2015
Seat Belt Use in Virginia

Final Report

Prepared for:

Virginia Department of Motor Vehicles' Highway Safety Office

By:

Bryan E. Porter, Ph.D.*
Psychology

Norou Diawara, Ph.D.
Mathematics & Statistics

Isabel C. Buss Balk
Psychology

Old Dominion University
Norfolk, Virginia 23529-0267

With Special Acknowledgement to:

Collectors from the Behavioral Psychology Research & Analysis Team
Old Dominion University

***For Further Information:**
757-683-4458
bporter@odu.edu

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Summary

This report documents procedures to produce the 2015 seat belt use rate for Virginia. The procedures were developed as a result of the federally-mandated "re-design" based on the final rule for 23 CFR Part 1340: Uniform Criteria for State Observational Surveys of Seat Belt Use. The rule was published in the *Federal Register* Vol. 76 No. 63, April 1, 2011, Rules and Regulations, pp. 18042 – 18059. Virginia's plan was approved by the National Highway Traffic Safety Administration on May 3, 2012 after working closely with federal personnel to ensure compliance with the law.

The report provides significant details about sampling, procedures, and analyses. In brief:

(1) The 2015 weighted seat belt use rate, calculated with the methodology and sample approved by NHTSA in 2012, was **80.9%.**

(2) The 95% confidence interval for the seat belt use rate was between 80.2% and 81.7%.

(3) The error rate was 0.3735%, well below the maximum 2.5% allowed by code.

(4) The "miss rate" or rate of "unknown" belt use observations (i.e., seeing an occupant but not knowing whether he or she was buckled up) was 7.1%, below the maximum 10% allowed by code.

(5) These results were based on a weighted survey deign sample of 13,861 vehicles providing driver and/or passenger belt use observations.

Additional analyses of driver, vehicle, and area differences are included in the report. Readers desiring more information are encouraged to contact the lead author (contact information on the title page).

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1.0 Introduction

The National Highway Traffic Safety Administration (NHTSA) issued new Uniform Criteria for State Observational Surveys of Seat Belt Use. The final rule was published in Federal Register Vol. 76 No. 63, April 1, 2011, Rules and Regulations, pp. 18042 – 18059. This survey plan and its execution in 2012 represent Virginia's response to the requirement. NHTSA approved Virginia's protocol for this revised annual state survey to estimate passenger vehicle occupant restraint use on May 3, 2012. Virginia is fully compliant with the Uniform Criteria.

2.0 Study Design

Virginia is composed of 95 county aggregates (an aggregate is a county and independent cities included in one geographical area), 57 of which account for 87.2 percent of the passenger vehicle crash-related fatalities according to Virginia Department of Motor Vehicles' data averages for the period 2006 - 2010. We used these 57 counties as the eligible pool from which to sample counties for inclusion in the survey. We chose 15 of these 57 for observation (see below for selection procedures).

Using 2010 TIGER data developed by the U.S. Census Bureau, NHTSA provided us with a listing of road segments for each county/city jurisdiction. These have been identified by road functional classification (S1100: Interstate/Primary, S1200: Arterial/Secondary, and S1400: Local). Local roads (S1400s) were excluded from county areas in non-Metropolitan Statistical Areas as allowed by the federal rule. In addition, the listings included segment length as determined by TIGER. This descriptive information allowed for stratification of road segments, and we employed a systematic probability proportional to size (PPS) sample to select the road segments to be used as observation sites.

All passenger vehicles with a gross vehicle weight up to 10,000 pounds were included in the survey. This included small commercial vehicles. The target population was all drivers and right front seat passengers (excluding children harnessed in child safety seats) of these vehicles who traveled on public roads between the hours of 0700 and 1800. The observation period for each selected road segment was 50 minutes (10 additional minutes were used for site setup, background data recording such as estimated traffic volume, and organizational paperwork and check-ins with on-call supervisors as needed; the total time at the sites was 60 minutes to allow efficient collection schedules and travel routes within a given day). Fifty minutes of belt-use collection was sufficient based on past experiences with similar state projects.

Data collection was conducted by single observers who received two days of classroom and field training. Quality Control (QC) Monitors made unannounced visits to scheduled data collection locations in order to ensure that data were being collected according to the research protocol. Further, each day had an "on-call supervisor" who handled collector check-ins, questions, replacement site decisions, and so forth. Additional procedures used when scheduled data collection sites were not available due to temporary or permanent circumstances are described below. (Although in 2015 these latter procedures were not required.)

The approaches to data weighting and belt use estimation and variance estimation complied with the Uniform Criteria and stipulated procedures to be followed when data quality goals (e.g. item response rates) were not met. In 2015, all data quality goals were met.

3.0 Sample Design

Our research design conformed to the requirements of the Uniform Criteria and generated "the" annual estimate of occupant restraint use for adults and children using booster seats in the front seats of passenger vehicles. We intend to update the sample of data collection sites every five years in order to have survey results that reflect geographic areas in which more than 85% of crash-related fatalities occur. Our basic approach includes a stratified systematic PPS sample of data collection sites as described below. This sample design was provided to Virginia under a consultant agreement with Dr. Bryan Porter (Project Director) and Dr. Norou Diawara (Statistician) of Old Dominion University.

In Virginia, there are separate county jurisdictions and city jurisdictions. Our first step was to aggregate independent cities with the most appropriate county. Treating cities and their surrounding counties as units made sense in the Commonwealth from historical considerations, travel issues, and planning. All data for each area were then aggregated in kind. For example, Bristol City and Washington County were aggregated into what we called the Washington County Aggregate. Treating Bristol City as a separate entity for sampling from Washington County did not make sense given how those two jurisdictions work together and are geographically linked.

We also created three county aggregates where they did not exist, but did so again because of geography, history, and how the areas work together. We also did this so that these aggregates would only enter the final sample once each at most, which allowed other areas of the Commonwealth better odds of being selected for observation. The South Hampton Roads' cities of Norfolk, Virginia Beach, Chesapeake, Portsmouth, and Suffolk were combined into the Southeast Cities Aggregate. The Peninsula cities of Williamsburg, Poquoson, Hampton, and Newport News were combined with York County into the York County Aggregate. And the counties of Accomack and Northampton were combined into the Eastern Shore Aggregate.

Fatalities were the key measure of eligibility based on the revised Uniform Criteria. The federal rule stated that, at minimum, counties producing 85% of the state's roadway fatalities must be considered eligible. States were given leeway in how many years' data would be used to make this assessment (3 – 5), with Virginia choosing a 5-year average. To determine eligibility, Virginia county aggregates were ranked by their 5-year average fatalities. Table 1 gives the ranked aggregates and their average 5-year fatalities. Bold-printed and shaded counties are those that were marked as "eligible for selection." Note that these eligible counties contributed 87.2% of the average fatalities, a higher cut-off than required by the rule. We made this decision because the last counties on the list had ties on the 5-year average, so we allowed all counties with that last value to be included as eligible.

Table 1. Virginia Average Passenger Vehicle Crash-Related Fatalities by County 2006 - 2010*

No.	County	Including Additional Cities/ Counties if Combined	5-year Fatal avg.	Pct of Fatals	Cumulative Pct
1	**Southeast Aggregate**	Norfolk, Virginia Beach, Chesapeake, Portsmouth, Suffolk	79.40	0.092	0.092
2	**Fairfax County**	Alexandria, Fairfax, Manassas Park	48.80	0.057	0.149
3	**Henrico County**	Richmond	47.20	0.055	0.204
4	**Prince William County**	Manassas	28.80	0.033	0.237
5	**Chesterfield County**	Colonial Heights	27.40	0.032	0.269
6	**York County Aggregate**	Hampton, Newport News, Poquoson, Williamsburg	26.40	0.031	0.300
7	**Pittsylvania County**	Danville	18.20	0.021	0.321
8	**Rockingham County**	Harrisonburg	17.60	0.020	0.341
9	**Spotsylvania County**	Fredericksburg	17.60	0.020	0.362
10	**Augusta County**	Staunton, Waynesboro	17.20	0.020	0.382
11	**Eastern Shore**	Accomack County, Northampton County	16.40	0.019	0.401
12	**Roanoke County**	Roanoke, Salem	15.80	0.018	0.419
13	**Loudoun County**		15.20	0.018	0.437
14	**Fauquier County**		14.20	0.016	0.453
15	**Albemarle County**	Charlottesville	14.00	0.016	0.470
16	**Campbell County**	Lynchburg	13.80	0.016	0.486
17	**Hanover County**		13.20	0.015	0.501
18	**Bedford County**	Bedford	12.20	0.014	0.515
19	**Henry County**	Martinsville	12.00	0.014	0.529
20	**Prince George County**	Hopewell, Petersburg	12.00	0.014	0.543
21	**Frederick County**	Winchester	11.40	0.013	0.556
22	**Halifax County**		11.20	0.013	0.569
23	**Stafford County**		11.00	0.013	0.582
24	**Sussex County**		10.80	0.013	0.595
25	**Wythe County**		10.00	0.012	0.606
26	**Louisa County**		9.80	0.011	0.618
27	**Washington County**	Bristol	9.80	0.011	0.629
28	**Carroll County**	Galax	9.60	0.011	0.640
29	**Dinwiddie County**		9.60	0.011	0.651
30	**Gloucester County**		9.40	0.011	0.662
31	**Franklin County**		9.20	0.011	0.673
32	**Montgomery County**	Radford	9.00	0.010	0.683
33	**Isle of Wight County**		8.40	0.010	0.693
34	**Tazewell County**		8.40	0.010	0.703
35	**Buchanan County**		7.80	0.009	0.712
36	**Culpeper County**		7.80	0.009	0.721
37	**Southampton County**	Franklin	7.80	0.009	0.730
38	**Mecklenburg County**		7.60	0.009	0.739
39	**Shenandoah County**		7.60	0.009	0.748
40	**Botetourt County**		7.40	0.009	0.756

41	**Brunswick County**		7.20	0.008	0.765
42	**Prince Edward County**		7.00	0.008	0.773
43	**Goochland County**		6.80	0.008	0.781
44	**Wise County**	Norton	6.60	0.008	0.788
45	**Lee County**		6.40	0.007	0.796
46	**New Kent County**		6.40	0.007	0.803
47	**Orange County**		6.20	0.007	0.810
48	**Caroline County**		6.00	0.007	0.817
49	**Rockbridge County**	Buena Vista, Lexington	6.00	0.007	0.824
50	**Arlington County**		5.40	0.006	0.831
51	**Greensville County**	Emporia	5.40	0.006	0.837
52	**James City County**		5.20	0.006	0.843
53	**Alleghany County**	Covington	5.00	0.006	0.849
54	**Amelia County**		5.00	0.006	0.855
55	**Fluvanna County**		5.00	0.006	0.860
56	**Patrick County**		5.00	0.006	0.866
57	**Warren County**		5.00	0.006	0.872
58	Clarke County		4.80	0.006	0.878
59	Pulaski County		4.80	0.006	0.883
60	Russell County		4.80	0.006	0.889
61	King George County		4.60	0.005	0.894
62	Lunenburg County		4.60	0.005	0.899
63	Scott County		4.60	0.005	0.905
64	Nelson County		4.20	0.005	0.910
65	Nottoway County		4.20	0.005	0.914
66	Greene County		4.00	0.005	0.919
67	Appomattox County		3.60	0.004	0.923
68	Charles City County		3.60	0.004	0.928
69	Smyth County		3.60	0.004	0.932
70	Buckingham County		3.40	0.004	0.936
71	Westmoreland County		3.40	0.004	0.940
72	Charlotte County		3.20	0.004	0.943
73	Powhatan County		3.20	0.004	0.947
74	Grayson County		3.00	0.003	0.951
75	Bland County		2.80	0.003	0.954
76	Northumberland County		2.80	0.003	0.957
77	Amherst County		2.60	0.003	0.960
78	Floyd County		2.60	0.003	0.963
79	Giles County		2.60	0.003	0.966
80	Madison County		2.60	0.003	0.969
81	Rappahannock County		2.60	0.003	0.972
82	Page County		2.40	0.003	0.975
83	Richmond County		2.40	0.003	0.978
84	Essex County		2.20	0.003	0.980
85	King & Queen County		2.20	0.003	0.983
86	Lancaster County		2.20	0.003	0.985
87	Surry County		2.20	0.003	0.988
88	Dickenson County		2.00	0.002	0.990
89	Mathews County		1.80	0.002	0.992

90	Craig County	1.60	0.002	0.994
91	King William County	1.60	0.002	0.996
92	Middlesex County	1.20	0.001	0.997
93	Highland County	1.00	0.001	0.999
94	Bath County	0.60	0.001	0.999
95	Cumberland County	0.60	0.001	1.000
	Virginia Average 5-year Fatal Count:	860.80		

* Data are from 2006 – 2010. Bold-printed and shaded counties were eligible for selection.

3.1 Sample Size and Precision

A standard error of less than 2.5% on the seat belt use estimate was required by the Final Rule. Since the last Virginia sample re-design in 2008, but before the federally-mandated 2012 re-design, Virginia's Annual Seat Belt Use Study's standard errors were below this threshold (e.g. 0.862 – 1.170) and had observed sample sizes of approximately 22,000 – 30,000 occupants. These observed sample sizes were obtained from 15 county aggregates and 8 – 16 road segments per county (136 segments overall). Therefore, we felt that our new design created in 2012 that included 15 county aggregates and 136 road segments would likewise reach the precision objective. Indeed, in 2015 the precision objective was met without difficulty. Had we not met the objective, additional observations would have been taken starting with sites with the fewest observations, and new data would have been added to existing valid data until the desired precision was achieved.

3.2 County Selection

Data

Vehicle Miles Traveled (VMT) in millions was used to weight the probability of counties being sampled. Specifically, we used a 5-year average VMT, obtained from the Virginia Department of Transportation database (2006 -2010), as our "measure of size" in a "probability proportion to size" (PPS) sampling procedure[1]. Simple random sampling (SRS) could have been used, but that method could result in all counties coming from one region of the Commonwealth. This was not desirable. Instead, PPS was deemed more desirable, with PPS strata sampling chosen. The strata had approximately the same size definitions (see the following section).

County Ranking and Sampling

To ensure we included a representative range of VMTs across Virginia, counties were grouped into high, medium, and low VMT strata. The High VMT stratum was formed of counties with at least 1001 million miles traveled on average each year. The Low VMT stratum was formed of counties with fewer than 501 million miles average. The medium stratum was categorized between those two groups. This categorization, which was deemed reasonable, produced 21

[1] Use of VMT for measure of size was suggested by NHTSA personnel in documents supporting the re-design and in a personal communication with a Lead Mathematical Statistician at NHTSA, on August 22, 2011 (e-mail).

"high", 15 "medium", and 21 "low" counties, a good balance of VMT clusters across the Commonwealth. Then, within each VMT strata, five counties were selected via PPS with average VMT as the weighting factor. This produced a group of 15 counties for consideration.

Within each stratum, counties were selected with probability proportional to size with the MOS being the average VMT from 2006 to 2010. Let $g = 1,2, \ldots G = 3$ be the first stage strata, VMT_{gc} be the average VMT for county c in stratum g, and $VMT_g = \sum_{all\ c\ in\ g} VMT_{gc}$ be the total average VMT for all counties in first stage stratum g. Then PSU inclusion probability is: $\pi_{gc} = n_g VMT_{gc}/VMT_g$; here $n_g$is the PSU sample size for first stage stratum g that was allocated. If a county was selected with certainty (i.e., its MOS was equal to or exceeded VMT_g/n_g), it was set aside as a certainty selection and the probabilities of selection were recalculated for the remaining counties in the stratum. This was repeated and the certainty selections were identified successively until no county's MOS was equal to or exceeded the recalculated VMT_g/n_g.

The selection was completed using different seeds in the SAS® package (SAS® institute Inc., Cary NC, USA) version 9.2 software system.

Table 2 shows the average 5-year VMTs, VMT Strata, and probability of selection for each of the resulting 15 county aggregates sampled for observations. The region within which the county resides is also provided, but region itself is not considered a weight in estimates.

Table 2. Selected County, Measure of Size (VMT Strata), and Probability of Selection

County	Average 5-Yr VMT (millions)	VMT Group (Stratum)	Region	Probability of Selection
Fairfax County	11067.4	High	N	0.966588530
Southeast Aggregate	8936.8	High	SE	0.780509277
Loudoun County	2373.4	High	N	0.207284567
Stafford County	1493.0	High	N	0.130393469
Prince George County	1022.6	High	SE	0.089310356
Washington County	973.4	Medium	SW	0.471311186
Shenandoah County	775.8	Medium	N	0.375635112
Rockbridge County	738.2	Medium	SW	0.357429544
Henry County	670.0	Medium	SW	0.324407741
Carroll County	627.2	Medium	SW	0.303684381
Mecklenburg County	484.6	Low	SW	0.327982024
Tazewell County	434.4	Low	SW	0.294006173
Southampton County	431.0	Low	SW	0.291705019
Halifax County	388.8	Low	SW	0.263143646
Alleghany County	305.0	Low	SW	0.206426986

Note: Data are from 2006 – 2010. N = North; SE = Southeast; SW = Southwest.

3.3 Road Segment Selection

Virginia employed the Census TIGER data for the selection of road segments. We excluded without exception any road segment that was not coded S1100 (primary), S1200 (secondary), or S1400 (local) from any county selected. Virginia also exercised the exclusion option allowed by the federal rule to remove S1400 local roads in counties that were not within Metropolitan Statistical Areas (MSAs).

Road segments within each county were first stratified by functional classification group (Interstate/Primary, Arterial/Secondary, and Local) and segment length (Short, Medium, and Long). The Short, Medium, and Long classifications were based on segment length within county and functional classification group. Road segments were selected with PPS using length as the MOS. Road segments selected with certainty were identified using procedures similar to those described in Section 3.2 for counties. For each county, a PPS sample of 6 primary, 12 secondary, and 6 local segments were chosen. Then, within those samples segments were randomly ordered using SRS. The first two segments in the primary list, first four in the secondary, and first two in the local groups were chosen as the locations for observation. The remaining segments were held for reserve, with the order of their use determined by their order from the SRS outcome. The exception to this procedure was to double the segments chosen for two county aggregates: Fairfax and Southeast. We doubled their selected and reserve segments because these two county areas had more than double the average VMT than other counties (and had significantly more segment length miles as well).

When a county did not have any segment classified as S1100 (and not all counties had interstate/primary segments), then the assigned number of segments to that stratum was re-allocated across the other segment types. For example, if a county had no S1100 segments, the two segments needed for that stratum were re-allocated so that 5, instead of 4, S1200 segments were sampled and 3, instead of 2, S1400 segments were selected.

For counties without S1400 roads (after removal for being in a non-Metropolitan Statistical Area), the number of segments required was re-allocated to other strata available. One of the 2 needed S1400 segments was allocated to the S1100 stratum, and the second to the S1200 stratum. For counties that only had S1200 segments eligible for observation after applying the exclusion option for non-MSAs, all needed segments were S1200s.

More detail about the segment selection is given in Section 5.2.

Appendix B-1 presents the selected road segments within each county and their probabilities of selection. Table 3 provides the number of segments by stratum for each county area, and the total number of each segment type selected for each county. The procedure produced 136 segments to observe[2].

[2] The appendix gives information about the observed sites and all possible alternatives.

Table 3. - Roadway Functional Strata by County, Road Segments Population (N), Length, and Number of Segments Selected (n)

County		Roadway Functional Strata			Total
		Interstate/Primary (S1100)	Arterial/Secondary (S1200)	Local[3] (S1400)	
Alleghany	N	332	919	NA	1251
	Length	77.68	90.33	NA	168.01
	n	3	5	NA	8
Carroll	N	280	3328	NA	3608
	Length	71.76	360.29	NA	432.05
	n	3	5	NA	8
Fairfax	N	985	7406	47262	55653
	Length	119.89	581.19	3429.60	4130.67
	n	4	8	4	16
Halifax	N	0	2293	NA	2293
	Length	0	222.53	NA	222.53
	n	0	8	NA	8
Henry	N	0	1617	NA	1617
	Length	0	165.99	NA	165.99
	n	0	8	NA	8
Loudoun	N	0	6788	16640	23408
	Length	0	805.69	1331.73	2137.42
	n	0	5	3	8
Mecklenburg	N	116	1636	NA	1752
	Length	38.38	190.51	NA	228.88
	n	3	5	NA	8
Prince George	N	339	1562	8855	10756
	Length	66.80	123.00	711.66	901.46
	n	2	4	2	8
Rockbridge	N	360	1482	NA	1842
	Length	107.01	146.29	NA	253.30
	n	3	5	NA	8
Shenandoah	N	309	834	NA	1143
	Length	68.66	93.29	NA	161.96
	n	3	5	NA	8
Southampton	N	0	1180	NA	1180
	Length	0	144.74	NA	144.74
	n	0	8	NA	8
Southeast	N	1059	9203	57694	67956
	Length	134.26	723.77	4326.97	5184.99
	n	4	8	4	16
Stafford	N	136	755	10739	11630
	Length	30.71	62.31	841.66	934.68
	n	2	4	2	8
Tazewell	N	0	2098	NA	2098
	Length	0	204.49	NA	204.49
	n	0	8	NA	8
Washington	N	306	1974	14054	16334
	Length	69.09	142.71	1227.33	1439.13
	n	2	4	2	8

[3] Local roads (S1400s) excluded from county aggregates not identified as part of Metropolitan Statistical Area. Exclusion allowable by federal rule.

3.4 Reserve Sample

In the event that an original road segment was permanently unavailable, a reserve road segment would have been used. The reserve road segment sample consisted of two additional road segments per original road segment selected, resulting in a reserve sample of 272 road segments (136 segments for observation x 2 reserves for each = 272 total reserve sites). These reserve segments were identified and selected using the procedures described above. Thus, replacement locations are considered selected with PPS using road segment length as MOS by the same approach as the primary locations, with the only difference being the SRS that determined order of selection: primary or reserve/alternate. For the purposes of data weighting, the reserve road segment inherits all probabilities of selection and weighting components up to and including the road segment stage of selection from the original road segment actually selected. Probabilites and weights for any subsequent stages of selection (e.g., the sampling of vehicles; actual segment lengths) would be determined by the reserve road segment itself. (Note that additional reserve sites would have been sampled if, after initial segment screening prior to data collection, we discovered that our first selected locations were not viable and we had to move very far down in the reserve list; in all cases we would have reserve samples ready to use in case of any unforeseen circumstance, and such reserve sites would have been chosen via the procedures above).

4.0 Data Collection

4.1 Site Selection

Road segments were mapped according to their latitude and longitude. The selected road segment was identified by an intersection or interchange that occurred within or just beyond the segment. If no intersection or interchange occurred within the segment, then any point on that road was used for observation assuming it was (a) as close to the chosen segment as possible, (b) within the boundaries of two intersecting roads, *and* (c) was a safe place to park and observe. Data collection sites were deterministically selected such that traffic would be moving during the observation period. Therefore, sites were assigned to locations in the segment which were at least 50 yards from any controlled intersections for the observed direction of travel (and in most cases we were able to maintain this distance from a controlled intersection except in only the most dense town/city location with regular and close intersection crossings). For interstate highways or other limited access segments, data collection occurred on a ramp carrying traffic that was exiting the roadway.

The observed direction of travel was randomly assigned *a priori* for each road segment. However, if advance scouting of each segment determined that the randomly chosen direction could not be safely observed due to lack of shoulder space or lack of other protective road space for the observer, then we took additional action. If such safety could not be found up- or downstream on the road segment or in its adjacent segments as close to the sampled segment as possible before a major intersection that would divert the segment's traffic, then we collected data in the other direction of traffic at the segment. This alteration also depended upon whether observing the other direction could be accomplished from a safe location at or near the segment.

It is standard for field research to protect observers exposed to roadside traffic for liability reasons. Further, we believed traffic moving in the opposite direction from the direction originally chosen by random procedures was more representative of the segment than abandoning the segment altogether for an alternate location.

