

Crash Analysis Procedure and Safety Review for Maintenance Projects

Assessment of maintenance projects along on a segment of roadway should consider the safety of the environment (roadway type and conditions, terrain/alignment, adjacent land-use, weather), driver and vehicles (types/mix, volumes, speeds). To review these safety characteristics, the crash data should be compiled and assessed to determine the related issues and then a field safety review should be conducted to determine the appropriate and feasible improvements that should be made to mitigate existing maintenance-related concerns. This process is known as conducting and documenting a Roadway Safety Assessment (RSA). TED Safety has prepared guidelines and procedures to be followed for conducting RSAs for multiple uses, including maintenance projects.

The basic steps in conducting an RSA to support the decision making on maintenance projects are:

1. Conduct detailed crash analysis of the subject highway segment
2. Develop a list of the top trends and high severe crash locations for investigation
3. Conduct RSA field review with attention to high severe crash clusters and systematic crash type trends. Ask for local enforcement and/or maintenance personnel input and perspective on identified trends and severe crash locations. Document observations and proposed treatments.
4. Classify the RSA recommended countermeasures as short-term maintenance fixes to be included in the resurfacing contract, mid-term fixes through an application to the HSIP program or long-term SYP construction improvements
5. Identify and implement critical safety improvements with maintenance forces and/or 3R project.

Before conducting the safety study, the study area needs to be defined. With the maintenance project, say after an intersection or interchange, the study areas should incorporate the upstream major feature (length) that could be impacted by the maintenance project and some distance downstream to allow for a transition from the maintenance project. In most cases, an additional length of about 0.25-0.5 miles on both ends of the maintenance project will cover changes in the roadway characteristics that should be considered. For the safety analysis the study area will be called the roadway segment. A roadway segment may be divided into sections.

The crash data analysis supporting an RSA should follow a funnel approach. Figure 1 shows the six steps that should be considered for the crash data elements, as follows:

- **STEP 1** First, the segment of roadway is compared to overall crash record with particular attention to severe crash density and rates.
- **STEP 2** For longer segments, the corridor should be divided into sections of similar configuration and environments (e.g., cross-section, terrain, adjacent land-use/driveway density) to determine subsection requiring further assessment and more detailed field review. Statewide crash statistics have been compiled for all Interstates and Primary system roads to provide aggregate comparisons based on the functional class and configuration (cross-section) of the roadway. Multiple years of data from the VDOT Annual Summary of Crash Data Reports have been entered into Excel sheets to use for the initial comparisons.

<Link to team site>

- **STEP 3** There should be an assessment of the overall trends and influence of the roadway, weather/pavement, lighting and perhaps driver behavior. Step three should summarize the following types of crash cause related data for the entire segment or by section as determined to be pertinent based on knowledge of the area :
 - Collision Type
 - Surface and Light Conditions
 This analysis will be somewhat trial and error refinement of the most important causal factors.
- **STEP 4** Based on the issues identified, a detailed assessment of crash types and severity should be developed for each 0.25 mile in the corridor.
- **STEP 5** Define trends and high severe crash locations for further RSA investigation .

Figure 2 further defines the process of comparing the segment and/or section crash or injury density to

similar roadways in Steps 4 and 5 for each 0.25 mile (sub-section). Step 4 involves creating histograms or tables of the total crashes, deaths plus injuries, and collision types (summing to total crashes) in each 0.25 mile (sub-section) of the study segment from CAT summary tables. Using the average crash or injury density of the comparison route or routes (local, regional or statewide crash data), the 90 to 95 percent confidence limits (CL) can be determined using the Poisson distribution¹ in Step 5. Crash densities above the CL are considered to be statistically above average and are thus critical locations to investigate. Review of the predominant collision types (STEP 3) plotted by 0.25 mile section around the critical sections above the CL thresholds may review additional length and details to be considered with the RSA field review. The collision types (total crashes) by 0.25 mile should be reviewed around the identified high injury locations to determine if the same issues may be adjoining that should be addressed. When no 0.25 mile severe crash density sub-sections are identified for further review, then the collision type, driver and environment factors summarized in step three should be used to determine any systematic safety concerns and potential countermeasures.

