

TACKLING THE CAPITAL REGION'S ROADWAY CONGESTION: PERFORMANCE-DRIVEN TOLLING

MAY 2018



GREATER WASHINGTON PARTNERSHIP

FROM BALTIMORE TO RICHMOND.
FOSTERING UNITY. ADVANCING GROWTH.

EXECUTIVE SUMMARY

The Capital Region of Baltimore, Washington, and Richmond is the third largest regional economy in the United States, with a deep and diverse talent pool and globally leading innovation assets. However, the performance of our region's transportation system risks holding back our potential.

Roadway congestion places a significant burden on many of our 10.2 million residents and their employers.

While congestion is a sign of robust economic activity, excessive congestion inhibits our economic performance by limiting the ability of consumers to access jobs, arrive on time for work and meetings, and efficiently access necessary services like education and healthcare. Congestion increases the cost of trips, preventing workers, businesses, universities, and entrepreneurs from taking full advantage of the Capital Region's amenities. A well-connected Capital Region that ensures strong income and productivity growth, retains and attracts talented workers, and provides for a high-quality of life for families who live here requires that we tackle our growing congestion challenge.

The entire region faces elements of congestion, although the challenges are most acute in the Washington and Baltimore metro areas, as well as along the I-95 corridor connecting Richmond to the District of Columbia, particularly when our roadways transform into parking lots during peak morning and evening rush. Capital Region residents and employers are paying for this congestion every day. One estimate puts the annual costs of congestion for the region at more than \$7 billion.¹ On average, each Baltimore metro commuter loses \$1,115 annually as a result of congestion and each Washington metro area commuter loses \$1,834 annually—the highest cost in the nation. And without action, the region's congestion costs are projected to grow, with estimates showing that roadway congestion will increase by more than 50 percent by 2040.²

Congestion occurs when roadway capacity cannot meet demand, producing a crawling queue of vehicles. Roadway congestion is non-linear—the last vehicles entering a congested road contribute disproportionately to the delay that everyone experiences. Convincing just a small number of consumers to shift travel to transit, high-occupancy vehicles (HOV) or move the trip to non-peak periods can greatly improve speed and reliability, which translates into less congestion.

Performance-driven tolling is a tool that, when deployed correctly, allocates a fee to single occupant vehicles, which creates incentives for consumers to divert trips to non-peak periods, increase vehicle occupants, or opt for public transportation and carpooling. As a result, congestion is reduced, speeds are increased, and reliability improves. Additionally, consumers will have improved travel options available across the board. Performance-driven tolling can also more equitably levy the costs for maintenance and capacity expansion for the road.

The Capital Region is at the national forefront of using performance-driven tolling to combat roadway congestion and improve mobility and access, with expansion of this tool currently being proposed in parts of the region. In total, Maryland and Virginia have 35 toll facilities operating, under construction, or in planning stages (13 in Maryland and 22 in Virginia). However, not all facilities deploy performance-driven outcomes, which creates an inconsistent patchwork of tolled facilities oriented around different and sometimes uncoordinated goals. This patchwork approach limits the



potential benefits to the consumers and our region experiences persistent congestion points where toll systems start and end.

The Capital Region has the potential to deliver a performance-driven tolling network that improves mobility and access in highway corridors including the Washington and Baltimore Beltways, I-95, and I-270, and connects these facilities to enhanced toll operations on highways such as the Intercounty County Connector and the network of tolled facilities in Northern Virginia connected by the Woodrow Wilson Bridge and a new American Legion Bridge. It is critical the region deploy a consistent and coordinated approach to create a seamless performance-driven tolling network that delivers fair and equitable benefits, including for those without the financial means to afford the tolls, regardless of where the facility is located. This is critical because every day in the Capital Region, between home and work, one in two commuters cross a county boundary and one in five cross a state boundary. Political boundaries do not define consumer's lives in the Capital Region. A connected performance-driven tolling *network* must overcome jurisdictional silos to maximize benefits.

A consistent and coordinated approach will improve each consumer's mobility and better connect the Capital Region. The Partnership, working with a wide range of stakeholders and experts, proposes the below six principles for decision-makers

to deliver on the potential of performance-driven tolling in the Capital Region. As new tolling facilities are considered and implemented, and as existing tolling facilities evolve and connect, the use of these principles consistently in Maryland, Virginia, and the District will reduce congestion and deliver the improvements to the system we desperately need. The need is too great.

