

Street Sign Design and Location Assessment



June 30, 2002

Town of
Ashland
Counties of
Charles City
Chesterfield
Goochland
Hanover
Henrico
New Kent
Powhatan
City of
Richmond



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Richmond Regional Planning District Commission

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Acknowledgement

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Executive Summary

As discussed at the January 18, 2001 Rural Transportation Advisory Committee meeting, the rural planning directors determined that some street signs in the rural portion of the region are difficult to see; visibility is often affected by sign design (size, color) and location (distance from intersection). To address this concern, planning staff has reviewed the standards used by Virginia Department of Transportation on both the design and location of street signs; worked with the local planning directors, VDOT resident engineers, and sheriffs' departments to collect examples of problem street sign locations; and made recommendations about possible changes to VDOT standards in order to address identified problem areas.

The process began with staff contacting the local planning departments, seeking examples of localized sign issues. Once each planning department responded, these sites were visited. Staff recorded characteristics of each sign including size, location, visibility, and overall condition. Photographs were taken to document specific concerns and possible solutions were created.

Staff also visited local sheriffs' departments and interviewed officers. In their daily patrols, officers develop an inherent knowledge of road signage and problems that may arise due to their size, location, visibility, or overall condition. Based on information provided by the departments, additional sign issues were identified. Once again these issues were documented and photographed.

Another source of information were the VDOT resident engineers. They assisted staff with gaining a better understanding of the VDOT sign regulations. They also made suggestions for possible resolution to the sign issues.

This report identifies current VDOT street sign design and location standards, problem street sign locations in the rural areas, and possible solutions to improve street sign design and location standards in the rural areas. It is hoped that this report will assist VDOT with consideration of size, location, and visibility when signing within the rural areas of the Richmond region.

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Section 1. Introduction

Everyone sees signs in their daily travels and may wonder why a sign was designed in a particular way or how its placement was selected. That is usually as far as the thought goes, until an incident occurs where an incorrect or poorly placed sign plays a role, and then the sign becomes a problem. One way to help alleviate the possibility of an incident occurring is to identify and correct sign issues as soon as possible.

VDOT follows the *Manual on Uniform Traffic Control Devices* (MUTCD) as guidance in placing signs. The MUTCD states in Section 2A.16 Standardization of Location, that “standardization of position cannot always be attained in practice.” It provides minimum and maximum location positions but in the end it is up to the highway engineer to determine the location. In some instances the signs are located correctly and then accidentally removed only to be relocated to an inappropriate location. This report will review the VDOT standards, actual sign locations, designs, or visibility issues within the rural areas of the Richmond region and make recommendations for improvement of street sign standards in these rural areas.