Prior to official data collection, ALL sites whether selected as primary locations or alternatives were visited and vetted for eligibility per federal rule and safety. Each was mapped and GPS coordinates of where to observe within or near-within the segment per rule were recorded. That process discovered some primary sites that were not eligible for observation as well as some alternatives that were also not viable. Appendix B-2 provides information about which sites were observed and where the observations technically occurred. It also provides updated information on alternatives for future collections. Note, that because these actions occurred *a priori* (in 2012 when we performed this sample selection), the team was well-prepared and knew exactly what its sample would be before collections. This reduced errors and ensured the Project Director and his lead assistants used standardized techniques to set up locations.

The locations of the data collection sites were described on Site Assignment Sheets for each county and maps were developed to aid the Data Collectors and Quality Control (QC) Monitors in traveling to the assigned locations.

4.2 Training

Old Dominion University on behalf of Virginia recruited and hired Data Collectors. ODU recruited and hired QC Monitors in addition to the Project Director who also acted as a QC Monitor. Each QC Monitor was available to check work of any Data Collector; their assignments were randomly determined and then coordinated to be travel efficient. For example, a QC monitor was randomly assigned to visit Site A unannounced, but then visited Site B immediately thereafter because it was nearby and travel efficient.

Data Collectors and QC Monitors were recruited by the Project Director from mostly students in the Norfolk, Virginia area. Preference was given to individuals who had experience in field data collection, and most already had similar experience working for the Project Director on related evaluations. They were required to stand for long periods of time, work outdoors, and successfully complete the training program. Law enforcement personnel were not used to collect data per the Uniform Code.

Data Collector and QC Monitor training was conducted at Old Dominion University in May. It included lecture, classroom, and field exercises. The overall syllabus is shown as Figure 1.

At the conclusion of the training, Data Collectors were given a quiz to ensure that they understood the survey terminology, the data collection protocols, and reporting requirements. All Collector personnel passed with high marks. Misses were discussed with collectors. QC Monitors are normally quizzed as well; however in 2015 experienced monitors were involved who had QC'd before in previous work. Quizzing was not required.

Day 1

Welcome and distribution of equipment

Survey overview

Data collection techniques
- Definitions of belt/booster seat use, passenger vehicles
- Observation protocol
- Weekday/weekend/rush hour/non-rush hour
- Weather conditions
- Duration at each site

Scheduling and rescheduling
- Site Assignment Sheet
- Daylight
- Temporary impediments such as weather
- Permanent impediments at data collection sites

Site locations
- Locating assigned sites
- Interstate ramps and surface streets
- Direction of travel/number of observed lanes
- Non-intersection requirement
- Alternate site selection

Day 2

Data collection forms
- Cover sheet
- Recording observations
- Recording alternate site information

In-field data-to-home-office reporting; rules for returning datasheets to Norfolk and ODU

Safety and security

Timesheet and expense reports

Field practice at ramps and surface streets

Figure 1. Training Syllabus.

QC Monitors' duties included conducting unannounced site visits to each Data Collector at a minimum of 2 sites (more than 10% of all sites were checked, which was the minimum required by rule, and each collector was visited at least twice). The field protocol was reviewed during each visit. QC Monitors were also available during the survey to respond to questions and offer assistance to Data Collectors as needed. QC Monitors could have acted as Data Collectors at

some points of the collection period, *however* a Data Collector was not also the Quality Monitor simultaneously for a given location.

In addition, there was an "on-call supervisor" assigned to each collection day. This individual could have been any of the QC Monitors not in the field that day. The on-call supervisor received check-ins from collectors at the beginning of each collection period, and would make decisions to resolve weather and reserve site questions as relevant (in 2015 no reserve sites were needed, but there were weather issues). Collectors checked in regularly with the on-call supervisor to ensure that schedules were met and assigned sites were observed when they were expected to be. These procedures were an augmentation to basic QC Monitor activities.

4.3 Observation Periods and Quality Control

All seat belt use observations were conducted during weekdays and weekends between 0700 and 1800. Available time slots were as follows: 0700 – 0830; 0830 – 1000; 1000 – 1130; 1130 – 1300; 1300 – 1430; 1430 – 1600; 1600 – 1730. Collections were considered part of the time slot in which most of the observation time occurred, which is why 30 extra minutes per time slot and 30 extra minutes at the end of the day were provided to account for any delays in data collector arrivals to an assigned location. If the collector could not collect more than half of the assigned collection time within the time assigned to a site, then that site would have been considered "missed" and would have been rescheduled.

The schedule included rush hour (before 0930 and after 1530) and non-rush hour observations. Data collection of belt use was conducted for 50 minutes at each site with an additional 10 minutes per site for situation variables to be recorded, such as location characteristics and volume estimates. Fifty minutes historically had provided more than sufficient observations for reliable estimates in Virginia. Four (4) sites were scheduled each day. Start times were staggered to ensure that a representative number of weekday/weekend/ rush hour/non-rush hour sites were included.

Note that sufficient room was built into the schedule to allow for inclement weather. Naturally, field work such as this is often exposed to rain strong enough to dampen the datasheets. At that point, procedures dictated that collectors would remove themselves to shelter and wait up to 15 minutes for the weather to clear before resuming their collections. If the weather did clear, they were to continue collections to obtain at least 50 minutes of observation. However, if the weather did not clear, they were to work with the "on call" supervisor assigned that day to determine if additional waiting was possible without jeopardizing the remainder of the day (and be able to collect the remaining sites within their assigned time periods). If they had to move on to the next site, then the location would be rescheduled. However, if at least half (i.e., 26 minutes or more) of belt-use data collection occurred before the decision was made to move on to the next site due to weather, then that location would be considered complete and no rescheduling would occur. There were rain make-ups in 2015 that required a collector to return to the location a week later to complete the observation (collectors could not get the minimum minutes of collection). Two locations did not provide the full 50 minutes of observation, but each had more than the minimally-required 26 minutes.

Maps showing the location of all observation sites in a county and Site Assignment Sheets were provided to the Data Collectors and QC Monitors. These indicated the observed road name, the crossroad included within the road segment (or nearest crossroad), assigned date, assigned time, and direction of travel assigned. Sites within relatively close geographic proximity were assigned as data collection clusters.

Each county had two clusters of four sites each created with sites close together (exception: Southeast and Fairfax had four clusters). Each cluster was randomly assigned to a day. One site from each cluster was randomly selected as the anchor site. Then the anchor site was randomly assigned to a time interval. The other sites in the cluster were organized around the anchor site. Specifically, other sites within a cluster were assigned to the same day in order to minimize travel costs and to time periods judiciously given travel time demands. Note that if the first site was randomly chosen to be observed late in the day, the route organized to collect data in the cluster "wrapped around" to the morning hours, such that the full day could have been used. For example, if Site 1 was assigned to a start time of 1600, Site 2 was assigned to an earlier time that same day, continuing on to the other sites in the cluster. It was possible therefore, that Site 1 may be the last site observed in that actual day of collection depending on what time slot was assigned. It was also possible that time slots may not have been continuous (every 90 minutes) if data collectors had a significant distance to travel. Travel resources were managed to accomplish the demands of this design while being sensitive to avoiding unnecessary costs. Time was allotted in the schedule, too, to allow data collectors to obtain lunch among their collection commitments.

Data Collection

All passenger vehicles, including commercial vehicles weighing less than 10,000 pounds, were eligible for observation. The data collection cover sheet and observation form are given in Appendix C. The cover sheet was designed to allow for documentation of descriptive site information, including: date, site location, site number, alternate site data, assigned traffic flow, number of lanes available and observed, start and end times for observations, and weather conditions. This cover form was completed by the Data Collector at each site.

The observation form was used to record seat belt use by drivers and front seat passengers. Other variables of interest were recorded that have meaning to Virginia evaluations, again to use resources efficiently. These variables included vehicle type, driver gender, and handheld mobile phone use, but these variables were not included in calculating Virginia's overall seat belt use rate. Additional observation forms were used when more than 50 vehicles were observed at a site, which was the maximum number that could be recorded per datasheet single page. The forms were labeled 1 of 2, and 2 of 2, etc.

The data collector observed as many lanes of traffic as s/he could comfortably monitor while attempting to collect complete data from vehicles chosen for belt use observations. To be specific, for most sites we knew from experience that data collectors could observe all lanes and choose a vehicle passing a fixed point, record observed data on the sheet, and look up to find the next vehicle crossing that fixed point and being selected for the second observation, etc. If

collectors were at a location that had a free-flowing volume making it uncomfortable to observe/monitor all lanes, then they had the choice to record an even amount of time for each lane up to the 50 minutes of the observation interval. The datasheet in Appendix C shows collectors how much time to observe each lane of traffic given the number of lanes. Clearly not every vehicle could be observed at every site if the volume was too high or cars were following too closely. But, these procedures produced sufficient *n*-size to obtain a reliable seat belt estimate. Further, we were able to meet the requirement of no more than 10% "unknown" observations of belt use (see Section 6 for the actual rate). Only one direction of traffic was observed at any given site. This direction was pre-determined (see Section 4.1).

Observations were made of all drivers and right front seat occupants. This included children riding in booster seats. *The only right front seat occupants excluded from this study were child passengers who were traveling in child seats with harness straps*. The basic codes in Table 4 were used to record seat belt use. These codes are those included in the datasheet shown in Appendix C.

Table 4 - Seat Belt Use Codes and Definitions

Code	Meaning	Definition
Y	Yes, belted	The shoulder belt is in front of the person's shoulder. Marked as "Y" on the datasheet.
N	No, unbelted	The shoulder belt is not in front of the person's shoulder. Marked as "N" on the datasheet.
U	Unknown	It cannot reasonably be determined whether the driver or right front passenger is belted. Marked as "U" on the datasheet.
NP	No passenger	There is no right front passenger present. Marked as "NP" on the datasheet in a special column. This is to ensure no confusion between missing data and the notation that there were no data for the passenger to be recorded.

According to the codes and data procedures above, a right front passenger, restrained in a car seat with harnesses would be coded as NP since we would not record such harnessed children in this study.

Alternate Sites and Rescheduling

Protocol dictated that when a site was temporarily unavailable due to a crash, or inclement weather, data collection was rescheduled for the same time of day and day of week. In the event that the site was permanently unworkable, such as located within a gated community, then an alternate site, selected as part of the reserve sample, would have been used as a permanent replacement. The alternates for each site were clearly identified and listed on the Site Assignment Sheet. Data Collectors would have picked the first alternative listed as it was chosen randomly to be the first alternate. If the selected reserve was also permanently unworkable, then the Data Collector would have used the next listed reserve site, and so forth. However, all such decisions to move to a reserve site would have been made with the "on-call" supervisor, with

that supervisor having the final authority on the use of a reserve location. In 2015, we used all sites that were vetted as eligible, primary locations and were the same as observed since the 2012 re-design.

Quality Control Procedures

The QC Monitor made unannounced visits to at least one data collection site within each county. There were 15 counties, giving a minimum of 15 sites for the unannounced visits. This size exceeded the requirement of 10% sites being chosen (minimum required = 14 with a total sample of 136 sites). During these visits, the QC Monitor first evaluated the Data Collector's performance from a distance (if possible), and then worked alongside the Data Collector. The QC Monitor ensured that the Data Collector was following all survey protocol including: being on time at assigned sites, using safety equipment properly, completing the cover sheet and observation forms, and making accurate observations of seat belt use. The QC Monitor would have prepared a site visit report highlighting any problems with data collection site locations and Data Collector performance if necessary (in reality, no such findings were needed in 2015; rather the QC Monitors and Project Director communicated regularly and often in real time to discuss any questions or concerns just as we have done in previous projects so that issues were resolved immediately). The Project Director was responsible for reviewing such reports (and communications) and making decisions regarding any findings of concern. Again, there were no concerns requiring remediation.

In the event it had been discovered that a Data Collector had falsified data, the Data Collector would have been removed from the project. Another Data Collector would have replaced him/her, returned to the falsified site, and collected new data. Further, new Data Collectors would have revisited all sites proven to be or suspected to be falsified and recollected all data.

At the end of each day, the Data Collector reported to the "on call" supervisor for the day the number of sites completed, and the total number of data sheets collected. They did this via email, text, or phone call. Previous experience assured us that collectors could return the datasheets safely to Old Dominion University's laboratory for the Project Director within 24 hours of returning to campus. The Project Director and his staff reviewed the forms. If the rate of overall seat belt use unknowns had exceeded 10% for any site (potentially leading to an overall nonresponse rate of 10% or more), then the Project Director would have begun preliminary plans to return to that site to collect data for an additional period. However, if the overall unknown belt use rate for the full project did not exceed 10%, then these return plans would not have been implemented (the rule only requires that the overall unknown rate be less than 10% for the entire collection protocol). Collectors would have returned to sites with the highest unknown rates for belt use for an additional observation period, and continued this procedure until the overall unknown rate for belt use for the full project use fell below 10%. In 2015, the unknown rate was below the maximum allowed 10% level (i.e., 7.1%).

5.0 Imputation, Estimation and Variance Estimation

The following sections describe the details involved in calculating the weighted seat belt use rate. A brief description of these procedures is provided in Appendix A.

5.1 Imputation

No imputation was performed on missing data.

5.2 Sampling Weights and Statistical Design

The following is a summary of the notations used in this section.

PSU level:

For this level, g subscript was used for primary sampling units (PSU) strata of VMT as a measure of size: g goes from 1 to 3, for Low, Medium and High classes of VMT aggregated from years 2006 to 2010. This classification by VMT (in millions) is broken up into less than 500, between 500 and 1000, and above 1000 for low, medium, and high, respectively. A simple test was performed to show that there were exactly significant differences among the strata. We used PPS design for each stratum. Stratified sampling leads to estimates with smaller standard errors compared to a simple random sampling.

We have 15 counties selected
c is used for county PSU, c goes from 1 to 15.
h is for road segment strata or road type. We have 3 levels of road segments.
i is for road segment name: that is the category and the name of the road.
(h, i) are nested within (g, c). Such subscripts will be our variable identifier.

Because additional information is available, it will be used to create a second stage sample by drawing segment roads from the first stage sampling of the counties.

SSU level with road site:

j represents the time segment, time of day, and the day of the week.
k is for the road site direction. It has 4 levels: N, W, S, E
l for lane within road site type stratum and county
m represents the index for the number of vehicles
n represents the number of front seat occupants
L is for the road segment length in the g, c, h, i combination , we call it L_{gchi}. This is available in the data set. But we will discretize it in 3 levels also for the selection of the road types. So we will think of L_{gchi} as the segment length in the g, c, h, i combination.

The sum of the road length over all the road segment names i and road segment strata h, is denoted as L_{gc}. So $L_{gc} = \sum_{hi \in gc} L_{gchi}$. And $L_g = \sum_{c \in g} L_{gc}$.

The indices j, k, l, m, n are nested within the index class g, c, h, i, and $Y_{gchiklmn}$ is the observed number of seat belts used (drivers and outboard front-seat passengers) from the segment road of length L_{gchi} described by its level

kth road site direction

lth lane

mth vehicle,

nth number of front seat occupants

$Y_{gchiklmn}$ takes values 0 or 1 or 2, because we cannot have more than 2 persons sitting in the front seat of a vehicle or truck who are eligible for observation and wearing seat belts. So, $Y_{gchiklmn}$ is an indicator of the observed front-seat occupant (driver/passenger seat belt use status), that is:

$$Y_{gchijklmn} = \begin{cases} 2, \text{ if 2 passengers are using the belts,} \\ 1, \text{ if 1 passenger is using the belt,} \\ 0, \text{ otherwise.} \end{cases}$$

And $N_{gchiklmn}$ can be thought as the number of occupants (drivers and outboard front-seat passengers) whose belt use was observed from ith road name, hth segment type, cth county and gth strata, and takes values 1 or 2, and is always greater or equal to $Y_{gchiklmn}$.

The second sampling units (SSU) were obtained using road segment lengths, and in a PPS scheme. The goal was to select from each road type. Because there were at most 3 road types, the design included all available road types in the county selected, and a PPS based on each road type was applied on each county, after adjustment of the road segment length L. This was accounted by classifying the road segment length into three class categories: Short, Medium, and Long classes. This classification is effective because the strata were relatively homogeneous in their sample sizes, and the clusters were based on the quantiles of the road segment length data.

For county aggregates in Metropolitan Statistical Areas, samples of sizes (6, 12, 6) from each primary, secondary, and local segment class respectively, balancing for the three segment length classes of low, median, and high, were selected, and through a random mechanism were assigned numbers to represent the order in which the segments would be chosen for observation. The first two ordered segments in the primary road type, first 4 in the secondary, and first two in the local were selected as the main segments to observe. The remaining segments in each road type were replacements. However for the Southeast and Fairfax counties, instead of samples of sizes (6, 12, 6) pulled to determine segments to observe, samples of sizes (12, 24, 12) were pulled to result in 4 primary, 8 secondary, and 4 local segments chosen for observation, with the remainder being replacements.

For county aggregates not in MSAs, and for whom local roads (S1400s) were excluded by federal rule allowance, the same procedures were used to pull segments from primary (S1100) and secondary (S1200) strata, with the allotment for local roads re-allocated across these other road types. Therefore, for such counties that had S1100 and S1200 road types the samples were

(9, 15) with 3 primary (S1100) and 5 secondary (S1200) being selected as locations to observe, with the remainder as reserve/alternates.

For any county without primary roads (S1100s), selection procedures distributed selected segment allocations across remaining road strata. Specifically, if a county had no primary roads then a sample of (15, 9) was selected from which 5 secondary (S1200) and 3 local (S1400) segments were sampled for observation with the remainder being alternates. If such a county had only secondary roads because the local roads were excluded in the non-MSA provision, then all sampled segments came from the secondary segment strata; the sample was (24) with 8 being chosen for observation and remainder being alternates.

The sum of all $Y_{gchiklmn}$ over all the k, l, m, n within the g, c, h, i combination is called n_{gchi}. So n_{gchi} can be thought as the number of belted occupants from ith road name, hth segment type, cth county and gth strata.

And N_{gchi} can be thought as the number of occupants (drivers and outboard front-seat passengers) from ith road name, hth segment type, cth county and gth strata, that is:

$$N_{gchi} = \sum_{klmn \in gchi} N_{gchiklmn} .$$

In all, the following notations reflect all levels, strata, and weights to be considered in this design, from the choice of counties and road segments through to the calculations of the seat belt use rate.

p	L	n	N
p_g	L_g		N_g
p_{gc}	L_{gc}	n_{gc}	
p_{gch}	L_{gch}	n_{gch}	
p_{gchi}	L_{gchi}	n_{gchi}	N_{gchi}

For example, L_{gchi} is the average of road segment lengths in g^{th} strata, c^{th} county, h^{th} road type and i^{th} road segment. And L_g is the average of road segment lengths in g^{th} strata, that is the average of road lengths L_{gc} for all c counties in g^{th} PSU cluster for all observed roadways.

Under this stratified multistage sample design, the inclusion probability for each selected road segment is the product of selection probabilities at two stages: $\pi_{gc}$for county, $\pi_{hi|gc}$ for road segment. So the overall road segment inclusion probability is:

$$\pi_{gchi} = \pi_{gc}\pi_{hi|gc}.$$

The sampling weight (design weight) for county gc is then:

$$w_{gc} = \frac{1}{\pi_{gc}}.$$

The sampling weight (design weight) for road segment $hi|gc$ is:

$$w_{hi|gc} = \frac{1}{\pi_{hi|gc}}.$$

The overall sampling weight (design weight) for a given road segment hi is:

$$w_{gchi} = \frac{1}{\pi_{gchi}}.$$

5.3 Nonresponse Adjustment

Given the data collection protocol described in this plan, including the provision for the use of alternate observation sites, road segments with non-zero eligible volume and yet zero observations conducted should be a rare event. Nevertheless, if eligible vehicles passed an eligible site or an alternate eligible site during the observation time but no usable data were collected for some reason, then this site would be considered as a "non-responding site." To compensate for the nonresponses, a nonresponse adjustment weight is built in. The weight for a non-responding site will be distributed over other sites in the same road type in the same PSU.

The nonresponding site nonresponse adjustment factor:

$$f_{gch} = \frac{\sum_{all\ i} w_{gchi}}{\sum_{responding\ i} w_{gchi}}$$

would be obtained by dividing all sampling weights of non-missing road segments and all responding weights in the same road type of the same county. However, if there were no vehicles passing the site during the selected observation time (50 minutes) then this is simply an empty block at this site and this site would not be considered as a non-responding site, and would not require nonresponse adjustment. In 2015, there were no nonresponding sites, but there were two sites at which no vehicles passed during the observation period of 50 minutes.

5.4 Estimators

Seat Belt Use Rate Estimators

Seat belt use rates were calculated using formulas based on the proportion of the state's road segment length L (excluding roads types that were not S1100, S1200, or S1400) of a particular site. Seat belt use rate calculations followed a four-step process.

First, estimated rates were calculated for each of the three road type strata within each county. The observed use rates for all of the sites within each stratum-county combination were combined by simple averaging, as shown below. Because the sites' original probability of inclusion in the sample was proportional to their county's VMTs, averaging their use rates makes use of that sampling probability to reflect their different VMTs.

We assume that the observed vehicles at segment road type i, have same equal probability, then the seat belt use rate for the i^{th} road segment and the h^{th} road type stratum, in c^{th} county nested within g^{th} PSU cluster, denoted as p_{gchi} is expressed as:

Formula 1:

$$p_{gchi} = \sum_{klmn \in gchi} Y_{gchiklmn}/N_{gchi} = \frac{n_{gchi}}{N_{gchi}},$$

where i^{th} road segment in h^{th} road segment strata or road type, c^{th} county PSU and in the g^{th} PSU stratum and county,

N_{gchi} = number of occupants (drivers and outboard front-seat passengers) from ith road name, hth segment type, cth county and gth strata.

Second, a county-by-county seat belt use rate, p_{gc}, were obtained by combining county-stratum seat belt use rates across strata within counties, weighted by the stratum's relative contribution to average county road segment length used as MOS:

Formula 2:

$$p_{gc} = \frac{\sum_{hi \in gc} w_{hi|gc} L_{gchi} p_{gchi}}{\sum_{hi \in gc} w_{hi|gc} L_{gchi}},$$

where L_{gchi} is the average of all road segment lengths in all k^{th} directions, in all l^{th} lanes for the m^{th} vehicle nested c^{th} county nested within g^{th} VMT cluster, respectively[4].

In the third step, weighted seat belt use rates for each VMT cluster were obtained by combining and weighting the rates from the sampled counties in each VMT cluster by their VMT average length values and probabilities of being selected:

[4] The weight used in Formula 2 in section 5.4 reflects the nonresponse adjustment in section 5.3.

Formula 3:

$$p_g = \frac{\sum_i w_{gc} L_{gc} p_{gc}}{\sum_i w_{gc} L_{gc}},$$

where L_{gc} = the average length for c[th] county in g[th] PSU cluster for all three road types.

Finally, the statewide belt use rate was calculated by combining the cluster proportions weighted by their proportion of statewide road length L:

Formula 4:

$$p = \frac{\sum_{g=1}^{3} L_g \; p_g}{\sum_{g=1}^{3} L_g},$$

where L_g is the average of road segment lengths L_{gc} for all c counties in g^{th} PSU cluster for all observed roadways.

The result of Formula 4 would be a weighted combination of the individual site seat belt use rates. This estimator captures traffic volume and vehicle miles traveled through design weights (which includes nonresponse adjustment factors as described in section 5.3, if any) at various stages and it does not require knowledge of road segment specific VMT.

5.5 Variance Estimation

Standard error of estimate values are based on the maximum total number of sites as $n = 136$, estimated through a jackknife approach (calculated with SAS 9.2 software), based on the general formula:

$$\hat{\sigma}_{\hat{p}} = \left[\frac{(n-1)}{n} \sum_{i=1}^{n} (\hat{p}_{(i)} - \hat{p})^2 \right]^{1/2},$$

where $\hat{\sigma}_{\hat{p}}$ = standard deviation (standard error) of $\hat{p}$ the estimated statewide seat belt use proportion (equivalent to p in the notation of formula 4, the overall weighted statewide belt use rate),

n = the number of sites, i.e., maximum of 136,

and $\hat{p}_{(i)}$ = the estimated statewide belt use proportion with site i excluded from the calculation.

