Superstreet Benefits and Capacities

by

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16. Abstract

This research evaluated operational, safety, and perceived effects of superstreets, called restricted crossing U-turn intersections by FHWA, and developed a useful level of service estimation program which could be used on North Carolina's urban and rural arterial roadway system. The operational analysis involved calibrating and validating VISSIM models of three existing signalized superstreets in North Carolina – two isolated intersections, and one five-intersection superstreet corridor. Results from the three models were compared to results from models of equivalent conventional intersections at various volume levels using travel time as the main measure of effectiveness. The superstreet outperformed the conventional intersection at each location studied, reducing the overall average travel time per vehicle traveling through the intersection. The safety analysis involved three separate methods – naïve, comparison-group, and Empirical Bayes. Only unsignalized superstreets were analyzed using the Empirical Bayes method. Three signalized superstreets were also evaluated using SSAM. The results from the analyses were inconclusive with signalized superstreets. Unsignalized superstreets, however, showed a significant reduction in total, angle and right turn, and left turn collisions in all analyses. Analyses also showed a significant reduction in fatal and injury collisions as well. Resident, commuter, and business perceptions of superstreets were evaluated using survey data. The perceptions were mixed within each of the three groups, with some positive and some negative feelings. A LOS program was developed to provide highway capacity and service volumes for superstreets for use in planning applications. The research outcomes will enable NCDOT to have a better understanding of superstreet performance, which can lead to cost saving by reductions in collisions and travel time.

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EXECUTIVE SUMMARY

Arterials across North Carolina and the United States are operating inefficiently these days. In urban and suburban areas they are becoming more and more congested due to growing traffic demands, and in rural and suburban areas they experience far too many collisions. Agencies tasked with fixing these arterials are running out of good solutions. Superstreets, called restricted crossing U-turns by the Federal Highway Administration, are a part of a menu of unconventional arterial designs that may provide a promising solution. Up to this point, there is little valid information available on the effects of superstreets. Studies have been done analyzing this new design, but the results are from theoretical analyses, macroscopic analyses, and simulations of hypothetical arterials. The purpose of this research was to determine the operational and safety effects of the superstreet treatment on real arterials in North Carolina.

The operational analysis involved calibrating and validating VISSIM models of three existing signalized superstreets in North Carolina – two isolated intersections, and one five-intersection superstreet corridor. Results from the three models were compared to results from models of equivalent conventional intersections at various volume levels using travel time as the main measure of effectiveness. The superstreet outperformed the conventional intersection at each location studied, reducing the overall average travel time per vehicle traveling through the intersection. The travel time savings and extra capacity at higher volumes can buy agencies more years of good operation before intersection improvements are necessary.

The safety study involved a naïve analysis and comparison group (C-G) analysis of rural signalized and unsignalized superstreets and an Empirical Bayes (EB) method analysis of rural unsignalized superstreets. The project team also evaluated three signalized superstreets using the Surrogate Safety Assessment Model (SSAM) because the VISSIM models were previously calibrated and validated against travel time. These three methods of analysis were used to find the effects a superstreet design has on collision frequencies and severities. Signalized superstreets utilized the naïve and C-G methods because the NCDOT installed superstreets at these sites for their congestion problems and not for their safety problems. Based on this fact, regression-to-the-mean will not have an effect on the collision frequencies which makes the use of the naïve and C-G methods acceptable. Conversely, unsignalized superstreets were installed for their safety issues and therefore, regression-to-the-mean must be accounted for in the analysis. The results from analyses are inconclusive with signalized superstreets. Unsignalized superstreets, however, showed a significant reduction in total, angle and right turn, and left turn collisions in all analyses. Analyses also showed a significant reduction in fatal and injury collisions as well.

In addition to the operational and safety analyses, the team conducted three surveys: a residential survey to gather opinions of drivers that live near a superstreet, a survey to gather opinions of commuters driving through a superstreet on a daily basis, and a business survey to gather the perceived effects of superstreets on adjacent businesses. Each of the surveys provided interesting feedback. Residents living near superstreets had mixed reactions about the ease of navigation through superstreets compared to typical intersections, but they agree the design helps them travel more safely through the intersection. Commuting drivers perceived superstreets to be more difficult to navigate, but felt strongly about savings in travel time and reductions in

numbers of stopped vehicles. Business reactions varied greatly depending on the ability to make direct left turns from the arterial. In general, more business managers felt superstreets negatively impacted business growth and operations. Based on the opinions of adjacent business owners/managers, access and confusion have been identified as key problems in retaining the number of regular customers and attracting new customers near superstreets. Agencies contemplating superstreet projects should be aware of these perceptions and try to mitigate the negative ones if possible.

The existing NCLOS program was modified to include a determination of highway capacity for superstreets based upon the specific conditions present in North Carolina for use in planning applications. The NCLOS tool is based upon the methodology and theory already present in the 2000 Highway Capacity Manual, but is geared specifically to North Carolina. The software program includes a graphical interface that allows for various planning scenarios to be examined in an efficient, yet accurate manner. Default values are provided for key parameters (such as saturation flow rate, effective green, etc.) in calculating service volumes and capacity for the superstreet being examined. However, users are able to change the values in lieu of more specific or current information for their particular project.

The research outcomes will enable NCDOT to have a better understanding of superstreet performance, which can lead to cost saving by reductions in collisions and travel time. The NCDOT can better allocate its limited resources by understanding the best implementation for signalized and unsignalized superstreets. The results of this research provide the first calibrated VISSIM models, Empirical Bayes safety analysis, and LOS evaluation for superstreets, which can help transportation agencies to implement this promising design in an optimal manner.

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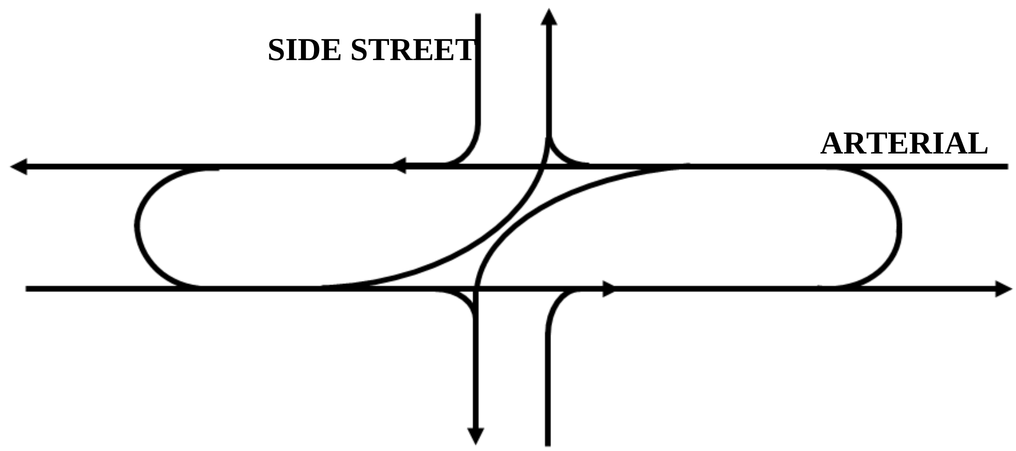
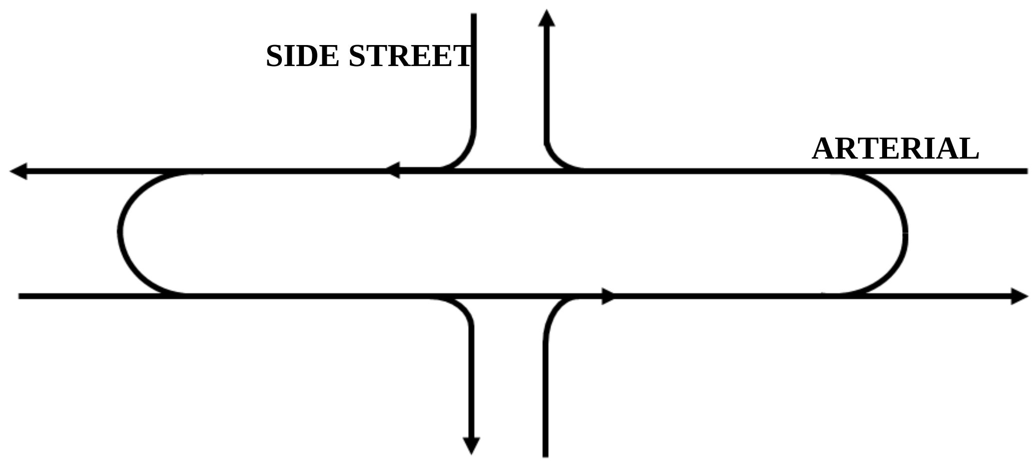
1.0 INTRODUCTION

Many arterials with four or more lanes in NC and across the US operate very poorly these days. In suburban areas they are often congested, due in part to growing traffic demands that probably will continue for some time, and in rural and suburban areas they experience far too many collisions. Unfortunately, agencies tasked with fixing their arterials do not have many good solutions available. For suburban arterials, conventional traffic engineering solutions like actuated signals, turn bays, and signal systems have generally been exhausted. Widening projects and bypasses are expensive, environmentally disruptive, and may not help operations much. Flyovers and interchanges are expensive and unpopular with roadside businesses left in the shadows. Intelligent transportation, transit, demand management, and other possibilities have not yet proven helpful on arterials. For rural highways, signal installations, flashing beacons, reduced speed limits, and other conventional measures all have serious drawbacks.

Superstreets, called restricted crossing U-turns by the Federal Highway Administration, are a part of a menu of unconventional arterial designs that may provide a promising solution for arterials. They have the potential to move more vehicles efficiently and safely through the same arterial pavement as conventional arterials, at-grade, with minimal disruptions to the surrounding environment and businesses. A superstreet works by redirecting left turn and through movements from side streets. Instead of allowing those to be made directly through a two-way median opening, as in a conventional design, a superstreet sends those movements to a one-way median opening 800 feet or so downstream, as Figure 1.1 shows. Thus, a side street through movement will be made by a right turn, then a U-turn, then another right turn. Readers should note that a superstreet is different from the design called a “directional crossover” in North Carolina, in which one or both of the U-turn maneuvers is made using a two-way median opening. Superstreets, outside of North Carolina, are known to exist in Maryland, Minnesota, and Michigan.



Superstreet with direct left turns from the arterial



Superstreet without direct left turns from the arterial

Figure 1.1. Superstreet Design

The results from this redirection are dramatic. Traffic signals now require only two phases instead of the four or more phases—with green arrows for left turns from both streets--usually required at a busy two-way median opening. Since every signal phase introduces extra "lost time" for all motorists, this reduction in phases means significant time savings for everyone. In addition, the superstreet intersection without direct left turns shown in Figure 1.1 has only eight conflict points—places where vehicle streams cross, merge, or diverge—and the superstreet intersection with direct left turns only has 14 conflict points while a conventional intersection with a two-way median opening has 32. Since each conflict point adds another way for a vehicle to get hit, superstreets are likely to be safer.

The most profound change provided by a superstreet in a suburban area is in progression, which is the ability of vehicles to move along a road at a steady speed hitting one green signal after another. With a superstreet, the signals that control one direction of the arterial have nothing to do with the signals that control the other direction. This means that a superstreet will operate like a pair of one-way streets, and that perfect progression is possible at any speed with any signal spacing. This is an extraordinary capability; conventional arterials cannot approach this efficiency even with excruciating control of accesses and signal installations. The ability of a superstreet to control motorist speeds should add to its safety. Superstreets also provide superb and safe service to crossing pedestrians.

1.1 Research Objectives

Superstreets are a promising new arterial design, but the idea meets resistance when proposed in some places. Business owners and land owners are concerned about less direct access, developers are concerned about higher signal equipment costs, and emergency officials are concerned about indirect movements of their vehicles, for example. Motorists, who would enjoy the presumed safety and travel time benefits from superstreets, are a "silent majority" whose voices could get drowned out by the concerns of these other more vocal groups. The NCDOT needs valid and local information on the benefits and capacities of superstreets to represent this silent majority, answer the concerns of the vocal groups, and make the best decisions for all stakeholders when superstreets are proposed.

One objective of this project was to fill this information gap and determine whether superstreets are producing safety and operational benefits for motorists in North Carolina. In rural areas, such as on US-23 and US-74 near Waynesville, superstreets have been in place long enough on large enough stretches of highway to provide a good look at changes in safety. In suburban areas such as US-17 in Brunswick County, the project team investigated safety and delay, using sophisticated traffic models to simulate what conditions would be with a conventional boulevard design. In both rural and suburban areas, the project team also conducted surveys of local officials, business owners, shoppers, motorists, and other stakeholders to gather opinions on the effects of the superstreet design.

This project also filled a critical need for a capacity and level of service methodology for superstreets. The potential problems lie in two areas. First, there are questions about the saturation flow rates—the basic building blocks of a capacity calculation--for the various types of U-turn crossovers. To this point, analysts looking at superstreets are using default saturation flow rates in their macroscopic procedures or microscopic simulation models. No one has calibrated those models for superstreets. Some work has been done on capacities of U-turns but superstreet crossovers are different from U-turns on conventional roads. The NCDOT needs valid saturation flow rates for five types of crossovers:

- U-turn unopposed (shown above in Figure 1.1),
- U-turn unopposed and left turn,
- U-turn opposed,
- U-turn opposed and left turn, and
- Left turn (shown above in Figure 1.1).

Valid saturation flow values are the building blocks to help solve the second problem, which is putting a capacity and level of service estimate together for an entire superstreet intersection. A superstreet essentially breaks up a large conventional intersection into four small intersections. Analysts can use conventional techniques to estimate the capacity and level of service for these pieces, but no one has tried to assemble the pieces into a single overall estimate of capacity and level of service for the entire intersection, including consideration of the outstanding mainline progression and the extra travel times some vehicles experience in completing their maneuvers.

This research has updated the NC LOS program to include a capability to estimate capacity and level of service for superstreets. Co-PI Foyle helped develop the NC LOS program (1) currently being used by several units within NCDOT. It is a unique, visual display of the Highway Capacity Manual methodologies for freeways, multilane highways, arterials, and two-lane highways. The program creates a graphical plot of LOS against AADT based on default, boundary and user inputs, and has output reports and linking capabilities to TransCAD. Another module can be added to this very intuitive and user-friendly software.

1.2 Research Scope

The scope of this research is the effect of superstreets on North Carolina motorists. Superstreets affect safety, travel time and delay, and stakeholder opinion. The operational analysis produced an overall intersection capacity estimate and a revision to the NC LOS program.

Two main sources of data have been pursued in this research. The first source of data was field and video-collected data for the travel time experiment. This included travel time runs, free flow speeds, saturation flow studies, and origin-destination movements. The second source of data was the Traffic Engineering Accident Analysis System (TEAAS) software for the safety analysis. TEAAS is the primary tool used by the NCDOT to analyze and report on crashes within North Carolina.

The extent of the data collection activity of this research is tremendous compared to similar research reported in the literature. The relatively large data sets enabled us to evaluate the impacts of superstreets and to create high-quality travel time models.

Though the team followed typical calibration and safety procedures, readers should note that the direct results of this research (such as the travel time calibrated models or the safety results) may not be directly applicable to other geographic regions of the US and other countries. The readers in other geographic regions could use the methodologies and procedures presented here, but, they may need to use their own data and draw conclusions based on the data collected in their region.

1.3 Outcomes and Benefits

The results of the travel time experiment showed that all three signalized superstreets, which included two isolated intersections and one five-intersection corridor, performed better than the corresponding conventional intersections when comparing the average travel times per vehicle. The largest travel time savings occurred at the peak, peak+10%, and peak+20% demand levels.

With the superstreet reducing overall travel time through the intersection at peak periods and higher, the design can buy an agency more years after the conventional intersection hits capacity. Using the critical sum as a capacity check, the superstreet was able to provide more capacity beyond what the conventional intersection could provide when it reached high demand levels in these three cases. When agencies are looking to make intersection improvements along their corridors, the superstreet can give them more capacity and at the same time reduce travel time, therefore adding more years to the intersections' useful lives before having to make additional improvements, and thus saving money.

The safety analyses of signalized superstreets did not provide a clear result. Each site we examined had unique characteristics that affected its analysis. The US-15/501 superstreet was affected by spillback from a downstream intersection; the US-17 superstreets were implemented with signals and with a large development that significantly influenced traffic volume and safety; and the US-421 superstreet has flashing yellow arrows for major left turns and U-turns which no other signalized superstreet uses. The SSAM analysis for signalized sites was also difficult because we coded our VISSIM models to produce travel time results, and this was not optimal for a realistic safety model.

Unsignalized superstreets showed unambiguously a significant reduction in total, angle and right turn, and left turn collisions in all analyses. Analyses also showed a significant reduction in fatal and injury collisions as well.

The significant collision reduction from unsignalized superstreets is important because it shows the strong success of NCDOT superstreet application. The cost savings to taxpayers from this collision reduction will be enormous. Additionally, the NCDOT can use the information to justify their design decisions to local citizens and business owners.

Each of the survey types provide interesting feedback. Residents living near superstreets have mixed reactions about the ease of navigation through superstreets compared to typical intersections, but agree that the design helps them travel more safely through the intersection. Commuting drivers perceive superstreets to be more difficult to navigate, but feel strongly about savings in travel time and reductions in numbers of stopped vehicles. Business reactions varied greatly depending on the ability to make direct left turns from the arterial. In general, more business managers feel superstreets negatively impact business growth and operations. Based on the opinions of adjacent business owners/managers, access and confusion have been identified as key problems in retaining the number of regular customers and attracting new customers near superstreets. Agencies contemplating superstreet projects should be aware of these perceptions and try to mitigate the negative ones if possible.

The benefits from this research should easily extend beyond the borders of North Carolina. It is our hope that the benefits documented here would inspire analysts worldwide to also consider superstreet alternatives in confidence, much as the publication of solid research results on the safety of roundabouts in the late-1990s boosted confidence in that design. The NCDOT and its motorist customers should enjoy a huge savings in construction, collision, and delay costs in the future due to superstreets. The construction savings will come from selecting a superstreet on an arterial rather than interchanges, which have become extremely expensive over the past few years. The collision savings could be substantial, especially in leading to less severe collisions. The prevention of an injury collision that would have occurred at an unsignalized two-way median opening would save North Carolina citizens an average of $100,000. The delay savings will be from motorists cruising through a superstreet with minimal signal delay. A one-mile long superstreet design on a busy arterial that saves motorists an average of one minute each during peak periods over a conventional boulevard could easily add up to $1,000,000 per year in total savings. This delay savings would also mean lower fuel consumption, better air quality, and other environmental benefits.

1.4 Report Organization

The remainder of the report is organized into chapters that present each of the major analyses performed during this project. Chapters 2 and 3 introduce the travel time experiment and safety analyses. Chapter 4 presents the resident, commuter, and business surveys. Chapter 5 discusses the NC LOS program. Chapters 6 and 7 present conclusions and recommendations for each major analysis, and Chapter 8 presents technology transfer plans of the research project. Chapters 9 and 10 are references and appendices for the report.

2.0 TRAVEL TIME EXPERIMENT

2.1 Literature Review

The literature review for this section addresses operational studies on both superstreets and median U-turns. An important part of the superstreet concept is the use of directional median U-turns, which is why it is important to include median U-turns in the literature review. Most of the studies on median U-turns give similar results showing that the design decreases average total delay at an intersection and reduces the number of conflict points and collisions. There are fewer studies available on superstreets. Most of the studies on superstreets are based on macroscopic analyses and simulations of hypothetical arterials.

2.1.1 Median U-turns

Median U-turns are similar to the superstreet in that both designs eliminate left turns from the minor road to the arterial and send them instead to downstream directional U-turn crossovers. The difference between the median U-turn intersection and the superstreet is that the median U-turn allows through movements from both the arterial and minor road at the main intersection. No left turns from the arterial to the minor road are allowed at the main intersection, which operates with a two-phase signal. Figure 2.1 shows a diagram of the median U-turn design.

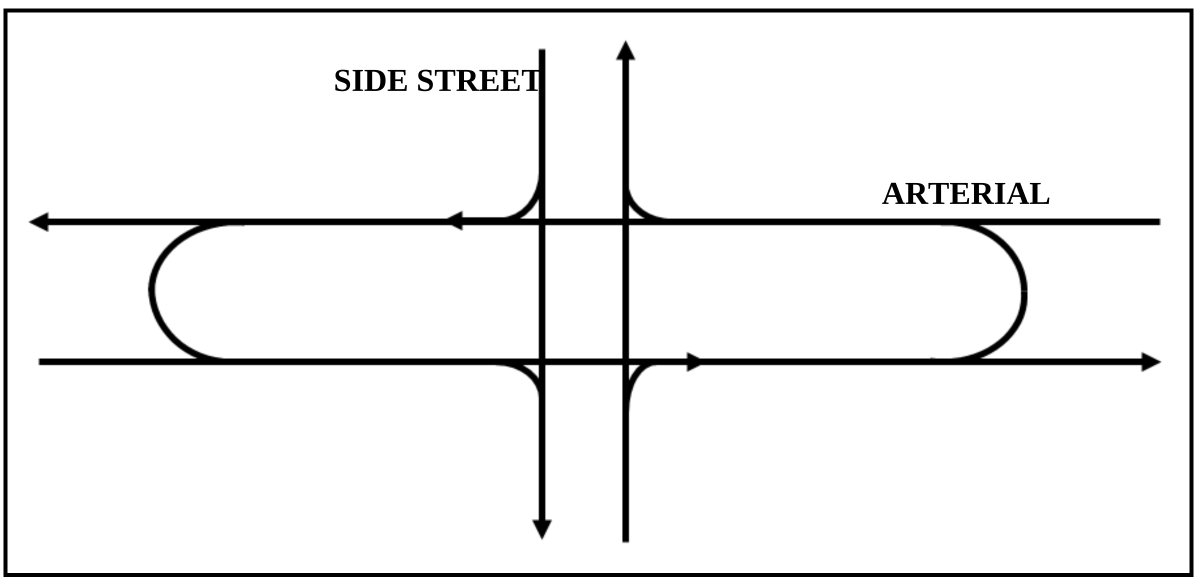


Figure 2.1. Median U-Turn Design

There is a large variety of literature on median U-turns. The studies of interest to this project include operational research for signalized intersections, as well as access management studies. Some of the research topics include capacity of U-turns at unsignalized and signalized openings, and travel time efficiency of median U-turns.

2.1.1.1 Operations

Al-Maseid (2) conducted a study on capacity of U-turns at median openings using two different methods: empirical and gap-acceptance. The U-turn capacity model showed strong correlation between conflicting traffic flow and average total delay. The gap-acceptance model showed that critical gap varied according to average total delay and speed of conflicting traffic flow. Both models yielded similar results for high and low conflicting traffic volumes. The differences between the models were not significant at the 95% confidence level so he concluded that both models give similar capacity results. Al-Maseid noted that it is important to consider the delay effect on gap acceptance because drivers change behavior the longer they have to wait, therefore accepting smaller gaps.

Liu et al (3) also performed a study on capacity of U-turns at median openings. Their study was conducted on multilane highways in the Tampa Bay, Florida area. They predicted that the factors affecting U-turn capacity would be major street traffic volume in the direction of conflict, the critical gap for U-turn movements, and the follow up time for U-turn movements. Results showed that U-turns at narrow median openings have a larger critical gap than those at wide medians, and that median size can greatly affect the capacity - wide medians were found to have up to 268 pc/h greater capacity than narrow medians. The major street traffic volume was also a major factor – U-turn capacity decreased at a faster rate than the capacity of a left turn movement from a major street when the major street volume increased.

The Michigan Department of Transportation is a frequent user of directional crossovers on their boulevards to relieve capacity problems that are associated with interlocking left turns in bi-directional crossovers. Maki reported on this strategy (4); at the time (1996) Michigan had over 425 miles of boulevards with 700 directional crossovers in their state highway system. A capacity analysis showed a 20-50% capacity improvement, although it is not clear in the report what volumes this applies to, or how many sites were analyzed. The measures of effectiveness (MOEs) used for the operational analysis were network total time and left turn total time in the network. The network consisted of six intersections. It was found that even though left-turning vehicles would have to travel a longer distance, that extra travel time was offset by delay savings at the intersection (compared to direct left turns), which is similar to findings from other papers. Since this analysis was done on a network of six intersections, it is possible that smaller networks with one, two or three intersections would yield different results.

Dorothy et al performed a study (5) that compared a five-lane highway with a two-way left turn lane (TWLTL) to a four-lane highway with a median (boulevard design). The measures of effectiveness used were network total time (total time vehicle spends in the network which includes delay and travel time), and left turn total time (time it takes to make a left turn as a combination of delay and travel time). All analysis was done using TRAF-NETSIM computer simulation and modeling. Results showed that the boulevard design with indirect left turns and signalized crossovers had best results for both total network time and left turn total time. Boulevards with direct left turns had the highest amount of delay. Hummer and Boone's study on unconventional arterial intersection designs for NCDOT (6) compared the travel efficiency of the median U-turn, continuous green T, and the NCSU bowtie intersections to conventional intersections. They used Traf-Netsim 4.0 for network simulation which was calibrated using field data from Michigan, Florida and Maryland. The MOEs were total travel time and number of stops. The median U-turn was most effective with higher through volumes and left turns. The relative efficiency varied with the through volume. The median U-turn overall led to more travel time and stopped delay for left-turning vehicles than the standard intersection.

Bared and Kaisar (7) performed a study investigating the operational benefits of median U-turns for left-turning vehicles. They compared a typical intersection (four lanes intersecting four lanes) to a median U-turn design. Their median U-turn design implemented U-turns for the left-turning vehicles on the major road and direct left turns within the intersection for vehicles on the minor road, which is opposite from a typical superstreet. CORSIM was used for model simulation and TRANSYT-7F was used for signal optimization. Average network travel time became noticeably better for the median U-turn design for entering flows upwards of 6000 vph. Bared and Kaisar also found that the average proportion of vehicles that stop in the network is 20-40% lower for the U-turn design; however, stopping time is higher for the U-turning vehicles by 10-18 s/veh because they are likely to stop at both the main intersection and the left turn bay downstream. The significance of the results could have been greater if the models were calibrated with field data and if a series of intersections was used instead of an isolated intersection.

Henderson and Stamatiadis (8) conducted a study on how median U-turns improve traffic flow along arterials. Their study implemented median U-turns on a major arterial in Lexington, Kentucky to see how it would help relieve congestion. They looked at both the bowtie and superstreet designs before deciding that the median U-turn would be more appropriate given the geometry of the road in an effort to keep construction time and cost at a minimum. Modeling was done using TSIS and CORSIM, while TRANSYT-7F was used for signal optimization. A p.m. peak hour travel time study validated the models. The researchers implemented median U-turns at intersections with high left turn volumes and high delays. The computer simulation had the following system-wide effects from the median U-turns: increased speed, decreased average and total delay time, and an increase in move/total time ratio, therefore increasing the efficiency of the network. Peak hour travel times were reduced by 32% and delays were reduced by 35%. They also ran a simulation that widened the arterial to three instead of two lanes in each direction, but the median U-turn efficiency remained superior. Table 2.1 is a summary of the network-wide operating measures of effectiveness.

Table 2.1. Summary of Network-Wide Operating MOE (7)

	Move/Total time	System speed (mph)	Total delay (veh-hr)	Average delay (min/veh-trip)
Existing Conditions	0.35	15.4	855	3.40
Signal Optimization	0.36	16.2	842	3.22
Additional Lane	0.41	17.8	703	2.65
U-turns[1]	0.41	17.8	647	2.45
U-turns[2]	0.44	19.0	583	2.19
U-turns & Additional Lane	0.47	20.8	498	1.85

Note:

1. At four intersections
2. At six intersections

Thakkar et al (9) conducted a study to evaluate the impacts of prohibiting median opening movements. The factors that were investigated included: impacts on adjacent intersection operations, median opening/driveway operations, arterial weaving operations, overall system operations, rerouted motorist's convenience, safety, cost-benefit value, and public acceptance. The investigators made the case that preventing left turns at a median opening or driveway would shift the traffic to the nearest intersection, which would in turn decrease the operation level due to heavier U-turn traffic volumes. This would not necessarily be the case for superstreets since a designated directional crossover is built into the design, and would theoretically be able to handle the volume of traffic needing to make U-turns to switch directions.

2.1.1.2 Access Management

The TRB Access Management Manual (10) presented studies done across the country indicating that raised medians have little to no overall adverse impact on surrounding businesses. In Kansas, changes in traffic patterns did not cause a change in use in the abutting businesses. In Texas, the perception of the median installation by business owners prior to construction is usually worse than reality. Also, "accessibility to store" is usually ranked lower than customer service, quality of product, and product price by business owners when asked what factors were important in attracting customers.

Similar results were found in a study done by the Texas Transportation Institute (11) addressing the economic impacts of raised medians. This four-year study was done at eleven locations to assess the effects prior, during, and after construction of raised medians. Through surveys and interviews with business owners and customers, the researchers found that the only major adverse impact raised medians have is during the construction phase. For businesses that were present before, during, and after construction, property value increased by 6.7 percent after the construction of the raised median compared to the before conditions, while owners thought they would experience a decrease in value. The duration of construction typically lasted one to two years, with construction dates between 1979 and 1998 for all study locations. As with other studies, accessibility is ranked lower in importance for destination businesses, and slightly higher for pass-by businesses such as gas stations. Overall, the study concludes that there is no negative economic impact caused by raised medians.

2.1.2 Superstreets

Richard Kramer (12) first developed the superstreet concept in the 1980s as a way to alleviate congestion on arterials. While the concept was new, the techniques he used were not. Kramer listed ten "dream" characteristics of ideal operations on an arterial, with the major focus on the importance of giving through traffic priority. The ten characteristics are as follows:

1. Its three or four lanes in each direction of travel would receive a minimum of two-thirds to three-fourths of the signal cycle as green time at all intersections encountered along its entire length.
2. Each direction of travel would be signalized for progressive movement so that traffic would simultaneously flow as smoothly in each direction as if it were two parallel one way streets.
3. Thru traffic would be protected (by signalization) from conflicting left turns from the opposing direction.
4. Direct left turns would be provided from the arterial at frequent intervals, and would be protected by signalization from conflicting thru traffic movements from the opposing direction.
5. The facility would accommodate all maneuvers of increased truck sizes and combinations allowable under the 1982 STAA.
6. Pedestrians crossing this arterial would be provided protected signal phasing and be free from (lawful) conflict with any vehicular traffic crossing their path; and the spacing of pedestrian crossing would be so convenient as to discourage pedestrian crossing at unprotected locations.
7. The facility would also provide for transit operations that would not impede thru traffic movement at any bus stop.
8. Transit bus operations would be enhanced by providing stops at all convenient locations in close proximity to protected pedestrian crossings.
9. The geometric design of the facility would accommodate the infusion of additional major traffic generators with minimal adverse affect to the road user; i.e., thru traffic could continue to receive a minimum of two-thirds to three-fourths of the signal cycle as arterial green time.
10. Signalization timing and offset programs for this arterial would be independently variable for each direction to take into account changes in traffic volumes, provide for special event (stadium) traffic, and accommodate an uninterrupted flow for emergency vehicles having on-board pre-emption equipment.

These characteristics provide the foundation for the superstreet design, which results in perfect signalized progression. Each direction of the arterial acting as independent one-way streets allows the flexibility to change progression speed, cycle lengths, and signal spacing in either direction while still maintaining optimal progression along the corridor.

Hummer (13) in 1998 presented seven unconventional alternatives for intersections that focus on left turns to and from the arterial. The two major points of the designs are to reduce delay for through traffic and decrease the number of conflict points. Both the median U-turn and superstreet are presented in this paper. While the paper does not include any quantitative studies, data, or analysis, it does present the designs with a description, variations, history, advantages, disadvantages, and when to consider each alternative. Since the superstreet design is closely related to the median U-turn design, it is not surprising that similar advantages and disadvantages are listed for both options. Both designs are said to operate best with low to medium left turn volumes from the minor street. The median U-turn can handle more minor street through traffic than the superstreet, but the superstreet can handle more left turns from the arterial. The superstreet also has the advantage of "perfect progression" in both directions at any time with any intersection spacing.

Hummer (14) also wrote a chapter on superstreets in an information report by the FHWA on non-traditional intersections and interchanges. The chapter covers all aspects of the superstreet design, including operations, safety, signalization treatment, pedestrian accommodations, and access management considerations. VISSIM was used to assess the operational performance of five geometric design cases, where 90 unique simulations were done for both superstreet and comparable conventional intersections. When the ratio of minor road volumes compared to total intersection volumes is small (less than 0.25), simulation results show that superstreets have higher intersection capacities and shorter travel times than conventional intersections. Pedestrians are accommodated better in low to medium volume traffic scenarios.

Kim, Edara, and Bared (15) conducted a study on the operation and safety performance of the superstreet. The study analyzed three scenarios of the superstreet design – one left lane and two through lanes on major road, one left lane and three through lanes on major road, and two left lanes and three through lanes – and compared them to the conventional intersection. Using VISSIM to run various traffic flows, the researchers came up with ideal volumes where a superstreet would function better than a standard intersection. Those volumes were 260-340 veh/h/ln for left turn traffic and 900-1150 veh/h/ln for through traffic on the major road with one left turn lane and two to three through lanes. It is important to keep in mind that this analysis was done without collecting field data to calibrate the models or check the numbers.

Reid and Hummer (16) conducted an experiment comparing travel time efficiency of median U-turns to two-way left turn lanes and superstreets. The tests were done using CORSIM with real traffic volumes and geometry from a median U-turn arterial in Detroit, MI. Four time periods were tested – AM peak, noon, midday, and PM peak. The superstreet proved better than the TWLTL in mean speed for all four time periods and total system time for the peak periods; however it had the highest mean stops for all time periods compared to both the TWLTL and median U-turn. The superstreet was inferior to the median U-turn for all four time periods in all three categories – total system time, mean stops per vehicle, and mean speed. At first glance it seems that the median U-turn is superior to the superstreet, but it is important to remember that the volumes used were based on an existing median U-turn arterial with high cross street through volumes. Superstreets are not designed to handle high cross street volumes, as their primary function is to serve the through vehicles. The results from this experiment were restated in another paper by Hummer and Reid (17) on unconventional left turn alternatives for urban and suburban arterials.

Another study by Reid and Hummer (18) compared travel times between seven unconventional arterial intersection designs, which included both the median U-turn and superstreet. The study obtained actual data from seven high-volume, conventional intersections in North Carolina and Virginia and used them to construct traffic models in CORSIM. For each simulation model the number of lanes, signal timing parameters, design speeds, turn bay lengths and driver characteristics were all kept constant. Three volume levels were used: peak afternoon, 15% greater than peak afternoon, and midday (off-peak). The use of the off-peak volumes makes this study noteworthy since they take into consideration that designers will want to know how the unconventional design performs at all times of the day, not just the peak period. Results showed that while the conventional design had the fewest amount of stops, at each type of intersection analyzed there was at least one unconventional design that had a lower travel time. Superstreets only proved better than the conventional design at intersections with two-lane cross streets, although superstreets were still optimal for two-way progression.

Lu and Liu (19) conducted a study on the operational evaluation of right turns followed by U-turns in which they developed travel time regression models for right turn U-turns (RTUT) at both signalized intersections and unsignalized median openings. Data were collected from sixteen four-lane arterial sites in Florida. The sites were selected based on the following criteria: raised median with full or directional opening big enough to safely store vehicles, four lanes of through traffic (two in each direction), speed limit of 40 mph or higher, driveway with either two lanes (one for right turn and one for left turn) or shoulder flare so the two movements do not interfere, high RTUT and direct left turn (DLT) volumes, median width wide enough to store left turn vehicles, and downstream signal with exclusive left turn lane and protected left turn phase. The travel time regression models developed were based on RTUT flow rate, length to downstream intersection, and percent split in upstream through traffic. Table 2.2 shows the comparison of the average total travel time for different volume categories for a RTUT at a signalized intersection (sig), a RTUT at a median opening (med), and a direct left turn. The model, however, does not take deceleration or acceleration into consideration, and it does not take the vehicle through the entire length of the intersection.

Table 2.2. Comparison of the Average Total Travel Time in Different Volume Categories (19)

Traffic Volume (vph)		Average Travel Time (sec)		
Through Volume	Left turn/U-turn volume	RTUT (sig)	RTUT (med)	DLT
1000-1999 vph	0-49 vph	101.2	48.1	22.2
2000-2999 vph		114.1	53.3	28.8
3000-3999 vph		115.2	74.3	40.5
>= 4000 vph		N/A	N/A	49.7
1000-1999 vph	>= 50 vph	116.7	50.8	22.8
2000-2999 vph		122.6	55.1	32.2
3000-3999 vph		114.7	64.2	40.8
>= 4000 vph		111.4	72.6	48.7

Notes-- Through Volume: the major road through traffic volume in both directions of the arterials; N/A: no data points in the specific category

A paper presented at the 3rd Urban Street Symposium by Hummer et al (20) explores the capacity and progression of superstreets. To find intersection capacity they used the HCM critical lane volume method but with modifications for the superstreet. Adjustments to the ideal saturation flow rate were made for trucks, and an average saturation headway of 2.1 seconds was used to calculate a new base critical lane capacity of 1587 pcu/hr/ln. Lane volumes were also adjusted to account for the slower speeds of turning movements. The authors created an Excel spreadsheet to check demand against capacity. While they recommend this procedure as a good starting tool for planners and traffic engineers to determine the feasibility of a superstreet intersection, it does have limitations since it does not address delay or travel times. FHWA recently released an alternative intersection selection tool (21) that builds upon this concept using the critical lane volume as a comparable method to determine capacity at conventional and unconventional intersections, including the superstreet.

Hummer et al (20) also researched the effects of progression speed on total travel time and total delay. A Synchro model was built representing the first superstreet opened on US-17 in Brunswick County, NC. Existing intersection spacing was used; however assumptions and simplifications were made for traffic volumes and geometry. Different scenarios were run involving different levels of entering volumes, turning volumes, and progression speed, for a total of 32 model runs. The results showed total delay staying approximately constant across varying speeds, while travel time changes with speed. It also showed that the impact of additional through vehicles is less than the impact of additional turning movements and side street volumes. This study could be expanded by using the actual geometry from the site in a model and comparing how it performs against the model with the simplified geometry.

2.1.3 Other Unconventional Intersection Designs

There are other unconventional intersection designs in place with similar concepts to the superstreet. One of those is the reduced conflict intersection (RCI), developed by Denny Eyler (22). The RCI prohibits direct left and through movements from the minor street, similar to the superstreet. The minor street through and lefts essentially do a two-stage crossing, first crossing one direction of traffic, but then travel away from the “center” of the intersection to cross the other direction. Figure 2.2 shows a layout of the RCI.

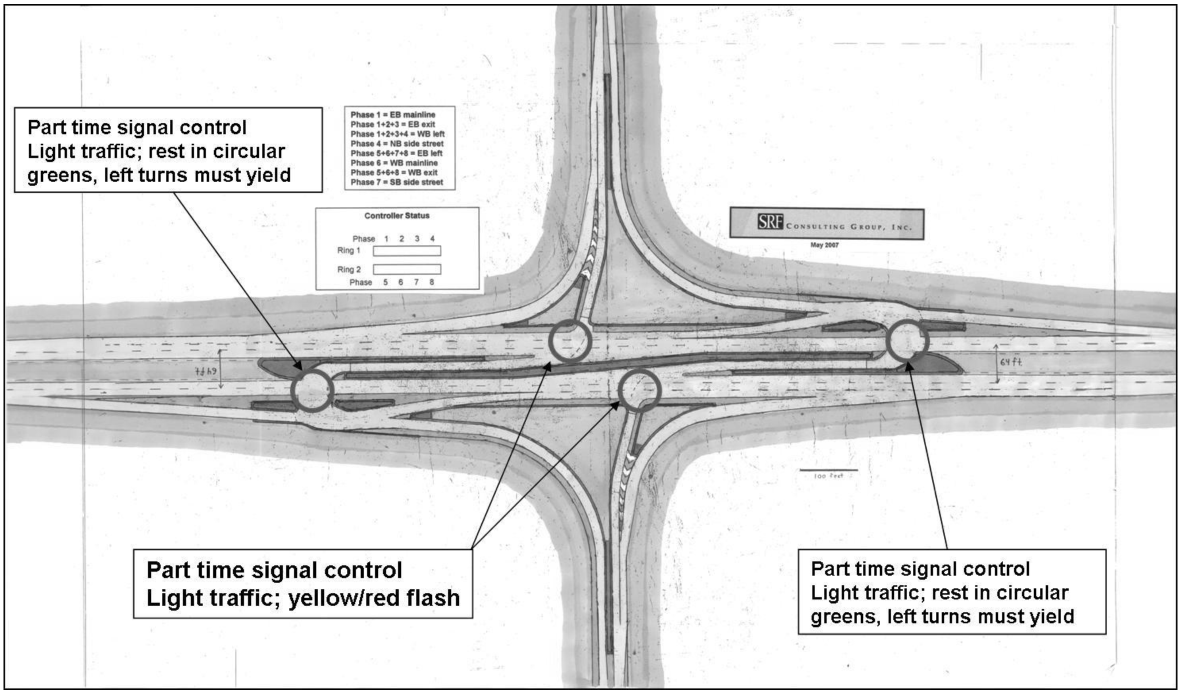


Figure 2.2. Reduced Conflict Intersection Developed by D. Eyler, SRF Consulting Group, Inc. (22)

Demand-based signal controls are used to help guide traffic efficiently when excessive queues or delays are detected. A partial RCI was built on US 169 near Mankato, Minnesota. Currently there have not been any studies done on the operational affects of reduced conflict intersections.

2.2 Methodology

This section describes the methodology used for the operational analysis conducted for this research project. The operational analysis involved conducting a saturation flow study at directional crossovers and simulating three superstreets in North Carolina and comparing them to the equivalent conventional intersection. This section describes the process behind the site selection, data collection, and data analysis.

2.2.1 Identification and Selection of Sites

The sites selected for the operational study were taken from a list that included all operating signalized superstreets in North Carolina. The criteria for selection were signalization on all legs of the intersection and at each crossover location. Unsignalized superstreet sites, also referred to as directional crossovers, were not analyzed in the operational study because they are generally implemented in rural areas as a safety countermeasure. There are currently four existing signalized superstreet sites in North Carolina. Three of these sites were selected for the study and are listed below in Table 2.3. Figures 2.3 through 2.9 show aerial photos of the study sites and the distances to the U-turn crossovers. The only site not chosen for this study was a corridor on US-17 in Pender and New Hanover counties. This site was eliminated because of low volumes along the minor roads.

Table 2.3. Signalized Superstreet Sites Selected for Operational Study

Arterial	No. of Intersections	Cross Street(s)	Location
US-15/501	1	Erwin Rd./Europa Dr.	Chapel Hill, NC
US-421	1	Myrtle Gardens Dr./Carolina Beach Rd.	Wilmington, NC
US-17	5	Ploof Rd./Poole Rd. Gregory Rd./Walmart entrance West Gate Dr./Grandiflora Dr. Brunswick Forest Pkwy Lanvale Rd./Brunswick Forest Dr.	Leland, NC

Figure 2.3. US-15/501 at Erwin Rd./Europa Dr. in Chapel Hill, NC

Figure 2.4. US-421 at Myrtle Gardens Dr./Carolina Beach Rd. in Wilmington, NC

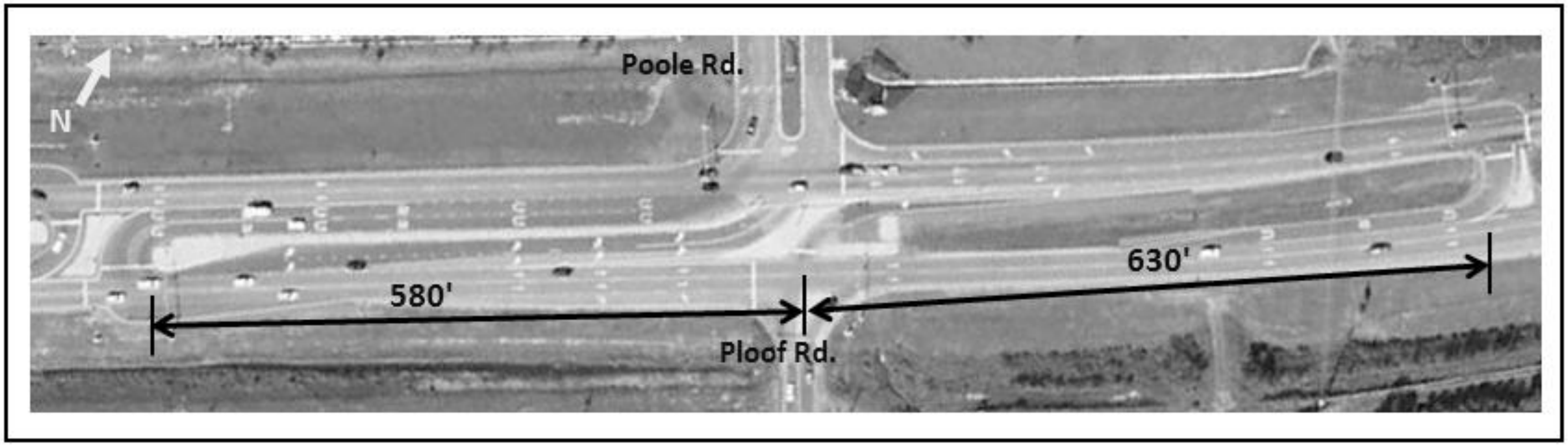


Figure 2.5. US-17 at Ploof Rd./Poole Rd. in Leland, NC

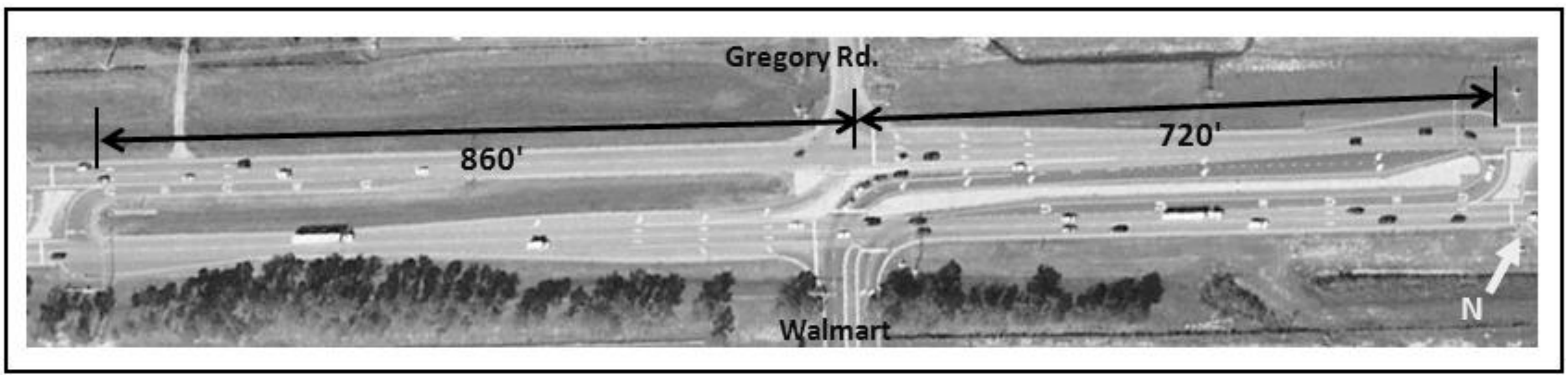


Figure 2.6. US-17 at Walmart/Gregory Rd. in Leland, NC

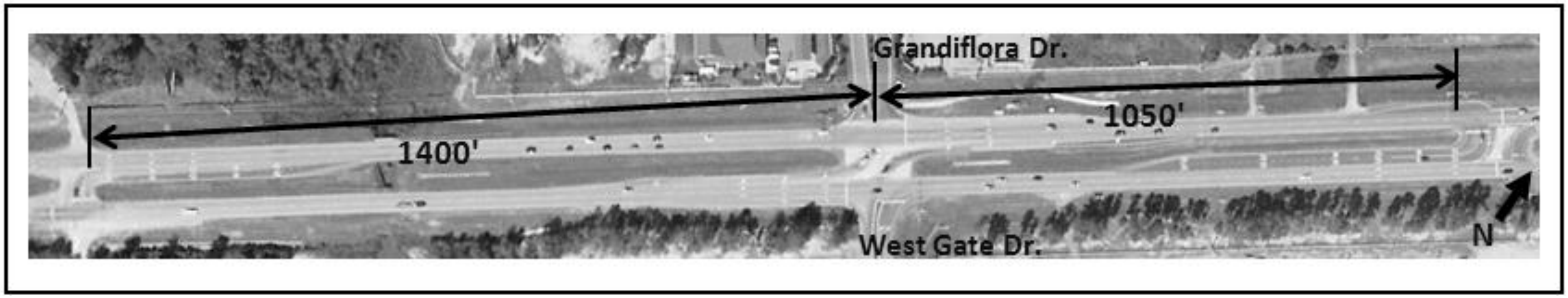


Figure 2.7. US-17 at Grandiflora Dr./West Gate Dr. in Leland, NC

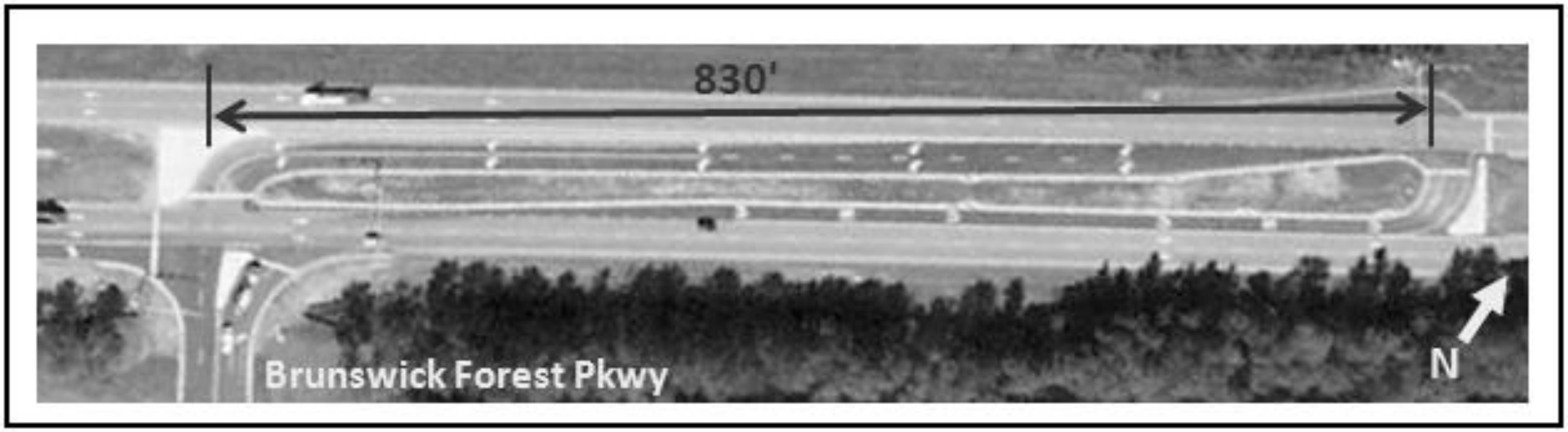


Figure 2.8. US-17 at Brunswick Forest Pkwy. in Leland, NC

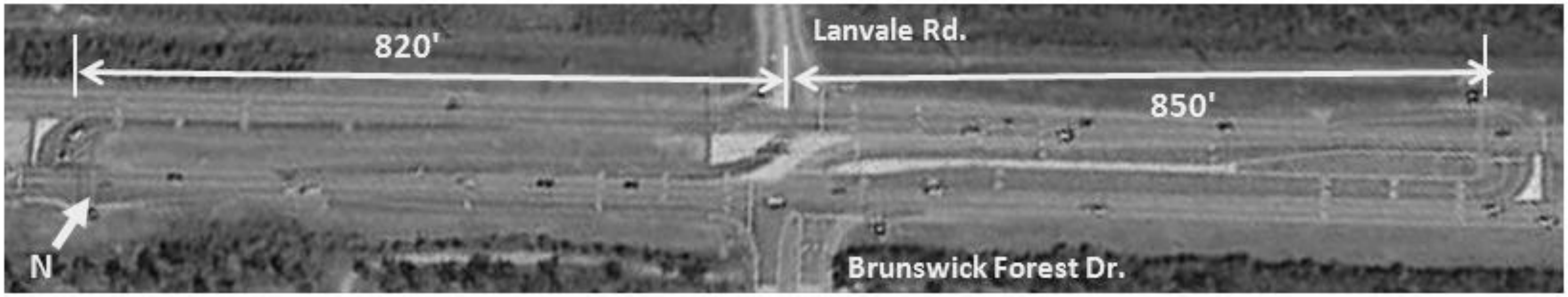


Figure 2.9. US-17 at Lanvale Rd./Brunswick Forest Dr. in Leland, NC

Along with the signalized superstreet sites, the team needed to identify sites for other types of crossovers that exist for use in the saturation flow study. There were eight possible types of crossovers identified by the team: U-turn unopposed, U-turn unopposed and left turn, U-turn opposed, U-turn opposed and left turn, left turn, left-over, left-out with signal, and left-out with merge. Figure 2.10 shows the crossover types considered for this study.

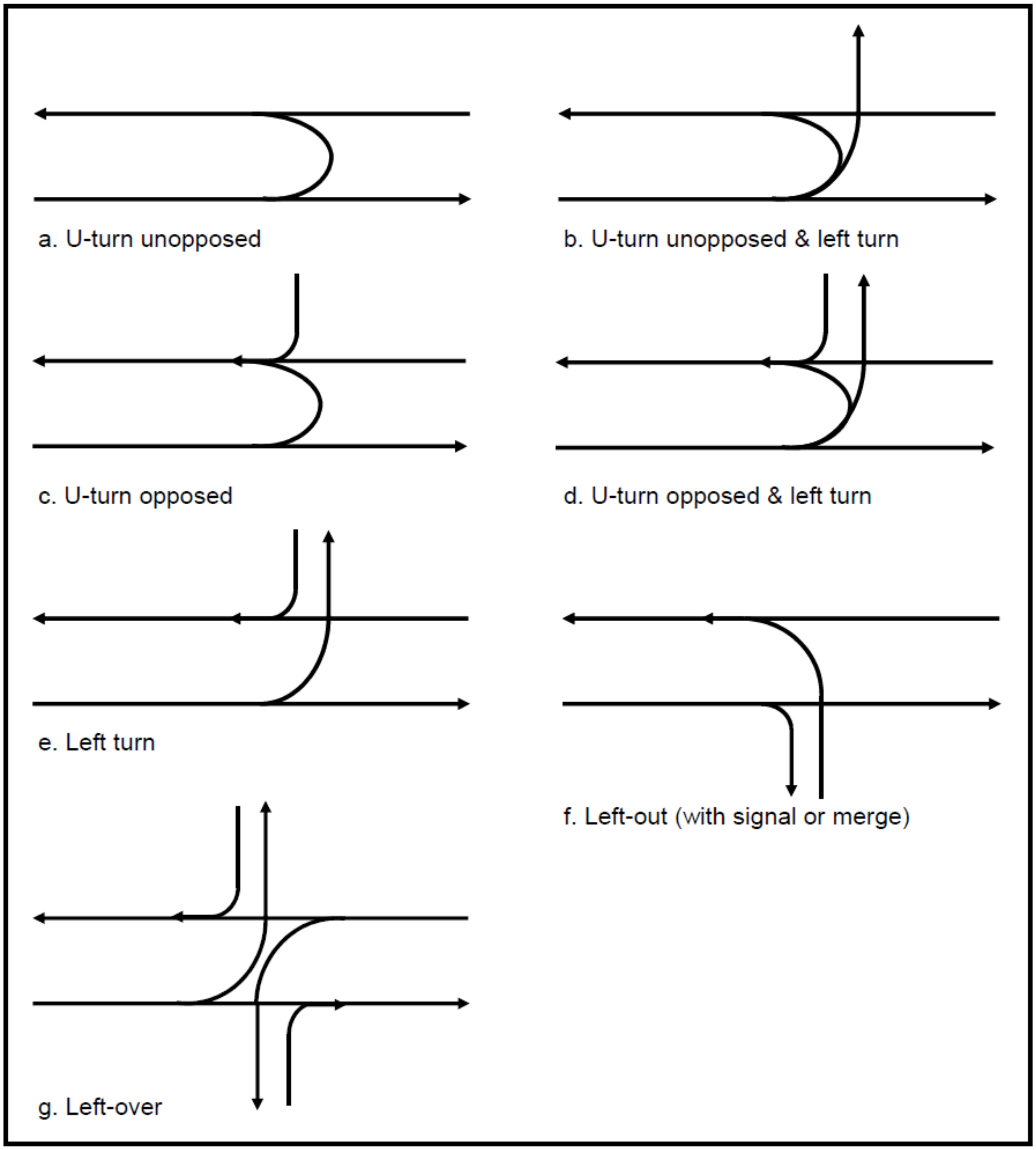


Figure 2.10. Crossover Types Considered for Saturation Flow Study

The list of crossover types used in the saturation flow study was reduced down to four: U-turn unopposed, U-turn opposed and left turn, left turn, and left-out with signal. The U-turn unopposed with left turn and the U-turn opposed designs were eliminated because they are a rare occurrence, most likely due to the one-way minor street. The left-over was eliminated because it is the same as the left turn crossover, except with left turns added from both directions on the major road. Saturation flows from the left turn can be applied to both left turns on the left-over design. Finally, the left-out with merge was eliminated because saturation flow is not relevant with the merges.

Study sites for the remaining crossover types were selected based on the criteria for saturation flow studies as suggested by the ITE Manual of Transportation Engineering Studies (23). Queues needed to have a minimum of seven vehicles to record the headways, so high-volume arterials throughout North Carolina were scoured for crossover sites. Finding few signalized crossovers in NC with enough queuing, the team focused site selection in the Detroit, Michigan metro area. Michigan has hundreds of miles of arterial roads with median U-turns (the "Michigan left"), with varying number of lanes and median widths. Table 2.4 lists the sites selected for the saturation flow study. The team did not collect saturation flow data at any of the NC superstreets because of the lack of queue buildup at the U-turn crossovers.

Table 2.4. Crossover Sites Selected for the Saturation Flow Study

Site type	Intersection(s)	Location	No. of Lanes	Median width
U-turn opposed + left turn	Telegraph & 12 Mile	Southfield, MI	1	narrow
	Hall & Schoenherr	Utica, MI	2	wide
U-turn unopposed	Telegraph & Maple	Bloomfield Township, MI	1	narrow
	Hall & Hayes	Clinton, MI	2	wide
Left-out	Telegraph & Ford	Dearborn Heights, MI	1	narrow
	Hall & M53 (SB)	Utica, MI	2	wide
Left turn	Hall & M53 (NB)	Utica, MI	2	wide

2.2.2 Data Collection

The field data collected from each of the three NC study sites were turning movement counts, travel times, and free-flow speeds. The turning movement counts and free-flow speeds were used as model inputs. The travel times collected in the field were compared to the VISSIM travel time output during the calibration and validation process. The field data can be found in Appendix 10.1.

2.2.2.1 Turning Movement Data

To collect the turning movement counts video cameras were set up (two or three depending on the site) to capture all movements at the central intersection and the crossovers. The team collected the data in two 90-minute sets at each site, which was limited by the length of the video tapes.

Origin-destination counts were extracted from the videos for each of the twelve turning movements at the intersection (left, through, and right from each leg) by tracking the individual vehicles. Vehicles were counted in five-minute intervals, then converted into 15-minute flows. Tracking the vehicles through the intersection is a time-consuming but necessary process due to the redirection of side street traffic at superstreets. All U-turning vehicles were ignored, as well as vehicles entering from and exiting to driveways along the arterial. Passenger cars and heavy vehicles were counted separately to determine the vehicle distribution at each site.

2.2.2.2 Travel Time Data

Travel time runs were done simultaneously with the turning movement count data collection using GPS units in the vehicle. Prior to collecting the data, an initial set of travel time runs were recorded from the Chapel Hill superstreet to determine the sample size needed. At a 95% confidence level with a 3.0 mph permitted error, a minimum of three runs for each movement were needed (23). When collecting the actual data as many travel time runs as time permitted before the 90-minute video tape ran out were performed, or before traffic volume characteristics changed.

The US 17 superstreet in Leland consists of five total intersections, with three intersections back-to-back and the remaining two farther apart. Data was collected at two of the five intersections: US-17 at Walmart/Gregory Road and US-17 at Lanvale Road. Based on traffic volume observations and the number of lanes from the minor road and at the crossovers, the data from these intersections would be representative of the remaining three intersections. The data collected from these intersections were applied to the remaining intersections along the US-17 corridor.

The data collected from all three sites were post-processed in the office using GeoStats TravTime 2.0. Travel time runs were constructed in the program using the GPS data points collected in the field. The team calculated the achieved permitted error for all travel time movements based on the tables from the ITE Manual of Transportation Engineering Studies (23). Table 2.5 lists the achieved permitted travel time error from each site for the combined twelve movements.

Table 2.5. Achieved Permitted Travel Time Error for All Movements

Site	Range (mph)	Avg. (mph)
Chapel Hill	1.5 - 5.0	2.8
Wilmington	1.0 - 5.0	2.4
US-17 (Walmart/Gregory Rd.)	1.0 - 3.0	1.8
US-17 (Lanvale Rd.)	1.0 - 5.0	2.3

2.2.2.3 Free-Flow Speed Data

The final set of data collected was free-flow speed data. Speeds were collected during off-peak periods using a laser gun. For each of the three sites, speeds were collected at a location approaching the superstreet but far enough away from the influence of signals. Using the laser gun, the speeds of randomly selected non-platooned vehicles were recorded. These speeds were used to construct a speed distribution curve for each site for use in VISSIM. Each distribution was checked using the chi-squared goodness-of-fit test, and all were confirmed normally distributed.

2.2.3 Data Analysis

2.2.3.1 Saturation Flow Study

The team compiled the headway data collected in Michigan and calculated saturation flow for each collection site for both the crossover and the adjacent through lanes. The saturation flow for each observed queue was calculated, and then all were averaged to get a final average saturation flow for each movement at that location. The saturation flow adjustment factor was then calculated as the ratio of the crossover saturation flow to the through lane saturation flow.

2.2.3.2 Travel Time Comparison of Superstreets and Conventional Intersections

Using the data collected in the field, the team calibrated and validated the three superstreet models in VISSIM. The team also constructed models in VISSIM of an equivalent conventional signalized intersection, had the superstreet not been built. The reason for using VISSIM over other programs, such as SimTraffic, was because of the ability to specify origin-destination segments for collecting travel time. Travel time was used as the measure of effectiveness for the calibration and validation of the models, and in the comparison of the superstreet and conventional models, so it was important to be able to specify the origin and destination points for the travel time segments.

It was important to keep the comparison between the superstreet to the conventional intersection fair. For this analysis, the team defined "fair" based on geometry only, not cost. This analysis was not a "before and after" comparison, but a comparison of the superstreet design to an equivalent conventional intersection. The geometries (i.e. lanes) of the conventional intersections were updated from the before scenario prior to the construction of the superstreet. This was done to replicate what the conventional improvements would have been had the superstreet not been built, assuming that improvements would have been made at each site. At the Chapel Hill site, this included adding an additional left turn lane in both directions of the major road. The superstreet along the US-17 corridor was built in conjunction with major development along the arterial – a new Super-Walmart was constructed, along with new retail, business, and residential developments. In this case assumptions were made on the number of lanes for the conventional intersections.

Table 2.6 lists the approach configurations for each site. The major road with the U-turn crossovers was the north-south street in each case. There were two approaches where there were fewer lanes for the conventional than the superstreet, while there were four approaches with fewer lanes for the superstreet than the conventional. As with the superstreet models, the conventional models also included the adjacent intersections. No geometric improvements were made to the adjacent intersections.

Table 2.6. Lane Configurations by Approach for Study Sites

SITE	SUPERSTREET						CONVENTIONAL			
	NB	SB	EB	WB	South UT	North UT	NB	SB	EB	WB
Chapel Hill	T,T,R	T,T,R	R,R	R,R	2	2	L,L, T,T,R	L,L, T,T,R	LT,R	LT,R
Wilmington	L,T, T,R	L,T, T,R	R,R	R,R	1	1	L,T, T,R	L,T, T,R	L,T,R	L,TR
US-17: Ploof	L,L, T,T,R	L,T, T,R	R,R,R	R	2	1	L,L, T,T,R	L,T, T,R	L,T,R	L,TR
US-17: Walmart	L,T, T,R	L,L, T,T,R	R	R,R	1	1	L,T, T,R	L,L, T,T,R	L,TR	L,TR
US-17: Grandiflora	L,T, T,R	L,T, T,R	R,R	R,R	2	2	L,T, T,R	L,T, T,R	L,TR	L,TR
US-17: Brunswick Forest	T,T,R	L,L, T,T	-	R,R	-	1	T,T,R	L,L, T,T	-	L,R
US-17: Lanvale	L,T, T,R	L,L, T,T,R	R	R,R,R	1	2	L,T, T,R	L,T, T,R	L,TR	L,TR

* L = left turn lane, R = right turn lane, T = through lane

To keep the comparison fair, the team used Synchro to optimize signal timings for both the superstreets and the conventional intersections. This was done for various demand levels. The yellow and all-red times were used from the original superstreet timings from the field since the intersection widths did not change very much. All signals were coded as actuated-coordinated with protected left turns. Signal timings and offsets were optimized for each network. Tables 2.7 through 2.9 list the cycle lengths for all intersections in this study.

Table 2.7. Cycle Lengths for Chapel Hill Superstreet and Conventional Intersections (sec)

Demand Level / Intersections	Peak-40%	Peak-20%	Peak-10%	Peak	Peak+10%	Peak+20%
Superstreet:						
Ephesus Church*	80	90	110	120	100	110
South UT	110	115	115	120	110	115
Europa	110	115	115	120	110	115
Erwin	90	105	105	120	85	95
North UT	90	105	105	120	85	95
Sage/Old Durham*	90	105	105	120	120	125
Conventional:						
Ephesus Church	90	120	120	120	100	110
Erwin/Europa	90	120	120	120	110	130
Sage/Old Durham	90	120	120	120	115	125

*Adjacent conventional intersections

Table 2.8. Cycle Lengths for Wilmington Superstreet and Conventional Intersections (sec)

Demand Level / Intersections	Peak-40%	Peak-20%	Peak-10%	Peak	Peak+10%	Peak+20%
Superstreet:						
Sanders*	75	80	100	90	110	120
South UT	75	80	100	90	110	120
Myrtle Gardens	75	80	100	90	110	120
Carolina Beach	80	110	90	120	130	130
North UT	80	55	90	60	130	130
College/Piner*	80	110	90	120	130	130
Conventional:						
Sanders	75	115	115	120	120	120
Myrtle Gardens	75	115	115	120	120	120
College/Piner	75	115	115	120	120	120

*Adjacent conventional intersections

Table 2.9. Cycle Lengths for US-17 Superstreet and Conventional Intersections (sec)

Intersections \ Demand Level	Peak-40%	Peak-20%	Peak-10%	Peak	Peak+10%	Peak+20%
Superstreet:						
Ploof	110	95	120	120	120	120
Ploof North UT	70	90	90	100	105	120
Poole	70	90	90	100	105	120
Poole South UT	110	95	120	120	120	120
Walmart	110	95	120	120	120	120
Walmart North UT	70	90	90	100	105	120
Gregory	70	90	90	100	105	120
Gregory South UT	110	95	120	120	120	120
West Gate	110	95	120	120	120	120
West Gate North UT	70	90	90	100	105	120
Grandiflora	70	90	90	100	105	120
Grandiflora South UT	110	95	120	120	120	120
Brunswick Forest Pkwy	70	90	60	70	105	120
Brunswick Forest North UT	110	95	90	100	120	120
Brunswick Forest Dr.	70	90	60	70	105	120
Brunswick Forest North UT	110	95	90	100	120	120
Lanvale	110	95	90	100	120	120
Lanvale South UT	70	90	60	70	105	120
Conventional:						
Ploof/Poole	95	115	120	120	150	150
Walmart/Gregory	95	115	120	120	150	150
Grandiflora/West Gate	95	75	120	120	150	150
Brunswick Forest	75	75	120	120	105	105
Lanvale/Brunswick Forest	75	75	120	120	105	105

With varying volume levels and optimized signal timings, the travel time output from the superstreet model was compared to the travel time output from the conventional model for all three sites. Using travel time as the measure of effectiveness in this analysis allows for a fair comparison between superstreets and conventional intersections because superstreets have additional signals and require drivers to travel an extra distance to complete certain maneuvers. The analysis was done comparing the travel times for each turning movement, as well as comparing the average travel time per vehicle for the intersection as a whole.

