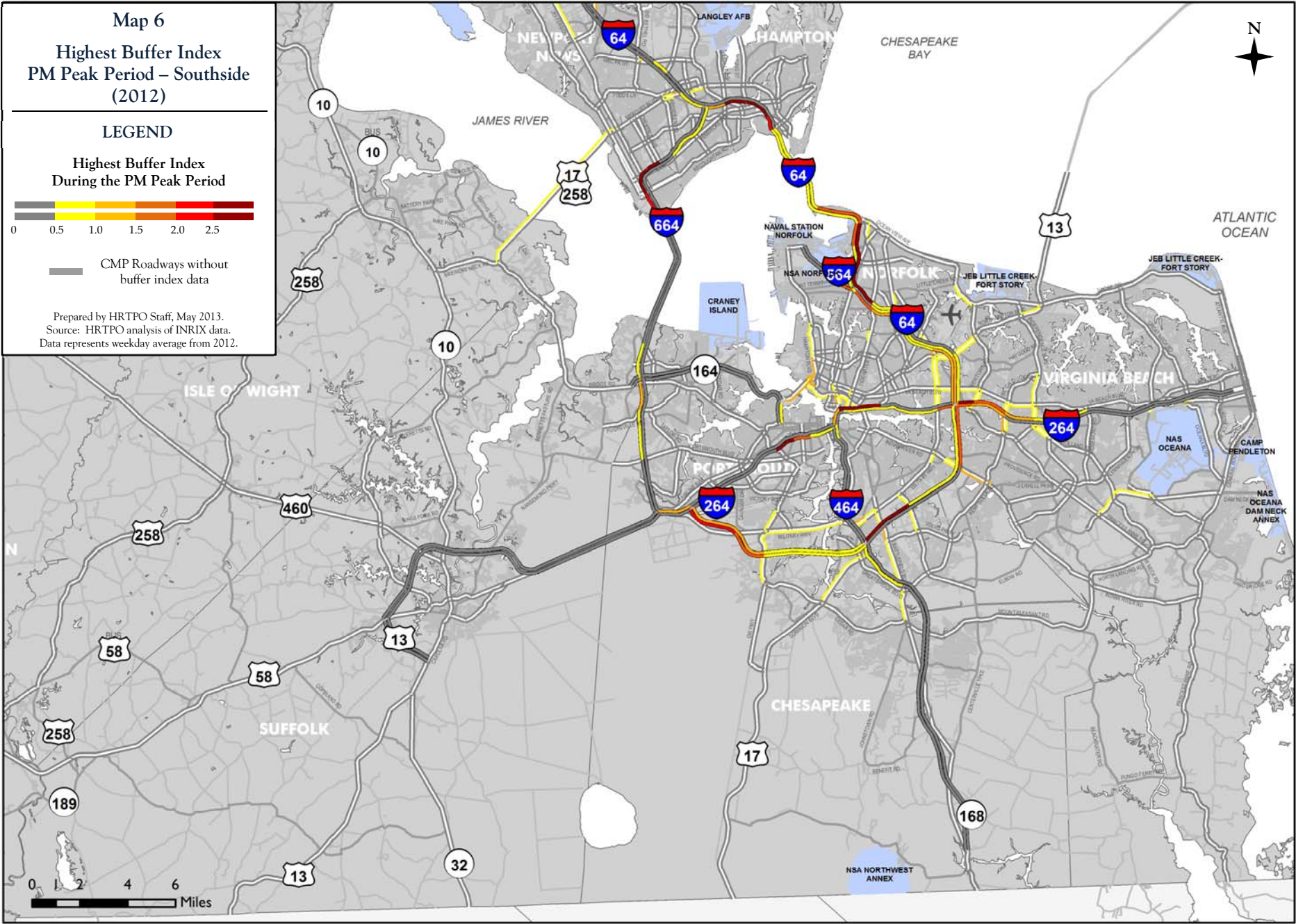
Table 4 – Arterial Segments with the Highest Buffer Index – PM Peak Period (2012)

Source: HRTPO analysis of INRIX data. Includes all arterial segments with a highest buffer index of 0.75 or higher.









Planning Time Index

The planning time index (PTI) measures reliability by comparing travel times during some of the most congested conditions with travel times in free-flow, uncongested conditions. The planning time index is the ratio of the 95th percentile travel time (also referred to as the planning time) versus the travel time during free-flow conditions as shown in the following formula:

$$\text{Planning Time Index} = \frac{\text{95}^{\text{th}} \text{ Percentile Travel Time}}{\text{Free-Flow Travel Time}}$$

The planning time index increases as the roadway network becomes congested and less reliable and generally has a value greater than or equal to one. More information on the planning time index and other travel time reliability measures is included in the Delay and Travel Time Reliability Measures section of this report.

Appendix A includes information on the planning time index for each roadway segment during both the AM peak period (defined in this study as the four hours occurring between 5:00 am and 9:00 am) and the PM peak period (defined as the four hours occurring between 3:00 pm and 7:00 pm) on weekdays in 2012. **Maps 7-10** on pages 22-25 also show the planning time index for each roadway during both peak periods. The planning time index shown is the highest of the four hourly average planning time indices that occurred in each direction, as described in the Data Collection and Analysis section of this report.

JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGH PROFILE LOCATION	HIGHEST PLANNING TIME INDEX	HIGHEST PTI HOUR
PORT	I-264	FREDERICK BLVD	DES MOINES AVE	EB	DT	9.20	8:00
HAM	I-64	RIP RAP RD	SETTLERS LANDING RD	EB	HRBT	7.34	7:00
PORT	I-264	DES MOINES AVE	EFFINGHAM ST	EB	DT	6.36	8:00
PORT	M L K FREEWAY	LONDON BLVD	WESTERN FREEWAY/MIDTOWN TUN	NB	MT	5.74	7:00
NOR	I-264	WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	WB	DT	5.41	7:00
NOR	I-264/BERKLEY BRIDGE	I-464	WATERSIDE/CITY HALL/TIDEWATER	WB	DT	5.35	7:00
PORT	I-264	PORTSMOUTH BLVD	FREDERICK BLVD	EB	DT	4.89	8:00
CHES	I-64	GEORGE WASHINGTON HWY	MILITARY HWY	WB	I-64 CHES	4.81	7:00
HAM	I-64	SETTLERS LANDING RD	MALLORY ST	EB	HRBT	4.64	7:00
PORT	WESTERN FWY	WEST NORFOLK RD	MLK FREEWAY/MIDTOWN TUNNEL	EB	MT	4.36	7:00
HAM	I-64	ARMISTEAD AVE	RIP RAP RD	EB	HRBT	4.33	8:00
NOR	I-464	SOUTH MAIN ST	I-264	NB	DT	4.26	8:00
CHES	I-64	MILITARY HWY	I-264&664	WB	I-64 CHES	4.09	8:00
CHES/NOR	I-464	POINDEXTER ST	SOUTH MAIN ST	NB	DT	3.82	8:00
PORT	WESTERN FWY	CEDAR LN	WEST NORFOLK RD	EB	MT	3.78	7:00
NOR	I-564	ADMIRAL TAUSSIG BLVD	INTERNATIONAL TERMINAL BLVD	NB	I-64/I-564	3.70	6:00

Table 5 – Freeway Segments with the Highest Planning Time Index – AM Peak Period (2012)

Source: HRTPO analysis of INRIX data. Includes all freeway segments with a planning time index of 3.00 or higher.

JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGH PROFILE LOCATION	HIGHEST PLANNING TIME INDEX	HIGHEST PTI HOUR
NOR/PORT	MIDTOWN TUNNEL	MLK FWY/WESTERN FREEWAY	BRAMBLETON AVE	NB	MT	3.32	8:00
VB	INDIAN RIVER RD	KEMPSVILLE RD	FERRELL PKWY	WB	-	3.32	7:00
VB	INDEPENDENCE BLVD	HOLLAND RD	BAXTER RD	NB	-	3.13	8:00
NOR/VB	NORTHAMPTON BLVD	I-64	DIAMOND SPRINGS RD	WB	-	2.86	8:00
VB	KEMPSVILLE RD	PROVIDENCE RD	PRINCESS ANNE RD	EB	-	2.80	8:00
VB	INDIAN RIVER RD	CENTERVILLE TNPK	KEMPSVILLE RD	WB	-	2.56	7:00
CHES	MILITARY HWY/GILMERTON BRIDGE	CANAL DR	BAINBRIDGE BLVD	EB	GILM	2.54	8:00
VB	WITCHDUCK RD	I-264	VA BEACH BLVD	SB	-	2.41	8:00
VB	INDIAN RIVER RD	MILITARY HWY	PROVIDENCE RD	WB	-	2.39	8:00
HAM	MERCURY BLVD	POWER PLANT PKWY	I-64	WB	-	2.35	8:00
VB	INDIAN RIVER RD	I-64	CENTERVILLE TNPK	EB	-	2.33	8:00
VB	LONDON BRIDGE RD	POTTERS RD	VA BEACH BLVD	NB	-	2.33	8:00
CHES	MILITARY HWY	GEORGE WASHINGTON HWY	CANAL DR	EB	GILM	2.31	8:00
VB	VA BEACH BLVD	LYNNHAVEN PKWY	LASKIN RD	WB	-	2.27	8:00
NOR	HAMPTON BLVD	21ST ST	27TH ST	NB	-	2.26	8:00

Table 6 – Arterial Segments with the Highest Planning Time Index – AM Peak Period (2012)

Source: HRTPO analysis of INRIX data. Includes all arterial segments with a planning time index of 2.25 or higher.

Table 5 on page 19 shows the freeway segments throughout the region with the highest planning time indices during the weekday AM peak period. A total of 16 freeway segments have a planning time index of 3.00 or higher during the AM peak period, which means that these freeway segments all have 95th percentile travel times that are at least three times larger than the travel time during free-flow conditions. All 16 of these freeway segments are located on high profile corridors throughout the region including 7 segments on approaches to the Downtown Tunnel, 3 segments on approaches to the Hampton Roads Bridge-Tunnel, and 3 segments on the Portsmouth approaches to the Midtown Tunnel.

Table 6 on page 19 shows the arterial segments throughout the region with the highest planning time indices during the weekday AM peak period. A total of 15 arterial segments have a planning time index of 2.25 or higher during this period. The arterial segments with the highest planning time indices during the AM peak period include the northbound Midtown Tunnel and sections of westbound Indian River Road, northbound Independence Boulevard, westbound Northampton Boulevard approaching I-64, and eastbound Kempsville Road.

Table 7 shows the freeway segments throughout the region with the highest planning time indices during the weekday PM peak period. A total of 32 freeway segments have a planning time index of 3.00 or higher during the PM peak period, as compared to 16 freeway segments during the AM peak period. All 32 of these freeway segments are located in high profile corridors, including 7 segments on approaches to the Hampton Roads Bridge-Tunnel, 6 segments in the I-64/I-564 corridor in Norfolk, 5

JURIS- DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGH PROFILE LOCATION	HIGHEST PLANNING TIME INDEX	HIGHEST PTI HOUR
NOR	I-264	WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	WB	DT	10.54	17:00
NOR	I-64	4TH VIEW AVE	BAY AVE	WB	HRBT	7.69	16:00
NOR	I-64	BAY AVE	I-564/LITTLE CREEK RD	WB	HRBT	6.96	16:00
HAM	I-64	RIP RAP RD	SETTLERS LANDING RD	EB	HRBT	6.69	16:00
NOR	I-264	BRAMBLETON AVE	BALLENTINE BLVD	WB	DT	6.61	17:00
CHES	I-64	BATTLEFIELD BLVD	I-464	EB	I-64 CHES	6.52	17:00
NOR	I-264/BERKLEY BRIDGE	I-464	WATERSIDE/CITY HALL/TIDEWATER	WB	DT	6.45	17:00
PORT	I-264	DES MOINES AVE	EFFINGHAM ST	EB	DT	5.84	16:00
NN	I-664	TERMINAL AVE	23RD ST	SB	MMMBT	5.80	16:00
NOR	I-64	I-564/LITTLE CREEK RD	TIDEWATER DR	WB	HRBT	5.39	17:00
NN	I-664	23RD ST	CHESTNUT AVE	SB	MMMBT	5.32	16:00
NN	I-64	YORKTOWN RD	FORT EUSTIS BLVD	EB	I-64 PEN	5.05	17:00
HAM	I-64	SETTLERS LANDING RD	MALLORY ST	EB	HRBT	5.01	16:00
NN	I-64	RTE 143 (NORTH)	YORKTOWN RD	EB	I-64 PEN	4.95	17:00
CHES	I-64	GREENBRIER PKWY	BATTLEFIELD BLVD	EB	I-64 CHES	4.82	17:00
NOR	I-64	I-564/LITTLE CREEK RD	TIDEWATER DR	EB	I-64/I-564	4.71	17:00
NOR	I-264	I-64	NEWTOWN RD/WCL VA. BEACH	WB	I-64/I-264	4.58	17:00
PORT	I-264	FREDERICK BLVD	DES MOINES AVE	EB	DT	4.43	16:00
NOR	I-64	OCEAN VIEW AVE	4TH VIEW AVE	WB	HRBT	3.94	16:00
JCC/NN/YC	I-64	GROVE CONNECTOR	RTE 143 (NORTH)	EB	I-64 PEN	3.92	17:00
NOR	I-64	TIDEWATER DR	CHESAPEAKE BLVD	EB	I-64/I-564	3.88	17:00
NOR	I-564	INTERNATIONAL TERMINAL BLVD	I-64	SB	I-64/I-564	3.87	17:00
HAM	I-64	ARMISTEAD AVE	RIP RAP RD	EB	HRBT	3.83	17:00
CHES	I-64	MILITARY HWY	I-264&664	WB	I-64 CHES	3.70	17:00
CHES	I-64	GEORGE WASHINGTON HWY	MILITARY HWY	WB	I-64 CHES	3.62	16:00
NOR	I-264	I-64	NEWTOWN RD/WCL VA. BEACH	EB	I-64/I-264	3.59	17:00
NOR	I-64	4TH VIEW AVE	BAY AVE	EB	I-64/I-564	3.42	15:00
NOR	I-64	MILITARY HWY	NORTHAMPTON BLVD	EB	I-64/I-564	3.30	17:00
NOR/VB	I-64	I-264	INDIAN RIVER RD	WB	I-64/I-264	3.29	17:00
NOR	I-64	CHESAPEAKE BLVD	NORVIEW AVE	EB	I-64/I-564	3.26	17:00
VB	I-264	NEWTOWN RD/ECL NORFOLK	WITCHDUCK RD	WB	I-64/I-264	3.08	17:00
NOR	I-64	NORTHAMPTON BLVD	I-264	EB	I-64/I-264	3.06	17:00

Table 7 – Freeway Segments with the Highest Planning Time Index – PM Peak Period (2012)

Source: HRTPO analysis of INRIX data. Includes all freeway segments with a planning time index of 3.00 or higher.

segments in the vicinity of the I-64/I-264 interchange in Norfolk, 5 segments on approaches to the Downtown Tunnel, and 4 segments in the I-64 corridor in Chesapeake.

Table 8 shows the arterial segments with the highest planning time indices during the weekday PM peak period. A total of 50 arterial segments have a planning time index of 2.25 or higher during the PM peak period, as compared to only 15 segments during the AM peak period. Arterial segments with the highest planning time indices during the PM peak period include two segments approaching the Gilmerton Bridge, two segments approaching the Midtown Tunnel in Norfolk, two segments on eastbound Indian River Road, Fourth View Street approaching the Hampton Roads Bridge-Tunnel, and a section of southbound Witchduck Road approaching I-264.

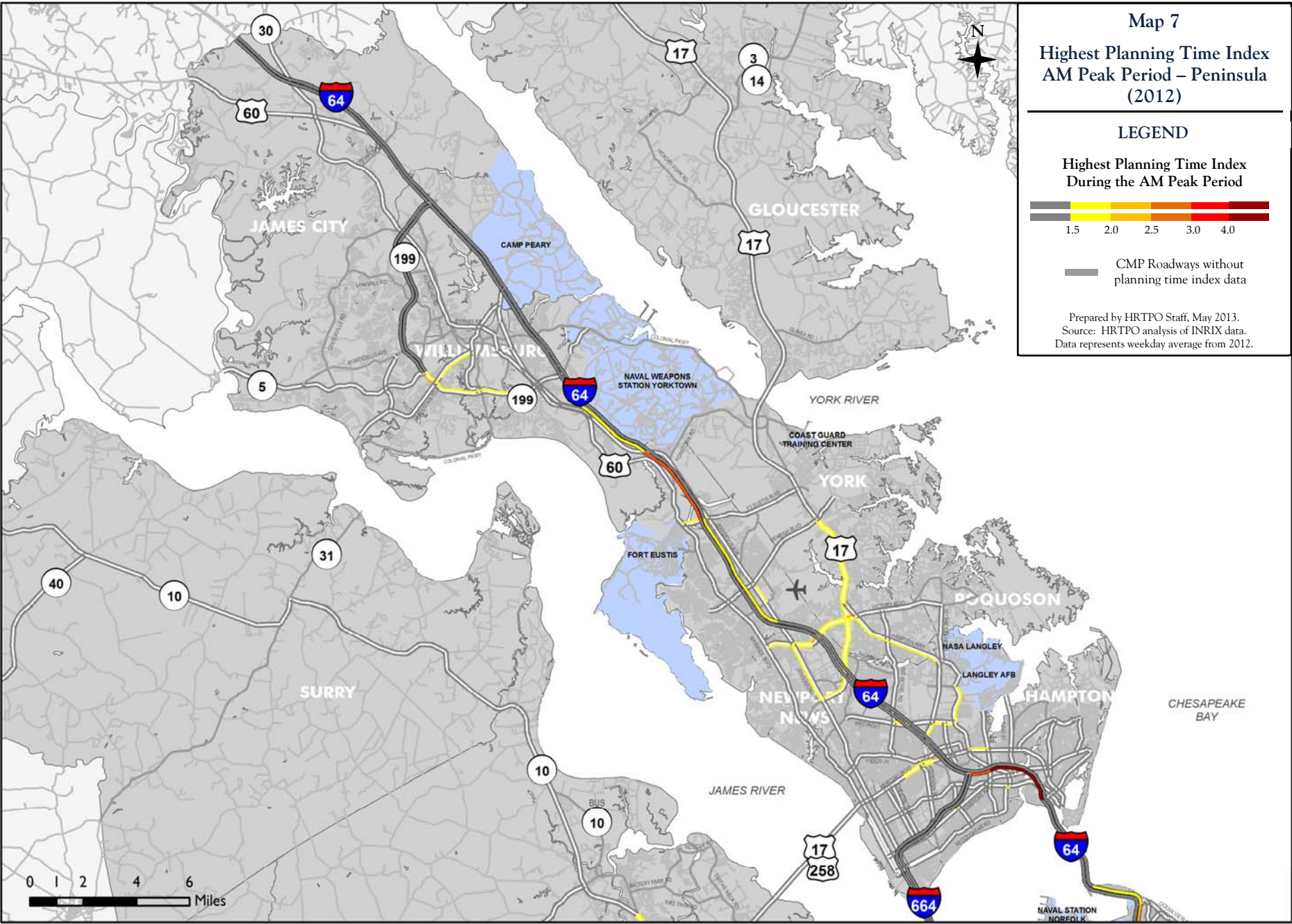
It should be noted that the roadway segments with high buffer indices in previous tables tend to also have similarly high planning time indices. There are exceptions, including:

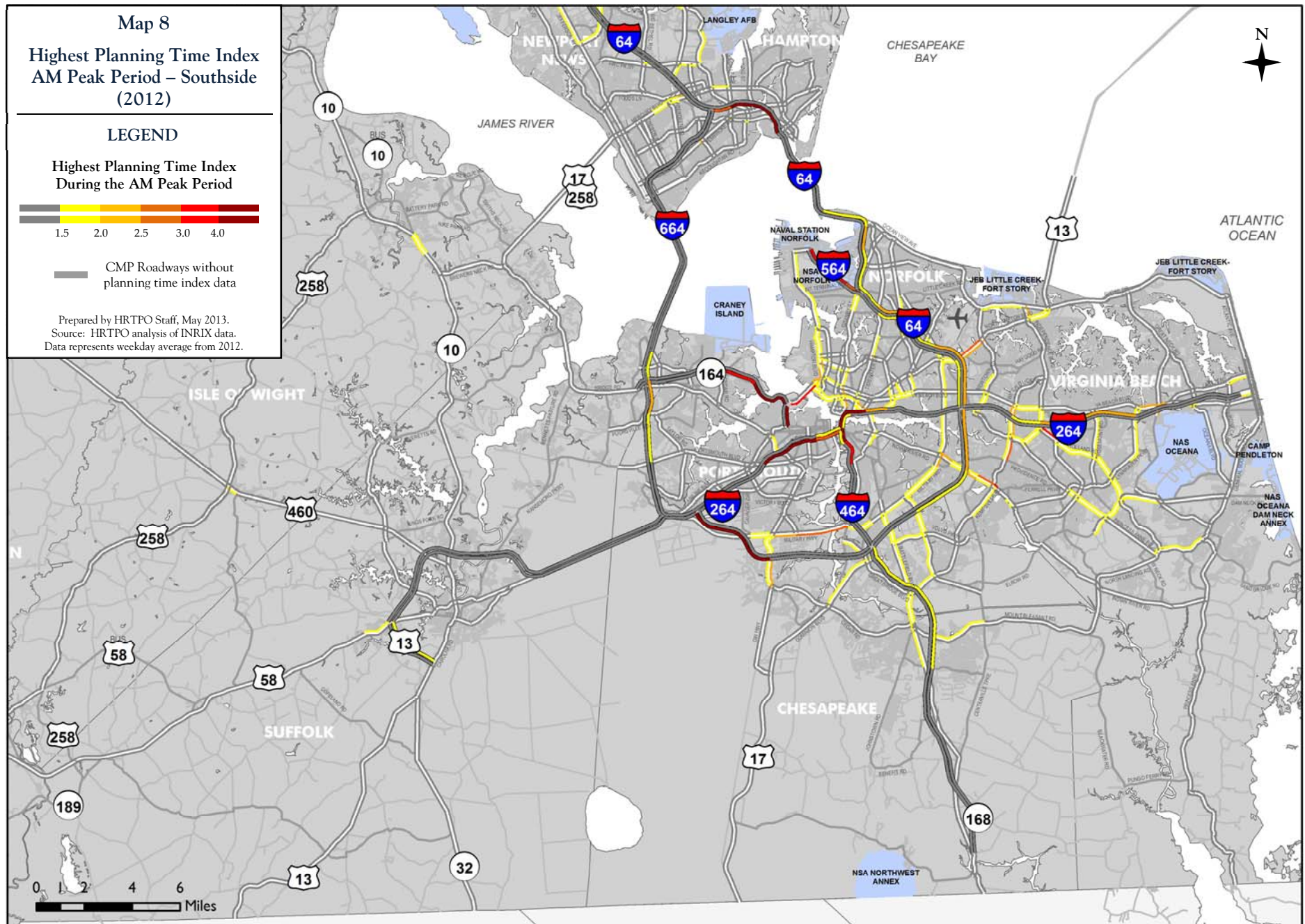
- Eastbound I-64 approaching Rip Rap Road, AM peak period – 3rd highest buffer index, 11th highest planning time index.
- Westbound Oyster Point Road, AM peak period – 3rd highest arterial buffer index, 17th highest planning time index.
- Eastbound I-64 approaching Yorktown Road, PM peak period – 4th highest freeway buffer index, 14th highest planning time index.
- Southbound Jefferson Avenue, PM peak period - 3rd highest arterial buffer index, 15th highest planning time index.

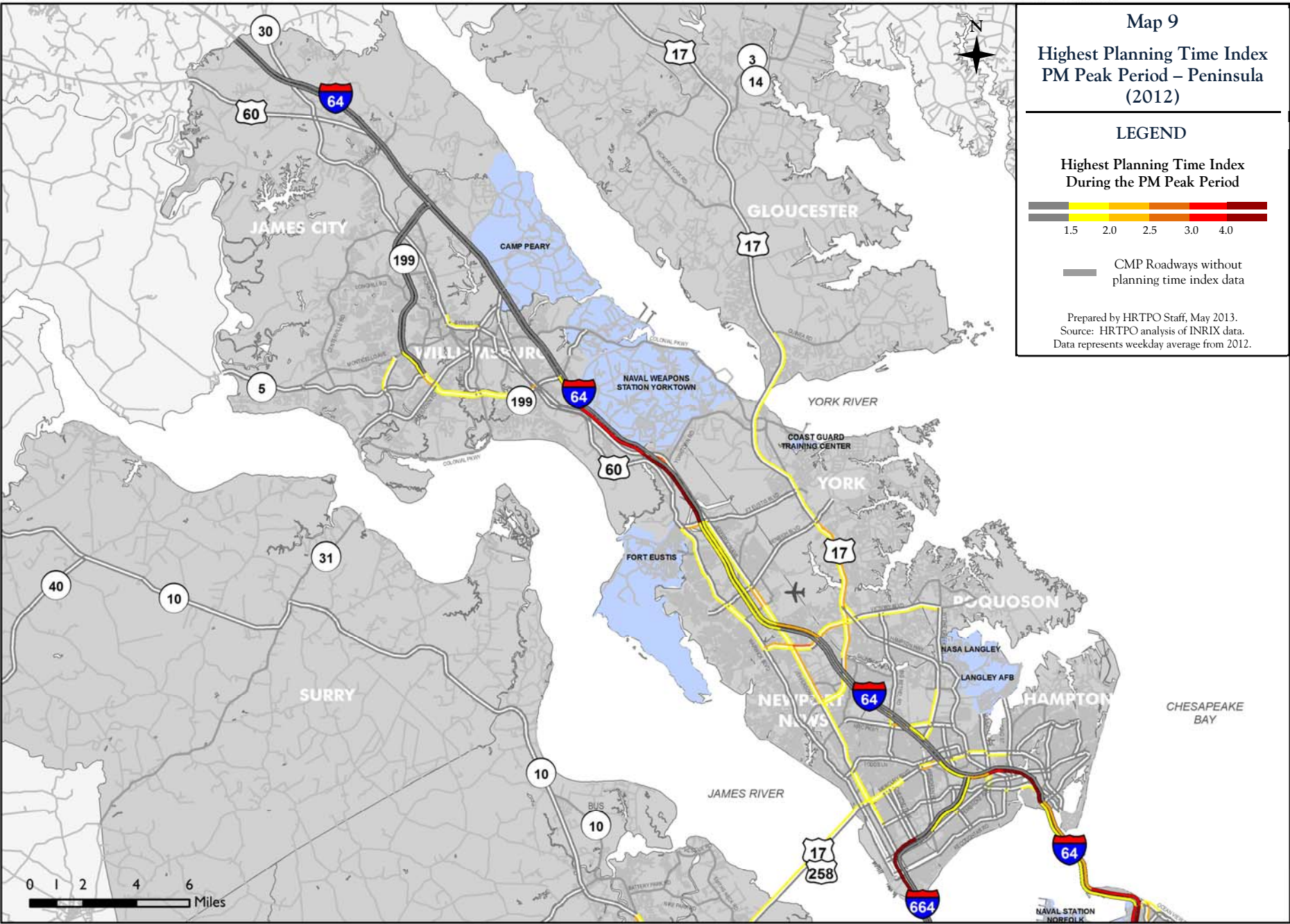
JURIS-DICTION	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	HIGH PROFILE LOCATION	HIGHEST PLANNING TIME INDEX	HIGHEST PTI HOUR
NOR	4TH VIEW ST	I-64	OCEAN VIEW AVE	WB	HRBT	5.19	16:00
CHES	MILITARY HWY	BAINBRIDGE BLVD	I-464	WB	GILM	4.50	16:00
VB	INDIAN RIVER RD	I-64	CENTERVILLE TNPK	EB	-	4.37	17:00
NOR	HAMPTON BLVD	BRAMBLETON AVE	21ST ST	SB	MT	3.94	15:00
VB	INDIAN RIVER RD	CENTERVILLE TNPK	KEMPSVILLE RD	EB	-	3.87	17:00
VB	WITCHDUCK RD	PRINCESS ANNE RD	I-264	SB	-	3.56	17:00
NOR	BRAMBLETON AVE	HAMPTON BLVD	COLLEY AVE	WB	MT	3.27	17:00
CHES	MILITARY HWY	I-464	CAMPOSTELLA RD	WB	GILM	3.26	17:00
VB	INDIAN RIVER RD	KEMPSVILLE RD	FERRELL PKWY	WB	-	3.00	17:00
NOR	MILITARY HWY	PRIN ANNE RD/NORTHAMPTON BLVD	I-64	SB	-	2.99	17:00
NOR/PORT	MIDTOWN TUNNEL	MLK FWY/WESTERN FREEWAY	BRAMBLETON AVE	NB	MT	2.98	16:00
NOR	HAMPTON BLVD	21ST ST	27TH ST	SB	MT	2.83	15:00
NOR	ST PAULS BLVD	I-264 RAMP/MACARTHUR MALL	BRAMBLETON AVE	SB	DT	2.79	17:00
NN	OYSTER POINT RD	JEFFERSON AVE	CANON BLVD	WB	-	2.76	17:00
NN	JEFFERSON AVE	JAMES CITY CL	YORKTOWN RD	SB	-	2.74	17:00
VB	DAM NECK RD	HOLLAND RD	LONDON BRIDGE RD	WB	-	2.74	16:00
CHES	BATTLEFIELD BLVD	VOLVO PKWY	I-64	SB	-	2.63	17:00
CHES	GREENBRIER PKWY	VOLVO PKWY	I-64	SB	-	2.61	17:00
CHES	GEORGE WASHINGTON HWY	MOSES GRANDY TR @ HINTON AVE	I-64	SB	-	2.60	17:00
CHES	MILITARY HWY/GILMERTON BRIDGE	CANAL DR	BAINBRIDGE BLVD	EB	GILM	2.59	16:00
VB	WITCHDUCK RD	I-264	VA BEACH BLVD	NB	-	2.59	15:00
NOR	TIDEWATER DR	CITY HALL AVE	BRAMBLETON AVE	SB	-	2.59	16:00
NOR/VB	NORTHAMPTON BLVD	I-64	DIAMOND SPRINGS RD	WB	-	2.58	16:00
NOR	CHESAPEAKE BLVD	I-64	LITTLE CREEK RD	NB	-	2.57	17:00
CHES	DOMINION BLVD	CEDAR RD	CHESAPEAKE EXPRESSWAY	SB	-	2.56	17:00
NOR	TIDEWATER DR	BRAMBLETON AVE	VA BEACH BLVD	SB	-	2.53	17:00
VB	INDIAN RIVER RD	PROVIDENCE RD	I-64	EB	-	2.52	17:00
YC	GEORGE WASHINGTON HWY	HAMPTON HWY (RTE 134)	DENBIGH BLVD (RTE 173)	NB	US17 PEN	2.48	17:00
VB	INDEPENDENCE BLVD	VA BEACH BLVD	PEMBROKE BLVD	SB	-	2.48	17:00
NOR	BRAMBLETON AVE	TIDEWATER DR	I-264	EB	-	2.46	17:00
CHES	BATTLEFIELD BLVD	CEDAR RD	GREAT BRIDGE BLVD/KEMPSVILLE RD	SB	-	2.46	17:00
YC	GEORGE WASHINGTON HWY	VICTORY BLVD (RTE 171)	HAMPTON HWY (RTE 134)	NB	US17 PEN	2.44	17:00
VB	WITCHDUCK RD	I-264	VA BEACH BLVD	SB	-	2.44	17:00
NN/YC	ROUTE 17	HARPERSVILLE RD	VICTORY BLVD (RTE 171)	NB	US17 PEN	2.43	17:00
VB	WITCHDUCK RD	PRINCESS ANNE RD	I-264	NB	-	2.42	17:00
NOR	NEWTOWN RD	KEMPSVILLE RD	I-264	SB	-	2.42	16:00
VB	INDIAN RIVER RD	PROVIDENCE RD	I-64	WB	-	2.41	16:00
NOR	BRAMBLETON AVE	ST PAULS BLVD	TIDEWATER DR	EB	-	2.38	17:00
NN	JEFFERSON AVE	OYSTER POINT RD	J CLYDE MORRIS BLVD	NB	-	2.37	17:00
NN	J CLYDE MORRIS BLVD	I-64	HARPERSVILLE RD	NB	-	2.34	17:00
CHES	MILITARY HWY	GEORGE WASHINGTON HWY	CANAL DR	EB	GILM	2.34	16:00
VB	MILITARY HWY	PROVIDENCE RD	INDIAN RIVER RD	NB	-	2.34	15:00
VB	INDEPENDENCE BLVD	I-264	VA BEACH BLVD	SB	-	2.34	17:00
VB	LONDON BRIDGE RD	POTTERS RD	VA BEACH BLVD	SB	-	2.34	17:00
NOR	NEWTOWN RD	I-264	VA BEACH BLVD	SB	-	2.31	17:00
JCC/WMB	ROUTE 199	JOHN TYLER HWY (RTE 5)	JAMESTOWN RD	EB	-	2.29	17:00
VB	DAM NECK RD	PRINCESS ANNE RD	HOLLAND RD	WB	-	2.29	17:00
VB	INDEPENDENCE BLVD	HOLLAND RD	BAXTER RD	SB	-	2.29	17:00
VB	FIRST COLONIAL RD	VA BEACH BLVD	I-264	NB	-	2.27	16:00
HAM	MERCURY BLVD	POWER PLANT PKWY	I-64	WB	-	2.27	16:00

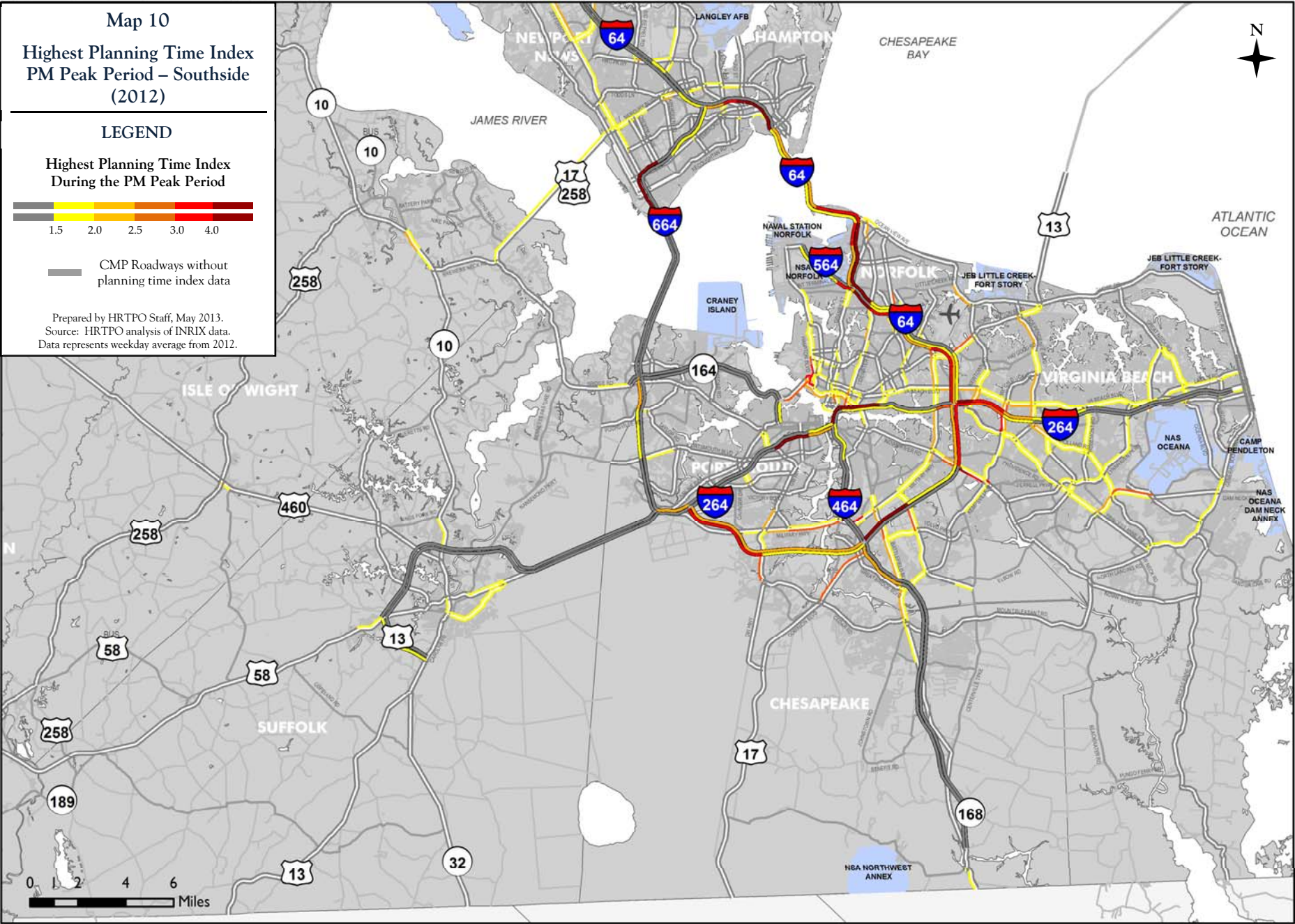
Table 8 – Arterial Segments with the Highest Planning Time Index – PM Peak Period (2012)

Source: HRTPO analysis of INRIX data. Includes all arterial segments with a planning time index of 2.25 or higher.









Hampton Roads High Profile Corridors

The previous section detailed the travel time reliability of individual roadway segments throughout the region. This section examines in further detail the reliability at ten high profile corridors throughout Hampton Roads, including bridges and tunnels and other major bottlenecks. These corridors include:

- **Downtown Tunnel**
- **Midtown Tunnel**
- **Hampton Roads Bridge-Tunnel (HRBT)**
- **Monitor-Merrimac Memorial Bridge-Tunnel (MMMBT)**
- **I-64 in Chesapeake**
- **I-64/I-564 in Norfolk**
- **I-64/I-264 Interchange Area**
- **I-64 on the Peninsula**
- **Route 17 on the Peninsula**
- **Gilmerton Bridge**

These locations (as shown in **Figure 6**) were chosen due to their importance in the Hampton Roads transportation network. These locations are not necessarily those corridors with the highest congestion levels, nor do they necessarily have the most unreliable travel times. These corridors have also been studied in detail in previous HRTPO reports, including the *Hampton Roads Regional Travel Time/Speed Study*³ and the *Hampton Roads Regional Freight Study*⁴.

In addition to the weekday peak period travel time reliability analyzed in the previous section, a number of other aspects of travel time reliability are examined for these high profile corridors. These aspects include reliability by time of day, day of week, and time of year. Each corridor is documented on the following pages (**Figure 7**), and travel time reliability data for each corridor is also included in **Appendix B**.

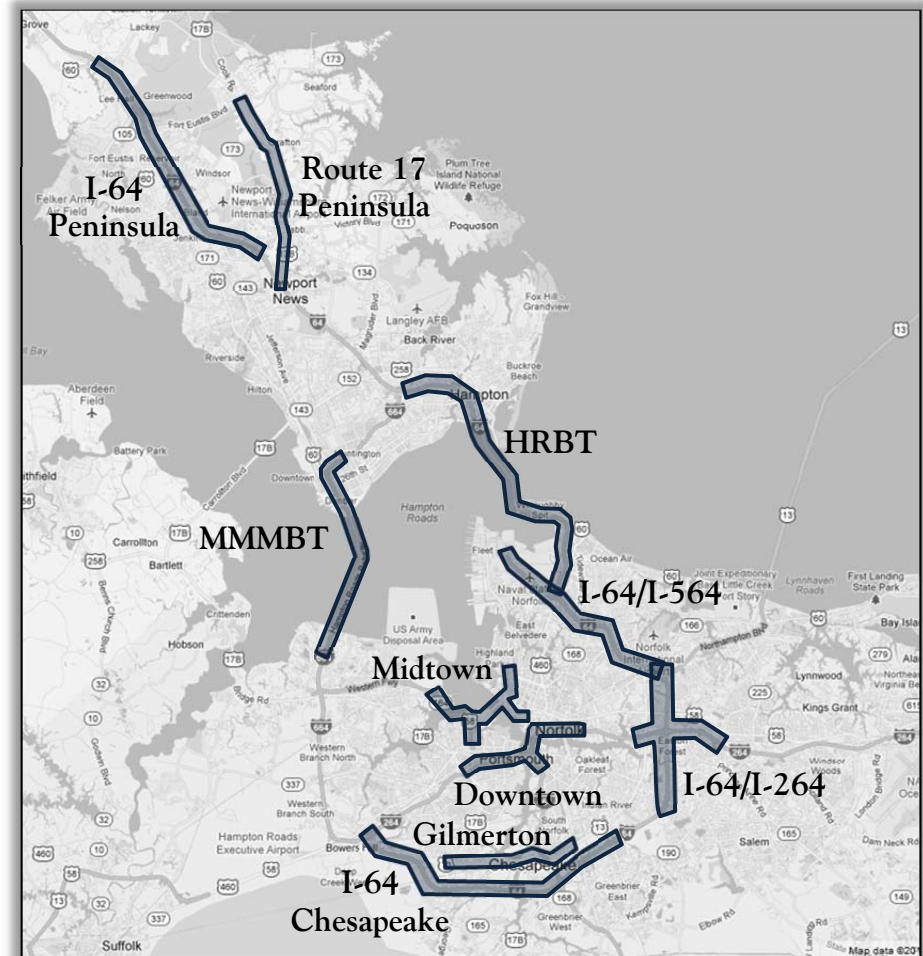


Figure 6 – High Profile Corridors in Hampton Roads

Source: HRTPO.

³ *Hampton Roads Regional Travel Time/Speed Study*, HRTPO, April 2012.

⁴ *Hampton Roads Regional Freight Study*, HRTPO, September 2012.

Downtown Tunnel Corridor Between Portsmouth Boulevard and Ballentine Boulevard



Weekday Factors by Segment – Worst Hour in Peak Period (2012)

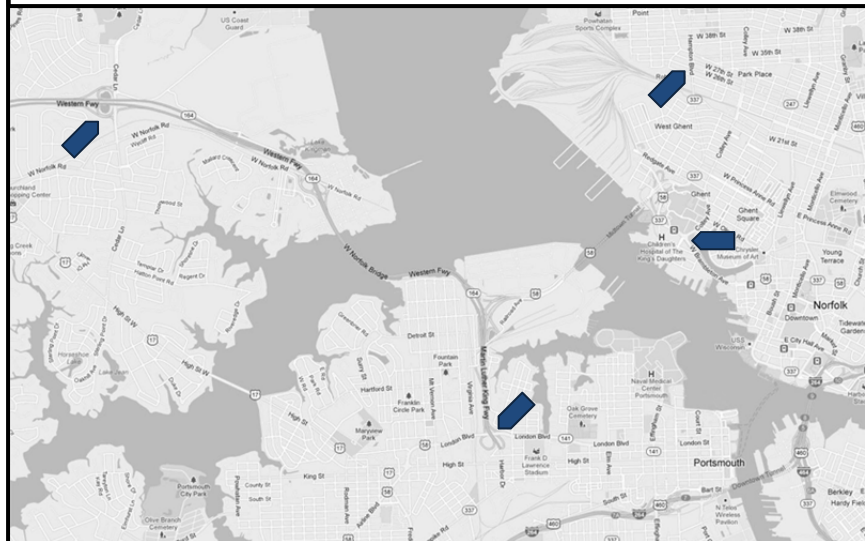
I-264 Eastbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
PORTSMOUTH BLVD	FREDERICK BLVD	51	1.25	2.96	4.89	61	1.01	0.48	1.49
FREDERICK BLVD	DES MOINES AVE	29	2.29	3.17	9.20	48	1.29	2.71	4.43
DES MOINES AVE	EFFINGHAM ST	15	3.57	2.53	6.36	17	3.25	1.80	5.84
EFFINGHAM ST	I-464	27	1.70	0.73	2.79	33	1.42	0.53	2.09
I-464	WATERSIDE/CITY HALL/TIDEWATER	40	1.17	0.36	1.60	45	1.04	0.39	1.46
WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	55	1.03	0.14	1.18	54	1.05	0.71	1.79
BRAMBLETON AVE	BALLENINE BLVD	61	1.00	0.13	1.13	59	1.05	0.86	1.95

I-264 Westbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
BALLENINE BLVD	BRAMBLETON AVE	56	1.07	1.01	2.15	37	1.68	3.04	6.61
BRAMBLETON AVE	WATERSIDE/CITY HALL/TIDEWATER	41	1.36	3.11	5.41	16	3.46	3.76	10.54
WATERSIDE/CITY HALL/TIDEWATER	I-464	24	1.97	1.80	5.35	12	3.94	1.43	6.45
I-464	EFFINGHAM ST	38	1.30	0.52	1.94	37	1.35	0.45	1.84
EFFINGHAM ST	DES MOINES AVE	60	1.00	0.11	1.13	60	1.00	0.20	1.21
DES MOINES AVE	FREDERICK BLVD	62	0.97	0.09	1.07	62	0.97	0.12	1.09
FREDERICK BLVD	PORTSMOUTH BLVD	61	1.01	0.19	1.12	61	1.00	0.18	1.19

Midtown Tunnel Corridor Between Cedar Lane/London Boulevard and Colley Avenue/27th Street



Weekday Factors by Segment – Worst Hour in Peak Period (2012)

Western Freeway Eastbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
CEDAR LN	WEST NORFOLK RD	49	1.32	2.06	3.78	60	1.02	0.07	1.10
WEST NORFOLK RD	MLK FREEWAY/MIDTOWN TUNNEL	40	1.40	2.17	4.36	52	1.03	0.34	1.38

MLK Freeway/Midtown Tunnel Northbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
LONDON BLVD	WESTERN FWY/MIDTOWN TUNNEL	30	1.82	2.17	5.74	39	1.30	0.50	1.98
MLK FWY/WESTERN FREEWAY	BRAMBLETON AVE	26	1.69	1.10	3.32	29	1.50	1.00	2.98

Brambleton Avenue Westbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
COLLEY AVE	HAMPTON BLVD	34	1.04	0.53	1.58	24	1.45	1.28	3.27

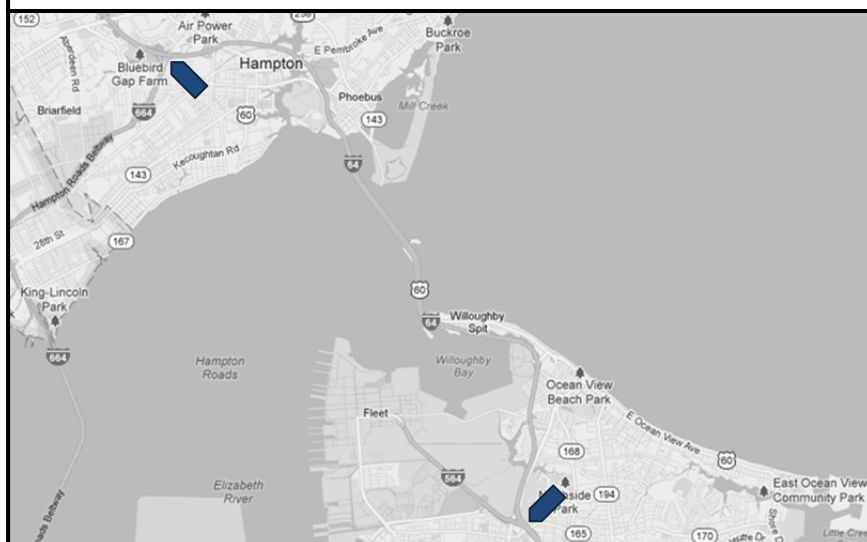
Hampton Boulevard Southbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
27TH ST	21ST ST	31	1.20	0.33	1.61	27	1.36	1.12	2.83
21ST ST	BRAMBLETON AVE	26	1.25	0.76	2.15	18	1.85	1.17	3.94
BRAMBLETON AVE	WESTERN FWY	40	0.89	0.37	1.22	40	0.91	0.38	1.26

Figure 7 – High Profile Corridors

Source: HRTPO analysis of INRIX data. Data included in these tables are also included in Appendix A.

Hampton Roads Bridge-Tunnel Corridor Between I-664 and I-564



Weekday Factors by Segment – Worst Hour in Peak Period (2012)

I-64 Eastbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
I-664	ARMISTEAD AVE	61	1.02	1.83	2.83	61	1.02	1.30	2.35
ARMISTEAD AVE	RIP RAP RD	58	1.08	3.12	4.33	58	1.08	2.70	3.83
RIP RAP RD	SETTLERS LANDING RD	33	2.00	3.99	7.34	38	1.86	4.31	6.69
SETTLERS LANDING RD	MALLORY ST	26	2.39	1.80	4.64	28	2.39	2.18	5.01
MALLORY ST	OCEAN VIEW AVE	51	1.14	0.34	1.49	48	1.20	0.51	1.66
OCEAN VIEW AVE	4TH VIEW AVE	62	0.97	0.16	1.11	58	1.05	0.85	1.97
4TH VIEW AVE	BAY AVE	62	0.98	0.12	1.09	50	1.26	1.95	3.42
BAY AVE	I-564	62	0.98	0.11	1.07	52	1.17	0.76	2.06

I-64 Westbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
I-564	BAY AVE	62	0.99	0.82	1.80	36	2.01	3.21	6.96
BAY AVE	4TH VIEW AVE	61	1.02	1.28	2.29	23	3.12	3.28	7.69
4TH VIEW AVE	OCEAN VIEW AVE	58	1.04	0.86	1.89	30	2.14	1.62	3.94
OCEAN VIEW AVE	MALLORY ST	57	1.03	0.24	1.27	46	1.38	0.59	2.00
MALLORY ST	SETTLERS LANDING RD	63	0.97	0.08	1.04	63	0.98	0.08	1.06
SETTLERS LANDING RD	RIP RAP RD	64	0.98	0.21	1.16	63	0.98	0.09	1.07
RIP RAP RD	ARMISTEAD AVE	64	0.98	0.21	1.16	63	0.98	0.09	1.07
ARMISTEAD AVE	I-664	65	0.99	0.06	1.04	64	0.99	0.22	1.21

Monitor-Merrimac Memorial Bridge-Tunnel Corridor Between College Drive and Chestnut Avenue



Weekday Factors by Segment – Worst Hour in Peak Period (2012)

I-664 Northbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
COLLEGE DR	TERMINAL AVE	61	0.98	0.16	1.14	62	0.97	0.11	1.08
TERMINAL AVE	23RD ST	63	0.99	0.06	1.06	63	0.99	0.12	1.12
23RD ST	CHESTNUT AVE	64	0.98	0.08	1.06	63	0.98	0.16	1.14

I-664 Southbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
CHESTNUT AVE	23RD ST	62	0.99	0.20	1.19	47	1.44	3.08	5.32
23RD ST	TERMINAL AVE	59	1.01	0.31	1.31	23	2.76	2.20	5.80
TERMINAL AVE	COLLEGE DR	63	0.98	0.10	1.06	57	1.07	0.35	1.38

Figure 7 (continued) – High Profile Corridors

Source: HRTPO analysis of INRIX data. Data included in these tables are also included in Appendix A.