The 95% confidence interval for p is then obtained by adding and subtracting the estimate with the margin of error $1.96\hat{\sigma}_{\hat{p}}$, that is: $\hat{p} \pm 1.96\hat{\sigma}_{\hat{p}}$.

These values are reported for the overall statewide seat belt use rate. In 2015, there were 134 sites with non-zero observations; therefore n = 134 for these calculations.

6.0 Results

6.1 Overall Weighted State Rate

Overall, a weighted survey design sample of 13,861 vehicles from 134 sites provided known driver and/or front, outboard passenger belt use observations. In raw frequencies, there were 17,357 occupants for whom belt use was known; of these, 14,601 were belted. The "miss rate" or rate of "unknown" belt use (i.e., seeing an occupant but not knowing whether he or she was buckled up) was only 7.1%, below the maximum 10% allowed by the new federal code.

The 2015 weighted seat belt use rate, calculated with the new methodology and sample, was <u>80.9%</u>. The unweighted use rate was 84.1% (the ratio between the raw number of known belted occupants and the raw number of total occupants with known belt use). The latter number does not account for the stratified random sampling used to choose the counties and road segments (VMT levels, segment lengths, selection probabilities) under NHTSA approved guidelines. Hence the reportable number is 80.9%. This rate, and all others for Virginia calculated since the 1980s, are given in Figure 2. *<u>However, note that these estimates for years past were calculated with different guidelines and sampling strategies, meaning a direct comparison between pre-2012 and post-2012 years is tentative.</u>*

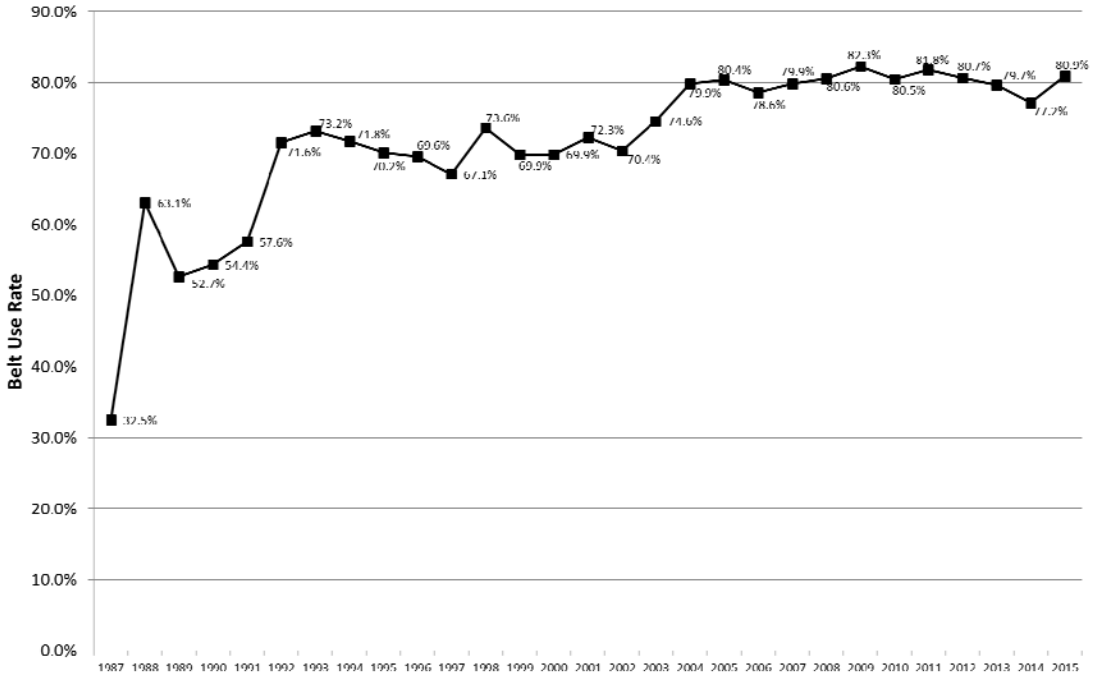

Figure 2. The historical trend of Virginia's seat belt use rate (see text for interpretation). Rates for 2012 and 2014 are adjusted from previous reports.

The 95% confidence interval for the seat belt use rate was <u>80.2% to 81.7%</u>. The error rate was 0.3735%, well below the maximum 2.5% allowed by code.

6.2 Additional Data Comparisons—Descriptives

The following sections provide descriptive data to help further understand differences among the observed occupants. These data are not mandated by federal code, but historically have provided useful information to different groups interested in learning more about seat belt use patterns in Virginia.

The data are meant only to guide readers about patterns for comparison to past reports with a different sample, and to prepare the collection of trend data as this sample is among the 2012 – 2016 sample approved by the National Highway Traffic Safety Administration.

Each of these additional comparisons represented weighted data as well. Figure 3 shows the comparisons among the 15 selected counties segregated by VMT group. In general, counties in the high VMT group had higher belt use rates.

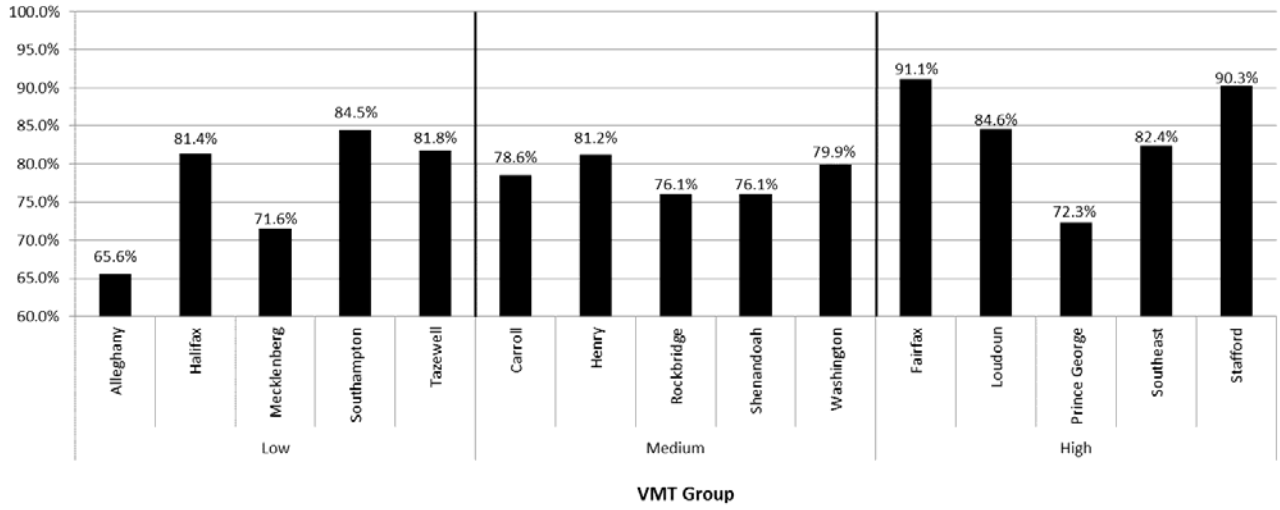

Figure 3. Belt use rates by VMT grouping weighted by road segment lengths for each selected county.

The remaining descriptive data are at the individual person level (e.g., gender differences in belt use). These data were weighted by the inverse of the county selection probability only. We made this choice deliberately as the descriptives now present individual variables which did not contribute to the sampling design (e.g., gender, vehicle types). However, these data may still be related to particular counties (by culture, politics, education, economy, etc.) and therefore the county weight was judged to be an appropriate adjustment. Note, the following analyses were conducted with SPSS 22 software and should be treated as exploratory in nature.

First, we compared drivers and passengers by gender as well as by VMT grouping. Figure 4 provides the data. It is clear that women, regardless of seating position used their seat belts at higher levels than men. Further, belt use rates for both occupant positions mostly increased as the VMT levels increased (across VMT groupings).

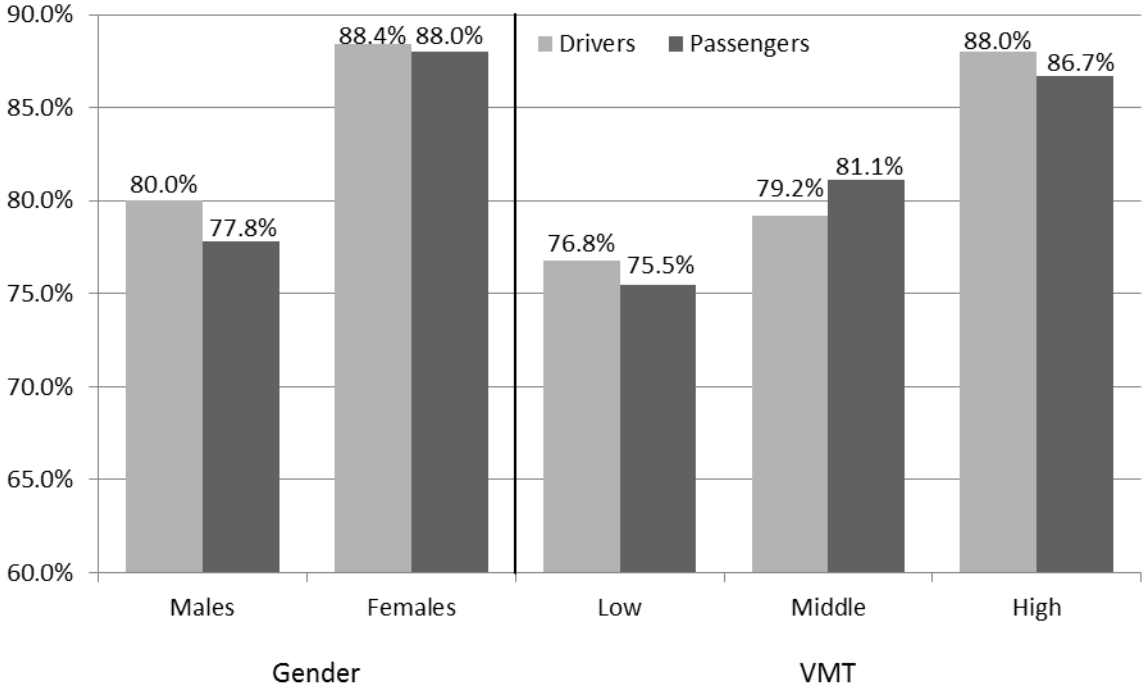

Figure 4. Belt use rate comparison between drivers and passengers by gender and by VMT.

Another interesting comparison involves the role of road type. Figure 5 displays male vs. female differences again by the three road types in this project. While we must be cautious in interpreting data from local roads due to lower sample sizes of observations than the other two road types, we continue to find interstate/primary and secondary/arterial roads tend to have higher use rates by both genders than local roads (female passengers on local roads are an exception to the overall trend). However, gender differences are still present. Women tend to have higher rates regardless of location.

Finally, we inspected differences among vehicle types. Recall that we observed cars, pickup trucks, SUVs, vans, and mini-vans. Figure 6 shows findings for vehicle type across VMT groupings. Note that the low VMT group is not included in this assessment because the sample sizes for observed vehicle types tend to be too low to reliably compare to the other two VMT groupings. Pickup and van occupants (with vans being more of the commercial vehicles compared to mini-vans mostly used by family occupants) used belts less often than other vehicle occupants.

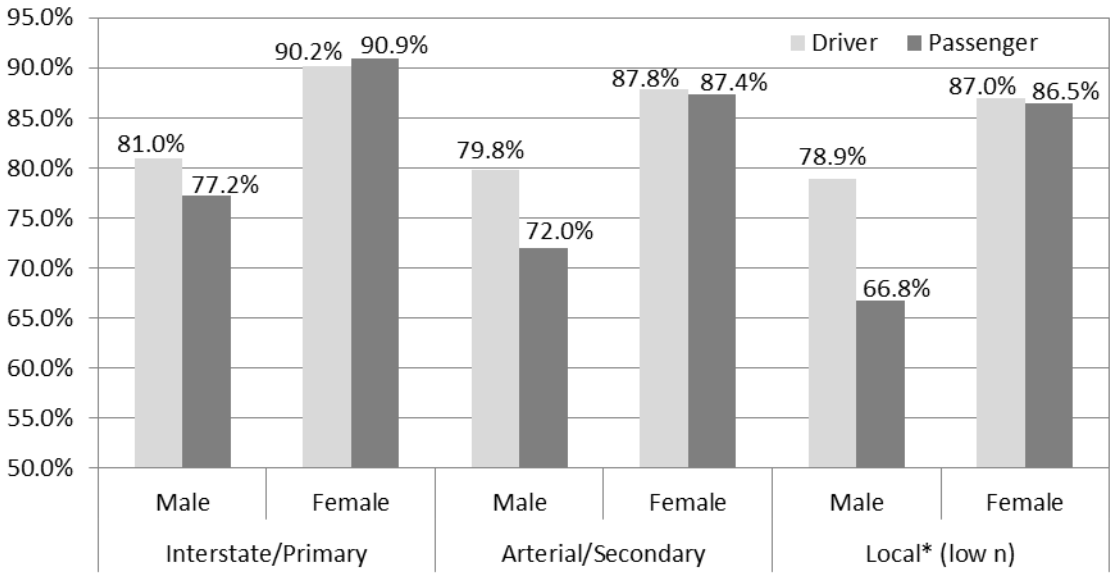

Figure 5. Belt use by gender at the three sampled road types (local to be interpreted cautiously due to much lower sample sizes).

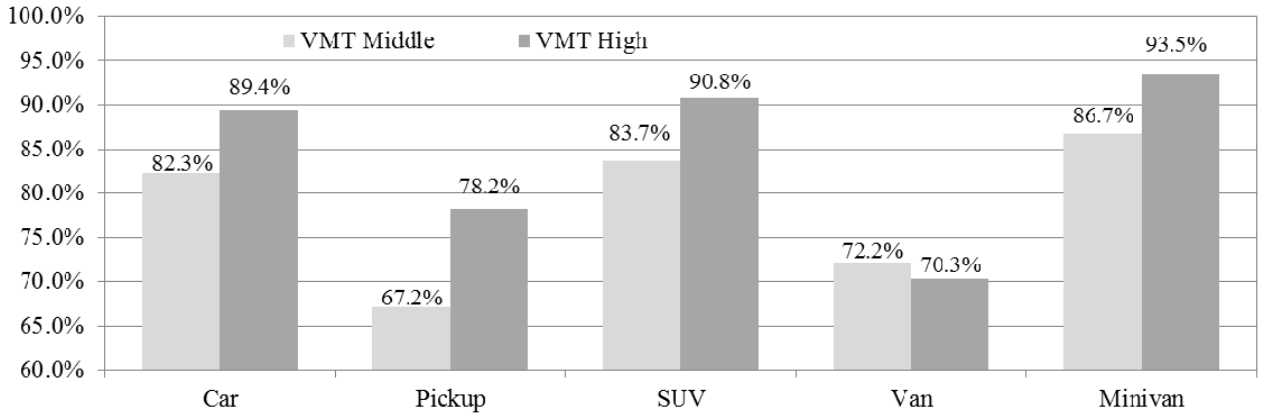

Figure 6. Belt use by vehicle type across VMT groups (note: low VMT group not included because low raw sample sizes for some vehicle types limit reliable comparisons).

Similarly, vehicle types had use rate differences when considering the two major road types of interstate/expressways and secondary/arterials (Figure 7). Local roads are not considered here because the sample sizes among vehicle types were too low compared to sizes observed for the other two road types to render appropriate estimates. Pickup and van occupants had lower use rates overall.

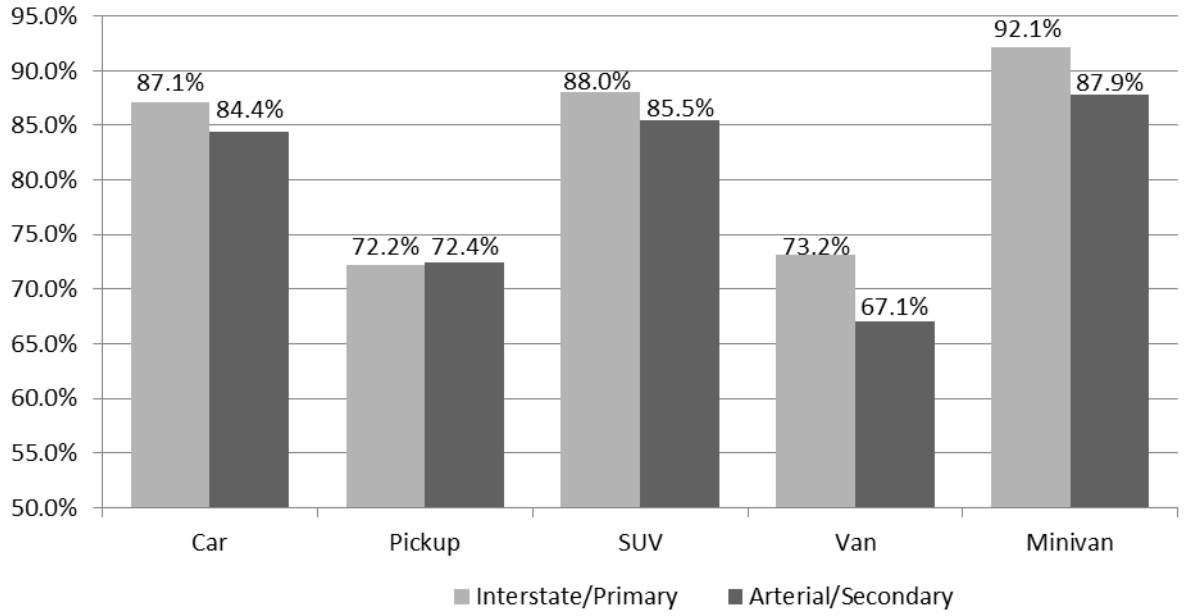

Figure 7. Belt use by vehicle type for two observed road types (note: local roads not included because of low sample sizes limiting reliable comparisons).

7.0 Discussion

This year, 2015, was the fourth year of the new sampling design required by the revised Uniform Criteria approved by the National Highway Traffic Safety Administration. More than 13,000 vehicles were observed. We met the requirements of small measurement error and small unknown belt use recordings.

The 2015 belt use rate was 80.9%, up from 2014's adjusted rate of 77.2%. This was the highest rate observed since the adjusted 2012 rate (2015's rate was also the third highest observed since Commonwealth's annual surveys began in 1987).

Driver belt use, as in previous years, continued to be higher than passengers' use. Female belt use remained higher than for men. Pickup and van occupants continued to have lower belt use rates (in the 60s to 70s) than rates for occupants in cars, SUVs, and minivans (mid 80s to low 90s).

Again, as in previous years, counties in high VMT areas had higher observed rates (mid to upper 80 percent range), whereas low VMT counties had the lowest observed rates (mid 70 percent range). However, the positive news for the Commonwealth comes from improvements across VMT regions. While some counties decreased use rates in 2015, the general increases in more than one VMT region were improvements over 2014, and contributed to the increase in the statewide belt use rate for 2015 from that reported in 2014.

Appendix A: Brief Notes on Calculating the Virginia Seat Belt Use Rate (2012 – 2016)

The federally-approved protocol for calculating a point estimate of belt use requires the inclusion of the probability of selected location or their inverse called weights. Weights are required in this case to accurately represent the data disparities. For example when sampling from any population, one must take into account the fact that there may be important differences that could affect the data and therefore should be taken into account. VMT differences are one example, and these differences could be stratified before a sample is taken to ensure that we do not over- or under-sample different levels of VMTs. Using VMTs then to stratify a sample and apply a VMT-based weight, as one example, allows us to reduce bias and error in the parameter estimate of belt use. While unweighted use rates (overall, collapsed across counties) can be useful indicators of belt use, they do not account for sampling designs. By not accounting for sampling designs, unweighted rates can be misleading indicators of belt use.

Virginia's sampling design is a multiple step process, and therefore has multiple weights. In the next sections, this plan is outlined. For more details, see the full protocol document.

The new federal rule requires the use of raw fatalities for sampling state areas to observe (aggregated over a time period; VA uses 5 years). Specifically, counties/cities making up the top 85% of the fatalities must be considered eligible for sampling. This new rule made 57 Virginia areas eligible, compared to the 35 eligible when the previous sample design was based on the top 85% of the population.

Eligible counties were then categorized by high, medium, and low VMTs based on state data provided by Richmond. These VMTs represent our primary sampling unit (PSU) used for weighting. Five counties from each VMT stratum were sampled, and each county had a "probability of selection." This probability of selection was an important component of the weighting design.

Within each sampled county, 8 to 16 road segments were chosen. Eight segments were chosen from 13 counties, whereas 16 were chosen from Fairfax County and the Southeast Cities (the latter were aggregated to form a "county" for historical purposes) given their VMTs. The segments were roughly divided among three road types: primary/interstate/expressway; arterial; and local, and were probabilistically sampled based on segment lengths. They represent our secondary sampling units (SSU). The road types themselves have their probability of selection or weights. However, length of road segment is also used along as an adjustment factor. In fact road segment is used as another strata with long, medium, and short classes. Data on segments and lengths were provided by NHTSA.

The weighted state rate is calculated in the following manner:

For each location, a score is first calculated for each vehicle observed: driver and/or passenger belted (0 to 2 maximum) and the total number of occupants recorded in that vehicle (0 to 2 maximum). An overall rate is then calculated for the location.

A county score is then calculated by aggregating the county's locations together and weighting by length of road segments observed.

A VMT strata score is then calculated. To do this, counties within each VMT cluster (high, medium, and low) are aggregated together, weighting for selection probability, average VMT, and probabilities of selection.

The final, weighted state rate is calculated by combining the VMT clusters weighted within each cluster and its proportion of road segment length.

Appendix B-1: List of Sampled Road Segments by County

Key for Unique Information (beyond that understood from segment datasets and general selection information):
Bold: Segments selected to be primary sites AND used; non-bold AND non-italics: reserve.[5]
Italics: Segments selected to be primary sites, BUT excluded for various reasons (see Appendix B-2)
Class: Stratification by road segment length (lower, average, upper); used in PPS to choose segments within counties (see text).
Order Sort: Randomly generated rank to determine order that segments would be chosen; order generated within each road type.

COUNTY	TYPE	ROAD NAME	TLID	ALT ROAD NAME	LONGITUDE	LATITUDE	CLASS	SEG LENGTH (MILES)	SELECTION PROBABILITY	ORDER SORT
Alleghany	**S1100**	**I- 64**	**62575391**		**-79.992568**	**37.773306**	**lower**	**0.02**	**0.043794852**	**0.110066422**
Alleghany	**S1100**	**I- 64**	**213118075**		**-80.053324**	**37.798094**	**upper**	**0.37**	**0.015909542**	**0.119485393**
Alleghany	**S1100**	**I- 64**	**213123485**	**US Hwy 60**	**-80.195088**	**37.803888**	**avera**	**0.12**	**0.058206353**	**0.278923632**
Alleghany	S1100	I- 64	213121421		-79.660271	37.82547	upper	0.56	0.023766476	0.361050453
Alleghany	S1100	I- 64	62555898	I- 64	-79.897944	37.787016	lower	0.02	0.066284684	0.369515784
Alleghany	S1100	I- 64	62561114		-79.683267	37.812028	avera	0.12	0.05555354	0.400914313
Alleghany	S1100	I- 64	62575532		-79.987888	37.772443	lower	0.02	0.0434359	0.454625951
Alleghany	S1100	I- 64	213118758	US Hwy 60	-80.071883	37.813729	avera	0.08	0.038778704	0.482037747
Alleghany	S1100	I- 64	213119236		-79.778732	37.828518	upper	0.77	0.033144114	0.968678735
Alleghany	**S1200**	**Midland Trl**	**213123704**	**Midland Trl**	**-80.056**	**37.80616**	**upper**	**0.37**	**0.032092404**	**0.031906845**
Alleghany	**S1200**	**W Ridgeway St**	**62551372**	**W Ridgeway St**	**-79.83832**	**37.81123**	**lower**	**0.02**	**0.023928767**	**0.231109965**
Alleghany	**S1200**	**N Alleghany Ave**	**62576138**	**US Hwy 220**	**-79.987987**	**37.809176**	**lower**	**0.03**	**0.036999528**	**0.231161836**
Alleghany	**S1200**	**Dunlap Creek Rd**	**62546739**	**State Rte 159**	**-80.185221**	**37.738467**	**avera**	**0.08**	**0.01284071**	**0.282524319**
Alleghany	**S1200**	**A St**	**62551242**	**A St**	**-79.819201**	**37.814248**	**lower**	**0.02**	**0.024987608**	**0.355373019**
Alleghany	S1200	Potts Creek Rd	62555329	Potts Creek Rd	-80.099495	37.686421	avera	0.06	0.009498305	0.416399329
Alleghany	S1200	Dunlap Creek Rd	213123719	Dunlap Creek Rd	-80.093435	37.791567	upper	0.37	0.03234736	0.485618585
Alleghany	S1200	Dunlap Creek Rd	213123727	State Rte 159	-80.06831	37.806391	upper	0.25	0.022066147	0.520988069
Alleghany	S1200	Forty Two Rd	62551776	State Rte 42	-79.739325	37.870643	avera	0.05	0.007751531	0.561678567
Alleghany	S1200	Forty Two Rd	62551773	State Rte 42	-79.742108	37.872338	avera	0.13	0.022721576	0.616386545

[5] The main and reserve samples were selected simultaneously, and are reflected in "selection probability" and "order sort" probability, respectively.

