

Rethinking Collaborative Rural Transportation Planning In The Shenandoah Valley

Author: Tyler Hinkle

Executive Summary

Federal regulations require that the Virginia Department Of Transportation (VDOT) and the Department of Rail and Public Transportation (DRPT) review the Virginia rural transportation cooperation process at least every five years.¹ These departments fall under the review of the Commonwealth's Secretary of Transportation and the Virginia's Commonwealth Transportation Board (CTB). CTB adopted the recent rural transportation cooperation process in 2018 and after a review in 2016. An interim review can occur before the required five year review, yet the next review that will allow for substantial changes will occur between 2021 and 2023. This policy memorandum will seek to provide a brief review of the current cooperation process in order to help guide the discussion between 2021 and 2023 between VDOT, DRPT, and the localities in the Staunton VDOT District, otherwise known as the Shenandoah Valley of Virginia. The recommendations herein will demonstrate the need for more proactive transportation planning, involving a wider range of stakeholders, defining types of roads and streets, and amendments to the Smart Scale program.

Background

The Shenandoah Valley of Virginia is home to a unique rural form of development due to concerted conservation efforts and deep roots in agricultural practices. At times the forms of development in the countryside can be contradictory such as tourists and farm vehicles. VDOT developed the 2018 Rural Transportation Cooperation Process that calls for collaboration with the Smart Scale grant application process, Six-Year Improvement Program (SYIP), Long-Range Statewide Transportation Plan, and consultation with localities on rezonings, special use permits, and updates to local comprehensive plans. The current issues that the Shenandoah Valley faces in

¹ VDOT; DRPT. 2018. "The Commonwealth Of Virginia Rural Transportation Cooperation Processes," Richmond, Virginia. 2.

terms of transportation revolve around four main factors: dependency on fatality rates, lack of investment in conflict management, tunnel vision to vehicular traffic, and unequal scoring for funding.

Current Policy Model

69.2 percent of all roads in Virginia are rural in nature and range from rural interstates to rural local roads. While there are more miles of roads in the rural areas of Virginia, there is more traffic on urban roads with 62.4 percent of traffic compared to the only 37.6 percent on rural roads.² In addition to addressing rural road improvements through implementing a collaborative planning process, VDOT also classifies roads as being High Risk Rural Roads if one of the following is true: the accident rate for fatalities and incapacitating injuries exceeds the statewide average for the road classification, or potential increases in traffic volume will force the roads to have conditions as described in the first scenario.³ This model relies on the need for quantitative data on the number of individuals who have already died or land use decisions that will increase automobile traffic to create conditions similar to areas where there are high death rates.

VDOT first took a stance on addressing the need for more wildlife crossings in 2005 with a study that examined seven underpass sites in Virginia in order to determine the number of animals that would use such infrastructure if implemented in other parts of the State. The report pointed out that there were likely more than 34,000 deer-vehicle collisions in 2003. With the average property damage being \$2,530 the report stated that, "This could translate into more than \$42.6 million in property damage in 1 year."⁴ Underpasses for animals in the past were implemented in order to allow for cattle and other livestock to pass under interstates, and wildlife to cross under Skyline Drive. Livestock underpasses were constructed under Interstate 81, yet not under primary State roads. In addition, little attention has been paid to long-term improvements to manage that 41 percent of all freight truck transit in Virginia occurs on Interstate 81.⁵ The State Legislature commissioned a study to examine the alternatives for Interstate 81 and the Legislature preferred widening I-81 over improving rail.

In 2014 VDOT combined the rural and urban classifications so all roads are classified under the same system.⁶ The sub-classifications VDOT has adopted follow the

² Lim, In-Kyu. "High Risk Rural Roads (HRRR) Program in Virginia." VDOT. 5.

³ Idib 2.

⁴ Donaldson, Bridget. 2005. "The Use Of Highway Underpasses By Large Mammals In Virginia And Factors Influencing Their Effectiveness." Virginia Transportation Research Council. Charlottesville, Virginia. 1. http://www.virginiadot.org/vtrc/main/online_reports/pdf/06-r2.pdf

⁵ Jadhon, Jean. 2019. "Special Report: Has Interstate 81 become more dangerous?" WDBJ. WDBJ.com Roanoke, Virginia. <https://www.wdbj7.com/content/news/I-81--566354041.html>

