Hampton Roads Rural Safety Study

HAMPTON ROADS
PLANNING DISTRICT COMMISSION

FEBRUARY 2006

T06-01

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HAMPTON ROADS RURAL SAFETY STUDY

This report was included in the Work Program for Fiscal Year 2005-2006, which was approved by the Commission and the Metropolitan Planning Organization at their meetings of March 16, 2005.

PREPARED BY:

HAMPTON ROADS
PLANNING DISTRICT COMMISSION

FEBRUARY 2006

T06-01

REPORT DOCUMENTATION

TITLE:
Hampton Roads Rural Safety Study

REPORT DATE
February 2006

GRANT/SPONSORINGAGENCY
FHWA/VDOT/LOCAL FUNDS

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ABSTRACT

In 2004 the Hampton Roads Planning District Commission (HRPDC) completed the Hampton Roads Regional Safety Study, which comprehensively examined highway safety in the communities within the Hampton Roads Metropolitan Planning Organization (MPO). The Hampton Roads Rural Safety Study primarily examines roadway safety data and trends in the rural areas of Hampton Roads. Specifically, roadway safety was analyzed in communities that are members of the Hampton Roads Planning District Commission (PDC), but are not within the Hampton Roads MPO. These four jurisdictions are the City of Franklin, Gloucester County, Southampton County, and Surry County.

This report examines crash numbers and trends in each of the four rural jurisdictions, details crash severity rates for major roadways in the rural jurisdictions as well as selected roadways within the Hampton Roads MPO, analyzes high crash locations and recommends possible countermeasures to reduce crashes.

ACKNOWLEDGMENTS

This report was prepared by the Hampton Roads Planning District Commission (HRPDC) in cooperation with the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), the Virginia Department of Transportation (VDOT), the Virginia Department of Motor Vehicles (DMV), and the City of Franklin, Virginia. The contents of this report reflect the views of the staff of the Hampton Roads Area Metropolitan Planning Organization (MPO). The MPO staff is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the FHWA, VDOT, or HRPDC. This report does not constitute a standard, specification, or regulation. FHWA or VDOT acceptance of this report as evidence of fulfillment of the objectives of this planning study does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

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INTRODUCTION

In 2004 the Hampton Roads Planning District Commission (HRPDC) completed the Hampton Roads Regional Safety Study. This report comprehensively examined highway safety in the communities within the Hampton Roads Metropolitan Planning Organization (MPO). Since the release of this study, roadway safety and safety conscious planning have taken on a more prominent role both locally and nationally. The new federal surface transportation reauthorization package, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), created the Highway Safety Improvement Program, which provides significant funding increases to highway safety planning and improvements. The state of Virginia has also implemented various safety initiatives including the Highway Safety Corridor Program, which aims to improve safety on high crash corridors.

This report will primarily examine roadway safety data and trends in the rural areas of Hampton Roads. Specifically, roadway safety was analyzed in communities that are members of the Hampton Roads Planning District Commission (PDC), but are not within the Hampton Roads MPO. These four jurisdictions, which are shown in **Map 1**, are:

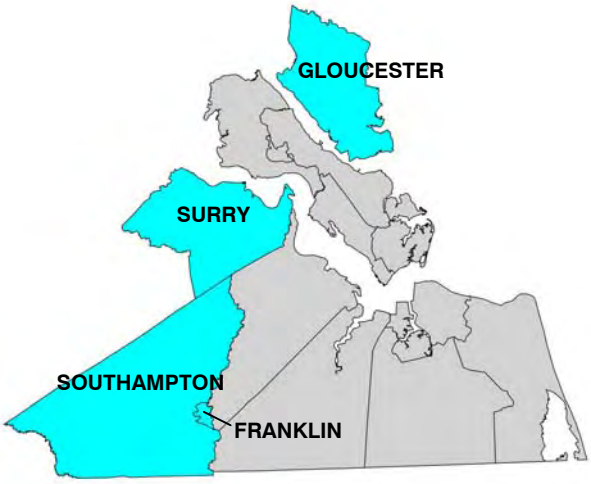
- City of Franklin
- Gloucester County
- Southampton County
- Surry County

Combined, these four communities had 68,000 residents in 2004, or 4% of the population within the Hampton Roads PDC. There were an average of 2,394,000 vehicle-miles of travel (VMT) each day in these four communities in 2004 according to VDOT, or 6% of the VMT within the Hampton Roads PDC.

This report is divided into the following four sections:

- General Crash Data and Trends – This section includes crash numbers and trends in each of the four rural jurisdictions, including the total number and rate of crashes, injuries, fatalities, and crashes that involved alcohol. Comparisons are also made with regionwide trends.

MAP 1 – Rural HRPDC Jurisdictions Analyzed in this Study



- Crash Locations – Crash severity rates are analyzed for major roadways in the rural jurisdictions of Hampton Roads. In addition, selected roadways within the MPO that provide access between these rural jurisdictions and the urban areas of the region are also analyzed. This information is used to determine high-crash locations. The location of fatalities is also examined in this section.
- General Crash Countermeasures – This section includes an analysis of high crash locations and recommends possible countermeasures to reduce crashes.
- Appendix – Includes data used in this report.

GENERAL CRASH DATA AND TRENDS

In the following section, characteristics of traffic crashes in the rural communities of Hampton Roads are examined. These characteristics include the number and rate of traffic crashes, fatalities, and injuries, crashes that involved alcohol, and crash types. Comparisons are also made between the rural communities and regionwide trends. The data analyzed in this section of the report is included in **Appendix A**.

Traffic Crashes

Figure 1 shows the annual traffic crashes in each rural jurisdiction for the years 1999 to 2004. A traffic crash in the Commonwealth of Virginia is defined by the Department of Motor Vehicles as one that occurs on a public roadway that involves a fatality, injury, or estimated property damage of at least $1,000.

Among the rural jurisdictions, Gloucester County experienced the highest number of annual traffic crashes, with nearly 500 crashes in 2004. Southampton County, which had just over 400 crashes in 2004, was the only rural jurisdiction that experienced an increase in crashes between 1999 and 2004. By comparison, there was an 8.7% increase in the number of crashes across Hampton Roads between 1999 and 2004.

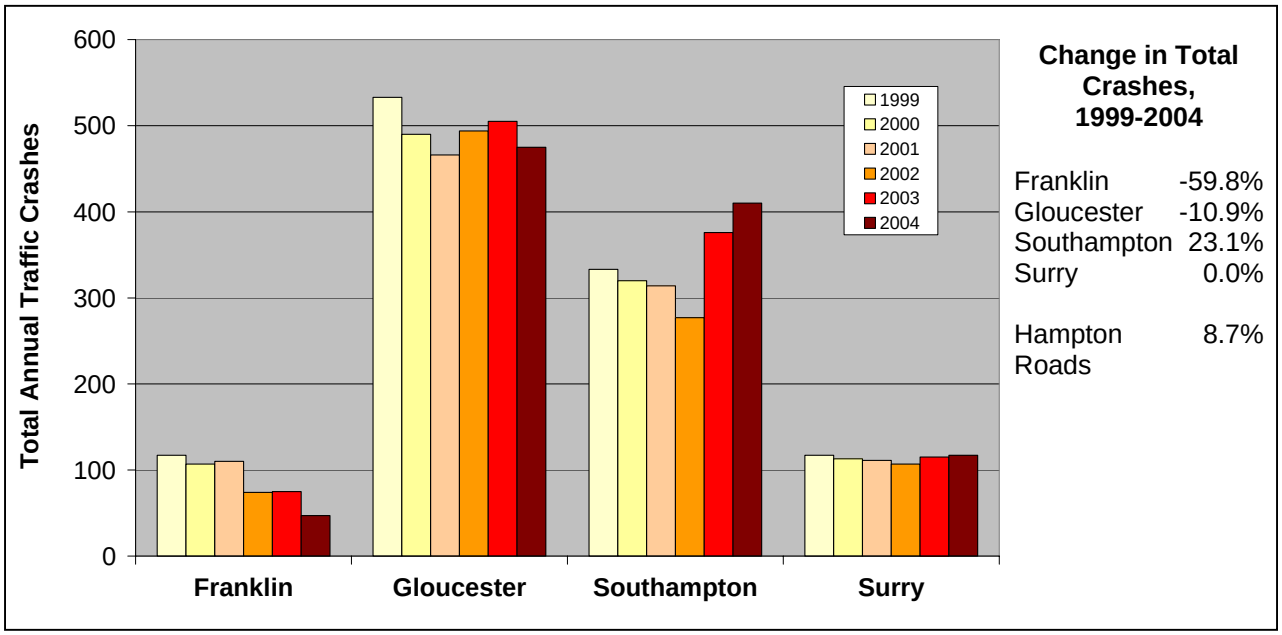
The 1,049 crashes that occurred in these four rural jurisdictions in 2004 comprised just over 3% of the total number of crashes that occurred in the Hampton Roads PDC. By comparison, 4% of total regional population and 6% of total regional vehicle-miles of travel (VMT) occurred in these same four communities.

Traffic Crash Rates

Analyzing traffic safety only by the total number of traffic crashes does not reflect the fact that the amount of travel, and therefore the amount of exposure to crashes, varies both from roadway to roadway and from jurisdiction to jurisdiction. Analyzing safety with traffic crash rates accounts for this varied amount of travel. The annual number of vehicle-miles of travel in 2004 in the rural jurisdictions of Hampton Roads were:

Franklin – 36,014,000
Gloucester County – 372,917,000
Southampton County – 394,914,000
Surry County – 72,505,000

FIGURE 1 – Traffic Crashes by Jurisdiction, 1999 to 2004

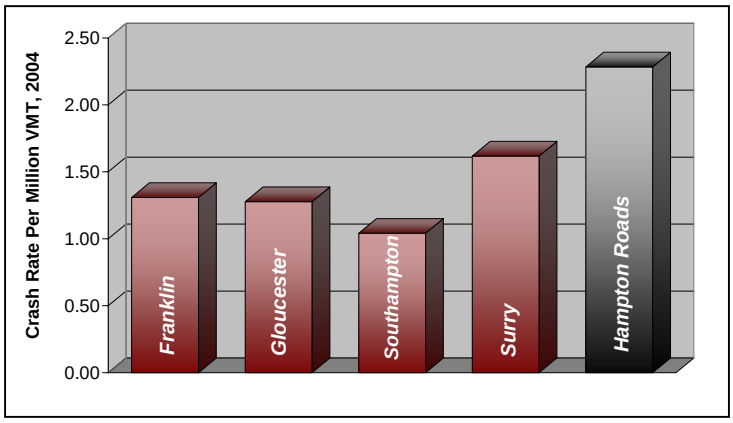


Data Source: Virginia DMV.

Although jurisdictions with higher amounts of travel are more likely to have a higher number of crashes than jurisdictions with lower travel levels, this is not always the case. While Southampton County has the highest amount of travel among the rural jurisdictions, Gloucester County had the most crashes in 2004.

Figure 2 shows the traffic crash rates for the rural jurisdictions and Hampton Roads. Among the rural jurisdictions, Southampton County had the lowest traffic crash rate in 2004, with 1.04 crashes per million vehicle-miles of travel. Surry County had the highest crash rate at 1.62 crashes per million VMT. All four of these jurisdictions had a significantly lower crash rate than the Hampton Roads region in 2004.

FIGURE 2 – Traffic Crash Rates by Jurisdiction, 2004



Data Sources: Virginia DMV, VDOT.

Traffic Crashes Involving Alcohol

Traffic crashes involving alcohol, although a problem in all areas of the country, are particularly a problem in rural areas across the United States. According to the National Highway Traffic Safety Administration (NHTSA), there are a larger percentage of fatal crashes where at least one driver had a blood alcohol concentration (BAC) over the legal limit in rural areas than in urban areas.

Table 1 shows the number of traffic crashes that involved alcohol in the four rural jurisdictions between 1999 and 2004.[1] The total number of crashes that involved alcohol in the rural jurisdictions of Hampton Roads decreased between 1999 and 2004. During this same period, the number of crashes that involved alcohol in Hampton Roads actually increased by 7.2%.

Although the number of crashes involving alcohol has decreased in the rural areas, the percentage of crashes that involve alcohol is higher than the regional average in all of the rural communities of Hampton Roads except for the City of Franklin. Gloucester County had the highest rate, with 12% of all crashes involving alcohol in 2004. By comparison, the percentage of crashes that involved alcohol regionwide was 7.8% of all crashes in 2004.

TABLE 1 – Traffic Crashes that Involved Alcohol by Jurisdiction, 1999 to 2004

Jurisdiction	Total Crashes that Involved Alcohol							% of total crashes in 2004 that involved alcohol
	1999	2000	2001	2002	2003	2004	% change 1999-2004	
Franklin	5	8	7	3	7	2	-60.0%	4.3%
Gloucester	51	45	51	56	52	57	11.8%	12.0%
Southampton	47	43	33	32	41	35	-25.5%	8.5%
Surry	16	16	14	13	18	11	-31.3%	9.4%
Hampton Roads	2,410	2,214	2,302	2,502	2,392	2,584	7.2%	7.8%

Data Source: Virginia DMV.