2.3 Calibration and Validation of VISSIM Models

This section describes the processes used to calibrate and validate the superstreet models in VISSIM. The team collected two sets of field data from each site—turning movement counts, travel times, and free-flow speeds—to calibrate and validate each model.

The measure of effectiveness (MOE) used for calibration and validation was the travel time output from VISSIM compared to the travel times collected in the field for all twelve movements at the intersection (left, through, and right turn from each leg). This was also the MOE used in the analysis of the results. Superstreets have additional signals and require drivers to travel an extra distance to complete certain movements. Using travel time as the MOE allows for a fair comparison between the superstreet and conventional intersection because it takes into account any extra delay at the signals and the extra time it might take to complete a turning movement.

2.3.1 Model Construction

The VISSIM models were calibrated using field data collected at each of three superstreet sites. The team collected two sets of data from each site: the first data set was used for the calibration, and the second data set was used for validating the models. The data included turning movement counts, travel times, and free flow speeds at four intersections—two out of the five superstreet intersections from the US-17 corridor, and one superstreet intersection each at US-15/501 in Chapel Hill and US-421 in Wilmington. This set of intersections makes up most of the signalized superstreets in North Carolina. Currently, the only other signalized site in NC is on US-17 near the Pender and New Hanover County lines. This site was not included in the study because of low minor street volumes. The team used the turning movement counts for the vehicle inputs and origin-destination routing decisions, and the free-flow speeds for speed distributions specific to each site.

The models were coded to replicate the superstreets using construction drawings and aerial photography from Google Earth ©. Both the Chapel Hill and Wilmington superstreets have adjacent conventional signalized intersections, which were included in the models to account for platooning effects as vehicles enter the superstreet. All the signal timing data that were used in the models, for both the superstreet and adjacent conventional intersections, were actual field timings that were received from the NCDOT, the City of Wilmington, and the Town of Chapel Hill.

Since the team included the adjacent intersections in the models, assumptions were made on the percentages of the vehicle inputs that were coming from each leg of the adjacent intersection. For Chapel Hill the team assumed a 60/40 split for the northbound vehicles, and a 80/20 split for the southbound vehicles (the larger percentage of vehicles coming from the main arterial). For Wilmington, the team assumed a 75/25 split for the northbound vehicles, and a 70/30 split for the southbound vehicles. These assumptions were based on knowledge on the operations of the adjacent intersection from field observations. The US-17 corridor does not have adjacent signalized intersections, so the model only includes the five superstreet intersections along the corridor. Vehicles arrived at the first signal on US-17 in a random arrival distribution. Vehicle counts were binned into 15-minute counts, and then converted to 15-minute flows since VISSIM requires volume inputs to be entered in vehicles per hour.

Each superstreet model was run in sets of 10 runs. The team applied a 15-minute seeding period to provide adequate time to fill the network with vehicles. The simulation period for Chapel Hill and Wilmington was 5400 seconds (1.5 hours), and the period was 6300 seconds (1.75 hours) for US-17. The duration of each simulation was based on the amount of traffic volume data obtained from the first set of field data which was time-limited by the video tapes used to record the data. Travel time output files were not collected during the seeding period. All models were run using the multi-run setting, with a starting random seed of one and with a random seed increment of one for each run in the set of ten.

2.3.2 Model Calibration

The models were calibrated using travel time as the comparison between VISSIM and the field data. The team collected travel time data from four intersections—the superstreet intersections in Chapel Hill and Wilmington, and two intersections along the US-17 superstreet corridor. Each intersection had twelve possible travel patterns (left, through, and right at each leg of the intersection), for a total of 48 movements that were driven. The purpose of the calibration was to test the mean percent difference in field collected travel time versus modeled travel time over each of the 48 movements. This was achieved by combining the travel times for each of the 48 movements from all three sites and calibrating the models together based on the mean percent difference to achieve a "global" calibration rather than calibrating them as individual sites. This was done to find the single set of VISSIM parameters that was the best for all the sites, rather than settling for different VISSIM parameters for different sites.

The main parameters adjusted in VISSIM were speed distribution and conflict areas. The speed distribution for each site was based on the free-flow speed data collected in the field. During the calibration process, the team kept the same shape of the distribution curve, but changed the mean speed. The final speed distribution used for all three sites was a 25% reduction of the original free-flow speed data collected in the field. The free-flow speed data were collected during the off-peak period on the arterial approaching the superstreet, but far enough away from the influence of the signals. Having to reduce the speeds to calibrate the model is not surprising because the models are capturing the peak periods so there is a higher volume of traffic, and vehicles travel slower through the intersection than on the open arterial.

Conflict areas were used for coding the right turn on red (RTOR) at all sites, and for the flashing yellow arrows utilized by NCDOT at Wilmington to allow permitted/protected lefts for the mainline left turn movements and at the U-turn crossovers. The team used the video from Wilmington to calculate the average rear gap that vehicles accepted when making a U-turn and major left maneuver on a flashing yellow arrow, as well as a RTOR. This was the only site with proper video footage to collect these data, so the team applied the RTOR gap values from the Wilmington site to the Chapel Hill and US-17 models. Table 2.10 lists the front and rear gap values used in VISSIM. At the time of data collection, the flashing yellow arrow was still a new concept in North Carolina, so the team was unaware if vehicles were not accepting gaps as efficiently as expected because of the actual gap size, or because of unfamiliarity of the flashing yellow arrow. For future studies of superstreets, the team recommends conducting a more thorough gap study at crossovers with flashing yellows and for RTOR in conjunction with VISSIM calibration.

Table 2.10. Gap Values Used for Coding Conflict Areas in VISSIM

SITE	RTOR		U-turn (flashing yellow)		Major left (flashing yellow)	
	Front gap (sec)	Rear gap (sec)	Front gap (sec)	Rear gap (sec)	Front gap (sec)	Rear gap (sec)
Chapel Hill	2.0	3.6	N/A	N/A	N/A	N/A
Wilmington	2.0	3.6	3.0	7.1	2.0	5.5
US-17	2.5	3.6	N/A	N/A	N/A	N/A

To calibrate the models the team ran multiple sets of runs for each site as parameters were adjusted in VISSIM. Table 2.11 shows the parameters adjusted for each set of runs. “Set 1” is the earliest effort and “Set 5” is the latest effort. The team did not follow any particular method when changing the parameters in each set; the team simply ran a set of runs, checked the results, adjusted the parameters, and repeated until the final set of parameters could be determined. The order of conducting these sets of runs does not have an impact on the outcome of the final set of results. The models could be replicated by disregarding the adjustments made in sets one through four, and directly inputting the parameters used in the final set of runs (set five). The final set of parameters can be found in Appendix 10.1.

Table 2.11. VISSIM Parameters Adjusted in Each Set of Runs During Calibration

SET 1	SET 2	SET 3	SET 4	SET 5
• orig. parameters • no adjustments	• reduced orig. speed dist. by 20% • reduced speed zones for U-turns • incr. SF for conflict areas for minor RTOR	• reduced orig. speed dist. by 25% • added reduced speed zones for UT approaches • added desired speed decisions for minor roads • reduced des. speed zones for all turns	• updated signal timing offsets	• adjusted gap values for all RTOR and flashing yellow arrows

Table 2.12 shows the percent difference in the VISSIM travel time output compared to field data for each site, as well as the mean difference for all sites combined. The Lanvale Rd. intersection, part of the US-17 corridor, had consistently high differences in travel time and did not calibrate as well as the other models. This is a low-volume intersection, and the travel time data were collected at a different time than the other data from the corridor, and were therefore under a different time of day plan for the signal operations. In the model, the team used signal plans for the same time of day for the entire corridor. The discrepancy in the signal timing between the model and when the team collected the field data at Lanvale Road could be a reason for the large differences in travel time. The final calibration value was a mean percent difference of -15.2% between the VISSIM output and field data. Fifteen percent is a generally accepted target for comparing model and observed travel times (24).

Table 2.12. Percent Difference in Travel Time (VISSIM – Field Data) from Calibration

SITE	SET 1	SET 2	SET 3	SET 4	SET 5
Chapel Hill	-16.9%	-12.2%	-9.5%	-9.5%	-9.2%
Wilmington	-22.3%	-22.5%	-21.9%	-21.9%	-18.7%
US-17 (Walmart)	-24.5%	-16.9%	-10.0%	-9.6%	-8.5%
US-17 (Lanvale Rd)	-35.9%	-31.7%	-23.8%	-23.4%	-25.0%
Mean difference	**-23.7%**	**-20.6%**	**-16.0%**	**-15.8%**	**-15.2%**

2.3.3 Model Validation

With the calibration complete, the team validated the models using the second set of field data. The second set of field data was collected in the same manner as the first, but at a different time of day. All parameters in the models were kept the same as they were in the final calibration set. The only changes made to the models were the signal timing, which was adjusted to the time of day plans corresponding to the time when the second data set was collected, and the vehicle inputs. The vehicle counts from the second field data set were grouped in 15-minute flows. The models were run in sets of ten runs each, keeping the same seeding time, simulation period, and random seed generation as in the calibration stage.

Table 2.13 lists the percent difference in travel time for each site and the overall mean percent difference. The final mean percent difference comparing the VISSIM travel time output to the field data was -4.4%. Since the mean percent differences are less that the percent differences from the calibration stage, all models are validated. Both the calibration and validation results can be found in Appendix 10.1.

Table 2.13. Percent Difference in Travel Time (VISSIM – Field Data) from Validation

SITE	SET 1
Chapel Hill	5.6%
Wilmington	-10.5%
US-17 (Walmart)	2.1%
US-17 (Lanvale Rd)	-17.6%
Mean percent difference	**-4.4%**

2.4 Results

This section describes the results from the saturation flow study of U-turn crossovers and the travel time experiment comparing superstreets to conventional intersections.

2.4.1 Saturation Flow Adjustment Factor for Directional Crossovers

The team calculated the saturation flow adjustment factor for four different crossovers types based on the data collected in Michigan. Finding few signalized crossovers in NC with enough queuing, the team focused site selection in the Detroit, Michigan metro area. Michigan has hundreds of miles of arterial roads with median U-turns (the “Michigan left”), with varying number of lanes and median widths. The saturation flow adjustment factor was calculated as the ratio of the crossover saturation flow to the through lane saturation flow. Table 2.14 lists the saturation flow adjustment factors for each site and type of crossover. Table 2.15 lists the saturation flow for each crossover including sample size, mean, standard deviation and variance.

Table 2.14. Saturation Flow Adjustment Factors for Directional Crossovers

Crossover type	Location	No. of Crossover Lanes	Median Width (ft)	Sat. Flow Adjustment Factor
U-turn opposed + left turn	Telegraph Rd. & 12 Mile Rd.	1	45	0.895
	Hall Rd. & Schoenherr Rd.	2	150	1.006
U-turn unopposed	Telegraph Rd. & Maple Rd.	1	45	0.839
	Hall Rd. & Hayes Rd.	2	150	1.017
Left-out	Telegraph Rd. & Ford Rd.	1	30	1.016
	Hall Rd. & M53 (SB)	2	200	0.945
Left turn	Hall Rd. & M53 (NB)	2	160	1.054

Table 2.15. Saturation Flow for Directional Crossovers

Crossover Type	SITE	Sample Size	Saturation flow (veh/h/ln)		
			Mean	St. Dev.	Var.
U-turn opposed + left turn	TELEGRAPH RD. & 12 MILE RD.				
	Crossover	84	1515	172.7	29828
	Thru lanes	104	1693	257.1	66112
	HALL RD. & SCHOENHERR RD.				
	Crossover	51	1762	238.7	56967
	Thru lanes	159	1751	285.0	81220
U-turn unopposed	TELEGRAPH RD. & MAPLE RD.				
	Crossover	60	1555	217.7	47381
	Thru lanes	97	1854	334.3	111750
	HALL RD. & HAYES RD.				
	Crossover	83	1802	218.4	47688
	Thru lanes	35	1772	274.8	75489
Left-out	TELEGRAPH RD. & FORD RD.				
	Crossover	51	1992	244.3	59697
	Thru lanes	220	1961	290.7	84535
	HALL RD. & M53 (SB)				
	Crossover	114	1851	245.0	60012
	Thru lanes	54	1958	381.0	145142
Left turn	HALL RD. & M53 (NB)				
	Crossover	106	2086	269.3	72498
	Thru lanes	115	1978	354.1	125397

Based on the site characteristics and the saturation flows, the team noticed that one-lane, narrow median U-turn crossovers had saturation flow adjustment factors from around 0.85 to 0.90, while everything else, which includes two-lane, wide median U-turn crossovers as well as left-outs and left turn crossovers, had an adjustment factor of about 1.0. The team statistically analyzed this theory by conducting t-tests to compare the saturation flows of the two sites for each crossover type. At the 95% confidence level, the one-lane narrow median U-turn and two-lane wide median U-turn saturation flows were statistically different. The team then compared the saturation flows for both one-lane, narrow median sites to see if there was a difference between the U-turn unopposed and U-turn opposed. The t-test confirmed that there was no significant difference at the 95% confidence level. Based on this the team concluded that the adjustment factors for U-turns should be 0.85-0.90 for one-lane, narrow medians and 1.0 for all other crossovers.

2.4.2 Travel Time Comparison of Superstreets and Conventional Intersections

Using the calibrated and validated models of three of the four signalized superstreets in North Carolina, the team set up an experiment to test the operational effects of superstreets compared to conventional intersections. Models of the equivalent conventional intersection at each site were also constructed in VISSIM. The team ran both the superstreet and conventional models from each site at various demand levels and collected the travel time output to compare the superstreet against the conventional, as well as to find the capacity limits of the superstreet.

2.4.2.1 Travel Time Comparison

As discussed in Section 2.2, we ran both the superstreet and conventional models from each site in VISSIM under varying demand levels. For each site the flow from the peak 15-minute period from the turning movement count field data was used as the baseline. It was important to use volume levels greater than and less than the peak to compare the two designs not only during periods with increased demand, but also during off-peak periods. The following demand levels were used in the comparison:

- Peak,
- Peak minus 10%,
- Peak minus 20%,
- Peak minus 40%,
- Peak plus 10%,
- Peak plus 20%, and
- Peak plus 40%.

All models were run in sets of ten runs for each demand level. A 15-minute seeding period was used to provide adequate time to fill the network with vehicles. The simulation period was one hour for all models. Travel time output files were not collected during the seeding period. All models were run using the multi-run setting, with a starting random seed of one and with a random seed increment of one for each run in the set of ten. The team used Equation 2.1 (24) to determine if ten runs were sufficient for producing the estimated mean travel time within 15% of the true mean at the 95% confidence level. Fifteen percent was chosen as the desired confidence level because that is what was used as the target for the calibration of the models.

Equation 2.1. $$CI_{(1-\alpha)\%} = 2 * t_{(1-\alpha/2),N-1} \, S/\sqrt{N}$$

Where:

$CI_{(1-\alpha)\%}$ = the (1-α)% confidence interval for the true mean, where alpha equals the probability of the true mean not lying within the confidence interval
$T_{(1-\alpha/2),N-1}$ = the t statistic for the probability of the two-sided error summing to alpha within N-1 degrees of freedom
N = the number of repetitions
S = the standard deviation of the model results

The following shows an example calculation of the confidence interval for the WBL movement at the Chapel Hill superstreet for the peak demand level. The average travel time was 152 seconds with a standard deviation of 7.04 seconds.

$CI_{(1-\alpha)\%} = 2*t_{(1-\alpha/2),N-1}\ S/\sqrt{N}$
$= 2*(2.262)*(7.044)/\sqrt{10}$
$= 10.08$ sec
CI as a percent of travel time = $[(CI_{(1-\alpha)\%}/\text{Avg.TT})*100]/2$
$= [(10.08/152)*100]/2$
$= 3.31\%$

The achieved confidence interval for the WBL movement at Chapel Hill during the peak period was within 3.31% of the true mean travel time. All models, both superstreet and conventional, from each site were well within the 15% target. Table 2.16 shows the achieved confidence interval for the travel time results. The results were within +/- 2.4 to 6.5% of the true mean travel time. Therefore, the team did not make more VISSIM runs than the original ten for each scenario.

Table 2.16. Achieved Confidence Interval for Travel Time Results

Site	Confidence Interval	
	Superstreet	Conventional
Chapel Hill	2.4%	3.2%
Wilmington	2.5%	5.9%
US-17 corridor	3.6%	6.5%

Certain geometric factors at the sites were influencing the travel time output enough at the higher demand levels that the team made some changes to the original models. At the Chapel Hill site there is a lane drop after the adjacent conventional intersection just south of the superstreet. This lane drop was causing major congestion at the peak+10% and higher demand levels, so vehicles were not entering the superstreet at the demand level expected. To get the full demand into the superstreet, an additional lane was added to alleviate the lane drop problem. This allowed the vehicles to enter the superstreet at the appropriate demand level, and thus allowed for a better analysis of the capabilities of the design without compromising the fair comparison. This modified geometry was used for the peak+10% and peak+20% levels for both the superstreet and conventional models. The original geometry was kept for all other demand levels because the upstream lane drop did not affect traffic flow into the superstreet, and the team wanted to keep the existing conditions as much as possible for a more accurate assessment of the superstreet at that location.

The other major factor that affected the travel time results was the adjacent intersections. At the higher demand levels (peak+20% and peak+40%), these intersections were over capacity and failing, causing major delay and congestion to spill back to the superstreet locations. Using the data from these scenarios would not be a fair representation of the superstreet, so the team did not include the peak+40% scenario in the results. The US-17 corridor does not have nearby adjacent signalized intersections, but at the peak+20% level the conventional comparison reached its limit, and any higher demand level caused errors in the model output.

Travel time output was collected for all twelve turning movements at each intersection. At each intersection the major road runs in the north/south direction, while the minor road runs east/west. Tables 2.17 through 2.22 give the volumes and travel times for each movement at each intersection studied. The average travel time per vehicle for each movement was calculated and compared between the superstreet and conventional intersection. Figures 2.11 through 2.17 display the results from each intersection. A negative percent difference means the superstreet required less travel time than the conventional, while a positive percent difference means the superstreet required more travel time.

Table 2.17. Chapel Hill Volumes by Movement (vph)

Movement	Peak-40%	Peak-20%	Peak-10%	PEAK	Peak+10%	Peak+20%
WBL	29	40	46	50	55	59
WBR	94	121	137	153	167	183
WBT	36	52	57	63	67	72
EBL	22	30	34	39	43	47
EBR	197	259	290	323	352	386
EBT	30	41	46	50	55	62
NBL	130	172	206	216	238	257
NBR	31	41	46	51	55	59
NBT	950	1270	1414	1590	1758	1905
SBL	55	72	81	88	94	109
SBR	35	48	53	59	65	71
SBT	912	1227	1362	1527	1681	1824

Table 2.18. Chapel Hill Travel Times by Movement (sec)

Movement	Peak-40%		Peak-20%		Peak-10%		PEAK (AM)		Peak+10%		Peak+20%	
	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.
WBL	133	103	146	121	152	120	178	125	155	121	169	145
WBR	52	46	60	49	65	51	69	53	66	59	75	70
WBT	133	78	155	96	157	97	203	100	159	99	203	120
EBL	152	96	161	115	163	111	191	108	168	104	178	125
EBR	56	58	62	62	64	66	72	72	69	79	76	98
EBT	137	73	148	89	156	89	178	86	158	84	167	103
NBL	121	80	127	93	133	96	153	99	132	109	165	129
NBR	31	34	31	37	31	38	31	37	32	43	32	45
NBT	41	54	43	58	44	60	45	58	48	66	50	71
SBL	130	69	137	116	136	91	122	97	143	101	145	129
SBR	47	48	47	71	49	58	48	58	54	71	54	71
SBT	50	55	53	76	55	63	56	66	62	80	63	83

Table 2.19. Wilmington Volumes by Movement (vph)

Movement	Peak-40%	Peak-20%	Peak-10%	PEAK	Peak+10%	Peak+20%
WBL	62	83	93	103	117	129
WBR	66	90	104	115	124	134
WBT	12	15	16	18	21	23
EBL	26	36	40	45	51	56
EBR	55	73	83	91	100	108
EBT	6	7	8	9	10	11
NBL	47	61	70	78	86	94
NBR	54	73	81	88	97	106
NBT	883	1184	1334	1484	1629	1775
SBL	80	107	118	133	143	159
SBR	48	64	74	81	86	95
SBT	990	1318	1483	1649	1799	1962

Table 2.20. Wilmington Travel Times by Movement (sec)

Movement	Peak-40%		Peak-20%		Peak-10%		PEAK (AM)		Peak+10%		Peak+20%	
	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.
WBL	106	77	114	101	125	121	125	147	153	279	164	278
WBR	41	41	43	48	46	53	47	64	50	111	51	110
WBT	90	50	105	72	107	74	109	88	132	135	155	128
EBL	110	69	121	85	129	94	134	92	152	111	171	108
EBR	47	47	50	48	52	49	54	58	59	60	64	64
EBT	97	57	110	73	117	68	114	71	143	77	159	76
NBL	52	50	57	52	60	54	61	72	70	85	78	93
NBR	39	39	41	40	41	41	42	41	41	42	42	44
NBT	50	52	53	59	53	61	55	58	54	62	55	66
SBL	48	45	55	50	57	51	62	63	67	67	73	73
SBR	33	34	36	36	34	37	37	35	36	36	37	38
SBT	49	54	53	59	51	62	55	53	53	54	53	55

Table 2.21. US-17 Volumes by Movement (vph)

	Movement	Peak-40%	Peak-20%	Peak-10%	Peak	Peak+10%	Peak+20%
Ploof/Poole	WBL	12	16	18	20	22	24
	WBR	13	16	18	20	22	24
	WBT	5	7	8	9	10	11
	EBL	39	53	60	66	75	80
	EBR	236	311	350	391	434	469
	EBT	5	8	9	11	11	13
	NBL	189	254	283	319	357	379
	NBR	23	31	33	37	42	47
	NBT	1425	1898	2133	2358	2629	2834
	SBL	14	17	20	22	23	26
	SBR	38	54	59	65	72	79
	SBT	859	1148	1294	1436	1571	1725
Walmart/Gregory	WBL	40	54	60	66	73	78
	WBR	209	278	310	345	381	413
	WBT	6	8	9	11	11	12
	EBL	11	14	17	18	20	21
	EBR	12	17	18	20	23	26
	EBT	5	7	7	9	10	10
	NBL	13	17	19	20	23	24
	NBR	42	56	65	71	79	85
	NBT	1224	1632	1838	2029	2272	2446
	SBL	193	258	291	321	361	386
	SBR	24	31	34	38	45	47
	SBT	977	1305	1466	1637	1772	1960
Grandiflora/West Gate	WBL	44	55	64	71	78	84
	WBR	238	317	352	391	431	473
	WBT	5	8	8	10	10	11
	EBL	42	57	67	74	82	89
	EBR	234	312	345	387	424	466
	EBT	6	8	9	10	11	11
	NBL	18	24	26	28	24	33
	NBR	60	80	90	101	86	121
	NBT	1152	1546	1742	1934	2158	2323
	SBL	13	16	18	20	22	23
	SBR	40	52	59	64	70	77
	SBT	975	1303	1462	1629	1782	1953

Table 2.21. continued

	Movement	Peak-40%	Peak-20%	Peak-10%	Peak	Peak+10%	Peak+20%
Brunswick Forest	WBL	40	53	60	68	74	81
	WBR	235	315	351	389	430	467
	NBR	45	58	64	71	78	86
	NBT	1006	1340	1507	1686	1843	2016
	SBL	194	261	288	318	350	382
	SBT	1054	1407	1581	1762	1926	2119
Lanvale/BrunswickForest#2	WBL	42	57	64	72	77	84
	WBR	208	271	306	340	372	410
	WBT	6	8	11	11	12	12
	EBL	12	17	19	21	24	26
	EBR	11	14	16	18	19	21
	EBT	6	8	9	10	11	12
	NBL	13	16	19	21	22	25
	NBR	43	57	62	68	75	80
	NBT	766	1030	1155	1283	1413	1541
	SBL	12	16	18	19	21	24
	SBR	43	56	63	68	75	84
	SBT	1036	1386	1562	1743	1909	2094

Table 2.22. US-17 Travel Times by Movement (sec)

Int.	Movement	Peak-40%		Peak-20%		Peak-10%		PEAK (AM)		Peak+10%		Peak+20%	
		SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.
Ploof/Poole	WBL	125	71	128	82	139	91	138	91	147	123	131	123
	WBR	37	40	44	47	48	50	52	60	59	67	62	66
	WBT	125	68	120	79	134	78	132	78	135	87	121	85
	EBL	104	66	119	75	133	79	137	78	141	140	163	205
	EBR	37	38	44	48	48	56	56	63	66	143	80	217
	EBT	106	63	125	77	140	71	139	74	139	143	171	212
	NBL	73	58	62	68	62	71	65	75	66	87	79	91
	NBR	26	26	26	27	26	28	27	29	27	30	27	32
	NBT	21	22	21	25	22	28	22	33	22	37	23	39
	SBL	69	82	79	88	90	93	87	95	86	129	81	137
	SBR	26	28	27	29	27	29	28	31	28	35	29	46
	SBT	24	30	26	34	26	35	28	39	29	60	30	91
Walmart/Gregory	WBL	144	77	146	88	155	90	174	95	208	105	200	139
	WBR	51	51	62	68	73	87	81	113	107	115	111	132
	WBT	123	62	126	75	140	83	153	100	182	101	180	110
	EBL	113	74	119	87	142	87	149	93	152	117	175	124
	EBR	33	37	38	37	40	39	41	41	43	50	50	49
	EBT	102	67	112	68	138	73	131	66	136	75	152	73
	NBL	92	82	81	90	81	93	84	105	91	144	94	138
	NBR	35	37	38	40	37	51	38	64	40	80	46	84
	NBT	39	43	44	50	43	65	44	85	47	111	57	120
	SBL	62	72	72	106	83	124	87	170	103	365	86	421
	SBR	24	24	24	24	25	25	25	25	25	31	25	40
	SBT	35	36	36	37	37	38	38	40	38	49	39	59

Table 2.22. continued

Int.	Movement	Peak-40%		Peak-20%		Peak-10%		PEAK (AM)		Peak+10%		Peak+20%	
		SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.
Grandiflora/West Gate	WBL	157	77	155	75	162	119	167	151	174	221	170	386
	WBR	42	45	50	51	55	66	61	90	69	140	77	357
	WBT	124	58	135	55	137	71	146	76	159	101	149	368
	EBL	131	75	153	73	174	128	162	163	182	255	190	391
	EBR	46	47	52	49	54	59	58	64	63	71	68	73
	EBT	120	55	137	44	158	64	157	58	163	76	169	73
	NBL	89	93	79	76	75	94	80	97	79	178	93	194
	NBR	35	38	36	38	38	38	39	40	38	120	40	117
	NBT	41	50	44	49	45	49	48	63	48	187	54	193
	SBL	67	90	74	74	82	114	76	112	77	123	70	111
	SBR	30	31	30	34	31	32	31	32	32	33	32	44
	SBT	41	45	42	56	44	48	44	49	45	56	47	74
Brunswick Forest	WBL	131	83	128	72	130	89	133	86	148	123	147	149
	WBR	40	38	45	43	44	50	47	56	57	132	61	165
	NBR	32	32	33	33	34	35	34	34	33	41	35	44
	NBT	34	38	35	39	36	51	38	53	39	107	40	126
	SBL	60	53	68	52	53	65	57	72	78	75	75	75
	SBT	32	34	33	36	33	36	33	39	34	41	34	43

Table 2.22. continued

Int.	Movement	Peak-40%		Peak-20%		Peak-10%		PEAK (AM)		Peak+10%		Peak+20%	
		SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.	SS	Conv.
Lanvale/BrunswickForest#2	**WBL**	132	71	128	70	128	82	136	83	145	88	163	104
	WBR	45	47	50	52	50	59	55	64	66	100	75	140
	WBT	127	59	116	56	114	71	121	68	129	76	153	103
	EBL	124	77	137	81	127	111	138	105	159	123	160	141
	EBR	50	50	51	51	52	55	53	59	57	57	57	57
	EBT	106	57	122	59	106	74	113	74	142	69	139	65
	NBL	107	84	95	81	97	106	100	109	102	101	109	113
	NBR	39	40	40	40	41	41	41	42	41	42	42	48
	NBT	51	54	53	57	56	59	56	61	58	91	60	121
	SBL	63	75	71	74	60	98	63	100	85	83	84	97
	SBR	40	37	40	38	41	39	41	41	41	43	43	42
	SBT	49	52	49	56	50	57	50	59	51	63	53	61

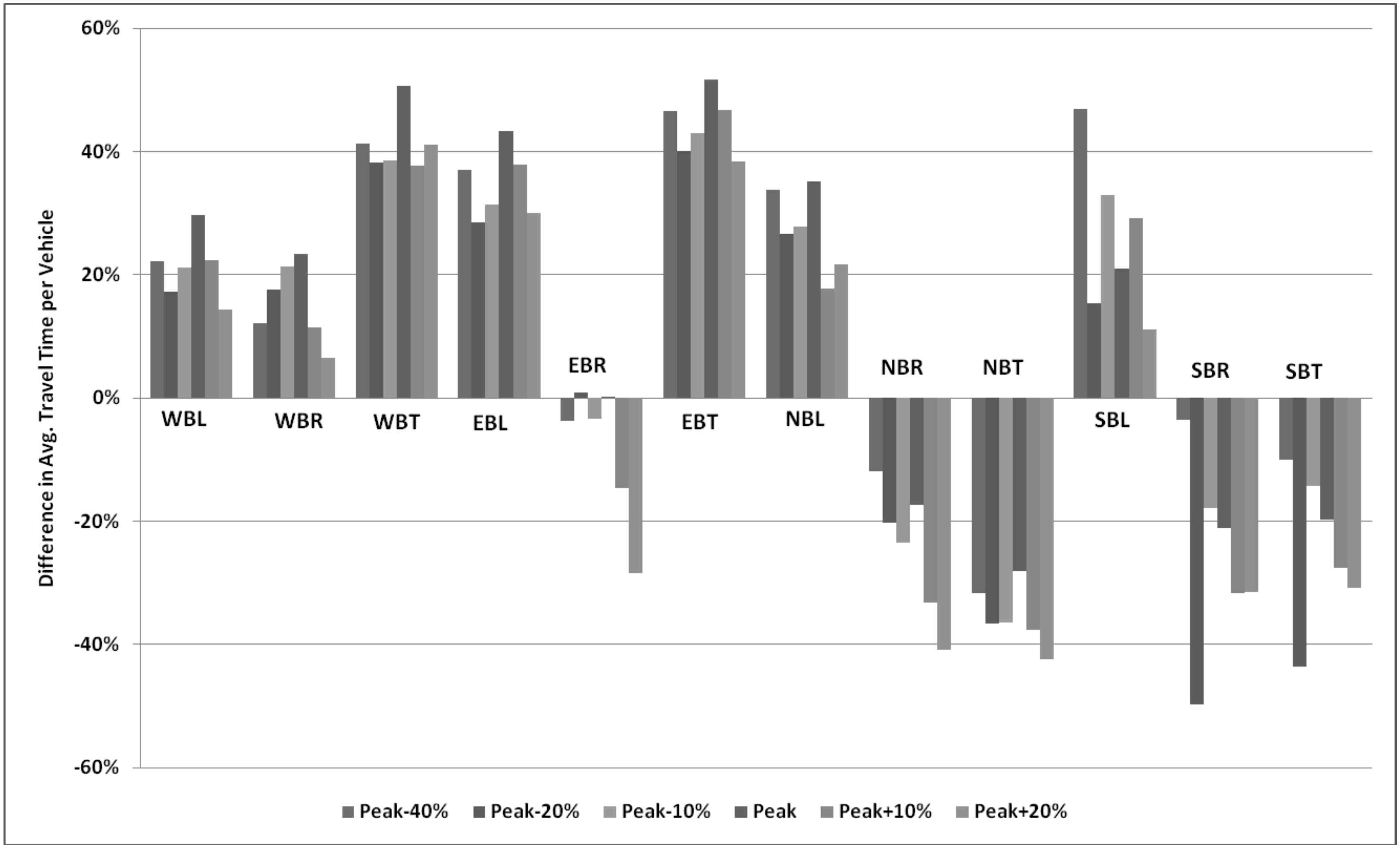


Figure 2.11. Comparison of Travel Times by Movement – Chapel Hill

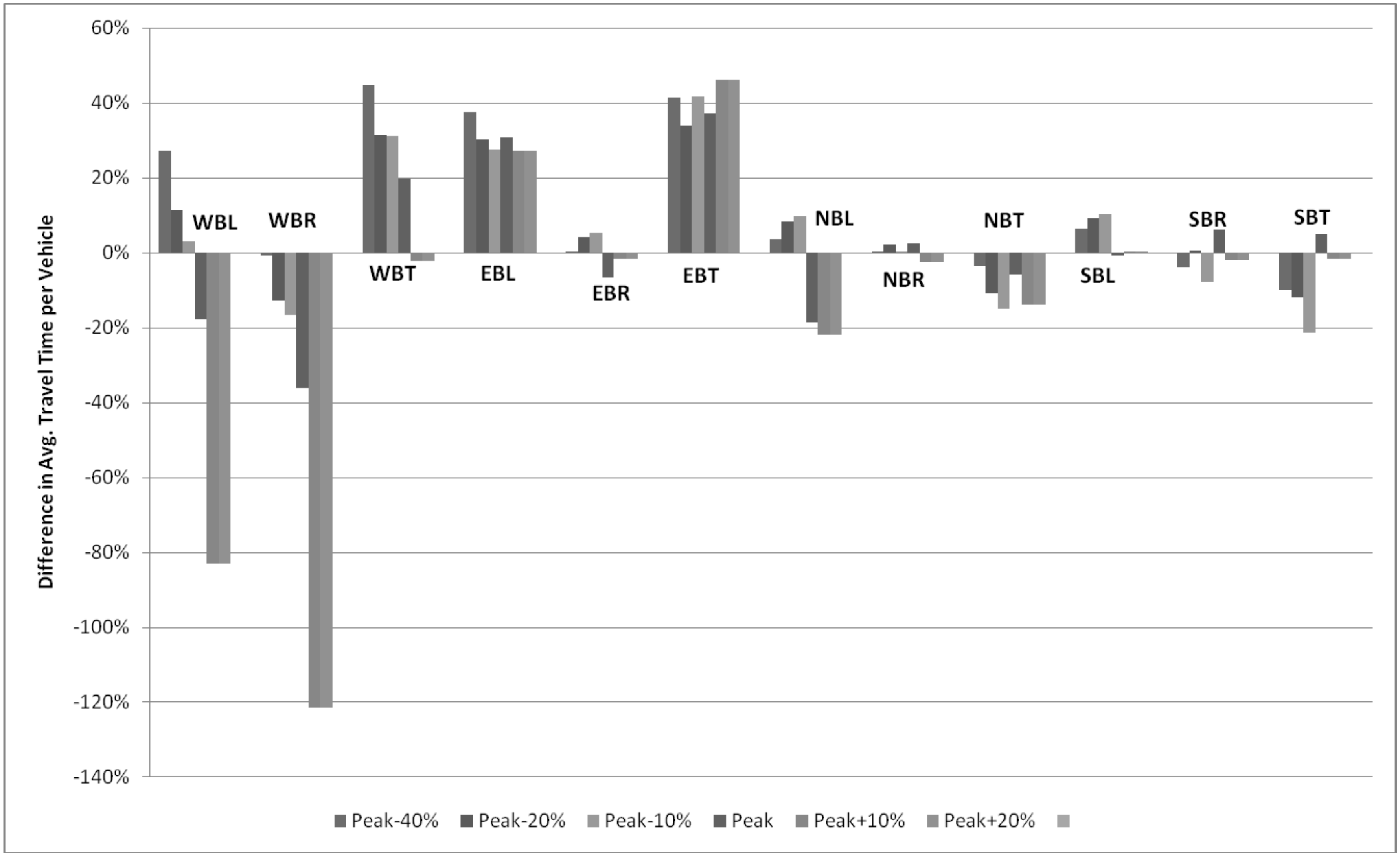


Figure 2.12. Comparison of Travel Times by Movement – Wilmington

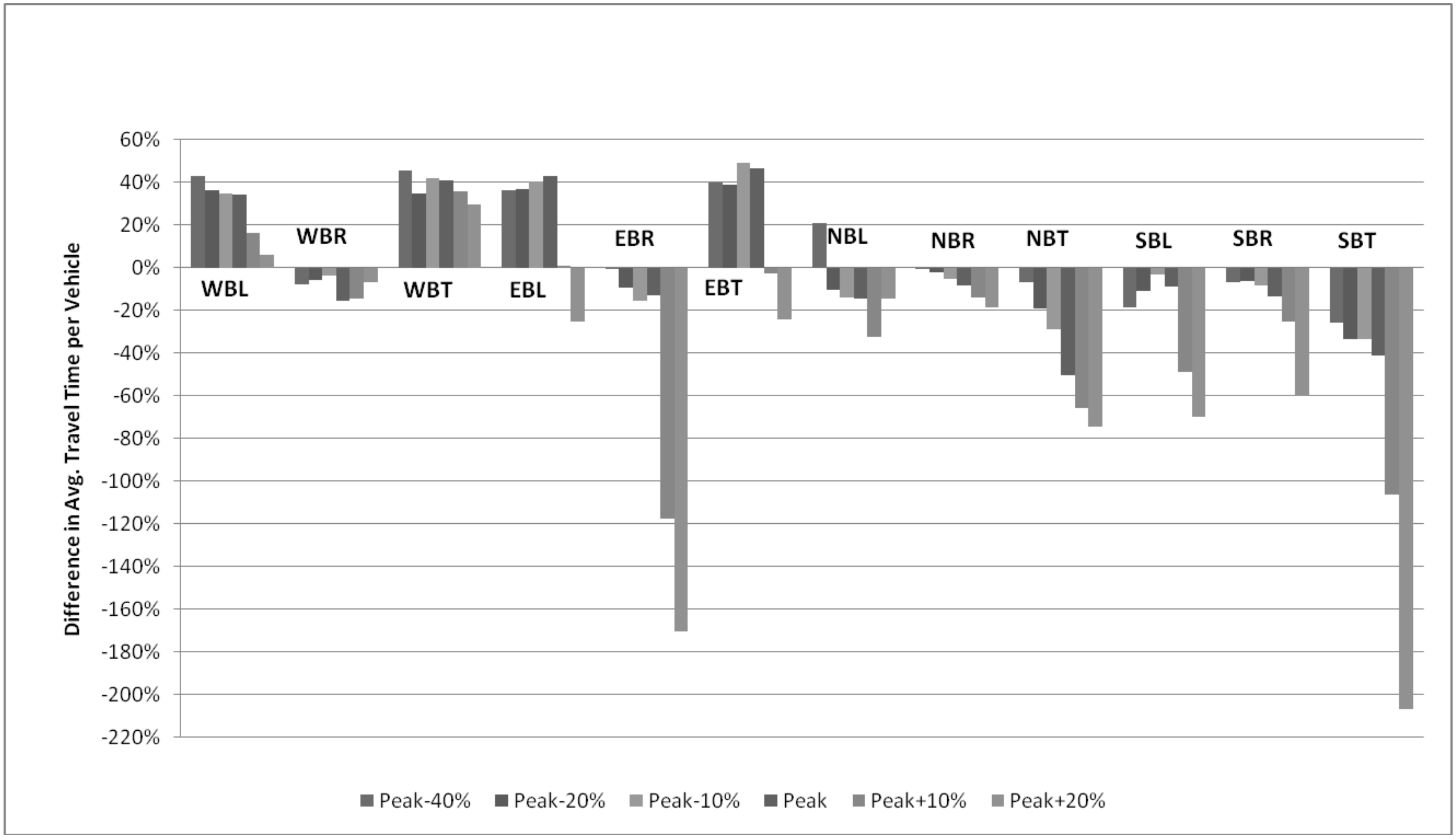


Figure 2.13. Comparison of Travel Times by Movement – US-17 @ Ploof/Poole

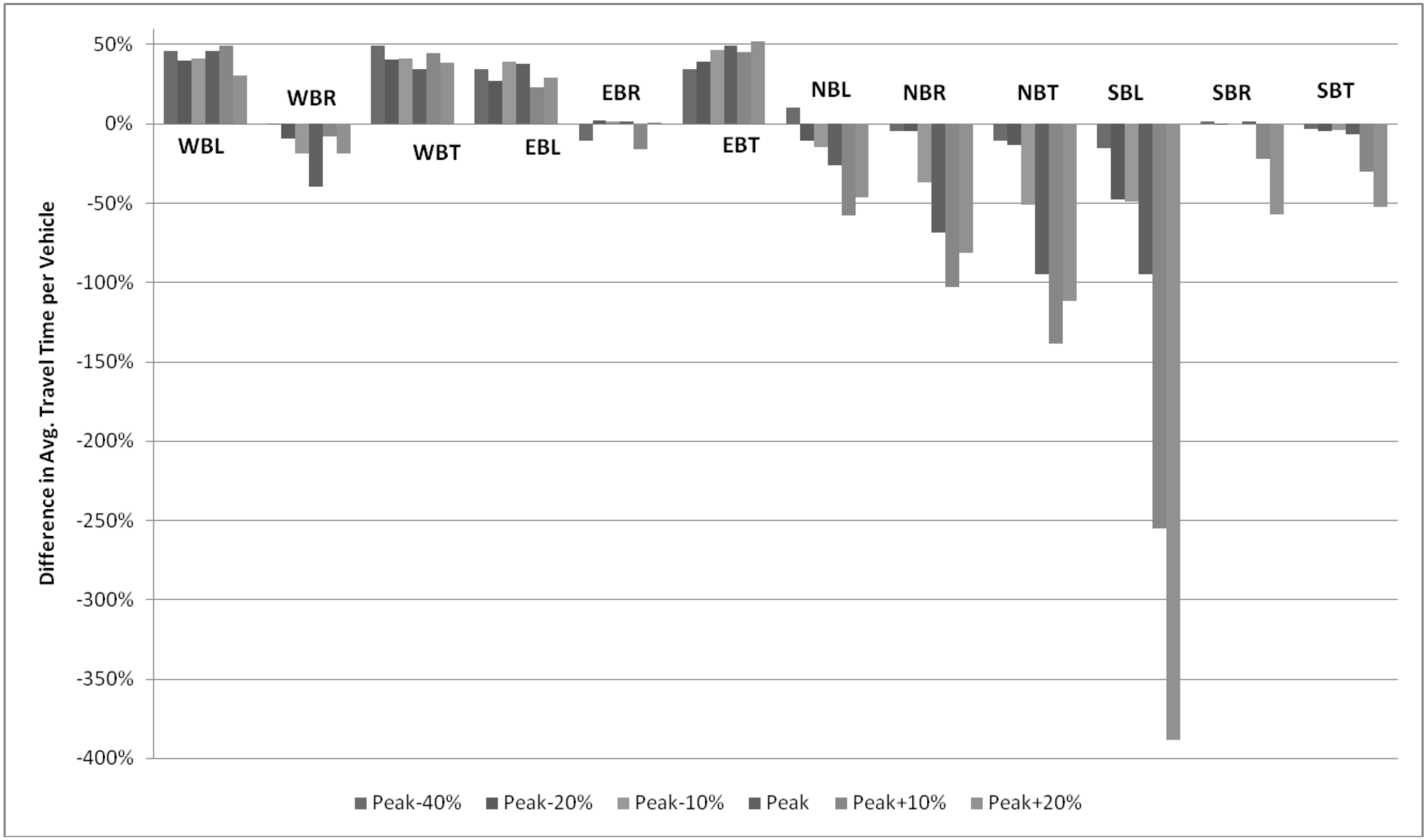


Figure 2.14. Comparison of Travel Times by Movement – US-17 @ Walmart/Gregory

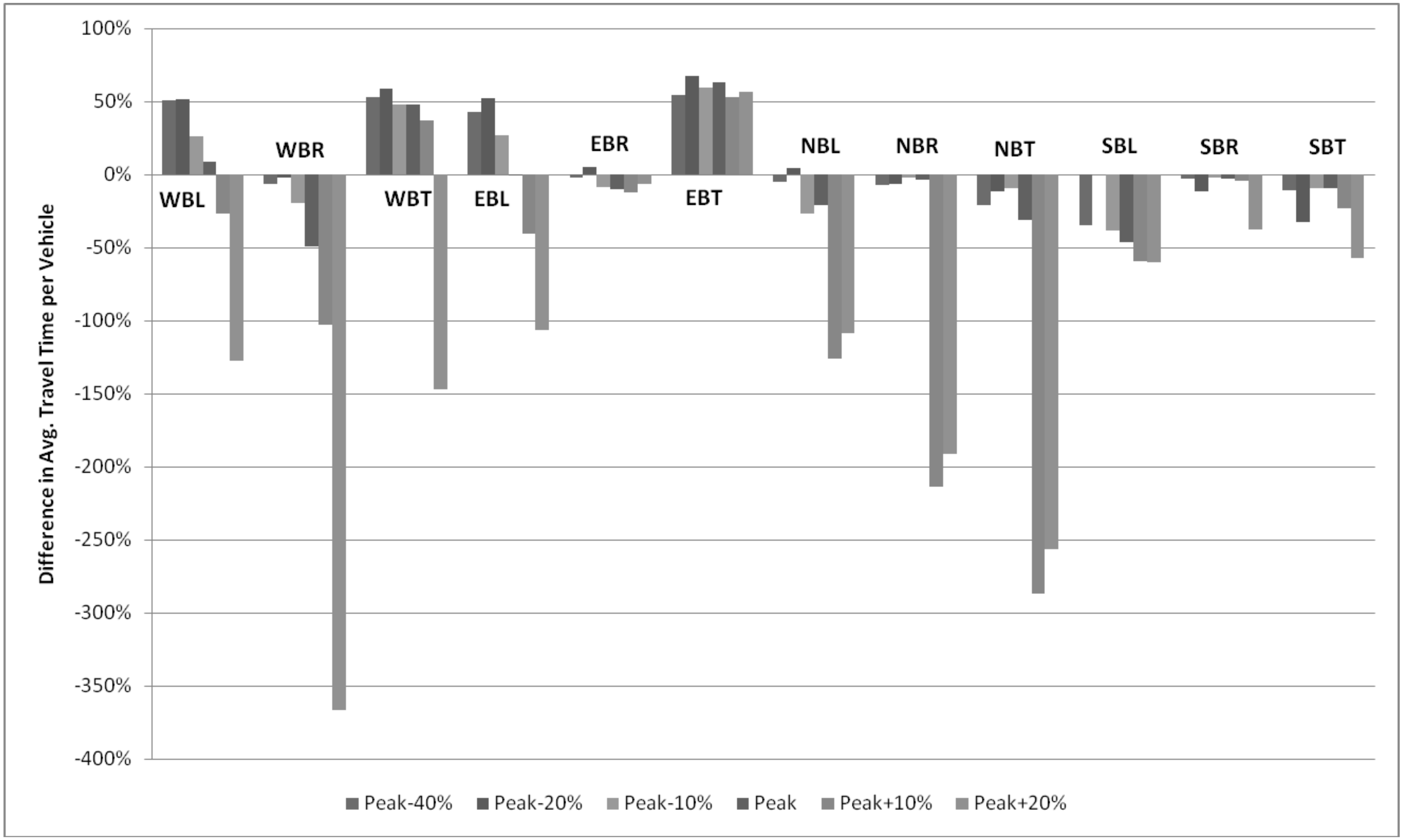


Figure 2.15. Comparison of Travel Times by Movement – US-17 @ Grandiflora/West Gate

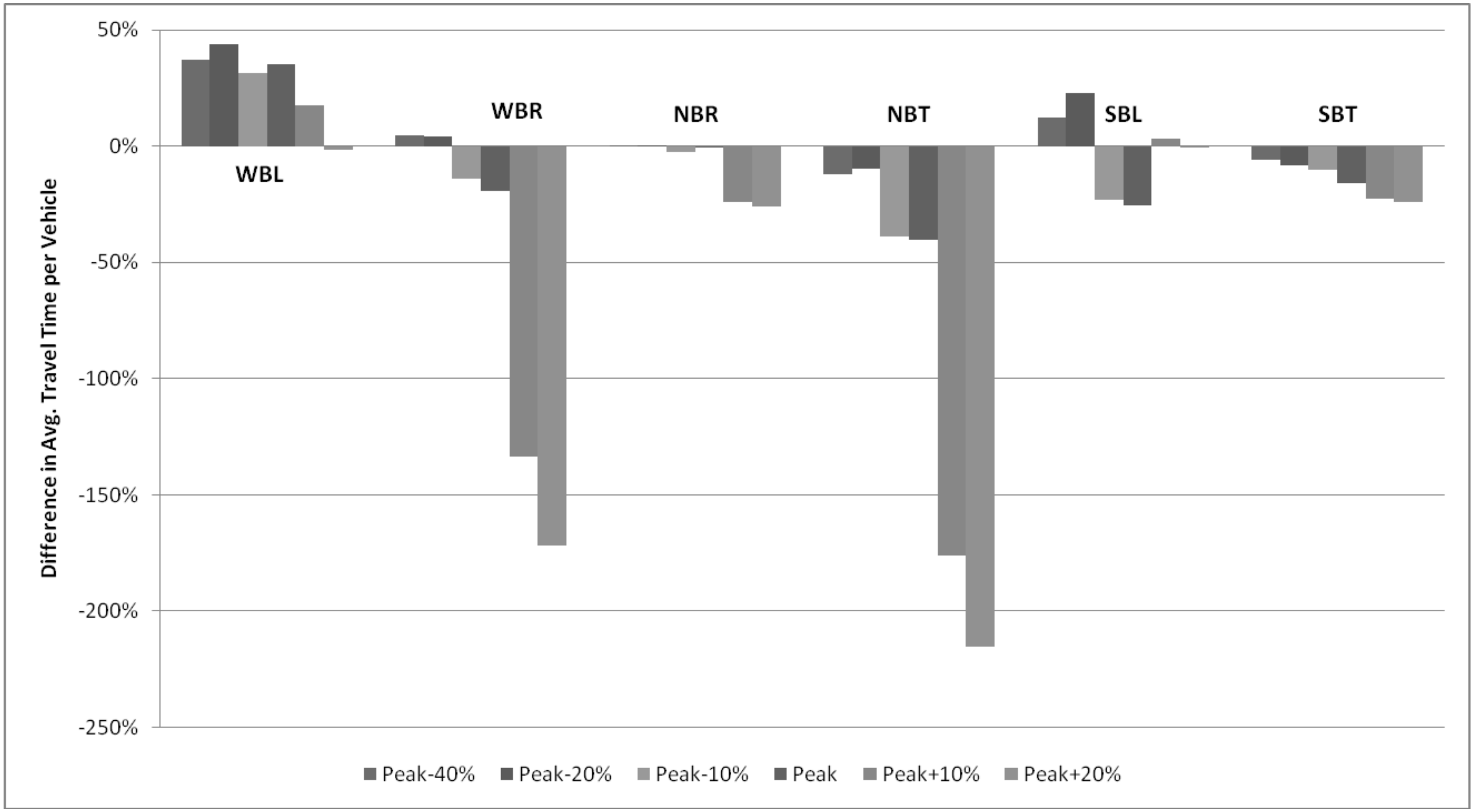


Figure 2.16. Comparison of Travel Times by Movement – US-17 @ Brunswick Forest

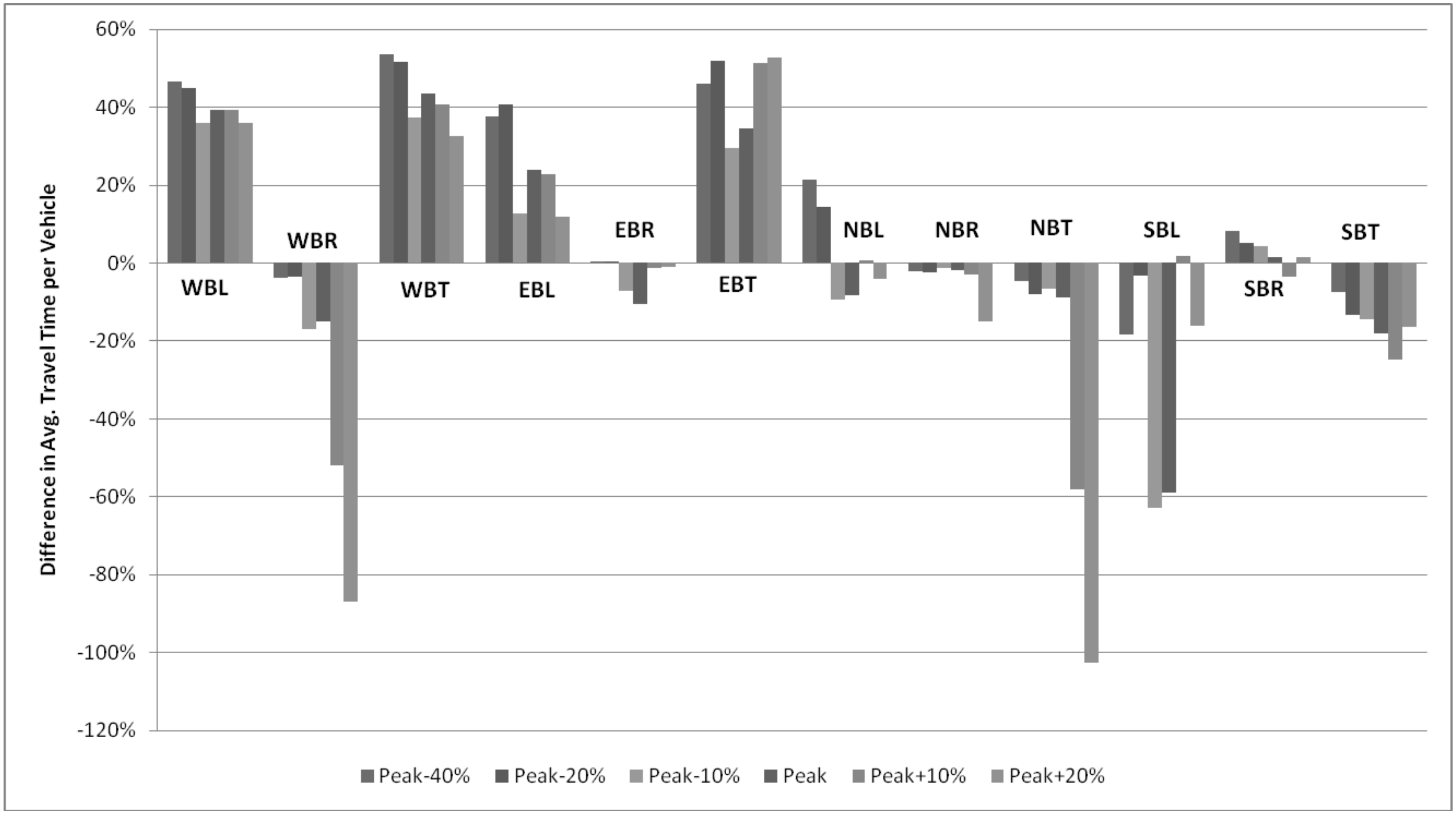


Figure 2.17. Comparison of Travel Times by Movement – US-17 @ Lanvale Rd

The team ran an ANOVA to determine if there was a statistically significant difference in the travel time results between the three sites, the designs (superstreet or conventional), and the demand levels. Table 2.23 lists the results of the ANOVA. At a 95% confidence level the interactions between all three factors, and between combinations of the factors, were all statistically significant. This shows that location, the design choice, and the volume levels all play a role and impact the travel times through the intersection. It is not surprising that the sites and demand levels had a significant impact on travel time. The important result from this is that the design choice – superstreet or conventional – did impact the travel time of vehicles traveling through the intersection, doing so at both isolated intersections and corridors.

Table 2.23. Analysis of Variance for Travel Time, Using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Site	6	74785.4	74785.4	12464.2	1361.45	0.0000
Demand	5	96874.5	96874.5	19374.9	2116.29	0.0000
Design	1	48482.4	48482.4	48482.4	5295.66	0.0000
Site*Demand	30	28129	28129	937.6	102.42	0.0000
Site*Design	6	15860.5	15860.5	2643.4	288.74	0.0000
Demand*Design	5	44107.5	44107.5	8821.5	963.56	0.0000
Site*Demand*Design	30	24329.4	24329.4	811	88.58	0.0000
Error	756	6921.3	6921.3	9.2		
Total	839	339490.1				
	S = 3.02574		R-Sq = 97.96%		R-Sq(adj) = 97.74%	

2.4.2.2 Travel Time Effects on the Intersection

The simulations show that the superstreet reduces travel time for the major road through and left movements, and increases travel time for the minor road through and left movements. However, looking at the operation of the intersection as a whole, the superstreet outperforms the conventional design. Table 2.24 shows the percent difference in average travel time per vehicle. The superstreet reduced travel time for the average vehicle traveling through the intersection at every location.

Table 2.24. Percent Difference in Average Travel Time Per Vehicle Between Superstreet and Conventional Intersections

Intersection	Pk-40%	Pk-20%	Pk-10%	Peak	Pk+10%	Pk+20%
US-15/501 @ Erwin / Europa	-1.6%	-16.2%	-4.8%	-1.6%	-13.8%	-16.8%
US-421 @ Myrtle Gardens Dr.	-2.2%	-6.7%	-12.7%	-1.5%	-11.9%	-12.7%
US-17 corridor (avg. for all intersections)	-3.7%	-7.7%	-15.4%	-26.5%	-79.6%	-100.2%
US-17 @ Ploof / Poole	-2.8%	-15.1%	-18.6%	-27.8%	-71.8%	-106.3%
US-17 @ Walmart / Gregory	-3.9%	-10.9%	-27.8%	-54.0%	-89.6%	-99.2%
US-17 @ Grandiflora / West Gate	-7.2%	-8.3%	-5.6%	-19.2%	-122.8%	-146.6%
US-17 @ Brunswick Forest Pkwy	-2.6%	-0.6%	-20.2%	-23.4%	-80.8%	-104.3%
US-17 @ Lanvale / Brunswick Forest	-1.7%	-5.4%	-8.2%	-10.0%	-32.9%	-49.4%

Not only did the superstreet reduce travel time, but it also reduced travel time variability. Table 2.25 shows the standard deviation of the simulated travel times by movement for each site. The superstreet had less travel time variability than the conventional intersection at the Wilmington site and the US-17 corridor. The Chapel Hill simulations produced similar standard deviations for the two designs, with the superstreet slightly greater than the conventional. However, with the exception of the NBL, the arterial travel time variability was less for the superstreet than the conventional model. The lower travel time standard deviation means drivers experience less variability, and thus more reliability, when driving through superstreet intersections and corridors compared to the conventional equivalent.

Table 2.25. Standard Deviation of Simulated Travel Time by Movement (sec)

Movement		Chapel Hill		Wilmington		US-17	
		SS	Conv.	SS	Conv.	SS	Conv.
Minor road	**WBL**	8.09	8.16	2.93	27.26	6.55	14.67
	WBR	2.34	2.10	1.35	9.24	2.84	7.65
	WBT	12.16	7.53	6.69	17.21	13.66	15.93
	EBL	6.67	6.40	6.92	10.40	6.08	22.22
	EBR	1.47	1.86	1.78	1.67	2.59	7.44
	EBT	5.10	4.82	9.58	12.27	11.84	14.72
Arterial	**NBL**	9.04	5.14	2.44	3.40	5.67	8.26
	NBR	1.00	1.32	0.86	0.74	0.85	2.22
	NBT	0.42	1.09	0.56	1.16	0.76	4.71
	SBL	3.34	8.91	2.31	3.68	5.21	13.31
	SBR	1.12	2.05	1.05	1.15	0.68	1.59
	SBT	0.51	0.86	0.62	0.71	0.31	2.30
Intersection Avg.		4.27	4.19	3.09	7.41	4.75	9.59

2.4.2.3 Travel Time Effects on the Arterial

At all sites the superstreet outperformed the conventional intersection for the major road through movements. This was expected because the superstreet benefits the arterial through movements due to the ability to have perfect progression in both directions. The superstreet major through travel times improved over the conventional by a greater amount at the higher volume levels. At both Wilmington and along the US-17 corridor, the major lefts also saw travel time improvements over the conventional design.

At Chapel Hill, the northbound through (NBT) remained consistent at each volume level, with improvements from 28% to 42%. With the exception of the peak-20% volumes, the southbound through (SBT) travel times savings steadily increased over the conventional with each increasing demand level. This was the only site where the major left turns experience more travel time than the conventional design. This superstreet intersection does not allow the direct major left turns at the main intersection. This is a modified design of the superstreet where the major left turns use the downstream directional U-turn crossover to make the left turn maneuver. The direct left turns were not built at this site because of a suspected weaving problem due to two roads merging together just upstream of the superstreet.

The Wilmington superstreet resulted in a similar situation to the Chapel Hill superstreet, with travel times improving more with each increase in traffic through the intersection for the NBT.

The NBT travel time savings for the superstreet over the conventional ranged from 3% to 14%. The SBT improved steadily with increasing demand for the superstreet as well, except during the peak, peak+10% and peak+20% scenarios. The superstreet saw a minimal increase in travel time during these three cases, from 1.5% to 5.1%.

The US-17 corridor saw similar effects as the Chapel Hill and Wilmington superstreets with travel time steadily improving as demand increased. At the peak+10% and peak+20% levels, the major through movements had large travel time savings over the conventional, reaching up to over 100% and even 200% in some cases. This is an indication that the conventional intersections were most likely overloaded and failing.

2.4.2.4 Travel Time Effects on the Minor Road

The minor road through and left turn movements were negatively impacted by the superstreet. By the nature of the design, the minor road through and left turns have to travel an extra distance to a downstream U-turn, then back through the main intersection. The travel times for these movements were higher at the superstreet than the conventional intersections for all sites. The minor lefts were impacted less than the minor through movements at all sites.

Along the US-17 corridor, the minor left turn and through movements were affected more during the low-volume scenarios, with the travel time difference between the superstreet and conventional decreasing as the volumes increased. The percent differences ranged from a 30 to 40% increase at the lowest volumes (peak-40%), to a 9 to 18% decrease in travel time at the highest volumes (peak+20%). At the highest demand level the superstreet travel times were lower than the conventional travel times for all movements.

At the Chapel Hill and Wilmington sites, the minor left turn and through movements were affected differently than they were along US-17. At Chapel Hill the minor left and through movements were negatively impacted the most during the peak period, with 30 to 50% increases in travel time. The differences then decreased as the volume levels changed from the peak. The minor street movements were least negatively impacted by the superstreet during the highest demand level, at only a 14 to 30% difference from the conventional. At Wilmington the eastbound and westbound directions were affected differently. The WBT movement was affected in the same way as the minor movements at Chapel Hill with the largest difference at the peak demand. The opposite effect happened for the eastbound minor movements. The EBL and EBT were negatively impacted the least during the peak period, and more during the high volume and low volume scenarios. The WBL movement was different from the rest, with superstreet travel times higher than the conventional for the low volume scenarios, and lower than the conventional for the high volume scenarios.

2.4.2.5 Capacity Check

For a check on the capacity of each intersection, both superstreet and conventional, the team applied the critical sum method. This method involves computing the sum of the critical lane volumes for each signal phase. This was not done to calculate the actual capacity of superstreets or the conventional intersections, but to compare the two designs to estimate how much more capacity one might get out of a superstreet than a conventional intersection. A signal-controlled intersection is generally considered to be in good operating condition if the critical sum is less than 1400 vphpl with a four-phase signal, and 1600 vphpl with a two-phase signal. These values come from the base saturation flow rate of 1900 pc/h/ln and multiplied by adjustment factors for heavy vehicles, left turns, right turns, and U-turns (21). Table 2.26 lists the critical sums for both the superstreet and conventional intersections for the high volume demand levels. The superstreet outperforms the conventional intersections at all sites, and is below the 1600 vphpl reference for two-phase signals at five of the intersections for all demand levels up to peak+40%. Based on this check, the superstreet design has a higher capacity than the conventional design.

Table 2.26 Critical Sums for Superstreet and Conventional Intersections

Site	Demand	Critical Sum (vphpl)	
		Conv.	SS
Chapel Hill	Peak	1190	1020
	Peak+10%	1310	1120
	Peak+20%	1430	1220
	Peak+40%	1670	1430
Wilmington	Peak	1120	1100
	Peak+10%	1230	1210
	Peak+20%	1340	1320
	Peak+40%	1570	1540
Ploof/Poole (US-17)	Peak	1320	1410
	Peak+10%	1450	1560
	Peak+20%	1580	1700
	Peak+40%	1840	1980
Walmart/Gregory (US-17)	Peak	1750	1410
	Peak+10%	1930	1560
	Peak+20%	2100	1700
	Peak+40%	2450	1980
Grandiflora/West Gate (US-17)	Peak	1310	1080
	Peak+10%	1520	1280
	Peak+20%	1570	1300
	Peak+40%	1830	1520
Brunswick Forest (US-17)	Peak	1140	1110
	Peak+10%	1250	1230
	Peak+20%	1360	1340
	Peak+40%	1590	1560
Lanvale Rd. (US-17)	Peak	1320	960
	Peak+10%	1450	1060
	Peak+20%	1580	1150
	Peak+40%	1840	1340
	Peak+60%	2100	1540

3.0 SAFETY ANALYSES

3.1 Literature Review

The literature review for this section addresses safety studies on both superstreets and median U-turns, as well as access management studies for safety and economic impacts. Median U-turn intersections are included in the literature review because they use directional crossovers like superstreets, and median U-turns have been used more extensively for a longer period of time. Median U-turns, as in Figure 2.1, use directional crossovers for all left-turn movements, and unlike superstreets, they allow minor street through movements. Most studies on median U-turns and superstreets show they reduce the number of conflict points and collisions. There are significantly fewer studies available on superstreets because of their limited field implementation. Access management studies are included in the literature review because they give depth into the safety and economic impacts of superstreets.

3.1.1 Median U-Turns

Maki conducted an evaluation of Michigan's median U-turns (4). As part of that effort, he conducted a before and after study using five years of collision data at four locations where directional crossovers replaced bi-directional crossovers. Directional crossovers allow movement in one direction only, whereas bi-directional crossovers allow both turning movements. The results showed a 60 percent reduction in total crashes, with more than a 95 percent reduction in angle crashes. Taylor et al performed a similar study (25). They examined eight arterial road segments for 54 bi-directional crossover replacements and ten years of collision data. The results showed an average of 30 percent reduction in total crashes. No significant change occurred at intersections or crossovers that were not altered. Neither study accounted for traffic volume changes, seasonal effects, or regression to the mean.

A study by Carter et al examined the operational and safety effects of U-turns at signalized intersections (26). The locations used were a combination of randomly selected sites and U-turn problem sites as identified by local traffic engineers. Despite the problem sites in the sample, 65 out of 78 sites had no U-turn collisions in the three year study period. Results showed that locations with double left-turn lanes, protected right-turn overlap, high left-turn and conflicting right-turn traffic volumes had the greatest number of U-turn collisions. The protected right-turn overlap was a significant factor in increasing the likelihood of a collision. Overall, Carter et al concluded that U-turns do not have a large negative effect on signalized intersections.