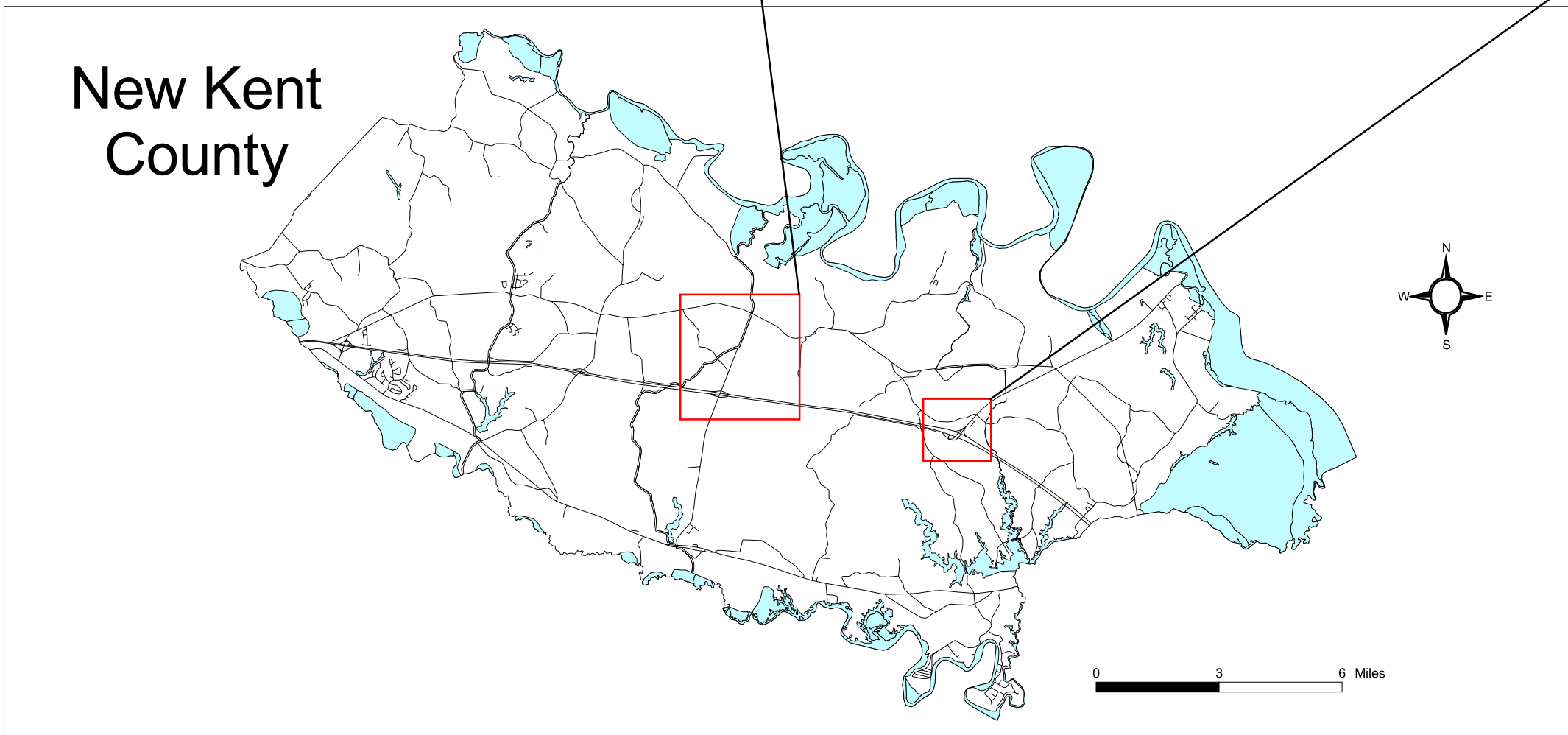
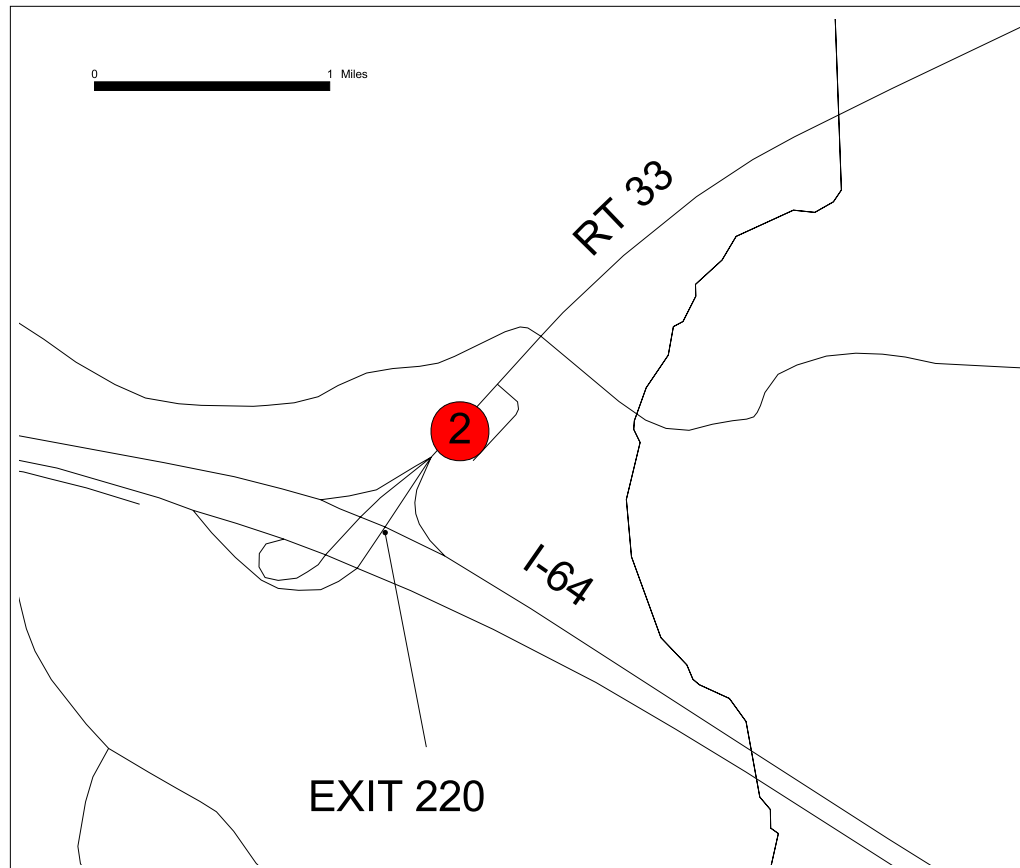
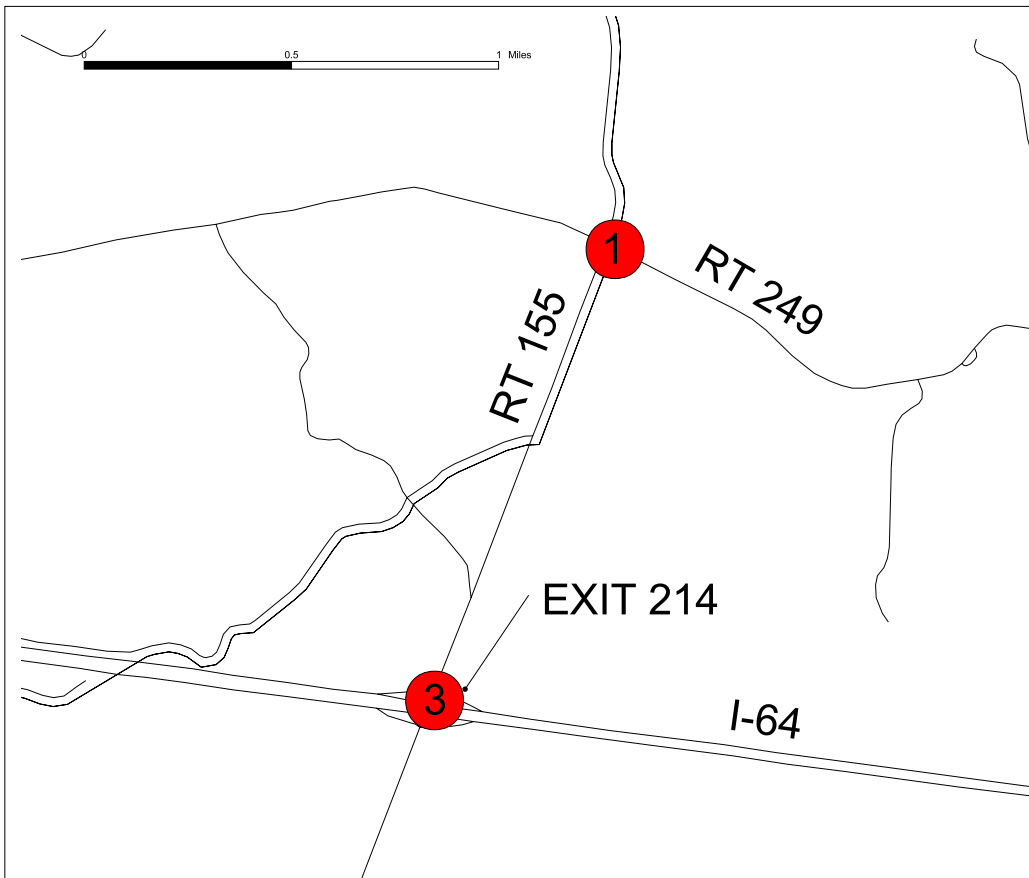
Section 2. Intent and Purpose

This assessment is intended to be used as a guide; it should not be considered to be a comprehensive list of all sign related issues. This study is intended to be used as a beginning point for discussion with VDOT, the rural communities of the Richmond region, and other interested parties.

The purpose of this assessment is to identify and review current VDOT standards on the design and location of street signs, identify examples of problem street signs, research and analyze other possibilities for street sign location and design standards to improve visibility, and make recommendations to improve street sign standards in the rural areas. It is intended that this report will assist the local communities in developing solutions to improve upon street sign design and location standards.