¹ For approximate values, two times the comparison (statewide or region) average gives the 95 percent confidence limits that the spot is statistically above average.

Example: I-85 Crash Data Summaries

I-85 was determined to have crash rates and frequencies less than the southeastern districts when assessed for the Highway Safety Corridor program. This finding was primarily due to the much higher urban area crash statistics in Richmond and Hampton Roads. However, as shown in Table 1 attached, the I-85 crash rate is slightly above average compared to all other rural interstates and has an above average injury rate per vehicle miles and a death rate almost twice the rural average. On a density per mile basis I-85 is slightly below average for all crashes and for severe crashes. However, Table 2 attached shows that, although severe crash densities are below rural averages, the severe crashes are occurring primarily in Dinwiddie and Brunswick Counties. Further, the severity is higher in the southbound direction in those two counties. For severe crash rates, specific counties and directions have above average rate compared to the statewide rural trend. As such, this corridor should be investigated in more detail to determine what trends or location specific safety issues are causing the higher crash severity.

Crash summaries were compiled for I-85 for the five year period between 2001 and 2005. First, the crashes were summarized by collision type (Table 3) which revealed that almost 70 percent of the crashes resulted in striking a fixed object off the road or non-collisions. Over 100 crashes (6.6%) with animals (mostly deer) were recorded. A summary of the fixed objects struck is provided in Table 4. Nearly 50 percent of the fixed objects are guardrails and over 1 in 4 of those crashes are severe. Trees are hit in about 15 percent of the roadway departures, but about 55 percent of those crashes result in injuries.

Most crashes, then, are single vehicle lane departures. Table 5 shows that about 1 in 5 single vehicle crashes (1 in 4 in Brunswick) are related to driver fatigue. Tables 6 to 8 report the driver actions for single and two vehicle crashes in the three counties under study. From 20 to 40 percent of the single vehicle crashes were recorded to be predominately related to speed (exceed posted or safe speed) by the law officer in each of the three counties. A time of day analysis was not conducted, but the combination of driver fatigue and speed are a dangerous mix on I-85. Further analysis to identify high crash severity locations should benefit a safety assessment of the corridor to determine if improvements are prudent and feasible for raising the speed limit.

Figures 1 to 4 show the northbound and southbound I-85 total and injury crash densities in Dinwiddie county and the corresponding collision types of those crashes in each 0.25 mile section. To determine the severe crash locations for further safety review, the critical density was set based on the directional averages for I-85 itself. Overall the injury and death density on I-85 is just below the statewide rural average, but directionally southbound is experiencing more severe crashes. As such, the directional bias was somewhat accounted for in setting the critical density sections to review.

I-85 Crash Analysis Findings and Recommendations

Assessment of the crashes occurring on I-85 in the study area reveals that 70 percent of the crashes are roadway departure and 21 percent of the single vehicle crash drivers are falling asleep. In addition, 7 percent of the crashes were deer or animal related. Finally, we have identified specific mileposts where there is a high incidence of severe crashes compared to the directional I-85 averages. These should be compared the collision types at the same locations to help identify if specific countermeasures are needed and feasible.

The overall countermeasure strategy should be a system-wide approach that attempts to keep the driver on the roadway and minimizes the consequences if they depart. We have the following recommendations after a thorough review of the crash data:

1. Document the present deployment of rumble strips on I-85. Install rumble strips where none exist. **(Short Term Maintenance Fix)**

2. Check all guardrails and end treatments for Report 350 compliance and upgrade deficiencies. **(Short Term Maintenance Fix)**
3. Check the clear zone throughout the corridor and identify areas where the 70MPH clear zone criteria are not met. Create clear zones where necessary to comply with current standards. **(Short Term Maintenance Fix)**
4. Look at deer crossing and deer crash concentrations and check limited access fencing for repairs. **(Short Term Maintenance Fix)**
5. Utilize 6" pavement markings and RPMs per current standards. **(Short Term Maintenance Fix)**
6. Lengthen entrance and exit ramps to current standards **(Medium HSIP and / or Long Term SYP Fix)**

Items 1 through 5 should be completed with maintenance projects. Additional countermeasures may be identified through the RSA review of the high severe crash locations. One element that may require attention is the surface condition. Each year the materials engineers run a HTRIS "wet-surface" crash analysis. The past several years of this information should be reviewed to determine if pavement condition may be contributing to the roadway departure and interchange rear-end crash clusters.