Alleghany	S1200	Kanawha Trl	62559171	Kanawha Trl	-80.238227	37.763123	lower	0.02	0.027975285	0.656338986
Alleghany	S1200	Totten Dr	62546068	State Rte F-203	-80.015025	37.783793	upper	0.6	0.052151728	0.753739126
Alleghany	S1200	Dunlap Creek Rd	62546055	State Rte 159	-80.106662	37.781125	lower	0.02	0.026405908	0.879781752
Alleghany	S1200	Potts Creek Rd	62547642	State Hwy 18	-80.184862	37.623031	upper	0.39	0.033780817	0.90566897
Alleghany	S1200	Kanawha Trl	62559162	State Rte 311	-80.2407	37.757587	avera	0.09	0.015311868	0.988919275
Carroll	**S1100**	**I- 77**	**628860298**		**-80.770447**	**36.74169**	**lower**	**0.02**	**0.084952762**	**0.110066422**
Carroll	**S1100**	**I- 77**	**153836489**		**-80.741886**	**36.591685**	**upper**	**0.43**	**0.02039905**	**0.119485393**
Carroll	**S1100**	**Blue Ridge Pkwy**	**153809369**		**-80.676745**	**36.670352**	**avera**	**0.14**	**0.051753148**	**0.278923632**
Carroll	S1100	I- 77	153837538		-80.713013	36.643384	upper	0.53	0.025427555	0.361050453
Carroll	S1100	I- 77	221823930		-80.776261	36.752396	lower	0.03	0.143944673	0.369515784
Carroll	S1100	I- 77	153827104		-80.708886	36.669176	avera	0.14	0.050017031	0.400914313
Carroll	S1100	I- 77	153807515		-80.770569	36.741949	lower	0.02	0.082275522	0.454625951
Carroll	S1100	I- 77	153803063		-80.851634	36.830284	avera	0.09	0.032794459	0.482037747
Carroll	S1100	Blue Ridge Pkwy	153820175		-80.656519	36.66867	upper	0.58	0.02782257	0.968678735
Carroll	*S1200*	*Misty Trl*	*629295712*	*State Rte 608*	*-80.737576*	*36.633425*	*upper*	*0.3*	*0.007321592*	*0.031906845*
Carroll	**S1200**	**Snake Creek Rd**	**153832571**	**State Rte 670**	**-80.706356**	**36.756226**	**lower**	**0.02**	**0.0071061**	**0.231109965**
Carroll	**S1200**	**Ivanhoe Rd**	**153830789**	**State Rte 94**	**-80.981559**	**36.742091**	**lower**	**0.03**	**0.010268157**	**0.231161836**
Carroll	**S1200**	**Danville Pike**	**153831630**	**US Hwy 58**	**-80.628519**	**36.734056**	**avera**	**0.1**	**0.003542028**	**0.282524319**
Carroll	**S1200**	**Crooked Creek Rd**	**153826321**	**Crooked Creek Rd**	**-80.808839**	**36.641713**	**lower**	**0.03**	**0.007502581**	**0.355373019**
Carroll	**S1200**	**Danville Pike**	**153830452**	**US Hwy 58**	**-80.602664**	**36.719605**	**avera**	**0.07**	**0.002633245**	**0.416399329**
Carroll	S1200	E Stuart Dr	613282064	E Stuart Dr	-80.941252	36.655614	upper	0.3	0.007328574	0.485618585
Carroll	S1200	Coulson Church Rd	153834015	Coulson Church Rd	-80.82499	36.796284	upper	0.23	0.005638195	0.520988069
Carroll	S1200	Sleepy Hollow Rd	153826850	Sleepy Hollow Rd	-80.83562	36.655832	avera	0.06	0.002183531	0.561678567
Carroll	S1200	Coal Creek Rd	153814990	State Rte 608	-80.869736	36.626022	avera	0.15	0.005707623	0.616386545
Carroll	S1200	Stoots Mountain Rd	153834531	Stoots Mountain Rd	-80.918236	36.821417	lower	0.03	0.008473172	0.656338986
Carroll	S1200	Mount Zion Rd	153832081	Mount Zion Rd	-80.840123	36.751288	upper	0.43	0.010246848	0.753739126
Carroll	S1200	N Main St	153833290	US Hwy 52	-80.744608	36.777436	lower	0.03	0.00800641	0.879781752
Carroll	S1200	Wards Gap Rd	153822772	State Rte 679	-80.612008	36.56321	upper	0.32	0.007622058	0.90566897
Carroll	S1200	Sylvatus Smith Rd	153820610	Sylvatus Smith Rd	-80.736655	36.876725	avera	0.11	0.004179089	0.988919275
Fairfax	**S1100**	**I- 495**	**215935350**	**I- 495**	**-77.194245**	**38.797064**	**lower**	**0**	**0.003206199**	**0.110066422**
Fairfax	**S1100**	**I- 495**	**215923141**	**I- 495**	**-77.202087**	**38.946209**	**lower**	**0.03**	**0.022055465**	**0.119485393**

Fairfax	**S1100**	**I- 66**	**76043384**	**Custis Memorial Pkwy**	**-77.284003**	**38.874792**	**avera**	**0.08**	**0.020557674**	**0.278923632**
Fairfax	**S1100**	**I- 66**	**76035027**	**I- 66**	**-77.277171**	**38.876842**	**lower**	**0.03**	**0.026107975**	**0.361050453**
Fairfax	S1100	I- 495	215923073	I- 495	-77.209524	38.932719	lower	0.02	0.014441986	0.369515784
Fairfax	S1100	I- 495	76059641	I- 495	-77.218308	38.831057	upper	0.13	0.005107257	0.38503435
Fairfax	S1100	I- 95	615671182	I- 95	-77.061506	38.795408	avera	0.07	0.01944899	0.400914313
Fairfax	S1100	I- 66	215919802	Custis Memorial Pkwy	-77.222742	38.886139	avera	0.08	0.021512301	0.454625951
Fairfax	S1100	I- 66	215972974	I- 66	-77.427142	38.847293	avera	0.06	0.014676123	0.482037747
Fairfax	S1100	I- 95	629867763	I- 95	-77.130275	38.797048	upper	0.34	0.013446398	0.906951576
Fairfax	S1100	I- 495	76028939	I- 495	-77.20325	38.944292	upper	0.19	0.007459773	0.936391481
Fairfax	S1100	I- 495	215980479	American Legion Memorial Brg	-77.17994	38.967531	upper	0.11	0.004386403	0.968678735
Fairfax	**S1200**	**S Washington St**	**76062943**	**State Rte 400**	**-77.04726**	**38.803727**	**lower**	**0.03**	**0.005392343**	**0.031906845**
Fairfax	**S1200**	**Leesburg Pike**	**619956533**	**State Rte 7**	**-77.362199**	**39.009542**	**upper**	**0.22**	**0.004905951**	**0.039622502**
Fairfax	**S1200**	**Dolley Madison Blvd**	**215950459**	**State Rte 123**	**-77.140966**	**38.942159**	**upper**	**0.18**	**0.004052432**	**0.193590145**
Fairfax	**S1200**	**Telegraph Rd**	**75985698**	**State Rte 611**	**-77.129484**	**38.763154**	**avera**	**0.08**	**0.003408686**	**0.231109965**
Fairfax	**S1200**	**Mount Vernon Memorial Hwy**	**76053189**	**Mount Vernon Memorial Hwy**	**-77.090231**	**38.722524**	**lower**	**0.02**	**0.003489015**	**0.231161836**
Fairfax	**S1200**	**Gallows Rd**	**76031761**	**State Rte 650**	**-77.227563**	**38.880223**	**avera**	**0.06**	**0.002477499**	**0.282524319**
Fairfax	**S1200**	**Lee Hwy**	**75978534**	**State Rte 237**	**-77.206599**	**38.875342**	**avera**	**0.09**	**0.003996068**	**0.355373019**
Fairfax	**S1200**	**Sydenstricker Rd**	**615674962**	**State Rte 640**	**-77.256688**	**38.767719**	**upper**	**0.13**	**0.00301543**	**0.360112463**
Fairfax	S1200	Zion Dr	76057549	State Rte 654	-77.301636	38.807576	avera	0.05	0.002108485	0.416399329
Fairfax	S1200	Pleasant Valley Rd	215978666	State Rte 609	-77.491228	38.856926	upper	0.48	0.010735662	0.477116326
Fairfax	S1200	Washington Dulles Access & Toll Rd	75960611	Washington Dulles Access & Toll Rd	-77.305382	38.948306	upper	0.11	0.002451373	0.478694874
Fairfax	S1200	Spring Hill Rd	215950027	State Rte 684	-77.233143	38.934397	lower	0.03	0.005934156	0.485618585
Fairfax	S1200	Guinea Rd	76057510	Guinea Rd	-77.298496	38.798498	lower	0.02	0.004488092	0.520988069
Fairfax	S1200	Sully Rd	215973967	State Rte 28	-77.439409	38.897021	avera	0.04	0.001937697	0.561678567
Fairfax	S1200	Kirby Rd	615653433	State Rte 695	-77.137017	38.938485	upper	0.13	0.003006978	0.57836555
Fairfax	S1200	Compton Rd	615876936	State Rte 658	-77.430831	38.804985	avera	0.08	0.003349354	0.616386545
Fairfax	S1200	Dranesville Rd	615652595	Dranesville Rd	-77.37837	38.982289	lower	0.01	0.001424151	0.656338986
Fairfax	S1200	Braddock Rd	75980701	Braddock Rd	-77.187938	38.811853	upper	0.15	0.00342746	0.719922444
Fairfax	S1200	Spring Hill Rd	215950006	Spring Hill Rd	-77.233015	38.933275	lower	0.03	0.006021227	0.753739126

Fairfax	S1200	N Patrick St	75993368	N Patrick St	-77.048756	38.815634	avera	0.03	0.006516305	0.805173074
Fairfax	S1200	Washington Dulles Access & Toll Rd	75962966	State Rte 267	-77.191821	38.916719	upper	0.38	0.008419122	0.805792708
Fairfax	S1200	Gallows Rd	75980253	State Rte 711	-77.189717	38.836063	avera	0.09	0.004025647	0.879781752
Fairfax	S1200	S Henry St	75991447	US Hwy 1	-77.051415	38.805405	lower	0.03	0.005940168	0.90566897
Fairfax	S1200	Reston Pkwy	635445008	State Rte 602	-77.346542	38.983171	avera	0.06	0.002698969	0.988919275
Fairfax	**S1400**	**Hollinger Ave**	**629308965**		**-77.410082**	**38.889033**	**lower**	**0.01**	**0.000105767**	**0.118486287**
Fairfax	*S1400*	*Owens View Ct*	*75984514*		*-77.206618*	*38.710994*	*lower*	*0.02*	*0.000345065*	*0.144930154*
Fairfax	**S1400**	**Bramblewood Ln**	**215921452**		**-77.39595**	**38.911087**	**avera**	**0.07**	**0.000212508**	**0.155668397**
Fairfax	**S1400**	**Detwiller Dr**	**619025823**		**-77.42106**	**38.784237**	**upper**	**0.1**	**0.000222702**	**0.281824237**
Fairfax	**S1400**	**Grigsby St**	**75982649**		**-77.128882**	**38.834977**	**avera**	**0.07**	**0.000202428**	**0.31912469**
Fairfax	S1400	Keithley Dr	75956039		-77.348207	39.024208	avera	0.03	0.000502731	0.347739755
Fairfax	S1400	Meyer Woods Ln	614136257		-77.397723	38.899315	lower	0.03	0.000436818	0.573482753
Fairfax	S1400	N Kensington St	215921236		-77.15389	38.910349	avera	0.08	0.000223757	0.611056318
Fairfax	S1400	Locust Hill Dr	76014124		-77.283541	38.965363	upper	0.13	0.000286016	0.660034642
Fairfax	S1400	Barbour Rd	215921108		-77.202608	38.897495	upper	0.1	0.000234162	0.671972791
Fairfax	S1400	Norton Rd	75988761		-77.0933	38.798409	upper	0.18	0.00040686	0.771794952
Fairfax	S1400	Misty Creek Ln	215918968		-77.386225	38.887669	avera	0.05	0.00015447	0.861963322
Halifax	**S1200**	**Mountain Rd**	**90342190**	**State Rte 360**	**-78.981062**	**36.757274**	**lower**	**0.03**	**0.017583148**	**0.031906845**
Halifax	**S1200**	**Bill Tuck Hwy**	**90345675**	**Bill Tuck Hwy**	**-78.790743**	**36.670252**	**upper**	**0.29**	**0.022462109**	**0.039622502**
Halifax	**S1200**	**Philpott Rd**	**90340371**	**US Hwy 360**	**-79.125815**	**36.585574**	**upper**	**0.25**	**0.019336529**	**0.193590145**
Halifax	**S1200**	**Mountain Rd**	**90342149**	**Mountain Rd**	**-79.000503**	**36.753185**	**avera**	**0.13**	**0.009831795**	**0.231109965**
Halifax	**S1200**	**Macdonald Rd**	**90323707**	**Macdonald Rd**	**-78.74977**	**36.746502**	**lower**	**0.02**	**0.011873671**	**0.231161836**
Halifax	**S1200**	**N Main St**	**90310079**	**N Main St**	**-78.898655**	**36.704175**	**avera**	**0.08**	**0.006215883**	**0.282524319**
Halifax	**S1200**	**Scottsburg Rd**	**90331130**	**Scottsburg Rd**	**-78.796605**	**36.763287**	**avera**	**0.16**	**0.011919583**	**0.355373019**
Halifax	**S1200**	**Philpott Rd**	**90358295**	**US Hwy 360**	**-79.002447**	**36.644102**	**upper**	**0.21**	**0.015985368**	**0.360112463**
Halifax	S1200	Wilborn Ave	90345424	US Hwy 501	-78.91174	36.710008	avera	0.07	0.00511662	0.416399329
Halifax	S1200	Philpott Rd	90358681	Philpott Rd	-78.956312	36.671814	upper	0.41	0.032037219	0.477116326
Halifax	S1200	Philpott Rd	90325000	Philpott Rd	-79.02939	36.627734	upper	0.18	0.013656199	0.478694874
Halifax	S1200	L P Bailey Memorial Hwy	90352426	L P Bailey Memorial Hwy	-78.982185	36.967139	lower	0.04	0.019321387	0.485618585
Halifax	S1200	Clarksville Rd	90336255	Clarksville Rd	-78.73596	36.549458	lower	0.03	0.01480383	0.520988069
Halifax	S1200	Mountain Rd	90341425	Mountain Rd	-79.020539	36.754199	avera	0.06	0.004439785	0.561678567

Halifax	S1200	Philpott Rd	90351316	US Hwy 360	-79.035749	36.624761	upper	0.21	0.01586848	0.57836555
Halifax	S1200	Bethel Rd	90308987	State Rte 360	-78.815363	36.780429	avera	0.12	0.009552117	0.616386545
Halifax	S1200	Philpott Rd	90317480	US Hwy 360	-79.157185	36.582886	lower	0.01	0.004677174	0.656338986
Halifax	S1200	Huell Matthews Hwy	90345727	US Hwy 501	-78.900364	36.660426	upper	0.22	0.017208512	0.719922444
Halifax	S1200	L P Bailey Memorial Hwy	90328170	US Hwy 501	-78.992554	36.954239	lower	0.04	0.019507333	0.753739126
Halifax	S1200	Bethel Rd	90331160	Bethel Rd	-78.829036	36.789333	lower	0.04	0.021409578	0.805173074
Halifax	S1200	L P Bailey Memorial Hwy	90347032	US Hwy 501	-79.016196	36.888188	upper	0.39	0.030169957	0.805792708
Halifax	S1200	S Main St	90307619	US Hwy 501	-78.928358	36.763055	avera	0.16	0.012043111	0.879781752
Halifax	S1200	L P Bailey Memorial Hwy	90328167	US Hwy 501	-78.995711	36.950763	lower	0.04	0.019458516	0.90566897
Halifax	S1200	Mountain Rd	90315598	Mountain Rd	-79.100861	36.75311	avera	0.09	0.006904588	0.988919275
Henry	**S1200**	**Figsboro Rd**	**55539436**	**State Rte 108**	**-79.858939**	**36.778266**	**lower**	**0.03**	**0.0274369**	**0.031906845**
Henry	**S1200**	**Greensboro Rd**	**55540305**	**US Hwy 220**	**-79.882119**	**36.560835**	**upper**	**0.33**	**0.027002686**	**0.039622502**
Henry	**S1200**	**William F Stone Hwy**	**55545506**	**US Hwy 58 Byp**	**-79.845292**	**36.628957**	**upper**	**0.26**	**0.021246649**	**0.193590145**
Henry	**S1200**	**Fairy Stone Park Hwy**	**55546141**	**State Rte 57**	**-79.938361**	**36.738987**	**avera**	**0.1**	**0.013940551**	**0.231109965**
Henry	**S1200**	**Fayette St**	**55549340**	**State Rte 457**	**-79.876789**	**36.693179**	**lower**	**0.02**	**0.018461572**	**0.231161836**
Henry	**S1200**	**Fairystone Park Hwy**	**55531465**	**Fairystone Park Hwy**	**-80.062372**	**36.755806**	**avera**	**0.07**	**0.009594164**	**0.282524319**
Henry	**S1200**	**Old Chatham Rd**	**55516795**	**Chatham Heights Rd**	**-79.833869**	**36.705763**	**avera**	**0.13**	**0.017241697**	**0.355373019**
Henry	**S1200**	**Greensboro Rd**	**55541397**	**US Hwy 220 Bus**	**-79.86518**	**36.645341**	**upper**	**0.19**	**0.015598659**	**0.360112463**
Henry	S1200	Fairystone Park Hwy	613280187	Fairystone Park Hwy	-80.089276	36.754895	avera	0.06	0.00760493	0.416399329
Henry	S1200	William F Stone Hwy	55525980	William F Stone Hwy	-79.839486	36.634213	upper	0.67	0.054515797	0.477116326
Henry	S1200	A L Philpott Hwy	55540816	US Hwy 58	-79.995172	36.62281	upper	0.16	0.012655056	0.478694874
Henry	S1200	E Church St	55549918	E Church St	-79.853766	36.691672	lower	0.03	0.03036227	0.485618585
Henry	S1200	Fayette St	55513028	State Rte 57	-79.890518	36.687318	lower	0.02	0.022518389	0.520988069
Henry	S1200	Fayette St	55512907	Fayette St	-79.879356	36.693495	avera	0.05	0.006655679	0.561678567
Henry	S1200	A L Philpott Hwy	55542209	US Hwy 58	-79.741135	36.672249	upper	0.19	0.015514714	0.57836555
Henry	S1200	Chatham Rd	55537749	Chatham Rd	-79.778763	36.728669	avera	0.1	0.013690195	0.616386545
Henry	S1200	Fairystone Park Hwy	55538622	State Rte 57	-80.075593	36.750858	lower	0.01	0.008038333	0.656338986

Henry	S1200	William F Stone Hwy	55525981	US Hwy 58 Byp	-79.832732	36.637938	upper	0.22	0.01795188	0.719922444
Henry	S1200	A L Philpott Hwy	55536835	State Rte 57	-79.835142	36.691776	lower	0.03	0.030551956	0.753739126
Henry	S1200	Greensboro Rd	55541692	US Hwy 220 Bus	-79.882918	36.66203	lower	0.03	0.032574646	0.805173074
Henry	S1200	William F Stone Hwy	55515730	US Hwy 220	-79.956308	36.709953	upper	0.53	0.043377935	0.805792708
Henry	S1200	Chatham Rd	55511739	State Rte 57	-79.713219	36.772135	avera	0.13	0.017448911	0.879781752
Henry	S1200	Figsboro Rd	55524594	State Rte 108	-79.84429	36.794387	lower	0.03	0.030494764	0.90566897
Henry	S1200	Chatham Rd	55536882	State Rte 57	-79.827538	36.695413	avera	0.08	0.01058076	0.988919275
Loudoun	**S1200**	**Silcott Springs Rd**	**635459508**	**Silcott Springs Rd**	**-77.734251**	**39.114023**	**upper**	**0.3**	**0.002490005**	**0.031906845**
Loudoun	**S1200**	**Waxpool Rd**	**613886339**	**Waxpool Rd**	**-77.496233**	**39.015147**	**lower**	**0.02**	**0.00436932**	**0.231109965**
Loudoun	**S1200**	**Dry Hollow Rd**	**62370469**	**Dry Hollow Rd**	**-77.554784**	**39.128138**	**lower**	**0.03**	**0.006417071**	**0.231161836**
Loudoun	**S1200**	**E A St**	**613883853**	**E A St**	**-77.710245**	**39.126926**	**avera**	**0.08**	**0.002153794**	**0.282524319**
Loudoun	**S1200**	**S King St**	**62369139**	**US Hwy 15 Bus**	**-77.56648**	**39.111161**	**lower**	**0.02**	**0.004587199**	**0.355373019**
Loudoun	S1200	Trappe Rd	62364592	State Rte 619	-77.873461	39.036344	avera	0.06	0.001674146	0.416399329
Loudoun	S1200	Berlin Pike	62319333	Berlin Pike	-77.657285	39.224854	upper	0.3	0.002491605	0.485618585
Loudoun	S1200	Forest Mills Rd	62323173	Forest Mills Rd	-77.68524	39.095038	upper	0.21	0.001747554	0.520988069
Loudoun	S1200	Cedar Green Rd	62361965	Cedar Green Rd	-77.445847	38.982579	avera	0.05	0.001418355	0.561678567
Loudoun	S1200	Gleedsville Rd	625139623	Gleedsville Rd	-77.590348	39.076406	avera	0.11	0.003180179	0.616386545
Loudoun	S1200	Spinks Ferry Rd	62321447	Spinks Ferry Rd	-77.477951	39.219311	lower	0.02	0.00517182	0.656338986
Loudoun	S1200	Rodeffer Rd	62372969	State Rte 682	-77.630607	39.238658	upper	0.45	0.003705114	0.753739126
Loudoun	S1200	Trappe Rd	62349658	State Rte 619	-77.865553	39.058091	lower	0.02	0.004819288	0.879781752
Loudoun	S1200	Irish Corner Rd	218965942	State Rte 673	-77.651356	39.283961	upper	0.31	0.002572011	0.90566897
Loudoun	S1200	Bolington Rd	62373597	Bolington Rd	-77.667676	39.243005	avera	0.09	0.002474789	0.988919275
Loudoun	*S1400*	*Baffin Pl*	*632686919*		*-77.719981*	*39.140218*	*lower*	*0.02*	*0.000808111*	*0.118486287*
Loudoun	**S1400**	**Ocala Cir**	**62373879**		**-77.492987**	**38.892893**	**lower**	**0.03**	**0.001136486**	**0.144930154**
Loudoun	**S1400**	**Pepperbush Pl**	**62374024**	**Pepperbush Pl**	**-77.550314**	**38.930064**	**avera**	**0.1**	**0.000513584**	**0.155668397**
Loudoun	*S1400*	*Wildwood Ln*	*62361341*		*-77.779042*	*38.976212*	*upper*	*0.26*	*0.001131654*	*0.281824237*
Loudoun	**S1400**	**Briarwood Ct**	**62330700**		**-77.402065**	**38.986436**	**avera**	**0.09**	**0.000476961**	**0.31912469**
Loudoun	S1400	Morven Park Rd NW	62329796		-77.573	39.121276	upper	0.23	0.00099298	0.347739755
Loudoun	S1400	S Cameron St	62331958		-77.38979	38.997077	upper	0.18	0.000787466	0.573482753
Loudoun	S1400	Thurmont Ter	62346734		-77.395857	39.029813	lower	0.02	0.000786381	0.611056318