Section 3. Identified Sign Issues

Sign issues were identified in three of the four rural localities in the Richmond region. These three localities were New Kent County, Powhatan County, and Charles City County. Goochland County had no identified road sign issues. Each county’s discussion begins with a map identifying the locations of the signs that will be discussed. Each county map locates particular sign issues by number. The number on the map relates to the sign issue number in this report.



New Kent County Signage Issues

LEGEND

-  WATER
-  ROADS
-  APPROXIMATE SIGN LOCATION
(corresponds to document)



Prepared by the Richmond Regional Planning District Commission, June 2002
Data Source: VDOT County Data CD 2001

NEW KENT COUNTY

The New Kent County planning department, sheriff's department, and a local business owner identified three signage issues in New Kent County. One of the issues was sign location and intersection design and the other two involved the lack of signage. Richmond Regional Planning District Commission planning staff investigated the three locations. These locations were selected due to the hazardous conditions and the number of incidents occurring at the intersections involving signage issues. The map at the beginning of this section references the locations.

Sign Issue 1: Intersection of Route 155 and Route 249, New Kent County, VA



Figure 1. Intersection of Route 155 and Route 249, New Kent County, VA.

At the intersection of Route 155 and Route 249 in New Kent County, the stop sign is located in the center of the roadway on an island. It is obvious, by the condition of the sign post (Figure 2) and the many skid marks on the pavement, that the location of this sign is hazardous. New Kent County Sheriff's Department (NKSD) has observed that the sign's location has contributed to several accidents. An advance traffic control sign (Figure 3) with a "stop ahead" symbol precedes this sign. It is correctly located according to VDOT standards and visible to traffic. However, because of the number of accidents originating from this direction of travel, signage with intersection improvements may be warranted.



Figure 2. Post at intersection of Route 155 and Route 249.



Figure 3. Stop ahead warning sign

Route 249 provides access for traffic to Interstate 64 and handles many large vehicles such as school buses and tractor trailer trucks, including the logging truck seen in Figure 1. Having the sign located in the center of the road can create a hazard for large vehicles navigating their way to Interstate 64. The sharp turn may be difficult for the trucks to maneuver due to the limited turning radius, causing the sign to be removed from its housing.

It appears that the sign at this intersection has both poor visibility and location. To improve visibility it may be necessary to mount a warning beacon on the stop sign at this intersection, making the sign more apparent. Another option would be to place rumble strips to alert the driver of the upcoming event, but neither of these suggestions would reduce the hazard to large vehicles when making a turn. To rectify the large vehicle navigation issue, an option would be to create a channelized intersection and move the sign to an island located on the right side of the centerline providing a wider turning radius for larger trucks (Figure 4).

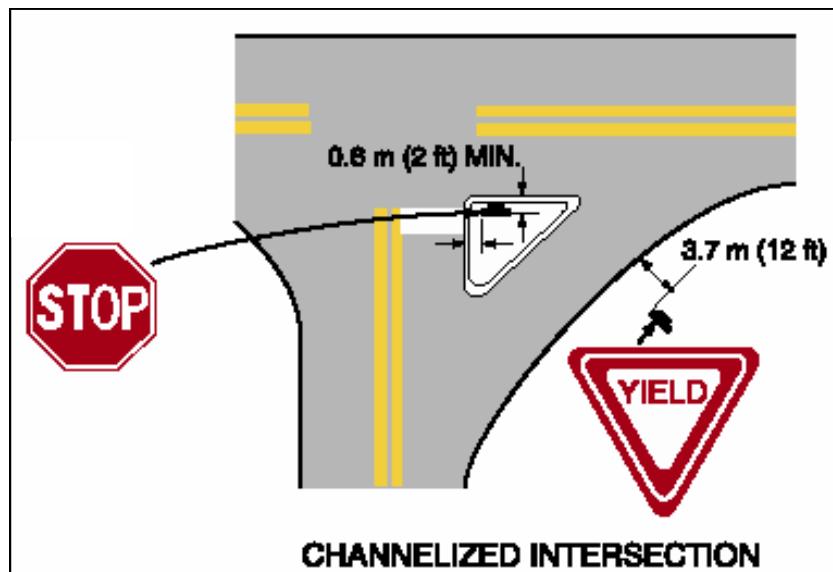


Figure 4. MUTCD Part 2, Signs, Figure 2A-2 Typical Locations for Signs at Intersections, p 2A-13, December 2000 USDOT, FHWA.

Sign Issue 2: Route 33 near I-64, New Kent County, VA



Figure 5. Route 33 north of I-64, New Kent County, VA.

A local gas station owner identified the sign issue at this location. He reported that many drivers are confused about access to nearby I-64 from the gas station. There is a large berm in the median, which is 45 feet +/- (see Figure 6), dividing the north- and southbound lanes of Route 33. A one-way sign is placed opposite the location of one of the two entrances, but is absent from the second entrance (Figure 7). Drivers have become confused and a few people have mistakenly driven south in the northbound lanes. The station owner stated that a head-on collision occurred recently, due to this confusion.