Figure 1 Crash Data Analysis Steps to Support RSA Investigations

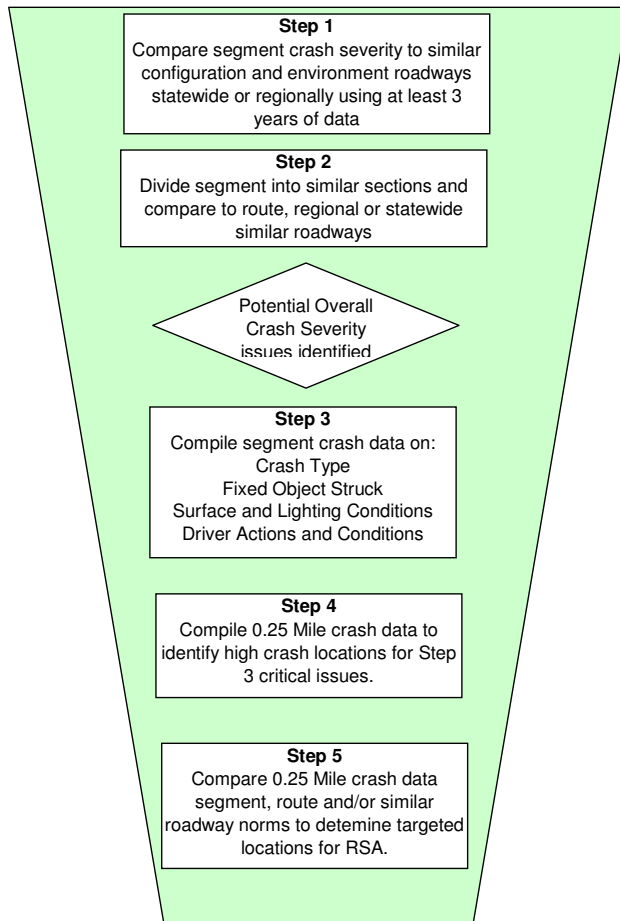


Figure 2 Detailed Crash Data Comparisons

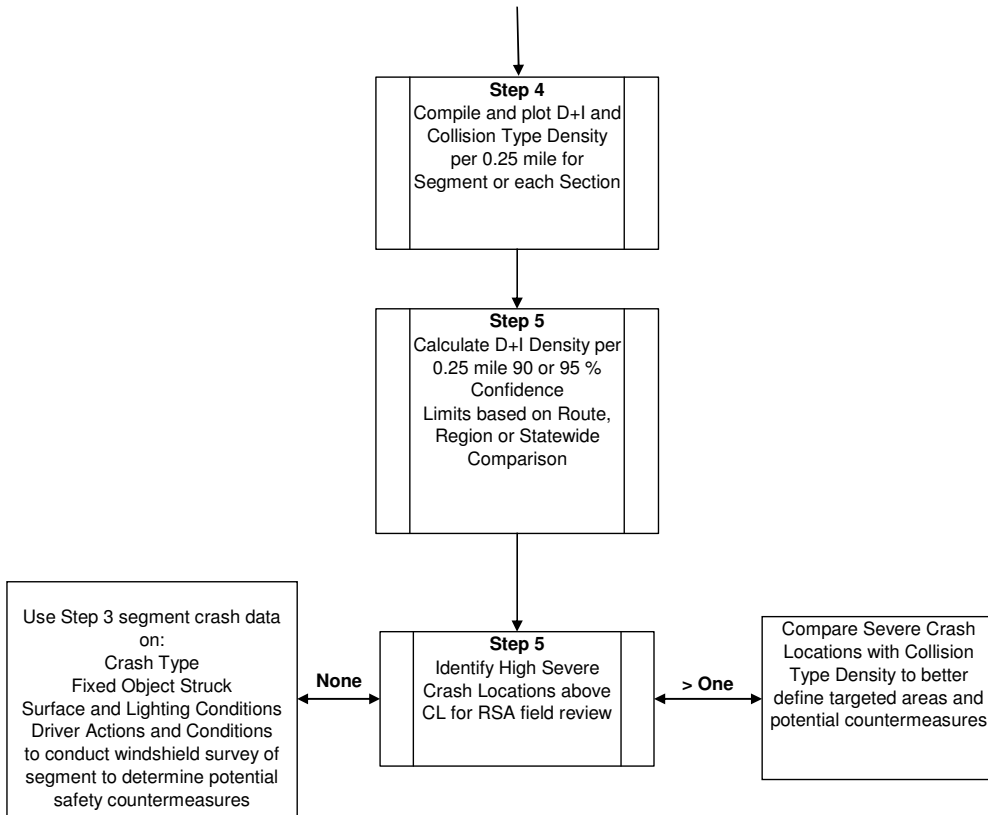


Table 1 I-85 Crash Data and Comparison to Statewide Rural and Two Directional Lane Interstate Averages

Route ID	Dir	Dir_Lanes	Jurisdiction	Func_Class	Year	Length	DVMT	Fatal Crashes	Persons Killed	Pedestrian s Killed	Injury Crashes	Persons Injured	Pedestrian PD Injured	Total Crashes	Crash Rate	Injury Rate	Death Rate	Crash/ mi/yr	F+I Crashes/ mi/yr	F+I Pers /mi/yr	F+I (pers) Rate	
IS-85	N		All	All	2000	68.55												0.00	0.00	0.00	NA	
IS-85	N		All	All	2001	68.55												0.00	0.00	0.00	NA	
IS-85	N		All	All	2002	68.55	847,144	2	2	0	65	112	0	98	165	53	36	0.65	2.41	0.98	1.66	36.9
IS-85	N		All	All	2003	68.55	871,783	3	3	0	78	124	1	110	191	60	39	0.94	2.79	1.18	1.85	39.9
IS-85	N		All	All	2004	68.55	885,095	4	4	0	57	80	0	118	179	55	25	1.24	2.61	0.89	1.23	26.0
IS-85	N		All	All	2005	68.55												0.00	0.00	0.00	NA	
IS-85	N		All	All	Total	68.55	2,604,022	9	9	-	200	316	1	326	535	56	33	0.95	2.60	1.02	1.58	34.2
IS-85	S		All	All	2000	68.55												0.00	0.00	0.00	NA	
IS-85	S		All	All	2001	68.55												0.00	0.00	0.00	NA	