1 The Virginia Department of Motor Vehicles defines a traffic crash as involving alcohol when the police report indicates that a driver, bicyclist, or pedestrian had been drinking before the crash, regardless of blood alcohol content.

Traffic Crash Injuries

Injury traffic crashes are defined by the Virginia Department of Motor Vehicles as any crash that involves at least one injury to a driver, passenger, or pedestrian, but results in no fatalities within 30 days of the crash. Over 38% of all crashes in Hampton Roads resulted in at least one injury to a driver, passenger, or pedestrian in 2004.

Figure 3 shows the injuries resulting from traffic crashes in the four rural jurisdictions between 1999 and 2004. In 2004 there were 703 injuries due to traffic crashes in these jurisdictions, an average of almost two each day. Gloucester County, which had the highest number of crashes, also had the highest number of injuries among the rural jurisdictions in 2004.

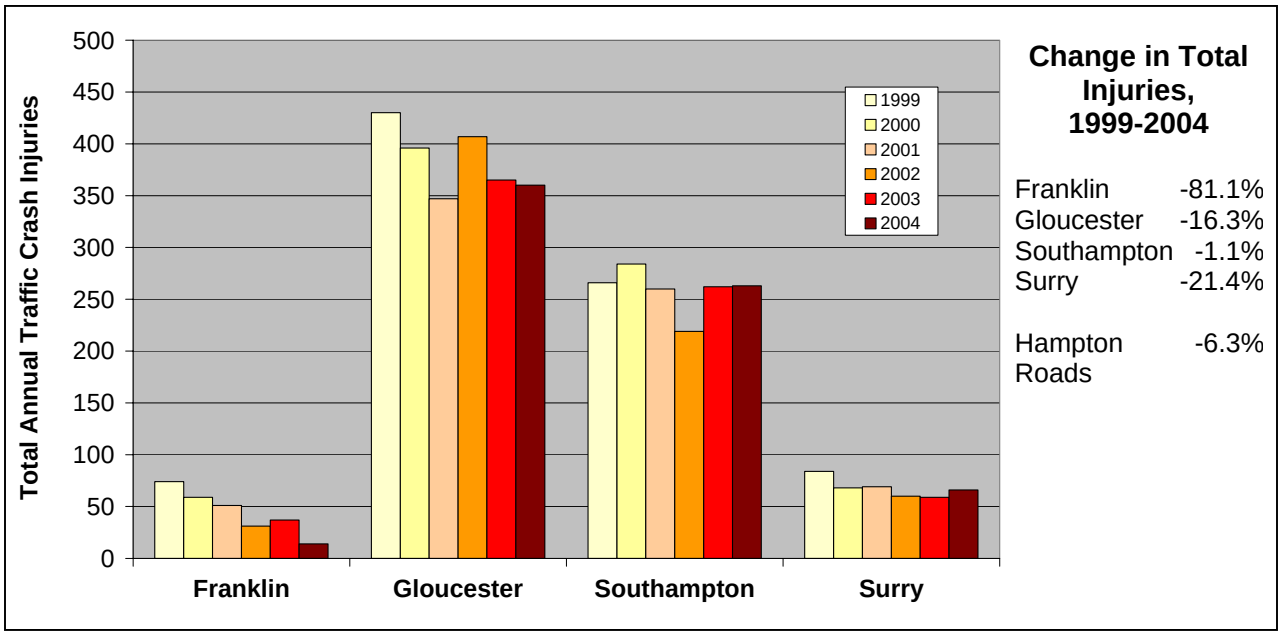
In each of the rural jurisdictions, the total number of injuries decreased between 1999 and 2004. Large decreases occurred in the City of Franklin (-81%), Surry County (-21%), and Gloucester County (-16%), while Southampton County had a modest decrease (-1%). By comparison, the number of injuries resulting from traffic crashes decreased more than 6% in Hampton Roads. These decreases occurred in spite of an increase in the number of crashes both in Gloucester County as well as in Hampton Roads.

Traffic Crash Injury Rate

Similar to the crash rate, the number of injuries as a result of traffic crashes in each jurisdiction is affected by the amount of travel. Analyzing injury rates accounts for this varying amount of travel.

Figure 4 on page 5 shows the traffic crash injury rates by jurisdiction for 2004. Among the rural jurisdictions, the City of Franklin had the lowest traffic crash injury rate with 0.39 injuries per million vehicle-miles of travel in 2004. Gloucester County, although only having the third-highest crash rate among the four rural jurisdictions, had the highest crash injury rate at 0.97 injuries per million VMT in 2004. Similar to the crash rate, all of the rural jurisdictions also had a significantly lower crash injury rate than the Hampton Roads region in 2004.

FIGURE 3 – Traffic Crash Injuries by Jurisdiction, 1999 to 2004



Data Source: Virginia DMV.

Traffic Crash Fatalities

A fatality type of traffic crash is any crash that causes the death of at least one driver, passenger, or pedestrian within 30 days as the result of injuries suffered in the crash. About 0.3% of all crashes in Hampton Roads involve at least one fatality to a driver, passenger, or pedestrian.

Figure 5 shows the traffic crash fatalities between 1999 and 2004 for the rural communities. Although Gloucester County had the highest number of crashes and injuries among the rural jurisdictions during this time period, Southampton County had the highest number of fatalities. The City of Franklin had the lowest number of fatalities.

The largest factor in traffic crash fatalities is alcohol use. In Hampton Roads, 43% of all fatalities occurred in crashes that involved alcohol between 1999 and 2004. The total number of traffic crash fatalities and those that involved alcohol between 1999 and 2004 in the rural jurisdictions are:

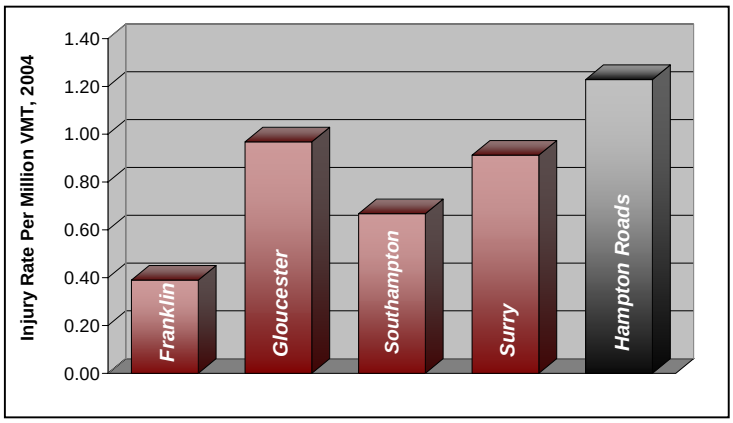
Franklin – 3 total fatalities
2 involved alcohol (67%)

Gloucester – 26 total fatalities
13 involved alcohol (50%)

Southampton - 38 total fatalities
18 involved alcohol (47%)

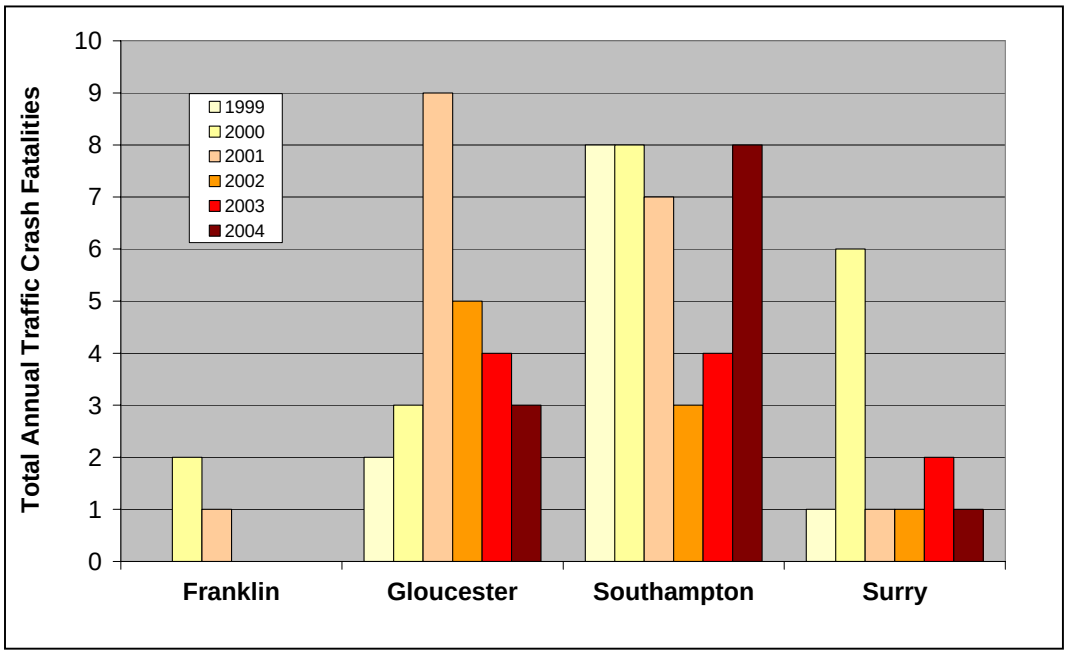
Surry - 12 total fatalities
4 involved alcohol (33%)

FIGURE 4 – Crash Injury Rates by Jurisdiction, 2004



Data Sources: Virginia DMV, VDOT.

FIGURE 5 – Traffic Crash Fatalities by Jurisdiction, 1999 to 2004

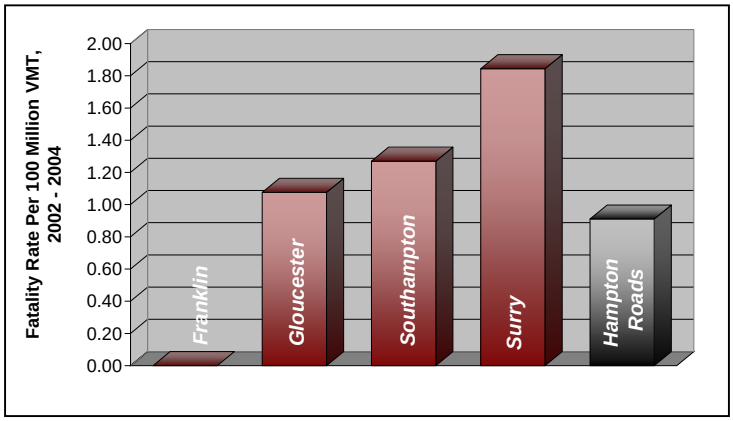


Data Source: Virginia DMV.

Traffic Crash Fatality Rate

Figure 6 shows the rate of traffic crash fatalities per 100 million vehicle-miles of travel for the rural jurisdictions between 2002 and 2004. Gloucester County, Southampton County, and Surry County all had significantly higher fatality rates than Hampton Roads. Surry County's fatality rate was not only the highest among the rural jurisdictions but was more than twice the regional rate. Both Southampton and Surry County also had fatality rates higher than 1.17 fatalities per 100 million VMT, which is the statewide fatality rate.

FIGURE 6 – Crash Fatality Rates by Jurisdiction, 2002 to 2004



Data Sources: Virginia DMV, VDOT.

These rates are not unusual, as rural areas nationwide have a traffic crash fatality rate that is more than twice that of urban areas according to the National Highway Traffic Safety Administration (NHTSA). There are many factors influencing this, including an increased likelihood of speeding in rural areas, increased emergency response times, more conflicts with wildlife, lower safety belt usage rates, and more roadway design deficiencies. By improving some of these factors, the state of Virginia aims to reduce the statewide fatality rate to one fatality per 100 million VMT.

Traffic Crash Types

Table 2 on page 7 includes the traffic crash types by percentage occurring in each jurisdiction between 2002 and 2004. In Hampton Roads the most prevalent crash types during this period were rear end (36% of all crashes), angle (27%), and fixed objects off the roadway (16%). In the rural jurisdictions, however, crashes involving fixed objects off the roadway were much more prevalent. The most common types of crashes in each rural jurisdiction between 2002 and 2004 were:

Franklin
- Angle crashes (43% of all crashes)
- Rear end (22%)
- Fixed objects off roadway (12%)

Gloucester
- Rear end (31% of all crashes)
- Fixed objects off roadway (31%)
- Angle (21%)

Southampton County
- Fixed objects off roadway (47% of all crashes)
- Rear end (12%)
- Angle (12%)

Surry County
- Fixed objects off roadway (42% of all crashes)
- Noncollision/overturned vehicle (15%)
- Deer/Other Animals (14%)

Although crashes involving fixed objects off the roadway surface were much more prevalent in the rural areas than in Hampton Roads, the percentage of fatalities resulting from these crashes wasn't significantly different. Ten fatalities occurred between 2002 and 2004 in the four rural jurisdictions as a result of crashes with fixed objects off the roadway. At 32%, this rate is equal to Hampton Roads, which also had 32% of all traffic crash fatalities result from crashes with fixed objects off the roadway.

There were also ten fatal crashes that were the result of noncollisions/overturned vehicles in the rural jurisdictions between 2002 and 2004. At 32%, this percentage of total fatalities is much higher than in Hampton Roads (13%).