⁶ Baker. 2014. "Functional Classification Comprehensive Guide." VDOT. Richmond, Virginia. 6. https://www.virginiadot.org/Functional_Classification_Comprehensive_Guide.pdf

dendritic traffic system model rather than a grid or clear delineations between streets and roads. In fact, the word, "sidewalk," does not appear once in the classification guide published by VDOT. While rural communities may want to invest in sidewalks, bike lanes, and other forms of infrastructure to promote multimodal transportation, the requirements provided by VDOT may restrict that due to the focus on vehicular traffic. In addition, VDOT provides funds to cities, and towns with a population over 5,000 to construct and maintain their own roads, while towns with smaller populations and other rural communities must abide by the rules that VDOT sets out for the development and improvement of transportation routes. While the Department of Conservation and Recreation (DCR) has provided a program to address rural road preservation through the Scenic Routes program, the only enforcement the program has is the ability to strip roads of the recognition. The reliance on a dendritic model and the lack of attention to alternative modes of transportation in VDOT's classification system can lead to smaller urban pocket communities, such as villages, hamlets, and towns that do not meet the population requirements, to be hollowed out.

The funds that are divvied out to rural communities largely come from the VDOT Smart Scale program which requires for improvements to meet one of the four project types:

- Highway Improvements
- Transit- and rail-capacity expansion
- Bicycle and pedestrian improvements
- Transportation Demand Management

The program excludes the following project types:

- Stand-alone studies
- Asset management
- Systemwide improvements
- Transit maintenance facilities without capacity expansion

Projects must be funneled through the local Metropolitan Planning Organization, Planning District Commission, or Transit Agency and they are limited to the number of applications and pre-applications they can file based on the population. Once projects have qualified for the Smart Scale application process they are scored based on their impact on various factor areas. In addition, the state of Virginia has been split into different zones for prioritizing investment as shown on the map to the right.⁷ As can be noted with the geographic disparities on the map, VDOT has moved to prioritize investment in transportation improvements in the already urbanized areas of Virginia.

⁷ VDOT. "Virginia Smart Scale." Virginia Department of Transportation. Richmond, Virginia. <http://vasmartscale.org/about/default.asp>

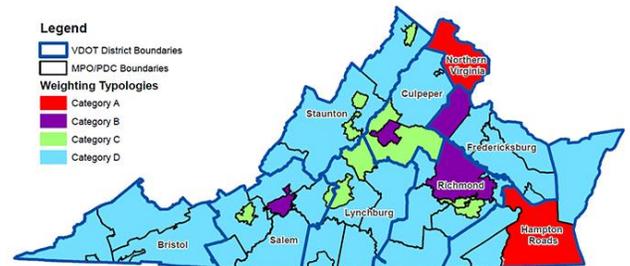
This unequal distribution of scoring points leads to an unequal distribution of funding to urban areas than rural.

Case Study Policies And Methods

Issue #1: Retroactive Planning

Netherlands

The Netherlands was able to reduce its annual number of vehicular fatalities by 50 percent and its annual number of vehicular accidents by 40 percent over twenty years after running predictive models on its transportation infrastructure and making improvements in order to reduce the number of possible accidents based on the design of the roadways.⁸



Czech Republic

The Czech Republic ran a model that examined existing data on accidents and deaths caused by vehicles in order to determine problematic areas. Then they used that data to inform an Empirical Bayes Estimation in order to determine key areas for investments in changes in the transportation system and methods for proactive road evaluations.⁹ Between 2007 and 2017 the Czech Republic reduced traffic fatalities by 52.8 percent.¹⁰

Issue #2: Lack Of Conflict Management

Albemarle County, Virginia

Adjacent to the Shenandoah Valley, Albemarle County developed its first wildlife underpass and barrier pilot program in 2017 with VDOT and since its installment it has reported a 98 percent success rate in reducing deer collisions. In addition to the reduction of deer-caused collisions, there was a 500 percent increase of wildlife usage of existing underpasses once the fencing was installed.¹¹

⁸ Sayed, Tarek; De Leur, Paul. 2010. "Developing A Systematic Framework For Proactive Road Safety Planning." *Traffic Safety Measures*. University Of British Columbia, Canada. 8.

⁹ Ambros, Jiří, Pavel Havránek, Veronika Valentová, Zuzana Křivánková, and Radim Striegler. 2016. "Identification of Hazardous Locations in Regional Road Network - Comparison of Reactive and Proactive Approaches". *Transportation Research Procedia*. 14: 4209-4217.

