



CONGESTION
MANAGEMENT
SYSTEM

SPECIAL REPORT:

STATE OF
TRANSPORTATION
IN HAMPTON ROADS

INTRODUCTION →

A transportation system is more than the roads people use to commute to work or for a quick trip to the store. A transportation system also includes the airways people fly to attend conventions, vacation, or visit family. It's the ship or rail car that transports food and manufactured goods from the farm or factory. It's the trucks that disperse food and products to stores where people buy them for use in their everyday lives. The daily commute to work or the store, though a small part of the larger transportation system, is crucial to regional, state, national and global economic vitality.

Hampton Roads' regional transportation system is complex and multi-faceted, hosting the major modes of transportation: air, rail, maritime, and roadway. Hampton Roads' unique geography, its abundance of waterways, encourages maritime commerce, but at the same time, creates multiple chokepoints for the other modes, as numerous and expensive bridges and tunnels are required to traverse these waterways. To have a better understanding of Hampton Roads'



transportation system and the serious transportation dilemma facing Hampton Roads citizens, it's critical to examine the past and current conditions.

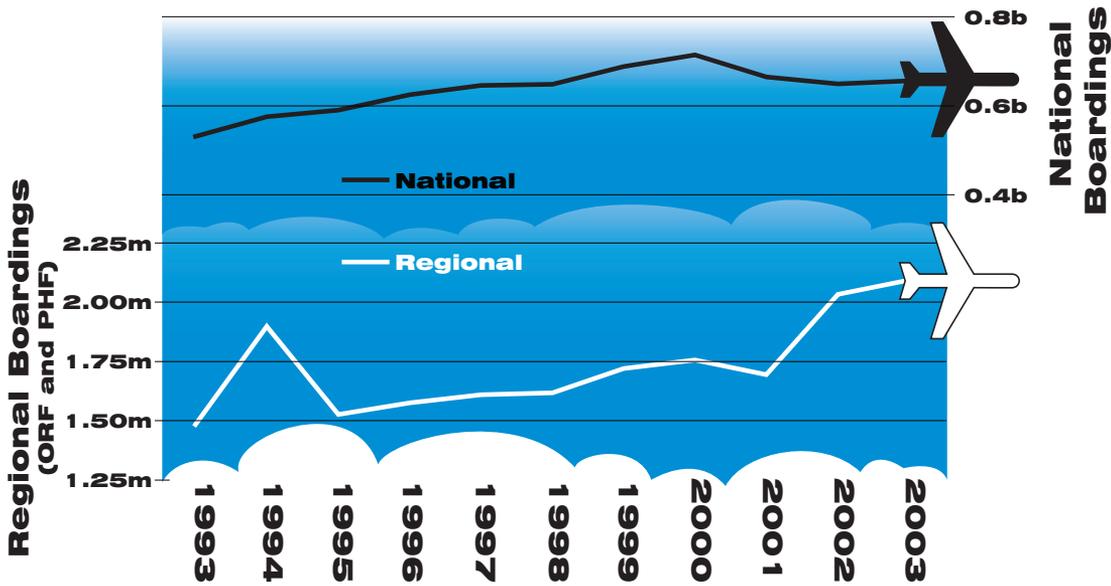
The Hampton Roads community is more mobile now than ever before, with all modes of transportation experiencing noticeable usage increases. Beginning with the Hampton Roads harbor, which provides the fuel for Hampton Roads major economic engines – the military, the ports, shipbuilding and tourism – increased maritime traffic at the Port of Virginia has led to growth and development in the region and the State of Virginia.

The Port is a major economic engine for the State of Virginia, creating 165,000 jobs statewide and \$4.8 billion in payroll. Between 1993-2004, general cargo tonnage more than doubled at the Port of Virginia, which includes the public-private marine terminals in Newport News, Norfolk, and Portsmouth. The addition of several distribution centers for major retailers such as Target and Wal-Mart have continued to stimulate growth at the port and throughout the region.

Cargo is not the only thing moving into and out of Hampton Roads' harbor. In recent years several



Source: Virginia Port Authority



Source: Federal Aviation Administration, Norfolk International Airport, and Newport News-Williamsburg International Airport

cruise lines have made Hampton Roads a port of call and homeport. In 2005, more than 110,000 passengers were expected at the downtown Norfolk cruise terminal, up from 35,000 in 2002.

Hampton Roads is also well served by a large rail network. During 1998, rail lines transported 69% of all inbound freight and 11% of outbound freight to the region. Passenger travel is available in Hampton Roads through Amtrak stations in Newport News and Williamsburg, with bus service connecting to Norfolk and Virginia Beach. In 2004, 93,000 passengers boarded Amtrak in Newport News and 35,500 passengers boarded in Williamsburg.

Hampton Roads' international airports in Newport News (PHF) and Norfolk (ORF) have experienced a growth in passenger volumes that has outpaced national figures in recent years. This growth is largely attributed to the arrival of low-fare service at Norfolk (Southwest) and increased low-fare service at Newport News (AirTran).

In 2004, Norfolk International Airport saw a 10% increase in passenger volumes and Newport News-Williamsburg International Airport saw a 26% increase in passenger volumes versus 2003 figures.