TABLE 2 – Traffic Crash Types by Jurisdiction, 2002 to 2004

	Franklin			Gloucester			Southampton			Surry			Hampton Roads		
Collision Type	Crashes	Injuries	Fatalities	Crashes	Injuries	Fatalities	Crashes	Injuries	Fatalities	Crashes	Injuries	Fatalities	Crashes	Injuries	Fatalities
Rear End	22%	24%	0%	31%	31%	8%	12%	17%	7%	6%	6%	0%	36%	37%	7%
Angle	43%	54%	0%	21%	27%	0%	12%	20%	7%	10%	20%	25%	27%	33%	17%
Fixed Object Off Road	12%	13%	0%	31%	29%	33%	47%	37%	33%	42%	40%	25%	16%	13%	32%
Same Dir Sideswipe	7%	1%	0%	5%	4%	0%	6%	7%	0%	4%	4%	0%	9%	6%	3%
Fixed Object In Road	6%	1%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	4%	1%	6%
Noncollision/overturned	0%	0%	0%	3%	3%	25%	7%	8%	33%	15%	15%	50%	2%	2%	13%
Pedestrian	1%	2%	0%	1%	1%	33%	0%	0%	7%	1%	1%	0%	2%	3%	12%
Deer/Other Animals	1%	0%	0%	3%	1%	0%	10%	4%	0%	14%	4%	0%	1%	0%	0%
Opp Dir Sideswipe	1%	2%	0%	3%	3%	0%	3%	4%	0%	7%	11%	0%	1%	2%	1%
Head On	1%	1%	0%	1%	1%	0%	0%	1%	13%	0%	0%	0%	1%	1%	8%
Backed Into	4%	0%	0%	1%	0%	0%	1%	0%	0%	1%	1%	0%	1%	1%	0%
Other	1%	0%	0%	0%	0%	0%	1%	1%	0%	1%	0%	0%	1%	1%	2%

Data Source: VDOT.

CRASH LOCATIONS

In this section, crash rates for the years 2002 through 2004 are analyzed for major roadways in the rural areas of Hampton Roads. The location of fatalities on these roadways is also examined.

Roadways analyzed in this study include all primary roadways within the rural jurisdictions, as well as all secondary roadways with average traffic volumes of greater than 2,000 vehicles per day (or 5,000 vehicles per day in the City of Franklin). The list of roadways that meet these qualifications include:

Franklin
- Armory Drive/Second Avenue
- Clay Street
- College Drive/Hunterdale Road
- Fourth Avenue/Mechanic Street
- South Street/Main Street

Northern Gloucester County
- Route 3
- Route 14
- Route 17
- Route 33
- Route 198

Southampton County
- Route 35
- Route 58
- Business Route 58
- Route 186
- Route 189
- Route 258
- Route 308
- Route 641
- Route 671

Surry County
- Route 10
- Route 31
- Route 40
- Route 650

In addition, major highways within the MPO boundaries that provide access between the urban areas of Hampton Roads and the four rural jurisdictions were also analyzed. These facilities include:

Suffolk
- Route 58
- Business Route 58
- Route 189
- Route 272
- Route 460

Isle of Wight County
- Route 10
- Business Route 58
- Route 258
- Route 460

Southern Gloucester County
- Route 17

Crash data was obtained from VDOT's Mobility Management Division for the counties examined in this study. For the City of Franklin, crash data was obtained from the city's police department. Both data sources include all crashes that involve either a fatality, an injury, or property damage of at least $1,000.

Crashes were aggregated on a roadway segment basis. Segment breaks were placed at intersecting roadways so that most roadway segments were between one and three miles in length. Crashes occurring at these segment breaks were split evenly among the adjacent analyzed roadway segments. Primary data characteristics analyzed for each segment include the number of crashes, number of injuries, number of fatalities, collision type, primary driver action, alcohol involvement, and daily traffic volumes. Data for each roadway segment is included in **Appendix B**.

The safety of each roadway segment was analyzed using the crash severity method. In this method, each crash is categorized based on whether the crash had at least one fatality (fatality crashes), had at least one injury but no fatalities (injury crashes), or had no injuries or fatalities (property damage only crashes). These categories are each weighted by separate factors. In this study, as well as in the Hampton Roads Regional Safety Study, the weighting factors are:

- Property Damage Only Crashes: 1
- Injury Crashes: 3
- Fatality Crashes: 12

Although these factors are commonly used to calculate crash severity rates, they do vary between different agencies. Applying these factors to crashes provides equivalence to property damage only crashes, commonly referred to as Equivalent Property Damage Only crashes, or EPDO. The formula for calculating EPDO is:

Yearly EPDO =
12 x (Fatality Crashes per year) +
3 x (Injury Crashes per year) +
Property Damage Only Crashes per year

For each roadway segment analyzed in this study, the EPDO crash rate was calculated by dividing the segment's yearly EPDO by the annual amount of travel on the roadway segment.

EPDO Crash Rate =

$$\frac{1{,}000{,}000 \times \text{Yearly EPDO}}{365 \times \text{Average Daily Traffic} \times \text{Segment Length}}$$

Map 2 on page 10 shows the EPDO Crash Rates from 2002 to 2004 for the roadways listed previously in this section. Of the 171 segments analyzed in this study, 14 had EPDO crash rates of 4.0 or higher. These 14 segments (shown in **Table 3**) are considered to be high crash locations, and crash countermeasures for each of these locations are analyzed in the next section of this report.

Map 3 on page 11 shows the locations of fatalities between 2000 and 2004 on the roadways listed previously in this section. Upon visual inspection, the locations with a high number of fatalities include:

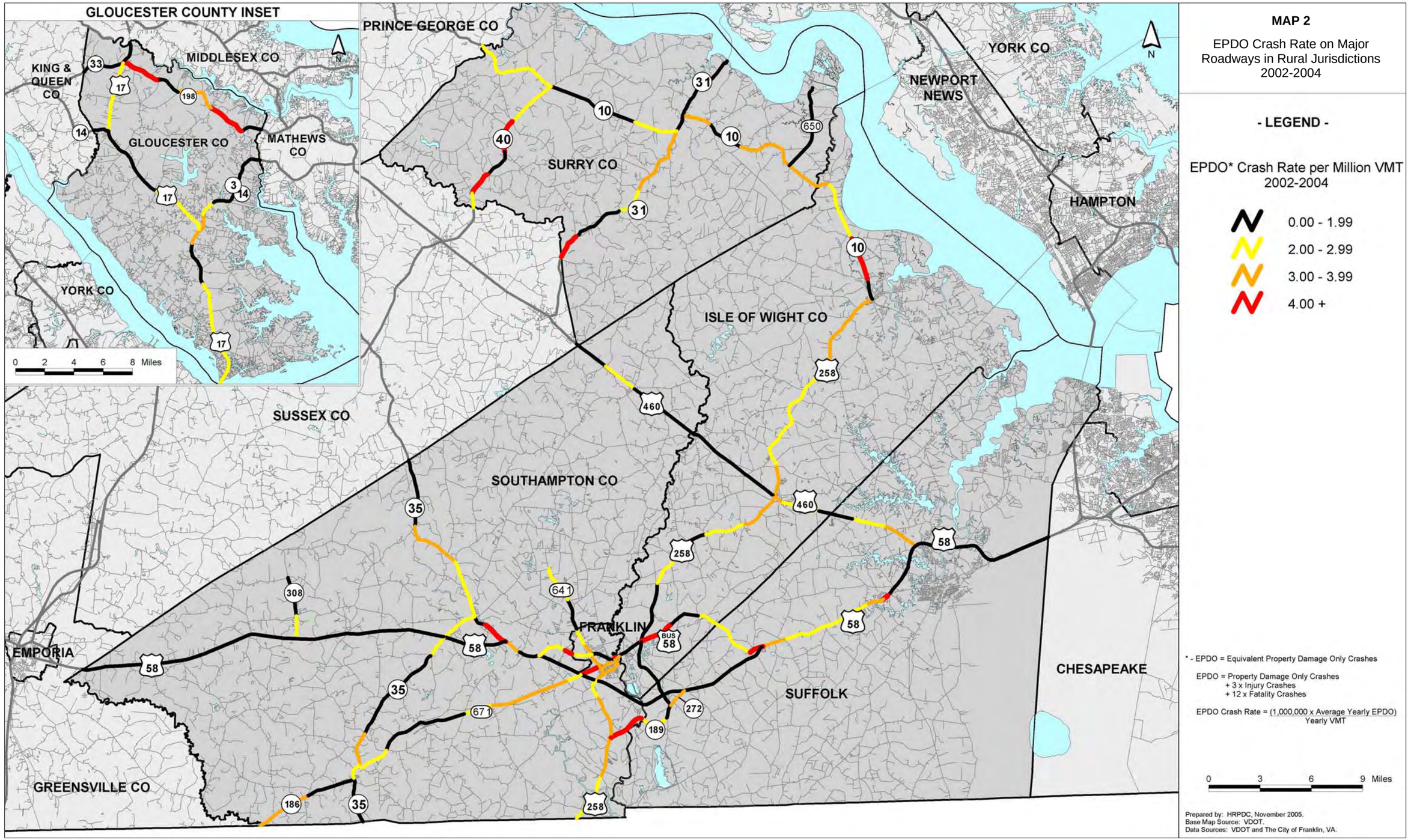
- Route 58 in Suffolk between Wilroy Road and the Suffolk/Chesapeake City Line. This stretch travels the northern edge of the Great Dismal Swamp. Nine fatalities occurred on this segment between 2000 and 2004.
- Route 58 in Suffolk between the Holland area and the Suffolk Bypass. Nine fatalities occurred on this segment between 2000 and 2004.
- Route 58 in Southampton County between Business Route 58 East of Courtland and Business Route 58 West of Franklin. Five fatalities occurred on this 2.5-mile stretch between 2000 and 2004.

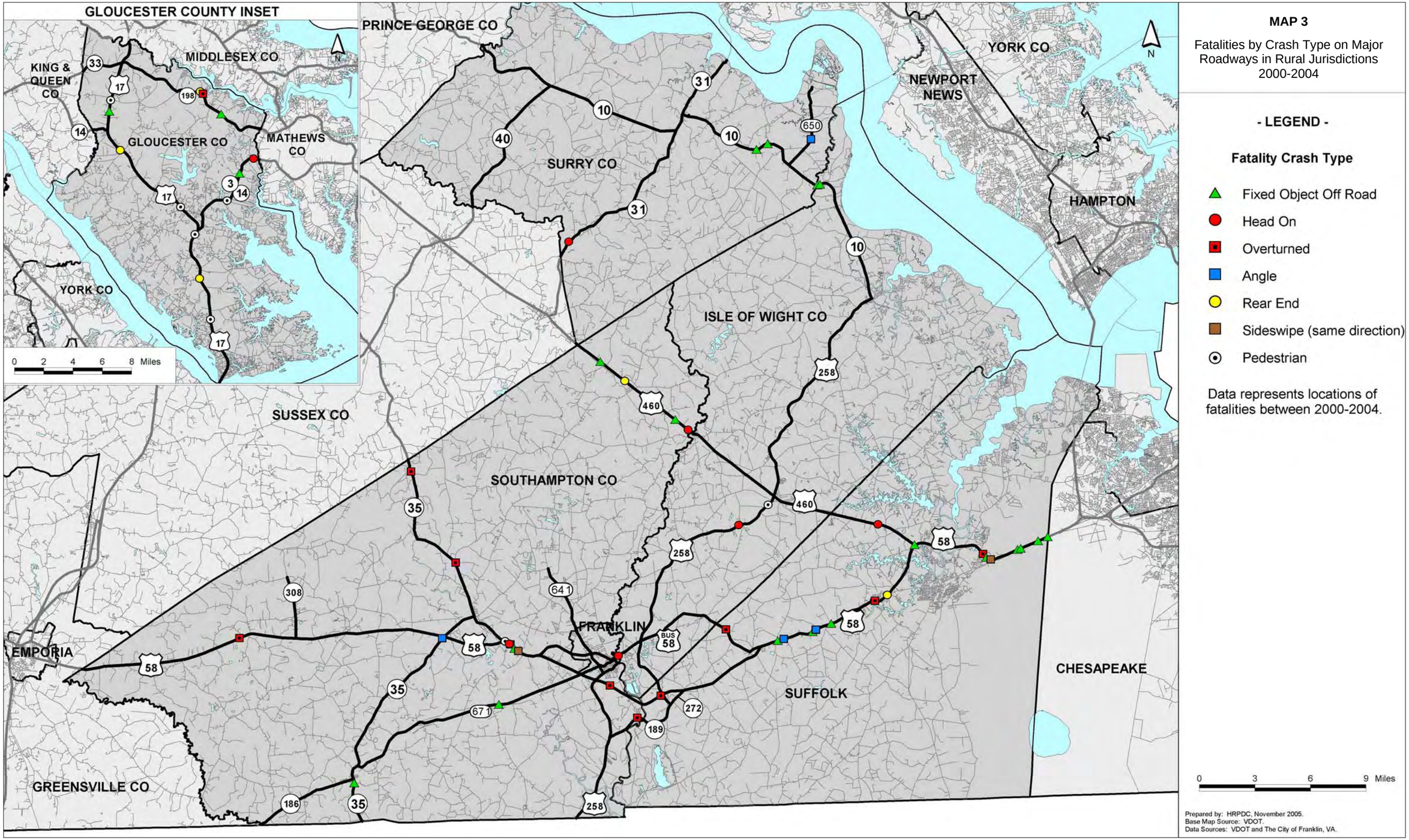
Crash countermeasures for these three locations are also analyzed in the next section of this report. It should be noted that Route 460, notorious as a hazardous facility between I-295 and Route 58, had six fatalities within the Hampton Roads planning district between 2000 and 2004. During this same time period, twelve fatalities occurred in Sussex and Prince George Counties, to the west of the study area.