Loudoun	S1400	E St	62319060		-77.709166	39.132281	avera	0.06	0.000308924	0.861963322
Mecklenburg	**S1100**	**I- 85**	**54338612**		**-78.027564**	**36.775893**	**lower**	**0.02**	**0.16571469**	**0.110066422**
Mecklenburg	**S1100**	**I- 85**	**54330887**		**-78.072726**	**36.765174**	**upper**	**0.44**	**0.037307952**	**0.119485393**
Mecklenburg	**S1100**	**I- 85**	**54317832**		**-78.178445**	**36.567027**	**avera**	**0.15**	**0.154439477**	**0.278923632**
Mecklenburg	S1100	I- 85	54318893		-78.099776	36.739584	upper	0.75	0.06356253	0.361050453
Mecklenburg	S1100	I- 85	54336168		-78.113436	36.713861	lower	0.03	0.298903593	0.369515784
Mecklenburg	S1100	I- 85	54335184		-78.09733	36.746009	avera	0.14	0.145676472	0.400914313
Mecklenburg	S1100	I- 85	54329789		-78.097402	36.744809	lower	0.02	0.159012816	0.454625951
Mecklenburg	S1100	I- 85	54321551		-78.028685	36.775525	avera	0.11	0.115519367	0.482037747
Mecklenburg	S1100	I- 85	54336051		-78.1758	36.573976	upper	0.84	0.071221645	0.968678735
Mecklenburg	**S1200**	**N Mecklenburg Ave**	**54316753**	**N Mecklenburg Ave**	**-78.105388**	**36.747228**	**upper**	**0.3**	**0.013989394**	**0.031906845**
Mecklenburg	**S1200**	**US Hwy 1**	**54328101**		**-78.215188**	**36.659052**	**lower**	**0.03**	**0.014834487**	**0.231109965**
Mecklenburg	**S1200**	**N Main St**	**54296478**	**N Main St**	**-78.459537**	**36.801354**	**lower**	**0.04**	**0.02128831**	**0.231161836**
Mecklenburg	**S1200**	**US Hwy 58**	**54322619**		**-78.410934**	**36.661917**	**avera**	**0.11**	**0.007079518**	**0.282524319**
Mecklenburg	**S1200**	**E 2nd St**	**54319218**	**State Rte 49**	**-78.46021**	**36.798838**	**lower**	**0.03**	**0.015584105**	**0.355373019**
Mecklenburg	S1200	Virginia Ave	54299717	State Rte 49	-78.554552	36.625906	avera	0.08	0.005555345	0.416399329
Mecklenburg	S1200	US Hwy 1	54325748		-78.200132	36.54948	upper	0.3	0.014018317	0.485618585
Mecklenburg	S1200	US Hwy 1	54328207		-78.044468	36.766878	upper	0.23	0.010800815	0.520988069
Mecklenburg	S1200	US Hwy 58	54304347		-78.063586	36.701478	avera	0.07	0.004650369	0.561678567
Mecklenburg	S1200	State Rte 92	614353762		-78.405081	36.703698	avera	0.16	0.010696627	0.616386545
Mecklenburg	S1200	State Rte 49	54305398		-78.655639	36.576803	lower	0.03	0.017767615	0.656338986
Mecklenburg	S1200	W Danville St	635389889	W Danville St	-78.155003	36.719623	upper	0.42	0.019681498	0.753739126
Mecklenburg	S1200	State Rte 47	54298162		-78.189112	36.772143	lower	0.03	0.016453432	0.879781752
Mecklenburg	S1200	US Hwy 58	54331838		-78.457831	36.653912	upper	0.3	0.014350092	0.90566897
Mecklenburg	S1200	State Rte 49	54315003		-78.645344	36.583819	avera	0.12	0.008193821	0.988919275
Prince George	**S1100**	**I- 295**	**54191756**		**-77.335216**	**37.301148**	**upper**	**0.37**	**0.012265418**	**0.110066422**
Prince George	**S1100**	**I- 95**	**54215916**		**-77.35848**	**37.19093**	**lower**	**0.01**	**0.018200703**	**0.278923632**
Prince George	S1100	I- 295	635262885		-77.294563	37.230488	upper	0.97	0.03230979	0.369515784
Prince George	S1100	I- 95	54213740	I- 95	-77.395394	37.228509	avera	0.09	0.032068499	0.400914313

Prince George	S1100	I- 295	54196129		-77.322518	37.266674	lower	0.03	0.061241662	0.454625951
Prince George	S1100	I- 95	54217003	I- 95	-77.389122	37.218467	avera	0.07	0.025398235	0.482037747
Prince George	**S1200**	**S Crater Rd**	**54146870**	**US Hwy 301**	**-77.356738**	**37.10249**	**upper**	**0.59**	**0.033514519**	**0.031906845**
Prince George	**S1200**	**Prince George Dr**	**54182637**	**Prince George Dr**	**-77.275525**	**37.15585**	**lower**	**0.03**	**0.014153355**	**0.231109965**
Prince George	**S1200**	**Prince George Dr**	**54154319**	**Prince George Dr**	**-77.259922**	**37.22188**	**upper**	**0.25**	**0.014090608**	**0.231161836**
Prince George	**S1200**	**N 6th Ave**	**54149335**	**N 6th Ave**	**-77.293259**	**37.307405**	**avera**	**0.07**	**0.006657855**	**0.282524319**
Prince George	S1200	S Crater Rd	54152587	S Crater Rd	-77.374978	37.194117	lower	0.03	0.014515972	0.355373019
Prince George	S1200	Wagner Rd	613898602	Wagner Rd	-77.351264	37.190595	avera	0.06	0.005027503	0.416399329
Prince George	S1200	James River Dr	54189997	James River Dr	-77.234938	37.285515	upper	0.4	0.022935627	0.520988069
Prince George	S1200	Bollingbrook St	54150939	US Hwy 301	-77.403432	37.232656	avera	0.05	0.004360714	0.561678567
Prince George	S1200	E Bank St	54215382	State Rte 36	-77.388568	37.234998	lower	0.01	0.004039825	0.616386545
Prince George	S1200	County Dr	54182270	US Hwy 460	-77.244505	37.136026	upper	0.18	0.010047269	0.656338986
Prince George	S1200	E Washington St	54216614	E Washington St	-77.365473	37.239703	lower	0.03	0.015479191	0.879781752
Prince George	S1200	James River Dr	54185691	James River Dr	-77.176587	37.258638	avera	0.09	0.007731055	0.988919275
Prince George	**S1400**	**Old Town Rd**	**54183506**	**State Rte 666**	**-77.172039**	**37.203505**	**upper**	**0.19**	**0.000946147**	**0.118486287**
Prince George	**S1400**	**Defense Rd**	**54212859**		**-77.431299**	**37.198053**	**upper**	**0.35**	**0.00176736**	**0.144930154**
Prince George	S1400	Old Keswick Ln	54181586	State Rte 770	-77.390818	37.126228	lower	0.01	0.000565269	0.155668397
Prince George	S1400	W Quaker Rd	54182912	State Rte 629	-77.291952	37.185495	avera	0.09	0.000676825	0.31912469
Prince George	S1400	W City Point Rd	54196737		-77.305036	37.299507	lower	0.03	0.00134916	0.611056318
Prince George	S1400	Walnut St	54151645		-77.40616	37.210007	avera	0.07	0.000474919	0.861963322
Rockbridge	**S1100**	**I- 64**	**632946021**	**I- 64**	**-79.548914**	**37.882347**	**avera**	**0.12**	**0.063326731**	**0.13723092**

Rockbridge	**S1100**	**I- 64**	**63115658**	**I- 64**	**-79.263281**	**37.906288**	**avera**	**0.12**	**0.060913783**	**0.155402958**
Rockbridge	**S1100**	**I- 64**	**629401837**		**-79.425135**	**37.805214**	**lower**	**0.01**	**0.043826333**	**0.328258545**
Rockbridge	S1100	Blue Ridge Pkwy	63129620		-79.212343	37.796423	upper	0.73	0.021721672	0.425819109
Rockbridge	S1100	I- 81	63112004		-79.507226	37.668596	avera	0.09	0.044972217	0.569298133
Rockbridge	S1100	I- 81	63112000		-79.506268	37.671016	lower	0.03	0.080797892	0.601253365
Rockbridge	S1100	I- 81	215054828		-79.409564	37.756814	lower	0.01	0.044571829	0.895027267
Rockbridge	S1100	Blue Ridge Pkwy	63129627		-79.177778	37.812208	upper	0.49	0.014603033	0.916689185
Rockbridge	S1100	I- 64	63124244	I- 81	-79.361962	37.849841	upper	0.65	0.019284496	0.991254482
Rockbridge	**S1200**	**S Lee Hwy**	**63112699**	**US Hwy 11**	**-79.486735**	**37.690302**	**upper**	**0.32**	**0.019338791**	**0.031906845**
Rockbridge	**S1200**	**Brownsburg Tpke**	**215049318**	**State Rte 252**	**-79.370928**	**37.888851**	**lower**	**0.02**	**0.016207538**	**0.231109965**
Rockbridge	**S1200**	**Virginia Ave**	**625330408**	**Virginia Ave**	**-79.450875**	**38.029529**	**lower**	**0.03**	**0.025593627**	**0.231161836**
Rockbridge	**S1200**	**N Lee Hwy**	**623970722**	**N Lee Hwy**	**-79.267911**	**37.888813**	**avera**	**0.08**	**0.00744277**	**0.282524319**
Rockbridge	**S1200**	**Maury River Rd**	**613916685**	**Maury River Rd**	**-79.381421**	**37.880547**	**lower**	**0.02**	**0.017235681**	**0.355373019**
Rockbridge	S1200	Collierstown Rd	63127888	Collierstown Rd	-79.483545	37.757407	avera	0.06	0.005447425	0.416399329
Rockbridge	S1200	S Lee Hwy	63125103	US Hwy 11	-79.564908	37.6294	upper	0.33	0.019759728	0.485618585
Rockbridge	S1200	Blue Ridge Pkwy	215064295		-79.306243	37.736611	upper	0.24	0.014132305	0.520988069
Rockbridge	S1200	S Main St	63116059	US Hwy 11	-79.447064	37.780235	avera	0.05	0.004513313	0.561678567
Rockbridge	S1200	N Lee Hwy	63130769	US Hwy 11	-79.36125	37.842774	avera	0.13	0.01170608	0.616386545
Rockbridge	S1200	Va Ave	63106542	Va Ave	-79.497595	37.988316	lower	0.02	0.020845174	0.656338986
Rockbridge	S1200	Collierstown Rd	63108388	State Rte 251	-79.555047	37.763899	upper	0.54	0.032309529	0.753739126
Rockbridge	S1200	S Main St	63144179	US Hwy 11	-79.449044	37.777261	lower	0.02	0.019061535	0.879781752
Rockbridge	S1200	Maury River Rd	629922756	State Rte 39	-79.496237	37.966767	upper	0.34	0.020220962	0.90566897
Rockbridge	S1200	Virginia Ave	215052218	Virginia Ave	-79.456592	38.022618	avera	0.1	0.00845471	0.988919275
Shenandoah	**S1100**	**I- 81**	**55953058**		**-78.336559**	**39.008773**	**lower**	**0.02**	**0.056020982**	**0.110066422**
Shenandoah	**S1100**	**I- 81**	**55958230**		**-78.370144**	**39.009106**	**upper**	**0.42**	**0.022164659**	**0.119485393**
Shenandoah	**S1100**	**I- 81**	**55950351**		**-78.387214**	**39.000866**	**avera**	**0.17**	**0.045436477**	**0.278923632**
Shenandoah	S1100	I- 81	55941144		-78.549442	38.847177	upper	0.52	0.027730654	0.361050453
Shenandoah	S1100	I- 81	55944731		-78.533281	38.861758	lower	0.04	0.087918323	0.369515784
Shenandoah	S1100	I- 81	55944862		-78.620267	38.774279	avera	0.15	0.041953805	0.400914313
Shenandoah	S1100	I- 81	55942171		-78.450659	38.95521	lower	0.02	0.052569051	0.454625951
Shenandoah	S1100	I- 81	616406561		-78.618908	38.775823	avera	0.1	0.026947489	0.482037747
Shenandoah	S1100	I- 81	55952650		-78.680445	38.641357	upper	0.57	0.030342021	0.968678735

Shenandoah	**S1200**	**Orkney Grade**	**55947875**	**Orkney Grade**	**-78.751394**	**38.773155**	**upper**	**0.4**	**0.041446619**	**0.031906845**
Shenandoah	**S1200**	**Senedo Rd**	**55947878**	**Senedo Rd**	**-78.741973**	**38.778053**	**lower**	**0.03**	**0.025759436**	**0.231109965**
Shenandoah	**S1200**	**Main St**	**55930504**	**US Hwy 11**	**-78.598641**	**38.784008**	**lower**	**0.04**	**0.037828701**	**0.231161836**
Shenandoah	**S1200**	**Main St**	**55930518**	**Main St**	**-78.60676**	**38.779664**	**avera**	**0.1**	**0.012751675**	**0.282524319**
Shenandoah	**S1200**	**Main St**	**55926873**	**US Hwy 11**	**-78.466964**	**38.925074**	**lower**	**0.03**	**0.026566939**	**0.355373019**
Shenandoah	S1200	Old Valley Pike	55943227	Old Valley Pike	-78.317569	39.006956	avera	0.08	0.009758741	0.416399329
Shenandoah	S1200	Senedo Rd	55928978	Senedo Rd	-78.632254	38.873759	upper	0.41	0.04196963	0.485618585
Shenandoah	S1200	W Lee Hwy	55940509	W Lee Hwy	-78.695102	38.648303	upper	0.3	0.031103286	0.520988069
Shenandoah	S1200	S Congress St	55940895	US Hwy 11	-78.679185	38.637717	avera	0.07	0.008257929	0.561678567
Shenandoah	S1200	Senedo Rd	55944456	Senedo Rd	-78.734761	38.784392	avera	0.19	0.023625729	0.616386545
Shenandoah	S1200	Stoney Creek Rd	55930612		-78.577762	38.830541	lower	0.03	0.03075297	0.656338986
Shenandoah	S1200	Senedo Rd	55929123	Senedo Rd	-78.693047	38.826448	upper	0.52	0.053256011	0.753739126
Shenandoah	S1200	Old Valley Pike	55935012	US Hwy 11	-78.37009	38.989393	lower	0.03	0.028227188	0.879781752
Shenandoah	S1200	Senedo Rd	55945797	State Rte 42	-78.729425	38.710849	upper	0.42	0.043217579	0.90566897
Shenandoah	S1200	Main St	55930884	Old Valley Pike	-78.569491	38.820796	avera	0.12	0.014684457	0.988919275
Southampton	**S1200**	**Delaware Rd**	**82714293**	**State Rte 687**	**-76.965298**	**36.694743**	**lower**	**0.03**	**0.035065915**	**0.031906845**
Southampton	**S1200**	**Meherrin Rd**	**82723978**	**State Rte 35**	**-77.126308**	**36.674977**	**upper**	**0.39**	**0.040851698**	**0.039622502**
Southampton	**S1200**	**S Quay Rd**	**82723466**	**State Rte 189**	**-76.911281**	**36.619522**	**upper**	**0.32**	**0.033482992**	**0.193590145**
Southampton	**S1200**	**Smiths Ferry Rd**	**82708104**	**Smiths Ferry Rd**	**-76.940966**	**36.57874**	**avera**	**0.15**	**0.019651068**	**0.231109965**
Southampton	**S1200**	**Pittman Rd**	**82715448**	**State Rte 186**	**-77.203915**	**36.581159**	**lower**	**0.02**	**0.023212947**	**0.231161836**
Southampton	**S1200**	**Southampton Pkwy**	**82728572**	**US Hwy 58**	**-77.035611**	**36.694968**	**avera**	**0.09**	**0.012208096**	**0.282524319**
Southampton	**S1200**	**Plank Rd**	**82720025**	**Plank Rd**	**-77.12803**	**36.806168**	**avera**	**0.19**	**0.024294781**	**0.355373019**
Southampton	**S1200**	**Southampton Pkwy**	**82723968**	**Southampton Pkwy**	**-77.297301**	**36.70674**	**upper**	**0.26**	**0.026959573**	**0.360112463**
Southampton	S1200	Jerusalem Rd	82728532	Jerusalem Rd	-77.041799	36.697508	avera	0.07	0.009621568	0.416399329
Southampton	S1200	Southampton Pkwy	82728130	US Hwy 58	-76.973768	36.672213	upper	0.75	0.079017966	0.477116326
Southampton	S1200	Southampton Pkwy	632946276	Southampton Pkwy	-76.915861	36.649946	upper	0.23	0.023917087	0.478694874
Southampton	S1200	Meherrin Rd	82721689	Meherrin Rd	-77.110012	36.692411	lower	0.04	0.03901083	0.485618585
Southampton	S1200	Hunterdale Rd	82733054	Hunterdale Rd	-76.957983	36.696824	lower	0.03	0.028998216	0.520988069
Southampton	S1200	Pittman Rd	82712685	State Rte 186	-77.220122	36.577241	avera	0.06	0.008362582	0.561678567
Southampton	S1200	Three Creeks Rd	82710058	Three Creeks Rd	-77.257302	36.730842	upper	0.25	0.026919618	0.57836555
Southampton	S1200	Southampton Pkwy	82710496	US Hwy 58	-77.173753	36.707103	avera	0.14	0.018699142	0.616386545
Southampton	S1200	Southampton Pkwy	82719187	Southampton Pkwy	-76.958672	36.665962	lower	0.01	0.00972411	0.656338986

Southampton	S1200	Southampton Pkwy	82725658	US Hwy 58	-77.236698	36.701917	upper	0.28	0.029616252	0.719922444
Southampton	S1200	Camp Pkwy	624475627	Camp Pkwy	-76.987788	36.690231	lower	0.04	0.040062605	0.753739126
Southampton	S1200	Southampton Pkwy	82726348	US Hwy 58	-77.102438	36.701243	lower	0.04	0.044219091	0.805173074
Southampton	S1200	Hugo Rd	82712212	Hugo Rd	-77.266547	36.562154	upper	0.59	0.062636698	0.805792708
Southampton	S1200	Dale Cir	82706708	Dale Cir	-76.964233	36.701016	avera	0.19	0.024789845	0.879781752
Southampton	S1200	Southampton Pkwy	82729910	Southampton Pkwy	-77.481509	36.680736	lower	0.04	0.039027027	0.90566897
Southampton	S1200	General Mahone Blvd	82723803	US Hwy 460	-76.870613	36.891844	avera	0.11	0.013869911	0.988919275
Southeast	**S1100**	**I- 664**	**613347996**		**-76.426664**	**36.89348**	**lower**	**0.01**	**0.003920213**	**0.110066422**
Southeast	**S1100**	**I- 64**	**121772975**		**-76.233986**	**36.784156**	**lower**	**0.02**	**0.018446689**	**0.119485393**
Southeast	**S1100**	**I- 664**	**122241922**		**-76.429458**	**36.88639**	**avera**	**0.07**	**0.018292537**	**0.278923632**
Southeast	**S1100**	**I- 664**	**121799963**		**-76.422797**	**36.786467**	**lower**	**0.03**	**0.024467321**	**0.361050453**
Southeast	S1100	I- 64	122139347		-76.295709	36.966998	lower	0.01	0.011363409	0.369515784
Southeast	S1100	I- 64	122134346		-76.254185	36.905424	upper	0.15	0.005146803	0.38503435
Southeast	S1100	I- 64	122151403		-76.196515	36.845524	avera	0.07	0.017017977	0.400914313
Southeast	S1100	I- 264	122139207	US Hwy 460 Alt	-76.287057	36.83813	avera	0.08	0.019307108	0.454625951
Southeast	S1100	I- 264	122203501	I- 264	-76.294973	36.832148	avera	0.05	0.013124234	0.482037747
Southeast	S1100	I- 264	121798692		-76.402841	36.78645	upper	0.34	0.012078283	0.906951576
Southeast	S1100	I- 64	122149544		-76.232646	36.893683	upper	0.22	0.007864678	0.936391481
Southeast	S1100	I- 264	613585641	State Rte 44	-76.08616	36.838668	upper	0.12	0.004124504	0.968678735
Southeast	**S1200**	**Western Fwy**	**122196907**	**Western Fwy**	**-76.352291**	**36.864851**	**lower**	**0.03**	**0.004349784**	**0.031906845**
Southeast	**S1200**	**Holland Rd**	**122239403**	**Holland Rd**	**-76.753473**	**36.689352**	**upper**	**0.25**	**0.00462967**	**0.039622502**
Southeast	**S1200**	**College Dr**	**122248412**	**State Rte 135**	**-76.428289**	**36.885749**	**upper**	**0.19**	**0.003514949**	**0.193590145**
Southeast	**S1200**	**N Military Hwy**	**122139409**	**N Military Hwy**	**-76.211604**	**36.878444**	**avera**	**0.07**	**0.002487967**	**0.231109965**
Southeast	**S1200**	**Chesapeake Blvd**	**613342191**	**State Rte 194**	**-76.243973**	**36.946809**	**lower**	**0.02**	**0.002828599**	**0.231161836**
Southeast	**S1200**	**Virginia Beach Blvd**	**122278667**	**Virginia Beach Blvd**	**-76.141461**	**36.843747**	**avera**	**0.05**	**0.001764515**	**0.282524319**
Southeast	**S1200**	**Kempsville Rd**	**613588585**	**Kempsville Rd**	**-76.166559**	**36.810992**	**avera**	**0.09**	**0.003040432**	**0.355373019**
Southeast	**S1200**	**N Military Hwy**	**122130382**	**N Military Hwy**	**-76.210026**	**36.846747**	**upper**	**0.14**	**0.002532526**	**0.360112463**
Southeast	S1200	Whaleyville Blvd	122239471	Co Rd 759	-76.650477	36.645831	avera	0.05	0.001566408	0.416399329
Southeast	S1200	Great Brg Byp	121796655	Great Brg Byp	-76.214699	36.624604	upper	1.06	0.019301646	0.477116326
Southeast	S1200	Lynnhaven Pkwy	122269909	State Rte 414	-76.072879	36.810288	upper	0.11	0.001948237	0.478694874
Southeast	S1200	State Rte 165	122145961	State Rte 165	-76.251583	36.915655	lower	0.03	0.004826921	0.485618585

