



Super Regional Model

—
Virginia Department of Transportation Office of P3

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A bold new approach

Super Regional Model (SRM) is a state-of-the-art tool for forecasting future traffic in the Northern Virginia, Fredericksburg, and Richmond regions. SRM is a *network approach* for capturing traffic data across this area.

SRM covers nearly 10,600 square miles over 40 jurisdictions and 22 counties in Virginia, Washington, D.C., and Maryland. Three Metropolitan Planning Organization (MPO) model regions together constitute a system of approximately 6,000 traffic analysis zones. With SRM, the Virginia Department of Transportation (VDOT) Office of Public-Private Partnership (Office of P3) is able to drive insights on traffic corridors unprecedented in public sector transportation organizations.



What is a network approach?

The network approach brings together data insights from three distinct MPO models and combines them into a single model for greater insights across a larger area.

It connects the express and toll lane systems spanning across different model regions in a coherent analysis tool.

Further, it incorporates enhanced 'toll choice functions' which simulates drivers' real behavior towards toll lanes usage more reasonably.

Why SRM?

SRM provides an off-the-shelf tool for running in-depth or expedited analysis for any potential express lane corridor in the region. The Office of P3 recognized the need for a tool that would be suitable for analyzing corridors within the super region without having to repeatedly invest time and effort into developing individual corridor subarea models.

- ✓ Allows the Commonwealth to more accurately understand and forecast long-distance travel along the I-95 corridor between Washington, DC, and Richmond, including commuters and commercial/freight trips
- ✓ Allows the Commonwealth to understand how recent infrastructure investments and changes in driver behavior are impacting traffic demand
- ✓ Allows the Commonwealth to “get it right” in understanding where innovative infrastructure investments, such as Express Lanes, can best benefit the general public



What is a subarea model?



Subarea models allow users the ability to drive insights on a focused area or corridor from a larger regional travel demand model.

Out with the old...

Over the nearly 2 decades of analyzing express lanes across the region, VDOT has often had to invest significant time and effort tailoring traffic forecasting models for specific isolated corridors (e.g., I-495) for each express lanes project.

Traditional traffic forecasting models have several limitations:

- Typically limited to urban area boundaries (there are separate models for the Washington, DC, Fredericksburg, and Richmond areas)
- Typically rooted in underlying data on driver behavior and traffic volumes that may be several years old (or older)
- Typically limited in ability to accurately model long-distance travel, particular for commercial/freight movements