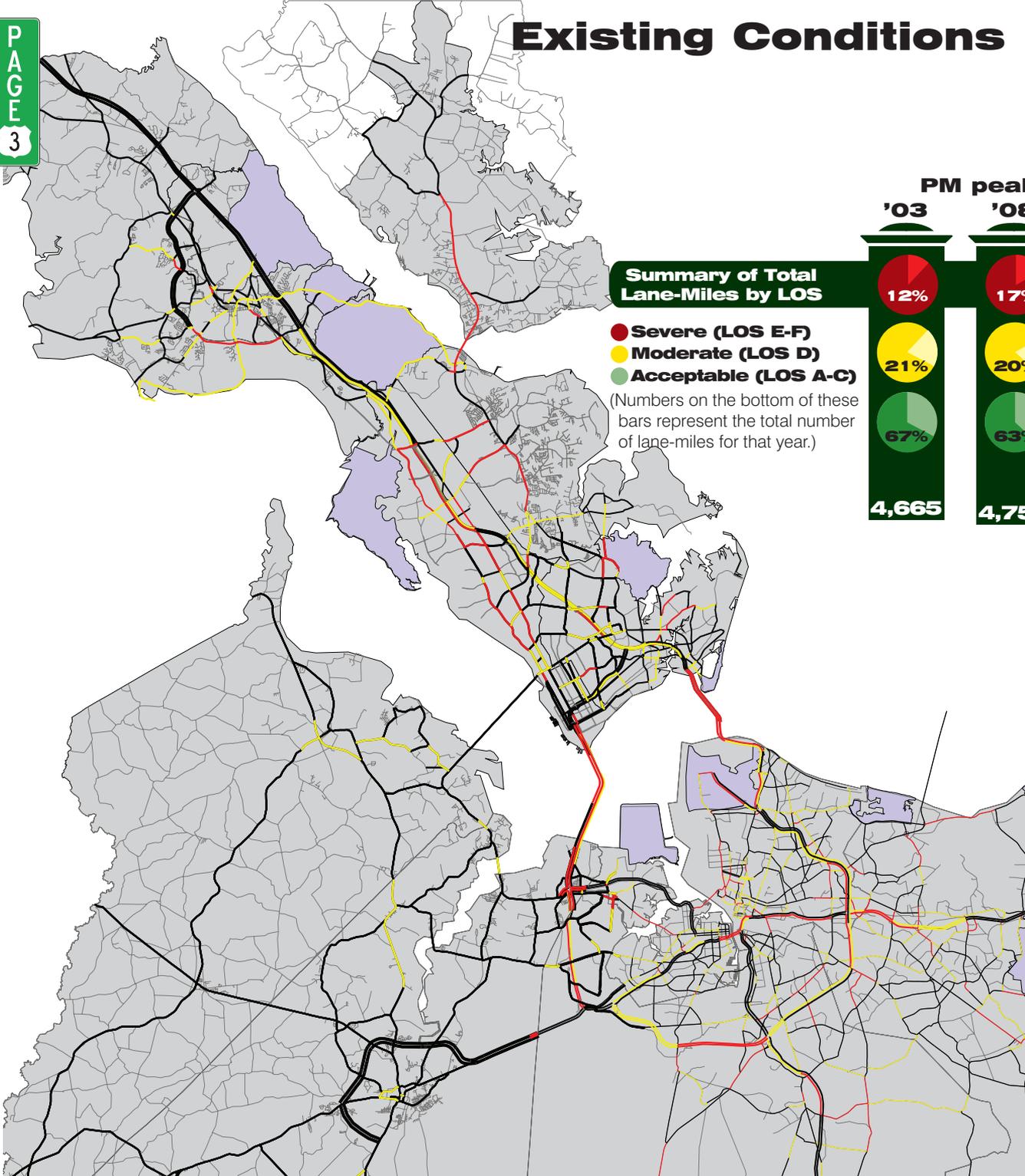


While maritime, rail and air travel play important roles in the Hampton Roads' transportation system, the most common transportation elements for the region's citizens are bicycle; pedestrian; and vehicular travel, including cars, buses, and trucks.

Vehicular travel is dependent upon the regional roadway network to move people and goods. However, that movement is often hindered by congestion. In Hampton Roads and across the U.S., roadway congestion is on the rise. And like the rest of the country, Hampton Roads is struggling with a lack of funding to increase capacity on the roadway network as evidenced by limited funded improvements in the coming year.

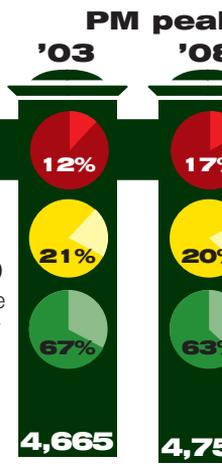


Existing Conditions



Summary of Total Lane-Miles by LOS

- Severe (LOS E-F)
 - Moderate (LOS D)
 - Acceptable (LOS A-C)
- (Numbers on the bottom of these bars represent the total number of lane-miles for that year.)