Potts et al conducted a study on the safety of unsignalized median openings on urban and suburban arterials (27). Field data from twenty corridors in five different geographic regions of the US were collected for specific median opening types, along with safety data from 668 median openings. The study looked at fifteen median opening types, including directional and conventional openings, with and without left turn lanes and loons, mid-block openings, and three- and four-leg intersections. The findings showed that collisions relating to U-turn and left-turn movements at unsignalized median openings were infrequent. The rate of U-turn plus left-turn crashes per median opening per year was found to be 0.41 for urban arterials and 0.20 for rural arterials. Also, at three-leg intersections the rate was 48 percent lower for directional median openings compared to conventional median openings. Four-leg intersections have a 15 percent reduction for directional median openings than conventional openings. This is relevant to our study because superstreets use directional median openings and this design feature indicates no safety concern.

Hummer and Reid compared the safety effectiveness of median U-turns to arterials with two-way left turn lanes (TWLTL) and medians with conventional left turns using five years of collision data in Michigan (17). Hummer and Reid found that total collision rates were significantly lower for roadway sections with signalized median U-turns than with medians or TWLTL. Roadway sections with unsignalized median U-turns had higher total collision rates than conventional medians but were lower than TWLTL.

The Federal Highway Administration (FHWA) published a TechBrief on the safety and operational benefits of median U-turns (28). The report provides design guidelines and a literature review of the important publications on median U-turns. Reported relevant safety information found that replacing bidirectional crossovers with directional crossovers reduced the number of total crash frequencies by 58 percent at four-legged intersections and 34 percent at three-legged intersections. However, the safety study did not account for regression to the mean. Also reported was that directional and bidirectional crossovers have approximately the same collision rate for divided highway sections without traffic signals; however, as the traffic signal density increases the directional crossovers have a 50 percent lower crash rate than the bidirectional crossovers.

FHWA's Alternative Intersections Informational Report provides safety results for median U-turn intersections (29). Implementation of median U-turn intersections from conventional four-leg signalized intersections reduced rear-end, angle, and sideswipe collisions by 17, 96, and 61 percent, respectively.

3.1.2 Superstreets

A 2007 study by Kim, Edara and Bared also analyzed the safety performance of the superstreet compared to conventional intersections (15). The safety analysis was done using the Surrogate Safety Assessment Methodology tool (SSAM), which is a module of the VISSIM simulation program that records the number of conflicts for each VISSIM run, for both single U-turn and double U-turn lanes. Based on simulation runs in VISSIM, the single U-turn lanes reduced the total number of conflicts by 80 percent. There was a 100 percent improvement in rear end conflicts and a 10 percent increase in lane change conflicts; however, the increase in lane change conflicts was not a significant finding. Double U-turn lanes resulted in a less favorable outcome. They showed a significant increase in rear end conflicts (81 percent) and lane change conflicts (75 percent), proving to be more dangerous in this measure than the conventional intersection. The analysis was done using computer simulations that were not calibrated with field data.

A study by Hochstein et al analyzed crash data from unsignalized J-turn intersections in Maryland and North Carolina (superstreets in Maryland are referred to as J-turns) (30). One site in Maryland was converted to a J-turn from a two-way stopped-controlled intersection, resulting in a 92 percent reduction in annual crash frequency at the main intersection. It should be noted that crash data were not available for the crossover sections. In North Carolina, three spot studies were conducted that showed 48-69 percent reductions in total collisions. The study locations were the intersections of US-23/74 and SR-1527/1449, US-64 and SR-2234/2500, and US-321 and SR-1796. While these studies give insight on the safety effects of superstreets, conclusions on safety benefits cannot be drawn from the report because of the limited number of sites, sample size, and the use of naïve before and after analysis. Hochstein et al, however, report that rural TWSC intersections will benefit from J-turn (superstreet) implementation if they have any of the following characteristics: a history of far-side right-angle collisions, collisions within the median, or "left-turn leaving" collisions; high through volumes; or relatively low volumes of left turns from the minor road. Hummer et al also investigated the safety aspects of the superstreet (20, 29, 31). The papers analyzed the same sites in Maryland and North Carolina as the Hochstein et al paper and yielded similar results and conclusions.

The North Carolina Department of Transportation (NCDOT) performed several spot study evaluations at locations across the state where directional median crossovers were installed as a safety countermeasure (32-42). The directional crossovers prohibited left and through movements from the side streets onto the main roadway. The locations either had full-median openings or were two-way stop controlled intersections in the before period. All the locations had divided major roadways. The spot studies consisted of a naïve before and after analysis of treatment sites, and in some cases, an analysis of intersections of either side of the location to test for crash migration (treatment influenced intersections). At the US-64 and SR-2234 site in Wake County, NCDOT also chose to evaluate the intersection using an odds ratio. The before and after periods were equal for each study and ranged from three to six years. Although these studies are naïve, they generally show a crash reduction at the treatment sites. Table 1 shows the percent reduction in total crashes and frontal impact crashes for the treatment sites, the treatment influenced intersections, and the corridor strip which includes both treatment and influenced intersections.

Table 3.1. Percent Crash Reduction from NCDOT Spot Studies (32-42)

US-23/74 from Jackson County Line to East of SR-1158, Haywood County			
	% reduction (-), % increase (+)		
	Total Crashes	Frontal Impact Crashes	ADT
US-23/74 strip	-2.0	-75.0	5.6
Treatment site 4	20.0	-71.4	5.5
Treatment site 5	-66.7	-100.0	6.5
Treatment site 8	-42.9	-84.6	5.4

US-64 and SR-2234/SR-2500/Mark's Creek Rd., Wake County				
	% reduction (-), % increase (+)			
	Total Crashes	Frontal Impact Crashes	Odds Ratio	ADT
Treatment site	-47.6	-76.5	---	5.8
Comparison site	53.8		-66.0	6.4
Treatment Influenced Intersections				
Crossover 1	0.0			
Crossover 2	-11.1			

US-321/Hickory Blvd. and SR-1796/Victoria Ct./Clover Dr., Caldwell County			
	% reduction (-), % increase (+)		
	Total Crashes	Frontal Impact Crashes	ADT
US-321 strip	-38.0	-70.3	2.1
Crossover section	-68.8	-83.3	
Treatment Influenced Intersections			
SR-1164	-60.0	-71.4	
SR-1774	-66.7	-66.7	

SR-1223/Dickerson Blvd. from US-74 to Commerce Dr., Union County			
	% reduction (-), % increase (+)		
	Total Crashes	Frontal Impact Crashes	ADT
US-74 strip	-54.7	-88.0	8.0
Treatment site 1	-61.3	-100.0	

US-23/74 at SR-1527/Steeple Dr. and SR-1449/Cope Creek Rd., Jackson County			
	% reduction (-), % increase (+)		
	Total Crashes	Frontal Impact Crashes	ADT
Treatment site	-53.3	-72.7	18.3
Treatment Influenced Intersections			
Exit 85 ramp	100.0		
SR-1788	0.0		

US-70, Craven County			
	% reduction (-), % increase (+)		
	Total Crashes	Frontal Impact Crashes	ADT
US-70 strip	146.4	6.7	10.6
Treatment sites (1-4)	-46.2	-50.0	11.3
Treatment Influenced Intersections (1-3)	261.5	57.1	12.7

Table 3.1. continued (32-42)

US-29/70 / I-85B at SR-1744/Mendenhall St., Davidson County			
	% reduction (-), % increase (+)		
	Total Crashes	Frontal Impact Crashes	ADT
Treatment site	-76.9	-90.5	5.5
Treatment Influenced Intersections			
I-85B at North Ave	0.0		5.2
I-85B at National Hwy	64.1		6.8
NC-132 and SR-2003/King's Grant Rd., New Hanover County			
	% reduction (-), % increase (+)		
	Total Crashes	Frontal Impact Crashes	ADT
Treatment site	11.8	-50.0	30.0
Treatment Influenced Intersections			
NC-132 and SR-2004	9.4	-36.4	
NC-132 and SR-2061	72.7	71.4	
US-17 and Parkwood Dr., Onslow County			
	% reduction (-), % increase (+)		
	Total Crashes	Frontal Impact Crashes	ADT
US-17 strip	-3.8		
Treatment site	-95.7		
Treatment Influenced Intersections			
US-17 and McDaniel Dr	209.5		
US-17 and SR-1470	6.4		
US-64 at SR-1163/Kelly Rd., Wake County			
	% reduction (-), % increase (+)		
	Total Crashes	Frontal Impact Crashes	ADT
Treatment site	-18.6	-96.4	31.3
Treatment Influenced Intersections			
Crossover 1	-50.0		
Crossover 2	0.0		
US-70 and SR-1731/Piney Grove Rd., Wayne County			
	% reduction (-), % increase (+)		
	Total Crashes	Frontal Impact Crashes	ADT
Treatment site	-85.2	-100.0	-3.4

NCDOT also performed a spot study evaluation at the intersection of NC-87 and SR-1150/Peanut Plant Road in Bladen County where a superstreet was installed as a safety countermeasure (43). The spot study consisted of a naïve before and after analysis with three years of before and after crash data. NCDOT found that the superstreet reduced total crashes and frontal impact crashes by 83.3 percent and 90.9 percent, respectively. The average daily traffic decreased by 19.8 percent from the before period year to the after period year (2004 to 2008). NCDOT also analyzed surrounding intersections for crash migration. The study showed a possible, but not likely, crash migration with an increase of three and six collisions in the after period to the nearby intersections.

FHWA's Alternative Intersections Informational Report includes the safety benefits of superstreets (also known as restricted crossing U-turn intersection or RCUT) (29). The relevant safety information included a before and after study of crash rates from the RCUTs along the US-23/74 corridor in North Carolina and from the US-301 site in Maryland (previously mentioned). The study also shows comparisons of the after period crash rates from three RCUTs along US-17 in North Carolina to comparable conventional intersections in Charlotte, NC. A before and after study was not used because the RCUTs were implemented as a part of the redevelopment of the area and traffic patterns changed significantly from the before conditions. The study used crash performance predictions for four-legged signalized intersections based on Chapter 12 of AASHTO's Highway Safety Manual (HSM to be published later in 2010). The findings showed that the total crash rates for all three RCUT intersections were below both the HSM predicted rates and the comparison sites in Charlotte.

3.1.3 Access Management

There is a large variety of literature on access management. The studies of interest to this project include safety impacts of directional median openings from driveways and economic impacts of these access management techniques on businesses. Much of the safety literature for access management is similar to or can be applied to median U-turns because they both involve directional crossovers. The safety literature for access management is different because the studies involve turns from driveways rather than turns from intersections.

3.1.3.1 Safety

Liu et al conducted a study to compare the safety of direct left turns versus right turns followed by U-turns (RTUT) from driveways in Florida (44). The researchers used video-captured data from sixteen median openings along urban or suburban multilane highways to conduct a conflict study. The median openings were located on six- to eight-lane divided roadways and were split between signalized intersections and unsignalized openings. The study produced 2,873 conflicts for various driveway left turn alternatives. The findings show that indirect left turn movements from a driveway at a median opening and at a signalized intersection have fewer conflicts than direct left turn movements by 47 percent and 26 percent, respectively.

Pirinccioglu et al conducted a similar conflict study comparing RTUT with direct left turns (DLT) along four-lane divided arterials (45). The researchers used video-collected U-turn data at signalized intersections and median openings. The study showed that RTUT related conflicts are less severe than DLT related conflicts at signalized intersections; however, RTUT movements had a five percent higher conflict rate than DLTs. At median openings, DLT conflicts are more severe and the rates are 62 percent higher than RTUT movements. The severity and conflict rates for both DLT and RTUT are higher at median openings than signalized intersections.

Lu et al also evaluated the safety effects of indirect driveway left turn treatments or RTUTs (46). The study used 140 roadway segments where U-turns replace direct left turns from driveways and 32 three-leg unsignalized intersections with direct left turns in Florida. The researchers found that U-turn crashes are very infrequent with a collision rate of 0.2 crashes per year per site, and most RTUT related crashes occur in the weaving section between driveways and U-turn openings. Lu et al developed a crash prediction model. They identified three key factors that contribute to RTUT weaving section collisions: major roadway ADT, location of the U-turn bay, and separation distances between driveway exits and downstream U-turn locations.

The National Cooperative Highway Research Program *(*NCHRP*)* Reports 420 and 524 showed similar results for access management techniques on arterials (27, 47). NCHRP 420 reported that U-turns generally provide a 20 percent collision reduction by eliminating direct left-turns from driveways and a 35 percent reduction when the U-turns are signalized. NCHRP 524 produced results of safety effectiveness of U-turns at unsignalized median openings. The study used 918 unsignalized median openings found in 62 arterial corridors in seven states. The arterials consisted of either four or six lane cross-sections with a balanced mixture of low and high speed roadways. Forty-three percent of median openings were located on low speed arterials (≤ 50 mph) and 57 percent on high speed arterials (≥ 55 mph). The research concluded that access management strategies that increase U-turn volumes at unsignalized median openings can be used safely and effectively. The study also found that U-turn and left-turn maneuvers at unsignalized median openings occur very infrequently at 0.41 collisions per median opening per year in urban arterial corridors, and 0.20 collisions per median opening per year in rural arterial corridors. Median opening collision rates are significantly lower for midblock than at intersections for urban arterials, and collision rates at three-leg conventional intersections are slightly lower than for four-leg conventional intersections.

3.1.3.2 Economic Impacts

The Transportation Research Board Access Management Manual presented studies done across the country indicating that raised medians have little to no overall adverse impact on surrounding businesses (10). In Kansas, changes in access or traffic patterns did not cause a change in use of the abutting businesses. In Texas, the number of customers and employment increased overall, and the perception of the median installation by business owners prior to construction is usually worse than reality. Also, business owners ranked "accessibility to store" lower in priority than customer service, quality of product, and product price. In Iowa, before and after survey data were collected from seven projects. Findings showed that 80 percent of businesses reported equal or higher sales and reported no customer complaints about business access after project completion. Ninety (90) to 100 percent of motorists also favored the roadway modifications from controlled access. In Florida, a study showed no adverse impacts on truck deliveries and business activity. Williams presented similar findings in all states (49)

Similar results were found in a study done by the Texas Transportation Institute addressing the economic impacts of raised medians (11). This four-year study was done at eleven locations to assess the effects prior, during, and after construction of raised medians. Through surveys and interviews with business owners and customers, the researchers found that the only major adverse impact raised medians have is during the construction phase. For businesses that were present before, during, and after construction, property value increased by 6.7 percent after the construction of the raised median compared to the before conditions, while owners thought they would experience a decrease in value. The duration of construction typically lasted one to two years, with construction dates between 1979 and 1998 for all study locations. As with other studies, accessibility is ranked lower in importance for destination businesses, while slightly higher for pass-by businesses such as gas stations. Overall, the study concludes that there is no negative economic impact caused by raised medians.

FHWA's Alternative Intersections Informational Report provides access management considerations for median U-turn and superstreet intersections (29). Because the designs primarily service through traffic on the major road, inferences can be made that some land uses that rely on pass-by traffic may suffer; however, no documented studies of median U-turns or superstreets on adjacent land users are identified. The designs' flexibility on crossover placement can provide safer and more efficient access.

3.2 Methodology

This section describes the approach used to complete the evaluation of the safety effectiveness of superstreets installed in North Carolina. The safety study involved a naïve and comparison group (C-G) analyses of signalized and unsignalized superstreets and an Empirical Bayes (EB) method analysis of unsignalized superstreets. The team also evaluated signalized superstreets using the Surrogate Safety Assessment Model (SSAM) because VISSIM models were previously calibrated and validated (see Chapter 2). The team used these three methods of analysis to find the effects a superstreet design has on collision frequencies and severities. Signalized superstreets utilized the C-G method because the NCDOT installed superstreets at these sites for their congestion problems and not for their safety problems. Based on this fact, regression-to-the-mean will not have an effect on the collision frequencies, thus making the use of the C-G method acceptable. Conversely, unsignalized superstreets were installed for their safety issues; therefore, regression-to-the-mean must be accounted for in the analysis.

3.2.1 Selection of Sites

The identification of sites for the safety analysis involved finding both signalized and unsignalized superstreets in North Carolina. Sites were selected for the study only if they were, by definition, a full superstreet. A site is considered to be a full superstreet if it reroutes left and through movements from the side street to directional crossovers on both sides of the main intersection. Figure 1.1, shown previously, displays the two most common four-legged superstreet designs. Four-legged sites that had only one U-turn crossover or used a full-median opening as a directional crossover were not included in the study. Table 3.2 lists the sites selected for analysis. Site selection criteria also included that the roads must have existed prior to the superstreet and the superstreet was not installed with other major improvements (no two-lane to four-lane conversion for example).

Table 3.2. Sites Selected for the Safety Analysis

Main Road	Cross Street(s)	City	County
US-15/501	Erwin Rd./Europa Dr.	Chapel Hill	Orange
US-17 (Ocean Hwy)	Ploof Rd./Olde Waterford Way	Leland	Brunswick
US-17 (Ocean Hwy)	West Gate Dr./Grandiflora Dr.	Leland	Brunswick
US-17 (Ocean Hwy)	Gregory Rd.	Leland	Brunswick
US-421 (Carolina Beach Rd.)	SR-2501	Wilmington	New Hanover
US-17 (Ocean Hwy)	Mt. Pisgah Rd. (SR-1130)/Sellers Rd. (SR-1344)		Brunswick
US-17 (Ocean Hwy)	Ocean Isle Beach Rd. (SR-1184)		Brunswick
US-74 (Great Smokey Mtn. Expressway) / US-23	Red Bank Rd. (SR-1155)/Walker Rd. (SR-1157)		Haywood
US-74 (Great Smokey Mtn. Expressway)/US-23	Old Balsam Rd. (SR-1243)/Balsam Ridge Rd. (SR-1158)		Haywood
US-74/441	Barkers Creek Rd. (SR-1392)/Wilmont Rd.		Jackson
US-74/441	Dicks Creek Rd. (SR-1388)		Jackson
US-74 (Andrew Jackson Hwy)	Elmore Rd. (SR-1321)		Scotland
US-74/76	Blacksmith Rd. (SR-1800)	Bolton	Columbus
NC-24 (Beulaville Hwy)	Haw Branch Rd. (SR-1230)		Onslow
US-1	Camp Easter Rd./Aiken Rd. (SR-1853)		Moore
NC-87	Peanut Plant Rd. (SR-1150)	Elizabethtown	Bladen
NC-87/24 (Bragg Blvd.)	N. 2nd St.	Spring Lake	Cumberland
NC-87	School Rd./Butler Nursery Rd. (SR-2233)	Fayetteville	Cumberland
NC-87	Alderman Rd. (SR-2261)/Grays Creek Church Rd.	Fayetteville	Cumberland

3.2.2 Data Collection

The team began data collection by gathering information related to each site that was necessary to assemble the appropriate collision reports. These data included distances from the main intersection to the directional crossovers, all possible road names of the intersections including route numbers, and the construction period. The team needed distances to the crossovers to specify the area around the intersection for collecting relevant collision reports. Many roads in the state have multiple names that collision reports could be filed under, so it was important to list all possible road names when amassing collision reports. Lastly, the construction period was needed to make sure the team requested collision reports for enough time prior to construction of the superstreet. Most of these data gathered at this stage were useful in collecting collision data and later in the safety analysis as well.

In addition to the data needed to acquire collision reports, the team also needed annual average daily traffic (AADT), along with data on road geometry, traffic control information, and other pertinent features of the site. The team retrieved AADT from the NCDOT traffic volume maps, and used Google Earth to note road geometry and features.

To use the C-G method of analysis, it was necessary to identify a suitable list of comparison sites for each superstreet. Comparison sites were used to predict what the collision frequency of the treatment site would have been in the "after" period had the treatment not been in place. This is important in determining the net safety effect following installation of the superstreet. Graphing the collision frequency of the comparison sites with the superstreet sites in the "before" period versus time, or using the sample odds ratio, helps show if the collision frequencies at the comparison sites were tracking the treatment sites. If they tracked well, the team assumed that the comparison sites would be good predictors of collision frequency if the superstreet had not been built. The team typically used two comparison sites per superstreet for the C-G method; however, some superstreets did not track well with two comparison sites so the team used either one or three in those cases. The following criteria were used to find comparison sites:

1. Conventional intersections,
2. Similar geometry,
3. Traffic control measures,
4. Divided major road,
5. Proximity to the superstreet, and
6. Similar AADT.

The first three measures listed above were required for comparison sites. That is, comparison sites must be conventional intersections (full median openings), they must have the same geometry (number of approaches), and they must have the same form of traffic control as their superstreet comparison. For instance, if a superstreet was a three-legged signalized intersection, then its comparison sites must be three-legged signalized conventional intersections.

The last three measures listed above were not required but were highly recommended. That is, the team wanted similar medians, similar AADTs, and proximity to the superstreets. Most comparison sites had divided major roads, but at some locations the team was not able to find adequate divided conventional intersections. If the AADTs were similar between treatment and comparison sites they had a better chance of having a similar history of collisions because the exposure levels were similar. Comparison sites with similar or higher AADTs helped ensure a large enough sample of collisions to provide for a better analysis. The team wanted comparison sites to be within five miles of the superstreet, and every effort was made to find similar sites in this influence area. This was important because if the sites are in close proximity they likely experienced the same weather events, driver demographics, and effects of policies which play an important role on the collision history.

The EB method involves using a model to predict the collision frequency. The team chose to calibrate and use the Highway Safety Manual (HSM) model, which will be discussed later. To use the EB method of analysis for collision frequency, the team needed to find a large pool of calibration sites for three-legged and four-legged superstreets. Unlike the C-G method, the EB method does not require each treatment site to have its own specific comparison sites. Instead, the team found a model calibration factor for three-legged superstreets by analyzing a large pool of three-legged calibration sites, and the team made a similar effort for four-legged sites. The EB method works better if the calibration sites have varying characteristics in numbers of turn lanes and AADTs. Calibration sites only need to share the most basic set of traits as the superstreet sites: divided four-lane major road, undivided two-lane minor road, and two-way stop-control. Varying the other characteristics enabled the team to collect a robust set of calibration sites that will give a better estimate of the group need (50). Three-legged and four-legged calibration sites were found by initially looking for intersections with given major and minor approach AADTs on NCDOT traffic volume maps. Available AADTs were limited and, to be time- and cost-efficient, the search focused on intersections or highways that already had recorded volumes. Next, each candidate calibration site was checked using Google Maps to confirm that it fit the necessary criteria. Sites that had one minor approach but had a commercial driveway opposite of the minor approach were considered four-legged sites. Alternatively, sites that had one minor approach and had a residential driveway opposite of the minor approach were considered three-legged sites. The team used the following criteria to evaluate three-legged and four-legged calibration sites:

- Full median opening or median that allows all direct movements,
- Major road is four-lane and divided for at least 500 feet beyond the intersection,
- Traffic control limited to stop-control on minor approach(s), and
- At least one minor approach AADT greater than 700 vehicles per day.

The criteria helped ensure fair comparisons between superstreets and their conventional counterparts. The major road must be divided at least 500 feet beyond the intersection on the major road because the only collisions desired are those related to the intersection and not from geometry changes. The team also chose to set a constraint on the minor approach volume because it was assumed a conventional intersection would only be retrofitted into a superstreet if the volumes were significant enough to cause a safety concern. Although the HSM model has no minimum volume, 700 vehicles per day was chosen as the constraint.

NCDOT traffic volume maps were reviewed from all counties in North Carolina to give the best opportunity for site selection. Counties varied in the availability of calibration sites. Some counties did not have four-lane divided highways with unsignalized intersections and others had several. The goal was to collect between 30 and 50 calibration sites for each type of site, three-legged and four-legged, because that is the recommendation of the Highway Safety Manual (51). The team achieved a complete census rather than a random selection of calibration sites because of setting certain criteria for calibration sites, and choosing every site meeting those criteria.

Strip analyses and collision reports were collected for all sites analyzed including superstreets, comparison sites, and calibration sites. To collect the strip analyses the team used the Traffic Engineering Accident Analysis System (TEAAS) software which is the primary tool used by the NCDOT to analyze and report on crashes within North Carolina (52). This software provides a complete set of all police-reported collisions in North Carolina. It was necessary to collect code numbers for each major road and mile posts for each area of interest. The area of interest for treatment sites included 150 feet beyond the intersection on the minor road(s), and 500 feet beyond each median crossover on the major road. The team chose 150 feet for the minor road because that is standard NCDOT practice. The team chose 500 feet beyond the median crossovers on the major road to capture all collisions that may have been affected by the unconventional geometry. Comparison sites had the same area of interest as their superstreet sites because it ensured a fair comparison for the C-G method. Calibration sites' area of interest included 150 feet on the minor road(s) and 500 feet along the major road from the intersection. The team chose 500 feet beyond the intersection on the major road to capture all collisions that may have been affected by the intersection. The team used code numbers and mile posts in conjunction with the appropriate time period for each site in TEAAS. The time period for collected collision data for superstreets and their comparison sites was from five years prior to the construction of the superstreet to the most recent day for which data were available. Calibration sites were collected for five years as well, from January 1, 2004 to December 31, 2008.

To collect the collision reports the team used North Carolina's Division of Motor Vehicles (DMV) Crash Reports Request which is a primary tool used by the NCDOT to gather specific details on each collision (52). The DMV tool provided review of collision reports for all crashes that were suspected at the intersections to make sure the location identified was correct, to see if construction was ongoing or if construction may have attributed to the crash, and to see if the geometry or traffic control had changed at any time during the data collection period. The team included collisions that occurred during construction if the construction was temporary or if only a few collisions occurred during construction. A site was not used if all of the collisions occurred while the roadway was under construction. Appendix 10.2 contains dates of before and after time periods, geometric details, and major and minor road AADTs for each site.

3.2.3 Data Analysis

The team conducted an observational before and after safety study using the naïve and C-G methods for signalized and unsignalized superstreets, and an EB approach for unsignalized superstreets. Signalized superstreets utilized the naïve and C-G methods because (based on feedback from NCDOT) the NCDOT installed superstreets at these sites for their congestion problems and not for their safety problems. Based on this fact, regression-to-the-mean would not have an effect on the collision frequencies which makes the use of the naïve and C-G methods acceptable. The C-G method properly accounts for any changes in collision frequencies from the before period to the after period. Comparison sites were used to predict what the "after" period would have been had the superstreet not been built. Graphing the collision frequency of the comparison sites with the superstreet sites in the "before" period versus time, or using the sample odds ratio, helps show if the comparison sites have similar trends to the treatment site. If they tracked well, then it was assumed that the comparison sites would be good predictors for what the collision frequency would have been at the treatment sites if the superstreet had not been built. This analysis will summarize the effects, if any, the superstreet had on intersection safety by comparing the actual number of collisions at the treatment site to what would have likely happened had no treatment been installed.

The EB method was used to analyze the safety of unsignalized intersections. The NCDOT selected most unsignalized sites for superstreet installation due to safety problems. The decision to make a change based on safety is a red flag for regression-to-the-mean (RTM). RTM effects make a treatment seem a lot safer than it really is because the intersections already had a higher-than-average collision frequency, and regardless of whether or not a treatment had been installed, the collision frequency was very likely to decrease even if the treatment had not been installed.

By taking RTM into account, the estimate of collisions had the treatment not been installed will be unbiased, showing the actual affect of the countermeasure.

The EB method uses a model to predict the collision frequency at typical sites of interest (in this case, on four-lane rural divided arterials). There were several available options for models, each with its own advantages and disadvantages:

1. The intersection model in Chapter 11 of the Highway Safety Manual (51),
2. Dr. Jongdae Baek's model for multilane highway segments with or without curbs (53),
3. Ms. Stacie Phillips' model for four-lane median divided highways (54), or
4. Dr. Raghavan Srinivasan's model for two-lane highways (55).

The HSM Chapter 11 collision frequency model was beneficial because it is applicable to rural divided multilane highway intersections. It is also applicable to three-legged and four-legged intersections. The drawback to using this model was that it was not calibrated for North Carolina.

Jongdae Baek's and Stacie Phillips' models would have been beneficial because they were calibrated in North Carolina. The disadvantage of these models was that they do not take into account side streets, and trying to modify the models to include minor road AADT's would have been more complicated than calibrating the HSM model for North Carolina with no guarantee that they would have fit well.

Raghavan Srinivasan's model for two-lane highways would have been beneficial because his model had an adaptation if minor road AADT was unavailable, like at many of the study's potential rural reference sites. However, it was not appropriate because it was for two-lane highways only.

The team determined that the most effective approach was to use the HSM model and calculate a calibration factor. The HSM model uses a procedure to estimate the expected average crash frequency of a specific facility type. The chosen facility was a rural multilane highway unsignalized intersection. The model estimates the expected average crash frequency for an individual site, with the cumulative sum of all sites representing the entire network. The model requires a set time period, consistent traffic control measures, and known AADTs on at least one major and minor approach. Equation 3.1 shows the predictive model used for three-leg and four-leg stop-controlled intersections (51).

Equation 3.1 $$N_{predicted\ int} = N_{spf\ int} \times C_i \times (AMF_{1i} \times AMF_{2i} \times \ldots \times AMF_{4i})$$

Where:

$N_{predicted\ int}$ = predicted average crash frequency for an individual intersection for the selected year,
$N_{spf\ int}$ = predicted average crash frequency for an intersection with base conditions,
AMF_{1i} … AMF_{4i} = Accident Modification Factors for three- and four-leg stop-controlled intersections, and
C_i = calibration factor for intersections of a specific type developed for use in North Carolina.

Safety Performance Functions (SPFs) predict the average crash frequency for three- and four-leg stop-controlled intersections with base conditions. The SPF base conditions are shown below:

- Zero degree intersection skew angle,
- No left turn lanes on major road,
- No right turn lanes on major road, and
- No presence of lighting.

The rural highway intersection SPF, $N_{spf\ int}$, is calculated per year using regression coefficients and major and minor leg AADTs. The SPF equation is modified for intersection type (three-leg or four-leg) and severity level (total collisions, fatal and injury collisions, or KAB collisions using the KABCO scale) through the regression coefficients. Equation 3.2 shows the SPF calculation (51):

Equation 3.2 $$N_{spf\ int} = e^{a+b\times\ln AADT_{maj}+c\times\ln AADT_{min}}$$

Where:

$N_{spf\ int}$ = SPF estimate of intersection-related expected average crash frequency for base conditions,
$AADT_{maj}$ = AADT (vehicles per day) for major road,
$AADT_{min}$ = AADT (vehicles per day) for minor road, and
a, b, c = regression coefficients.

The team calculated the three-legged and four-legged SPFs for years 2004 to 2009 and for two severity types: total collisions and fatal and injury collisions. Some sites did not have major or minor AADTs for every year, and in those cases, a linear trend line was used to estimate the missing traffic volumes. HSM methodology suggested using the higher AADT if both volumes are given for a roadway

Accident Modification Factors (AMFs) are used to adjust the predicted average crash frequency when base conditions are not met. AMFs are calculated per site, and can be modified for total crashes or fatal and injury crashes (51). AMFs for intersections modify the effect on safety due to intersection skew angle, presence of a left-turn(s) on the major road, presence of a right-turn(s) on the major road, and presence of intersection lighting. "The AMFs are multiplicative because the safety effects of the features they represent are presumed to be independent. Little research exists regarding the independence of these effects, but there is no basis in current knowledge for any assumption other than the independence of these effects" (51).

The calibration factor, C_i, is calculated separately for facility type and severity level. Equation 3.3 shows the calibration equation (51):

Equation 3.3 $$C_i = \frac{\sum_{all\ sites} observed\ crashes}{\sum_{all\ sites} predicted\ crashes}$$

Table 3.3 shows the calculated calibration factors for 2004 to 2009 that were calculated from the data collected for North Carolina. The results from Table 3.3 indicate that North Carolina collisions occur at a higher rate than the collisions used to develop the base equation for the HSM. This is not unusual as "the general level of crash frequencies may vary substantially from one jurisdiction to another for a variety of reasons including climate, driver populations, animal populations, crash reporting thresholds, and crash reporting system procedures" (51). For example, unlike most other states, North Carolina has one single owner and agency for its roads which would lead to more uniform crash reporting.

Table 3.3. Calculated HSM Calibration Factors

Facility Type	Severity Level	Calibration Factor
Three-legged	Total Fatal and injury	1.57 2.05
Four-legged	Total Fatal and injury	1.39 1.74

3.3 Results

The team separated the analysis of superstreets into three separate groups. First, signalized superstreets were not affected by RTM; therefore, they were only analyzed using observational naïve and comparison group (C-G) methods instead of Empirical Bayes (EB). As a supplemental analysis of signalized superstreets, the team used a time-of-day and milepost analysis and the Surrogate Safety Assessment Model (SSAM). Second, unsignalized superstreets were affected by RTM; thus, they were analyzed using EB methods. As a supplemental analysis of unsignalized superstreets, the team used observational naïve and C-G methods. Third, some superstreets were converted with additional major improvements, such as signalized traffic control, additional through lanes, or as a brand new road. These signalized and unsignalized superstreets had dissimilar before and after periods; therefore, they were only analyzed using the HSM model for collision rates. These analyses are shown in the following subsections.

3.3.1 Naïve Analysis

A naïve study was performed on the superstreet sites to obtain a basic before/after analysis. The naïve study predicts what the safety of the site would have been in the after period had the superstreet not been implemented; however, it has some shortcomings compared to more rigorous studies used later in this effort. The team used the naïve study because it provided a good base comparison for the C-G and EB methods. The team conducted the study on three groups: all superstreets, only signalized superstreets, and only unsignalized sites. Then, each group was analyzed using different collision types: total, fatal and injury, angle and right turns, rear-end, sideswipes, left turns, and other. Right turn collisions were included with angles because most crashes reported as right turns could also be categorized as angle crashes. Left turn collisions could be reported as 'Left Turn, Same Roadway' or 'Left Turn, Different Roadways', and were combined together in one category because the collision types were indistinguishable in the collision reports. Left turn collisions were separated from angle and right turn collisions because there was a distinguishable difference between the two categories in the collision reports. The 'other' category includes all collision types not covered by the specific categories. Table 3.4 shows the number of collisions per treatment site and by the collision type. Table 3.5 shows the before and after collisions for each treatment site and its comparison sites (which will be used for the C-G methods later). These collision data were used in all other safety analyses, where appropriate, and will not be repeated in the rest of the paper. Appendix 10.2 contains superstreet and comparison site crash data.

Table 3.4. Number of Collisions per Treatment Site and by Collision Type

Treatment site	Total	Fatal & injury	Angles & right turns	Rear ends	Sideswipes	Left turns	Other
All	1331	556	270	493	118	181	269
Signalized	617	220	88	337	55	79	58
Unsignalized	714	336	182	156	63	102	211
Signalized superstreets							
Erwin/Europa	226	72	33	150	16	9	18
Leland corridor	140	47	30	56	17	12	25
Carolina Beach	251	101	25	131	22	58	15
Unsignalized superstreets							
Mt. Pisgah	83	35	21	18	5	21	18
Ocean Isle Beach	84	29	8	39	2	17	18
Red Bank/Old Balsam corridor	169	92	32	33	18	31	55
Barkers Creek	31	16	6	6	4	3	12
Dicks Creek	24	11	4	1	4	5	10
Elmore	20	12	9	2	0	1	8
Blacksmith	19	15	10	4	0	0	5
Haw Branch	42	14	14	1	2	5	20
Camp Easter/Aiken	39	15	6	7	8	5	13
Peanut Plant	48	32	35	1	2	1	9
2nd Street	84	28	15	40	16	7	6
School Road	44	25	12	3	1	5	23
Grays Creek Church	27	12	10	1	1	1	14

Table 3.5. Total Before and After Collisions for Treatment Sites and Comparison Sites

Treatment site	Time Period (months)		Treatment Sites		Comparison Sites	
	Before	After	Before	After	Before	After
Signalized sites						
Erwin/Europa	90	18	180	46	393	49
Leland corridor	59	34	42	98	754	410
Carolina Beach	60	11	218	33	224	38
Unsignalized sites						
Mt. Pisgah	59	10	76	7	139	17
Ocean Isle Beach	59	11	76	8	42	6
Red Bank/Old Balsam corridor	96	115	87	82	222	392
Barkers Creek	58	8	28	3	83	5
Dicks Creek	58	8	21	3	52	5
Elmore	58	13	18	2	62	11
Blacksmith	59	32	14	5	6	8
Haw Branch	59	21	36	6	44	15
Camp Easter/Aiken	59	41	24	15	22	24
Peanut Plant	58	36	38	10	23	26
2nd Street	59	34	60	24	208	118
School Road	60	13	34	10	37	5
Grays Creek Church	60	13	26	1	42	16

The team performed the naïve studies with the duration factor, r_d, and traffic flow adjustment factor, r_{tf}. The duration factor used the ratio of before and after time periods to adjust for different durations before and after superstreet installation. The traffic flow adjustment factor used the ratio of HSM rural unsignalized intersection SPFs for the before and after periods. The team used the ratio of SPFs instead of a simple AADT proportionality for r_{tf} because the HSM SPFs are more robust functions that take more into account than the simple AADT proportionality. Due to time and resource constraints, the team was only able to conduct a calibration study on unsignalized sites. Therefore, signalized intersections used the unsignalized SPF for consistency.

The SPFs used AADTs taken from NCDOT traffic volume maps. A weighted average of AADTs was used in the before period and after period where possible, and where impossible, linear regression was used to estimate before or after volumes because it generally fit most trends. The superstreets in Leland were not included in the naïve study because huge development in that area occurred along with the implementation of the superstreets. It is not a fair study to analyze the Leland superstreets without taking into account the change in traffic patterns that affected the safety of the sites. Equations 3.4 and 3.5 show the r_d and r_{tf} calculations, respectively. Table 3.6 shows the naïve method results for each superstreet by total collisions, and Table 3.7 shows the results by collision type. A negative value in the table indicates a reduction in the number of collisions, and a positive value indicates an increase in the number of collisions.

Equation 3.4 $$r_d = \frac{\text{duration of after period}}{\text{duration of before period}}$$

Equation 3.5 $$r_{tf} = \frac{f(\text{average traffic flows for the after period})}{f(\text{average traffic flows for the before period})}$$

Table 3.6. Naïve Method Results for Individual Superstreets – Total Collisions

Superstreet	Impact (%)	St. dev. (%)
Signalized superstreets		
US-15/501 and Erwin Rd/Europa Dr	25.2	25.7
US-421 and SR-2501	-26.1*	21.0
Unsignalized superstreets		
US-17 and Mt Pisgah Rd/SR-1130	-54.6*	19.5
US-17 and Ocean Isle Beach Rd/SR-1184	-55.7*	18.3
US-74 and Red Bank Rd/Old Balsam Rd corridor	-31.7*	18.1
US-74/441 and Barkers Creek Rd/SR-1392	-32.6	40.3
US-74/441 and Dicks Creek Rd/SR-1388	-11.9	52.7
US-74 and Elmore Rd/SR-1321	-53.1*	33.1
US-74/76 and Blacksmith Rd/SR-1800	-31.9	33.7
NC-24 and Haw Branch Rd/SR-1230	-61.0*	17.3
US-1 and Camp Easter Rd/SR-1853	-22.7	26.3
NC-87 and Peanut Plant Rd/SR-1150	-49.4*	18.6
NC-87/24 and 2nd St	-35.4*	17.1
NC-87 and School Rd/Butler Nursery Rd	7.6	39.8
NC-87 and Grays Creek Church Rd/Alderman Rd	-84.2*	15.4

* Denotes a significant difference of at least one standard deviation from zero.

Table 3.7. Naïve Method Results

Collision type	All		Signalized		Unsignalized	
	Impact %	St. dev %	Impact %	St. dev %	Impact %	St. dev %
Total	-26.2*	8.5	-1.0	18.1	-34.3*	9.2
Fatal and injury	-53.4*	7.7	-35.0*	17.8	-57.6*	8.1
Angle and right-turns	-69.8*	6.7	102.5*	61.3	-86.4*	4.3
Rear-end	7.1	15.7	-10.0	18.6	22.2	25.0
Sideswipe	14.8	27.6	9.4	46.0	13.9	31.9
Left-turns	-74.8*	7.4	-77.2*	13.5	-74.7*	8.3
Other	14.6	20.7	80.2*	70.3	8.7	20.9

* Denotes a significant difference of at least one standard deviation from zero.

The results from the naïve method for individual superstreets infer that most implementations were successful in reducing crashes. The signalized superstreet at US-421 showed a small reduction in collisions while the US-15/501 signalized superstreet showed an increase in collisions but was statistically insignificant. Eight of the 13 unsignalized superstreets significantly reduced total collisions, while the other five were statistically insignificant (four showed a reduction in collisions).

The results from the naïve method by collision type show that superstreets reduce most types of crashes. Superstreets reduced total crashes by 26 percent, fatal and injury crashes by 53 percent, and angle and right turn crashes by 70 percent. The increase in rear-end, sideswipe, and other crashes can be explained by the addition of more signals and additional vehicle maneuvers made from the side street to the median U-turn opening; even so, the predicted increases in these categories were not statistically significant. The results also show that unsignalized superstreets reduced total crashes by 34 percent, fatal and injury crashes by 58 percent, and turning crashes by approximately 80 percent (75 percent for left turns and 86 percent for angle and right turns). The naïve method shows that signalized superstreets reduce fatal and injury crashes by 35 percent and left-turning crashes by 77 percent. However, the results also indicate that signalized superstreets increased angle and right turn crashes by just over 100 percent. As noted earlier, findings from naïve analyses should be used with caution. For our purposes, the team used these findings to spot possible trends, and to help explain the findings of the C-G or EB methods which account for more variability in the data.

3.3.2 C-G Analysis

Prior to conducting C-G studies, the team calculated sample odds ratios from total collisions by individual sites, the set of all signalized sites, and the set of all unsignalized sites, to determine if the comparison sites tracked well with the superstreets. If the mean of the odds ratio was within one standard deviation of one, the collisions were assumed to track well and the comparison sites were used in the C-G study. Equation 3.6 shows the odds ratio formula. The odds ratio can only be calculated from whole years of data (i.e. partial years are not acceptable).

Equation 3.6 $$o = (K*N)/(L*M)/(1+1/L+1/M)$$

Where:

o = odds ratio for year n,
K = superstreet collisions in year n-1,
L = superstreet collisions in year n,
M = sum of comparison site collisions in year n-1, and
N = sum of comparison site collisions in year n.

The following shows an example calculation of the odds ratio for US-74/441 and Barkers Creek Road/Wilmont Road and its comparison sites. Table 3.8 shows the input data and Table 3.9 shows the calculation steps.

Table 3.8. Odds Ratio Example – Input Data

	Superstreet	Sum of Comparison Sites
2003 collision data	9	18
2004 collision data	5	11
2005 collision data	7	21
2006 collision data	3	12

Table 3.9. Odds Ratio Example - Calculation

	Odds Ratio (o)		
	Formula	**Calculation**	**Answer**
2003-2004	=(K*N)/(L*M)/(1+1/L+1/M)	=(9*11)/(18*5)/(1+1/18+1/5)	0.876
2004-2005	=(K*N)/(L*M)/(1+1/L+1/M)	=(5*21)/(11*7)/(1+1/11+1/7	1.105
2005-2006	=(K*N)/(L*M)/(1+1/L+1/M)	=(7*12)/(21*3)/(1+1/21+1/3)	0.966
Mean (m)	$=(o_{03\text{-}04}+o_{04\text{-}05}+o_{05\text{-}06})/n$	=(0.876+1.105+0.966)/3	0.982
Variance (v)	$=((o_{03\text{-}04}-m)^2+(o_{04\text{-}05}-m)^2+(o_{05\text{-}06}-m)^2)/(n-1)$	$=((0.876-0.982)^2+(1.105-0.982)^2+(0.966-0.982)^2)/2$	0.013
Standard deviation (s)	$=(v/n)^{0.5}$	$=(0.013/3)^{0.5}$	0.067
Within 1 standard deviation of 1.0?	Is m-s ≤ 1.0 ≤ m+s ?	Is 0.982-0.067≤1.0≤ 0.982+0.067 ?	Yes

The team performed the odds ratio test for the set of signalized and unsignalized sites by bringing all of the construction start dates to time zero. This enabled all sites to be analyzed in one group even though the before periods varied greatly. This was possible because there were no changes in reporting thresholds that would have caused significant problems during the analysis. All sites had successful odds ratios except for NC-87 and Grays Creek Church Road/Alderman Road in Cumberland County. The team used the comparison sites in the C-G analysis for that site anyway because the mean plus the standard deviation equals 0.952 which the team assumed to be close enough. Also, the unavailability of four-legged, unsignalized, conventional intersections on divided major roadways near this superstreet made the analysis difficult. In the unsignalized analysis, the team did not include collisions before 1996 to account for collision recording changes that occurred in 1995. Table 3.10 shows the odds ratios for the signalized set, the unsignalized set, and individual superstreets.

Table 3.10. Odds Ratio Results

Superstreet	Average m(o)	Std. dev. s(o)	Within 1 std. dev.of 1.0?
Signalized sites	0.937	0.173	Yes
Unsignalized sites	1.013	0.151	Yes
US-15/501 and Erwin Rd/Europa Dr	0.919	0.113	Yes
US-17 Leland corridor	0.847	0.473	Yes
US-421 and SR-2501	1.108	0.302	Yes
US-17 and Mt Pisgah Rd/SR-1130	0.923	0.393	Yes
US-17 and Ocean Isle Beach Rd/SR-1184	0.883	0.162	Yes
US-74 and Red Bank Rd/Old Balsam Rd corridor	1.235	0.354	Yes
US-74/441 and Barkers Creek Rd/SR-1392	0.982	0.067	Yes
US-74/441 and Dicks Creek Rd/SR-1388	0.844	0.333	Yes
US-74 and Elmore Rd/SR-1321	0.936	0.341	Yes
US-74/76 and Blacksmith Rd/SR-1800	0.728	0.372	Yes
NC-24 and Haw Branch Rd/SR-1230	0.792	0.395	Yes
US-1 and Camp Easter Rd/SR-1853	1.349	1.144	Yes
NC-87 and Peanut Plant Rd/SR-1150	1.147	0.577	Yes
NC-87/24 and 2nd St	1.042	0.143	Yes
NC-87 and School Rd/Butler Nursery Rd	0.875	0.186	Yes
NC-87 and Grays Creek Church Rd/Alderman Rd	0.760	0.192	No

Figure 3.1 shows a plot of the total before collisions for US-74/441 and Barkers Creek Road/Wilmont Road and its comparison sites as an example to show if the collisions in both groups had similar trends. Figure 3.2 shows the total crashes for the signalized set of superstreets and their comparison sites in the before period using one start date. Similar to Figure 3.2, Figure 3.3 shows the crashes for the unsignalized set.

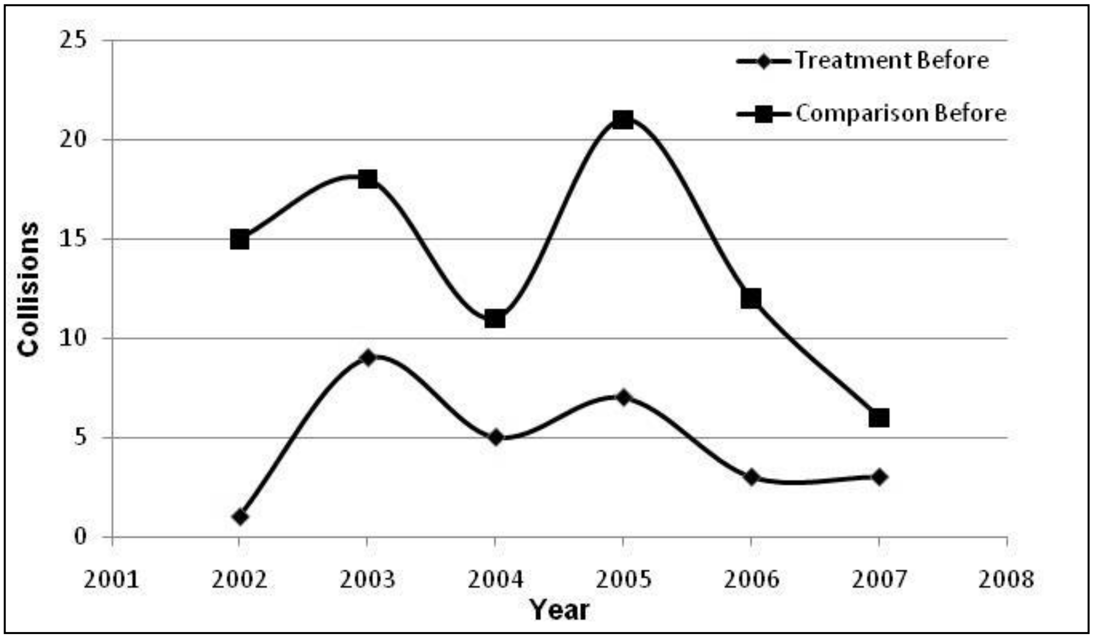


Figure 3.1. US-74/441 and Barkers Creek Road/Wilmont Road Collisions in the Before Period

Figure 3.2. Signalized Superstreet and Comparison Site Collisions in the Before Period

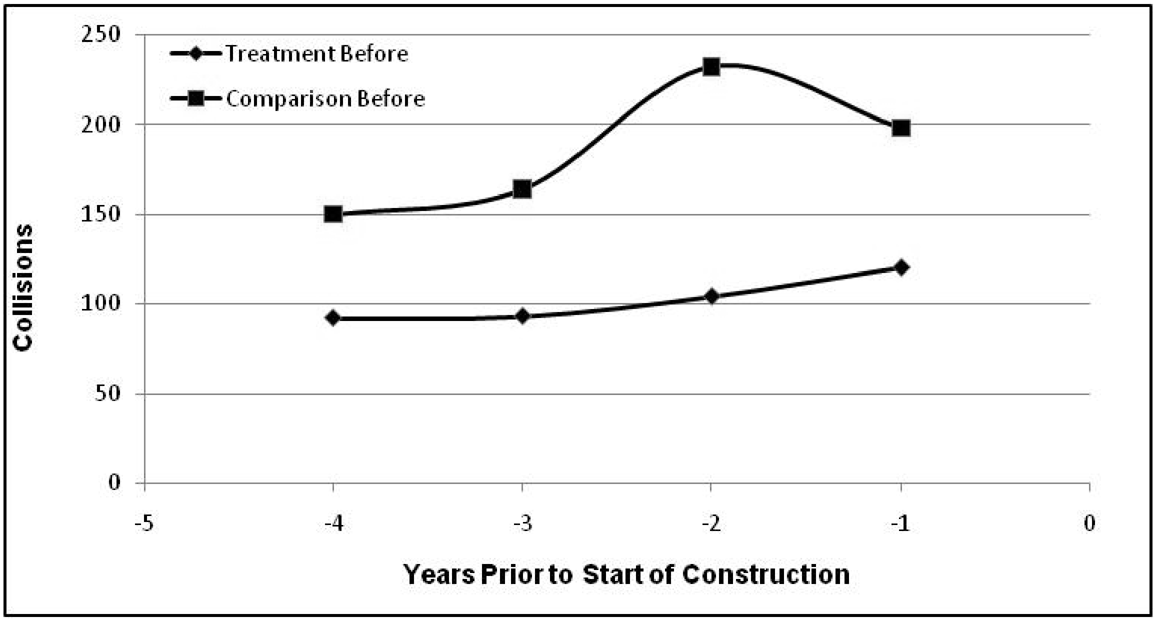


Figure 3.3. Unsignalized Superstreet and Comparison Site Collisions in the Before Period

The team conducted C-G studies on individual superstreets, the signalized set of superstreets, and the unsignalized set of superstreets. Conventional Hauer symbology and methodology were used in the evaluation (50). The following is an example of a C-G analysis using total collisions from US-74/441 and Barkers Creek Road/Wilmont Road and its comparison sites. The input data are as follows: K=28, L=3, M=83, N=5, Variance(o)=0.013. Table 3.11 shows the calculations.

Table 3.11. C-G Method Example – Total Collisions

Step	Formula	Calculation	Answer
λ	=L	=3	3
r_c	=(N/M)/(1+1/M)	=(5/83)/(1+1/83)	0.06
π	$=r_c$*K	=0.06*28	1.67
Variance(λ)	=L	=3	3
Variance(ω)	=Variance(o)-(1/K+1/L+1/M+ 1/N)>0, 0 otherwise	=0.013-(1/28+1/3+1/83+ 1/5)>0, 0 otherwise	0
Variance(r_t)/r_t^2	=1/M+1/N+Variance(ω)	=1/83+1/5+0	0.212
Variance(π)	$=\pi^2$(1/K+ Variance(r_t)/r_t^2)	$=1.67^2$(1/28+0.212)	0.69
δ	$=\pi-\lambda$	=1.67-3	-1.3
θ	$=(\lambda/\pi)/(1+\text{Variance}(\pi)/\pi^2)$	$=(3/1.67)/(1+0.69/1.67^2)$	1.44
Variance(δ)	=Variance(π)+Variance(λ)	=0.69+3	3.69
Variance(θ)	$=\theta^2(\text{Variance}(\lambda)/\lambda^2+\text{Variance}(\pi)/\pi^2)$ $/(1+\text{Variance}(\pi)/\pi^2)^2$	$=1.44^2(3/3^2+0.69/1.67^2)/$ $(1+0.69/1.67^2)^2$	0.78
Standard deviation(δ)	$=\text{Variance}(\delta)^{0.5}$	$=3.69^{0.5}$	1.92
Standard deviation(θ)	$=\text{Variance}(\theta)^{0.5}$	$=0.78^{0.5}$	0.88

Where:

λ = Actual number of after period crashes,

r_c = Ratio of expected number of after collisions to the expected number of before collisions on the comparison group (comparison ratio),

π = Predicted number of after period crashes had the treatment not been in place,

δ = Reduction in the expected frequency of collisions in the after period, and

θ = Ratio of what safety was with the treatment to what it would have been without the treatment (Index of effectiveness).

Table 3.12 shows the C-G results for the individual superstreets. Due to sample size, individual superstreets were only analyzed for total collisions. Note that a negative impact value indicates a reduction in collisions.

Table 3.12. C-G Method Results for Individual Superstreets – Total Collisions

Superstreet	Impact (%)	St. dev. (%)
Signalized superstreets		
US-15/501 and Erwin Rd/Europa Dr	94.7*	51.2
US-17 Leland corridor	158.8*	127.6
US-421 and SR-2501	-27.9	30.3
Unsignalized superstreets		
US-17 and Mt Pisgah Rd/SR-1130	-42.6*	29.6
US-17 and Ocean Isle Beach Rd/SR-1184	-10.7	45.9
US-74 and Red Bank Rd/Old Balsam Rd corridor	-71.3*	14.4
US-74/441 and Barkers Creek Rd/SR-1392	44.3	88.1
US-74/441 and Dicks Creek Rd/SR-1388	19.5	73.1
US-74 and Elmore Rd/SR-1321	-47.2*	37.1
US-74/76 and Blacksmith Rd/SR-1800	-77.1*	12.6
NC-24 and Haw Branch Rd/SR-1230	-68.7*	16.5
US-1 and Camp Easter Rd/SR-1853	-87.7*	5.0
NC-87 and Peanut Plant Rd/SR-1150	-87.2*	6.7
NC-87/24 and 2nd St	-31.2*	17.9
NC-87 and School Rd/Butler Nursery Rd	77.9	84.5
NC-87 and Grays Creek Church Rd/Alderman Rd	-90.8*	8.7

* Denotes a significant difference of at least one standard deviation from zero.

The results from the individual superstreets show that unsignalized superstreet installations were successful. Ten superstreets showed a reduction in collisions with nine of those being statistically significant. Of those ten, six superstreets had a reduction in collisions of 65 percent or greater. Three unsignalized sites showed a decrease in safety, but those sites were also not statistically different from zero. The signalized sites did not appear as successful; however, the signalized superstreet analysis is limited because each site has issues. US-15/501 and Erwin Road/Europa Drive is affected by spillback from the downstream conventional intersection and the design does not allow major left turns, the US-17 superstreet was built with a large development which affected the before/after study results, and the US-421 site has flashing yellow arrows for major left turns and U-turns, a characteristic unique to that signalized superstreet.

The team analyzed the signalized and unsignalized set of superstreets using different collision types: total, fatal and injury, angle and right turns, rear-end, sideswipes, left turns, and other. Right turn collisions were included with angles because most crashes reported as right turns could also be categorized as angle crashes. Left turn collisions could be reported as 'Left Turn, Same Roadway' or 'Left Turn, Different Roadways', and were combined together in one category because the collision types were indistinguishable in the collision reports. The team separated left turn collisions from angle and right turn collisions because there was a distinguishable difference between the two categories in the collision reports. Table 3.13 shows the C-G results for the signalized and unsignalized set of superstreets. Note that a negative impact value indicates a reduction in collisions.

Table 3.13. C-G Method Results for Signalized and Unsignalized Superstreets

Collision Type	Signalized Set		Unsignalized Set	
	Impact (%)	**Std. dev. (%)**	**Impact (%)**	**Std. dev. (%)**
Total	110.9*	35.1	-46.2*	8.0
Fatal and injury	108.5*	47.1	-62.7*	6.9
Angles and right turns	266.1*	114.9	-74.5*	7.8
Rear ends	192.6*	54.8	-0.6	24.2
Sideswipes	48.2	54.1	-13.3	29.6
Left turns	-56.1*	20.3	-59.4*	12.4
Other	59.0*	53.3	-14.6	18.2

* Denotes a significant difference of at least one standard deviation from zero.

The results show that unsignalized superstreets reduced collisions in every category. Total collisions were reduced by 46 percent and fatal and injury collisions by 63 percent. Angle and right turn collisions were reduced the most at 75 percent. The results also indicate that signalized superstreets generally increased collisions. Total collisions increased by approximately 111 percent and fatal and injury collisions by 109 percent. However, the signalized sites had study issues that limited the usefulness of their analysis as noted above.

3.3.3 EB Method

The team analyzed unsignalized superstreets using the EB method to account for RTM because these sites were primarily installed for safety reasons. The EB method can be applied to the naïve and C-G analyses (known hereafter as "EB naïve" and "EB C-G"). The team followed the EB naïve method as described in Chapter 9 of the HSM (51), and the EB C-G method as described by Hauer (50). Each analysis type and the results are discussed below.

3.3.3.1 EB Naïve

Chapter 9 of the HSM provides a 14-step approach to the EB naïve method (51). The necessary input data include duration of the before and after periods, number of before and after collisions, and major and minor traffic volumes. The SPF also uses an overdispersion parameter (given by the model), appropriate AMFs, and a calibration factor that the team calculated previously. The steps have been repeated below:

1. Calculate the predicted crash frequency, $N_{pre\text{-}B}$, for each site in the before period using SPFs and AMFs.

2. Calculate the expected crash frequency, N_{exp-B}, for each site in the before period using N_{pre-B} and a weighting factor, w. The weighting factor is a function of the SPF overdispersion parameter and N_{pre-B} that combines the two into a weighted average.
3. Calculate the predicted crash frequency, N_{pre-A}, for each site in the after period.
4. Calculate the adjustment factor, r, at each site to account for differences between the before and after periods in duration and traffic volume.
5. Calculate the expected crash frequency, N_{exp-A}, for each site in the after period as if the treatment had not been in place. N_{exp-A} is a function of N_{exp-B} and r.
6. Calculate an odds ratio at each site. The odds ratio is an estimate of the safety effectiveness of the superstreet and is a function of the observed after period collisions and N_{exp-A}.
7. Calculate the safety effectiveness as a percentage crash change at each site. This is a function of the odds ratio.
8. Calculate the overall effectiveness of the superstreet, in the form of an odds ratio, for all sites combined.
9. Calculate a factor to adjust the odds ratio from Step 8 because it may be potentially biased. The factor is in terms of the variance of N_{exp-A}.
10. Calculate the unbiased safety effectiveness, θ, as a percentage change in crash frequency across all sites.
11. Calculate the variance of the odds ratio from Step 8.
12. Calculate the standard deviation of the odds ratio from Step 8.
13. Calculate the standard deviation of θ from Step 10.
14. Assess the statistical significance of θ to determine if it is significant or not significant at least one standard deviation from zero.

The team used these steps to analyze unsignalized superstreets. Tables 3.14 and 3.15 show the results for unsignalized superstreets individually and as a whole, respectively. Due to sample size, individual superstreets were only analyzed for total collisions. Note that a negative impact value indicates a reduction in collisions.

Table 3.14. EB Naïve Results for Individual Unsignalized Superstreets

Superstreet	Impact (%)	Std. dev. (%)
US-17 and Mt Pisgah Rd/SR-1130	-50.6*	19.6
US-17 and Ocean Isle Beach Rd/SR-1184	-49.1*	19.0
US-74 and Red Bank Rd/Old Balsam Rd corridor	-22.9	11.9
US-74/441 and Barkers Creek Rd/SR-1392	-25.3	46.0
US-74/441 and Dicks Creek Rd/SR-1388	-7.7	57.8
US-74 and Elmore Rd/SR-1321	-49.3*	38.5
US-74/76 and Blacksmith Rd/SR-1800	-20.8	41.8
NC-24 and Haw Branch Rd/SR-1230	-51.2*	21.7
US-1 and Camp Easter Rd/SR-1853	-4.1	31.7
NC-87 and Peanut Plant Rd/SR-1150	-42.8*	20.4
NC-87/24 and 2nd St	-28.4*	17.3
NC-87 and School Rd/Butler Nursery Rd	35.1	49.0
NC-87 and Grays Creek Church Rd/Alderman Rd	-81.2*	19.5

* Denotes a significant difference of at least one standard deviation from zero.

Table 3.15. EB Naïve Results for Unsignalized Superstreets

Collision type	Impact (%)	Std. dev. (%)
Total	-27.2*	24.5
Fatal and injury	-51.0*	26.0
Angles and right turns	-85.9*	15.4
Rear ends	12.4	71.3
Sideswipes	-11.5	81.5
Left turns	-76.1*	26.4
Other	8.4	62.6

* Denotes a significant difference of at least one standard deviation from zero.

The EB naïve results for the individual unsignalized superstreets showed a collision reduction at all 13 sites, except for one site that was not statistically significant. NC-87 and Grays Creek Church Road/Alderman Road showed the largest crash reduction at 81 percent. Six sites showed reductions in collisions that were statistically significant.

The EB naïve results for unsignalized superstreets as a group indicate that the superstreet significantly reduced total crashes by 27 percent and fatal and injury crashes by over 50 percent. Unsignalized superstreets had a tremendous impact on turning collisions with a reduction of 86 percent on angles and right turn crashes and 76 percent on left turn crashes. Estimated changes in rear end, sideswipe, and other collisions were not statistically significant.

The team observed that the US-74 and Red Bank/Old Balsam corridor had 82 of the 176 total collisions in the after period. Because of this site's potential impact on the group results in Table 3.15, the team conducted the analysis again excluding the site. Table 3.16 shows the comparison between the EB naïve method results with and without the US-74 corridor. The team determined that the US-74 and Red Bank/Old Balsam corridor did not have an overwhelming effect on the EB naïve analysis.

Table 3.16. EB Naïve Results for Total Collisions with and without US-74 and Red Bank/Old Balsam Corridor

	Impact (%)	Std. dev. (%)
With US-74 corridor	-27.2	6.8
Without US-74 corridor	-30.9	27.6

The EB naïve method is described by two sources: the HSM and Ezra Hauer (50, 51). The team chose to use the HSM method because it uses a clear step-by-step approach, it is the later source, and with the HSM's publication, it will likely become the premier source for all safety analyses in the United States. However, the team wanted to compare the results of the HSM EB naïve method with Hauer's EB naïve method to confirm the validity of the results. Table 3.17 shows the comparison between the two methods for total collisions.

Table 3.17. Comparison of EB Naïve Results for Total Collisions between HSM and Hauer Methods

Collision type	HSM		Hauer	
	Impact (%)	Std. dev. (%)	Impact (%)	Std. dev. (%)
Total	-27.2	6.8	-29.1	11.0
Fatal and injury	-51.0	7.2	-53.0	10.0
Angles and right turns	-85.9	4.3	-86.5	4.4
Rear ends	12.4	19.8	12.4	22.2
Sideswipes	-11.5	22.6	-8.1	23.4
Left turns	-76.1	7.3	-77.6	7.5
Other	8.4	17.4	4.8	21.6

Table 3.17 shows that the two methods produce similar results for all collision types. The largest difference between results was 3.4 percent for the other collision category. All collision types had the same effect in regards to a reduction or an increase in collisions. This similarity of results between the two methods indicates that the results are valid.

3.3.3.2 EB C-G

The team used Hauer's multivariate regression method in the EB C-G analysis because it should account for RTM as well as seasonality, historical trends, and other factors that the C-G method attempted to account for. However, the HSM does not include this type of analysis. The multivariate regression method uses an SPF to estimate κ, the expected number of crashes in the before period, to compare with the observed collisions in the before period. The necessary input data included observed collisions for treatment sites and comparison sites in the before and after period and major and minor traffic volumes in the before period for the treatment sites. The SPFs also used appropriate AMFs and a calibration factor. Guided by Hauer (51) the team used the following steps to complete the EB C-G analysis:

1. Calculate r_c, a ratio of collisions for the comparison sites.
2. Calculate κ, the expected number of collisions for the treatment site in the before period. This uses the SPF, appropriate AMFs, and the calibration factor.
3. Calculate the variance of κ. This step involves finding the residual and difference between κ and the observed value, and then fitting a model to those differences. The team chose to use a linear regression to find variance of κ; however, any model that links κ to the difference is appropriate.
4. Calculate α, a weighting factor between zero and one that weights the model prediction with the observed collisions.
5. Calculate E(κ|K), the expected number of crashes when it is given that the site recorded K observed collisions. This takes into account α which specifies how important the model is compared to the observed collisions.
6. Calculate π, the expected number of crashes in the after period had there not been treatment.
7. Calculate δ, the reduction in the expected frequency of collisions
8. Calculate θ, the index of effectiveness.

Tables 3.18 and 3.19 show the results for unsignalized superstreets individually and as a whole, respectively. Due to sample size, individual superstreets were only analyzed for total collisions. Note that a negative impact value indicates a reduction in collisions.

Table 3.18. EB C-G Results for Individual Unsignalized Superstreets

Superstreet	Impact (%)	Std. dev. (%)
US-17 and Mt Pisgah Rd/SR-1130	-68.6*	8.2
US-17 and Ocean Isle Beach Rd/SR-1184	-93.1*	2.0
US-74 and Red Bank Rd/Old Balsam Rd corridor	-94.8*	1.6
US-74/441 and Barkers Creek Rd/SR-1392	13.0	67.7
US-74/441 and Dicks Creek Rd/SR-1388	-13.0	52.8
US-74 and Elmore Rd/SR-1321	-44.6*	38.2
US-74/76 and Blacksmith Rd/SR-1800	-84.8*	8.2
NC-24 and Haw Branch Rd/SR-1230	-97.3*	0.6
US-1 and Camp Easter Rd/SR-1853	-94.9*	1.4
NC-87 and Peanut Plant Rd/SR-1150	-97.4*	0.8
NC-87/24 and 2nd St	-90.4*	3.3
NC-87 and School Rd/Butler Nursery Rd	-87.2*	3.0
NC-87 and Grays Creek Church Rd/Alderman Rd	-98.2*	0.7

* Denotes a significant difference of at least one standard deviation from zero.

Table 3.19. EB C-G Results for Unsignalized Superstreets

Collision type	Impact (%)	Std. dev. (%)
Total	-73.7*	13.2
Fatal and injury	-85.2*	7.2
Angles and right turns	-78.0*	9.3
Rear ends	-16.3	29.1
Sideswipes	-35.9*	24.8
Left turns	-66.5*	12.9
Other	-27.1*	23.0

* Denotes a significant difference of at least one standard deviation from zero.