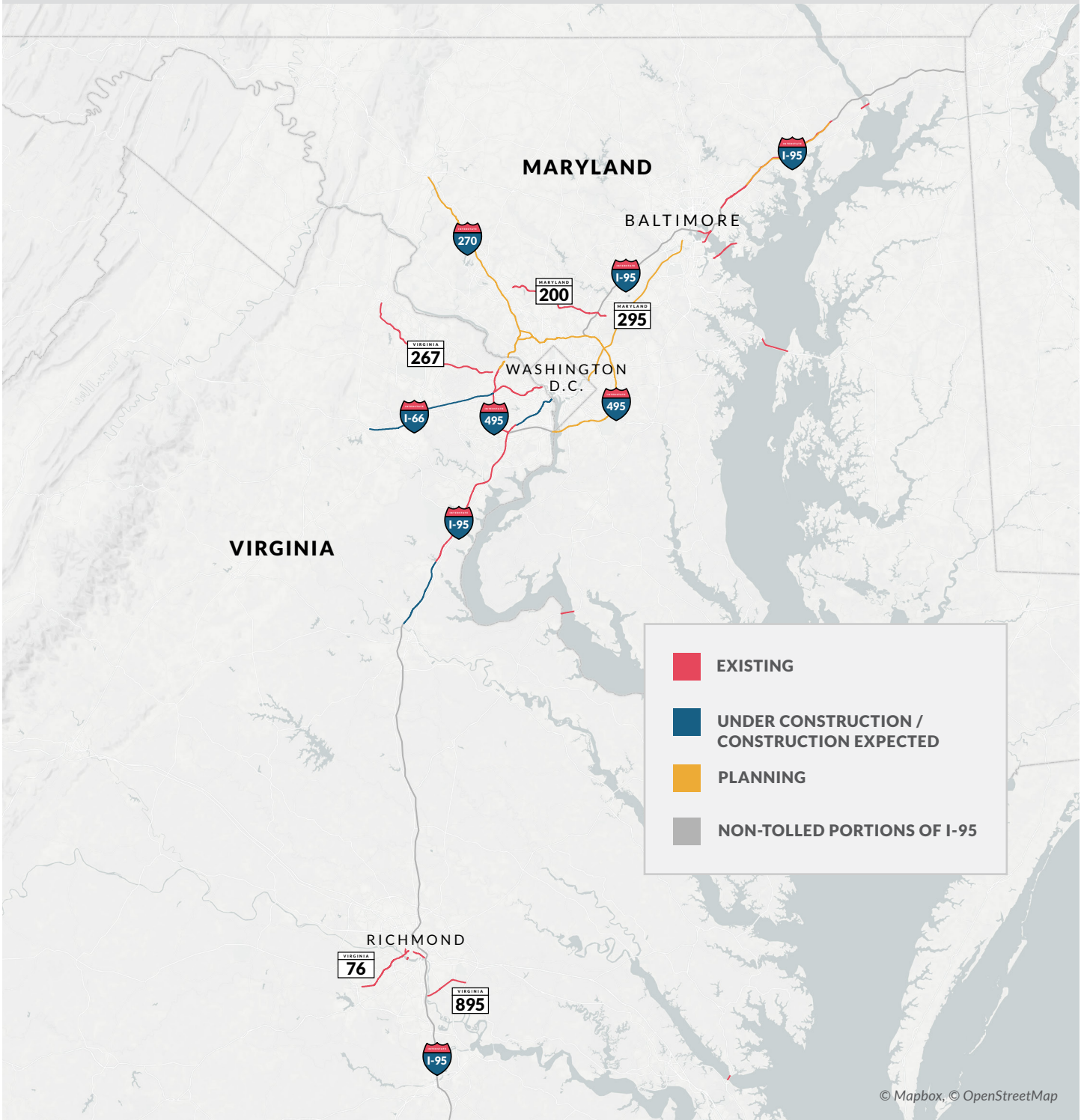
With growing roadway congestion holding back our region's economic performance, the expansion of smart and well-executed performance-driven tolling projects can help transform our region's transportation system. However, the history of tolling projects in the United States clearly shows that initial design and delivery decisions have significant impacts on the success of a region's entire transportation system. That is why the Greater Washington Partnership is releasing clear and demonstrable principles, that should be deployed for all new tolling facilities and, where appropriate, on existing tolling facilities as changes are considered and facilities are increasingly connected. The Partnership plans to work with decision-makers and stakeholders to ensure our region will maximally benefit from a performance-driven toll network. Our region cannot miss this opportunity.³

PRINCIPLES FOR PERFORMANCE-DRIVEN TOLLING IN THE CAPITAL REGION



1. Tolling investments should improve the transportation *system*, not just the tolled *facility*
2. Toll planning should be coordinated regionally to deliver the benefits of greater mobility and reliability to *all* consumers of the transportation system
3. Decision-makers should prioritize providing *enhanced connectivity to the greatest number of people*, not moving the most vehicles or generating the most revenue
4. Consumers of *all income levels* should benefit from the tolling investment, including those without the financial means to afford the tolls
5. Tolling revenue should be invested in *cost-effective public transportation* enhancements
6. Public agencies should conduct robust and broad *public engagement* to develop *goals, performance metrics* and *public benefit assessments* for each tolling project, whether delivered by the public agency or by a public-private partnership

CAPITAL REGION TOLL FACILITIES



01

**BACKGROUND ON
CONGESTION AND
PERFORMANCE-
DRIVEN TOLLING**

ROADWAY CONGESTION

Congestion in our region has a direct impact on our quality of life, health, and air quality. However, most of us have limited awareness of the true costs we pay every day because of our region's roadway congestion. Those costs are a result of time and money wasted sitting in traffic, foregone wages from not being able to access a high-quality job, lower economic productivity, and higher prices for goods. One estimate puts the annual costs of congestion for Capital Region residents at more than \$7 billion annually, with the Washington metro area drivers each losing \$1,834 in 2014, which is the highest amount for any metro area in the nation.⁴

Roadway congestion also harms the ability for employers in our region to retain and attract a talented workforce, particularly recent college graduates. Millennials consistently cite traffic as a key indicator for where they choose to live and whether they would leave the region.⁵ The ease and cost of each trip affects the jobs that a resident can access and, in turn, the size of the talent pool from which employers can draw.

ANNUAL CONGESTION COST (PER DRIVER)



Source: 2015 Urban Mobility Scorecard, Texas A&M Transportation Institute

CAUSES OF CONGESTION

Roadway congestion occurs when the demand from vehicles—personal, commercial, and public—exceeds the road’s capacity. Similar to other regions in the country, peak congestion occurs during peak morning and evening rush periods while commuters are traveling to and from work. However, the length of our region’s congestion periods is longer, not limited to peak hours and less reliable, leading to an unpredictable and costly consumer experience.

In congested areas, history has demonstrated that increasing the supply of existing non-tolled highway space tends to deliver short-term benefit by increasing capacity to

match demand. However, over time the new capacity tends to become congested as new demand is generated that exceeds the new capacity.⁶ For decades, transportation practitioners and elected officials expanded capacity to combat highway congestion with diminishing benefit and mounting internal and external costs. In many parts of the Capital Region, we no longer have sufficient funding or land to continue to solely prioritize free highway capacity expansion. Elected officials and government transportation agencies are increasingly looking to implement performance-driven tolling to address congestion and get better performance from the capacity that we have.

Congestion is not linear. Evidence shows that by removing just a small fraction (i.e. as little as five percent⁷) of vehicles from a congested roadway allows the transportation system to flow more efficiently and enables more people to move through the same corridor at more predictable and higher speeds, increasing person throughput.