LEGEND

- Low to Moderate Congestion (LOS A, B, or C)
- Moderate Congestion (LOS D)
- Severe Congestion (LOS E or F)
- Non-CMS Roadways



ROADWAY USAGE →

Peak hour '26

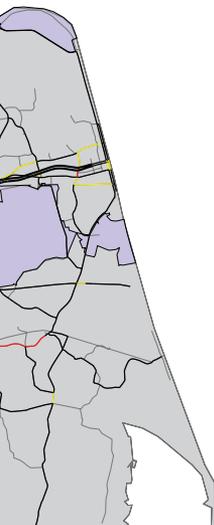
23%

29%

48%

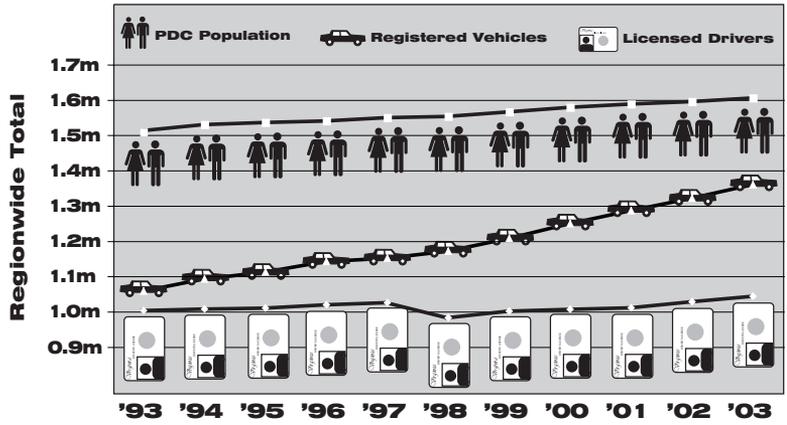
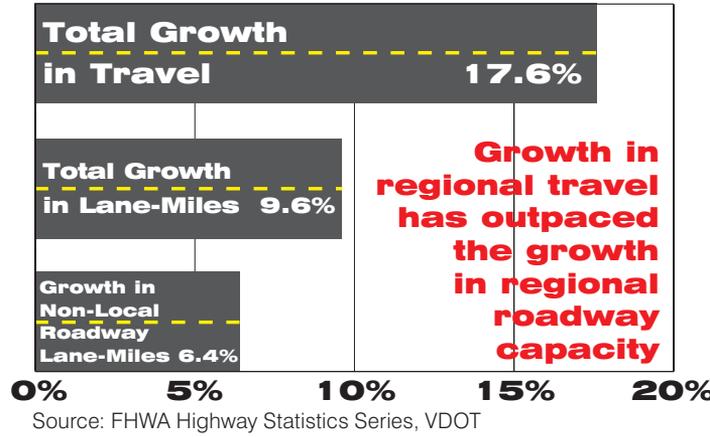
5,248

The sum of the number of miles vehicles travel, vehicle-miles of travel (VMT), has been consistently increasing across the country. Hampton Roads is no different. VMT in Hampton Roads increased 18%, or over 5 million miles daily, between 1994 and 2003. Travel growth has and continues to outpace roadway capacity improvement and the region's population growth. Additionally, the number of registered vehicles in Hampton Roads has grown more than four times faster than the population over the same time period. More vehicles and more travel means more congestion on Hampton Roads' roadways and increased congestion-related costs.

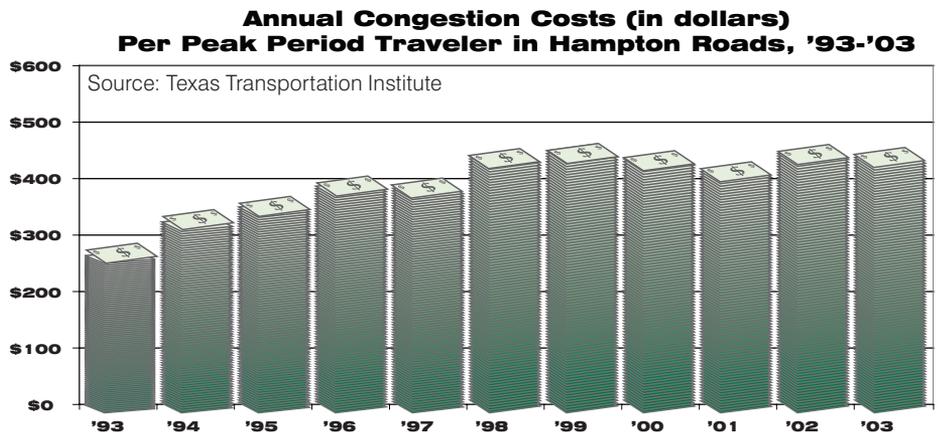


The time travelers spend on Hampton Roads' congested roadways has increased throughout the years. According to the 2005 Texas Transportation Institute's (TTI) Urban Mobility Report, Hampton Roads ranked 19th among 26 large urban areas with 26 hours of annual average delay per person during peak travel periods. That means, travelers in Hampton Roads lose over a day of their lives annually just waiting to move through everyday traffic.

(TTI numbers do not include bridges and tunnels.)



Besides lost time, there is a monetary cost associated with congestion. TTI estimated that the cost of being stuck in Hampton Roads peak period traffic is \$438 per person annually. For the whole region this totals over \$360 million! Given that these are 2003 figures and gas prices have risen significantly since this study was conducted, that congestion cost will certainly rise when the next TTI report is produced.