IS-85	S		All	All	2002	68.55	847,144	5	5	0	53	116	0	101	159	51	38	1.62	2.32	0.85	1.77	39.1
IS-85	S		All	All	2003	68.55	871,783	1	1	0	72	120	0	121	194	61	38	0.31	2.83	1.06	1.77	38.0
IS-85	S		All	All	2004	68.55	885,095	7	8	0	88	156	0	112	207	64	48	2.48	3.02	1.39	2.39	50.8
IS-85	S		All	All	2005	68.55												0.00	0.00	0.00	NA	
IS-85	S		All	All	Total	68.55	2,604,022	13	14	-	213	392	-	334	560	59	41	1.47	2.72	1.10	1.97	42.7
IS-85	Total		All	All	2000	68.55	-	-	-	-	-	-	-	-	-	0	0	0.00	0.00	0.00	NA	
IS-85	Total		All	All	2001	68.55	-	-	-	-	-	-	-	-	-	0	0	0.00	0.00	0.00	NA	
IS-85	Total		All	All	2002	68.55	1,694,288	7	7	-	118	228	-	199	324	52	37	1.13	4.73	1.82	3.43	38.0
IS-85	Total		All	All	2003	68.55	1,743,566	4	4	-	150	244	1	231	385	60	38	0.63	5.62	2.25	3.62	39.0
IS-85	Total		All	All	2004	68.55	1,770,190	11	12	-	145	236	-	230	386	60	37	1.86	5.63	2.28	3.62	38.4
IS-85	Total		All	All	2005	68.55	-	-	-	-	-	-	-	-	-	0	0	0.00	0.00	0.00	NA	
IS-85	Total		All	All	Total	68.55	5,208,044	22	23	-	413	708	1	660	1,095	58	37	1.21	5.32	2.12	3.55	38.5
IS	All		All	Rural	Total	697.865	1541436	332	373	24	10118	15750	53	18918	29368	52.20	27.99	0.66	7.03	2.50	3.85	28.66
IS	All	2	All	All	Total	794.0633	88860	384	427	0	13764	20834	0	25841	39998	123.32	64.24	1.32	8.40	2.97	5.02	65.55