The results from the EB C-G method show that unsignalized superstreets as a whole reduced all types of collisions. Total, fatal and injury, and turning (angle and right turns and left turns) crashes were all reduced by over 65 percent. A reduction in rear end collisions was the only type that was not statistically significant. The EB C-G analysis for individual unsignalized superstreets showed that all of the superstreets either had a significant reduction in collisions or were not statistically significant. Nine of the 13 superstreets had a reduction in collisions of 85 percent or greater. Only one superstreet showed a small increase in collisions but it was not statistically significant.

As noted above, the US-74 and Red Bank/Old Balsam corridor had 82 of the 176 total treatment collisions in the after period. Because of this site's potential impact on the results, the team conducted the analysis again excluding the site. Table 3.20 shows the comparison between the EB C-G method results with and without the US-74 and Red Bank/Old Balsam corridor. The team determined that the US-74 and Red Bank/Old Balsam corridor did not have an overwhelming effect on the EB C-G analysis.

Table 3.20. EB C-G Results for Total Collisions with and without US-74 and Red Bank/Old Balsam Corridor

	Impact (%)	Std. dev. (%)
With US-74 corridor	-73.7	13.2
Without US-74 corridor	-71.9	14.1

3.3.4 Supplemental Collision Rate Analysis

The team used the Highway Safety Manual (HSM) collision prediction model to calculate expected collisions for signalized and unsignalized superstreets that did not have comparable before and after periods. This analysis provided collision predictions for the superstreets as if they were conventional one-way stop-controlled intersections. The superstreets selected for this analysis are along US-1, US-17, and US-601 in North Carolina. The US-601 superstreets in Monroe County were implemented in conjunction with a two- to four-lane conversion. The US-1 sites in Moore and Lee Counties were newly constructed sites and had no before period. The Lanvale Road and Brunswick Forest Parkway superstreet intersections on US-17 in Brunswick County were implemented in conjunction with signalization. Finally, the Sidbury Road and Scotts Hill Loop Road superstreet intersections on US-17 in Pender County were constructed in conjunction with a three- to four-lane conversion. Although the HSM does have a signalized intersection prediction model, the team used the unsignalized intersection prediction model on the signalized as well as the unsignalized sites due to time and cost constraints. To use the signalized intersection prediction model, the team would have had to calibrate the signalized HSM model as well. Table 3.21 shows the HSM collision prediction model results by severity level. Note that a negative difference indicates fewer collisions occurred in the after period than what the model predicted would have occurred if a conventional stop-controlled intersection was in place.

Table 3.21. Collision Rate Comparison by Severity Level (crashes/year)

Main road	Cross street	County	Total			Fatal & injury		
			Observed	Predicted	Diff. (%)	Observed	Predicted	Diff. (%)
Signalized superstreets								
US-17	Lanvale Rd	Brunswick	6.00	15.66	-9.66 (-161%)	4.80	7.07	-2.27 (-47%)
US-17	Brunswick Forest Pkwy	Brunswick	6.00	9.96	-3.96 (-66%)	1.20	4.21	-3.01 (-251%)
US-17	Sidbury Rd	Pender	20.90	16.49	4.41 (21%)	5.81	7.54	-1.73 (-30%)
US-17	Scotts Hill Loop Rd	Pender	15.10	15.34	-0.24 (-2%)	5.81	6.93	-1.12 (-19%)
Unsignalized superstreets								
US-1	Cranes Creek Rd (SR-1825)	Moore	2.00	1.74	0.26 (13%)	0.67	0.76	-0.09 (-13%)
US-1	Cedar Lane Rd (SR-1182)	Lee	1.67	1.79	-0.12 (-7%)	0.00	0.93	-0.93 (N/A)
US-601	Marion Lee Rd (SR-2105)	Union	0.00	1.05	-1.05 (N/A)	0.00	0.44	-0.44 (N/A)
US-601	Eudy Rd (SR-2204)	Union	0.00	1.10	-1.10 (N/A)	0.00	0.47	-0.47 (N/A)
US-601	Carl Funderburk (SR-1950)	Union	0.00	0.87	-0.87 (N/A)	0.00	0.33	-0.33 (N/A)
US-601	Griffin Cemetery Rd (SR-1971)	Union	2.00	1.42	0.58 (29%)	0.00	0.59	-0.59 (N/A)
US-601	Hargette Rd (SR-1939)	Union	0.00	1.27	-1.27 (N/A)	0.00	0.52	-0.52 (N/A)
US-601	Ervin Thomas Rd (SR-2112)	Union	0.00	2.18	-2.18 (N/A)	0.00	2.57	-2.57 (N/A)
US-601	Landsford Rd (SR-1005)	Union	4.00	1.99	2.01 (50%)	2.00	0.88	1.12 (56%)

The HSM collision prediction model results show that most superstreets performed well. Nine of 13 superstreets had fewer total crashes than the model predicted. This means that if the intersection had been conventional, then these sites would likely have had more collisions. Twelve of the 13 superstreet sites performed better than conventional model predictions for fatal and injury crashes as well.

3.3.5 Supplemental Time-of-Day and Mile Post Analysis

The team analyzed three signalized superstreets using a time-of-day and mile post analysis because each roadway is operating uniquely. The three signalized superstreets are US-15/501 and Erwin Road/Europa Drive, US-17 and the Leland corridor, and US-17 and Lanvale Road.

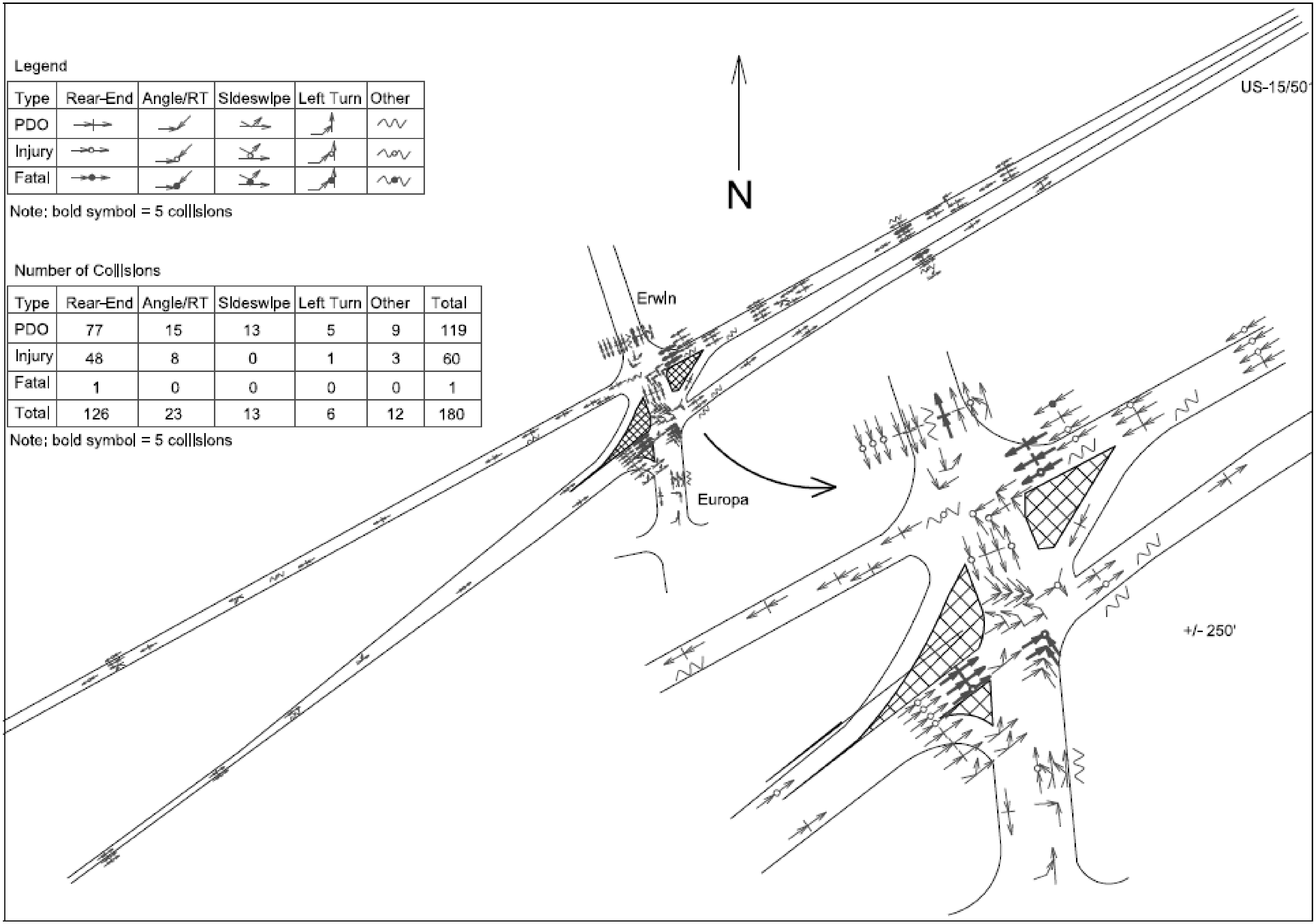
3.3.5.1 US-15/501 and Erwin Road/Europa Drive

The team created a collision diagram of the superstreet at US-15/501 in Chapel Hill because it was the first implementation of a signalized superstreet and some people perceive the site to have safety problems. This superstreet is also the only signalized design in North Carolina that does not allow direct left turns from the major roadway. Major left turns are instead directed through downstream directional crossovers. The team was concerned that this type of design would have a negative safety impact because of the longer driving distances, higher U-turning volumes, and possible driver confusion. Figures 3.4 and 3.5 show the collision diagrams for the before and after cases, respectively. As expected, the large majority of collisions in the before period were near the intersection. With the superstreet in the after period, the collisions are spread out and no longer centrally located. However, the team did notice an unusually high number of collisions in the after period near the ***north crossover*** involving northbound vehicles: 15 crashes in the before period and ten in the after period. With 90 months making up the before period, and only 18 months in the after period, this over involvement in the after period led to further analysis. The team went over the collision reports for all ten northbound crashes near the north crossover in the after period; the following is a summary of our findings:

- Eight collisions were rear ends and two were sideswipes,
- The two sideswipe collisions were an attempt by the driver to reduce impact (so were essentially rear end collisions as well),
- Seven collisions explicitly say in the collision report that the first vehicle was stopped due to traffic ahead, and
- Eighty percent of collisions occurred during a lunch or PM peak hour.

The team concluded that these ten collisions were not the result of the superstreet at US-15/501 and Erwin Road/Europa Drive, but rather a failure of the conventional downstream intersection at US-15/501 and Sage Road/Old Durham Road to process its demand. The team recommends that the downstream intersection be analyzed for superstreet conversion because the progression benefits of a superstreet corridor would likely prevent the spillover that currently exists.

The team also conducted a second C-G analysis without crossover collisions on the northbound or southbound side. These included northbound collisions between the intersection and the northern crossover and southbound collisions between the intersection and the southern crossover. The results showed an increase of 28.5 percent of total crashes in the after period with a standard deviation of 40.2 percent. Although this analysis still showed an increase in collisions, the predicted increase was less than the C-G analysis showed earlier.

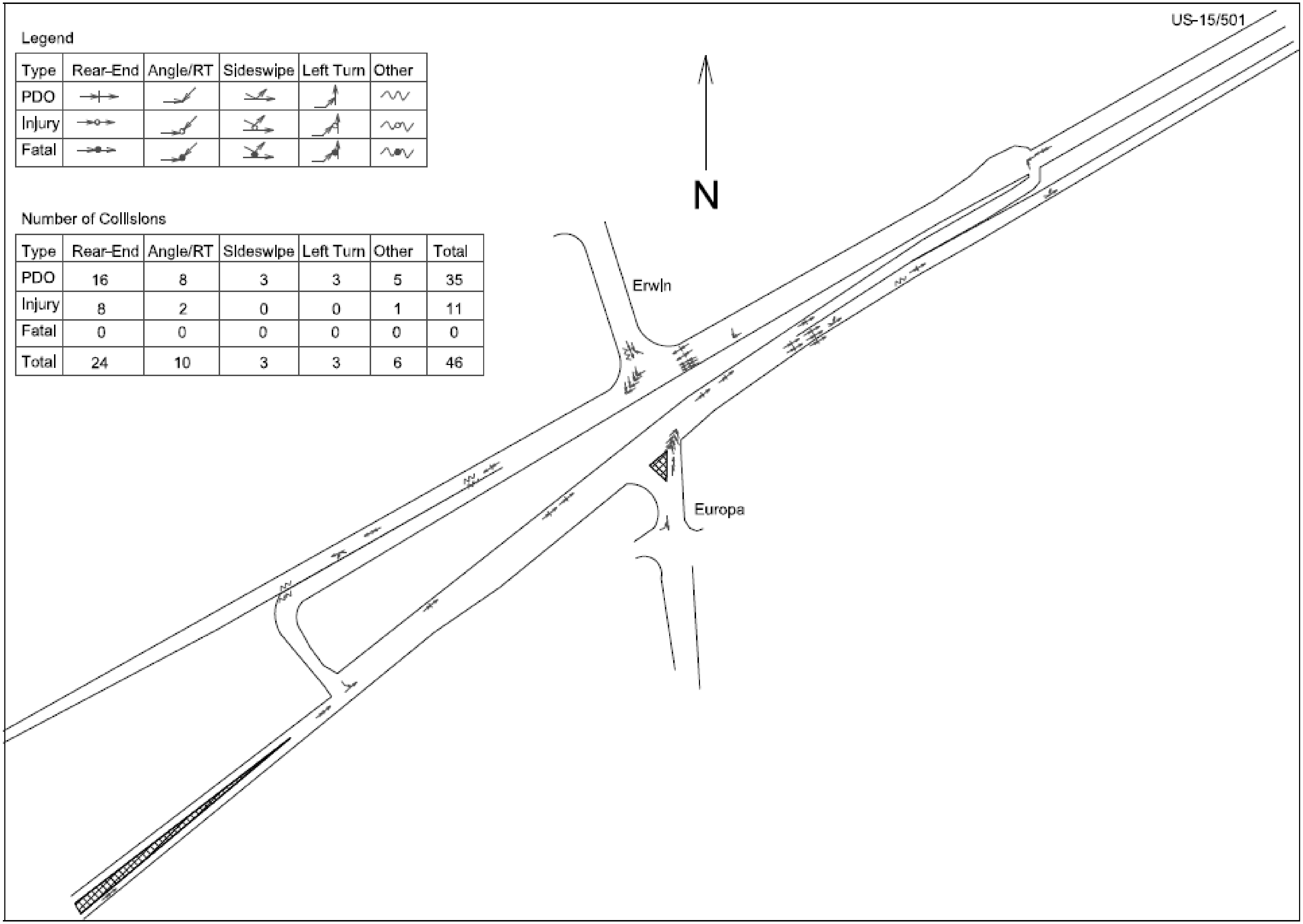


Number of Collisions

Type	Rear-End	Angle/RT	Sideswipe	Left Turn	Other	Total
PDO	77	15	13	5	9	119
Injury	48	8	0	1	3	60
Fatal	1	0	0	0	0	1
Total	126	23	13	6	12	180

Note: bold symbol = 5 collisions

Figure 3.4. US-15/501 and Erwin Road/Europa Drive Before Period Collision Diagram



Number of Collisions

Type	Rear-End	Angle/RT	Sideswipe	Left Turn	Other	Total
PDO	16	8	3	3	5	35
Injury	8	2	0	0	1	11
Fatal	0	0	0	0	0	0
Total	24	10	3	3	6	46

Figure 3.5. US-15/501 and Erwin Road/Europa Drive After Period Collision Diagram

3.3.5.2 US-17 and the Leland Corridor

The team conducted a time-of-day and mile post analysis on the Leland corridor because the superstreets were implemented in conjunction with a large development, and the type of traffic control changed from the before to the after period. The development influenced both traffic volumes and collision data which prevented a fair before and after evaluation with a C-G method. The team analyzed data from the collision reports for both before and after crashes. The following is a summary of the findings:

- Before scenario
  - 42 collisions in 59 months
  - 36 percent of crashes were turning related (e.g. left turn or angle)
  - 17 percent of crashes were rear end related
- After scenario
  - 98 collisions in 34 months
  - 35 percent of crashes were turning related
  - 52 percent of crashes were rear end related

The installation of signals and the large development severely impacted the safety of the corridor. Therefore, the team was unable to determine the impact the superstreet installation itself had on safety in the corridor.

3.3.5.3 US-17 and Lanvale Road

Again, the team conducted a time-of-day and mile post analysis on the Lanvale Road superstreet because the type of traffic control changed from stop signs in the before to signals in the after period. The team analyzed data from the collision reports for both before and after crashes. The team concluded that the superstreet is functioning well because of the very small number of crashes. Also, four of the five collisions were rear end related which is generally an indicator of a signalized intersection and not necessarily indicative of a superstreet. The following is a summary of the findings:

- Before scenario
  - 36 collisions in 59 months
  - 36 percent of collisions were turning related
  - 28 percent of collisions were rear end related
- After scenario
  - 5 collisions in 10 months
  - 80 percent of collisions were rear end related
  - 20 percent were turning related

3.3.6 Supplemental SSAM Analysis

SSAM is a microsimulation tool that counts the frequency of conflicts within a model run. Conflicts occur when different road users will likely collide without evasive action. SSAM counts four types of conflicts—rear end, lane-change, crossing, and unclassified—based on the angle between the two vehicles involved. A SSAM niche is that it can be applied to designs that have not been built because it does not require the collection or assessment of police-reported crashes. Although not in the project proposal, the team used SSAM to analyze the three signalized superstreets that were previously calibrated and validated for travel time studies in VISSIM as described in Chapter 2. These superstreets are located at US-15/501 and Erwin Road/Europa Drive, US-17 and the Leland corridor, and US-421 and SR-2501. The team also applied SSAM to the superstreets' conventional counterparts as described in Chapter 2 (conventional signalized intersections that had comparable numbers of lanes to the superstreets).

Applying SSAM to the previously calibrated and validated superstreet VISSIM models was more difficult than the team initially expected. The difficulty was in the way the team coded the VISSIM models. A strong benefit of VISSIM is that it can be coded to produce an unlimited number of design solutions; however, with that freedom, there exist an unlimited number of options for coding. The way the team coded the models was to produce travel time results, but it did not realistically depict the safety of the superstreet because of the location and number of links and connectors. For readers unfamiliar with VISSIM, links are the lanes and roadways that contain vehicles and connectors are short pieces to connect links. From the team's experience with the difficult VISSIM to SSAM crossover, the team recommends that VISSIM models should be coded with any future applications in mind so that driver behavior and crash opportunity are both more realistic.

The team analyzed each of the three sites using a range of volumes for both the conventional and superstreet geometries. The team completed ten runs in VISSIM and then input the files in SSAM to evaluate the number of conflicts. Because of the coding difficulties discussed earlier, the team chose only to evaluate the total number of conflicts and not the types of conflicts because how the team coded the VISSIM models will directly affect the type of conflicts produced. The team hoped that the relative number of conflicts would be illustrative when comparing different designs (superstreet or conventional). The total number of conflicts included all conflicts with a time to collision (TTC) less than or equal to 1.5 seconds, the standard measure for SSAM, and within 500 feet beyond the directional crossovers on the major roadway and 150 feet beyond the intersection on the minor roadway (the distances the team used for collision data collection). The corridor of signalized superstreets at US-17 in Leland was not analyzed for peak plus 40 percent volume because the conventional geometries had significant operational break down at that volume level. Table 3.22 shows the results from SSAM, as well as a ratio of conflicts to compare geometries at each site. Table 3.23 shows the comparison of actual collisions per month in the after period to SSAM conflicts for the peak volume.

Table 3.22. Total Number of Conflicts per Site from SSAM

Site \ Volume Level	Peak -40%	Peak -20%	Peak -10%	Peak	Peak +10%	Peak +20%	Peak +40%
US-15/501 Conventional	366	1272	1014	1092	1832	1818	3031
US-15/501 Superstreet	422	806	1085	1405	2244	2461	5359
Ratio of Superstreet to Conventional	1.15	0.63	1.07	1.29	1.22	1.35	1.77
US-17 Conventional	2307	3947	4371	5459	6907	9262	-
US-17 Superstreet	1776	3500	4229	5280	5549	6581	-
Ratio of Superstreet to Conventional	0.77	0.89	0.97	0.97	0.80	0.71	-
US-421 Conventional	564	1180	1608	1017	1504	1796	3438
US-421 Superstreet	248	652	743	1473	1163	1416	3382
Ratio of Superstreet to Conventional	0.44	0.55	0.46	1.45	0.77	0.79	0.98

Table 3.23. Comparison of After Collisions to SSAM Conflicts

Site	After Period Collisions per Month	SSAM Conflicts at Peak Volume
US-15/501	2.56	1405
US-17	2.88	5280
US-421	3.00	1473

The results from SSAM show that the superstreet implementation was successful in reducing conflicts at US-17 for all volumes and US-421 for most volumes. The US-17 superstreet showed a bigger reduction in conflicts as the volumes increased from the peak period which may be promising for the superstreet as traffic growth occurs. The US-15/501 superstreet did not perform as well with an increase in conflicts compared to the conventional design at most volumes. In general, the results are not consistent with other analyses of signalized superstreets. As discussed previously with the link/connector assignments, the VISSIM models were not designed specifically for SSAM, and the team would change the models if time and cost permitted; therefore, analysts should use these results with caution.

4.0 RESIDENT, COMMUTER, AND BUSINESS SURVEYS

Some operational and safety elements of superstreets have been evaluated; however, no information has been gathered on the perceived effects of superstreets on local drivers, commuters, and adjacent businesses. The purpose of this section of the report is to summarize feedback from users of North Carolina superstreets. This section summarizes three surveys: a residential survey to gather opinions of drivers that live near a superstreet, a survey to gather opinions of commuters driving through a superstreet on a daily basis, and a business survey to gather the perceived effects of superstreets on adjacent businesses.

4.1 Resident Survey

As mentioned above, one aspect of the superstreet design that has not been researched to this point is the effect on nearby residents. It is important to consider the opinions of those directly affected by the adjacent design because these residents can politically derail a superstreet proposal, and because these effects cannot be captured through traffic simulation or collision analyses. The team conducted a residential survey to gather opinion data from the taxpayers, voters, and frequent users of the adjacent superstreet intersections and corridors. The team chose to survey residents because they provide insight to the effects superstreets have on accessibility and property value. In addition, nearby residents are also frequent users of the facility who can provide insight on the navigability, travel time, and perceived delay associated with superstreets and the conventional intersections they replaced, especially concerning the side street movements. The following sections provide details on the methodology, results, and analysis of the residential opinion survey.

4.1.1 Methodology

4.1.1.1 Identification and Selection of Sites

The sites selected for the resident survey were taken from a list that included all operating superstreet intersections and corridors located in North Carolina. To get a full understanding of the public's opinion, both signalized and unsignalized sites were included in the list, encompassing both urban and rural areas. There were two major criteria used in the final site selection:

1. The superstreet must have been constructed within the past five years.
2. There must have been a comparable "before" scenario.

The reason for the first criterion was that residents might have difficulty remembering driving conditions of the previous intersection if the superstreet was constructed more than five years prior. The second criterion was imposed because it was important that the residents had something to compare to the superstreet. At a few sites there was no before scenario (i.e. no major intersection prior to the construction of the superstreet). For example, the superstreet corridor on US-17 in the town of Leland was built because of a major boom in land development in the area. This site was eliminated from the survey list because there was little development along that stretch of US-17 prior to the superstreet, so opinions on the superstreet would be difficult to separate from opinions on the new development. After reducing the list based on the above criteria, the final list totaled ten sites including three signalized superstreets (one corridor and two intersections) and seven unsignalized superstreet intersections. Table 4.1 lists the sites selected for the survey.

Table 4.1. Sites Selected for Resident Survey

Main Road	Cross street(s)	City	County	Type
US 15-501	Europa Dr. / Erwin Rd.	Chapel Hill	Orange	Signalized
US 17	Stephens Church Rd. Scotts Hill Loop Rd. (corridor) Sidbury Rd.	Wilmington	New Hanover Pender Pender	Signalized
US 17	Lanvale Rd.	Lanvale	Brunswick	Signalized
US 17	Mt. Pisgah Rd. / Sellers Rd.	Supply	Brunswick	Unsignalized
US 17	Ocean Isle Beach Rd.	Shallotte	Brunswick	Unsignalized
US 74-76	Blacksmith Rd.	Bolton	Columbus	Unsignalized
US 74	Elmore Rd.	Laurinburg	Scotland	Unsignalized
US 74	Dicks Creek Rd.	Whittier	Jackson	Unsignalized
NC 87	Peanut Plant Rd	Elizabethtown	Bladen	Unsignalized
NC 24	Haw Branch Rd.	Richlands	Onslow	Unsignalized

4.1.1.2 Data Collection

The research team considered three options to collect the resident opinion data: door-to-door interviews, survey by mail to households, or collection of license plate numbers and then survey by mail to vehicle owners. The authors concluded that mail-out surveys to households would reach the greatest number of people and be the most cost effective method to obtain a large sample size. The team used a four-wave mailing method. This technique involved sending mail four different times to each randomly-selected household in approximately one-week intervals. NCDOT personnel expect response rates for mail-out and mail-back surveys with just one mailing to be around ten percent (10%), but with multiple mailings the response rate should be much larger. The team calculated the required sample size for the mailings using Equation 4.1 (56).

Equation 4.1 $$n = t^2pq/d^2$$

Where:

n = sample size needed,
t = constant corresponding to the desired level of confidence, α,
p = proportion of units answering "yes",
q = proportion of units answering "no", and
d = percent error.

Assuming a 15/85 response split on a key question in the survey, the researchers needed to receive 196 total responses to achieve a five percent error (d=0.05) at the 95 percent confidence level (t=1.96). The final sample size the team determined as necessary was 500, which was calculated based on these parameters and an expected 40% return rate.

The researchers hired a local mailing service contractor to provide the addresses for households near the selected sites. All addresses were within a two-mile radius of the nearest superstreet location, and included both homeowners and renters. The list the researchers received contained addresses for 2,000 households – 1,000 from the group of signalized sites and 1,000 from the group of unsignalized sites. Each group contained an equal number of addresses from each site within the group. The households receiving the survey were randomly selected using a random number generator to extract 250 names from each group for an even representation of both signalized and unsignalized superstreets. To ensure a good cross-section of the population, the team provided instructions in the mailings to have the licensed driver (at least 16 years of age) within the household who would be celebrating the next birthday to respond to the survey.

The four mailings included an initial letter describing the study, the survey packet, a reminder letter, and a final survey packet. The survey packet included a cover letter explaining the survey with instructions, the survey questions, and a return envelope with pre-paid postage. The researchers mailed the first wave of mailings in mid-June, 2009. The second, third, and fourth wave of mailings followed approximately one week apart. As the surveys were mailed back, the results were recorded in a spreadsheet along with comments expressed by the residents. Addresses were tracked to determine who responded and when the response was received. The survey consisted of twelve questions, four of which the authors identified as key questions. These questions were about perceived navigability, safety, travel time, and number of stopped vehicles. Appendix 10.3 includes sample survey letters.

4.1.2 Results

Approximately two months after the initial letters were mailed the team received 145 surveys back from the 500 selected households, for a 29% response rate. The three signalized sites yielded 92 responses and the eight unsignalized sites combined for 53 responses. Table 4.2 lists the number of responses the team received from each site. Table 4.3 provides the results for each question. It is important to note that not all of question responses total 100% in Table 4.3 because not all respondents answered every question. It is also likely that those who responded to the survey had strong opinions either for or against the superstreet design.

Table 4.2. Number of Responses from Each Survey Site

Site	City	State	Type	# of Responses
US 15-501 & Europa Dr. / Erwin Rd.	Chapel Hill	NC	Signalized	37
US 17 & Scotts Hill Loop Rd. / Sidbury Rd.	Wilmington	NC	Signalized	38
US 17 & Lanvale Rd.	Leland	NC	Signalized	17
US 17 & Mt. Pisgah Rd. / Sellers Rd.	Supply	NC	Unsignalized	10
US 17 & Ocean Isle Beach Rd.	Shallotte	NC	Unsignalized	9
US 74-76 & Blacksmith Rd.	Bolton	NC	Unsignalized	8
US 74 & Elmore Rd.	Laurinburg	NC	Unsignalized	3
US 74 & Dicks Creek Rd.	Whittier	NC	Unsignalized	6
NC 87 & Peanut Plant Rd.	Elizabethtown	NC	Unsignalized	10
NC 24 & Haw Branch Rd.	Richlands	NC	Unsignalized	7

Table 4.3. Resident Survey Results by Question

Question	Response	Signalized	Unsignalized	All
1. How long have you, personally, lived near this intersection?	Less than 1 year	3%	4%	3%
	1 - 3 years	22%	8%	17%
	4 - 10 years	43%	17%	34%
	More than 10 years	32%	68%	45%
2. How often do you, personally, drive this section of road?	Daily	57%	42%	51%
	Weekly	26%	42%	32%
	Monthly	10%	8%	9%
	Few times a year	8%	6%	7%
3. How does navigation through the superstreet compare to a typical intersection?	Easier/less confusing	33%	38%	35%
	Same	17%	21%	19%
	More difficult/more confusing	41%	32%	38%
4. Had you heard about the superstreet concept before it was built at your location?	Yes	34%	45%	38%
	No	66%	53%	61%
4a. If yes, what was your opinion on the superstreet concept before it was built at your location?	Positive opinion	26%	50%	36%
	Neutral opinion	23%	17%	10%
	Negative opinion	29%	21%	26%
	Did not know enough	23%	12%	18%
5. Did you live here and have your driver's license prior to the construction of the superstreet? If no, skip ahead to question 10. If yes, proceed with survey.	Yes	92%	91%	92%
	No (skip to question 10)	8%	6%	7%
6. How do you, personally, feel the superstreet has affected your ability to safely navigate the roadway compared to the previous roadway design?	Positively	49%	56%	52%
	Same	28%	17%	24%
	Negatively	22%	23%	23%
7. How do you, personally, feel the superstreet has affected property values in your area?	Positively	9%	15%	11%
	Same	56%	58%	57%
	Negatively	12%	8%	11%
	Don't know - I rent	20%	10%	17%
8. How was travel time through this section of roadway affected during the construction period?	Less travel time	1%	4%	2%
	No change	24%	44%	31%
	More travel time	74%	48%	65%

Table 4.3. continued

Question	Response	Signalized	Unsignalized	All
9. What differences, if any, have you, personally, experienced in travel time since the opening of the superstreet?	Less travel time	18%	10%	15%
	No change	32%	52%	39%
	More travel time	51%	33%	44%
10. What differences, if any, have you, personally, noticed in the number of stopped vehicles waiting to make a safe maneuver since the opening of the superstreet?	Fewer stopped vehicles	36%	38%	37%
	No change	16%	26%	20%
	More stopped vehicles	45%	28%	39%
11. Please select your age range:	16-29	11%	2%	8%
	30-40	26%	32%	28%
	50-65	36%	43%	39%
	66 or above	27%	21%	25%
12. Please select your gender:	Male	52%	42%	49%
	Female	47%	57%	50%

Most respondents had lived near the superstreet intersection for a long-enough time to remember the previous intersection design. Overall, the responses from males and females were evenly split. The slight difference in male/female responses between signalized and unsignalized sites was not large enough to be statistically significant. The team also received a relatively even split for the age range of respondents, with the 16-29 age group being the only exception. The results confirm there was no over-representation of any particular age group or gender.

The team tested the accuracy provided by the final sample size using Equation 4.1 for simple random sampling of proportional data. Assuming a 95% confidence level, the achieved percent error ranged from 6% to just over 8% for the four key questions in the survey. This is only slightly greater than the team's goal of staying within 5% of the mean, and still within an acceptable range for the results to show meaningful differences if they existed. Table 4.4 shows the percent error (d) achieved and the sample size that the team would need to achieve results within 5% of the mean.

Table 4.4. Value of d Achieved for the Key Questions

	Q. 3	Q. 6	Q. 9	Q. 10
Alpha	0.05	0.05	0.05	0.05
Actual n	145	133	133	145
Achieved d	7.90	8.49	6.11	7.99
n needed for d = 5%	*362*	*383*	*199*	*371*

4.1.3 Analysis

The team identified four key questions from the survey – questions three, six, nine, and ten – on navigation, safety, travel time, and the number of stopped vehicles, respectively. Overall, thirty-five percent (35%) of the total respondents found navigation through a superstreet easier and less confusing compared to a typical intersection, while thirty-eight percent (38%) found it more difficult and more confusing. Over half of the respondents (52%) reported that the superstreet has a positive effect on their ability to safely navigate through the intersection, while twenty-three percent (23%) reported a negative effect. Fifteen percent (15%) of the respondents reported less travel time negotiating the superstreet, while forty-four percent (44%) reported experiencing an increase in travel time. The team further analyzed the key questions comparing responses from signalized and unsignalized superstreet sites.

4.1.3.1 Signalized vs. Unsignalized

The team performed a two-tailed Z-test for proportions at the 95% confidence level for the four key survey questions to compare the responses from the signalized and unsignalized sites. Table 4.5 shows the results of the tests. It should be noted that not all of the responses in the table sum to 100% because some respondents chose not to answer all of the questions. The only key question with significant proportional differences between signalized and unsignalized sites was question nine on travel time: just over half of the residents near unsignalized superstreets report no change in travel time, compared to 32% reporting no change at signalized superstreets.

Table 4.5. Comparison of Signalized and Unsignalized Survey Responses

KEY QUESTION	Answer	Response		Significant difference?
		Signalized	*Unsignalized*	
#3 - How does navigation through the superstreet compare to a typical intersection?	Easier	33%	38%	No
	Same	17%	21%	No
	More difficult	41%	32%	No
#6 - How do you, personally, feel the superstreet has affected your ability to safely navigate the roadway compared to the previous roadway design?	Positively	49%	56%	No
	Same	28%	17%	No
	Negatively	22%	23%	No
#9 - What differences, if any, have you, personally, experienced in travel time since the opening of the superstreet?	Less TT	18%	10%	No
	No change	32%	52%	Yes
	More TT	51%	33%	No
#10 - What differences, if any, have you, personally, noticed in the number of stopped vehicles waiting to make a safe maneuver since the opening of the superstreet?	Fewer stopped	36%	38%	No
	No change	16%	26%	No
	More stopped	45%	28%	No

A reason for a high percentage of responses for increased travel time is likely due to the survey responses coming mostly from the neighborhoods located off of the side streets. More complaints regarding travel time came from the signalized superstreets as opposed to the unsignalized superstreets. One of the purposes of signalized superstreets is to improve progression for the major street through movement, and as a result minor road left turn and through traffic is required to make extra maneuvers. It is possible that motorists perceive this as an increase in travel time because of the added movement. There were many comments from the surveyed residents expressing how they feel they have to go out of their way to make a left or through movement from the side road. One of the sites with multiple complaints was the US 15-501 site in Chapel Hill, NC where there is no direct left turn from the major road to the minor road (as shown in Figure 1.1).

Although not significant, another large difference in responses between the signalized and unsignalized groups was for the number of stopped vehicles (Question 10). More residents near the signalized sites (45%) felt there were more stopped vehicles than near the unsignalized sites (28%). The team received multiple complaints of non-compliance for the “no turn on red” signs and illegal left turns on red at the U-turn crossovers at two of the signalized sites, US-17 at Scotts Hill Loop Road and US-17 at Lanvale Road. Under North Carolina law it is illegal to make a left turn on red; therefore, drivers likely feel they are delayed unnecessarily at signalized U-turn intersections if there are acceptable gaps in the approaching traffic.

4.1.3.2 Signalized Sites

The team separately analyzed the answers provided for each question for both signalized and unsignalized sites. As before, a two-tailed Z-test for proportions was conducted at the 95% confidence level on the same four key questions.

Table 4.6 shows the results for the signalized sites. The responses show that navigation through a superstreet is not significantly easier or harder than a typical intersection (Question 3). However, residents felt the superstreet design positively affected their ability to safely navigate the intersection, with the results showing a significant difference between "positive" responses (49%) and "negative" responses (22%), and between "positive" and "the same" responses (28%).

Table 4.6. Comparison of Key Survey Question Responses for Signalized Sites

KEY QUESTIONS	Comparison				Significant difference?
		% response		*% response*	
#3 - How does navigation through the superstreet compare to a typical intersection?	Easier	33%	More difficult	41%	No
	Easier	33%	Same	17%	Yes
	Same	17%	More difficult	41%	Yes
#6 - How do you, personally, feel the superstreet has affected your ability to safely navigate the roadway compared to the previous roadway design?	Positively	49%	Negatively	22%	Yes
	Positively	49%	Same	28%	Yes
	Same	28%	Negatively	22%	No
#9 - What differences, if any, have you, personally, experienced in travel time since the opening of the superstreet?	Less TT	18%	More TT	51%	Yes
	Less TT	18%	No change	32%	Yes
	No change	32%	More TT	51%	Yes
#10 - What differences, if any, have you, personally, noticed in the number of stopped vehicles waiting to make a safe maneuver since the opening of the superstreet?	More stopped	45%	Fewer stopped	36%	No
	More stopped	45%	No change	16%	Yes
	No change	16%	Fewer stopped	36%	Yes

Only 18% of residents reported a reduction in travel time (question nine), while 51% reported an increase, and 32% reported no change. There were statistically significant differences between all these answers. As previously discussed, the reason for the higher responses for increased travel time or no change in travel time is likely because these were surveys of residents who live along the side streets.

4.1.3.3 Unsignalized Sites

Table 4.7 displays the results for the two-tailed Z-tests for proportions for responses from unsignalized sites. Similar to the signalized superstreets, the results for question six regarding safe navigation through the superstreet showed significant differences between positive (56%) and negative (23%), as well as positive and the same (17%). Unsignalized superstreets are generally installed as a safety countermeasure, and while this survey is not a safety analysis, the results are clear that nearby residents at least have a feeling of increased safety while traversing the unsignalized superstreet compared to the previous intersection design.

Table 4.7. Comparison of Key Survey Question Responses for Unsignalized Sites

KEY QUESTIONS	**Comparison between response choices**				**Significant difference?**
		% response		*% response*	
#3 - How does navigation through the superstreet compare to a typical intersection?	Easier	38%	More difficult	32%	No
	Easier	38%	The same	21%	No
	The same	21%	More difficult	32%	No
#6 - How do you, personally, feel the superstreet has affected your ability to safely navigate the roadway compared to the previous roadway design?	Positively	56%	Negative	23%	Yes
	Positively	56%	The same	17%	Yes
	The same	17%	Negative	23%	No
#9 - What differences, if any, have you, personally, experienced in travel time since the opening of the superstreet?	Less TT	10%	More TT	33%	Yes
	Less TT	10%	No change	52%	Yes
	No change	52%	More TT	33%	No
#10 - What differences, if any, have you, personally, noticed in the number of stopped vehicles waiting to make a safe maneuver since the opening of the superstreet?	More stopped	28%	Fewer stopped	38%	No
	More stopped	28%	No change	26%	No
	No change	26%	Fewer stopped	38%	No

4.2 Commuter Survey

This study gathered opinions from the University of North Carolina – Chapel Hill (UNC-CH) faculty and staff to determine their perceptions of the superstreet located on US-15/501 in Chapel Hill. The team's intention was to capture the opinions of commuting drivers because the residential survey focused on drivers entering from or exiting to the side streets, which did not include the entire population of drivers utilizing the facility. Commuters were considered to be drivers who only drive though the intersection both into and out of town, without turning onto the side streets (Erwin Road or Europa Drive).

4.2.1 Methodology

The team counted on the fact that a large portion of commuting UNC-CH faculty and staff drive through the superstreet at US-15/501 and Europa Drive/Erwin Road from I-40 or Durham because UNC-CH is located nearly three miles from the superstreet, and access into campus from US-15/501 is a primary route because of the interchange at I-40, a major commuter freeway. Figure 4.1 shows the superstreet location relative to the UNC-CH campus (57). Although the faculty and staff population is not equivalent to the through movement population, the faculty and staff population should be representative of any commuters. UNC-CH employs over 17,000 people (58), of which an estimated 75% have an email address in the campus directory. The immense size of the employee base and the ease of using the publicly available campus directory made the UNC-CH faculty and staff a great resource for the survey.

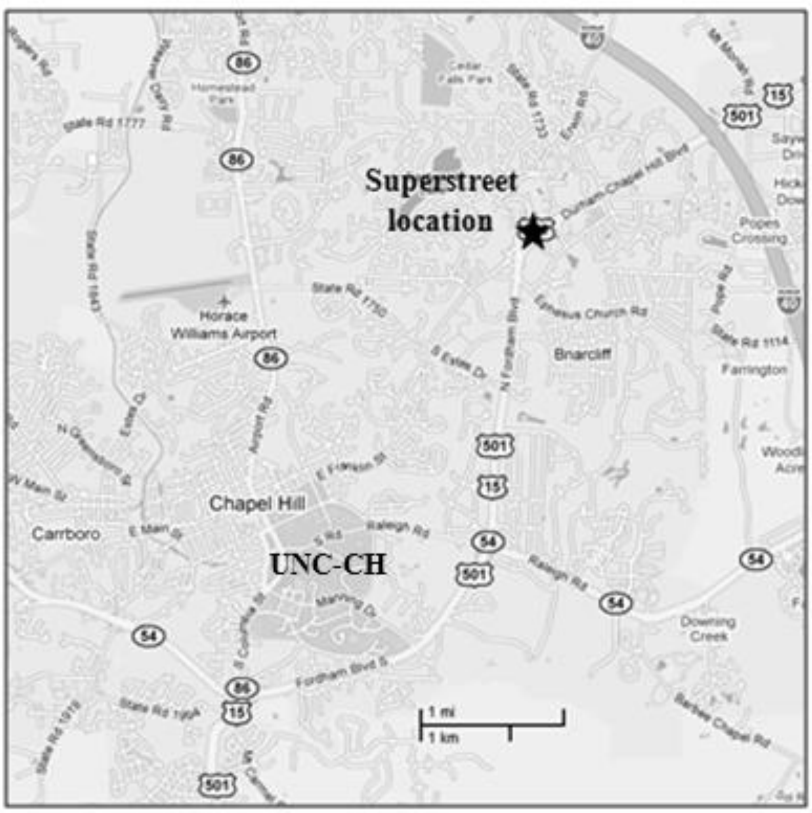


Figure 4.1. Map of UNC-CH and the Superstreet (57).

To collect the opinions of UNC-CH faculty and staff, the team decided that emailing a survey was the most cost-effective and time-efficient way to reach the greatest number of people. As noted in the previous survey, the sample size calculation for a key question with an 85/15 split on the response shown above produced a target number of responses of just under 200. The team expected a return rate of ten percent, based on opinions expressed for such surveys during a recent webinar (11). Therefore, the team planned to select 2,000 names from the UNC-CH campus directory to obtain the necessary sample. An estimation of the number of people per page with an email address prompted a selection of every ninth person. Choosing every ninth person ensured random selection. This method resulted in an actual selection of 2,520 people.

The email included an introduction explaining the purpose of the survey and the definition of a superstreet. It was important to make sure the survey participants were at UNC-CH long enough before the superstreet was constructed to develop clear opinions on the before and after cases. Faculty and staff were then asked questions about the road design and its effect on travel time, safety, and navigation. Participants were given one week to respond. If they had not submitted the survey after one week, they were sent another reminder survey. The majority of survey questions were the same as the residential survey to facilitate comparisons. Appendix 10.3 includes a sample survey. The team added Questions 3 and 4 to establish through travelers from those who turn at the superstreet. The team also modified the questions to specify the location of the superstreet because the residential survey was generic in location. Otherwise, the survey questions were the same as for the resident survey to allow easy comparison of the results.

4.2.2 Results

Seven weeks after the initial surveys were emailed, the team received 513 survey responses from the 2,520 selected faculty and staff, resulting in a 20% response rate, which was well above the anticipated 10% response rate and the desired 200 responses for an 85/15 split. Table 4.8 shows the results. Not all of question responses total 100% because not all respondents answered every question, and despite the instructions, some respondents provided more than one response per question. In the analysis in Table 4.8, the team included multiple responses per question if those were provided.

Table 4.8. Commuter Survey Results by Question

Question	Response Choice	% Response
1. How long have you worked in Chapel Hill?	Less than 1 year	0%
	1 - 3 years	18%
	4 - 10 years	31%
	More than 10 years	50%
	I don't work in Chapel Hill	1%
2. How often do you, personally, drive on US-15/501 at Europa Dr./Erwin Rd.?	Daily	17%
	Weekly	38%
	Monthly	27%
	Few times a year	18%
	Never (skip to Question 11)	0%
3. How do you drive through the intersection of US-15/501 and Europa Dr./Erwin Rd. into town most often?	As a through driver on US-15/501 without turning onto Europa Dr. or Erwin Rd.	74%
	Turning from US-15/501 onto Europa Dr. or Erwin Rd.	11%
	Turning from Europa Dr. or Erwin Rd. onto US-15/501	15%
4. How do you drive through the intersection of US-15/501 and Europa Dr. / Erwin Rd. out of town most often?	As a through driver on US-15/501 without turning onto Europa Dr. or Erwin Rd.	77%
	Turning from US-15/501 onto Europa Dr. or Erwin Rd.	16%
	Turning from Europa Dr. or Erwin Rd. onto US-15/501	6%
5. How does navigation through the superstreet compare to a typical intersection?	Easier/less confusing	18%
	Same	33%
	More difficult/more confusing	48%
6a. Had you heard about the superstreet concept before it was built at US-15/501?	Yes	27%
	No	73%
6b. If yes, what was your opinion on the superstreet concept before it was built at US-15/501?	Positive opinion	11%
	Neutral opinion	29%
	Negative opinion	17%
	Did not know enough about superstreets to form an opinion	43%
7. How do you, personally, feel the superstreet has affected your ability to safely navigate the roadway compared to the previous roadway design?	Positively	34%
	Same	40%
	Negatively	26%

Table 4.8. continued

Question	Response Choice	% Response
8. How was travel time through this section of roadway affected during the superstreet construction period?	Less travel time No change More travel time	10% 31% 59%
9. What differences, if any, have you, personally, experienced in travel time since the opening of the superstreet?	Less travel time No change More travel time	33% 48% 19%
10. What differences, if any, have you, personally, noticed in the number of stopped vehicles waiting to make a safe maneuver since the opening of the superstreet?	Fewer stopped vehicles No change More stopped vehicles	48% 31% 21%
11. Please select your age range:	18-29 30-49 50-65 66 or above	6% 42% 48% 4%
12. Please select your gender:	Male Female	37% 63%

The age distribution of respondents varied from what was expected, but gender distribution did not. The age range bins were broken into 18-29, 30-49, 50-65, and 66 and older. The youngest and oldest age groups were a minority at 6% and 4%, respectively. The 18-29 year-old group and the 66+ group, the groups of most concern, did not have responses that were significantly different from each other.

The researchers compared daily users of the superstreet (17% of respondents) with infrequent users (18% of respondents) to see if daily users of the superstreet have significantly different opinions compared to those who infrequently drive through the superstreet. The team compared the results from Question 2 in Table 4.8 using a two-tailed Z-test for proportions at the 95% confidence level. The remaining 65% of respondents drove US-15/501 at Erwin Road/Europa Drive either weekly or monthly. Daily and infrequent users both perceived the same or more difficult navigation through the superstreet. Both types of users generally perceive that the superstreet has not had a large effect on safety or travel time. Noticeable differences between daily and infrequent users occur with respect to the number of stopped vehicles. Nearly 50% of daily users perceive fewer stopped vehicles whereas half of infrequent users perceive no change in the number of stopped vehicles.

The team compared job titles between respondents and a separate sample of the UNC-CH directory to determine if the survey respondent population was representative of the faculty and staff population. The first 500 individuals listed in the directory comprised the directory sample. The team categorized the participants into five groups: UNC-CH Hospital, medicine-related, academia, facility or maintenance, and other. Any person working at the UNC-CH Hospital, regardless of job title, was included in UNC-CH Hospital set. The team isolated the hospital employees because it was assumed they would be going to the same location on campus. The medicine-related category included people who do not work at UNC-CH Hospital, but whose job title or department is in the field of medicine. Examples include campus health services, family medicine, dermatology, orthodontics, etc. The team grouped medicine-related fields together because they also tend to work on a particular part of campus. The academia category included any other college or institution within the university. Facility or maintenance included building services, ground services, energy services, etc. People whose job title or department could not be placed in the other four categories were lumped into the "Other" category. Table 4.9 shows the results. The percentage of respondents was statistically different than the directory sample using a two-tailed Z-test for proportions at the 95% confidence level for every group except the medicine-related job group. This could be because the Hospital complex is the furthest part of campus from the superstreet.

Table 4.9. Job Representation

Job Location/Department	% Respondents	% Directory Sample	Significant Difference?
UNC-CH Hospital	21	30	Yes
Medicine related	22	26	No
Academia	28	23	Yes
Facility/maintenance	2	4	Yes
Other	28	18	Yes

The team tested the accuracy of the final sample size using Equation 4.1 (shown previously) for simple random sampling of proportional data. Assuming a 95% confidence level, the achieved error in a mean proportion ranged from 3 to 4% for the four key questions which asked about specific operation and safety issues.

4.2.3 Analysis

The team performed a two-tailed Z-test for proportions at the 95% confidence level for the four key survey questions to analyze the responses from the commuter survey. Nearly all comparisons of the responses for each key question showed significant differences. Approximately half of the surveyed population perceived superstreets to be more difficult to travel through, but the same percentage perceived fewer stopped cars at the intersection. Thirty-four percent of respondents perceived positive safety effects, compared to 26% of respondents that perceived negative safety effects.

A major reason for conducting the commuter survey was to gain the opinion of commuting drivers because the residential survey did not capture their opinions. Sixty-seven percent (67%) of respondents were "commuters" in the sense that they drove straight through the intersection both into and out of town, without turning onto Erwin Road or Europa Drive. Major left turns onto the side streets are not allowed from US-15/501; all left turns are made by making a U-turn. Table 4.10 shows the results for commuters and non-commuters using a two-tailed Z-test for proportions at the 95% confidence level. It should be noted that not all of the responses in Table 10 sum to 100% because some respondents chose not to answer all of the questions. Surprisingly, commuters did not find the superstreet to be easier to navigate. Approximately 50% of commuters perceived no change in safety or travel time. An important difference was noted between commuters and non-commuters for travel time; 35% of non-commuters believe superstreets take more travel time compared to only 12% for commuters.

Table 4.10. Analysis of Survey Responses for Through vs. Non-Through Drivers

KEY QUESTIONS	Answers	Response: Commuters	Response: Non-Commuters	Significant Difference?
#5 - How does navigation through the superstreet compare to a typical intersection?	Easier	19%	18%	No
	Same	36%	28%	No
	More difficult	45%	54%	No
#7 - How do you, personally, feel the superstreet has affected your ability to safely navigate the roadway compared to the previous roadway design?	Positively	33%	36%	No
	Same	44%	32%	Yes
	Negatively	22%	32%	Yes
#9 - What differences, if any, have you, personally, experienced in travel time since the opening of the superstreet?	Less TT	36%	27%	Yes
	No change	52%	39%	Yes
	More TT	12%	35%	Yes
#10 - What differences, if any, have you, personally, noticed in the number of stopped vehicles waiting to make a safe maneuver since the opening of the superstreet?	Fewer stopped	45%	53%	No
	No change	36%	22%	Yes
	More stopped	20%	24%	No

The team compared the opinions of UNC-CH faculty and staff non-commuters with the respondents from the residential survey in Chapel Hill to determine if the responses would be similar. The team used a two-tailed Z-test for proportions at the 95% confidence level. Table 4.11 shows the comparison. Only the key question on travel time had a response that was significantly different. Fifty-nine percent (59%) of residential respondents perceived more travel time compared to only 35% of UNC-CH faculty and staff non-commuters. In general, both populations of respondents who use the minor street approaches to the superstreet perceive superstreets to be safer, but more difficult to navigate and less efficient.

Table 4.11. Comparison Between UNC-CH Non-Commuters and Residents

KEY QUESTIONS	Answers	Response: UNC-CH	Response: Residential	Significant Difference?
#5 - How does navigation through the superstreet compare to a typical intersection?	Easier	18%	22%	No
	Same	28%	19%	No
	More Difficult	54%	54%	No
#7 - How do you, personally, feel the superstreet has affected your ability to safely navigate the roadway compared to the previous roadway design?	Positive	36%	41%	No
	Same	32%	35%	No
	Negative	32%	24%	No
#9 - What differences, if any, have you, personally, experienced in travel time since the opening of the superstreet?	Less	27%	21%	No
	No Change	39%	21%	No
	More	35%	59%	Yes
#10 - What differences, if any, have you, personally, noticed in the number of stopped vehicles waiting to make a safe maneuver since the opening of the superstreet?	More	24%	38%	No
	No Change	22%	22%	No
	Fewer	53%	38%	No

4.3 Business Survey

4.3.1 Methodology

The team conducted a survey of business owners and managers to obtain a better understanding of the opinion of those people directly affected by proximity to the superstreet design. The business survey helps evaluate the effect the design has on accessibility and property values of land located near a superstreet intersection or corridor. No such survey on superstreets has been done before, and very little information is known on the business impacts of superstreets, or even conventional widening projects.

The team went door-to-door to conduct personal interviews at businesses along a superstreet intersection or corridor. This process ensured that the team members spoke to a manager or business owner. It also helped limit confusion on the purpose of the survey or questions within the survey and allowed the team to obtain higher response rates on the limited sample of businesses available to survey. The team chose to conduct business surveys for the signalized superstreet intersections on US-15/501in Chapel Hill and on US-421 in Wilmington. The team chose not to survey businesses near the other two signalized superstreet corridors in North Carolina because they did not have adjacent businesses prior to the superstreet implementation.

The team also chose not to conduct surveys at unsignalized superstreets because they are in rural areas with fewer businesses, and that effort would have resulted in only a few responses.

There are approximately 40 businesses near the superstreet at the US-421 site in Wilmington and 15 at the US-15/501 site in Chapel Hill. Because of the small sample size, the team decided a door-to-door visit to each business would provide the best chance to obtain a survey response. It was important to make sure the survey participants were there long enough before the superstreet was constructed to develop clear opinions on the before and after cases. The team went door-to-door to personally conduct the survey. If a manager or business owner was not available a survey was left at the location to be mailed back. The team analyzed the sites separately because of the different geometries. The superstreet in Chapel Hill does not allow left turns from US-15/501 but the superstreet in Wilmington does allow left turns from US-17 (both shown in Figure 1.1).

4.3.2 Results

The team received responses from ten businesses (67% response) near the superstreet in Chapel Hill and 19 businesses (48% response) in Wilmington. The team members were not able to obtain responses from several businesses because they had strict no solicitation policies, they thought it was against company policy to answer surveys, or they did not mail the survey back if a survey was left at the business.

Businesses varied along the superstreets in both type and size. National chains composed 70% of respondents along the superstreet in Chapel Hill, but only 42% in Wilmington. At both locations the team received feedback from hotels, restaurants, and services. The team did not perform statistical analyses on the responses because of the small sample size.

4.3.3 Analysis

Table 4.12 shows the business survey results for Chapel Hill. It is important to note that not all percentages add up to 100% because some respondents did not respond to that question or did not know the answer. Fifty percent (50%) of managers or business owners have noticed a positive or negative change in their monthly revenue pattern since the opening of the superstreet in 2008. Of the 50%, none of the respondents felt that the change was due to roadway modifications. Negative changes were perceived to be a result of the economy. Some positive changes were perceived as a result of recent interior renovations to the businesses. In general, business owners/managers felt that the superstreet had a positive impact on traffic flow and safety, but a negative or neutral impact on business growth. Some businesses mentioned access problems because major left turns are not allowed at the intersection.

A comment and opinion section concluded each survey. Some business owners/managers made multiple comments. Of all the comments, 30% of respondents expressed that the superstreet is confusing and 30% felt it is less safe than a conventional intersection. However, another 30% of respondents expressed that the superstreet has made a positive impact on safety and traffic flow. Table 4.13 shows the results of the comments section.

Table 4.12. Chapel Hill Business Survey Results

Question	Response		
	Increase	No change	Decrease
6a - Changes in monthly revenue pattern?	30%	10%	20%
9b - Change in number of regular customers since opening of the superstreet?	20%	40%	10%
	Better	Stayed the same	Worse
10a - How has the superstreet affected traffic congestion?	40%	20%	10%
10b - How has the superstreet affected traffic safety?	40%	20%	20%
10c - How has the superstreet affected number of customers per day?	10%	40%	20%
10d - How has the superstreet affected gross sales?	20%	30%	20%
10e - How has the superstreet affected property value?	0%	20%	10%
10f - How has the superstreet affected customer satisfaction with access to the store?	0%	30%	40%
10g - How has the superstreet affected delivery convenience?	0%	70%	0%

Table 4.13. Chapel Hill Business Survey Comments

Comment	Response
Superstreet is confusing	30%
Concern with safety	30%
Overall positive effect	30%

Table 4.14 shows the business survey results for the US-421 site. Not all percentages add up to 100% because some managers or owners did not respond to that question or did not know the answer. Seventy-four percent (74%) of managers or business owners/managers have noticed a change in their monthly revenue pattern since the opening of the superstreet in the summer of 2009. Of the 74%, half of the respondents felt roadway modifications had a net effect on revenue patterns. Of that half, most business owners/managers felt the roadway negatively affected revenue. The other half of business owners/managers felt the economy was the cause for decreased revenue. Almost half of the respondents thought there was no change in the

number of regular customers, but nearly 40% believe that the superstreet has negatively impacted their number of regular customers.

Table 4.14. US-421 Business Survey Results

Question	Response		
	Increase	**No change**	**Decrease**
6a - Changes in monthly revenue pattern?	16%	16%	58%
9b - Change in number of regular customers since opening of the superstreet?	16%	47%	37%
	Better	**Same**	**Worse**
10a - How has the superstreet affected traffic congestion?	26%	53%	16%
10b - How has the superstreet affected traffic safety?	37%	11%	53%
10c - How has the superstreet affected number of customers per day?	11%	42%	47%
10d - How has the superstreet affected gross sales?	11%	26%	53%
10e - How has the superstreet affected property value?	5%	5%	16%
10f - How has the superstreet affected customer satisfaction with access to the store?	0%	37%	58%
10g - How has the superstreet affected delivery convenience?	0%	37%	47%

In general, US-421 business owners and managers felt the superstreet had a large negative impact on safety because of the particular operations at the intersection. Major left turns are allowed at this superstreet; however, U-turns at the major intersection are illegal. Sixty-three percent (63%) of businesses noted the prevalence and danger of illegal U-turns even though it is signed and flagged as illegal. Another operational impact that businesses generally dislike is the flashing yellow arrow signal for left turns at the major intersection and U-turns. They find it confusing and dangerous because, in general, drivers do not use appropriate caution at the signal.

A comment and opinion section concluded each survey. In this comment section, 42% percent of respondents felt the superstreet is confusing, and 42% felt it creates poor access for businesses. Twenty-one percent (21%) thought it takes too long to maneuver from the side road. Only 26% felt the superstreet created a safer intersection. This safety percentage might be skewed because, as several businesses noted, the superstreet has significantly limited the frequency of injury and fatal crashes, but the illegal U-turns are creating a separate safety issue involving less serious crashes. Table 4.15 shows the results of the comments section.

Table 4.15. US-421 Business Survey Comments

Comment	Response
Poor access	42%
Illegal U-turns	63%
Confusing	42%
Longer travel time	21%
Safer	26%
Helps congestion	5%

5.0 LOS PROGRAM

The North Carolina Level-of-Service (NCLOS) software program was developed through a previous research project (No. 2003-12). It is unique in that it provides a visual depiction of the service volume in relation to the measure of effectiveness (MOE) for four highway systems as defined in the Highway Capacity Manual (2000HCM). The software program utilizes the operational methodologies for basic freeway segments, multilane highways, urban streets, and two-lane highways to back-calculate the service volume (expressed as AADT) against the MOE for that facility type for use in planning applications. The program then provides a visual plot of that relationship for the analyst to see the effect of various inputs, which can be changed. Three curves are provided in the plot: the best case, the default case, and the worst case.

Superstreets are a different facility type than those already programmed into NCLOS. The signalized superstreet (a signalized multilane highway), with a left turn crossover from the major highway, was decided to be programmed within NCLOS. The capacity of the facility is largely dictated by the operation of the signal system. This represents an interrupted flow facility type versus the previous four facility types (freeways, multilane highways, arterials, and two-lane highways). For signalized intersections the MOE is average control delay per vehicle. Table 5.1 shows the 2000HCM LOS boundary thresholds for signalized intersections.

Table 5.1. 2000HCM LOS Boundary Thresholds

LOS	Average Control Delay/Vehicle (s/veh)
A	≤ 10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

Another feature of the superstreet is that all side street traffic must turn right prior to the through and left turning vehicles using the downstream U-turn to move "through" the intersection. This activity greatly impacts the average control delay for side street traffic. However, NCLOS is used as a capacity check for the mainline traffic. Hence, the programming for the superstreet within NCLOS is only for the mainline. There is a separate spreadsheet application under development that incorporates the side street movements into the analysis.

With this as background, the capacity of the mainline within a superstreet design will be governed by the delay equation in the 2000HCM, shown by Equation 5.1.

Equation 5.1 $\mathbf{d = d_1(PF)+d_2+d_3}$

Where:

d = average control delay per vehicle (s/veh),
d_1 = uniform control delay assuming uniform arrivals (s/veh),
PF = uniform delay progression adjustment factor to account for effects of signal progression,
d_2 = incremental delay to account for effect of random arrivals and oversaturation queues (s/veh), and
d_3 = initial queue delay for delay to all vehicles at the start of any analysis period if queues already present (s/veh).

For this application, PF is assumed to be 1.0, representing random arrivals at the upstream signal. The d_2 and d_3 terms are set to zero, assuming superstreets are being considered for locations where arrival patterns and queuing would result in these terms having only a marginal effect on overall control delay per vehicle. It is noted here that the mainline signal controlling the left turns from the main street would provide very high progression for the mainline platoon released from the upstream signal. The capacity at this signal location would be higher than the upstream signal, but this capacity will not be used within NCLOS as the upstream signal will meter the mainline flow.

With the above assumptions then, the calculation of d_1 uses Equation 5.2.

Equation 5.2

$$d_1 = \frac{0.5C\left(1-\frac{g}{C}\right)^2}{1-\left[\min(1, X)\frac{g}{C}\right]}$$

Where:

C = cycle length (s),
g = effective green time for lane group (s), and
X = v/c ratio or degree of saturation for lane group.

Thus, setting X = volume/capacity, one can solve the above equation for volume:

$$volume = \frac{capacity}{g/C}\left[1-\frac{0.5C\,(1-g/C)^{2}}{d_1}\right]$$

Now recall that:

$$capacity = satflow \times g/C$$

which when substituted into the equation gives the following:

$$volume = satflow\left[1-\frac{0.5C\left(1-g/C\right)^{2}}{d_1}\right]$$

By setting d_1 equal to the threshold values for delay in the LOS table, and providing inputs for satflow, cycle length, and g/C ratio, the volume can be determined for that control delay value. (The program actually calculates the volume for control delay increments from 0.1 to 80.0 in increments of 0.1 for plotting the curves.)

Recall that the volume above would be in pc/h/ln if an ideal satflow value is used. Therefore, some additional corrections are needed to bring this volume to an AADT value. The final equation becomes:

$$AADT = satflow\left[1-\frac{0.5C\left(1-g/C\right)^{2}}{d_1}\right]\left(\#of\ lanes\right)\left(PHF\right)\left(f_{HV}\right)\left(\frac{1}{K\times D}\right)$$

Where:

AADT = annual average daily traffic (veh/day),
Satflow = saturation flow rate, adjusted to represent local conditions minus the effect of trucks (pc/h/ln),
# of lanes = number of through lanes per direction,
PHF = peak hour factor,
f_{HV} = heavy vehicle correction factor,
K = proportion of daily traffic occurring during the peak hour, and
D = direction distribution of traffic occurring during the peak hour.

The input values used for best, default, and worst cases are shown in Table 5.2.

Table 5.2. Input Values for Best, Default, and Worst Cases

Input	Best Case	Default Case	Worst Case
Adj. satflow	1800	1700	1600
C	80	90	120
g/C	0.80	0.70	0.65
# of lanes	3	2	2
PHF	0.95	0.90	0.80
% of Trucks	2	5	20
K	0.08	0.10	0.20
D	0.50	0.55	0.70

For the calculation of f_{HV}, the standard equation from the HCM is used, shown in Equation 5.3.

Equation 5.3 $$f_{HV} = \frac{1}{1 + PT \;\; E_T - 1}$$

Where:

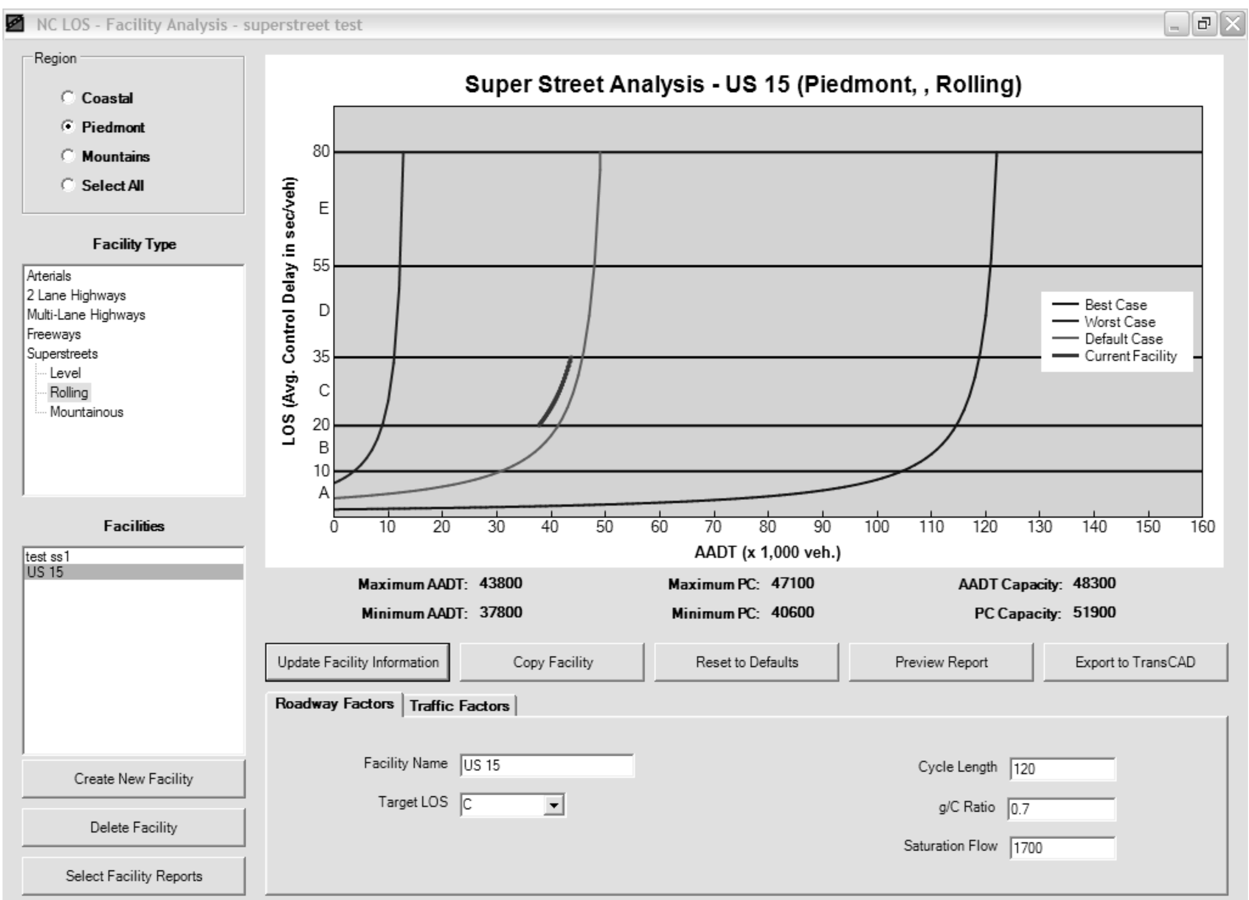
PT = proportion of trucks (decimal) and
E_T = passenger car equivalent for trucks and buses.