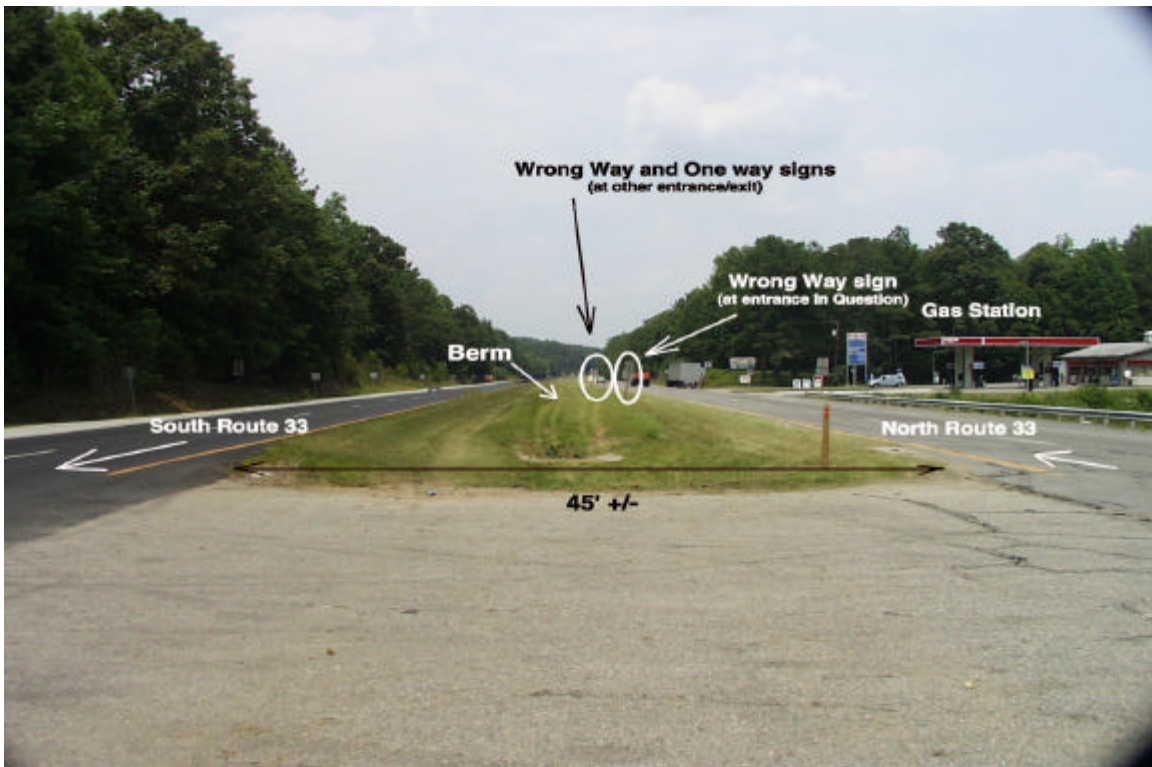


Figure 6. Median across from Exxon station on Route 33, New Kent County, VA



Figure 7. One-way sign at entrance/exit of gas station near Route 33 and I-64

In the past there was a one-way sign located across from the entrance/exit in question, but has since been removed and not replaced. The business owner was unsure if the sign was intentionally or accidentally removed. Presently, only signs stating “wrong way” remain (see Figure 5). The wrong way signs are not apparent until a driver is already traveling into head-on traffic.

Page 2A-25, Section 2A.24, “Wrong-Way Traffic Control” of the Manual on Uniform Traffic Control Devices states,

“Engineering studies should be conducted to identify and suggest practical corrections at intersections on divided highways where wrong-way usage is being experienced or where a wide median, a rural unlighted environment, or other contributing factors indicate the likelihood of wrong-way movements.

If used, DO NOT ENTER signs should be placed on divided highways at locations directly in view of a driver making a wrong-way entry from the crossroad, and WRONG WAY signs should be placed further from the crossroad than the DO NOT ENTER signs.”

It appears that this intersection needs attention due to the number of severe accidents that have occurred. With the amount of out of town motorists traveling through this area, a one-way sign needs to be located across from the entrance/exit of the gas station. An unfamiliar motorist may mistake the northbound lanes as a two-way street due to the inability to see across the berm and enter the lanes traveling in the wrong direction.

A sign instructing a motorist how to return to I-64 by traveling northbound and making a U-turn at the next turn around could be placed in the median. This could be done by placing an appropriate sign so not to interrupt the landscape. A solution that would be the most costly and least desirable would be to cut the berm and increase visibility of the southbound lanes. Allowing the motorist to see that Route 33 is a divided highway could

possibly deter a motorist from traveling southbound in the northbound lanes, diverting a hazardous situation.

Sign Issue 3: Exit ramp from west bound I-64, at Route 155, New Kent County, VA

NKSD also identified the intersection of Interstate 64 and Route 155 as another intersection with signage problems in New Kent County. The stop sign is located on the left of the intersection and a stop bar only covers a portion of intersection. Many people do not understand that the stop sign pertains to them and they yield instead of stopping. The NKSD recommendation was to place a second stop sign to the right of this intersection and extend the stop bar to cover both lanes (Figure 8).



Figure 8. Intersection of westbound I-64 off ramp, exit 214 and Route 155.