Southeast	S1200	Virginia Beach Blvd	122301960	US Hwy 58 Bus	-75.993957	36.841917	lower	0.02	0.003530087	0.520988069
Southeast	S1200	Pacific Ave	122299387	Pacific Ave	-75.976384	36.848352	avera	0.04	0.001436628	0.561678567
Southeast	S1200	S Military Hwy	121798427	US Hwy 13	-76.349179	36.772344	upper	0.14	0.002519444	0.57836555
Southeast	S1200	Dominion Blvd N	613352389	State Rte 104	-76.277756	36.751996	avera	0.07	0.002445297	0.616386545
Southeast	S1200	Shore Dr	122300106	US Hwy 60	-76.06851	36.912359	lower	0.01	0.00128212	0.656338986
Southeast	S1200	S Military Hwy	635390025	US Hwy 13	-76.403587	36.784314	upper	0.16	0.002884724	0.719922444
Southeast	S1200	Bridge Rd	122245925	US Hwy 17	-76.490161	36.875151	lower	0.03	0.00486412	0.753739126
Southeast	S1200	High St W	122202292	High St W	-76.398645	36.861378	lower	0.03	0.005274464	0.805173074
Southeast	S1200	S Military Hwy	121769546	US Hwy 13	-76.302549	36.773904	upper	0.62	0.011236868	0.805792708
Southeast	S1200	Battlefield Blvd S	121775896	State Rte 168	-76.236258	36.706771	avera	0.09	0.003083171	0.879781752
Southeast	S1200	High St W	122198748	US Hwy 17	-76.377373	36.850573	lower	0.03	0.004827086	0.90566897
Southeast	S1200	Bridge Rd	613345632	Bridge Rd	-76.46349	36.862117	avera	0.06	0.001910525	0.988919275
Southeast	**S1400**	**Saint Brides Rd E**	**121789244**		**-76.201069**	**36.605457**	**lower**	**0.01**	**9.99872E-05**	**0.118486287**
Southeast	**S1400**	**Broad Bay Rd**	**122261045**		**-76.054016**	**36.906306**	**lower**	**0.02**	**0.000328504**	**0.144930154**
Southeast	**S1400**	**Gladesdale Dr**	**121778486**		**-76.20926**	**36.693162**	**avera**	**0.07**	**0.000162317**	**0.155668397**
Southeast	**S1400**	**Cannon Point Dr**	**121768136**		**-76.396328**	**36.840145**	**upper**	**0.1**	**0.000169555**	**0.281824237**
Southeast	S1400	Inlet Rd	122125130		-76.221054	36.933181	avera	0.07	0.000154337	0.31912469
Southeast	S1400	Loper Ln	122296613		-76.123263	36.814818	lower	0.03	0.000475665	0.347739755
Southeast	S1400	Orange St	122200699		-76.354144	36.838301	lower	0.03	0.000415325	0.573482753
Southeast	S1400	Ingleside Rd	122129316		-76.236611	36.849557	avera	0.07	0.000171809	0.611056318
Southeast	S1400	Cotton Farm Ln	122221465		-76.531073	36.891166	upper	0.13	0.000220891	0.660034642
Southeast	S1400	Hollygreen Dr	122288575		-76.093585	36.812138	upper	0.1	0.00017772	0.671972791
Southeast	S1400	Woodland Dr	121789435		-76.410678	36.805301	upper	0.2	0.000335025	0.771794952
Southeast	S1400	de Bree Ave	122123386		-76.287547	36.874143	avera	0.05	0.00011768	0.861963322
Stafford	**S1100**	**I- 95**	**25569759**		**-77.419463**	**38.429042**	**upper**	**0.39**	**0.026432985**	**0.110066422**
Stafford	**S1100**	**I- 95**	**25574806**		**-77.409373**	**38.461364**	**lower**	**0.01**	**0.035100845**	**0.278923632**
Stafford	S1100	I- 95	25567753		-77.374318	38.515775	upper	0.69	0.047171652	0.369515784
Stafford	S1100	I- 95	25569621		-77.404275	38.470972	avera	0.1	0.18574803	0.400914313
Stafford	S1100	I- 95	632544754		-77.466154	38.369048	lower	0.02	0.154625331	0.454625951
Stafford	S1100	I- 95	228325847		-77.501009	38.326842	avera	0.05	0.091167924	0.482037747
Stafford	**S1200**	**Jefferson Davis Hwy**	**25579699**	**US Hwy 1**	**-77.40611**	**38.455027**	**upper**	**0.47**	**0.047709999**	**0.031906845**

Stafford	**S1200**	**Jefferson Davis Hwy**	**25580632**	**US Hwy 1**	**-77.373594**	**38.506355**	**lower**	**0.03**	**0.024868936**	**0.231109965**
Stafford	**S1200**	**Jefferson Davis Hwy**	**25579752**	**US Hwy 1**	**-77.415715**	**38.408141**	**upper**	**0.22**	**0.022709624**	**0.231161836**
Stafford	**S1200**	**Jefferson Davis Hwy**	**25576545**	**US Hwy 1**	**-77.411015**	**38.413506**	**avera**	**0.08**	**0.016827295**	**0.282524319**
Stafford	S1200	White Oak Rd	25578619	State Rte 218	-77.426929	38.311194	lower	0.03	0.02556951	0.355373019
Stafford	S1200	Cambridge St	25565633	US Hwy 1	-77.458002	38.351468	avera	0.06	0.012430985	0.416399329
Stafford	S1200	Jefferson Davis Hwy	25567566	Jefferson Davis Hwy	-77.423408	38.400631	upper	0.36	0.036213368	0.520988069
Stafford	S1200	Kings Hwy	228326424	State Rte 3	-77.370437	38.253274	avera	0.05	0.010965692	0.561678567
Stafford	S1200	Jefferson Davis Hwy	630599046	US Hwy 1	-77.376932	38.49749	lower	0.01	0.007603805	0.616386545
Stafford	S1200	Warrenton Rd	25567491	Warrenton Rd	-77.614506	38.420752	upper	0.17	0.017241509	0.656338986
Stafford	S1200	Jefferson Davis Hwy	25576623	Jefferson Davis Hwy	-77.370041	38.510195	lower	0.03	0.026466619	0.879781752
Stafford	S1200	Jefferson Davis Hwy	25554244	US Hwy 1	-77.407516	38.426113	avera	0.09	0.019674842	0.988919275
Stafford	**S1400**	**Spyglass Ln**	**228324383**		**-77.497185**	**38.470349**	**upper**	**0.17**	**0.0007636**	**0.118486287**
Stafford	**S1400**	**Ridgeway Rd**	**25563486**		**-77.548414**	**38.516365**	**upper**	**0.3**	**0.001299526**	**0.144930154**
Stafford	S1400	Marjorie Ln	228325978		-77.515579	38.461364	lower	0.01	0.000440637	0.155668397
Stafford	S1400	Banks Ford Pkwy	632546078		-77.520357	38.354998	avera	0.1	0.000576686	0.31912469
Stafford	S1400	Hollywood Farm Rd	25573513	Co Rd 601	-77.351728	38.263478	lower	0.03	0.001219427	0.611056318
Stafford	S1400	Krieger Ln	632546425		-77.496708	38.332131	avera	0.07	0.000401301	0.861963322
Tazewell	**S1200**	**Tazewell Ave**	**47313215**	**State Rte 16**	**-81.526589**	**37.129798**	**lower**	**0.02**	**0.021157632**	**0.031906845**
Tazewell	**S1200**	**Trl of the Lonesome Pine**	**47329470**	**US Hwy 19**	**-81.450354**	**37.171149**	**upper**	**0.35**	**0.020616327**	**0.039622502**
Tazewell	**S1200**	**Adria Rd**	**47313146**	**State Rte 16**	**-81.542032**	**37.161656**	**upper**	**0.28**	**0.016371451**	**0.193590145**
Tazewell	**S1200**	**Trl of the Lonesome Pine**	**47324900**	**Trl of the Lonesome Pine**	**-81.384568**	**37.201884**	**avera**	**0.09**	**0.01209515**	**0.231109965**
Tazewell	**S1200**	**W Riverside Dr**	**47291617**	**W Riverside Dr**	**-81.536646**	**37.130201**	**lower**	**0.01**	**0.013129128**	**0.231161836**
Tazewell	**S1200**	**State Rte 616**	**47312633**	**State Rte 621**	**-81.783722**	**37.196369**	**avera**	**0.06**	**0.007673903**	**0.282524319**
Tazewell	**S1200**	**Adria Rd**	**47320869**	**State Rte 16**	**-81.544111**	**37.147464**	**avera**	**0.11**	**0.014941123**	**0.355373019**
Tazewell	**S1200**	**State Rte 61**	**47305503**		**-81.372987**	**37.146141**	**upper**	**0.19**	**0.011119501**	**0.360112463**
Tazewell	S1200	State Rte 91	47317246		-81.612355	37.076708	avera	0.04	0.005984328	0.416399329
Tazewell	S1200	Buchanan Hwy	47336580	Buchanan Hwy	-81.523698	37.035847	upper	0.83	0.048546341	0.477116326
Tazewell	S1200	State Rte 61	47321830		-81.37635	37.144153	upper	0.15	0.008498121	0.478694874
Tazewell	S1200	Fincastle Tpke	613925118	Fincastle Tpke	-81.504229	37.122757	lower	0.02	0.022962665	0.485618585

Tazewell	S1200	Cedar Valley Dr	47315408	State Rte 631	-81.763274	37.088016	lower	0.02	0.016790457	0.520988069
Tazewell	S1200	State Rte 102	47322719		-81.279749	37.261742	avera	0.04	0.005158636	0.561678567
Tazewell	S1200	State Rte 61	47314908		-81.294365	37.177796	upper	0.19	0.011048031	0.57836555
Tazewell	S1200	State Rte 61	47314911		-81.291573	37.17946	avera	0.09	0.011784812	0.616386545
Tazewell	S1200	Bigcreek Rd	47323426	Bigcreek Rd	-81.795894	37.101989	lower	0.01	0.005877449	0.656338986
Tazewell	S1200	Steelburg Hwy	47315521	US Hwy 19	-81.760217	37.059159	upper	0.23	0.013470455	0.719922444
Tazewell	S1200	Main St	47297910	US Hwy 19 Bus	-81.519568	37.116012	lower	0.02	0.023327418	0.753739126
Tazewell	S1200	Valley Dale St	47308546	State Rte 720	-81.261422	37.237605	lower	0.03	0.024928387	0.805173074
Tazewell	S1200	Clinch Mt Rd	47336696	Clinch Mt Rd	-81.650817	36.999715	upper	0.68	0.03962028	0.805792708
Tazewell	S1200	US Hwy 460	47331127		-81.28665	37.233762	avera	0.11	0.015182452	0.879781752
Tazewell	S1200	US Hwy 19 Bus	47297173	US Hwy 460 Bus	-81.573164	37.11925	lower	0.02	0.023020828	0.90566897
Tazewell	S1200	Trl of the Lonesome Pine	47331795	US Hwy 19	-81.688092	37.086706	avera	0.07	0.008751243	0.988919275
Washington	**S1100**	**I- 81**	**154344552**	**US Hwy 58**	**-82.17705**	**36.625954**	**upper**	**0.47**	**0.014671742**	**0.110066422**
Washington	**S1100**	**I- 381**	**154381240**	**Commonwealth Ave**	**-82.193341**	**36.6082**	**lower**	**0.01**	**0.020231769**	**0.278923632**
Washington	S1100	I- 81	230659142		-81.845351	36.761409	upper	0.93	0.029183214	0.369515784
Washington	S1100	I- 81	230646558		-81.745338	36.780259	avera	0.11	0.046623553	0.400914313
Washington	S1100	I- 81	622726240	US Hwy 58	-82.016355	36.692525	lower	0.02	0.068525446	0.454625951
Washington	S1100	I- 381	154383818	I- 381	-82.193886	36.610252	avera	0.07	0.030996682	0.482037747
Washington	**S1200**	**Hayters Gap Rd**	**154360485**	**Hayters Gap Rd**	**-81.941023**	**36.862587**	**upper**	**0.81**	**0.041658824**	**0.031906845**
Washington	**S1200**	**Cumberland St**	**154347707**	**Cumberland St**	**-82.187445**	**36.598282**	**lower**	**0.02**	**0.009868847**	**0.231109965**
Washington	**S1200**	**Crescent Rd**	**154376466**	**State Rte 91**	**-81.767501**	**36.814862**	**upper**	**0.24**	**0.012610034**	**0.231161836**
Washington	**S1200**	**US Hwy 58**	**230645112**	**Jeb Stuart Hwy**	**-81.672965**	**36.656388**	**avera**	**0.08**	**0.005364125**	**0.282524319**
Washington	S1200	Lee Hwy	154375367	US Hwy 19	-82.065458	36.665166	lower	0.02	0.010433063	0.355373019
Washington	S1200	US Hwy 58	154378199	US Hwy 58	-81.648784	36.62683	avera	0.05	0.003856541	0.416399329
Washington	S1200	Lee Hwy	154363311	US Hwy 11	-81.757374	36.778042	upper	0.37	0.019207213	0.520988069
Washington	S1200	Lee Hwy	154353426	US Hwy 11	-82.092438	36.649722	avera	0.04	0.003137969	0.561678567
Washington	S1200	Lindell Rd	154378138	State Rte 80	-81.865806	36.770989	lower	0.01	0.003167314	0.616386545
Washington	S1200	Porterfield Hwy	154377947	Porterfield Hwy	-82.028058	36.728114	upper	0.18	0.009251667	0.656338986
Washington	S1200	Hayters Gap Rd	154362077	Hayters Gap Rd	-81.927365	36.833304	lower	0.02	0.010930099	0.879781752
Washington	S1200	W State St	635378398	W State St	-82.20447	36.595577	avera	0.09	0.006434276	0.988919275
Washington	**S1400**	**Rutledge St**	**154359776**		**-81.795146**	**36.638222**	**upper**	**0.22**	**0.000577672**	**0.118486287**

Washington	*S1400*	*Thistledown Rd*	*154364746*		*-81.898059*	*36.702779*	*upper*	*0.41*	*0.001099151*	*0.144930154*
Washington	**S1400**	**Prince St**	**154381963**		**-82.189456**	**36.603642**	**lower**	**0.01**	**0.00034043**	**0.155668397**
Washington	S1400	Rich Valley Rd	154379397	Co Rd 700	-81.898237	36.805625	avera	0.1	0.000484814	0.31912469
Washington	S1400	Brumley Gap Rd	154368302	Brumley Gap Rd	-82.026769	36.802384	lower	0.02	0.000987426	0.611056318
Washington	S1400	Grassy Ridge Rd	154342402	Co Rd 859	-81.660185	36.658837	avera	0.07	0.000322471	0.861963322

Appendix B-2: List of Observation Road Segments by County

Key for Unique Information (beyond that understood from segment datasets and general selection information):
Bold: Segments selected to be primary sites AND observed; non-bold: reserve (notes indicate if reserve would be eligible).[6]
Italics: Segments selected to be primary sites, but excluded for various reasons (see notes column)
Order Sort: Randomly generated rank to determine order that segments would be chosen; order generated within each road type.

COUNTY	SITE NUMBER	ROAD NAME	TLID	ALT ROAD NAME	PARKING LONGITUDE	PARKING LATITUDE	NOTES
Alleghany	**ALL1001**	**I- 64**	**62575391**		**-79.99303**	**37.77177**	
Alleghany	**ALL1002**	**I- 64**	**213118075**		**-80.05793**	**37.80807**	
Alleghany	**ALL1003**	**I- 64**	**213123485**	**US Hwy 60**	**-80.19659**	**37.80273**	
Alleghany	ALL1004	I- 64	213121421		-79.67239	37.81488	
Alleghany	ALL1005	I- 64	62555898	I- 64	-79.88554	37.78944	
Alleghany	ALL1006	I- 64	62561114		-79.67872	37.81277	
Alleghany	ALL1007	I- 64	62575532		-79.97005	37.77553	
Alleghany	ALL1008	I- 64	213118758	US Hwy 60	-80.06380	37.80824	
Alleghany	ALL1009	I- 64	213119236		-79.79167	37.82770	
Alleghany	**ALL2001**	**Midland Trl**	**213123704**	**Midland Trl**	**-80.05579**	**37.80580**	
Alleghany	**ALL2002**	**W Ridgeway St**	**62551372**	**W Ridgeway St**	**-79.83842**	**37.81148**	
Alleghany	**ALL2003**	**N Alleghany Ave**	**62576138**	**US Hwy 220**	**-79.98887**	**37.80709**	
Alleghany	**ALL2004**	**Dunlap Creek Rd**	**62546739**	**State Rte 159**	**-80.18360**	**37.73887**	
Alleghany	**ALL2005**	**A St**	**62551242**	**A St**	**-79.81881**	**37.81549**	
Alleghany	ALL2006	Potts Creek Rd	62555329	Potts Creek Rd	-80.09901	37.68669	
Alleghany	ALL2007	Dunlap Creek Rd	213123719	Dunlap Creek Rd	-80.10250	37.78864	
Alleghany	ALL2008	Dunlap Creek Rd	213123727	State Rte 159	-80.07083	37.07083	
Alleghany	ALL2009	Forty Two Rd	62551776	State Rte 42	-79.73849	37.86978	
Alleghany	ALL20010	Forty Two Rd	62551773	State Rte 42	-79.73875	37.87041	
Alleghany	ALL20011	Kanawha Trl	62559171	Kanawha Trl	-80.24080	37.75827	

[6] The main and reserve samples were selected simultaneously, and are reflected in "selection probability" and "order sort" probability, respectively.

Alleghany	ALL20012	Totten Dr	62546068	State Rte F-203	-80.01694	37.78495	*would be excluded: gravel road
Alleghany	ALL20013	Dunlap Creek Rd	62546055	State Rte 159	-80.10867	37.77748	
Alleghany	ALL20014	Potts Creek Rd	62547642	State Hwy 18	-80.18201	37.62654	
Alleghany	ALL20015	Kanawha Trl	62559162	State Rte 311	-80.24080	37.75827	
Carroll	**CAR1001**	**I- 77**	**628860298**		**-80.70842**	**36.67400**	
Carroll	**CAR1002**	**I- 77**	**153836489**		**-80.74503**	**36.57772**	
Carroll	**CAR1003**	**Blue Ridge Pkwy**	**153809369**		**-80.67580**	**36.67066**	
Carroll	CAR1004	I- 77	153837538		-80.71108	36.67530	
Carroll	CAR1005	I- 77	221823930		-80.82864	36.78303	
Carroll	CAR1006	I- 77	153827104		-80.70842	36.67400	
Carroll	CAR1007	I- 77	153807515		-80.77333	36.74638	
Carroll	CAR1008	I- 77	153803063		-80.83159	36.78272	
Carroll	CAR1009	Blue Ridge Pkwy	153820175		-80.66793	36.65460	
Carroll	*CAR2001*	*Misty Trl*	*629295712*	*State Rte 608*	*-80.73641*	*36.63405*	*excluded: dirt road
Carroll	**CAR2002**	**Snake Creek Rd**	**153832571**	**State Rte 670**	**-80.70623**	**36.75614**	
Carroll	**CAR2003**	**Ivanhoe Rd**	**153830789**	**State Rte 94**	**-80.97931**	**36.74141**	
Carroll	**CAR2004**	**Danville Pike**	**153831630**	**US Hwy 58**	**-80.62848**	**36.73438**	
Carroll	**CAR2005**	**Crooked Creek Rd**	**153826321**	**Crooked Creek Rd**	**-80.80867**	**36.64147**	
Carroll	**CAR2006**	**Danville Pike**	**153830452**	**US Hwy 58**	**-80.60270**	**36.71952**	
Carroll	CAR2007	E Stuart Dr	613282064	E Stuart Dr	-80.94053	36.65662	
Carroll	CAR2008	Coulson Church Rd	153834015	Coulson Church Rd	-80.82469	36.79470	
Carroll	CAR2009	Sleepy Hollow Rd	153826850	Sleepy Hollow Rd	-80.83688	36.65747	
Carroll	CAR20010	Coal Creek Rd	153814990	State Rte 608	-80.86863	36.62516	
Carroll	CAR20011	Stoots Mountain Rd	153834531	Stoots Mountain Rd	-80.91810	36.82143	
Carroll	CAR20012	Mount Zion Rd	153832081	Mount Zion Rd	-80.84567	36.75006	
Carroll	CAR20013	N Main St	153833290	US Hwy 52	-80.74454	36.7773	
Carroll	CAR20014	Wards Gap Rd	153822772	State Rte 679	-80.61272	36.56097	
Carroll	CAR20015	Sylvatus Smith Rd	153820610	Sylvatus Smith Rd	-80.73532	36.87744	
Fairfax	**FAI1001**	**I- 495**	**215935350**	**I- 495**	**-77.21584**	**38.80938**	
Fairfax	**FAI1002**	**I- 495**	**215923141**	**I- 495**	**-77.19419**	**38.95314**	
Fairfax	**FAI1003**	**I- 66**	**76043384**	**Custis Memorial Pkwy**	**-77.30658**	**38.87047**	
Fairfax	**FAI1004**	**I- 66**	**76035027**	**I- 66**	**-77.27798**	**38.87759**	

Fairfax	FAI1005	I- 495	215923073	I- 495	-77.21347	38.93377
Fairfax	FAI1006	I- 495	76059641	I- 495	-77.21773	38.83223
Fairfax	FAI1007	I- 95	615671182	I- 95	-77.05440	38.79365
Fairfax	FAI1008	I- 66	215919802	Custis Memorial Pkwy	-77.26672	38.88005
Fairfax	FAI1009	I- 66	215972974	I- 66	-77.43142	38.84787
Fairfax	FAI10010	I- 95	629867763	I- 95	-77.11242	38.80109
Fairfax	FAI10011	I- 495	76028939	I- 495	-77.19419	38.95314
Fairfax	FAI10012	I- 495	215980479	American Legion Memorial Brg	-77.18197	38.96316
Fairfax	**FAI2001**	**S Washington St**	**76062943**	**State Rte 400**	**-77.04754**	**38.80398**
Fairfax	**FAI2002**	**Leesburg Pike**	**619956533**	**State Rte 7**	**-77.36150**	**39.00950**
Fairfax	**FAI2003**	**Dolley Madison Blvd**	**215950459**	**State Rte 123**	**-77.14003**	**38.94200**
Fairfax	**FAI2004**	**Telegraph Rd**	**75985698**	**State Rte 611**	**-77.12962**	**38.76236**
Fairfax	**FAI2005**	**Mount Vernon Memorial Hwy**	**76053189**	**Mount Vernon Memorial Hwy**	**-77.09029**	**38.72291**
Fairfax	**FAI2006**	**Gallows Rd**	**76031761**	**State Rte 650**	**-77.22745**	**38.87947**
Fairfax	**FAI2007**	**Lee Hwy**	**75978534**	**State Rte 237**	**-77.20742**	**38.87561**
Fairfax	**FAI2008**	**Sydenstricker Rd**	**615674962**	**State Rte 640**	**-77.25644**	**38.76765**
Fairfax	FAI2009	Zion Dr	76057549	State Rte 654	-77.30253	38.80738
Fairfax	FAI20010	Pleasant Valley Rd	215978666	State Rte 609	-77.48943	38.85466
Fairfax	FAI20011	Washington Dulles Access & Toll Rd	75960611	Washington Dulles Access & Toll Rd	-77.30077	38.94805
Fairfax	FAI20012	Spring Hill Rd	215950027	State Rte 684	-77.23527	38.93529
Fairfax	FAI20013	Guinea Rd	76057510	Guinea Rd	-77.29824	38.79845
Fairfax	FAI20014	Sully Rd	215973967	State Rte 28	-77.44070	38.89562
Fairfax	FAI20015	Kirby Rd	615653433	State Rte 695	-77.13663	38.93949
Fairfax	FAI20016	Compton Rd	615876936	State Rte 658	-77.42876	38.80559
Fairfax	FAI20017	Dranesville Rd	615652595	Dranesville Rd	-77.37908	38.98131
Fairfax	FAI20018	Braddock Rd	75980701	Braddock Rd	-77.18917	38.81179
Fairfax	FAI20019	Spring Hill Rd	215950006	Spring Hill Rd	-77.23253	38.93524
Fairfax	FAI20020	N Patrick St	75993368	N Patrick St	-77.04888	38.81624
Fairfax	FAI20021	Washington Dulles Access & Toll Rd	75962966	State Rte 267	-77.18518	38.89998
Fairfax	FAI20022	Gallows Rd	75980253	State Rte 711	-77.18983	38.83616
Fairfax	FAI20023	S Henry St	75991447	US Hwy 1	-77.05020	38.80588