Table 2 I-85 Crash Data by County

Route ID	Dir	Dir_lanes	Jurisdiction	Func_Class	Year	Length	DMVT	Fatal Crashes	Persons Killed	Pedestrians Killed	Injury Crashes	Persons Injured	Pedestrian Injured	PD Crashes	Total Crashes	Crash Rate	Injury Rate	Death Rate	Crash/ mi/yr	F+I Crashes/ mi/yr	F+I Pers /mi/yr	F+I (pers) Rate	EPDO/ Mile/Yr
Interstate Route Statistics																							
IS-85	N		Dinwiddie	All	2000														NA	NA	NA	NA	NA
IS-85	N		Dinwiddie	All	2001														NA	NA	NA	NA	NA
IS-85	N		Dinwiddie	All	2002														NA	NA	NA	NA	NA
IS-85	N		Dinwiddie	All	2003	21.58	260,547	1	1	0	19	31	0	24	44	46	32	1.05	2.04	0.93	1.48	33.6	241470.8
IS-85	N		Dinwiddie	All	2004	21.58	262,806	0	0	0	13	19	0	36	49	51	19	0	2.27	0.60	0.88	19.8	243564.4
IS-85	N		Dinwiddie	All	2005	21.58	264,139	0	0	0	23	35	0	41	64	66	36	0	2.97	1.07	1.62	36.3	244799.8
IS-85	N		Dinwiddie	All	Total	21.58	787,492	1	1	-	55	85	-	101	157	55	30	0.35	2.43	0.86	1.33	29.9	243,278.3
IS-85	S		Dinwiddie	All	2000														NA	NA	NA	NA	NA
IS-85	S		Dinwiddie	All	2001														NA	NA	NA	NA	NA
IS-85	S		Dinwiddie	All	2002														NA	NA	NA	NA	NA
IS-85	S		Dinwiddie	All	2003	22.04	270,410	1	1	0	17	43	0	32	50	50	43	1.01	2.27	0.82	2.00	44.6	245381.1
IS-85	S		Dinwiddie	All	2004	22.04	269,168	3	4	0	22	50	0	31	56	57	50	4.07	2.54	1.13	2.45	55.0	244254.1
IS-85	S		Dinwiddie	All	2005	22.04	269,168	3	4	0	22	50	0	31	56	57	50	5.0	2.54	1.13	2.45	55.0	244254.1
IS-85	S		Dinwiddie	All	Total	22.04	808,746	7	9	-	61	143	-	94	162	55	48	3.05	2.45	1.03	2.30	51.5	244,629.8
IS-85	Total		Dinwiddie	All	2000	#DIV/0!	-	-	-	-	-	-	-	-	-	0	0	0.00	#DIV/0!	#DIV/0!	#DIV/0!	NA	#DIV/0!
IS-85	Total		Dinwiddie	All	2001	#DIV/0!	-	-	-	-	-	-	-	-	-	0	0	0.00	#DIV/0!	#DIV/0!	#DIV/0!	NA	#DIV/0!
IS-85	Total		Dinwiddie	All	2002	#DIV/0!	-	-	-	-	-	-	-	-	-	0	0	0.00	#DIV/0!	#DIV/0!	#DIV/0!	NA	#DIV/0!
IS-85	Total		Dinwiddie	All	2003	21.81	530,957	2	2	-	36	74	-	56	94	49	36	1.03	4.31	1.74	3.48	39.2	496893.2