The 2000HCM recommends a set value for E_T = 2.0 for signalized intersection operations. However, multilane highway analysis procedures offer a range of values for both general terrain and specific grade analyses. NCLOS allows use of the multilane highway general terrain values for E_T as show in Table 5.3, with 2.0 as the minimum.

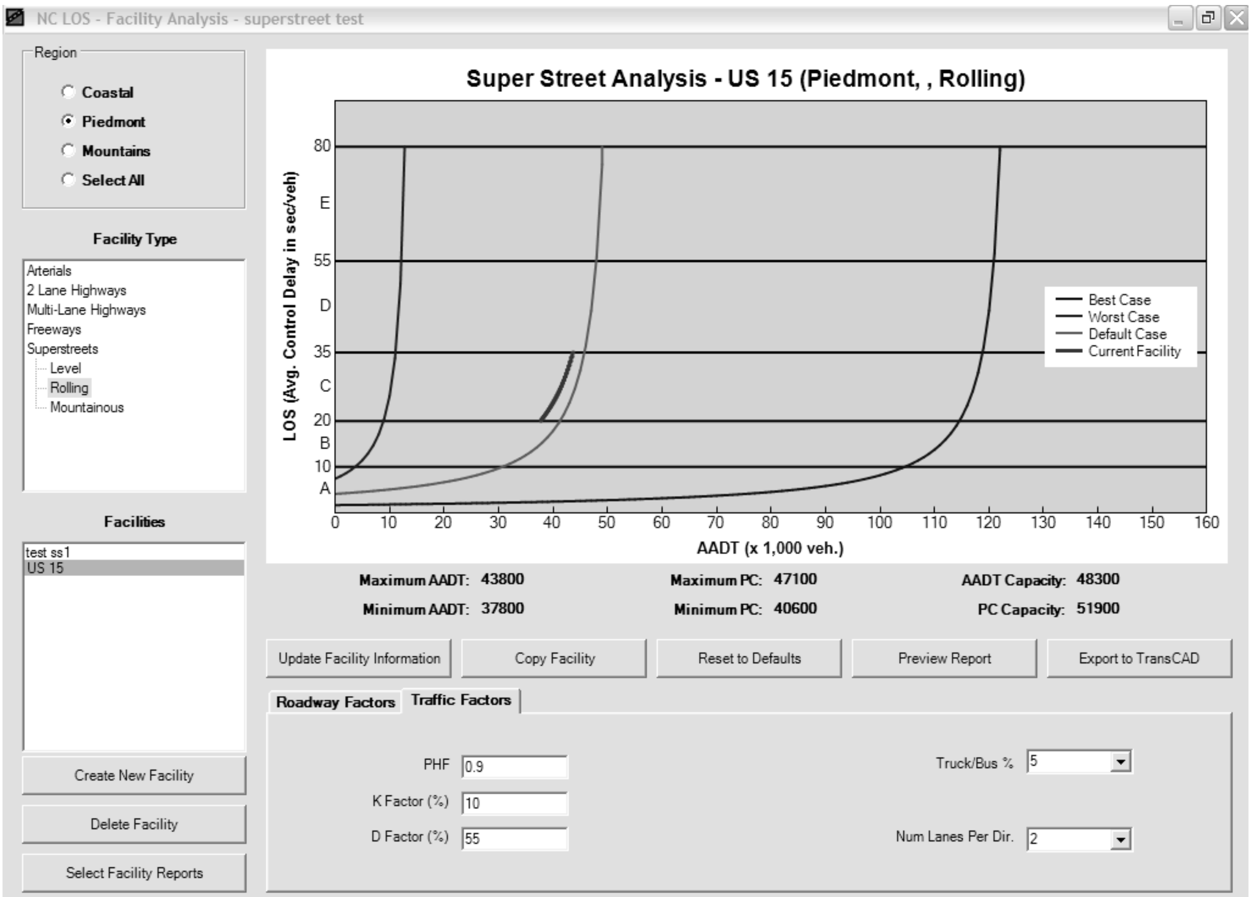
Table 5.3. Multilane Highway General Terrain Values

Vehicle Type	Level	Rolling	Mountainous
Trucks/Buses	2.0	2.5	4.5

Screen shots of the NCLOS superstreet program are shown below.



The screen shot on the previous page shows the display graph along with the roadway factor inputs (target LOS, cycle length, g/C ratio, and saturation flow rate). LOS C was selected and a plot of the LOS C range for AADT is shown in the graph with corresponding AADT values displayed just below the graph, including volumes for capacity (veh/day) and in passenger cars per day.



The screen shot above shows the traffic factor inputs (PHF, K factor, D factor, % truck/bus, and number of lanes per direction).

Using the default values as shown above for both 4-lane and 6-lane facilities, capacities at the five LOS thresholds calculate to the AADT values in Table 5.4.

Table 5.4. AADT Capacity for LOS Boundary Thresholds

	AADT (veh/day) 4-lane Superstreet Highway (Isolated Location)			AADT (veh/day) 6-lane Superstreet Highway (Isolated Location)		
LOS	**Level**	**Rolling**	**Mountain**	**Level**	**Rolling**	**Mountain**
A	32,300	30,800	28,200	48,400	46,200	42,300
B	43,300	41,300	37,800	64,900	61,900	56,600
C	48,000	45,800	41,900	72,000	68,600	62,800
D	50,300	47,900	43,900	75,400	71,900	65,800
E	51,500	49,100	45,000	77,300	73,700	67,400

Default inputs: Partial adjusted sat. flow = 1700 pcphpl; cycle length = 90 sec; g/C = 0.70; number of lanes = 2; PHF = 0.90; % of trucks = 5; K = 0.10; D = 0.55.

The superstreet analysis for NCLOS covers an isolated superstreet intersection. Similar results can be expected for a superstreet corridor where two or more adjacent intersections are also designed as a superstreet. The mainline flow rate could be thought of as being metered by the upstream signal for each direction. As long as the cycle length and g/C ratio remain constant for all intersections, the results from NCLOS would be representative of the mainline flow rate through the superstreet corridor since there should be better performance in the interior intersections because of superior progression along the mainline in each direction. Another way of stating this is the upstream signals are expected to have random arrivals versus ideal progression for the interior signals. The random arrival pattern for the upstream signals means that they are metering the flow through the superstreet corridor.

The analyst should recognize that speed limit (or free flow speed) is not an input parameter into the superstreet analysis for the mainline flow rate. The signalized intersection delay function does not depend on this input parameter.

Should it be necessary, the adjusted saturation flow rate value can be increased or decreased to account for different regions of the state and different locations in or near urban areas. Local knowledge will be important in selecting the appropriate value.

6.0 CONCLUSIONS

6.1 Travel Time Experiment

This project investigated the operational effects of superstreets compared to conventional intersections. The team calibrated and validated models of three existing signalized superstreets in VISSIM and compared them to the equivalent conventional intersection using travel time as the measure of effectiveness. All three superstreets, which included two isolated intersections and one five-intersection corridor, performed better than the corresponding conventional intersections when comparing the average travel times per vehicle. The largest travel time savings occurred at the peak, peak+10%, and peak+20% demand levels.

With the superstreet reducing overall travel time through the intersection at peak periods and higher, it means that it can buy an agency more years after the conventional intersection hits capacity before a major upgrade is funded. Using the critical sum as a capacity check, the superstreet was able to provide more capacity beyond what the conventional intersection could provide when it reached high demand levels in these three cases. When agencies are looking to make intersection improvements along their corridors, the superstreet can give them more capacity and at the same time reduce travel time, therefore adding more years to the intersections' useful life before having to make additional improvements, and thus saving money.

The three superstreets modeled were all different from each other. The Chapel Hill site is a single, isolated superstreet that does not allow direct left turns from the major road to the minor road. The Wilmington site is also a single, isolated superstreet but it did allow direct left turns from the major road, and it also allowed permitted *and* protected movements at the left turn and U-turn crossovers. The Leland superstreet is as example of corridor application, with five adjacent signalized superstreet intersections. At all three of these sites the superstreet required less travel time for the average vehicle than the conventional intersection. This proves that the superstreet design could work well as both an isolated intersection and a corridor. The corridor, however, had a greater reduction in travel time over the conventional compared to the single superstreet intersection locations. The superstreet design allows for perfect progression through the arterial by creating a one-way pair and requiring only two-phase signals. Theory suggests, and these results confirm, that the more superstreet intersections that are back-to-back along a corridor, the better the progression will be relative to a conventional corridor. The Chapel Hill and Wilmington sites both have adjacent conventional intersections, which limit the progression capabilities of the superstreet.

Broken down by movement, the major road through and left movements were positively impacted by the superstreet design, having lower travel times than the conventional comparison intersections. The minor road left and through movements were negatively impacted, with the travel time higher for the superstreet than the conventional. The minor road left and through movements have to travel an extra distance to a downstream crossover, and in doing so pass through two extra signals. The minor movements were affected more during the low volume, off-peak periods than the peak periods. Along the US-17 corridor the difference in travel time steadily decreased as the demand increased. The minor left and minor through travel times were only 9-18% higher than the conventional during the peak periods.

The Highway Capacity Manual defines an arterial as "a signalized street that primarily serves through-traffic and that secondarily provides access to abutting properties, with signal spacing of 2.0 miles or less" (59). The positive affect the superstreet has on the arterial through and left movements should prevail over any negative impacts to the minor road movements in many corridors. By definition, the superstreet is helping serve the purpose of the arterial by effectively and efficiently moving vehicles along the corridor.

6.2 Safety Analysis

The team investigated the safety effects of signalized and unsignalized superstreets in North Carolina as a part of this project. Geometric, volume, and collision data were collected for sixteen superstreets across the state.

The team conducted different analyses of signalized and unsignalized superstreets because signalized superstreets were implemented for congestion purposes, and therefore, were not affected by RTM. The team analyzed three signalized superstreets – two isolated intersections and one three-intersection corridor – using SSAM and observational naïve and C-G methods. The team analyzed 13 unsignalized superstreets using observational naïve and C-G methods as well as the EB method.

In the EB method, the team used the HSM model for rural multilane highway unsignalized intersections and calculated a calibration factor. The calculated calibration factor indicated that North Carolina collisions occur at a higher rate than the collisions used to develop the base equation for the HSM. The calibration factors for total collisions were 1.57 and 1.39 for three-legged and four-legged unsignalized intersections, respectively. The calibration factors for fatal and injury collisions were 2.05 and 1.74 for three-legged and four-legged unsignalized intersections, respectively.

In the examination of signalized superstreets the team determined that each site had unique characteristics that made its analysis difficult. The US-15/501 superstreet was likely affected by spillback from a downstream intersection and by the fact that it does not allow direct left turns from the major roadway; the US-17 superstreets were implemented in conjunction with signals and a large development that significantly influenced traffic volume and safety; and the US-421 superstreet had flashing yellow arrows for major left turns and U-turns which no other signalized superstreet uses. The SSAM analysis for signalized sites was also difficult because the team coded the VISSIM models to produce travel time results, and this was not helpful in building a realistic safety model. Due to time and cost constraints, the team was unable to code new models; therefore, the SSAM results should not be used confidently.

The safety impacts of signalized superstreets are therefore inconclusive. The collision rate comparison using the HSM model and SSAM results generally showed a reduction in collisions. However, the naïve and C-G methods showed conflicting results. The US-421 superstreet generally showed a reduction in collisions, which is important because the US-421 site is the most typical signalized superstreet. This site allows direct left turns from the major road and the development adjacent to the superstreet existed prior to superstreet implementation. Although results are inconclusive from all signalized superstreets, the fact that the US-421 site showed positive results is important for future signalized superstreet application because it is the typical situation for implementation – an urban arterial with pre-existing heavy development.

Unsignalized superstreets showed a significant reduction in total, angle and right turn, and left turn collisions in all analyses. All analyses also showed a significant reduction in fatal and injury collisions as well.

Naïve, C-G, and EB analytical methods for unsignalized superstreets showed significant reduction in collisions; however the EB C-G method results were much more optimistic. The EB C-G method was not included in the HSM, and the method described by Hauer was not absolutely clear to the team or other safety professionals the team consulted – of particular concern is the regression calculation used for the variance of κ. For these reasons, the team does not suggest using the overly optimistic results as provided by the EB C-G method.

The significant collision reduction from unsignalized superstreets is important because it shows the strong success of NCDOT superstreet application. The cost savings from this collision reduction will be enormous. Additionally, the NCDOT can use the information to justify their design decisions to local citizens and business owners.

6.3 Resident, Commuter, and Business Survey

Based on the residential survey results, the following summarizes the major conclusions:

- Residents agreed that the superstreet design helps them travel more safely through the intersection.
- Residents near signalized superstreets perceived more travel time through the intersection.
- Residents near signalized superstreets perceived more stopped vehicles at the intersection.

The difference between unsignalized and signalized sites in relation to travel time and the number of stopped vehicles is likely due in part to the nature of the traffic control device (signal versus stop sign), and also to the inability of vehicles at signalized sites to make a legal left turn on red. By surveying residents living near superstreets, the results reflect mostly those drivers coming to and from the side streets, rather than the majority of through travelers. The responses showing perceived increased travel time or no change in travel time are likely a reflection of those making the additional movements of a right turn then U-turn to move in and/or out of the minor roads.

Based on the commuter survey results, the following summarizes the major conclusions:

- Commuters perceived superstreets as more difficult to navigate.
- Commuters perceived savings in travel time and reductions in number of stopped vehicles.

- Commuters perceived the superstreet intersection as safer than the conventional intersection.

As drivers become more familiar with superstreets, the team believes the perceived effects on safety and ease of navigation will improve. The superstreet in Chapel Hill does not allow major left turns onto Erwin Road or Europa Drive which may aid in perceived increases in travel time because of longer queues at crossovers, and therefore a longer delay at those signals.

Based on the business survey results, the following summarizes the major conclusions:

- Respondents from Chapel Hill recognize traffic flow and safety improvements at the intersection.
- Business owners/managers at both locations felt the superstreet negatively impacted business growth and operations.
- Business owners/managers at both locations identified customer access and confusion problems associated with the superstreet design.

The businesses at Chapel Hill and Wilmington had separate issues with their respective superstreet designs. The superstreet in Chapel Hill does not allow major left turns, which creates some access issues, and the superstreet in Wilmington has an illegal U-turn problem at the main intersection which is causing safety and delay concerns. Due to the small sample size, the team recognizes these results may not be applicable to other superstreet locations.

6.4 LOS Program

The NCLOS program, version 2.2, has been programmed to include modeling the superstreet using the MOE criteria of average control delay for signalized intersections. The program is based on the delay equation in the 2000HCM for signalized intersections. Note that the d_2 and d_3 terms are assumed to have negligible effect on the delay because superstreets are not installed where breakdown conditions are expected to occur during the peak hour.

There are a wide range of AADT outputs for the best, default and worst cases within the NCLOS program. This is primarily because the best case has three lanes per direction (versus two lanes per direction for the default and worst cases) and a favorable cycle length, g/C ratio, saturation flow rate, and truck percentage.

As with the previous version of NCLOS, the Department can change the default values in a master spreadsheet if experience shows that adjustments are needed to better match with field AADT values.

7.0 RECOMMENDATIONS

7.1 Travel Time Experiment

Agencies should consider superstreets as a viable option for upgrading arterials that look like the three cases studied here. These intersections should be where low volume, two-lane roads meet a high-volume, divided, four-, six-, or eight-lane arterial. Building a superstreet instead of upgrading the conventional intersection can save money over the long run because the increasing traffic along the arterial will outgrow the conventional design before it outgrows the superstreet.

The team recommends building superstreets as a corridor rather than a single, isolated intersection where possible. While a single superstreet intersection will improve travel time and reduce congestion, the design works better as a corridor treatment since that allows for perfect progression in both directions at any speed and signal spacing. The team also recommends building them along developing corridors as a preventative measure to increase capacity and reduce congestion before it actually happens, as was the case with the US-17 superstreet corridor in Leland, NC.

The superstreet is best suited for divided arterials with high through and left turn volumes on the major road. The arterial left turn volume per lane should be greater than 80% of the minor road traffic per lane that moves during the same signal phase. Superstreets are not the optimal choice for minor roads with high left turn and through volumes. The minor road total volume should typically be less than 20% of the total intersection volume. Another useful rule of thumb, based on Kramer's definition of an arterial receiving at least 2/3 of the green time (12), is that the minor street two-way demand should be less than about 22,000 vehicles per day. The median width should be between 40 and 70 feet to accommodate large trucks. If the median is not wide enough, or there is not enough right-of-way to widen, loons can be built across from the median crossovers for wide-turning vehicles (14).

Multiple residents from each signalized site commented on the disregard for the no left turn on red rule at the U-turn crossovers. With the number of superstreets in North Carolina likely to increase in future years, the team recommends evaluating the possibility of changing this rule so a vehicle could make a left turn on red when entering a one-way street (which is essentially what they are doing when completing the U-turn maneuver). This is allowed in other states at similar locations.

Agencies should be proactive in education and public awareness of the benefits of superstreets. The team suggests showing aerial video of an actual intersection or corridor before and after superstreet implementation to help viewers understand how a superstreet functions compared to a conventional intersection. Simulations are an excellent tool for analyzing designs but may not provide the best visualization for the general public. Instead, a video showing an actual before and after construction from an aerial vantage point may be more convincing. It is also important to understand any perceived negative aspects of the design and mitigate them. As with any intersection treatment, it is important to understand the circumstances where the superstreet will be most beneficial. Superstreets reroute minor street left turn and through movements, and if the demand for those movements is high, superstreets may not be the optimum design choice. Superstreets are a promising solution for congested arterials, and agencies should seriously consider them for operational and safety improvements.

7.2 Safety Analysis

NCDOT should consider unsignalized superstreets as a viable option for rural arterials. These intersections should be where low-volume, two-lane roads meet a high-volume, divided, four-lane arterial. A superstreet will have a higher initial cost than a conventional two-way STOP controlled intersection because of the extra pavement in the directional crossovers and loons, but it can save enormously over the life of the roadway because of the collision savings.

NCDOT should use caution when implementing signalized superstreets because our analyses are inconclusive on their safety effects. However, the safety results from the US-421 site were promising, and the previous travel time analysis indicates that signalized superstreets reduced overall travel time.

As driver behavior changes, the predictive quality of the calibration factor used in the EB method may deteriorate with time. As a result, the collision models should be recalibrated periodically to ensure that they are continuing to adequately predict collisions. The calibration factor also suggests that other state departments of transportation should not use these results directly but rather should recalibrate them with data from their own state.

The team also recommends that NCDOT use the C-G method as the main tool to analyze the safety of superstreets. RTM did not have an important impact as the team discovered when comparing the EB naïve results to the observational naïve results (a 34 percent reduction compared to a 27 percent reduction for total collisions, respectively) This indicates that the effort to use the EB method is likely greater than the improvement in the results the method provided for superstreets in North Carolina. This also shows that the NCDOT was opportunistic in unsignalized superstreet implementation by choosing sites with a poor collision history but not sites significantly affected by RTM. The C-G method is beneficial because it accounts for more factors than the naïve method. The C-G method uses comparison sites to capture other trends that affect crash frequency and severity but whose causes are unknown. These other factors included historical effects, weather conditions, driver behavior, and traffic pattern changes.

With the C-G method as the recommended analysis, the team believes the unsignalized superstreet results should be used as a collision modification factor (CMF). The CMF would allow for other states and agencies to make an estimated effect of unsignalized superstreet implementation. The CMF for total collisions is -0.462 (or a reduction of 46.2%).

7.3 Resident, Commuter, and Business Survey

Multiple residents from each signalized site commented on the disregard for the no left turn on red rule at the U-turn crossovers. With the number of superstreets in North Carolina likely to increase in future years, the researchers recommend evaluating the possibility of changing this rule so a vehicle could make a left turn on red when entering a one-way street (which is essentially what they are doing when completing the U-turn maneuver). This is allowed in other states at similar locations.

The team believes that many of the safety and confusion problems associated by the business respondents with their superstreets will resolve themselves in time. Superstreets in these locations are still new and drivers are unfamiliar with their operation. Unfortunately, businesses are forced to experience these growing pains. A follow-up survey in five to ten years is recommended to determine if any opinions have changed. The team recommends that in future superstreet implementation where major left turns are allowed at the main intersection, the engineers design the left turn bay to make illegal U-turns difficult and uninviting. The team also recommends surveying more businesses statewide once more superstreets are in place to better understand the effect superstreets have on adjacent development.

Agencies considering superstreets should take a proactive approach in presenting safety and operational benefits. Agencies should emphasize the safety benefits to the nearby residents and the operational benefits to the commuters. They should pay special attention to businesses and inform them of the benefits of the superstreet design. Benefits for businesses include choosing a progression speed through the intersection and flexibility on location of crossovers. Additional crossovers can be added with no effect on the operations of the intersection.

Planning meetings typically hear the voices from nearby residents and immediate community, but may not hear opinions from the commuters who are benefiting most from the improved operations. Agencies need to represent commuters in the discussions with other stakeholders. In general, agencies need to identify what is of value to the stakeholders (residents, businesses, and commuters). They should be proactive in education and public awareness. The team suggests showing aerial video of an actual intersection or corridor before and after superstreet implementation to help viewers understand how a superstreet functions compared to a conventional intersection. Simulations are an excellent tool for analyzing designs but may not provide the best visualization for the general public. It is also important to understand any perceived negative aspects of the design and mitigate them. As with any intersection treatment, it is important to understand under what circumstances the superstreet will be most beneficial. Superstreets reroute minor street left-turn and through movements, and if the demand for those movements is high, superstreets may not be the optimum design choice (*2*). Superstreets are a promising solution for congested arterials, and agencies should seriously consider them for safety and operational improvements.

7.4 LOS Program

The NCLOS program is available to use for determining the range of AADT volumes for isolated superstreet installations across the state. The program can be helpful for planners when considering various treatment options for arterials and thoroughfares throughout the state. The program only considers the mainline LOS without any analysis provided for the side street traffic. It would be helpful for future alternative considerations for NCLOS to have a superstreet corridor analysis option.

7.5 Future Research

7.5.1 Travel Time Experiment

For any future research on the operational effects of superstreets, the team has suggestions to consider when collecting data at existing superstreets. Lane utilization studies should be done when collecting data from crossovers. From field observations, team members noted an uneven distribution of vehicles at the two-lane crossovers. The team did not do a full lane utilization study, but were able to look back at the videos and pull data from the Walmart intersection on US-17 where there was an approximate 80/20 split in the lane use. At the rest of the two-lane crossovers the team made assumptions on the lane utilization based on qualitative observations.

Another recommendation when collecting field data is to do a gap study where there are permitted/protected movements at crossovers, as well as for right turn on red (RTOR). The team was able to use the video footage to collect some gap data, but for future studies of superstreets, the team recommends conducting a full-scale gap study in conjunction with VISSIM calibration.

There are many other studies that could be done to assess the operational impact of superstreets that were not within the scope of this research project. Some of these research topics include investigating the impacts:

- Of allowing left turns on red,
- Of not allowing right turns on red,
- On operations with and without the direct left turn from the arterial to the minor road,
- Of different distances to the U-turn crossovers and signal spacing,
- Of driveways along the arterial,
- On emissions and fuel savings, and
- On pedestrians and bicycles.

The safety impact of superstreets is included in the report, but there is also more research beyond operational and safety analyses that can be done to assess the impact of the superstreet design. A benefit/cost analysis and a decision support guideline would help provide assistance to DOTs and other agencies considering the superstreet design.

Superstreets have the ability to be flexible with crossover distances and driveways along the arterial because the road essentially acts as a one-way pair. Studies should be done to investigate the impact of crossover distances and driveway locations on different signal options, such as allowing permissive movements at the crossovers. When studying these effects, the team recommends modeling them using data from existing superstreets and their adjacent intersections. Using data from existing superstreets and modifying the geometry or signals will allow for a good understanding of the effects of these changes on actual intersections.

7.5.2 Safety Analysis

Future research on the safety impacts of superstreets should include a SSAM analysis for unsignalized sites using calibrated and validated VISSIM models. The VISSIM models should be designed to realistically depict the safety of the arterial, a common oversight when travel time or delay are calibrated and validated. Future research should also include validation of SSAM with collision history. This should be done on both signalized and unsignalized superstreets to assess each performance.

The safety effects of signalized superstreets were inconclusive because of the limited sample size and nature of each site. When a larger sample size is available, future research should be conducted to determine their safety impact.

The EB C-G method is not included in the HSM and I had problems using it in my analysis. When this method is included in the HSM, future research should use it to analyze unsignalized superstreets.

7.5.3 Resident, Commuter, and Business Survey

Business surveys were only conducted at two superstreet locations – US-15/501 in Chapel Hill and US-17 in Wilmington. The after period at both locations was less than a year when the surveys were conducted. Future research should include surveying those businesses after several years to determine if opinions changed about the superstreet. More superstreet locations should be surveyed as well to gain a larger sample population.

7.5.4 LOS Program

As more superstreets are installed across the state, additional calibration of the NCLOS programming to field conditions is needed for the AADT outputs to match actual values.

8.0 IMPLEMENTATION AND TECHNOLOGY TRANSFER PLAN

The following outlines how NCDOT and other agencies can use the products developed as part of the research to analyze signalized and unsignalized superstreets in North Carolina and beyond.

8.1 Research Products

The project has produced research products in four areas: travel time, safety, perceived effects, and NCLOS. This research report includes a literature summary, the full data sets, and details of the statistical analyses. The research products include:

- Calibrated and validated VISSIM models for three signalized superstreets,
- Calibration factors for HSM collision prediction equations for unsignalized three-leg and four-leg intersections in North Carolina,
- The NCLOS program updated (version 2.2) to make AADT estimates for superstreets, presented in Chapter 5 of this report,
- The set of recommendations given in Chapter 7, and
- Four papers submitted to peer-reviewed journals or conferences:

  Ott, S. E., Haley, R. L, Hummer, J. E., Foyle, R. S., and Cunningham, C. M., "Resident, Commuter, and Business Perceptions of New Superstreets," Journal of Transportation Engineering, American Society of Civil Engineers, Submitted 4-19-2010.

  Haley, R. L., Ott, S. E, Hummer, J. E., Foyle, R. S., Cunningham, C. M., and Schroeder, B. J., "Operational Effects of Signalized Superstreets in North Carolina," Transportation Research Board, National Research Council, Washington, D. C., Submitted 8-1-2010.

  Ott, S. E., Haley, R. L, Hummer, J. E., Foyle, R. S., and Cunningham, C. M., "Safety Effects of Superstreets in North Carolina," Accident Analysis and Prevention, To be submitted.

  Foyle, R. S., Hummer, J. E, Haley, R. L., Ott, S. E., and Cunningham, C. M., "NCDOT Level of Service Software Program for Signalized Superstreets," To be submitted.

8.2 Research Products Users

The following groups within the NCDOT can apply the research products to inform and improve their decisions and policies:

- Traffic Management Unit,
- Traffic Systems Operation Unit,
- Traffic Safety Unit,
- Transportation Planning Branch, and
- Strategic Planning Office.

In addition, the research products can be useful to other departments of transportation, the FHWA, other agencies, and consultants interested in the areas of superstreet design, operations and safety.

The authors plan to send the paper on safety effects to the Highway Safety Research Center staff in Chapel Hill who maintain the FHWA's Collision Countermeasure Clearinghouse. Hopefully, the safety results will be accepted by the Clearinghouse and engineers around the country can use the safety results to help judge their own superstreet proposals.

Planners, designers, and local officials can also use the research in public hearings. This information can be used to present the operational and safety benefits, as well as understanding the perceived effects of stakeholders and mitigating them.

8.3 Research Products Applications

The NCDOT and others outside the department can use the research products named in Section 8.1 to advance superstreet implementation and other areas. The recommendations in Chapter 7 can be applied across the NCDOT to improve implementation strategies and practical operational and safety results for signalized and unsignalized superstreets.

The turning movement and travel time data collected as part of this research should be valuable to the NCDOT, FHWA, and other agencies that are involved in superstreet, and more generally unconventional intersection, data collection. The calibrated and validated VISSIM models are valuable tools that NCDOT can use to evaluate other signalized superstreet sites.

The NCLOS program was created to meet the needs of NCDOT's planning activities, including travel demand model efforts. The NCLOS program is a user-friendly software program that allows for the determination of service levels and capacities for superstreets from basic roadway, geographic, and traffic data.

Finally, the journal papers written as results of this research project advance the overall knowledge of superstreet performance. The papers disseminate the research findings to transportation agencies and the research community.

Planning, design, safety, and operations professionals should be able to use the products of this research without formal training courses or seminars. Nonetheless, presentations at NCDOT conferences, meetings of the NC Section Institute of Transportation Engineers, MPO meetings, or other meetings may be wise to publicize the findings. The authors will likely be available during the next year or two to make those presentations.

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10.0 APPENDICES

10.1 Travel Time Experiment

10.1.1 Field Data Collection

The field data collection for each signalized superstreet included a travel time study, turning movement counts, and a spot speed study. Figures 10.1 through 10.4 show the travel times for each superstreet. Figures 10.5 through 10.10 show the turning movement counts at each site, and Figures 10.11 through 10.15 show the data from the spot speed studies.

Scenario	# runs	Distance (mi)	Avg. # Stops	Avg Speed (mph)	Avg. Travel Time (min)	St.Dev. Travel Time
Minor left (EB)	6	0.73	2	19.6	2.38	0.634
Minor left (WB)	6	0.64	2	15.0	2.63	0.599
Minor right (EB)	4	0.30	1	11.7	1.57	0.357
Minor right (WB)	4	0.27	1	12.2	1.42	0.417
Minor thru (EB)	5	0.58	3	15.2	2.36	0.513
Minor thru (WB)	6	0.40	2	15.7	1.72	0.743
Major left (NB)	5	0.34	2	12.5	1.75	0.423
Major left (SB)	6	0.28	1	19.2	0.94	0.279
Major right (NB)	4	0.31	0	26.0	0.78	0.306
Major right (SB)	4	0.26	1	22.4	0.71	0.130
Major thru (NB)	4	0.49	0	38.2	0.78	0.122
Major thru (SB)	4	0.53	1	36.8	0.92	0.297

Figure 10.1. Chapel Hill Travel Times

Scenario	# runs	Distance (mi)	Avg. # Stops	Avg Speed (mph)	Avg. Travel Time (min)	St.Dev. Travel Time
Minor left (EB)	4	0.67	2	18.5	2.76	1.560
Minor left (WB)	4	0.63	3	13.3	3.12	1.012
Minor right (EB)	3	0.40	2	18.3	1.34	0.367
Minor right (WB)	3	0.32	1	19.7	1.12	0.433
Minor thru (EB)	5	0.51	3	12.9	2.64	0.959
Minor thru (WB)	4	0.51	2	12.4	2.55	0.436
Major left (NB)	5	0.73	1	23.0	2.15	0.974
Major left (SB)	4	0.63	1	16.4	2.47	0.643
Major right (NB)	3	0.34	0	30.5	0.67	0.058
Major right (SB)	3	0.34	0	32.1	0.65	0.089
Major thru (NB)	4	0.54	0	40.6	0.81	0.108
Major thru (SB)	4	0.49	0	44.3	0.82	0.320

Figure 10.2. Wilmington Travel Times

Scenario	# runs	Distance (mi)	Avg. # Stops	Avg Speed (mph)	Avg. Travel Time (min)	St.Dev. Travel Time
Minor left (EB)	5	0.54	3	13.4	2.45	0.41
Minor left (WB)	5	0.57	2	18.1	2.00	0.54
Minor right (EB)	5	0.29	2	15.5	1.38	0.97
Minor right (WB)	6	0.22	1	17.2	0.89	0.39
Minor thru (EB)	6	0.44	2	12.7	2.25	0.76
Minor thru (WB)	4	0.34	2	11.3	2.09	0.85
Major left (NB)	6	0.31	1	17.9	1.17	0.43
Major left (SB)	6	0.25	1	12.8	1.26	0.32
Major right (NB)	4	0.33	0	31.5	0.64	0.07
Major right (SB)	5	0.21	0	31.9	0.40	0.02
Major thru (NB)	5	0.44	0	33.0	0.81	0.13
Major thru (SB)	5	0.43	0	43.8	0.58	0.02

Figure 10.3. Walmart/Gregory on US-17 Travel Times

Scenario	# runs	Distance (mi)	Avg. # Stops	Avg Speed (mph)	Avg. Travel Time (min)	St.Dev. Travel Time
Minor left (EB)	6	0.79	2	18.6	2.61	0.45
Minor left (WB)	1	0.64	2	19.9	1.93	-
Minor right (EB)	2	0.42	1	26.3	1.03	0.39
Minor right (WB)	2	0.38	1	18.0	1.27	0.07
Minor thru (EB)	2	0.50	2	14.6	2.08	0.39
Minor thru (WB)	2	0.51	3	11.1	2.77	0.16
Major left (NB)	5	0.43	1	17.6	1.58	0.39
Major left (SB)	2	0.47	1	16.7	1.69	0.01
Major right (NB)	2	0.33	1	26.8	0.73	0.07
Major right (SB)	2	0.48	0	40.8	0.71	0.04
Major thru (SB)	4	0.68	0	54.1	0.75	0.02

Figure 10.4. Lanvale/Brunswick Forest on US-17 Travel Times

Time:	7:30 - 7:45am		7:45 - 8:00am		8:00 - 8:15am		8:15-8:30am		8:30 - 8:45am	
Movement	cars	trucks	cars	trucks	cars	trucks	cars	trucks	cars	trucks
NBT	312	11	408	7	381	8	321	8	321	8
NBR	8	1	11	0	9	1	9	0	11	0
NBL	31	2	54	0	53	2	63	5	47	1
SBT	313	7	377	10	298	12	365	5	324	11
SBR	5	0	14	0	25	0	11	0	7	0
SBL	16	0	21	0	30	0	27	0	26	0
EBT	3	1	14	0	24	0	6	0	7	0
EBR	67	0	87	1	74	0	138	2	105	0
EBL	9	0	3	0	9	0	5	0	8	1
WBT	2	1	12	0	14	0	28	0	15	0
WBR	37	2	22	0	30	0	28	0	33	0
WBL	8	1	7	0	7	0	7	0	7	0

Figure 10.5. Chapel Hill Turning Movement Counts: Data Set #1, Collected on 10/27/2009

Time:	11:30 - 11:45am		11:45 - 12:00pm		12:00 - 12:15pm		12:15 - 12:30pm		12:30 - 12:45pm	
Movement	cars	trucks	cars	trucks	cars	trucks	cars	trucks	cars	trucks
NBT	308	6	334	6	336	9	358	7	392	8
NBR	10	0	14	0	11	0	10	0	15	0
NBL	38	4	43	0	39	0	51	0	66	0
SBT	343	4	320	12	314	6	290	6	363	7
SBR	18	0	12	2	16	0	11	0	12	0
SBL	13	0	26	0	17	1	19	0	12	0
EBT	12	0	13	0	10	0	16	0	10	0
EBR	44	2	49	0	55	0	54	0	57	1
EBL	9	0	8	1	8	0	9	1	7	0
WBT	11	1	14	2	8	0	17	0	14	0
WBR	36	0	29	0	38	1	41	0	29	0
WBL	13	0	8	1	13	1	19	0	15	0

Figure 10.6. Chapel Hill Turning Movement Counts: Data Set #2, Collected on 10/27/2009

Time:	12:00 - 12:15pm		12:15 - 12:30pm		12:30 - 12:45pm		12:45 - 1:00pm		1:00 - 1:15pm	
Movement	cars	trucks	cars	trucks	cars	trucks	cars	trucks	cars	trucks
NBT	360	4	330	8	372	3	325	5	321	3
NBR	27	0	11	1	21	0	23	0	18	0
NBL	23	1	22	0	16	0	18	0	19	0
SBT	358	3	412	5	391	2	387	3	382	4
SBR	16	0	16	0	17	0	20	1	28	0
SBL	35	1	32	1	42	0	33	2	35	0
EBT	2	0	4	0	2	0	3	0	2	0
EBR	21	0	14	0	13	0	24	0	32	0
EBL	18	0	8	0	7	0	13	0	16	0
WBT	2	0	4	0	2	0	2	0	4	0
WBR	13	0	38	0	17	1	23	0	26	0
WBL	18	0	23	0	27	0	38	0	32	1

Figure 10.7. Wilmington Turning Movement Counts: Data Set #1, Collected on 7/17/2009

Time:	10:30 - 10:45am		10:45 - 11:00am		11:00 - 11:15am		11:15 - 11:30am		11:30 - 11:45am	
Movement	cars	trucks	cars	trucks	cars	trucks	cars	trucks	cars	trucks
NBT	333	2	341	4	334	3	403	3	324	5
NBR	20	0	21	0	25	0	31	0	17	0
NBL	17	0	14	0	17	0	11	0	18	0
SBT	393	4	371	4	412	3	427	2	461	0
SBR	19	0	18	0	9	0	13	0	17	0
SBL	37	0	33	0	29	0	21	0	33	1
EBT	0	0	0	0	1	0	2	0	3	0
EBR	20	1	18	0	23	0	18	0	19	0
EBL	17	0	10	0	7	0	4	0	12	0
WBT	5	0	9	0	4	0	3	0	1	0
WBR	20	0	16	0	31	0	32	0	46	0
WBL	22	0	23	0	25	1	24	0	26	0

Figure 10.8. Wilmington Turning Movement Counts: Data Set #2, Collected on 7/18/2009

Time:	7:30 - 7:45		7:45 - 8:00		8:00 - 8:15		8:15 - 8:30		8:30 - 8:45		8:45 - 9:00	
Movement	cars	trucks	cars	trucks	cars	trucks	cars	trucks	cars	trucks	cars	trucks
NBT	278	8	270	8	245	8	222	5	218	9	232	9
NBR	13	0	9	0	12	0	14	0	6	0	7	0
NBL	4	0	6	0	5	0	3	0	2	0	3	0
SBT	148	9	188	14	175	18	189	16	167	20	135	13
SBR	5	2	13	0	8	3	7	0	10	1	6	1
SBL	25	1	36	0	31	0	45	1	43	0	52	2
EBT	0	0	2	0	3	0	1	0	1	0	3	0
EBR	0	0	3	0	4	0	3	1	7	0	1	0
EBL	3	0	5	2	4	0	1	3	3	2	4	1
WBT	0	0	0	0	0	0	0	0	0	0	0	0
WBR	45	0	47	1	58	0	55	1	50	1	48	1
WBL	5	0	5	0	6	0	4	0	5	0	5	0

Figure 10.9. Walmart/Gregory onUS-17 Turning Movement Counts: Data Set #1, Collected on 7/17/2009

Time:	1:45 - 2:00		2:00 - 2:15		2:15 - 2:30		2:30 - 2:45		2:45 - 3:00		3:00 - 3:15	
Movement	cars	trucks	cars	trucks	cars	trucks	cars	trucks	cars	trucks	cars	trucks
NBT	209	2	250	4	210	5	188	4	225	5	165	4
NBR	16	0	15	0	15	0	11	0	14	0	12	0
NBL	2	0	0	0	1	0	1	0	0	0	2	0
SBT	412	2	477	0	428	3	417	2	461	0	393	2
SBR	1	0	4	0	6	0	1	0	4	0	1	0
SBL	76	0	90	1	93	0	96	0	85	0	65	0
EBT	0	0	0	0	0	0	0	0	1	0	0	0
EBR	1	0	1	0	8	0	3	0	2	0	3	0
EBL	1	0	5	0	3	0	0	0	0	0	2	0
WBT	1	0	2	0	2	0	0	0	0	0	0	0
WBR	107	0	86	0	92	0	97	0	106	1	85	0
WBL	41	0	32	0	28	0	16	0	15	0	22	0

Figure 10.10. Walmart/Gregory onUS-17 Turning Movement Counts: Data Set #2, Collected on 7/18/2009

Site	No. Obs.	Mean	St. Dev.	Median	Mode
Chapel Hill	359	50.2	4.50	50.3	49.4
Wilmington	291	51.8	4.85	51.4	46.2
US-17	153	57.4	4.40	58.0	59.3
Lanvale Rd.	308	61.7	4.23	61.3	62.6

Figure 10.11. Spot Speed Data

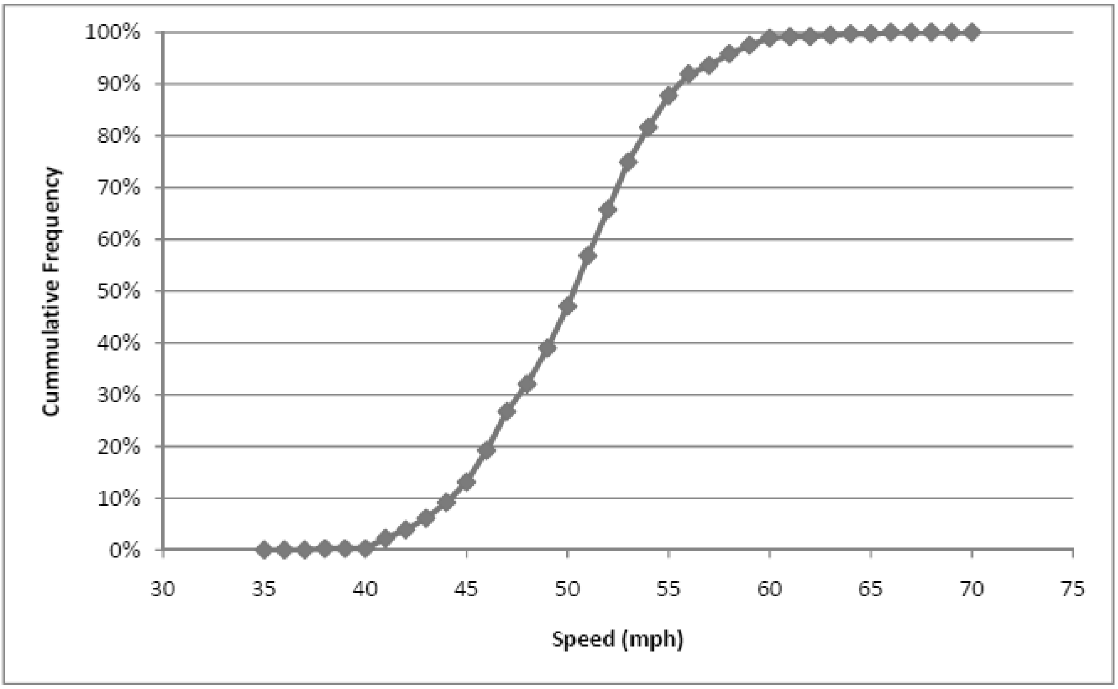

Figure 10.12. Chapel Hill Speed Distribution Curve

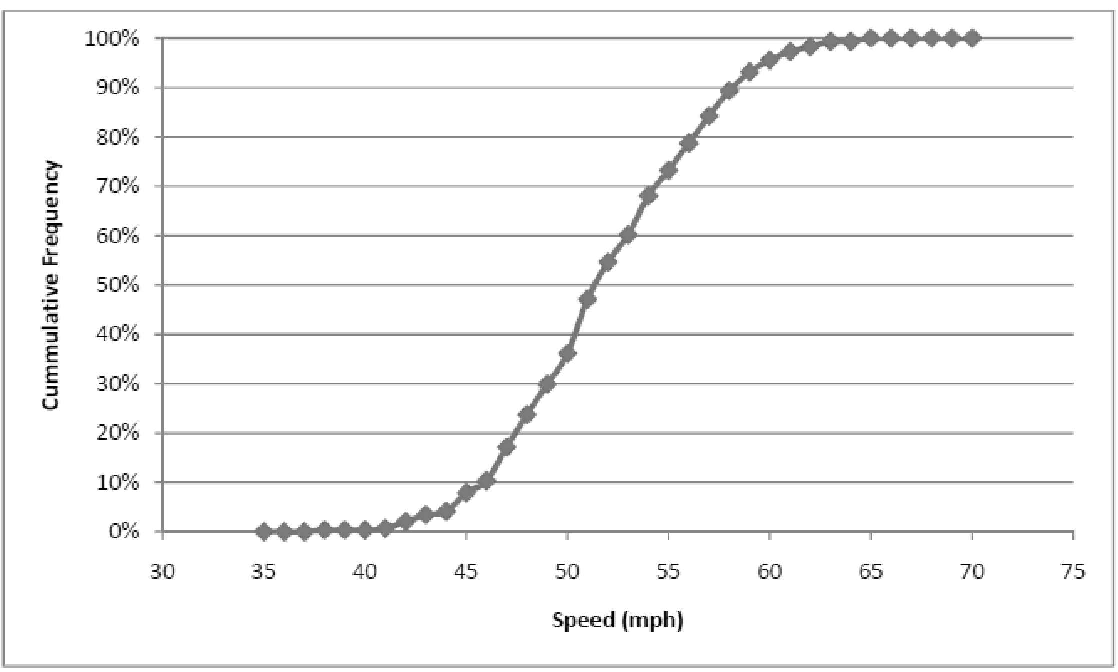

Figure 10.13. Wilmington Speed Distribution Curve

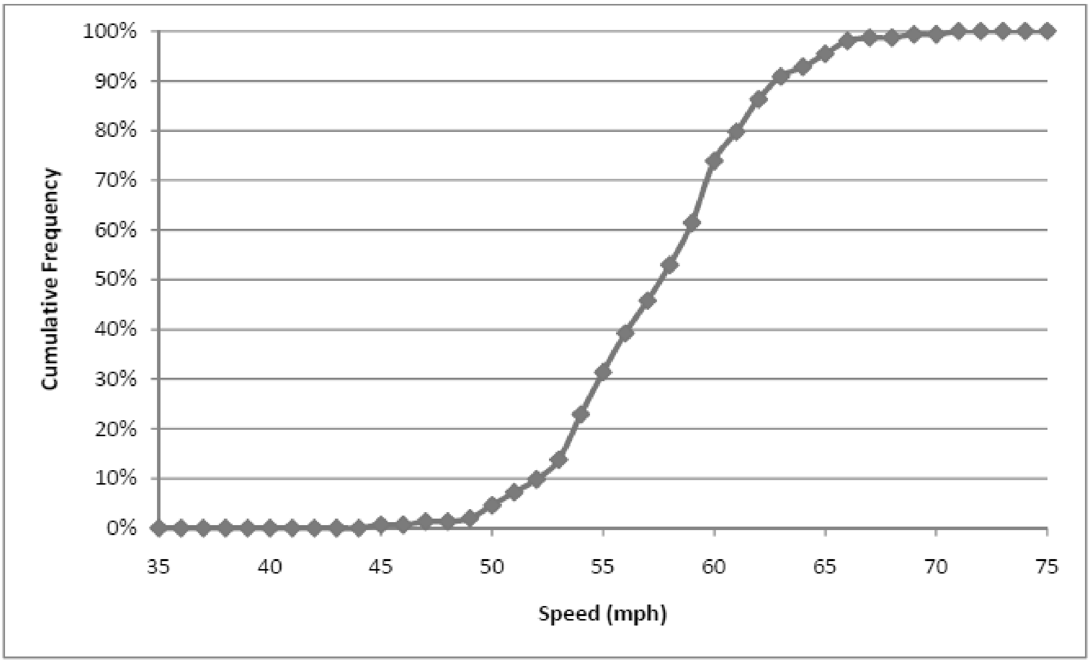

Figure 10.14. US-17 Speed Distribution Curve

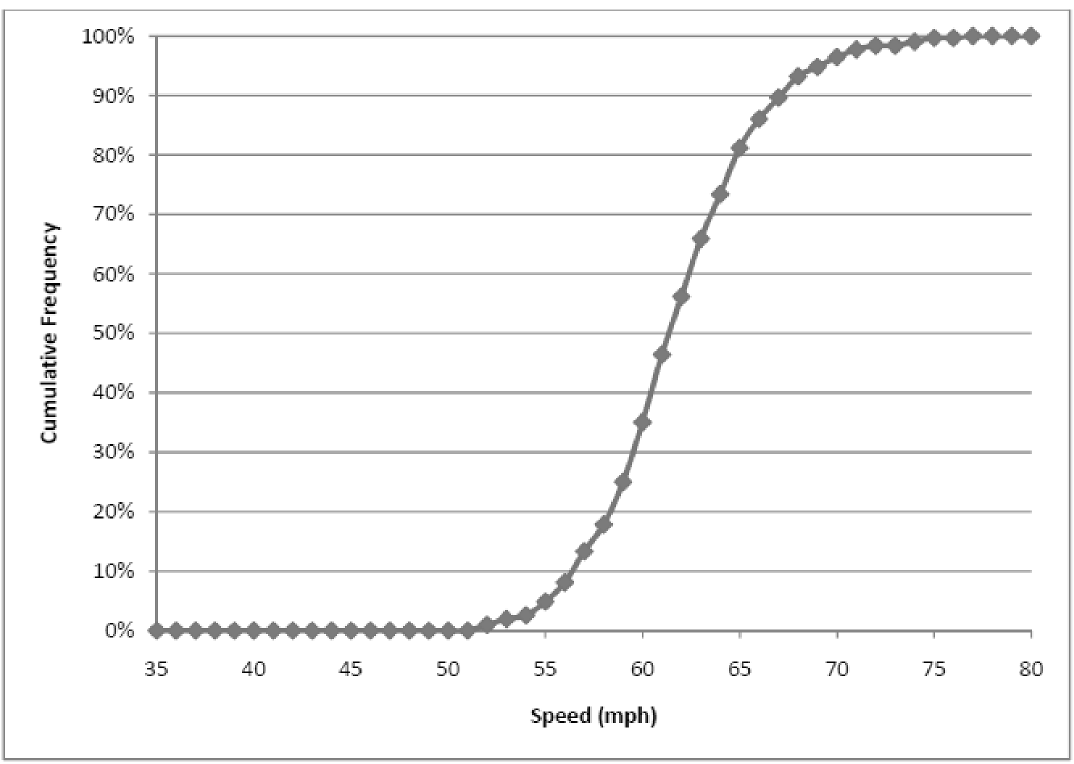

Figure 10.15. Lanvale Road Speed Distribution Curve

10.1.2 VISSIM Calibration Parameters

The VISSIM calibration parameters included vehicle inputs, speed distributions, conflict areas, reduced speed areas, and desired speed decisions for each superstreet. Figures 10.16 through 10.18 show the vehicle inputs for each superstreet. Figure 10.19 shows the speed distributions at each site. Figures 10.20 through 10.22 show the conflict area parameters, Figures 10.23 through 10.25 show the reduced speed areas, and Figures 10.26 through 10.28 show the desired speed decisions for each superstreet.

INPUT	SIMULATION PERIOD (sec)					
	0-900	900-1800	1800-2700	2700-3600	3600-4500	4500-5400
NB input (TOTAL)*	1460	1460	1920	1816	1624	1552
15-501 NB	876	876	1152	1090	974	931
Franklin NB	292	292	384	363	325	310
Ephesus Church (WBR)	292	292	384	363	325	310
SB input (TOTAL)*	1364	1364	1688	1460	1632	1472
15-501 SB	1091	1091	1350	1168	1306	1178
Sage (EBR)	136	136	169	146	163	147
Old Durham (WBL)	136	136	169	146	163	147
EB input	320	320	420	428	604	484
WB input	204	204	164	204	252	220

* NB assumptions: 60% US-15/501, 20% Franklin St, 20% Ephesus Church Rd.

* SB assumptions: 80% US-15/501, 10% Sage Rd, 10% Old Durham Rd.

Figure 10.16. Vehicle Inputs for US-15/501 Superstreet in Chapel Hill (vph)

INPUT	SIMULATION PERIOD (sec)					
	0-900	900-1800	1800-2700	2700-3600	3600-4500	4500-5400
NB input (TOTAL)*	1660	1660	1488	1648	1484	1444
421NB	1245	1245	1116	1236	1113	1083
Sanders	415	415	372	412	371	361
SB input (TOTAL)*	1652	1652	1864	1808	1784	1796
College Rd SB	1156	1156	1305	1266	1249	1257
Piner (WBL)	165	165	186	181	178	180
US-421 (EBR)	330	330	373	362	357	359
EB input	164	164	104	88	160	200
WB input	132	132	260	188	252	252

* NB assumptions: 75% US-421, 25% Sanders Dr.

* SB assumptions: 70% College Rd, 10 % Piner Rd, 15% US-421

Figure 10.17. Vehicle Inputs for US-421 Superstreet in Wilmington (vph)

INPUT	SIMULATION PERIOD (sec)						
	0-900	900-1800	1800-2700	2700-3600	3600-4500	4500-5400	5400-6300
NB (US-17)	1212	1212	1172	1080	976	940	1004
SB (US-17)	1360	1360	1640	1436	1404	1392	1132
WB (Ploof)	12	12	48	44	36	52	36
EB (Poole)	200	200	212	256	240	224	216
WB (Walmart)	200	200	212	256	240	224	216
EB (Gregory)	12	12	48	44	36	52	36
WB (West Gate)	200	200	212	256	240	224	216
EB (Grandiflora)	200	200	212	256	240	224	216
WB (Brunswick Forest Pkwy)	164	164	168	156	196	132	180
EB (Lanvale)	164	164	168	156	196	132	180
WB (Brunswick Forest Dr.)	0	0	4	4	8	8	0

Figure 10.18. Vehicle Inputs for US-17 Superstreet Corridor in Leland (vph)

Name	Input speed points	
	Speed	%
ChapelHill_mod3.	27.8	0.00
(reduced original speeds by 25%)	30.8	0.02
	33.0	0.09
	36.0	0.32
	37.5	0.47
	39.8	0.75
	41.3	0.88
	43.5	0.96
	48.0	1.00
MyrtleGrove_mod2.	30.3	0.00
(reduced original speeds by 25%)	36.8	0.11
	39.2	0.30
	42.4	0.60
	45.6	0.85
	48.0	0.95
	51.9	1.00
Leland_mod3	33.0	0.00
(reduced original speeds by 25%)	39.0	0.10
	41.3	0.31
	44.3	0.61
	46.5	0.86
	48.8	0.95
	53.3	1.00

Figure 10.19. Speed Distributions

Who yields?	Font Gap	Rear Gap	SF	Add'l stop dist.	Obsv. Adj. Routes	Anticipate routes	Avoid blocking
EBR to SBT	2	3.6	10	10	X	1	1
EBR to SBT	2	3.6	10	10	X	1	1
WBR to NBT	2	3.6	10	8	X	1	1
WBR to NBT	2	3.6	10	6	X	1	1

Figure 10.20. Chapel Hill Conflict Area Parameters

Who yields?	Font Gap	Rear Gap	SF	Add'l stop dist.	Obsv. Adj. Routes	Anticipate routes	Avoid blocking
EBR to SBT	2.0	3.6	12	5	X	1	1
EBR to SBT	2.0	3.6	12	5	X	1	1
NBL to SBT	2.0	5.5	15	23	X	1	1
NBR to SBL	2.0	3.6	12	5	X	1	1
NUT to SBT	3.0	7.1	15	23	X	1	1
SBL to NBT	2.0	5.5	15	23	X	1	1
SBR to NBL	2.0	3.6	12	5	X	1	1
SUT to NBT	3.0	7.1	15	20	X	1	1
WBR to NBT	2.0	3.6	12	5	X	1	1

Figure 10.21. Wilmington Conflict Area Parameters

Who yields?	Font Gap	Rear Gap	SF	stop dist.	Obsv. Adj. Routes	Anticipate routes	Avoid blocking
P/P: EBR to SBT	2.5	3.6	10	8	X	1	1
P/P: EBR to SBT	2.5	3.6	10	8	X	1	1
P/P: NBR to SBL	2.5	3.6	10	8	X	1	1
P/P: SBR to NBL	2.5	3.6	10	8	X	1	1
P/P: WBR to NBT	2.5	3.6	10	8	X	1	1
W/G: EBR to SBT	2.5	3.6	10	8	X	1	1
W/G: NBR to SBL	2.5	3.6	10	8	X	1	1
W/G: SBR to NBL	2.5	3.6	10	8	X	1	1
W/G: WBR to NBT	2.5	3.6	10	8	X	1	1
W/G: WBR to NBT	2.5	3.6	10	8	X	1	1
G/WG: EBR to SBT	2.5	3.6	10	8	X	1	1
G/WG: NBR to SBL	2.5	3.6	10	8	X	1	1
G/WG: SBR to NBL	2.5	3.6	10	8	X	1	1
G/WG: WBR to NBT	2.5	3.6	10	8	X	1	1
BF: NBR to SBL	2.5	3.6	10	8	X	1	1
BF: WBR to NBT	2.5	3.6	10	8	X	1	1
L/BF: EBR to SBT	2.5	3.6	10	8	X	1	1
L/BF: NBR to SBL	2.5	3.6	10	8	X	1	1
L/BF: SBR to NBL	2.5	3.6	10	8	X	1	1
L/BF: WBR to NBT	2.5	3.6	10	8	X	1	1
L/BF: WBR to NBT	2.5	3.6	10	8	X	1	1

Figure 10.22. US-17 Conflict Area Parameters

No.	Name	Speed Dist car (min, max)	Speed Dist HGV (min, max)
1	NBR	2 (15, 20)	2 (15, 20)
2	NBR(2)	2 (15, 20)	2 (15, 20)
3	WBR_outer	2 (15, 20)	2 (15, 20)
4	WBR_inner	2 (15, 20)	2 (15, 20)
5	NUT_inner approach	2 (15, 20)	2 (15, 20)
6	NUT_outer approach	2 (15, 20)	2 (15, 20)
7	SBR	2 (15, 20)	2 (15, 20)
8	EBR_inner	2 (15, 20)	2 (15, 20)
9	EBR_outer	2 (15, 20)	2 (15, 20)
10	SUT_inner approach	2 (15, 20)	2 (15, 20)
11	SUT_outer approach	2 (15, 20)	2 (15, 20)
12	NUT_inner	4 (9, 14)	4 (9, 14)
13	NUT_outer	4 (9, 14)	4 (9, 14)
14	SUT_inner	4 (9, 14)	4 (9, 14)
15	SUT_outer	4 (9, 14)	4 (9, 14)
16	NUT_inner approach1	2 (15, 20)	2 (15, 20)
17	NUT_outer approach1	2 (15, 20)	2 (15, 20)

Figure 10.23. Chapel Hill Reduced Speed Areas

No.	Name	Speed Dist car (min, max)	Speed Dist HGV (min, max)
1	NBR	3 (15, 20)	3 (15, 20)
2	NBL	3 (15, 20)	3 (15, 20)
3	SBR	3 (15, 20)	3 (15, 20)
4	SBL	3 (15, 20)	3 (15, 20)
5	North UT	4 (9, 14)	4 (9, 14)
6	South UT	4 (9, 14)	4 (9, 14)
7	WBR	3 (15, 20)	3 (15, 20)
8	WBR-2	3 (15, 20)	3 (15, 20)
9	EBR	3 (15, 20)	3 (15, 20)
10	EBR-2	3 (15, 20)	3 (15, 20)
11	Piner-WBL	3 (15, 20)	3 (15, 20)
12	North UT (1)	3 (15, 20)	3 (15, 20)
13	WBR approach	3 (15, 20)	3 (15, 20)
14	WBR-2 approach	3 (15, 20)	3 (15, 20)
15	SBR approach	3 (15, 20)	3 (15, 20)
16	SBL approach	3 (15, 20)	3 (15, 20)
17	NBL approach	3 (15, 20)	3 (15, 20)
18	NBR approach	3 (15, 20)	3 (15, 20)
19	EBR approach	3 (15, 20)	3 (15, 20)
20	EBR-2 approach	3 (15, 20)	3 (15, 20)
21	South UT approach	3 (15, 20)	3 (15, 20)

Figure 10.24. Wilmington Reduced Speed Areas

No.	Name	Speed Dist car (min, max)	Speed Dist HGV (min, max)
1	P/P WBR	3 (15, 20)	3 (15, 20)
2	P/P NBR	3 (15, 20)	3 (15, 20)
3	P/P SBL	3 (15, 20)	3 (15, 20)
4	P/P NBL	3 (15, 20)	3 (15, 20)
5	P/P NBL	3 (15, 20)	3 (15, 20)
6	P/P SBR	3 (15, 20)	3 (15, 20)
7	P/P EBR	3 (15, 20)	3 (15, 20)
8	P/P EBR	3 (15, 20)	3 (15, 20)
9	P/P EBR	3 (15, 20)	3 (15, 20)
10	P/P NUT	3 (15, 20)	3 (15, 20)
11	P/P SUT approach2	3 (15, 20)	3 (15, 20)
12	P/P SUT approach2	3 (15, 20)	3 (15, 20)
13	W/G NUT	3 (15, 20)	3 (15, 20)
14	W/G SBR	3 (15, 20)	3 (15, 20)
15	W/G SBL	3 (15, 20)	3 (15, 20)
16	W/G SBL	3 (15, 20)	3 (15, 20)
17	W/G NBL	3 (15, 20)	3 (15, 20)
18	W/G WBR	3 (15, 20)	3 (15, 20)
19	W/G WBR	3 (15, 20)	3 (15, 20)
20	W/G NBR	3 (15, 20)	3 (15, 20)
21	W/G EBR	3 (15, 20)	3 (15, 20)
22	W/G SUT approach	3 (15, 20)	3 (15, 20)
23	G/WG NUT approach	3 (15, 20)	3 (15, 20)
24	G/WG NUT approach	3 (15, 20)	3 (15, 20)
25	G/WG WBR	3 (15, 20)	3 (15, 20)
26	G/WG WBR	3 (15, 20)	3 (15, 20)
27	G/WG SBL	3 (15, 20)	3 (15, 20)
28	G/WG NBR	3 (15, 20)	3 (15, 20)
29	G/WG NBL	3 (15, 20)	3 (15, 20)
30	G/WG SBR	3 (15, 20)	3 (15, 20)
31	G/WG EBR	3 (15, 20)	3 (15, 20)
32	G/WG EBR	3 (15, 20)	3 (15, 20)
33	G/WG SUT approach	3 (15, 20)	3 (15, 20)
34	G/WG SUT approach	3 (15, 20)	3 (15, 20)
35	BF NUT approach	3 (15, 20)	3 (15, 20)
36	BF SBL	3 (15, 20)	3 (15, 20)

No.	Name	Speed Dist car (min, max)	Speed Dist HGV (min, max)
37	BF SBL	3 (15, 20)	3 (15, 20)
38	BF WBR	3 (15, 20)	3 (15, 20)
39	BF WBR	3 (15, 20)	3 (15, 20)
40	BF NBR	3 (15, 20)	3 (15, 20)
41	L/BF NUT approach	3 (15, 20)	3 (15, 20)
42	L/BF NUT approach	3 (15, 20)	3 (15, 20)
43	L/BF WBR	3 (15, 20)	3 (15, 20)
44	L/BF WBR	3 (15, 20)	3 (15, 20)
45	L/BF WBR	3 (15, 20)	3 (15, 20)
46	L/BF SBL	3 (15, 20)	3 (15, 20)
47	L/BF SBL	3 (15, 20)	3 (15, 20)
48	L/BF NBR	3 (15, 20)	3 (15, 20)
49	L/BF NBL	3 (15, 20)	3 (15, 20)
50	L/BF SBR	3 (15, 20)	3 (15, 20)
51	L/BF EBR	3 (15, 20)	3 (15, 20)
52	L/BF SUT approach	3 (15, 20)	3 (15, 20)
53	W/G SBR approach	3 (15, 20)	3 (15, 20)
54	W/G NBR approach	3 (15, 20)	3 (15, 20)
55	G/WG NBR approach	3 (15, 20)	3 (15, 20)
56	L/BF SBR approach	3 (15, 20)	3 (15, 20)
57	L/BF SUT	6 (9, 14)	6 (9, 14)
58	L/BF NUT	6 (9, 14)	6 (9, 14)
59	L/BF NUT	6 (9, 14)	6 (9, 14)
60	BF NUT	6 (9, 14)	6 (9, 14)
61	G/WG SUT	6 (9, 14)	6 (9, 14)
62	G/WG SUT	6 (9, 14)	6 (9, 14)
63	G/WG NUT	6 (9, 14)	6 (9, 14)
64	G/WG NUT	6 (9, 14)	6 (9, 14)
65	W/G SUT	6 (9, 14)	6 (9, 14)
66	W/G SBL approach	3 (15, 20)	3 (15, 20)
67	W/G SBL approach	3 (15, 20)	3 (15, 20)
68	P/P SUT approach	3 (15, 20)	3 (15, 20)
69	P/P SUT approach	3 (15, 20)	3 (15, 20)
70	P/P SUT	6 (9, 14)	6 (9, 14)
71	P/P SUT	6 (9, 14)	6 (9, 14)
72	P/P SBL approach	3 (15, 20)	3 (15, 20)

Figure 10.25. US-17 Reduced Speed Areas

No.	Name	Speed Dist car (min, max)	Speed Dist HGV (min, max)
1	Europa WB	7 (20,30)	7 (20,30)
2	Europa EB	7 (20,30)	7 (20,30)
3	Europa WBR	6 (29.6, 51.2)	6 (29.6, 51.2)
4	Europa WBR	6 (29.6, 51.2)	6 (29.6, 51.2)
5	Erwin WB	50 (29.8, 36.0)	50 (29.8, 36.0)
6	Erwin EB	50 (29.8, 36.0)	50 (29.8, 36.0)
7	Erwin EBR	6 (29.6, 51.2)	6 (29.6, 51.2)
8	Erwin EBR	6 (29.6, 51.2)	6 (29.6, 51.2)
9	NUT approach	8 (25, 35)	8 (25, 35)
10	NUT approach	8 (25, 35)	8 (25, 35)
11	15-501SB after NUT	6 (29.6, 51.2)	6 (29.6, 51.2)
12	15-501SB after NUT	6 (29.6, 51.2)	6 (29.6, 51.2)
13	SUT approach	8 (25, 35)	8 (25, 35)
14	15-501NB after SUT	6 (29.6, 51.2)	6 (29.6, 51.2)
15	15-501NB after SUT	6 (29.6, 51.2)	6 (29.6, 51.2)
16	NBR lane	8 (25, 35)	8 (25, 35)

Figure 10.26. Chapel Hill Desired Speed Decisions

No.	Name	Speed Dist car (min, max)	Speed Dist HGV (min, max)
1	Myrtle Gardens WB	30 (18.6, 21.7)	30 (18.6, 21.7)
2	Myrtle Gardens WB	30 (18.6, 21.7)	30 (18.6, 21.7)
3	Service Rd EB	7 (25, 33)	7 (25, 33)
4	Piner WB	60 (36, 42.3)	60 (36, 42.3)
5	Sanders EB	60 (36, 42.3)	60 (36, 42.3)
6	MyrtleGardens WBR	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
7	MyrtleGardens WBR	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
8	Piner WBL	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
9	Piner WBL	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
10	Service Rd EBR	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
11	Service Rd EBR	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
12	Sanders EBL	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
13	Sanders EBL	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
14	NUT approach	8 (25, 35)	8 (25, 35)
15	NBL approach	8 (25, 35)	8 (25, 35)
16	SBL approach	8 (25, 35)	8 (25, 35)
17	SUT approach	8 (25, 35)	8 (25, 35)
18	MyrtleGardens EB	30 (18.6, 21.7)	30 (18.6, 21.7)
19	Service Rd WB	7 (25, 33)	7 (25, 33)
20	US 421 after NUT	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
21	US 421 after NUT	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
22	US 421 after NUT	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
23	US 421 after SUT	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)
24	US 421 after SUT	MG_mod2(30.3, 51.9)	MG_mod2(30.3, 51.9)

Figure 10.27. Wilmington Desired Speed Decisions

No.	Name	Speed Dist car (min, max)	Speed Dist HGV (min, max)
1	Ploof WB	50 (29.8, 36.0)	50 (29.8, 36.0)
2	Poole EB	50 (29.8, 36.0)	50 (29.8, 36.0)
3	Poole EB	50 (29.8, 36.0)	50 (29.8, 36.0)
4	Gregory EB	9 (25, 35)	9 (25, 35)
5	Grandiflora EB	50 (29.8, 36.0)	50 (29.8, 36.0)
6	Grandiflora EB	50 (29.8, 36.0)	50 (29.8, 36.0)
7	WestGate WB	50 (29.8, 36.0)	50 (29.8, 36.0)
8	WestGate WB	50 (29.8, 36.0)	50 (29.8, 36.0)
9	BrunswickForest WB	50 (29.8, 36.0)	50 (29.8, 36.0)
10	BrunswickForest WB	50 (29.8, 36.0)	50 (29.8, 36.0)
11	BF#2 WB	40 (24.9, 28.0)	40 (24.9, 28.0)
12	BF#2 WB	40 (24.9, 28.0)	40 (24.9, 28.0)
13	BF#2 WB	40 (24.9, 28.0)	40 (24.9, 28.0)
14	Lanvale EB	50 (29.8, 36.0)	50 (29.8, 36.0)
15	Walmart WB	8 (20, 25)	8 (20, 25)
16	Walmart WB	8 (20, 25)	8 (20, 25)
17	Ploof WBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
18	Ploof WBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
19	Poole EBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
20	Poole EBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
21	P/P SUT	9 (25, 35)	9 (25, 35)
22	P/P SUT	9 (25, 35)	9 (25, 35)
23	Walmart WBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
24	Walmart WBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
25	Gregory EBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
26	Gregory EBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
27	WestGate WBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
28	WestGate WBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
29	Grandiflora EBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
30	Grandiflora EBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
31	BrunswickForeset WBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
32	BF#2 WBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
33	BF#2 WBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
34	BF#2 WBR	9 (25, 35)	9 (25, 35)
35	BF#2 WBR	9 (25, 35)	9 (25, 35)
36	Lanvale EBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
37	Lanvale EBR	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
38	Lanvale SUT	9 (25, 35)	9 (25, 35)
39	BF NUT	9 (25, 35)	9 (25, 35)
40	BF NUT to U-17SB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
41	BF NUT to U-17SB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
42	L/BF NUT to US-17SB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
43	L/BF NUT to US-17SB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
44	L/BF SUT to US-17NB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
45	L/BF SUT to US-17NB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
46	G/WG SUT to US-17NB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
47	G/WG SUT to US-17NB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
48	G/WG NUT to US-17SB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
49	G/WG NUT to US-17SB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
50	W/G SUT to US-17NB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
51	W/G SUT to US-17NB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)

Figure 10.28. US-17 Desired Speed Decisions

No.	Name	Speed Dist car (min, max)	Speed Dist HGV (min, max)
52	W/G NUT to US-17SB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
53	W/G NUT to US-17SB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
54	P/P SUT to US-17NB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
55	P/P SUT to US-17NB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
56	P/P NUT to US-17SB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
57	P/P NUT to US-17SB	Leland_mod2 (35.2, 56.8)	Leland_mod2 (35.2, 56.8)
58	P/P NUT	9 (25, 35)	9 (25, 35)
59	W/G NUT	9 (25, 35)	9 (25, 35)
60	W/G SUT	9 (25, 35)	9 (25, 35)
61	G/WG NUT	9 (25, 35)	9 (25, 35)
62	G/WG NUT	9 (25, 35)	9 (25, 35)
63	G/WG SUT	9 (25, 35)	9 (25, 35)
64	G/WG SUT	9 (25, 35)	9 (25, 35)
65	Ploof EB	50 (29.8, 36.0)	50 (29.8, 36.0)
66	Poole WB	50 (29.8, 36.0)	50 (29.8, 36.0)
67	Poole WB	50 (29.8, 36.0)	50 (29.8, 36.0)
68	Walmart EB	8 (20, 25)	8 (20, 25)
69	Walmart EB	8 (20, 25)	8 (20, 25)
70	Gregory WB	9 (25, 35)	9 (25, 35)
71	WestGate EB	50 (29.8, 36.0)	50 (29.8, 36.0)
72	WestGate EB	50 (29.8, 36.0)	50 (29.8, 36.0)
73	Grandiflora WB	50 (29.8, 36.0)	50 (29.8, 36.0)
74	Grandiflora WB	50 (29.8, 36.0)	50 (29.8, 36.0)
75	BrunswickForest EB	50 (29.8, 36.0)	50 (29.8, 36.0)
76	BrunswickForest EB	50 (29.8, 36.0)	50 (29.8, 36.0)
77	BF#2 EB	40 (24.9, 28.0)	40 (24.9, 28.0)
78	BF#2 EB	40 (24.9, 28.0)	40 (24.9, 28.0)
79	Lanvale WB	50 (29.8, 36.0)	50 (29.8, 36.0)
80	P/P NUT to US-17SB	50 (29.8, 36.0)	50 (29.8, 36.0)
81	W/G NBR	9 (25, 35)	9 (25, 35)
82	W/G SBR	9 (25, 35)	9 (25, 35)
83	P/P NBT	9 (25, 35)	9 (25, 35)
84	P/P SBR	9 (25, 35)	9 (25, 35)
85	G/WG NBR	9 (25, 35)	9 (25, 35)
86	G/WG SBR	9 (25, 35)	9 (25, 35)
87	BF NBR	9 (25, 35)	9 (25, 35)
88	L/BF NBR	9 (25, 35)	9 (25, 35)
89	L/BF SBR	9 (25, 35)	9 (25, 35)
90	L/BF NBL	9 (25, 35)	9 (25, 35)
91	L/BF SBL	9 (25, 35)	9 (25, 35)
92	L/BF SBL	9 (25, 35)	9 (25, 35)
93	BF SBL	9 (25, 35)	9 (25, 35)
94	BF SBL	9 (25, 35)	9 (25, 35)
95	G/WG NBL	9 (25, 35)	9 (25, 35)
96	G/WG SBL	9 (25, 35)	9 (25, 35)
97	W/G NBL	9 (25, 35)	9 (25, 35)
98	W/G SBL	9 (25, 35)	9 (25, 35)
99	W/G SBL	9 (25, 35)	9 (25, 35)
100	P/P NBL	9 (25, 35)	9 (25, 35)
101	P/P NBL	9 (25, 35)	9 (25, 35)
102	P/P SBL	9 (25, 35)	9 (25, 35)

Figure 10.28. continued

10.1.3 VISSIM Calibration and Validation Results

The VISSIM results are split into two parts: calibration and validation. Figure 10.29 shows the calibration results by movement and Figure 10.30 shows the validation results by movement.