I-64 Chesapeake Corridor Between I-264/I-664 and Greenbrier Parkway



Weekday Factors by Segment – Worst Hour in Peak Period (2012)

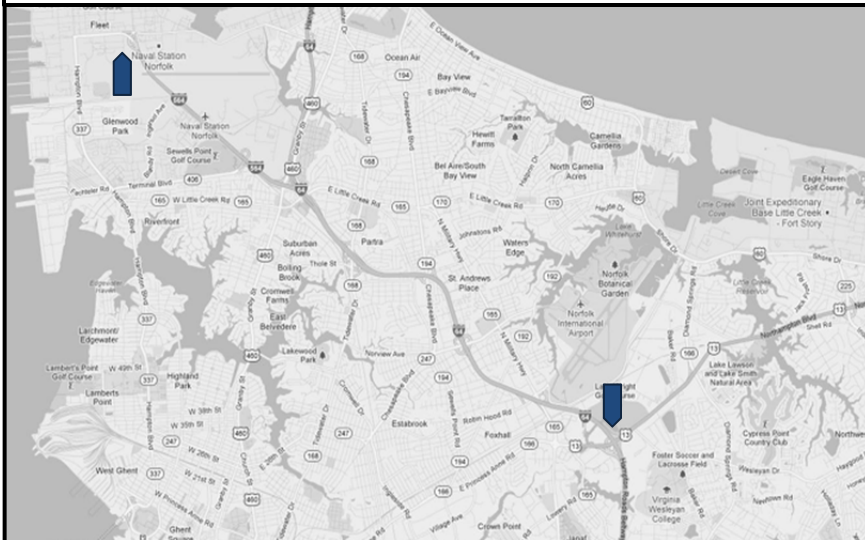
I-64 Eastbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
GREENBRIER PKWY	BATTLEFIELD BLVD	62	0.99	0.11	1.10	54	1.18	3.16	4.82
BATTLEFIELD BLVD	I-464	61	1.00	0.49	1.49	36	1.89	3.07	6.52
I-464	GEORGE WASHINGTON HWY	61	0.98	0.20	1.19	51	1.23	0.92	2.31
GEORGE WASHINGTON HWY	MILITARY HWY	63	0.97	0.07	1.04	59	1.05	1.38	2.44
MILITARY HWY	I-264/I-664	62	0.98	0.07	1.06	57	1.09	1.26	2.38

I-64 Westbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
I-264/I-664	MILITARY HWY	50	1.26	2.34	4.09	54	1.16	2.09	3.70
MILITARY HWY	GEORGE WASHINGTON HWY	37	1.73	2.13	4.81	49	1.28	1.77	3.62
GEORGE WASHINGTON HWY	I-464	58	1.05	0.42	1.48	58	1.05	0.68	1.79
I-464	BATTLEFIELD BLVD	62	0.99	0.08	1.07	63	0.98	0.08	1.07
BATTLEFIELD BLVD	GREENBRIER PKWY	63	1.00	0.25	1.26	64	0.99	0.26	1.25

I-64/I-564 Corridor Between Admiral Taussig Boulevard and Northampton Boulevard



Weekday Factors by Segment – Worst Hour in Peak Period (2012)

I-64/I-564 Eastbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
ADMIRAL TAUSSIG BLVD	INT TERMINAL BLVD	49	1.17	0.02	1.18	48	1.20	0.37	1.67
INT TERMINAL BLVD	I-64	50	1.20	0.02	1.22	40	1.50	1.56	3.87
I-564	TIDEWATER DR	63	0.99	0.22	1.20	42	1.53	1.98	4.71
TIDEWATER DR	CHESAPEAKE BLVD	61	1.01	0.78	1.82	36	1.72	1.27	3.88
CHESAPEAKE BLVD	NORVIEW AVE	59	1.04	0.88	1.91	36	1.75	1.12	3.26
NORVIEW AVE	MILITARY HWY	60	1.02	0.31	1.33	44	1.39	0.82	2.44
MILITARY HWY	NORTHAMPTON BLVD	61	1.00	0.27	1.28	42	1.51	1.47	3.3

I-64/I-564 Westbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
NORTHAMPTON BLVD	MILITARY HWY	57	1.07	1.05	2.18	62	0.99	0.16	1.15
MILITARY HWY	NORVIEW AVE	58	1.05	0.87	1.97	62	0.99	0.15	1.14
NORVIEW AVE	CHESAPEAKE BLVD	59	1.04	1.15	2.31	62	0.98	0.25	1.23
CHESAPEAKE BLVD	TIDEWATER DR	58	1.08	1.12	2.41	62	0.99	0.53	1.50
TIDEWATER DR	I-564	61	1.01	0.67	1.68	53	1.24	3.61	5.39
I-564	INT TERMINAL BLVD	46	1.34	0.88	2.57	50	1.23	0.05	1.29
INT TERMINAL BLVD	ADMIRAL TAUSSIG BLVD	34	1.71	1.13	3.7	50	1.16	0.01	1.18

Figure 7 (continued) – High Profile Corridors

Source: HRTPO analysis of INRIX data. Data included in these tables are also included in Appendix A.

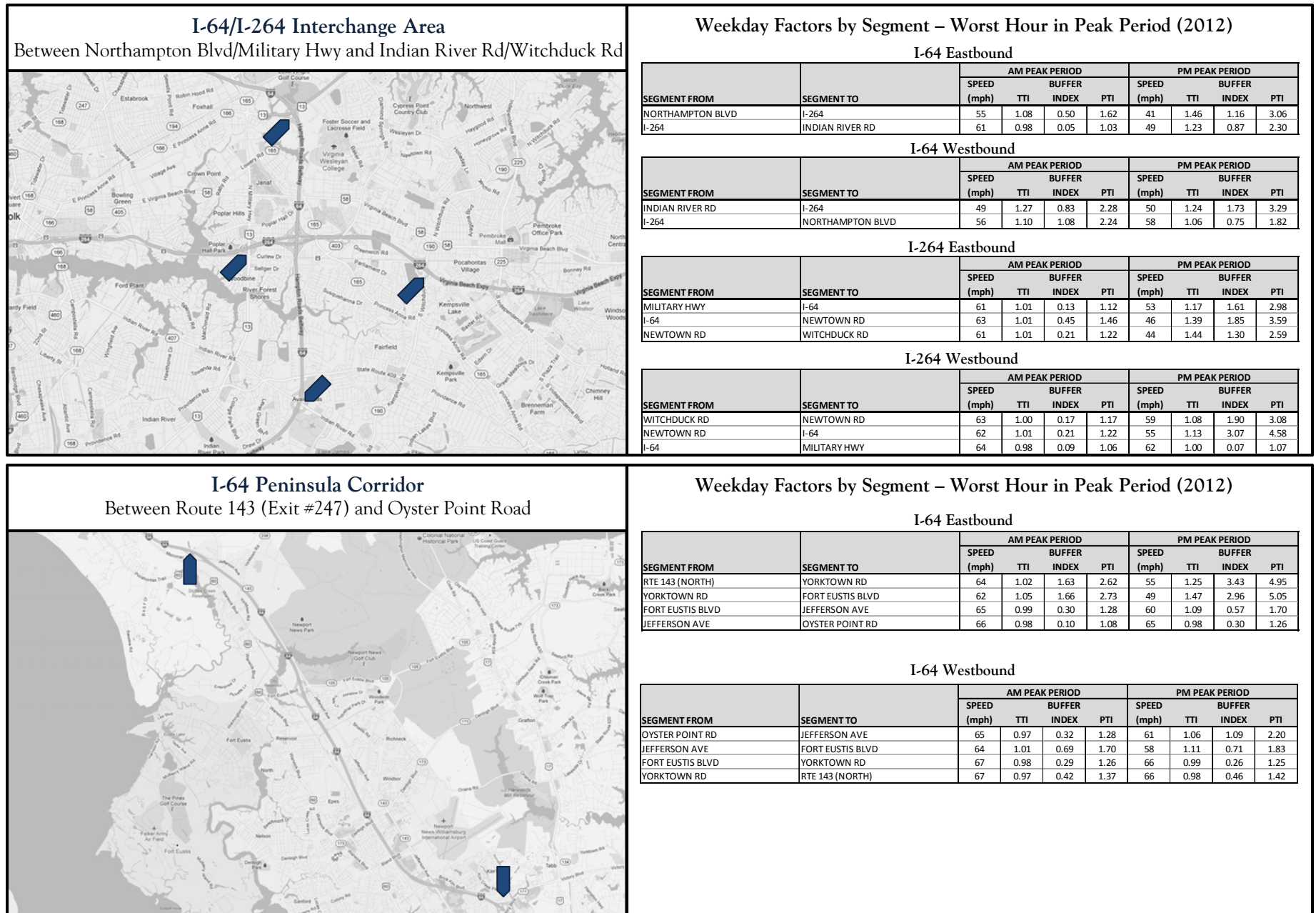


Figure 7 (continued) – High Profile Corridors

Source: HRTPO analysis of INRIX data. Data included in these tables are also included in Appendix A.

Route 17 Peninsula Corridor Between I-64 and Denbigh Boulevard



Weekday Factors by Segment – Worst Hour in Peak Period (2012)

Route 17 Northbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
I-64	HARPERSVILLE RD	36	1.07	0.47	1.55	31	1.22	1.02	2.34
HARPERSVILLE RD	VICTORY BLVD (RTE 171)	36	1.27	0.30	1.64	33	1.40	0.83	2.43
VICTORY BLVD (RTE 171)	HAMPTON HWY (RTE 134)	39	1.10	0.46	1.59	35	1.25	0.95	2.44
HAMPTON HWY (RTE 134)	DENBIGH BLVD (RTE 173)	40	1.21	0.40	1.67	34	1.44	0.68	2.48

Route 17 Southbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
DENBIGH BLVD (RTE 173)	HAMPTON HWY (RTE 134)	39	1.23	0.49	1.82	39	1.25	0.45	1.85
HAMPTON HWY (RTE 134)	VICTORY BLVD (RTE 171)	37	1.13	0.66	1.87	33	1.25	0.57	1.95
VICTORY BLVD (RTE 171)	HARPERSVILLE RD	37	1.23	0.35	1.65	35	1.28	0.36	1.71
HARPERSVILLE RD	I-64	38	1.11	0.43	1.60	41	1.03	0.30	1.34

Gilmerton Bridge Corridor Between George Washington Highway and Campostella Road



Weekday Factors by Segment – Worst Hour in Peak Period (2012)

Military Highway Eastbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
GEORGE WASHINGTON HWY	CANAL DR	33	1.35	0.71	2.31	32	1.42	0.63	2.34
CANAL DR	BAINBRIDGE BLVD	31	1.41	0.80	2.54	30	1.50	0.69	2.59
BAINBRIDGE BLVD	I-464	36	1.20	0.40	1.67	37	1.15	0.31	1.48
I-464	CAMPOSTELLA RD	34	1.12	0.50	1.67	34	1.12	0.55	1.75

Military Highway Westbound

SEGMENT FROM	SEGMENT TO	AM PEAK PERIOD				PM PEAK PERIOD			
		SPEED (mph)	TTI	BUFFER INDEX	PTI	SPEED (mph)	TTI	BUFFER INDEX	PTI
CAMPOSTELLA RD	I-464	34	1.22	0.31	1.59	30	1.41	1.23	3.26
I-464	BAINBRIDGE BLVD	40	1.13	0.24	1.39	27	1.69	1.79	4.50
BAINBRIDGE BLVD	CANAL DR	40	1.17	0.13	1.32	36	1.32	0.30	1.74
CANAL DR	GEORGE WASHINGTON HWY	37	1.10	0.18	1.32	36	1.18	0.21	1.43

Figure 7 (continued) – High Profile Corridors

Source: HRTPO analysis of INRIX data. Data included in these tables are also included in Appendix A.

The figures on the following pages detail delay and travel time reliability levels at these high profile corridors. Individual graphs are shown for each measure by day of week (weekdays — which are defined in this study as including Tuesdays through Thursdays — Fridays, and Saturdays) and by time of year (annually and summer). **Figure 8** on page 33 shows the highest hourly travel time indices and **Figure 9** on page 34 shows the number of hours each day with high travel time indices for each high profile corridor. **Figures 10 and 11** on pages 35 and 36 show the same information for the buffer index, and **Figures 12 and 13** on pages 37 and 38 show this information for the planning time index.

Certain high profile corridors appear at the top of many of these graphs. The westbound Downtown Tunnel corridor is the most prominent example. Among all of the high profile corridors, the westbound Downtown Tunnel corridor has:

- The highest travel time index on weekdays and Fridays.
- The most hours with a high travel time index on weekdays.
- The most hours with a high buffer index on weekdays and Fridays.
- The highest planning time index on weekdays.
- The most hours with a high planning time index on weekdays and Fridays.

Both directions of the Hampton Roads Bridge-Tunnel corridor also rank high in terms of delay and travel time reliability measures. Among all of the high profile corridors, the Hampton Roads Bridge-Tunnel has:

- The highest travel time index on Saturdays annually.
- The most hours with high travel time indices on Fridays and Saturdays.
- The most hours with a high buffer index on Saturdays annually.
- The most hours with a high planning time index on Saturdays annually.

It should also be noted that at least one direction of the Hampton Roads Bridge-Tunnel ranks in the top three on nearly every graph shown on the following pages.

I-64 in both directions on the Peninsula also ranks high, particularly on Saturdays. Among all of the high profile corridors, I-64 on the Peninsula has:

- The highest travel time index on Saturdays in summer.
- The most hours with a high travel time index on Saturdays in summer.
- The highest buffer index on Fridays annually and on Saturdays.
- The most hours with a high buffer index on Saturdays.
- The highest planning time index on Fridays annually and on Saturdays.
- The most hours with a high planning time index on Saturdays in summer.

Other corridors that rank at the top of these delay and travel time reliability measures include I-264 westbound approaching the I-64/I-264 interchange (highest buffer index on weekdays), the eastbound I-64/I-564 corridor in Norfolk (highest buffer index on Fridays in summer), and the eastbound I-64 corridor in Chesapeake (highest planning time index on Fridays in summer).

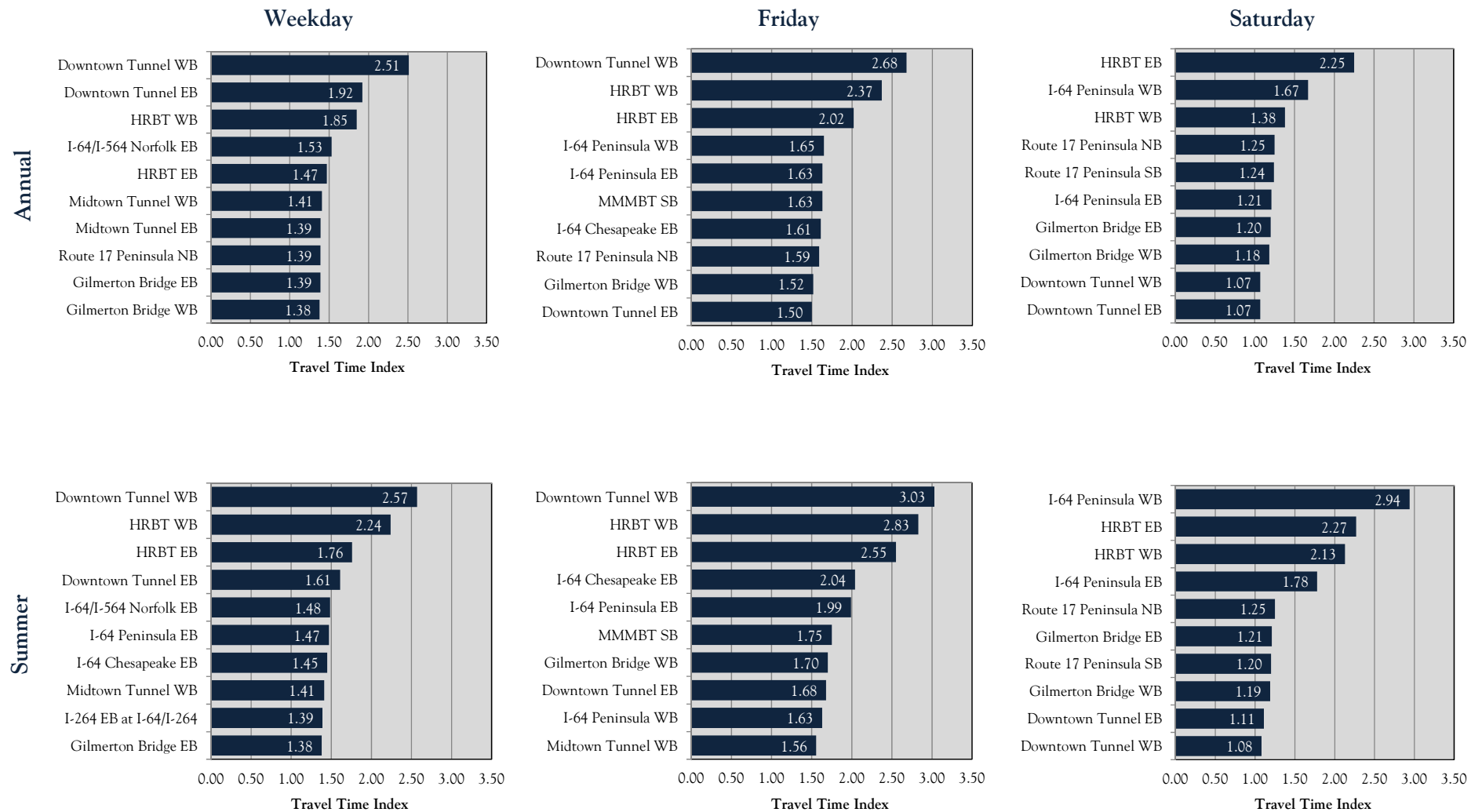


Figure 8 – High Profile Corridors with the Highest Hourly Travel Time Indices (2012)

Source: HRTPO analysis of INRIX data.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

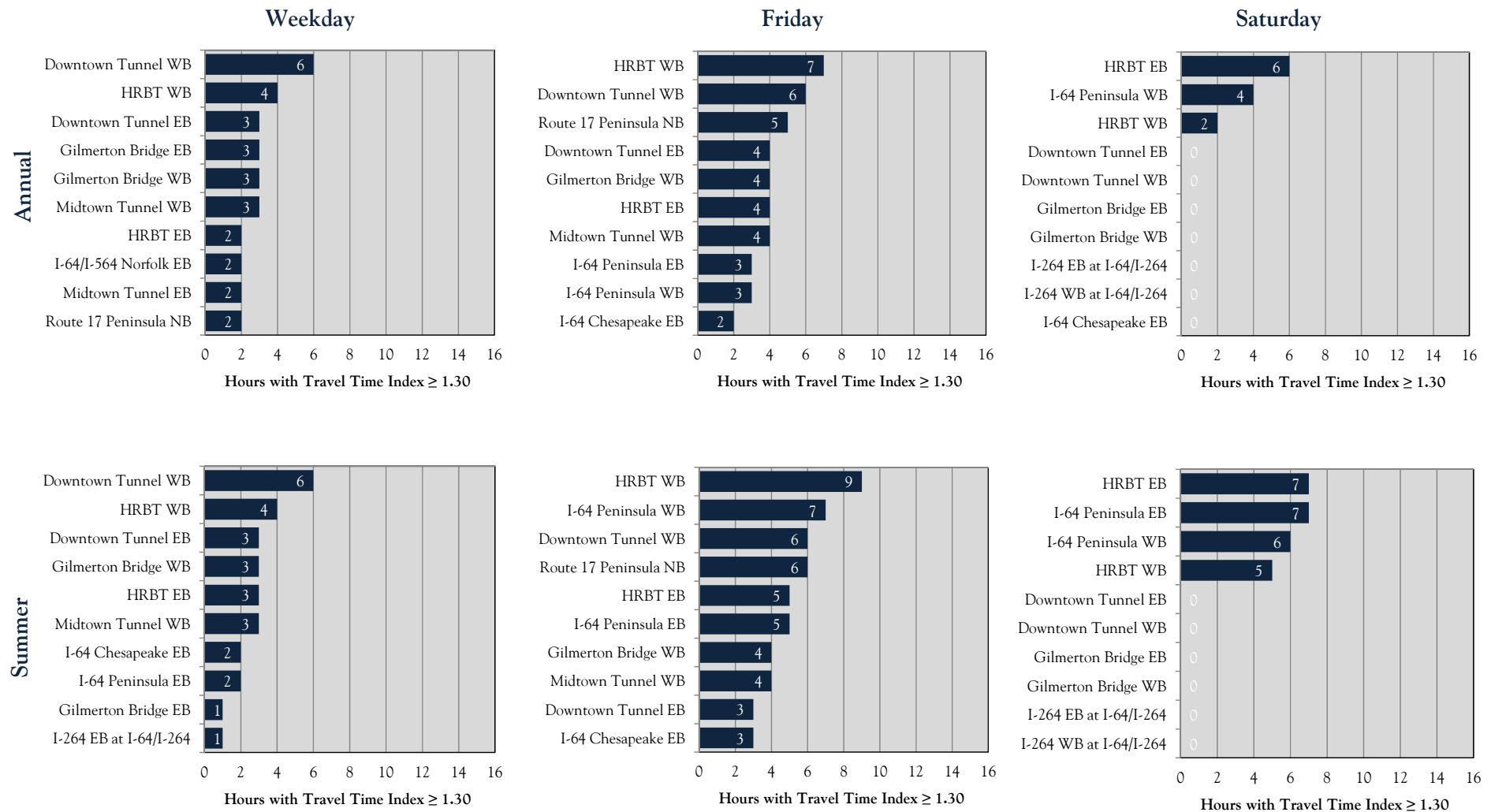


Figure 9 – High Profile Corridors with the Highest Number of Hours with Travel Time Indices ≥1.30 (2012)

Source: HRTPO analysis of INRIX data.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

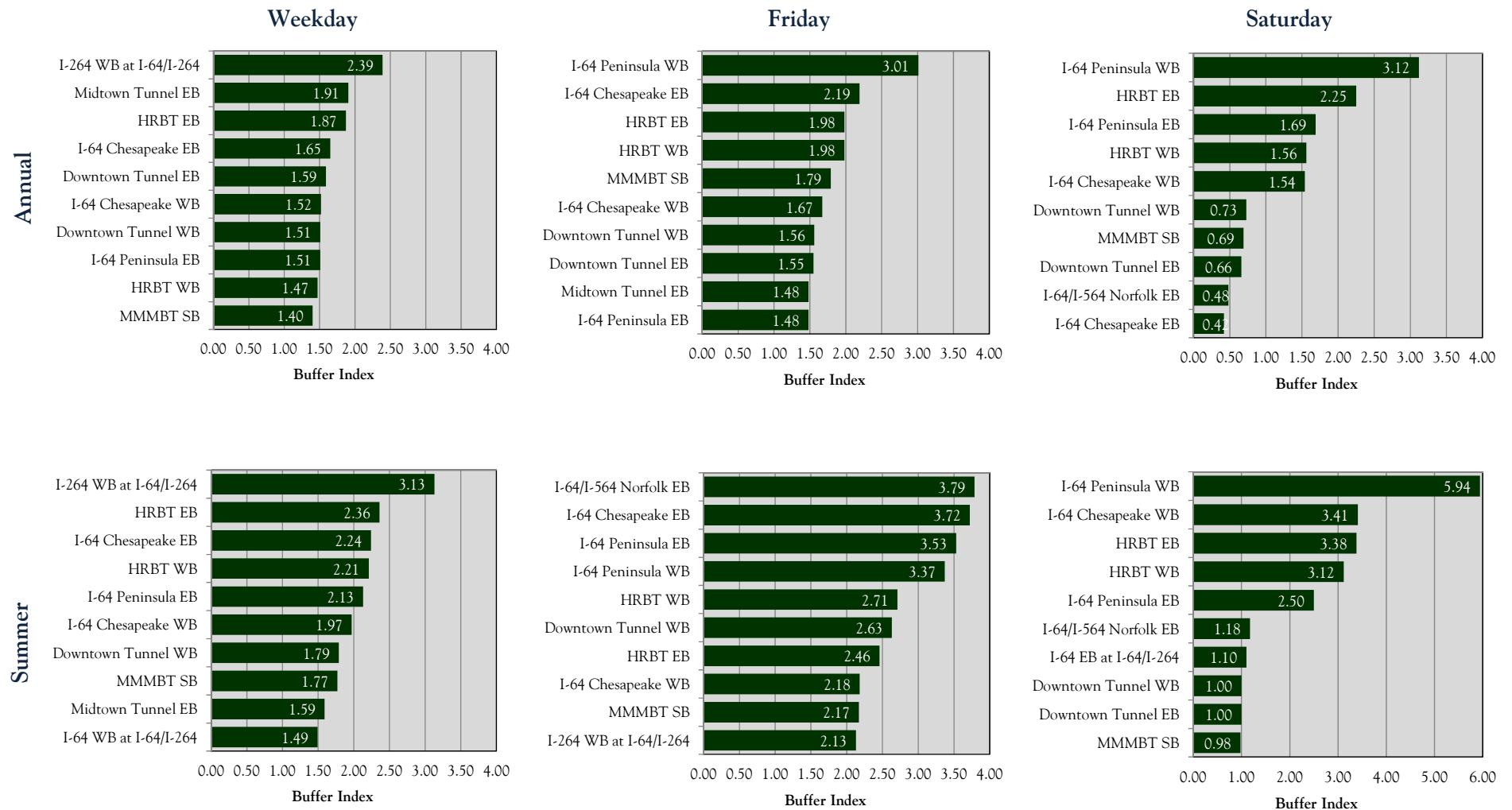


Figure 10 – High Profile Corridors with the Highest Hourly Buffer Indices (2012)

Source: HRTPO analysis of INRIX data.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

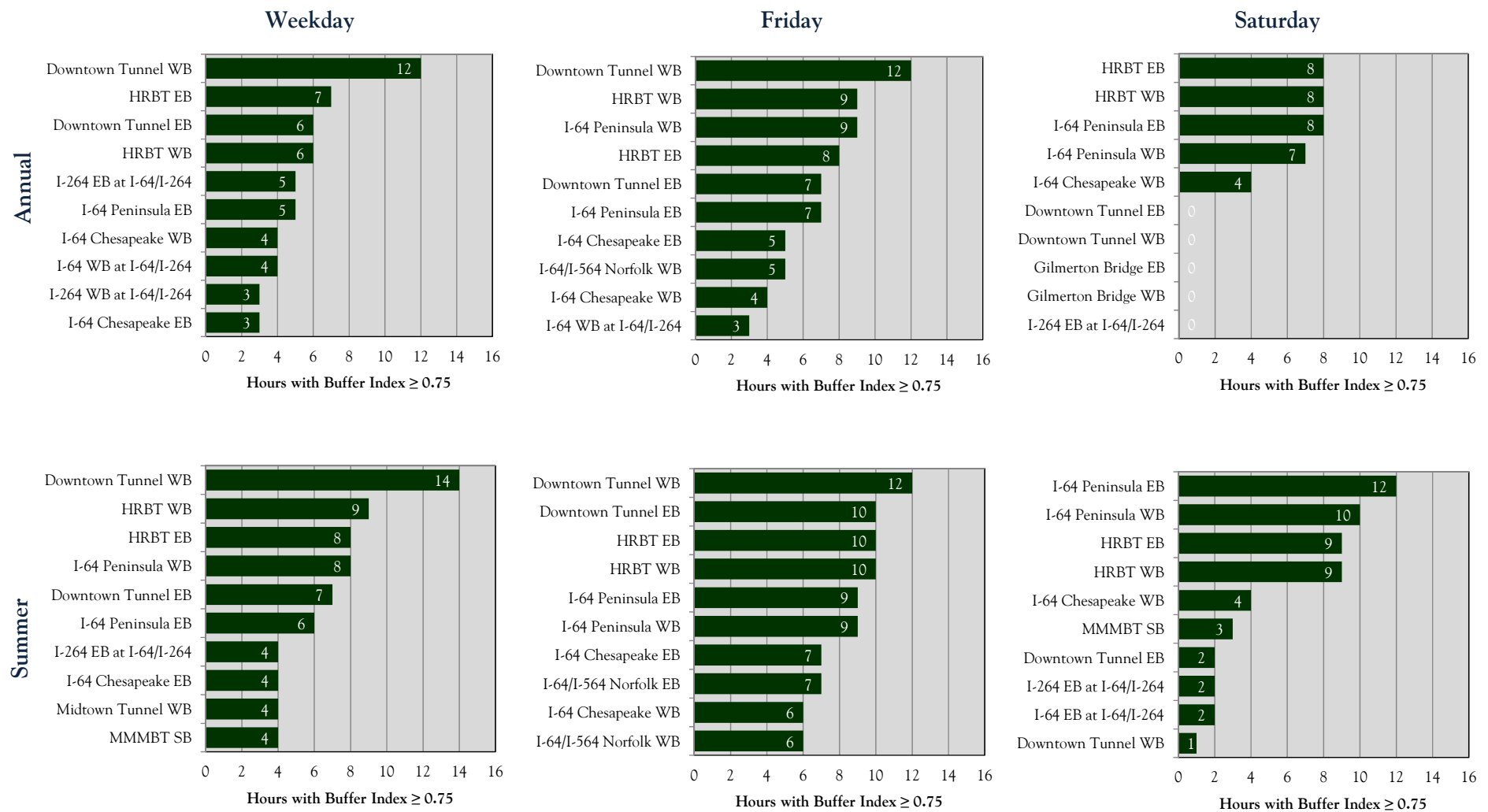


Figure 11 – High Profile Corridors with the Highest Number of Hours with Buffer Indices ≥ 0.75 (2012)

Source: HRTPO analysis of INRIX data.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

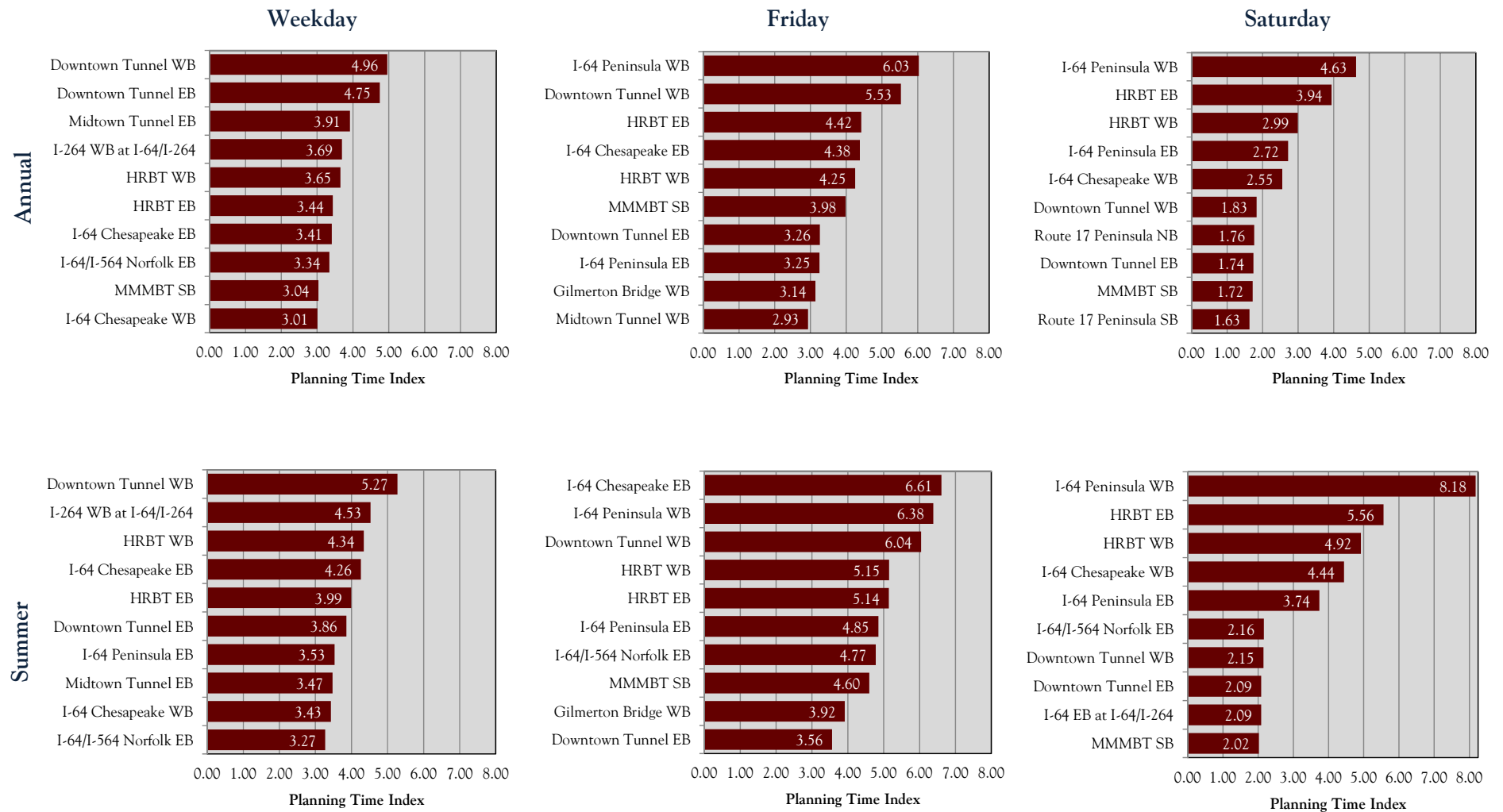


Figure 12 – High Profile Corridors with the Highest Hourly Planning Time Indices (2012)

Source: HRTPO analysis of INRIX data.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

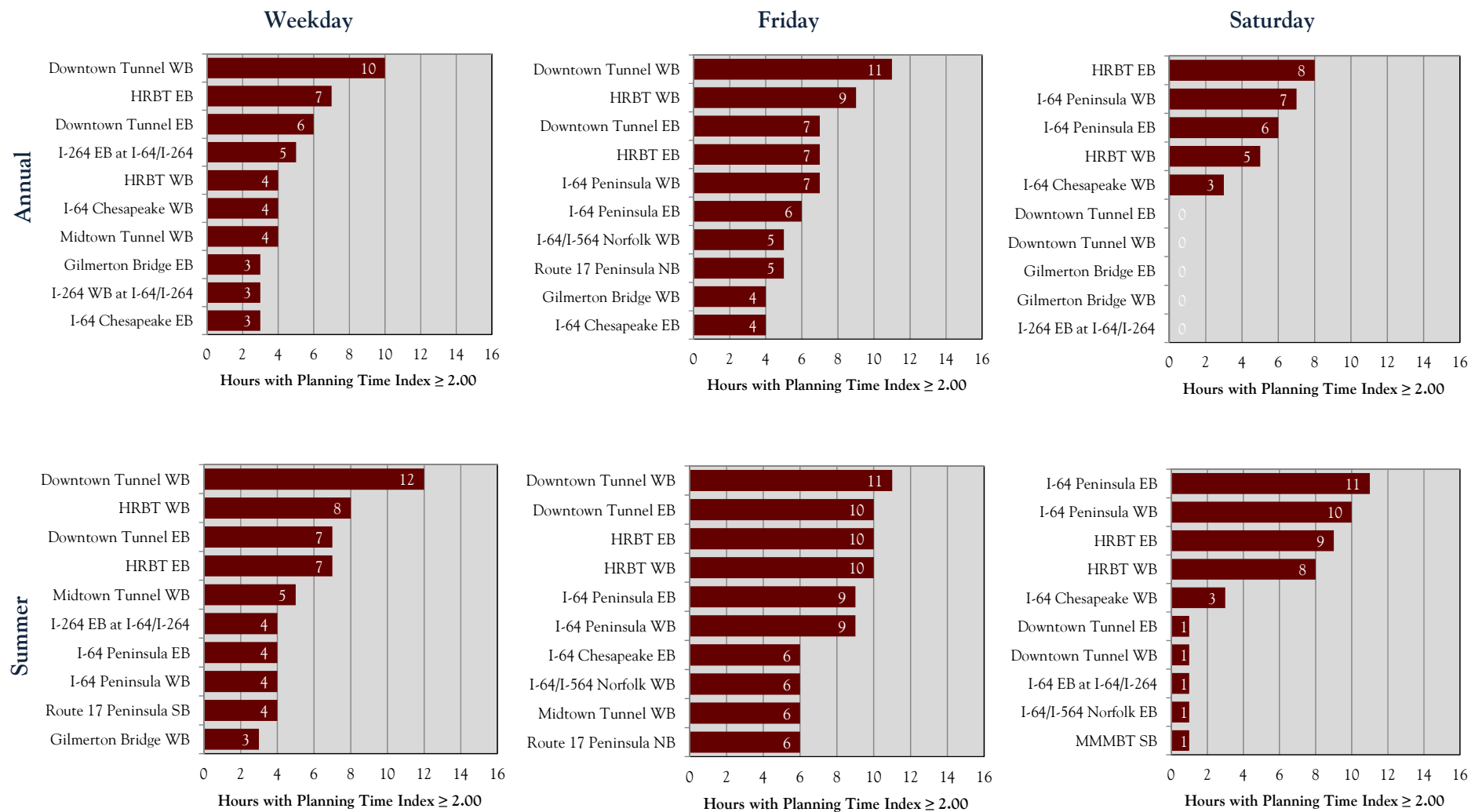


Figure 13 – High Profile Corridors with the Highest Number of Hours with Planning Time Indices ≥ 2.0 (2012)

Source: HRTPO analysis of INRIX data.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

CONCLUSIONS/NEXT STEPS

INRIX's archived travel time and speed data has provided HRTPO staff with a valuable tool to monitor regional roadway performance data. HRTPO staff can determine both roadway congestion levels and the travel time reliability of the regional roadway network based on this data.

Improving travel time reliability has a number of benefits. Time and money is saved due to less congestion and wasted fuel. Safety is improved with less dangerous stop-and-go driving conditions. Businesses benefit with further guarantees of on-time delivery of their goods and services. And quality of life is improved due to more reliable trip times, which require less time budgeted for each trip.

Travel time reliability measures were analyzed by HRTPO staff using the INRIX travel time and speed data. These measures include the buffer index and the planning time index. Based on the analysis, a number of locations throughout the region ranked high on both of these measures. These locations, not surprisingly, include many of the bottlenecks in the region such as I-64 on the Peninsula and in Chesapeake, the I-64/I-264 interchange area, and the approaches to the Downtown Tunnel and Hampton Roads Bridge-Tunnel, among others.

Travel time reliability data based on actual travel times and speeds will help improve HRTPO's transportation planning efforts. This travel time reliability data will be used in future HRTPO transportation planning efforts, including:

- **Project Prioritization** – In light of scarce financial resources, the HRTPO in 2010 developed an objective methodology to assist the HRTPO Board with determining regional transportation priorities. In HRTPO's Project Prioritization Process, a score for each potential project is produced based on project utility, project viability, and economic vitality. Projects are ranked and prioritized based on these scores.

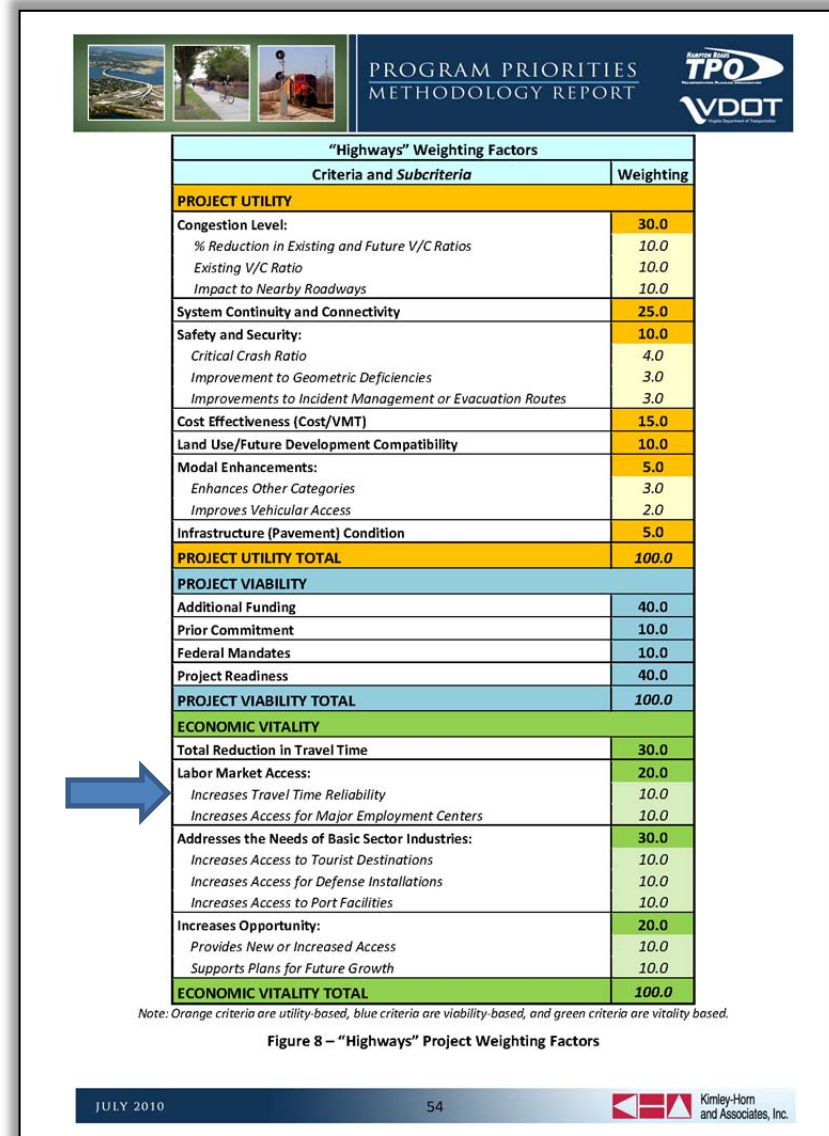


Figure 14 - Travel Time Reliability in the Project Prioritization Process for Highway Projects

Source: HRTPO.

Travel time reliability is currently incorporated into the economic vitality component of the Project Prioritization Process for potential highway, bridge/tunnel, transit, and intermodal projects. In the most recent Long-Range Transportation Plan⁵, travel time reliability benefits were estimated for each project due to a lack of reliability data at that time. HRTPO staff estimated these travel time reliability impacts by using daily traffic volumes, roadway congestion levels, crash data, and noting the availability of viable diversion routes. Based on this information, travel time reliability for each project was assigned into one of six categories: high, medium-high, medium, low-medium, low, or none. Points were assigned to each project based on these six categories.

Future iterations of the Project Prioritization Process will use the travel time reliability data included in this report. This will improve the project selection process in future regional Long-Range Transportation Plans and Transportation Improvement Programs.

- **Congestion Management Process** – This report is produced as part of the HRTPO Congestion Management Process (CMP). The Congestion Management Process is an ongoing effort that identifies, develops, evaluates, and implements transportation strategies to enhance mobility regionwide.

The Travel Time Reliability Database used in this report has been linked to the HRTPO CMP database. This database supports all of HRTPO's Congestion Management Process efforts with data related to traffic volume and speeds, peak hour characteristics, congestion levels, crashes, truck volumes, roadway characteristics, and planned projects.

HRTPO will release an update to the Congestion Management Process report in summer 2014. Travel time reliability data from this study will be incorporated into that effort.

⁵ *Hampton Roads 2034 Long-Range Transportation Plan*, HRTPO, January 2012.

PUBLIC REVIEW AND COMMENTS

The *Hampton Roads Regional Travel Time Reliability Study* was open for public review and comments between June 5th, 2013, and June 20th, 2013. No public comments were received for this report during this time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Freeway Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
CHES	CHESAPEAKE EXPWY	GALLBUSH RD	BATTLEFIELD BLVD (NEAR INDIAN CREEK)	NS	59	0.99	0.07	1.05	54	1.11	0.05	1.16	58	1.02	0.10	1.12	56	1.07	0.13	1.21
CHES	CHESAPEAKE EXPWY	BATTLEFIELD BLVD (NEAR INDIAN CREEK)	HILLCREST PKWY	NS	62	1.04	0.03	1.07	61	1.03	0.04	1.07	61	1.05	0.03	1.08	61	1.02	0.05	1.06
CHES	CHESAPEAKE EXPWY	HILLCREST PKWY	BATTLEFIELD BLVD (S OF GREAT BRIDGE)	NS	61	1.04	0.05	1.10	61	1.03	0.04	1.07	60	1.05	0.04	1.09	61	1.02	0.05	1.06
CHES	CHESAPEAKE EXPWY	BATTLEFIELD BLVD (S OF GREAT BRIDGE)	HANBURY RD	NS	61	1.04	0.05	1.10	61	1.03	0.04	1.07	60	1.05	0.04	1.09	61	1.02	0.05	1.06
CHES	CHESAPEAKE EXPWY	HANBURY RD	MT PLEASANT RD	NS	58	1.09	0.71	1.85	61	1.04	0.04	1.08	61	1.03	0.05	1.07	63	1.02	0.07	1.08
CHES	CHESAPEAKE EXPWY	MT PLEASANT RD	BATTLEFIELD BLVD (N OF GREAT BRIDGE)	NS	57	1.09	0.46	1.60	60	1.02	0.05	1.07	60	1.03	0.08	1.11	57	1.07	0.36	1.46
CHES	CHESAPEAKE EXPWY	BATTLEFIELD BLVD (N OF GREAT BRIDGE)	DOMINION BLVD	NS	48	1.29	0.52	1.97	52	1.21	0.04	1.25	50	1.24	0.19	1.48	49	1.28	0.77	2.26
CHES	CHESAPEAKE EXPWY	DOMINION BLVD	I-64	NS	48	1.29	0.52	1.97	52	1.21	0.04	1.25	50	1.24	0.19	1.48	49	1.28	0.77	2.26
JCC	I-64	NEW KENT CL	RTE 30	EW	69	0.95	0.13	1.05	68	0.96	0.22	1.14	70	0.93	0.09	1.02	70	0.93	0.15	1.07
JCC	I-64	RTE 30	CROAKER RD (RTE 607)	EW	69	0.95	0.39	1.30	68	0.96	0.06	1.02	69	0.94	0.28	1.20	70	0.94	0.22	1.14
JCC	I-64	CROAKER RD (RTE 607)	YORK CL	EW	68	0.95	0.32	1.24	67	0.96	0.07	1.02	69	0.94	0.06	1.01	69	0.95	0.07	1.02
YC	I-64	JAMES CITY CL	RTE 199/646	EW	68	0.95	0.32	1.24	67	0.96	0.07	1.02	69	0.94	0.06	1.01	69	0.95	0.07	1.02
YC	I-64	RTE 199/646	RTE 143	EW	69	0.95	0.06	1.00	67	0.97	0.06	1.01	69	0.94	0.08	1.01	68	0.95	0.33	1.27
YC	I-64	RTE 143	RTE 199 (EAST OF WILLIAMSBURG)	EW	68	0.96	0.21	1.14	67	0.97	0.06	1.01	68	0.95	0.18	1.12	69	0.95	0.14	1.09
YC	I-64	RTE 199 (EAST OF WILLIAMSBURG)	GROVE CONNECTOR	EW	67	0.97	0.25	1.20	65	0.98	0.12	1.08	66	0.98	0.58	1.54	66	0.97	0.09	1.07
YC	I-64	GROVE CONNECTOR	JAMES CITY CL	EW	66	0.99	1.00	1.96	67	0.97	0.29	1.25	60	1.13	2.71	3.92	66	1.00	0.34	1.30
JCC	I-64	YORK CL	NEWPORT NEWS CL	EW	66	0.99	1.00	1.96	67	0.97	0.29	1.25	60	1.13	2.71	3.92	66	1.00	0.34	1.30
NN	I-64	JAMES CITY CL	RTE 143 (NORTH)	EW	66	0.99	1.00	1.96	67	0.97	0.29	1.25	60	1.13	2.71	3.92	66	1.00	0.34	1.30
NN	I-64	RTE 143 (NORTH)	YORKTOWN RD	EW	64	1.02	1.63	2.62	67	0.97	0.42	1.37	55	1.25	3.43	4.95	66	0.98	0.46	1.42
NN	I-64	YORKTOWN RD	FORT EUSTIS BLVD	EW	62	1.05	1.66	2.73	67	0.98	0.29	1.26	49	1.47	2.96	5.05	66	0.99	0.26	1.25
NN	I-64	FORT EUSTIS BLVD	JEFFERSON AVE	EW	65	0.99	0.30	1.28	64	1.01	0.69	1.70	60	1.09	0.57	1.70	58	1.11	0.71	1.83
NN	I-64	JEFFERSON AVE	OYSTER POINT RD	EW	66	0.98	0.10	1.08	65	0.97	0.32	1.28	65	0.98	0.30	1.26	61	1.06	1.09	2.20
NN	I-64	OYSTER POINT RD	J C MORRIS BLVD	EW	65	0.98	0.09	1.07	65	0.98	0.05	1.02	65	0.98	0.32	1.30	65	0.98	0.23	1.22
NN	I-64	J C MORRIS BLVD	HAMPTON CL	EW	65	0.99	0.29	1.28	64	0.98	0.21	1.19	65	0.99	0.23	1.20	62	1.01	0.39	1.41
HAM	I-64	NEWPORT NEWS CL	HRC PARKWAY	EW	65	0.99	0.29	1.28	64	0.98	0.21	1.19	65	0.99	0.23	1.20	62	1.01	0.39	1.41
HAM	I-64	HRC PARKWAY	MAGRUDER BLVD	EW	66	0.98	0.07	1.06	65	0.97	0.10	1.07	66	0.98	0.07	1.05	62	1.02	0.83	1.86
HAM	I-64	MAGRUDER BLVD	MERCURY BLVD	EW	65	0.97	0.14	1.11	65	0.97	0.05	1.02	65	0.97	0.12	1.08	64	0.98	0.48	1.45
HAM	I-64	MERCURY BLVD	I-664	EW	64	0.98	0.42	1.40	64	0.97	0.05	1.03	64	0.98	0.54	1.51	63	0.99	0.28	1.26
HAM	I-64	I-664	ARMISTEAD AVE	EW	61	1.02	1.83	2.83	65	0.99	0.06	1.04	61	1.02	1.30	2.35	64	0.99	0.22	1.21
HAM	I-64	ARMISTEAD AVE	RIP RAP RD	EW	58	1.08	3.12	4.33	64	0.98	0.21	1.16	58	1.08	2.70	3.83	63	0.98	0.09	1.07
HAM	I-64	RIP RAP RD	SETTLERS LANDING RD	EW	33	2.00	3.99	7.34	64	0.98	0.21	1.16	38	1.86	4.31	6.69	63	0.98	0.09	1.07
HAM	I-64	SETTLERS LANDING RD	MALLORY ST	EW	26	2.39	1.80	4.64	63	0.97	0.08	1.04	28	2.39	2.18	5.01	63	0.98	0.08	1.06
HAM	I-64/HRBT	MALLORY ST	NORFOLK CL	EW	51	1.14	0.34	1.49	57	1.03	0.24	1.27	48	1.20	0.51	1.66	46	1.38	0.59	2.00
NOR	I-64/HRBT	HAMPTON CL	OCEAN VIEW AVE	EW	51	1.14	0.34	1.49	57	1.03	0.24	1.27	48	1.20	0.51	1.66	46	1.38	0.59	2.00
NOR	I-64	OCEAN VIEW AVE	4TH VIEW AVE	EW	62	0.97	0.16	1.11	58	1.04	0.86	1.89	58	1.05	0.85	1.97	30	2.14	1.62	3.94
NOR	I-64	4TH VIEW AVE	BAY AVE	EW	62	0.98	0.12	1.09	61	1.02	1.28	2.29	50	1.26	1.95	3.42	23	3.12	3.28	7.69
NOR	I-64	BAY AVE	GRANBY ST	EW	62	0.98	0.11	1.07	62	0.99	0.82	1.80	52	1.17	0.76	2.06	36	2.01	3.21	6.96
NOR	I-64	GRANBY ST	I-564/LITTLE CREEK RD	EW	62	0.98	0.11	1.07	62	0.99	0.82	1.80	52	1.17	0.76	2.06	36	2.01	3.21	6.96
NOR	I-64 REVERSIBLE LANES	I-564/LITTLE CREEK RD	TIDEWATER DR	EW	-	-	-	-	64	1.01	0.33	1.33	61	1.05	0.26	1.33	-	-	-	-
NOR	I-64	I-564/LITTLE CREEK RD	TIDEWATER DR	EW	63	0.99	0.22	1.20	61	1.01	0.67	1.68	42	1.53	1.98	4.71	53	1.24	3.61	5.39
NOR	I-64 REVERSIBLE LANES	TIDEWATER DR	CHESAPEAKE BLVD	EW	-	-	-	-	65	0.99	0.25	1.24	60	1.08	0.71	1.80	-	-	-	-
NOR	I-64	TIDEWATER DR	CHESAPEAKE BLVD	EW	61	1.01	0.78	1.82	58	1.08	1.12	2.41	36	1.72	1.27	3.88	62	0.99	0.53	1.50
NOR	I-64 REVERSIBLE LANES	CHESAPEAKE BLVD	NORVIEW AVE	EW	-	-	-	-	65	1.00	0.44	1.45	60	1.08	1.07	2.18	-	-	-	-
NOR	I-64	CHESAPEAKE BLVD	NORVIEW AVE	EW	59	1.04	0.88	1.91	59	1.04	1.15	2.31	36	1.75	1.12	3.26	62	0.98	0.25	1.23
NOR	I-64 REVERSIBLE LANES	NORVIEW AVE	MILITARY HWY	EW	-	-	-	-	66	0.98	0.14	1.11	62	1.05	0.81	1.89	-	-	-	-
NOR	I-64	NORVIEW AVE	MILITARY HWY	EW	60	1.02	0.31	1.33	58	1.05	0.87	1.97	44	1.39	0.82	2.44	62	0.99	0.15	1.14
NOR	I-64 REVERSIBLE LANES	MILITARY HWY	NORTHAMPTON BLVD	EW	-	-	-	-	66	0.98	0.11	1.09	62	1.04	0.90	1.96	-	-	-	-
NOR	I-64	MILITARY HWY	NORTHAMPTON BLVD	EW	61	1.00	0.27	1.28	57	1.07	1.05	2.18	42	1.51	1.47	3.30	62	0.99	0.16	1.15
NOR	I-64 REVERSIBLE LANES	NORTHAMPTON BLVD	I-264	EW	-	-	-	-	64	1.02	0.13	1.15	62	1.06	1.08	2.21	-	-	-	-
NOR	I-64	NORTHAMPTON BLVD	I-264	EW	55	1.08	0.50	1.62	56	1.10	1.08	2.24	41	1.46	1.16	3.06	58	1.06	0.75	1.82

