Learning from Loudoun's Route 50 Traffic Calming Project, a National Model

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Loudoun County residents are ready for Route 15 to change. Today, there is a lot of traffic congestion, and safety is an issue as well. Conventional traffic engineering wisdom says that the solution is to widen Route 15. But while that may seem like it might solve these problems, it would not: a wider road would beget heavier cut-through traffic from Maryland and more congestion. Evidence from around the world teaches us that wider and faster roads actually make people *less* safe.

Fortunately, it is not as though the only option is to widen Route 15 or do nothing and continue to suffer with the problems that exist today. There is a better way to accomplish the objectives of moving traffic more effectively and making Route 15 safer for all who use it: follow the example that Loudoun County itself set with its groundbreaking approach to similar problems along Route 50 in the early 90s. Rather than making the road wider, use thoughtful design to manage traffic flow strategically and in the best short and long-term interests of the County. The result of a traffic calmed Route 15 will be a road where motorists can access the road safely and easily and Loudoun County's rural community character and economy is preserved and enhanced.

My experience with roads like Route 15

In my 31-year career as a traffic engineer who focuses on safe and comfortable street design, I have seen this scene replay itself dozens of times in communities around the US and abroad. Residents are frustrated with a congested and unsafe road, conventional traffic models predict increasing traffic volumes over the coming years, and the obvious solution seems to be a road widening. I have probably been involved with these issues at the international, federal, state, and local levels more than most transportation engineers in the country.

My job involves advising the federal government, cities, and states from coast to coast about calming arterial roads, replacing highways with boulevards in cities and older suburbs, and moving away from conventional engineering models that measure "level-of-service" for motorists towards sustainable measures of effectiveness. I know that all of the people who have weighed in on the future of Route 15 have the best of intentions at heart—from the County transportation planners, to VDOT, to the consultants, to the nonprofit groups, to the citizens and elected officials, everyone believes that what they are recommending is best for the County. The same was true in 1993, when I was hired to help with a very similar situation along Route 50. There are many lessons to be learned from that story, which is regarded, in the transportation profession, as a national precedent for highway planning and sustainability.

Traffic models said to widen Route 50

Like with Route 15 today, much of the momentum behind the widening of Route 50 was tied to a traffic demand forecast model. The model predicted that the traffic volumes would almost double in 20 years, mandating that Route 50 had to bypass Aldie, Upperville, and Middleburg. The model also suggested that to safely accommodate current and future traffic volumes, Route 50 had to become a multi-lane highway between the towns. The highway had to be extended west to West Virginia. Initially, it would be a four-lane divided highway. However, the plan for Route 50 was to widen it to more than four lanes, creating a major highway to West Virginia. Concrete evidence of those plans can still be found just west of Middleburg. There you can find the first segment of the four-lane divided highway. Now that 25 years have passed, the model was clearly wrong but it would have come true had Route 50 been widened.

Route 50 is now celebrated for thinking beyond the models

A team of dedicated residents and professionals, which I was proud to be part of, worked with the County traffic engineers to conceive a traffic calming solution to the problem. There was strong support amongst long-time residents to preserve and enhance the rural character and economy of the County, and this led public officials to experiment with the sustainable approach. The Route 50 Traffic Calming Plan didn't follow the typical conventional traffic engineering practices. Instead, it capped the motor vehicle volume to the "environmental capacity" of the corridor, which meant the maximum volume of motor vehicles that could reasonably be accommodated while meeting community and planning goals for the area. Examples of the goals included:

i) maintaining the ability to enter and exit driveways and side streets during peak hours;
ii) increasing safety;
iii) reducing queueing issues at intersections;
iv) better accommodating walking and cycling;
v) preserving and enhancing the character and beauty of the route; and
vi) working in harmony with the "main streets" of hamlets and villages, and towns (i.e., where Route 50 becomes the main street and supports local social and economic exchange).

Instead of building the bypasses, the concept of "environmental capacity" helped decision-makers ultimately decide to cap the road at two lanes. The team used design changes to result in slow and safe speeds along the route, between the towns, and even slower and safer speeds in the towns. The design also employed a series of roundabouts to reduce back-ups at Routes 50 and 15.