						SET 1		SET 2		SET3	
Site	**Date**	**Road**	**Movement**	**# runs**	**Field**	**VISSIM**	**% Diff.**	**VISSIM**	**% Diff.**	**VISSIM**	**% Diff.**
Chapel Hill	10/27/2009	minor	WBL	2	235.2	119.1	-49.3%	129.2	-45.1%	137.10	-41.7%
	7:30-9:00am		WBR	1	76.8	54.1	-29.6%	56.8	-26.0%	63.31	-17.6%
	(data set #1)		WBT	2	168.0	118.0	-29.8%	130.6	-22.3%	128.61	-23.4%
		minor	EBL	2	240.9	136.3	-43.4%	141.3	-41.3%	142.04	-41.0%
			EBR	1	78.0	63.2	-18.9%	66.6	-14.7%	66.53	-14.7%
			EBT	2	199.2	126.3	-36.6%	132.0	-33.7%	124.07	-37.7%
		major	NBL	2	173.4	102.2	-41.1%	112.0	-35.4%	119.19	-31.3%
			NBR	1	42.0	27.3	-35.0%	28.0	-33.3%	32.37	-22.9%
			NBT	2	43.5	44.0	1.2%	46.3	6.3%	51.13	17.5%
		major	SBL	2	180.3	129.4	-28.2%	133.7	-25.8%	125.54	-30.4%
			SBR	1	34.8	52.5	50.9%	55.1	58.4%	57.03	63.9%
			SBT	2	39.0	61.5	57.6%	64.9	66.4%	64.48	65.3%
Myrtle Grove	7/17/2009	minor	WBL	6	158.0	110.8	-29.9%	113.9	-27.9%	126.13	-20.2%
	12:00-1:30pm		WBR	2	89.4	41.0	-54.2%	40.9	-54.2%	47.01	-47.4%
	(data set #1)		WBT								
		minor	EBL								
			EBR	2	78.0	51.8	-33.6%	50.9	-34.7%	55.46	-28.9%
			EBT	5	141.8	103.0	-27.4%	102.8	-27.6%	102.58	-27.7%
		major	NBL	5	105.0	53.9	-48.7%	53.1	-49.4%	51.59	-50.9%
			NBR	2	39.9	39.8	-0.2%	39.4	-1.2%	37.15	-6.9%
			NBT	2	45.9	55.3	20.5%	54.5	18.8%	50.51	10.0%
		major	SBL								
			SBR	2	42.0	33.8	-19.5%	34.9	-16.9%	35.07	-16.5%
			SBT	2	58.2	53.6	-7.8%	52.9	-9.1%	53.02	-8.9%
US-17 corridor	7/17/2009	minor	WBL	5	124.8	82.0	-34.3%	91.9	-26.3%	124.32	-0.4%
Walmart	7:30-9:00am		WBR	4	49.4	39.8	-19.4%	42.6	-13.6%	48.44	-1.8%
	(data set #1)		WBT								
		minor	EBL								
			EBR	2	42.0	32.8	-21.9%	34.1	-18.8%	31.03	-26.1%
			EBT	6	139.0	76.7	-44.9%	81.9	-41.1%	105.67	-24.0%
		major	NBL	5	75.7	54.3	-28.3%	59.3	-21.7%	80.21	5.9%
			NBR	2	38.4	24.0	-37.6%	26.9	-30.1%	27.39	-28.7%
			NBT	2	41.1	38.8	-5.5%	43.6	6.0%	37.67	-8.3%
		major	SBL	1	78.0	48.7	-37.6%	52.8	-32.3%	65.89	-15.5%
			SBR	3	24.0	22.6	-5.8%	24.2	1.0%	23.32	-2.8%
			SBT	2	34.2	30.9	-9.5%	36.8	7.6%	34.89	2.0%
US-17 corridor	7/17/2009	minor	WBL	1	115.8	0.0		90.7	-21.7%	61.83	-46.6%
Lanvale Rd.	5:00-6:30pm		WBR	2	76.2	0.0		40.6	-46.7%	38.89	-49.0%
	(data set #1)		WBT	2	165.9	0.0		56.8	-65.8%	104.08	-37.3%
		minor	EBL	6	156.8	86.2	-45.0%	98.6	-37.1%	127.27	-18.8%
			EBR	2	61.5	43.5	-29.3%	48.1	-21.8%	49.18	-20.0%
			EBT	2	124.5	66.9	-46.3%	68.4	-45.1%	94.36	-24.2%
		major	NBL	5	94.9	60.9	-35.8%	67.6	-28.7%	90.38	-4.8%
			NBR	2	43.8	0.0		32.0	-27.0%	36.19	-17.4%
			NBT								
		major	SBL	2	101.4	43.6	-57.0%	50.7	-50.0%	77.8	-23.3%
			SBR	2	42.3	28.0	-33.8%	33.8	-20.2%	28.12	-33.5%
			SBT	4	45.2	43.3	-4.1%	52.2	15.5%	51.16	13.3%
		total no. field runs:		110	mean difference:		-23.7%		-20.6%		-16.0%

*Very low input volumes

*excluding values because no TT runs conducted in field for data set #1

Figure 10.29. Calibration Results by Movement

						SET 4		SET 5	
Site	**Date**	**Road**	**Movement**	**# runs**	**Field**	**VISSIM**	**% Diff.**	**VISSIM**	**% Diff.**
Chapel Hill	10/27/2009	minor	WBL	2	235.2	137.10	-41.7%	138.92	-40.9%
	7:30-9:00am		WBR	1	76.8	63.31	-17.6%	63.85	-16.9%
	(data set #1)		WBT	2	168.0	128.61	-23.4%	128.93	-23.3%
		minor	EBL	2	240.9	142.04	-41.0%	143.82	-40.3%
			EBR	1	78.0	66.53	-14.7%	67.58	-13.4%
			EBT	2	199.2	124.07	-37.7%	124.24	-37.6%
		major	NBL	2	173.4	119.19	-31.3%	119.36	-31.2%
			NBR	1	42.0	32.37	-22.9%	32.31	-23.1%
			NBT	2	43.5	51.13	17.5%	51.32	18.0%
		major	SBL	2	180.3	125.54	-30.4%	126.26	-30.0%
			SBR	1	34.8	57.03	63.9%	56.77	63.1%
			SBT	2	39.0	64.48	65.3%	64.52	65.4%
Myrtle Grove	7/17/2009	minor	WBL	6	158.0	126.13	-20.2%	132.56	-16.1%
	12:00-1:30pm		WBR	2	89.4	47.01	-47.4%	46.86	-47.6%
	(data set #1)		WBT						
		minor	EBL						
			EBR	2	78.0	55.46	-28.9%	55.07	-29.4%
			EBT	5	141.8	102.58	-27.7%	111.60	-21.3%
		major	NBL	5	105.0	51.59	-50.9%	58.36	-44.4%
			NBR	2	39.9	37.15	-6.9%	39.58	-0.8%
			NBT	2	45.9	50.51	10.0%	50.9	10.9%
		major	SBL						
			SBR	2	42.0	35.07	-16.5%	36.92	-12.1%
			SBT	2	58.2	53.02	-8.9%	53.89	-7.4%
US-17 corridor	7/17/2009	minor	WBL	5	124.8	123.92	-0.7%	129.71	3.9%
Walmart	7:30-9:00am		WBR	4	49.4	48.71	-1.3%	48.84	-1.0%
	(data set #1)		WBT						
		minor	EBL						
			EBR	2	42.0	31.67	-24.6%	34.8	-17.1%
			EBT	6	139.0	105.19	-24.3%	106.17	-23.6%
		major	NBL	5	75.7	80.56	6.4%	79.24	4.6%
			NBR	2	38.4	28.58	-25.6%	27.22	-29.1%
			NBT	2	41.1	37.77	-8.1%	38.25	-6.9%
		major	SBL	1	78.0	65.92	-15.5%	65.6	-15.9%
			SBR	3	24.0	22.86	-4.8%	23.67	-1.4%
			SBT	2	34.2	34.94	2.2%	34.86	1.9%
US-17 corridor	7/17/2009	minor	WBL	1	115.8	61.3	-47.1%	60.54	-47.7%
Lanvale Rd.	5:00-6:30pm		WBR	2	76.2	40.31	-47.1%	40.28	-47.1%
	(data set #1)		WBT	2	165.9	102.33	-38.3%	102.78	-38.0%
		minor	EBL	6	156.8	127.21	-18.9%	117.87	-24.8%
			EBR	2	61.5	50.29	-18.2%	50.26	-18.3%
			EBT	2	124.5	93.48	-24.9%	85.58	-31.3%
		major	NBL	5	94.9	90.81	-4.3%	88.54	-6.7%
			NBR	2	43.8	35.59	-18.7%	33.76	-22.9%
			NBT						
		major	SBL	2	101.4	79.97	-21.1%	81.27	-19.9%
			SBR	2	42.3	28.65	-32.3%	27.8	-34.3%
			SBT	4	45.2	51.26	13.5%	52.64	16.6%
		total no. field runs:		110			-15.8%		-15.2%

*excluding values because no TT runs conducted in field for data set #1

Figure 10.29. continued

Site	Date	Road	Movement	# runs	Field	SET 1 VISSIM	SET 1 % Diff.
Chapel Hill	10/27/2009 11:30-1:00pm (data set #2)	minor	WBL	2	138.9	132	-4.8%
			WBR	2	62.4	63.62	2.0%
			WBT	2	137.4	124.52	-9.4%
		minor	EBL	2	90.0	146.71	63.0%
			EBR	2	81.9	60.89	-25.7%
			EBT	3	131.4	121.49	-7.5%
		major	NBL	3	99.2	117.89	18.8%
			NBR	2	39.0	32.33	-17.1%
			NBT	2	53.1	51.45	-3.1%
		major	SBL	2	115.5	124.34	7.7%
			SBR	2	41.1	56.93	38.5%
			SBT	2	59.4	62.41	5.1%
Myrtle Grove	7/18/2009 10:30-11:45am (data set #2)	minor	WBL	0		131.6	
			WBR	2	81.0	48.7	-39.9%
			WBT	6	103.4	116.0	12.2%
		minor	EBL	6	143.0	122.4	-14.4%
			EBR	2	110.4	55.7	-49.5%
			EBT	0		118.9	
		major	NBL	0		58.7	
			NBR	2	53.1	39.2	-26.1%
			NBT	2	48.0	51.0	6.3%
		major	SBL	6	56.5	73.4	29.9%
			SBR	2	43.5	36.6	-15.8%
			SBT	2	52.5	54.1	3.1%
US-17 corridor Walmart	7/18/2009 1:45-3:15pm (data set #2)	minor	WBL	1	100.2	143.22	42.9%
			WBR	2	60.9	59.97	-1.5%
			WBT	4	125.6	127.65	1.7%
		minor	EBL	5	147.2	131.98	-10.4%
			EBR	2	74.7	40.34	-46.0%
			EBT	1	157.2	119.14	-24.2%
		major	NBL	1	42.0	82.00	95.2%
			NBR	2	38.4	35.75	-6.9%
			NBT	3	54.0	40.46	-25.1%
		major	SBL	5	75.1	64.77	-13.8%
			SBR	2	23.4	25.35	8.3%
			SBT	3	35.6	37.47	5.3%
US-17 corridor Lanvale Rd.	**NO 2nd DATA SET** (volume inputs from 1st data set, so compare to TT from 1st data set)	minor	WBL	1	115.8	61.63	-46.8%
			WBR	2	76.2	40.07	-47.4%
			WBT	2	165.9	104.04	-37.3%
		minor	EBL	6	156.8	135.43	-13.6%
			EBR	2	61.5	58.38	-5.1%
			EBT	2	124.5	94.91	-23.8%
		major	NBL	5	94.9	97.21	2.4%
			NBR	2	43.8	36.99	-15.5%
			NBT				
		major	SBL	2	101.4	71.3	-29.7%
			SBR	2	42.3	43.62	3.1%
			SBT	4	45.2	54.24	20.1%
		total no. field runs:		117	mean difference:		-4.4%

*excluding values because no TT runs conducted in field for data set #1

Figure 10.30. Validation Results by Movement

10.2 Safety Analysis

10.2.1 Site Information

Table 10.1 shows the location of each superstreet site and its respective comparison sites.

Table 10.1. Comparison Sites

Intersection	Main Road	Cross Street(s)	County
Signalized sites			
Superstreet	US-15/501	Erwin Rd./Europa Dr.	Orange
Comparison	US-15/501	S. Estes Dr./SR-1750	Orange
Comparison	US-15/501	Sage Rd./Old Durham Rd.	Orange
Superstreet	US-17	Leland corridor (Ploof Rd./Olde Waterford Way, West Gate Dr./Grandiflora Dr., Gregory Rd.)	Brunswick
Comparison	NC-132	Bragg Dr.	New Hanover
Comparison	NC-132	Pinecliff Dr.	New Hanover
Comparison	US-117	Holly Tree Rd.	New Hanover
Superstreet	US-421	SR-2501/Carolina Beach Rd.	New Hanover
Comparison	US-421	Sanders Rd./SR-1187	New Hanover
Comparison	US-421	Halyburton Memorial Pkwy./Veterans. Dr.	New Hanover
Unsignalized sites			
Superstreet	US-17	Mt. Pisgah Rd. (SR-1130)/Sellers Rd. (SR-1344)	Brunswick
Comparison	US-17	Smith Ave./SR-1357	Brunswick
Comparison	US-17	NC-211/Green Swamp Rd.	Brunswick
Superstreet	US-17	Ocean Isle Beach Rd./SR-1184	Brunswick
Comparison	US-17	Mintz Cemetery Rd./SR-1318	Brunswick
Comparison	US-17	Cumbee Rd./SR-1131	Brunswick
Comparison	US-17	Red Bug Rd./SR-1136	Brunswick
Superstreet	US-74/23	Red Bank Rd. (SR-1155)/Walker Rd. (SR-1157) and Old Balsam Rd. (SR-1243)/Balsam Ridge Rd. (SR-1158)	Haywood
Comparison	US-74/23	Mineral Springs Rd./SR-1456	Jackson
Comparison	US-74/23	Hidden Valley Rd./SR-1788	Jackson
Superstreet	US-74/441	Barkers Creek Rd. (SR-1392)/Wilmont Rd.	Jackson
Comparison	US-74/23	Timberlake Rd./SR-1156	Haywood
Comparison	US-23/441	Mockingbird Ln. (SR-1360)/Macktown Gap Rd. (SR-1377)	Jackson
Superstreet	US-74/441	Dicks Creek Rd./SR-1388	Jackson
Comparison	US-74/23	Blanton Branch Rd./SR-1709	Jackson
Comparison	US-74/441	Wilmont Cemetery Rd./SR-1534	Jackson
Comparison	US-74/441	Bradley Branch Rd./SR-1404	Jackson

Table 10.1. continued

Intersection	Main Road	Cross Street(s)	County
Superstreet	US-74	Elmore Rd./SR-1321	Scotland
Comparison	US-74	Murdock St. (SR-1251)/Church St. (SR-1312)	Scotland
Comparison	US-401	Orlando St.	Scotland
Superstreet	US-74/76	Blacksmith Rd./SR-1800	Columbus
Comparison	NC-214	Spearman Rd./SR-1806	Columbus
Comparison	NC-214	9th St.	Columbus
Superstreet	NC-24	Haw Branch Rd. (SR-1230)	Onslow
Comparison	NC-24	Koonce Fork Rd./SR-1238	Onslow
Comparison	NC-24	Blizzardtown Rd./SR-1702	Duplin
Superstreet	US-1	Camp Easter Rd./Aiken Rd. (SR-1853)	Moore
Comparison	US-1	Causey Rd. (SR-2025)/Grant Rd. (SR-1869)	Moore
Comparison	US-1	Valleyview Rd./SR-1857	Moore
Superstreet	NC-87	Peanut Plant Rd. (SR-1150)	Bladen
Comparison	NC-87	Cromartie Rd./SR-1155	Bladen
Comparison	NC-87	Martin Luther King Dr./SR-1145	Bladen
Superstreet	NC-87/24	N. 2nd St.	Cumberland
Comparison	NC-210	Weaver St.	Cumberland
Comparison	NC-210	N. 5th St.	Cumberland
Superstreet	NC-87	School Rd./Butler Nursery Rd. (SR-2233)	Cumberland
Comparison	NC-87	County Line Rd./SR-2257	Cumberland
Comparison	NC-87	Tobermory Rd./SR-1303	Bladen
Comparison	NC-24	Downing Rd./SR-1834	Cumberland
Superstreet	NC-87	Alderman Rd. (SR-2261)/Grays Creek Church Rd. (SR-2235)	Cumberland
Comparison	NC-87	Thrower Rd./SR-2245	Cumberland
Comparison	NC-87	Doc Bennett Rd. (SR-2212)/Wilmington Hwy (SR-2337)	Cumberland

Table 10.2 shows the dates of data collection for each superstreet. The team used one month of burning period before and after construction to account for driver adjustment, as well as give a buffer for approximate construction dates.

Table 10.2. Superstreet Dates of Data Collection

Superstreet	Before Period Collection			After Period Collection		
	Start Date	End Date	Total (months)	Start Date	End Date	Total (months)
Signalized superstreets						
US-15/501 and Erwin/Europa	1/1/1999	6/31/2006	90	8/1/2008	1/31/2010	18
US-17 and Leland corridor	4/1/2001	2/30/2006	59	10/1/2006	7/31/2009	34
US-421 and SR-2501	10/1/2003	9/30/2008	60	8/1/2009	6/30/2010	11
Unsignalized superstreets						
US-17 and Mt. Pisgah	5/1/2003	3/31/2008	59	10/1/2008	7/31/2009	10
US-17 and Ocean Isle Beach	6/1/2003	4/30/2008	59	1/1/2009	7/31/2009	11
US-74 and Red Bank/Old Balsam corridor	1/1/1991	12/31/1998	96	1/1/2000	7/31/2009	115
US-74/441 and Barkers Creek	9/1/2002	6/30/2007	58	12/1/2008	7/31/2009	8
US-74/441 and Dicks Creek	9/1/2002	6/30/2007	58	12/1/2008	7/31/2009	8
US-74 and Elmore	1/1/2003	10/31/2007	58	7/1/2008	7/31/2009	13
US-74/76 and Blacksmith	8/1/2001	6/30/2006	59	12/1/2006	7/31/2009	32
NC-24 and Haw Branch	6/1/2002	4/30/2007	59	1/1/2008	9/30/2009	21
US-1 and Camp Easter	9/1/2000	7/31/2005	59	5/1/2006	9/30/2009	41
NC-87 and Peanut Plant	4/1/2001	1/31/2006	58	10/1/2006	9/30/2009	36
NC-87/24 and 2nd St.	4/1/2001	2/30/2006	59	12/1/2006	9/30/2009	34
NC-87 and School Rd.	9/1/2003	8/31/2008	60	6/1/2009	6/30/2010	13
NC-87 and Grays Creek Church	9/1/2003	8/31/2008	60	6/1/2009	6/30/2010	13

Table 10.3 shows the intersection location by milepost (MP), number of legs, and distances to crossovers for each superstreet. The MP location is for the arterial with the lowest route number if coinciding routes exist. Coinciding routes are when a road or segment of road has dual names (e.g. US-15/501 or Ocean Isle Beach Rd./SR-1184). The distances to the crossover(s) are also shown; however, in the collection the team included an additional 500 feet beyond each crossover to include collisions related to the nearby intersection.

Table 10.3. Superstreet Geometric Details and Milepost Location

Superstreet	Legs	Distance to Crossover(s) (ft)	MP Location
Signalized superstreets			
US-15/501 and Erwin/Europa	4	800N, 800S	7.41
US-17 and Leland corridor	4	700N, 1500S (ends of corridor)	N/A
US-421 and SR-2501	4	900N, 1300S	13.42
Unsignalized superstreets			
US-17 and Mt. Pisgah	4	1500E, 1200W	20.17
US-17 and Ocean Isle Beach	3	900E	10.21
US-74 and Red Bank/Old Balsam corridor	4	1900N, 900S (ends of corridor)	N/A
US-74/441 and Barkers Creek	4	1550N, 1400S	6.53
US-74/441 and Dicks Creek	3	1600W	8.11
US-74 and Elmore	4	950N, 900S	7.95
US-74/76 and Blacksmith	4	900E, 900W	35.53
NC-24 and Haw Branch	4	950E, 1850W	1.21
US-1 and Camp Easter	4	1150E, 1200W	17.49
NC-87 and Peanut Plant	4	700N, 700S	27.00
NC-87/24 and 2nd St.	3	1000S	3.14
NC-87 and School Rd.	4	2600N, 1250S	3.14
NC-87 and Grays Creek Church	4	1900N, 2000S	3.94S, 3.97N

Tables 10.4 and 10.5 show the annual average daily traffic (AADT) for the major and minor roadway, respectively, for each superstreet in the study years. The AADT was taken from NCDOT AADT maps. In cases where AADTs are given on either side of the intersection, the larger of the two AADTs was used, per NCDOT and HSM guidelines. Three minor roadways did not have AADTs, and in two cases the team used AADTs from nearby, similar intersections. These sites included US-74/441 and Dicks Creek and NC-87/24 and 2nd Street. The other site, US-421 and Carolina Beach Road, did not have a comparable nearby intersection so in that case the team used hourly distribution factors (K factors) for North Carolina freeways as developed by Asad Khattak et al (60). Also, some sites did not have traffic volumes in either before years or after years, so in those cases the team used a linear regression to obtain traffic volumes. AADTs that were not directly provided by NCDOT AADT maps are italicized in Tables 10.4 and 10.5.

Table 10.4. Superstreet Major Roadway AADTs

Superstreet	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Signalized superstreets												
US-15/501 and Erwin/Europa	41000		40000			44000	42000			*44080*	*44490*	
US-17 and Leland corridor			21000		27000		*33000*		*39000*		*45000*	
US-421 and SR-2501					35000		37000		38000			
Unsignalized superstreets												
US-17 and Mt. Pisgah							26000	28000	31000	31000	*33500*	
US-17 and Ocean Isle Beach					19000	21000	20000	24000	25000	23000	*25600*	
US-74 and Red Bank/Old Balsam corridor		21000	21000	21000	19000	23000	22000	21000	22000	22000		
US-74/441 and Barkers Creek				21000	21000	21000	22000	20000	23000	22000	*22285*	
US-74/441 and Dicks Creek				21000	21000	21000	22000	20000	23000	22000	*22285*	
US-74 and Elmore					22000	20000	22000	19000		*18000*	*17500*	
US-74/76 and Blacksmith			9000	9200	9500	12000	12000	13000	10000	8400		
NC-24 and Haw Branch				8100	7800	8400	7900	8400	8400	9300		
US-1 and Camp Easter			14000		16000	15000	16000	17000	17000	16000		
NC-87 and Peanut Plant				8000	6600	8300	6700	6900	6200	5900		
NC-87/24 and 2nd St.								31000		32000		
NC-87 and School Rd.						8400		9200		9400	*9750*	*10000*
NC-87 and Grays Creek Church						8400		9200		9400	*9750*	*10000*

Table 10.5. Superstreet Minor Roadway AADTs

Superstreet	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Signalized superstreets												
US-15/501 and Erwin/Europa	13000		13000			12000	10000		12000	*10820*	*10575*	
US-17 and Leland corridor									1800			
US-421 and SR-2501												*17250*
Unsignalized superstreets												
US-17 and Mt. Pisgah					5000							
US-17 and Ocean Isle Beach					5000							
US-74 and Red Bank/Old Balsam corridor			630		550				650			
US-74/441 and Barkers Creek					1600		1500		1600			
US-74/441 and Dicks Creek					*1600*		*1500*		*1600*			
US-74 and Elmore					430		330	570		*550*	*590*	
US-74/76 and Blacksmith								820				
NC-24 and Haw Branch				1300		1500		1500		1500		
US-1 and Camp Easter					470		510		520			
NC-87 and Peanut Plant				3200		3200		3400		2600		
NC-87/24 and 2nd St.										*1000*		
NC-87 and School Rd.						900		1200		1200	*1325*	*1400*
NC-87 and Grays Creek Church						1700		1600		1600	*1560*	*1530*

10.2.2 Crash Data

The following tables show the crash data, obtained through TEAAS, for each superstreet and comparison site. Each table includes the time of the crash (month, day, year), collision type, crash severity level (F, A, B, C), conditions (R, L, W), crash ID, and MP. The features of each crash are described below by the North Carolina Department of Transportation Division of Motor Vehicles Crash Report Instruction Manual.

Crash severity level is the most severe injury sustained to a person involved in the crash. Severity level can be one of the following:

1. F – A death that occurs within 12 months after the crash.
2. A injury type (disabling) – Injury obviously serious enough to prevent the person injured from performing his normal activities for at least one day beyond the day of the collision. Massive blood loss, broken bone, unconsciousness of more than momentary duration are examples.
3. B injury type (evident) – Obvious injury, other than killed or disabling, which is evident at the scene. Bruises, swelling, limping, soreness, are examples. Class B injury would not necessarily prevent the person from carrying on his normal activities.
4. C injury type (possible) – No visible injury, but person complains for pain or has been momentarily unconscious.

Road surface condition (R) describes the roadway surface conditions at the time and place of the crash, and can be the following:

1. Dry
2. Wet
3. Water (standing, moving)
4. Ice
5. Snow
6. Slush
7. Sand, mud, dirt, gravel
8. Fuel, oil
9. Other
10. Unknown

Ambient light condition (L) is the type of light that existed at the time of the crash. Light conditions are described as follows:

1. Daylight
2. Dusk
3. Dawn
4. Darkness (lighted roadway)

Weather condition (W) is the general atmospheric conditions that existed at the time of the crash. Weather conditions include the following:

1. Clear
2. Cloudy
3. Raining

4. Snowing
5. Fog, smog, smoke
6. Sleet, hail, freezing rain/drizzle
7. Severe crosswinds
8. Blowing sand, dirt, snow
9. Other

Tables 10.6 through 10.8 show the crashes for the three signalized superstreets, and Tables 10.9 through 10.21 show the crashes for the 13 unsignalized superstreets. Tables 10.22 through 10.28 show the crashes for the signalized comparison sites. Tables 10.29 through 10.57 show the crashes for unsignalized comparison sites.

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Table 10.6. US-15/501 and Erwin Road/Europa Drive Crash Data

Month	Day	Year	Collision Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	21	1999	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	4	1	99012989	7.395
1	22	1999	ANGLE	0	0	0	0	1	1	2	99013807	7.419
2	20	1999	REAR END, SLOW OR STOP	0	1	0	0	1	1	1	99033750	7.42
3	11	1999	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	99046604	7.51
3	18	1999	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	99050943	7.17
4	8	1999	ANGLE	0	0	0	0	1	1	1	99065636	7.41
4	16	1999	ANGLE	0	0	0	2	1	1	1	99070948	7.41
4	30	1999	LEFT TURN, SAME ROADWAY	0	0	0	0	2	1	2	99081534	7.41
5	12	1999	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	99089734	7.406
6	9	1999	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	99109460	7.408
6	23	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99119289	7.41
6	30	1999	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	99124459	7.51
7	10	1999	REAR END, SLOW OR STOP	0	0	0	0	1	4	2	99131126	7.438
7	12	1999	REAR END, TURN	0	0	0	0	2	1	3	99132620	7.41
7	30	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99144575	7.31
8	6	1999	REAR END, SLOW OR STOP	0	0	0	0	6	1	1	99149277	7.39
8	9	1999	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	99151153	7.17
8	20	1999	REAR END, SLOW OR STOP	0	0	0	2	2	1	3	99158882	7.51
8	21	1999	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	99159635	7.415
8	23	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99160701	7.406
8	30	1999	OVERTURN/ROLLOVER	0	0	0	0	1	1	2	99165971	7.42
9	14	1999	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	99177875	7.41
9	18	1999	ANGLE	0	0	0	0	1	4	1	99181773	7.41
9	30	1999	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	99191078	7.391
10	26	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99211952	7.406
12	21	1999	REAR END, SLOW OR STOP	0	0	0	1	2	4	3	99258791	7.414
1	12	2000	OTHER NON-COLLISION	0	0	0	0	1	5	1	100006968	7.401

Table 10.6. continued (US-15/501 and Erwin Road/Europa Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	14	2000	REAR END, SLOW OR STOP	0	0	0	3	1	5	1	100008712	7.206
2	3	2000	REAR END, SLOW OR STOP	0	0	0	0	1	2	1	100024046	7.406
2	13	2000	BACKING UP	0	0	0	0	2	4	2	100030427	7.41
4	15	2000	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	100074113	7.17
4	25	2000	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100081058	7.41
5	13	2000	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	100094166	7.41
5	21	2000	RAN OFF ROAD - RIGHT	0	0	0	0	2	4	3	100099750	7.41
6	14	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100117027	7.523
6	26	2000	ANGLE	0	0	0	0	1	1	1	100126078	7.41
6	28	2000	RAN OFF ROAD - LEFT	0	0	2	0	2	4	3	100127674	7.271
6	30	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100129724	7.41
7	25	2000	REAR END, SLOW OR STOP	0	0	0	1	2	2	3	100145882	7.41
8	20	2000	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	100164571	7.41
9	22	2000	REAR END, SLOW OR STOP	0	0	0	0	2	4	3	100188577	7.473
10	10	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100202155	7.372
10	28	2000	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100215368	7.398
11	3	2000	REAR END, SLOW OR STOP	0	0	0	3	1	1	1	100220898	7.51
11	28	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100241033	7.419
12	5	2000	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100246577	7.41
12	18	2000	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	100255824	7.28
12	20	2000	REAR END, SLOW OR STOP	0	0	0	1	1	5	1	100257656	7.22
12	28	2000	ANGLE	0	0	0	0	1	1	2	100263015	7.406
12	28	2000	ANGLE	0	0	0	3	1	4	1	100263088	7.41
1	4	2001	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100266892	7.42
1	8	2001	REAR END, SLOW OR STOP	0	0	0	0	2	4	2	100269726	7.473
1	18	2001	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100276107	7.51
2	15	2001	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	100295583	7.506

Table 10.6. continued (US-15/501 and Erwin Road/Europa Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
2	20	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	100298829	7.419
2	26	2001	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100303100	7.41
3	16	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100314700	7.438
4	20	2001	ANGLE	0	0	0	0	1	1	1	100339651	7.41
5	2	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100347648	7.552
5	15	2001	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	100356939	7.415
5	15	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	100356565	7.53
6	12	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100375887	7.41
6	23	2001	ANGLE	0	0	0	0	1	1	2	100380250	7.53
7	7	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	100392530	7.55
8	30	2001	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	3	1	3	100428827	7.406
9	11	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100438520	7.51
9	13	2001	OTHER COLLISION WITH VEHICLE	0	0	0	0	1	1	1	100439467	7.369
9	20	2001	REAR END, SLOW OR STOP	0	0	1	0	2	2	2	100444099	7.523
10	12	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100461740	7.41
11	7	2001	ANIMAL	0	0	0	1	1	1	1	100482863	7.51
11	11	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100487005	7.443
11	14	2001	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	100489698	7.41
11	15	2001	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100489430	7.406
11	16	2001	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100490425	7.41
11	19	2001	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	4	1	100492640	7.256
12	5	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100505313	7.51
12	16	2001	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100515657	7.466
1	7	2002	REAR END, SLOW OR STOP	0	0	0	2	2	1	1	100532186	7.41
1	7	2002	REAR END, SLOW OR STOP	0	0	0	3	1	4	1	100532185	7.41
1	7	2002	REAR END, SLOW OR STOP	0	0	0	0	1	2	1	100532183	7.466
1	10	2002	ANGLE	0	0	0	0	1	1	1	100535162	7.41

Table 10.6. continued (US-15/501 and Erwin Road/Europa Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	13	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100541673	7.41
1	22	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100543546	7.41
1	27	2002	ANGLE	0	0	0	2	1	1	1	100546442	7.41
1	29	2002	ANGLE	0	0	0	1	1	1	1	100547671	7.41
3	23	2002	REAR END, SLOW OR STOP	0	0	0	4	1	1	1	100584453	7.404
4	27	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100609161	7.504
4	30	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100611126	7.22
5	28	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100630976	7.42
5	31	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100634027	7.38
8	5	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100679464	7.556
8	13	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100685024	7.463
9	14	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100708916	7.558
9	21	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100714883	7.51
10	10	2002	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100728741	7.21
11	11	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100756127	7.406
1	11	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100804170	7.25
3	22	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100856225	7.221
3	30	2003	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100861470	7.406
4	7	2003	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100867593	7.51
4	12	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100872096	7.553
5	7	2003	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	2	100890991	7.406
5	22	2003	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100902849	7.41
6	2	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100911566	7.553
8	1	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100968037	7.41
8	8	2003	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	100963375	7.467
9	5	2003	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100985355	7.353
9	18	2003	ANGLE	0	0	0	1	2	1	3	100994722	7.41

Table 10.6. continued (US-15/501 and Erwin Road/Europa Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	19	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100995578	7.21
9	19	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100995588	7.421
9	27	2003	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101002065	7.372
10	18	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101019115	7.51
10	20	2003	ANGLE	0	0	1	2	1	4	1	101021199	7.41
12	10	2003	BACKING UP	0	0	0	0	2	4	3	101065658	7.41
12	13	2003	REAR END, SLOW OR STOP	1	1	0	0	1	4	1	101136882	7.48
12	23	2003	REAR END, SLOW OR STOP	0	0	1	1	1	1	1	101077363	7.506
1	5	2004	ANGLE	0	0	0	1	1	1	2	101086218	7.406
1	16	2004	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	101094301	7.372
3	6	2004	ANGLE	0	0	0	0	2	1	2	101135784	7.41
4	20	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101168147	7.41
4	29	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101175368	7.41
4	30	2004	REAR END, SLOW OR STOP	0	0	0	5	1	1	1	101175730	7.51
5	11	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101184986	7.457
5	27	2004	RAN OFF ROAD - LEFT	0	0	0	0	1	1	1	101197576	7.25
6	18	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101214856	7.41
6	29	2004	REAR END, SLOW OR STOP	0	0	1	1	2	5	1	101223292	7.542
7	12	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101233143	7.429
7	25	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101242739	7.42
8	17	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101258806	7.408
8	23	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101265460	7.41
9	16	2004	RAN OFF ROAD - RIGHT	0	0	0	0	1	1	2	101285050	7.51
9	17	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101286118	7.53
10	7	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	2	1	101302917	7.277
10	11	2004	REAR END, SLOW OR STOP	0	0	0	1	1	3	1	101306047	7.41
10	14	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101308750	7.456

Table 10.6. continued (US-15/501 and Erwin Road/Europa Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	21	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101341939	7.41
11	24	2004	REAR END, SLOW OR STOP	0	0	0	0	2	3	5	101344871	7.406
1	6	2005	REAR END, SLOW OR STOP	0	0	0	1	2	4	2	101380120	7.21
1	16	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101387547	7.41
1	19	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101389685	7.41
1	19	2005	ANGLE	0	0	0	0	4	1	4	101389020	7.41
1	24	2005	REAR END, SLOW OR STOP	0	0	0	1	1	2	2	101394195	7.429
2	1	2005	UNKNOWN	0	0	0	1	1	4	1	101401376	7.406
2	4	2005	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101403116	7.53
2	21	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101416394	7.51
3	4	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101425454	7.399
3	25	2005	ANGLE	0	0	1	1	1	4	1	101440903	7.41
3	31	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	1	3	101444734	7.51
4	2	2005	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	101446692	7.387
4	5	2005	REAR END, TURN	0	0	0	0	1	1	1	101448689	7.41
4	15	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101455749	7.41
4	21	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101459720	7.406
4	21	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101459718	7.41
4	25	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101462572	7.419
5	7	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101471435	7.41
5	13	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	101475574	7.406
5	23	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101482086	7.399
6	30	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101419785	7.41
7	14	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101518739	7.51
7	26	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101526052	7.505
8	22	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101546543	7.429
8	23	2005	ANGLE	0	0	0	0	1	1	1	101547724	7.482

Table 10.6. continued (US-15/501 and Erwin Road/Europa Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	3	2005	REAR END, SLOW OR STOP	0	0	0	1	1	2	1	101600414	7.32
12	10	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101569823	7.397
12	20	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101638944	7.41
12	23	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101641252	7.397
12	27	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101644281	7.467
12	28	2005	REAR END, SLOW OR STOP	0	0	0	1	2	4	3	101644761	7.413
12	30	2005	RAN OFF ROAD - RIGHT	0	0	0	0	1	1	1	101646411	7.41
1	5	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101650032	7.41
1	16	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101657782	7.41
2	5	2006	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101671304	7.41
3	3	2006	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101687660	7.412
3	22	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101700009	7.41
3	31	2006	ANGLE	0	0	0	0	1	4	2	101707145	7.41
5	24	2006	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101739209	7.457
5	25	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101739400	7.407
6	21	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101766571	7.41
6	22	2006	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101766822	7.457
6	28	2006	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101770910	7.403
8	4	2008	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	1	1	1	1	102367697	7.41
8	5	2008	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102381288	7.41
8	17	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102389751	7.4
8	17	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102390206	7.429
8	21	2008	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	102391433	7.485
8	25	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102393101	7.17
9	10	2008	BACKING UP	0	0	0	0	2	1	2	102407791	7.41
9	15	2008	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	102408589	7.41
9	19	2008	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	4	1	102410016	7.405

Table 10.6. continued (US-15/501 and Erwin Road/Europa Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	8	2008	REAR END, SLOW OR STOP	0	0	0	0	1	3	1	102420648	7.41
10	11	2008	REAR END, SLOW OR STOP	0	0	0	0	1	5	2	102421645	7.467
10	17	2008	OTHER NON-COLLISION	0	0	0	0	1	1	2	102437463	7.372
10	24	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102453186	7.363
11	8	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	5	1	102460662	7.457
11	10	2008	ANGLE	0	0	0	0	1	1	1	102460570	7.41
11	17	2008	RAN OFF ROAD - STRAIGHT	0	0	0	0	1	1	1	102466623	7.353
11	22	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102468242	7.46
11	22	2008	REAR END, SLOW OR STOP	0	0	0	0	1	2	1	102468239	7.46
11	24	2008	REAR END, SLOW OR STOP	0	0	0	0	2	4	3	102473816	7.372
11	24	2008	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102468251	7.41
12	2	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	102478749	7.446
12	10	2008	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	2	2	102487953	7.406
12	19	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102492343	7.41
12	19	2008	REAR END, SLOW OR STOP	0	0	0	0	1	4	2	102494011	7.457
12	22	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102495218	7.448
12	26	2008	ANGLE	0	0	0	0	1	4	2	102502751	7.448
1	16	2009	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	5	2	102517456	7.41
1	20	2009	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	5	1	4	102521086	7.41
2	17	2009	REAR END, SLOW OR STOP	0	0	0	3	1	1	1	102538505	7.51
2	20	2009	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102540434	7.41
3	11	2009	PARKED MOTOR VEHICLE	0	0	0	0	1	1	1	102553848	7.505
4	7	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102572690	7.438
4	18	2009	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102576801	7.36
4	25	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102581026	7.31
6	10	2009	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	102618280	7.41
6	10	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102618284	7.429

Table 10.6. continued (US-15/501 and Erwin Road/Europa Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	11	2009	RIGHT TURN, SAME ROADWAY	0	0	0	1	2	4	3	102618318	7.41
6	22	2009	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102625076	7.46
7	2	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102636929	7.41
7	30	2009	RAN OFF ROAD - STRAIGHT	0	0	1	0	1	1	1	102652395	7.31
8	17	2009	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	102669286	7.31
8	19	2009	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102662595	7.32
10	27	2009	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	102713078	7.413
12	2	2009	REAR END, TURN	0	0	0	0	2	1	3	102756484	7.41
12	22	2009	OTHER COLLISION WITH VEHICLE	0	0	0	0	1	5	1	102771122	7.41
1	12	2010	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102782552	7.41

Table 10.7. US-17 and the Leland Corridor Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	29	2003	Other Non-Collision	0	0	0	1	1	5	1	100817833	42.45
3	7	2004	Fixed Object	0	0	0	0	1	5	1	101135103	42.45
3	19	2007	Sideswipe, Opposite Direction	0	0	0	0	1	1	1	101988118	42.45
3	23	2007	Rear End, Slow or Stop	0	0	1	1	1	1	1	102580148	42.5
9	1	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101553094	42.55
10	4	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101575241	42.55
2	2	2002	Overturn/Rollover	0	0	0	0	1	1	1	100550198	42.59
10	11	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101854317	42.6
3	29	2005	Fixed Object	0	0	0	1	1	1	1	101443195	42.64
11	29	2004	Left Turn, Same Roadway	0	0	0	0	1	5	1	101348488	42.69
3	16	2008	Ran Off Road - Right	0	0	1	0	2	5	2	102284250	42.7
5	29	2008	Angle	0	0	0	0	1	1	1	102314171	42.7
9	13	2001	Left Turn, Different Roadways	0	0	0	1	1	1	1	100439148	42.75
12	21	2002	Left Turn, Different Roadways	0	0	0	0	1	5	1	100789908	42.75
10	4	2003	Animal	0	0	0	0	1	5	1	101007187	42.75
5	12	2004	Angle	0	0	1	0	1	1	1	101185753	42.75
10	21	2004	Angle	0	0	0	1	1	5	1	101313695	42.75
5	18	2005	Angle	0	0	0	0	1	5	1	101478644	42.75
7	11	2005	Angle	0	0	0	0	1	1	1	101516236	42.75
9	1	2005	Right Turn, Different Roadways	0	0	0	2	1	1	1	101553110	42.75
12	20	2006	Rear End, Slow or Stop	0	0	0	0	1	2	1	101916658	42.75
1	3	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	101928019	42.75
3	13	2007	Angle	0	0	0	0	1	1	1	101982421	42.75
3	19	2007	Right Turn, Different Roadways	0	0	0	0	1	1	1	101988114	42.75
11	21	2007	Ran Off Road - Left	0	0	0	0	1	1	1	102197649	42.75
7	27	2008	Right Turn, Same Roadway	0	0	0	0	1	1	1	102399684	42.75
10	1	2008	Right Turn, Different Roadways	0	0	0	0	1	1	1	102436691	42.75

Table 10.7. continued (US-17 and the Leland Corridor Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	5	2008	Angle	0	0	0	0	1	1	1	102436707	42.75
2	24	2009	Rear End, Turn	0	0	0	0	1	1	1	102555065	42.75
7	18	2009	Rear End, Slow or Stop	0	0	0	0	1	1	2	102643782	42.75
10	28	2006	Rear End, Slow or Stop	0	0	1	1	1	1	1	101870565	42.752
1	4	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102232671	42.752
2	14	2005	Left Turn, Same Roadway	0	0	0	0	1	1	1	101409665	42.755
12	29	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102228364	42.755
11	8	2005	Fixed Object	0	0	0	0	1	1	1	101603357	42.84
11	22	2006	Rear End, Slow or Stop	0	0	0	2	2	5	2	101893886	42.85
9	23	2007	Rear End, Slow or Stop	0	0	0	2	1	1	1	102146869	42.85
9	26	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102149112	42.85
3	16	2007	Fixed Object	0	0	0	0	1	1	1	101984510	42.89
10	15	2006	Rear End, Slow or Stop	0	0	0	2	1	1	1	101857155	42.93
1	30	2007	Angle	0	0	0	1	1	1	1	101948426	42.93
3	10	2002	Jackknife	0	0	4	0	1	5	1	100574818	42.939
8	27	2004	Overturn/Rollover	0	1	0	0	1	5	1	101267969	42.943
3	8	2007	Rear End, Slow or Stop	0	0	0	1	1	1	1	101978803	43.03
4	26	2005	Left Turn, Different Roadways	0	0	0	0	2	1	2	101462953	43.09
4	16	2007	Rear End, Slow or Stop	0	0	0	1	1	1	1	102013303	43.09
9	10	2007	Sideswipe, Same Direction	0	0	0	0	1	1	1	102134917	43.107
10	11	2006	Sideswipe, Same Direction	0	0	0	0	1	1	1	101854328	43.13
3	14	2007	Rear End, Slow or Stop	0	0	0	1	1	1	1	101983977	43.13
4	6	2007	Angle	0	0	0	1	1	1	1	102004297	43.13
6	29	2007	Angle	0	0	0	0	1	1	1	102077065	43.13
11	11	2007	Angle	0	0	2	4	1	1	1	102189776	43.13
1	5	2008	Rear End, Turn	0	0	1	0	1	4	1	102268693	43.13
4	10	2008	Angle	0	0	0	1	1	1	1	102259673	43.13

Table 10.7. continued (US-17 and the Leland Corridor Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	22	2008	Angle	0	0	0	0	1	1	2	102310334	43.13
5	3	2008	Angle	0	0	2	0	1	1	1	102317907	43.13
6	13	2008	Angle	0	0	0	0	10	1	1	102345712	43.13
6	15	2008	Rear End, Slow or Stop	0	0	0	0	1	1	2	102348063	43.13
6	20	2008	Angle	0	0	0	1	2	1	3	102350434	43.13
8	23	2008	Sideswipe, Same Direction	0	0	0	0	1	1	1	102399819	43.13
9	19	2008	Rear End, Turn	0	0	0	1	1	1	1	102420547	43.13
12	31	2008	Angle	0	0	0	0	1	1	1	102511192	43.13
2	18	2009	Rear End, Slow or Stop	0	0	0	3	2	1	2	102538731	43.13
3	13	2009	Left Turn, Same Roadway	0	0	1	2	1	5	1	102553596	43.13
5	31	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102608001	43.13
11	15	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102464105	43.135
2	21	2004	Fixed Object	0	0	0	3	1	5	1	101123724	43.14
4	14	2004	Fixed Object	0	0	0	0	1	1	1	101163255	43.14
12	7	2007	Sideswipe, Same Direction	0	0	0	0	1	5	1	102210278	43.14
5	8	2009	Rear End, Slow or Stop	0	0	1	5	1	1	1	102600979	43.14
3	13	2009	Sideswipe, Same Direction	0	0	0	0	1	1	2	102553100	43.149
10	6	2008	Angle	0	0	0	0	1	1	1	102436717	43.18
7	17	2009	Rear End, Slow or Stop	0	0	4	1	1	1	1	102644408	43.188
4	27	2002	Animal	0	0	0	0	1	5	1	100608853	43.19
4	27	2002	Animal	0	0	0	0	1	5	1	100608854	43.19
9	4	2002	Movable Object	0	0	0	0	1	1	1	100911868	43.19
5	8	2005	Fixed Object	0	0	0	0	1	5	1	101471817	43.19
8	9	2005	Left Turn, Different Roadways	0	0	0	0	1	1	2	101536495	43.24
5	14	2005	Fixed Object	0	0	0	0	1	5	1	101733427	43.25
5	20	2005	Sideswipe, Same Direction	0	0	0	0	2	5	3	101480139	43.29
11	16	2005	Rear End, Slow or Stop	0	0	0	0	2	1	2	101609712	43.29

Table 10.7. continued (US-17 and the Leland Corridor Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	24	2007	Rear End, Slow or Stop	0	0	0	1	1	1	2	102171338	43.29
1	10	2009	Rear End, Slow or Stop	0	0	0	1	1	2	1	102511183	43.295
1	3	2009	Rear End, Slow or Stop	0	1	0	2	1	1	2	102511249	43.345
5	23	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102019335	43.352
7	23	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102096511	43.352
9	21	2003	Animal	0	0	0	0	1	5	2	100996766	43.371
4	7	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102579195	43.371
1	14	2002	Ran Off Road - Left	0	0	0	0	2	2	3	100536808	43.383
10	13	2006	Rear End, Slow or Stop	0	0	0	1	1	1	1	101854887	43.386
10	22	2004	Left Turn, Different Roadways	0	0	0	0	1	1	2	101314197	43.39
2	11	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101407702	43.39
2	18	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101412360	43.39
3	25	2005	Angle	0	0	0	1	1	1	1	101440693	43.39
5	29	2005	Rear End, Slow or Stop	0	0	0	0	1	5	1	101486425	43.39
2	9	2006	Left Turn, Different Roadways	0	0	0	2	1	1	2	101673339	43.39
10	28	2006	Rear End, Slow or Stop	0	0	0	1	2	1	3	101870577	43.39
12	22	2006	Ran Off Road - Left	0	0	0	0	2	4	3	101918489	43.39
2	28	2007	Left Turn, Same Roadway	0	0	0	1	1	4	1	101971259	43.39
3	27	2007	Sideswipe, Same Direction	0	0	0	0	1	1	1	101956327	43.39
4	10	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102007223	43.39
4	16	2007	Backing Up	0	0	0	0	1	5	1	102012616	43.39
5	17	2007	Rear End, Slow or Stop	0	0	0	0	2	1	2	102041165	43.39
7	20	2007	Sideswipe, Same Direction	0	0	0	0	1	1	1	102093420	43.39
8	18	2007	Rear End, Slow or Stop	0	0	0	0	1	5	1	102116195	43.39
11	14	2007	Angle	0	0	0	0	1	2	1	102190997	43.39
1	9	2008	Sideswipe, Same Direction	0	0	0	0	1	1	1	102352404	43.39
6	22	2008	Rear End, Slow or Stop	0	0	2	0	1	1	3	102353510	43.39

Table 10.7. continued (US-17 and the Leland Corridor Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	11	2008	Angle	0	0	0	0	1	1	1	102366118	43.39
8	23	2008	Sideswipe, Same Direction	0	0	0	0	1	1	1	102399819	43.39
8	26	2008	Rear End, Slow or Stop	0	0	0	0	2	1	3	102399807	43.39
8	26	2008	Angle	0	0	0	2	2	1	3	102399801	43.39
9	8	2008	Angle	0	0	0	0	1	1	1	102408994	43.39
10	25	2008	Sideswipe, Same Direction	0	0	0	0	2	1	2	102435248	43.39
12	8	2008	Rear End, Slow or Stop	0	0	0	0	1	5	1	102493166	43.39
12	16	2008	Angle	0	0	0	3	1	1	2	102493160	43.39
12	22	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102510097	43.39
12	31	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102510078	43.39
6	10	2009	Rear End, Slow or Stop	0	0	0	1	1	1	1	102616156	43.39
6	26	2009	Angle	0	0	0	0	1	1	1	102631102	43.39
7	12	2009	Rear End, Slow or Stop	0	0	0	1	1	4	1	102643785	43.39
6	24	2007	Rear End, Slow or Stop	0	0	1	0	1	1	2	102073294	43.391
4	14	2008	Left Turn, Different Roadways	0	0	0	0	1	1	1	102305124	43.395
12	21	2004	Left Turn, Different Roadways	0	0	0	0	1	1	1	101367731	43.397
6	6	2009	Rear End, Slow or Stop	0	0	0	0	1	1	2	102620085	43.4
6	26	2005	Sideswipe, Same Direction	0	0	0	0	1	2	1	101506027	43.409
6	30	2007	Ran Off Road - Right	0	0	0	0	2	1	3	102078049	43.409
11	12	2007	Rear End, Slow or Stop	0	0	0	1	1	2	1	102189292	43.409
4	14	2009	Rear End, Slow or Stop	0	0	0	0	2	1	2	102579008	43.409
6	9	2009	Rear End, Slow or Stop	0	0	0	1	1	1	1	102620079	43.409
6	30	2007	Rear End, Slow or Stop	0	0	0	0	2	1	3	102078054	43.418
9	26	2008	Ran Off Road - Right	0	0	0	0	3	5	3	102410122	43.42
8	24	2008	Angle	0	0	0	0	1	1	1	102409260	43.428
11	14	2007	Fixed Object	0	0	2	0	1	1	1	102191018	43.44
12	6	2006	Sideswipe, Same Direction	0	0	0	0	1	1	1	101905598	43.49

Table 10.7. continued (US-17 and the Leland Corridor Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	2	2007	Rear End, Slow or Stop	0	0	0	0	1	1	2	102056340	43.49
4	1	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102294849	43.49
5	27	2009	Sideswipe, Same Direction	0	0	0	0	1	1	1	102598496	43.49
10	28	2001	Sideswipe, Same Direction	0	0	0	0	1	1	1	100474008	43.54
8	16	2005	Sideswipe, Same Direction	0	0	0	0	1	1	1	101464423	43.59

Table 10.8. US-421 and SR-2501/Carolina Beach Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	14	2005	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	101454908	13.08
3	16	2010	FIXED OBJECT	0	0	0	0	1	1	1	102816477	13.08
4	17	2010	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102841755	13.08
10	26	2009	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	102713448	13.09
8	8	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101535388	13.12
5	16	2006	REAR END, SLOW OR STOP	0	0	1	0	1	1	1	101734143	13.12
3	31	2008	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	102294320	13.12
3	6	2010	REAR END, SLOW OR STOP	0	0	0	3	1	1	1	102822464	13.12
5	30	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101200275	13.22
7	24	2004	REAR END, SLOW OR STOP	0	0	0	0	4	1	1	101242080	13.22
4	30	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101465939	13.22
6	25	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101505673	13.22
7	30	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101529202	13.22
8	22	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101546513	13.22
9	9	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101558831	13.22
6	8	2006	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101754000	13.22
12	7	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101906741	13.22
1	24	2007	PEDALCYCLIST	0	0	1	0	1	5	1	101944564	13.22
1	24	2007	PEDALCYCLIST	0	0	1	0	1	5	1	101944570	13.22
3	27	2008	BACKING UP	0	0	0	0	1	1	1	102292050	13.22
5	18	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102327531	13.22
9	26	2008	REAR END, SLOW OR STOP	0	0	0	0	2	3	3	102413706	13.22
11	1	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101597954	13.25
9	21	2005	LEFT TURN, SAME ROADWAY	0	0	0	3	1	1	1	101566544	13.26
4	14	2005	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	101454898	13.27
3	2	2007	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101974286	13.27
5	10	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102035191	13.27

Table 10.8. continued (US-421 and SR-2501/Carolina Beach Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	5	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102032425	13.28
5	6	2010	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102857021	13.311
3	8	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101136448	13.32
3	13	2004	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101140203	13.32
8	16	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101259938	13.32
9	9	2004	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	101279526	13.32
11	29	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	2	2	101348758	13.32
11	29	2004	REAR END, SLOW OR STOP	0	0	0	1	1	5	2	101348752	13.32
3	3	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101424237	13.32
6	11	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101496327	13.32
6	29	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101508750	13.32
6	30	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101509347	13.32
5	5	2006	REAR END, SLOW OR STOP	0	0	0	1	2	5	3	101728326	13.32
7	10	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101782300	13.32
7	11	2006	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101780812	13.32
8	11	2006	REAR END, TURN	0	0	0	0	2	1	2	101805417	13.32
2	16	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101961735	13.32
11	12	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102189554	13.32
12	27	2007	PEDALCYCLIST	0	0	0	0	1	1	2	102226508	13.32
3	16	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102284408	13.32
1	13	2010	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	5	1	102783127	13.32
1	21	2004	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101097619	13.344
3	26	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102291147	13.37
5	8	2008	PARKED MOTOR VEHICLE	0	0	0	0	1	1	1	102321218	13.37
11	22	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101343173	13.385
4	4	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101447567	13.39
10	28	2005	REAR END, SLOW OR STOP	0	0	0	4	2	1	2	101594837	13.39

Table 10.8. continued (US-421 and SR-2501/Carolina Beach Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
8	28	2009	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	102672228	13.39
10	31	2007	SIDESWIPE, SAME DIRECTION	0	0	0	1	1	1	1	102179197	13.408
12	3	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101352272	13.409
4	14	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101163629	13.411
1	26	2008	REAR END, SLOW OR STOP	0	0	0	0	2	2	2	102250075	13.411
2	7	2007	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101954828	13.413
9	10	2009	REAR END, SLOW OR STOP	0	0	1	0	1	1	2	102684494	13.413
5	4	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102318269	13.414
12	19	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	102220948	13.415
6	27	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	4	1	102356136	13.415
10	30	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101029684	13.416
5	31	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102054162	13.416
11	30	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102205084	13.416
11	16	2005	LEFT TURN, SAME ROADWAY	0	0	0	3	2	1	2	101610596	13.417
6	23	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101218620	13.418
11	14	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101886511	13.418
10	8	2003	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	2	1	3	101010714	13.42
10	17	2003	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101018525	13.42
10	31	2003	LEFT TURN, SAME ROADWAY	0	0	0	3	1	4	1	101033331	13.42
11	11	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101040434	13.42
11	14	2003	LEFT TURN, SAME ROADWAY	0	0	0	1	1	5	1	101043204	13.42
11	23	2003	LEFT TURN, SAME ROADWAY	0	0	1	0	1	1	1	101051081	13.42
12	17	2003	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	2	101072781	13.42
1	28	2004	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	2	1	1	1	101105226	13.42
1	29	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101106088	13.42
2	12	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101116293	13.42
2	16	2004	MOVABLE OBJECT	0	0	0	0	1	1	1	101120031	13.42

Table 10.8. continued (US-421 and SR-2501/Carolina Beach Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
3	14	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	5	1	101140998	13.42
3	15	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	2	101141569	13.42
3	15	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	2	101141554	13.42
4	11	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101161112	13.42
4	25	2004	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101172239	13.42
4	26	2004	ANGLE	0	0	0	2	1	1	1	101173284	13.42
5	4	2004	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101179615	13.42
5	8	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101183183	13.42
5	21	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101192973	13.42
5	28	2004	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	101198216	13.42
5	29	2004	REAR END, SLOW OR STOP	0	0	0	2	1	5	1	101199335	13.42
6	6	2004	FIXED OBJECT	0	0	0	1	1	5	1	101205479	13.42
6	27	2004	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	101221876	13.42
7	3	2004	LEFT TURN, SAME ROADWAY	0	0	1	1	1	5	2	101226548	13.42
7	6	2004	REAR END, SLOW OR STOP	0	0	0	5	1	1	1	101228781	13.42
7	24	2004	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	101241845	13.42
7	26	2004	REAR END, SLOW OR STOP	0	0	1	3	1	1	2	101243293	13.42
8	27	2004	LEFT TURN, SAME ROADWAY	0	0	0	2	2	1	2	101268346	13.42
10	13	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101307249	13.42
10	15	2004	ANIMAL	0	0	0	0	1	5	1	101309483	13.42
11	18	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101339417	13.42
12	2	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	5	1	101351388	13.42
12	4	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101352913	13.42
1	7	2005	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101381605	13.42
1	7	2005	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101381072	13.42
1	17	2005	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	101388074	13.42
2	15	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	5	101410653	13.42

Table 10.8. continued (US-421 and SR-2501/Carolina Beach Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
3	14	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	1	2	1	2	101393297	13.42
3	29	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101443501	13.42
4	10	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101452450	13.42
4	26	2005	LEFT TURN, SAME ROADWAY	0	0	0	0	2	5	3	101463192	13.42
5	12	2005	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101475001	13.42
5	12	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101475002	13.42
6	29	2005	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	2	1	2	101508569	13.42
7	4	2005	LEFT TURN, SAME ROADWAY	0	0	2	0	1	1	1	101511948	13.42
7	17	2005	LEFT TURN, SAME ROADWAY	0	0	1	1	1	1	1	101520247	13.42
7	22	2005	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101524262	13.42
9	17	2005	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101564279	13.42
11	9	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101604676	13.42
1	4	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101649432	13.42
1	25	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	4	1	101663578	13.42
2	10	2006	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	101674201	13.42
3	4	2006	RAN OFF ROAD - RIGHT	0	0	0	0	1	1	1	101688238	13.42
3	9	2006	SIDESWIPE, OPPOSITE DIRECTION	0	0	0	0	1	4	2	101691538	13.42
3	15	2006	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101696087	13.42
3	16	2006	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101696517	13.42
4	4	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	4	1	101707331	13.42
4	15	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101715164	13.42
4	27	2006	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101722812	13.42
5	5	2006	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	2	101728331	13.42
5	8	2006	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	101729835	13.42
5	19	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101735956	13.42
3	20	2006	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	101765871	13.42
7	21	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101790417	13.42

Table 10.8. continued (US-421 and SR-2501/Carolina Beach Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	27	2006	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101794759	13.42
8	30	2006	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101820201	13.42
9	2	2006	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101822861	13.42
9	12	2006	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101829738	13.42
9	13	2006	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	101830499	13.42
9	17	2006	ANGLE	0	0	4	4	1	1	1	101834125	13.42
10	9	2006	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101851675	13.42
10	31	2006	BACKING UP	0	0	0	0	1	5	1	101873155	13.42
10	31	2006	LEFT TURN, SAME ROADWAY	0	0	0	5	1	4	1	101873160	13.42
11	10	2006	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	101882926	13.42
11	22	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101894424	13.42
1	7	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101931887	13.42
2	23	2007	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101967669	13.42
3	3	2007	LEFT TURN, SAME ROADWAY	0	0	1	1	1	4	1	101975223	13.42
3	6	2007	SIDESWIPE, SAME DIRECTION	0	0	0	1	1	1	1	101953666	13.42
3	8	2007	ANGLE	0	0	0	0	1	1	1	101979006	13.42
3	22	2007	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101990346	13.42
3	28	2007	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101994892	13.42
4	16	2007	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	102013421	13.42
5	24	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102047945	13.42
6	4	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102058066	13.42
6	27	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102075857	13.42
7	3	2007	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	4	2	102080802	13.42
7	29	2007	LEFT TURN, SAME ROADWAY	0	0	0	2	1	4	1	102101358	13.42
7	29	2007	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	102101359	13.42
8	2	2007	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	102104155	13.42
8	12	2007	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102111389	13.42