ADDRESSING ROADWAY CONGESTION

POSSIBLE SOLUTIONS



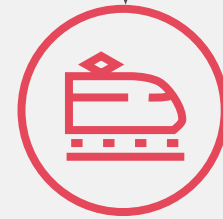
Build additional highway capacity

- Requires infrastructure investment and land
- Free lane access induces more trips that can negate most benefits from new capacity
- LA spent \$1.6 billion over six years to widen the I-405 that resulted in average rush hour travel time increasing by one minute



Manage highway demand by tolling new/untolled roads

- Toll revenue pays for capital and maintenance investments for the facility
- Improves travel time, reliability and decreases congestion
- Increases person throughput
- Can generate revenue to invest in public transportation
- Can encourage carpooling



Develop transit network and service

- Requires infrastructure investment and land depending on the type of transit (i.e. bus versus rail)
- Investment in transit alone provides minimal decrease in roadway congestion

PERFORMANCE-DRIVEN TOLLING

Many international and domestic roads charge a toll to access the facility. This method explicitly prices roadway travel, enabling drivers to make more informed decisions regarding their transportation options, costs, and level of congestion.

Tolling, more broadly, has been deployed for decades on many highways in the United States. Early tolling experiments charged static tolls to access an entire highway (e.g. Pennsylvania Turnpike). The charge was assessed primarily as a means to maintain and expand the facility.

Recent technological advances have enabled tolling to be deployed in new ways, for example through uniform quick payment systems across jurisdictions (e.g. E-Z Pass) and variable priced tolls (i.e., toll facilities that use precision pricing that adjusts in real-time with the level of congestion on the road) to better manage demand and normalize congestion levels. These advances enable tolling to go beyond simply charging fees to raise revenue to cover upfront capital costs, but to also improve the management and demand for the entire transportation system.

There are many instances where the promised benefits of investments tolled facilities have not materialized, including high profile setbacks using public-private concessionaire

models. These have included instances where the public has paid large sums of money or been restricted from upgrading nearby facilities that may compete with the toll facility (e.g. CA SR 91), where the public has paid for services that were not rendered (e.g. VA U.S. 460) or where revenue and vehicle projections were too low, forcing bankruptcy for the private entity (e.g. Indiana Turnpike).

Recent advancements in technology and lessons from these setbacks have resulted in improvements to projects to better address underlying causes of congestion and issues associated with it, including from the consumer's perspective:

- A lack of economic incentives to change travel behavior such as enhancing person throughput in each vehicle (e.g. HOV trips), diverting travel to non-peak travel periods of the day, forgoing travel altogether (e.g. telework) or opting for other trip options such as public transportation and carpooling; and
- A lack of travel alternatives.

HOW PERFORMANCE-DRIVEN TOLLING WORKS



Performance-driven tolling provides a mechanism to charge each single-occupant vehicle a fee to access congested roadways, which better manages the demand for the limited roadway capacity and delivers increased travel speeds and predictability, maintains roadways, incents HOV use, and enhances multimodal travel options for the region. When done correctly, performance-driven tolling can provide broad benefits that improve the entire transportation system, including to the roads adjacent to or near the toll facility; and enable equitable access to the toll facility for the unbanked and/or those unable to afford the tolls through enhanced public transportation services and free HOV access.

REAL LIFE EXAMPLES

On average, consumers driving alone do not use toll facilities on a daily basis. However, consumers find them useful when time is limited because the toll facility provides reliable travel at higher speeds. This reliability provides a form of insurance policy offering mobility and access for all income groups when needed, such as life events and aspects of work.

PLUMBER

A self-employed plumber wants to squeeze in another job—a clogged drain that he charges \$200 to fix—but travel is backed up on the Virginia portion of the Capital Beltway heading to his first job in Bethesda. The only way he will be able to accept the late afternoon appointment is if he takes the 495 Express Lanes.



DAYCARE PICKUP

A parent working in Alexandria is late to pick up her child at daycare in Stafford after a successful 3-hour business meeting with a new client. For every 15 minutes she is late for pickup, the daycare charges \$30.



Examples representative of average toll rates and cost savings projected between on and off ramps of operating toll system in Virginia. Source: 2017 Customer Case Studies, Transurban.

APPROACHES TO PERFORMANCE-DRIVEN TOLLING

There are three main categories of roadway tolling strategies deployed throughout the world:

- Toll Lanes
- Whole Facility Tolling
- Zonal Pricing

PRICING TYPE	TYPE DESCRIPTION	CASE STUDY
<p>TOLL LANES</p>	<p>Tolls on managed roadway lanes such as High Occupancy Toll (HOT)</p>	<p>TEXPRESS LANES</p> <p>Operations:</p> <ul style="list-style-type: none"> • Toll lanes built within or added to existing highways to add capacity to accommodate more traffic and to relieve congestion. • Toll prices vary based on the level of traffic in the corridor to maintain a minimum 50 miles per hour travel speeds. • It is the consumers' choice to drive in the TEXpress lanes and pay the tolls or to drive in the adjacent non-tolled general highway lanes. • A 50 percent toll discount is offered for HOV 2+ vehicles during peak periods. <p>Benefits:</p> <ul style="list-style-type: none"> • The North Tarrant Express (NTE), TEXpress and the LBJ TEXpress have resulted in improvements in general-purpose traffic on both facilities. • Speeds for the adjacent general-purpose lanes near the NTE TEXpress are around 7 percent higher, and average speed has increased for the general-purpose lanes abutting the LBJ TEXpress Lanes by 10 to 15 percent since opening.^{8,9}
<p>WHOLE FACILITY TOLLING</p>	<p>Dedicated toll roads or bridges (without a free general-purpose alternative)</p>	<p>FLORIDA'S TURNPIKE SYSTEM</p> <p>Operations:</p> <ul style="list-style-type: none"> • The 483-mile system is operated by Florida's Turnpike Enterprise (FTE), which acts as a separate business unit of the Florida Department of Transportation (FDOT). • Toll rates are established on a per-mile and per-axle basis. <p>Benefits:</p> <ul style="list-style-type: none"> • All revenue from Florida's Turnpike is reinvested into projects like building new roadways or maintaining existing roadways.¹⁰
<p>ZONAL PRICING</p>	<p>Charges to drive into a high-demand area (e.g. central business district) within a city</p>	<p>LONDON—CONGESTION CHARGING ZONE</p> <p>Operations:</p> <ul style="list-style-type: none"> • First introduced in 2003, aims to reduce congestion within central London. • Designed to encourage motorists to shift to public transportation walking and cycling. • Fee levied within specified zone from Monday—Friday from 7 a.m. to 6 p.m., providing vehicles unlimited driving, exiting and re-entering of the congestion zone the remainder of day that the fee is assessed. <p>Benefits:</p> <ul style="list-style-type: none"> • Business sales, profitability, and start-ups in the charging zone have exhibited strong growth post deployment. • Traffic entering the charging zone has remained stable at 27 percent lower than pre-deployment conditions in 2002. • Almost 80,000 fewer cars enter the charging zone per day. • Cycling levels in the charging zone are up by 66 percent since the introduction of the program. • Net revenue from the congestion charge must be spent on further improvements to transportation across London—£1.2 billion in total net revenue in the program's first 10 years.¹¹