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Freeway Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
NOR	I-64	I-264	VA BEACH CL	EW	61	0.98	0.05	1.03	49	1.27	0.83	2.28	49	1.23	0.87	2.30	50	1.24	1.73	3.29
VB	I-64	NORFOLK CL	INDIAN RIVER RD	EW	61	0.98	0.05	1.03	49	1.27	0.83	2.28	49	1.23	0.87	2.30	50	1.24	1.73	3.29
VB	I-64	INDIAN RIVER RD	CHESEAPEAKE CL	EW	62	0.99	0.07	1.05	57	1.08	0.86	1.94	61	1.00	0.59	1.59	61	1.01	0.43	1.43
CHES	I-64	VA BEACH CL	GREENBRIER PKWY	EW	62	0.99	0.07	1.05	57	1.08	0.86	1.94	61	1.00	0.59	1.59	61	1.01	0.43	1.43
CHES	I-64	GREENBRIER PKWY	BATTLEFIELD BLVD	EW	62	0.99	0.11	1.10	63	1.00	0.25	1.26	54	1.18	3.16	4.82	64	0.99	0.26	1.25
CHES	I-64	BATTLEFIELD BLVD	I-464	EW	61	1.00	0.49	1.49	62	0.99	0.08	1.07	36	1.89	3.07	6.52	63	0.98	0.08	1.07
CHES	I-64	I-464	GEORGE WASHINGTON HWY	EW	61	0.98	0.20	1.19	58	1.05	0.42	1.48	51	1.23	0.92	2.31	58	1.05	0.68	1.79
CHES	I-64	GEORGE WASHINGTON HWY	MILITARY HWY	EW	63	0.97	0.07	1.04	37	1.73	2.13	4.81	59	1.05	1.38	2.44	49	1.28	1.77	3.62
CHES	I-64	MILITARY HWY	I-264&664	EW	62	0.98	0.07	1.06	50	1.26	2.34	4.09	57	1.09	1.26	2.38	54	1.16	2.09	3.70
CHES	I-264	I-64&664	WCL PORTSMOUTH	EW	61	0.99	0.08	1.07	61	0.99	0.07	1.06	61	1.00	0.14	1.14	60	1.00	0.42	1.42
PORT	I-264	WCL PORTSMOUTH	GREENWOOD DR	EW	61	0.99	0.08	1.07	61	0.99	0.07	1.06	61	1.00	0.14	1.14	60	1.00	0.42	1.42
PORT	I-264	GREENWOOD DR	VICTORY BLVD	EW	62	0.99	0.09	1.09	62	1.00	0.08	1.09	62	0.99	0.16	1.15	61	1.01	0.42	1.44
PORT	I-264	VICTORY BLVD	PORTSMOUTH BLVD	EW	61	1.01	0.36	1.37	62	1.01	0.09	1.09	62	0.99	0.16	1.15	62	1.00	0.30	1.31
PORT	I-264	PORTSMOUTH BLVD	FREDERICK BLVD	EW	51	1.25	2.96	4.89	61	1.01	0.19	1.20	61	1.01	0.48	1.49	61	1.00	0.18	1.19
PORT	I-264	FREDERICK BLVD	FUTURE MLK FWY	EW	29	2.29	3.17	9.20	62	0.97	0.09	1.07	48	1.29	2.71	4.43	62	0.97	0.12	1.09
PORT	I-264	FUTURE MLK FWY	DES MOINES AVE	EW	29	2.29	3.17	9.20	62	0.97	0.09	1.07	48	1.29	2.71	4.43	62	0.97	0.12	1.09
PORT	I-264	DES MOINES AVE	EFFINGHAM ST	EW	15	3.57	2.53	6.36	60	1.00	0.11	1.13	17	3.25	1.80	5.84	60	1.00	0.20	1.21
PORT	I-264/DOWNTOWN TUNNEL	EFFINGHAM ST	NORFOLK CL	EW	27	1.70	0.73	2.79	38	1.30	0.52	1.94	33	1.42	0.53	2.09	37	1.35	0.45	1.84
NOR	I-264/DOWNTOWN TUNNEL	PORTSMOUTH CL	I-464	EW	27	1.70	0.73	2.79	38	1.30	0.52	1.94	33	1.42	0.53	2.09	37	1.35	0.45	1.84
NOR	I-264/BERKLEY BRIDGE	I-464	WATERSIDE/CITY HALL/TIDEWATER	EW	40	1.17	0.36	1.60	24	1.97	1.80	5.35	45	1.04	0.39	1.46	12	3.94	1.43	6.45
NOR	I-264	WATERSIDE/CITY HALL/TIDEWATER	BRAMBLETON AVE	EW	55	1.03	0.14	1.18	41	1.36	3.11	5.41	54	1.05	0.71	1.79	16	3.46	3.76	10.54
NOR	I-264	BRAMBLETON AVE	BALLENTINE BLVD	EW	61	1.00	0.13	1.13	56	1.07	1.01	2.15	59	1.05	0.86	1.95	37	1.68	3.04	6.61
NOR	I-264	BALLENTINE BLVD	MILITARY HWY	EW	61	1.01	0.09	1.08	61	1.00	0.35	1.34	58	1.06	0.67	1.76	61	1.00	0.31	1.32
NOR	I-264	MILITARY HWY	I-64	EW	61	1.01	0.13	1.12	64	0.98	0.09	1.06	53	1.17	1.61	2.98	62	1.00	0.07	1.07
NOR	I-264	I-64	NEWTOWN RD/WCL VA. BEACH	EW	63	1.01	0.45	1.46	62	1.01	0.21	1.22	46	1.39	1.85	3.59	55	1.13	3.07	4.58
VB	I-264	NEWTOWN RD/ECL NORFOLK	WITCHDUCK RD	EW	61	1.01	0.21	1.22	63	1.00	0.17	1.17	44	1.44	1.30	2.59	59	1.08	1.90	3.08
VB	I-264	WITCHDUCK RD	INDEPENDENCE BLVD	EW	62	1.00	0.11	1.11	59	1.06	0.52	1.56	59	1.07	0.45	1.55	59	1.06	1.17	2.28
VB	I-264	INDEPENDENCE BLVD	ROSEMONT RD	EW	62	1.00	0.06	1.04	58	1.09	1.33	2.39	63	0.99	0.23	1.22	62	1.00	0.58	1.58
VB	I-264	ROSEMONT RD	LYNNHAVEN PKWY	EW	62	1.01	0.05	1.04	61	1.03	1.28	2.28	63	0.99	0.11	1.11	63	0.99	0.22	1.22
VB	I-264	LYNNHAVEN PKWY	LONDON BRIDGE RD	EW	61	1.03	0.06	1.05	62	0.99	0.22	1.21	63	0.99	0.14	1.14	62	0.99	0.43	1.44
VB	I-264	LONDON BRIDGE RD	LASKIN RD	EW	61	1.03	0.06	1.05	62	0.99	0.22	1.21	63	0.99	0.14	1.14	62	0.99	0.43	1.44
VB	I-264	LASKIN RD	FIRST COLONIAL RD	EW	61	1.03	0.05	1.06	63	0.99	0.06	1.04	63	0.99	0.06	1.05	63	0.99	0.34	1.33
VB	I-264	FIRST COLONIAL RD	S.E. PARKWAY CORRIDOR	EW	61	1.02	0.05	1.06	61	1.00	0.06	1.05	61	1.01	0.07	1.09	61	1.01	0.29	1.30
VB	I-264	S.E. PARKWAY CORRIDOR	BIRDNECK RD	EW	61	1.02	0.05	1.06	61	1.00	0.06	1.05	61	1.01	0.07	1.09	61	1.01	0.29	1.30
VB	I-264	BIRDNECK RD	PARKS AVE	EW	57	1.05	0.09	1.15	53	0.99	0.11	1.09	57	1.06	0.09	1.16	52	1.01	0.12	1.12
CHES	I-464	I-64	MILITARY HWY	NS	56	1.06	0.24	1.33	58	1.06	0.29	1.37	57	1.03	0.11	1.13	60	1.03	0.39	1.43
CHES	I-464	MILITARY HWY	FREEMAN AVE	NS	63	1.01	0.10	1.11	59	1.02	0.13	1.16	62	1.02	0.12	1.15	62	0.98	0.29	1.26
CHES	I-464	FREEMAN AVE	POINDEXTER ST	NS	62	1.03	0.40	1.45	60	1.05	0.09	1.15	62	1.02	0.14	1.17	63	1.01	0.10	1.11
CHES	I-464	POINDEXTER ST	NORFOLK CL	NS	48	1.30	1.95	3.82	59	1.05	0.11	1.16	58	1.07	0.42	1.52	61	1.01	0.09	1.10
NOR	I-464	CHESEAPEAKE CL	SOUTH MAIN ST	NS	48	1.30	1.95	3.82	59	1.05	0.11	1.16	58	1.07	0.42	1.52	61	1.01	0.09	1.10
NOR	I-464	SOUTH MAIN ST	I-264	NS	36	1.63	1.66	4.26	48	1.21	0.23	1.52	51	1.13	0.59	1.81	54	1.06	0.33	1.43
NOR	I-564	ADMIRAL TAUSSIG BLVD	FUTURE INTERMODAL CONNECTOR	NS	34	1.71	1.13	3.70	49	1.17	0.02	1.18	50	1.16	0.01	1.18	48	1.20	0.37	1.67
NOR	I-564	FUTURE INTERMODAL CONNECTOR	INTERNATIONAL TERMINAL BLVD	NS	34	1.71	1.13	3.70	49	1.17	0.02	1.18	50	1.16	0.01	1.18	48	1.20	0.37	1.67
NOR	I-564	INTERNATIONAL TERMINAL BLVD	I-64	NS	46	1.34	0.88	2.57	50	1.20	0.02	1.22	50	1.23	0.05	1.29	40	1.50	1.56	3.87
CHES	I-664	I-64 & I-264	ROUTES 13/58/460	NS	62	0.99	0.11	1.10	61	0.99	0.12	1.11	55	1.14	1.07	2.28	61	0.99	0.40	1.39
CHES	I-664	ROUTES 13/58/460	DOCK LANDING RD	NS	63	0.99	0.15	1.14	60	1.03	0.27	1.31	59	1.06	0.37	1.39	61	1.01	0.36	1.36
CHES	I-664	DOCK LANDING RD	PORTSMOUTH BLVD	NS	63	0.99	0.33	1.32	62	1.02	0.33	1.36	63	1.00	0.23	1.22	62	1.02	0.44	1.48
CHES	I-664	PORTSMOUTH BLVD	PUGHVILLE RD	NS	63	0.99	0.82	1.80	63	1.00	0.27	1.26	63	0.98	0.19	1.17	60	1.06	0.60	1.67
CHES	I-664	PUGHVILLE RD	SUFFOLK CL	NS	63	1.00	1.16	2.16	64	0.99	0.39	1.39	64	0.99	0.45	1.44	58	1.11	1.24	2.39
SUF	I-664	CHESEAPEAKE CL	BRIDGE RD	NS	63	1.00	1.16	2.16	64	0.99	0.39	1.39	64	0.99	0.45	1.44	58	1.11	1.24	2.39

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Freeway Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
SUF	I-664	BRIDGE RD	WESTERN FWY	NS	63	1.00	1.16	2.16	64	0.99	0.39	1.39	64	0.99	0.45	1.44	58	1.11	1.24	2.39
SUF	I-664	WESTERN FWY	COLLEGE DR	NS	64	0.99	0.64	1.63	65	0.99	0.21	1.20	64	0.99	0.43	1.41	64	1.00	0.50	1.49
SUF	I-664/MMMBT	COLLEGE DR	NEWPORT NEWS CL	NS	61	0.98	0.16	1.14	63	0.98	0.10	1.06	62	0.97	0.11	1.08	57	1.07	0.35	1.38
NN	I-664/MMMBT	SUFFOLK CL	TERMINAL AVE	NS	61	0.98	0.16	1.14	63	0.98	0.10	1.06	62	0.97	0.11	1.08	57	1.07	0.35	1.38
NN	I-664	TERMINAL AVE	23RD ST	NS	63	0.99	0.06	1.06	59	1.01	0.31	1.31	63	0.99	0.12	1.12	23	2.76	2.20	5.80
NN	I-664	23RD ST	CHESTNUT AVE	NS	64	0.98	0.08	1.06	62	0.99	0.20	1.19	63	0.98	0.16	1.14	47	1.44	3.08	5.32
NN	I-664	CHESTNUT AVE	HAMPTON CL	NS	63	0.98	0.11	1.10	62	0.98	0.41	1.39	63	0.98	0.29	1.29	63	0.98	0.38	1.36
HAM	I-664	NEWPORT NEWS CL	ABERDEEN RD	NS	63	0.98	0.11	1.10	62	0.98	0.41	1.39	63	0.98	0.29	1.29	63	0.98	0.38	1.36
HAM	I-664	ABERDEEN RD	POWER PLANT PKWY	NS	64	0.97	0.07	1.05	63	0.98	0.36	1.33	63	0.99	0.75	1.72	64	0.97	0.15	1.12
HAM	I-664	POWER PLANT PKWY	I-64	NS	62	0.98	0.08	1.06	63	0.97	0.23	1.20	60	1.02	0.83	1.82	62	0.98	0.08	1.06
PORT	M L K FREEWAY	LONDON BLVD	WESTERN FREEWAY/MIDTOWN TUNNEL	NS	30	1.82	2.17	5.74	48	1.07	0.12	1.22	39	1.30	0.50	1.98	48	1.06	0.12	1.18
CHES	ROUTE 13/58/460	SUFFOLK CL	I-664	EW	61	1.01	0.29	1.30	63	1.00	0.09	1.08	62	1.00	0.19	1.19	63	0.99	0.29	1.26
SUF	ROUTE 13/58/460	SUFFOLK BYPASS	CHESAPEAKE CL	EW	61	1.01	0.29	1.30	63	1.00	0.09	1.08	62	1.00	0.19	1.19	63	0.99	0.29	1.26
YC	ROUTE 199	I-64	MOORETOWN RD	EW	57	1.02	0.07	1.09	55	1.03	0.09	1.11	57	1.01	0.08	1.08	56	1.01	0.12	1.13
YC	ROUTE 199	MOORETOWN RD	JCC LINE (WESTSIDE)	EW	56	1.07	0.07	1.14	58	1.05	0.07	1.11	56	1.07	0.08	1.14	57	1.06	0.10	1.15
JCC	ROUTE 199	YORK CL	RICHMOND RD (RTE 60)	EW	56	1.07	0.07	1.14	58	1.05	0.07	1.11	56	1.07	0.08	1.14	57	1.06	0.10	1.15
JCC	ROUTE 199	RICHMOND RD (RTE 60)	LONGHILL RD (RTE 612)	EW	50	1.24	0.01	1.25	52	1.18	0.02	1.20	50	1.23	0.00	1.24	52	1.18	0.04	1.22
JCC	ROUTE 199	LONGHILL RD (RTE 612)	MONTICELLO AVE (RTE 321)	EW	50	1.18	0.00	1.18	50	1.23	0.02	1.25	50	1.18	0.01	1.19	50	1.22	0.01	1.24
JCC	ROUTE 199	MONTICELLO AVE (RTE 321)	JOHN TYLER HWY (RTE 5)	EW	45	1.23	0.10	1.36	49	1.12	0.04	1.17	42	1.31	0.14	1.51	49	1.13	0.06	1.19
SUF	SOUTHWEST SUFFOLK BYPASS	HOLLAND RD	CAROLINA RD	NS	61	1.02	0.05	1.50	58	1.06	0.05	1.11	60	1.03	0.04	1.07	59	1.03	0.05	1.70
SUF	SUFFOLK BYPASS	HOLLAND RD	PITCHKETTLE RD	EW	62	1.00	0.05	1.04	57	1.01	0.13	1.14	62	1.00	0.05	1.05	55	1.06	0.36	1.41
SUF	SUFFOLK BYPASS	PITCHKETTLE RD	PRUDEN BLVD	EW	63	0.97	0.06	1.03	63	1.00	0.06	1.04	63	0.98	0.07	1.05	64	0.98	0.05	1.03
SUF	SUFFOLK BYPASS	PRUDEN BLVD	GODWIN BLVD	EW	63	0.98	0.11	1.08	58	1.01	0.07	1.07	62	0.98	0.19	1.18	59	1.00	0.09	1.09
SUF	SUFFOLK BYPASS	GODWIN BLVD	WILROY RD	EW	64	0.98	0.27	1.23	63	0.98	0.08	1.06	64	0.97	0.06	1.02	63	0.99	0.21	1.19
SUF	SUFFOLK BYPASS	WILROY RD	ROUTES 13/58/460	EW	64	0.98	0.25	1.20	64	0.98	0.05	1.02	64	0.97	0.06	1.03	64	0.97	0.30	1.26
SUF	WESTERN FWY	BRIDGE RD	I-664	EW	57	1.01	0.13	1.12	57	0.99	0.07	1.06	58	1.00	0.10	1.08	57	1.00	0.19	1.18
SUF	WESTERN FWY	I-664	COLLEGE DR	EW	60	1.03	0.22	1.26	57	0.99	0.07	1.06	60	1.02	0.22	1.24	57	1.00	0.19	1.18
SUF	WESTERN FWY	COLLEGE DR	PORTSMOUTH CL	EW	62	1.01	0.07	1.08	61	1.02	0.13	1.17	62	1.00	0.14	1.14	61	1.03	0.09	1.13
PORT	WESTERN FWY	SUFFOLK CL	TOWNE POINT RD	EW	62	1.01	0.07	1.08	61	1.02	0.13	1.17	62	1.00	0.14	1.14	61	1.03	0.09	1.13
PORT	WESTERN FWY	TOWNE POINT RD	CEDAR LN	EW	62	1.02	0.19	1.21	62	1.02	0.06	1.08	62	1.01	0.06	1.07	61	1.02	0.11	1.12
PORT	WESTERN FWY	CEDAR LN	APM BLVD	EW	49	1.32	2.06	3.78	59	1.03	0.07	1.11	60	1.02	0.07	1.10	59	1.02	0.18	1.21
PORT	WESTERN FWY	APM BLVD	WEST NORFOLK RD	EW	49	1.32	2.06	3.78	59	1.03	0.07	1.11	60	1.02	0.07	1.10	59	1.02	0.18	1.21
PORT	WESTERN FWY	WEST NORFOLK RD	MLK FREEWAY/MIDTOWN TUNNEL	EW	40	1.40	2.17	4.36	54	1.02	0.09	1.12	52	1.03	0.34	1.38	54	1.02	0.25	1.27

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
CHES	22ND ST	LIBERTY ST	BERKLEY AVE/NORFOLK CL	EW	20	1.23	0.20	1.49	26	1.04	0.03	1.08	21	1.17	0.05	1.21	25	1.10	0.11	1.23
CHES	AIRLINE BLVD	I-664	JOLLIFF RD	EW	34	1.12	0.09	1.22	39	1.13	0.07	1.21	33	1.13	0.07	1.22	40	1.12	0.08	1.21
CHES	AIRLINE BLVD	JOLLIFF RD	PORTSMOUTH CL	EW	34	1.12	0.09	1.22	39	1.13	0.07	1.21	33	1.13	0.07	1.22	40	1.12	0.08	1.21
CHES	BAINBRIDGE BLVD	MILITARY HWY	FREEMAN AVE	NS	31	1.08	0.09	1.18	33	1.13	0.08	1.23	30	1.10	0.07	1.16	33	1.13	0.09	1.26
CHES	BAINBRIDGE BLVD	FREEMAN AVE	SWAIN AVE	NS	31	1.05	0.09	1.14	30	1.05	0.06	1.12	30	1.09	0.07	1.15	30	1.06	0.08	1.14
CHES	BAINBRIDGE BLVD	SWAIN AVE	CHESAPEAKE DR	NS	31	1.05	0.09	1.14	30	1.05	0.06	1.12	30	1.09	0.07	1.15	30	1.06	0.08	1.14
CHES	BAINBRIDGE BLVD	CHESAPEAKE DR	POINDEXTER ST	NS	31	1.05	0.09	1.14	30	1.05	0.06	1.12	30	1.09	0.07	1.15	30	1.06	0.08	1.14
CHES	BATTLEFIELD BLVD	NORTH CAROLINA STATE LINE	BALLAHACK RD	NS	52	1.04	0.07	1.10	52	1.05	0.07	1.12	51	1.08	0.05	1.14	52	1.05	0.47	1.52
CHES	BATTLEFIELD BLVD	BALLAHACK RD	GALLBUSH RD	NS	50	1.11	0.14	1.25	46	1.12	0.13	1.26	48	1.17	0.20	1.39	47	1.11	0.12	1.25
CHES	BATTLEFIELD BLVD	GALLBUSH RD	INDIAN CREEK RD	NS	50	1.10	0.03	1.13	49	1.09	0.08	1.18	50	1.10	0.02	1.12	50	1.09	0.15	1.25
CHES	BATTLEFIELD BLVD	INDIAN CREEK RD	CENTERVILLE TNPK	NS	48	1.10	0.04	1.15	49	1.09	0.08	1.18	48	1.10	0.03	1.14	50	1.09	0.15	1.25
CHES	BATTLEFIELD BLVD	CENTERVILLE TNPK	HILLCREST PKWY	NS	42	1.18	0.20	1.43	44	1.11	0.07	1.19	42	1.18	0.08	1.26	44	1.11	0.10	1.23
CHES	BATTLEFIELD BLVD	HILLCREST PKWY	PEACEFUL RD/HILLWELL RD	NS	42	1.11	0.03	1.14	43	1.11	0.04	1.17	43	1.10	0.03	1.13	43	1.11	0.02	1.13
CHES	BATTLEFIELD BLVD	PEACEFUL RD/HILLWELL RD	HANBURY RD	NS	42	1.11	0.03	1.14	43	1.11	0.04	1.17	43	1.10	0.03	1.13	43	1.11	0.02	1.13
CHES	BATTLEFIELD BLVD	HANBURY RD	JOHNSTOWN RD	NS	31	1.18	0.07	1.27	28	1.12	0.43	1.62	32	1.16	0.08	1.25	25	1.25	0.35	1.72
CHES	BATTLEFIELD BLVD	JOHNSTOWN RD	CEDAR RD	NS	28	1.13	0.31	1.48	28	1.12	0.43	1.62	24	1.36	0.37	1.63	25	1.25	0.35	1.72
CHES	BATTLEFIELD BLVD	CEDAR RD	GREAT BRIDGE BLVD/KEMPSVILLE RD	NS	33	1.22	0.53	1.87	32	1.19	0.32	1.57	33	1.22	0.31	1.60	26	1.47	0.66	2.46
CHES	BATTLEFIELD BLVD	GREAT BRIDGE BLVD/KEMPSVILLE RD	GREAT BRIDGE BYPASS	NS	36	1.13	0.25	1.42	41	1.00	0.23	1.22	37	1.11	0.17	1.31	34	1.22	0.48	1.78
CHES	BATTLEFIELD BLVD	GREAT BRIDGE BYPASS	VOLVO PKWY	NS	37	1.13	0.35	1.53	38	1.13	0.30	1.47	34	1.23	0.37	1.70	33	1.30	0.67	2.19
CHES	BATTLEFIELD BLVD	VOLVO PKWY	I-64	NS	37	1.16	0.51	1.76	29	1.08	0.76	1.90	37	1.16	0.43	1.67	25	1.23	1.12	2.63
CHES	BATTLEFIELD BLVD	I-64	MILITARY HWY	NS	42	1.08	0.49	1.62	40	1.08	0.39	1.61	42	1.10	0.37	1.48	39	1.18	0.79	2.14
CHES	BATTLEFIELD BLVD	MILITARY HWY	CAMPOSTELLA RD	NS	34	1.09	0.31	1.45	35	1.09	0.24	1.36	30	1.24	0.34	1.66	34	1.13	0.33	1.50
CHES	BRIDGE RD	SUFFOLK CL	CHURCHLAND BLVD	EW	34	1.14	0.15	1.31	33	1.16	0.13	1.28	33	1.17	0.14	1.36	32	1.18	0.12	1.32
CHES	BUTTS STATION RD	KEMPSVILLE RD	ELBOW RD	EW	41	1.11	0.07	1.19	38	1.17	0.13	1.31	40	1.12	0.13	1.25	39	1.14	0.08	1.25
CHES	BUTTS STATION RD	ELBOW RD	CENTERVILLE TNPK	EW	43	1.09	0.06	1.13	44	1.01	0.03	1.05	43	1.09	0.48	1.62	41	1.08	0.07	1.10
CHES	CANAL DR	MILITARY HWY	GEORGE WASHINGTON HWY	NS	30	1.25	0.10	1.37	28	1.19	0.04	1.31	28	1.31	0.05	1.36	29	1.18	0.08	1.27
CHES	CEDAR RD	DOMINION BLVD	BELLS MILL RD (WEST)	EW	36	1.16	0.12	1.29	35	1.16	0.09	1.27	35	1.21	0.14	1.37	35	1.15	0.10	1.27
CHES	CEDAR RD	BELLS MILL RD (WEST)	BELLS MILL RD (EAST)	EW	36	1.16	0.12	1.29	35	1.16	0.09	1.27	35	1.21	0.14	1.37	35	1.15	0.10	1.27
CHES	CEDAR RD	BELLS MILL RD (EAST)	BRIARFIELD DR	EW	36	1.16	0.12	1.29	35	1.16	0.09	1.27	35	1.21	0.14	1.37	35	1.15	0.10	1.27
CHES	CEDAR RD	BRIARFIELD DR	BATTLEFIELD BLVD	EW	36	1.16	0.12	1.29	35	1.16	0.09	1.27	35	1.21	0.14	1.37	35	1.15	0.10	1.27
CHES	DOCK LANDING RD	JOLLIFF RD	I-664	EW	42	1.06	0.02	1.08	40	1.02	0.02	1.04	40	1.11	0.03	1.14	41	1.00	0.03	1.03
CHES	DOCK LANDING RD	I-664	EAGLE HILL DR	EW	36	1.08	0.02	1.10	35	1.12	0.03	1.15	36	1.07	0.03	1.08	36	1.11	0.03	1.14
CHES	DOCK LANDING RD	EAGLE HILL DR	PORTSMOUTH BLVD	NS	36	1.08	0.02	1.10	35	1.12	0.03	1.15	36	1.07	0.03	1.08	36	1.11	0.03	1.14
CHES	DOMINION BLVD	GEORGE WASHINGTON HWY	CEDAR RD	NS	37	1.06	0.18	1.25	41	0.99	0.07	1.06	40	0.97	0.06	1.03	37	1.10	0.14	1.26
CHES	DOMINION BLVD/STEEL BRIDGE	CEDAR RD	BAINBRIDGE BLVD	NS	36	1.15	0.27	1.48	30	1.27	0.37	1.80	39	1.07	0.14	1.23	27	1.41	0.68	2.56
CHES	DOMINION BLVD	BAINBRIDGE BLVD	GREAT BRIDGE BLVD	NS	36	1.15	0.27	1.48	30	1.27	0.37	1.80	39	1.07	0.14	1.23	27	1.41	0.68	2.56
CHES	GEORGE WASHINGTON HWY	NORTH CAROLINA STATE LINE	DOMINION BLVD	NS	61	1.04	0.04	1.07	59	1.04	0.06	1.10	61	1.05	0.03	1.08	60	1.02	0.04	1.05
CHES	GEORGE WASHINGTON HWY	DOMINION BLVD	GW HWY RELOCATED	NS	48	1.11	0.07	1.18	48	1.07	0.01	1.09	47	1.11	0.07	1.19	50	1.04	0.03	1.07
CHES	GEORGE WASHINGTON HWY	GW HWY RELOCATED	MOSES GRANDY TR @ HINTON AVE	NS	48	1.11	0.07	1.18	48	1.07	0.01	1.09	47	1.11	0.07	1.19	50	1.04	0.03	1.07
CHES	GW HWY (DEEP CREEK BRIDGE)	MOSES GRANDY TR @ HINTON AVE	MILL CREEK PKWY	NS	30	1.33	0.45	2.03	27	1.23	0.30	1.64	33	1.16	0.19	1.41	22	1.54	0.61	2.60
CHES	GEORGE WASHINGTON HWY	MILL CREEK PKWY	WILLOWOOD DR	NS	30	1.33	0.45	2.03	27	1.23	0.30	1.64	33	1.16	0.19	1.41	22	1.54	0.61	2.60
CHES	GEORGE WASHINGTON HWY	WILLOWOOD DR	I-64	NS	30	1.33	0.45	2.03	27	1.23	0.30	1.64	33	1.16	0.19	1.41	22	1.54	0.61	2.60
CHES	GEORGE WASHINGTON HWY	I-64	MILITARY HWY	NS	32	1.16	0.30	1.51	36	1.13	0.35	1.54	30	1.24	0.58	1.99	38	1.05	0.32	1.41
CHES	GEORGE WASHINGTON HWY	MILITARY HWY	CANAL DR	NS	30	1.18	0.14	1.35	28	1.18	0.16	1.38	29	1.22	0.13	1.38	25	1.32	0.64	2.15
CHES	GEORGE WASHINGTON HWY	CANAL DR	PORTSMOUTH CL	NS	31	1.14	0.13	1.29	31	1.15	0.16	1.33	29	1.18	0.17	1.40	30	1.21	0.22	1.49
CHES	GREAT BRIDGE BLVD	BAINBRIDGE BLVD	CAMPOSTELLA RD	EW	28	1.31	0.49	1.81	30	1.15	0.06	1.24	30	1.22	0.01	1.25	30	1.14	0.06	1.23
CHES	GREAT BRIDGE BLVD	CAMPOSTELLA RD	I-64	EW	28	1.31	0.49	1.81	30	1.15	0.06	1.24	30	1.22	0.01	1.25	30	1.14	0.06	1.23
CHES	GREAT BRIDGE BLVD	I-64	DOMINION BLVD	EW	26	1.09	0.39	1.40	32	1.09	0.17	1.29	26	1.08	0.08	1.18	32	1.11	0.12	1.25
CHES	GREAT BRIDGE BLVD	DOMINION BLVD	RIVERWALK PKWY WEST	EW	31	1.23	0.10	1.37	32	1.21	0.07	1.31	31	1.22	0.10	1.36	33	1.21	0.06	1.29
CHES	GREAT BRIDGE BLVD	RIVERWALK PKWY WEST	BATTLEFIELD BLVD	EW	31	1.23	0.10	1.37	32	1.21	0.07	1.31	31	1.22	0.10	1.36	33	1.21	0.06	1.29

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
CHES	GREENBRIER PKWY	KEMPSVILLE RD	VOLVO PKWY	NS	36	1.17	0.25	1.48	36	1.20	0.26	1.52	37	1.16	0.21	1.43	34	1.27	0.47	1.88
CHES	GREENBRIER PKWY	VOLVO PKWY	EDEN WAY	NS	35	1.25	0.46	1.79	29	1.20	0.45	1.74	34	1.31	0.45	1.88	24	1.48	0.77	2.61
CHES	GREENBRIER PKWY	EDEN WAY	I-64	NS	35	1.25	0.46	1.79	29	1.20	0.45	1.74	34	1.31	0.45	1.88	24	1.48	0.77	2.61
CHES	GREENBRIER PKWY	I-64	WOODLAKE DR	NS	29	1.18	0.40	1.63	39	1.10	0.29	1.42	27	1.29	0.32	1.67	34	1.25	0.53	1.92
CHES	GREENBRIER PKWY	WOODLAKE DR	MILITARY HWY	NS	29	1.18	0.40	1.63	39	1.10	0.29	1.42	27	1.29	0.32	1.67	34	1.25	0.53	1.92
CHES	INDIAN RIVER RD	NORFOLK CL	KEMP LANE	EW	34	1.13	0.07	1.19	32	1.17	0.15	1.37	35	1.08	0.09	1.19	33	1.15	0.13	1.28
CHES	INDIAN RIVER RD	KEMP LANE	VA BEACH CL	EW	33	1.13	0.17	1.33	35	1.16	0.11	1.30	32	1.18	0.16	1.39	33	1.22	0.14	1.41
CHES	KEMPSVILLE RD	BATTLEFIELD BLVD	CHESAPEAKE EXPRESSWAY	EW	34	1.24	0.18	1.47	32	1.36	0.42	1.92	34	1.22	0.23	1.50	30	1.45	0.40	1.92
CHES	KEMPSVILLE RD	CHESAPEAKE EXPRESSWAY	GREENBRIER PKWY	EW	34	1.24	0.18	1.47	32	1.36	0.42	1.92	34	1.22	0.23	1.50	30	1.45	0.40	1.92
CHES	KEMPSVILLE RD	GREENBRIER PKWY	VOLVO PKWY	EW	41	1.10	0.07	1.19	38	1.22	0.11	1.33	42	1.10	0.09	1.20	40	1.14	0.08	1.24
CHES	KEMPSVILLE RD	VOLVO PKWY	VA BEACH CL	EW	36	1.20	0.15	1.40	36	1.20	0.14	1.38	36	1.21	0.19	1.46	37	1.18	0.14	1.36
CHES	LIBERTY ST	22ND ST	POINDEXTER RD	EW	26	1.04	0.03	1.08	20	1.23	0.20	1.49	25	1.10	0.11	1.23	21	1.17	0.05	1.21
CHES	MILITARY HWY	AIRLINE BLVD	I-64	EW	38	1.09	0.17	1.26	38	1.09	0.06	1.15	39	1.06	0.15	1.22	38	1.08	0.09	1.18
CHES	MILITARY HWY	I-64	CAVALIER BLVD	EW	38	1.09	0.17	1.26	38	1.09	0.06	1.15	39	1.06	0.15	1.22	38	1.08	0.09	1.18
CHES	MILITARY HWY	CAVALIER BLVD	GEORGE WASHINGTON HWY	EW	42	1.06	0.44	1.54	36	1.17	0.29	1.50	43	1.06	0.48	1.59	34	1.21	0.25	1.48
CHES	MILITARY HWY	GEORGE WASHINGTON HWY	CANAL DR	EW	33	1.35	0.71	2.31	37	1.10	0.18	1.32	32	1.42	0.63	2.34	36	1.18	0.21	1.43
CHES	MILITARY HWY/GILMERTON BRIDGE	CANAL DR	BAINBRIDGE BLVD	EW	31	1.41	0.80	2.54	40	1.17	0.13	1.32	30	1.50	0.69	2.59	36	1.32	0.30	1.74
CHES	MILITARY HWY	BAINBRIDGE BLVD	I-464	EW	36	1.20	0.40	1.67	40	1.13	0.24	1.39	37	1.15	0.31	1.48	27	1.69	1.79	4.50
CHES	MILITARY HWY	I-464	CAMPOSTELLA RD	EW	34	1.12	0.50	1.67	34	1.22	0.31	1.59	34	1.12	0.55	1.75	30	1.41	1.23	3.26
CHES	MILITARY HWY	CAMPOSTELLA RD	BATTLEFIELD BLVD	EW	41	1.08	0.13	1.20	40	1.10	0.23	1.35	41	1.06	0.19	1.26	38	1.15	0.61	1.87
CHES	MILITARY HWY	BATTLEFIELD BLVD	ALLISON DR	EW	33	1.25	0.25	1.58	36	1.11	0.13	1.27	32	1.27	0.22	1.53	34	1.18	0.22	1.47
CHES	MILITARY HWY	ALLISON DR	GREENBRIER PKWY	EW	33	1.25	0.25	1.58	36	1.11	0.13	1.27	32	1.27	0.22	1.53	34	1.18	0.22	1.47
CHES	MILITARY HWY	GREENBRIER PKWY	VA BEACH CL	EW	33	1.32	0.24	1.66	32	1.21	0.25	1.51	32	1.36	0.26	1.71	30	1.31	0.32	1.70
CHES	MLK HWY (FORMER DOMINION BLVD)	GREAT BRIDGE BLVD	CHESAPEAKE EXPRESSWAY	NS	36	1.15	0.27	1.48	30	1.27	0.37	1.80	39	1.07	0.14	1.23	27	1.41	0.68	2.56
CHES	MOSES GRANDY TRAIL	GW HWY @ HINTON AVE	SHIPYARD/CEDAR RD/GW HWY RELOC	EW	38	1.20	0.12	1.34	38	1.22	0.11	1.35	39	1.16	0.06	1.23	39	1.18	0.11	1.31
CHES	MOSES GRANDY TRAIL	SHIPYARD RD/CEDAR RD	CEDAR RD	EW	38	1.20	0.12	1.34	38	1.22	0.11	1.35	39	1.16	0.06	1.23	39	1.18	0.11	1.31
CHES	MOSES GRANDY TRAIL	CEDAR RD	DOMINION BLVD	EW	38	1.20	0.12	1.34	38	1.22	0.11	1.35	39	1.16	0.06	1.23	39	1.18	0.11	1.31
CHES	MOUNT PLEASANT RD	BATTLEFIELD BLVD	CHESAPEAKE EXPRESSWAY	EW	35	1.12	0.10	1.22	35	1.12	0.06	1.17	36	1.10	0.09	1.20	33	1.18	0.19	1.43
CHES	MOUNT PLEASANT RD	CHESAPEAKE EXPRESSWAY	CENTERVILLE TNPK	EW	36	1.14	0.09	1.22	37	1.16	0.30	1.50	36	1.14	0.15	1.31	38	1.13	0.10	1.23
CHES	MOUNT PLEASANT RD	CENTERVILLE TNPK	FENTRESS AIRFIELD RD	EW	47	1.08	0.08	1.17	47	1.13	0.05	1.18	48	1.06	0.03	1.10	48	1.13	0.06	1.20
CHES	MOUNT PLEASANT RD	FENTRESS AIRFIELD RD	VA BEACH CL	EW	41	1.13	0.11	1.25	46	1.10	0.03	1.13	41	1.13	0.08	1.22	46	1.09	0.07	1.17
CHES	OLD BATTLEFIELD BLVD	BALLAHACK RD	BATTLEFIELD BLVD	NS	27	1.02	0.02	1.04	33	1.02	0.01	1.03	24	1.15	0.03	1.18	30	1.11	0.01	1.13
CHES	POINDEXTER ST	BAINBRIDGE BLVD	LIBERTY ST	EW	20	1.16	0.12	1.28	17	1.35	0.05	1.41	20	1.18	0.05	1.24	18	1.28	0.07	1.34
CHES	PORTSMOUTH BLVD	SUFFOLK CL	JOLIFF RD	EW	41	1.06	0.08	1.14	38	1.14	0.11	1.25	40	1.08	0.08	1.16	38	1.16	0.18	1.37
CHES	PORTSMOUTH BLVD	JOLIFF RD	I-664	EW	41	1.06	0.08	1.14	38	1.14	0.11	1.25	40	1.08	0.08	1.16	38	1.16	0.18	1.37
CHES	PORTSMOUTH BLVD	I-664	TAYLOR RD	EW	31	1.09	0.17	1.26	34	1.11	0.17	1.30	27	1.26	0.23	1.56	32	1.21	0.22	1.48
CHES	PORTSMOUTH BLVD	TAYLOR RD	DOCK LANDING RD	EW	35	1.04	0.10	1.11	35	1.08	0.08	1.18	33	1.12	0.09	1.23	33	1.13	0.08	1.23
CHES	PORTSMOUTH BLVD	DOCK LANDING RD	PORTSMOUTH CL	EW	35	1.04	0.10	1.11	35	1.08	0.08	1.18	33	1.12	0.09	1.23	33	1.13	0.08	1.23
CHES	PUGHSVILLE RD	SUFFOLK CL	I-664	EW	35	1.09	0.09	1.18	34	1.13	0.03	1.17	33	1.15	0.07	1.24	34	1.12	0.09	1.21
CHES	PUGHSVILLE RD	I-664	TAYLOR RD	EW	32	1.00	0.23	1.24	35	1.07	0.15	1.22	25	1.29	0.20	1.54	34	1.10	0.17	1.30
CHES	TAYLOR RD	PORTSMOUTH BLVD	ELIZABETH HARBOR RD	NS	34	1.09	0.08	1.16	32	1.02	0.04	1.06	32	1.16	0.07	1.25	29	1.13	0.09	1.23
CHES	TAYLOR RD	ELIZABETH HARBOR RD	BRUCE RD	NS	34	1.09	0.08	1.16	32	1.02	0.04	1.06	32	1.16	0.07	1.25	29	1.13	0.09	1.23
CHES	TAYLOR RD	BRUCE RD	PUGHSVILLE RD	NS	30	1.04	0.04	1.08	28	1.06	0.06	1.13	28	1.12	0.04	1.17	26	1.16	0.10	1.24
CHES	TAYLOR RD	PUGHSVILLE RD	WESTERN BRANCH BLVD	NS	34	1.15	0.03	1.19	34	1.16	0.04	1.19	34	1.14	0.04	1.19	34	1.16	0.05	1.21
CHES	TOWNE POINT RD	PORTSMOUTH CL	CHURCHLAND BLVD	EW	26	1.16	0.10	1.23	26	1.13	0.07	1.22	25	1.19	0.14	1.34	26	1.16	0.17	1.32
CHES	VOLVO PKWY	BATTLEFIELD BLVD	GREENBRIER PKWY	EW	28	1.15	0.28	1.47	29	1.17	0.29	1.50	26	1.20	0.27	1.52	27	1.24	0.33	1.65
CHES	VOLVO PKWY	GREENBRIER PKWY	EDEN WAY	EW	34	1.16	0.11	1.29	32	1.31	0.13	1.46	33	1.23	0.12	1.38	32	1.31	0.09	1.45
CHES	VOLVO PKWY	EDEN WAY	KEMPSVILLE RD	EW	34	1.16	0.11	1.29	32	1.31	0.13	1.46	33	1.23	0.12	1.38	32	1.31	0.09	1.45
CHES	VOLVO PKWY	KEMPSVILLE RD	VA BEACH CL	EW	36	1.11	0.05	1.14	36	1.08	0.21	1.26	35	1.16	0.05	1.21	36	1.07	0.08	1.14
CHES	WESTERN BRANCH BLVD	CHURCHLAND BLVD	TAYLOR RD	EW	30	1.15	0.08	1.26	31	1.09	0.08	1.18	29	1.19	0.12	1.35	29	1.19	0.14	1.34

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
CHES	WESTERN BRANCH BLVD	TAYLOR RD	PORTSMOUTH CL	EW	30	1.15	0.08	1.26	31	1.09	0.08	1.18	29	1.19	0.12	1.35	29	1.19	0.14	1.34
FR	MAIN ST	SOUTH ST	SECOND AVE	NS	26	1.09	0.02	1.12	26	1.13	0.03	1.15	26	1.09	0.04	1.15	26	1.13	0.04	1.17
FR	SECOND AVE	MAIN ST	MECHANIC ST	EW	32	1.11	0.06	1.18	33	1.15	0.04	1.18	34	1.05	0.04	1.10	33	1.17	0.05	1.21
FR	SECOND AVE	MECHANIC ST	ISLE OF WIGHT CL	EW	32	1.11	0.06	1.18	33	1.15	0.04	1.18	34	1.05	0.04	1.10	33	1.17	0.05	1.21
FR	SOUTH ST	ROUTE 58	COLLEGE DR	EW	26	1.09	0.02	1.12	26	1.13	0.03	1.15	26	1.09	0.04	1.15	26	1.13	0.04	1.17
FR	SOUTH ST	COLLEGE DR	PRETLOW ST	EW	26	1.09	0.02	1.12	26	1.13	0.03	1.15	26	1.09	0.04	1.15	26	1.13	0.04	1.17
FR	SOUTH ST	PRETLOW ST	HIGH ST	EW	26	1.09	0.02	1.12	26	1.13	0.03	1.15	26	1.09	0.04	1.15	26	1.13	0.04	1.17
FR	SOUTH ST	HIGH ST	MAIN ST	EW	26	1.09	0.02	1.12	26	1.13	0.03	1.15	26	1.09	0.04	1.15	26	1.13	0.04	1.17
GLO	RTE 17 (COLEMAN BRIDGE)	YORK CL	RTE 216 (GUINEA RD)	NS	45	1.05	0.13	1.19	46	1.04	0.21	1.26	42	1.14	0.30	1.50	46	1.05	0.15	1.22
GLO	RTE 17	RTE 216 (GUINEA RD)	RTE 614 (HICKORY FORK RD)	NS	52	1.06	0.12	1.19	51	1.08	0.21	1.29	52	1.05	0.16	1.22	49	1.11	0.21	1.35
GLO	RTE 17	RTE 614 (HICKORY FORK RD)	RTE 17 BUS S (MAIN ST)	NS	49	1.11	0.19	1.30	51	1.05	0.19	1.24	48	1.13	0.22	1.37	48	1.11	0.14	1.26
GLO	RTE 17	RTE 17 BUS S (MAIN ST)	RTE 17 BUS N (MAIN ST)	NS	52	1.06	0.07	1.13	49	1.09	0.24	1.35	52	1.06	0.12	1.19	49	1.09	0.19	1.30
GLO	RTE 17	RTE 17 BUS N (MAIN ST)	RTE 606 (ARK RD)	NS	50	1.13	0.08	1.22	53	1.07	0.10	1.16	53	1.08	0.11	1.18	50	1.12	0.13	1.26
GLO	RTE 17	RTE 606 (ARK RD)	ROUTE 14	NS	58	1.06	0.05	1.11	58	1.04	0.09	1.12	59	1.03	0.06	1.09	58	1.04	0.07	1.12
GLO	RTE 17	ROUTE 14	ROUTES 33/198	NS	57	1.06	0.06	1.12	59	1.03	0.06	1.09	58	1.05	0.09	1.14	59	1.03	0.04	1.07
GLO	RTE 17	ROUTES 33/198	MIDDLESEX CL	NS	55	1.07	0.06	1.14	55	1.05	0.07	1.12	55	1.07	0.05	1.11	55	1.05	0.07	1.12
GLO	RTE 33	KING AND QUEEN CL	ROUTE 17	EW	50	1.19	0.02	1.22	50	1.22	0.00	1.22	50	1.19	0.02	1.22	50	1.22	0.01	1.23
HAM	ABERDEEN RD	PEMBROKE AVE	I-664	NS	24	1.09	0.22	1.21	19	1.22	0.17	1.29	27	0.95	0.14	1.08	18	1.27	0.09	1.44
HAM	ABERDEEN RD	I-664	BRIARFIELD RD	NS	30	1.16	0.15	1.34	31	1.12	0.24	1.37	30	1.15	0.15	1.30	31	1.11	0.13	1.25
HAM	ABERDEEN RD	BRIARFIELD RD	MERCURY BLVD	NS	34	1.11	0.20	1.33	35	1.16	0.10	1.25	34	1.10	0.11	1.20	35	1.15	0.08	1.23
HAM	ABERDEEN RD	MERCURY BLVD	TODDS LA	NS	20	1.34	0.05	1.43	24	1.09	0.11	1.21	24	1.13	0.16	1.25	21	1.25	0.09	1.29
HAM	ARMISTEAD AVE	COMMANDER SHEPPARD BLVD	HRC PARKWAY	NS	35	1.20	0.40	1.68	34	1.17	0.04	1.23	38	1.12	0.05	1.18	35	1.14	0.11	1.27
HAM	ARMISTEAD AVE	HRC PARKWAY	MERCURY BLVD	NS	33	1.22	0.18	1.45	32	1.27	0.07	1.38	34	1.22	0.06	1.28	32	1.26	0.17	1.39
HAM	ARMISTEAD AVE	MERCURY BLVD	PINE CHAPEL RD	NS	32	1.22	0.15	1.40	34	1.07	0.07	1.14	33	1.20	0.10	1.34	33	1.12	0.10	1.24
HAM	ARMISTEAD AVE	PINE CHAPEL RD	LASALLE AVE	NS	32	1.22	0.15	1.40	34	1.07	0.07	1.14	33	1.20	0.10	1.34	33	1.12	0.10	1.24
HAM	ARMISTEAD AVE	LASALLE AVE	RIP RAP RD	NS	27	1.27	0.35	1.71	32	1.12	0.03	1.17	29	1.16	0.15	1.34	33	1.08	0.06	1.14
HAM	ARMISTEAD AVE	RIP RAP RD	PEMBROKE AVE	NS	33	1.07	0.03	1.11	31	1.12	0.02	1.17	33	1.07	0.05	1.11	33	1.07	0.06	1.12
HAM	ARMISTEAD AVE	PEMBROKE AVE	SETTLERS LANDING RD	NS	25	0.95	0.02	0.97	24	1.25	0.04	1.32	21	1.17	0.04	1.24	26	1.13	0.16	1.22
HAM	BIG BETHEL RD	TODDS LANE	HRC PKWY	NS	28	1.35	0.10	1.49	30	1.23	0.07	1.32	29	1.27	0.13	1.44	30	1.24	0.09	1.37
HAM	BIG BETHEL RD	HRC PKWY	THOMAS NELSON DR	NS	35	1.11	0.12	1.22	32	1.30	0.14	1.49	34	1.13	0.15	1.31	31	1.32	0.27	1.66
HAM	BIG BETHEL RD	THOMAS NELSON DR	SAUNDERS RD	NS	41	1.13	0.06	1.21	41	1.08	0.09	1.14	41	1.13	0.06	1.19	41	1.08	0.04	1.13
HAM	BIG BETHEL RD	SAUNDERS RD	SEMPLE FARM RD	NS	32	1.28	0.03	1.33	35	1.06	0.06	1.13	33	1.20	0.05	1.26	34	1.10	0.06	1.13
HAM	BIG BETHEL RD	SEMPLE FARM RD	YORK CL	NS	32	1.28	0.03	1.33	35	1.06	0.06	1.13	33	1.20	0.05	1.26	34	1.10	0.06	1.13
HAM	BRIARFIELD RD	NEWPORT NEWS CL	ABERDEEN RD	EW	28	1.26	0.02	1.30	30	1.17	0.03	1.22	30	1.18	0.03	1.22	29	1.22	0.03	1.26
HAM	BRIARFIELD RD	ABERDEEN RD	POWER PLANT PKWY	EW	29	1.30	0.05	1.35	31	1.27	0.01	1.30	32	1.16	0.05	1.21	31	1.26	0.02	1.29
HAM	CHESTNUT AVE	NEWPORT NEWS CL	MERCURY BLVD	NS	28	1.19	0.02	1.22	32	1.10	0.04	1.14	29	1.19	0.02	1.23	30	1.16	0.05	1.19
HAM	COMMANDER SHEPPARD BLVD	ARMISTEAD AVE	NASA MAIN GATE	NS	39	1.08	0.03	1.13	37	1.12	0.07	1.16	39	1.10	0.06	1.18	37	1.14	0.04	1.20
HAM	COMMANDER SHEPPARD BLVD	NASA MAIN GATE	WYTHE CREEK RD	NS	39	1.08	0.03	1.13	37	1.12	0.07	1.16	39	1.10	0.06	1.18	37	1.14	0.04	1.20
HAM	COLISEUM DR	PINE CHAPEL RD	MERCURY BLVD	NS	21	1.29	0.07	1.35	23	1.12	0.05	1.15	23	1.15	0.06	1.22	24	1.08	0.09	1.12
HAM	COLISEUM DR	MERCURY BLVD	MARCELLA DR	NS	28	1.11	0.09	1.22	26	1.12	0.05	1.17	27	1.18	0.14	1.32	27	1.09	0.09	1.18
HAM	COLISEUM DR	MARCELLA DR	HRC PARKWAY	NS	28	1.11	0.09	1.22	26	1.12	0.05	1.17	27	1.18	0.14	1.32	27	1.09	0.09	1.18
HAM	COUNTY ST	WOODLAND RD	MALLORY ST	EW	27	1.24	0.05	1.30	27	1.05	0.01	1.08	26	1.28	0.06	1.34	25	1.14	0.01	1.17
HAM	CUNNINGHAM DR	TODDS LA	COLISEUM DR	EW	30	1.24	0.06	1.30	29	1.23	0.02	1.27	28	1.30	0.06	1.39	26	1.33	0.03	1.39
HAM	CUNNINGHAM DR	COLISEUM DR	MERCURY BLVD	EW	28	0.99	0.04	1.03	27	1.22	0.01	1.25	27	1.05	0.07	1.11	26	1.28	0.03	1.33
HAM	FOX HILL RD	OLD BUCKROE RD	WOODLAND RD	EW	33	1.16	0.03	1.19	33	1.09	0.06	1.14	34	1.11	0.06	1.18	32	1.13	0.03	1.16
HAM	FOX HILL RD	WOODLAND RD	MERCURY BLVD	EW	33	1.15	0.05	1.22	32	1.19	0.08	1.29	32	1.20	0.09	1.33	31	1.22	0.07	1.33
HAM	HRC PARKWAY	NEWPORT NEWS CL	BIG BETHEL RD	EW	41	1.19	0.08	1.29	43	1.15	0.08	1.25	43	1.13	0.11	1.25	42	1.19	0.10	1.30
HAM	HRC PARKWAY	BIG BETHEL RD	I-64	EW	45	1.13	0.12	1.26	36	1.29	0.40	1.87	45	1.12	0.13	1.27	34	1.29	0.52	2.01
HAM	HRC PARKWAY	I-64	MAGRUDER BLVD	EW	49	1.16	0.09	1.26	48	1.12	0.06	1.19	49	1.16	0.07	1.24	48	1.13	0.35	1.52
HAM	HRC PARKWAY	MAGRUDER BLVD	COLISEUM DR	EW	39	1.21	0.22	1.50	44	1.11	0.05	1.17	40	1.17	0.17	1.31	46	1.08	0.12	1.21