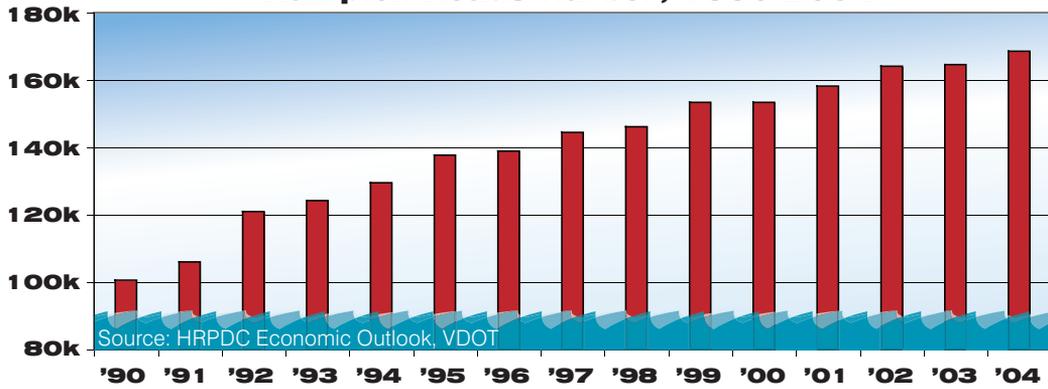
HAMPTON ROADS CROSSINGS →

Hampton Roads' geography presents multiple challenges to moving traffic through the region. There are eight major bridge or tunnel facilities that serve as the backbone for Hampton Roads' transportation system. As vital as they are, they are also the reason for many of the region's transportation headaches.

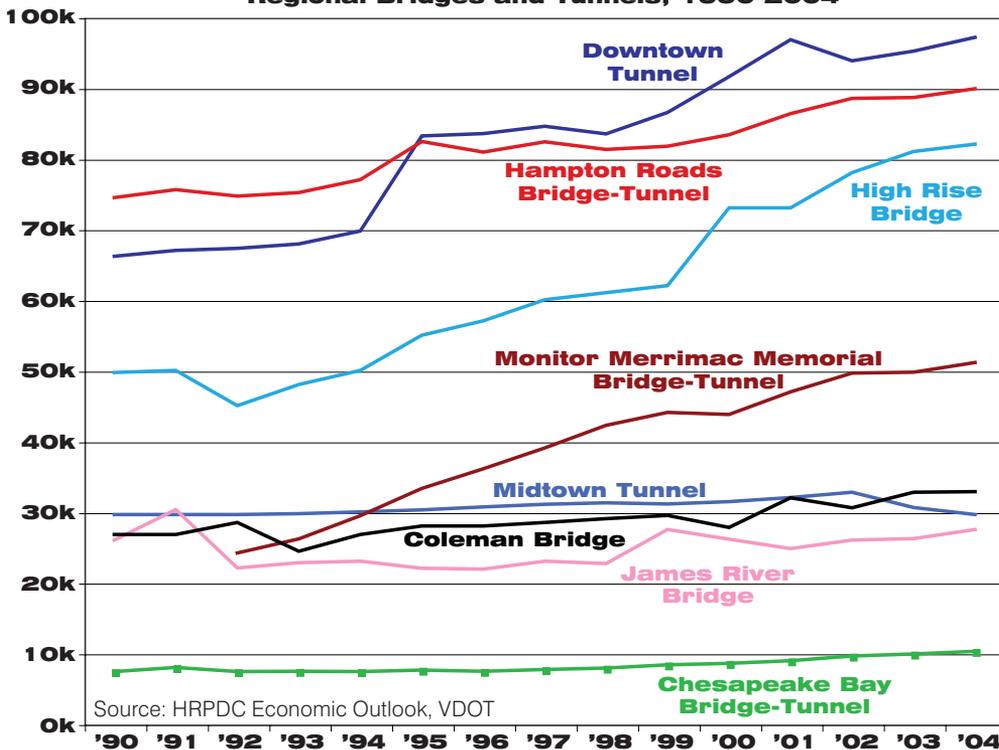
Growth in tourism also contributes to the number of travelers crossing the Hampton Roads Harbor. The HRBT, which serves as the main route for tourists heading to the beaches, is at its busiest during the summer months. In 2004, it experienced a 12% growth in traffic from winter to summer.

- The region's major bridges & tunnels:**
- Downtown Tunnel
 - Midtown Tunnel
 - High-Rise Bridge in Chesapeake
 - Coleman Bridge
 - Chesapeake Bay Bridge-Tunnel (CBBT)
 - Hampton Roads Bridge-Tunnel (HRBT)
 - Monitor-Merrimac Memorial Bridge Tunnel (MMMBT)
 - James River Bridge (JRB)

