

**Northwestern Region Traffic Engineering
VDOT Speed Study – May 6, 2009**

This Speed Study conducted under the direction of _____

Vijay N. Kulkarni
05/19/2009
Vijay N. Kulkarni, P.E., PTOE
Licensed Engineer

Study Area:

Location: Route 0003
Street: Germanna Highway
County: Culpeper
From: 0.30 Mi. West of Route 600 (Westend)
To: 0.21 Mi. East of Route 750
Length: 4.62 Miles
Functional Class: Rural Minor Arterial

Speed Zone(s) in Study Area

Route 3, in the study area, is currently governed by a posted statutory 55 mph speed limit.

Speed Zones(s) adjoining Study Area:

Adjoining the study area to the east and west, Route 3 is governed by a posted 55 mph statutory speed limit. Side roads intersecting Route 3 in the study area have the following posted speed limits:

Route 600 (York Road)	25 mph speed limit
Route 663 North (Stevensburg Road)	25 mph speed limit
Route 669 (Carrico Mills Road)	45 mph speed limit

Origin and Nature of Request:

Due to the number of fatal crashes within the two lane section of Route 3, the Department initiated a Speed Study as a part of a Roadway Safety Assessment (RSA) along this section of Rte 3. Local governing bodies and community residents also expressed concerns along this road section and the possibility of a speed reduction.

Study Results and Recommendation:

Our recommendations are as outlined below:

1. The two fatal crashes that occurred between the 7.45 and 7.70 milepost indicates a fatality rate that is more than twice the District Fatality Rate. This fact combined with the speed samples obtained within the curve (63 mph) lends us to encourage slower speeds along the curve. We therefore recommend a 50 mph advisory speed along the horizontal curve at M.P. 7.61. In addition we recommend the existing regulatory speed limit of 55 mph be retained over the study section. This speed limit is currently at the lower end of the pace speed and appears to be adequately zoned.

2. We recommend that the curve section be widened to incorporate two 12 ft travel lanes and 5 ft paved shoulders to mitigate run off the road type of crashes. We also recommend additional chevrons on the outside of the curve, increased advance curve warning signs approaching the curve and the addition of reflective flex posts when pavement widening and paved shoulder is completed.
3. In order to minimize “crossing the centerline” type of crashes, we recommend the installation of Center line rumble strips and double row of Centerline Snow Plowable Markers. Additionally, we recommend a wider 6 inch centerline and 6 inch edge line to better delineate the curve and guide drivers track the curve better.

A full discussion of the recommendations is documented in the Safety Assessment Report.

Study Details:

A. Speed Data:

On April 13 and 14, 2009 three spot speed samples were secured in the study area. Analysis of the speed data indicated the following results:

Sample Location	85 th Percentile	50 th Percentile	10 mph pace speed
0.10 mi. E. Rt. 600	63.73 mph	57 mph	55-64 mph
0.04 mi. W Rt. 739	64.02 mph	59 mph	55-64 mph
0.10 mi. W Rt 750	64.55 mph	58 mph	55-64 mph

Ball bank runs conducted along the curve located in the vicinity of the intersection with Rte 739 indicated that the curve can be driven comfortably at the posted 55 mph in accordance with guidelines in the AASHTO-Green Book- A Policy on Geometric Design of Highways and Streets, 2004 Edition.

B. Road Characteristics:

The alignment of Route 3 is generally flat with areas of gentle horizontal and vertical curves. The reviewed area consists of a two-lane roadway with two 11 foot paved lanes and 4 foot paved shoulders that extend from the west end four lane section to Route 739. The remaining 2.6 miles also has 22 foot total paved width with 4 to 8 foot variable gravel/grass shoulders. Pavement markings include double solid yellow centerline, with marked passing zones and white edge lines. Secondary routes intersecting Route 3 in the study area include: Route 600 (York Road), Route 663 (Batna/Stevensburg Road), Route 739 (Clay Hill Road), Route 669 (Carrico Mills Road) and Route 750 (Ellis Road). Stopping sight distance for the intersecting secondary routes was at least 850’-1200’ which exceeds the minimum 495’ required for a 55 mph speed limit. However, several private entrances along the reviewed area have limited sight

distance due to their location. The road segment from Route 669 to Route 750 has a series of gentle vertical curves and our observations indicate that these locations exceed the minimum required stopping sight distance along Rte 3. Signing consists of secondary route markers, curve/crossroad warning, mileage/guide and regulatory 55 mph speed limit signs. Please see the attached straight line diagram for sign locations. The ADT at the time of our review was recorded to be 7,739 vehicles per day.