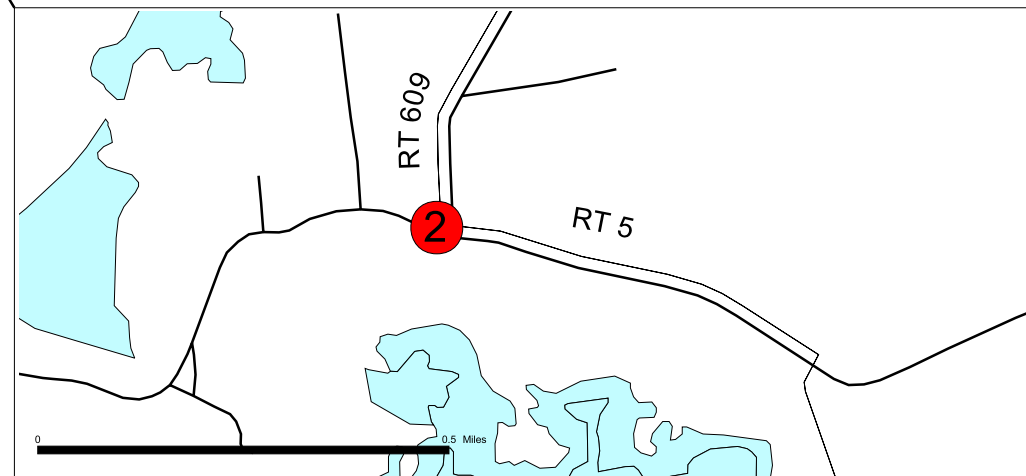
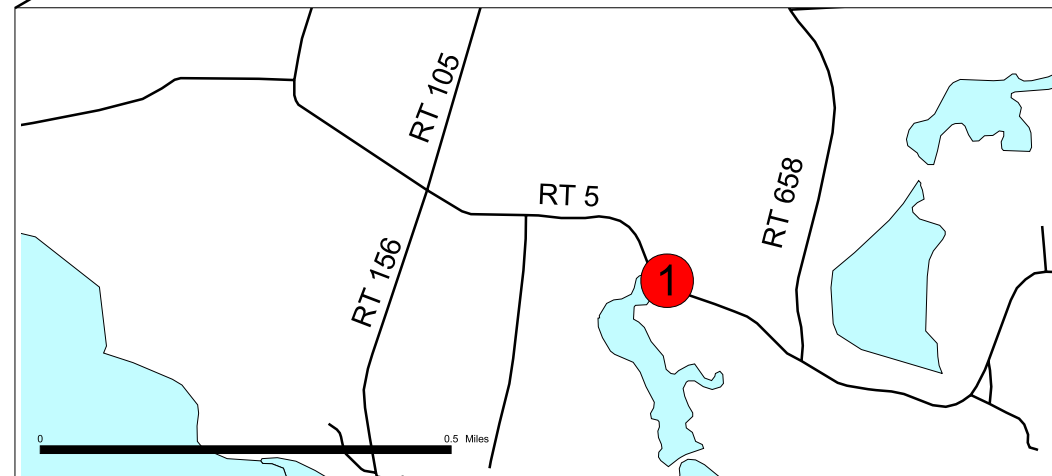
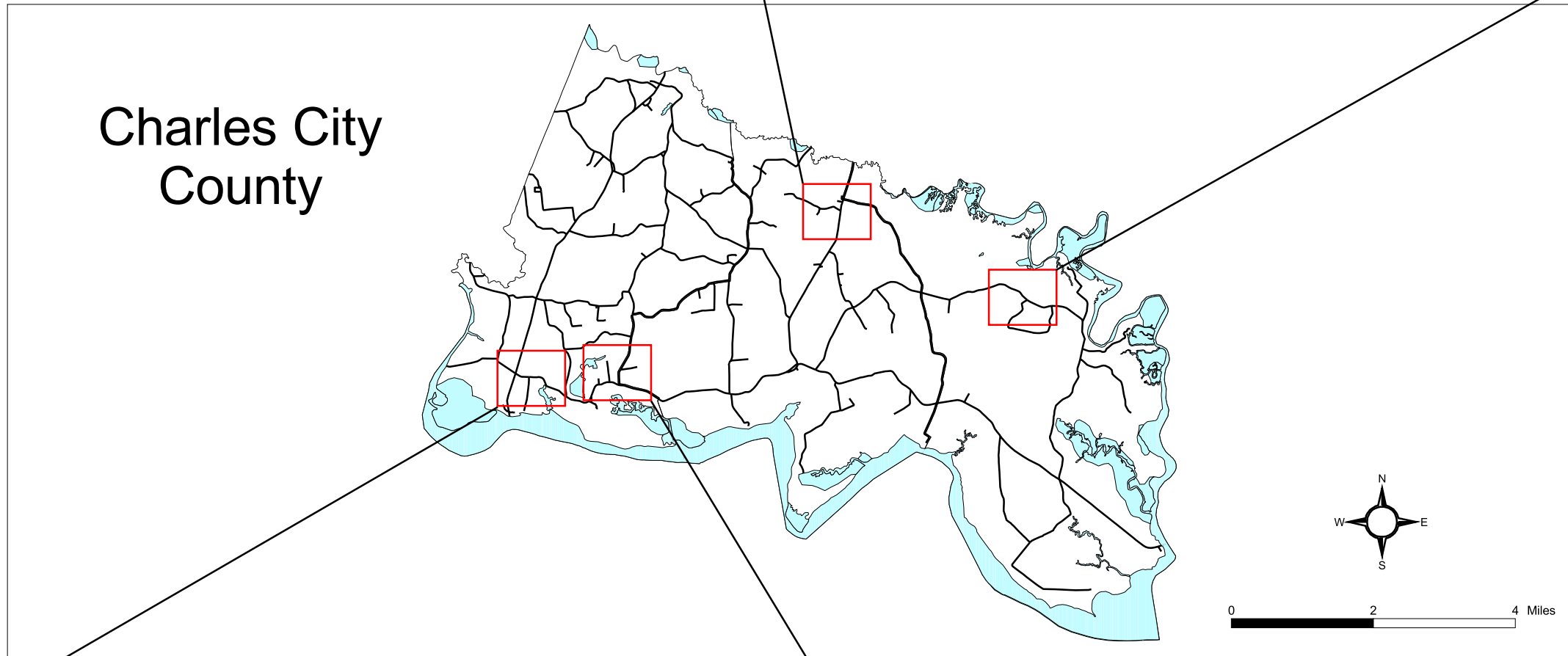
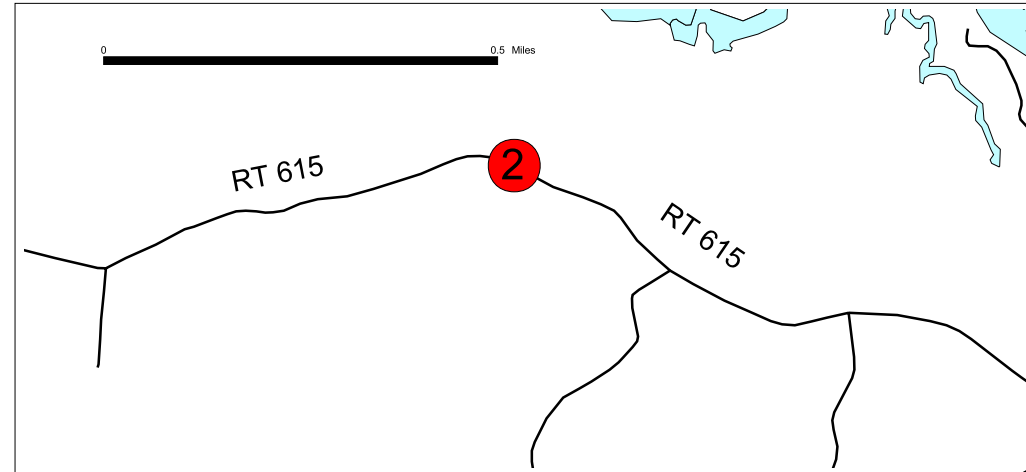
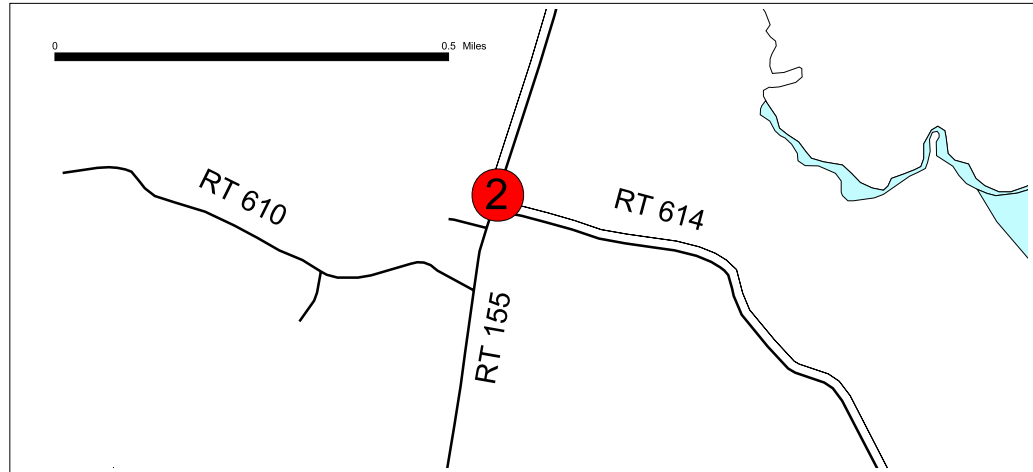