The resulting design crafted a far better future for Route 50 and its surrounding areas. The decision has helped preserved the local economy by creating an attractive *place* as opposed to serving as an artery for cars cutting through from other states. Furthermore, the design was implemented at a tiny fraction of the cost of the large highway. Even beyond the immediate cost savings, the design avoided incalculable costs from the loss of the historic fabric and rural character; and helped prevent the large future costs of subsequent widenings that were shown on long-range highway plans.

Now that 25 years have passed, we can clearly see that the traffic models' forecasts for Route 50 were wrong. It is easy to imagine the subsequent sprawl, market changes, travel behavior changes, and development changes that would have happened had decision-makers not been so visionary. Route 50

would have been inundated with through traffic. The traffic model forecasts would have come true if and only if the widenings happened (i.e., a self-fulfilling prophesy). Examples of these unsustainable patterns exist elsewhere in Virginia and across the US.

Route 50 was certainly not the first time that widening was presented as the solution to congestion and safety problems. Conventional traffic models are highly speculative calculations with one central objective: to minimize vehicle delay (a.k.a. shorter travel time/higher speeds). If the model says we'll have to wait too long at a traffic light in the year 2040, for example, then the conclusion is to widen the road. On its face, this typical practice sounds like a good thing – we'd all like to spend less time waiting at stop lights. However, as with Route 50, these models show just one version of future and encourage us to over-build roads. They also trap us in a vicious cycle caused by a proven phenomenon called "induced demand," where the new capacity created by a widened roadway actually leads to more driving and, in this case, cut-through traffic from Maryland. Induced demand means that it is impossible to permanently widen your way out of congestion.

At the beginning, VDOT was pushing for a wider Route 50. Now, they agree that not widening was the best solution. What seemed impossible before 1993 was not only made possible with the Route 50 project, it became a national model.

Roundabouts keep traffic moving

Replacing signalized intersections with roundabouts was a particularly crucial part of alleviating congestion and safety problems along Route 50. This happened at the intersection of Route 50 and Route 15 and they are being planned for the Town of Hillsboro. Roundabouts could and should happen at all of the signalized, and potentially signalized, intersections north of Leesburg. Roundabouts have numerous advantages over signalized intersections. From a traffic perspective, they keep traffic moving at a steady speed, rather than backing up and creating congestion. More specific examples of advantages to roundabouts include:

i) roundabouts result in large increases in safety (e.g., about half as many crashes and 80 to 90% fewer deaths and injuries), compared to traffic signals;
ii) roundabouts have lower maintenance and energy costs compared to traffic signals;
iii) roundabouts fit in with the context (i.e., attractive landscaping) unlike the unsightly metal mast arms, lights, and control boxes used for traffic signals;
iv) roundabouts help to reduce speeding (i.e., many drivers speed up for stale green lights or yellow lights, creating danger at signalized intersections. Nobody speeds up for roundabouts);
v) roundabouts work during power outages; and
vi) roundabouts use less impervious surface and less asphalt because they do not need turn lanes and storage lanes.

There are some common misconceptions about roundabouts, including:

i) roundabouts eliminate gaps downstream, making entering the road from driveways more difficult, compared to traffic signals;
ii) roundabouts require similar volumes of motorists on all the approaches; and
iii) roundabouts are not good for pedestrians and cyclists.

These assertions have been around for as long as roundabouts have existed, but they are untrue. The truth is that there are plenty of gaps after roundabouts, similar traffic volumes on all approaches are not required, and roundabouts are safer and easier to use than signalized intersections for pedestrians and cyclists. While a poorly designed roundabout can be difficult for pedestrians and cyclists, poorly designed signalized intersections are dangerous and uncomfortable for pedestrians and cyclists and represent a much larger problem in Virginia and across the country.