Annual Average Daily Traffic Crossing the Hampton Roads Harbor, 1990-2004



Annual Average Daily Traffic at Regional Bridges and Tunnels, 1990-2004



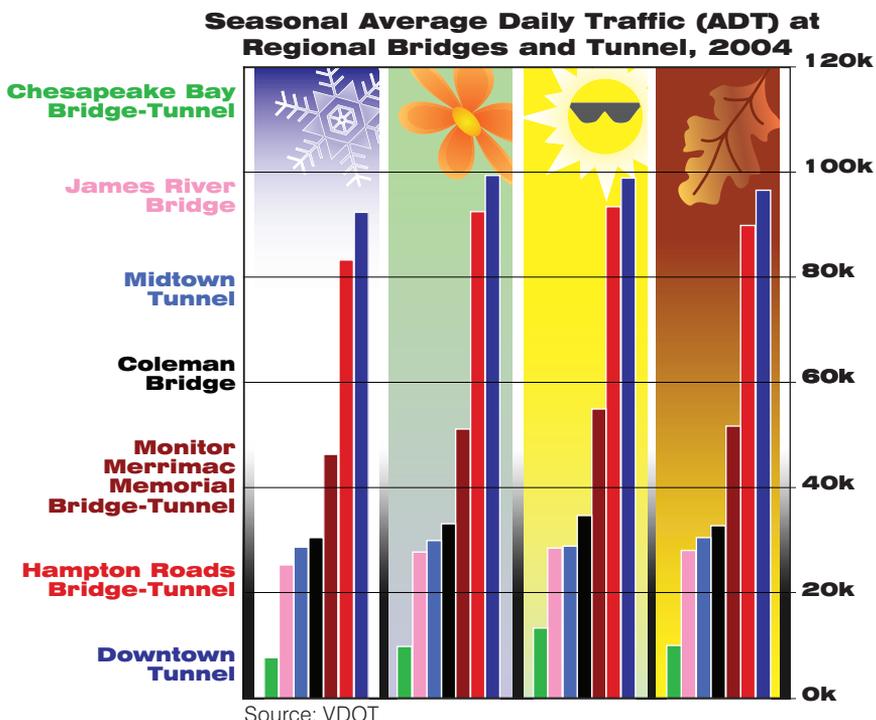
Interestingly, according to the 2004 figures, the HRBT is not the busiest facility in Hampton Roads. That title belongs to the Downtown Tunnel. During the spring and fall, the Downtown Tunnel is as busy as the HRBT is during the summer, and has more usage than the HRBT during the summer. Daily commuter traffic between Portsmouth and Norfolk contributes to the larger figures.

When congestion occurs on these bridge and tunnel facilities, it spills out onto other already congested roadways, creating longer delays for travelers in Hampton Roads.

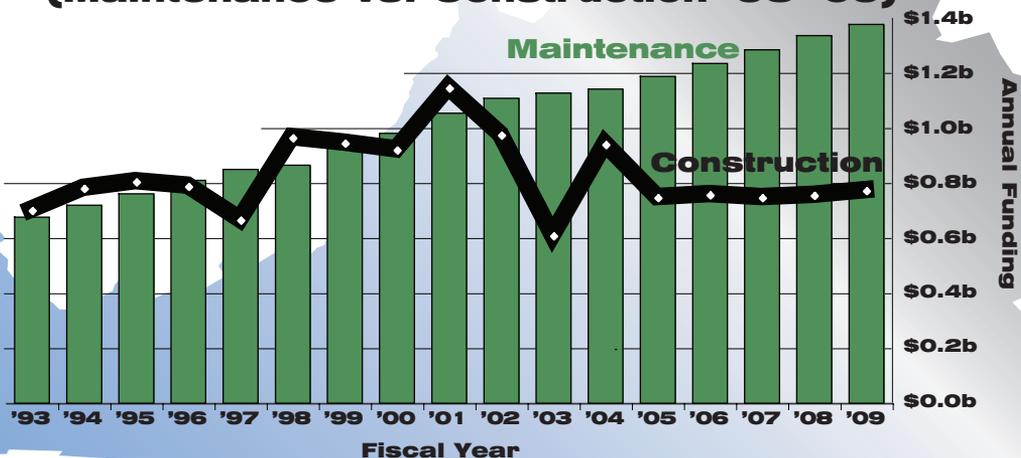
Many of Hampton Roads' most congested roadways do not have any funded planned improvements in the future, and congestion on and around those roadways is expected to worsen. Coupled with the fact that the amount of

state funding for construction is falling behind due to significant and necessary increases in maintenance spending, Hampton Roads' travelers can expect slower, more congested traffic conditions in the future.

Despite the lack of funds for adding capacity, there are several alternatives that could produce some relief if applied.



Statewide Highway Funding by Fiscal Year (Maintenance vs. Construction '93-'09)



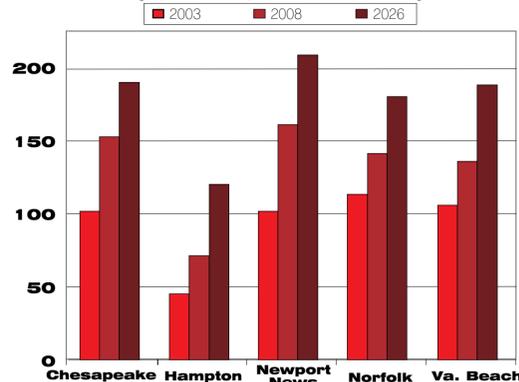
ALTERNATIVES for the FUTURE

The Hampton Roads' Congestion Management System (CMS) roadway network includes 4,666 lane-miles of interstates, expressways, principal and minor arterials, and selected collectors in Hampton Roads. Lane-miles are the length of a road, multiplied by the number of lanes. For example, a two-lane, five-mile long road would have ten lane-miles. The more lanes a road has the more lane-miles are available. If the aforementioned road had four lanes, it would have a total of 20 lane-miles.