C. Roadside Development and Environment:

Roadside development consists of approximately 32 private entrances. Commercial entrances consist of a truck and equipment repair business, a local store/post office, equestrian center, and a large greenhouse. The density of private driveways, business entrances and intersecting secondary routes creates approximately 10 access points per mile which the Highway Capacity Manual considers to be low.

D. Parking Practices and Pedestrian Activity:

Private entrances serve the development along this stretch of roadway with no on-street parking observed within the study area. There are neither sidewalks nor bike paths adjacent to the studied road segment and no pedestrian activity was observed. However it is possible that there might be some equestrian traffic usage due to the location of an equestrian facility along the inside of the horizontal curve located at approximately M.P. 7.61.

E. Reported Crash Experience for Most Recent 3-Year Period*:

*A shorter period is permitted only where extended data is not available.

Crash records obtained through "HTRIS" are for the period

From: August 1, 2005

To: July 31, 2008

Length of Period: 36 months

Note: Crashes where no injuries were sustained and property damage was below \$1,000 may not be recorded in HTRIS. Also, due to the time required to process and coded, crash data in HTRIS may not include occurrences in the past 2 months.

According to our records, the total number of reported **crashes** for this section of highway is:

57;

the total number of reported **injuries** for this section of highway is: 42; and

the total number of reported **fatalities** for this section of highway is: 2.

The **crash** rate for this section of highway is: 145.59 per 100 million VMT.

The **injury** rate for this section of highway is: 107.28 per 100 million VMT.

The **fatality** rate for this section of highway is: 5.10 per 100 million VMT.

For Interstate, Primary and Secondary highways: not applicable

For this type of roadway (primary):

The statewide average **crash** rate is: 159.67 per 100 million VMT.

The statewide average **injury** rate is: 86.67 per 100 million VMT.

The statewide average **fatality** rate is 1.57 per 100 million VMT.

*Alternatively, for primary highways: not applicable

The district average **crash** rate is: 1.29 per 100 million VMT.

The district average **injury** rate is: 63 per 100 million VMT.

The district average **fatality** rate is: 1.54 per 100 million VMT.

*For primary roads the district average may be used in lieu of the statewide average.

Discussion of crash experience and relevant information:

Summary of crashes:

<u>Crash Type:</u>	<u># Total:</u>	<u># Injured:</u>	<u># Fatalities:</u>
Rear End	7	8	0
Angle	9	7	0
Sideswipe (SD)	4	4	0
Sideswipe (OD)	6	7	1
Fixed Object	17	13	0
Head On	1	2	1
Non Collision	2	1	0
Deer/Animal	<u>11</u>	<u>0</u>	<u>0</u>
Totals:	57	42	2

Crash Analysis identified run off the road (fixed object), sideswipe, weather related and driver inattention as the leading causal factors. In addition, the fatality that occurred in March 2009 was tied to a driving under the influence type of crash. Angle types of crashes were identified at several intersections along Rte 3. Collisions with animals accounted for 11 of the 57 crashes during the analysis period.

A full discussion of the Crash Analysis is included in the Safety Assessment Report that accompanies this Speed Study. This report discusses the crashes along the curve section and the tangent section of Rte 3.

F. Enforcement Consensus:

This results of the Speed Study have been discussed with First Sergeant Grover Dean of the Virginia State Police and Sheriff H. Jim Branch of the Culpeper County Sheriff's Office.