Widening Route 15 will not make users safer

A calmed Route 15 will outperform a four-lane divided highway for safety for several reasons:

- When roads are widened, more people drive, and they drive faster. More traffic driving at faster speeds will endanger motorists driving to and from their driveways and side streets and cause Route 15 to be less safe and comfortable for people walking or cycling.
- The biggest contributor to crashes, injuries, and fatalities is, by far, speed. An entire movement, called "Vision Zero", was started to reduce fatal crashes and the most important change is to slow speeds to safe speeds. A traffic calmed Route 15 will result in slower and safer speeds while a widening will do the opposite.
- Most crashes occur at intersections. By using roundabouts at all the key intersections, the number and severity of accidents will significantly decrease. Roundabouts have about half as many crashes as signalized intersections, and the crashes that do occur have far lower injury and fatality rates.
- So, the bottom line is widening Route 15 will make residents and visitors less safe and a calmed Route 15 will increase safety.

Some people have a perception that *not widening* is unsafe because emergency vehicles won't be able to get through. However, this is perception is incorrect for a couple of reasons:

- There will be fewer and less severe crashes for emergency vehicles to reach with a calmed Route 15, compared to a widened Route 15.
- Shoulders allow for motorists to pull over to allow emergency services to pass and allow rerouting traffic around collisions. Ideally, reinforced grass shoulders would be used rather than paved shoulders, because they make the roadway appear narrower and help reduce the perception that speeding is "safe," while preserving the rural character of the road. As a result, speeding will be reduced and safety will increase.

A traffic calming approach for Route 15

Envision what Route 15 in Loudoun County can be: healthy; distinctive; sustainable; and attractive to visitors and businesses. A wider highway would threaten this vision. Just like on Route 50, the traffic volumes on Route 15 can be metered to the "environmental capacity" of the route, starting at the Virginia/Maryland border. This can readily be achieved through a series of targeted and easily implemented design changes along the route, which can be accomplished at far lower cost compared to a four-lane highway (and the subsequent widenings a four-lane highway would necessitate). The changes should include:

i) restoring attractive rural shoulders;

ii) using slower and safer design speeds and posted speeds;
iii) realigning some intersecting roads and building roundabouts at the key intersections;
iv) creating and celebrating views in key locations;
v) creating a treed canopy in appropriate locations;
vi) restoring the dignity and role of the street in Lucketts with entrance features and an attractive streetscape that would include the areas around the elementary school and community park;
vii) alter the designs around Leesburg's schools and library to be slower, safer, more attractive, and multimodal; and
viii) change the northern entrance into Leesburg from a highway interchange into something attractive and civic.

In addition, the decision to undertake a Route 15 traffic calming project should include comfortable facilities for walking and cycling, and this could be accomplished by advancing the parallel multiuse trail that is part of the current widening proposal. However, the trail and the 2-lane road would fit into a much smaller and less expensive right-of-way than a trail and a 4-lane divided highway. The trail could connect the residential communities, Lucketts, the schools, parks, other trails, and Leesburg. Roundabouts would be much more suitable for accommodating the trail, compared to traffic signals.

The Choice for the Future

If the County goes through with widening Route 15, the result would be a cycle of widenings and expenses, more widenings and expenses, and so on. This will generate increased traffic volumes, reduce safety, create more traffic downstream in the Leesburg area, and likely augment future demands for a new bridge to Maryland. Most importantly, it would diminish the character, charm, and local business profitability that the National Scenic Byway designation has advanced since 2008, and the way of life that is central to rural Loudoun County's identity. A traffic calmed Route 15 would be less expensive initially and would also be the long-term solution, preserving and enhancing the corridor for generations while simultaneously avoiding the costs of future widenings.

For Route 15, the future can be very bright

The technical elements of this decision speak for themselves: Route 50 is a shining example of why a redesign focused on managing and calming traffic is a better approach to tackling Route 15's challenges than an ongoing series of widening and costs. There is, however, the political element, where people see widening as an easy solution and so there is pressure to widen. But Loudoun's current leaders have a chance to be visionaries; with a traffic calmed Route 15, they can make the road safer, solve the congestion issues, and save County taxpayers money and lives in both the short and long terms. As with any significant transportation decision, it is hard to confront the typical practices, even when they are obviously heading down an unsustainable path. But with Route 15, a brave act of leadership has the potential to preserve and enhance Loudoun as we know it for current residents and future generations.