TOLLING IN THE CAPITAL REGION

Both **Virginia** and **Maryland** have deep experience developing toll facilities, with 35 toll facilities operating, under construction, or in planning stages across the two states (22 in Virginia and 13 in Maryland) (see Appendix A). These facilities include a mix of fixed and variable priced toll lanes and whole facility tolling, and not all support performance-driven tolling. The **District of Columbia** has no toll lanes.

In recent years, **Virginia** has expanded its toll network through High Occupancy Tolls (HOT)—where high-occupancy vehicles pay no fees or lower toll fees, and single-occupant vehicles pay a variable toll to access the lane. Virginia’s recent approach to tolling new capacity in its most congested areas of the state has generally included the following aspects:

- Defining goals and performance metrics for the highway project, and developing estimates of costs and public benefits under both public and private delivery and management scenarios
- Using public-private partnership (P3) mechanisms involving private concessionaires to build, operate, and maintain tolled facilities with low levels of upfront public investment
- Provides funding to non-tolling transportation projects (e.g. park and ride lots, and public transportation)
- Providing free access for HOV-3+ vehicles
- Utilizing uncapped tolls to allow appropriate pricing responses to congestion

Data collected on consumer outcomes for Virginia’s tolled network and adjacent non-tolled lanes before and after the deployment generally suggests an increase in travel speeds and reliability during the most congested periods of the day for both the tolled lanes and the adjacent non-tolled lanes, and increases in total traffic volumes.¹² Surveys also show satisfaction from toll users, with 80 percent of consumers of I-95 and I-495

Express Lanes believing the toll facilities are a “good option when needed”, and personal reasons such as appointments and visiting family and friends cited as top reasons for using the toll lanes.¹³

Virginia recently opened HOT on all I-66 lanes (i.e. whole facility tolling) inside the Virginia portion of the Beltway to the District’s border for morning and evening peak directions. The state is also converting two existing reversible HOV lanes to HOT for eight miles along I-395 to near the District’s border, expanding capacity and deploying High Occupancy Tolls on I-66 outside the Beltway, adding additional 11 miles of HOT capacity along I-95 to Fredericksburg, and is planning to extend the I-495 Express Lanes to the American Legion Bridge and the Maryland border.

Maryland’s toll facilities throughout the state employ different toll approaches (e.g. variable priced tolls, static priced tolls, whole facility tolling). In September 2017, Governor Hogan’s Administration announced its Traffic Relief Plan¹⁴ aimed at providing congestion relief in the Washington suburbs and on the Baltimore-Washington Parkway corridor. The Traffic Relief Plan is bold, and, if deployed correctly, presents the region an opportunity to greatly reduce congestion, improve reliability, and enhance mobility for all consumers. The plan includes four key components:

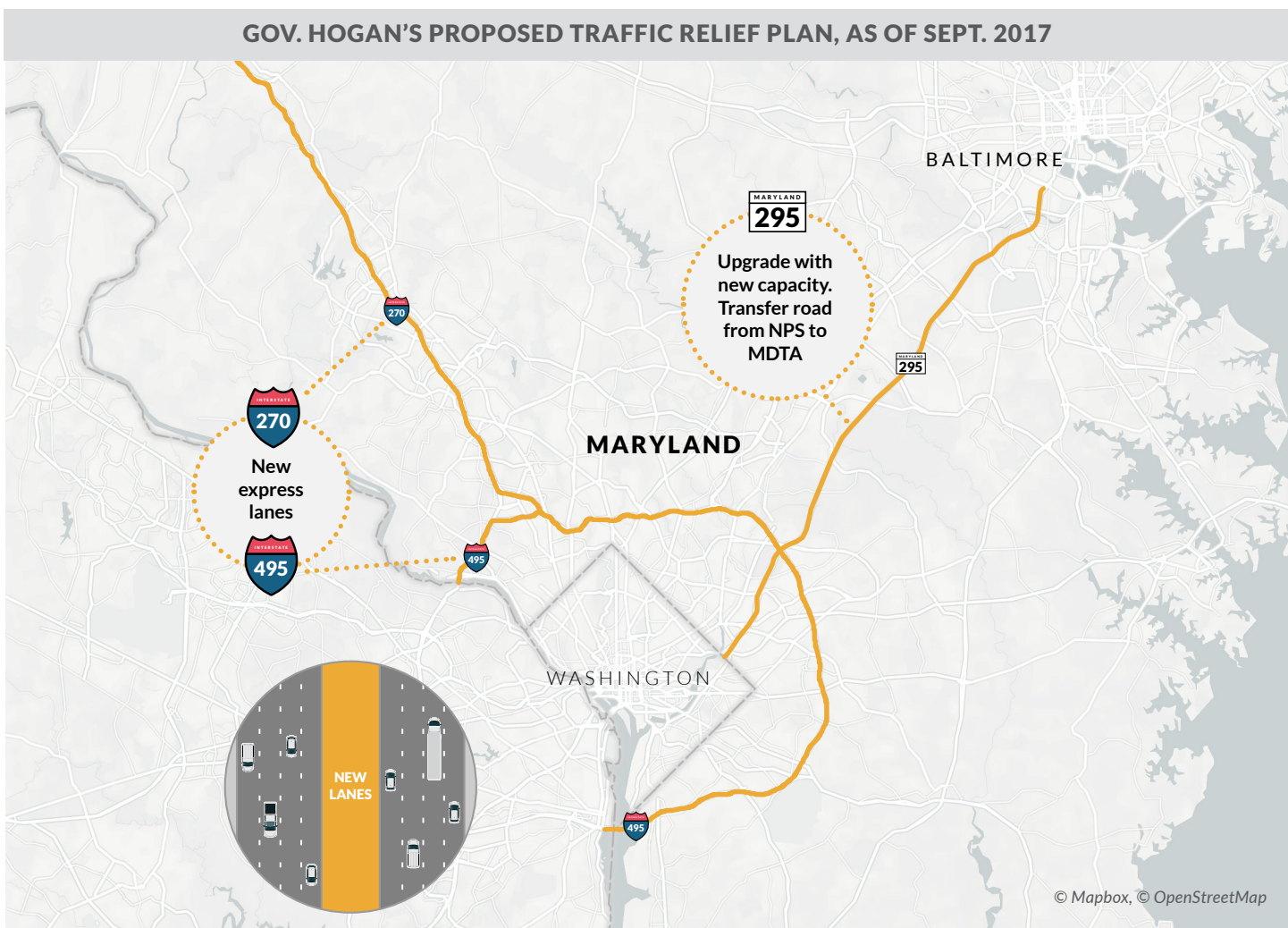
- Add capacity with four new tolled lanes on I-495 in Maryland between American Legion Bridge and Woodrow Wilson Bridge that would connect to Virginia’s toll network
- Add capacity with four new tolled lanes on I-270 between I-495 and I-70 in Frederick
- Gain ownership of the Baltimore-Washington Parkway (MD 295) from the federal government, and add capacity with four new tolled lanes between Washington, D.C. and Baltimore