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
HAM	HRC PARKWAY	COLISEUM DR	ARMISTEAD AVE	EW	39	1.21	0.22	1.50	44	1.11	0.05	1.17	40	1.17	0.17	1.31	46	1.08	0.12	1.21
HAM	KECOUGHTAN RD	NEWPORT NEWS CL	POWHATAN PKWY	EW	29	1.09	0.01	1.11	31	1.06	0.04	1.10	29	1.10	0.06	1.15	31	1.07	0.06	1.11
HAM	KECOUGHTAN RD	POWHATAN PKWY	LASALLE AVE	EW	33	1.11	0.02	1.14	35	1.05	0.02	1.07	33	1.11	0.03	1.13	33	1.13	0.01	1.15
HAM	KECOUGHTAN RD	LASALLE AVE	VICTORIA BLVD	NS	31	1.16	0.02	1.19	32	1.06	0.06	1.08	31	1.17	0.03	1.21	31	1.10	0.04	1.13
HAM	KECOUGHTAN RD	VICTORIA BLVD	SETTLERS LANDING RD	NS	27	1.22	0.03	1.25	25	1.28	0.02	1.30	28	1.19	0.06	1.25	26	1.23	0.06	1.26
HAM	KING ST	PEMBROKE AVE	I-64 OVERPASS	NS	28	1.23	0.02	1.25	30	1.22	0.02	1.25	29	1.21	0.04	1.26	30	1.24	0.05	1.27
HAM	KING ST	I-64 OVERPASS	RIP RAP RD	NS	28	1.23	0.02	1.25	30	1.22	0.02	1.25	29	1.21	0.04	1.26	30	1.24	0.05	1.27
HAM	KING ST	RIP RAP RD	MERCURY BLVD	NS	26	1.15	0.03	1.21	30	1.15	0.05	1.21	27	1.12	0.14	1.27	30	1.15	0.13	1.29
HAM	KING ST	MERCURY BLVD	OLD FOX HILL RD	NS	30	1.28	0.10	1.35	31	1.18	0.07	1.27	30	1.29	0.07	1.38	33	1.11	0.14	1.22
HAM	KING ST	OLD FOX HILL RD	LITTLE BACK RIVER RD	NS	30	1.28	0.10	1.35	31	1.18	0.07	1.27	30	1.29	0.07	1.38	33	1.11	0.14	1.22
HAM	KING ST	LITTLE BACK RIVER RD	LAMINGTON RD	NS	30	1.32	0.14	1.48	28	1.16	0.01	1.19	32	1.27	0.05	1.32	32	1.02	0.08	1.08
HAM	KING ST	LAMINGTON RD	OLD BUCKINGHAM RD	NS	30	1.32	0.14	1.48	28	1.16	0.01	1.19	32	1.27	0.05	1.32	32	1.02	0.08	1.08
HAM	KING ST	OLD BUCKINGHAM RD	LANGLEY AFB	NS	30	1.32	0.14	1.48	28	1.16	0.01	1.19	32	1.27	0.05	1.32	32	1.02	0.08	1.08
HAM	LASALLE AVE	KECOUGHTAN RD	VICTORIA BLVD	NS	32	1.07	0.01	1.08	32	1.13	0.04	1.17	31	1.11	0.02	1.13	31	1.18	0.01	1.20
HAM	LASALLE AVE	VICTORIA BLVD	SETTLERS LANDING RD	NS	31	1.04	0.04	1.08	30	1.09	0.03	1.14	27	1.16	0.04	1.22	31	1.07	0.03	1.11
HAM	LASALLE AVE	SETTLERS LANDING RD	PEMBROKE AVE	NS	23	1.30	0.09	1.45	24	1.22	0.17	1.43	23	1.35	0.13	1.57	24	1.25	0.20	1.51
HAM	LASALLE AVE	PEMBROKE AVE	ARMISTEAD AVE	NS	23	1.30	0.09	1.45	24	1.22	0.17	1.43	23	1.35	0.13	1.57	24	1.25	0.20	1.51
HAM	LASALLE AVE	ARMISTEAD AVE	MERCURY BLVD	NS	44	1.07	0.06	1.13	38	1.24	0.05	1.31	45	1.06	0.03	1.08	39	1.17	0.10	1.30
HAM	LASALLE AVE	MERCURY BLVD	LANGLEY GATE	NS	48	1.14	0.20	1.36	47	1.11	0.02	1.14	48	1.14	0.05	1.17	48	1.11	0.06	1.17
HAM	MAGRUDER BLVD	YORK CL	SEMPLE FARM RD	NS	41	1.20	0.07	1.25	40	1.38	0.16	1.54	41	1.21	0.22	1.48	44	1.26	0.15	1.45
HAM	MAGRUDER BLVD	SEMPLE FARM RD	COMM SHEPPARD BLVD (SOUTH)	NS	45	1.10	0.15	1.26	45	1.10	0.11	1.22	44	1.11	0.26	1.40	46	1.08	0.15	1.24
HAM	MAGRUDER BLVD	COMM SHEPPARD BLVD (SOUTH)	HRC PARKWAY	NS	47	1.13	0.10	1.24	44	1.17	0.13	1.33	45	1.16	0.11	1.29	44	1.19	0.33	1.56
HAM	MAGRUDER BLVD	HRC PARKWAY	I-64	NS	40	1.18	0.32	1.57	46	1.09	0.08	1.19	39	1.22	0.41	1.73	44	1.13	0.12	1.27
HAM	MALLORY ST	I-64	COUNTY ST	EW	23	1.02	0.07	1.05	24	1.04	0.11	1.16	23	1.05	0.05	1.09	22	1.14	0.16	1.31
HAM	MALLORY ST	COUNTY ST	MERCURY BLVD	EW	26	1.10	0.03	1.13	27	1.07	0.12	1.17	25	1.11	0.06	1.16	26	1.14	0.11	1.28
HAM	MALLORY ST	MERCURY BLVD	PEMBROKE AVE	EW	34	1.12	0.02	1.14	36	1.07	0.05	1.12	35	1.09	0.04	1.12	34	1.10	0.02	1.12
HAM	MELLEN ST	MERCURY BLVD	MALLORY ST	NS	24	1.04	0.01	1.08	23	1.07	0.01	1.08	24	1.04	0.03	1.06	22	1.08	0.01	1.10
HAM	MERCURY BLVD	NEWPORT NEWS CL	BIG BETHEL RD	EW	39	1.03	0.32	1.37	39	1.03	0.40	1.45	36	1.14	0.43	1.62	37	1.11	0.44	1.60
HAM	MERCURY BLVD	BIG BETHEL RD	ABERDEEN RD	EW	38	1.17	0.51	1.79	41	1.09	0.43	1.56	41	1.08	0.24	1.32	41	1.10	0.30	1.41
HAM	MERCURY BLVD	ABERDEEN RD	POWER PLANT PKWY	EW	35	1.08	0.39	1.51	38	1.07	0.48	1.59	32	1.18	0.77	2.10	37	1.10	0.54	1.70
HAM	MERCURY BLVD	POWER PLANT PKWY	I-64	EW	41	1.05	0.18	1.25	29	1.16	1.02	2.35	39	1.10	0.25	1.39	31	1.09	1.07	2.27
HAM	MERCURY BLVD	I-64	COLISEUM DR	EW	31	1.04	0.36	1.33	36	1.03	0.24	1.27	29	1.10	0.54	1.67	34	1.12	0.34	1.48
HAM	MERCURY BLVD	COLISEUM DR	CUNNINGHAM DR	EW	31	1.04	0.36	1.33	36	1.03	0.24	1.27	29	1.10	0.54	1.67	34	1.12	0.34	1.48
HAM	MERCURY BLVD	CUNNINGHAM DR	ARMISTEAD AVE	EW	31	1.04	0.36	1.33	36	1.03	0.24	1.27	29	1.10	0.54	1.67	34	1.12	0.34	1.48
HAM	MERCURY BLVD	ARMISTEAD AVE	LASALLE AVE	EW	41	1.13	0.08	1.16	38	1.20	0.32	1.54	43	1.09	0.13	1.23	37	1.23	0.29	1.61
HAM	MERCURY BLVD	LASALLE AVE	KING ST	EW	40	1.15	0.16	1.24	43	1.08	0.18	1.27	40	1.16	0.29	1.50	42	1.11	0.17	1.31
HAM	MERCURY BLVD	KING ST	FOX HILL RD	EW	41	1.05	0.11	1.17	39	1.13	0.11	1.26	40	1.08	0.15	1.23	38	1.15	0.10	1.27
HAM	MERCURY BLVD	FOX HILL RD	ANDREWS BLVD	EW	41	1.05	0.11	1.17	39	1.13	0.11	1.26	40	1.08	0.15	1.23	38	1.15	0.10	1.27
HAM	MERCURY BLVD	ANDREWS BLVD	PEMBROKE AVE	EW	39	1.15	0.10	1.27	36	1.19	0.04	1.24	39	1.17	0.22	1.40	36	1.20	0.05	1.27
HAM	MERCURY BLVD	PEMBROKE AVE	WOODLAND RD	EW	32	1.22	0.11	1.35	31	1.14	0.05	1.20	32	1.22	0.19	1.40	31	1.15	0.06	1.20
HAM	MERCURY BLVD	WOODLAND RD	MALLORY ST	EW	32	1.16	0.11	1.28	33	0.96	0.05	1.00	29	1.30	0.09	1.36	34	0.94	0.03	0.97
HAM	MERCURY BLVD	MALLORY ST	MELLEN ST/INGALLS RD	EW	32	1.16	0.11	1.28	33	0.96	0.05	1.00	29	1.30	0.09	1.36	34	0.94	0.03	0.97
HAM	OLD BUCKROE RD	PEMBROKE AVE	FOX HILL RD	NS	30	1.11	0.01	1.13	29	1.15	0.03	1.18	30	1.12	0.03	1.14	29	1.14	0.01	1.16
HAM	PEMBROKE AVE	NEWPORT NEWS CL	ABERDEEN RD	EW	34	1.13	0.06	1.21	34	1.16	0.07	1.23	34	1.15	0.05	1.20	34	1.16	0.03	1.20
HAM	PEMBROKE AVE	ABERDEEN RD	POWHATAN PKWY	EW	31	1.21	0.07	1.30	30	1.20	0.05	1.27	31	1.22	0.06	1.28	31	1.16	0.06	1.25
HAM	PEMBROKE AVE	POWHATAN PKWY	SETTLERS LANDING RD	EW	38	1.13	0.06	1.20	38	1.13	0.06	1.22	38	1.14	0.08	1.22	36	1.18	0.07	1.26
HAM	PEMBROKE AVE	SETTLERS LANDING RD	LASALLE AVE	EW	20	1.44	0.17	1.69	26	1.07	0.08	1.11	27	1.06	0.17	1.21	29	0.96	0.06	1.00
HAM	PEMBROKE AVE	LASALLE AVE	ARMISTEAD AVE	EW	27	1.38	0.05	1.46	27	1.32	0.02	1.39	30	1.26	0.09	1.35	29	1.22	0.03	1.27
HAM	PEMBROKE AVE	ARMISTEAD AVE	KING ST	EW	26	1.31	0.06	1.38	24	1.23	0.04	1.29	28	1.21	0.08	1.29	26	1.15	0.05	1.21
HAM	PEMBROKE AVE	KING ST	EATON ST	EW	26	1.31	0.06	1.38	24	1.23	0.04	1.29	28	1.21	0.08	1.29	26	1.15	0.05	1.21

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
HAM	PEMBROKE AVE	EATON ST	BARRON ST	EW	29	1.18	0.01	1.20	31	1.09	0.04	1.12	29	1.17	0.03	1.22	31	1.09	0.02	1.12
HAM	PEMBROKE AVE	BARRON ST	MERCURY BLVD	EW	29	1.18	0.01	1.20	31	1.09	0.04	1.12	29	1.17	0.03	1.22	31	1.09	0.02	1.12
HAM	PEMBROKE AVE	MERCURY BLVD	WOODLAND RD	EW	29	1.24	0.03	1.28	28	1.20	0.05	1.25	30	1.20	0.03	1.24	26	1.30	0.02	1.35
HAM	PEMBROKE AVE	WOODLAND RD	OLD BUCKROE RD	EW	29	1.24	0.03	1.28	28	1.20	0.05	1.25	30	1.20	0.03	1.24	26	1.30	0.02	1.35
HAM	PEMBROKE AVE	OLD BUCKROE RD	MALLORY ST	EW	29	1.24	0.03	1.28	28	1.20	0.05	1.25	30	1.20	0.03	1.24	26	1.30	0.02	1.35
HAM	POWER PLANT PKWY	I-664	BRIARFIELD RD	NS	38	1.17	0.05	1.25	37	1.12	0.07	1.21	39	1.14	0.11	1.22	37	1.09	0.04	1.12
HAM	POWHATAN PKWY	KECOUGHTAN RD	PEMBROKE AVE	NS	24	1.22	0.02	1.26	24	1.20	0.04	1.23	23	1.24	0.03	1.27	24	1.23	0.02	1.26
HAM	POWHATAN PKWY	PEMBROKE AVE	I-664	NS	24	1.20	0.08	1.28	18	1.50	0.38	2.00	26	1.11	0.14	1.25	18	1.45	0.11	1.63
HAM	QUEEN ST	BRIARFIELD RD	MICHIGAN DR	EW	31	1.19	0.05	1.23	30	1.27	0.04	1.30	32	1.15	0.04	1.19	30	1.25	0.06	1.30
HAM	QUEEN ST	MICHIGAN DR	PEMBROKE AVE	EW	31	1.19	0.05	1.23	30	1.27	0.04	1.30	32	1.15	0.04	1.19	30	1.25	0.06	1.30
HAM	ROANOKE AVE	NEWPORT NEWS CL	MERCURY BLVD	NS	25	1.14	0.07	1.16	25	1.10	0.02	1.13	23	1.26	0.02	1.31	27	1.01	0.07	1.06
HAM	SETTLERS LANDING RD	PEMBROKE AVE	LASALLE AVE	EW	20	1.27	0.17	1.52	21	0.97	0.08	1.03	24	1.03	0.24	1.25	20	1.02	0.16	1.12
HAM	SETTLERS LANDING RD	LASALLE AVE	KECOUGHTAN RD	EW	30	1.25	0.12	1.41	32	1.12	0.04	1.14	33	1.13	0.11	1.25	31	1.16	0.04	1.20
HAM	SETTLERS LANDING RD	KECOUGHTAN RD	ARMISTEAD AVE	EW	22	1.21	0.31	1.62	26	1.09	0.04	1.14	23	1.14	0.32	1.50	25	1.13	0.12	1.22
HAM	SETTLERS LANDING RD	ARMISTEAD AVE	EATON ST	EW	24	1.10	0.24	1.34	22	1.17	0.07	1.27	23	1.11	0.27	1.42	23	1.12	0.08	1.21
HAM	SETTLERS LANDING RD	EATON ST	TYLER ST	EW	31	1.14	0.29	1.44	31	1.08	0.13	1.22	30	1.17	0.28	1.52	30	1.11	0.14	1.23
HAM	SETTLERS LANDING RD	TYLER ST	I-64	EW	31	1.14	0.29	1.44	31	1.08	0.13	1.22	30	1.17	0.28	1.52	30	1.11	0.14	1.23
HAM	TODDS LA	NEWPORT NEWS CL	BIG BETHEL RD	EW	35	1.08	0.05	1.14	33	1.11	0.03	1.15	33	1.14	0.04	1.19	33	1.13	0.06	1.19
HAM	TODDS LA	BIG BETHEL RD	ABERDEEN RD	EW	33	1.19	0.05	1.25	31	1.24	0.03	1.29	33	1.22	0.05	1.29	31	1.24	0.15	1.35
HAM	TODDS LA	ABERDEEN RD	CUNNINGHAM DR	EW	34	1.15	0.06	1.21	34	1.07	0.11	1.16	32	1.22	0.06	1.28	32	1.14	0.10	1.23
HAM	WOODLAND RD	MERCURY BLVD	PEMBROKE AVE	NS	30	1.26	0.06	1.37	31	1.19	0.19	1.43	30	1.27	0.09	1.36	30	1.22	0.07	1.28
HAM	WOODLAND RD	PEMBROKE AVE	FOX HILL RD	NS	30	1.26	0.02	1.30	32	1.13	0.05	1.20	31	1.22	0.02	1.25	32	1.13	0.04	1.18
HAM	WYTHE CREEK RD	COMMANDER SHEPPARD BLVD	POQUOSON CL	NS	38	1.15	0.05	1.22	36	1.14	0.12	1.23	35	1.25	0.12	1.41	37	1.10	0.05	1.15
IW	BENNS CHURCH BLVD	SUFFOLK CL	RIDDICK RD	NS	49	1.13	0.03	1.16	49	1.12	0.03	1.15	49	1.14	0.02	1.16	49	1.12	0.04	1.16
IW	BENNS CHURCH BLVD	RIDDICK RD	ROUTE 10 & 32 (BREWERS NECK BLVD)	NS	49	1.13	0.03	1.16	49	1.12	0.03	1.15	49	1.14	0.02	1.16	49	1.12	0.04	1.16
IW	BENNS CHURCH BLVD	ROUTE 10 & 32 (BREWERS NECK BLVD)	ECL SMITHFIELD (RTE 644)	NS	44	1.09	0.11	1.21	40	1.14	0.27	1.46	41	1.16	0.11	1.28	39	1.17	0.29	1.51
IW	BENNS CHURCH BLVD	ECL SMITHFIELD (RTE 644)	CHURCH ST S	NS	40	1.16	0.39	1.60	37	1.25	0.51	1.94	34	1.39	0.42	1.92	33	1.44	0.46	2.12
IW	BREWERS NECK BLVD	ROUTE 10 & 32 (BENN'S CHURCH)	ROUTE 670	EW	50	1.05	0.16	1.22	50	1.05	0.11	1.17	50	1.05	0.10	1.16	47	1.13	0.25	1.43
IW	BREWERS NECK BLVD	ROUTE 670	ROUTE 17	EW	50	1.05	0.16	1.22	50	1.05	0.11	1.17	50	1.05	0.10	1.16	47	1.13	0.25	1.43
IW	BUS RTE 58/BUS RTE 258	FRANKLIN CL	JAMESTOWN LN (RTE 691)	EW	32	1.11	0.06	1.18	33	1.15	0.04	1.18	34	1.05	0.04	1.10	33	1.17	0.05	1.21
IW	BUS RTE 58/BUS RTE 258	JAMESTOWN LN (RTE 691)	ROUTE 258	EW	32	1.11	0.06	1.18	33	1.15	0.04	1.18	34	1.05	0.04	1.10	33	1.17	0.05	1.21
IW	CARROLLTON BLVD	SUFFOLK CL	WEST END CHUCKATUCK BRIDGE	NS	48	1.11	0.33	1.47	49	1.07	0.11	1.19	48	1.10	0.12	1.23	48	1.08	0.13	1.22
IW	CARROLLTON BLVD	WEST END CHUCKATUCK BRIDGE	ROUTE 258	NS	48	1.11	0.33	1.47	49	1.07	0.11	1.19	48	1.10	0.12	1.23	48	1.08	0.13	1.22
IW	CARROLLTON BLVD	ROUTE 258	SMITH'S NECK RD	NS	52	1.03	0.27	1.30	53	1.04	0.13	1.18	52	1.04	0.17	1.23	49	1.14	0.63	1.87
IW	CARROLLTON BLVD/JAMES RIVER BR	SMITH'S NECK RD	NEWPORT NEWS CL	NS	52	1.03	0.27	1.30	53	1.04	0.13	1.18	52	1.04	0.17	1.23	49	1.14	0.63	1.87
IW	ROUTE 10 (OLD STAGE HWY)	BUS RTE 10	IW/SURRY CL	NS	49	1.12	0.02	1.14	49	1.11	0.02	1.14	49	1.11	0.02	1.14	50	1.10	0.02	1.13
IW	ROUTE 10 BYPASS	CHURCH ST S	FAIRWAY DR	NS	49	1.08	0.08	1.16	49	1.04	0.06	1.09	43	1.20	0.17	1.42	48	1.06	0.17	1.24
IW	ROUTE 10 BYPASS	FAIRWAY DR	MAIN ST	NS	49	1.08	0.08	1.16	49	1.04	0.06	1.09	43	1.20	0.17	1.42	48	1.06	0.17	1.24
IW	ROUTE 10 BYPASS	MAIN ST	NCL SMITHFIELD	NS	49	1.13	0.03	1.17	48	1.06	0.06	1.12	49	1.12	0.04	1.17	48	1.08	0.15	1.24
IW	ROUTE 10 BYPASS	NCL SMITHFIELD	BUS RTE 10	NS	49	1.13	0.03	1.17	48	1.06	0.06	1.12	49	1.12	0.04	1.17	48	1.08	0.15	1.24
IW	ROUTE 258	CARRSVILLE HWY (BUS RTE 58)	BURDETTE RD (W RTE 619)	EW	52	1.05	0.02	1.08	52	1.04	0.02	1.06	52	1.05	0.02	1.07	51	1.05	0.03	1.08
IW	ROUTE 258	BURDETTE RD (W RTE 619)	RIVER RUN TRAIL (W RTE 614)	EW	52	1.05	0.02	1.08	52	1.04	0.02	1.06	52	1.05	0.02	1.07	51	1.05	0.03	1.08
IW	ROUTE 258	RIVER RUN TRAIL (W RTE 614)	BLACKWATER RD (RTE 603)	EW	52	1.05	0.02	1.08	52	1.04	0.02	1.06	52	1.05	0.02	1.07	51	1.05	0.03	1.08
IW	ROUTE 258	BLACKWATER RD (RTE 603)	WCL WINDSOR	EW	52	1.05	0.02	1.08	52	1.04	0.02	1.06	52	1.05	0.02	1.07	51	1.05	0.03	1.08
IW	ROUTE 258	WCL WINDSOR	ROUTE 460	EW	52	1.05	0.02	1.08	52	1.04	0.02	1.06	52	1.05	0.02	1.07	51	1.05	0.03	1.08
IW	ROUTE 258	ROUTE 460	ECL WINDSOR	EW	53	1.06	0.03	1.10	52	1.03	0.04	1.06	53	1.05	0.03	1.08	52	1.05	0.03	1.08
IW	ROUTE 258	ECL WINDSOR	COURT ST NORTH (RTE 610)	EW	53	1.06	0.03	1.10	52	1.03	0.04	1.06	53	1.05	0.03	1.08	52	1.05	0.03	1.08
IW	ROUTE 258	COURT ST NORTH (RTE 610)	IRON MINE SPRINGS RD (RTE 605)	EW	53	1.06	0.03	1.10	52	1.03	0.04	1.06	53	1.05	0.03	1.08	52	1.05	0.03	1.08
IW	ROUTE 258	IRON MINE SPRINGS RD (RTE 605)	CENTRAL HILL RD (W RTE 637)	EW	53	1.06	0.03	1.10	52	1.03	0.04	1.06	53	1.05	0.03	1.08	52	1.05	0.03	1.08
IW	ROUTE 258	CENTRAL HILL RD (W RTE 637)	SCOTTS FACTORY RD (RTE 620)	EW	51	1.03	0.03	1.07	51	1.03	0.08	1.11	52	1.02	0.02	1.04	52	1.02	0.03	1.04

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
IW	ROUTE 258	SCOTTS FACTORY RD (RTE 620)	WCL SMITHFIELD	EW	40	1.02	0.05	1.09	39	1.10	0.07	1.18	40	1.03	0.04	1.09	39	1.10	0.05	1.15
IW	ROUTE 258/N MAIN ST	WCL SMITHFIELD	RTE 10 BYPASS	EW	40	1.02	0.05	1.09	39	1.10	0.07	1.18	40	1.03	0.04	1.09	39	1.10	0.05	1.15
IW	ROUTE 460	SOUTHAMPTON CL	FIRETOWER RD (RTE 644)	EW	55	1.01	0.10	1.11	56	1.02	0.09	1.11	55	1.02	0.12	1.14	57	1.02	0.05	1.07
IW	ROUTE 460	FIRETOWER RD (RTE 644)	WCL WINDSOR	EW	55	1.01	0.10	1.11	56	1.02	0.09	1.11	55	1.02	0.12	1.14	57	1.02	0.05	1.07
IW	ROUTE 460	WCL WINDSOR	ROUTE 258	EW	55	1.01	0.10	1.11	56	1.02	0.09	1.11	55	1.02	0.12	1.14	57	1.02	0.05	1.07
IW	ROUTE 460	ROUTE 258	COURT ST (RTE 610)	EW	31	1.15	0.39	1.58	33	1.08	0.24	1.34	30	1.16	0.42	1.64	32	1.13	0.33	1.48
IW	ROUTE 460	COURT ST (RTE 610)	ECL WINDSOR	EW	52	1.01	0.08	1.08	51	1.02	0.07	1.09	52	1.01	0.08	1.09	50	1.04	0.11	1.15
IW	ROUTE 460	ECL WINDSOR	SUFFOLK CL	EW	52	1.01	0.08	1.08	51	1.02	0.07	1.09	52	1.01	0.08	1.09	50	1.04	0.11	1.15
JCC	BARHAMSVILLE RD	I-64	ROUTE 60	NS	46	1.03	0.12	1.14	48	1.02	0.09	1.11	46	1.04	0.10	1.14	47	1.04	0.06	1.09
JCC	IRONBOUND RD/NEWS RD	JOHN TYLER HWY	MONTICELLO AVE	NS	35	1.08	0.02	1.09	36	1.19	0.01	1.21	33	1.15	0.02	1.18	30	1.45	0.03	1.56
JCC	IRONBOUND RD/SANDY BAY RD	JAMESTOWN RD	JOHN TYLER HWY	NS	31	1.33	0.03	1.37	34	1.16	0.03	1.18	30	1.36	0.02	1.40	35	1.11	0.03	1.14
JCC	JAMESTOWN RD	COLONIAL PARKWAY (RTE 359)	SANDY BAY RD (RTE 681)	EW	43	1.05	0.03	1.07	41	1.11	0.01	1.12	40	1.13	0.02	1.16	43	1.06	0.03	1.08
JCC	JAMESTOWN RD	SANDY BAY RD (RTE 681)	NECK-O-LAND RD	EW	35	1.12	0.01	1.14	36	1.12	0.03	1.14	35	1.09	0.02	1.12	36	1.12	0.03	1.15
JCC	JAMESTOWN RD	NECK-O-LAND RD	WILLIAMSBURG CL	EW	35	1.12	0.01	1.14	36	1.12	0.03	1.14	35	1.09	0.02	1.12	36	1.12	0.03	1.15
JCC	JOHN TYLER HWY	CHARLES CITY CL	MONTICELLO AVE	EW	49	1.09	0.03	1.12	49	1.17	0.02	1.20	49	1.09	0.03	1.12	48	1.18	0.03	1.20
JCC	JOHN TYLER HWY	MONTICELLO AVE	CENTERVILLE RD (RTE 614)	EW	49	1.09	0.03	1.12	49	1.17	0.02	1.20	49	1.09	0.03	1.12	48	1.18	0.03	1.20
JCC	JOHN TYLER HWY	CENTERVILLE RD (RTE 614)	IRONBOUND RD (RTE 615)	EW	41	1.09	0.03	1.12	41	1.09	0.02	1.12	39	1.16	0.05	1.21	40	1.12	0.02	1.14
JCC	JOHN TYLER HWY	IRONBOUND RD (RTE 615)	STANLEY DR (RTE 712)	EW	34	1.19	0.05	1.23	35	1.13	0.04	1.17	34	1.20	0.03	1.25	34	1.16	0.03	1.20
JCC	JOHN TYLER HWY	STANLEY DR (RTE 712)	ROUTE 199	EW	34	1.19	0.05	1.23	35	1.13	0.04	1.17	34	1.20	0.03	1.25	34	1.16	0.03	1.20
JCC	MERRIMAC TRL	NEWPORT NEWS CL @ I-64	YORK CL (SOUTH OF GROVE INT)	EW	46	1.18	0.06	1.26	47	1.14	0.05	1.19	49	1.12	0.07	1.20	43	1.26	0.08	1.34
JCC	MERRIMAC TRL	YORK CL @ ROUTE 199	PENNIMAN RD (YORK CL)	EW	42	1.02	0.06	1.09	40	1.13	0.07	1.22	42	1.04	0.09	1.14	38	1.18	0.06	1.25
JCC	OLD STAGE RD	NEW KENT CL	BARNES RD (RTE 601 S)	EW	49	1.15	0.02	1.18	49	1.13	0.02	1.15	50	1.14	0.04	1.19	50	1.13	0.04	1.16
JCC	OLD STAGE RD	BARNES RD (RTE 601 S)	I-64	EW	49	1.09	0.09	1.18	49	1.12	0.03	1.14	50	1.08	0.12	1.21	50	1.10	0.04	1.15
JCC	POCAHONTAS TRL	WILLIAMSBURG CL	YORK CL @ 199	EW	34	1.08	0.07	1.16	34	1.10	0.04	1.13	33	1.11	0.10	1.22	35	1.07	0.06	1.14
JCC	POCAHONTAS TRL	YORK CL	BASF RD/ROUTE 60 RELOCATION	EW	39	1.07	0.15	1.22	48	1.06	0.06	1.13	39	1.08	0.25	1.35	48	1.07	0.08	1.16
JCC	POCAHONTAS TRL	BASF RD/ROUTE 60 RELOCATION	NEWPORT NEWS CL	EW	39	1.07	0.15	1.22	48	1.06	0.06	1.13	39	1.08	0.25	1.35	48	1.07	0.08	1.16
JCC	RICHMOND RD	ROUTE 199	OLDE TOWNE RD (RTE 658)	EW	42	1.13	0.06	1.19	35	1.10	0.07	1.18	40	1.17	0.14	1.32	35	1.12	0.11	1.25
JCC	RICHMOND RD	OLDE TOWNE RD (RTE 658)	WILLIAMSBURG CL	EW	32	1.04	0.06	1.11	35	1.10	0.07	1.18	30	1.08	0.09	1.16	35	1.12	0.11	1.25
JCC	ROCHAMBEAU DR	ROUTE 60	0.7 MI EAST OF ASHINGTON WAY	EW	47	1.08	0.06	1.13	50	1.06	0.04	1.09	47	1.07	0.07	1.14	50	1.07	0.04	1.11
JCC	ROCHAMBEAU DR	0.7 MI EAST OF ASHINGTON WAY	CROAKER RD (RTE 607)	EW	47	1.08	0.06	1.13	50	1.06	0.04	1.09	47	1.07	0.07	1.14	50	1.07	0.04	1.11
JCC	ROUTE 199	JOHN TYLER HWY (RTE 5)	WILLIAMSBURG CL	EW	35	1.26	0.60	2.02	33	1.24	0.22	1.54	30	1.48	0.60	2.29	34	1.21	0.25	1.53
JCC	ROUTE 199	WILLIAMSBURG CL	HENRY ST/COLONIAL PKWY	EW	44	1.20	0.17	1.41	42	1.32	0.16	1.55	41	1.29	0.23	1.57	42	1.32	0.37	1.80
JCC	ROUTE 199	HENRY ST/COLONIAL PKWY	MOUNTS BAY RD/QUARTERPATH RD	EW	44	1.20	0.17	1.41	42	1.32	0.16	1.55	41	1.29	0.23	1.57	42	1.32	0.37	1.80
JCC	ROUTE 199	MOUNTS BAY RD/QUARTERPATH RD	RTE 60/RTE 143/YORK CL	EW	51	1.10	0.03	1.14	49	1.21	0.18	1.43	50	1.10	0.08	1.19	46	1.27	0.66	2.09
JCC	ROUTE 60	NEW KENT CL	ROUTE 30	EW	56	1.04	0.03	1.06	53	1.12	0.01	1.15	55	1.07	0.04	1.10	54	1.11	0.02	1.13
JCC	ROUTE 60	ROUTE 30	CROAKER RD (RTE 607)	EW	42	1.13	0.10	1.21	43	1.01	0.08	1.09	43	1.11	0.06	1.17	43	1.00	0.07	1.07
JCC	ROUTE 60	CROAKER RD (RTE 607)	LIGHTFOOT RD (RTE 646)	EW	38	1.06	0.10	1.16	39	1.06	0.07	1.13	36	1.12	0.06	1.19	37	1.10	0.11	1.23
JCC	ROUTE 60	LIGHTFOOT RD (RTE 646)	CENTERVILLE RD (RTE 614)	EW	38	1.06	0.10	1.16	39	1.06	0.07	1.13	36	1.12	0.06	1.19	37	1.10	0.11	1.23
JCC	ROUTE 60	CENTERVILLE RD (RTE 614)	ROUTE 199	EW	37	1.07	0.09	1.16	27	1.11	0.07	1.20	36	1.10	0.12	1.23	29	1.02	0.37	1.32
NN	23RD/25TH CONNECTOR	HUNTINGTON AVE	JEFFERSON AVE	EW	31	1.05	0.14	1.16	-	-	-	-	32	1.02	0.17	1.18	-	-	-	-
NN	25TH ST	JEFFERSON AVE	26TH ST	EW	27	1.06	0.04	1.10	-	-	-	-	26	1.10	0.05	1.13	-	-	-	-
NN	25TH ST	26TH ST	HAMPTON CL	EW	29	1.09	0.01	1.11	31	1.06	0.04	1.10	29	1.10	0.06	1.15	31	1.07	0.06	1.11
NN	26TH ST	25TH ST	ROANOKE AVE	EW	-	-	-	-	24	0.99	0.04	1.00	-	-	-	-	23	1.06	0.04	1.09
NN	26TH ST	ROANOKE AVE	JEFFERSON AVE	EW	-	-	-	-	29	1.06	0.04	1.11	-	-	-	-	29	1.07	0.09	1.12
NN	26TH ST	JEFFERSON AVE	WARWICK BLVD	EW	-	-	-	-	32	0.91	0.13	1.04	-	-	-	-	38	0.76	0.08	0.80
NN	26TH ST	WARWICK BLVD	HUNTINGTON AVE	EW	-	-	-	-	32	0.91	0.13	1.04	-	-	-	-	38	0.76	0.08	0.80
NN	39TH ST	HUNTINGTON AVE	MADISON AVE	EW	34	1.13	0.06	1.21	34	1.16	0.07	1.23	34	1.15	0.05	1.20	34	1.16	0.03	1.20
NN	39TH ST	MADISON AVE	HAMPTON CL	EW	34	1.13	0.06	1.21	34	1.16	0.07	1.23	34	1.15	0.05	1.20	34	1.16	0.03	1.20
NN	BRIARFIELD RD	JEFFERSON AVE	HAMPTON CL	EW	28	1.26	0.02	1.30	30	1.17	0.03	1.22	30	1.18	0.03	1.22	29	1.22	0.03	1.26
NN	CHESTNUT AVE	39TH ST	44TH ST	NS	29	1.14	0.12	1.26	29	1.18	0.10	1.31	31	1.09	0.06	1.16	31	1.10	0.09	1.19

Source: HRTPO analysis of INRIX data.

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Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
NN	CHESTNUT AVE	44TH ST	BRIARFIELD RD	NS	29	1.14	0.12	1.26	29	1.18	0.10	1.31	31	1.09	0.06	1.16	31	1.10	0.09	1.19
NN	CHESTNUT AVE	BRIARFIELD RD	HAMPTON CL	NS	28	1.19	0.02	1.22	32	1.10	0.04	1.14	29	1.19	0.02	1.23	30	1.16	0.05	1.19
NN	DENBIGH BLVD	LUCAS CREEK RD	WARWICK BLVD	EW	30	1.13	0.06	1.19	30	1.22	0.02	1.24	26	1.26	0.05	1.31	31	1.17	0.07	1.21
NN	DENBIGH BLVD	WARWICK BLVD	JEFFERSON AVE	EW	34	1.11	0.08	1.21	32	1.15	0.07	1.24	31	1.19	0.12	1.33	30	1.22	0.12	1.39
NN	DENBIGH BLVD	JEFFERSON AVE	YORK CL	EW	43	1.10	0.07	1.17	44	1.13	0.08	1.23	41	1.15	0.17	1.35	43	1.17	0.07	1.25
NN	FORT EUSTIS BLVD	WARWICK BLVD	I-64	EW	39	1.12	0.25	1.33	41	1.18	0.48	1.77	37	1.17	0.82	2.12	44	1.09	0.10	1.18
NN	FORT EUSTIS BLVD	I-64	JEFFERSON AVE	EW	39	1.12	0.25	1.33	41	1.18	0.48	1.77	37	1.17	0.82	2.12	44	1.09	0.10	1.18
NN	FORT EUSTIS BLVD	JEFFERSON AVE	.54 MILES EAST OF RTE 143	EW	45	1.11	0.08	1.20	43	1.15	0.16	1.33	43	1.15	0.21	1.39	44	1.13	0.07	1.20
NN	FORT EUSTIS BLVD	.54 MILES EAST OF RTE 143	YORK CL	EW	45	1.11	0.08	1.20	43	1.15	0.16	1.33	43	1.15	0.21	1.39	44	1.13	0.07	1.20
NN	HRC PARKWAY	HARPERSVILLE RD	HAMPTON CL	EW	41	1.19	0.08	1.29	43	1.15	0.08	1.25	43	1.13	0.11	1.25	42	1.19	0.10	1.30
NN	HUNTINGTON AVE	71ST ST	39TH ST	NS	-	-	-	-	34	1.11	0.07	1.17	-	-	-	-	35	1.10	0.20	1.32
NN	HUNTINGTON AVE	39TH ST	26TH ST	NS	-	-	-	-	30	1.08	0.11	1.21	-	-	-	-	32	1.04	0.35	1.38
NN	J CLYDE MORRIS BLVD	JEFFERSON AVE	THIMBLE SHOALS BLVD	NS	38	1.10	0.26	1.39	34	1.16	0.43	1.71	36	1.14	0.41	1.63	34	1.19	0.41	1.70
NN	J CLYDE MORRIS BLVD	THIMBLE SHOALS BLVD	I-64	NS	38	1.10	0.26	1.39	34	1.16	0.43	1.71	36	1.14	0.41	1.63	34	1.19	0.41	1.70
NN	J CLYDE MORRIS BLVD	I-64	HARPERSVILLE RD	NS	36	1.07	0.47	1.55	38	1.11	0.43	1.60	31	1.22	1.02	2.34	41	1.03	0.30	1.34
NN	J CLYDE MORRIS BLVD	HARPERSVILLE RD	YORK CL	NS	36	1.27	0.30	1.64	37	1.23	0.35	1.65	33	1.40	0.83	2.43	35	1.28	0.36	1.71
NN	JEFFERSON AVE	JAMES CITY CL	YORKTOWN RD	NS	46	1.06	0.13	1.19	42	1.12	0.22	1.37	46	1.05	0.05	1.09	42	1.10	1.46	2.74
NN	JEFFERSON AVE	YORKTOWN RD	FORT EUSTIS BLVD	NS	45	1.12	0.05	1.17	43	1.16	0.07	1.22	45	1.14	0.03	1.20	45	1.09	0.06	1.16
NN	JEFFERSON AVE	FORT EUSTIS BLVD	FUTURE ATKINSON BLVD	NS	37	1.11	0.15	1.28	36	1.11	0.17	1.31	35	1.14	0.23	1.41	34	1.19	0.30	1.57
NN	JEFFERSON AVE	FUTURE ATKINSON BLVD	DENBIGH BLVD	NS	37	1.11	0.15	1.28	36	1.11	0.17	1.31	35	1.14	0.23	1.41	34	1.19	0.30	1.57
NN	JEFFERSON AVE	DENBIGH BLVD	BLAND BLVD	NS	35	1.16	0.30	1.51	34	1.12	0.29	1.46	28	1.48	0.43	2.03	30	1.29	0.72	2.24
NN	JEFFERSON AVE	BLAND BLVD	I-64	NS	36	1.08	0.24	1.33	35	1.08	0.25	1.37	31	1.25	0.36	1.70	29	1.30	0.41	1.83
NN	JEFFERSON AVE	I-64	OYSTER POINT RD	NS	36	1.08	0.24	1.33	35	1.08	0.25	1.37	31	1.25	0.36	1.70	29	1.30	0.41	1.83
NN	JEFFERSON AVE	OYSTER POINT RD	MUELLER LA	NS	35	1.18	0.21	1.46	35	1.26	0.32	1.67	30	1.37	0.71	2.37	35	1.26	0.32	1.66
NN	JEFFERSON AVE	MUELLER LA	MIDDLE GROUND BLVD	NS	35	1.18	0.21	1.46	35	1.26	0.32	1.67	30	1.37	0.71	2.37	35	1.26	0.32	1.66
NN	JEFFERSON AVE	MIDDLE GROUND BLVD	J CLYDE MORRIS BLVD	NS	35	1.18	0.21	1.46	35	1.26	0.32	1.67	30	1.37	0.71	2.37	35	1.26	0.32	1.66
NN	JEFFERSON AVE	J CLYDE MORRIS BLVD	HARPERSVILLE RD	NS	39	1.09	0.26	1.39	42	1.05	0.19	1.28	36	1.18	0.41	1.62	40	1.11	0.25	1.39
NN	JEFFERSON AVE	HARPERSVILLE RD	MAIN ST	NS	41	1.06	0.24	1.32	42	1.06	0.18	1.25	39	1.12	0.42	1.61	40	1.12	0.25	1.40
NN	JEFFERSON AVE	MAIN ST	CENTER AVE	NS	38	1.11	0.29	1.43	39	1.14	0.29	1.43	35	1.22	0.35	1.66	36	1.22	0.42	1.71
NN	JEFFERSON AVE	CENTER AVE	MERCURY BLVD	NS	38	1.11	0.29	1.43	39	1.14	0.29	1.43	35	1.22	0.35	1.66	36	1.22	0.42	1.71
NN	JEFFERSON AVE	MERCURY BLVD	BRIARFIELD RD	NS	37	1.11	0.23	1.38	41	1.12	0.16	1.27	35	1.18	0.33	1.58	39	1.17	0.11	1.31
NN	JEFFERSON AVE	BRIARFIELD RD	41ST ST	NS	38	1.13	0.09	1.22	40	1.11	0.11	1.24	38	1.13	0.13	1.26	39	1.14	0.09	1.26
NN	JEFFERSON AVE	41ST ST	35TH ST	NS	38	1.13	0.09	1.22	40	1.11	0.11	1.24	38	1.13	0.13	1.26	39	1.14	0.09	1.26
NN	JEFFERSON AVE	35TH ST	25TH ST	NS	26	1.03	0.11	1.14	26	1.13	0.05	1.18	25	1.07	0.18	1.23	26	1.13	0.06	1.19
NN	MAIN ST	WARWICK BLVD	JEFFERSON AVE	EW	31	1.12	0.04	1.17	28	1.15	0.04	1.19	29	1.19	0.20	1.36	29	1.11	0.04	1.16
NN	MAIN ST	JEFFERSON AVE	HAMPTON CL	EW	35	1.08	0.05	1.14	33	1.11	0.03	1.15	33	1.14	0.04	1.19	33	1.13	0.06	1.19
NN	MERCURY BLVD/JAMES RIVER BR	ISLE OF WIGHT CL	RIVER RD	EW	52	1.03	0.27	1.30	53	1.04	0.13	1.18	52	1.04	0.17	1.23	49	1.14	0.63	1.87
NN	MERCURY BLVD	RIVER RD	WARWICK BLVD	EW	52	1.03	0.27	1.30	53	1.04	0.13	1.18	52	1.04	0.17	1.23	49	1.14	0.63	1.87
NN	MERCURY BLVD	WARWICK BLVD	JEFFERSON AVE	EW	52	1.03	0.27	1.30	53	1.04	0.13	1.18	52	1.04	0.17	1.23	49	1.14	0.63	1.87
NN	MERCURY BLVD	JEFFERSON AVE	HAMPTON CL	EW	39	1.03	0.32	1.37	39	1.03	0.40	1.45	36	1.14	0.43	1.62	37	1.11	0.44	1.60
NN	OYSTER POINT RD	WARWICK BLVD	JEFFERSON AVE	EW	29	1.24	0.39	1.72	32	1.16	0.20	1.40	30	1.21	0.29	1.56	27	1.38	0.53	2.16
NN	OYSTER POINT RD	JEFFERSON AVE	CANON BLVD	EW	37	1.13	0.57	1.76	33	1.20	0.37	1.68	35	1.19	0.46	1.71	29	1.40	0.96	2.76
NN	OYSTER POINT RD	CANON BLVD	I-64	EW	44	1.08	0.18	1.28	37	1.04	0.09	2.18	44	1.08	0.36	1.47	38	1.02	1.03	2.09
NN	ROANOKE AVE	I-664	43RD ST	NS	28	1.10	0.12	1.17	25	1.26	0.09	1.37	29	1.07	0.05	1.11	29	1.06	0.06	1.10
NN	ROANOKE AVE	43RD ST	BRIARFIELD RD	NS	28	1.10	0.12	1.17	25	1.26	0.09	1.37	29	1.07	0.05	1.11	29	1.06	0.06	1.10
NN	ROANOKE AVE	BRIARFIELD RD	HAMPTON CL	NS	25	1.14	0.07	1.16	25	1.10	0.02	1.13	23	1.26	0.02	1.31	27	1.01	0.07	1.06
NN	VICTORY BLVD	I-64	YORK CL	EW	33	1.16	0.55	1.78	38	1.19	0.43	1.69	29	1.31	0.67	2.17	38	1.20	0.44	1.74
NN	WARWICK BLVD	JAMES CITY CL	YORKTOWN RD	NS	48	1.06	0.06	1.13	39	1.07	0.15	1.22	48	1.07	0.08	1.16	39	1.08	0.25	1.35
NN	WARWICK BLVD	YORKTOWN RD	FORT EUSTIS BLVD	NS	34	1.12	0.18	1.32	35	1.12	0.25	1.41	33	1.15	0.19	1.33	34	1.13	0.33	1.49
NN	WARWICK BLVD	FORT EUSTIS BLVD	SNIDOW BLVD	NS	36	1.10	0.17	1.30	36	1.12	0.20	1.34	35	1.16	0.22	1.41	33	1.23	0.51	1.89