TABLE 3 – Analyzed Roadway Segments with EPDO Crash Rates of Above 4.0, 2002 to 2004

Juris-diction	Route	Segment From	Segment To	EPDO RATE PER MVMT
SUF	Route 58	Route 645 (Manning Rd)	Holland Rd	**10.98**
FR	Fourth Ave/Mechanic St	High St	Second Ave	**9.86**
GLO	Route 198	Route 606 (Harcum Rd)	Route 602 (Burkes Pond Rd)	**6.95**
SH	Route 189	Route 258	Route 714 (Pretlow Rd)	**5.98**
SU	Route 40	Route 615 (Carsley Rd)	Route 611 (Salisbury Rd)	**5.94**
GLO	Route 198	Route 17	Route 637 (Turks Ferry Rd)	**5.37**
FR	Armory Dr	Route 58	College Dr	**5.31**
SH	Bus Route 58	Route 687 (Delaware Rd)	Franklin CL	**4.96**
SUF	Bus Route 58	Route 189	Route 58	**4.84**
SU	Route 31	Sussex CL	Route 615 (Carsley Rd)	**4.45**
IW	Bus Route 58	Route 258	Route 630 (Beaverdam Rd)	**4.44**
IW	Route 10	Bus Route 10	Route 666 (Berry Hill Rd)	**4.38**
SH	Bus Route 58	Linden St	Route 58	**4.33**
SU	Route 40	Route 601 (Laurel Dr)	Route 612 (Otterdam Rd)	**4.30**

Data source: VDOT and the City of Franklin.


GLOUCESTER COUNTY INSET
KING & QUEEN CO
MIDDLESEX CO
GLOUCESTER CO
MATHEWS CO
YORK CO
0 2 4 6 8 Miles
PRINCE GEORGE CO
SURRY CO
SUSSEX CO
SOUTHAMPTON CO
ISLE OF WIGHT CO
FRANKLIN
EMPORIA
GREENSVILLE CO
SUFFOLK
CHESAPEAKE
NEWPORT NEWS
HAMPTON
YORK CO
N
MAP 2
EPDO Crash Rate on Major Roadways in Rural Jurisdictions 2002-2004
- LEGEND -
EPDO* Crash Rate per Million VMT 2002-2004
0.00 - 1.99
2.00 - 2.99
3.00 - 3.99
4.00 +
* - EPDO = Equivalent Property Damage Only Crashes
EPDO = Property Damage Only Crashes
+ 3 x Injury Crashes
+ 12 x Fatality Crashes
EPDO Crash Rate = (1,000,000 x Average Yearly EPDO) / Yearly VMT
0 3 6 9 Miles
Prepared by: HRPDC, November 2005.
Base Map Source: VDOT.
Data Sources: VDOT and The City of Franklin, VA.



MAP 3

Fatalities by Crash Type on Major Roadways in Rural Jurisdictions 2000-2004

- LEGEND -

Fatality Crash Type

- Fixed Object Off Road
- Head On
- Overturned
- Angle
- Rear End
- Sideswipe (same direction)
- Pedestrian

Data represents locations of fatalities between 2000-2004.

Prepared by: HRPDC, November 2005.
Base Map Source: VDOT.
Data Sources: VDOT and The City of Franklin, VA.

CRASH COUNTERMEASURES

A vast array of countermeasures exists to address roadway safety problems. Crashes commonly occur as a result of one of the following thirteen causes:

1) Roadway Departure
2) Road Surface Conditions
3) Narrow Roadways and Bridges
4) Railroad Crossings
5) Work Zones
6) Intersections
7) Roadway Design Limitations
8) Roadway Access Problems
9) Pedestrian and Bicycle Traffic
10) Driver Actions
11) Driver Condition
12) Vehicle Design or Malfunctions
13) Traffic Congestion

Among these thirteen causes, certain types are more prevalent in rural areas. One of the biggest concerns in rural areas is roadway departure crashes. 36% of all crashes in the four rural jurisdictions in this study involved collisions with fixed objects off the roadway. 32% of the fatalities in the rural jurisdictions involved noncollision/overturned vehicles.

Driver actions also lead to many crashes in rural areas. Speeding is more prevalent in crashes in rural areas than in urban areas. According to the NHTSA, speeding is a factor in 36% of all rural fatal crashes, as compared to 30% of all urban fatal crashes. Seat belt usage, on the national level, is lower in rural areas than urban areas. Vehicle occupants involved in rural fatal crashes are ejected 15% of the time according to the NHTSA, while 7% of occupants involved in urban fatal crashes are ejected. Drivers in rural areas are also more likely to drive while intoxicated than urban drivers, particularly with high blood alcohol content levels of 0.14 or higher.

Roadway design limitations are also common in rural areas. Narrow roadways, blind curves, and trees and ditches close to the edge of the roadway are more common in rural areas than in urban areas.

Table 4 on page 13 includes countermeasures and general strategies to reduce crashes based on the various causes of crashes. These crash countermeasures, which were also included in Part III of the Hampton Roads Regional Safety Study, are from the Roadway Safety Foundation's *Roadway Safety Guide*.

Route 58 just west of the Suffolk Bypass had the highest EPDO crash rate among the analyzed roadways.

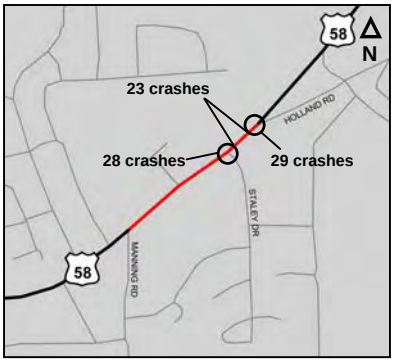
In the previous section, EPDO crash rates were detailed for roadway segments in the rural areas. Those segments with an EPDO crash rate of greater than 4.0 are considered high crash locations. Locations with a high number of fatalities were also detailed in the previous section. Pages 14-22 of this report further examine these fourteen high crash locations in the order of their EPDO crash rates, as well as the three high fatality locations. For each location observations, based both on pictures and notes taken at each site as well as data analyses, are included. Also included are primary crash types, primary driver actions, and possible crash countermeasures for each location.

TABLE 4 – Summary of Countermeasures and General Strategies to Reduce Motor Vehicle Crashes

Causes of Motor Vehicle Crashes	Countermeasures & General Strategies						
1. Roadway Departure	Clear Zones	Gradual Side Slopes	Forgiving Devices	Rumble Strips	Clear Signing, Pavement Marking, and Delineation		
2. Road Surface Conditions	Increased Surface Friction	Temporary Friction Enhancement (i.e. salt and sand)	Pavement Improvements	Stabilizing Shoulders	Preventive Maintenance	Proper Drainage	Advanced Transportation Weather Information Systems
3. Narrow Roadways and Bridges	Widening Lanes	Adding or Widening Shoulders	Channelization	Pedestrian/Cyclist Facilities for Narrow Roadways	Widening Bridges	Bridge Approach Improvements	Clear Signing, Pavement Marking, and Delineation for Bridges
4. Railroad Crossings	Education	Advance Warning Devices					
5. Work Zones	Education	Enforcement	Adequate Signage	Advance Warning			
6. Intersections	Add or Upgrade Lighting	Level Steep Grades	Add Turn Lanes	Improve or Add Signals	Roundabouts	Guard Against Red-Light Running	Eliminate Obstructions
7. Roadway Design Limitations	Improve Geometric Realignment (Horizontal & Vertical)	Review Speed Limits	Add or Upgrade Pavement Markings	Add a Raised-Curb Median			
8. Roadway Access Problems	Limit the Number of Conflict Points	Separate Conflict Areas	Reduce the Interference of Through Traffic	Provide Sufficient Spacing for Placement of Traffic Signals	Provide Adequate and Easy-Access Parking Areas		
9. Pedestrian and Bicycle Traffic	Increasing Public Education	Stepping Up Law Enforcement	Engineering Improvements				
10. Driver Actions	Public Awareness	Enforcement					
11. Driver Condition	Rumble Strips	Driver Education	Stricter Enforcement				
12. Vehicle Design or Malfunctions	Readdress Vehicle and Roadway Design Standards	Continue to Monitor and Inspect Vehicles	Incident Management Programs				
13. Traffic Congestion	Add Capacity	Encourage Carpools and Use of Public Transportation	Telecommuting and Staggered Work Hours				

#1 - Route 58 between Manning Rd and Holland Rd

City of Suffolk
EPDO Rate per MVMT = 10.98
81 crashes/50 injuries between 2002 and 2004



Observations:

- Congested area between two less-congested divided highways.
- Signs are in place warning of the congested area.
- Many access points for adjacent businesses.
- There is a two-way left-turn lane on the eastern portion of this segment.
- 22% of all crashes involve trucks.
- Most of the crashes occurred between Staley Dr and Holland Rd.

Primary Crash Types:

- Rear end (47%)
- Angle (30%)
- Sideswipe same dir (20%)

Primary Driver Actions:

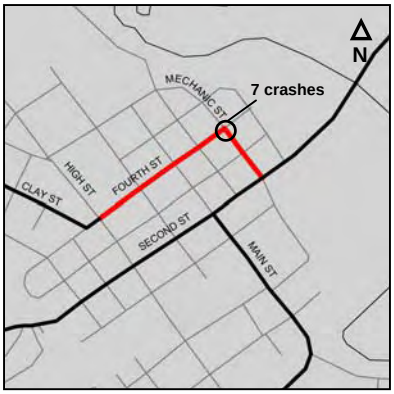
- Driver distraction (28%)
- Did not have ROW (17%)
- Following too close (16%)

Possible Countermeasures:

- Add a median to reduce conflicts.
- Reduce access points where possible.
- Improve visibility of the signal at Holland Rd, possibly with electronic advance signage.

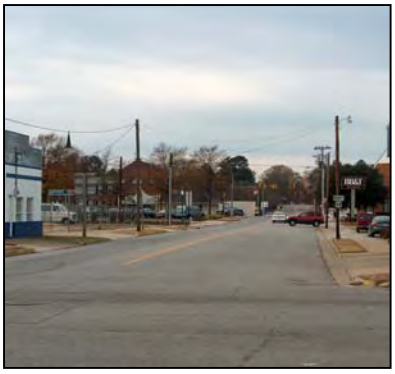
#2 - Fourth Ave/Mechanic St between High St and Second Ave

City of Franklin
EPDO Rate per MVMT = 9.86
13 crashes/2 injuries between 2002 and 2004



Observations:

- Lightly-traveled corridor in a downtown setting.
- Many driveways to adjacent businesses.
- Most of the crashes occurred at the intersection of Fourth Ave and Mechanic St.
- The intersection of Fourth Ave and Mechanic St has unusual traffic control. SE-bound Mechanic St and SW-bound Fourth Ave have stop control, NE-bound Fourth Ave has Yield control, and NW-bound Mechanic St is free flow.



Primary Crash Types:

- Angle (77%)
- Sideswipe same dir (15%)

Primary Driver Actions:

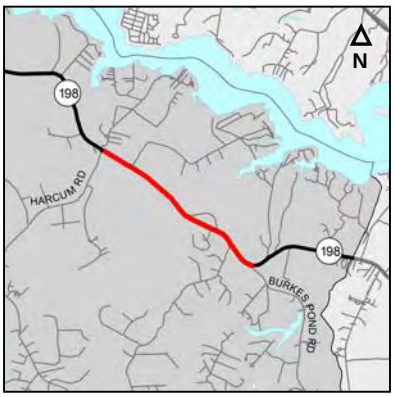
- Disregarded stop sign (38%)
- Driver distraction (15%)
- Did not have ROW (15%)

Possible Countermeasures:

- Consider changing traffic control to either two-way stop control or all-way stop control at Fourth Ave/Mechanic St to reduce confusion.

#3 - **Route 198** between Route 606 (Harcum Rd) and Route 602 (Burkes Pond Rd)

Gloucester County
EPDO Rate per MVMT = 6.95
17 crashes/11 injuries/1 fatality between 2002 and 2004



Observations:

- Narrow travel lanes (10' lane width).
- No shoulder in most places. In some places, there is a ditch close to the roadway surface.
- Trees are close to the roadway surface in many places.
- Crashes occurred in varied locations throughout the segment.
- Twelve crashes (71%) occurred in dark conditions.
- One crash involved alcohol.