- Use P3 mechanisms for a private concessionaire to design, build, finance, operate and maintain the facilities under a long-term contract

Maryland estimates that the total cost for the Traffic Relief Plan will be \$9 billion. Private financing of the project, along with ongoing operations and maintenance would be funded from the tolls paid by toll lane users.

Detailed information on the design and governing policies for the new toll lanes in the Traffic Relief Plan is still being

developed. Maryland's Traffic Relief Plan is an important project that will connect Virginia and Maryland's toll systems for the first time requiring coordination and agreement to not only align tolling policies, but to make critical investments to rebuild the American Legion Bridge. These are important connections that, if delivered correctly, will provide tangible benefits for the region's transportation system for decades. It is important for the Capital Region that this project is delivered correctly so that it is successful.



Source: Maryland Department of Transportation Traffic Relief Plan

02

**THE PARTNERSHIP'S
PERFORMANCE-
DRIVEN TOLLING
PRINCIPLES**



A well-coordinated regional toll network provides faster, more reliable transportation options that can better connect the Capital Region and can also support new capacity, maintain facilities, provide equitable access to the new facility, and enhance multimodal travel options for all consumers. Performance-driven toll planning and investments, if delivered correctly, represent a critical tool to improve our transportation system and connect our super-region with seamless and reliable transportation options.

The Capital Region is at the forefront of leveraging tolling to combat roadway congestion and improve mobility outcomes. However, as Virginia and Maryland's toll systems expand

and connect, it becomes critical that the region execute a coordinated approach that delivers outcomes to improve each consumer's travel experience and better connects our region.

The following six principles establish the path for the Capital Region to achieve peak performance and maximum benefits from performance-driven tolling in our transportation system. Maryland, Virginia, and the District of Columbia have an opportunity to use this powerful tool in the right way to improve our quality of life, enhance personal mobility, and strengthen our economic performance, positioning the Capital Region as the international leader on how to deploy performance-driven tolling solutions.

1. Tolling investments should improve the transportation system, not just the tolled facility

Toll networks can and should improve mobility and access outcomes for consumers using the region's transportation network. The toll lanes and the resulting investments from the toll fees should move more people and goods efficiently in the tolled lanes, non-tolled lanes, and public transportation system, resulting in improved travel conditions for the broader transportation network.



PUT INTO PRACTICE

The I-66 Express Lanes Inside-the-Beltway project was structured to ensure toll revenues maintain the facility's operation and maintenance, with remaining funds invested to improve the competitiveness of non-drive alone trips in the broader I-66 corridor, including expanded bus service, vanpool and carpool assistance, and expanded park-and-ride capacity. Based on data from the first three months of operation, the tolls have delivered increased travel speeds and new predictability for consumers using the highway, while not degrading nearby roadways' travel conditions.

The \$3.7 billion I-66 Outside-the-Beltway project is a P3. The project requires zero public investment and Virginia's private partner will provide an upfront payment of approximately \$500 million that will be used to fund additional transportation improvements in the broader corridor. Additionally, the P3 agreement requires the private partner to pay a net present value of \$800 million for public transportation service in the broader corridor, and \$350 million for other projects to improve the I-66 corridor over the next 50 years.¹⁵

2. Toll planning should be coordinated regionally to deliver the benefits of greater mobility and reliability to all consumers of the transportation system

Strong intra-regional collaboration and policy alignment between all government and private stakeholders will not be easy with the existence of various tolled facilities in Maryland and Virginia, but it is necessary, ensuring roadway tolling policies are complementary and seamless for consumers regardless of where their trip starts or ends. The region's transportation system spans political jurisdictions, enabling consumers to travel across borders without needing to change transportation options. It is critical, especially for our unique region that spans many political jurisdictions, that there is strong collaboration to ensure that policies, planning and deployment are aligned to maximize the potential benefits of tolling for all consumers. Outside congested periods, the region's existing road network enables seamless travel, and this should be a guarantee for the region with expansion of the toll network.



PUT INTO PRACTICE

The Metropolitan Transportation Commission (MTC) is the transportation planning, financing and coordinating agency for the nine-county San Francisco Bay Area. The MTC understood the need for a coordinated approach to toll lanes in the region and, in 2006, planned a network of HOT lanes sharing design, finance, and operational characteristics in an effort to accelerate delivery of the express lane network and reduce costs. The MTC has indicated that simplifying assumptions in the network planning phase have significant benefits for cost, schedule and phasing.^{16, 17}

3. Decision-makers should prioritize providing *enhanced connectivity to the greatest number of people, not moving the most vehicles or generating the most revenue*

Regional policies should be deployed to maximize the use of this scarce resource, our roadways. Prioritizing people throughput enhances the efficiency of the roadway's carrying capacity, providing the greatest number of people access to their destination—the purpose of nearly all trips. This is a long-recognized goal for the region's transportation investments and can reduce the need to expand roads. For example, a typical interstate lane can carry 1,900 vehicles per hour at rush, which carries roughly 2,250 people per hour at an estimated 1.2 people per vehicle. Just 50 to 60 buses per hour could carry a similar load—saving the additional space for drivers.¹⁸ Uniform regional policies that provide free access for HOVs and public transportation vehicles are essential to incentivize behavior change that results in moving the most people without pushing vehicles and congestion to other roads.