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
NN	WARWICK BLVD	SNIDOW BLVD	DENBIGH BLVD	NS	36	1.10	0.17	1.30	36	1.12	0.20	1.34	35	1.16	0.22	1.41	33	1.23	0.51	1.89
NN	WARWICK BLVD	DENBIGH BLVD	BLAND BLVD	NS	34	1.12	0.08	1.24	36	1.11	0.16	1.31	29	1.31	0.49	1.96	32	1.27	0.53	1.95
NN	WARWICK BLVD	BLAND BLVD	OYSTER POINT RD	NS	37	1.12	0.12	1.24	36	1.14	0.16	1.34	34	1.22	0.22	1.47	32	1.26	0.28	1.63
NN	WARWICK BLVD	OYSTER POINT RD	MAXWELL LN	NS	35	1.06	0.16	1.24	36	1.04	0.12	1.18	34	1.08	0.38	1.49	34	1.10	0.18	1.32
NN	WARWICK BLVD	MAXWELL LN	DEEP CREEK RD	NS	35	1.06	0.16	1.24	36	1.04	0.12	1.18	34	1.08	0.38	1.49	34	1.10	0.18	1.32
NN	WARWICK BLVD	DEEP CREEK RD	J CLYDE MORRIS BLVD	NS	35	1.06	0.16	1.24	36	1.04	0.12	1.18	34	1.08	0.38	1.49	34	1.10	0.18	1.32
NN	WARWICK BLVD	J CLYDE MORRIS BLVD	HARPERSVILLE RD	NS	40	1.08	0.11	1.21	41	1.08	0.07	1.15	39	1.11	0.18	1.33	40	1.11	0.07	1.18
NN	WARWICK BLVD	HARPERSVILLE RD	MAIN ST	NS	33	1.11	0.08	1.21	33	1.14	0.07	1.22	31	1.15	0.14	1.31	31	1.18	0.11	1.31
NN	WARWICK BLVD	MAIN ST	CENTER AVE	NS	31	1.18	0.06	1.25	34	1.16	0.06	1.24	30	1.22	0.15	1.42	35	1.15	0.12	1.32
NN	WARWICK BLVD	CENTER AVE	MERCURY BLVD	NS	31	1.18	0.06	1.25	34	1.16	0.06	1.24	30	1.22	0.15	1.42	35	1.15	0.12	1.32
NN	WARWICK BLVD	MERCURY BLVD	HUNTINGTON AVE	NS	37	1.06	0.07	1.14	34	1.11	0.07	1.17	36	1.08	0.10	1.20	35	1.10	0.20	1.32
NN	WARWICK BLVD	23RD ST	39TH ST	NS	27	1.12	0.04	1.17	-	-	-	-	28	1.06	0.09	1.11	-	-	-	-
NN	WARWICK BLVD	39TH ST	HUNTINGTON AVE	NS	37	1.06	0.07	1.14	-	-	-	-	36	1.08	0.10	1.20	-	-	-	-
NOR	26TH ST	HAMPTON BLVD	COLLEY AVE	EW	24	1.22	0.04	1.25	-	-	-	-	25	1.16	0.11	1.31	-	-	-	-
NOR	26TH ST	COLLEY AVE	LLEWELLYN AVE	EW	20	1.36	0.14	1.56	-	-	-	-	21	1.26	0.19	1.54	-	-	-	-
NOR	26TH ST	LLEWELLYN AVE	MONTICELLO AVE	EW	20	1.36	0.14	1.56	-	-	-	-	21	1.26	0.19	1.54	-	-	-	-
NOR	26TH ST	MONTICELLO AVE	CHURCH ST	EW	24	1.05	0.05	1.11	-	-	-	-	24	1.06	0.14	1.21	-	-	-	-
NOR	26TH ST	CHURCH ST	27TH ST	EW	29	1.19	0.06	1.25	-	-	-	-	26	1.30	0.13	1.47	-	-	-	-
NOR	27TH ST	HAMPTON BLVD	COLLEY AVE	EW	-	-	-	-	23	1.37	0.20	1.66	-	-	-	-	26	1.20	0.04	1.25
NOR	27TH ST	COLLEY AVE	LLEWELLYN AVE	EW	-	-	-	-	25	1.22	0.16	1.36	-	-	-	-	25	1.20	0.12	1.35
NOR	27TH ST	LLEWELLYN AVE	MONTICELLO AVE	EW	-	-	-	-	25	1.22	0.16	1.36	-	-	-	-	25	1.20	0.12	1.35
NOR	27TH ST	MONTICELLO AVE	CHURCH ST	EW	-	-	-	-	22	1.14	0.29	1.49	-	-	-	-	22	1.15	0.14	1.33
NOR	27TH ST	CHURCH ST	26TH ST	EW	-	-	-	-	28	1.14	0.12	1.26	-	-	-	-	29	1.11	0.06	1.17
NOR	38TH ST	HAMPTON BLVD	COLLEY AVE	EW	21	0.98	0.02	0.99	23	1.11	0.05	1.15	19	1.14	0.04	1.22	20	1.30	0.04	1.37
NOR	38TH ST	COLLEY AVE	LLEWELLYN AVE	EW	21	1.27	0.02	1.31	21	1.21	0.03	1.25	20	1.34	0.04	1.39	22	1.12	0.07	1.17
NOR	38TH ST	LLEWELLYN AVE	GRANBY ST	EW	21	1.27	0.02	1.31	21	1.21	0.03	1.25	20	1.34	0.04	1.39	22	1.12	0.07	1.17
NOR	4TH VIEW ST	I-64	OCEAN VIEW AVE	EW	29	1.27	0.07	1.36	41	1.21	0.33	1.59	29	1.31	0.25	1.54	26	1.80	1.80	5.19
NOR	ADMIRAL TAUSSIG BLVD	HAMPTON BLVD	I-564	EW	30	1.21	0.08	1.30	30	1.12	0.25	1.43	34	1.05	0.41	1.44	29	1.16	0.12	1.29
NOR	AZALEA GARDEN RD	VA BEACH BLVD	PRINCESS ANNE RD	NS	26	1.20	0.39	1.67	25	1.18	0.22	1.43	26	1.20	0.28	1.53	25	1.19	0.17	1.38
NOR	AZALEA GARDEN RD	PRINCESS ANNE RD	SEWELLS POINT RD	NS	27	1.20	0.09	1.32	25	1.33	0.08	1.46	27	1.21	0.07	1.30	25	1.36	0.09	1.53
NOR	AZALEA GARDEN RD	SEWELLS POINT RD	ROBIN HOOD RD	NS	27	1.20	0.09	1.32	25	1.33	0.08	1.46	27	1.21	0.07	1.30	25	1.36	0.09	1.53
NOR	AZALEA GARDEN RD	ROBIN HOOD RD	I-64	NS	26	1.19	0.04	1.25	26	1.37	0.10	1.46	25	1.20	0.07	1.24	27	1.31	0.05	1.38
NOR	AZALEA GARDEN RD	I-64	MILITARY HWY	NS	26	1.19	0.04	1.25	26	1.37	0.10	1.46	25	1.20	0.07	1.24	27	1.31	0.05	1.38
NOR	AZALEA GARDEN RD	MILITARY HWY	NORVIEW AVE	NS	30	1.17	0.01	1.20	31	1.10	0.03	1.15	30	1.15	0.08	1.20	31	1.10	0.03	1.14
NOR	AZALEA GARDEN RD	NORVIEW AVE	LITTLE CREEK RD	NS	30	1.18	0.02	1.20	31	1.20	0.02	1.24	31	1.16	0.04	1.21	31	1.20	0.02	1.24
NOR	BALLENTINE BLVD	I-264	VA BEACH BLVD	NS	26	1.27	0.37	1.73	22	1.25	0.31	1.67	27	1.23	0.29	1.55	21	1.32	0.48	1.95
NOR	BALLENTINE BLVD	VA BEACH BLVD	PRINCESS ANNE RD	NS	26	1.24	0.10	1.36	23	1.37	0.10	1.53	26	1.24	0.08	1.34	23	1.36	0.10	1.51
NOR	BALLENTINE BLVD	PRINCESS ANNE RD	CHESAPEAKE BLVD	NS	26	1.22	0.08	1.31	25	1.21	0.06	1.28	27	1.21	0.06	1.28	26	1.20	0.04	1.25
NOR	BAYVIEW BLVD	GRANBY ST	TIDEWATER DR	EW	27	1.19	0.02	1.21	26	1.19	0.08	1.21	27	1.18	0.05	1.21	25	1.23	0.01	1.26
NOR	BAYVIEW BLVD	TIDEWATER DR	CHESAPEAKE BLVD	EW	26	1.23	0.03	1.26	26	1.19	0.07	1.22	26	1.22	0.08	1.29	25	1.25	0.02	1.28
NOR	BAYVIEW BLVD	CHESAPEAKE BLVD	CAPE VIEW AVE	EW	28	1.14	0.06	1.18	27	1.07	0.04	1.11	28	1.14	0.06	1.18	26	1.10	0.05	1.13
NOR	BOUSH ST/WATERSIDE DR	ST PAULS BLVD	CITY HALL AVE	NS	24	1.18	0.21	1.46	23	1.16	0.08	1.29	24	1.16	0.21	1.40	24	1.15	0.29	1.53
NOR	BOUSH ST	CITY HALL AVE	BUTE STREET	NS	22	1.17	0.21	1.39	24	1.03	0.11	1.15	22	1.18	0.17	1.39	24	1.07	0.24	1.31
NOR	BOUSH ST	BUTE STREET	BRAMBLETON AVE	NS	22	1.17	0.21	1.39	24	1.03	0.11	1.15	22	1.18	0.17	1.39	24	1.07	0.24	1.31
NOR	BRAMBLETON AVE	HAMPTON BLVD	COLLEY AVE	EW	30	1.17	0.36	1.59	34	1.04	0.53	1.58	29	1.20	0.70	2.01	24	1.45	1.28	3.27
NOR	BRAMBLETON AVE	COLLEY AVE	BOUSH ST	EW	29	1.29	0.27	1.64	29	1.21	0.51	1.79	26	1.43	0.57	2.21	29	1.21	0.35	1.60
NOR	BRAMBLETON AVE	BOUSH ST	MONTICELLO AVE	EW	22	1.16	0.30	1.51	23	1.15	0.30	1.50	24	1.08	0.39	1.50	21	1.22	0.40	1.68
NOR	BRAMBLETON AVE	MONTICELLO AVE	ST PAULS BLVD	EW	22	1.16	0.30	1.51	23	1.15	0.30	1.50	24	1.08	0.39	1.50	21	1.22	0.40	1.68
NOR	BRAMBLETON AVE	ST PAULS BLVD	CHURCH ST	EW	24	1.28	0.23	1.49	24	1.27	0.51	1.91	22	1.34	0.80	2.38	26	1.17	0.28	1.50
NOR	BRAMBLETON AVE	CHURCH ST	TIDEWATER DR	EW	24	1.28	0.23	1.49	24	1.27	0.51	1.91	22	1.34	0.80	2.38	26	1.17	0.28	1.50

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
NOR	BRAMBLETON AVE	TIDEWATER DR	PARK AVE	EW	29	1.22	0.30	1.57	23	1.38	0.45	2.03	26	1.36	0.80	2.46	24	1.29	0.36	1.77
NOR	BRAMBLETON AVE	PARK AVE	I-264	EW	29	1.22	0.30	1.57	23	1.38	0.45	2.03	26	1.36	0.80	2.46	24	1.29	0.36	1.77
NOR	CAMPOSTELLA RD	WILSON RD	S. END CAMPOSTELLA BRIDGE	NS	34	1.03	0.22	1.27	31	1.07	0.12	1.18	35	0.99	0.20	1.19	29	1.15	0.43	1.66
NOR	CAMPOSTELLA BLVD	S. END CAMPOSTELLA BRIDGE	KIMBALL TERR	NS	28	1.30	0.31	1.72	30	1.24	0.12	1.35	30	1.22	0.13	1.39	32	1.16	0.48	1.72
NOR	CAMPOSTELLA RD	KIMBALL TERR	I-264	NS	28	1.30	0.31	1.72	30	1.24	0.12	1.35	30	1.22	0.13	1.39	32	1.16	0.48	1.72
NOR	CHESAPEAKE BLVD	LAFAYETTE BLVD	CROMWELL DR	NS	23	1.19	0.09	1.30	24	1.27	0.10	1.42	24	1.16	0.12	1.31	25	1.24	0.07	1.35
NOR	CHESAPEAKE BLVD	CROMWELL DR	ROBIN HOOD RD	NS	27	1.16	0.10	1.25	31	1.12	0.10	1.21	28	1.12	0.15	1.28	31	1.13	0.10	1.21
NOR	CHESAPEAKE BLVD	ROBIN HOOD RD	HYDE CIR	NS	27	1.16	0.10	1.25	31	1.12	0.10	1.21	28	1.12	0.15	1.28	31	1.13	0.10	1.21
NOR	CHESAPEAKE BLVD	HYDE CIR	NORVIEW AVE	NS	27	1.16	0.10	1.25	31	1.12	0.10	1.21	28	1.12	0.15	1.28	31	1.13	0.10	1.21
NOR	CHESAPEAKE BLVD	NORVIEW AVE	I-64	NS	35	1.16	0.13	1.32	29	1.30	0.17	1.58	36	1.14	0.12	1.28	30	1.27	0.16	1.47
NOR	CHESAPEAKE BLVD	I-64	JOHNSTONS RD	NS	26	1.46	0.30	1.78	32	1.20	0.17	1.40	24	1.55	0.64	2.57	33	1.16	0.16	1.33
NOR	CHESAPEAKE BLVD	JOHNSTONS RD	LITTLE CREEK RD	NS	26	1.46	0.30	1.78	32	1.20	0.17	1.40	24	1.55	0.64	2.57	33	1.16	0.16	1.33
NOR	CHESAPEAKE BLVD	LITTLE CREEK RD	SHEPPARD AVE	NS	31	1.21	0.04	1.27	29	1.25	0.07	1.35	30	1.23	0.10	1.36	29	1.25	0.08	1.31
NOR	CHESAPEAKE BLVD	SHEPPARD AVE	BAYVIEW BLVD	NS	31	1.21	0.04	1.27	29	1.25	0.07	1.35	30	1.23	0.10	1.36	29	1.25	0.08	1.31
NOR	CHESAPEAKE BLVD	BAYVIEW BLVD	CHESAPEAKE ST	NS	31	1.21	0.04	1.27	29	1.25	0.07	1.35	30	1.23	0.10	1.36	29	1.25	0.08	1.31
NOR	CHESAPEAKE BLVD	CHESAPEAKE ST	OCEAN VIEW AVE	NS	31	1.21	0.04	1.27	29	1.25	0.07	1.35	30	1.23	0.10	1.36	29	1.25	0.08	1.31
NOR	CHURCH ST	MONTICELLO AVE	GRANBY ST	NS	29	1.15	0.19	1.33	27	1.09	0.11	1.22	28	1.19	0.19	1.41	25	1.16	0.38	1.62
NOR	CITY HALL AVE	BOUSH ST	GRANBY ST	EW	19	1.07	0.07	1.16	19	1.17	0.17	1.37	16	1.26	0.15	1.46	20	1.10	0.08	1.17
NOR	CITY HALL AVE	GRANBY ST	MONTICELLO AVE	EW	19	1.07	0.07	1.16	19	1.17	0.17	1.37	16	1.26	0.15	1.46	20	1.10	0.08	1.17
NOR	CITY HALL AVE	MONTICELLO AVE	ST PAULS BLVD	EW	19	1.07	0.07	1.16	19	1.17	0.17	1.37	16	1.26	0.15	1.46	20	1.10	0.08	1.17
NOR	COLLEY AVE	BRAMBLETON AVE	OLNEY RD	NS	18	1.38	0.06	1.44	21	1.17	0.11	1.29	20	1.25	0.09	1.32	18	1.37	0.11	1.55
NOR	COLLEY AVE	OLNEY RD	PRINCESS ANNE RD	NS	18	1.38	0.06	1.44	21	1.17	0.11	1.29	20	1.25	0.09	1.32	18	1.37	0.11	1.55
NOR	COLLEY AVE	PRINCESS ANNE RD	21ST ST	NS	22	1.10	0.08	1.18	21	1.06	0.06	1.14	17	1.38	0.07	1.51	17	1.26	0.09	1.38
NOR	COLLEY AVE	21ST ST	26TH ST	NS	23	1.33	0.06	1.41	24	1.26	0.11	1.43	23	1.35	0.07	1.48	20	1.46	0.17	1.73
NOR	COLLEY AVE	26TH ST	27TH ST	NS	23	1.33	0.06	1.41	24	1.26	0.11	1.43	23	1.35	0.07	1.48	20	1.46	0.17	1.73
NOR	COLLEY AVE	27TH ST	38TH ST	NS	23	1.11	0.05	1.17	23	1.10	0.08	1.18	21	1.21	0.07	1.26	21	1.24	0.07	1.32
NOR	COLLEY AVE	38TH ST	53RD ST	NS	23	1.11	0.05	1.17	23	1.10	0.08	1.18	21	1.21	0.07	1.26	21	1.24	0.07	1.32
NOR	GRANBY ST	CHURCH ST	38TH ST	NS	29	1.15	0.19	1.33	27	1.09	0.11	1.22	28	1.19	0.19	1.41	25	1.16	0.38	1.62
NOR	GRANBY ST	38TH ST	LLEWELLYN AVE	NS	29	1.16	0.17	1.36	30	1.12	0.15	1.30	29	1.16	0.18	1.37	28	1.19	0.23	1.47
NOR	GRANBY ST	LLEWELLYN AVE	WILLOW WOOD DRIVE	NS	29	1.16	0.17	1.36	30	1.12	0.15	1.30	29	1.16	0.18	1.37	28	1.19	0.23	1.47
NOR	GRANBY ST	WILLOW WOOD DRIVE	THOLE ST	NS	34	1.19	0.12	1.35	34	1.13	0.14	1.30	34	1.19	0.12	1.33	34	1.14	0.18	1.35
NOR	GRANBY ST	THOLE ST	LITTLE CREEK RD	NS	27	1.29	0.26	1.64	26	1.29	0.26	1.63	28	1.28	0.31	1.69	26	1.32	0.35	1.82
NOR	GRANBY ST	LITTLE CREEK RD	I-564	NS	27	1.29	0.26	1.64	26	1.29	0.26	1.63	28	1.28	0.31	1.69	26	1.32	0.35	1.82
NOR	GRANBY ST	I-564	I-64	NS	36	1.13	0.24	1.42	35	1.14	0.07	1.21	38	1.07	0.18	1.27	37	1.09	0.08	1.18
NOR	GRANBY ST	I-64	BAYVIEW BLVD	NS	36	1.13	0.24	1.42	35	1.14	0.07	1.21	38	1.07	0.18	1.27	37	1.09	0.08	1.18
NOR	GRANBY ST	BAYVIEW BLVD	BAY AVE	NS	30	1.22	0.05	1.28	30	1.21	0.06	1.26	32	1.17	0.12	1.30	29	1.26	0.06	1.32
NOR	GRANBY ST	BAY AVE	TIDEWATER DR	NS	30	1.22	0.05	1.28	30	1.21	0.06	1.26	32	1.17	0.12	1.30	29	1.26	0.06	1.32
NOR	GRANBY ST	TIDEWATER DR	OCEAN VIEW AVE	NS	30	1.22	0.02	1.26	33	1.13	0.06	1.20	30	1.22	0.07	1.28	33	1.13	0.06	1.18
NOR	HAMPTON BLVD	BRAMBLETON AVE	PRINCESS ANNE RD	NS	29	1.20	0.46	1.75	26	1.25	0.76	2.15	28	1.24	0.37	1.69	18	1.85	1.17	3.94
NOR	HAMPTON BLVD	PRINCESS ANNE RD	21ST ST	NS	29	1.20	0.46	1.75	26	1.25	0.76	2.15	28	1.24	0.37	1.69	18	1.85	1.17	3.94
NOR	HAMPTON BLVD	21ST ST	26TH ST	NS	30	1.18	0.94	2.26	31	1.20	0.33	1.61	29	1.19	0.40	1.67	27	1.36	1.12	2.83
NOR	HAMPTON BLVD	26TH ST	27TH ST	NS	30	1.18	0.94	2.26	31	1.20	0.33	1.61	29	1.19	0.40	1.67	27	1.36	1.12	2.83
NOR	HAMPTON BLVD	27TH ST	38TH ST	NS	27	1.28	0.41	1.81	27	1.18	0.42	1.67	28	1.21	0.32	1.60	26	1.22	0.60	1.95
NOR	HAMPTON BLVD	38TH ST	JAMESTOWN CRESCENT	NS	27	1.28	0.41	1.81	27	1.18	0.42	1.67	28	1.21	0.32	1.60	26	1.22	0.60	1.95
NOR	HAMPTON BLVD	JAMESTOWN CRESCENT	LITTLE CREEK RD	NS	32	1.23	0.56	1.85	36	1.12	0.14	1.29	33	1.22	0.29	1.57	37	1.12	0.17	1.31
NOR	HAMPTON BLVD	LITTLE CREEK RD	INTERNATIONAL TERMINAL BLVD	NS	32	1.23	0.56	1.85	36	1.12	0.14	1.29	33	1.22	0.29	1.57	37	1.12	0.17	1.31
NOR	HAMPTON BLVD	INTERNATIONAL TERMINAL BLVD	INTERMODAL CONNECTOR	NS	26	1.30	0.39	1.81	27	1.09	0.12	1.22	27	1.21	0.11	1.36	28	1.07	0.13	1.21
NOR	HAMPTON BLVD	INTERMODAL CONNECTOR	ADM TAUSSIG BLVD	NS	26	1.30	0.39	1.81	27	1.09	0.12	1.22	27	1.21	0.11	1.36	28	1.07	0.13	1.21
NOR	INDIAN RIVER RD	MARSH ST	WILSON RD	EW	27	1.19	0.10	1.28	29	1.16	0.12	1.30	25	1.30	0.13	1.41	30	1.13	0.13	1.25
NOR	INDIAN RIVER RD	WILSON RD	CAMPOSTELLA RD	EW	21	1.37	0.13	1.52	23	1.29	0.11	1.44	23	1.26	0.11	1.38	23	1.27	0.09	1.40

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
NOR	INDIAN RIVER RD	CAMPOSTELLA RD	CHESAPEAKE CL	EW	34	1.13	0.07	1.19	32	1.17	0.15	1.37	35	1.08	0.09	1.19	33	1.15	0.13	1.28
NOR	INGLESIDE RD	VA BEACH BLVD	PRINCESS ANNE RD	NS	28	1.19	0.21	1.43	26	1.24	0.24	1.55	27	1.23	0.16	1.40	28	1.17	0.16	1.35
NOR	INGLESIDE RD	PRINCESS ANNE RD	TAIT TERRACE DR	NS	27	1.15	0.12	1.30	28	1.14	0.13	1.28	27	1.15	0.12	1.29	28	1.13	0.12	1.28
NOR	JAMESTOWN CRESCENT	53RD ST	HAMPTON BLVD	NS	29	1.08	0.07	1.16	29	1.01	0.05	1.05	27	1.14	0.04	1.17	27	1.09	0.02	1.12
NOR	LAFAYETTE BLVD	27TH ST	TIDEWATER DR	EW	29	1.19	0.06	1.25	28	1.14	0.12	1.26	26	1.30	0.13	1.47	29	1.11	0.06	1.17
NOR	LAFAYETTE BLVD	TIDEWATER DR	CHESAPEAKE BLVD	EW	23	1.19	0.09	1.30	24	1.27	0.10	1.42	24	1.16	0.12	1.31	25	1.24	0.07	1.35
NOR	LLEWELLYN AVE	VA BEACH BLVD	PRINCESS ANNE RD	NS	26	1.25	0.02	1.30	32	0.95	0.06	0.99	26	1.26	0.07	1.31	31	0.96	0.06	1.00
NOR	LLEWELLYN AVE	PRINCESS ANNE RD	21ST ST	NS	25	1.38	0.02	1.43	27	1.26	0.03	1.30	25	1.34	0.04	1.37	28	1.21	0.04	1.26
NOR	LLEWELLYN AVE	21ST ST	26TH ST	NS	23	1.09	0.03	1.12	25	0.93	0.07	0.99	22	1.11	0.03	1.14	25	0.92	0.10	0.97
NOR	LLEWELLYN AVE	26TH ST	27TH ST	NS	23	1.09	0.03	1.12	25	0.93	0.07	0.99	22	1.11	0.03	1.14	25	0.92	0.10	0.97
NOR	LLEWELLYN AVE	27TH ST	35TH ST	NS	29	0.97	0.03	0.99	26	1.02	0.03	1.05	29	0.97	0.03	1.00	25	1.07	0.06	1.11
NOR	LLEWELLYN AVE	35TH ST	38TH ST	NS	29	0.97	0.03	0.99	26	1.02	0.03	1.05	29	0.97	0.03	1.00	25	1.07	0.06	1.11
NOR	LLEWELLYN AVE	38TH ST	DELAWARE AVE	NS	23	1.25	0.01	1.30	28	1.16	0.06	1.23	24	1.18	0.04	1.24	29	1.15	0.07	1.24
NOR	LLEWELLYN AVE	DELAWARE AVE	GRANBY ST	NS	-	-	-	-	28	1.16	0.06	1.23	-	-	-	-	29	1.15	0.07	1.24
NOR	MIDTOWN TUNNEL	PORTSMOUTH CL	BRAMBLETON AVE	NS	26	1.69	1.10	3.32	40	0.89	0.37	1.22	29	1.50	1.00	2.98	40	0.91	0.38	1.26
NOR	MILITARY HWY	VA BEACH CL	I-264	NS	41	1.13	0.28	1.46	38	1.22	0.28	1.56	41	1.14	0.18	1.34	32	1.44	0.49	2.17
NOR	MILITARY HWY	I-264	VA BEACH BLVD	NS	40	1.00	0.49	1.51	39	1.07	0.34	1.44	36	1.10	0.51	1.66	33	1.26	0.50	1.90
NOR	MILITARY HWY	VA BEACH BLVD	LOWERY RD	NS	29	1.10	0.49	1.59	34	1.11	0.29	1.44	27	1.18	0.61	1.92	28	1.40	0.52	2.13
NOR	MILITARY HWY	LOWERY RD	PRIN ANNE RD/NORTHAMPTON BLVD	NS	29	1.10	0.49	1.59	34	1.11	0.29	1.44	27	1.18	0.61	1.92	28	1.40	0.52	2.13
NOR	MILITARY HWY	PRIN ANNE RD/NORTHAMPTON BLVD	I-64	NS	34	1.10	0.39	1.49	29	1.19	0.55	1.86	35	1.07	0.22	1.30	25	1.40	1.11	2.99
NOR	MILITARY HWY	I-64	AZALEA GARDEN RD	NS	32	1.13	0.29	1.39	29	1.31	0.30	1.72	31	1.16	0.18	1.37	30	1.26	0.58	1.99
NOR	MILITARY HWY	AZALEA GARDEN RD	NORVIEW AVE	NS	33	1.07	0.19	1.28	32	1.13	0.10	1.23	28	1.25	0.25	1.56	33	1.11	0.24	1.39
NOR	MILITARY HWY	NORVIEW AVE	JOHNSTONS RD	NS	36	1.18	0.06	1.27	36	1.28	0.08	1.37	33	1.29	0.09	1.42	33	1.40	0.13	1.59
NOR	MILITARY HWY	JOHNSTONS RD	LITTLE CREEK RD	NS	37	1.03	0.06	1.08	36	1.12	0.07	1.19	35	1.13	0.05	1.19	35	1.15	0.09	1.24
NOR	MONTICELLO AVE	ST PAULS BLVD	VA BEACH BLVD	NS	24	1.36	0.54	2.08	23	1.14	0.22	1.35	26	1.24	0.33	1.64	22	1.21	0.50	1.85
NOR	MONTICELLO AVE	VA BEACH BLVD	PRINCESS ANNE RD	NS	24	1.36	0.54	2.08	23	1.14	0.22	1.35	26	1.24	0.33	1.64	22	1.21	0.50	1.85
NOR	MONTICELLO AVE	PRINCESS ANNE RD	21ST ST	NS	25	1.26	0.22	1.55	25	1.14	0.14	1.32	26	1.20	0.24	1.50	25	1.14	0.21	1.40
NOR	MONTICELLO AVE	21ST ST	26TH ST	NS	23	1.23	0.35	1.65	26	1.04	0.08	1.10	24	1.16	0.18	1.40	25	1.08	0.16	1.26
NOR	MONTICELLO AVE	26TH ST	27TH ST	NS	23	1.23	0.35	1.65	26	1.04	0.08	1.10	24	1.16	0.18	1.40	25	1.08	0.16	1.26
NOR	MONTICELLO AVE	27TH ST	CHURCH ST	NS	23	1.23	0.35	1.65	26	1.04	0.08	1.10	24	1.16	0.18	1.40	25	1.08	0.16	1.26
NOR	NEWTOWN RD	KEMPSVILLE RD	I-264	NS	29	1.11	0.37	1.51	27	1.05	0.42	1.50	27	1.20	0.54	1.85	22	1.27	0.91	2.42
NOR	NEWTOWN RD	I-264	VA BEACH BLVD	NS	29	1.23	0.32	1.62	30	1.22	0.57	1.93	26	1.39	0.59	2.22	26	1.39	0.66	2.31
NOR	NEWTOWN RD	VA BEACH BLVD	VA BEACH CL	NS	30	1.19	0.16	1.39	28	1.30	0.34	1.75	29	1.25	0.27	1.56	26	1.40	0.40	1.99
NOR	NORTHAMPTON BLVD	MILITARY HWY	KEMPSVILLE RD	EW	34	1.15	0.39	1.61	32	1.11	0.43	1.59	31	1.26	0.58	1.95	29	1.22	0.63	1.95
NOR	NORTHAMPTON BLVD	KEMPSVILLE RD	I-64	EW	34	1.15	0.39	1.61	32	1.11	0.43	1.59	31	1.26	0.58	1.95	29	1.22	0.63	1.95
NOR	NORTHAMPTON BLVD	I-64	WESLEYAN DR/VA BEACH CL	EW	29	1.35	0.57	2.12	28	1.35	1.07	2.86	32	1.23	0.50	1.82	28	1.39	0.85	2.58
NOR	NORVIEW AVE	CHESAPEAKE BLVD	I-64	EW	32	1.16	0.12	1.33	28	1.27	0.09	1.37	33	1.10	0.12	1.20	26	1.36	0.18	1.58
NOR	OCEAN VIEW AVE	4TH VIEW ST	TIDEWATER DR	EW	28	1.12	0.08	1.21	28	1.17	0.10	1.25	28	1.12	0.20	1.34	27	1.23	0.33	1.62
NOR	OCEAN VIEW AVE	TIDEWATER DR	GRANBY ST	EW	28	1.12	0.08	1.21	28	1.17	0.10	1.25	28	1.12	0.20	1.34	27	1.23	0.33	1.62
NOR	OCEAN VIEW AVE	GRANBY ST	CHESAPEAKE BLVD	EW	32	1.17	0.08	1.25	33	1.09	0.07	1.18	30	1.24	0.16	1.43	32	1.11	0.12	1.23
NOR	OCEAN VIEW AVE	CHESAPEAKE BLVD	21ST BAY ST	EW	33	1.17	0.10	1.27	34	1.13	0.08	1.23	32	1.21	0.20	1.46	33	1.16	0.12	1.29
NOR	PARK AVE	BRAMBLETON AVE	VA BEACH BLVD	EW	22	1.29	0.03	1.34	21	1.40	0.04	1.48	21	1.33	0.06	1.40	19	1.53	0.15	1.79
NOR	PARK AVE	VA BEACH BLVD	PRINCESS ANNE RD	EW	21	0.94	0.03	0.96	21	1.07	0.07	1.15	22	0.92	0.06	0.97	20	1.19	0.07	1.28
NOR	PRINCESS ANNE RD	HAMPTON BLVD	COLLEY AVE	EW	15	1.04	0.05	1.06	15	1.22	0.04	1.28	16	0.97	0.08	1.03	16	1.11	0.07	1.17
NOR	PRINCESS ANNE RD	COLLEY AVE	LLEWELLYN AVE	EW	20	1.22	0.11	1.29	17	1.47	0.24	1.83	19	1.25	0.14	1.46	19	1.35	0.12	1.51
NOR	PRINCESS ANNE RD	LLEWELLYN AVE	MONTICELLO AVE	EW	19	1.20	0.12	1.33	17	1.26	0.22	1.53	19	1.20	0.12	1.33	19	1.12	0.07	1.17
NOR	PRINCESS ANNE RD	MONTICELLO AVE	CHURCH ST	EW	22	1.27	0.06	1.32	23	1.27	0.12	1.44	23	1.21	0.09	1.33	23	1.27	0.07	1.37
NOR	PRINCESS ANNE RD	CHURCH ST	TIDEWATER DR	EW	22	1.27	0.06	1.32	23	1.27	0.12	1.44	23	1.21	0.09	1.33	23	1.27	0.07	1.37
NOR	PRINCESS ANNE RD	TIDEWATER DR	MAY AVE	EW	24	1.17	0.08	1.28	24	1.29	0.14	1.48	24	1.15	0.12	1.30	25	1.21	0.16	1.38
NOR	PRINCESS ANNE RD	MAY AVE	PARK AVE	EW	24	1.17	0.08	1.28	24	1.29	0.14	1.48	24	1.15	0.12	1.30	25	1.21	0.16	1.38

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
NOR	PRINCESS ANNE RD	PARK AVE	BALLENTINE BLVD	EW	29	1.19	0.08	1.29	29	1.18	0.11	1.34	28	1.22	0.13	1.39	29	1.17	0.09	1.28
NOR	PRINCESS ANNE RD	BALLENTINE BLVD	INGLESIDE RD	EW	25	1.14	0.19	1.36	25	1.18	0.22	1.44	25	1.14	0.19	1.36	25	1.20	0.18	1.41
NOR	PRINCESS ANNE RD	INGLESIDE RD	AZALEA GARDEN RD	EW	29	1.14	0.24	1.43	29	1.14	0.19	1.36	29	1.16	0.22	1.40	29	1.16	0.19	1.38
NOR	PRINCESS ANNE RD	AZALEA GARDEN RD	SEWELLS POINT RD	EW	29	1.14	0.24	1.43	29	1.14	0.19	1.36	29	1.16	0.22	1.40	29	1.16	0.19	1.38
NOR	PRINCESS ANNE RD	SEWELLS POINT RD	MILITARY HWY	EW	29	1.14	0.24	1.43	29	1.14	0.19	1.36	29	1.16	0.22	1.40	29	1.16	0.19	1.38
NOR	SEWELLS POINT RD	PRINCESS ANNE RD	AZALEA GARDEN RD	NS	28	1.20	0.09	1.29	24	1.38	0.05	1.42	24	1.38	0.06	1.49	24	1.36	0.08	1.41
NOR	SEWELLS POINT RD	AZALEA GARDEN RD	ROBIN HOOD RD	NS	28	1.20	0.09	1.29	24	1.38	0.05	1.42	24	1.38	0.06	1.49	24	1.36	0.08	1.41
NOR	SEWELLS POINT RD	ROBIN HOOD RD	CHESAPEAKE BLVD	NS	30	1.12	0.11	1.25	31	1.18	0.10	1.32	28	1.18	0.07	1.25	32	1.15	0.06	1.20
NOR	SEWELLS POINT RD	CHESAPEAKE BLVD	PARTRIDGE ST	NS	25	1.07	0.07	1.16	24	1.27	0.03	1.32	24	1.14	0.05	1.21	20	1.55	0.07	1.72
NOR	SEWELLS POINT RD	PARTRIDGE ST	PHILPOTTS RD	NS	25	1.07	0.07	1.16	24	1.27	0.03	1.32	24	1.14	0.05	1.21	20	1.55	0.07	1.72
NOR	SEWELLS POINT RD	PHILPOTTS RD	I-64	NS	28	1.05	0.06	1.13	27	1.10	0.06	1.16	27	1.10	0.05	1.16	26	1.13	0.05	1.20
NOR	SEWELLS POINT RD	I-64	LITTLE CREEK RD	NS	28	1.05	0.06	1.13	27	1.10	0.06	1.16	27	1.10	0.05	1.16	26	1.13	0.05	1.20
NOR	SHORE DRIVE	21ST BAY ST	LITTLE CREEK RD	EW	33	1.17	0.10	1.27	34	1.13	0.08	1.23	32	1.21	0.20	1.46	33	1.16	0.12	1.29
NOR	SHORE DRIVE	LITTLE CREEK RD	VA BEACH CL	EW	41	1.14	0.12	1.27	41	1.11	0.20	1.33	36	1.31	0.57	2.01	41	1.11	0.25	1.40
NOR	ST PAULS BLVD	WATERSIDE DR	CITY HALL AVE	NS	23	0.91	0.20	1.11	20	1.11	0.15	1.29	19	1.08	0.21	1.35	21	1.07	0.25	1.33
NOR	ST PAULS BLVD	CITY HALL AVE	I-264 RAMP/MACARTHUR MALL	NS	23	0.75	0.67	1.24	21	1.10	0.42	1.48	21	0.82	0.27	1.05	21	1.12	0.72	1.85
NOR	ST PAULS BLVD	I-264 RAMP/MACARTHUR MALL	BRAMBLETON AVE	NS	24	1.18	0.83	2.16	24	1.22	0.49	1.80	24	1.16	0.53	1.79	21	1.36	1.03	2.79
NOR	ST PAULS BLVD	BRAMBLETON AVE	MONTICELLO AVE	NS	24	1.36	0.54	2.08	23	1.14	0.22	1.35	26	1.24	0.33	1.64	22	1.21	0.50	1.85
NOR	TIDEWATER DR	CITY HALL AVE	BRAMBLETON AVE	NS	31	1.16	0.41	1.64	33	1.15	0.24	1.44	32	1.10	0.39	1.53	28	1.34	0.96	2.59
NOR	TIDEWATER DR	BRAMBLETON AVE	VA BEACH BLVD	NS	27	1.20	0.50	1.81	29	1.06	0.23	1.33	31	1.03	0.42	1.45	24	1.27	0.98	2.53
NOR	TIDEWATER DR	VA BEACH BLVD	PRINCESS ANNE RD	NS	26	1.21	0.57	1.87	28	1.11	0.38	1.56	30	1.08	0.48	1.61	27	1.15	0.75	2.06
NOR	TIDEWATER DR	PRINCESS ANNE RD	LAFAYETTE BLVD	NS	33	1.08	0.13	1.23	33	1.09	0.17	1.29	33	1.11	0.16	1.30	32	1.16	0.28	1.51
NOR	TIDEWATER DR	LAFAYETTE BLVD	CROMWELL DR	NS	29	1.23	0.27	1.60	32	1.11	0.13	1.27	29	1.22	0.28	1.57	31	1.16	0.16	1.34
NOR	TIDEWATER DR	CROMWELL DR	NORVIEW AVE	NS	30	1.20	0.25	1.52	30	1.18	0.23	1.48	32	1.14	0.24	1.42	25	1.41	0.63	2.22
NOR	TIDEWATER DR	NORVIEW AVE	THOLE ST	NS	36	1.09	0.12	1.23	38	1.07	0.20	1.30	36	1.11	0.25	1.39	37	1.09	0.46	1.55
NOR	TIDEWATER DR	THOLE ST	I-64	NS	36	1.09	0.12	1.23	28	1.05	0.16	1.21	36	1.11	0.25	1.39	28	1.05	0.14	1.21
NOR	TIDEWATER DR	I-64	LITTLE CREEK RD	NS	31	1.06	0.12	1.20	28	1.05	0.16	1.21	31	1.11	0.30	1.45	28	1.05	0.14	1.21
NOR	TIDEWATER DR	LITTLE CREEK RD	BAYVIEW BLVD	NS	34	1.20	0.05	1.27	37	1.13	0.07	1.21	36	1.15	0.10	1.25	37	1.16	0.05	1.22
NOR	TIDEWATER DR	BAYVIEW BLVD	GRANBY ST	NS	39	1.09	0.05	1.15	38	1.09	0.08	1.14	39	1.10	0.09	1.17	37	1.10	0.07	1.16
NOR	TIDEWATER DR	GRANBY ST	OCEAN VIEW AVE	NS	35	1.17	0.16	1.34	37	1.16	0.04	1.18	33	1.26	0.61	2.00	38	1.12	0.06	1.18
NOR	VA BEACH BLVD	MONTICELLO AVE	CHURCH ST	EW	25	1.14	0.08	1.20	24	1.18	0.08	1.27	25	1.14	0.08	1.22	25	1.14	0.09	1.23
NOR	VA BEACH BLVD	CHURCH ST	TIDEWATER DR	EW	25	1.14	0.08	1.20	24	1.18	0.08	1.27	25	1.14	0.08	1.22	25	1.14	0.09	1.23
NOR	VA BEACH BLVD	TIDEWATER DR	PARK AVE	EW	28	1.17	0.08	1.27	26	1.25	0.11	1.39	28	1.16	0.19	1.39	24	1.34	0.11	1.53
NOR	VA BEACH BLVD	PARK AVE	BALLENTINE BLVD	EW	30	1.09	0.05	1.15	31	1.04	0.07	1.11	29	1.12	0.16	1.31	31	1.05	0.08	1.13
NOR	VA BEACH BLVD	BALLENTINE BLVD	INGLESIDE RD	EW	29	1.11	0.36	1.51	28	1.18	0.52	1.78	29	1.10	0.40	1.54	30	1.12	0.34	1.50
NOR	VA BEACH BLVD	INGLESIDE RD	AZALEA GARDEN RD	EW	30	1.19	0.53	1.86	31	1.05	0.47	1.54	33	1.10	0.36	1.50	30	1.08	0.34	1.45
NOR	VA BEACH BLVD	AZALEA GARDEN RD	JETT ST	EW	33	1.11	0.28	1.43	34	1.12	0.23	1.40	33	1.13	0.35	1.54	33	1.16	0.23	1.41
NOR	VA BEACH BLVD	JETT ST	MILITARY HWY	EW	33	1.11	0.28	1.43	34	1.12	0.23	1.40	33	1.13	0.35	1.54	33	1.16	0.23	1.41
NOR	VA BEACH BLVD	MILITARY HWY	GLENROCK RD	EW	32	1.12	0.24	1.38	34	1.07	0.19	1.24	28	1.28	0.70	2.20	31	1.17	0.16	1.35
NOR	VA BEACH BLVD	GLENROCK RD	KEMPSVILLE RD	EW	32	1.12	0.24	1.38	34	1.07	0.19	1.24	28	1.28	0.70	2.20	31	1.17	0.16	1.35
NOR	VA BEACH BLVD	KEMPSVILLE RD	NEWTOWN RD	EW	32	1.12	0.24	1.38	34	1.07	0.19	1.24	28	1.28	0.70	2.20	31	1.17	0.16	1.35
NOR	WILSON RD	BERKLEY AVE/CHESAPEAKE CL	INDIAN RIVER RD	EW	21	1.27	0.19	1.51	24	1.14	0.07	1.21	22	1.25	0.07	1.30	22	1.25	0.21	1.47
NOR	WILSON RD	INDIAN RIVER RD	CAMPOSTELLA RD	EW	21	1.27	0.19	1.51	24	1.14	0.07	1.21	22	1.25	0.07	1.30	22	1.25	0.21	1.47
POQ	VICTORY BLVD	YORK CL	WYTHE CREEK RD	EW	40	1.20	0.08	1.30	39	1.25	0.15	1.40	35	1.36	0.10	1.52	38	1.30	0.10	1.46
POQ	WYTHE CREEK RD	HAMPTON CL	ALPHUS ST	NS	35	1.13	0.07	1.22	36	1.10	0.07	1.15	35	1.14	0.07	1.22	36	1.09	0.03	1.13
POQ	WYTHE CREEK RD	ALPHUS ST	LITTLE FLORIDA RD	NS	35	1.13	0.07	1.22	36	1.10	0.07	1.15	35	1.14	0.07	1.22	36	1.09	0.03	1.13
PORT	AIRLINE BLVD	CHESAPEAKE CL	GREENWOOD DR	EW	34	1.12	0.09	1.22	39	1.13	0.07	1.21	33	1.13	0.07	1.22	40	1.12	0.08	1.21
PORT	AIRLINE BLVD	GREENWOOD DR	ELMHURST LN	EW	29	1.19	0.16	1.39	28	1.13	0.10	1.23	28	1.19	0.06	1.26	27	1.17	0.09	1.28
PORT	AIRLINE BLVD	ELMHURST LN	.55 MI E ELMHURST LN	EW	29	1.19	0.16	1.39	28	1.13	0.10	1.23	28	1.19	0.06	1.26	27	1.17	0.09	1.28
PORT	AIRLINE BLVD	.55 MI E ELMHURST LN	VICTORY BLVD	EW	29	1.19	0.16	1.39	28	1.13	0.10	1.23	28	1.19	0.06	1.26	27	1.17	0.09	1.28

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
PORT	AIRLINE BLVD	VICTORY BLVD	PORTSMOUTH BLVD	EW	29	1.19	0.16	1.39	28	1.13	0.10	1.23	28	1.19	0.06	1.26	27	1.17	0.09	1.28
PORT	AIRLINE BLVD	PORTSMOUTH BLVD	FREDERICK BLVD	EW	28	1.22	0.07	1.31	28	1.21	0.09	1.31	27	1.25	0.06	1.32	27	1.22	0.12	1.37
PORT	AIRLINE BLVD	FREDERICK BLVD	HIGH ST	EW	28	1.15	0.18	1.33	23	1.25	0.18	1.48	27	1.19	0.13	1.33	24	1.21	0.20	1.47
PORT	CEDAR LN	HIGH ST	W NORFOLK RD	NS	32	1.12	0.06	1.20	28	1.27	0.05	1.37	31	1.17	0.04	1.23	32	1.12	0.04	1.17
PORT	CEDAR LN	W NORFOLK RD	WESTERN FREEWAY	NS	32	1.12	0.06	1.20	28	1.27	0.05	1.37	31	1.17	0.04	1.23	32	1.12	0.04	1.17
PORT	ELM AVE	LONDON BLVD	HIGH ST	NS	19	1.32	0.07	1.40	21	1.09	0.06	1.15	21	1.14	0.08	1.22	20	1.13	0.07	1.19
PORT	ELM AVE	HIGH ST	COUNTY ST	NS	19	1.32	0.07	1.40	21	1.09	0.06	1.15	21	1.14	0.08	1.22	20	1.13	0.07	1.19
PORT	ELM AVE	COUNTY ST	SOUTH ST	NS	19	1.32	0.07	1.40	21	1.09	0.06	1.15	21	1.14	0.08	1.22	20	1.13	0.07	1.19
PORT	ELM AVE	SOUTH ST	I-264	NS	22	1.13	0.07	1.40	23	1.13	0.06	1.15	23	1.07	0.08	1.22	22	1.17	0.07	1.19
PORT	ELM AVE	I-264	PORTSMOUTH BLVD	NS	22	1.13	0.07	1.40	23	1.13	0.06	1.15	23	1.07	0.08	1.22	22	1.17	0.07	1.19
PORT	ELM AVE	PORTSMOUTH BLVD	GEORGE WASHINGTON HWY	NS	27	1.24	0.07	1.40	31	1.08	0.06	1.15	29	1.13	0.08	1.22	31	1.08	0.07	1.19
PORT	FREDERICK BLVD	GEORGE WASHINGTON HWY	PORTSMOUTH BLVD	NS	33	1.14	0.11	1.27	34	1.10	0.09	1.21	32	1.20	0.13	1.35	34	1.12	0.10	1.23
PORT	FREDERICK BLVD	PORTSMOUTH BLVD	DEEP CREEK BLVD	NS	32	1.07	0.29	1.37	32	1.11	0.10	1.24	31	1.11	0.28	1.41	31	1.12	0.12	1.25
PORT	FREDERICK BLVD	DEEP CREEK BLVD	I-264	NS	32	1.07	0.29	1.37	32	1.11	0.10	1.24	31	1.11	0.28	1.41	31	1.12	0.12	1.25
PORT	FREDERICK BLVD	I-264	TURNPIKE RD	NS	27	1.18	0.30	1.54	28	1.11	0.21	1.35	27	1.18	0.40	1.67	26	1.19	0.40	1.66
PORT	FREDERICK BLVD	TURNPIKE RD	AIRLINE BLVD	NS	27	1.18	0.30	1.54	28	1.11	0.21	1.35	27	1.18	0.40	1.67	26	1.19	0.40	1.66
PORT	FREDERICK BLVD	AIRLINE BLVD	HIGH ST	NS	33	1.14	0.09	1.24	33	1.16	0.09	1.27	32	1.17	0.09	1.29	32	1.17	0.09	1.26
PORT	GEORGE WASHINGTON HWY	CHESAPEAKE CL	VICTORY BLVD	NS	31	1.14	0.13	1.29	31	1.15	0.16	1.33	29	1.18	0.17	1.40	30	1.21	0.22	1.49
PORT	GEORGE WASHINGTON HWY	VICTORY BLVD	DAVIS ST	NS	33	1.11	0.11	1.25	31	1.15	0.09	1.25	30	1.20	0.12	1.34	30	1.19	0.12	1.32
PORT	GEORGE WASHINGTON HWY	DAVIS ST	GREENWOOD DR	NS	33	1.11	0.11	1.25	31	1.15	0.09	1.25	30	1.20	0.12	1.34	30	1.19	0.12	1.32
PORT	GEORGE WASHINGTON HWY	GREENWOOD DR	FREDERICK BLVD	NS	33	1.11	0.11	1.25	31	1.15	0.09	1.25	30	1.20	0.12	1.34	30	1.19	0.12	1.32
PORT	GREENWOOD DR	AIRLINE BLVD	I-264	EW	29	1.01	0.17	1.18	27	1.00	0.17	1.19	28	1.02	0.09	1.15	27	1.02	0.28	1.23
PORT	GREENWOOD DR	I-264	CAVALIER BLVD	EW	32	1.11	0.08	1.20	35	1.07	0.06	1.12	30	1.19	0.04	1.25	35	1.07	0.06	1.12
PORT	GREENWOOD DR	CAVALIER BLVD	VICTORY BLVD	EW	33	1.08	0.02	1.10	32	1.11	0.03	1.15	32	1.11	0.02	1.13	32	1.11	0.05	1.14
PORT	GREENWOOD DR	VICTORY BLVD	INDEPENDENCE ST	EW	29	1.11	0.05	1.16	26	1.17	0.05	1.20	26	1.21	0.03	1.23	26	1.18	0.02	1.20
PORT	GREENWOOD DR	INDEPENDENCE ST	DEEP CREEK BLVD	EW	29	1.11	0.05	1.16	26	1.17	0.05	1.20	26	1.21	0.03	1.23	26	1.18	0.02	1.20
PORT	GREENWOOD DR	DEEP CREEK BLVD	GEORGE WASHINGTON HWY	EW	29	1.11	0.05	1.16	26	1.17	0.05	1.20	26	1.21	0.03	1.23	26	1.18	0.02	1.20
PORT	HIGH ST	TYRE NECK RD	CHURCHLAND BLVD	EW	30	1.15	0.08	1.26	31	1.09	0.08	1.18	29	1.19	0.12	1.35	29	1.19	0.14	1.34
PORT	HIGH ST	CHURCHLAND BLVD	CEDAR LA	EW	30	1.15	0.08	1.26	31	1.09	0.08	1.18	29	1.19	0.12	1.35	29	1.19	0.14	1.34
PORT	HIGH ST	CEDAR LA	FREDERICK BLVD	EW	33	1.16	0.09	1.27	33	1.14	0.09	1.24	32	1.17	0.09	1.26	32	1.17	0.09	1.29
PORT	LONDON BLVD	HIGH ST	MT VERNON AVE	EW	28	1.15	0.18	1.33	23	1.25	0.18	1.48	27	1.19	0.13	1.33	24	1.21	0.20	1.47
PORT	LONDON BLVD	MT VERNON AVE	M L K FWY	EW	35	1.12	0.25	1.38	34	1.06	0.27	1.36	35	1.12	0.10	1.23	34	1.05	0.34	1.41
PORT	MIDTOWN TUNNEL	MLK FWY/WESTERN FREEWAY	NORFOLK CL	NS	26	1.69	1.10	3.32	40	0.89	0.37	1.22	29	1.50	1.00	2.98	40	0.91	0.38	1.26
PORT	PORTSMOUTH BLVD	CHESAPEAKE CL	ELMHURST LN	EW	35	1.04	0.10	1.11	35	1.08	0.08	1.18	33	1.12	0.09	1.23	33	1.13	0.08	1.23
PORT	PORTSMOUTH BLVD	ELMHURST LN	VICTORY BLVD	EW	33	1.07	0.12	1.18	32	1.09	0.08	1.18	32	1.11	0.09	1.18	32	1.12	0.11	1.23
PORT	PORTSMOUTH BLVD	VICTORY BLVD	AIRLINE BLVD	EW	24	1.13	0.34	1.39	31	1.01	0.13	1.14	25	1.08	0.13	1.18	29	1.09	0.21	1.31
PORT	PORTSMOUTH BLVD	AIRLINE BLVD	TURNPIKE RD	EW	34	1.10	0.07	1.18	22	0.95	0.22	1.18	34	1.06	0.06	1.11	22	0.94	0.23	1.14
PORT	PORTSMOUTH BLVD	TURNPIKE RD	I-264	EW	34	1.10	0.07	1.18	22	0.95	0.22	1.18	34	1.06	0.06	1.11	22	0.94	0.23	1.14
PORT	PORTSMOUTH BLVD	I-264	DEEP CREEK BLVD	EW	32	1.23	0.04	1.27	32	1.17	0.03	1.19	34	1.16	0.04	1.21	33	1.15	0.02	1.18
PORT	PORTSMOUTH BLVD	DEEP CREEK BLVD	FREDERICK BLVD	EW	30	1.03	0.08	1.05	25	1.20	0.01	1.25	29	1.03	0.02	1.05	27	1.12	0.04	1.17
PORT	PORTSMOUTH BLVD	FREDERICK BLVD	ELM AVE	EW	32	1.11	0.04	1.14	31	1.12	0.04	1.15	28	1.23	0.01	1.25	27	1.28	0.04	1.33
PORT	PORTSMOUTH BLVD	ELM AVE	EFFINGHAM ST	EW	25	1.17	0.06	1.23	23	1.09	0.02	1.13	24	1.21	0.05	1.23	26	0.98	0.04	1.02
PORT	PORTSMOUTH BLVD	EFFINGHAM ST	PORTCENTRE PKWY	EW	24	1.24	0.07	1.29	25	1.08	0.04	1.09	23	1.29	0.06	1.31	26	1.05	0.06	1.09
PORT	TOWNE POINT RD	SUFFOLK CL	TWIN PINES RD	EW	28	1.12	0.05	1.18	28	1.22	0.03	1.26	27	1.18	0.04	1.22	26	1.29	0.03	1.35
PORT	TOWNE POINT RD	TWIN PINES RD	WESTERN FREEWAY	EW	27	1.18	0.12	1.25	28	1.17	0.05	1.26	26	1.22	0.10	1.38	26	1.22	0.13	1.38
PORT	TOWNE POINT RD	WESTERN FREEWAY	CHESAPEAKE CL	EW	26	1.16	0.10	1.23	26	1.13	0.07	1.22	25	1.19	0.14	1.34	26	1.16	0.17	1.32
PORT	VICTORY BLVD	PORTSMOUTH BLVD	AIRLINE BLVD	EW	24	1.08	0.04	1.13	25	1.02	0.10	1.11	22	1.18	0.09	1.23	26	0.96	0.20	1.16
PORT	VICTORY BLVD	AIRLINE BLVD	I-264	EW	25	0.98	0.29	1.26	27	1.05	0.25	1.33	24	1.05	0.28	1.36	26	1.09	0.32	1.45
PORT	VICTORY BLVD	I-264	GREENWOOD DR	EW	30	1.12	0.17	1.32	29	1.18	0.23	1.47	28	1.21	0.25	1.51	29	1.18	0.30	1.56
PORT	VICTORY BLVD	GREENWOOD DR	DEEP CREEK BLVD	EW	31	1.14	0.12	1.29	31	1.17	0.09	1.28	29	1.22	0.13	1.39	30	1.22	0.10	1.35