The CMS network is expected to expand by a total of 583 lane-miles by 2026, equating to a 0.5% annual average growth rate in lane-miles. This minimal increase in road capacity will be outpaced by a 1.1% annual average growth rate in daily vehicle miles of travel during the same period.

Currently, 562 lane-miles in the CMS network are severely congested. Of those lane miles, only 121 lane-miles, or 22%, have funded plans for improvement over the next 20 years. Even with those funded improvements, severely congested lane-miles are expected to more than double throughout the region by 2026. And, as evidenced by looking at the PM Peak Hour, the congested lane-miles will not be limited to Hampton Roads' larger cities.

Severely Congested Lane Miles (By Locality PM Peak Hour)



Continuing to look at the PM Peak Hour, there are 441 congested lane-miles that have no funded plans for improvement across Hampton Roads. As such, alternatives must be sought to improve efficiency at these locations. Fortunately, transportation engineers and planners have developed a congestion mitigation strategy "toolbox" that can be employed.

The congested areas were examined for probable congestion causes, and potential packages of strategies from the "toolbox" were developed for those locations. Employing such packages at these locations could provide some congestion relief without increasing roadway capacity. (Two of the congested areas are depicted; for more strategies and locations, consult the HRPDC's technical report, *Congestion Management System-Part 2, Bridges and Tunnels, Roadway Congestions Analysis, Mitigation Strategies and Evaluation.*)

NEXT STEPS

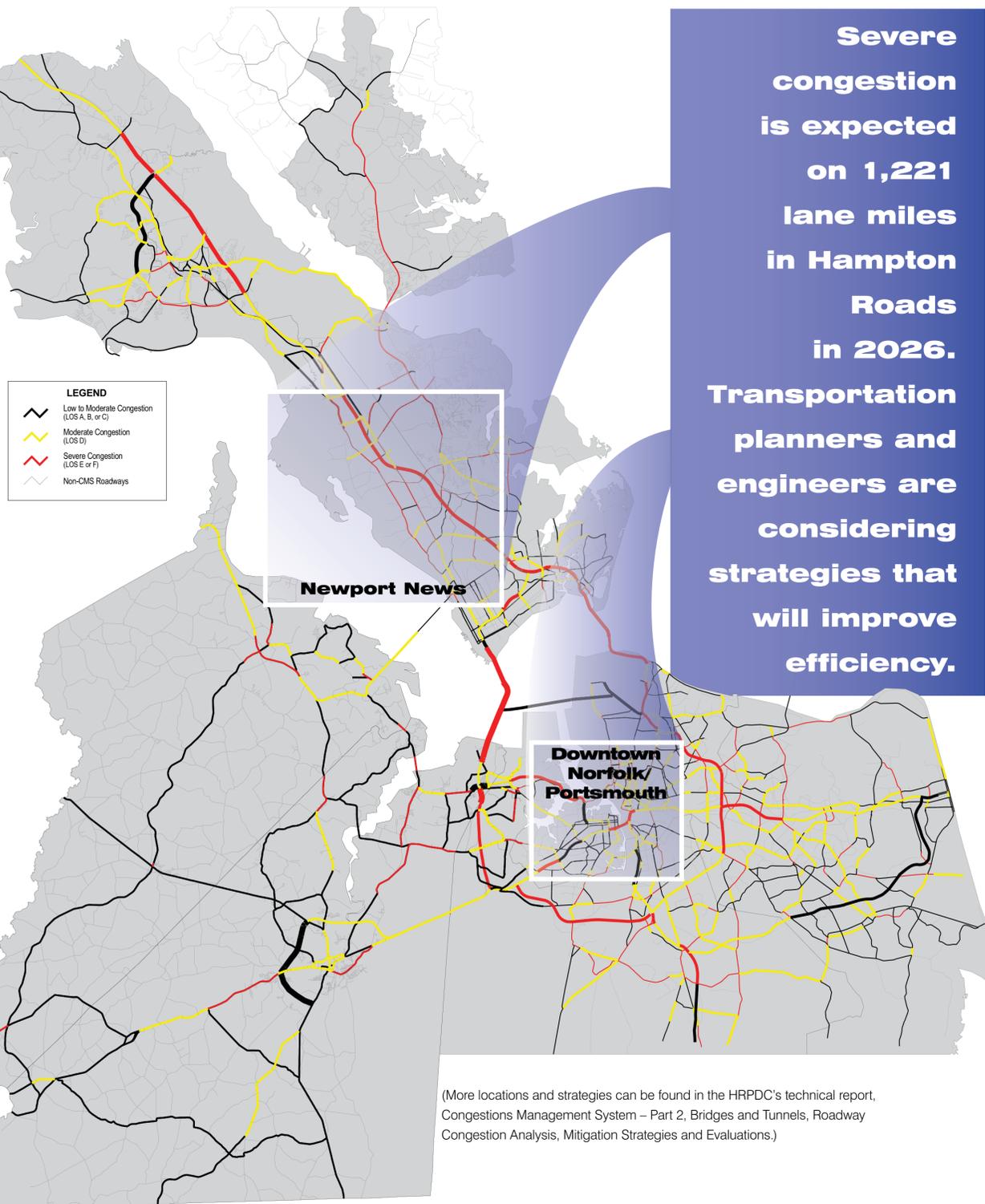
Across the country, metropolitan areas of all sizes are struggling with congested roads and a lack of available funding to increase roadway capacities. It is becoming increasingly evident that with continued economic and population growth, even if unlimited funding were available, Hampton Roads could not build enough capacity to fully eliminate congestion. Transportation engineers and planners, here in Hampton Roads and across the country, are now looking for ways to make existing transportation systems operate more efficiently.