PUT INTO PRACTICE

Each day more than 14,000 consumers opt for public transportation to traverse the SR 520 corridor in the Seattle region. If buses stopped providing service along this roadway, 1.5 additional non-tolled lanes would be needed to meet demand from additional vehicle travel.¹⁹

4. Consumers of *all income levels* should benefit from the tolling investment, including those without the financial means to afford the tolls

All consumers should benefit from the tolling investment, including those without the means to afford the tolls. This can be achieved through investments in high-quality public transportation options adjacent to or near the toll corridor, incentives that encourage HOV use, and/or providing vouchers or discounts to low-income consumers. Additionally, policies and laws should seek to reduce barriers that disproportionately impact those without access to the internet, bank accounts and credit cards—the assets often required to efficiently pay tolls and use the tolling technology.



PUT INTO PRACTICE

The Los Angeles region converted HOV lanes to toll facilities on the I-110 and I-10 interstates as part of the federal Congestion Reduction Demonstration Program. As part of the program, the region flexes toll revenues in order to lower barriers for low-income families to benefit from the toll facility, and make it easier for public transportation consumers to use the facility when needed. The Low-Income Assistance Plan provides consumers earning less than twice the federal poverty level with a one-time \$25 credit after an account has been successfully setup, as well as waivers to the \$1 monthly account maintenance fee. Through the Transit Rewards Program frequent public transportation consumers receive \$5 in toll credits for every 32 one-way public transportation trips taken in the toll corridor. The benefit of free trip in the toll lane is an added incentive to use public transportation, which helps reduce roadway congestion.²⁰

5. Tolling revenue should be invested in *cost-effective public transportation enhancements*

It is critical that new tolling projects provide consumers the freedom to opt out of paying the toll all together through high-quality, cost-effective non-toll trip alternatives (e.g. carpool, vanpool, bus, rail, and cycling). These travel options can and should be supported by toll revenues. While a portion of the revenues generated will be required to operate the toll collection and traffic management systems, net revenues after payment of operating costs and debt costs should be used to (1) pay for the maintenance and improvement of existing facilities; (2) provide alternatives to single-occupancy vehicle travel within the corridor through HOV policies or enhancements to nearby public transportation services; (3) invest in new public transportation services to connect underserved areas to jobs, education, and other essential services; and (4) consider innovative concepts to incent meaningful behavioral change, such as matching employer transit benefits to bring public transportation benefits to par with parking subsidies.



PUT INTO PRACTICE

After covering maintenance, administration, operations, toll collection, and enforcement costs for the toll facilities on the I-110 and I-10 in Los Angeles, the region invests excess toll revenue in transit, active transportation, and additional highway improvements. From 2014 to 2016, LA Metro has provided more than \$75 million in toll revenue for ancillary projects, including \$37 million for transit operating subsidies and capital costs.²¹

6. Public agencies should conduct robust and broad *public engagement to develop goals, performance metrics and public benefit assessments for each tolling project, whether delivered by the public agency or by a public-private partnership*

Performance-driven tolls can be delivered by a public agency or through a P3. Regardless of the deliverer—public or private—consumers of our transportation system should play a role in determining the goals and performance metrics that will determine the success for each performance-driven tolling project. This should be done through a robust and broad public engagement process at the front end of each project. During this process, public agencies should present rigorous analysis of the full-life cycle cost, especially if using a private delivery option, to ensure projections are as transparent and accurate as possible. This is important, as there are examples throughout the country when decision-makers over-valued upfront capital cost allocations that ultimately reduced public benefit over the life of the project. To ensure accountability, the public agencies should provide ongoing visibility into where the toll revenue is being invested and the outcomes being achieved, through frequent public reports that review the project.



PUT INTO PRACTICE

Tolling in the Puget Sound region of Washington State was incubated over the course of nearly two decades, starting with a few individual projects and culminating in a long-range transportation plan that called for extensive deployment of tolling. Leadership by elected officials and a willingness to develop and apply state-of-the-art analytical tools provided a strong platform to expand the use of tolling. The Washington State Department of Transportation implemented several measures to increase public understanding of the implications of both action and inaction with respect to the region's transportation system, as well as to ensure the community is

involved in delivering these important projects. In particular, cost/benefit analysis enabled participants in the planning process to see the value of different approaches, encouraging a fresh look at the region's transportation problems and non-traditional solutions. The state Department of Transportation has dedicated an ombudsman and community liaisons who regularly host meetings with the public and produce quarterly reports on community engagement, concerns, and project-level impacts.²²

CONCLUSION

The Capital Region will never reach its maximum potential if we do not address our worsening roadway congestion. Roadway congestion limits our growth potential, harms our quality of life, restricts income growth for families, and reduces economic mobility. We must tackle this challenge together.

Performance-driven tolling, if done correctly, is a valuable tool to reduce roadway congestion and, in so doing, improve the overall transportation system. The principles presented in this report provide the roadmap for Capital Region decision-makers and stakeholders to deliver the greatest benefit from tolling investments. Each principle should be incorporated and deployed in each decision going forward regardless of the jurisdiction in which the project is located and, where possible,

should be deployed to enhance the system's outcomes from existing toll facilities.