Table 10.8. continued (US-421 and SR-2501/Carolina Beach Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
8	27	2007	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102123249	13.42
9	7	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102132745	13.42
10	4	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102156075	13.42
10	7	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102158850	13.42
10	9	2007	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	5	1	102160202	13.42
10	14	2007	LEFT TURN, SAME ROADWAY	0	0	0	0	1	5	1	102164208	13.42
10	24	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	102171670	13.42
10	28	2007	LEFT TURN, SAME ROADWAY	0	0	0	3	1	1	1	102176409	13.42
11	12	2007	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	102189533	13.42
12	3	2007	ANGLE	0	0	0	1	2	1	2	102208240	13.42
12	7	2007	LEFT TURN, SAME ROADWAY	0	0	1	2	1	2	1	102210866	13.42
12	9	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102213609	13.42
12	12	2007	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102214770	13.42
1	3	2008	MOVABLE OBJECT	0	0	0	0	1	5	1	102232338	13.42
1	23	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102247188	13.42
2	7	2008	LEFT TURN, SAME ROADWAY	0	0	1	1	1	1	1	102257513	13.42
2	12	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102263095	13.42
2	13	2008	LEFT TURN, SAME ROADWAY	0	0	0	3	2	1	2	102261218	13.42
3	17	2008	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	102285033	13.42
3	26	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102291152	13.42
3	26	2008	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102291151	13.42
3	30	2008	LEFT TURN, SAME ROADWAY	0	0	0	0	2	1	3	102293805	13.42
5	4	2008	LEFT TURN, SAME ROADWAY	0	0	0	0	2	1	3	102318259	13.42
5	12	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102323997	13.42
6	23	2008	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	102356942	13.42
6	29	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102357171	13.42
7	20	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102372138	13.42

Table 10.8. continued (US-421 and SR-2501/Carolina Beach Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	24	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102374817	13.42
8	7	2009	PARKED MOTOR VEHICLE	0	0	0	0	1	1	1	102658986	13.42
8	19	2009	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102656121	13.42
10	7	2009	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102701084	13.42
1	22	2010	REAR END, SLOW OR STOP	0	0	0	1	2	5	2	102773441	13.42
3	16	2010	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102816418	13.42
4	1	2010	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102830003	13.42
4	13	2010	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102838448	13.42
4	21	2010	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	2	1	2	102851961	13.42
5	11	2010	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	102860786	13.42
5	13	2010	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102862594	13.42
6	9	2010	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102899992	13.42
6	11	2010	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102886084	13.42
11	4	2005	LEFT TURN, SAME ROADWAY	0	0	0	3	1	1	1	101601909	13.426
10	15	2004	REAR END, SLOW OR STOP	0	0	0	2	2	1	3	101309478	13.49
2	12	2005	REAR END, SLOW OR STOP	0	0	0	0	1	2	1	101408678	13.49
7	11	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101516438	13.49
10	28	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101594373	13.49
1	30	2006	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	1	2	101667189	13.49
2	3	2006	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	101669469	13.49
3	10	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102280041	13.49
12	17	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102762336	13.49
1	23	2010	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	102793134	13.49
2	16	2010	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102793433	13.49
11	12	2003	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101040809	13.52
4	13	2010	SIDESWIPE, SAME DIRECTION	0	0	0	2	1	1	1	102838442	13.54
9	11	2003	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	2	100989300	13.59

Table 10.8. continued (US-421 and SR-2501/Carolina Beach Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	30	2004	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	2	1	101106719	13.59
4	14	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101163634	13.59
5	3	2004	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	101178859	13.59
5	28	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101198614	13.59
7	15	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	101235696	13.59
9	11	2005	PEDALCYCLIST	0	0	0	1	1	5	1	101560088	13.59
11	11	2005	ANGLE	0	0	0	0	1	1	1	101606491	13.59
12	8	2005	REAR END, SLOW OR STOP	0	0	0	1	2	5	2	101628486	13.59
12	20	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101638955	13.59
3	10	2006	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101692548	13.59
4	28	2006	REAR END, SLOW OR STOP	0	0	0	0	2	5	2	101723606	13.59
6	13	2006	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101759999	13.59
9	11	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101829066	13.59
10	17	2006	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	1	3	101859181	13.59
5	28	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102051427	13.59
7	28	2007	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	2	1	2	102100521	13.59
8	14	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102113271	13.59
6	10	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102343480	13.59
7	5	2008	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	102361441	13.59
8	27	2008	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	1	2	1	2	102395736	13.59
8	29	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102397409	13.59
8	23	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102658316	13.59
11	6	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102728876	13.59
3	24	2010	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102831676	13.59
4	21	2010	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	102844609	13.59
5	8	2010	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102872668	13.59
5	10	2010	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102869380	13.59

Table 10.8. continued (US-421 and SR-2501/Carolina Beach Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	24	2010	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	102847279	13.595
4	14	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101714364	13.64
8	9	2006	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	101804064	13.64
3	8	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101979017	13.652
4	30	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101176180	13.658
1	21	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101391397	13.66
9	28	2009	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102690204	13.663
4	6	2010	OVERTURN/ROLLOVER	0	0	1	0	1	5	1	102840593	13.664

Table 10.9. US-17 and Mt. Pisgah Road/Sellers Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	23	2003	Sideswipe, Same Direction	0	0	0	0	2	5	2	100903687	19.87
6	19	2003	Angle	0	0	2	0	1	1	1	100924587	20.17
6	25	2003	Rear End, Slow or Stop	0	0	0	3	1	1	1	100929141	20.17
7	25	2003	Rear End, Slow or Stop	0	0	0	1	2	1	2	100951635	19.97
7	26	2003	Sideswipe, Same Direction	0	0	0	0	1	1	1	100952496	20.47
8	19	2003	Fixed Object	0	0	0	0	2	1	2	100971687	19.97
2	9	2004	Left Turn, Different Roadways	0	0	2	1	1	1	3	101113762	20.17
2	20	2004	Left Turn, Different Roadways	0	0	1	0	1	1	1	101122671	20.17
2	20	2004	Rear End, Slow or Stop	0	0	0	1	1	1	1	101122668	20.27
3	10	2004	Left Turn, Same Roadway	0	0	0	3	1	5	1	101137812	20.17
3	10	2004	Parked Motor Vehicl	0	0	0	1	1	5	1	101137826	20.17
3	23	2004	Fixed Object	0	0	1	0	1	1	1	101147187	20.37
4	5	2004	Right Turn, Different Roadways	0	0	0	0	1	1	1	101156458	20.17
4	13	2004	Left Turn, Same Roadway	0	0	0	0	1	1	1	101162304	20.17
4	10	2004	Animal	0	0	0	0	1	5	1	101160225	20.175
5	7	2004	Angle	0	0	0	0	1	1	1	101181900	20.17
6	23	2004	Rear End, Slow or Stop	0	0	0	0	1	5	1	101217929	20.174
7	16	2004	Angle	0	0	0	2	1	1	1	101235867	20.17
7	20	2004	Left Turn, Different Roadways	0	0	0	0	1	1	1	101238682	20.17
10	18	2004	Left Turn, Same Roadway	0	0	0	3	1	1	2	101311310	20.17
10	19	2004	Animal	0	0	0	0	1	1	1	101312155	20.17
11	19	2004	Left Turn, Different Roadways	0	0	0	2	1	1	1	101340109	20.17
12	9	2004	Left Turn, Different Roadways	0	0	0	0	1	1	1	101356781	20.17
12	10	2004	Rear End, Slow or Stop	0	0	0	0	2	5	2	101320635	20.22
12	3	2004	Left Turn, Different Roadways	0	0	0	1	1	1	1	101351667	20.47
1	10	2005	Angle	0	0	1	0	1	1	1	101382914	20.17
2	16	2005	Rear End, Turn	0	0	2	0	1	5	5	101411148	20.17
2	24	2005	Angle	0	0	1	0	2	1	2	101418515	20.17
4	12	2005	Angle	0	0	0	1	1	1	2	101453401	20.17
5	12	2005	Left Turn, Same Roadway	0	0	0	0	1	1	1	101474675	20.17

Table 10.9. continued (US-17 and Mt. Pisgah Road/Sellers Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	18	2005	Angle	0	0	0	0	1	1	1	101501053	20.17
6	23	2005	Sideswipe, Same Direction	0	0	0	0	1	1	1	101504187	20.37
7	25	2005	Left Turn, Same Roadway	0	0	0	0	1	1	1	101525587	20.37
8	10	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101537630	20.17
10	2	2005	Animal	0	0	0	0	1	5	1	101573895	20.07
11	12	2005	Animal	0	0	0	0	1	5	1	101606744	19.97
11	11	2005	Left Turn, Same Roadway	0	0	0	0	1	2	1	101606171	20.17
12	10	2005	Angle	0	0	1	0	1	1	1	101630042	20.37
1	29	2006	Angle	0	1	1	0	2	5	2	101666315	20.17
2	3	2006	Left Turn, Different Roadways	0	0	0	3	1	1	2	101669167	20.17
5	5	2006	Fixed Object	0	0	0	1	2	1	2	101744726	19.97
7	9	2006	Rear End, Slow or Stop	0	0	0	2	1	1	1	101778669	20.17
8	24	2006	Angle	0	0	0	1	1	1	1	101815317	20.165
8	4	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101800677	20.17
8	14	2006	Angle	0	0	0	0	1	1	1	101807637	20.17
10	21	2006	Animal	0	0	0	0	1	5	1	101862362	19.97
10	15	2006	Animal	0	0	0	0	1	1	1	101857144	20.07
10	16	2006	Angle	0	0	0	0	1	1	1	101857636	20.17
1	21	2007	Fixed Object	0	0	0	0	1	1	1	101942534	19.87
1	4	2007	Rear End, Slow or Stop	0	0	0	0	1	1	2	101929065	20.17
2	23	2007	Angle	0	0	0	0	1	1	1	101967527	20.17
3	20	2007	Rear End, Slow or Stop	0	0	1	0	1	1	1	101988790	19.83
3	15	2007	Left Turn, Different Roadways	0	0	0	2	1	1	1	101983614	20.17
3	30	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	101998552	20.17
4	5	2007	Movable Object	0	0	0	0	1	1	1	102003354	20.07
4	19	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102014856	20.17
5	2	2007	Sideswipe, Same Direction	0	0	0	0	1	1	1	102028225	20.17
5	15	2007	Left Turn, Different Roadways	0	0	0	0	1	1	1	102042064	20.17
5	30	2007	Angle	0	0	0	3	1	1	1	102053160	20.17

Table 10.9. continued (US-17 and Mt. Pisgah Road/Sellers Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	23	2007	Left Turn, Same Roadway	0	0	0	0	1	1	1	102095934	20.17
8	11	2007	Right Turn, Same Roadway	0	0	0	0	1	1	1	102110381	20.17
9	5	2007	Angle	0	0	3	0	1	1	1	102130011	20.17
9	11	2007	Left Turn, Same Roadway	0	0	0	4	1	1	1	102136142	20.17
9	22	2007	Left Turn, Same Roadway	0	0	2	3	1	1	1	102146035	20.17
10	25	2007	Fixed Object	1	0	0	0	2	5	2	102172338	19.97
10	9	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102159790	20.17
11	14	2007	Angle	0	0	0	2	1	1	1	102191000	20.17
11	26	2007	Left Turn, Same Roadway	0	0	0	4	1	1	2	102142917	20.17
11	28	2007	Angle	0	0	0	1	1	5	1	102203136	20.17
11	28	2007	Other Collision With Vehicle	0	0	0	0	1	5	1	102203128	20.198
12	11	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102213765	20.17
12	20	2007	Angle	0	0	1	0	1	1	1	102221411	20.17
2	7	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102257157	20.17
2	7	2008	Angle	0	0	0	0	1	5	1	102257159	20.17
2	5	2008	Fixed Object	0	0	0	0	2	5	5	102255594	20.27
3	23	2008	Other Non-Collision	0	0	0	0	1	1	1	102289118	20.17
11	8	2008	Animal	0	0	0	0	1	1	1	102438245	19.87
11	17	2008	Sideswipe, Same Direction	0	0	0	0	1	1	1	102466442	19.97
12	18	2008	Rear End, Slow or Stop	0	0	0	0	1	5	1	102476740	20.07
2	17	2009	Animal	0	0	0	0	1	5	1	102521352	20.34
4	2	2009	Left Turn, Same Roadway	0	0	0	2	2	1	3	102564819	20.17
6	15	2009	Rear End, Slow or Stop	0	0	0	0	1	1	2	102613726	20.17
7	6	2009	Left Turn, Different Roadways	0	0	0	0	1	1	1	102627499	20.37

Table 10.10. US-17 and Ocean Isle Beach Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	18	2003	Rear End, Slow or Stop	0	0	0	1	2	1	2	100923819	10.21
6	18	2003	Rear End, Slow or Stop	0	0	0	0	2	1	2	100923829	10.21
6	21	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100926435	10.21
6	22	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100927025	10.21
7	5	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100936960	10.21
7	11	2003	Angle	0	0	1	1	1	1	1	100941024	10.21
8	31	2003	Angle	0	0	0	0	1	1	1	100980867	10.21
10	14	2003	Rear End, Slow or Stop	0	0	0	1	2	1	2	101015300	10.21
10	26	2003	Angle	0	0	1	2	1	5	1	101025655	10.21
10	29	2003	Left Turn, Same Roadway	0	0	0	0	1	1	1	101028198	10.21
11	29	2003	Rear End, Slow or Stop	0	0	0	0	1	5	1	101055842	10.21
1	30	2004	Rear End, Slow or Stop	0	0	0	1	1	5	1	101106433	10.21
2	5	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101110561	10.21
3	4	2004	Rear End, Turn	0	0	0	1	1	1	1	101132772	10.21
5	18	2004	Rear End, Slow or Stop	0	0	0	2	1	1	1	101190094	10.21
5	26	2004	Sideswipe, Same Direction	0	0	0	0	1	1	1	101196418	10.21
6	29	2004	Rear End, Slow or Stop	0	0	0	1	1	1	2	101222733	10.21
7	2	2004	Left Turn, Different Roadways	0	0	0	2	1	1	2	101225066	10.21
7	8	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101229651	10.21
7	30	2004	Rear End, Turn	0	0	0	0	1	1	2	101246074	10.21
8	7	2004	Rear End, Slow or Stop	0	0	0	2	1	1	1	101252812	10.21
9	1	2004	Rear End, Slow or Stop	0	0	0	0	2	1	2	101272267	10.21
10	27	2004	Left Turn, Different Roadways	0	0	0	0	1	1	1	101318822	10.21
1	14	2005	Rear End, Slow or Stop	0	0	0	0	2	1	3	101385634	10.21
2	20	2005	Rear End, Slow or Stop	0	0	0	0	2	1	3	101415507	10.21
2	23	2005	Angle	0	0	3	0	1	1	1	101417985	10.21
4	27	2005	Angle	0	0	0	0	1	1	1	101463785	10.21
5	27	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101484657	10.21
7	17	2005	Left Turn, Different Roadways	0	0	0	0	1	1	1	101520274	10.21
7	29	2005	Rear End, Slow or Stop	0	0	0	1	1	1	1	101528169	10.21

Table 10.10. continued (US-17 and Ocean Isle Beach Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	20	2005	Left Turn, Different Roadways	0	0	1	0	1	1	1	101565943	10.21
9	26	2005	Rear End, Slow or Stop	0	0	0	1	1	1	1	101569541	10.21
11	17	2005	Rear End, Slow or Stop	0	0	0	1	1	1	1	101610650	10.21
1	4	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101648804	10.21
3	31	2006	Left Turn, Same Roadway	0	1	1	0	1	1	1	101704777	10.21
4	12	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101718572	10.21
6	22	2006	Rear End, Slow or Stop	0	0	0	1	1	1	1	101767098	10.21
7	6	2006	Angle	0	0	0	2	1	1	2	101774779	10.21
7	7	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101779661	10.21
7	12	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101782318	10.21
8	1	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101797578	10.21
8	5	2006	Left Turn, Same Roadway	0	1	2	1	1	1	2	101800369	10.21
8	20	2006	Overturn/Rollover	0	0	0	0	1	1	1	101808257	10.21
8	25	2006	Left Turn, Different Roadways	0	0	0	1	1	1	1	101815946	10.21
11	14	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101886222	10.21
12	28	2006	Left Turn, Different Roadways	0	0	0	0	1	5	1	101922696	10.21
2	22	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	101966701	10.21
3	6	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	101978100	10.21
3	26	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	101995848	10.21
5	17	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102041172	10.21
5	24	2007	Left Turn, Different Roadways	0	0	0	0	1	1	1	101993938	10.21
5	27	2007	Left Turn, Different Roadways	1	0	0	0	1	1	1	102051049	10.21
5	28	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102051249	10.21
6	10	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102062434	10.21
6	21	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102070065	10.21
7	6	2007	Left Turn, Same Roadway	0	0	0	0	1	1	1	102082205	10.21
8	1	2007	Left Turn, Different Roadways	1	0	2	0	1	1	1	102102847	10.21
8	2	2007	Left Turn, Different Roadways	0	0	0	0	1	1	1	102103402	10.21
8	6	2007	Rear End, Slow or Stop	0	0	0	0	1	5	1	102106970	10.21

Table 10.10. continued (US-17 and Ocean Isle Beach Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	3	2007	Left Turn, Different Roadways	0	0	0	1	1	1	1	102127845	10.21
9	26	2007	Left Turn, Different Roadways	0	1	0	2	1	5	1	102149123	10.21
10	11	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102161238	10.21
11	2	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102180604	10.21
12	27	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102226923	10.21
1	2	2008	Left Turn, Different Roadways	0	0	0	1	1	1	1	102231237	10.21
2	22	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102267792	10.21
4	18	2008	Right Turn, Different Roadways	0	0	0	0	1	1	1	102265929	10.21
1	1	2009	Rear End, Slow or Stop	0	0	0	0	1	5	1	102484267	10.21
1	16	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102497784	10.21
1	26	2009	Rear End, Slow or Stop	0	0	0	0	1	1	2	102523720	10.21
2	11	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102516737	10.21
2	13	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102518962	10.21
3	7	2009	Rear End, Turn	0	0	0	0	1	1	1	102550076	10.21
5	2	2009	Rear End, Turn	0	0	0	0	1	1	2	102586416	10.21
7	9	2009	Rear End, Slow or Stop	0	0	0	0	1	1	2	102929575	10.21
7	27	2004	Left Turn, Different Roadways	0	0	0	2	1	1	1	101243649	10.211
7	5	2003	Angle	0	0	0	0	1	1	1	100936947	10.219
9	18	2007	Left Turn, Same Roadway	0	0	0	1	1	1	1	102143129	10.219
10	18	2005	Animal	0	0	0	0	1	5	1	101586476	10.31
11	8	2005	Sideswipe, Same Direction	0	0	0	1	1	1	1	101603365	10.31
6	28	2007	Fixed Object	0	0	0	0	1	1	1	102076189	10.31
1	7	2005	Animal	0	0	0	0	1	5	1	101380771	10.41
2	21	2006	Rear End, Slow or Stop	0	0	1	2	1	1	2	101680848	10.41
2	18	2008	Animal	0	0	0	0	1	5	1	102265222	10.41

Table 10.11. US-74/23 and Red Bank Road and Old Balsam Road Corridor Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
3	1	2009	Fixed Object	0	0	0	0	5	1	4	102546617	0.84
7	13	2000	Angle	0	0	0	0	2	1	2	100137213	0.88
9	22	1992	Rear End, Slow or Stop	0	0	2	0	2	1	3	92139351	0.91
10	6	1992	Rear End, Slow or Stop	0	0	1	0	1	1	1	92148471	0.91
9	16	1994	Rear End, Slow or Stop	0	0	0	0	1	1	1	94161068	0.91
10	14	1994	Sideswipe, Same Direction	0	0	0	1	2	1	3	94180662	0.91
7	23	1995	Angle	0	0	1	4	1	1	1	95136878	0.91
9	21	1996	Angle	0	0	1	3	1	1	1	96180048	0.91
9	22	1996	Left Turn, Different Roadways	0	3	2	0	1	1	1	96180660	0.91
12	16	1997	Rear End, Slow or Stop	0	0	0	0	1	5	1	97245995	0.91
10	9	2000	Left Turn, Different Roadways	0	0	0	0	1	1	1	100201181	0.91
8	31	2001	Left Turn, Different Roadways	0	0	0	1	2	1	3	100429825	0.91
7	5	2002	Fixed Object	0	0	0	0	1	1	1	100657786	0.91
10	15	2002	Backing Up	0	0	0	0	2	1	3	100733168	0.91
10	12	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101306638	0.91
10	26	1998	Sideswipe, Same Direction	0	0	0	0	1	1	1	98205563	0.92
7	1	1997	Rear End, Turn	0	0	3	0	2	1	3	97124007	0.93
10	24	1994	Left Turn, Different Roadways	0	0	0	2	1	1	1	94188141	0.94
3	1	1996	Left Turn, Different Roadways	0	0	1	0	1	1	2	96043632	0.94
5	24	1997	Left Turn, Different Roadways	0	0	0	1	1	1	1	97097809	0.94
10	13	2000	Sideswipe, Same Direction	0	0	0	0	1	1	1	100204512	0.94
11	4	2001	Left Turn, Different Roadways	0	0	0	0	1	1	1	100480522	0.94
10	15	1995	Angle	0	0	0	0	1	1	1	95197182	0.95
5	23	1996	Left Turn, Different Roadways	1	2	0	1	1	1	1	96097108	0.95
2	5	1997	Angle	0	1	0	1	1	1	1	97022870	0.96
7	10	1994	Ran Off Road - Right	0	2	0	0	2	1	3	94116485	0.97
7	29	1995	Left Turn, Different Roadways	0	4	0	0	1	1	2	95141272	0.97
4	26	1997	Angle	0	5	0	0	1	1	1	97077967	0.97
5	13	2000	Fixed Object	0	0	0	1	1	1	1	100093991	0.99
6	2	2003	Rear End, Turn	0	0	1	3	1	1	1	100911045	0.99

Table 10.11. continued (US-74/23 and Red Bank Road and Old Balsam Road Corridor Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
3	11	1994	Right Turn, Different Roadways	0	0	0	0	1	1	1	94042398	1
2	10	2003	Fixed Object	0	0	0	0	5	5	4	100826898	1
6	9	2003	Sideswipe, Same Direction	0	0	0	0	1	1	1	100917389	1
6	23	2004	Sideswipe, Same Direction	0	0	0	1	2	1	3	101218195	1
7	7	2009	Sideswipe, Same Direction	0	0	0	0	1	1	1	102638221	1
6	6	1993	Ran Off Road - Left	0	0	0	0	1	1	1	93086667	1.01
7	4	1993	Sideswipe, Same Direction	0	0	0	0	1	1	1	93102345	1.01
9	16	1995	Left Turn, Different Roadways	0	0	1	1	2	1	3	95174921	1.01
9	9	1997	Angle	0	0	0	0	2	1	3	97169653	1.01
10	6	1997	Left Turn, Different Roadways	0	0	0	0	1	1	1	97188009	1.01
11	23	2001	Rear End, Slow or Stop	0	0	0	1	2	1	3	100495612	1.01
5	15	2004	Rear End, Slow or Stop	1	0	0	2	1	5	1	101188297	1.01
10	24	2008	Animal	0	0	0	0	2	1	3	102453146	1.01
9	23	2003	Sideswipe, Same Direction	0	0	0	0	1	1	1	100998432	1.04
11	20	2008	Rear End, Slow or Stop	0	0	0	1	1	1	1	102449598	1.04
10	1	2003	Sideswipe, Same Direction	0	0	0	1	1	1	1	101004922	1.091
7	3	1997	Angle	0	0	0	3	1	1	1	97125474	1.095
9	9	1994	Head On	0	0	0	1	2	1	3	94156812	1.1
5	8	2002	Fixed Object	0	0	0	0	1	1	1	100616704	1.1
11	22	2003	Left Turn, Different Roadways	0	0	0	3	1	1	1	101050523	1.1
9	29	1998	Angle	0	0	0	2	1	1	2	98185407	1.101
9	16	2000	Sideswipe, Same Direction	0	0	0	0	1	1	1	100183651	1.101
1	25	1998	Pedestrian	0	1	0	0	1	1	1	98016442	1.104
12	6	2000	Right Turn, Different Roadways	0	0	0	0	1	1	2	100247052	1.106
5	24	1991	Angle	1	0	0	1	1	1	1	91070932	1.11
7	20	1991	Angle	0	0	2	0	1	1	1	91100399	1.11
8	24	1992	Left Turn, Different Roadways	0	0	5	0	1	1	1	92123678	1.11
3	15	1993	Right Turn, Same Roadway	0	0	0	0	2	5	2	93039132	1.11
7	7	1993	Angle	0	0	0	1	1	1	1	93103914	1.11

Table 10.11. continued (US-74/23 and Red Bank Road and Old Balsam Road Corridor Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	18	1994	Angle	0	0	1	1	1	1	1	94084074	1.11
2	23	1995	Left Turn, Different Roadways	0	0	0	0	1	1	1	95034561	1.11
6	20	1995	Left Turn, Same Roadway	0	0	0	0	2	1	3	95114394	1.11
9	1	1995	Right Turn, Same Roadway	0	0	0	1	1	5	2	95165077	1.11
1	4	1996	Angle	0	0	0	2	1	1	1	96002538	1.11
7	9	1996	Ran Off Road - Left	0	0	1	0	1	1	1	96127820	1.11
11	24	1996	Left Turn, Different Roadways	0	0	0	1	1	1	1	96229788	1.11
4	3	1997	Left Turn, Different Roadways	0	0	3	4	1	2	1	97061909	1.11
8	5	1997	Left Turn, Different Roadways	0	0	1	1	1	1	2	97147016	1.11
1	20	1998	Sideswipe, Same Direction	0	0	0	0	1	1	1	98012948	1.11
8	22	1998	Rear End, Turn	0	0	0	0	1	1	1	98158939	1.11
2	25	2002	Sideswipe, Same Direction	0	0	0	0	1	1	1	100565958	1.11
5	15	2004	Rear End, Slow or Stop	0	0	0	0	1	5	1	101188272	1.11
3	3	2001	Fixed Object	0	0	0	0	2	2	3	100306191	1.111
8	25	2007	Overturn/Rollover	0	0	0	2	2	1	3	102121881	1.114
4	29	2000	Fixed Object	0	0	0	1	1	1	2	100084049	1.116
7	28	2007	Sideswipe, Same Direction	0	0	0	0	2	1	2	102100843	1.14
8	24	1993	Rear End, Slow or Stop	0	0	0	1	1	1	2	93132101	1.179
12	6	1992	Ran Off Road - Right	0	2	0	0	4	5	6	92186997	1.21
9	16	2004	Fixed Object	0	0	0	1	2	5	2	101284949	1.23
11	13	2008	Fixed Object	0	0	3	0	1	5	2	102442650	1.29
7	24	2009	Sideswipe, Same Direction	0	0	0	0	1	1	1	102640466	1.29
12	6	1992	Ran Off Road - Right	0	0	0	1	4	4	6	92186992	1.31
8	6	2007	Fixed Object	0	0	0	0	1	5	1	102112779	1.37
4	30	1993	Fixed Object	0	0	0	0	1	1	1	93065533	1.39
3	28	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	101994812	1.39
3	13	2001	Fixed Object	0	0	0	1	2	1	3	100312727	1.4
1	9	2005	Right Turn, Different Roadways	0	0	0	2	1	2	1	101382172	1.4
4	10	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101452427	1.4

Table 10.11. continued (US-74/23 and Red Bank Road and Old Balsam Road Corridor Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	25	2006	Sideswipe, Same Direction	0	0	0	0	1	5	1	101896545	1.4
12	11	2008	Fixed Object	0	0	0	0	2	1	3	102487577	1.4
1	30	1995	Ran Off Road - Right	0	0	0	0	5	1	4	95012467	1.41
10	23	1995	Ran Off Road - Right	0	0	0	0	1	1	1	95203609	1.41
7	3	2000	Fixed Object	0	0	0	0	1	1	1	100131011	1.41
3	1	2009	Fixed Object	1	0	3	0	6	1	4	102534253	1.41
12	4	1991	Rear End, Slow or Stop	0	0	0	0	4	5	1	91175445	1.49
12	4	1991	Rear End, Slow or Stop	0	0	0	0	4	5	1	91175446	1.49
12	4	1991	Angle	0	0	1	1	4	5	1	91175448	1.49
5	14	1995	Ran Off Road - Right	0	0	1	0	2	1	3	95087318	1.49
1	26	2003	Sideswipe, Same Direction	0	0	0	0	1	1	2	100903390	1.49
4	6	2004	Fixed Object	0	0	0	1	1	5	1	101157371	1.49
12	4	1993	Ran Off Road - Right	0	0	0	0	2	5	3	93198587	1.51
2	7	2003	Fixed Object	0	0	0	0	1	1	1	100824895	1.51
9	9	1995	Rear End, Slow or Stop	0	0	1	0	1	1	2	95170316	1.54
7	3	1997	Ran Off Road - Right	0	0	0	2	1	5	1	97125470	1.59
7	24	2004	Fixed Object	0	0	0	0	1	1	1	101241723	1.59
8	3	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101249507	1.59
5	11	2005	Sideswipe, Same Direction	0	0	0	0	1	1	1	101474240	1.6
1	6	1994	Ran Off Road - Left	0	0	0	1	1	1	1	94002948	1.61
6	12	2000	Rear End, Slow or Stop	0	0	0	0	1	1	1	100115558	1.65
11	18	1993	Rear End, Turn	0	0	0	4	1	1	1	93187992	1.662
5	2	1997	Ran Off Road - Left	0	1	0	0	1	1	1	97082678	1.67
10	4	2002	Rear End, Slow or Stop	0	0	0	1	2	5	2	100724364	1.676
8	4	1991	Angle	0	0	0	0	1	1	1	91108942	1.69
7	25	1992	Ran Off Road - Left	0	0	0	1	1	5	1	92107509	1.69
10	9	1992	Angle	0	1	2	0	1	1	1	92150306	1.69
11	23	1994	Left Turn, Different Roadways	0	3	0	0	1	5	1	94210919	1.69
5	3	1995	Left Turn, Different Roadways	0	1	0	0	1	1	1	95079707	1.69

Table 10.11. continued (US-74/23 and Red Bank Road and Old Balsam Road Corridor Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	5	1996	Angle	0	0	0	0	1	1	1	96105523	1.69
9	22	1996	Left Turn, Different Roadways	0	0	0	0	1	1	1	96180658	1.69
8	16	1997	Angle	0	0	2	2	1	1	1	97154223	1.69
10	5	1997	Left Turn, Different Roadways	1	6	0	0	1	5	1	97187522	1.69
10	10	1997	Left Turn, Different Roadways	0	0	1	1	1	1	1	97192429	1.69
10	21	1997	Left Turn, Different Roadways	0	0	0	2	2	1	2	97199815	1.69
10	24	1997	Angle	0	0	0	1	2	1	3	97202243	1.69
4	17	1998	Left Turn, Different Roadways	0	1	0	4	1	1	2	98071979	1.69
7	16	1998	Angle	0	0	0	0	1	1	2	98132304	1.69
9	25	1998	Left Turn, Different Roadways	0	0	0	2	1	1	1	98182803	1.69
10	16	1998	Left Turn, Different Roadways	0	0	0	0	1	1	1	98197998	1.69
2	4	2000	Rear End, Turn	0	0	0	1	1	1	1	100024737	1.69
11	16	2000	Rear End, Slow or Stop	0	0	0	0	2	5	3	100231721	1.69
4	8	2002	Rear End, Slow or Stop	0	0	0	0	1	1	2	100595236	1.69
7	13	2002	Fixed Object	0	0	0	0	2	1	3	100662872	1.69
7	26	2002	Rear End, Slow or Stop	0	1	0	1	1	1	1	100672816	1.69
9	7	2002	Left Turn, Same Roadway	1	1	3	1	1	1	1	100704039	1.69
11	7	2002	Overturn/Rollover	0	0	0	0	1	1	1	100752483	1.69
7	2	2004	Fixed Object	0	0	0	0	1	1	2	101225354	1.69
10	10	2004	Right Turn, Different Roadways	0	0	0	3	1	5	1	101305224	1.69
5	31	2005	Rear End, Slow or Stop	0	0	0	1	1	1	1	101487496	1.69
8	9	2005	Left Turn, Same Roadway	0	0	0	2	1	1	1	101535622	1.69
10	16	2006	Rear End, Slow or Stop	0	0	0	0	1	1	2	101857795	1.69
1	24	2008	Left Turn, Different Roadways	0	0	0	1	1	5	1	102247446	1.69
5	10	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102329196	1.69
5	20	2008	Fixed Object	0	0	0	0	1	1	1	102312710	1.69
5	10	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102586945	1.69
7	4	2007	Fixed Object	0	0	0	1	1	1	1	102081208	1.709
3	10	2003	Rear End, Slow or Stop	0	0	0	1	1	1	1	100847027	1.713

Table 10.11. continued (US-74/23 and Red Bank Road and Old Balsam Road Corridor Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	31	2003	Left Turn, Different Roadways	0	0	0	3	1	1	1	101030695	1.72
3	31	2009	Fixed Object	0	0	0	0	1	5	1	102568818	1.79
2	28	2005	Fixed Object	0	0	0	0	6	1	4	101421827	1.8
4	17	2006	Ran Off Road - Left	0	0	0	0	1	5	1	101716129	1.8
12	25	2002	Fixed Object	0	0	0	0	5	1	4	100793196	1.88
3	6	1992	Ran Off Road - Right	0	0	1	0	2	1	2	92031906	1.89
12	6	1992	Ran Off Road - Right	0	0	0	0	4	5	6	92186993	1.89
9	6	1995	Ran Off Road - Right	0	0	0	1	1	5	1	95168095	1.89
10	5	2000	Fixed Object	0	0	0	1	1	1	1	100198506	1.9
9	14	1992	Right Turn, Different Roadways	0	0	0	0	1	1	1	92134800	1.94
8	3	1993	Sideswipe, Same Direction	0	0	0	2	2	1	3	93119504	1.99
3	1	1994	Ran Off Road - Left	0	0	0	0	2	1	3	94035865	1.99
12	23	2007	Fixed Object	0	0	0	1	1	1	1	102224501	1.99
9	20	1993	Rear End, Slow or Stop	0	0	1	2	1	1	2	93148029	2
6	22	2004	Fixed Object	0	0	2	0	1	1	2	101217656	2
12	13	2007	Rear End, Slow or Stop	0	0	0	1	2	1	2	102216022	2
12	1	2008	Fixed Object	0	0	0	0	5	1	2	102472812	2
4	10	2009	Movable Object	0	0	0	0	2	2	3	102564994	2
10	10	1997	Angle	0	0	1	1	1	1	1	97192428	2.07
10	29	2000	Angle	0	0	0	0	1	1	1	100216398	2.07
8	29	2001	Right Turn, Same Roadway	0	0	1	2	1	5	2	100428178	2.07
4	11	1994	Ran Off Road - Right	0	0	2	1	2	1	3	94062544	2.11
4	11	1998	Angle	0	0	0	1	1	1	1	98068087	2.16

Table 10.12. US-74/441 and Barkers Creek Road/Wilmont Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	28	2003	Sideswipe, Same Direction	0	0	0	0	1	1	1	101002696	6.19
4	6	2005	Right Turn, Same Roadway	0	0	0	0	1	1	1	101413031	6.19
11	26	2005	Fixed Object	0	0	0	1	1	1	1	101618264	6.22
12	9	2004	Rear End, Slow or Stop	0	0	0	3	2	1	2	101357131	6.23
12	9	2004	Fixed Object	0	0	0	1	2	1	2	101357130	6.23
7	7	2003	Sideswipe, Same Direction	0	0	0	0	1	1	1	100938034	6.33
12	15	2003	Rear End, Slow or Stop	0	0	0	0	1	1	2	101070990	6.33
11	24	2003	Overturn/Rollover	0	0	0	1	1	5	1	101051978	6.362
8	25	2003	Rear End, Turn	0	0	0	0	1	1	1	100976306	6.39
10	26	2002	Fixed Object	0	0	1	0	1	1	2	100741946	6.43
6	17	2009	Sideswipe, Same Direction	0	0	0	0	1	1	1	102622641	6.43
12	28	2006	Other Non-Collision	0	0	0	0	1	1	1	101922841	6.455
4	12	2003	Angle	0	0	0	1	1	1	1	100871956	6.53
1	26	2004	Angle	0	1	0	2	1	1	1	101103047	6.53
9	10	2004	Left Turn, Different Roadways	0	0	0	1	1	1	1	101280370	6.53
7	10	2005	Left Turn, Same Roadway	0	0	0	8	1	1	2	101515862	6.53
10	14	2005	Left Turn, Same Roadway	0	0	0	0	1	1	1	101583824	6.53
4	9	2006	Angle	0	0	0	2	1	1	1	101711123	6.53
4	24	2007	Angle	0	0	0	2	1	5	1	102021039	6.53
6	17	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102622616	6.53
11	18	2003	Right Turn, Different Roadways	0	0	0	0	1	1	1	101046830	6.545
5	13	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102038089	6.59
8	8	2005	Fixed Object	0	0	0	1	2	5	2	101535640	6.63
2	17	2007	Rear End, Slow or Stop	0	0	0	0	5	5	4	101962459	6.63
5	12	2009	Fixed Object	0	0	0	0	1	1	1	102608763	6.69
6	30	2004	Fixed Object	0	0	0	1	2	1	2	101223901	6.71
8	6	2006	Overturn/Rollover	0	0	0	4	1	1	1	101801380	6.71
8	7	2003	Sideswipe, Same Direction	0	0	0	0	1	1	1	100962160	6.73
8	27	2005	Fixed Object	0	0	0	0	1	1	2	101550296	6.78
12	15	2003	Overturn/Rollover	0	0	0	1	1	1	1	101070096	6.83
6	30	2005	Fixed Object	0	0	0	1	1	5	1	101509306	6.83

Table 10.13. US-74/441 and Dicks Creek Road/SR-1388 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	5	2003	Fixed Object	0	0	1	0	1	5	5	101008335	7.73
10	30	2005	Fixed Object	0	0	0	2	1	1	1	101596013	7.81
12	8	2004	Rear End, Slow or Stop	0	0	0	2	1	5	1	101355970	7.91
6	9	2005	Fixed Object	0	0	0	0	2	1	3	101494291	8.01
9	15	2005	Sideswipe, Same Direction	0	0	0	0	1	1	1	101562252	8.01
11	1	2005	Fixed Object	0	0	0	0	1	1	1	101597900	8.01
7	24	2006	Fixed Object	0	0	0	0	2	5	2	101791756	8.01
3	14	2009	Fixed Object	0	0	0	1	2	1	2	102553189	8.01
5	11	2007	Fixed Object	0	0	0	1	3	1	3	102036092	8.015
3	20	2004	Sideswipe, Same Direction	0	0	0	0	3	5	3	101145374	8.06
5	5	2007	Fixed Object	0	0	0	0	2	1	3	102031401	8.072
6	12	2005	Angle	0	1	2	0	2	1	3	101496521	8.076
2	18	2006	Fixed Object	0	0	0	0	2	1	3	101679637	8.091
11	29	2003	Angle	0	0	0	1	1	1	1	101056087	8.11
6	8	2004	Left Turn, Different Roadways	0	0	0	0	1	1	2	101206823	8.11
6	25	2004	Angle	0	1	0	1	2	1	2	101220207	8.11
8	9	2004	Angle	0	0	0	0	1	1	1	101254266	8.11
6	20	2005	Left Turn, Different Roadways	0	0	1	2	1	1	1	101502438	8.11
10	28	2005	Sideswipe, Same Direction	0	0	0	0	1	1	1	101595450	8.11
11	13	2006	Left Turn, Different Roadways	0	0	0	2	1	1	1	101885445	8.11
5	10	2009	Left Turn, Same Roadway	0	2	0	0	1	1	1	102606287	8.11
8	20	2003	Left Turn, Same Roadway	0	0	0	0	1	1	1	100972688	8.117
7	3	2005	Fixed Object	0	0	0	0	1	5	2	101511683	8.19
5	26	2009	Sideswipe, Same Direction	0	0	0	0	3	1	3	102608780	8.193

Table 10.14. US-74 and Elmore Road/SR-1321 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	15	2004	Fixed Object	0	0	0	1	1	5	2	101309577	7.68
3	22	2004	Rear End, Turn	0	0	0	2	1	1	1	101146896	7.75
9	25	2008	Overturn/Rollover	0	0	0	1	2	1	3	102415671	7.75
3	16	2009	Rear End, Slow or Stop	0	0	0	3	2	1	2	102549567	7.75
6	10	2006	Pedestrian	0	1	0	0	1	5	2	101759361	7.8
1	26	2004	Fixed Object	0	0	0	0	4	5	6	101103506	7.85
2	22	2003	Angle	0	0	1	2	1	5	2	100836526	7.95
12	8	2003	Left Turn, Same Roadway	0	0	0	0	1	1	1	101063761	7.95
12	12	2003	Fixed Object	0	0	0	0	1	1	2	101067533	7.95
1	31	2004	Angle	0	0	4	3	1	1	2	101110175	7.95
11	12	2004	Angle	0	0	0	0	2	1	3	101334043	7.95
5	17	2005	Angle	0	0	0	0	1	1	1	101478426	7.95
11	13	2005	Angle	0	0	0	0	1	1	1	101607996	7.95
2	10	2006	Angle	0	0	0	0	1	1	1	101674286	7.95
2	25	2006	Movable Object	0	0	2	0	1	1	1	101683972	7.95
8	26	2006	Angle	1	0	0	1	1	1	1	101817054	7.95
9	19	2006	Angle	0	0	1	0	1	5	1	101835392	7.95
9	26	2006	Angle	0	0	2	0	1	1	1	101839914	7.95
8	7	2007	Ran Off Road - Right	0	0	0	3	1	5	2	102107899	8.05
12	25	2006	Fixed Object	0	0	0	0	2	1	2	101921657	8.15

Table 10.15. US-74/76 and Blacksmith Road/SR-1800 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
8	21	2001	Other Non-Collision	0	0	0	0	1	5	1	100422245	35.33
4	15	2005	Rear End, Slow or Stop	0	0	1	0	1	1	1	101413162	35.33
8	12	2008	Rear End, Slow or Stop	0	0	0	2	1	3	1	102385479	35.33
8	2	2008	Rear End, Turn	0	0	0	2	1	1	1	102379303	35.43
3	29	2005	Movable Object	0	0	0	0	1	1	1	101443282	35.519
2	4	2002	Angle	0	0	0	2	1	1	1	100551390	35.53
2	28	2002	Angle	0	0	2	1	1	2	1	100567565	35.53
7	16	2002	Angle	0	0	3	0	1	1	2	100664802	35.53
7	21	2003	Angle	0	0	2	0	1	1	1	100948552	35.53
10	18	2003	Angle	0	0	0	0	1	5	1	101019234	35.53
5	6	2004	Angle	2	0	0	1	1	1	1	101181137	35.53
1	11	2005	Angle	0	0	2	0	1	1	2	101342462	35.53
1	12	2005	Angle	0	0	0	2	1	1	5	101384605	35.53
1	12	2005	Angle	0	0	0	2	1	5	1	101384149	35.53
8	24	2005	Angle	0	0	3	0	1	1	2	101547871	35.53
1	13	2002	Fixed Object	0	0	0	1	2	1	1	100536403	35.6
12	10	2006	Fixed Object	0	0	2	0	1	5	1	101909079	35.63
2	5	2008	Animal	0	0	0	0	1	3	1	102255727	35.73
3	5	2009	Rear End, Slow or Stop	0	0	0	1	1	1	1	102549210	35.73

Table 10.16. NC-24 and Haw Branch Road/SR-1230 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
2	27	2005	Animal	0	0	0	0	1	5	1	101421222	0.81
3	13	2007	Animal	0	0	0	0	1	5	2	101982651	1
12	31	2002	Animal	0	0	0	0	1	5	1	100796929	1.01
11	26	2004	Animal	0	0	0	0	1	5	1	101346660	1.01
11	4	2006	Animal	0	0	0	0	1	5	1	101877123	1.01
4	16	2008	Fixed Object	0	0	0	0	1	2	1	102306402	1.209
6	23	2002	Angle	0	0	0	0	2	5	3	100649169	1.21
10	15	2002	Angle	0	0	0	1	2	1	3	100733462	1.21
3	2	2003	Angle	0	0	0	0	1	1	2	100842200	1.21
10	12	2003	Angle	1	0	2	1	1	1	2	101014340	1.21
11	7	2003	Angle	0	0	0	0	1	5	1	101037437	1.21
2	8	2004	Left Turn, Same Roadway	0	0	0	3	1	5	1	101113503	1.21
3	12	2004	Left Turn, Same Roadway	0	0	2	0	1	2	1	101139828	1.21
4	21	2004	Angle	0	0	0	2	1	1	1	101168952	1.21
6	2	2004	Angle	0	0	0	2	1	1	1	101202227	1.21
6	11	2004	Left Turn, Same Roadway	0	0	0	0	1	1	1	101209322	1.21
7	15	2004	Angle	0	0	0	0	1	1	1	101235349	1.21
8	1	2004	Angle	0	0	1	1	1	1	2	101247852	1.21
10	16	2004	Animal	0	0	0	0	1	5	1	101310427	1.21
11	23	2004	Animal	0	0	0	0	2	5	2	101344160	1.21
4	7	2005	Left Turn, Different Roadways	0	0	0	2	1	1	2	101450059	1.21
8	8	2005	Angle	0	0	1	1	1	1	2	101535723	1.21
9	1	2005	Angle	0	0	0	0	1	1	1	101553347	1.21
11	3	2005	Angle	0	0	0	0	1	1	1	101600410	1.21
7	15	2006	Angle	0	0	0	0	1	1	1	101785639	1.21
9	4	2006	Left Turn, Same Roadway	0	0	0	0	1	1	1	101824058	1.21
1	17	2007	Angle	0	0	0	0	1	1	1	101939334	1.21
6	27	2009	Animal	0	0	0	0	1	5	1	102621740	1.21
7	25	2009	Rear End, Slow or Stop	0	0	0	1	1	1	1	102640492	1.21
8	18	2009	Fixed Object	0	0	0	0	1	1	1	102658073	1.21
7	14	2003	Sideswipe, Same Direction	0	0	0	0	1	1	1	100944324	1.31

10	25	2005	Animal	0	0	0	0	1	1	1	101591553	1.31

Table 10.16. continued (NC-24 and Haw Branch Road/SR-1230 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	5	2006	Animal	0	0	0	0	1	5	1	101847841	1.31
1	9	2007	Animal	0	0	1	0	1	5	1	101934775	1.31
1	22	2005	Animal	0	0	0	0	1	5	1	101392634	1.38
9	24	2005	Animal	0	0	0	0	1	5	1	101568951	1.41
2	18	2009	Fixed Object	0	0	0	1	3	1	3	102538619	1.41
5	27	2006	Sideswipe, Same Direction	0	0	0	0	1	1	1	101740096	1.51
6	2	2006	Animal	0	0	0	0	1	5	1	101742601	1.51
11	1	2002	Fixed Object	0	0	0	1	1	5	1	100747500	1.54
3	25	2008	Animal	0	0	0	0	1	5	2	102293794	1.55
2	25	2007	Fixed Object	0	0	1	0	1	3	1	101972351	1.65

Table 10.17. US-1 and Camp Easter Road/Aiken Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	10	2008	Overturn/Rollover	0	0	0	0	2	1	2	102237340	17.23
10	30	2007	Rear End, Slow or Stop	0	0	0	1	1	1	1	102105892	17.27
8	6	2009	Rear End, Slow or Stop	0	0	1	2	1	1	2	102649859	17.31
9	28	2006	Parked Motor Vehicl	0	0	0	1	1	1	1	101831913	17.33
11	21	2006	Rear End, Slow or Stop	0	0	0	2	2	1	2	101893306	17.33
11	21	2006	Jackknife	0	0	0	1	2	1	3	101874393	17.33
11	28	2006	Other Non-Collision	0	0	0	0	1	1	1	101863313	17.33
2	4	2008	Sideswipe, Same Direction	0	0	0	0	1	1	1	102255252	17.33
11	13	2008	Animal	0	0	0	0	1	5	1	102441266	17.33
3	30	2007	Sideswipe, Same Direction	0	0	0	0	1	1	1	101998133	17.354
1	27	2002	Ran Off Road - Left	0	0	0	0	1	1	1	100546435	17.405
11	17	2007	Other Collision With Vehicle	0	0	0	0	1	5	1	102195315	17.416
4	12	2001	Left Turn, Same Roadway	0	0	0	0	1	1	1	100334395	17.43
9	16	2002	Left Turn, Different Roadways	0	0	0	0	1	1	2	100711181	17.43
3	10	2003	Angle	0	0	0	2	1	1	1	100847472	17.43
6	19	2003	Angle	1	3	2	1	1	1	1	100924530	17.43
2	22	2004	Angle	0	0	0	0	1	5	1	101124192	17.43
3	19	2004	Angle	0	0	0	0	1	1	1	101144787	17.43
11	2	2004	Left Turn, Same Roadway	0	0	0	0	1	5	1	101324552	17.43
11	10	2004	Sideswipe, Opposite Direction	0	0	0	0	1	1	1	101331927	17.43
1	18	2005	Left Turn, Different Roadways	0	0	0	1	1	1	1	101388664	17.43
1	24	2005	Angle	0	0	0	0	1	5	1	101394168	17.43
12	29	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101924250	17.43
11	15	2007	Rear End, Slow or Stop	0	0	0	0	2	1	3	102192510	17.43
5	10	2008	Left Turn, Different Roadways	0	0	1	3	1	1	1	102322499	17.43
1	29	2001	Sideswipe, Same Direction	0	0	0	1	1	1	1	100283962	17.433
11	14	2008	Right Turn, Different Roadways	0	0	0	1	2	1	3	102453760	17.436
7	22	2005	Movable Object	0	0	0	0	2	1	3	101524212	17.439
9	15	2004	Fixed Object	0	0	0	0	1	1	1	101284217	17.53
2	28	2003	Fixed Object	0	0	0	0	1	1	2	100840798	17.55
2	23	2001	Sideswipe, Same Direction	0	0	0	1	1	1	1	100301251	17.59

6	5	2002	Ran Off Road - Right	0	0	1	0	1	1	1	100636853	17.63

Table 10.17. continued (US-1 and Camp Easter Road/Aiken Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	21	2002	Animal	0	0	0	0	1	5	1	100764999	17.63
4	13	2004	Sideswipe, Same Direction	0	0	0	0	2	5	1	101162639	17.63
8	20	2002	Sideswipe, Same Direction	0	0	0	0	1	1	1	100690379	17.69
9	18	2000	Rear End, Slow or Stop	0	0	0	2	2	1	3	100185332	17.73
2	6	2004	Jackknife	0	0	0	0	2	1	3	101111169	17.73
3	24	2004	Sideswipe, Opposite Direction	0	0	1	1	1	5	1	101148155	17.73
3	17	2005	Rear End, Slow or Stop	0	0	0	0	2	1	3	101434906	17.73

Table 10.18. NC-87 and Peanut Plant Road/SR-1150 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	13	2007	Animal	0	0	0	0	1	1	1	101933735	26.8
12	14	2001	Animal	0	0	0	0	1	5	1	100513449	26.9
1	22	2008	Fixed Object	0	0	0	0	2	5	3	102245805	26.9
3	28	2009	Fixed Object	0	0	0	0	2	5	2	102561911	26.9
5	5	2008	Fixed Object	0	0	1	0	2	1	2	102318835	26.957
4	2	2001	Angle	0	0	0	0	1	1	1	100327203	27
5	3	2001	Angle	0	0	0	2	1	1	1	100348332	27
5	24	2001	Angle	0	0	0	1	1	1	1	100362924	27
5	26	2001	Angle	0	0	0	2	1	1	1	100364602	27
6	28	2001	Angle	0	0	2	1	1	1	1	100386748	27
9	2	2001	Angle	0	0	0	3	1	5	1	100431271	27
10	25	2001	Angle	0	0	0	0	1	1	1	100471450	27
12	21	2001	Angle	0	0	0	1	1	5	1	100519254	27
2	22	2002	Left Turn, Different Roadways	0	0	0	0	1	1	1	100563864	27
2	28	2002	Angle	1	0	0	0	1	1	1	100567498	27
5	17	2002	Angle	0	0	1	0	1	1	1	100623260	27
6	13	2002	Angle	1	0	2	0	1	1	1	100641902	27
9	21	2002	Angle	0	0	1	0	1	1	1	100714460	27
1	27	2003	Angle	1	0	2	1	1	1	1	100816501	27
3	31	2003	Angle	0	0	1	1	1	1	1	100861816	27
4	17	2003	Angle	0	0	3	0	1	1	1	100875214	27
10	2	2003	Angle	0	0	0	0	1	1	1	101005674	27
11	22	2003	Angle	0	0	0	1	1	1	1	101049850	27
1	2	2004	Angle	0	0	0	0	1	5	1	101083625	27
3	15	2004	Angle	0	0	0	3	1	1	1	101141133	27
5	27	2004	Angle	0	0	0	1	1	1	1	101197120	27

Table 10.18. continued (NC-87 and Peanut Plant Road/SR-1150 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	31	2004	Angle	0	0	0	4	1	1	1	101200355	27
7	10	2004	Angle	0	0	0	2	1	2	1	101231304	27
7	10	2004	Angle	0	0	0	2	1	2	1	101231363	27
8	3	2004	Angle	0	0	2	0	1	1	2	101249277	27
8	7	2004	Angle	0	0	0	1	1	1	1	101252650	27
8	24	2004	Movable Object	0	0	1	0	1	1	1	101265790	27
9	4	2004	Angle	0	1	0	0	1	1	1	101274671	27
9	28	2004	Angle	0	0	1	4	1	1	1	101295042	27
10	20	2004	Angle	0	0	3	0	1	1	1	101313066	27
6	27	2005	Angle	1	2	0	0	1	1	1	101425349	27
7	20	2005	Angle	0	0	0	0	1	1	1	101438431	27
4	2	2005	Angle	0	0	0	1	1	1	1	101446356	27
4	10	2005	Angle	0	0	1	4	1	1	1	101452275	27
10	21	2005	Angle	0	0	1	1	1	1	1	101587483	27
11	14	2005	Angle	0	0	0	2	1	1	1	101608061	27
7	31	2007	Right Turn, Different Roadways	0	0	0	0	1	1	1	102102121	27
4	4	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102561125	27
3	6	2008	Sideswipe, Same Direction	0	0	0	0	1	1	1	102276697	27.006
2	10	2009	Sideswipe, Same Direction	0	0	0	0	1	1	1	102534511	27.019
10	7	2005	Fixed Object	0	0	0	2	3	1	3	101578431	27.08
12	20	2006	Animal	0	0	0	0	1	5	1	101916656	27.1
10	24	2007	Animal	0	0	0	0	1	5	2	102171334	27.2

Table 10.19. NC-87/24 and 2nd Street Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	6	2005	Sideswipe, Same Direction	0	0	0	1	1	1	1	101337061	3.05
1	5	2007	Sideswipe, Opposite Direction	0	0	0	0	2	4	3	101880308	3.055
1	2	2002	Sideswipe, Same Direction	0	0	0	0	5	4	8	100535086	3.062
4	12	2008	Rear End, Slow or Stop	0	0	0	3	1	4	1	102252435	3.062
8	18	2001	Rear End, Slow or Stop	0	0	0	1	1	1	2	100420972	3.065
3	9	2005	Rear End, Slow or Stop	0	0	0	2	1	1	1	101315462	3.067
2	4	2004	Left Turn, Different Roadways	0	0	2	0	1	1	1	101110245	3.071
12	14	2004	Pedestrian	0	0	0	1	1	4	1	101233641	3.071
1	15	2002	Rear End, Slow or Stop	0	0	1	0	1	1	1	100537902	3.075
8	9	2005	Left Turn, Different Roadways	0	0	0	0	2	1	3	101447127	3.079
6	5	2001	Rear End, Slow or Stop	0	0	0	0	1	2	2	100370871	3.081
7	30	2003	Sideswipe, Same Direction	0	0	0	0	2	7	2	100955274	3.081
6	26	2005	Right Turn, Different Roadways	0	0	0	2	2	4	2	101413705	3.084
12	26	2004	Rear End, Slow or Stop	0	0	0	0	4	4	6	101242334	3.087
12	22	2004	Other Collision With Vehicle	0	0	0	2	1	4	2	101238534	3.089
1	30	2002	Sideswipe, Same Direction	0	0	0	0	1	1	1	100547846	3.09
2	4	2002	Rear End, Slow or Stop	0	0	0	1	1	1	1	100551240	3.09
11	29	2002	Right Turn, Same Roadway	0	0	0	0	1	4	1	100770663	3.09
3	20	2004	Right Turn, Same Roadway	0	0	0	0	1	1	1	101145638	3.09
4	5	2005	Right Turn, Different Roadways	0	0	0	0	1	1	1	101346346	3.09
1	5	2006	Rear End, Slow or Stop	0	0	1	0	1	4	1	101620129	3.09
2	15	2008	Angle	0	0	0	0	1	1	2	102183863	3.09
8	17	2002	Rear End, Slow or Stop	0	0	0	0	1	1	2	100687849	3.092
12	9	2001	Sideswipe, Same Direction	0	0	0	0	1	1	2	100510859	3.094
5	12	2004	Left Turn, Different Roadways	0	0	0	0	2	1	3	101185603	3.094
3	26	2003	Angle	0	0	0	0	1	1	1	100858081	3.096
1	31	2007	Rear End, Slow or Stop	0	0	0	0	1	4	1	101904606	3.096
10	29	2001	Rear End, Slow or Stop	0	0	0	0	1	4	1	100500069	3.099
10	11	2005	Rear End, Slow or Stop	0	0	0	0	1	1	2	101498997	3.102
7	10	2008	Rear End, Slow or Stop	0	0	0	1	1	1	2	102346356	3.102
4	9	2005	Other Non-Collision	0	0	0	0	1	1	1	101335638	3.104
6	8	2007	Sideswipe, Opposite Direction	0	0	0	1	3	1	3	101995688	3.105

Table 10.19. continued (NC-87/24 and 2nd Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	12	2002	Left Turn, Same Roadway	0	0	0	0	1	1	2	100604690	3.112
9	22	2009	Rear End, Slow or Stop	0	0	0	1	1	1	2	102692803	3.13
9	1	2008	Angle	0	0	0	1	1	1	1	102382388	3.134
10	27	2005	Left Turn, Different Roadways	0	0	0	0	1	1	1	101514192	3.137
3	15	2002	Sideswipe, Same Direction	0	0	0	1	1	1	1	100578406	3.14
6	22	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100926981	3.14
9	17	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100993343	3.14
4	17	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101165926	3.14
5	22	2004	Angle	0	0	0	0	1	2	2	101193213	3.14
8	27	2004	Left Turn, Same Roadway	0	0	0	1	1	3	2	101129549	3.14
7	10	2007	Angle	0	0	0	0	1	1	2	102020031	3.14
6	27	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102334886	3.14
2	22	2003	Sideswipe, Same Direction	0	0	0	0	2	1	2	100904110	3.143
1	15	2003	Left Turn, Same Roadway	0	0	0	0	1	1	1	100806604	3.144
5	6	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102281044	3.147
8	2	2008	Rear End, Slow or Stop	0	0	0	3	1	1	1	102370790	3.147
5	23	2001	Rear End, Slow or Stop	0	0	0	0	1	1	1	100362062	3.149
12	13	2001	Sideswipe, Same Direction	0	0	0	0	2	4	5	100512318	3.149
6	25	2002	Angle	0	0	0	2	1	1	1	100650730	3.149
6	9	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	101998358	3.15
4	27	2002	Rear End, Slow or Stop	0	0	0	0	1	1	1	100608788	3.158
4	4	2009	Rear End, Slow or Stop	0	0	0	0	1	4	1	102567163	3.16
12	23	2002	Rear End, Slow or Stop	0	0	0	1	1	1	1	100791227	3.161
8	19	2007	Sideswipe, Same Direction	0	0	0	0	1	1	1	102058920	3.168
4	26	2004	Angle	0	0	0	0	2	1	3	101172389	3.17
9	22	2007	Animal	0	0	0	0	1	1	1	102068914	3.178
12	23	2007	Sideswipe, Same Direction	0	0	0	0	2	1	3	102141943	3.178
1	25	2003	Rear End, Slow or Stop	0	0	0	1	1	1	1	100815451	3.18
5	16	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100897590	3.18
5	23	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100903304	3.197
5	3	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102290361	3.197
2	1	2002	Rear End, Slow or Stop	0	0	0	1	1	1	1	100550053	3.211

Table 10.19. continued (NC-87/24 and 2nd Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
3	4	2002	Rear End, Slow or Stop	0	0	0	1	1	1	1	100570515	3.215
7	3	2001	Rear End, Slow or Stop	0	0	0	0	1	1	1	100389958	3.225
11	27	2008	Sideswipe, Same Direction	0	0	0	0	1	4	1	102455405	3.23
12	24	2002	Rear End, Slow or Stop	0	0	0	2	2	1	1	100792102	3.232
8	31	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102070456	3.235
10	22	2008	Ran Off Road - Right	0	0	0	0	1	1	1	102438087	3.235
11	18	2003	Angle	0	0	0	0	1	1	1	101045645	3.24
1	16	2004	Sideswipe, Same Direction	0	0	0	0	1	4	1	101093840	3.254
10	14	2005	Right Turn, Different Roadways	0	0	0	0	1	1	1	101502043	3.28
1	2	2007	Ran Off Road - Right	0	0	2	1	1	1	1	101892154	3.28
3	25	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102249074	3.28
2	13	2004	Angle	0	0	0	0	1	1	1	101116596	3.293
6	9	2001	Rear End, Slow or Stop	0	0	0	4	1	1	2	100373263	3.33
1	24	2005	Rear End, Slow or Stop	0	0	0	0	1	4	2	101263744	3.33
8	8	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101447121	3.341
8	8	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101447121	3.341
12	20	2003	Right Turn, Different Roadways	0	0	0	2	1	1	1	101074975	3.36
12	6	2005	Sideswipe, Same Direction	0	0	0	0	1	1	1	101596377	3.39
12	12	2004	Sideswipe, Same Direction	0	0	0	0	1	1	1	101230828	3.4
4	17	2007	Rear End, Slow or Stop	0	0	0	1	1	1	1	101961068	3.416

Table 10.20. NC-87 and School Road/Butler Nursery Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
12	23	2003	ANIMAL	0	0	0	0	2	5	1	101077525	2.84
11	16	2006	OTHER NON-COLLISION	0	0	0	0	1	5	1	101890235	2.84
1	27	2004	ANGLE	0	0	0	1	4	5	1	101103830	3.04
1	28	2004	FIXED OBJECT	0	0	0	4	4	5	1	101105004	3.04
2	28	2004	OVERTURN/ROLLOVER	0	0	0	1	1	3	1	101129663	3.04
4	3	2004	ANGLE	0	0	0	3	1	1	1	101155248	3.04
11	26	2004	OTHER NON-COLLISION	0	0	0	0	1	5	1	101346250	3.04
12	7	2004	OVERTURN/ROLLOVER	0	0	1	0	1	5	1	101355030	3.04
10	16	2005	ANIMAL	0	0	0	0	1	5	1	101585156	3.04
12	21	2005	LEFT TURN, SAME ROADWAY	0	0	0	1	1	5	1	101640357	3.04
11	9	2006	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	101881708	3.04
12	2	2006	LEFT TURN, SAME ROADWAY	0	0	0	6	1	5	1	101904132	3.04
1	23	2007	ANGLE	0	1	0	1	1	1	1	101926038	3.04
2	7	2007	ANIMAL	0	0	0	0	1	1	1	101954636	3.04
2	8	2007	FIXED OBJECT	0	0	1	0	1	1	1	101955466	3.04
3	14	2008	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102282912	3.04
3	31	2008	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	2	2	5	2	102294717	3.04
6	20	2008	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102350454	3.04
6	26	2009	FIXED OBJECT	0	0	0	0	2	1	3	102621568	3.04
7	22	2009	FIXED OBJECT	0	0	1	0	2	1	3	102644665	3.04
8	2	2009	FIXED OBJECT	0	0	0	0	2	1	3	102652527	3.04
9	3	2009	FIXED OBJECT	0	0	0	0	1	5	1	102667833	3.04
10	25	2009	OVERTURN/ROLLOVER	0	0	0	0	1	1	1	102718857	3.04
11	26	2009	OVERTURN/ROLLOVER	0	0	1	0	1	5	2	102730541	3.04
2	13	2010	FIXED OBJECT	0	0	0	0	5	5	2	102802248	3.04
3	22	2010	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102820303	3.04

Table 10.20. continued (NC-87 and School Road/Butler Nursery Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	4	2010	ANGLE	0	0	1	0	1	1	1	102840091	3.04
6	10	2010	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102885297	3.04
11	6	2005	ANGLE	0	0	0	0	1	1	1	101602256	3.135
12	16	2004	ANGLE	0	0	0	1	1	1	1	101363307	3.14
8	20	2005	ANGLE	0	0	1	0	1	1	1	101544892	3.14
7	9	2006	OVERTURN/ROLLOVER	0	0	1	0	1	1	1	101778656	3.14
1	17	2007	ANGLE	0	0	0	0	1	1	1	101934512	3.14
4	21	2007	ANGLE	0	0	2	0	1	1	1	102021782	3.14
6	8	2007	ANGLE	0	0	1	2	1	1	1	102061036	3.14
3	19	2008	ANGLE	0	1	2	3	1	1	1	102286723	3.14
6	6	2008	ANGLE	0	0	1	1	1	1	1	102340371	3.14
10	14	2003	OVERTURN/ROLLOVER	0	0	0	1	1	5	1	101015381	3.24
4	15	2007	FIXED OBJECT	0	0	1	2	2	1	2	102011724	3.42
7	1	2004	FIXED OBJECT	0	0	0	0	2	5	3	101224446	3.64
10	8	2003	FIXED OBJECT	0	0	0	0	3	1	3	101010092	3.67
12	15	2005	OTHER COLLISION WITH VEHICLE	0	0	0	0	2	1	3	101633423	3.67
8	5	2006	FIXED OBJECT	0	0	1	0	2	1	3	101800443	3.69
1	5	2007	SIDESWIPE, SAME DIRECTION	0	0	0	2	2	5	3	101927309	3.72