Fairfax	FAI20024	Reston Pkwy	635445008	State Rte 602	-77.34796	38.98188	
Fairfax	**FAI4001**	**Hollinger Ave**	**629308965**		**-77.41019**	**38.88909**	
Fairfax	*FAI4002*	*Owens View Ct*	*75984514*		*-77.20658*	*38.71070*	*excluded: cul-de-sac
Fairfax	**FAI4003**	**Bramblewood Ln**	**215921452**		**-77.39600**	**38.91111**	
Fairfax	**FAI4004**	**Detwiller Dr**	**619025823**		**-77.42107**	**38.78538**	
Fairfax	**FAI4005**	**Grigsby St**	**75982649**		**-77.12908**	**38.83496**	
Fairfax	FAI4006	Keithley Dr	75956039				*would be excluded: private drive
Fairfax	FAI4007	Meyer Woods Ln	614136257		-77.39714	38.89864	
Fairfax	FAI4008	N Kensington St	215921236		-77.15352	38.91020	
Fairfax	FAI4009	Locust Hill Dr	76014124		-77.28328	38.96541	
Fairfax	FAI40010	Barbour Rd	215921108		-77.20300	38.89794	
Fairfax	FAI40011	Norton Rd	75988761		-77.09306	38.79779	
Fairfax	FAI40012	Misty Creek Ln	215918968		-77.38726	38.88771	
Halifax	**HAL2001**	**Mountain Rd**	**90342190**	**State Rte 360**	**-78.98280**	**36.75803**	
Halifax	**HAL2002**	**Bill Tuck Hwy**	**90345675**	**Bill Tuck Hwy**	**-78.79946**	**36.67024**	
Halifax	**HAL2003**	**Philpott Rd**	**90340371**	**US Hwy 360**	**-79.13929**	**36.58488**	
Halifax	**HAL2004**	**Mountain Rd**	**90342149**	**Mountain Rd**	**-79.00398**	**36.75262**	
Halifax	**HAL2005**	**Macdonald Rd**	**90323707**	**Macdonald Rd**	**-78.74976**	**36.74623**	
Halifax	**HAL2006**	**N Main St**	**90310079**	**N Main St**	**-78.89830**	**36.70477**	
Halifax	**HAL2007**	**Scottsburg Rd**	**90331130**	**Scottsburg Rd**	**-78.79570**	**36.76019**	
Halifax	**HAL2008**	**Philpott Rd**	**90358295**	**US Hwy 360**	**-79.00993**	**36.63768**	
Halifax	HAL2009	Wilborn Ave	90345424	US Hwy 501	-78.91232	36.71017	
Halifax	HAL20010	Philpott Rd	90358681	Philpott Rd	-78.95531	36.67270	
Halifax	HAL20011	Philpott Rd	90325000	Philpott Rd	-79.03204	36.62667	
Halifax	HAL20012	L P Bailey Memorial Hwy	90352426	L P Bailey Memorial Hwy	-78.98413	36.96470	
Halifax	HAL20013	Clarksville Rd	90336255	Clarksville Rd	-78.73607	36.54927	
Halifax	HAL20014	Mountain Rd	90341425	Mountain Rd	-79.01542	36.75323	
Halifax	HAL20015	Philpott Rd	90351316	US Hwy 360	-79.03716	36.62383	
Halifax	HAL20016	Bethel Rd	90308987	State Rte 360	-78.81486	36.78003	
Halifax	HAL20017	Philpott Rd	90317480	US Hwy 360	-79.16203	36.58221	
Halifax	HAL20018	Huell Matthews Hwy	90345727	US Hwy 501	-78.90125	36.65425	
Halifax	HAL20019	L P Bailey Memorial Hwy	90328170	US Hwy 501	-78.99249	36.95369	

Halifax	HAL20020	Bethel Rd	90331160	Bethel Rd	-78.82575	36.78841
Halifax	HAL20021	L P Bailey Memorial Hwy	90347032	US Hwy 501	-79.01505	36.87804
Halifax	HAL20022	S Main St	90307619	US Hwy 501	-78.92839	36.76218
Halifax	HAL20023	L P Bailey Memorial Hwy	90328167	US Hwy 501	-78.99793	36.94819
Halifax	HAL20024	Mountain Rd	90315598	Mountain Rd	-79.10239	36.75439
Henry	**HEN2001**	**Figsboro Rd**	**55539436**	**State Rte 108**	**-79.85892**	**36.77904**
Henry	**HEN2002**	**Greensboro Rd**	**55540305**	**US Hwy 220**	**-79.88582**	**36.55976**
Henry	**HEN2003**	**William F Stone Hwy**	**55545506**	**US Hwy 58 Byp**	**-79.82256**	**36.64437**
Henry	**HEN2004**	**Fairy Stone Park Hwy**	**55546141**	**State Rte 57**	**-79.94062**	**36.73888**
Henry	**HEN2005**	**Fayette St**	**55549340**	**State Rte 457**	**-79.87592**	**36.69312**
Henry	**HEN2006**	**Fairystone Park Hwy**	**55531465**	**Fairystone Park Hwy**	**-80.05791**	**36.75770**
Henry	**HEN2007**	**Old Chatham Rd**	**55516795**	**Chatham Heights Rd**	**-79.83483**	**36.70594**
Henry	**HEN2008**	**Greensboro Rd**	**55541397**	**US Hwy 220 Bus**	**-79.86369**	**36.64463**
Henry	HEN2009	Fairystone Park Hwy	613280187	Fairystone Park Hwy	-80.08898	36.75470
Henry	HEN20010	William F Stone Hwy	55525980	William F Stone Hwy	-79.82256	36.64437
Henry	HEN20011	A L Philpott Hwy	55540816	US Hwy 58	-80.00751	36.61918
Henry	HEN20012	E Church St	55549918	E Church St	-79.85157	36.69157
Henry	HEN20013	Fayette St	55513028	State Rte 57	-79.89034	36.68744
Henry	HEN20014	Fayette St	55512907	Fayette St	-79.87958	36.69325
Henry	HEN20015	A L Philpott Hwy	55542209	US Hwy 58	-79.74187	36.67292
Henry	HEN20016	Chatham Rd	55537749	Chatham Rd	-79.77977	36.72876
Henry	HEN20017	Fairystone Park Hwy	55538622	State Rte 57	-80.07533	36.75068
Henry	HEN20018	William F Stone Hwy	55525981	US Hwy 58 Byp	-79.85921	36.62405
Henry	HEN20019	A L Philpott Hwy	55536835	State Rte 57	-79.83552	36.69196
Henry	HEN20020	Greensboro Rd	55541692	US Hwy 220 Bus	-79.88204	36.66549
Henry	HEN20021	William F Stone Hwy	55515730	US Hwy 220	-79.95630	36.69594
Henry	HEN20022	Chatham Rd	55511739	State Rte 57	-79.71321	36.77213
Henry	HEN20023	Figsboro Rd	55524594	State Rte 108	-79.84473	36.79428
Henry	HEN20024	Chatham Rd	55536882	State Rte 57	-79.82699	36.69580
Loudoun	**LOU2001**	**Silcott Springs Rd**	**635459508**	**Silcott Springs Rd**	**-77.73344**	**39.11617**
Loudoun	**LOU2002**	**Waxpool Rd**	**613886339**	**Waxpool Rd**	**-77.49609**	**39.01461**
Loudoun	**LOU2003**	**Dry Hollow Rd**	**62370469**	**Dry Hollow Rd**	**-77.55482**	**39.12815**

Loudoun	**LOU2004**	**E A St**	**613883853**	**E A St**	**-77.70978**	**39.12692**	
Loudoun	**LOU2005**	**S King St**	**62369139**	**US Hwy 15 Bus**	**-77.56676**	**39.11111**	
Loudoun	LOU2006	Trappe Rd	62364592	State Rte 619	-77.87331	39.03666	*would be excluded: gravel road
Loudoun	LOU2007	Berlin Pike	62319333	Berlin Pike	-77.65935	39.22068	
Loudoun	LOU2008	Forest Mills Rd	62323173	Forest Mills Rd	-77.68616	39.09541	*would be excluded: gravel road
Loudoun	LOU2009	Cedar Green Rd	62361965	Cedar Green Rd	-77.44463	38.98338	
Loudoun	LOU20010	Gleedsville Rd	625139623	Gleedsville Rd	-77.59031	39.07644	
Loudoun	LOU20011	Spinks Ferry Rd	62321447	Spinks Ferry Rd	-77.47748	39.21926	*would be excluded: gravel road
Loudoun	LOU20012	Rodeffer Rd	62372969	State Rte 682	-77.63062	39.23687	*would be excluded: gravel road
Loudoun	LOU20013	Trappe Rd	62349658	State Rte 619	-77.86447	39.05517	*would be excluded: gravel road
Loudoun	LOU20014	Irish Corner Rd	218965942	State Rte 673	-77.65289	39.28501	
Loudoun	LOU20015	Bolington Rd	62373597	Bolington Rd	-77.66669	39.24328	*would be excluded: gravel road
Loudoun	*LOU4001*	*Baffin Pl*	*632686919*		*-77.719981*	*39.140218*	*excluded: road did not exist
Loudoun	**LOU4002**	**Ocala Cir**	**62373879**		**-77.49297**	**38.89260**	
Loudoun	**LOU4003**	**Pepperbush Pl**	**62374024**	**Pepperbush Pl**	**-77.55047**	**38.93011**	
Loudoun	*LOU4004*	*Wildwood Ln*	*62361341*		*-77.77891*	*38.97673*	*excluded: gravel road
Loudoun	**LOU4005**	**Briarwood Ct**	**62330700**		**-77.40210**	**38.98630**	
Loudoun	LOU4006	Morven Park Rd NW	62329796		-77.57297	39.12138	
Loudoun	LOU4007	S Cameron St	62331958		-77.38975	38.99708	
Loudoun	LOU4008	Thurmont Ter	62346734		-77.39615	39.20977	*would be excluded: private road
Loudoun	LOU4009	E St	62319060		-77.70971	39.13186	
Mecklenburg	**MEC1001**	**I- 85**	**54338612**		**-78.09824**	**36.74968**	
Mecklenburg	**MEC1002**	**I- 85**	**54330887**		**-78.09319**	**36.74968**	
Mecklenburg	**MEC1003**	**I- 85**	**54317832**		**-78.15209**	**36.60068**	
Mecklenburg	MEC1004	I- 85	54318893		-78.11325	36.71611	
Mecklenburg	MEC1005	I- 85	54336168		-78.1119	36.71338	
Mecklenburg	MEC1006	I- 85	54335184		-78.11325	36.71611	
Mecklenburg	MEC1007	I- 85	54329789		-78.09319	36.74968	
Mecklenburg	MEC1008	I- 85	54321551		-78.96023	36.81897	
Mecklenburg	MEC1009	I- 85	54336051		-78.15209	36.60068	
Mecklenburg	**MEC2001**	**N Mecklenburg Ave**	**54316753**	**N Mecklenburg Ave**	**-78.10515**	**36.74710**	
Mecklenburg	**MEC2002**	**US Hwy 1**	**54328101**		**-78.21521**	**36.65860**	

Mecklenburg	**MEC2003**	**N Main St**	**54296478**	**N Main St**	**-78.45937**	**36.80163**
Mecklenburg	**MEC2004**	**US Hwy 58**	**54322619**		**-78.40778**	**36.66211**
Mecklenburg	**MEC2005**	**E 2nd St**	**54319218**	**State Rte 49**	**-78.46159**	**36.79800**
Mecklenburg	MEC2006	Virginia Ave	54299717	State Rte 49	-78.55421	36.62634
Mecklenburg	MEC2007	US Hwy 1	54325748		-78.19866	36.54655
Mecklenburg	MEC2008	US Hwy 1	54328207		-78.04444	36.76682
Mecklenburg	MEC2009	US Hwy 58	54304347		-78.06164	36.70231
Mecklenburg	MEC20010	State Rte 92	614353762		-78.40757	36.70541
Mecklenburg	MEC20011	State Rte 49	54305398		-78.65450	36.57689
Mecklenburg	MEC20012	W Danville St	635389889	W Danville St	-78.15559	36.71936
Mecklenburg	MEC20013	State Rte 47	54298162		-78.18929	36.77250
Mecklenburg	MEC20014	US Hwy 58	54331838		-78.46089	36.65393
Mecklenburg	MEC20015	State Rte 49	54315003		-78.63940	36.58738
Prince George	**PG1001**	**I- 295**	**54191756**		**-77.32355**	**37.26528**
Prince George	**PG1002**	**I- 95**	**54215916**		**-77.35802**	**37.19093**
Prince George	PG1003	I- 295	635262885		-77.31966	37.26721
Prince George	PG1004	I- 95	54213740	I- 95	-77.39504	37.23187
Prince George	PG1005	I- 295	54196129		-77.32209	37.26482
Prince George	PG1006	I- 95	54217003	I- 95	-77.39622	37.22982
Prince George	**PG2001**	**S Crater Rd**	**54146870**	**US Hwy 301**	**-77.35631**	**37.10306**
Prince George	**PG2002**	**Prince George Dr**	**54182637**	**Prince George Dr**	**-77.27553**	**37.15499**
Prince George	**PG2003**	**Prince George Dr**	**54154319**	**Prince George Dr**	**-77.25992**	**37.21992**
Prince George	**PG2004**	**N 6th Ave**	**54149335**	**N 6th Ave**	**-77.29326**	**37.30751**
Prince George	PG2005	S Crater Rd	54152587	S Crater Rd	-77.37505	37.19421
Prince George	PG2006	Wagner Rd	613898602	Wagner Rd	-77.34968	37.19091
Prince George	PG2007	James River Dr	54189997	James River Dr	-77.23484	37.28554
Prince George	PG2008	Bollingbrook St	54150939	US Hwy 301	-77.40355	37.23264
Prince George	PG2009	E Bank St	54215382	State Rte 36	-77.38778	37.23519
Prince George	PG20010	County Dr	54182270	US Hwy 460	-77.24556	37.13672

Prince George	PG20011	E Washington St	54216614	E Washington St	-77.36538	37.23971
Prince George	PG20012	James River Dr	54185691	James River Dr	-77.17844	37.25984
Prince George	**PG4001**	**Old Town Rd**	**54183506**	**State Rte 666**	**-77.17298**	**37.20569**
Prince George	**PG4002**	**Defense Rd**	**54212859**		**-77.43190**	**37.19830**
Prince George	PG4003	Old Keswick Ln	54181586	State Rte 770	-77.39123	37.12618
Prince George	PG4004	W Quaker Rd	54182912	State Rte 629	-77.29826	37.18522
Prince George	PG4005	W City Point Rd	54196737		-77.30534	37.29936
Prince George	PG4006	Walnut St	54151645		-77.40571	37.21009
Rockbridge	**ROC1001**	**I- 64**	**632946021**	**I- 64**	**-79.48044**	**37.85252**
Rockbridge	**ROC1002**	**I- 64**	**63115658**	**I- 64**	**-79.22941**	**37.93058**
Rockbridge	**ROC1003**	**I- 64**	**629401837**		**-79.41689**	**37.80132**
Rockbridge	ROC1004	Blue Ridge Pkwy	63129620		-79.20685	37.79669
Rockbridge	ROC1005	I- 81	63112004		-79.50843	37.66614
Rockbridge	ROC1006	I- 81	63112000		-79.50660	37.66882
Rockbridge	ROC1007	I- 81	215054828		-79.40813	37.75684
Rockbridge	ROC1008	Blue Ridge Pkwy	63129627		-79.17963	37.80946
Rockbridge	ROC1009	I- 64	63124244	I- 81	-79.36826	37.84162
Rockbridge	**ROC2001**	**S Lee Hwy**	**63112699**	**US Hwy 11**	**-79.48851**	**37.68864**
Rockbridge	**ROC2002**	**Brownsburg Tpke**	**215049318**	**State Rte 252**	**-79.36451**	**37.89202**
Rockbridge	**ROC2003**	**Virginia Ave**	**625330408**	**Virginia Ave**	**-79.45123**	**38.02892**
Rockbridge	**ROC2004**	**N Lee Hwy**	**623970722**	**N Lee Hwy**	**-79.26846**	**37.88838**
Rockbridge	**ROC2005**	**Maury River Rd**	**613916685**	**Maury River Rd**	**-79.38187**	**37.87766**
Rockbridge	ROC2006	Collierstown Rd	63127888	Collierstown Rd	-79.48378	37.75762
Rockbridge	ROC2007	S Lee Hwy	63125103	US Hwy 11	-79.56831	37.62873
Rockbridge	ROC2008	Blue Ridge Pkwy	215064295		-79.31322	37.72038
Rockbridge	ROC2009	S Main St	63116059	US Hwy 11	-79.44698	37.78049
Rockbridge	ROC20010	N Lee Hwy	63130769	US Hwy 11	-79.35936	37.84301
Rockbridge	ROC20011	Va Ave	63106542	Va Ave	-79.49866	37.98887
Rockbridge	ROC20012	Collierstown Rd	63108388	State Rte 251	-79.55571	37.76436
Rockbridge	ROC20013	S Main St	63144179	US Hwy 11	-79.44920	37.77756
Rockbridge	ROC20014	Maury River Rd	629922756	State Rte 39	-79.49374	37.96630

Rockbridge	ROC20015	Virginia Ave	215052218	Virginia Ave	-79.45670	38.02246
Shenandoah	**SHE1001**	**I- 81**	**55953058**		**-78.33687**	**39.00843**
Shenandoah	**SHE1002**	**I- 81**	**55958230**		**-78.35928**	**39.01450**
Shenandoah	**SHE1003**	**I- 81**	**55950351**		**-78.36515**	**39.00980**
Shenandoah	SHE1004	I- 81	55941144		-78.57651	38.83134
Shenandoah	SHE1005	I- 81	55944731		-78.52700	38.87086
Shenandoah	SHE1006	I- 81	55944862		-78.63239	38.76421
Shenandoah	SHE1007	I- 81	55942171		-78.43768	38.96352
Shenandoah	SHE1008	I- 81	616406561		-78.59727	38.80961
Shenandoah	SHE1009	I- 81	55952650		-78.67554	38.64759
Shenandoah	**SHE2001**	**Orkney Grade**	**55947875**	**Orkney Grade**	**-78.76144**	**38.77805**
Shenandoah	**SHE2002**	**Senedo Rd**	**55947878**	**Senedo Rd**	**-78.74258**	**38.77357**
Shenandoah	**SHE2003**	**Main St**	**55930504**	**US Hwy 11**	**-78.60297**	**38.78241**
Shenandoah	**SHE2004**	**Main St**	**55930518**	**Main St**	**-78.60881**	**38.77723**
Shenandoah	**SHE2005**	**Main St**	**55926873**	**US Hwy 11**	**-78.46661**	**38.92512**
Shenandoah	SHE2006	Old Valley Pike	55943227	Old Valley Pike	-78.31905	39.00730
Shenandoah	SHE2007	Senedo Rd	55928978	Senedo Rd	-78.63628	38.87128
Shenandoah	SHE2008	W Lee Hwy	55940509	W Lee Hwy	-78.69395	38.64862
Shenandoah	SHE2009	S Congress St	55940895	US Hwy 11	-78.67908	38.63813
Shenandoah	SHE20010	Senedo Rd	55944456	Senedo Rd	-78.73618	38.78331
Shenandoah	SHE20011	Stoney Creek Rd	55930612		-78.57879	38.83147
Shenandoah	SHE20012	Senedo Rd	55929123	Senedo Rd	-78.69870	38.81937
Shenandoah	SHE20013	Old Valley Pike	55935012	US Hwy 11	-78.37135	38.98910
Shenandoah	SHE20014	Senedo Rd	55945797	State Rte 42	-78.72998	38.71072
Shenandoah	SHE20015	Main St	55930884	Old Valley Pike	-78.57099	38.82077
Southampton	**SOU2001**	**Delaware Rd**	**82714293**	**State Rte 687**	**-76.96660**	**36.69351**
Southampton	**SOU2002**	**Meherrin Rd**	**82723978**	**State Rte 35**	**-77.12240**	**36.67821**
Southampton	**SOU2003**	**S Quay Rd**	**82723466**	**State Rte 189**	**-76.91087**	**36.62000**
Southampton	**SOU2004**	**Smiths Ferry Rd**	**82708104**	**Smiths Ferry Rd**	**-76.94365**	**36.57513**
Southampton	**SOU2005**	**Pittman Rd**	**82715448**	**State Rte 186**	**-77.20370**	**36.58120**
Southampton	**SOU2006**	**Southampton Pkwy**	**82728572**	**US Hwy 58**	**-77.03553**	**36.69518**
Southampton	**SOU2007**	**Plank Rd**	**82720025**	**Plank Rd**	**-77.12790**	**36.80748**

Southampton	**SOU2008**	**Southampton Pkwy**	**82723968**	**Southampton Pkwy**	**-77.29931**	**36.70696**
Southampton	SOU2009	Jerusalem Rd	82728532	Jerusalem Rd	-77.04261	36.69787
Southampton	SOU20010	Southampton Pkwy	82728130	US Hwy 58	-76.97300	36.67188
Southampton	SOU20011	Southampton Pkwy	632946276	Southampton Pkwy	-76.91585	36.64994
Southampton	SOU20012	Meherrin Rd	82721689	Meherrin Rd	-77.10751	36.69484
Southampton	SOU20013	Hunterdale Rd	82733054	Hunterdale Rd	-76.95665	36.69520
Southampton	SOU20014	Pittman Rd	82712685	State Rte 186	-77.21535	36.57838
Southampton	SOU20015	Three Creeks Rd	82710058	Three Creeks Rd	-77.25740	36.73279
Southampton	SOU20016	Southampton Pkwy	82710496	US Hwy 58	-77.17217	36.70705
Southampton	SOU20017	Southampton Pkwy	82719187	Southampton Pkwy	-76.96180	36.66716
Southampton	SOU20018	Southampton Pkwy	82725658	US Hwy 58	-77.23698	36.70208
Southampton	SOU20019	Camp Pkwy	624475627	Camp Pkwy	-76.98720	36.69048
Southampton	SOU20020	Southampton Pkwy	82726348	US Hwy 58	-77.10518	36.70171
Southampton	SOU20021	Hugo Rd	82712212	Hugo Rd	-77.25154	36.56795
Southampton	SOU20022	Dale Cir	82706708	Dale Cir	-76.96371	36.70084
Southampton	SOU20023	Southampton Pkwy	82729910	Southampton Pkwy	-77.48166	36.68054
Southampton	SOU20024	General Mahone Blvd	82723803	US Hwy 460	-76.86867	36.89059
Southeast	**SE1001**	**I- 664**	**613347996**		**-76.43056**	**36.89049**
Southeast	**SE1002**	**I- 64**	**121772975**		**-76.23020**	**36.78624**
Southeast	**SE1003**	**I- 664**	**122241922**		**-76.42726**	**36.88766**
Southeast	**SE1004**	**I- 664**	**121799963**		**-76.42430**	**36.78545**
Southeast	SE1005	I- 64	122139347		-76.29582	36.96643
Southeast	SE1006	I- 64	122134346		-76.25664	36.90345
Southeast	SE1007	I- 64	122151403		-76.19402	36.84461
Southeast	SE1008	I- 264	122139207	US Hwy 460 Alt	-76.28373	36.84508
Southeast	SE1009	I- 264	122203501	I- 264	-76.30371	36.83122
Southeast	SE10010	I- 264	121798692		-76.41641	36.78663
Southeast	SE10011	I- 64	122149544		-76.22861	36.89203
Southeast	SE10012	I- 264	613585641	State Rte 44	-76.06788	36.83575
Southeast	**SE2001**	**Western Fwy**	**122196907**	**Western Fwy**	**-76.35362**	**36.86623**
Southeast	**SE2002**	**Holland Rd**	**122239403**	**Holland Rd**	**-76.75351**	**36.68918**
Southeast	**SE2003**	**College Dr**	**122248412**	**State Rte 135**	**-76.42802**	**36.88509**