Figure 9. Intersection of westbound I-64 off ramp, exit 214 and Route 155.

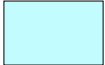


This intersection was also identified by the NKSD, due to the lack of sight distance. As demonstrated by the preceding photos, sight distance is reduced by vegetation. Even if the driver pulls completely to the stop bar, sight distance is reduced, causing drivers to “roll” into the intersection. This intersection may need immediate attention because traffic volumes at the intersection are increasing due to the growth on the surrounding areas.

It appears that this intersection could use a couple of minor improvements to enhance safety. In order to increase sight distance, the vegetation could be cut back or trimmed. A large directional sign should be moved or redesigned (Figure 8). By placing an additional stop sign and extending the stop bar to cover the entire intersection drivers will become more aware of the potential danger. Reduced speeds and signs warning travelers on Route 155 that an intersection is ahead may be warranted to increase safety at this intersection.

Charles City County Signage Issues



LEGEND

-  WATER
-  ROADS
-  APPROXIMATE SIGN LOCATION
(corresponds to document)



Prepared by the Richmond Regional Planning District Commission, June 2002
Data Source: VDOT County Data CD 2001

CHARLES CITY COUNTY

In Charles City County two signage issues were investigated by the RRPDC planning staff. The first is an issue of incorrect signage. The second issue concerns political signage. While the latter topic is not specific to VDOT, it does concern sign locations within the VDOT right-of-ways. The placement of political signs in the right-of-ways is an issue that is widespread throughout the rural communities of the Richmond region.

Sign Issue 1: Route 5 near Route 639, Charles City County, VA



Figure 10. Curve on Route 5.

In Charles City County on Route 5, approximately 1.5 miles east of Route 639, the speed limit is reduced to 35 MPH.



Figure 11. Maximum safe speed in curve sign, Route 5.

Approximately 0.4 of a mile further down Route 5 is a sign stating the maximum safe speed in the curve is 45 MPH. It is unclear why a posted maximum speed of 35 MPH, on a straight stretch of road earlier, is allowed to increase to 45 MPH on a curve. It is

recommended that VDOT investigate this segment of the road and evaluate proper speed limits to rectify this situation.

Sign Issue 2: Political Campaign Signs



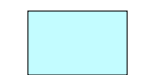
Figure 12. Three examples of outdated political signage.

The Charles City County Development Department identified political signs as a significant signage problem in the locality. Although political campaign signs are not street signs per se, they have become de facto street signs because they are intended to be read by motorists. These signs are left up until VDOT or the county removes them, but neither the county nor VDOT have the resources to do so. The signs are often times illegally placed on utility poles and street signs. If not removed, eventually the signs will deteriorate, falling to the ground, becoming litter.

To resolve this problem in the future, the county may develop a litter prevention program and request that the citizens assist with removal. The county could also involve the local utility companies by having them remove the signs if an employee is in the vicinity. As a last alternative, the county could impose fines on the campaign committee or even the campaigner. This could possibly result in the campaigners being more aware of their sign removal efforts.