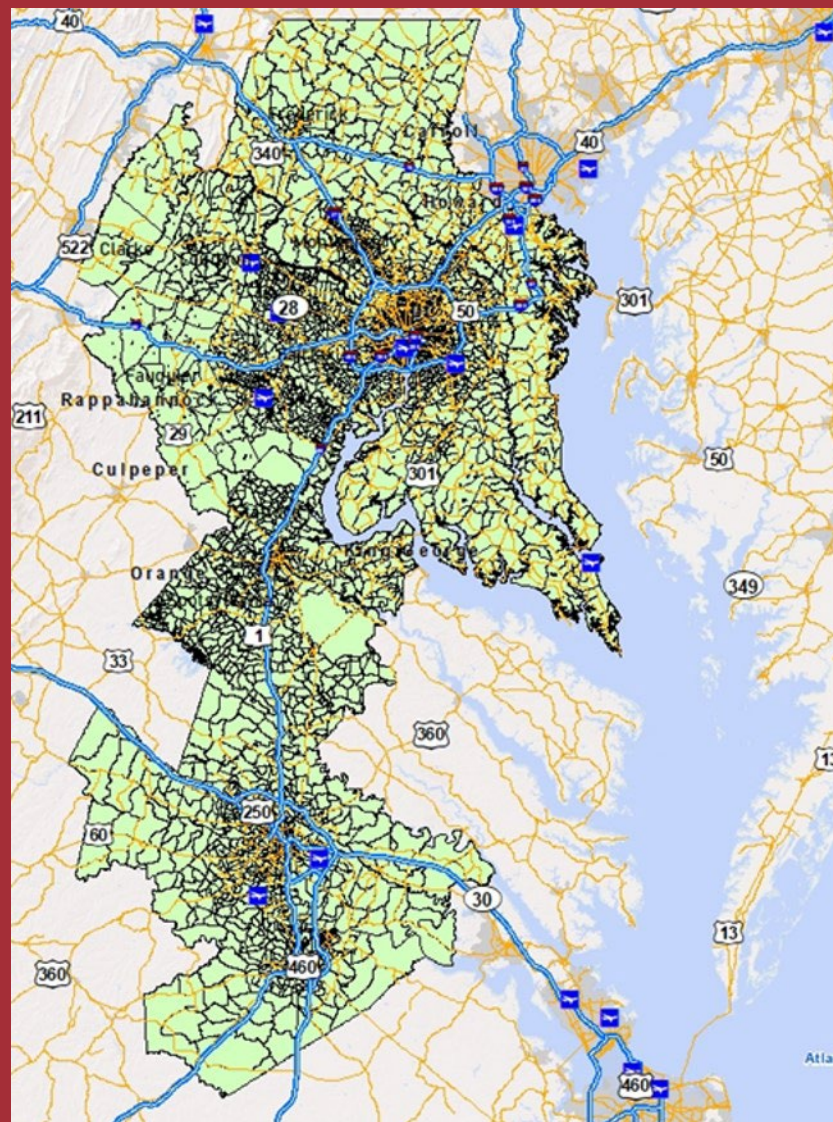
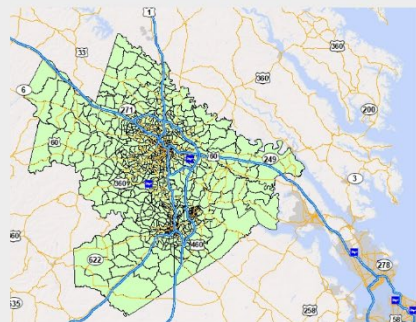
The previous paradigm was resulting in extensive costs to the Commonwealth to develop tailored models for each express lanes project that still had significant limitations.





Designing a best-in-class model

Working across three major MPOs including Washington D.C., Fredericksburg, and Richmond to develop a model of this complexity has rarely been attempted. The project team had the task of standardizing data sets across these MPOs to drive a high-quality model. This data was further refined using VDOT's own traffic data combined with surveys to define socioeconomic and demographic realities and project changes on the system decades into the future. The Office of P3 partnered with C&M Associates, Inc. and Kimley-Horn to drive a best-in-class model while leveraging VDOT expertise.



Act local, think global

A planning tool that considers the interconnectivity of the entire express lanes/toll roads network, SRM is more than just a tool for the Office of P3 to leverage in discussions and negotiations with concessionaires. SRM allows assessment of corridor improvement impacts on the entire express lane network and could serve as a regional planning tool by identifying future network bottlenecks in prioritizing projects. SRM is benefitting from data captured across VDOT, including:

- ✓ Capturing and understanding shifts in driver behavior
- ✓ Supporting planning for future corridors and understanding the impact of future corridors on existing corridors.
- ✓ Driving equitable development of transportation infrastructure.
- ✓ Examining multiple policies comprehensively all at the same time
- ✓ Incorporating frequently conducted survey and observations on traffic data

SRM puts the Commonwealth in a better position to engage with concessionaires and “get it right” in understanding where innovative infrastructure investments, such as Express Lanes, can best benefit the general public.



What is interconnectivity?



Express lanes do not exist independently of other traffic corridors. A change in traffic in one area of SRM can have an impact on corridors across the model. Interconnectivity allows SRM users to make data driven insights on how shifts in one corridor can affect traffic across the network.

Always Updating and Evolving

With extensive input from industry, multiple consultants delivering expertise into the model, and an independent external review, SRM has been built from the ground-up to leverage expertise from across VDOT and industry specialists.

SRM is continuously updating and improving its model with new data to provide the Office of P3 with near-real-time insights across the network.

With SRM, the Office of P3 has a resource to leverage with concessionaires to maximize the critical insights needed to manage some of the most complex P3 contracts in the country.





Recognized for excellence

SRM was a featured initiative at the 2022 Transportation Research Board in Washington, DC. The team continues to hold frequent meetings with State Departments of Transportation across the United States interested in how a similar model can be emulated across the country to drive excellence in P3 management.