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
PORT	VICTORY BLVD	DEEP CREEK BLVD	GEORGE WASHINGTON HWY	EW	31	1.14	0.12	1.29	31	1.17	0.09	1.28	29	1.22	0.13	1.39	30	1.22	0.10	1.35
PORT	VICTORY BLVD	GEORGE WASHINGTON HWY	AFTON PKWY	EW	35	1.02	0.05	1.07	36	1.13	0.08	1.21	34	1.05	0.02	1.07	35	1.19	0.06	1.25
PORT	VICTORY BLVD	AFTON PKWY	ELM AVE	EW	35	1.02	0.05	1.07	36	1.13	0.08	1.21	34	1.05	0.02	1.07	35	1.19	0.06	1.25
PORT	WESTERN BRANCH BLVD	CHESAPEAKE CL	TYRE NECK RD	EW	30	1.15	0.08	1.26	31	1.09	0.08	1.18	29	1.19	0.12	1.35	29	1.19	0.14	1.34
SH	BUS ROUTE 58	ROUTE 35	ECL COURTLAND	EW	38	1.09	0.02	1.11	39	1.09	0.02	1.11	38	1.09	0.01	1.10	38	1.11	0.03	1.13
SH	BUS ROUTE 58	ECL COURTLAND	ROUTE 58	EW	38	1.09	0.02	1.11	39	1.09	0.02	1.11	38	1.09	0.01	1.10	38	1.11	0.03	1.13
SH	ROUTE 35	NC STATE LINE	SCL BOYKINS	NS	43	1.09	0.01	1.10	46	1.04	0.01	1.06	42	1.12	0.02	1.14	44	1.09	0.01	1.10
SH	ROUTE 35	SCL BOYKINS	ROUTE 1324	NS	43	1.09	0.01	1.10	46	1.04	0.01	1.06	42	1.12	0.02	1.14	44	1.09	0.01	1.10
SH	ROUTE 35	ROUTE 1324	ROUTE 186	NS	43	1.09	0.01	1.10	46	1.04	0.01	1.06	42	1.12	0.02	1.14	44	1.09	0.01	1.10
SH	ROUTE 35	ROUTE 186	NCL BOYKINS	NS	32	1.10	0.02	1.12	30	1.08	0.03	1.11	31	1.12	0.04	1.15	27	1.17	0.02	1.20
SH	ROUTE 35	NCL BOYKINS	ROUTE 671	NS	32	1.10	0.02	1.12	30	1.08	0.03	1.11	31	1.12	0.04	1.15	27	1.17	0.02	1.20
SH	ROUTE 35	ROUTE 671	GRAYS SHOP RD (RTE 673)	NS	48	1.24	0.09	1.30	49	1.22	0.03	1.24	49	1.19	0.02	1.21	50	1.21	0.02	1.22
SH	ROUTE 35	GRAYS SHOP RD (RTE 673)	ROUTE 58	NS	50	1.18	0.01	1.19	50	1.18	0.01	1.19	50	1.18	0.01	1.19	50	1.18	0.01	1.19
SH	ROUTE 35/BUS ROUTE 58	ROUTE 58	WCL COURTLAND	EW	42	1.16	0.05	1.21	44	1.09	0.06	1.13	42	1.16	0.04	1.21	44	1.08	0.03	1.10
SH	ROUTE 35/BUS ROUTE 58	WCL COURTLAND	BUS RTE 58	EW	42	1.16	0.05	1.21	44	1.09	0.06	1.13	42	1.16	0.04	1.21	44	1.08	0.03	1.10
SH	ROUTE 35	BUS RTE 58	NCL COURTLAND	NS	49	1.15	0.02	1.17	49	1.17	0.02	1.20	49	1.16	0.03	1.18	49	1.17	0.02	1.19
SH	ROUTE 35	NCL COURTLAND	IVOR RD (RTE 616)	NS	49	1.15	0.02	1.17	49	1.17	0.02	1.20	49	1.16	0.03	1.18	49	1.17	0.02	1.19
SH	ROUTE 35	IVOR RD (RTE 616)	CARYS BRIDGE RD (RTE 653)	NS	49	1.15	0.02	1.17	49	1.17	0.02	1.20	49	1.16	0.03	1.18	49	1.17	0.02	1.19
SH	ROUTE 35	CARYS BRIDGE RD (RTE 653)	SUSSEX CL	NS	49	1.15	0.02	1.17	49	1.17	0.02	1.20	49	1.16	0.03	1.18	49	1.17	0.02	1.19
SH	ROUTE 58	GREENSVILLE CL	ADAMS GROVE RD (RTE 615)	EW	63	0.99	0.05	1.04	63	0.99	0.03	1.02	63	0.99	0.05	1.04	63	0.98	0.04	1.01
SH	ROUTE 58	ADAMS GROVE RD (RTE 615)	DREWRY RD (RTE 659)	EW	63	0.99	0.05	1.04	63	0.99	0.03	1.02	63	0.99	0.05	1.04	63	0.98	0.04	1.01
SH	ROUTE 58	DREWRY RD (RTE 659)	PINOPOLIS RD (ROUTE 653)	EW	63	1.00	0.09	1.09	63	1.00	0.06	1.05	63	1.00	0.07	1.06	63	0.99	0.05	1.04
SH	ROUTE 58	PINOPOLIS RD (ROUTE 653)	ROUTE 35	EW	61	1.01	0.08	1.08	62	1.01	0.08	1.08	61	1.02	0.09	1.10	61	1.01	0.09	1.10
SH	ROUTE 58	ROUTE 35	BUS RTE 58 W	EW	60	1.03	0.13	1.16	61	1.02	0.08	1.10	60	1.03	0.16	1.20	61	1.02	0.08	1.09
SH	ROUTE 58	BUS RTE 58 W	CAMP PKWY (BUS RTE 58 E)	EW	55	1.02	0.14	1.15	55	1.03	0.19	1.23	54	1.04	0.25	1.30	52	1.09	0.29	1.40
SH	ROUTE 58	CAMP PKWY (BUS RTE 58 E)	ARMORY DR (RTE 671)	EW	62	1.00	0.06	1.05	63	1.00	0.04	1.04	62	1.00	0.05	1.05	63	0.99	0.04	1.03
SH	ROUTE 58	ARMORY DR (RTE 671)	ROUTE 258	EW	63	1.00	0.05	1.05	63	0.99	0.06	1.04	63	1.00	0.06	1.05	63	0.99	0.07	1.05
SH	ROUTE 58	ROUTE 258	PRETLOW RD (RTE 714)	EW	64	0.99	0.04	1.03	64	0.99	0.05	1.04	63	1.00	0.05	1.04	64	0.99	0.07	1.05
SH	ROUTE 58	PRETLOW RD (RTE 714)	SUFFOLK CL	EW	64	0.99	0.04	1.03	63	1.00	0.05	1.04	63	1.00	0.04	1.04	64	0.99	0.05	1.03
SH	ROUTE 258	NC STATE LINE	ROUTE 189	EW	59	1.06	0.02	1.08	58	1.03	0.03	1.05	57	1.10	0.02	1.12	58	1.03	0.02	1.05
SH	ROUTE 258	ROUTE 189	DOGWOOD BEND RD (RTE 684)	EW	55	1.03	0.02	1.04	52	1.07	0.03	1.09	53	1.07	0.03	1.09	53	1.06	0.04	1.07
SH	ROUTE 258	DOGWOOD BEND RD (RTE 684)	ROUTE 58	EW	55	1.03	0.02	1.04	52	1.07	0.03	1.09	53	1.07	0.03	1.09	53	1.06	0.04	1.07
SH	ROUTE 460	SUSSEX CL	WCL IVOR	EW	54	1.00	0.09	1.07	55	1.01	0.07	1.08	55	0.99	0.06	1.04	55	1.00	0.09	1.08
SH	ROUTE 460	WCL IVOR	ROUTE 616 (IVOR RD)	EW	54	1.00	0.09	1.07	55	1.01	0.07	1.08	55	0.99	0.06	1.04	55	1.00	0.09	1.08
SH	ROUTE 460	ROUTE 616 (IVOR RD)	ECL IVOR	EW	55	1.01	0.10	1.11	56	1.02	0.09	1.11	55	1.02	0.12	1.14	57	1.02	0.05	1.07
SH	ROUTE 460	ECL IVOR	ISLE OF WIGHT CL	EW	55	1.01	0.10	1.11	56	1.02	0.09	1.11	55	1.02	0.12	1.14	57	1.02	0.05	1.07
SUF	BRIDGE RD	ISLE OF WIGHT CL	E. END CHUCKATUCK BRIDGE	EW	49	1.07	0.11	1.19	48	1.11	0.33	1.47	48	1.08	0.13	1.22	48	1.10	0.12	1.23
SUF	BRIDGE RD	E. END CHUCKATUCK BRIDGE	CRITTENDEN RD	EW	49	1.07	0.11	1.19	48	1.11	0.33	1.47	48	1.08	0.13	1.22	48	1.10	0.12	1.23
SUF	BRIDGE RD	CRITTENDEN RD	N. END NANSEMOND RIVER	EW	51	1.06	0.08	1.15	53	1.04	0.15	1.20	51	1.07	0.16	1.24	52	1.05	0.14	1.19
SUF	BRIDGE RD	N. END NANSEMOND RIVER	S. END NANSEMOND RIVER	EW	51	1.06	0.08	1.15	53	1.04	0.15	1.20	51	1.07	0.16	1.24	52	1.05	0.14	1.19
SUF	BRIDGE RD	S. END NANSEMOND RIVER	BENNETTS PASTURE RD	EW	51	1.06	0.08	1.15	53	1.04	0.15	1.20	51	1.07	0.16	1.24	52	1.05	0.14	1.19
SUF	BRIDGE RD	BENNETTS PASTURE RD	SHOULDERS HILL RD	EW	45	1.10	0.20	1.32	48	1.09	0.13	1.22	44	1.14	0.25	1.43	47	1.11	0.16	1.29
SUF	BRIDGE RD	SHOULDERS HILL RD	HARBOUR VIEW BLVD	EW	42	1.11	0.21	1.33	40	1.21	0.22	1.47	41	1.13	0.18	1.34	38	1.27	0.33	1.68
SUF	BRIDGE RD	HARBOUR VIEW BLVD	WESTERN FWY	EW	42	1.11	0.21	1.33	40	1.21	0.22	1.47	41	1.13	0.18	1.34	38	1.27	0.33	1.68
SUF	BRIDGE RD	WESTERN FWY	I-664	EW	42	1.11	0.21	1.33	40	1.21	0.22	1.47	41	1.13	0.18	1.34	38	1.27	0.33	1.68
SUF	BRIDGE RD	I-664	COLLEGE DR	EW	34	1.14	0.15	1.31	33	1.16	0.13	1.28	33	1.17	0.14	1.36	32	1.18	0.12	1.32
SUF	BRIDGE RD	COLLEGE DR	CHESAPEAKE CL	EW	34	1.14	0.15	1.31	33	1.16	0.13	1.28	33	1.17	0.14	1.36	32	1.18	0.12	1.32
SUF	CAROLINA RD	NC STATE LINE	RTE 642	NS	50	1.23	0.01	1.25	50	1.19	0.01	1.21	50	1.23	0.01	1.25	50	1.19	0.02	1.22
SUF	CAROLINA RD	RTE 642	RTE 675	NS	50	1.23	0.01	1.25	50	1.19	0.01	1.21	50	1.23	0.01	1.25	50	1.19	0.02	1.22
SUF	CAROLINA RD	RTE 675	BABB TOWN RD (RTE 759)	NS	50	1.23	0.01	1.25	50	1.19	0.01	1.21	50	1.23	0.01	1.25	50	1.19	0.02	1.22

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

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Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
SUF	CAROLINA RD	BABBTOWN RD (RTE 759)	WHALEYVILLE BLVD	NS	50	1.23	0.01	1.25	50	1.19	0.01	1.21	50	1.23	0.01	1.25	50	1.19	0.02	1.22
SUF	CAROLINA RD	WHALEYVILLE BLVD	TURLINGTON RD	NS	51	1.08	0.16	1.26	48	1.08	0.19	1.26	51	1.09	0.13	1.24	49	1.06	0.15	1.19
SUF	CAROLINA RD	TURLINGTON RD	SW SUFFOLK BYPASS	NS	51	1.08	0.16	1.26	48	1.08	0.19	1.26	51	1.09	0.13	1.24	49	1.06	0.15	1.19
SUF	CAROLINA RD	SW SUFFOLK BYPASS	FAYETTE ST	NS	40	1.17	0.08	1.24	39	1.13	0.10	1.21	38	1.23	0.07	1.31	40	1.11	0.09	1.20
SUF	COLLEGE DR	BRIDGE RD	WESTERN FREEWAY	NS	31	1.11	0.09	1.19	26	1.20	0.04	1.25	32	1.10	0.10	1.16	24	1.29	0.07	1.40
SUF	COLLEGE DR	WESTERN FREEWAY	HAMPTON ROADS PKWY	NS	34	1.20	0.16	1.34	39	1.09	0.10	1.21	38	1.07	0.12	1.18	39	1.09	0.07	1.18
SUF	COLLEGE DR	HAMPTON ROADS PKWY	I-664	NS	38	1.06	0.16	1.19	27	1.10	0.17	1.31	38	1.04	0.10	1.15	24	1.27	0.11	1.42
SUF	CONSTANCE RD	HOLLAND RD	PITCHKETTLE RD	EW	34	1.13	0.04	1.17	33	1.12	0.04	1.17	32	1.19	0.04	1.22	33	1.12	0.06	1.19
SUF	CONSTANCE RD	PITCHKETTLE RD	MAIN ST	EW	29	1.12	0.06	1.16	28	1.17	0.05	1.24	28	1.18	0.04	1.23	29	1.16	0.07	1.22
SUF	CONSTANCE RD	MAIN ST	WILROY RD	EW	33	1.11	0.05	1.16	32	1.16	0.08	1.23	31	1.18	0.07	1.27	30	1.25	0.12	1.42
SUF	GODWIN BLVD	PRUDEN BLVD	SUFFOLK BYPASS	NS	35	1.06	0.10	1.17	31	1.23	0.07	1.32	34	1.10	0.12	1.23	28	1.34	0.07	1.45
SUF	GODWIN BLVD	SUFFOLK BYPASS	KINGS FORK RD	NS	37	1.13	0.21	1.35	34	1.14	0.14	1.30	36	1.15	0.18	1.37	31	1.24	0.23	1.56
SUF	GODWIN BLVD	KINGS FORK ROAD	1.36 MI N OF KINGS FORK RD	NS	49	1.11	0.04	1.16	49	1.11	0.04	1.16	49	1.11	0.02	1.14	49	1.12	0.03	1.15
SUF	GODWIN BLVD	1.36 MILES N OF KINGS FORK RD	EVERETS RD	NS	49	1.11	0.04	1.16	49	1.11	0.04	1.16	49	1.11	0.02	1.14	49	1.12	0.03	1.15
SUF	GODWIN BLVD	EVERETS RD	KINGS HWY	NS	39	1.09	0.10	1.20	39	1.08	0.14	1.20	38	1.11	0.09	1.21	39	1.09	0.14	1.24
SUF	GODWIN BLVD	KINGS HWY	ISLE OF WIGHT CL	NS	49	1.13	0.03	1.16	49	1.12	0.03	1.15	49	1.14	0.02	1.16	49	1.12	0.04	1.16
SUF	HAMPTON ROADS PKWY	HARBOUR VIEW BLVD	COLLEGE DR	EW	33	1.15	0.07	1.24	31	1.25	0.04	1.31	32	1.18	0.06	1.25	35	1.09	0.07	1.15
SUF	HAMPTON ROADS PKWY	COLLEGE DR	PORTSMOUTH CL	EW	28	1.12	0.05	1.18	28	1.22	0.03	1.26	27	1.18	0.04	1.22	26	1.29	0.03	1.35
SUF	HOLLAND RD (BUS RTE 58)	SUFFOLK BYPASS	CONSTANCE RD	EW	34	1.13	0.04	1.17	33	1.12	0.04	1.17	32	1.19	0.04	1.22	33	1.12	0.06	1.19
SUF	LAKE PRINCE DR (RTE 604)	ROUTE 460 (PRUDEN BLVD)	ROUTE 603 (EVERETS RD)	NS	39	1.15	0.01	1.16	40	1.21	0.01	1.22	39	1.15	0.01	1.16	40	1.20	0.01	1.21
SUF	MAIN ST	FAYETTE ST	WASHINGTON ST	NS	40	1.17	0.08	1.24	39	1.13	0.10	1.21	38	1.23	0.07	1.31	40	1.11	0.09	1.20
SUF	MAIN ST	WASHINGTON ST	MARKET ST	NS	23	1.16	0.05	1.25	24	1.11	0.10	1.23	20	1.32	0.10	1.45	20	1.37	0.15	1.61
SUF	MAIN ST	MARKET ST	CONSTANCE RD	NS	23	1.16	0.05	1.25	24	1.11	0.10	1.23	20	1.32	0.10	1.45	20	1.37	0.15	1.61
SUF	MAIN ST	CONSTANCE RD	PRUDEN BLVD/GODWIN BLVD	NS	32	1.04	0.10	1.15	31	1.16	0.10	1.27	29	1.15	0.16	1.34	29	1.24	0.14	1.39
SUF	PITCHKETTLE RD	CONSTANCE RD	SUFFOLK BYPASS	NS	38	1.24	0.02	1.27	37	1.21	0.01	1.23	36	1.29	0.01	1.32	37	1.21	0.02	1.22
SUF	PITCHKETTLE RD	SUFFOLK BYPASS	KINGS FORK RD	NS	45	1.12	0.01	1.13	46	1.10	0.01	1.11	47	1.06	0.03	1.08	46	1.08	0.02	1.10
SUF	PORTSMOUTH BLVD	WILROY RD	WASHINGTON ST	EW	41	1.18	0.17	1.35	40	1.16	0.11	1.30	39	1.23	0.12	1.37	38	1.24	0.21	1.51
SUF	PORTSMOUTH BLVD	WASHINGTON ST	SUFFOLK BYPASS	EW	52	1.07	0.11	1.16	49	1.07	0.20	1.26	51	1.08	0.14	1.24	49	1.08	0.36	1.47
SUF	PROVIDENCE RD (RTE 604)	KINGS FORK RD	ROUTE 460 (PRUDEN BLVD)	NS	34	1.08	0.01	1.09	34	1.08	0.01	1.09	34	1.08	0.01	1.09	34	1.08	0.01	1.09
SUF	PRUDEN BLVD	ISLE OF WIGHT CL	LAKE PRINCE DR	EW	52	1.01	0.08	1.08	51	1.02	0.07	1.09	52	1.01	0.08	1.09	50	1.04	0.11	1.15
SUF	PRUDEN BLVD	LAKE PRINCE DR	KINGS FORK RD	EW	42	1.09	0.32	1.45	42	1.13	0.27	1.44	43	1.08	0.37	1.47	43	1.12	0.25	1.38
SUF	PRUDEN BLVD	KINGS FORK RD	SUFFOLK BYPASS	EW	39	1.07	0.29	1.38	40	1.15	0.27	1.45	40	1.04	0.27	1.29	40	1.14	0.29	1.47
SUF	PRUDEN BLVD	SUFFOLK BYPASS	GODWIN BLVD	EW	38	1.11	0.13	1.25	38	1.11	0.11	1.22	36	1.16	0.07	1.24	38	1.10	0.11	1.23
SUF	PUGHSVILLE RD	SHOULDERS HILL RD	TOWN POINT RD	EW	35	1.09	0.09	1.18	34	1.13	0.03	1.17	33	1.15	0.07	1.24	34	1.12	0.09	1.21
SUF	PUGHSVILLE RD	TOWN POINT RD	CHESAPEAKE CL	EW	35	1.09	0.09	1.18	34	1.13	0.03	1.17	33	1.15	0.07	1.24	34	1.12	0.09	1.21
SUF	ROUTE 58	SOUTHAMPTON CL	RTE 189/258	EW	64	0.99	0.04	1.03	63	1.00	0.05	1.04	63	1.00	0.04	1.04	64	0.99	0.05	1.03
SUF	ROUTE 58	RTE 189/258	RTE 272 (S. QUAY RD)	EW	63	0.98	0.04	1.03	63	0.99	0.05	1.03	63	0.98	0.05	1.03	64	0.99	0.05	1.03
SUF	ROUTE 58	RTE 272	S. QUAY RD (ROUTE 189)	EW	62	0.99	0.06	1.04	63	0.99	0.04	1.03	62	0.99	0.09	1.08	63	0.99	0.05	1.03
SUF	ROUTE 58 (HOLLAND BYPASS)	S. QUAY RD (ROUTE 189)	BUS RTE 58 (HOLLAND RD)	EW	61	0.98	0.05	1.02	61	1.00	0.06	1.04	61	0.98	0.06	1.03	62	0.99	0.05	1.04
SUF	ROUTE 58 (HOLLAND RD)	BUS RTE 58 (HOLLAND RD)	RTE 649 (LUMMIS RD)	EW	60	0.99	0.07	1.05	60	1.00	0.05	1.03	60	0.99	0.05	1.04	60	0.99	0.06	1.04
SUF	ROUTE 58 (HOLLAND RD)	RTE 649 (LUMMIS RD)	RTE 643 (MANNING BRIDGE RD)	EW	50	1.09	0.24	1.32	55	1.01	0.16	1.17	50	1.08	0.23	1.32	51	1.08	0.36	1.46
SUF	ROUTE 58 (HOLLAND RD)	RTE. 643 (MANNING BRIDGE RD)	COVE POINT DR	EW	50	1.09	0.24	1.32	55	1.01	0.16	1.17	50	1.08	0.23	1.32	51	1.08	0.36	1.46
SUF	ROUTE 58 (HOLLAND RD)	COVE POINT DR	SUFFOLK BYPASS	EW	40	1.10	0.27	1.39	39	1.19	0.31	1.57	39	1.13	0.32	1.49	36	1.28	0.42	1.79
SUF	WASHINGTON ST	MAIN ST	PINNER ST	EW	33	1.33	0.07	1.41	32	1.36	0.08	1.47	30	1.47	0.12	1.66	30	1.46	0.17	1.70
SUF	WASHINGTON ST	PINNER ST	PORTSMOUTH BLVD	EW	33	1.33	0.07	1.41	32	1.36	0.08	1.47	30	1.47	0.12	1.66	30	1.46	0.17	1.70
SUF	WHALEYVILLE BLVD	NC STATE LINE	RTE 616 (MINERAL SPRING RD)	NS	55	1.03	0.03	1.40	54	1.05	0.05	1.08	54	1.05	0.03	1.08	54	1.04	0.03	1.06
SUF	WHALEYVILLE BLVD	RTE 616 (MINERAL SPRING RD)	RTE 677 (GREAT FORK RD)	NS	55	1.03	0.03	1.40	54	1.05	0.05	1.08	54	1.05	0.03	1.08	54	1.04	0.03	1.06
SUF	WHALEYVILLE BLVD	RTE 677 (GREAT FORK RD)	RTE 675 (CYPRESS CHAPEL RD)	NS	55	1.03	0.03	1.40	54	1.05	0.05	1.08	54	1.05	0.03	1.08	54	1.04	0.03	1.06
SUF	WHALEYVILLE BLVD	RTE 675 (CYPRESS CHAPEL RD)	RTE 759 (BABBTOWN RD)	NS	55	1.03	0.03	1.40	54	1.05	0.05	1.08	54	1.05	0.03	1.08	54	1.04	0.03	1.06
SUF	WHALEYVILLE BLVD	RTE 759 (BABBTOWN RD)	RTE 32 (CAROLINA RD)	NS	55	1.03	0.03	1.40	54	1.05	0.05	1.08	54	1.05	0.03	1.08	54	1.04	0.03	1.06

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
SUR	ROUTE 10	PRINCE GEORGE CL	ROUTE 40	EW	49	1.14	0.01	1.14	50	1.18	0.01	1.18	49	1.14	0.01	1.14	50	1.18	0.02	1.21
SUR	ROUTE 10	ROUTE 40	ROUTE 31 (SOUTH)	EW	50	1.13	0.01	1.15	50	1.17	0.01	1.18	50	1.14	0.01	1.15	50	1.17	0.00	1.17
SUR	ROUTES 10/31	ROUTE 31 (SOUTH)	ROUTE 31 (NORTH)	NS	35	1.06	0.03	1.08	37	1.14	0.03	1.15	36	1.04	0.04	1.06	38	1.11	0.02	1.12
SUR	ROUTE 10	ROUTE 31 (NORTH)	ROUTE 617	EW	48	1.14	0.04	1.17	48	1.10	0.07	1.18	49	1.13	0.04	1.18	49	1.10	0.04	1.13
SUR	ROUTE 10	ROUTE 617	ISLE OF WIGHT CL	EW	49	1.11	0.02	1.14	49	1.12	0.02	1.14	50	1.10	0.02	1.13	49	1.11	0.02	1.14
SUR	ROUTE 40	SUSSEX CL	ROUTE 615	NS	48	1.14	0.02	1.17	49	1.11	0.03	1.15	49	1.12	0.03	1.16	49	1.10	0.04	1.13
SUR	ROUTE 40	ROUTE 615	ROUTE 10	NS	50	1.16	0.01	1.17	50	1.12	0.02	1.15	50	1.16	0.01	1.16	49	1.14	0.01	1.15
VB	21ST ST	PARKS AVE	PACIFIC AVE	EW	24	1.22	0.26	1.54	-	-	-	-	23	1.27	0.20	1.54	-	-	-	-
VB	21ST ST	PACIFIC AVE	ATLANTIC AVE	EW	24	1.22	0.26	1.54	-	-	-	-	23	1.27	0.20	1.54	-	-	-	-
VB	22ND ST	PARKS AVE	PACIFIC AVE	EW	-	-	-	-	25	1.02	0.15	1.16	-	-	-	-	24	1.03	0.31	1.37
VB	22ND ST	PACIFIC AVE	ATLANTIC AVE	EW	-	-	-	-	25	1.02	0.15	1.16	-	-	-	-	24	1.03	0.31	1.37
VB	ATLANTIC AVE	83RD ST	PACIFIC AVE	NS	34	1.14	0.04	1.19	33	1.12	0.03	1.16	34	1.15	0.04	1.20	32	1.15	0.04	1.20
VB	ATLANTIC AVE	PACIFIC AVE	LASKIN RD	NS	19	1.14	0.06	1.20	20	1.01	0.09	1.05	20	1.12	0.14	1.26	18	1.10	0.05	1.14
VB	ATLANTIC AVE	LASKIN RD	22ND ST	NS	19	1.05	0.06	1.07	19	1.06	0.07	1.09	17	1.18	0.07	1.27	18	1.14	0.12	1.23
VB	ATLANTIC AVE	22ND ST	21ST ST	NS	20	0.84	0.06	0.86	20	1.12	0.04	1.14	16	1.05	0.09	1.14	17	1.33	0.06	1.42
VB	ATLANTIC AVE	21ST ST	VA BEACH BLVD	NS	21	0.91	0.10	0.95	21	0.95	0.07	1.00	18	1.06	0.12	1.17	17	1.22	0.08	1.31
VB	ATLANTIC AVE	VA BEACH BLVD	5TH ST	NS	18	1.10	0.09	1.14	21	1.08	0.04	1.10	16	1.23	0.05	1.31	18	1.26	0.05	1.35
VB	BAXTER RD	PRINCESS ANNE RD	INDEPENDENCE BLVD	NS	31	1.24	0.27	1.54	25	1.43	0.14	1.59	30	1.25	0.18	1.45	29	1.22	0.18	1.44
VB	BIRDNECK RD	GENERAL BOOTH BLVD	NORFOLK AVE	NS	30	1.15	0.13	1.32	33	1.08	0.08	1.16	30	1.15	0.16	1.35	33	1.09	0.10	1.20
VB	BIRDNECK RD	NORFOLK AVE	VA BEACH BLVD	NS	30	1.15	0.13	1.32	33	1.08	0.08	1.16	30	1.15	0.16	1.35	33	1.09	0.10	1.20
VB	BIRDNECK RD	VA BEACH BLVD	I-264	NS	32	1.11	0.25	1.35	31	1.09	0.17	1.25	31	1.14	0.39	1.61	31	1.09	0.34	1.42
VB	BIRDNECK RD	I-264	LASKIN RD	NS	26	1.30	0.12	1.48	31	1.09	0.07	1.19	27	1.27	0.12	1.40	31	1.08	0.13	1.21
VB	CHESAPEAKE BAY BRIDGE-TUNNEL	SHORE DR	TOLL PLAZA	NS	54	1.04	0.11	1.17	57	1.04	0.24	1.29	54	1.04	0.07	1.12	57	1.02	0.04	1.06
VB	CHESAPEAKE BAY BRIDGE-TUNNEL	TOLL PLAZA	NCL VA BEACH	NS	54	1.04	0.11	1.17	57	1.04	0.24	1.29	54	1.04	0.07	1.12	57	1.02	0.04	1.06
VB	DAM NECK RD	VA BEACH AMPHITHEATER	PRINCESS ANNE RD	EW	29	1.41	0.41	1.92	38	1.14	0.07	1.18	34	1.19	0.22	1.44	41	1.06	0.13	1.18
VB	DAM NECK RD	PRINCESS ANNE RD	ROSEMONT RD	EW	32	1.29	0.38	1.82	33	1.17	0.31	1.50	34	1.22	0.46	1.77	30	1.31	0.72	2.29
VB	DAM NECK RD	ROSEMONT RD	HOLLAND RD	EW	32	1.29	0.38	1.82	33	1.17	0.31	1.50	34	1.22	0.46	1.77	30	1.31	0.72	2.29
VB	DAM NECK RD	HOLLAND RD	DRAKESMILE RD	EW	37	1.28	0.34	1.69	43	1.12	0.23	1.38	39	1.20	0.43	1.73	32	1.55	0.73	2.74
VB	DAM NECK RD	DRAKESMILE RD	LONDON BRIDGE RD	EW	37	1.28	0.34	1.69	43	1.12	0.23	1.38	39	1.20	0.43	1.73	32	1.55	0.73	2.74
VB	DAM NECK RD	LONDON BRIDGE RD	HARPERS RD	EW	45	1.14	0.09	1.24	44	1.15	0.21	1.40	45	1.12	0.15	1.29	43	1.16	0.12	1.31
VB	DAM NECK RD	HARPERS RD	GENERAL BOOTH BLVD	EW	45	1.14	0.09	1.24	44	1.15	0.21	1.40	45	1.12	0.15	1.29	43	1.16	0.12	1.31
VB	DIAMOND SPRINGS RD	NEWTOWN RD	WESLEYAN RD	NS	35	1.17	0.07	1.26	37	1.12	0.17	1.32	34	1.21	0.08	1.32	37	1.13	0.20	1.38
VB	DIAMOND SPRINGS RD	WESLEYAN RD	NORTHAMPTON BLVD	NS	36	1.18	0.09	1.27	36	1.23	0.14	1.37	37	1.16	0.08	1.25	36	1.21	0.15	1.38
VB	DIAMOND SPRINGS RD	NORTHAMPTON BLVD	SHORE DR	NS	35	1.17	0.23	1.43	35	1.14	0.17	1.35	36	1.16	0.11	1.31	34	1.16	0.26	1.41
VB	FIRST COLONIAL RD	VA BEACH BLVD	I-264	NS	26	1.21	0.28	1.58	23	1.09	0.93	2.03	23	1.34	0.62	2.27	22	1.14	0.69	1.98
VB	FIRST COLONIAL RD	I-264	LASKIN RD	NS	29	1.15	0.17	1.36	29	1.13	0.11	1.27	28	1.20	0.25	1.51	26	1.24	0.29	1.60
VB	FIRST COLONIAL RD	LASKIN RD	OLD DONATION PKWY	NS	29	1.15	0.17	1.36	29	1.13	0.11	1.27	28	1.20	0.25	1.51	26	1.24	0.29	1.60
VB	FIRST COLONIAL RD	OLD DONATION PKWY	GREAT NECK RD	NS	29	1.15	0.17	1.36	29	1.13	0.11	1.27	28	1.20	0.25	1.51	26	1.24	0.29	1.60
VB	GENERAL BOOTH BLVD	PRINCESS ANNE RD	NIMMO PKWY	NS	33	1.16	0.10	1.28	34	1.19	0.11	1.31	32	1.22	0.14	1.40	32	1.24	0.22	1.51
VB	GENERAL BOOTH BLVD	NIMMO PKWY	LONDON BRIDGE RD	NS	33	1.16	0.10	1.28	34	1.19	0.11	1.31	32	1.22	0.14	1.40	32	1.24	0.22	1.51
VB	GENERAL BOOTH BLVD	LONDON BRIDGE RD	DAM NECK RD	NS	33	1.16	0.10	1.28	34	1.19	0.11	1.31	32	1.22	0.14	1.40	32	1.24	0.22	1.51
VB	GENERAL BOOTH BLVD	DAM NECK RD	OCEANA BLVD/PROSPERITY RD	NS	36	1.12	0.21	1.33	32	1.18	0.21	1.39	36	1.12	0.24	1.40	31	1.23	0.45	1.81
VB	GENERAL BOOTH BLVD	OCEANA BLVD/PROSPERITY RD	BIRDNECK RD	NS	45	1.15	0.13	1.29	41	1.19	0.11	1.33	45	1.16	0.12	1.31	41	1.19	0.18	1.42
VB	GENERAL BOOTH BLVD	BIRDNECK RD	HARBOUR POINT	NS	41	1.12	0.07	1.21	40	1.08	0.07	1.13	41	1.12	0.11	1.22	40	1.08	0.09	1.18
VB	GREAT NECK RD	VA BEACH BLVD	OLD DONATION PKWY	NS	38	1.16	0.11	1.31	37	1.22	0.13	1.40	37	1.19	0.12	1.36	33	1.36	0.31	1.77
VB	GREAT NECK RD	OLD DONATION PKWY	FIRST COLONIAL RD	NS	38	1.16	0.11	1.31	37	1.22	0.13	1.40	37	1.19	0.12	1.36	33	1.36	0.31	1.77
VB	GREAT NECK RD	FIRST COLONIAL RD	SHOREHAVEN RD	NS	39	1.18	0.14	1.36	39	1.18	0.14	1.36	40	1.15	0.11	1.28	40	1.17	0.11	1.30
VB	GREAT NECK RD	SHOREHAVEN RD	SHORE DR	NS	39	1.18	0.14	1.36	39	1.18	0.14	1.36	40	1.15	0.11	1.28	40	1.17	0.11	1.30
VB	HOLLAND RD	INDEPENDENCE BLVD	SOUTH PLAZA TRAIL	NS	32	1.23	0.35	1.66	34	1.21	0.27	1.51	32	1.26	0.25	1.58	30	1.36	0.41	1.93
VB	HOLLAND RD	SOUTH PLAZA TRAIL	ROSEMONT RD	NS	32	1.23	0.35	1.66	34	1.21	0.27	1.51	32	1.26	0.25	1.58	30	1.36	0.41	1.93

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

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Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
VB	HOLLAND RD	ROSEMONT RD	LYNNHAVEN PKWY	NS	32	1.23	0.34	1.65	34	1.21	0.33	1.58	32	1.24	0.36	1.68	32	1.29	0.31	1.69
VB	HOLLAND RD	LYNNHAVEN PKWY	DAM NECK RD	NS	29	1.32	0.43	1.79	31	1.26	0.28	1.61	30	1.30	0.41	1.85	30	1.31	0.37	1.80
VB	HOLLAND RD	DAM NECK RD	NIMMO PKWY	NS	36	1.16	0.08	1.25	35	1.17	0.06	1.23	37	1.13	0.09	1.22	38	1.10	0.08	1.19
VB	HOLLAND RD	NIMMO PKWY	PRINCESS ANNE RD	NS	36	1.16	0.08	1.25	35	1.17	0.06	1.23	37	1.13	0.09	1.22	38	1.10	0.08	1.19
VB	INDEPENDENCE BLVD	INDIAN RIVER RD	SALEM RD	NS	37	1.17	0.02	1.18	39	1.08	0.03	1.11	37	1.15	0.03	1.17	37	1.12	0.03	1.13
VB	INDEPENDENCE BLVD	SALEM RD	PRINCESS ANNE RD	NS	32	1.38	0.03	1.44	38	1.16	0.04	1.20	33	1.33	0.07	1.40	38	1.18	0.06	1.25
VB	INDEPENDENCE BLVD	PRINCESS ANNE RD	LYNNHAVEN PKWY	NS	32	1.09	0.20	1.31	28	1.23	0.18	1.45	28	1.24	0.25	1.53	26	1.32	0.40	1.86
VB	INDEPENDENCE BLVD	LYNNHAVEN PKWY	PLAZA TRAIL	NS	39	1.10	0.16	1.28	38	1.16	0.14	1.30	38	1.12	0.14	1.26	38	1.16	0.22	1.42
VB	INDEPENDENCE BLVD	PLAZA TRAIL	HOLLAND RD	NS	35	1.18	0.25	1.48	38	1.12	0.15	1.27	35	1.19	0.28	1.52	36	1.18	0.29	1.52
VB	INDEPENDENCE BLVD	HOLLAND RD	BAXTER RD	NS	27	1.58	0.95	3.13	40	1.13	0.31	1.49	30	1.38	0.59	2.22	32	1.45	0.54	2.29
VB	INDEPENDENCE BLVD	BAXTER RD	I-264	NS	35	1.18	0.49	1.76	35	1.18	0.50	1.83	34	1.21	0.52	1.86	36	1.15	0.96	2.24
VB	INDEPENDENCE BLVD	I-264	BONNEY RD	NS	28	1.04	0.74	1.79	36	1.13	0.51	1.69	27	1.07	0.56	1.67	31	1.31	0.80	2.34
VB	INDEPENDENCE BLVD	BONNEY RD	COLUMBUS ST	NS	28	1.04	0.74	1.79	36	1.13	0.51	1.69	27	1.07	0.56	1.67	31	1.31	0.80	2.34
VB	INDEPENDENCE BLVD	COLUMBUS ST	VA BEACH BLVD	NS	28	1.04	0.74	1.79	36	1.13	0.51	1.69	27	1.07	0.56	1.67	31	1.31	0.80	2.34
VB	INDEPENDENCE BLVD	VA BEACH BLVD	JEANNE ST	NS	38	1.10	0.22	1.35	36	1.21	0.21	1.48	37	1.13	0.23	1.40	31	1.41	0.74	2.48
VB	INDEPENDENCE BLVD	JEANNE ST	PEMBROKE BLVD	NS	38	1.10	0.22	1.35	36	1.21	0.21	1.48	37	1.13	0.23	1.40	31	1.41	0.74	2.48
VB	INDEPENDENCE BLVD	PEMBROKE BLVD	HAYGOOD RD	NS	34	1.26	0.16	1.47	37	1.11	0.19	1.33	32	1.34	0.31	1.75	32	1.26	0.36	1.74
VB	INDEPENDENCE BLVD	HAYGOOD RD	NORTHAMPTON BLVD	NS	40	1.14	0.11	1.27	37	1.23	0.17	1.44	38	1.20	0.16	1.38	32	1.42	0.48	2.14
VB	INDEPENDENCE BLVD	NORTHAMPTON BLVD	SHORE DR	NS	25	1.56	0.39	2.00	40	1.08	0.06	1.12	33	1.17	0.07	1.27	40	1.04	0.07	1.12
VB	INDIAN RIVER RD	CHESAPEAKE CL	MILITARY HWY	EW	33	1.13	0.17	1.33	35	1.16	0.11	1.30	32	1.18	0.16	1.39	33	1.22	0.14	1.41
VB	INDIAN RIVER RD	MILITARY HWY	PROVIDENCE RD	EW	31	1.22	0.22	1.49	30	1.33	0.78	2.39	32	1.20	0.18	1.42	29	1.36	0.22	1.66
VB	INDIAN RIVER RD	PROVIDENCE RD	I-64	EW	36	1.09	0.43	1.56	31	1.15	0.62	1.82	29	1.35	0.84	2.52	24	1.47	0.63	2.41
VB	INDIAN RIVER RD	I-64	CENTERVILLE TNPK	EW	29	1.33	0.73	2.33	38	1.12	0.63	1.82	19	2.06	1.37	4.37	35	1.24	0.45	1.79
VB	INDIAN RIVER RD	CENTERVILLE TNPK	KEMPSVILLE RD	EW	32	1.21	0.49	1.83	32	1.24	1.06	2.56	18	2.16	1.05	3.87	31	1.31	0.37	1.81
VB	INDIAN RIVER RD	KEMPSVILLE RD	FERRELL PKWY	EW	39	1.03	0.27	1.33	25	1.55	1.20	3.32	39	1.04	0.22	1.26	24	1.56	1.06	3.00
VB	INDIAN RIVER RD	FERRELL PKWY	INDIAN LAKES BLVD	EW	43	1.10	0.03	1.14	36	1.10	0.17	1.25	44	1.07	0.06	1.14	35	1.13	0.08	1.20
VB	INDIAN RIVER RD	INDIAN LAKES BLVD	LYNNHAVEN PKWY	EW	28	1.47	0.20	1.85	35	1.07	0.18	1.25	33	1.09	0.11	1.22	34	1.10	0.09	1.19
VB	INDIAN RIVER RD	LYNNHAVEN PKWY	INDEPENDENCE BLVD	EW	39	1.11	0.04	1.14	40	1.06	0.07	1.14	40	1.09	0.04	1.13	39	1.11	0.04	1.18
VB	INDIAN RIVER RD	INDEPENDENCE BLVD	ELBOW RD	EW	39	1.11	0.04	1.14	40	1.06	0.07	1.14	40	1.09	0.04	1.13	39	1.11	0.04	1.18
VB	INDIAN RIVER RD	ELBOW RD	S.E. PARKWAY CORRIDOR	EW	40	1.15	0.04	1.20	40	1.14	0.08	1.23	41	1.13	0.03	1.17	41	1.12	0.02	1.15
VB	INDIAN RIVER RD	S.E. PARKWAY CORRIDOR	NORTH LANDING RD	EW	40	1.15	0.04	1.20	40	1.14	0.08	1.23	41	1.13	0.03	1.17	41	1.12	0.02	1.15
VB	INDIAN RIVER RD	NORTH LANDING RD	WEST NECK RD	EW	40	1.21	0.05	1.28	39	1.22	0.03	1.26	40	1.21	0.03	1.25	39	1.21	0.04	1.26
VB	INDIAN RIVER RD	WEST NECK RD	PRINCESS ANNE RD	EW	40	1.21	0.05	1.28	39	1.22	0.03	1.26	40	1.21	0.03	1.25	39	1.21	0.04	1.26
VB	KEMPSVILLE RD	CHESAPEAKE CL	CENTERVILLE TNPK	EW	36	1.20	0.15	1.40	36	1.20	0.14	1.38	36	1.21	0.19	1.46	37	1.18	0.14	1.36
VB	KEMPSVILLE RD	CENTERVILLE TNPK	INDIAN RIVER RD	EW	33	1.20	0.41	1.70	35	1.16	0.23	1.44	34	1.21	0.37	1.67	36	1.11	0.26	1.39
VB	KEMPSVILLE RD	INDIAN RIVER RD	PROVIDENCE RD	EW	37	1.13	0.25	1.42	35	1.13	0.14	1.19	35	1.20	0.18	1.43	32	1.30	0.48	1.95
VB	KEMPSVILLE RD	PROVIDENCE RD	PRINCESS ANNE RD	EW	26	1.45	0.93	2.80	30	1.28	0.26	1.61	29	1.31	0.45	1.89	32	1.19	0.20	1.43
VB	LASKIN RD	VA BEACH BLVD	FIRST COLONIAL RD	EW	34	1.18	0.23	1.45	38	1.12	0.13	1.27	33	1.25	0.26	1.55	36	1.20	0.21	1.47
VB	LASKIN RD	FIRST COLONIAL RD	WINWOOD DR	EW	38	1.15	0.08	1.24	36	1.25	0.06	1.30	36	1.20	0.11	1.35	33	1.37	0.17	1.61
VB	LASKIN RD	WINWOOD DR	BIRDNECK RD	EW	38	1.15	0.08	1.24	36	1.25	0.06	1.30	36	1.20	0.11	1.35	33	1.37	0.17	1.61
VB	LASKIN RD	BIRDNECK RD	30TH ST	EW	28	1.33	0.16	1.55	29	1.22	0.08	1.32	26	1.42	0.11	1.60	27	1.30	0.19	1.48
VB	LASKIN RD	30TH ST	PACIFIC AVE	EW	28	1.33	0.16	1.55	29	1.22	0.08	1.32	26	1.42	0.11	1.60	27	1.30	0.19	1.48
VB	LONDON BRIDGE RD	GENERAL BOOTH BLVD	DAM NECK RD	NS	37	1.15	0.13	1.29	35	1.19	0.10	1.27	36	1.16	0.17	1.35	36	1.16	0.21	1.41
VB	LONDON BRIDGE RD	DAM NECK RD	DRAKESMILE RD	NS	37	1.15	0.13	1.29	35	1.19	0.10	1.27	36	1.16	0.17	1.35	36	1.16	0.21	1.41
VB	LONDON BRIDGE RD	POTTERS RD	I-264	NS	29	1.31	0.78	2.33	32	1.22	0.29	1.44	29	1.31	0.72	2.22	30	1.29	0.78	2.34
VB	LONDON BRIDGE RD	I-264	VA BEACH BLVD	NS	29	1.31	0.78	2.33	32	1.22	0.29	1.44	29	1.31	0.72	2.22	30	1.29	0.78	2.34
VB	LYNNHAVEN PKWY	INDIAN RIVER RD	SALEM RD	EW	35	1.21	0.09	1.33	36	1.16	0.05	1.21	37	1.16	0.08	1.25	35	1.18	0.08	1.27
VB	LYNNHAVEN PKWY	SALEM RD	PRINCESS ANNE RD	EW	27	0.94	0.18	1.07	29	1.00	0.16	1.17	27	0.94	0.21	1.14	30	0.97	0.21	1.18
VB	LYNNHAVEN PKWY	PRINCESS ANNE RD	INDEPENDENCE BLVD	EW	33	1.17	0.27	1.46	31	1.24	0.15	1.42	32	1.19	0.16	1.36	29	1.31	0.31	1.72
VB	LYNNHAVEN PKWY	INDEPENDENCE BLVD	ROSEMONT RD	EW	33	1.17	0.27	1.46	31	1.24	0.15	1.42	32	1.19	0.16	1.36	29	1.31	0.31	1.72

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
VB	LYNNHAVEN PKWY	ROSEMONT RD	HOLLAND RD	EW	33	1.17	0.27	1.46	31	1.24	0.15	1.42	32	1.19	0.16	1.36	29	1.31	0.31	1.72
VB	LYNNHAVEN PKWY	HOLLAND RD	S LYNNHAVEN RD	EW	36	1.12	0.13	1.27	35	1.12	0.15	1.27	35	1.14	0.15	1.30	35	1.13	0.42	1.61
VB	LYNNHAVEN PKWY	S LYNNHAVEN RD	INTERNATIONAL PKWY	NS	31	1.25	0.20	1.53	31	1.19	0.19	1.40	29	1.33	0.33	1.78	31	1.21	0.22	1.49
VB	LYNNHAVEN PKWY	INTERNATIONAL PKWY	POTTERS RD	NS	31	1.25	0.20	1.53	31	1.19	0.19	1.40	29	1.33	0.33	1.78	31	1.21	0.22	1.49
VB	LYNNHAVEN PKWY	POTTERS RD	I-264	NS	31	1.25	0.20	1.53	31	1.19	0.19	1.40	29	1.33	0.33	1.78	31	1.21	0.22	1.49
VB	LYNNHAVEN PKWY	I-264	VA BEACH BLVD	NS	29	1.10	0.37	1.50	27	1.15	0.36	1.58	27	1.16	0.15	1.34	29	1.08	0.34	1.46
VB	MILITARY HWY	CHESAPEAKE CL	PROVIDENCE RD	NS	33	1.32	0.24	1.66	32	1.21	0.25	1.51	32	1.36	0.26	1.71	30	1.31	0.32	1.70
VB	MILITARY HWY	PROVIDENCE RD	INDIAN RIVER RD	NS	31	1.28	0.62	2.13	33	1.16	0.24	1.46	29	1.35	0.81	2.34	33	1.17	0.48	1.76
VB	MILITARY HWY	INDIAN RIVER RD	NORFOLK CL	NS	41	1.13	0.28	1.46	38	1.22	0.28	1.56	41	1.14	0.18	1.34	32	1.44	0.49	2.17
VB	NEWTOWN RD	NORFOLK CL	BAKER RD	NS	30	1.19	0.16	1.39	28	1.30	0.34	1.75	29	1.25	0.27	1.56	26	1.40	0.40	1.99
VB	NEWTOWN RD	BAKER RD	DIAMOND SPRINGS RD	NS	30	1.19	0.16	1.39	28	1.30	0.34	1.75	29	1.25	0.27	1.56	26	1.40	0.40	1.99
VB	NORTHAMPTON BLVD	WESLEYAN DR/NORFOLK CL	DIAMOND SPRINGS RD	EW	29	1.35	0.57	2.12	28	1.35	1.07	2.86	32	1.23	0.50	1.82	28	1.39	0.85	2.58
VB	NORTHAMPTON BLVD	DIAMOND SPRINGS RD	INDEPENDENCE BLVD	EW	52	1.04	0.11	1.14	48	1.07	0.36	1.46	52	1.04	0.09	1.13	47	1.10	0.34	1.47
VB	NORTHAMPTON BLVD	INDEPENDENCE BLVD	SHORE DR	EW	45	1.14	0.38	1.57	48	1.09	0.41	1.54	44	1.16	0.49	1.72	47	1.13	0.53	1.73
VB	NORTH LANDING RD	CHESAPEAKE CL	INDIAN RIVER RD	EW	41	1.13	0.11	1.25	46	1.10	0.03	1.13	41	1.13	0.08	1.22	46	1.09	0.07	1.17
VB	NORTH LANDING RD	INDIAN RIVER RD	SALEM RD	EW	37	1.09	0.11	1.25	40	1.14	0.10	1.26	38	1.05	0.08	1.22	40	1.13	0.08	1.23
VB	NORTH LANDING RD	SALEM RD	WEST NECK RD	EW	37	1.09	0.11	1.25	40	1.14	0.10	1.26	38	1.05	0.08	1.22	40	1.13	0.08	1.23
VB	NORTH LANDING RD	WEST NECK RD	PRINCESS ANNE RD	EW	37	1.09	0.11	1.25	40	1.14	0.10	1.26	38	1.05	0.08	1.22	40	1.13	0.08	1.23
VB	OCEANA BLVD	GENERAL BOOTH BLVD	HARPERS RD/S.E. PARKWAY CORRIDOR	NS	39	1.08	0.12	1.21	33	0.97	0.09	1.07	37	1.14	0.09	1.25	30	1.09	0.26	1.40
VB	OCEANA BLVD	HARPERS RD/S.E. PARKWAY CORRIDOR	TOMCAT BLVD (NAS MAIN ENT)	NS	45	1.12	0.06	1.20	43	1.15	0.06	1.22	41	1.22	0.13	1.39	44	1.12	0.10	1.23
VB	OCEANA BLVD/FIRST COLONIAL RD	TOMCAT BLVD (NAS MAIN ENT)	VA BEACH BLVD	NS	45	1.12	0.06	1.20	43	1.15	0.06	1.22	41	1.22	0.13	1.39	44	1.12	0.10	1.23
VB	PACIFIC AVE	ATLANTIC AVE	LASKIN RD	NS	33	1.06	0.11	1.16	33	1.10	0.09	1.20	31	1.13	0.07	1.19	31	1.16	0.15	1.34
VB	PACIFIC AVE	LASKIN RD	22ND ST	NS	26	1.08	0.14	1.23	25	1.06	0.07	1.15	24	1.17	0.09	1.29	22	1.17	0.23	1.38
VB	PACIFIC AVE	22ND ST	21ST ST	NS	20	0.93	0.23	1.16	25	0.88	0.08	0.95	19	0.97	0.20	1.19	24	0.94	0.23	1.11
VB	PACIFIC AVE	21ST ST	VA BEACH BLVD	NS	26	1.04	0.11	1.17	25	1.02	0.10	1.13	23	1.15	0.19	1.38	23	1.10	0.16	1.29
VB	PACIFIC AVE	VA BEACH BLVD	NORFOLK AVE	NS	29	1.15	0.09	1.26	29	1.16	0.08	1.26	27	1.21	0.11	1.36	27	1.21	0.09	1.32
VB	PACIFIC AVE	NORFOLK AVE	HARBOUR POINT	NS	29	1.15	0.09	1.26	29	1.16	0.08	1.26	27	1.21	0.11	1.36	27	1.21	0.09	1.32
VB	PEMBROKE BLVD	WITCHDUCK RD	INDEPENDENCE BLVD	EW	29	1.20	0.06	1.30	32	1.11	0.04	1.14	30	1.15	0.09	1.29	32	1.11	0.07	1.19
VB	PRINCESS ANNE RD	NEWTOWN RD/NORFOLK CL	KEMPSVILLE RD	EW	31	1.13	0.10	1.21	32	1.22	0.13	1.36	28	1.25	0.49	1.86	33	1.19	0.14	1.36
VB	PRINCESS ANNE RD	KEMPSVILLE RD	BAXTER RD	EW	32	1.13	0.13	1.24	30	1.30	0.50	1.97	30	1.22	0.43	1.74	27	1.39	0.37	1.94
VB	PRINCESS ANNE RD	BAXTER RD	PROVIDENCE RD	EW	36	1.17	0.16	1.37	35	1.17	0.23	1.48	33	1.26	0.17	1.50	34	1.21	0.31	1.59
VB	PRINCESS ANNE RD	PROVIDENCE RD	FERRELL PKWY	EW	38	1.14	0.29	1.48	36	1.15	0.22	1.42	38	1.15	0.30	1.51	36	1.15	0.25	1.46
VB	PRINCESS ANNE RD	FERRELL PKWY	LYNNHAVEN PKWY	EW	38	1.14	0.29	1.48	36	1.15	0.22	1.42	38	1.15	0.30	1.51	36	1.15	0.25	1.46
VB	PRINCESS ANNE RD	LYNNHAVEN PKWY	INDEPENDENCE BLVD	EW	33	1.29	0.52	1.89	36	1.23	0.41	1.75	37	1.17	0.38	1.61	36	1.21	0.30	1.55
VB	PRINCESS ANNE RD	INDEPENDENCE BLVD	DAM NECK RD	EW	33	1.29	0.52	1.89	36	1.23	0.41	1.75	37	1.17	0.38	1.61	36	1.21	0.30	1.55
VB	PRINCESS ANNE RD	DAM NECK RD	S.E. PARKWAY CORRIDOR	EW	35	1.25	0.11	1.39	35	1.17	0.06	1.24	35	1.26	0.08	1.38	34	1.22	0.12	1.32
VB	PRINCESS ANNE RD	S.E. PARKWAY CORRIDOR	NIMMO PKWY	EW	35	1.25	0.11	1.39	35	1.17	0.06	1.24	35	1.26	0.08	1.38	34	1.22	0.12	1.32
VB	PRINCESS ANNE RD	NIMMO PKWY	NORTH LANDING RD	EW	35	1.25	0.11	1.39	35	1.17	0.06	1.24	35	1.26	0.08	1.38	34	1.22	0.12	1.32
VB	PRINCESS ANNE RD	NORTH LANDING RD	HOLLAND RD	EW	31	1.16	0.07	1.16	31	1.26	0.24	1.58	25	1.44	0.08	1.44	29	1.34	0.37	1.85
VB	PRINCESS ANNE RD	HOLLAND RD	SEABOARD RD	EW	31	1.16	0.07	1.16	31	1.26	0.24	1.58	25	1.44	0.08	1.44	29	1.34	0.37	1.85
VB	PRINCESS ANNE RD	SEABOARD RD	GENERAL BOOTH BLVD	EW	31	1.16	0.07	1.16	31	1.26	0.24	1.58	25	1.44	0.08	1.44	29	1.34	0.37	1.85
VB	PRINCESS ANNE RD	GENERAL BOOTH BLVD	SANDBRIDGE RD/UPTON DR	NS	33	1.11	0.08	1.19	32	1.11	0.07	1.17	32	1.13	0.12	1.27	32	1.12	0.08	1.20
VB	PRINCESS ANNE RD	SANDBRIDGE RD/UPTON DR	SEABOARD RD	NS	42	1.12	0.04	1.17	39	1.10	0.04	1.14	41	1.16	0.03	1.19	39	1.11	0.05	1.17
VB	PRINCESS ANNE RD	SEABOARD RD	INDIAN RIVER RD	NS	42	1.12	0.04	1.17	39	1.10	0.04	1.14	41	1.16	0.03	1.19	39	1.11	0.05	1.17
VB	PRINCESS ANNE RD	INDIAN RIVER RD	PUNGO FERRY RD	NS	44	1.05	0.03	1.07	43	1.09	0.03	1.12	44	1.06	0.02	1.07	45	1.03	0.03	1.06
VB	PRINCESS ANNE RD	PUNGO FERRY RD	NORTH CAROLINA STATE LINE	NS	44	1.05	0.03	1.07	43	1.09	0.03	1.12	44	1.06	0.02	1.07	45	1.03	0.03	1.06
VB	ROSEMONT RD	LYNNHAVEN PKWY	HOLLAND RD	NS	35	1.19	0.04	1.24	34	1.18	0.05	1.22	34	1.22	0.09	1.34	33	1.24	0.07	1.32
VB	ROSEMONT RD	HOLLAND RD	PLAZA TRAIL	NS	29	1.29	0.34	1.74	31	1.19	0.09	1.33	27	1.35	0.34	1.83	28	1.33	0.33	1.81
VB	ROSEMONT RD	PLAZA TRAIL	I-264	NS	29	1.29	0.34	1.74	31	1.19	0.09	1.33	27	1.35	0.34	1.83	28	1.33	0.33	1.81
VB	ROSEMONT RD	I-264	VA BEACH BLVD	NS	19	0.95	0.41	1.36	27	1.05	0.11	1.16	21	0.88	0.36	1.22	25	1.11	0.35	1.45