Primary Crash Types:

- Fixed object off road (53%)
- Deer (24%)

Primary Driver Actions:

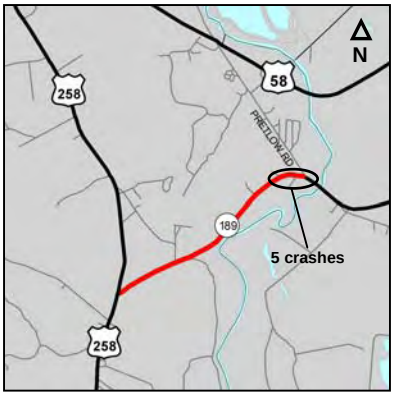
- None listed (53%)
- Driver distraction (24%)
- Exceeded speed limit (18%)

Possible Countermeasures:

- Add shoulders and rumble strips.
- Increase the distance between trees and the roadway surface.
- Improve the visibility of roadway markings, including reflective raised pavement markers on the edge of the roadway.

#4 - **Route 189** between Route 258 and Pretlow Rd

Southampton County
EPDO Rate per MVMT = 5.98
9 crashes/10 injuries between 2002 and 2004



Observations:

- A large percentage of traffic on this segment is trucks (21%), although only one crash involved a truck.
- No shoulder in most places.
- Many driveways.
- Five of the nine crashes occurred on the easternmost 2/10 of a mile of the segment, which includes a long curve.
- Most crashes occurred during daylight conditions.
- No crashes involved alcohol.

Primary Crash Types:

- Angle (22%)
- Sideswipe opp dir (22%)

Primary Driver Actions:

- Did not have ROW (33%)
- None listed (33%)
- Wrong side of road (22%)

Possible Countermeasures:

- Add shoulders and rumble strips.
- Increase the distance between trees and the roadway surface, particularly within the curve described above.

#5 - **Route 40** between Route 615 (Carsley Rd) and Route 611 (Salisbury Rd)

Surry County
EPDO Rate per MVMT = 5.94
7 crashes/4 injuries between 2002 and 2004

Observations:
- Narrow travel lanes.
- No shoulder in most places. In some places, there is a ditch close to the roadway surface.
- Trees are close to the roadway surface in many places.
- Crashes occurred in varied locations throughout the segment.
- Crashes were split nearly evenly between daytime and nighttime hours.
- Two crashes involved alcohol.

Primary Crash Types:
- Non-collision (29%)
- Fixed object off road (29%)

Primary Driver Actions:
- Driver distraction (43%)

Possible Countermeasures:
- Add shoulders and rumble strips.
- Increase the distance between trees and the roadway surface.

#6 - **Route 198** between Route 17 and Route 637 (Turks Ferry Rd)

Gloucester County
EPDO Rate per MVMT = 5.37
16 crashes/15 injuries between 2002 and 2004

Observations:
- Narrow travel lanes (10' lane width).
- No shoulder in most places. In some places, there is a ditch close to the roadway surface.
- Trees are close to the roadway surface in many places.
- Seven crashes occurred at or in the vicinity of Route 17.
- Most of the crashes occurred during daylight hours.
- Two crashes involved alcohol.

Primary Crash Types:
- Fixed object off road (56%)
- Rear end (19%)
- Angle (19%)

Primary Driver Actions:
- Exceeded speed limit/safe speed (38%)
- Driver distraction (19%)

Possible Countermeasures:
- Add shoulders and rumble strips.
- Increase the distance between trees and the roadway surface.
- Increase police enforcement.

#7 - **Armory Drive** between Route 58 and College Dr

City of Franklin
EPDO Rate per MVMT = 5.31
47 crashes/31 injuries between 2002 and 2004

Observations:

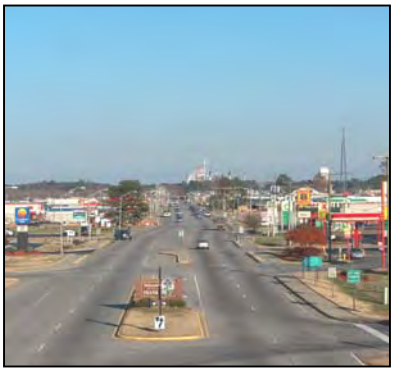
- Many access points for adjacent businesses.
- There is a two-way left-turn lane the entire length of the segment.
- There are very few right turn lanes along this segment.
- There were many mid-block collisions throughout the length of this segment.

Primary Crash Types:

- Angle (51%)
- Rear end (34%)

Primary Driver Actions:

- Did not have ROW (26%)
- Following too close (17%)
- Driver distraction (13%)



Possible Countermeasures:

- Add a median to reduce conflicts.
- Reduce access points where possible.
- Consider adjusting timing/phasing of signals.

#8 - **Business Route 58** between Route 687 (Delaware Rd) and Franklin CL

Southampton County
EPDO Rate per MVMT = 4.96
4 crashes/2 injuries between 2002 and 2004

Observations:

- Only four crashes occurred over the three-year period on this short segment (0.44 mi).
- Four-lane divided highway.
- No shoulder or rumble strips.

Primary Crash Types:

- Fixed object off road (50%)

Primary Driver Actions:

- None with more than one crash of each type.

Possible Countermeasures:

- Consider adding a shoulder and rumble strips.

#9 - **Business Route 58** between Route 189 and Route 58

City of Suffolk
EPDO Rate per MVMT = 4.84
6 crashes/5 injuries between 2002 and 2004

Observations:

- Segment is within the village of Holland and is suburban in nature, with many driveways.
- Segment has one lane in each direction with a two-way left-turn lane.
- Three of the crashes occurred on the ramp to Route 58.
- None of the crashes involved alcohol.

Primary Crash Types:

- Fixed object off road (50%)
- Non-collision (33%)

Primary Driver Actions:

- None with more than one crash of each type.

Possible Countermeasures:

- Consider adding warning signage and rumble strips on the ramp to Route 58.

#10 - **Route 31** between Sussex CL and Route 615 (Carsley Rd)

Surry County
EPDO Rate per MVMT = 4.45
7 crashes/3 injuries between 2002 and 2004

Observations:

- Although lanes are not narrow, there is no shoulder in many places. Other places only have 1' – 2' shoulders.
- Crashes occurred in varied locations throughout the segment.
- Crashes were split nearly evenly between daytime and nighttime hours.
- None of the crashes involved alcohol.

Primary Crash Types:

- Fixed object off road (57%)

Primary Driver Actions:

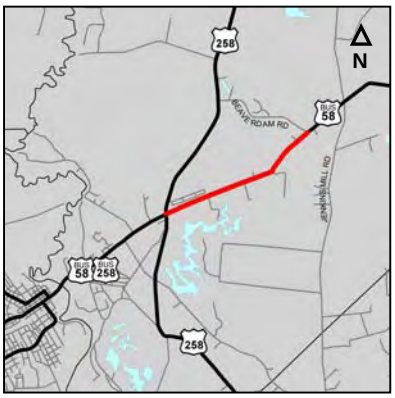
- Disregarded stop sign (29%)
- Driver distraction (29%)

Possible Countermeasures:

- Add shoulders and rumble strips.

#11 - **Business Route 58** between Route 258 and Route 630 (Beaverdam Rd)

Isle of Wight County
EPDO Rate per MVMT = 4.44
14 crashes and 15 injuries between 2002 and 2004



Observations:

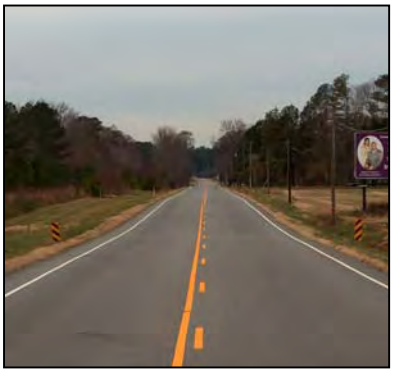
- Segment has 3' shoulders.
- There are a few driveways on the segment.
- Crashes occurred in varied locations throughout the segment.
- Most of the crashes occurred during daylight hours.
- One crash involved alcohol.

Primary Crash Types:

- Fixed object off road (29%)
- Deer/other animals (14%)
- Angle (14%)

Primary Driver Actions:

- Driver distraction (29%)
- None listed (29%)
- Did not have ROW (14%)

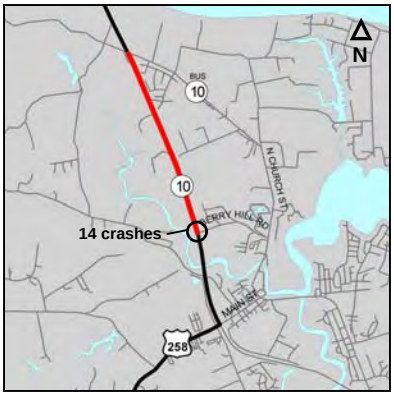


Possible Countermeasures:

- Consider adding rumble strips.
- Consider adding signage warning of animals crossing.

#12 - **Route 10** between Business Route 10 and Route 666 (Berry Hill Rd)

Isle of Wight County
EPDO Rate per MVMT = 4.38
22 crashes/10 injuries between 2002 and 2004



Observations:

- Roadway has 4' shoulders with no rumble strips.
- There is some distance between the roadway surface and trees and ditches.
- Many trucks use Route 10 and Berry Hill Road to access Smithfield plants. Two crashes involved trucks.
- 14 crashes occurred at the intersection of Rte 10 and Berry Hill Rd (some of these crashes were assigned to an adjacent segment).
- Two crashes involved alcohol.

Primary Crash Types:

- Fixed object off road (36%)
- Deer/other animals (32%)
- Rear end (14%)
- Angle (14%)

Primary Driver Actions:

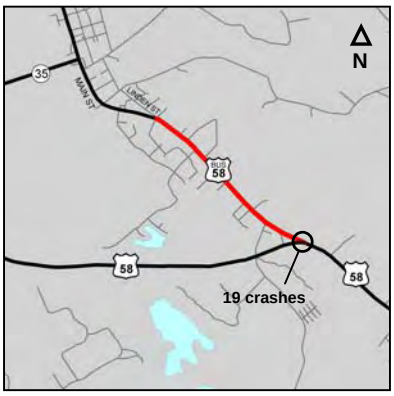
- None listed (32%)
- Driver distraction (18%)
- Exceeded speed limit/ safe speed (14%)

Possible Countermeasures:

- Consider adding rumble strips.
- Consider adding a traffic signal or roundabout at the intersection of Berry Hill Rd & Route 10.
- Consider adding signage warning of trucks entering.

#13 - **Business Route 58** between Linden St and Route 58

Southampton County
EPDO Rate per MVMT = 4.33
19 crashes/16 injuries between 2002 and 2004



Observations:

- The western portion of the segment is two lanes. The eastern portion is a four-lane divided roadway.
- Crashes occurred in varied locations throughout the segment.
- 19 crashes occurred at the intersection of Business Route 58 and Route 58 (most of these crashes were assigned to Route 58). This intersection has many warning signs indicating a dangerous intersection.
- Most of the crashes occurred during daylight hours.
- None of the crashes involved alcohol.

Primary Crash Types:

- Rear end (32%)
- Angle (26%)
- Fixed object off road (21%)

Primary Driver Actions:

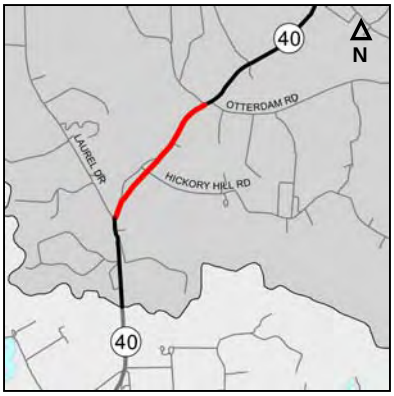
- Driver distraction (26%)
- Following too close (21%)
- Did not have ROW (21%)

Possible Countermeasures:

- Consider adding flashing lights over the intersection of Route 58 and Business Route 58 to better identify the intersection.
- Consider prohibiting left turns from Bus Route 58 to EB Route 58. Instead drivers could turn right and then U-turn to go eastbound.
- Consider realigning the intersection of Bus Rte 58 and Rte 58.

#14 - **Route 40** between Route 601 (Laurel Dr) and Route 612 (Otterdam Rd)

Surry County
EPDO Rate per MVMT = 4.30
4 crashes/8 injuries between 2002 and 2004



Observations:

- Narrow travel lanes.
- The shoulder is 1' – 2' wide in most places. In some places, there is a ditch close to the roadway surface.
- Trees are close to the roadway surface in many places.
- Seven of the eight total injuries occurred in one crash.
- None of the crashes involved alcohol.

Primary Crash Types:

- Deer/other animals (50%)

Primary Driver Actions:

- None with more than one crash of each type.