Powhatan County Signage Issues

LEGEND



WATER



ROADS

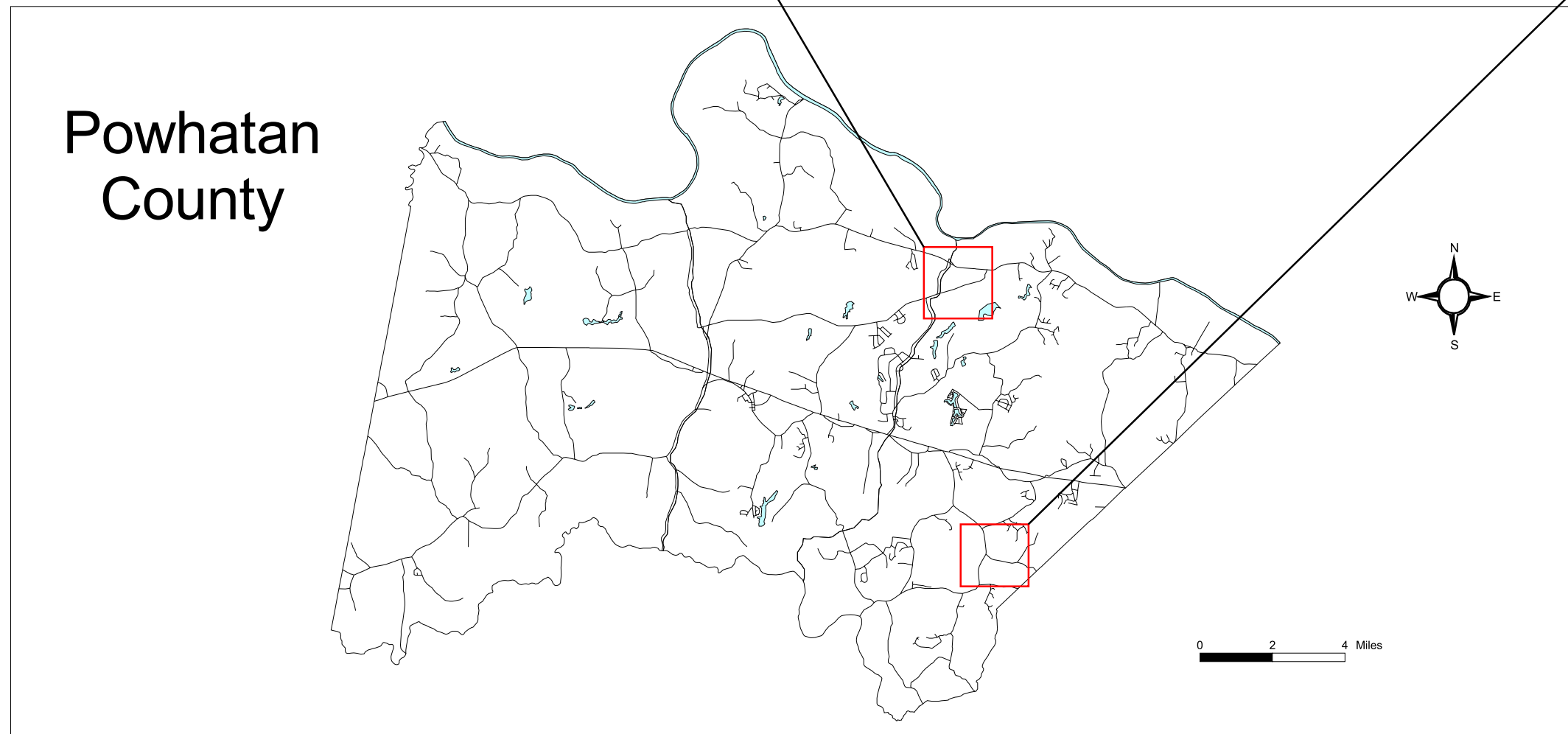
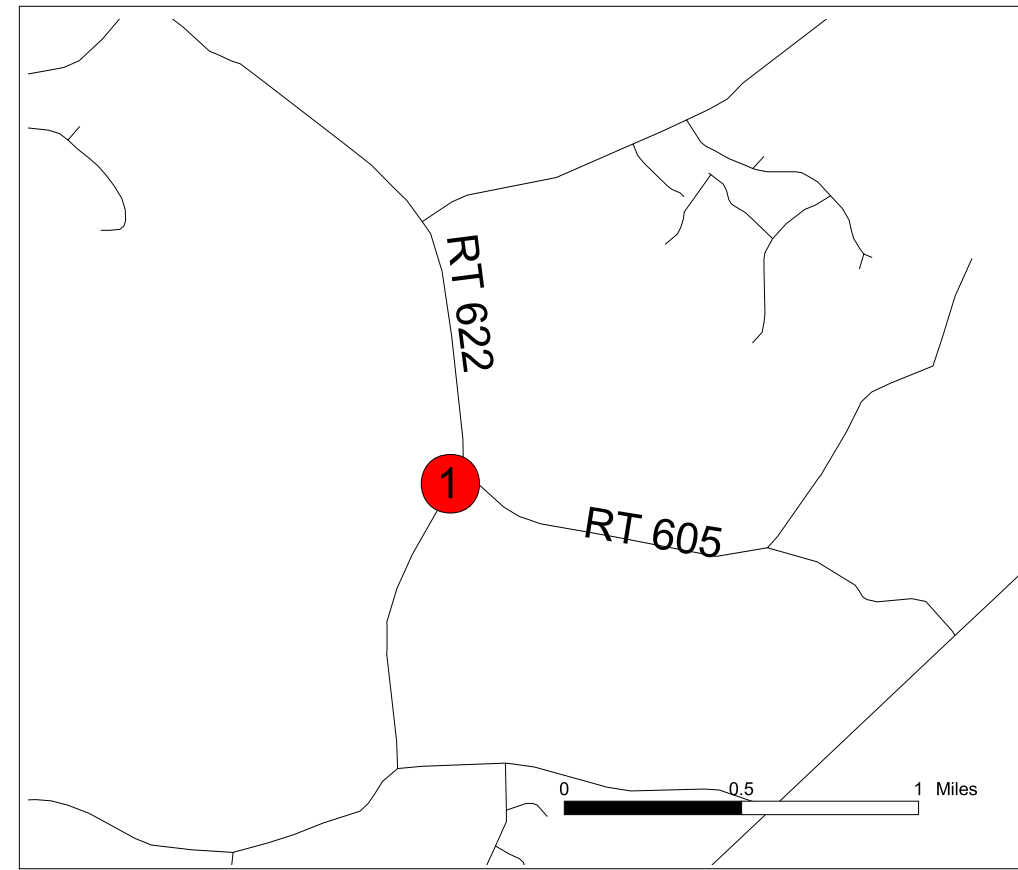
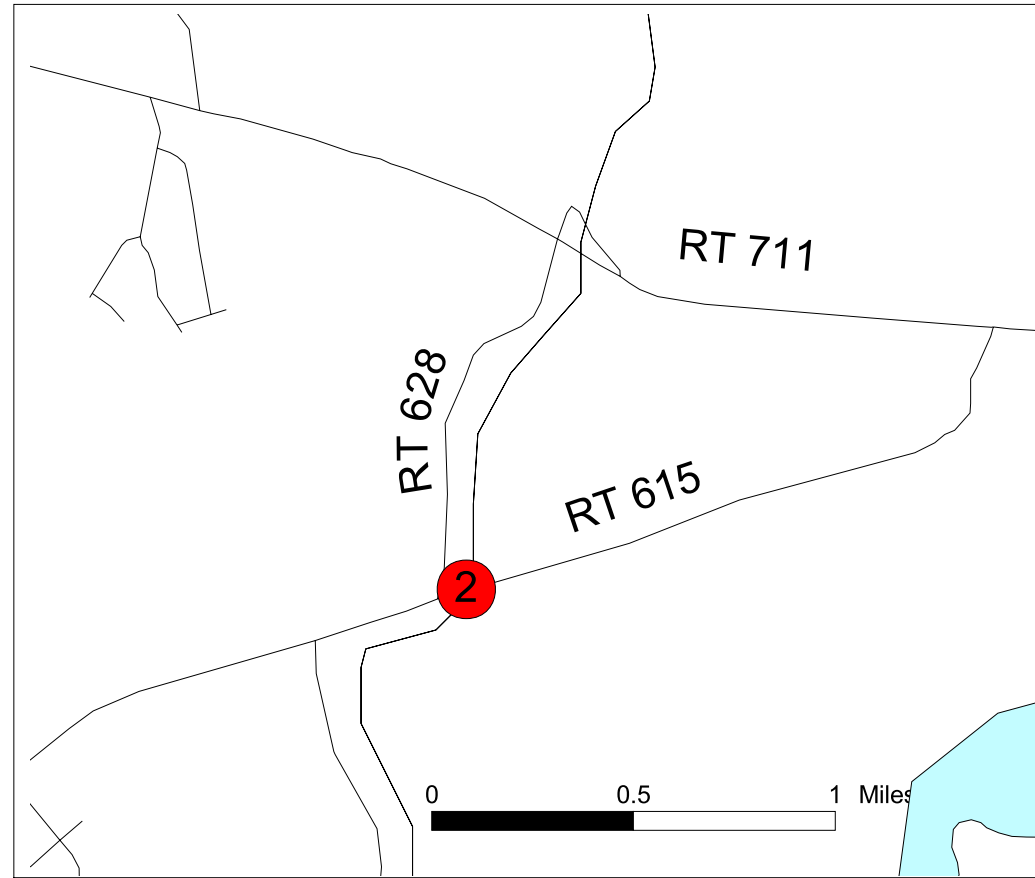