The Greater Washington Partnership will work with public officials and civic leaders in the Capital Region to advocate and encourage adoption of these principles to ensure the full benefits of performance-driven tolling are realized by the region's people. Strong intra-regional cooperation among government and private stakeholders is required to ensure roadway tolling policies are complementary and seamless for consumers and deliver the best performance for the entire transportation system. We can change our transportation system's trajectory, but it is our collective responsibility to deliver success.²³

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CO-CHAIRS & COMMITTEE MEMBERS

MOBILITY INITIATIVE CO-CHAIRS:

Thomas F. Farrell II

Chairman, President & CEO, Dominion Energy

Kenneth A. Samet

President & CEO, MedStar Health

Mark A. Weinberger

Global Chairman & CEO, EY

MOBILITY INITIATIVE STEERING COMMITTEE:

Robert Blue

Dominion Energy

Michael Curran

MedStar Health

Tyler Duvall

McKinsey & Company

Marcia Hale

Building America's Future

Maurice Jones

LISC

Jason Miller

Greater Washington Partnership

John Porcari

WSP USA

Kevin Virostek

EY

Edward Wytkind

EW Strategies, LLC

David Zipper

German Marshall Fund

ENDNOTES

1. Schrank, David, Bill Eisele, Tim Lomax, and Jim Bak. *2015 Urban Mobility Scorecard*. College Station: Texas A&M Transportation Institute, 2015. <https://static.tti.tamu.edu/tti.tamu.edu/documents/mobility-scorecard-2015.pdf>.
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3. This brief is part of the Partnership's Blueprint for Regional Mobility, planned for release in 2018.
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23. This brief is part of the Partnership's Blueprint for Regional Mobility, planned for release in 2018.

APPENDIX A

Toll facilities in Maryland and Virginia

Project	State	# of Toll lanes	# of General Purpose Lanes	Corridor Length (miles)	Project Cost	HOV policy	(Projected) date operational	Location	Annual Revenue (\$M)	Special Purpose Vehicle (SPV), Equity Investor, Developer, Operator
Existing/Projects in Operation										
I-95 EXPRESS LANES	VA	2/3 x 1 (reversible)	4x2	29	923	HOV-3	2014	I-95 corridor starting ~1 mile north of Route 648 (Edsall Road) to the ramp for the Route 610 interchange (Garrisonville Road) in Stafford County.	84 (2017)	SPV: 95 Express Lanes, LLC
										Developer: Fluor
										Operator: Transurban
I-95 SOUTHERN EXTENSION	VA	1	3x2	3	50	HOV-3	2017	I-95 Express Lanes about two miles beyond the flyover ramp where the 95 Express Lanes previously ended, north of Garrisonville Road (Exit 143) in Stafford County.	N/A	SPV: 95 Express Lanes, LLC
										Developer: TBD
										Operator: Transurban
I-495 EXPRESS LANES	VA	2x2	4x2	14	2,068	HOV-3	2012	On Capital Beltway from Old Dominion Drive Bridge (Route 738) just south of Georgetown Pike (Route 193) to the Springfield Interchange Phase VIII.	73 (2017)	SPV: Capital Beltway Express, LLC
										Developer: Fluor
										Operator: Transurban
I-66 INSIDE THE BELTWAY	VA	4 x 1 (peak direction tolled)	4x2	9	2,500	HOV-2	2017	I-66 from I-495/ Capital Beltway to U.S. Route 29 in Rosslyn	9.8* (2018)	VDOT
64 EXPRESS LANES	VA	2 x 1 (reversible)	3x2	8	10	HOV-2	2018	I-64 corridor from I-264 Interchange to I-564	1.3* (2018)	VDOT
DULLES TOLL ROAD	VA	4x2 (1x2 HOV)	2x2 - airport access only	14	N/A	HOV-2	1984	Corridor connecting Capital Beltway and I-66 to Dulles Greenway	152 (2017)	Metropolitan Washington Airports Authority

Project	State	# of Toll lanes	# of General Purpose Lanes	Corridor Length (miles)	Project Cost	HOV policy	(Projected) date operational	Location	Annual Revenue (\$M)	Special Purpose Vehicle (SPV), Equity Investor, Developer, Operator
Existing/Projects in Operation										
DULLES GREENWAY	VA	3x2	0	22	350	None	1995	Highway extending from Dulles Toll Road - which carries traffic between Washington's Capital Beltway and Dulles Airport - to Leesburg	91.7 (2016)	SPV: Toll Road Investors Partnership II Equity: Macquarie Infrastructure Group (2005) Operator: Autostrade International of Virginia O&M, Inc.
POCAHONTAS 895	VA	2x2	0	10	597	None	2002	Freeway between the junction of I-95 and VA-150 Chippenham Parkway in Chesterfield County, and I-295 in Henrico County	N/A	Developer: Fluor Daniel / Morrison Knudsen Operator: DBi (since 2013), Transurban (since 2006), VDOT (before 2006)
POWHITE PARKWAY	VA	2x2	0	3	N/A	None	1973	Powwhite Parkway between Chippenham Parkway and the Cary Street ramps, crossing James river	25.5 (2017)	Richmond Metropolitan Transportation Authority (RMTA)
POWHITE PARKWAY EXTENSION	VA	3x2	0	10	123	None	1988	I-195 Powwhite Parkway from Jahnke Road to central Chesterfield County	10.1 (2017)	VDOT
DOWN-TOWN EXPRESS-WAY	VA	3x2	0	2.5	73	None	1976	Highway from the Meadow Street Ramp in the west to I-95 in the east	13.9 (2017)	Richmond Metropolitan Transportation Authority (RMTA)
BOULEVARD BRIDGE	VA	1x2	0	0.5	10	None	1969	Bridge carries State Route 161 across the James River	1.5 (2017)	Richmond Metropolitan Transportation Authority (RMTA)
CHESAPEAKE BAY BRIDGE TUNNEL	VA	2x2	0	23	450	None	1999	Highway crossing of the lower Chesapeake Bay, connecting Virginia's Eastern Shore and south Hampton Roads	57.5 (2016)	Chesapeake Bay Bridge and Tunnel Commission
CHESAPEAKE EXPRESS-WAY	VA	2x2	0	17	112	None	2001	Highway between the I-64/I-464 interchange and the North Carolina border	12.9* (2017)	City of Chesapeake