IS-85	Total		Dinwiddie	All	2004	21.81	531,974	3	4	-	35	69	-	67	105	54	36	2.06	4.81	1.74	3.35	37.6	487825.8
IS-85	Total		Dinwiddie	All	2005	21.81	533,307	3	4	-	45	85	-	72	120	62	44	2.05	5.50	2.20	4.08	45.7	498048.1
IS-85	Total		Dinwiddie	All	Total	21.81	1,596,238	8	10	-	116	228	-	195	319	55	39	1.72	4.88	1.90	3.64	40.8	487,922.4
IS-85	N		Brunswick	All	2000														NA	NA	NA	NA	NA
IS-85	N		Brunswick	All	2001														NA	NA	NA	NA	NA
IS-85	N		Brunswick	All	2002														NA	NA	NA	NA	NA
IS-85	N		Brunswick	All	2003	20.77	232,649	0	0	0	15	25	0	37	52	61	29	0	2.50	0.72	1.20	29.4	224024.1
IS-85	N		Brunswick	All	2004	20.77	224,394	3	3	0	12	18	0	23	38	46	21	3.66	1.83	0.72	1.01	25.6	216075.1
IS-85	N		Brunswick	All	2005	20.77	228,193	0	0	0	10	14	0	21	31	37	16	0	1.49	0.48	0.67	16.8	219733.3
IS-85	N		Brunswick	All	Total	20.77	685,236	3	3	-	37	57	-	81	121	48	23	1.20	1.94	0.64	0.96	24.0	219,944.2
IS-85	S		Brunswick	All	2000														NA	NA	NA	NA	NA
IS-85	S		Brunswick	All	2001														NA	NA	NA	NA	NA
IS-85	S		Brunswick	All	2002														NA	NA	NA	NA	NA
IS-85	S		Brunswick	All	2003	20.77	232,649	0	0	0	25	53	0	26	51	60	62	0	2.46	1.20	2.55	62.4	224024.1
IS-85	S		Brunswick	All	2004	20.77	224,394	3	3	0	29	54	0	26	58	70	65	3.66	2.79	1.54	2.74	69.6	216075.1
IS-85	S		Brunswick	All	2005	20.77	228,193	2	2	0	16	30	0	34	52	62	36	2.4	2.50	0.87	1.54	38.4	219733.3
IS-85	S		Brunswick	All	Total	20.77	685,236	5	5	-	70	137	-	86	161	64	55	2.00	2.58	1.20	2.28	56.8	219,944.2
IS-85	Total		Brunswick	All	2000	#DIV/0!	-	-	-	-	-	-	-	-	-	0	0	0.00	#DIV/0!	#DIV/0!	#DIV/0!	NA	#DIV/0!
IS-85	Total		Brunswick	All	2001	#DIV/0!	-	-	-	-	-	-	-	-	-	0	0	0.00	#DIV/0!	#DIV/0!	#DIV/0!	NA	#DIV/0!
IS-85	Total		Brunswick	All	2002	#DIV/0!	-	-	-	-	-	-	-	-	-	0	0	0.00	#DIV/0!	#DIV/0!	#DIV/0!	NA	#DIV/0!
IS-85	Total		Brunswick	All	2003	20.77	465,298	-	-	-	40	78	-	63	103	61	46	0.00	4.96	1.93	3.76	45.9	448048.1
IS-85	Total		Brunswick	All	2004	20.77	448,788	6	6	-	41	72	-	49	96	59	44	3.66	4.62	2.26	3.76	47.6	432150.2