Hampton Roads' CMS is a continuous program that provides strategies for improving transportation efficiencies. As these strategies are

included in future Transportation Improvement Plans (TIP) and Long Range Plans, they will be evaluated for effectiveness and widespread applications.

The Hampton Roads Metropolitan Planning Organization and the HRPDC, as stewards of regional transportation funding, will continue to monitor and refine Hampton Roads' CMS to ensure the region is making the most of available transportation funds and that Hampton Roads' roadway network operates as efficiently as possible.

2026 Projected Conditions

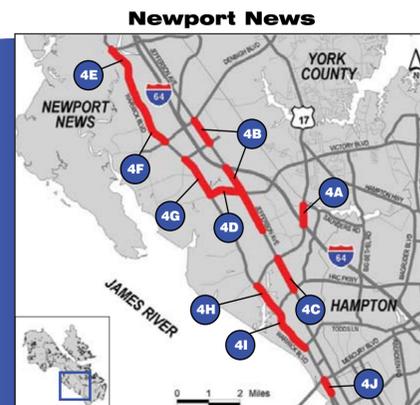


(More locations and strategies can be found in the HRPDC's technical report, *Congestion Management System - Part 2, Bridges and Tunnels, Roadway Congestion Analysis, Mitigation Strategies and Evaluations.*)

Congestion Mitigation Strategy "Toolbox"

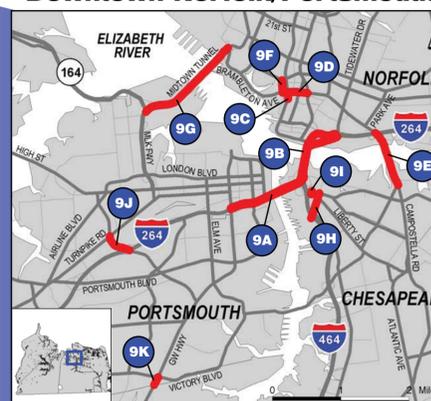
Strategy	Description	Strategies
Strategy #1	Eliminate Personal Trips or Reduce VMT	Growth Management/Activity Centers 1-1 Land Use Policies/Regulations Congestion/Value Pricing 1-2 Road User Fees/HOT Lanes 1-3 Parking Fees Transportation Demand Management 1-4 Telecommuting 1-5 Employee Flextime Benefits/Compressed Work Week
Strategy #2	Shift Trips from Auto to Other Modes	Public Transit Capital Improvements 2-1 Exclusive Right-of-Way - New Rail Service 2-2 Exclusive Right-of-Way - New Bus Facilities 2-3 Fleet Expansion 2-4 Improved Intermodal Connections 2-5 Improved/Increased Park & Ride Facilities & Capital Improvements Public Transit Operational Improvements 2-6 Service Expansion 2-7 Traffic Signal Preemption 2-8 Transit Fare Reductions Plan/Reduced Rate of Fare 2-9 Transit Information Systems Bicycle and Pedestrian Modes 2-10 Improved/Expanded Bicycle Network 2-11 Bicycle Storage Systems 2-12 Improved/Expanded pedestrian Network
Strategy #3	Shift Trips from Single Occupancy Vehicle (SOV) to HOV	Encouraging High Occupancy Vehicle (HOV) Use 3-1 Add HOV Lanes 3-2 HOV Toll Savings Transportation Demand Management 3-3 Rideshare Matching Services 3-4 Vanpool/Employer Shuttle Program 3-5 Employer Trip Reduction Program 3-6 Parking Management
Strategy #4	Improve Roadway Operations	Traffic Operational Improvements 4-1 Intersection Geometric Improvements 4-2 Intersection Channelization 4-3 Intersection Turn Restrictions 4-4 Intersection Signalization Improvements 4-5 Coordinated Intersections Signals 4-6 Traffic Calming 4-7 Intelligent Transportation Systems/Smart Traffic Centers 4-8 Reversible Lanes Freeway Operations & Management 4-9 Incident Management, detection, Response & Clearance 4-10 Elimination of Bottlenecks 4-11 Ramp Metering Access Management 4-12 Access Control 4-13 Median Control 4-14 Frontage Roads
Strategy #5	Add Capacity	Addition of General Purpose Lanes 5-1 Freeway Lanes 5-2 Arterial lanes 5-3 Interchanges 5-4 Improve Alternate Routes

Applying strategies from the Congestion Mitigation Strategy Toolbox to areas with moderate to severe congestion, such as these two locations, can help keep traffic moving.