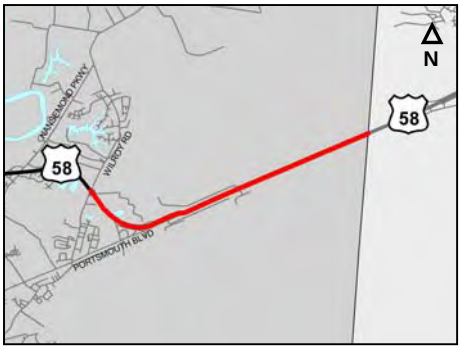
Possible Countermeasures:

- Consider adding signage warning of animals crossing.

Segments with a High Number of Fatalities

Route 58 between Wilroy Rd and Chesapeake CL

City of Suffolk
Segment = 5.76 miles
7 fatal crashes with 9 fatalities between 2000 – 2004



Observations:

- Heavily wooded area bordering the Great Dismal Swamp.
- Some sections have guardrails.
- Three of the fatal crashes involved alcohol.
- Two of the fatal crashes occurred during nighttime hours.
- Rumble strips are in place.

Primary Fatal Crash Types:

- Fixed object off road (71%)

Primary Driver Actions:

- None listed (57%)

Possible Countermeasures:

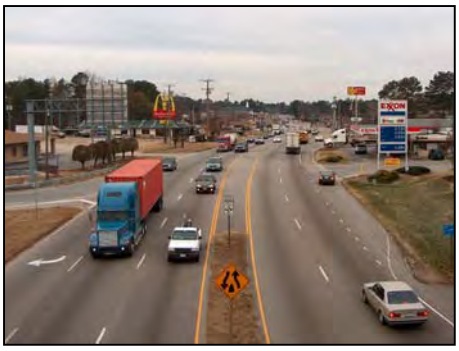
- Consider additional enforcement, including alcohol checkpoints.
- Install guardrail throughout the segment.

Route 58 between Bus Rte 58 East of Holland and Suffolk Bypass

City of Suffolk
Segment = 8.34 miles
9 fatal crashes with 9 fatalities between 2000 – 2004

Observations:

- Mostly four-lane divided highway, except for the eastern portion, which is a congested four-lane section with a two-way left turn lane.
- There is no inside shoulder, and there are no rumble strips.
- Fatal crashes occurred in varied locations throughout the segment.
- Four of the fatal crashes occurred during nighttime hours.
- One of the fatal crashes involved alcohol.



Primary Fatal Crash Types:

- Angle (33%)
- Fixed object off road (33%)

Primary Driver Actions:

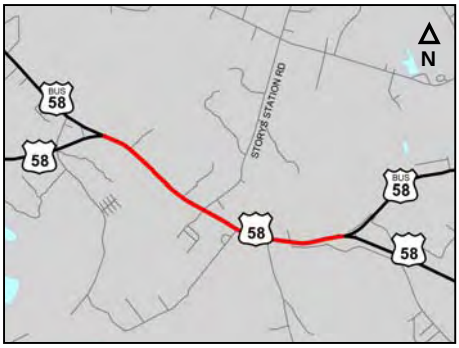
- Driver distraction (44%)

Possible Countermeasures:

- Consider adding rumble strips where possible.
- Consider improving hazardous intersections (i.e. eliminate obstructions, add lighting, prohibit certain turn movements, etc.)

Route 58 between Bus Rte 58 East of Courtland and Bus Rte 58 West of Franklin

Southampton County
Segment = 2.50 miles
5 fatal crashes with 5 fatalities between 2000 – 2004



Observations:

- Many driveways and access points for businesses.
- The right shoulder is 0' – 2' wide, and there is no left shoulder. There are no rumble strips.
- There are few right turn bays.
- One of the fatal crashes involved alcohol.

Primary Fatal Crash Types:

- No crash type with more than one occurrence.

Primary Driver Actions:

- Driver distraction (40%)

Possible Countermeasures:

- Consider adding a shoulder and rumble strips.
- Consider adding turn bays in hazardous locations.
- Consider improving the intersection of Bus Route 58 east of Courtland and Route 58, per Segment #13 on page 20.

APPENDIX A

General Crash Data

City of Franklin, Gloucester County, Southampton County, and Surry County

Hampton Roads Rural Safety Study
Raw Data 1999-2004

Population							
Jurisdiction	1999 Population	2000 Population	2001 Population	2002 Population	2003 Population	2004 Population	% change 1999-2004
Franklin	8,300	8,346	8,200	8,100	8,200	8,200	-1.2%
Gloucester	34,700	34,780	34,900	35,000	35,200	35,200	1.4%
Southampton	17,600	17,482	17,800	17,900	17,700	17,800	1.1%
Surry	6,800	6,829	6,800	6,800	6,800	6,800	0.0%
Hampton Roads	1,561,500	1,574,801	1,584,200	1,591,000	1,600,300	1,615,500	3.5%

July Estimates. Sources: Bureau of the Census, Weldon Cooper Center

Number of Licensed Drivers							
Jurisdiction	1999 # of licensed drivers	2000 # of licensed drivers	2001 # of licensed drivers	2002 # of licensed drivers	2003 # of licensed drivers	2004 # of licensed drivers	% change 1999-2004
Franklin	5,417	5,289	5,248	5,295	5,367	5,421	0.1%
Gloucester	25,756	26,005	26,098	26,749	27,276	27,691	7.5%
Southampton	11,969	11,861	11,765	11,835	11,980	12,075	0.9%
Surry	4,807	4,806	4,812	4,863	4,946	5,074	5.6%
Hampton Roads	997,468	1,002,643	1,006,433	1,023,995	1,039,634	1,053,065	5.6%

Source: Virginia Traffic Crash Facts

Daily Vehicle Miles Traveled (thousands)							
Jurisdiction	1999 VMT	2000 VMT	2001 VMT	2002 VMT	2003 VMT	2004 VMT	
Franklin	*	*	*	117.6	98.7	98.4	
Gloucester	*	*	*	998.0	1,007.0	1,018.9	
Southampton	*	*	*	950.9	1,070.8	1,079.0	
Surry	*	*	*	182.8	198.2	198.1	
Hampton Roads				37,872	39,947	39,727	

Source: VDOT. * - Data unavailable

Number of Crashes								
Jurisdiction	1999	2000	2001	2002	2003	2004	% change 1999-2004	2004 Crashes per MVMT
Franklin	117	107	110	74	75	47	-59.8%	1.31
Gloucester	533	490	466	494	505	475	-10.9%	1.28
Southampton	333	320	314	277	376	410	23.1%	1.04
Surry	117	113	111	107	115	117	0.0%	1.62
Hampton Roads	30,462	29,432	29,393	31,442	33,047	33,108	8.7%	2.28

Source: Virginia Traffic Crash Facts

Number of Fatalities								
Jurisdiction	1999	2000	2001	2002	2003	2004	% change 1999-2004	2002-2004 Fatalities per 100M VMT
Franklin	0	2	1	0	0	0	0.0%	0.00
Gloucester	2	3	9	5	4	3	50.0%	1.08
Southampton	8	8	7	3	4	8	0.0%	1.27
Surry	1	6	1	1	2	1	0.0%	1.84
Hampton Roads	130	132	153	136	129	131	0.8%	0.91

Source: Virginia Traffic Crash Facts

Number of Injuries								
Jurisdiction	1999	2000	2001	2002	2003	2004	% change 1999-2004	2004 Injuries per MVMT
Franklin	74	59	51	31	37	14	-81.1%	0.39
Gloucester	430	396	347	407	365	360	-16.3%	0.97
Southampton	266	284	260	219	262	263	-1.1%	0.67
Surry	84	68	69	60	59	66	-21.4%	0.91
Hampton Roads	19,011	17,860	17,563	17,785	18,065	17,815	-6.3%	1.23

Source: Virginia Traffic Crash Facts

Number of Alcohol Related Crashes								
Jurisdiction	1999	2000	2001	2002	2003	2004	% change 1999-2004	2004 Alcohol Crashes per MVMT
Franklin	5	8	7	3	7	2	-60.0%	0.06
Gloucester	51	45	51	56	52	57	11.8%	0.15
Southampton	47	43	33	32	41	35	-25.5%	0.09
Surry	16	16	14	13	18	11	-31.3%	0.15
Hampton Roads	2,410	2,214	2,302	2,502	2,392	2,584	7.2%	0.18

Source: Virginia Traffic Crash Facts

Number of Alcohol Related Fatalities								
Jurisdiction	1999	2000	2001	2002	2003	2004	% change 1999-2004	2002-2004 Alcohol Fatalities per 100M VMT
Franklin	0	2	0	0	0	0	0.0%	0.00
Gloucester	1	1	4	3	2	2	100.0%	0.63
Southampton	4	4	3	1	2	4	0.0%	0.59
Surry	1	3	0	0	0	0	-100.0%	0.00
Hampton Roads	54	47	63	62	66	54	0.0%	0.42

Source: Virginia Traffic Crash Facts

Number of Alcohol Related Injuries								
Jurisdiction	1999	2000	2001	2002	2003	2004	% change 1999-2004	2004 Alcohol Injuries per MVMT
Franklin	8	5	3	3	3	2	-75.0%	0.06
Gloucester	36	45	46	56	53	59	63.9%	0.16
Southampton	45	38	25	32	24	30	-33.3%	0.08
Surry	15	7	11	5	10	8	-46.7%	0.11
Hampton Roads	1,880	1,714	1,674	1,780	1,594	1,818	-3.3%	0.13

Source: Virginia Traffic Crash Facts

APPENDIX B

Crash Data by Roadway Segment

Crash Data by Roadway Segment, 2002-2004

Juris-diction	Route	Segment From	Segment To	Length (miles)	2003 ADT	Total Crashes '02-'04	Total Injuries '02-'04	Total Fatalities '02-'04	Total PDO Crashes '02-'04	Total INJ Crashes '02-'04	Total FAT Crashes '02-'04	3 YEAR EPDO	AVERAGE YEARLY EPDO	EPDO RATE PER MVMT
FR	Armory Dr	Route 58	College Dr	1.14	14,037	47	31	0	24	23	0	93	31.0	5.31
FR	Armory Dr/Second Ave	College Dr	High St	0.88	7,896	14	7	0	9	5	0	24	8.0	3.15
FR	Clay St	Southampton CL	College Dr/Hunterdale Rd	1.18	3,346	5	5	0	3	2	0	9	3.0	2.08
FR	Clay St	College Dr/Hunterdale Rd	High St	1.26	4,961	9	2	0	7	2	0	13	4.3	1.90
FR	College Dr	South St	Armory Dr	0.47	7,933	9	7	0	6	3	0	15	5.0	3.67
FR	College Dr	Armory Dr	Clay St	0.88	9,808	17	7	0	11	6	0	29	9.7	3.07
FR	Fourth Ave/Mechanic St	High St	Second Ave	0.36	4,374	13	2	0	11	2	0	17	5.7	9.86
FR	Hunterdale Rd	Clay St	North Dr	0.79	5,346	10	4	0	7	3	0	16	5.3	3.46
FR	Hunterdale Rd	North Dr	Southampton CL	0.96	5,657	7	5	0	4	3	0	13	4.3	2.19
FR	Second Ave	High St	Isle of Wight CL	0.46	11,449	12	5	0	9	3	0	18	6.0	3.12
FR	South St	Route 58	College Dr	0.28	5,033	4	1	0	3	1	0	6	2.0	3.89
FR	South St	College Dr	High St	1.12	8,873	21	9	0	12	9	0	39	13.0	3.58
FR	South St/Main St	High St	Second Ave	0.45	3,956	5	1	0	4	1	0	7	2.3	3.59
GLO	Route 3/14	Bus Route 17	Route 604 (Indian Rd)	1.18	17,110	22	21	0	10	12	0	46	15.3	2.08
GLO	Route 3/14	Route 604 (Indian Rd)	Route 623 (Ware Neck Rd)	1.00	17,110	9	8	0	4	5	0	19	6.3	1.01
GLO	Route 3/14	Route 623 (Ware Neck Rd)	Route 602 (Burkes Pond Rd)	3.59	12,621	23	17	0	12	11	0	45	15.0	0.91
GLO	Route 3/14	Route 602 (Burkes Pond Rd)	Mathews CL	0.48	12,621	3	1	0	2	1	0	5	1.7	0.75
GLO	Route 14	King & Queen CL	Route 17	1.04	4,114	1	1	0	0	1	0	3	1.0	0.64
GLO	Route 17	Coleman Bridge	Route 216	2.96	34,070	140	107	0	67	73	0	286	95.3	2.59
GLO	Route 17	Route 216	Route 636 (Providence Rd)	2.57	36,168	130	98	1	60	69	1	279	93.0	2.74
GLO	Route 17	Route 636 (Providence Rd)	Route 614 (Hickory Fork Rd)	2.36	32,922	78	83	0	30	48	0	174	58.0	2.05
GLO	Route 17	Route 614 (Hickory Fork Rd)	Route 615 (Short Ln)	3.06	29,232	85	68	1	38	46	1	188	62.7	1.92
GLO	Route 17	Route 615 (Short Ln)	Bus Route 17 South	1.06	29,232	57	46	0	26	31	0	119	39.7	3.51
GLO	Route 17	Bus Route 17 South	Bus Route 17 North/Route 14	1.68	17,672	30	29	0	11	19	0	68	22.7	2.09
GLO	Route 17	Bus Route 17 North/Route 14	Route 606 (Ark Rd)	2.45	14,808	40	28	1	21	18	1	87	29.0	2.19
GLO	Route 17	Route 606 (Ark Rd)	Route 613 (Ends Rd)	1.35	12,804	10	6	0	5	5	0	20	6.7	1.06
GLO	Route 17	Route 613 (Ends Rd)	Route 610 (Woods Cross Rd)	2.25	11,668	11	26	0	2	9	0	29	9.7	1.01
GLO	Route 17	Route 610 (Woods Cross Rd)	Route 14	1.78	11,668	9	11	0	4	5	0	19	6.3	0.84
GLO	Route 17	Route 14	Route 601 (Pampa Rd)	2.16	6,970	8	9	2	3	3	2	36	12.0	2.18
GLO	Route 17	Route 601 (Pampa Rd)	Routes 33/198	2.61	6,970	22	17	0	10	12	0	46	15.3	2.31
GLO	Route 17	Routes 33/198	Middlesex CL	1.55	12,463	12	8	0	7	5	0	22	7.3	1.04
GLO	Bus Route 17	Route 17	Route 3/14	1.20	21,754	52	26	0	35	17	0	86	28.7	3.01
GLO	Route 198	Route 17	Route 637 (Turks Ferry Rd)	2.83	2,043	16	15	0	7	9	0	34	11.3	5.37
GLO	Route 198	Route 637 (Turks Ferry Rd)	Route 601 (Pampa Rd)	1.62	2,043	2	3	0	0	2	0	6	2.0	1.66
GLO	Route 198	Route 601 (Pampa Rd)	Route 606 (Harcum Rd)	2.92	2,112	8	8	2	5	2	1	23	7.7	3.41
GLO	Route 198	Route 606 (Harcum Rd)	Route 602 (Burkes Pond Rd)	2.64	2,288	17	11	1	7	9	1	46	15.3	6.95
GLO	Route 198	Route 602 (Burkes Pond Rd)	Mathews CL	1.46	2,288	4	2	0	3	1	0	6	2.0	1.64
GLO	Route 33	King & Queen CL	Route 374	2.12	6,622	3	1	0	2	1	0	5	1.7	0.33
GLO	Route 33	Route 374	Route 17	0.80	6,622	1	1	0	0	1	0	3	1.0	0.52
IW	Route 10	Route 676 (Fort Huger Dr)	Route 621 (Burwells Bay Rd)	1.51	7,222	16	13	0	7	9	0	34	11.3	2.85
IW	Route 10	Route 621 (Burwells Bay Rd)	Bus Route 10	2.08	7,222	26	13	0	17	9	0	44	14.7	2.67
IW	Route 10	Bus Route 10	Route 666 (Berry Hill Rd)	1.25	6,665	22	10	0	13	9	0	40	13.3	4.38
IW	Route 10	Route 666 (Berry Hill Rd)	Route 258	2.49	10,159	15	12	0	8	7	0	29	9.7	1.05
IW	Bus Route 58/258	Franklin CL	Route 691 (Jamestown Ln)	0.33	11,449	5	1	0	4	1	0	7	2.3	1.69
IW	Bus Route 58/258	Route 691 (Jamestown Ln)	Route 258	1.19	8,508	9	5	0	6	3	0	15	5.0	1.35
IW	Bus Route 58	Route 258	Route 630 (Beaverdam Rd)	2.05	3,212	14	15	0	5	9	0	32	10.7	4.44
IW	Bus Route 58	Route 630 (Beaverdam Rd)	Route 641 (Colesse Rd)	1.81	3,212	6	3	0	4	2	0	10	3.3	1.57
IW/SUF	Bus Route 58	Route 641 (Colesse Rd)	Route 644 (Indian Trail)	2.02	2,891	9	7	0	5	4	0	17	5.7	2.66