IS-85	Total		Brunswick	All	2005	20.77	456,386	2	2	-	26	44	-	55	83	50	26	1.20	4.00	1.35	2.21	27.6	439466.5
IS-85	Total		Brunswick	All	Total	20.77	1,370,472	8	8	-	107	194	-	167	282	56	39	1.60	4.53	1.85	3.24	40.4	439,888.3
IS-85	N		Mecklenburg	All	2000														NA	NA	NA	NA	NA
IS-85	N		Mecklenburg	All	2001														NA	NA	NA	NA	NA
IS-85	N		Mecklenburg	All	2002														NA	NA	NA	NA	NA
IS-85	N		Mecklenburg	All	2003	19.52	210,878	1	1	0	25	43	1	21	47	61	56	1.3	2.41	1.33	2.25	57.2	216063.6
IS-85	N		Mecklenburg	All	2004	19.52	228,274	1	1	0	16	23	0	16	33	39	27	1.2	1.69	0.87	1.23	28.8	233887.3
IS-85	N		Mecklenburg	All	2005	19.52	231,737	0	0	0	21	32	0	30	51	60	37	0	2.61	1.08	1.64	37.8	237435.5
IS-85	N		Mecklenburg	All	Total	19.52	670,889	2	2	-	62	98	1	67	131	53	40	0.82	2.24	1.09	1.71	40.8	229,128.8
IS-85	S		Mecklenburg	All	2000														NA	NA	NA	NA	NA
IS-85	S		Mecklenburg	All	2001														NA	NA	NA	NA	NA
IS-85	S		Mecklenburg	All	2002														NA	NA	NA	NA	NA
IS-85	S		Mecklenburg	All	2003	19.52	210,878	0	0	0	23	33	0	34	57	74	42	0	2.92	1.18	1.69	42.9	216063.5
IS-85	S		Mecklenburg	All	2004	19.52	228,274	0	0	0	25	38	0	31	56	67	45	0	2.87	1.28	1.95	45.6	233887.3
IS-85	S		Mecklenburg	All	2005	19.52	231,737	1	1	0	21	40	0	29	51	60	47	1.1	2.61	1.13	2.10	48.5	237435.5
IS-85	S		Mecklenburg	All	Total	19.52	670,889	1	1	-	69	111	-	94	164	67	45	0.41	2.80	1.20	1.91	45.7	229,128.8
IS-85	Total		Mecklenburg	All	2000	-	-	-	-	-	-	-	-	-	-	0	0	0.00	NA	NA	NA	NA	NA
IS-85	Total		Mecklenburg	All	2001	-	-	-	-	-	-	-	-	-	0	0	0	0.00	NA	NA	NA	NA	NA
IS-85	Total		Mecklenburg	All	2002	-	-	-	-	-	-	-	-	-	0	0	0	0.00	NA	NA	NA	NA	NA
IS-85	Total		Mecklenburg	All	2003	19.52	421,756	1	1	-	48	76	1	55	104	68	49	0.65	5.33	2.51	3.94	50.0	432127.1
IS-85	Total		Mecklenburg	All	2004	19.52	456,548	1	1	-	41	61	-	47	89	53	37	0.60	4.56	2.15	3.18	37.2	467774.6
IS-85	Total		Mecklenburg	All	2005	19.52	463,474	1	1	-	42	72	-	59	102	60	43	0.59	5.23	2.20	3.74	43.2	474870.9
IS-85	Total		Mecklenburg	All	Total	19.52	1,341,778																