¹⁰ Statista. 2020. "Number of road traffic fatalities in Czechia from 2006 to 2017" Statista.com <https://www.statista.com/statistics/437891/number-of-road-deaths-in-czech-republic/>

¹¹ Markham, Chris. 2019. "Deer fencing on I-64 in Albemarle Co. has 100% success rate." NBC 29. NBC29.com. <https://www.nbc29.com/2019/11/19/deer-fencing-i-albemarle-co-has-success-rate/>

Pennsylvania

Pennsylvania Double Stack Clearance project involved the investment in addressing areas on Conrail's east-west route in order to allow for the double stacking of containers to increase the capacity of the existing rail network in Pennsylvania. After improvements were implemented, benefits were seen with reduced shipping costs, rail became more competitive to truck transport, and an increase of employment and shipment at the port.¹²

Issue #3: Failure To Properly Define Transportation Route Types

Ontario

Canadian Transportation Ministries operate with more focus on delineating rural roads from urban streets as noted that not only is sidewalk defined but so is bicycle, crosswalk, pedestrian crossover, and built-up area, which serves as their definition of urban. The definitions themselves do not change the conditions on the roads, yet they inform the focus of the locality, and this is reflected through the Ontario landscape which has few to no suburban characteristics.¹³

Issue #4: Not So Smart Smart Scale Program

Tennessee

Tennessee addresses the potential for inequities in the distribution of State resources for transportation by breaking their funding into nine different grants, two of which are dedicated to urban areas and two to rural, with the other five allowing for both rural and urban areas to qualify. The importance in this model is that the State is able to informally set transportation policy based on the types of grants it offers as none of the funds are specifically dedicated to highways, rather they are dedicated towards accessibility for those with disabilities, bus systems, and ridesharing.¹⁴

Future Policies For The Shenandoah Valley Of Virginia

Suggestions for the next steps have been outlined in brief policy suggestions:

1. Adopt proactive measures to reduce fatalities and transportation related injuries:
 - a. VDOT and local representatives to adopt a memorandum of understanding that localities will work with VDOT to identify areas of concern for future fatalities and vehicular accidents and prioritizing them.

¹² Bryan, Joseph. 2006. *Guidebook For Assessing Rail Freight Solutions To Roadway Congestion*. Global Insight, Inc. 20.

¹³ Highway Traffic Act, R.S.O. 1990. Ontario, Canada. <https://www.ontario.ca/laws/statute/90h08>

¹⁴ TDOT. 2020. "Public Transportation Grant Administration." TDOT. Nashville, Tennessee.. <https://www.tn.gov/tdot/multimodal-transportation-resources/office-of-public-transportation/grant-administration.html>

- b. VDOT to use existing GIS correlated data on vehicular accidents to run an Empirical Bayes Estimation and develop a public GIS layer identifying areas of predicted need for improvement or intervention.
2. Involve more stakeholders to mitigate conflicts on transportation networks:
 - a. VDOT to mandate to MPO's, PDC's, and Transit Agencies that they will rate locality projects at a higher status if the locality forms a local transportation advisory board with representatives with an agricultural or forestal background, commercial or retail background, industrial background, residential construction background, and representatives from the locality staff, VDOT, Planning Commission, and Board Of Supervisors or Town/City Council.
 - b. VDOT, DPRT, and Shenandoah Valley localities to petition the State Legislature to reconsider the current proposal for Interstate 81 and request that commercial freight transit by rail be given a priority.
3. Address the definition of urban, suburban, and rural transportation networks:
 - a. VDOT and local representatives to petition the State Legislature to amend VA § 33.2-100 Definitions to include definitions of what the differences are between urban, suburban, and rural roads as well as the difference between roads, streets, and stroads.
 - b. VDOT and local representatives to adopt a memorandum of understanding that each will work together to prevent the development of roadways that are suburban in nature or have stroad-like conditions, and to promote more urban multi-modal transportation in cities, towns, villages, and hamlets.
 - c. VDOT and DCR to mandate to MPO's, PDC's, and Transit Agencies that they will rate locality projects at a higher status if the locality develops zoning regulations to protect existing and future designated Scenic Routes.
4. Rethink the Smart Scale Program to be smart:
 - a. VDOT and local representatives to petition the State Legislature to amend VA §33.2-214.1 Statewide prioritization process for project selection, by addressing the recommendations in 1.b, 2.a., and 3.c as well as adding renovation or transitioning existing transportation improvements from vehicular to multi-modal or non-vehicular traffic in terms of allocation of funds and scoring projects under subsections B and C.
 - b. VDOT and local representatives to petition the State Legislature to restrict the amount of Smart Scale or other transportation funding placed towards highway related expansion projects and establish separate grant

funds for the priorities that the Legislature identifies for the State such as buses, connected sidewalks, and systems to aid those disabled.

The above proposed changes are a departure from current policies that the Shenandoah Valley, and other parts of Virginia must abide by yet will result in more investments in multi-modal focused transportation and development, increased local rewards for limiting sprawl, greater conservation efforts, and consistently lower rates of vehicular accidents.