APPROXIMATE
SIGN LOCATION
(corresponds to document)



Richmond Regional
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Prepared by the Richmond Regional Planning District Commission, June 2002
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Powhatan County

POWHATAN COUNTY

Powhatan County identified two intersections with a common problem. The intersections have a stop sign mounted on an island in the middle of the roadway. Having a sign located in the middle of the roadway causes a potentially hazardous situation and reduces the functionality of the intersection.

Sign Issue 1: Route 605 and Route 622, Powhatan County, VA



Figure 13. Intersection of Route 605 and Route 622.



Figure 14. Sign post at the intersection of Route 605 and Route 622.

Having signs mounted on sign islands appears to be common in the rural communities. In at least two instances in Powhatan County, there is a stop sign placed in the center of the road which has become a hazard for motorists (this is similar to the issue in New Kent County at the intersection of Routes 155 and 249). In particular two intersections are identified in Powhatan County. Figures 13 and 14 are at the intersection of Route 605 and Route 622 and Figures 15 and 16 are at the intersection of Route 615 and Route 628. The signs at the aforementioned intersections have been involved in many incidents and are not very secure.

The Route 605/622 intersection sign has been removed and replaced several times. The sign currently has numerous wedges between the post and concrete island to keep it in place. Figure 14 shows the base of the post and the wedges. Staff noted that the pole was not secure and could be dislodged easily.

VDOT Chesterfield Residency stated that VDOT was working to eliminate the sign islands and relocate the signs to the roadside. It is recommended that the signs be repaired to ensure safety, but ultimately relocation would be the best possible alternative for these signs.

Sign Issue 2: Route 615 and Route 628, Powhatan County, VA



Figure 15. Sign post at the intersection of Route 615 and Route 628.



Figure 16. Intersection of Route 615 and Route 628.

There are several observed factors that affect the driver's ability to properly negotiate the intersection of Route 615 and Route 628:

- 1.) The stop sign is located on the back side of an incline making the sight distance to the sign very short. (Figure 17)
- 2.) The short turning radius is difficult for SUVs and large construction vehicles to navigate
- 3.) Poor lighting.



Figure 17. Sitting in SUV facing north on Route 615. The stop sign is circled in gray and the red line represents the apex of the roadway.

It was observed that a number of SUVs and large construction vehicles were using this intersection. The increase in the number of larger vehicles could be related to the golf course entrance that is located off of Route 628. Also, Route 628 is used as a cut-through road from Route 711 to Route 615. Route 711 continues into Chesterfield County and Route 615 continues to Route 522 into Goochland County. These larger vehicles require more distance for stopping. With the sign being located on the low side of an incline

(Figure 18) and with no advance warning, the larger vehicles may not be able to come to a complete stop before entering the intersection.

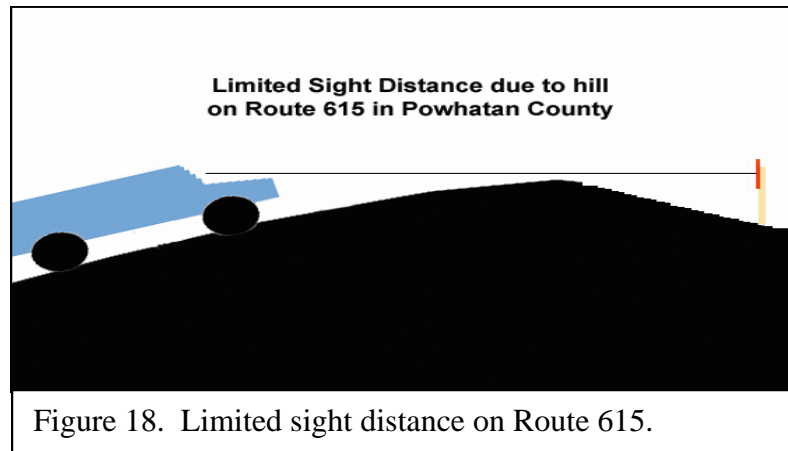


Figure 18. Limited sight distance on Route 615.

As mentioned before, having a sign located in the middle of the intersection causes a potentially hazardous situation and reduces the functionality of the intersection. In today's society it appears that "bigger is better" when it comes to vehicles. Having an increased number of larger vehicles may require VDOT to evaluate some of the intersections that were designed for small passenger vehicles.

The tree canopy blocks sunlight from the road causing the sign to be more difficult to see from a distance (Figure 17). A fast approaching vehicle may not see the sign until it is too late, causing property damage. An advance warning mechanism such as a stop ahead warning sign or rumble strips may assist in diverting a potentially hazardous situation.

A possible solution for this intersection may be to move the stop sign to the side of the road and to place a stop ahead warning sign and/or rumble strips at an appropriate distance from the stop sign. This solution would also assist the motorist regarding the lack of site distance. Moving the sign to the side the intersection will open the intersection and possibly prevent incidents involving the sign and vehicles.

Section 4. References

Federal Highway Administration. *Manual on Uniform Traffic Control Devices: Millennium Edition*, http://mutcd.fhwa.dot.gov/kno-millennium_12.18.00.htm, (30 June 2002).