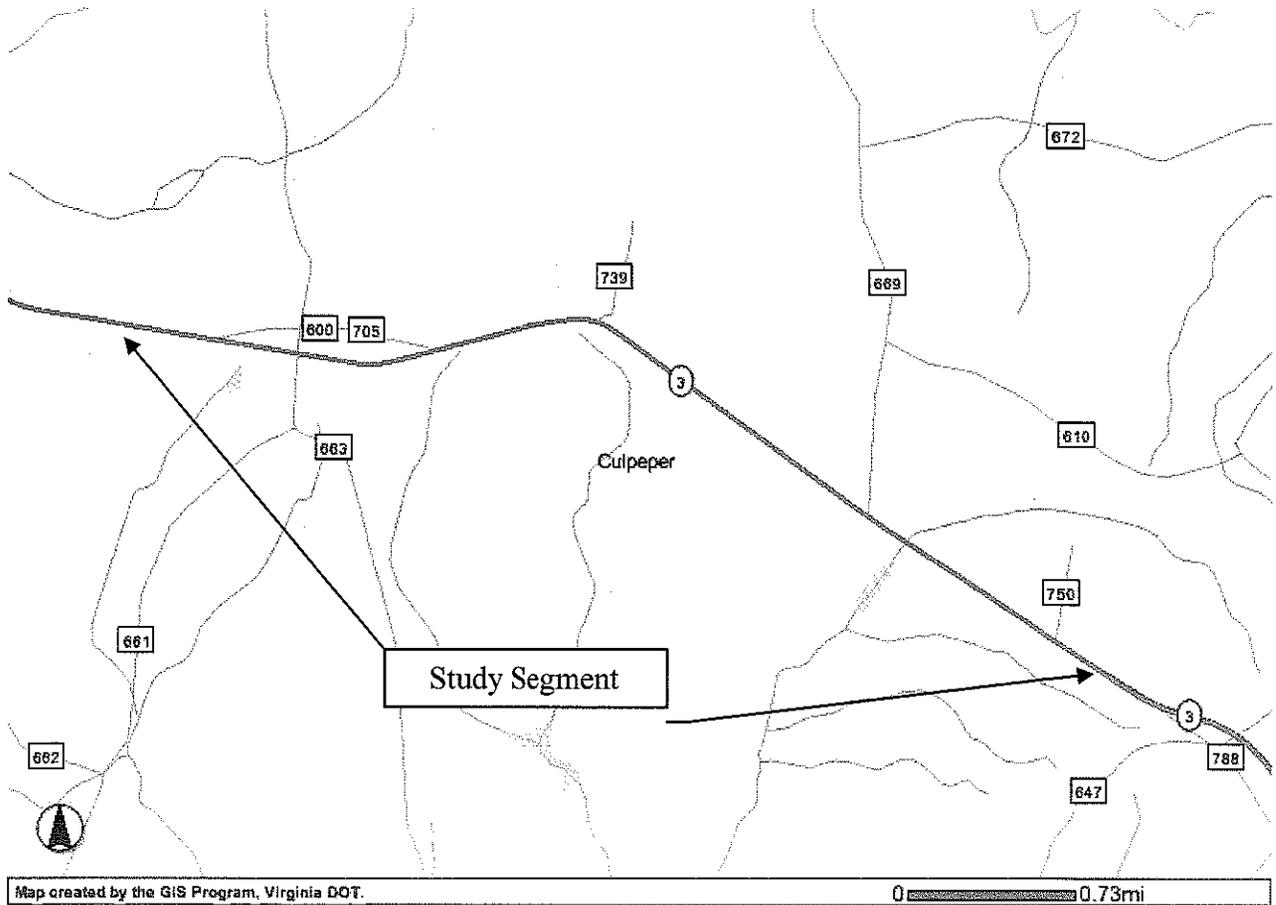
The State Police Officer:	The Sheriff/Deputy
<u> X </u> Concurs	<u> X </u> Concurs
_____ Opposes	_____ Opposes

If any officer opposes, please explain:

G. Additional Comments:

It is important to note the crashes in August 29, 2008 and March 22, 2009 that resulted in 5 fatalities, were not included in determining the injury and fatality rates which are well above the state and district averages for this type of roadway.

Study Area Map:



Note: Map is provided for illustrative purposes and may not accurately depict the most recent roadway conditions