Project	State	# of Toll lanes	# of General Purpose Lanes	Corridor Length (miles)	Project Cost	HOV policy	(Projected) date operational	Location	Annual Revenue (\$M)	Special Purpose Vehicle (SPV), Equity Investor, Developer, Operator
Existing/Projects in Operation										
DOMINION BOULEVARD	VA	2x2	0	4	345	None	2016	Highway from Cedar Road to the I-64/I-464/Oak Grove Connector Interchange in Chesapeake, Virginia	4.4* (2017)	City of Chesapeake
ELIZABETH RIVER TUNNELS	VA	2x2/3x2	0	N/A	2,100	None	2017	New two-lane tunnel adjacent to the existing Midtown Tunnel under the Elizabeth River, existing Midtown and Downtown tunnels, extending the MLK from London Boulevard to Interstate 264, and interchange modifications at Brambleton Avenue and Hampton Boulevard	109* (2017)	SPV: Elizabeth River Crossings Holdco LLC Equity: American Infrastructure Funds Developer: FIGG Bridge Engineers
SOUTH NORFOLK JORDAN BRIDGE	VA	1x2	0	1	140	None	2012	Bridge over the Elizabeth river connecting Chesapeake and Portsmouth	***	SPV: United Bridge Partners Equity Investor: Meridiam, APG Group, John Laing Operator: Cintra
GEORGE P. COLEMAN BRIDGE	VA	2x2	0	1	75	None	1996	Bridge over the York River between historic Yorktown and Gloucester County	6 (2017)	VDOT
INTER-COUNTY CONNECTOR	MD	3x2	0	19	2,386	None	2011	Highway that connects I-270 at I-370 in eastern Montgomery County to US 1 in northwestern Prince George's County	64.3 (2017)	Maryland Transportation Authority
I-95 EXPRESS LANES (NORTH OF BALTIMORE)	MD	2x2	4x2	8	360	None	2014	I-95 express lanes between Baltimore City Line north of Baltimore and White Marsh	12.5 (2017)	Maryland Transportation Authority
JFK MEMORIAL HIGHWAY EXPRESS TOLL LANES	MD	3x2/ 4x2	0	50	73	None	1963	Section of I-95 from the northern Baltimore City line to Delaware	173.4 (2017)	Maryland Transportation Authority

Project	State	# of Toll lanes	# of General Purpose Lanes	Corridor Length (miles)	Project Cost	HOV policy	(Projected) date operational	Location	Annual Revenue (\$M)	Special Purpose Vehicle (SPV), Equity Investor, Developer, Operator
Existing/Projects in Operation										
THOMAS J. HATEM MEMORIAL BRIDGE (US 40)	MD	2x2	0	2	5	None	1940	Bridge spanning the Susquehanna River on US 40 between Havre de Grace and Perryville in northeast Maryland	11.9 (2017)	Maryland Transportation Authority
FORT MCHENRY TUNNEL (I-95)	MD	4x2	0	13	750	None	1984	Interstate 95 from the southern Baltimore City limit (Caton Avenue) to the northern Baltimore City limit, including the eight-lane tunnel and I-395 into downtown Baltimore	201.4 (2017)	Maryland Transportation Authority
BALTIMORE HARBOR TUNNEL (I-895)	MD	2x2	0	19	130	None	1957	I-895 that crosses under the Patapsco River and connects major highways and many arterial routes in Baltimore City's industrial sections	88.4 (2017)	Maryland Transportation Authority
FRANCIS SCOTT KEY BRIDGE (I-695)	MD	2x2	0	11	60	None	1977	I-695 outer-harbor crossing over the Patapsco river	44.3 (2017)	Maryland Transportation Authority
HARRY W. NICE MEMORIAL BRIDGE (US 301)	MD	1x2	0	2	5	None	1940	US 301 over the Potomac River	21.3 (2017)	Maryland Transportation Authority
WILLIAM PRESTON LANE JR. MEMORIAL (BAY) BRIDGE	MD	2x2 +1 (reversible)	0	4	193	None	1973	Two-span bridge between Sandy Point and Stevensville, MD crossing the Chesapeake Bay	53.3 (2017)	Maryland Transportation Authority

Project	State	# of Toll lanes	# of General Purpose Lanes	Corridor Length (miles)	Project Cost	HOV policy	(Projected) date operational	Location	Annual Revenue (\$M)	Special Purpose Vehicle (SPV), Equity Investor, Developer, Operator
Projects Under Construction/Construction Expected										
I-66 OUTSIDE THE BELTWAY	VA	4 x 1 (peak direction tolled)	4x2	23	3,724	HOV-2	2022	I-66 corridor from the I-495 Capital Beltway to US 29 in Gainesville	181* (2023)	SPV: I-66 Express Mobility Partners LLC
										Equity Investor: Meridiam, APG Group, John Laing
										Operator: Cintra
I-395 EXPRESS LANES	VA	3 x 1 (reversible)	4x2	8	554	HOV-3	2020	On I-395 from Turkeycock Run in Fairfax County, Virginia through the Cities of Alexandria and Arlington, to the border with the District of Columbia.	N/A	SPV: 95 Express Lanes, LLC
										Developer: Fluor
										Operator: Transurban
I-95 EXPRESS LANES FREDERICKSBURG EXTENSION	VA	2 x 1 (reversible)	3x2	10	565	HOV-3	2022	I-95 from the terminus near Route 610 (Exit 143 - Garrisonville Road) in the north to the vicinity of Route 17 (Exit 133 - Warrenton Road) in the south	N/A	SPV: 95 Express Lanes, LLC
										Developer: TBD
										Operator: Transurban

Project	State	# of Toll lanes	# of General Purpose Lanes	Corridor Length (miles)	Project Cost	HOV policy	(Projected) date operational	Location	Annual Revenue (\$M)	Special Purpose Vehicle (SPV), Equity Investor, Developer, Operator
Projects Under Evaluation/Planning										
I-495 EXPRESS LANES EXTENSION	VA	2x2	4x2	2	550	HOV-3	N/A	Capital Beltway just south of Old Dominion Drive and extend north to the George Washington Memorial Parkway	N/A	TBD
I-495 EXPRESS LANES	MD	N/A	[4/5/6]x2	42	4300*	N/A	2025	I-495 corridor from American Legion Bridge to Woodrow Wilson Bridge	N/A	N/A
I-270 EXPRESS LANES	MD	N/A	[2/3/4/6]x2	34	3400*	N/A	N/A	I-270 corridor from I-495 to i-70 near Frederick	N/A	N/A
BALTI-MORE-WASHINGTON PARKWAY	MD	N/A	2x2	~20	1,400	N/A	N/A	MD 295 from I-495 to Baltimore	N/A	N/A
I-95 EXPRESS LANES EXTENSION (NORTH OF BALTI-MORE)	MD	N/A	3x2 (current)	~17	N/A	N/A	2040	North of MD 43 to north of MD 22	N/A	N/A

*Projection/ estimate

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