Data source: VDOT.

PDO - Crashes with no fatalities or injuries, property damage only
INJ – Crashes with at least one injury but no fatalities
FAT – Crashes with at least one fatality

EPDO = Equivalent Property Damage Only Crashes
EPDO = PDO crashes + 3 x INJ crashes + 12 x FAT crashes

$$\text{EPDO Rate per MVMT} = \frac{1{,}000{,}000 \times \text{Average Yearly EPDO}}{\text{ADT} \times \text{Segment Length} \times 365}$$

Crash Data by Roadway Segment, 2002-2004

Juris-diction	Route	Segment From	Segment To	Length (miles)	2003 ADT	Total Crashes '02-'04	Total Injuries '02-'04	Total Fatalities '02-'04	Total PDO Crashes '02-'04	Total INJ Crashes '02-'04	Total FAT Crashes '02-'04	3 YEAR EPDO	AVERAGE YEARLY EPDO	EPDO RATE PER MVMT
IW/SUF	Route 258	Route 58	Route 656 (Union Camp Dr)	2.45	3,372	6	6	0	4	2	0	10	3.3	1.11
IW	Route 258	Route 656 (Union Camp Dr)	Business Route 58/258	1.31	4,000	0	0	0	0	0	0	0	0.0	0.00
IW	Route 258	Business Route 58/258	Route 630S (Beaverdam Rd)	1.58	4,138	6	1	0	5	1	0	8	2.7	1.12
IW	Route 258	Route 630S (Beaverdam Rd)	Route 611 (Joyners Bridge Rd)	2.08	4,138	4	7	0	0	4	0	12	4.0	1.27
IW	Route 258	Route 611 (Joyners Bridge Rd)	Route 619 (Burdette Rd)	1.88	4,138	13	10	0	7	6	0	25	8.3	2.93
IW	Route 258	Route 619 (Burdette Rd)	Route 641 (Colesse Rd)	2.38	4,138	6	3	0	3	3	0	12	4.0	1.11
IW	Route 258	Route 641 (Colesse Rd)	Route 609 (Sunset Dr)	2.27	4,862	6	12	1	1	4	1	25	8.3	2.07
IW	Route 258	Route 609 (Sunset Dr)	Route 460	2.60	4,862	23	18	0	9	14	0	51	17.0	3.68
IW	Route 258	Route 460	Route 610 (Court St)	0.84	4,898	8	4	0	4	4	0	16	5.3	3.55
IW	Route 258	Route 610 (Court St)	Route 606 (Five Forks Rd)	0.98	4,648	6	8	0	1	5	0	16	5.3	3.21
IW	Route 258	Route 606 (Five Forks Rd)	Route 644 (Fire Tower Rd)	4.28	4,648	33	15	0	21	12	0	57	19.0	2.62
IW	Route 258	Route 644 (Fire Tower Rd)	Route 637 (Orbit Rd)	1.64	4,648	9	7	0	5	4	0	17	5.7	2.04
IW	Route 258	Route 637 (Orbit Rd)	Route 652 (Bob White Rd)	1.78	5,171	11	5	0	6	5	0	21	7.0	2.08
IW	Route 258	Route 652 (Bob White Rd)	Route 620 (Scotts Factory Rd)	3.13	5,171	31	21	0	16	15	0	61	20.3	3.44
IW	Route 258	Route 620 (Scotts Factory Rd)	Route 10	1.80	9,911	36	27	0	19	17	0	70	23.3	3.58
IW	Route 460	Route 644 (Fire Tower Rd)	Route 645 (Yellow Hammer Rd)	1.18	11,754	8	9	0	2	6	0	20	6.7	1.32
IW	Route 460	Route 645 (Yellow Hammer Rd)	Route 606 (Cut Thru Rd)	2.40	11,754	18	13	0	11	7	0	32	10.7	1.04
IW	Route 460	Route 606 (Cut Thru Rd)	Route 258	2.06	11,754	29	13	0	20	9	0	47	15.7	1.77
IW	Route 460	Route 258	Route 610 (Court St)	0.46	13,097	15	4	0	12	3	0	21	7.0	3.18
IW	Route 460	Route 610 (Court St)	Route 636 (Old Suffolk Rd)	2.36	14,531	49	32	0	26	23	0	95	31.7	2.53
IW/SUF	Route 460	Route 636 (Old Suffolk Rd)	Route 632 (Old Myrtle Rd)	2.02	15,245	33	20	0	16	17	0	67	22.3	1.99
SH	Route 35	NC State Line	Route 186 (Beaton Ave)	2.63	1,870	2	0	0	2	0	0	2	0.7	0.37
SH	Route 35	Route 186 (Beaton Ave)	Route 671 (General Thomas Hwy)	0.90	4,214	5	4	0	3	2	0	9	3.0	2.17
SH	Route 35	Route 671 (General Thomas Hwy)	Route 665 (Cross Keys Rd)	2.07	1,442	5	5	0	1	4	0	13	4.3	3.98
SH	Route 35	Route 665 (Cross Keys Rd)	Route 673 (Grays Shop Rd)	3.15	1,442	5	2	0	4	1	0	7	2.3	1.41
SH	Route 35	Route 673 (Grays Shop Rd)	Route 658 (Barrow Rd)	3.03	1,951	4	3	0	1	3	0	10	3.3	1.54
SH	Route 35	Route 658 (Barrow Rd)	Route 58	1.35	1,951	4	1	0	3	1	0	6	2.0	2.08
SH	Route 35	Route 58	Bus Route 58	2.17	3,654	9	8	0	4	5	0	19	6.3	2.19
SH	Route 35	Bus Route 58	Route 616 (Ivor Rd)	0.69	5,978	5	4	0	2	3	0	11	3.7	2.44
SH	Route 35	Route 616 (Ivor Rd)	Route 628 (Wakefield Rd)	2.75	2,046	8	5	0	4	4	0	16	5.3	2.60
SH	Route 35	Route 628 (Wakefield Rd)	Route 653 (Cary's Bridge Rd)	3.43	2,046	11	13	0	4	7	0	25	8.3	3.25
SH	Route 35	Route 653 (Cary's Bridge Rd)	Route 607 (Farmers Bridges Rd)	3.09	2,368	5	1	0	4	1	0	7	2.3	0.87
SH	Route 35	Route 607 (Farmers Bridges Rd)	Sussex CL	0.85	2,368	1	0	0	1	0	0	1	0.3	0.45
SH	Route 58	Greensville CL	Route 711 (Green Plains Rd)	2.38	14,905	26	12	0	18	8	0	42	14.0	1.08
SH	Route 58	Route 711 (Green Plains Rd)	Route 615 (Adams Grove Rd)	3.06	14,905	4	1	0	3	1	0	6	2.0	0.12
SH	Route 58	Route 615 (Adams Grove Rd)	Route 695 (Old Belfield Rd)	2.27	14,384	21	21	0	9	12	0	45	15.0	1.26
SH	Route 58	Route 695 (Old Belfield Rd)	Route 659 (Drewry Rd)	2.45	14,384	15	20	2	5	9	1	44	14.7	1.14
SH	Route 58	Route 659 (Drewry Rd)	Route 308 (Three Creeks Rd)	2.68	14,869	18	21	0	6	12	0	42	14.0	0.96
SH	Route 58	Route 308 (Three Creeks Rd)	Route 653 (Pinopolis Rd)	3.01	14,869	25	15	0	14	11	0	47	15.7	0.96
SH	Route 58	Route 653 (Pinopolis Rd)	Route 609 (Popes Station Rd)	1.84	14,403	10	7	0	5	5	0	20	6.7	0.69
SH	Route 58	Route 609 (Popes Station Rd)	Route 656 (Bryants Church Rd)	1.65	14,403	10	9	0	5	5	0	20	6.7	0.77
SH	Route 58	Route 656 (Bryants Church Rd)	Route 35	2.22	14,403	11	9	0	6	5	0	21	7.0	0.60
SH	Route 58	Route 35	Bus Route 58 W	3.46	16,275	40	34	0	24	16	0	72	24.0	1.17
SH	Route 58	Bus Route 58 W	Route 650 (Storys Station Rd)	1.21	19,245	31	30	3	13	15	3	94	31.3	3.69
SH	Route 58	Route 650 (Storys Station Rd)	Bus Route 58 E	1.29	19,245	12	8	0	7	5	0	22	7.3	0.81
SH	Route 58	Bus Route 58 E	Route 671 (Armory Dr)	2.70	19,266	27	22	0	17	10	0	47	15.7	0.83
SH	Route 58	Route 671 (Armory Dr)	Route 258S	0.97	19,266	10	8	0	5	5	0	20	6.7	0.98
SH	Route 58	Route 258S	Route 714 (Pretlow Rd)	1.88	17,429	19	9	0	13	6	0	31	10.3	0.86
SH/SUF	Route 58	Route 714 (Pretlow Rd)	Route 189/258	2.13	17,340	19	12	0	12	7	0	33	11.0	0.82

Data source: VDOT.