Map ID	Facility Name	2003 Lanes	2003 PM LOS	Probable Causes of Congestion	CMS Mitigation Strategy
4A	J Clyde Morris Blvd - I-64 to Harpersville Rd	4	F	Heavy peak hour volume and high signals per mile, capacity deficiency	Eliminate Person Trips through Transportation Demand Management, Improve Roadway Operations (Optimize signal timings), Add Capacity
4B	Jefferson Ave - Derbigh Blvd to Middle Ground Blvd	6	E	Heavy peak hour volume and high signals per mile	Shift trips from Auto to other modes (i.e. Light Rail Transit), Eliminate Person Trips through Transportation Demand Management or Changes in Land Use, Improve Roadway Operations (Optimize signal timings), Improve Alternate Routes
4C	Jefferson Ave - J Clyde Morris Blvd to Harpersville Rd	6	E	Heavy peak hour volume	Same as 4B and Access Management
4D	Oyster Point Rd - Warwick Blvd to Jefferson Ave	4	F	Heavy peak hour volume, capacity deficiency, high signals per mile	Same as 4B and Add Capacity
4E	Warwick Blvd - Ft Eustis Blvd to Snidow Blvd	4	F	Heavy peak hour volume and directional distribution, capacity deficiency, high signals per mile	Same as 4B and Add Capacity
4F	Warwick Blvd - Snidow Blvd to Derbigh Blvd	4	F	Heavy peak hour volume and high signals per mile, capacity deficiency	Shift trips from Auto to other modes (i.e. Light Rail Transit), Eliminate Person Trips through Transportation Demand Management or Changes in Land Use, Improve Roadway Operations (Optimize signal timings), Access Management, Improve Alternate Routes, Add Capacity
4G	Warwick Blvd - Bland Blvd to Oyster Point Rd	4	F	Heavy peak hour volume, capacity deficiency	Same as 4B and Add Capacity
4H	Warwick Blvd - J C Morris Blvd to Harpersville Rd	5	E	Heavy peak hour volume and directional distribution, capacity deficiency	Same as 4B and Add Capacity
4I	Warwick Blvd - Harpersville Rd to Main St	4	F	Heavy peak hour volume and directional distribution, high signals per mile	Same as 4B and Add Capacity
4J	Warwick Blvd - Mercury Blvd to Harrington Ave	6	F	Heavy peak hour volume and direction distribution, high signals per mile	Same as 4B

Downtown Norfolk/Portsmouth



Map ID	Facility Name	2003 Lanes	2003 PM LOS	Probable Causes of Congestion	CMS Mitigation Strategy
9A	I-264 Downtown Tunnel - Effingham St to I-664	4	F (EB) F (WB)	Heavy peak hour volume, capacity deficiency, and incidents	Eliminate person trips (Value pricing, Transportation Demand Management), ITS Improvements, Shift trips from Auto to other modes (Transit), Incident Management, Add Capacity, Improve alternate routes
9B	I-264 - I-664 to Waterside/ City Hall/Tidewater	8	F (WB)	Heavy peak hour volume and directional distribution, capacity deficiency, incidents, weaving, Downtown Tunnel congestion	Same as 9A and Add Capacity
9C	Bouth St - Bate St to Brambleton Ave	4	F	Heavy peak hour volume and directional distribution, high signals per mile, urban environment	Improve Roadway Operations (Optimize and coordinate signals), Shift trips from Auto to other modes (Transit and Ped Improvements), Transportation Demand Management
9D	Brambleton Ave - Bouth St to St Pauls Blvd	5/6	F	Heavy peak hour volume and directional distribution, high signals per mile, truck % above regional average	Improve Roadway Operations (Optimize and coordinate signals), Shift trips from Auto to other modes (Transit and Ped Improvements), Transportation Demand Management
9E	Camposilla Rd - Wilson Rd to I-264	6	F	Heavy peak hour volume and directional distribution, truck % above regional average	Improve Roadway Operations (Consider reversible lanes to alleviate heavy directional distribution)
9F	Duke St - Onley Rd to Brambleton Ave	2	E	Heavy peak hour volume, high signals per mile, urban environment	Improve Roadway Operations (Optimize and coordinate signals)
9G	Midtown Tunnel - MLK Fwy/Western Fwy to Brambleton Ave	2	F	Heavy peak hour volume, capacity deficiency, incidents, truck % above regional average	Eliminate person trips (Value pricing, Transportation Demand Management), ITS Improvements, Shift trips from Auto to other modes (Transit), Incident Management, Add Capacity, Improve alternate routes
9H	South Main St - I-464 to Berkeley Ave	2	E	High signals per mile	Improve Roadway Operations (Optimize and coordinate signals)
9I	Slate St - Liberty St to Berkeley Ave	2	E	High signals per mile	Improve Roadway Operations (Optimize and coordinate signals)
9J	Frederick Blvd - I-264 to Tumpkin Rd	4	F	Heavy peak hour volume, capacity deficiency, railroad crossing	Add Capacity, Improve alternate routes (MLK Extension)
9K	George Washington Hwy - Chesapeake Ct. to Victory Blvd	4	F	Heavy peak hour volume and directional distribution, truck % above regional average	Improve Roadway Operations (Access Management, Intersection Geometric Improvements)



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“CMS: Parts I & II”

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