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
VB	SHORE DRIVE	NORFOLK CL	DIAMOND SPRINGS RD	EW	41	1.14	0.12	1.27	41	1.11	0.20	1.33	36	1.31	0.57	2.01	41	1.11	0.25	1.40
VB	SHORE DRIVE	DIAMOND SPRINGS RD	INDEPENDENCE BLVD	EW	38	1.24	0.25	1.57	40	1.14	0.08	1.24	39	1.20	0.12	1.37	40	1.13	0.17	1.32
VB	SHORE DRIVE	INDEPENDENCE BLVD	PLEASURE HOUSE RD	EW	37	1.13	0.07	1.21	35	1.24	0.08	1.31	35	1.20	0.12	1.35	35	1.24	0.10	1.40
VB	SHORE DRIVE	PLEASURE HOUSE RD	NORTHAMPTON BLVD	EW	31	1.24	0.13	1.42	35	1.18	0.10	1.31	32	1.19	0.22	1.47	32	1.30	0.16	1.48
VB	SHORE DRIVE	NORTHAMPTON BLVD	GREAT NECK RD	EW	37	1.18	0.21	1.42	38	1.17	0.16	1.36	36	1.21	0.22	1.49	37	1.18	0.18	1.38
VB	SHORE DRIVE	GREAT NECK RD	ATLANTIC AVE	EW	48	1.05	0.04	1.10	48	1.07	0.02	1.10	48	1.06	0.05	1.11	48	1.08	0.06	1.14
VB	VA BEACH BLVD	NEWTOWN RD/NORFOLK CL	WITCHDUCK RD	EW	36	1.16	0.26	1.48	35	1.16	0.24	1.45	35	1.21	0.30	1.57	33	1.25	0.30	1.63
VB	VA BEACH BLVD	WITCHDUCK RD	INDEPENDENCE BLVD	EW	33	1.19	0.32	1.60	35	1.15	0.41	1.61	30	1.29	0.62	2.13	33	1.21	0.29	1.55
VB	VA BEACH BLVD	INDEPENDENCE BLVD	CONSTITUTION DR	EW	33	1.11	0.20	1.33	34	1.12	0.21	1.37	30	1.22	0.34	1.61	30	1.26	0.26	1.57
VB	VA BEACH BLVD	CONSTITUTION DR	ROSEMONT RD	EW	33	1.11	0.20	1.33	34	1.12	0.21	1.37	30	1.22	0.34	1.61	30	1.26	0.26	1.57
VB	VA BEACH BLVD	ROSEMONT RD	S. PLAZA TRAIL/LITTLE NECK RD	EW	36	1.08	0.18	1.27	34	1.10	0.31	1.44	32	1.22	0.27	1.50	32	1.18	0.36	1.57
VB	VA BEACH BLVD	S. PLAZA TRAIL/LITTLE NECK RD	LYNNHAVEN PKWY	EW	36	1.08	0.18	1.27	34	1.10	0.31	1.44	32	1.22	0.27	1.50	32	1.18	0.36	1.57
VB	VA BEACH BLVD	LYNNHAVEN PKWY	GREAT NECK RD	EW	33	1.24	0.23	1.45	29	1.35	0.64	2.27	35	1.19	0.33	1.59	28	1.37	0.38	1.89
VB	VA BEACH BLVD	GREAT NECK RD	LASKIN RD	EW	33	1.24	0.23	1.45	29	1.35	0.64	2.27	35	1.19	0.33	1.59	28	1.37	0.38	1.89
VB	VA BEACH BLVD	LASKIN RD	FIRST COLONIAL RD	EW	30	1.35	0.17	1.59	38	1.08	0.15	1.26	30	1.34	0.39	1.89	38	1.09	0.12	1.23
VB	VA BEACH BLVD	FIRST COLONIAL RD	N OCEANA BLVD	EW	28	1.17	0.06	1.21	32	1.09	0.06	1.17	28	1.18	0.05	1.25	31	1.15	0.08	1.25
VB	VA BEACH BLVD	N OCEANA BLVD	BIRDNECK RD	EW	28	1.17	0.06	1.21	32	1.09	0.06	1.17	28	1.18	0.05	1.25	31	1.15	0.08	1.25
VB	VA BEACH BLVD	BIRDNECK RD	PACIFIC AVE	EW	25	1.18	0.05	1.24	24	1.23	0.03	1.27	23	1.26	0.05	1.33	23	1.30	0.06	1.36
VB	WITCHDUCK RD	PRINCESS ANNE RD	I-264	NS	27	1.37	0.60	2.20	29	1.27	0.39	1.79	27	1.40	0.71	2.42	22	1.66	1.07	3.56
VB	WITCHDUCK RD	I-264	VA BEACH BLVD	NS	23	1.34	0.58	2.13	24	1.40	0.69	2.41	22	1.41	0.81	2.59	24	1.40	0.71	2.44
VB	WITCHDUCK RD	VA BEACH BLVD	PEMBROKE BLVD	NS	35	1.13	0.06	1.19	33	1.14	0.15	1.32	34	1.15	0.08	1.25	33	1.16	0.16	1.34
WMB	BYPASS RD	RICHMOND RD	YORK CL	EW	29	1.15	0.07	1.23	30	1.18	0.11	1.33	28	1.19	0.14	1.36	28	1.25	0.22	1.51
WMB	BYPASS RD	ROUTE 132/YORK CL	PAGE ST	EW	31	1.12	0.03	1.16	29	1.08	0.04	1.12	31	1.14	0.04	1.20	30	1.06	0.08	1.11
WMB	FRANCIS ST	BOUNDARY ST	HENRY ST	EW	19	1.12	0.00	1.15	19	1.21	0.02	1.26	20	1.03	0.03	1.06	18	1.27	0.05	1.34
WMB	HENRY ST S.	ROUTE 199	FRANCIS ST	NS	31	1.10	0.02	1.13	25	1.31	0.02	1.35	29	1.17	0.02	1.21	29	1.15	0.02	1.17
WMB	HENRY ST	FRANCIS ST	LAFAYETTE ST	NS	19	1.07	0.02	1.11	19	1.08	0.03	1.13	17	1.20	0.08	1.30	16	1.35	0.03	1.40
WMB	HENRY ST N.	LAFAYETTE ST	RTE 132Y	NS	29	1.15	0.06	1.16	25	1.41	0.02	1.44	27	1.25	0.04	1.33	27	1.29	0.03	1.33
WMB	JAMESTOWN RD	JAMES CITY CL	RTE 199	EW	35	1.12	0.01	1.14	36	1.12	0.03	1.14	35	1.09	0.02	1.12	36	1.12	0.03	1.15
WMB	JAMESTOWN RD	RTE 199	JOHN TYLER LN	EW	29	1.19	0.06	1.26	23	1.27	0.02	1.31	30	1.15	0.07	1.19	23	1.28	0.10	1.39
WMB	JAMESTOWN RD	JOHN TYLER LN	COLLEGE CREEK	EW	25	1.48	0.02	1.54	27	1.18	0.02	1.21	28	1.34	0.04	1.38	27	1.20	0.03	1.24
WMB	JAMESTOWN RD	COLLEGE CREEK	BOUNDARY ST	EW	25	1.48	0.02	1.54	27	1.18	0.02	1.21	28	1.34	0.04	1.38	27	1.20	0.03	1.24
WMB	MERRIMAC TRAIL	YORK CL (SOUTH)	CAPITOL LANDING RD	NS	35	1.07	0.03	1.11	32	1.10	0.03	1.13	34	1.10	0.05	1.14	32	1.12	0.04	1.16
WMB	MERRIMAC TRAIL	CAPITOL LANDING RD	YORK CL (NORTH)	NS	42	1.14	0.04	1.18	43	1.09	0.06	1.16	41	1.15	0.08	1.21	41	1.13	0.03	1.16
WMB	PAGE ST	BYPASS RD	SECOND ST	NS	29	1.08	0.04	1.12	31	1.12	0.03	1.16	30	1.06	0.08	1.11	31	1.14	0.04	1.20
WMB	PAGE ST	SECOND ST	YORK ST	NS	34	1.10	0.04	1.13	34	1.08	0.07	1.16	35	1.07	0.06	1.14	33	1.11	0.10	1.22
WMB	RICHMOND RD	JAMES CITY CL	IRONBOUND RD	NS	35	1.10	0.07	1.18	32	1.04	0.06	1.11	35	1.12	0.11	1.25	30	1.08	0.09	1.16
WMB	RICHMOND RD	IRONBOUND RD	BYPASS RD	NS	30	1.18	0.11	1.33	29	1.15	0.07	1.23	28	1.25	0.22	1.51	28	1.19	0.14	1.36
WMB	ROUTE 132	ROUTE 132Y	BYPASS RD/YORK CL	NS	30	1.09	0.09	1.11	34	1.07	0.06	1.08	30	1.12	0.07	1.21	36	1.01	0.02	1.04
WMB	ROUTE 199	JAMES CITY CL (WEST)	JAMESTOWN RD	EW	35	1.26	0.60	2.02	33	1.24	0.22	1.54	30	1.48	0.60	2.29	34	1.21	0.25	1.53
WMB	ROUTE 199	JAMESTOWN RD	JAMES CITY CL (EAST)	EW	44	1.20	0.17	1.41	42	1.32	0.16	1.55	41	1.29	0.23	1.57	42	1.32	0.37	1.80
WMB	YORK ST	PAGE ST	JAMES CITY CL	EW	34	1.08	0.07	1.16	34	1.10	0.04	1.13	33	1.11	0.10	1.22	35	1.07	0.06	1.14
YC	BIG BETHEL RD	HAMPTON CL	HAMPTON HWY (RTE 134)	NS	32	1.28	0.03	1.33	35	1.06	0.06	1.13	33	1.20	0.05	1.26	34	1.10	0.06	1.13
YC	BIG BETHEL RD	HAMPTON HWY (RTE 134)	VICTORY BLVD (RTE 171)	NS	32	1.34	0.02	1.38	35	1.08	0.03	1.12	36	1.20	0.04	1.24	35	1.05	0.08	1.14
YC	BYPASS RD	WILLIAMSBURG CL	WALLER MILL RD	EW	29	1.15	0.07	1.23	30	1.18	0.11	1.33	28	1.19	0.14	1.36	28	1.25	0.22	1.51
YC	BYPASS RD	WALLER MILL RD	ROUTE 132/WILLIAMSBURG CL	EW	29	1.15	0.07	1.23	30	1.18	0.11	1.33	28	1.19	0.14	1.36	28	1.25	0.22	1.51
YC	DENBIGH BLVD	NEWPORT NEWS CL	ROUTE 17	EW	43	1.10	0.07	1.17	44	1.13	0.08	1.23	41	1.15	0.17	1.35	43	1.17	0.07	1.25
YC	FORT EUSTIS BLVD	NEWPORT NEWS CL	ROUTE 17	EW	45	1.11	0.08	1.20	43	1.15	0.16	1.33	43	1.15	0.21	1.39	44	1.13	0.07	1.20
YC	GEORGE WASHINGTON HWY	NEWPORT NEWS CL	VICTORY BLVD (RTE 171)	NS	36	1.27	0.30	1.64	37	1.23	0.35	1.65	33	1.40	0.83	2.43	35	1.28	0.36	1.71
YC	GEORGE WASHINGTON HWY	VICTORY BLVD (RTE 171)	HAMPTON HWY (RTE 134)	NS	39	1.10	0.46	1.59	37	1.13	0.66	1.87	35	1.25	0.95	2.44	33	1.25	0.57	1.95
YC	GEORGE WASHINGTON HWY	HAMPTON HWY (RTE 134)	DARE RD	NS	40	1.21	0.40	1.67	39	1.23	0.49	1.82	34	1.44	0.68	2.48	39	1.25	0.45	1.85

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekday (including Tuesdays through Thursdays) peak period data for all of 2012. The AM peak period is defined as the four hour period from 5 am to 9 am, and the PM peak period is defined as the four hour period from 3 pm to 7 pm. The speed column represents the lowest of the four hourly intervals during each peak period, while the travel time index, buffer index, and planning time index columns represent the highest of the four hourly intervals.

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Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix A – 2012 Peak Period Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – Arterial Segments

JURIS	FACILITY NAME	SEGMENT FROM	SEGMENT TO	DIR	AM PEAK PERIOD								PM PEAK PERIOD							
					NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND				NORTHBOUND/EASTBOUND				SOUTHBOUND/WESTBOUND			
					SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX	SPEED (mph)	TRAVEL TIME INDEX	BUFFER INDEX	PLANNING TIME INDEX
YC	GEORGE WASHINGTON HWY	DARE RD	DENBIGH BLVD (RTE 173)	NS	40	1.21	0.40	1.67	39	1.23	0.49	1.82	34	1.44	0.68	2.48	39	1.25	0.45	1.85
YC	GEORGE WASHINGTON HWY	DENBIGH BLVD (RTE 173)	FORT EUSTIS BLVD (RTE 105)	NS	47	1.13	0.18	1.35	44	1.20	0.24	1.49	43	1.22	0.33	1.59	45	1.18	0.24	1.45
YC	GEORGE WASHINGTON HWY	FORT EUSTIS BLVD (RTE 105)	COOK RD	NS	47	1.13	0.18	1.35	44	1.20	0.24	1.49	43	1.22	0.33	1.59	45	1.18	0.24	1.45
YC	GEORGE WASHINGTON HWY	COOK RD	GOOSLEY RD (RTE 238)	NS	47	1.13	0.18	1.35	44	1.20	0.24	1.49	43	1.22	0.33	1.59	45	1.18	0.24	1.45
YC	GEORGE WASHINGTON HWY	GOOSLEY RD (RTE 238)	GLOUCESTER CL (COLEMAN BRIDGE)	NS	45	1.05	0.13	1.19	46	1.04	0.21	1.26	42	1.14	0.30	1.50	46	1.05	0.15	1.22
YC	GOODWIN NECK RD	ROUTE 17	WOLF TRAP RD	EW	34	1.29	0.09	1.39	33	1.29	0.10	1.44	34	1.29	0.09	1.38	31	1.34	0.10	1.43
YC	HAMPTON HWY	ROUTE 17	VICTORY BLVD (RTE 171)	NS	41	1.23	0.12	1.37	41	1.09	0.29	1.39	39	1.27	0.27	1.64	40	1.11	0.27	1.43
YC	HAMPTON HWY	VICTORY BLVD (RTE 171)	BIG BETHEL RD (RTE 600)	NS	44	1.14	0.13	1.29	41	1.25	0.39	1.70	42	1.20	0.21	1.46	42	1.23	0.18	1.46
YC	HAMPTON HWY	BIG BETHEL RD (RTE 600)	NCL HAMPTON	NS	41	1.20	0.07	1.25	40	1.38	0.16	1.54	41	1.21	0.22	1.48	44	1.26	0.15	1.45
YC	MERRIMAC TRAIL	JAMES CITY CL	BUSCH GARDENS INTERCHANGE	NS	47	1.14	0.05	1.19	46	1.18	0.06	1.26	43	1.26	0.08	1.34	49	1.12	0.07	1.20
YC	MERRIMAC TRAIL	BUSCH GARDENS INTERCHANGE	ROUTE 199/JAMES CITY CL	NS	44	1.12	0.10	1.23	47	1.07	0.04	1.10	44	1.13	0.11	1.25	48	1.06	0.05	1.11
YC	MERRIMAC TRAIL	PENNIMAN RD/JAMES CITY CL	SECOND ST	NS	34	1.07	0.09	1.17	34	1.04	0.08	1.13	32	1.14	0.12	1.29	32	1.08	0.16	1.24
YC	MERRIMAC TRAIL	SECOND ST	WILLIAMSBURG CL	NS	35	1.07	0.03	1.11	32	1.10	0.03	1.13	34	1.10	0.05	1.14	32	1.12	0.04	1.16
YC	MERRIMAC TRAIL	WILLIAMSBURG CL	ROUTE 132	NS	42	1.14	0.04	1.18	43	1.09	0.06	1.16	41	1.15	0.08	1.21	41	1.13	0.03	1.16
YC	PENNIMAN RD (RTE 641)	ROUTE 199	COLONIAL PKWY	EW	42	1.07	0.03	1.12	42	1.09	0.03	1.13	41	1.08	0.02	1.09	41	1.11	0.03	1.12
YC	POCAHONTAS TRAIL	JCC LINE @ RTE 199	KINGSMILL RD	EW	48	1.07	0.07	1.15	35	1.10	0.07	1.18	48	1.08	0.07	1.16	35	1.12	0.11	1.25
YC	POCAHONTAS TRAIL	KINGSMILL RD	BUSCH GARDENS INTERCHANGE	EW	48	1.07	0.07	1.15	35	1.10	0.07	1.18	48	1.08	0.07	1.16	35	1.12	0.11	1.25
YC	POCAHONTAS TRAIL	BUSCH GARDENS INTERCHANGE	JAMES CITY CL	EW	39	1.07	0.15	1.22	48	1.06	0.06	1.13	39	1.08	0.25	1.35	48	1.07	0.08	1.16
YC	ROUTE 132	BYPASS RD/WILLIAMSBURG CL	ROUTE 143	NS	44	1.11	0.03	1.15	44	1.11	0.07	1.15	44	1.11	0.10	1.23	44	1.10	0.06	1.15
YC	ROUTE 143	ROUTE 132	I-64	NS	40	1.05	0.08	1.12	42	1.06	0.17	1.20	37	1.12	0.13	1.21	42	1.05	0.07	1.12
YC	ROUTE 199	RTE 60/RTE 143/JCC LINE	I-64	EW	53	1.05	0.08	1.13	53	1.01	0.09	1.08	54	1.04	0.06	1.10	53	1.01	0.13	1.14
YC	VICTORY BLVD	NEWPORT NEWS CL	ROUTE 17	EW	33	1.16	0.55	1.78	38	1.19	0.43	1.69	29	1.31	0.67	2.17	38	1.20	0.44	1.74
YC	VICTORY BLVD	ROUTE 17	HAMPTON HWY (RTE 134)	EW	29	1.19	0.52	1.82	33	1.12	0.79	2.02	29	1.20	0.43	1.72	29	1.25	0.55	1.95
YC	VICTORY BLVD	HAMPTON HWY (RTE 134)	BIG BETHEL RD (RTE 600)	EW	42	1.22	0.11	1.32	41	1.21	0.13	1.37	35	1.43	0.24	1.82	40	1.23	0.08	1.34
YC	VICTORY BLVD	BIG BETHEL RD (RTE 600)	CARYS CHAPEL RD (RTE 782)	EW	40	1.20	0.08	1.30	39	1.25	0.15	1.40	35	1.36	0.10	1.52	38	1.30	0.10	1.46
YC	VICTORY BLVD	CARYS CHAPEL RD (RTE 782)	POQUOSON CL	EW	40	1.20	0.08	1.30	39	1.25	0.15	1.40	35	1.36	0.10	1.52	38	1.30	0.10	1.46

Source: HRTPO analysis of INRIX data.

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Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix B – 2012 Hourly Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – High Profile Corridors

Downtown Tunnel Corridor

TIME START			AVERAGE SPEED (mph)						TRAVEL TIME INDEX						BUFFER INDEX						PLANNING TIME INDEX					
			Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday	
			Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer
EASTBOUND	Portsmouth Blvd to Waterside Dr	5:00	56	56	56	55	56	56	0.96	0.96	0.96	0.97	0.95	0.95	0.12	0.14	0.13	0.16	0.12	0.12	1.08	1.10	1.09	1.12	1.06	1.06
		6:00	49	51	53	54	56	57	1.11	1.07	1.04	1.01	0.95	0.93	1.02	0.73	0.49	0.27	0.09	0.09	2.23	1.90	1.53	1.30	1.03	1.03
		7:00	35	39	43	47	56	56	1.90	1.61	1.36	1.22	0.96	0.96	1.46	1.04	1.34	0.90	0.10	0.10	4.40	3.65	3.01	2.44	1.06	1.06
		8:00	34	40	44	47	55	55	1.92	1.50	1.32	1.17	0.97	0.98	1.54	1.10	1.55	1.33	0.19	0.16	4.75	3.86	3.26	2.96	1.16	1.13
		9:00	47	49	51	51	54	55	1.17	1.13	1.06	1.07	0.98	0.98	1.59	1.26	0.64	1.01	0.18	0.15	3.11	2.70	1.77	2.19	1.17	1.13
		10:00	53	52	52	52	54	54	1.03	1.04	1.04	1.06	0.99	0.99	0.35	0.34	0.32	0.31	0.21	0.18	1.39	1.37	1.36	1.36	1.20	1.17
		11:00	52	51	51	51	54	54	1.05	1.07	1.10	1.11	1.01	1.00	0.55	0.65	0.55	0.48	0.26	0.22	1.64	1.76	1.72	1.64	1.27	1.21
		12:00	53	52	51	50	52	52	1.03	1.06	1.10	1.13	1.05	1.06	0.32	0.33	0.43	0.49	0.47	0.61	1.35	1.37	1.55	1.62	1.51	1.66
		13:00	52	52	49	47	52	51	1.04	1.05	1.15	1.22	1.07	1.08	0.45	0.60	0.96	1.23	0.66	0.78	1.52	1.68	2.16	2.49	1.74	1.86
		14:00	51	50	49	46	52	51	1.08	1.13	1.16	1.24	1.07	1.11	0.55	1.05	0.90	1.51	0.39	0.44	1.67	2.22	2.14	2.86	1.46	1.53
		15:00	49	48	45	41	52	51	1.16	1.19	1.33	1.48	1.06	1.11	0.68	0.90	1.08	1.62	0.56	0.45	1.94	2.22	2.63	3.39	1.64	1.54
		16:00	43	44	42	39	52	50	1.41	1.34	1.50	1.68	1.04	1.10	1.01	0.89	1.19	1.42	0.58	1.00	2.83	2.69	3.04	3.47	1.64	2.09
		17:00	47	47	47	43	53	52	1.21	1.21	1.24	1.40	1.02	1.05	1.18	1.19	1.19	1.88	0.36	0.66	2.64	2.67	2.65	3.56	1.38	1.69
18:00	53	53	51	49	54	53	1.03	1.03	1.07	1.16	1.00	1.03	0.51	0.70	0.66	1.32	0.41	0.58	1.56	1.76	1.77	2.49	1.42	1.59		
19:00	54	54	53	52	54	54	0.99	0.99	1.02	1.03	0.99	0.99	0.25	0.36	0.52	1.05	0.36	0.54	1.25	1.36	1.54	2.10	1.35	1.52		
20:00	53	54	53	53	54	54	1.01	0.99	1.00	1.00	0.98	0.99	0.26	0.24	0.26	0.32	0.11	0.11	1.27	1.26	1.26	1.33	1.10	1.09		
WESTBOUND	Ballentine Blvd to Effingham St	5:00	51	50	51	51	52	53	0.99	1.00	0.99	0.99	0.95	0.95	0.25	0.32	0.26	0.34	0.13	0.13	1.24	1.31	1.23	1.31	1.07	1.08
		6:00	39	41	44	45	53	54	1.47	1.36	1.24	1.22	0.95	0.93	1.20	1.10	1.03	0.96	0.12	0.10	3.25	3.09	2.44	2.35	1.07	1.04
		7:00	38	38	45	45	52	53	1.53	1.50	1.17	1.17	0.95	0.94	1.31	1.51	1.10	1.29	0.15	0.08	3.49	3.81	2.42	2.64	1.11	1.04
		8:00	46	46	49	49	52	52	1.12	1.12	1.04	1.03	0.95	0.96	1.04	1.34	0.65	0.60	0.23	0.41	2.27	2.63	1.72	1.66	1.17	1.35
		9:00	48	48	49	48	52	51	1.07	1.08	1.05	1.08	0.97	0.98	0.79	0.94	0.76	0.82	0.26	0.18	1.94	2.11	1.87	1.95	1.22	1.14
		10:00	49	48	49	49	51	51	1.03	1.06	1.02	1.04	0.98	0.98	0.50	0.87	0.43	0.55	0.22	0.19	1.54	1.92	1.46	1.59	1.19	1.16
		11:00	48	47	48	47	51	50	1.07	1.09	1.08	1.12	0.99	1.01	0.93	1.13	0.84	1.11	0.30	0.41	2.08	2.32	2.02	2.33	1.28	1.38
		12:00	48	48	47	42	50	50	1.06	1.07	1.12	1.27	1.01	1.03	0.58	0.75	1.01	2.21	0.47	0.53	1.65	1.84	2.22	3.59	1.48	1.55
		13:00	47	45	40	35	50	50	1.10	1.15	1.40	1.74	1.01	1.01	0.85	1.15	1.52	2.63	0.29	0.25	2.07	2.42	3.31	4.93	1.30	1.27
		14:00	44	43	35	31	49	50	1.20	1.23	1.77	2.16	1.03	1.03	1.19	1.22	1.46	1.70	0.39	0.23	2.64	2.69	4.04	4.55	1.42	1.27
		15:00	36	34	29	26	48	49	1.73	1.87	2.48	2.73	1.06	1.04	1.20	1.22	1.08	1.35	0.63	0.32	3.80	3.85	4.99	5.74	1.71	1.39
		16:00	31	31	26	23	48	48	2.31	2.40	2.68	3.03	1.07	1.08	0.91	1.02	1.29	1.42	0.73	1.00	4.33	4.63	5.53	6.04	1.83	2.15
		17:00	28	28	27	25	49	49	2.51	2.57	2.56	2.81	1.05	1.04	1.04	1.14	1.39	1.42	0.49	0.61	4.96	5.27	5.38	5.62	1.56	1.70
18:00	34	33	34	33	49	49	1.80	1.92	1.76	1.84	1.04	1.03	1.51	1.79	1.56	1.75	0.44	0.29	4.34	4.88	4.40	4.71	1.50	1.36		
19:00	47	47	46	46	50	50	1.07	1.09	1.12	1.13	1.01	1.00	0.80	1.15	0.97	1.16	0.32	0.36	1.94	2.32	2.24	2.46	1.34	1.38		
20:00	49	48	49	49	50	50	1.03	1.04	1.02	1.03	1.00	1.01	0.41	0.52	0.32	0.39	0.16	0.20	1.45	1.56	1.35	1.42	1.16	1.20		

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekdays (including Tuesdays through Thursdays), Fridays, and Saturdays in 2012. Annual data represents the entire year of 2012, whereas summer data represents the months of June, July, and August of 2012.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix B – 2012 Hourly Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – High Profile Corridors

Midtown Tunnel Corridor

		AVERAGE SPEED (mph)						TRAVEL TIME INDEX						BUFFER INDEX						PLANNING TIME INDEX							
		TIME START		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday	
				Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer
EASTBOUND	Cedar Rd/London Blvd to Brambleton Ave	5:00	51	51	51	51	53	53	1.03	1.02	1.02	1.02	0.98	0.97	0.06	0.05	0.05	0.07	0.02	0.02	1.09	1.09	1.07	1.09	1.00	1.00	
		6:00	47	48	50	49	53	53	1.13	1.11	1.07	1.08	0.98	0.99	0.57	0.40	0.31	0.49	0.04	0.04	1.78	1.61	1.41	1.59	1.02	1.02	
		7:00	40	42	46	46	52	52	1.39	1.30	1.18	1.16	0.99	0.99	1.91	1.59	1.48	1.57	0.04	0.03	3.91	3.47	2.84	2.95	1.03	1.02	
		8:00	42	44	47	48	52	52	1.31	1.25	1.13	1.10	0.99	1.00	1.60	1.26	0.74	0.33	0.04	0.04	3.36	2.90	1.99	1.52	1.04	1.04	
		9:00	47	49	50	50	52	52	1.15	1.09	1.06	1.06	1.00	1.00	0.89	0.44	0.43	0.41	0.05	0.06	2.20	1.68	1.53	1.52	1.07	1.07	
		10:00	50	50	50	50	52	52	1.05	1.06	1.04	1.04	1.00	1.00	0.43	0.49	0.25	0.22	0.06	0.06	1.52	1.58	1.31	1.28	1.06	1.06	
		11:00	51	50	50	51	52	52	1.04	1.05	1.04	1.03	1.00	1.00	0.22	0.30	0.24	0.20	0.05	0.05	1.28	1.37	1.31	1.26	1.05	1.05	
		12:00	51	51	50	50	52	52	1.03	1.03	1.04	1.04	1.00	1.00	0.17	0.22	0.23	0.29	0.05	0.05	1.22	1.27	1.29	1.36	1.05	1.06	
		13:00	51	51	51	50	52	51	1.03	1.03	1.03	1.05	1.00	1.07	0.16	0.20	0.20	0.23	0.04	0.04	1.20	1.25	1.25	1.27	1.05	1.06	
		14:00	51	50	51	50	52	52	1.04	1.05	1.04	1.06	0.99	0.99	0.17	0.21	0.18	0.26	0.06	0.05	1.22	1.26	1.23	1.32	1.05	1.05	
		15:00	50	49	50	49	52	52	1.07	1.07	1.07	1.09	0.99	0.99	0.20	0.29	0.35	0.68	0.06	0.06	1.31	1.41	1.48	1.86	1.05	1.05	
		16:00	48	48	49	49	52	53	1.11	1.11	1.08	1.10	1.00	0.99	0.36	0.34	0.29	0.38	0.15	0.08	1.54	1.52	1.43	1.54	1.15	1.08	
17:00	49	49	50	49	52	53	1.10	1.08	1.06	1.08	1.00	0.99	0.37	0.37	0.27	0.41	0.05	0.05	1.52	1.52	1.36	1.51	1.05	1.05			
18:00	50	50	50	50	53	53	1.05	1.05	1.04	1.05	1.00	0.99	0.16	0.27	0.21	0.46	0.06	0.05	1.24	1.35	1.28	1.54	1.06	1.05			
19:00	50	50	51	51	52	53	1.03	1.03	1.03	1.03	0.99	0.99	0.05	0.06	0.07	0.12	0.04	0.04	1.09	1.09	1.10	1.16	1.04	1.04			
20:00	51	51	51	51	52	52	1.03	1.03	1.02	1.03	1.01	1.01	0.06	0.06	0.05	0.04	0.03	0.03	1.09	1.09	1.07	1.07	1.05	1.05			
WESTBOUND	Colley Ave/27th St to Western Fwy	5:00	36	36	37	36	37	37	0.98	0.99	0.97	0.98	0.97	0.97	0.05	0.05	0.06	0.05	0.02	0.04	1.03	1.04	1.04	1.03	0.99	1.00	
		6:00	36	35	36	35	36	36	1.00	1.01	1.00	1.02	0.98	0.99	0.23	0.21	0.17	0.20	0.05	0.07	1.23	1.22	1.18	1.21	1.03	1.05	
		7:00	31	31	33	32	36	36	1.16	1.14	1.10	1.10	0.98	0.98	0.61	0.62	0.33	0.53	0.05	0.05	1.85	1.86	1.47	1.70	1.03	1.03	
		8:00	33	32	32	32	36	36	1.09	1.10	1.09	1.10	0.99	0.99	0.29	0.42	0.19	0.24	0.06	0.08	1.43	1.57	1.32	1.37	1.04	1.06	
		9:00	33	32	34	33	36	36	1.09	1.10	1.07	1.09	1.00	0.99	0.22	0.27	0.24	0.38	0.08	0.12	1.33	1.38	1.34	1.48	1.08	1.11	
		10:00	33	33	34	34	35	35	1.08	1.09	1.07	1.07	1.01	1.02	0.20	0.23	0.21	0.22	0.12	0.12	1.31	1.33	1.30	1.30	1.13	1.13	
		11:00	33	33	33	33	36	36	1.07	1.08	1.08	1.09	0.99	0.99	0.23	0.24	0.31	0.36	0.13	0.16	1.32	1.33	1.41	1.47	1.11	1.14	
		12:00	33	33	32	31	35	34	1.08	1.09	1.12	1.16	1.03	1.03	0.28	0.30	0.43	0.80	0.08	0.07	1.39	1.41	1.60	2.02	1.11	1.11	
		13:00	33	32	31	29	36	35	1.10	1.10	1.17	1.25	1.01	1.01	0.29	0.39	0.57	1.11	0.07	0.09	1.42	1.53	1.83	2.47	1.08	1.10	
		14:00	29	29	27	26	35	35	1.22	1.25	1.34	1.41	1.02	1.02	0.68	0.92	0.89	1.20	0.09	0.09	2.07	2.37	2.58	2.99	1.10	1.10	
		15:00	27	27	26	24	34	34	1.40	1.39	1.47	1.56	1.04	1.03	0.87	0.95	0.93	1.22	0.08	0.09	2.64	2.75	2.93	3.41	1.12	1.14	
		16:00	26	26	26	25	35	35	1.41	1.41	1.40	1.46	1.02	1.03	0.75	1.08	0.81	0.81	0.08	0.04	2.53	2.96	2.64	2.66	1.11	1.07	
		17:00	27	27	28	27	35	35	1.36	1.36	1.30	1.36	1.01	1.01	0.59	0.79	0.52	0.91	0.08	0.10	2.22	2.52	2.05	2.55	1.09	1.10	
		18:00	29	29	30	30	35	35	1.23	1.24	1.20	1.23	1.02	1.02	0.41	0.64	0.29	0.56	0.10	0.15	1.75	2.04	1.58	1.91	1.13	1.18	
19:00	34	33	34	34	35	35	1.07	1.07	1.06	1.07	1.01	1.01	0.18	0.35	0.12	0.15	0.07	0.09	1.25	1.44	1.18	1.22	1.10	1.12			
20:00	35	35	35	35	35	35	1.03	1.03	1.03	1.02	1.01	1.02	0.06	0.12	0.08	0.08	0.04	0.05	1.09	1.14	1.10	1.10	1.05	1.07			

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekdays (including Tuesdays through Thursdays), Fridays, and Saturdays in 2012. Annual data represents the entire year of 2012, whereas summer data represents the months of June, July, and August of 2012.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix B – 2012 Hourly Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – High Profile Corridors

Hampton Roads Bridge-Tunnel Corridor

TIME START			AVERAGE SPEED (mph)						TRAVEL TIME INDEX						BUFFER INDEX						PLANNING TIME INDEX					
			Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday	
			Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer
EASTBOUND	Armistead Ave to Ocean View Ave	5:00	61	62	61	61	60	60	0.94	0.93	0.94	0.94	0.08	0.96	0.13	0.16	0.16	0.35	0.08	0.11	1.07	1.09	1.11	1.28	1.04	1.07
		6:00	57	58	60	61	61	62	1.01	0.99	0.96	0.94	0.09	0.93	0.61	0.57	0.22	0.08	0.09	0.07	1.61	1.56	1.18	1.03	1.04	1.02
		7:00	44	46	54	56	60	61	1.46	1.37	1.09	1.03	0.15	0.95	1.53	1.35	0.87	0.48	0.15	0.10	3.44	3.20	2.05	1.59	1.10	1.05
		8:00	49	52	57	58	60	60	1.25	1.14	1.01	0.99	0.10	0.96	1.73	1.56	0.80	0.14	0.10	0.10	3.23	3.04	1.83	1.15	1.06	1.06
		9:00	56	56	58	59	60	58	1.03	1.03	0.99	0.98	0.25	0.99	1.17	1.04	0.54	0.15	0.25	0.35	2.21	2.07	1.53	1.14	1.20	1.30
		10:00	58	57	58	58	58	56	0.99	1.00	0.99	1.00	0.43	1.02	0.35	0.36	0.66	0.39	0.43	0.52	1.33	1.35	1.64	1.37	1.40	1.50
		11:00	58	57	57	54	56	52	0.99	1.01	1.01	1.07	0.66	1.13	0.37	0.53	0.56	1.13	0.66	0.96	1.35	1.57	1.57	2.15	1.67	2.00
		12:00	58	57	57	52	53	46	0.99	1.02	1.02	1.12	1.22	1.32	0.37	0.66	0.35	0.97	1.22	1.46	1.35	1.64	1.36	2.00	2.35	2.68
		13:00	59	58	56	53	52	42	0.98	1.00	1.05	1.11	1.65	1.57	0.21	0.30	0.74	0.93	1.65	2.46	1.18	1.28	1.77	2.01	2.88	3.93
		14:00	58	57	52	48	50	38	0.99	1.01	1.14	1.25	1.74	1.83	0.40	0.33	1.31	1.69	1.74	2.81	1.39	1.33	2.49	2.96	3.03	4.45
		15:00	53	48	43	37	48	32	1.13	1.27	1.60	1.97	1.96	2.27	1.09	1.54	1.85	2.22	1.96	3.10	2.27	2.82	3.84	4.54	3.44	5.06
		16:00	45	41	38	33	46	32	1.47	1.76	2.02	2.55	2.25	2.25	1.63	1.93	1.83	2.13	2.25	3.27	3.36	3.89	4.42	5.14	3.94	5.53
		17:00	49	43	41	34	46	34	1.29	1.57	1.81	2.38	2.24	2.13	1.87	2.36	1.98	2.46	2.24	3.38	3.31	3.99	4.14	5.14	3.86	5.56
18:00	55	51	47	38	48	37	1.06	1.17	1.52	2.01	1.78	1.90	1.28	2.17	1.72	2.43	1.78	2.97	2.34	3.32	3.24	4.33	3.35	5.09		
19:00	59	58	53	49	53	47	0.97	1.00	1.18	1.30	1.19	1.27	0.40	0.78	1.19	1.59	1.19	2.43	1.36	1.74	2.36	2.88	2.39	3.86		
20:00	59	58	57	55	57	57	0.98	1.00	1.02	1.05	0.51	1.02	0.24	0.45	0.68	1.01	0.51	0.68	1.21	1.42	1.70	2.05	1.52	1.71		
WESTBOUND	I-564 to Mallory St	5:00	61	61	61	62	60	61	0.97	0.97	0.97	0.95	0.98	0.98	0.10	0.16	0.08	0.07	0.07	0.06	1.07	1.12	1.05	1.04	1.05	1.05
		6:00	61	61	62	63	61	62	0.97	0.97	0.96	0.95	0.97	0.95	0.23	0.51	0.16	0.05	0.15	0.07	1.19	1.47	1.12	1.01	1.12	1.03
		7:00	60	59	60	61	61	61	1.00	1.00	0.99	0.98	0.97	0.98	0.39	0.48	0.33	0.14	0.09	0.10	1.39	1.49	1.31	1.13	1.06	1.07
		8:00	58	58	58	59	60	59	1.03	1.03	1.02	1.02	0.99	1.01	0.58	0.44	0.62	0.27	0.13	0.21	1.60	1.48	1.63	1.29	1.11	1.19
		9:00	59	57	58	57	58	54	1.02	1.04	1.03	1.05	1.03	1.12	0.32	0.41	0.34	0.37	0.41	1.14	1.34	1.45	1.36	1.41	1.43	2.20
		10:00	58	56	55	48	54	41	1.03	1.07	1.10	1.25	1.17	1.56	0.36	0.65	0.71	1.48	0.78	2.11	1.40	1.77	1.82	2.69	1.91	3.44
		11:00	58	56	53	39	50	33	1.02	1.07	1.18	1.67	1.33	2.10	0.33	0.77	1.01	2.71	1.38	2.63	1.35	1.82	2.25	4.32	2.70	4.26
		12:00	58	55	48	36	49	33	1.04	1.09	1.34	1.85	1.38	2.13	0.51	0.97	1.84	2.62	1.56	3.12	1.56	2.05	3.41	4.47	2.99	4.92
		13:00	57	55	43	34	50	37	1.04	1.11	1.58	2.07	1.29	1.80	0.65	1.39	1.98	2.42	1.22	2.46	1.70	2.48	4.01	4.73	2.61	4.13
		14:00	55	52	39	32	53	47	1.09	1.17	1.81	2.42	1.15	1.31	0.81	1.26	1.85	2.38	1.22	2.31	1.92	2.44	4.25	5.15	2.49	3.76
		15:00	47	41	34	31	55	52	1.35	1.58	2.13	2.36	1.09	1.16	1.41	1.83	1.27	1.60	0.92	1.56	2.99	3.58	4.24	4.98	2.07	2.79
		16:00	38	33	33	29	56	55	1.85	2.23	2.37	2.83	1.08	1.08	1.20	1.51	1.09	1.26	0.75	0.93	3.65	4.32	4.11	4.62	1.91	2.11
		17:00	39	32	35	31	56	57	1.80	2.24	2.05	2.48	1.07	1.06	1.22	1.61	1.30	1.59	0.83	0.80	3.52	4.34	4.04	4.68	1.97	1.96
		18:00	47	39	42	36	57	59	1.39	1.72	1.55	1.83	1.04	1.01	1.47	2.21	1.62	2.08	0.48	0.15	3.11	4.21	3.78	4.51	1.55	1.22
		19:00	56	52	53	47	59	60	1.07	1.16	1.15	1.30	1.01	0.99	0.79	1.78	1.31	2.38	0.33	0.07	1.88	2.98	2.60	3.85	1.35	1.09
20:00	59	58	59	58	59	59	1.01	1.02	1.01	1.03	1.01	1.01	0.14	0.28	0.25	0.44	0.14	0.18	1.16	1.30	1.27	1.46	1.15	1.19		

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekdays (including Tuesdays through Thursdays), Fridays, and Saturdays in 2012. Annual data represents the entire year of 2012, whereas summer data represents the months of June, July, and August of 2012.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix B – 2012 Hourly Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – High Profile Corridors

Monitor-Merrimac Memorial Bridge-Tunnel Corridor

TIME START			AVERAGE SPEED (mph)						TRAVEL TIME INDEX						BUFFER INDEX						PLANNING TIME INDEX					
			Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday	
			Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer
NORTHBOUND	College Dr to Terminal Ave	5:00	62	62	62	62	61	61	0.96	0.97	0.97	0.97	0.98	0.98	0.10	0.17	0.08	0.10	0.04	0.04	1.06	1.13	1.05	1.07	1.02	1.02
		6:00	62	63	62	63	62	63	0.96	0.95	0.96	0.95	0.96	0.95	0.09	0.17	0.13	0.10	0.07	0.05	1.06	1.13	1.09	1.07	1.03	1.01
		7:00	61	62	62	62	63	64	0.98	0.97	0.97	0.97	0.95	0.94	0.16	0.14	0.09	0.17	0.06	0.13	1.14	1.12	1.07	1.14	1.03	1.09
		8:00	62	62	63	63	63	64	0.97	0.97	0.96	0.95	0.96	0.94	0.15	0.07	0.06	0.03	0.06	0.05	1.13	1.11	1.02	0.99	1.02	1.01
		9:00	62	62	62	62	63	63	0.97	0.97	0.96	0.96	0.96	0.95	0.18	0.09	0.07	0.08	0.06	0.05	1.15	1.07	1.04	1.04	1.03	1.01
		10:00	62	62	62	61	62	62	0.97	0.96	0.97	0.98	0.97	0.97	0.11	0.08	0.11	0.16	0.11	0.08	1.09	1.06	1.09	1.14	1.08	1.05
		11:00	62	62	62	61	62	61	0.97	0.97	0.97	0.98	0.97	0.99	0.09	0.09	0.10	0.16	0.17	0.44	1.07	1.07	1.07	1.14	1.12	1.39
		12:00	62	62	61	61	62	60	0.97	0.96	0.98	0.99	0.97	1.00	0.10	0.09	0.15	0.27	0.22	0.61	1.07	1.06	1.13	1.25	1.19	1.57
		13:00	62	62	61	61	61	60	0.97	0.97	0.98	0.98	0.98	1.01	0.10	0.11	0.11	0.08	0.14	0.37	1.08	1.09	1.09	1.06	1.12	1.35
		14:00	62	62	61	59	62	61	0.97	0.97	0.99	1.02	0.97	0.98	0.10	0.10	0.21	0.44	0.09	0.14	1.08	1.08	1.20	1.43	1.07	1.11
		15:00	62	62	59	56	62	61	0.97	0.97	1.02	1.08	0.97	0.98	0.09	0.11	0.40	0.80	0.08	0.15	1.06	1.08	1.42	1.83	1.05	1.11
		16:00	63	63	60	60	62	62	0.96	0.96	1.00	1.00	0.96	0.96	0.06	0.06	0.32	0.35	0.06	0.07	1.03	1.03	1.30	1.33	1.03	1.04
		17:00	62	62	60	61	62	63	0.97	0.96	1.00	0.98	0.96	0.95	0.11	0.15	0.24	0.11	0.05	0.06	1.08	1.11	1.23	1.10	1.02	1.02
		18:00	62	62	61	61	62	63	0.97	0.96	0.98	0.98	0.97	0.96	0.09	0.10	0.16	0.23	0.08	0.05	1.06	1.07	1.14	1.21	1.06	1.03
19:00	60	59	62	62	62	63	0.99	1.02	0.98	0.97	0.97	0.96	0.19	0.51	0.09	0.17	0.05	0.05	1.19	1.51	1.08	1.15	1.02	1.02		
20:00	59	58	61	61	61	62	1.01	1.03	0.98	0.98	0.98	0.97	0.17	0.42	0.05	0.04	0.08	0.08	1.19	1.44	1.03	1.02	1.07	1.07		
SOUTHBOUND	Chestnut Ave to College Dr	5:00	62	61	62	62	62	63	0.99	0.99	0.99	0.98	0.99	0.98	0.07	0.10	0.10	0.16	0.05	0.03	1.06	1.09	1.09	1.15	1.05	1.04
		6:00	63	64	63	64	62	63	0.96	0.95	0.96	0.95	0.98	0.97	0.08	0.06	0.08	0.08	0.06	0.05	1.05	1.03	1.05	1.04	1.04	1.03
		7:00	63	63	63	63	62	62	0.97	0.97	0.97	0.96	0.99	0.98	0.15	0.27	0.08	0.06	0.07	0.09	1.13	1.25	1.06	1.04	1.06	1.08
		8:00	63	63	62	62	62	63	0.97	0.97	0.98	0.98	0.98	0.97	0.09	0.11	0.16	0.14	0.08	0.12	1.07	1.09	1.15	1.12	1.07	1.11
		9:00	62	62	62	62	63	63	0.99	0.99	0.99	0.99	0.97	0.96	0.20	0.31	0.21	0.34	0.09	0.09	1.19	1.29	1.20	1.33	1.07	1.07
		10:00	62	61	62	62	62	63	0.99	0.99	0.99	0.99	0.98	0.96	0.21	0.29	0.11	0.12	0.30	0.06	1.21	1.28	1.11	1.11	1.27	1.04
		11:00	62	61	62	62	62	62	0.99	0.99	0.99	0.99	0.99	0.98	0.15	0.15	0.14	0.08	0.39	0.21	1.15	1.14	1.14	1.08	1.37	1.18
		12:00	62	62	62	63	62	62	0.99	0.98	0.98	0.97	0.98	0.98	0.13	0.11	0.29	0.19	0.60	0.94	1.12	1.10	1.28	1.17	1.57	1.90
		13:00	62	62	62	62	61	62	0.99	0.99	0.98	0.98	0.99	0.99	0.17	0.25	0.10	0.11	0.63	0.69	1.16	1.25	1.08	1.09	1.62	1.68
		14:00	62	62	62	61	61	59	0.99	0.98	0.99	1.01	1.01	1.04	0.16	0.14	0.22	0.40	0.69	0.98	1.15	1.14	1.22	1.39	1.72	2.02
		15:00	60	59	58	54	61	59	1.02	1.04	1.08	1.20	1.01	1.05	0.52	0.88	0.88	1.43	0.65	0.88	1.55	1.92	2.00	2.60	1.66	1.88
		16:00	50	51	46	45	61	62	1.35	1.35	1.63	1.75	0.99	0.99	1.40	1.40	1.79	2.17	0.55	0.26	3.04	3.07	3.98	4.60	1.54	1.25
		17:00	56	55	56	55	62	62	1.11	1.13	1.13	1.18	0.99	0.98	1.39	1.77	1.16	1.98	0.47	0.10	2.57	2.98	2.36	3.27	1.46	1.08
		18:00	61	60	61	61	62	63	1.00	1.01	1.00	1.00	0.98	0.97	0.46	0.84	0.25	0.38	0.37	0.07	1.47	1.85	1.26	1.39	1.34	1.04
19:00	61	60	62	63	62	63	1.00	1.02	0.98	0.97	0.98	0.96	0.16	0.33	0.10	0.13	0.40	0.06	1.17	1.34	1.09	1.11	1.38	1.03		
20:00	59	58	61	61	61	62	1.03	1.05	1.00	1.01	1.00	0.98	0.20	0.31	0.22	0.60	0.46	0.08	1.22	1.35	1.23	1.62	1.44	1.06		