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INJ – Crashes with at least one injury but no fatalities
FAT – Crashes with at least one fatality

EPDO = Equivalent Property Damage Only Crashes
EPDO = PDO crashes + 3 x INJ crashes + 12 x FAT crashes
EPDO Rate per MVMT = $\frac{1{,}000{,}000 \times \text{Average Yearly EPDO}}{\text{ADT} \times \text{Segment Length} \times 365}$

Crash Data by Roadway Segment, 2002-2004

Juris-diction	Route	Segment From	Segment To	Length (miles)	2003 ADT	Total Crashes '02-'04	Total Injuries '02-'04	Total Fatalities '02-'04	Total PDO Crashes '02-'04	Total INJ Crashes '02-'04	Total FAT Crashes '02-'04	3 YEAR EPDO	AVERAGE YEARLY EPDO	EPDO RATE PER MVMT
SH	Bus Route 58 W	Route 35	Linden St	0.90	6,269	2	2	0	1	1	0	4	1.3	0.65
SH	Bus Route 58 W	Linden St	Route 58	1.38	6,269	19	16	0	8	11	0	41	13.7	4.33
SH	Bus Route 58 E	Route 58	Route 687 (Delaware Rd)	1.88	3,270	9	5	0	6	3	0	15	5.0	2.23
SH	Bus Route 58 E	Route 687 (Delaware Rd)	Franklin CL	0.44	3,346	4	2	0	2	2	0	8	2.7	4.96
SH	Route 186	NC State Line	Route 701 (Joyner Rd)	3.25	1,206	7	10	0	3	4	0	15	5.0	3.49
SH	Route 186	Route 701 (Joyner Rd)	Route 35	2.96	2,424	7	4	0	3	4	0	15	5.0	1.91
SH	Route 189	Route 258	Route 714 (Pretlow Rd)	2.20	2,083	9	10	1	3	5	1	30	10.0	5.98
SH/SUF	Route 189	Route 714 (Pretlow Rd)	Route 666 (Gates Rd)	1.58	2,824	4	5	0	0	4	0	12	4.0	2.46
SH	Route 258	NC State Line	Route 687 (Delaware Rd)	2.95	4,146	16	13	0	7	9	0	34	11.3	2.54
SH	Route 258	Route 687 (Delaware Rd)	Route 189 (S Quay Rd)	2.33	4,146	20	15	0	11	9	0	38	12.7	3.59
SH	Route 258	Route 189 (S Quay Rd)	Route 688 (Sycamore Church Rd)	2.52	3,525	15	15	0	7	8	0	31	10.3	3.19
SH	Route 258	Route 688 (Sycamore Church Rd)	Route 58	1.19	4,190	6	4	0	3	3	0	12	4.0	2.20
SH	Route 308	Route 58	Route 652 (Old Belfield Rd)	1.33	545	2	0	0	2	0	0	2	0.7	2.52
SH	Route 308	Route 652 (Old Belfield Rd)	Route 612 (Mill Rd)	2.32	545	0	0	0	0	0	0	0	0.0	0.00
SH	Route 460	Sussex CL	Route 618 (Sadler Rd)	2.14	10,797	9	2	1	6	2	1	24	8.0	0.95
SH	Route 460	Route 618 (Sadler Rd)	Route 616 (Ivor Rd)	2.14	10,797	18	21	1	6	11	1	51	17.0	2.02
SH	Route 460	Route 616 (Ivor Rd)	Route 635 (Tucker Swamp Rd)	2.42	10,470	12	6	0	7	5	0	22	7.3	0.79
SH/IW	Route 460	Route 635 (Tucker Swamp Rd)	Route 644 (Fire Tower Rd)	2.38	10,470	21	10	1	14	6	1	44	14.7	1.61
SH	Route 641	Franklin CL	Route 611 (Storys Station Rd)	1.82	2,947	5	3	0	3	2	0	9	3.0	1.53
SH	Route 641	Route 611 (Storys Station Rd)	Route 646 (Gov Darden Rd)	2.16	1,911	6	4	0	4	2	0	10	3.3	2.21
SH	Route 671	Route 35	Route 665 (Cross Keys Rd)	2.02	2,744	10	6	0	6	4	0	18	6.0	2.97
SH	Route 671	Route 665 (Cross Keys Rd)	Route 673 (Grays Shop Rd)	2.66	2,683	3	5	0	2	1	0	5	1.7	0.64
SH	Route 671	Route 673 (Grays Shop Rd)	Route 674 (Cypress Bridge Rd)	2.72	2,675	6	5	0	3	3	0	12	4.0	1.51
SH	Route 671	Route 674 (Cypress Bridge Rd)	Route 680 (Sunbeam Rd)	1.71	3,583	7	5	0	3	4	0	15	5.0	2.24
SH	Route 671	Route 680 (Sunbeam Rd)	Route 650 (Shady Brook Rd)	2.99	3,738	15	11	1	7	7	1	40	13.3	3.27
SH	Route 671	Route 650 (Shady Brook Rd)	Route 687 (Delaware Rd)	0.85	4,728	6	9	0	1	5	0	16	5.3	3.64
SH	Route 671	Route 687 (Delaware Rd)	Route 688 (Rose Valley Rd)	0.77	5,162	8	9	0	4	4	0	16	5.3	3.68
SH	Route 671	Route 688 (Rose Valley Rd)	Route 58	0.86	5,170	8	1	0	7	1	0	10	3.3	2.05
SUF	Route 58	Route 189/258	Route 272 (S Quay Rd)	1.26	17,513	10	10	0	4	6	0	22	7.3	0.91
SUF	Route 58	Route 272 (S Quay Rd)	Route 613N (Elwood Rd)	2.38	18,297	36	32	0	20	16	0	68	22.7	1.43
SUF	Route 58	Route 613N (Elwood Rd)	Route 189	1.79	18,297	26	21	0	10	16	0	58	19.3	1.62
SUF	Route 58	Route 189	Bus Route 58	1.11	18,741	7	7	0	1	6	0	19	6.3	0.83
SUF	Route 58	Bus Route 58	Route 610 (Pioneer Rd)	1.32	21,893	57	30	1	32	24	1	116	38.7	3.67
SUF	Route 58	Route 610 (Pioneer Rd)	Route 649 (Lummis Rd)	2.77	21,959	64	60	1	26	37	1	149	49.7	2.24
SUF	Route 58	Route 649 (Lummis Rd)	Route 643 (Manning Bridge Rd)	2.05	23,354	54	35	0	26	28	0	110	36.7	2.10
SUF	Route 58	Route 643 (Manning Bridge Rd)	Route 738 (Kenyon Rd)	0.67	23,814	24	15	0	16	8	0	40	13.3	2.29
SUF	Route 58	Route 738 (Kenyon Rd)	Route 645 (Manning Rd)	1.13	28,450	61	35	0	38	23	0	107	35.7	3.04
SUF	Route 58	Route 645 (Manning Rd)	Holland Rd	0.40	29,314	81	50	0	51	30	0	141	47.0	10.98
SUF	Route 58	Holland Rd	Pitchkettle Rd	1.41	28,460	45	44	0	26	19	0	83	27.7	1.89
SUF	Route 58	Pitchkettle Rd	Route 460 (Pruden Blvd)	1.88	30,195	36	19	0	22	14	0	64	21.3	1.03
SUF	Route 58	Route 460 (Pruden Blvd)	Route 10/32 (Godwin Blvd)	0.93	38,145	20	6	0	15	5	0	30	10.0	0.77
SUF	Route 58	Route 10/32 (Godwin Blvd)	Wilroy Rd	1.87	45,605	50	25	0	29	21	0	92	30.7	0.99
SUF	Route 58	Wilroy Rd	Portsmouth Blvd	2.30	36,884	42	27	1	20	21	1	95	31.7	1.02
SUF	Route 58	Portsmouth Blvd	Chesapeake CL	3.46	54,579	142	102	6	68	70	4	326	108.7	1.58
SUF	Bus Route 58	Route 644 (Indian Trail)	Route 189	1.88	2,891	11	3	0	8	3	0	17	5.7	2.86
SUF	Bus Route 58	Route 189	Route 58	0.72	3,668	6	5	0	2	4	0	14	4.7	4.84
SUF	Route 189	Route 666 (Gates Rd)	Route 272	0.72	4,159	0	0	0	0	0	0	0	0.0	0.00
SUF	Route 189	Route 272	Route 58	0.83	4,159	0	0	0	0	0	0	0	0.0	0.00

Data source: VDOT.

PDO - Crashes with no fatalities or injuries, property damage only
INJ – Crashes with at least one injury but no fatalities
FAT – Crashes with at least one fatality

EPDO = Equivalent Property Damage Only Crashes
EPDO = PDO crashes + 3 x INJ crashes + 12 x FAT crashes
EPDO Rate per MVMT = $\frac{1{,}000{,}000 \times \text{Average Yearly EPDO}}{\text{ADT} \times \text{Segment Length} \times 365}$

Crash Data by Roadway Segment, 2002-2004

Juris-diction	Route	Segment From	Segment To	Length (miles)	2003 ADT	Total Crashes '02-'04	Total Injuries '02-'04	Total Fatalities '02-'04	Total PDO Crashes '02-'04	Total INJ Crashes '02-'04	Total FAT Crashes '02-'04	3 YEAR EPDO	AVERAGE YEARLY EPDO	EPDO RATE PER MVMT
SUF	Route 272	Route 189	Route 58	1.24	1,406	3	3	0	1	2	0	7	2.3	3.67
SUF	Route 460	Route 632 (Old Myrtle Rd)	Route 604 (Lake Prince Dr)	2.02	15,245	43	30	1	25	17	1	88	29.3	2.61
SUF	Route 460	Route 604 (Lake Prince Dr)	Route 58	2.05	15,245	58	39	0	31	27	0	112	37.3	3.27
SUR	Route 10	Prince Georges CL	Route 613 (Cabin Point Rd)	1.46	1,616	3	2	0	1	2	0	7	2.3	2.71
SUR	Route 10	Route 613 (Cabin Point Rd)	Route 40	3.99	1,616	10	3	0	7	3	0	16	5.3	2.27
SUR	Route 10	Route 40	Route 618 (Hollybush Rd)	5.36	2,068	13	4	0	9	4	0	21	7.0	1.73
SUR	Route 10	Route 618 (Hollybush Rd)	Route 31 S	2.54	2,608	12	3	0	9	3	0	18	6.0	2.48
SUR	Route 10/31	Route 10/31 S	Route 10/31 N	1.04	4,708	2	3	0	0	2	0	6	2.0	1.12
SUR	Route 10	Route 31 N	Route 634 (Alliance Rd)	1.77	5,143	17	11	0	7	10	0	37	12.3	3.71
SUR	Route 10	Route 634 (Alliance Rd)	Route 616 (Golden Hill Rd)	2.25	5,143	7	2	0	5	2	0	11	3.7	0.87
SUR	Route 10	Route 616 (Golden Hill Rd)	Route 617 (White Marsh Rd)	2.72	5,143	24	14	1	12	11	1	57	19.0	3.72
SUR	Route 10	Route 617 (White Marsh Rd)	Route 650 (Hog Island Rd)	0.99	3,689	9	6	0	6	3	0	15	5.0	3.75
SUR/IW	Route 10	Route 650 (Hog Island Rd)	Route 676 (Fort Huger Dr)	2.68	3,689	15	11	0	6	9	0	33	11.0	3.05
SUR	Route 31	Sussex CL	Route 615 (Carsley Rd)	1.51	1,768	7	3	0	4	3	0	13	4.3	4.45
SUR	Route 31	Route 615 (Carsley Rd)	Route 630 (Spratley Mill Rd)	1.97	1,768	3	2	0	1	2	0	7	2.3	1.84
SUR	Route 31	Route 630 (Spratley Mill Rd)	Route 618 (Hollybush Rd)	1.15	1,716	0	0	0	0	0	0	0	0.0	0.00
SUR	Route 31	Route 618 (Hollybush Rd)	Route 616 (New Design Rd)	1.69	1,716	5	3	0	3	2	0	9	3.0	2.83
SUR	Route 31	Route 616 (New Design Rd)	Route 622 (Runnymede Rd)	2.79	1,716	8	6	0	2	6	0	20	6.7	3.81
SUR	Route 31	Route 622 (Runnymede Rd)	Route 10 S	1.65	1,716	5	6	0	2	3	0	11	3.7	3.55
SUR	Route 31	Route 10 N	Route 637/Ferry	4.28	2,327	7	2	0	5	2	0	11	3.7	1.01
SUR	Route 40	Sussex CL	Route 601 (Laurel Dr)	0.85	1,213	1	1	0	0	1	0	3	1.0	2.66
SUR	Route 40	Route 601 (Laurel Dr)	Route 612 (Otterdam Rd)	1.40	1,213	4	8	0	2	2	0	8	2.7	4.30
SUR	Route 40	Route 612 (Otterdam Rd)	Route 615 (Carsley Rd)	1.83	1,213	2	1	0	1	1	0	4	1.3	1.65
SUR	Route 40	Route 615 (Carsley Rd)	Route 611 (Salisbury Rd)	1.90	1,213	7	4	0	3	4	0	15	5.0	5.94
SUR	Route 40	Route 611 (Salisbury Rd)	Route 10	3.03	1,089	5	4	0	3	2	0	9	3.0	2.49
SUR	Route 650 (Hog Island Rd)	Route 10	Surry Nuclear Plant	5.40	2,341	8	6	1	5	2	1	23	7.7	1.66

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