Southeast	**SE2004**	**N Military Hwy**	**122139409**	**N Military Hwy**	**-76.21161**	**36.87844**	
Southeast	**SE2005**	**Chesapeake Blvd**	**613342191**	**State Rte 194**	**-76.24472**	**36.94477**	
Southeast	**SE2006**	**Virginia Beach Blvd**	**122278667**	**Virginia Beach Blvd**	**-76.14094**	**36.84401**	
Southeast	**SE2007**	**Kempsville Rd**	**613588585**	**Kempsville Rd**	**-76.16687**	**36.81062**	
Southeast	**SE2008**	**N Military Hwy**	**122130382**	**N Military Hwy**	**-76.21056**	**36.84740**	
Southeast	SE2009	Whaleyville Blvd	122239471	Co Rd 759	-76.65362	36.64379	
Southeast	SE20010	Great Brg Byp	121796655	Great Brg Byp	-76.21470	36.62456	
Southeast	SE20011	Lynnhaven Pkwy	122269909	State Rte 414	-76.07200	36.81025	
Southeast	SE20012	State Rte 165	122145961	State Rte 165	-76.25091	36.91554	
Southeast	SE20013	Virginia Beach Blvd	122301960	US Hwy 58 Bus	-75.99367	36.84199	
Southeast	SE20014	Pacific Ave	122299387	Pacific Ave	-75.97652	36.84864	
Southeast	SE20015	S Military Hwy	121798427	US Hwy 13	-76.34767	36.77225	
Southeast	SE20016	Dominion Blvd N	613352389	State Rte 104	-76.27674	36.75239	
Southeast	SE20017	Shore Dr	122300106	US Hwy 60	-76.06984	36.91193	
Southeast	SE20018	S Military Hwy	635390025	US Hwy 13	-76.40413	36.78435	
Southeast	SE20019	Bridge Rd	122245925	US Hwy 17	-76.49135	36.87825	
Southeast	SE20020	High St W	122202292	High St W	-76.39851	36.86134	
Southeast	SE20021	S Military Hwy	121769546	US Hwy 13	-76.30736	36.77332	
Southeast	SE20022	Battlefield Blvd S	121775896	State Rte 168	-76.23642	36.70727	
Southeast	SE20023	High St W	122198748	US Hwy 17	-76.37842	36.85104	
Southeast	SE20024	Bridge Rd	613345632	Bridge Rd	-76.46383	36.86212	
Southeast	**SE4001**	**Saint Brides Rd E**	**121789244**		**-76.20036**	**36.60567**	
Southeast	**SE4002**	**Broad Bay Rd**	**122261045**		**-76.05229**	**36.90680**	
Southeast	**SE4003**	**Gladesdale Dr**	**121778486**		**-76.20938**	**36.69294**	
Southeast	**SE4004**	**Cannon Point Dr**	**121768136**		**-76.39635**	**36.84017**	
Southeast	SE4005	Inlet Rd	122125130		-76.22097	36.93336	
Southeast	SE4006	Loper Ln	122296613		-76.12286	36.84190	
Southeast	SE4007	Orange St	122200699		-76.35424	36.83822	
Southeast	SE4008	Ingleside Rd	122129316		-76.23607	36.84909	
Southeast	SE4009	Cotton Farm Ln	122221465		-76.53146	36.89003	
Southeast	SE40010	Hollygreen Dr	122288575		-76.09357	36.81218	*would be excluded: private road
Southeast	SE40011	Woodland Dr	121789435		-76.41016	36.80521	

Southeast	SE40012	de Bree Ave	122123386		-76.28759	36.87406	
Stafford	**STA1001**	**I- 95**	**25569759**		**-77.42268**	**38.42304**	
Stafford	**STA1002**	**I- 95**	**25574806**		**-77.40765**	**38.46057**	
Stafford	STA1003	I- 95	25567753		-77.36960	38.52133	
Stafford	STA1004	I- 95	25569621		-77.40798	38.46725	
Stafford	STA1005	I- 95	632544754		-77.45986	38.37167	
Stafford	STA1006	I- 95	228325847		-77.49458	38.33734	
Stafford	**STA2001**	**Jefferson Davis Hwy**	**25579699**	**US Hwy 1**	**-77.40574**	**38.45409**	
Stafford	**STA2002**	**Jefferson Davis Hwy**	**25580632**	**US Hwy 1**	**-77.37410**	**38.50607**	
Stafford	**STA2003**	**Jefferson Davis Hwy**	**25579752**	**US Hwy 1**	**-77.41516**	**38.40877**	
Stafford	**STA2004**	**Jefferson Davis Hwy**	**25576545**	**US Hwy 1**	**-77.41145**	**38.41299**	
Stafford	STA2005	White Oak Rd	25578619	State Rte 218	-77.42737	38.31148	
Stafford	STA2006	Cambridge St	25565633	US Hwy 1	-77.45781	38.35189	
Stafford	STA2007	Jefferson Davis Hwy	25567566	Jefferson Davis Hwy	-77.42343	38.40060	
Stafford	STA2008	Kings Hwy	228326424	State Rte 3	-77.36945	38.25312	
Stafford	STA2009	Jefferson Davis Hwy	630599046	US Hwy 1	-77.37756	38.49605	
Stafford	STA20010	Warrenton Rd	25567491	Warrenton Rd	-77.61475	38.42074	
Stafford	STA20011	Jefferson Davis Hwy	25576623	Jefferson Davis Hwy	-77.36988	38.51048	
Stafford	STA20012	Jefferson Davis Hwy	25554244	US Hwy 1	-77.40711	38.42632	
Stafford	**STA4001**	**Spyglass Ln**	**228324383**		**-77.49729**	**38.47017**	
Stafford	**STA4002**	**Ridgeway Rd**	**25563486**		**-77.54755**	**38.51749**	
Stafford	STA4003	Marjorie Ln	228325978		-77.51482	38.46192	*would be excluded: gravel road
Stafford	STA4004	Banks Ford Pkwy	632546078		-77.51894	38.35454	
Stafford	STA4005	Hollywood Farm Rd	25573513	Co Rd 601	-77.35302	38.26744	
Stafford	STA4006	Krieger Ln	632546425		-77.49667	38.33367	*would be excluded: gravel road
Tazewell	**TAZ2001**	**Tazewell Ave**	**47313215**	**State Rte 16**	**-81.52655**	**37.12939**	
Tazewell	**TAZ2002**	**Trl of the Lonesome Pine**	**47329470**	**US Hwy 19**	**-81.45275**	**37.16944**	
Tazewell	**TAZ2003**	**Adria Rd**	**47313146**	**State Rte 16**	**-81.54200**	**37.16249**	
Tazewell	**TAZ2004**	**Trl of the Lonesome Pine**	**47324900**	**Trl of the Lonesome Pine**	**-81.38739**	**37.20104**	
Tazewell	**TAZ2005**	**W Riverside Dr**	**47291617**	**W Riverside Dr**	**-81.53651**	**37.13040**	
Tazewell	**TAZ2006**	**State Rte 616**	**47312633**	**State Rte 621**	**-81.78367**	**37.19604**	
Tazewell	**TAZ2007**	**Adria Rd**	**47320869**	**State Rte 16**	**-81.54432**	**37.14721**	

Tazewell	**TAZ2008**	**State Rte 61**	**47305503**		**-81.37155**	**37.14690**	
Tazewell	TAZ2009	State Rte 91	47317246		-81.61540	37.07572	
Tazewell	TAZ20010	Buchanan Hwy	47336580	Buchanan Hwy	-81.52624	37.03221	
Tazewell	TAZ20011	State Rte 61	47321830		-81.37629	37.14421	
Tazewell	TAZ20012	Fincastle Tpke	613925118	Fincastle Tpke	-81.50453	37.12363	
Tazewell	TAZ20013	Cedar Valley Dr	47315408	State Rte 631	-81.76302	37.08794	
Tazewell	TAZ20014	State Rte 102	47322719		-81.28014	37.26254	
Tazewell	TAZ20015	State Rte 61	47314908		-81.29586	37.17727	
Tazewell	TAZ20016	State Rte 61	47314911		-81.29049	37.17968	
Tazewell	TAZ20017	Bigcreek Rd	47323426	Bigcreek Rd	-81.79599	37.10275	
Tazewell	TAZ20018	Steelburg Hwy	47315521	US Hwy 19	-81.76073	37.05888	
Tazewell	TAZ20019	Main St	47297910	US Hwy 19 Bus	-81.51998	37.11598	
Tazewell	TAZ20020	Valley Dale St	47308546	State Rte 720	-81.25641	37.23648	
Tazewell	TAZ20021	Clinch Mt Rd	47336696	Clinch Mt Rd	-81.65113	36.99960	*would be excluded: gravel road
Tazewell	TAZ20022	US Hwy 460	47331127		-81.28403	37.23518	
Tazewell	TAZ20023	US Hwy 19 Bus	47297173	US Hwy 460 Bus	-81.57316	37.11938	
Tazewell	TAZ20024	Trl of the Lonesome Pine	47331795	US Hwy 19	-81.68681	37.08715	
Washington	**WAS1001**	**I- 81**	**154344552**	**US Hwy 58**	**-82.18120**	**36.62223**	
Washington	**WAS1002**	**I- 381**	**154381240**	**Commonwealth Ave**	**-82.19340**	**36.60676**	
Washington	WAS1003	I- 81	230659142		-81.83423	36.76426	
Washington	WAS1004	I- 81	230646558		-81.73625	36.78206	
Washington	WAS1005	I- 81	622726240	US Hwy 58	-82.01200	36.69261	
Washington	WAS1006	I- 381	154383818	I- 381	-82.19406	36.60855	
Washington	**WAS2001**	**Hayters Gap Rd**	**154360485**	**Hayters Gap Rd**	**-81.94697**	**36.86452**	
Washington	**WAS2002**	**Cumberland St**	**154347707**	**Cumberland St**	**-82.18734**	**36.59823**	
Washington	**WAS2003**	**Crescent Rd**	**154376466**	**State Rte 91**	**-81.76696**	**36.81428**	
Washington	**WAS2004**	**US Hwy 58**	**230645112**	**Jeb Stuart Hwy**	**-81.67226**	**36.65646**	
Washington	WAS2005	Lee Hwy	154375367	US Hwy 19	-82.06636	36.66491	
Washington	WAS2006	US Hwy 58	154378199	US Hwy 58	-81.64873	36.62685	
Washington	WAS2007	Lee Hwy	154363311	US Hwy 11	-81.74720	36.77970	
Washington	WAS2008	Lee Hwy	154353426	US Hwy 11	-82.09251	36.64967	
Washington	WAS2009	Lindell Rd	154378138	State Rte 80	-81.86581	36.77105	

Washington	WAS20010	Porterfield Hwy	154377947	Porterfield Hwy	-82.02331	36.72649	
Washington	WAS20011	Hayters Gap Rd	154362077	Hayters Gap Rd	-81.92845	36.83428	
Washington	WAS20012	W State St	635378398	W State St	-82.20553	36.59560	
Washington	**WAS4001**	**Rutledge St**	**154359776**		**-81.79477**	**36.63748**	
Washington	*WAS4002*	*Thistledown Rd*	*154364746*				*excluded: private road
Washington	**WAS4003**	**Prince St**	**154381963**		**-82.18960**	**36.60391**	
Washington	WAS4004	Rich Valley Rd	154379397	Co Rd 700	-81.89528	36.80719	
Washington	WAS4005	Brumley Gap Rd	154368302	Brumley Gap Rd	-82.02675	36.80244	
Washington	WAS4006	Grassy Ridge Rd	154342402	Co Rd 859	-81.66026	36.65876	

Appendix B-3: Data Collected at Observation Sites

SITE ID	SITE TYPE (AT SAMPLING)	DATE OBSERVED	WEIGHT[7]	NUMBER OF DRIVERS	NUMBER OF FRONT PASSENGERS	NUMBER OF OCCUPANTS BELTED	NUMBER OF OCCUPANTS UNBELTED	NUMBER OF OCCUPANTS WITH UNKNOWN BELT USE
ALL1001	Original	06/08/2015	4.844327863	60	29	66	20	3
ALL1002	Original	06/06/2015	4.844327863	28	4	18	10	4
ALL1003	Original	06/06/2015	4.844327863	6	4	8	2	0
ALL2001	Original	06/06/2015	4.844327863	34	8	29	11	2
ALL2002	Original	06/08/2015	4.844327863	194	58	157	84	11
ALL2003	Original	06/08/2015	4.844327863	165	55	150	60	10
ALL2004	Original	06/06/2015	4.844327863	37	22	39	17	3
ALL2005	Original	06/08/2015	4.844327863	75	26	63	37	1
CAR1001	Original	06/05/2015	3.292892432	41	22	54	6	3
CAR1002	Original	06/06/2015	3.292892432	34	24	47	10	1
CAR1003	Original	06/05/2015	3.292892432	38	20	36	2	20
CAR2002	Original	06/05/2015	3.292892432	34	10	32	12	0
CAR2003	Original	06/06/2015	3.292892432	57	28	52	31	2
CAR2004	Original	06/05/2015	3.292892432	60	22	61	15	6
CAR2005	Original	06/06/2015	3.292892432	12	6	14	3	1
CAR2006	Alternate8	06/06/2015	3.292892432	30	8	31	7	0
FAI1001	Original	06/05/2015	1.034566384	303	47	298	16	36
FAI1002	Original	06/06/2015	1.034566384	180	85	215	21	29
FAI1003	Original	06/11/2015	1.034566384	263	20	264	11	8
FAI1004	Original	06/18/2015	1.034566384	48	7	49	4	2
FAI2001	Original	06/05/2015	1.034566384	462	120	522	46	14
FAI2002	Original	06/11/2015	1.034566384	232	53	237	21	27
FAI2003	Original	06/06/2015	1.034566384	301	61	306	15	41
FAI2004	Original	06/05/2015	1.034566384	350	67	362	29	26
FAI2005	Original	06/05/2015	1.034566384	153	37	167	16	7

[7] Inverse of county selection probability.

[8]This site, and **all sites** listed as alternates, was first an alternate site when the sample was created ***but*** became a primary site *before* collections because one of the original sites was excluded as ineligible during pre-collection inspections in 2012. ***Every alternate listed in here became a new primary site before collections began in 2012 and remained a primary site since.***

FAI2006	Original	06/06/2015	1.034566384	332	121	404	32	17
FAI2007	Original	06/06/2015	1.034566384	350	135	406	57	22
FAI2008	Original	06/08/2015	1.034566384	89	18	94	9	4
FAI4001	Original	06/08/2015	1.034566384	36	9	40	4	1
FAI4003	Original	06/11/2015	1.034566384	2	0	1	1	0
FAI4004	Original	06/08/2015	1.034566384	2	1	3	0	0
FAI4005	Alternate	06/08/2015	1.034566384	6	0	5	1	0
HAL2001	Original	06/06/2015	3.800205763	122	40	96	47	19
HAL2002	Original	06/09/2015	3.800205763	123	56	116	56	7
HAL2003	Original	06/06/2015	3.800205763	147	55	161	8	33
HAL2004	Original	06/06/2015	3.800205763	63	25	66	19	3
HAL2005	Original	06/09/2015	3.800205763	12	1	9	4	0
HAL2006	Original	06/09/2015	3.800205763	140	41	145	34	2
HAL2007	Original	06/09/2015	3.800205763	21	7	14	14	0
HAL2008	Original	06/06/2015	3.800205763	132	69	134	13	54
HEN2001	Original	06/08/2015	3.0825405	129	25	105	43	6
HEN2002	Original	06/07/2015	3.0825405	186	97	210	23	50
HEN2003	Original	06/07/2015	3.0825405	110	52	133	22	7
HEN2004	Original	06/08/2015	3.0825405	258	76	242	80	12
HEN2005	Original	06/08/2015	3.0825405	62	22	47	36	1
HEN2006	Original	06/08/2015	3.0825405	121	47	105	59	4
HEN2007	Original	06/07/2015	3.0825405	98	30	112	6	10
HEN2008	Original	06/07/2015	3.0825405	175	56	188	37	6
LOU2001	Original	06/10/2015	4.824285833	79	15	75	9	10
LOU2002	Original	06/03/2015	4.824285833	129	16	122	10	13
LOU2004	Original	06/10/2015	4.824285833	110	20	111	18	1
LOU2005	Original	06/10/2015	4.824285833	195	39	200	32	2
LOU4002	Original	06/03/2015	4.824285833	3	0	2	1	0
LOU4003	Original	06/10/2015	4.824285833	16	3	15	4	0
LOU4005	Alternate	06/03/2015	4.824285833	9	4	8	4	1
MEC1001	Original	06/05/2015	3.048947585	85	40	116	7	2
MEC1002	Original	06/05/2015	3.048947585	84	23	83	22	2
MEC1003	Original	06/05/2015	3.048947585	41	19	56	4	0
MEC2001	Original	06/05/2015	3.048947585	167	40	132	68	7
MEC2002	Original	06/02/2015	3.048947585	20	8	16	5	7
MEC2003	Original	06/02/2015	3.048947585	145	42	93	67	27
MEC2004	Original	06/02/2015	3.048947585	90	18	74	9	25
MEC2005	Original	06/02/2015	3.048947585	129	29	72	51	35

PG1001	Original	06/07/2015	11.1969098	150	64	188	19	7
PG1002	Original	06/11/2015	11.1969098	34	13	33	4	10
PG2001	Original	06/11/2015	11.1969098	80	17	80	12	5
PG2002	Original	06/11/2015	11.1969098	91	26	91	17	9
PG2003	Original	06/07/2015	11.1969098	90	24	84	12	18
PG2004	Original	06/07/2015	11.1969098	78	15	60	28	5
PG4001	Original	06/07/2015	11.1969098	3	1	3	1	0
PG4002	Original	06/11/2015	11.1969098	94	22	62	34	20
ROC1001	Original	06/09/2015	2.797754178	17	6	15	5	3
ROC1002	Original	06/07/2015	2.797754178	72	46	107	5	6
ROC1003	Original	06/09/2015	2.797754178	72	23	73	20	2
ROC2001	Original	06/09/2015	2.797754178	85	28	82	26	5
ROC2002	Original	06/07/2015	2.797754178	15	6	17	2	2
ROC2003	Original	06/09/2015	2.797754178	35	9	26	13	5
ROC2004	Original	06/07/2015	2.797754178	32	11	30	11	2
ROC2005	Original	06/07/2015	2.797754178	20	12	22	3	7
SHE1001	Original	06/10/2015	2.662157951	65	17	57	22	3
SHE1002	Original	06/10/2015	2.662157951	109	27	94	33	9
SHE1003	Original	06/10/2015	2.662157951	25	6	25	6	0
SHE2001	Original	06/01/2015	2.662157951	48	18	56	6	4
SHE2002	Original	06/01/2015	2.662157951	12	4	11	3	2
SHE2003	Original	06/01/2015	2.662157951	63	10	56	6	11
SHE2004	Original	06/01/2015	2.662157951	90	27	84	20	13
SHE2005	Original	06/10/2015	2.662157951	183	42	154	59	12
SOU2001	Original	06/05/2015	3.428120652	33	4	24	8	5
SOU2002	Original	06/04/2015	3.428120652	14	1	9	3	3
SOU2003	Original	06/05/2015	3.428120652	22	6	20	0	8
SOU2004	Original	06/05/2015	3.428120652	38	10	43	1	4
SOU2005	Original	06/04/2015	3.428120652	38	10	28	20	0
SOU2006	Original	06/05/2015	3.428120652	269	82	292	33	26
SOU2007	Original	06/04/2015	3.428120652	30	1	24	5	2
SOU2008	Original	06/11/2015	3.428120652	169	44	160	45	8
SE1001	Original	06/01/2015	1.281214752	62	9	48	7	16
SE1002	Original	06/07/2015	1.281214752	250	65	276	10	29
SE1003	Original	06/01/2015	1.281214752	44	6	43	5	2
SE1004	Original	06/07/2015	1.281214752	19	3	18	2	2
SE2001	Original	06/08/2015	1.281214752	463	71	433	55	46
SE2002	Original	06/07/2015	1.281214752	252	91	294	15	34

SE2003	Original	06/01/2015	1.281214752	161	24	118	33	34
SE2004	Original	06/12/2015	1.281214752	370	72	340	78	24
SE2005	Original	06/12/2015	1.281214752	41	8	39	8	2
SE2006	Original	06/12/2015	1.281214752	335	98	346	65	22
SE2007	Original	06/10/2015	1.281214752	403	81	398	73	13
SE2008	Original	06/03/2015	1.281214752	312	58	283	73	14
SE4001	Original	06/03/2015	1.281214752	2	1	3	0	0
SE4002	Original	06/12/2015	1.281214752	54	11	51	11	3
SE4003	Original	06/03/2015	1.281214752	20	6	18	8	0
SE4004	Original	06/07/2015	1.281214752	1	0	1	0	0
STA1001	Original	06/10/2015	7.669095758	182	39	189	22	10
STA1002	Original	06/02/2015	7.669095758	135	40	142	9	24
STA2001	Original	06/10/2015	7.669095758	247	60	269	30	8
STA2002	Original	06/02/2015	7.669095758	297	42	305	9	25
STA2003	Original	06/10/2015	7.669095758	181	33	173	23	18
STA2004	Original	06/10/2015	7.669095758	165	28	152	28	13
STA4001	Original	06/09/2015	7.669095758	4	1	5	0	0
TAZ2001	Original	06/11/2015	3.401289129	91	36	81	46	0
TAZ2002	Original	06/04/2015	3.401289129	192	64	205	41	10
TAZ2003	Original	06/04/2015	3.401289129	82	35	83	25	9
TAZ2004	Original	06/04/2015	3.401289129	194	30	168	32	24
TAZ2005	Original	06/11/2015	3.401289129	90	41	90	27	14
TAZ2006	Original	06/11/2015	3.401289129	26	5	22	6	3
TAZ2007	Original	06/04/2015	3.401289129	79	32	86	12	13
TAZ2008	Original	06/11/2015	3.401289129	18	6	16	6	2
WAS1001	Original	06/09/2015	2.121740433	181	36	166	22	29
WAS1002	Original	06/09/2015	2.121740433	195	52	202	22	23
WAS2001	Original	06/07/2015	2.121740433	7	5	7	5	0
WAS2002	Original	06/09/2015	2.121740433	66	17	67	16	0
WAS2003	Original	06/07/2015	2.121740433	44	21	42	18	5
WAS2004	Original	06/07/2015	2.121740433	18	10	20	8	0
WAS4001	Original	06/07/2015	2.121740433	1	1	0	2	0
WAS4003	Alternate	06/09/2015	2.121740433	4	0	4	0	0
TOTALS	**134 (of 136 sampled; 2 had 0 observations)**		**473.92126**	**14,679**	**4,012**	**14,601**	**2,756**	**1,334**

Appendix C: Virginia Seat Belt Observation Forms – Cover Sheet

Date: _____

Site Identification:

Site Location: _____

Site Number:_____

Alternate Site Information:

Is this an alternate site? **No** **Yes**
(Circle one)

If yes, please provide a reason for using an alternate site from the reserve list:

_____

Site Description:

Assigned traffic flow: North South East West

Number of lanes observed: _____

Total number of lanes in this direction: _____

Weather Conditions: **Clear** **Light Fog** **Light Rain**

Site Start and End Time:

Start time for observations: _____**am/pm**

End time for observations: _____**am/pm**
(Total observation period MUST last exactly 50 minutes)

State Summer Safety Belt Observation Form

Observer: _____ Primary or Secondary: _____
Date: _____ Start Time: _____
Day of Week: _____ End Time: _____
Site Number: _____ Site: _____
Observed From: _____
Number of Lanes – _____
Notes: _____
_____

Total Observation = 50 minutes
Observation Times per Lane if Congested
1 lane = 50 minutes 3 lanes = 16.5 minutes each
2 lanes =25 minutes each 4 lanes = 12.5 minutes each

Volume 1: _____ Volume 2: _____

	Lane	Vehicle Type C Car T Truck S SUV V Van M Mini-Van	Driver		Passenger			Driver	Weather 1 Clear/Sunny 2 Light Rain 3 Cloudy 4 Fog 5 Clear but Wet
			Gender	Belt Use	Gender	Belt Use	Not Pres	Cell Use	
1		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
2		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
3		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
4		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
5		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
6		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
7		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
8		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
9		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
10		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
11		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
12		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
13		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
14		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
15		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
16		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
17		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
18		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
19		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
20		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	

	Lane	Vehicle Type C Car T Truck S SUV V Van M Mini-Van	Driver Gender	Belt Use	Passenger Gender	Belt Use	Not Pres	Driver Cell Use	Weather 1 Clear/Sunny 2 Light Rain 3 Cloudy 4 Fog 5 Clear but Wet
21		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
22		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
23		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
24		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
25		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
26		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
27		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
28		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
29		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
30		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
31		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
32		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
33		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
34		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
35		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
36		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
37		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
38		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
39		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
40		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
41		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
42		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
43		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
44		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
45		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
46		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
47		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
48		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
49		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	
50		C T S V M	M F	Y N U	M F	Y N U	NP	Y N	

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