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekdays (including Tuesdays through Thursdays), Fridays, and Saturdays in 2012. Annual data represents the entire year of 2012, whereas summer data represents the months of June, July, and August of 2012.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix B – 2012 Hourly Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – High Profile Corridors

I-64 Chesapeake Corridor

		AVERAGE SPEED (mph)						TRAVEL TIME INDEX						BUFFER INDEX						PLANNING TIME INDEX							
		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday			
		Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer		
EASTBOUND	Greenbrier Pkwy to George Washington Hwy	TIME START	5:00	62	62	63	63	61	62	0.97	0.98	0.97	0.96	0.99	0.98	0.06	0.07	0.05	0.05	0.04	0.04	1.04	1.05	1.03	1.02	1.04	1.03
		6:00	63	64	63	64	62	62	0.96	0.95	0.97	0.95	0.98	0.97	0.07	0.03	0.34	0.04	0.05	0.05	1.04	1.00	1.30	1.00	1.04	1.03	
		7:00	62	63	61	63	62	63	0.98	0.96	0.99	0.96	0.97	0.96	0.23	0.03	0.80	0.04	0.05	0.05	1.22	1.01	1.76	1.01	1.03	1.03	
		8:00	62	62	62	63	63	64	0.98	0.97	0.97	0.97	0.96	0.95	0.20	0.03	0.12	0.04	0.09	0.06	1.19	1.01	1.10	1.01	1.05	1.02	
		9:00	62	62	62	63	62	63	0.98	0.98	0.97	0.96	0.97	0.97	0.27	0.63	0.08	0.04	0.09	0.16	1.25	1.61	1.05	1.01	1.06	1.13	
		10:00	62	62	62	61	62	60	0.98	0.98	0.98	0.99	0.98	1.01	0.20	0.24	0.16	0.46	0.14	0.37	1.19	1.23	1.14	1.43	1.12	1.35	
		11:00	62	63	62	63	61	59	0.97	0.97	0.97	0.97	0.99	1.04	0.09	0.19	0.12	0.05	0.18	0.47	1.07	1.16	1.09	1.02	1.16	1.46	
		12:00	62	62	62	61	61	60	0.97	0.98	0.97	0.99	0.99	1.03	0.12	0.24	0.33	1.11	0.29	0.63	1.10	1.21	1.31	2.07	1.27	1.61	
		13:00	62	62	61	59	62	61	0.97	0.97	0.99	1.03	0.98	1.00	0.04	0.06	0.47	1.38	0.18	0.38	1.03	1.04	1.45	2.36	1.17	1.36	
		14:00	62	62	60	58	62	61	0.97	0.98	1.01	1.05	0.99	0.99	0.09	0.17	0.38	0.81	0.19	0.23	1.07	1.15	1.38	1.81	1.17	1.22	
		15:00	60	60	54	45	62	61	1.01	1.01	1.19	1.45	0.98	0.99	0.47	0.32	1.29	3.14	0.16	0.19	1.49	1.35	2.54	4.67	1.14	1.17	
		16:00	51	50	45	39	62	61	1.26	1.32	1.61	2.04	0.98	0.99	1.53	1.92	1.63	2.33	0.18	0.31	3.06	3.63	3.69	4.74	1.16	1.29	
17:00	49	47	46	41	62	62	1.33	1.45	1.45	1.70	0.98	0.98	1.65	2.24	2.19	3.72	0.20	0.33	3.41	4.26	4.38	6.61	1.19	1.32			
18:00	57	56	58	54	61	61	1.08	1.11	1.06	1.13	0.99	1.00	1.42	2.18	1.20	2.64	0.42	0.96	2.58	3.43	2.39	3.96	1.42	1.95			
19:00	61	61	61	61	61	61	1.00	0.99	0.99	1.00	0.99	1.00	0.59	0.81	0.23	0.57	0.20	0.41	1.60	1.83	1.22	1.57	1.19	1.39			
20:00	59	60	61	61	61	61	1.02	1.01	0.99	0.99	0.99	1.00	0.38	0.35	0.17	0.07	0.12	0.32	1.42	1.39	1.17	1.07	1.12	1.31			
WESTBOUND	I-264/I-664 to I-464	5:00	62	62	62	63	61	61	0.97	0.98	0.97	0.97	0.99	1.00	0.06	0.06	0.05	0.07	0.04	0.04	1.03	1.04	1.03	1.04	1.03	1.04	
		6:00	62	62	62	63	62	62	0.98	0.97	0.97	0.96	0.98	0.98	0.08	0.05	0.06	0.05	0.04	0.04	1.07	1.03	1.03	1.02	1.03	1.02	
		7:00	50	55	56	57	63	63	1.26	1.10	1.12	1.06	0.97	0.96	1.52	0.88	1.67	2.18	0.17	0.05	3.01	2.23	2.86	3.37	1.14	1.03	
		8:00	51	56	58	60	63	64	1.24	1.09	1.06	1.01	0.97	0.95	1.46	0.65	0.84	1.09	0.08	0.06	3.01	1.98	1.96	2.20	1.05	1.03	
		9:00	62	62	62	63	62	63	0.98	0.98	0.97	0.97	0.97	0.96	0.26	0.12	0.11	0.02	0.27	0.05	1.26	1.11	1.10	1.01	1.25	1.03	
		10:00	62	62	63	63	62	63	0.97	0.97	0.97	0.97	0.97	0.97	0.12	0.13	0.27	0.04	0.30	0.05	1.10	1.11	1.24	1.02	1.27	1.03	
		11:00	63	63	62	63	62	63	0.97	0.97	0.97	0.97	0.98	0.97	0.05	0.05	0.27	0.04	0.36	0.04	1.02	1.02	1.24	1.02	1.34	1.02	
		12:00	63	63	62	62	62	62	0.96	0.96	0.97	0.98	0.98	0.97	0.10	0.04	0.36	0.23	0.40	0.24	1.07	1.01	1.31	1.20	1.37	1.22	
		13:00	63	63	62	62	62	60	0.97	0.97	0.98	0.97	0.98	1.01	0.09	0.11	0.51	0.09	0.55	1.03	1.06	1.08	1.49	1.08	1.52	2.00	
		14:00	62	63	62	61	62	62	0.97	0.97	0.98	0.98	0.97	0.97	0.08	0.08	0.43	0.32	0.41	0.12	1.05	1.04	1.39	1.29	1.38	1.10	
		15:00	61	61	60	56	61	60	0.99	0.99	1.02	1.09	1.00	1.02	0.48	0.45	0.56	1.10	1.04	0.99	1.48	1.45	1.58	2.13	2.01	1.97	
		16:00	55	54	52	45	61	60	1.13	1.15	1.22	1.45	1.00	1.01	1.42	1.97	1.26	1.88	0.96	0.66	2.77	3.43	2.63	3.43	1.93	1.63	
17:00	55	55	55	49	61	59	1.13	1.14	1.14	1.32	1.00	1.03	1.30	1.32	0.84	1.36	1.54	3.41	2.66	2.68	2.03	2.65	2.55	4.44			
18:00	61	63	61	58	61	61	0.99	0.96	1.00	1.06	1.00	1.00	0.54	0.17	0.27	0.78	1.04	1.57	1.55	1.17	1.27	1.80	2.04	2.58			
19:00	62	63	62	62	61	62	0.98	0.96	0.97	0.98	0.99	0.97	0.20	0.08	0.14	0.21	0.43	0.05	1.18	1.06	1.13	1.19	1.42	1.04			
20:00	61	62	62	62	61	61	0.99	0.98	0.98	0.98	0.99	0.99	0.14	0.07	0.23	0.07	0.06	0.07	1.13	1.06	1.22	1.05	1.06	1.06			

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekdays (including Tuesdays through Thursdays), Fridays, and Saturdays in 2012. Annual data represents the entire year of 2012, whereas summer data represents the months of June, July, and August of 2012.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix B – 2012 Hourly Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – High Profile Corridors

I-64/I-564 Corridor

TIME START		AVERAGE SPEED (mph)						TRAVEL TIME INDEX						BUFFER INDEX						PLANNING TIME INDEX						
		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		
		Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	
EASTBOUND	Admiral Taussig Blvd to Northampton Blvd	5:00	61	61	61	61	61	1.00	1.00	1.00	0.99	1.00	1.00	0.06	0.06	0.05	0.05	0.05	0.06	1.07	1.06	1.07	1.06	1.06	1.07	
		6:00	62	63	62	63	61	62	0.98	0.98	0.98	0.98	0.99	0.98	0.06	0.05	0.06	0.06	0.07	0.07	1.05	1.04	1.05	1.05	1.08	1.07
		7:00	60	61	61	62	62	62	1.01	0.99	0.99	0.98	0.99	0.98	0.34	0.05	0.13	0.04	0.07	0.07	1.35	1.06	1.14	1.05	1.07	1.06
		8:00	60	61	61	61	62	62	1.03	1.00	1.01	0.99	0.98	0.98	0.37	0.09	0.36	0.06	0.09	0.08	1.42	1.13	1.39	1.08	1.08	1.07
		9:00	61	61	61	61	62	62	1.00	1.00	1.00	1.00	0.98	0.98	0.11	0.09	0.23	0.08	0.07	0.07	1.11	1.09	1.23	1.09	1.06	1.06
		10:00	61	61	61	59	61	62	1.00	0.99	1.01	1.04	0.99	0.98	0.14	0.07	0.66	1.47	0.21	0.07	1.14	1.07	1.67	2.45	1.20	1.06
		11:00	61	61	60	54	61	62	1.00	1.01	1.03	1.13	0.99	0.98	0.13	0.23	1.08	3.79	0.16	0.07	1.14	1.23	2.07	4.77	1.15	1.06
		12:00	61	60	59	55	61	61	1.01	1.02	1.05	1.11	1.01	0.99	0.24	0.43	0.96	1.56	0.37	0.09	1.23	1.43	1.98	2.61	1.37	1.10
		13:00	61	60	59	54	61	61	1.01	1.02	1.05	1.13	1.00	1.00	0.25	0.45	0.52	0.85	0.30	0.13	1.25	1.45	1.54	1.93	1.30	1.14
		14:00	60	60	59	57	61	61	1.03	1.03	1.05	1.07	1.00	1.00	0.53	0.48	0.51	0.80	0.40	0.20	1.55	1.51	1.56	1.86	1.39	1.20
		15:00	60	60	60	59	61	61	1.03	1.02	1.03	1.04	1.00	1.01	0.56	0.50	0.52	0.54	0.30	0.40	1.61	1.54	1.54	1.56	1.29	1.39
		16:00	46	48	55	56	61	60	1.34	1.28	1.12	1.12	1.00	1.03	1.23	1.38	0.69	1.00	0.48	1.18	3.01	3.24	1.91	2.25	1.47	2.16
		17:00	41	43	55	54	61	61	1.53	1.48	1.12	1.15	1.00	0.99	1.17	1.15	0.76	1.38	0.21	0.09	3.34	3.27	2.02	2.72	1.21	1.09
18:00	58	59	61	59	61	61	1.06	1.04	1.02	1.04	1.00	0.99	0.63	0.67	0.29	0.60	0.22	0.27	1.74	1.76	1.31	1.63	1.22	1.26		
19:00	61	61	61	60	61	61	1.01	1.00	1.01	1.01	1.00	0.99	0.13	0.13	0.33	0.25	0.09	0.10	1.15	1.17	1.34	1.26	1.10	1.10		
20:00	60	61	60	61	61	61	1.02	1.01	1.01	1.01	1.01	0.99	0.11	0.08	0.27	0.13	0.10	0.11	1.14	1.10	1.29	1.15	1.10	1.12		
WESTBOUND	Northampton Blvd to Admiral Taussig Blvd	5:00	60	61	60	61	61	61	1.03	1.02	1.01	1.00	1.00	1.00	0.19	0.09	0.15	0.08	0.07	0.08	1.25	1.14	1.17	1.09	1.07	1.08
		6:00	57	60	60	62	62	63	1.10	1.04	1.04	1.00	0.99	0.98	0.90	0.39	0.56	0.07	0.06	0.06	2.15	1.58	1.64	1.13	1.06	1.05
		7:00	56	58	60	61	62	62	1.09	1.06	1.02	1.00	0.99	0.99	0.83	0.53	0.19	0.06	0.09	0.09	2.01	1.69	1.22	1.09	1.06	1.07
		8:00	60	60	61	61	62	63	1.02	1.02	1.00	1.00	0.99	0.98	0.40	0.47	0.06	0.05	0.20	0.06	1.42	1.48	1.07	1.06	1.17	1.04
		9:00	61	61	61	61	62	62	0.99	1.00	0.99	1.00	0.99	0.99	0.18	0.05	0.05	0.05	0.18	0.07	1.18	1.05	1.05	1.04	1.15	1.06
		10:00	61	61	61	61	61	61	0.99	1.00	0.99	0.99	0.99	0.99	0.13	0.08	0.05	0.06	0.20	0.27	1.12	1.08	1.05	1.05	1.17	1.25
		11:00	61	61	61	61	61	61	0.99	1.00	0.99	1.00	0.99	1.00	0.15	0.39	0.12	0.31	0.34	0.26	1.14	1.40	1.11	1.31	1.31	1.25
		12:00	61	61	61	60	61	61	0.99	1.00	1.00	1.03	0.99	0.99	0.08	0.14	0.61	1.68	0.25	0.23	1.09	1.14	1.61	2.67	1.23	1.22
		13:00	61	61	60	59	62	62	0.99	1.00	1.02	1.06	0.99	0.99	0.13	0.22	1.18	2.10	0.10	0.09	1.12	1.22	2.19	3.10	1.08	1.08
		14:00	61	61	60	59	61	61	0.99	1.00	1.03	1.04	0.99	1.00	0.16	0.23	1.13	1.14	0.12	0.14	1.16	1.22	2.16	2.17	1.10	1.13
		15:00	61	61	59	58	61	62	0.99	1.00	1.07	1.08	0.99	0.99	0.20	0.15	1.39	1.17	0.17	0.08	1.19	1.15	2.48	2.27	1.16	1.08
		16:00	61	61	58	58	61	61	1.00	1.01	1.08	1.09	0.99	0.99	0.48	0.76	1.43	1.09	0.08	0.09	1.48	1.77	2.60	2.25	1.08	1.08
		17:00	60	60	58	58	61	62	1.02	1.03	1.07	1.08	0.99	0.99	0.56	0.92	1.38	1.07	0.14	0.07	1.59	1.96	2.56	2.23	1.15	1.07
18:00	61	61	60	61	61	62	1.01	1.02	1.02	1.01	1.00	0.99	0.30	0.67	0.68	0.36	0.13	0.07	1.32	1.68	1.72	1.39	1.13	1.08		
19:00	60	60	61	61	61	61	1.02	1.02	1.01	1.00	1.00	0.99	0.29	0.52	0.29	0.12	0.11	0.12	1.30	1.55	1.31	1.14	1.11	1.11		
20:00	59	58	60	61	61	61	1.04	1.05	1.02	1.01	1.01	1.01	0.26	0.38	0.12	0.09	0.11	0.12	1.28	1.41	1.14	1.11	1.12	1.13		

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekdays (including Tuesdays through Thursdays), Fridays, and Saturdays in 2012. Annual data represents the entire year of 2012, whereas summer data represents the months of June, July, and August of 2012.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix B – 2012 Hourly Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – High Profile Corridors

I-64 in the I-64/I-264 Interchange Area

TIME START		AVERAGE SPEED (mph)						TRAVEL TIME INDEX						BUFFER INDEX						PLANNING TIME INDEX					
		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday	
		Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer
I-64 EASTBOUND Northampton Blvd to Indian River Rd	5:00	61	61	61	61	61	61	0.98	0.98	0.98	0.97	0.99	0.98	0.05	0.06	0.05	0.05	0.06	0.06	1.04	1.04	1.04	1.04	1.05	1.04
	6:00	62	62	62	62	61	62	0.97	0.96	0.96	0.96	0.97	0.97	0.05	0.05	0.06	0.08	0.06	0.05	1.02	1.01	1.04	1.05	1.04	1.03
	7:00	61	61	61	61	62	62	0.98	0.98	0.98	0.98	0.96	0.96	0.11	0.08	0.13	0.17	0.06	0.08	1.10	1.07	1.11	1.15	1.02	1.04
	8:00	59	59	60	60	62	63	1.02	1.01	1.00	1.00	0.96	0.95	0.26	0.15	0.24	0.32	0.08	0.07	1.29	1.18	1.26	1.33	1.04	1.03
	9:00	61	61	61	60	62	63	0.99	0.98	0.98	0.99	0.96	0.96	0.17	0.08	0.08	0.13	0.07	0.07	1.16	1.07	1.06	1.12	1.03	1.03
	10:00	61	61	61	60	62	62	0.97	0.98	0.98	1.00	0.97	0.96	0.08	0.12	0.23	0.41	0.19	0.07	1.06	1.10	1.21	1.39	1.15	1.04
	11:00	61	61	60	58	62	62	0.97	0.99	1.00	1.05	0.97	0.96	0.10	0.21	0.16	0.35	0.11	0.06	1.07	1.18	1.15	1.34	1.08	1.04
	12:00	61	60	60	58	61	61	0.98	1.00	1.01	1.05	0.98	0.98	0.13	0.30	0.29	0.51	0.19	0.14	1.11	1.28	1.30	1.53	1.16	1.12
	13:00	61	60	60	58	61	61	0.98	1.00	1.01	1.04	0.99	0.99	0.17	0.36	0.23	0.31	0.26	0.14	1.15	1.34	1.22	1.31	1.25	1.14
	14:00	60	60	60	59	61	61	0.99	1.00	1.00	1.03	0.98	0.98	0.25	0.18	0.20	0.23	0.24	0.15	1.24	1.18	1.20	1.24	1.22	1.14
	15:00	60	59	60	59	61	61	1.01	1.01	1.00	1.02	0.98	0.98	0.30	0.58	0.24	0.26	0.18	0.11	1.31	1.60	1.24	1.26	1.16	1.10
	16:00	52	53	56	57	61	60	1.17	1.16	1.07	1.06	0.98	0.99	0.80	0.86	0.48	0.29	0.22	0.28	2.08	2.17	1.58	1.37	1.19	1.25
	17:00	46	47	53	53	61	61	1.33	1.30	1.14	1.15	0.98	0.98	0.99	0.89	0.77	0.65	0.21	0.15	2.64	2.49	2.03	1.89	1.19	1.13
18:00	56	57	59	59	60	61	1.07	1.05	1.02	1.02	0.99	0.99	0.73	0.69	0.40	0.44	0.40	1.10	1.89	1.83	1.46	1.49	1.39	2.09	
19:00	61	61	61	61	61	60	0.98	0.97	0.98	0.98	0.98	0.99	0.14	0.22	0.10	0.13	0.28	0.76	1.14	1.22	1.08	1.11	1.25	1.73	
20:00	60	61	60	60	60	60	0.99	0.99	0.99	0.99	0.99	0.99	0.15	0.18	0.09	0.11	0.09	0.11	1.16	1.19	1.08	1.10	1.08	1.10	
I-64 WESTBOUND Indian River Rd to Northampton Blvd	5:00	62	62	62	62	62	62	0.99	0.99	0.98	0.98	0.98	0.98	0.08	0.07	0.06	0.08	0.06	0.08	1.06	1.06	1.05	1.06	1.05	1.06
	6:00	61	62	62	62	63	64	1.00	0.99	0.98	0.98	0.97	0.95	0.30	0.23	0.10	0.07	0.05	0.05	1.30	1.23	1.08	1.05	1.03	1.02
	7:00	52	55	57	59	63	63	1.17	1.12	1.07	1.04	0.96	0.96	0.93	0.64	0.90	0.39	0.07	0.09	2.23	1.89	2.01	1.46	1.03	1.05
	8:00	54	55	57	59	63	63	1.15	1.12	1.07	1.03	0.97	0.96	0.73	0.56	0.81	0.65	0.11	0.06	1.98	1.79	1.95	1.77	1.08	1.03
	9:00	60	60	61	61	62	61	1.01	1.01	1.00	1.00	0.98	0.99	0.31	0.25	0.32	0.71	0.31	0.52	1.33	1.27	1.31	1.71	1.28	1.49
	10:00	62	62	62	62	62	62	0.98	0.98	0.98	0.98	0.98	0.99	0.09	0.14	0.06	0.09	0.14	0.37	1.07	1.13	1.04	1.07	1.12	1.34
	11:00	62	62	62	60	62	62	0.98	0.99	0.99	1.01	0.98	0.98	0.13	0.34	0.42	1.22	0.14	0.08	1.12	1.32	1.39	2.18	1.11	1.06
	12:00	62	62	62	61	63	63	0.98	0.98	0.98	0.99	0.97	0.97	0.13	0.09	0.08	0.14	0.16	0.08	1.12	1.08	1.06	1.12	1.13	1.06
	13:00	62	62	62	62	62	62	0.98	0.98	0.98	0.98	0.98	0.98	0.08	0.04	0.23	0.06	0.20	0.06	1.07	1.03	1.21	1.04	1.19	1.05
	14:00	62	62	61	61	62	62	0.98	0.98	1.00	1.00	0.99	0.98	0.14	0.06	0.72	0.91	0.19	0.09	1.12	1.04	1.70	1.90	1.17	1.08
	15:00	62	61	61	60	62	63	0.98	0.99	0.99	1.01	0.98	0.98	0.08	0.11	0.22	0.42	0.31	0.08	1.07	1.09	1.21	1.41	1.29	1.07
	16:00	60	60	60	59	62	61	1.02	1.02	1.01	1.04	0.99	0.99	0.40	0.36	0.28	0.54	0.18	0.43	1.42	1.39	1.29	1.56	1.16	1.41
	17:00	54	53	57	56	61	62	1.16	1.18	1.07	1.11	0.99	0.99	1.31	1.49	0.80	1.29	0.27	0.20	2.64	2.88	1.93	2.46	1.26	1.18
18:00	57	57	60	61	62	63	1.08	1.07	1.02	1.00	0.98	0.97	1.17	1.21	0.51	0.08	0.09	0.07	2.34	2.39	1.56	1.11	1.08	1.06	
19:00	59	61	61	62	62	63	1.04	1.02	0.99	0.98	0.98	0.97	0.82	0.70	0.20	0.14	0.08	0.07	1.85	1.70	1.20	1.13	1.06	1.06	
20:00	59	58	61	61	61	61	1.04	1.06	0.99	1.00	0.99	1.00	0.53	0.59	0.09	0.11	0.08	0.11	1.56	1.63	1.08	1.11	1.08	1.10	

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekdays (including Tuesdays through Thursdays), Fridays, and Saturdays in 2012. Annual data represents the entire year of 2012, whereas summer data represents the months of June, July, and August of 2012.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix B – 2012 Hourly Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – High Profile Corridors

I-264 in the I-64/I-264 Interchange Area

TIME START	AVERAGE SPEED (mph)						TRAVEL TIME INDEX						BUFFER INDEX						PLANNING TIME INDEX					
	Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday	
	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer
I-264 EASTBOUND Military Hwy to Witchduck Rd	5:00	62	62	62	62	61	1.00	1.00	1.00	1.00	1.01	1.01	0.05	0.05	0.05	0.05	0.05	0.04	1.05	1.05	1.06	1.06	1.05	1.05
	6:00	58	64	63	64	63	1.08	0.97	0.98	0.97	0.99	0.99	0.90	0.06	0.06	0.05	0.07	0.06	2.05	1.04	1.04	1.03	1.06	1.05
	7:00	63	63	63	63	64	0.99	0.98	0.99	0.98	0.98	0.97	0.16	0.05	0.06	0.05	0.07	0.06	1.15	1.04	1.04	1.04	1.05	1.04
	8:00	62	62	63	63	64	1.00	1.00	0.99	0.98	0.98	0.97	0.07	0.06	0.06	0.05	0.07	0.06	1.07	1.06	1.06	1.04	1.05	1.04
	9:00	63	62	63	63	64	0.99	1.00	0.99	0.99	0.97	0.97	0.06	0.07	0.06	0.06	0.10	0.06	1.06	1.07	1.05	1.05	1.08	1.04
	10:00	63	62	62	62	64	0.99	0.99	1.00	1.00	0.98	0.98	0.06	0.07	0.37	0.31	0.08	0.10	1.05	1.05	1.36	1.31	1.06	1.07
	11:00	63	62	62	62	63	0.99	0.99	1.00	1.00	0.98	0.99	0.13	0.33	0.24	0.23	0.09	0.09	1.11	1.32	1.23	1.23	1.06	1.06
	12:00	62	62	63	62	63	1.00	1.01	0.99	1.00	0.99	1.02	0.24	0.55	0.09	0.08	0.27	0.77	1.23	1.55	1.08	1.08	1.25	1.73
	13:00	63	62	62	63	63	0.99	1.01	1.00	0.99	0.98	1.00	0.12	0.31	0.26	0.04	0.25	0.75	1.11	1.30	1.26	1.04	1.23	1.72
	14:00	63	62	63	63	64	0.99	1.00	0.99	0.99	0.97	0.98	0.29	0.43	0.15	0.08	0.10	0.12	1.28	1.41	1.14	1.08	1.07	1.09
	15:00	61	60	62	60	64	1.03	1.04	1.01	1.04	0.98	0.98	1.06	1.19	0.25	0.40	0.31	0.09	2.08	2.23	1.25	1.40	1.28	1.06
	16:00	54	52	58	56	64	1.17	1.20	1.08	1.13	0.97	0.97	1.29	1.25	0.80	1.73	0.24	0.14	2.60	2.60	1.88	2.84	1.20	1.11
I-264 WESTBOUND Witchduck Rd to I-64	17:00	49	46	56	53	63	1.31	1.39	1.13	1.20	0.98	0.98	1.39	1.47	0.90	1.20	0.08	0.09	2.99	3.14	2.11	2.44	1.06	1.07
	18:00	58	57	61	61	63	1.08	1.10	1.02	1.01	0.99	0.98	0.90	0.89	0.34	0.31	0.10	0.12	2.05	2.04	1.36	1.32	1.09	1.11
	19:00	63	64	63	63	64	0.99	0.98	0.99	0.99	0.98	0.98	0.16	0.09	0.10	0.10	0.08	0.08	1.15	1.08	1.09	1.10	1.07	1.06
	20:00	62	62	62	62	63	1.00	0.99	1.00	1.00	0.99	0.99	0.07	0.08	0.08	0.09	0.09	0.10	1.07	1.08	1.08	1.08	1.07	1.09
	5:00	65	65	65	65	64	0.97	0.97	0.97	0.97	0.98	0.99	0.06	0.06	0.06	0.06	0.06	0.08	1.03	1.03	1.03	1.03	1.04	1.05
	6:00	64	65	65	65	64	0.97	0.96	0.97	0.97	0.99	0.98	0.06	0.06	0.08	0.16	0.04	0.04	1.04	1.03	1.05	1.13	1.03	1.03
	7:00	63	63	62	62	64	1.00	0.99	1.00	1.02	0.98	0.98	0.11	0.06	0.31	0.85	0.06	0.06	1.11	1.06	1.31	1.85	1.04	1.04
	8:00	62	63	62	62	65	1.00	0.99	1.01	1.00	0.97	0.97	0.19	0.07	0.43	0.21	0.07	0.07	1.19	1.07	1.44	1.23	1.03	1.03
	9:00	64	63	64	64	65	0.98	0.99	0.98	0.98	0.97	0.97	0.07	0.06	0.05	0.05	0.07	0.08	1.05	1.04	1.03	1.03	1.04	1.04
	10:00	64	64	64	64	64	0.98	0.98	0.98	0.98	0.98	0.98	0.06	0.06	0.06	0.05	0.08	0.07	1.04	1.04	1.04	1.03	1.06	1.05
	11:00	64	64	64	63	64	0.98	0.98	0.98	0.99	0.97	0.97	0.06	0.06	0.06	0.06	0.07	0.06	1.04	1.04	1.04	1.04	1.04	1.03
	12:00	63	63	64	63	64	0.99	0.99	0.98	0.99	0.98	0.97	0.23	0.06	0.07	0.07	0.07	0.06	1.21	1.04	1.05	1.05	1.04	1.04
	13:00	64	63	63	63	65	0.99	0.99	0.99	1.00	0.97	0.97	0.07	0.08	0.16	0.36	0.07	0.07	1.05	1.06	1.14	1.34	1.04	1.04
	14:00	63	63	64	63	64	0.99	0.99	0.99	0.99	0.97	0.98	0.08	0.09	0.08	0.12	0.07	0.07	1.07	1.08	1.06	1.10	1.04	1.03
	15:00	63	63	63	61	64	0.99	0.99	1.00	1.03	0.97	0.97	0.31	0.12	0.42	0.50	0.07	0.06	1.29	1.11	1.41	1.50	1.04	1.04
	16:00	60	61	62	61	64	1.05	1.03	1.02	1.03	0.98	0.98	1.85	1.00	1.38	1.59	0.08	0.11	2.96	2.09	2.40	2.62	1.06	1.09
	17:00	57	56	62	62	64	1.10	1.12	1.01	1.02	0.98	0.98	2.39	3.13	1.07	2.13	0.10	0.16	3.69	4.53	2.07	3.13	1.09	1.14
	18:00	61	63	63	64	63	1.03	1.01	0.99	0.98	0.99	0.98	0.98	0.49	0.45	0.09	0.08	0.06	2.03	1.53	1.44	1.07	1.06	1.04
	19:00	63	64	63	63	63	1.00	0.98	1.00	0.99	1.00	0.98	0.20	0.29	0.26	0.11	0.08	0.06	1.19	1.29	1.25	1.10	1.07	1.06
	20:00	62	62	62	62	61	1.01	1.01	1.01	1.01	1.01	1.02	0.11	0.23	0.08	0.10	0.09	0.14	1.11	1.24	1.09	1.10	1.10	1.16

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekdays (including Tuesdays through Thursdays), Fridays, and Saturdays in 2012. Annual data represents the entire year of 2012, whereas summer data represents the months of June, July, and August of 2012.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix B – 2012 Hourly Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – High Profile Corridors

I-64 Peninsula Corridor

TIME START		AVERAGE SPEED (mph)						TRAVEL TIME INDEX						BUFFER INDEX						PLANNING TIME INDEX						
		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		
		Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	
EASTBOUND	Route 143 (Exit 247) to Jefferson Ave	5:00	67	67	67	67	66	67	0.96	0.96	0.96	0.96	0.97	0.97	0.05	0.04	0.05	0.05	0.04	0.04	1.01	1.01	1.01	1.01	1.02	1.02
		6:00	68	68	68	68	67	68	0.95	0.95	0.95	0.94	0.96	0.95	0.25	0.12	0.04	0.05	0.05	0.05	1.19	1.06	0.99	0.99	1.02	1.02
		7:00	65	65	67	67	67	67	1.00	1.00	0.96	0.96	0.95	0.96	0.74	0.89	0.05	0.02	0.07	0.12	1.72	1.88	1.03	1.00	1.02	1.07
		8:00	64	63	67	67	67	65	1.01	1.02	0.96	0.96	0.96	0.99	0.81	0.98	0.04	0.04	0.55	2.01	1.80	1.99	1.00	1.00	1.48	2.87
		9:00	67	67	67	67	66	62	0.97	0.97	0.95	0.96	0.97	1.05	0.28	0.12	0.05	0.04	0.66	2.03	1.24	1.05	1.01	1.00	1.59	2.91
		10:00	67	66	67	67	63	56	0.97	0.97	0.96	0.96	1.03	1.17	0.34	0.54	0.05	0.05	1.29	2.22	1.29	1.49	1.00	1.01	2.26	3.22
		11:00	67	67	67	66	61	50	0.97	0.97	0.96	0.98	1.09	1.37	0.26	0.06	0.09	0.20	1.69	2.15	1.23	1.04	1.05	1.16	2.72	3.27
		12:00	66	67	65	61	60	45	0.97	0.97	0.99	1.06	1.13	1.53	0.32	0.08	0.41	1.18	1.13	2.32	1.28	1.05	1.38	2.15	2.21	3.55
		13:00	66	66	64	57	59	41	0.97	0.97	1.03	1.17	1.18	1.71	0.38	0.13	0.92	2.77	1.45	2.50	1.34	1.11	1.90	3.80	2.52	3.74
		14:00	66	65	59	49	58	40	0.98	0.99	1.15	1.47	1.21	1.78	0.42	0.30	1.48	3.53	1.27	1.92	1.39	1.28	2.59	4.85	2.35	3.14
		15:00	63	59	54	43	58	41	1.02	1.11	1.35	1.74	1.19	1.71	0.80	1.48	1.36	1.83	1.19	2.15	1.80	2.52	2.87	3.59	2.27	3.38
		16:00	57	48	48	40	59	43	1.19	1.47	1.63	1.99	1.17	1.64	1.35	2.13	1.24	1.32	0.75	1.55	2.58	3.53	3.25	3.57	1.85	2.78
		17:00	57	48	49	40	59	45	1.20	1.46	1.54	1.93	1.14	1.53	1.51	1.77	1.16	1.41	0.75	1.46	2.82	3.22	2.99	3.52	1.85	2.69
18:00	63	60	57	50	62	54	1.04	1.08	1.17	1.32	1.06	1.22	1.13	1.09	1.21	1.42	0.66	1.36	2.19	2.19	2.45	2.74	1.70	2.46		
19:00	66	67	62	57	64	62	0.97	0.96	1.04	1.14	1.01	1.04	0.18	0.19	1.04	1.77	0.38	0.75	1.15	1.15	2.09	2.87	1.38	1.75		
20:00	66	65	65	61	65	64	0.98	0.98	1.00	1.05	0.99	1.00	0.19	0.26	0.69	1.48	0.15	0.25	1.16	1.24	1.67	2.48	1.13	1.23		
WESTBOUND	Oyster Point Rd to Fort Eustis Blvd	5:00	66	66	66	65	65	66	0.97	0.97	0.97	0.98	0.98	0.97	0.05	0.05	0.04	0.04	0.04	0.06	1.02	1.03	1.02	1.02	1.03	1.04
		6:00	66	66	66	67	65	66	0.97	0.97	0.96	0.96	0.98	0.97	0.14	0.17	0.05	0.04	0.10	0.17	1.11	1.14	1.01	1.01	1.08	1.15
		7:00	64	64	66	66	66	65	0.99	0.99	0.97	0.97	0.97	0.98	0.23	0.29	0.04	0.07	0.13	0.27	1.22	1.29	1.02	1.05	1.10	1.23
		8:00	64	64	66	66	64	60	1.00	1.00	0.97	0.97	1.00	1.09	0.56	0.64	0.02	0.02	0.53	1.13	1.55	1.63	1.01	1.01	1.49	2.06
		9:00	65	64	66	66	60	46	0.98	1.00	0.97	0.97	1.10	1.46	0.46	0.88	0.05	0.08	1.05	3.18	1.44	1.86	1.03	1.05	2.06	4.25
		10:00	65	63	64	58	54	32	0.99	1.01	1.01	1.12	1.35	2.26	0.55	1.16	0.42	1.24	2.02	4.76	1.53	2.15	1.40	2.24	3.31	6.47
		11:00	65	64	61	50	49	27	0.99	0.99	1.09	1.34	1.58	2.77	0.68	0.30	0.78	1.94	2.32	4.05	1.66	1.29	1.82	3.07	3.84	5.98
		12:00	65	63	59	46	48	26	0.99	1.01	1.14	1.50	1.67	2.94	0.73	1.01	1.08	3.33	2.89	5.94	1.70	1.99	2.19	4.66	4.54	8.18
		13:00	65	64	58	45	50	30	0.98	1.00	1.15	1.50	1.53	2.51	0.32	0.89	1.32	3.26	3.12	5.82	1.28	1.85	2.52	4.77	4.63	7.73
		14:00	65	64	55	42	53	38	0.98	1.00	1.24	1.63	1.29	1.82	0.31	0.88	1.97	3.37	2.65	4.49	1.28	1.83	3.40	5.11	3.92	5.99
		15:00	65	63	51	45	60	55	0.99	1.03	1.30	1.47	1.07	1.17	0.43	1.37	2.00	2.95	1.17	1.68	1.42	2.35	3.75	5.02	2.21	2.72
		16:00	61	58	42	43	65	64	1.05	1.10	1.65	1.52	0.99	1.00	0.84	1.49	3.01	3.18	0.29	0.36	1.94	2.69	6.03	6.38	1.28	1.34
		17:00	59	57	44	48	66	67	1.09	1.12	1.56	1.35	0.97	0.95	0.75	0.91	3.00	2.78	0.12	0.06	1.90	2.14	5.69	5.31	1.10	1.04
18:00	65	65	55	60	65	64	0.99	0.98	1.18	1.07	0.98	0.99	0.35	0.41	1.84	0.92	0.53	1.84	1.34	1.40	3.28	2.17	1.50	2.78		
19:00	66	67	64	65	65	63	0.98	0.96	1.00	0.98	0.99	1.02	0.35	0.04	0.78	0.21	0.69	2.57	1.32	1.02	1.79	1.21	1.66	3.49		
20:00	65	66	65	65	65	64	0.98	0.98	0.98	0.98	0.98	0.99	0.12	0.06	0.09	0.15	0.15	0.41	1.10	1.05	1.07	1.13	1.13	1.38		

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekdays (including Tuesdays through Thursdays), Fridays, and Saturdays in 2012. Annual data represents the entire year of 2012, whereas summer data represents the months of June, July, and August of 2012.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix B – 2012 Hourly Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – High Profile Corridors

Route 17 Peninsula Corridor

TIME START			AVERAGE SPEED (mph)						TRAVEL TIME INDEX						BUFFER INDEX						PLANNING TIME INDEX					
			Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday	
			Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer
NORTHBOUND	I-64 to Denbigh Blvd	5:00	44	44	45	44	45	45	1.04	1.04	1.03	1.03	1.02	1.02	0.06	0.06	0.08	0.11	0.03	0.03	1.10	1.11	1.11	1.14	1.05	1.05
		6:00	43	43	43	43	44	44	1.08	1.08	1.08	1.08	1.04	1.04	0.16	0.14	0.14	0.11	0.08	0.07	1.26	1.23	1.23	1.20	1.11	1.11
		7:00	39	40	40	40	44	43	1.18	1.16	1.16	1.15	1.05	1.06	0.39	0.34	0.41	0.38	0.11	0.15	1.63	1.57	1.64	1.60	1.17	1.21
		8:00	39	39	39	39	42	42	1.20	1.20	1.19	1.20	1.09	1.11	0.36	0.36	0.36	0.40	0.16	0.24	1.63	1.62	1.62	1.67	1.26	1.36
		9:00	39	39	39	38	40	40	1.18	1.19	1.20	1.21	1.15	1.15	0.37	0.36	0.41	0.39	0.16	0.23	1.61	1.62	1.68	1.67	1.34	1.42
		10:00	39	39	39	38	39	38	1.18	1.19	1.20	1.22	1.19	1.21	0.36	0.39	0.41	0.49	0.26	0.38	1.59	1.63	1.68	1.80	1.51	1.66
		11:00	39	38	38	37	38	37	1.20	1.22	1.22	1.25	1.23	1.24	0.41	0.46	0.44	0.55	0.39	0.57	1.69	1.76	1.75	1.91	1.70	1.92
		12:00	38	37	37	36	37	37	1.23	1.25	1.27	1.30	1.25	1.25	0.42	0.48	0.47	0.57	0.41	0.45	1.75	1.83	1.85	2.01	1.76	1.81
		13:00	38	37	36	36	37	37	1.23	1.24	1.31	1.32	1.25	1.25	0.42	0.45	0.56	0.64	0.39	0.57	1.74	1.80	2.04	2.14	1.73	1.95
		14:00	38	38	35	35	38	39	1.23	1.23	1.33	1.36	1.20	1.20	0.43	0.43	0.56	0.69	0.24	0.23	1.76	1.76	2.05	2.22	1.50	1.50
		15:00	37	37	33	32	39	39	1.26	1.24	1.41	1.46	1.19	1.18	0.46	0.40	0.70	0.86	0.34	0.36	1.85	1.77	2.39	2.63	1.60	1.62
		16:00	34	36	30	31	40	40	1.39	1.28	1.59	1.54	1.16	1.15	0.60	0.37	0.78	0.70	0.22	0.18	2.27	1.93	2.89	2.77	1.42	1.37
		17:00	34	35	33	34	41	42	1.38	1.31	1.42	1.35	1.12	1.11	0.76	0.65	0.82	0.64	0.16	0.18	2.45	2.29	2.60	2.34	1.29	1.32
18:00	38	39	37	38	42	42	1.21	1.19	1.24	1.22	1.11	1.10	0.44	0.43	0.41	0.33	0.15	0.16	1.76	1.74	1.77	1.64	1.27	1.29		
19:00	41	41	40	41	42	43	1.12	1.12	1.14	1.14	1.09	1.08	0.14	0.15	0.16	0.17	0.08	0.09	1.28	1.29	1.32	1.34	1.18	1.19		
20:00	42	42	42	42	43	43	1.10	1.10	1.10	1.11	1.08	1.08	0.08	0.11	0.08	0.11	0.07	0.07	1.20	1.22	1.19	1.23	1.15	1.15		
SOUTHBOUND	Denbigh Blvd to I-64	5:00	45	45	45	45	46	45	1.01	1.01	1.01	1.01	0.99	1.00	0.06	0.05	0.09	0.08	0.06	0.06	1.07	1.05	1.09	1.09	1.05	1.05
		6:00	43	43	44	44	45	45	1.05	1.05	1.03	1.03	1.01	1.02	0.19	0.18	0.19	0.19	0.08	0.10	1.26	1.24	1.23	1.22	1.10	1.11
		7:00	39	40	40	41	43	43	1.17	1.14	1.13	1.11	1.06	1.05	0.39	0.33	0.33	0.34	0.10	0.12	1.66	1.58	1.52	1.53	1.16	1.19
		8:00	39	39	40	41	42	42	1.18	1.16	1.14	1.12	1.09	1.10	0.48	0.39	0.32	0.29	0.14	0.14	1.76	1.66	1.53	1.49	1.25	1.25
		9:00	39	39	39	39	41	42	1.18	1.18	1.18	1.18	1.11	1.10	0.41	0.51	0.39	0.41	0.17	0.10	1.67	1.80	1.65	1.68	1.32	1.23
		10:00	38	39	39	39	40	40	1.20	1.21	1.19	1.19	1.14	1.14	0.46	0.65	0.34	0.45	0.15	0.15	1.76	2.00	1.62	1.76	1.32	1.32
		11:00	38	38	38	38	38	39	1.21	1.22	1.21	1.22	1.20	1.19	0.45	0.63	0.42	0.52	0.23	0.24	1.77	2.00	1.75	1.87	1.49	1.50
		12:00	38	38	37	37	37	38	1.22	1.23	1.24	1.24	1.24	1.20	0.50	0.79	0.51	0.63	0.30	0.22	1.86	2.22	1.89	2.05	1.63	1.52
		13:00	38	38	37	37	38	38	1.21	1.21	1.24	1.25	1.20	1.20	0.53	0.78	0.44	0.55	0.23	0.36	1.86	2.17	1.82	1.96	1.50	1.66
		14:00	38	38	37	36	39	39	1.22	1.22	1.27	1.29	1.19	1.17	0.42	0.58	0.48	0.56	0.16	0.19	1.76	1.96	1.90	2.01	1.40	1.42
		15:00	38	38	38	38	39	40	1.23	1.20	1.23	1.23	1.16	1.15	0.38	0.45	0.50	0.65	0.15	0.21	1.73	1.82	1.88	2.08	1.35	1.42
		16:00	38	38	38	38	40	40	1.22	1.20	1.22	1.21	1.15	1.14	0.38	0.47	0.45	0.38	0.19	0.26	1.71	1.82	1.81	1.73	1.39	1.46
		17:00	38	38	38	38	41	41	1.21	1.20	1.21	1.21	1.12	1.11	0.40	0.56	0.46	0.55	0.15	0.16	1.71	1.91	1.79	1.92	1.29	1.31
18:00	39	40	40	40	41	42	1.17	1.15	1.16	1.16	1.10	1.09	0.26	0.32	0.27	0.36	0.12	0.14	1.49	1.56	1.49	1.59	1.23	1.25		
19:00	42	42	41	41	42	42	1.10	1.09	1.12	1.12	1.08	1.08	0.11	0.13	0.14	0.17	0.08	0.09	1.22	1.24	1.29	1.31	1.17	1.18		
20:00	42	42	42	42	42	42	1.09	1.09	1.08	1.09	1.08	1.08	0.08	0.10	0.12	0.19	0.06	0.07	1.18	1.21	1.22	1.30	1.15	1.16		

Source: HRTPO analysis of INRIX data.

Data in each column represents an average of weekdays (including Tuesdays through Thursdays), Fridays, and Saturdays in 2012. Annual data represents the entire year of 2012, whereas summer data represents the months of June, July, and August of 2012.

Travel Time Index is a metric used to describe levels of congestion by comparing travel conditions during the peak travel period with conditions during free-flow conditions. Travel Time Index = Average Travel Time / Free-flow Travel Time.

Buffer Index measures travel time reliability compared to average conditions. Buffer Index = (95th percentile Travel Time – Average Travel Time)/Average Travel Time.

Planning Time Index measures travel time reliability compared to free-flow conditions, and as such accounts for both typical delay and atypical delay. Planning Time Index = 95th percentile Travel Time / Free-flow Travel Time.

Appendix B – 2012 Hourly Speeds, Travel Time Indices, Buffer Indices, and Planning Time Indices – High Profile Corridors

Gilmerton Bridge Corridor

		AVERAGE SPEED (mph)						TRAVEL TIME INDEX						BUFFER INDEX						PLANNING TIME INDEX							
		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday		Weekday		Friday		Saturday			
		Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer	Annual	Summer		
EASTBOUND	George Washington Hwy to Bainbridge Blvd	TIME START	5:00	41	41	41	41	39	40	1.07	1.07	1.08	1.08	1.12	1.11	0.03	0.01	0.06	0.03	0.02	0.01	1.11	1.09	1.15	1.12	1.14	1.13
		6:00	38	39	37	37	38	38	1.15	1.14	1.18	1.19	1.17	1.17	0.12	0.12	0.08	0.10	0.02	0.01	1.30	1.30	1.30	1.32	1.20	1.19	
		7:00	34	36	35	36	39	39	1.31	1.24	1.26	1.22	1.13	1.13	0.53	0.36	0.62	0.65	0.05	0.06	2.03	1.77	2.01	2.03	1.19	1.19	
		8:00	34	36	35	35	38	38	1.33	1.23	1.27	1.27	1.14	1.15	0.67	0.40	0.73	0.86	0.06	0.07	2.22	1.83	2.18	2.33	1.22	1.23	
		9:00	36	37	37	37	39	39	1.21	1.18	1.19	1.19	1.12	1.13	0.35	0.21	0.34	0.32	0.09	0.10	1.64	1.47	1.61	1.59	1.22	1.23	
		10:00	37	38	37	37	38	38	1.17	1.17	1.18	1.18	1.15	1.15	0.21	0.18	0.26	0.29	0.07	0.12	1.43	1.38	1.49	1.54	1.24	1.29	
		11:00	38	38	38	38	37	37	1.17	1.16	1.17	1.16	1.20	1.21	0.19	0.25	0.21	0.18	0.08	0.08	1.39	1.45	1.41	1.38	1.30	1.31	
		12:00	37	37	37	36	37	37	1.18	1.19	1.20	1.22	1.19	1.20	0.19	0.19	0.25	0.29	0.09	0.10	1.41	1.41	1.50	1.55	1.30	1.32	
		13:00	37	37	37	37	37	38	1.18	1.17	1.18	1.18	1.18	1.17	0.19	0.26	0.27	0.32	0.07	0.06	1.41	1.48	1.49	1.55	1.27	1.26	
		14:00	37	37	37	37	39	39	1.18	1.18	1.20	1.20	1.13	1.13	0.25	0.23	0.29	0.30	0.08	0.08	1.48	1.45	1.56	1.57	1.22	1.23	
		15:00	35	35	35	34	40	40	1.26	1.26	1.27	1.30	1.10	1.11	0.41	0.46	0.41	0.51	0.07	0.06	1.79	1.85	1.80	1.94	1.18	1.17	
		16:00	33	33	33	31	40	40	1.39	1.38	1.38	1.45	1.10	1.10	0.59	0.53	0.57	0.76	0.09	0.06	2.25	2.16	2.17	2.49	1.20	1.17	
		17:00	35	35	36	36	40	40	1.28	1.26	1.22	1.23	1.09	1.10	0.49	0.41	0.22	0.26	0.13	0.21	1.94	1.82	1.49	1.55	1.23	1.32	
18:00	37	37	38	38	41	41	1.21	1.20	1.16	1.16	1.07	1.08	0.16	0.12	0.09	0.16	0.14	0.20	1.41	1.37	1.26	1.35	1.21	1.28			
19:00	40	40	40	40	41	41	1.10	1.11	1.11	1.10	1.07	1.08	0.07	0.07	0.07	0.08	0.10	0.13	1.18	1.18	1.18	1.20	1.18	1.21			
20:00	40	39	40	39	40	40	1.11	1.11	1.11	1.11	1.09	1.10	0.05	0.04	0.08	0.10	0.06	0.09	1.17	1.16	1.20	1.21	1.16	1.18			
WESTBOUND	Campostella Rd to Canal Dr	5:00	41	41	41	41	42	41	1.09	1.09	1.10	1.11	1.08	1.09	0.03	0.05	0.05	0.03	0.04	0.02	1.13	1.14	1.16	1.14	1.13	1.11	
		6:00	39	39	39	38	39	38	1.16	1.18	1.18	1.20	1.17	1.19	0.08	0.06	0.08	0.07	0.05	0.04	1.26	1.24	1.30	1.28	1.23	1.23	
		7:00	40	40	40	40	40	40	1.15	1.14	1.15	1.16	1.12	1.12	0.18	0.20	0.20	0.20	0.06	0.06	1.36	1.40	1.38	1.38	1.18	1.18	
		8:00	39	39	39	39	41	41	1.17	1.17	1.16	1.17	1.12	1.12	0.17	0.15	0.19	0.21	0.06	0.06	1.39	1.36	1.39	1.42	1.20	1.18	
		9:00	38	38	38	38	40	39	1.18	1.18	1.18	1.20	1.15	1.15	0.24	0.32	0.25	0.31	0.08	0.09	1.47	1.56	1.48	1.56	1.24	1.26	
		10:00	38	38	38	38	40	39	1.19	1.19	1.18	1.18	1.14	1.14	0.22	0.26	0.20	0.18	0.08	0.11	1.46	1.50	1.42	1.39	1.24	1.26	
		11:00	38	38	37	37	39	39	1.18	1.19	1.20	1.21	1.14	1.15	0.21	0.35	0.24	0.21	0.08	0.07	1.42	1.59	1.49	1.45	1.24	1.24	
		12:00	38	38	39	38	40	40	1.17	1.18	1.17	1.20	1.12	1.12	0.21	0.23	0.29	0.32	0.14	0.10	1.43	1.44	1.52	1.56	1.27	1.24	
		13:00	39	38	38	37	40	40	1.17	1.18	1.19	1.21	1.13	1.13	0.20	0.20	0.29	0.36	0.10	0.04	1.42	1.42	1.53	1.63	1.26	1.19	
		14:00	38	38	37	36	39	39	1.19	1.19	1.23	1.25	1.14	1.15	0.26	0.22	0.29	0.36	0.09	0.07	1.51	1.47	1.60	1.68	1.26	1.23	
		15:00	36	36	35	34	39	39	1.26	1.26	1.31	1.33	1.18	1.18	0.43	0.57	0.66	1.09	0.14	0.10	1.83	2.01	2.21	2.81	1.35	1.31	
		16:00	34	34	32	29	40	40	1.35	1.35	1.52	1.70	1.14	1.13	0.63	0.79	0.97	1.39	0.16	0.01	2.27	2.49	3.14	3.92	1.33	1.17	
		17:00	34	34	32	31	41	41	1.38	1.35	1.47	1.52	1.12	1.11	0.61	0.71	0.89	1.18	0.11	0.07	2.34	2.49	2.94	3.48	1.25	1.20	
18:00	35	36	34	33	40	40	1.30	1.29	1.34	1.38	1.13	1.13	0.30	0.43	0.44	1.01	0.09	0.01	1.73	1.92	2.00	2.82	1.24	1.16			
19:00	40	40	40	40	42	42	1.14	1.13	1.12	1.13	1.09	1.09	0.12	0.20	0.14	0.20	0.10	0.06	1.28	1.37	1.28	1.34	1.19	1.15			
20:00	41	40	40	40	42	42	1.11	1.11	1.14	1.14	1.09	1.08	0.06	0.07	0.05	0.04	0.06	0.06	1.18	1.19	1.20	1.19	1.15	1.14			

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