Table 3 I-85 Collision Types by County and Direction (2001-2005 Crashes)

Collision Type	Dinwiddie		Brunswick		Mecklenburg		Total	% Type
	NB	SB	NB	SB	NB	SB		
RearEnd	108	44	10	14	17	16	209	13.0%
Angle+Headon	3	1	1	0	0	0	5	0.3%
SideSwipeSame	38	45	9	19	18	16	145	9.0%
ObjectInroad	7	4	2	1	7	1	22	1.4%
NonCollision	23	17	6	11	8	6	71	4.4%
ObjectOffroad	264	232	120	156	125	143	1040	64.6%
Deer	13	23	15	13	26	16	106	6.6%
Pedestrian	0	1	0	0	2	0	3	0.2%
Misc	0	1	1	0	3	3	8	0.5%
Total	456	368	164	214	206	201	1609	

Table 4 I-85 Fixed Objects Hit Off the Road by Direction (2001-2005 Crashes)

I-85 NB Fixed Object Off the Road Crashes by Object Hit

Fixed Object Hit	PDO	Injuries	Deaths	Total	% Total	Injury SI	Death SI
Guard Rail or Post	190	68	1	259	47.9%	26.3%	0.4%
Bank or Ledge	67	60	1	128	23.7%	46.9%	0.8%
Trees	36	49	4	89	16.5%	55.1%	4.5%
Signs, Traffic Signal	11	7	0	18	3.3%	38.9%	0.0%
Miscellaneous	2	10	1	13	2.4%	76.9%	7.7%
Highway Structures	6	4	0	10	1.8%	40.0%	0.0%
Not Stated or Not Applicable	6	4	0	10	1.8%	40.0%	0.0%
Parked Vehicle	5	1	0	6	1.1%	16.7%	0.0%
Fence or Fence Post	2	2	0	4	0.7%	50.0%	0.0%
Not Applicable	2	0	0	2	0.4%	0.0%	0.0%
Utility Pole	2	0	0	2	0.4%	0.0%	0.0%
Total	329	205	7	541			

I-85 SB Fixed Object Off the Road Crashes by Object Hit

Fixed Object Hit	PDO	Injuries	Deaths	Total	% Total	Injury SI	Death SI
Guard Rail or Post	189	85	6	280	46.7%	30.4%	2.1%
Bank or Ledge	81	90	1	172	28.7%	52.3%	0.6%
Trees	32	49	4	85	14.2%	57.6%	4.7%
Miscellaneous	14	2	0	16	2.7%	12.5%	0.0%
Highway Structures	11	3	0	14	2.3%	21.4%	0.0%
Signs, Traffic Signal	4	6	0	10	1.7%	60.0%	0.0%
Not Stated or Not Applicable	5	3	0	8	1.3%	37.5%	0.0%
Parked Vehicle	6	1	0	7	1.2%	14.3%	0.0%
Not Applicable	4	1	0	5	0.8%	20.0%	0.0%
Utility Pole	2	0	0	2	0.3%	0.0%	0.0%
Fence or Fence Post	0	1	0	1	0.2%	100.0%	0.0%

Table 5. I-85 Major Driver Conditions Reported by County (2001-2005 Crashes)

Driver Condition> County V	One Vehicle				Two Vehicle			
	Apparently Asleep	Fatigued	Total Drivers	Percent	Apparently Asleep	Fatigued	Total Drivers	Percent
Dinwiddie	79	24	519	20%	9	1	433	2%
Brunswick	57	19	301	25%	8	4	123	10%
Mecklenberg	46	11	308	19%	4	0	142	3%
Total	182	54	1128	21%	21	5	698	4%

**Table 6 I-85 Driver Actions NB and SB in Dinwiddie County
Single Vehicle Crashes (2001-05 Total)**

	Driver action	Number of Crashes	% of Total
	00	7	
No Improper Action	01	82	16.0%
Exceed Speed Limit	02	43	8.4%
Exceed Safe Speed But Not Sp	03	67	13.1%
Other improper passing	09	1	0.2%
Following too close	12	1	0.2%
Improper turn from wrong lane	16	1	0.2%
Other improper turn	17	1	0.2%
Improper backing	18	1	0.2%
Driver distraction	23	147	28.8%
Avoiding other vehicles	31	8	1.6%
Avoiding animal	32	21	4.1%
Crowded Off Highway	33	2	0.4%
Hit and Run	34	4	0.8%
Other	37	0	0.0%
Avoid Object in Roadway	38	2	0.4%
Fail to maintain proper control	40	107	20.9%
Over correction	43	16	3.1%
		511	

**I-85 NB and SB in Dinwiddie County
Two Vehicle Crashes (2001-05 Total)**

	DRIVERACTION	VehicleOne	VehicleTwo
No Improper Action	01	54	131
Exceed Speed Limit	02	15	5
Exceed Safe Speed But Not Sp	03	8	2
Cutting in	08	5	15
Other improper passing	09	9	1
Did not have right of way	11	5	5
Following too close	12	53	24
Improper turn from wrong lane	16	1	1
Other improper turn	17	3	0
Improper backing	18	1	0
Disregard officer or flagger	20	3	0
Driver distraction	23	17	10
Avoiding other vehicles	31	23	10
Avoiding animal	32	1	0
Crowded Off Highway	33	1	2
Hit and Run	34	1	1
Other	37	9	2
Avoid Object in Roadway	38	2	1