Table 10.21. NC-87 and Grays Creek Church Road/Alderman Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	1	2004	FIXED OBJECT	0	0	0	0	2	5	3	101224446	3.64
10	8	2003	FIXED OBJECT	0	0	0	0	3	1	3	101010092	3.67
12	15	2005	OTHER COLLISION WITH VEHICLE	0	0	0	0	2	1	3	101633423	3.67
8	5	2006	FIXED OBJECT	0	0	1	0	2	1	3	101800443	3.69
1	5	2007	SIDESWIPE, SAME DIRECTION	0	0	0	2	2	5	3	101927309	3.72
7	23	2008	FIXED OBJECT	0	0	1	0	2	1	3	102366897	3.74
7	23	2008	FIXED OBJECT	0	0	0	0	2	1	3	102366902	3.74
4	16	2008	FIXED OBJECT	0	0	0	0	1	1	1	102306057	3.77
10	10	2004	OTHER NON-COLLISION	0	0	0	0	1	2	1	101305116	3.84
2	26	2007	ANIMAL	0	0	0	0	2	5	2	101970289	3.84
1	17	2005	ANIMAL	0	0	0	0	1	5	1	101387930	3.908
11	8	2003	ANGLE	0	0	0	0	1	1	2	101037764	3.94
9	28	2004	ANGLE	0	0	0	1	1	1	2	101295100	3.94
3	28	2008	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102292394	3.94
8	26	2007	FIXED OBJECT	0	0	0	0	1	4	1	102122349	3.945
6	11	2004	PARKED MOTOR VEHICLE	0	0	0	1	1	1	1	101208817	3.97
6	11	2004	ANGLE	0	0	0	0	1	1	1	101208821	3.97
6	30	2004	ANGLE	0	0	0	1	1	1	1	101223652	3.97
10	30	2005	ANGLE	0	0	3	0	1	1	1	101596617	3.97
11	23	2005	ANGLE	1	0	2	2	1	5	1	101616656	3.97
11	18	2005	ANGLE	0	0	2	3	1	1	1	101616873	3.97
2	8	2006	ANGLE	3	0	0	0	1	1	1	101672815	3.97
11	5	2007	ANGLE	0	0	0	0	1	1	1	102183436	3.97
7	26	2009	FIXED OBJECT	0	0	1	0	1	1	1	102645295	3.97
8	27	2004	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101268073	4.04
1	7	2007	REAR END, SLOW OR STOP	0	0	0	1	1	5	1	101931731	4.17
10	11	2006	ANIMAL	0	0	0	0	1	5	1	101846916	4.33

Table 10.22. US-15/501 and Sage Road/Old Durham Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	28	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99239601	7.573
12	13	2002	REAR END, SLOW OR STOP	0	0	0	0	2	4	3	100783481	7.573
5	22	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100361879	7.58
6	15	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100378150	7.58
5	6	2003	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100890253	7.58
7	15	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100944577	7.58
11	5	2003	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101035396	7.58
12	4	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101060365	7.58
5	10	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101184583	7.58
11	21	2005	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	101615151	7.58
6	27	2001	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100386464	7.591
2	21	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101680971	7.591
12	13	2000	ANIMAL	0	0	0	0	1	5	1	100252103	7.595
10	20	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100210275	7.606
5	27	2003	REAR END, SLOW OR STOP	0	0	0	1	1	4	2	100906569	7.606
6	26	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101221551	7.606
10	17	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100465602	7.61
2	12	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100557277	7.61
5	14	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100621445	7.61
8	2	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100676794	7.61
1	29	2003	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	1	2	100818306	7.61
7	28	2000	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100148256	7.623
3	27	1999	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	99056400	7.625
5	11	2000	RAN OFF ROAD - STRAIGHT	0	0	1	0	1	1	1	100092373	7.63
8	2	2000	REAR END, SLOW OR STOP	0	0	0	2	2	1	2	100151581	7.63
3	29	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	100860423	7.63
12	15	2001	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	100514956	7.64
6	9	2000	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100114107	7.65

Table 10.22. continued (US-15/501 and Sage Road/Old Durham Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	17	1999	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	99115330	7.656
7	25	2005	REAR END, SLOW OR STOP	0	0	1	1	1	1	1	101525826	7.659
6	9	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100114126	7.66
11	25	2003	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	101052741	7.66
6	12	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102616343	7.66
9	10	2003	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	100988588	7.666
11	12	2004	REAR END, SLOW OR STOP	0	0	0	0	2	5	3	101333898	7.666
4	1	1999	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	99061305	7.673
12	4	1999	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	99244113	7.673
10	31	2000	REAR END, SLOW OR STOP	0	0	0	1	1	5	1	100218246	7.673
12	23	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101077791	7.673
1	24	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101099719	7.673
9	17	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101286099	7.673
10	29	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101321306	7.673
11	28	2004	ANIMAL	0	0	0	0	1	1	1	101348046	7.673
3	4	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101688267	7.673
11	17	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	100232825	7.679
3	15	1999	PARKED MOTOR VEHICLE	0	0	0	0	1	1	1	99048831	7.68
12	3	1999	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	99243164	7.68
7	3	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100131139	7.68
11	9	2000	REAR END, SLOW OR STOP	0	0	0	2	2	1	2	100225165	7.68
10	3	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100454091	7.68
11	21	2001	OTHER COLLISION WITH VEHICLE	0	0	0	0	1	1	1	100494288	7.68
10	12	2002	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	100731241	7.68
2	27	2003	REAR END, SLOW OR STOP	0	0	0	0	2	5	3	100839671	7.68
12	8	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101063695	7.68
3	26	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101149556	7.68

Table 10.22. continued (US-15/501 and Sage Road/Old Durham Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	9	2004	ANIMAL	0	0	0	0	1	4	1	101332842	7.68
12	1	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101351325	7.68
6	17	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101500865	7.68
1	26	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101664282	7.68
2	3	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101669498	7.68
8	17	2009	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	102669292	7.68
10	30	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102719387	7.68
7	27	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102646916	7.683
6	1	1999	ANGLE	0	0	0	0	1	1	1	99104021	7.685
8	27	2002	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	100695583	7.685
10	31	2005	REAR END, SLOW OR STOP	0	0	0	1	1	5	1	101597049	7.685
5	14	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101733639	7.685
8	16	2003	RAN OFF ROAD - RIGHT	0	0	0	0	1	5	1	100969329	7.688
1	11	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100541967	7.694
11	5	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101328045	7.695
3	5	2000	REAR END, SLOW OR STOP	0	0	0	1	1	5	1	100045599	7.7
12	22	2001	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	100520799	7.706
2	20	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99033756	7.707
10	10	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100459731	7.717
10	25	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102444400	7.718
2	6	2001	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100289329	7.723
4	9	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	100869282	7.723
7	12	2000	RAN OFF ROAD - LEFT	0	0	0	0	1	4	2	100136691	7.73
11	24	2000	ANIMAL	0	0	0	0	1	4	1	100238166	7.73
12	5	2002	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	4	1	2	100776553	7.73
4	30	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101176273	7.73
12	2	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101623311	7.73

Table 10.22. continued (US-15/501 and Sage Road/Old Durham Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	3	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102419543	7.73
11	17	2008	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	102467327	7.73
5	6	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102587308	7.73
9	1	1999	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	99167399	7.733
1	13	2005	REAR END, SLOW OR STOP	0	0	0	0	2	5	3	101385095	7.733
11	19	2005	REAR END, SLOW OR STOP	0	0	2	0	1	1	1	101613002	7.733
9	9	2000	REAR END, SLOW OR STOP	0	0	0	0	1	2	1	100178937	7.736
9	24	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	100191749	7.736
2	17	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100297325	7.736
1	31	2003	REAR END, SLOW OR STOP	0	0	0	2	2	5	2	100819971	7.738
11	17	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101338031	7.742
2	9	2006	RAN OFF ROAD - LEFT	0	0	0	1	1	1	1	101673675	7.742
7	29	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102652403	7.742
1	25	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	100545330	7.745
7	12	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101517199	7.745
9	17	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99180987	7.749
4	21	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100605062	7.752
3	6	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101689397	7.752
2	20	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100298658	7.76
1	30	2003	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100819011	7.76
11	10	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99224381	7.761
10	21	2002	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	4	2	100738289	7.761
9	15	2000	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100182499	7.762
6	12	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100397279	7.762
5	14	1999	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	99091295	7.764
6	4	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99106153	7.767
9	23	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100998586	7.767

Table 10.22. continued (US-15/501 and Sage Road/Old Durham Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	13	1999	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	99177109	7.77
2	3	2000	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100023912	7.77
1	28	2001	REAR END, SLOW OR STOP	0	0	1	1	1	1	1	100283039	7.77
6	14	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100642818	7.771
10	31	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101323066	7.771
4	5	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99063712	7.773
5	22	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99096991	7.773
6	4	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99106154	7.773
7	27	1999	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	99142427	7.773
7	19	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	100141559	7.773
11	14	2000	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	100230246	7.773
10	26	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100472893	7.773
3	23	2002	LEFT TURN, SAME ROADWAY	0	0	0	0	1	4	1	100584446	7.773
3	26	2003	REAR END, SLOW OR STOP	0	0	0	3	1	4	2	100858603	7.773
6	7	2003	REAR END, SLOW OR STOP	0	0	0	2	2	1	3	100915431	7.773
7	15	2003	BACKING UP	0	0	0	1	1	4	1	100944568	7.773
11	16	2005	ANGLE	0	0	0	0	1	4	2	101610181	7.773
5	9	2009	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	4	1	102590007	7.773
7	20	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100141821	7.774
10	3	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	101299550	7.774
2	8	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100555021	7.776
8	24	2003	SIDESWIPE, OPPOSITE DIRECTION	0	0	0	0	2	4	2	100975824	7.776
2	10	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100292099	7.777
4	18	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101166617	7.777
10	30	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99215443	7.778
6	1	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101201375	7.778
8	27	1999	REAR END, SLOW OR STOP	0	0	1	1	1	1	1	99164293	7.78

Table 10.22. continued (US-15/501 and Sage Road/Old Durham Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
12	11	1999	ANGLE	0	0	0	0	1	1	1	99250224	7.78
1	7	2000	ANGLE	0	0	0	0	2	4	3	100003508	7.78
1	13	2000	BACKING UP	0	0	0	0	1	1	1	100008307	7.78
6	9	2000	REAR END, SLOW OR STOP	0	0	0	0	1	2	1	100114109	7.78
9	10	2000	LEFT TURN, DIFFERENT ROADWAYS	0	0	1	1	1	1	1	100204793	7.78
11	14	2000	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	1	2	100230209	7.78
11	16	2000	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	5	3	100231875	7.78
12	19	2000	MOVABLE OBJECT	0	0	1	0	2	5	2	100257367	7.78
3	2	2001	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	100310420	7.78
3	24	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100321069	7.78
4	27	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100343997	7.78
5	10	2001	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100353500	7.78
10	25	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100471390	7.78
10	29	2001	ANGLE	1	0	0	2	1	1	1	100475214	7.78
11	7	2001	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	100482345	7.78
2	11	2002	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100556616	7.78
4	28	2002	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	100609750	7.78
1	13	2003	ANIMAL	0	0	0	1	2	4	3	100819018	7.78
3	12	2003	SIDESWIPE, SAME DIRECTION	0	0	0	1	1	1	1	100849043	7.78
8	17	2003	UNKNOWN	0	0	0	0	1	2	2	100971466	7.78
10	12	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101014191	7.78
10	22	2003	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	101022589	7.78
4	18	2004	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101166884	7.78
7	12	2004	FIXED OBJECT	0	0	0	1	1	1	1	101233162	7.78
3	2	2005	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	101423354	7.78
8	27	2005	UNKNOWN	0	0	0	0	1	1	1	101550361	7.78
10	13	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101583197	7.78

Table 10.22. continued (US-15/501 and Sage Road/Old Durham Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	25	2008	REAR END, SLOW OR STOP	0	0	0	0	2	5	3	102438626	7.78
12	23	2008	SIDESWIPE, SAME DIRECTION	0	0	1	0	1	1	1	102501864	7.78
3	23	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102557095	7.78
1	9	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100585821	7.781
4	25	2004	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101171642	7.782
11	6	2003	REAR END, SLOW OR STOP	0	0	0	2	2	1	2	101036432	7.783
1	13	2000	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100008302	7.784
6	14	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101761950	7.784
1	13	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101385118	7.786
2	13	2004	RAN OFF ROAD - LEFT	0	0	0	0	1	5	1	101116695	7.788
4	16	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100074806	7.791
7	29	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	102652400	7.792
9	13	2003	REAR END, SLOW OR STOP	0	0	0	0	2	4	2	100991035	7.793
8	23	2003	REAR END, SLOW OR STOP	0	0	0	3	1	1	1	100975157	7.8
7	7	2009	REAR END, SLOW OR STOP	0	1	1	0	1	1	1	102634381	7.806
3	23	2001	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100584472	7.808
11	19	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101613004	7.808
3	25	2009	REAR END, SLOW OR STOP	0	0	0	1	2	4	3	102561681	7.808
9	1	2000	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100173318	7.81
9	16	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100992904	7.818
8	9	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102658657	7.818
5	27	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100630135	7.825
11	20	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100490428	7.83
1	27	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100816869	7.83
4	13	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101314483	7.83
5	31	2003	RAN OFF ROAD - LEFT	0	0	0	0	1	4	1	100910201	7.831
3	27	2009	PEDESTRIAN	0	0	1	0	2	4	3	102579027	7.831

Table 10.22. continued (US-15/501 and Sage Road/Old Durham Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	18	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100358550	7.836
9	21	2002	REAR END, SLOW OR STOP	0	0	0	2	1	5	1	100714894	7.837
4	7	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101157909	7.837
9	27	2002	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	100718838	7.84
12	13	2002	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	100783472	7.84
10	17	2008	REAR END, SLOW OR STOP	0	0	0	0	2	2	3	102462235	7.846
7	20	2001	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100401040	7.855
5	25	2003	SIDESWIPE, SAME DIRECTION	0	0	1	0	1	1	1	100905360	7.873
9	1	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100173276	7.874
1	8	2001	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	100269665	7.875
1	30	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101107162	7.875
7	6	1999	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	99128349	7.88
12	17	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100786217	7.88
4	12	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101161953	7.88
2	27	2006	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101685248	7.88
9	6	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100704169	7.883
1	22	2002	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	100543075	7.89
8	15	2004	REAR END, SLOW OR STOP	0	0	0	2	2	1	2	101259045	7.89
2	23	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100036635	7.906
1	19	2000	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	100043607	7.925
6	6	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100914529	7.93
10	1	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100195244	7.94
9	24	2002	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	100716772	7.94
3	13	2006	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	101694010	7.94
11	15	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100488933	7.951
1	23	2004	REAR END, SLOW OR STOP	0	0	0	1	1	5	1	101099411	7.951
8	9	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100414495	7.969

Table 10.22. continued (US-15/501 and Sage Road/Old Durham Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	31	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	100956466	7.973
4	13	2001	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100335165	7.975
3	16	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100579682	7.975
12	5	2009	BACKING UP	0	0	1	1	2	4	3	102757785	7.98
9	25	2001	REAR END, SLOW OR STOP	0	0	0	1	1	5	1	100447984	7.99
5	6	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101181392	7.998
1	15	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99009425	8
3	17	1999	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	99050305	8
7	9	1999	MOVABLE OBJECT	0	0	0	0	1	1	1	99130474	8
8	20	1999	LEFT TURN, SAME ROADWAY	0	0	0	0	2	1	2	99158884	8
9	10	1999	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	99175247	8
10	20	1999	SIDESWIPE, OPPOSITE DIRECTION	0	0	1	0	2	4	3	99206871	8
10	29	1999	RAN OFF ROAD - STRAIGHT	0	0	0	0	1	4	1	99214489	8
11	23	1999	ANGLE	0	0	0	0	1	5	1	99235552	8
11	29	1999	REAR END, SLOW OR STOP	0	0	1	0	1	1	1	99240250	8
12	8	1999	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	1	99246649	8
7	16	2000	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	100139710	8
11	2	2000	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100219940	8
2	28	2001	ANGLE	0	0	0	0	1	1	1	100304300	8
11	26	2001	ANGLE	0	0	0	0	1	1	1	100498240	8
12	3	2001	ANGLE	0	0	0	0	1	1	1	100504037	8
3	19	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	100581493	8
4	19	2002	REAR END, SLOW OR STOP	0	0	0	4	2	1	2	100603970	8
6	1	2002	ANGLE	0	0	0	0	10	4	1	100634347	8
6	12	2002	ANGLE	0	0	0	0	1	1	2	100656216	8
9	2	2002	RAN OFF ROAD - STRAIGHT	0	0	0	0	1	4	2	100700537	8
9	20	2002	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100714174	8

Table 10.22. continued (US-15/501 and Sage Road/Old Durham Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
12	11	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100781402	8
12	14	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100784415	8
2	11	2003	RAN OFF ROAD - RIGHT	0	0	0	1	4	1	1	100827789	8
3	19	2003	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	100853694	8
4	11	2003	SIDESWIPE, SAME DIRECTION	0	0	0	1	2	1	2	100871400	8
4	13	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100872429	8
5	12	2003	RAN OFF ROAD - STRAIGHT	0	0	0	1	1	4	1	100894882	8
7	7	2003	SIDESWIPE, OPPOSITE DIRECTION	0	0	0	0	1	2	1	100938445	8
11	8	2003	ANGLE	0	0	0	0	2	1	2	101037978	8
12	29	2003	RAN OFF ROAD - RIGHT	0	0	0	0	1	1	1	101081323	8
8	5	2004	ANGLE	0	0	0	0	1	1	2	101252025	8
8	27	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101269038	8
9	27	2004	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	2	1	2	101294719	8
10	19	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	2	101312466	8
1	13	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101385094	8
4	20	2005	ANGLE	0	0	0	0	1	1	1	101458914	8
4	28	2005	ANGLE	0	0	0	0	1	1	2	101464729	8
5	16	2005	ANGLE	0	0	0	0	1	1	2	101477583	8
5	21	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101481310	8
6	6	2005	HEAD ON	0	0	0	0	1	1	1	101492334	8
6	14	2005	ANGLE	0	0	0	0	1	1	1	101498344	8
10	18	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101586748	8
4	16	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101715671	8
5	18	2006	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101735534	8
8	18	2008	ANGLE	0	0	0	1	1	1	1	102390323	8
9	6	2008	ANGLE	0	0	0	0	2	4	1	102403069	8
10	17	2008	HEAD ON	0	0	0	0	2	4	3	102429394	8

Table 10.22. continued (US-15/501 and Sage Road/Old Durham Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	26	2008	ANGLE	0	0	0	0	1	4	1	102438607	8
11	14	2008	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	2	3	3	102465633	8
12	10	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102486486	8
6	8	2005	RAN OFF ROAD - RIGHT	0	0	1	0	2	4	2	101493890	8.006
4	1	1999	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	99061304	8.025
11	19	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99231890	8.025
11	30	1999	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	99240884	8.025
9	8	2005	RAN OFF ROAD - LEFT	0	0	0	1	1	1	1	101558125	8.025

Table 10.23. US-15/501 and S. Estes Drive/SR-1750 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
8	11	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102658652	5.867
12	9	1999	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	99248091	5.87
12	10	1999	REAR END, SLOW OR STOP	0	0	0	1	2	2	3	99249136	5.874
12	20	1999	REAR END, SLOW OR STOP	0	0	0	2	2	1	3	99257865	5.91
4	30	2000	OTHER NON-COLLISION	0	0	1	0	1	1	1	100084668	5.91
12	4	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100266195	5.91
4	11	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101711446	5.91
10	21	2009	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102710760	5.91
11	19	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	1	3	102739772	5.91
12	7	2004	ANIMAL	0	0	0	0	1	5	1	101355314	5.921
2	4	2002	ANIMAL	0	0	0	0	1	3	1	100551834	5.923
11	14	2000	ANGLE	0	0	0	1	2	1	2	100260100	5.946
6	22	2001	SIDESWIPE, SAME DIRECTION	0	0	0	2	1	1	1	100382762	5.96
11	16	2002	ANGLE	0	0	0	0	2	5	3	100761030	6
3	2	2003	RAN OFF ROAD - RIGHT	0	0	0	0	2	4	3	100842220	6
9	21	2005	ANGLE	0	0	0	0	1	1	1	101566566	6
7	30	2000	ANIMAL	0	0	0	0	1	5	1	100149545	6.01
2	18	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100561448	6.01
3	22	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100583741	6.01
6	22	2005	ANIMAL	0	0	0	0	1	1	1	101503692	6.01
1	16	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100274895	6.022
6	30	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	100932928	6.022
6	9	2005	PEDALCYCLIST	0	0	1	0	1	1	2	101494360	6.028
12	9	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101066058	6.057
12	20	2005	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	101639281	6.063
1	15	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	99009423	6.077
3	7	2004	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101135385	6.077
6	14	2000	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100117022	6.091

Table 10.23. continued (US-15/501 and S. Estes Drive/SR-1750 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	4	2000	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	2	1	3	100110433	6.092
6	4	2000	PARKED MOTOR VEHICLE	0	0	0	0	2	1	2	100110011	6.092
7	18	2009	MOVABLE OBJECT	0	0	1	0	2	5	2	102640847	6.096
4	9	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101159733	6.101
4	2	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	1	3	102566859	6.101
9	12	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102686103	6.101
12	28	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102774429	6.102
11	21	2008	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	102471809	6.105
1	18	2001	REAR END, SLOW OR STOP	0	0	0	0	2	2	2	100276106	6.106
10	8	2005	PEDALCYCLIST	0	0	1	0	1	1	1	101580036	6.106
2	14	2001	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	100294883	6.107
9	24	2001	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100447132	6.107
4	2	2004	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	101154537	6.108
1	19	2005	ANGLE	0	0	0	1	6	1	2	101389677	6.109
1	2	1999	LEFT TURN, SAME ROADWAY	0	1	2	0	2	5	3	99001102	6.11
2	3	1999	BACKING UP	0	0	0	0	1	1	1	99021987	6.11
4	20	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99073384	6.11
5	20	1999	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	99095461	6.11
8	20	1999	REAR END, SLOW OR STOP	0	0	1	0	1	1	2	99158883	6.11
1	20	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100013710	6.11
2	12	2000	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100029894	6.11
4	6	2000	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100067237	6.11
4	19	2000	REAR END, SLOW OR STOP	0	0	0	3	1	1	1	100076794	6.11
4	25	2000	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	1	2	100080479	6.11
5	21	2000	PEDALCYCLIST	0	0	0	0	1	1	2	100099414	6.11
10	7	2000	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	100200210	6.11
10	20	2000	RAN OFF ROAD - LEFT	0	0	0	0	1	4	1	100210253	6.11

Table 10.23. continued (US-15/501 and S. Estes Drive/SR-1750 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
12	8	2000	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	2	1	100248604	6.11
3	5	2001	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	2	1	100307848	6.11
6	18	2001	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100379834	6.11
7	23	2001	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100402734	6.11
9	7	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100434744	6.11
10	14	2001	REAR END, TURN	0	0	0	0	2	1	2	100463350	6.11
10	26	2001	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	100472896	6.11
12	1	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100502565	6.11
1	15	2002	ANGLE	0	0	0	1	1	1	1	100537993	6.11
4	5	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100593558	6.11
8	7	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100680846	6.11
10	12	2002	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	100731243	6.11
10	18	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100736039	6.11
10	24	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100740361	6.11
11	13	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100759028	6.11
1	14	2003	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100805768	6.11
1	23	2003	SIDESWIPE, SAME DIRECTION	0	0	0	0	4	1	1	100813611	6.11
1	23	2003	REAR END, SLOW OR STOP	0	0	0	0	4	1	1	100813615	6.11
4	4	2003	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100865237	6.11
4	24	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100880591	6.11
8	20	2003	LEFT TURN, SAME ROADWAY	0	0	0	3	1	5	1	100972787	6.11
9	3	2003	REAR END, TURN	0	0	0	1	1	2	1	100985361	6.11
10	4	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101007537	6.11
10	28	2003	REAR END, TURN	0	0	0	0	2	1	2	101027807	6.11
11	3	2003	ANGLE	0	0	2	0	1	1	1	101041760	6.11
1	10	2004	REAR END, TURN	0	0	0	0	1	1	1	101090502	6.11
4	5	2004	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101156750	6.11

Table 10.23. continued (US-15/501 and S. Estes Drive/SR-1750 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	24	2004	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	4	2	101171622	6.11
5	15	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101188359	6.11
6	30	2004	REAR END, TURN	0	0	1	0	1	1	2	101224025	6.11
7	28	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101244662	6.11
10	7	2004	REAR END, SLOW OR STOP	0	0	0	1	10	8	9	101302936	6.11
11	13	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101335268	6.11
12	20	2004	LEFT TURN, SAME ROADWAY	0	0	0	1	1	5	1	101367217	6.11
2	24	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101418978	6.11
2	28	2005	REAR END, TURN	0	0	0	0	2	1	3	101421942	6.11
4	13	2005	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	2	1	3	101455236	6.11
4	17	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	4	1	101457624	6.11
4	26	2005	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101595009	6.11
5	13	2005	REAR END, TURN	0	0	0	0	1	1	2	101475590	6.11
5	15	2005	REAR END, TURN	0	0	0	1	1	1	1	101476997	6.11
6	6	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	101492312	6.11
7	4	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101512222	6.11
7	25	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101525534	6.11
8	9	2005	REAR END, TURN	0	0	0	0	1	1	2	101536842	6.11
11	8	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101603891	6.11
2	9	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101673662	6.11
2	11	2006	RIGHT TURN, SAME ROADWAY	0	0	0	0	2	1	3	101675005	6.11
2	22	2006	ANGLE	0	0	0	0	2	5	3	101682418	6.11
2	24	2006	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101683474	6.11
3	25	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	2	101704173	6.11
6	19	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101764889	6.11
6	22	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101766816	6.11
8	8	2008	ANGLE	0	0	0	0	1	1	1	102383030	6.11

Table 10.23. continued (US-15/501 and S. Estes Drive/SR-1750 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
12	11	2008	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	102487716	6.11
3	8	2009	REAR END, SLOW OR STOP	0	0	0	5	1	5	1	102550834	6.11
5	6	2009	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	102587307	6.11
5	29	2009	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	2	102607879	6.11
6	24	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102625492	6.11
7	12	2009	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	102638916	6.11
9	5	2009	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	1	1	1	1	102678835	6.11
11	9	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102729167	6.11
12	31	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	4	3	102775273	6.11
6	19	2009	ANGLE	0	0	1	2	1	5	1	102626868	6.112
5	2	2000	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	100086015	6.114
12	30	2008	PEDESTRIAN	0	0	1	0	1	4	1	102504778	6.116
9	15	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100183059	6.117
3	20	2000	REAR END, SLOW OR STOP	0	0	0	0	2	2	2	100055722	6.119
5	22	2000	REAR END, SLOW OR STOP	0	0	0	2	1	5	1	100100331	6.119
1	21	2002	FIXED OBJECT	0	0	0	1	2	1	2	100542552	6.119
9	16	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99180125	6.12
9	28	2001	LEFT TURN, SAME ROADWAY	0	0	0	0	1	5	1	100450858	6.12
12	31	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	100526055	6.12
8	1	2003	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	100957573	6.122
2	1	1999	LEFT TURN, SAME ROADWAY	0	0	0	0	2	5	3	99020582	6.123
6	17	1999	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	99115329	6.123
8	19	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99157905	6.123
3	4	2000	PEDESTRIAN	0	1	0	0	2	1	2	100045127	6.123
6	2	2000	ANGLE	0	0	1	0	1	1	1	100108730	6.123
11	25	2000	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100239073	6.123
3	28	2001	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100323402	6.123

Table 10.23. continued (US-15/501 and S. Estes Drive/SR-1750 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	11	2001	ANGLE	0	0	0	0	1	1	1	100333307	6.123
6	1	2001	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100369945	6.123
8	21	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100422624	6.123
2	6	2002	PEDESTRIAN	0	0	0	1	2	4	3	100553454	6.123
3	16	2003	LEFT TURN, SAME ROADWAY	0	0	0	0	2	1	2	100851611	6.123
3	18	2003	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	100853083	6.123
2	4	2005	ANGLE	0	0	0	1	1	1	1	101403105	6.123
1	30	2006	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	101667202	6.123
11	25	2008	REAR END, SLOW OR STOP	0	0	0	1	1	2	1	102468259	6.123
8	26	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101549936	6.124
7	26	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100672444	6.126
5	14	2000	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100094363	6.128
12	16	2004	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101363631	6.131
4	19	1999	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	99072706	6.134
6	16	1999	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	99114673	6.16
5	1	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102585989	6.16
9	26	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101001298	6.167
12	11	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101066785	6.167
12	12	2001	REAR END, SLOW OR STOP	0	0	0	0	2	5	3	100511926	6.168
5	25	2009	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	102606960	6.237
4	2	2001	SIDESWIPE, SAME DIRECTION	0	0	0	1	1	1	1	100327568	6.26
1	14	2004	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	101093543	6.26
2	14	2002	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	100558569	6.271
11	19	2003	REAR END, SLOW OR STOP	0	0	1	0	1	4	1	101047501	6.271
9	12	1999	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	99176380	6.306
9	15	1999	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	99179132	6.306
7	27	2003	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	100953344	6.323

Table 10.24. NC-132 and Bragg Drive Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	30	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100675246	2.571
8	26	2003	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	100977530	2.571
3	14	2004	RAN OFF ROAD - RIGHT	0	0	0	0	1	4	1	101140979	2.571
9	30	2004	HEAD ON	0	0	0	0	1	4	1	101296920	2.571
11	8	2006	REAR END, SLOW OR STOP	0	0	0	0	1	4	2	101926320	2.571
4	8	2008	ANGLE	0	0	0	0	1	1	1	102300804	2.571
8	11	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102386683	2.571
2	7	2002	REAR END, SLOW OR STOP	0	0	0	2	2	4	3	100554006	2.572
8	18	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100688914	2.572
5	1	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102027581	2.572
2	23	2008	BACKING UP	0	0	0	0	1	4	1	102269246	2.572
4	15	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100600580	2.573
6	28	2009	RAN OFF ROAD - RIGHT	1	0	1	0	1	1	1	102644910	2.573
4	13	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101454082	2.574
2	2	2005	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101400957	2.575
4	10	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	4	1	102571838	2.576
10	26	2002	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	100742073	2.578
2	12	2008	LEFT TURN, SAME ROADWAY	0	0	0	0	1	2	1	102260962	2.578
2	25	2006	ANGLE	0	0	2	0	2	4	3	101684371	2.579
2	13	2008	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	102261962	2.579
7	25	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101242726	2.58
2	1	2007	REAR END, SLOW OR STOP	0	0	0	0	2	4	3	101950269	2.58
1	17	2004	OVERTURN/ROLLOVER	0	0	0	0	2	4	2	101095120	2.586
4	28	2001	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	4	1	100345192	2.588
1	7	2004	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101087148	2.589
11	3	2007	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	102182734	2.589
1	10	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102514711	2.589

Table 10.24. continued (NC-132 and Bragg Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
2	6	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102532135	2.589
5	6	2008	ANGLE	0	0	0	1	1	1	1	102320515	2.594
7	6	2003	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	100937879	2.598
7	11	2001	PEDALCYCLIST	0	1	0	0	1	1	1	100395156	2.607
12	16	2002	ANGLE	0	0	0	0	1	4	1	100785880	2.608
12	20	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100789470	2.608
11	13	2006	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101886163	2.608
3	9	2007	ANGLE	0	0	0	0	1	1	1	101980532	2.608
5	6	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102597942	2.608
8	2	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100677377	2.61
1	25	2005	ANGLE	0	0	0	0	1	1	1	101395001	2.615
11	4	2005	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101600951	2.615
11	4	2005	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101600969	2.615
12	2	2005	LEFT TURN, SAME ROADWAY	0	0	0	0	1	4	1	101623295	2.615
7	19	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100667254	2.617
3	2	2002	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	100569248	2.626
2	9	2005	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	101406541	2.627
4	16	2008	ANGLE	0	0	0	0	1	1	1	102307485	2.627
1	23	2009	REAR END, SLOW OR STOP	0	0	0	0	1	2	1	102522898	2.627
6	10	2005	PEDALCYCLIST	0	0	1	0	1	1	1	101494963	2.634
7	30	2008	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102377619	2.634
12	8	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101629012	2.646
10	26	2007	REAR END, SLOW OR STOP	0	0	0	0	2	4	3	102174951	2.65
2	23	2008	RAN OFF ROAD - RIGHT	0	0	0	0	2	5	3	102269238	2.663
7	17	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102642776	2.663
10	13	2001	MOVABLE OBJECT	0	0	0	0	1	4	1	100462499	2.664
1	3	2007	LEFT TURN, SAME ROADWAY	0	0	0	3	1	1	1	101929010	2.665

Table 10.24. continued (NC-132 and Bragg Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	9	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101557770	2.67
2	9	2004	BACKING UP	0	0	0	0	1	3	2	101114445	2.672
6	15	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101497677	2.672
7	17	2005	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101520661	2.672
3	16	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102284869	2.677
5	27	2003	SIDESWIPE, SAME DIRECTION	0	0	0	1	1	1	2	100907084	2.682
7	15	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101549113	2.682
8	17	2004	REAR END, SLOW OR STOP	0	0	1	0	1	1	1	101260818	2.683
12	6	2002	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	100777549	2.691
12	3	2003	LEFT TURN, SAME ROADWAY	0	0	0	2	1	4	1	101059285	2.691
8	13	2005	SIDESWIPE, SAME DIRECTION	0	0	0	1	1	1	1	101540113	2.691
12	10	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102487432	2.691
2	18	2009	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	102537074	2.691
4	5	2005	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	101448723	2.695
7	21	2003	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100949046	2.7
7	22	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100949278	2.7
12	7	2003	ANGLE	0	0	0	0	1	2	1	101064412	2.7
8	11	2005	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101538652	2.7
11	1	2006	LEFT TURN, SAME ROADWAY	0	0	1	0	1	4	1	101876308	2.7
4	17	2009	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102578316	2.7
3	30	2002	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	2	1	1	2	100589272	2.701
6	17	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101500118	2.701
1	8	2009	ANGLE	0	0	0	0	1	4	1	102512722	2.701
8	14	2001	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100418000	2.702
6	1	2005	ANGLE	0	0	0	0	2	1	3	101488149	2.704
4	1	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101153638	2.706
11	8	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102186990	2.706

Table 10.24. continued (NC-132 and Bragg Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	15	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100944553	2.708
11	22	2006	ANGLE	0	0	0	0	1	1	1	101894925	2.708
3	27	2009	REAR END, SLOW OR STOP	0	0	0	6	2	1	3	102562688	2.708
11	30	2004	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101349660	2.709
4	25	2001	ANGLE	0	0	0	0	2	1	3	100342906	2.71
10	29	2001	ANGLE	0	0	0	1	1	1	1	100475177	2.71
12	14	2001	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100514133	2.71
4	24	2002	ANGLE	0	0	0	1	1	1	1	100606979	2.71
4	28	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100610425	2.71
5	22	2002	ANGLE	0	0	0	1	1	1	2	100627010	2.71
7	1	2002	LEFT TURN, SAME ROADWAY	0	0	1	2	3	1	1	100655075	2.71
7	18	2002	ANGLE	0	0	0	0	1	1	1	100666431	2.71
9	13	2002	ANGLE	0	0	0	0	1	4	1	100708600	2.71
1	22	2003	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	100811789	2.71
3	4	2003	REAR END, TURN	0	0	0	0	1	1	2	100843491	2.71
3	19	2003	ANGLE	0	0	0	0	1	1	2	100853673	2.71
7	12	2003	ANGLE	0	0	0	0	2	1	2	100943302	2.71
8	8	2003	ANGLE	0	0	0	0	1	1	1	100964279	2.71
8	13	2003	LEFT TURN, SAME ROADWAY	0	0	0	0	1	5	1	100967149	2.71
8	28	2003	LEFT TURN, SAME ROADWAY	0	0	1	0	1	1	1	100978825	2.71
9	3	2003	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100983320	2.71
9	4	2003	LEFT TURN, SAME ROADWAY	0	0	1	0	1	1	1	100984480	2.71
11	4	2003	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101034390	2.71
12	4	2003	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	2	101059608	2.71
2	1	2004	ANGLE	0	0	0	0	1	1	2	101107869	2.71
3	2	2004	ANGLE	0	0	0	0	1	1	1	101132988	2.71
5	18	2004	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101190963	2.71

Table 10.24. continued (NC-132 and Bragg Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	21	2004	ANGLE	0	0	0	0	1	1	1	101192965	2.71
6	16	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101284676	2.71
6	17	2004	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101213898	2.71
6	18	2004	ANGLE	0	0	1	1	1	1	1	101214292	2.71
9	3	2004	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101274627	2.71
9	27	2004	OTHER COLLISION WITH VEHICLE	0	0	1	0	1	1	2	101294693	2.71
11	2	2004	LEFT TURN, SAME ROADWAY	0	0	0	1	1	4	1	101326335	2.71
11	12	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	2	1	2	101333868	2.71
5	5	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	1	1	2	1	3	101469179	2.71
10	15	2005	ANGLE	0	0	0	0	1	1	1	101584687	2.71
11	29	2005	ANGLE	0	0	0	0	2	4	1	101621171	2.71
12	2	2005	ANGLE	0	0	0	2	1	1	1	101623296	2.71
12	17	2005	LEFT TURN, SAME ROADWAY	0	0	3	0	1	1	2	101638061	2.71
1	5	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	3	1	1	101650611	2.71
1	6	2006	LEFT TURN, SAME ROADWAY	0	0	0	3	1	1	2	101650783	2.71
10	2	2006	ANGLE	0	0	0	0	1	1	1	101845618	2.71
2	11	2007	ANGLE	0	0	0	0	1	1	1	101958047	2.71
2	24	2007	ANGLE	0	0	2	0	1	1	1	101969264	2.71
5	3	2007	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102030308	2.71
7	20	2007	LEFT TURN, SAME ROADWAY	0	0	0	1	1	8	2	102094238	2.71
11	8	2007	ANGLE	0	0	0	1	1	1	1	102187657	2.71
1	4	2008	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102233333	2.71
4	3	2008	LEFT TURN, SAME ROADWAY	0	0	0	3	2	1	2	102296165	2.71
5	6	2008	LEFT TURN, SAME ROADWAY	0	0	0	5	1	1	1	102320504	2.71
5	13	2008	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102324736	2.71
8	1	2008	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102379238	2.71
9	28	2008	ANGLE	1	0	2	0	1	5	1	102425174	2.71

Table 10.24. continued (NC-132 and Bragg Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	4	2008	MOVABLE OBJECT	0	0	0	0	1	5	1	102426057	2.71
12	26	2008	ANGLE	0	0	0	1	1	1	1	102503188	2.71
4	17	2009	LEFT TURN, SAME ROADWAY	0	0	2	2	1	1	1	102590586	2.71
5	1	2009	ANGLE	0	0	0	1	1	1	1	102593329	2.71
5	6	2009	ANGLE	0	0	1	0	1	1	1	102594953	2.71
5	28	2009	REAR END, SLOW OR STOP	0	0	0	0	1	2	2	102612118	2.71
6	6	2009	ANGLE	0	0	0	1	1	1	1	102618072	2.71
6	30	2009	ANGLE	0	0	1	1	1	1	1	102633283	2.71
7	6	2009	ANGLE	0	0	0	0	1	1	1	102634295	2.71
7	27	2009	ANGLE	0	0	0	1	1	1	1	102653985	2.71
4	29	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102589641	2.715
12	20	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101639254	2.719
5	4	2007	ANGLE	0	0	0	2	1	1	2	102029839	2.722
10	31	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101030089	2.723
7	29	2004	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101245447	2.724
4	1	2005	REAR END, SLOW OR STOP	0	0	0	2	2	1	3	101445342	2.734
7	2	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101226854	2.75
10	9	2006	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	101851687	2.75
9	21	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101566859	2.761
8	22	2007	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	102118751	2.761
6	22	2001	ANGLE	0	0	0	0	1	1	1	100382743	2.8
3	7	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101135886	2.817
5	20	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	2	101191789	2.817
8	5	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100679443	2.82
3	2	2007	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	101974295	2.82
4	8	2003	ANGLE	0	0	0	1	2	1	3	100868439	2.836
10	31	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101030123	2.85

Table 10.24. continued (NC-132 and Bragg Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
2	5	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101953604	2.85
5	23	2009	ANGLE	0	0	0	0	1	1	1	102615659	2.85
11	11	2003	REAR END, SLOW OR STOP	0	0	0	0	1	2	1	101040143	2.855
6	28	2004	LEFT TURN, SAME ROADWAY	0	0	1	2	1	1	1	101222680	2.855
1	14	2005	LEFT TURN, SAME ROADWAY	0	0	0	0	2	4	3	101386171	2.855
1	3	2006	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101648414	2.855
12	11	2006	ANGLE	0	0	0	0	1	1	2	101910063	2.855
3	31	2007	ANGLE	0	0	0	2	1	1	1	101999989	2.855
8	8	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102108904	2.855
4	18	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102308520	2.855
11	4	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102452523	2.855
3	18	2009	ANGLE	0	0	0	0	1	1	1	102556867	2.855
6	27	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100651760	2.856
10	11	2006	UNKNOWN	0	0	0	0	1	1	1	101853160	2.857
9	25	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101000016	2.865
10	26	2005	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	101592865	2.865
10	12	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101306829	2.874
1	21	2005	ANGLE	0	0	0	0	1	1	2	101391390	2.874
3	17	2005	REAR END, SLOW OR STOP	0	0	0	0	2	4	3	101435293	2.874
5	6	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101470123	2.874
11	5	2001	ANGLE	0	0	0	0	1	1	2	100481221	2.875
7	15	2005	REAR END, SLOW OR STOP	0	0	0	4	1	1	1	101519497	2.887
7	31	2003	REAR END, SLOW OR STOP	0	0	0	3	1	1	1	100956716	2.893
7	17	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101237105	2.893
1	9	2008	REAR END, SLOW OR STOP	0	0	1	3	1	1	1	102236435	2.893
3	1	2008	ANGLE	0	0	2	0	1	1	1	102274849	2.893
8	26	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102395103	2.893

Table 10.24. continued (NC-132 and Bragg Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
8	27	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100426814	2.894
4	29	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102315730	2.898
3	4	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101424975	2.907
10	28	2003	REAR END, SLOW OR STOP	0	0	0	1	2	5	3	101027780	2.912
1	16	2004	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101094719	2.912
1	28	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	5	101105225	2.912
9	21	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102147938	2.912
11	25	2001	REAR END, SLOW OR STOP	0	0	0	0	2	4	3	100497418	2.913
1	16	2003	ANGLE	0	0	0	0	1	1	1	100807450	2.922
4	12	2005	RAN OFF ROAD - RIGHT	0	0	0	1	1	1	1	101453874	2.926
7	22	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101240276	2.929
5	12	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100894868	2.93
11	11	2002	ANGLE	0	0	0	0	2	1	2	100756598	2.94
2	5	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100822973	2.94
2	22	2003	REAR END, SLOW OR STOP	0	0	1	1	2	4	3	100836476	2.94
10	10	2003	REAR END, SLOW OR STOP	0	0	0	1	2	4	3	101012938	2.94
11	18	2004	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	4	1	101339438	2.94
11	30	2001	REAR END, SLOW OR STOP	0	0	0	0	1	4	2	100501685	2.941
5	20	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100901460	2.941
9	22	2007	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	5	1	1	1	102146764	2.941
12	12	2008	ANGLE	0	0	0	0	1	2	1	102492410	2.942
11	13	2008	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	102465559	2.945
3	28	2002	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	100587278	2.949
3	3	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101423963	2.949
9	2	2007	REAR END, TURN	0	0	0	1	1	1	1	102127813	2.949
5	30	2001	ANGLE	0	0	2	0	1	1	1	100367066	2.95
9	2	2001	ANGLE	0	0	1	4	1	2	1	100431259	2.95

Table 10.24. continued (NC-132 and Bragg Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	3	2001	ANGLE	0	0	7	0	1	1	2	100432131	2.95
9	26	2001	ANGLE	0	0	0	5	1	1	1	100449234	2.95
10	3	2001	ANGLE	0	0	0	0	1	1	1	100454515	2.95
11	2	2001	ANGLE	0	0	1	0	1	1	1	100478564	2.95
2	17	2002	RAN OFF ROAD - LEFT	0	0	0	3	1	4	1	100560931	2.95
2	26	2002	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100567360	2.95
4	14	2002	REAR END, SLOW OR STOP	0	0	1	0	1	4	1	100600206	2.95
5	10	2002	LEFT TURN, SAME ROADWAY	0	0	0	3	1	1	2	100618993	2.95
6	23	2002	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	100649170	2.95
8	9	2002	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100682361	2.95
9	1	2002	LEFT TURN, SAME ROADWAY	0	0	0	0	2	1	1	100700100	2.95
9	26	2002	LEFT TURN, DIFFERENT ROADWAYS	0	0	2	0	1	1	2	100717779	2.95
11	17	2002	ANGLE	0	0	0	1	2	4	3	100761324	2.95
2	17	2003	ANGLE	0	0	0	0	1	1	1	100832396	2.95
5	3	2003	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100888013	2.95
8	12	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100966502	2.95
10	17	2003	ANGLE	0	0	0	0	1	1	1	101018533	2.95
10	22	2003	HEAD ON	0	0	0	0	1	1	1	101022199	2.95
10	31	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101031749	2.95
12	1	2003	LEFT TURN, SAME ROADWAY	0	0	0	0	1	4	1	101057416	2.95
2	5	2004	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101111605	2.95
2	28	2004	ANGLE	0	0	0	0	1	1	1	101130473	2.95
6	26	2004	ANGLE	0	2	0	3	1	4	2	101221068	2.95
7	2	2004	ANGLE	0	0	0	1	1	1	2	101225434	2.95
8	6	2004	ANGLE	0	0	1	1	1	1	1	101252659	2.95
12	4	2004	ANGLE	0	0	0	0	1	1	1	101353409	2.95
1	11	2005	ANGLE	0	0	0	0	1	1	2	101383729	2.95

Table 10.24. continued (NC-132 and Bragg Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
2	4	2005	ANGLE	0	1	2	1	1	1	1	101402952	2.95
3	5	2005	OTHER COLLISION WITH VEHICLE	0	0	1	0	1	1	1	101426089	2.95
3	24	2005	ANGLE	0	0	0	0	1	4	1	101441462	2.95
7	3	2005	ANGLE	0	0	0	1	1	1	1	101511750	2.95
7	16	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101520137	2.95
12	26	2005	LEFT TURN, SAME ROADWAY	0	0	1	3	1	1	1	101643189	2.95
2	12	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	2	1	1	101675723	2.95
2	28	2006	LEFT TURN, SAME ROADWAY	0	0	0	2	1	4	1	101686534	2.95
2	14	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101960708	2.95
5	16	2007	LEFT TURN, SAME ROADWAY	0	0	1	3	1	1	1	102041122	2.95
8	8	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	4	1	102108616	2.95
9	20	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	2	2	102145126	2.95
9	28	2007	ANGLE	0	0	0	0	1	1	1	102151627	2.95
10	30	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	4	1	102178821	2.95
4	25	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102313272	2.95
5	20	2008	SIDESWIPE, SAME DIRECTION	0	0	0	1	1	1	1	102329032	2.95
5	22	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102330234	2.95
6	2	2008	REAR END, SLOW OR STOP	0	0	0	4	1	1	1	102341354	2.95
7	17	2008	ANGLE	0	0	0	0	1	1	1	102370315	2.95
8	30	2008	RIGHT TURN, SAME ROADWAY	0	0	0	3	1	1	1	102398398	2.95
10	11	2008	SIDESWIPE, OPPOSITE DIRECTION	0	0	0	0	1	4	1	102427009	2.95
10	25	2008	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	102442276	2.95
11	14	2008	ANGLE	0	0	0	0	1	1	2	102467232	2.95
2	3	2009	LEFT TURN, SAME ROADWAY	0	0	2	0	1	1	1	102528592	2.95
12	10	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101065640	2.952
2	17	2004	REAR END, SLOW OR STOP	0	0	0	4	2	1	2	101122309	2.953
5	3	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101179007	2.954

Table 10.24. continued (NC-132 and Bragg Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	4	2004	REAR END, SLOW OR STOP	0	0	0	5	1	1	1	101326422	2.958
2	24	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101419202	2.959
1	9	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101935143	2.969
8	31	2007	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	102126659	2.969
10	2	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102419426	2.969
5	1	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	100885951	2.983
5	1	2003	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	100885963	2.984
7	31	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	4	1	101530288	2.988
3	31	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102568445	2.988
2	7	2006	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	101671944	2.997
9	21	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101290680	3.003
1	17	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101388090	3.026
2	18	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101121484	3.045
1	19	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101389653	3.05
1	3	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102232616	3.06
2	1	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100820681	3.083
7	10	2008	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	102365237	3.103
2	16	2004	ANGLE	0	0	0	2	2	4	1	101120975	3.147
8	25	2003	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100976447	3.15
1	18	2005	PARKED MOTOR VEHICLE	0	0	0	0	1	4	1	101388684	3.15
11	13	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101885524	3.159
5	5	2007	RIGHT TURN, SAME ROADWAY	0	0	0	0	2	1	2	102031424	3.171
10	3	2002	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100723705	3.2
10	23	2008	OTHER COLLISION WITH VEHICLE	0	0	0	0	1	1	1	102441765	3.265
12	27	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100794681	3.303
9	24	2003	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	100999855	3.322
3	21	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102556827	3.322

Table 10.25. NC-132 and Pinecliff Drive Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
12	15	2003	REAR END, SLOW OR STOP	0	0	0	4	1	1	1	101071710	1.81
2	7	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100553993	1.825
11	13	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100758461	1.9
8	1	2004	OTHER NON-COLLISION	0	0	0	0	1	1	1	101247827	1.9
11	18	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101339436	1.9
7	4	2009	SIDESWIPE, SAME DIRECTION	0	0	0	1	1	2	1	102637256	1.911
4	23	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100341304	1.963
12	31	2005	REAR END, SLOW OR STOP	0	1	0	0	1	1	2	101646648	1.963
1	12	2006	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101654905	1.98
1	27	2009	REAR END, SLOW OR STOP	0	0	0	2	2	1	2	102525010	1.98
5	1	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102585978	1.995
2	9	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101406514	1.998
9	30	2001	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	100452223	2
2	18	2002	RIGHT TURN, SAME ROADWAY	0	0	0	1	1	1	1	100561456	2
3	21	2002	FIXED OBJECT	0	0	0	0	2	1	3	100584174	2
6	4	2003	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	2	1	3	100913350	2
2	5	2004	ANGLE	0	0	0	0	1	1	1	101111644	2
6	5	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	101204840	2
6	23	2004	ANGLE	0	0	0	0	1	1	1	101218267	2
1	4	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	1	1	1	1	101378985	2
6	23	2005	ANGLE	0	0	0	0	1	5	1	101504114	2
7	25	2005	ANGLE	0	0	0	0	1	1	1	101527066	2
8	24	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	101547784	2
12	19	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	1	1	5	1	101638166	2
1	16	2007	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	2	5	2	101934283	2
3	30	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101999154	2
4	22	2007	ANGLE	0	0	0	1	1	1	1	102036706	2

Table 10.25. continued (NC-132 and Pinecliff Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	31	2007	RAN OFF ROAD - RIGHT	0	0	0	0	1	2	1	102054173	2
1	5	2008	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102233565	2
5	19	2008	ANGLE	0	0	0	1	1	1	1	102328367	2
9	12	2008	LEFT TURN, SAME ROADWAY	0	0	0	2	1	5	1	102407563	2
11	26	2008	ANGLE	0	0	0	0	1	1	1	102474584	2
1	16	2009	REAR END, SLOW OR STOP	0	0	0	3	1	1	1	102517648	2
5	6	2009	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	5	1	102591692	2
3	30	2002	FIXED OBJECT	0	0	0	0	1	1	2	100589262	2.001
12	7	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101628190	2.002
11	18	2002	REAR END, SLOW OR STOP	0	0	0	3	1	1	1	100762142	2.004
8	4	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	2	1	102105456	2.005
1	17	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101388085	2.012
8	6	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	3	1	3	100961111	2.012
1	29	2008	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102251087	2.012
2	2	2006	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101680467	2.019
5	14	2001	REAR END, SLOW OR STOP	0	0	0	0	2	1	1	100356237	2.029
8	24	2005	REAR END, SLOW OR STOP	0	0	0	2	2	1	2	101548046	2.03
11	13	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100487818	2.056
4	12	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100598384	2.056
6	23	2008	FIXED OBJECT	0	0	0	0	1	5	1	102354541	2.057
8	18	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100971114	2.08
9	1	2004	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	101272561	2.08
12	12	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102214767	2.08
6	23	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102353865	2.08
2	2	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	5	1	102528117	2.08
10	18	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101311782	2.085
1	28	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101947027	2.11

Table 10.25. continued (NC-132 and Pinecliff Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	22	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102046179	2.14
5	14	2008	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102324894	2.17
7	9	2002	REAR END, SLOW OR STOP	0	0	1	0	1	1	1	100660812	2.171
12	16	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102472438	2.171
12	15	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101071702	2.173
6	3	2002	LEFT TURN, SAME ROADWAY	0	0	2	0	1	5	1	100635496	2.18
4	28	2003	LEFT TURN, SAME ROADWAY	0	0	0	3	1	1	1	100883773	2.18
7	10	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101231263	2.18
5	5	2005	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	101469193	2.18
10	1	2005	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	101573721	2.18
12	5	2005	ANGLE	0	0	0	2	1	2	2	101625588	2.18
12	3	2007	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102207193	2.18
12	30	2008	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	102504766	2.18
4	20	2009	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102579321	2.18
4	29	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102585773	2.182
5	2	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100348080	2.188
12	17	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102491805	2.189
1	9	2004	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	101089141	2.192
9	13	2007	REAR END, SLOW OR STOP	0	0	0	0	3	1	2	102137983	2.199
11	16	2001	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	100490422	2.2
2	7	2009	REAR END, SLOW OR STOP	0	0	1	2	1	1	1	102532289	2.204
7	2	2001	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	100389801	2.208
8	27	2005	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	101550368	2.208
11	18	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100762607	2.218
12	7	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101355729	2.22
5	2	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100887132	2.23
6	26	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100385873	2.236

Table 10.25. continued (NC-132 and Pinecliff Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	31	2006	REAR END, SLOW OR STOP	0	0	0	0	1	2	1	101667763	2.25
4	7	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101159135	2.254
1	4	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101378986	2.264
4	10	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102007408	2.27
8	31	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102126612	2.272
1	9	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100534024	2.28
1	25	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100545314	2.28
10	31	2002	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	100746576	2.28
8	3	2003	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100959150	2.28
5	12	2004	REAR END, TURN	0	0	0	1	1	1	1	101186108	2.28
11	12	2004	REAR END, SLOW OR STOP	0	0	1	0	2	1	2	101334450	2.28
1	9	2007	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101965411	2.28
2	22	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101967083	2.28
6	10	2003	RAN OFF ROAD - RIGHT	0	0	0	0	1	1	1	100918350	2.284
4	25	2004	REAR END, SLOW OR STOP	0	0	2	0	1	1	1	101173258	2.295
9	28	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101295383	2.298
5	24	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100905137	2.304
6	20	2002	UNKNOWN	0	0	0	0	1	1	2	100647586	2.307
12	24	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101371233	2.308
11	29	2005	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	101621146	2.311
11	1	2001	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	100477126	2.312
8	8	2005	REAR END, SLOW OR STOP	0	0	0	2	1	3	1	101535408	2.312
9	25	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102148700	2.317
7	28	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	1	2	102100523	2.32
1	23	2008	FIXED OBJECT	0	0	0	1	1	1	2	102246882	2.32
2	22	2004	REAR END, SLOW OR STOP	0	0	1	0	1	1	1	101124186	2.322
5	28	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102333973	2.322

Table 10.25. continued (NC-132 and Pinecliff Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	26	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100882301	2.327
4	1	2005	REAR END, SLOW OR STOP	0	0	0	1	2	5	3	101445655	2.33
5	28	2005	ANGLE	0	0	0	0	1	1	1	101486095	2.33
6	13	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102065379	2.33
3	18	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102301628	2.33
5	9	2003	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	100892158	2.334
6	9	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	101207424	2.336
1	26	2008	REAR END, SLOW OR STOP	0	0	1	2	2	4	2	102249386	2.339
8	3	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101249901	2.34
7	12	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100395828	2.345
4	5	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100593517	2.345
8	20	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100690397	2.346
8	6	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100961106	2.349
2	21	2006	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101682119	2.349
7	2	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100935101	2.354
10	8	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102425992	2.358
6	7	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102617246	2.365
12	13	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102489464	2.368
10	4	2005	ANGLE	0	0	0	0	1	1	2	101575186	2.382
7	3	2005	FIXED OBJECT	0	0	1	0	1	5	1	101511751	2.402
10	14	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101308758	2.42
6	2	2001	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	100369581	2.424
8	31	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	100430139	2.47
2	13	2009	ANGLE	0	0	0	0	1	1	1	102536211	2.475
9	7	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101556915	2.483
10	2	2005	ANGLE	0	0	0	0	10	8	9	101574105	2.494
5	1	2001	PEDALCYCLIST	0	0	1	0	1	1	1	100347396	2.509

Table 10.25. continued (NC-132 and Pinecliff Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	27	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102099198	2.513
11	7	2002	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	4	1	100752157	2.521
5	11	2001	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	100354249	2.523
3	3	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100842372	2.523
7	26	2004	ANGLE	0	0	0	0	1	1	1	101242986	2.523
2	5	2002	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	2	1	100552490	2.532
12	20	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100788691	2.532
12	12	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101067446	2.532
12	18	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101637568	2.532
9	21	2007	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	102145443	2.532
1	28	2004	REAR END, SLOW OR STOP	0	0	0	6	1	1	1	101349110	2.542
1	24	2007	REAR END, SLOW OR STOP	0	0	1	0	1	1	1	101941835	2.542
4	6	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100330291	2.55
9	18	2002	REAR END, SLOW OR STOP	0	0	0	2	1	4	2	100712744	2.55
7	20	2007	ANGLE	0	0	0	0	2	1	3	102088952	2.55
9	6	2003	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	100986267	2.551
5	8	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101183188	2.551
11	28	2008	ANGLE	0	0	0	2	1	4	1	102474927	2.551
4	3	2002	MOVABLE OBJECT	0	0	0	0	1	4	1	100592083	2.552
10	17	2006	REAR END, SLOW OR STOP	0	0	0	3	2	1	2	101859501	2.556

Table 10.26. US-117 and Holly Tree Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	13	2008	SIDESWIPE, SAME DIRECTION	0	0	0	1	1	1	1	102325261	2.78
4	28	2009	RAN OFF ROAD - LEFT	0	0	0	0	1	4	1	102589615	2.826
8	21	2001	ANGLE	0	0	0	0	1	1	1	100422470	2.83
12	28	2001	ANGLE	0	0	0	1	1	4	1	100523980	2.83
2	4	2002	ANGLE	0	0	0	0	1	1	1	100551812	2.83
11	13	2002	ANGLE	0	0	0	1	1	1	2	100758144	2.83
5	9	2003	ANGLE	0	0	0	1	1	1	1	100892784	2.83
3	16	2005	ANGLE	0	0	0	1	2	1	2	101433632	2.83
12	24	2006	ANGLE	0	0	0	1	1	1	1	101921113	2.83
1	24	2008	ANGLE	0	0	0	2	1	1	1	102247740	2.83
9	25	2008	ANGLE	0	0	0	2	2	1	3	102412529	2.83
1	26	2009	ANGLE	0	0	0	0	3	1	1	102524029	2.83
5	7	2009	ANGLE	0	0	0	1	1	1	1	102601389	2.83
12	4	2001	ANGLE	0	0	0	0	1	1	2	100504870	2.835
2	1	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100549682	2.848
3	17	2002	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	100580237	2.886
12	12	2002	RAN OFF ROAD - LEFT	0	0	0	0	1	5	1	100782138	2.887
3	17	2008	REAR END, SLOW OR STOP	0	0	1	0	1	4	1	102285683	2.887
2	18	2009	RAN OFF ROAD - LEFT	1	0	0	0	1	4	1	102537071	2.904
10	25	2007	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	102173578	2.906
6	17	2007	REAR END, TURN	0	0	0	0	1	1	1	102068059	2.925
10	24	2001	ANGLE	0	0	0	0	1	1	1	100461368	2.98
8	19	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101262290	2.98
6	20	2007	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	102071351	2.994
9	20	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100444489	3
9	6	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100703555	3
3	11	2003	ANGLE	0	0	0	0	2	1	3	100859045	3

Table 10.26. continued (US-117 and Holly Tree Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	6	2006	RAN OFF ROAD - RIGHT	0	0	0	0	1	4	1	101849556	3
11	7	2006	ANGLE	0	0	0	0	1	4	1	101928299	3
3	20	2007	LEFT TURN, SAME ROADWAY	0	0	1	0	1	1	1	101989514	3
2	2	2008	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102255685	3
10	29	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100475179	3.017
4	3	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100592343	3.027
12	12	2008	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	102489362	3.037
2	25	2002	OTHER COLLISION WITH VEHICLE	0	0	1	0	1	1	1	100565807	3.08
10	8	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101304244	3.112
1	11	2002	ANGLE	0	0	0	1	1	1	1	100535576	3.113
4	17	2003	ANGLE	0	0	0	1	1	1	1	100875639	3.131
8	15	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102114532	3.141
1	4	2006	REAR END, SLOW OR STOP	0	0	0	4	1	1	1	101649756	3.146
1	17	2003	SIDESWIPE, SAME DIRECTION	0	0	0	1	1	1	1	100808456	3.149
5	28	2001	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100365620	3.15
12	5	2001	ANGLE	0	0	0	2	1	1	1	100505797	3.15
2	28	2002	REAR END, SLOW OR STOP	0	0	2	0	1	1	1	100567825	3.15
3	3	2002	OVERTURN/ROLLOVER	0	0	0	2	2	1	3	100570352	3.15
4	16	2002	ANGLE	0	0	0	0	1	1	1	100601357	3.15
4	24	2002	FIXED OBJECT	0	0	0	0	1	1	1	100606981	3.15
6	29	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100653878	3.15
7	12	2002	REAR END, SLOW OR STOP	0	0	1	0	1	1	2	100661996	3.15
10	10	2002	ANGLE	0	0	0	0	1	1	1	100728714	3.15
1	14	2003	ANGLE	0	0	0	2	1	1	1	100805401	3.15
7	21	2003	LEFT TURN, SAME ROADWAY	0	0	0	3	1	1	1	100948983	3.15
8	12	2003	ANGLE	0	0	0	1	1	1	1	100966476	3.15
8	31	2003	ANGLE	0	0	0	1	1	1	1	100980850	3.15

Table 10.26. continued (US-117 and Holly Tree Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	10	2003	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	101012378	3.15
10	10	2003	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	101012332	3.15
11	24	2003	LEFT TURN, SAME ROADWAY	0	0	0	0	1	4	1	101051411	3.15
9	30	2004	ANGLE	0	0	1	0	1	1	2	101299808	3.15
6	12	2005	ANGLE	0	0	0	0	1	1	2	101497991	3.15
9	15	2005	ANGLE	0	0	0	0	1	1	1	101562626	3.15
10	2	2005	ANGLE	0	0	0	2	1	1	1	101574333	3.15
11	3	2005	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101599974	3.15
1	15	2006	ANGLE	0	0	3	2	1	1	1	101656956	3.15
2	5	2006	ANGLE	0	0	1	0	1	1	1	101676778	3.15
10	12	2006	ANGLE	0	0	0	3	1	4	1	101855099	3.15
11	29	2006	ANGLE	0	0	1	0	1	2	1	101899739	3.15
12	13	2006	ANGLE	0	0	0	0	2	1	2	101912251	3.15
1	7	2007	ANGLE	0	0	0	0	1	4	1	101932019	3.15
2	8	2007	ANGLE	0	0	0	0	1	1	1	101955972	3.15
4	24	2007	ANGLE	0	0	0	1	1	1	2	102021198	3.15
10	5	2007	ANGLE	0	0	1	0	2	1	2	102158267	3.15
11	15	2007	ANGLE	0	0	0	0	2	1	2	102193124	3.15
3	31	2008	ANGLE	0	0	1	1	1	1	2	102294802	3.15
4	28	2008	REAR END, SLOW OR STOP	0	0	0	0	2	4	2	102315146	3.15
5	10	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102323846	3.15
8	31	2008	ANGLE	0	0	0	2	1	1	1	102400799	3.15
9	7	2008	ANGLE	0	0	0	0	1	1	1	102403467	3.15
9	26	2008	ANGLE	0	0	0	1	1	1	2	102414519	3.15
9	30	2008	ANGLE	0	0	2	1	1	1	2	102418155	3.15
10	31	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102445894	3.15
12	31	2008	ANGLE	0	0	0	2	1	4	1	102506392	3.15

Table 10.26. continued (US-117 and Holly Tree Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	12	2009	ANGLE	0	0	0	1	1	4	1	102516510	3.15
3	12	2009	ANGLE	0	0	2	1	1	1	1	102556849	3.15
6	12	2009	ANGLE	0	0	0	1	1	1	1	102620077	3.15
7	14	2009	ANGLE	0	0	2	0	1	1	1	102669810	3.15
1	2	2009	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	102507830	3.152
5	21	2003	REAR END, SLOW OR STOP	0	0	0	1	1	4	1	100901785	3.154
2	19	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102544450	3.154
5	26	2004	REAR END, SLOW OR STOP	0	0	2	0	1	1	1	101196705	3.158
2	13	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	4	1	101409276	3.16
7	3	2008	ANGLE	0	0	0	0	1	1	1	102369608	3.16
9	13	2001	ANGLE	0	0	0	0	1	1	1	100439452	3.162
12	2	2002	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	100773042	3.165
4	25	2002	ANGLE	0	0	0	0	1	1	1	100607725	3.168
5	23	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100627782	3.168
10	30	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102445604	3.169
5	1	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100885949	3.17
3	14	2003	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100850291	3.178
1	24	2002	REAR END, SLOW OR STOP	0	0	0	1	1	2	1	100544601	3.18
9	13	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101561537	3.191
8	5	2003	ANGLE	0	0	0	1	1	1	1	100961000	3.197
1	16	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101093947	3.197
11	29	2001	HEAD ON	0	0	0	0	1	1	1	100500552	3.206
2	21	2002	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	100563429	3.225
6	26	2005	ANGLE	0	0	0	0	1	1	2	101506252	3.226
10	4	2002	REAR END, SLOW OR STOP	0	0	0	0	1	2	1	100724657	3.245
5	24	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	102332139	3.245
6	28	2004	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101222653	3.25

Table 10.26. continued (US-117 and Holly Tree Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	14	2001	RAN OFF ROAD - RIGHT	0	0	0	0	1	4	1	100440160	3.27
11	14	2007	RAN OFF ROAD - LEFT	0	0	0	0	1	1	1	102192089	3.27
8	31	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102126611	3.3
8	9	2003	OTHER NON-COLLISION	0	0	0	0	1	1	2	100964066	3.35
5	7	2004	ANGLE	0	0	1	0	1	1	1	101182342	3.37
11	22	2002	OTHER COLLISION WITH VEHICLE	0	0	0	0	1	4	1	100766009	3.381
9	14	2001	OTHER COLLISION WITH VEHICLE	0	0	4	0	1	1	1	100439706	3.4
8	26	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101267899	3.4
7	13	2005	UNKNOWN	0	0	0	0	1	1	1	101517463	3.4
7	30	2007	RAN OFF ROAD - LEFT	0	0	0	0	2	4	3	102102053	3.4
2	10	2003	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	100826634	3.434
10	20	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101021437	3.437
12	6	2005	ANGLE	0	0	0	0	1	1	2	101626521	3.437
2	14	2009	RAN OFF ROAD - LEFT	0	0	0	0	1	4	1	102537561	3.456
3	29	2003	ANGLE	0	0	0	0	1	1	1	100860838	3.47
5	19	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101479868	3.47
6	29	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	1	3	101508315	3.475
3	12	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102556853	3.475
5	1	2002	ANGLE	0	0	0	0	1	1	1	100611634	3.476
11	30	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101621365	3.494
1	4	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	4	1	101085689	3.513
5	10	2005	ANGLE	0	0	0	0	1	1	1	101473776	3.513

Table 10.27. US-421 and Sanders Road/SR-1187 Crash Data

Month	Day	Year	Crash Type								Crash ID	MP
				F	A	B	C	R	L	W		
6	9	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102061931	12.442
2	21	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	1	2	1	2	101416374	12.47
4	14	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101454901	12.47
11	28	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101619493	12.47
2	8	2006	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101673291	12.47
4	18	2007	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102014499	12.47
11	19	2004	OVERTURN/ROLLOVER	0	0	0	0	1	4	1	101340396	12.48
2	22	2010	OVERTURN/ROLLOVER	0	0	0	0	2	1	2	102815304	12.48
11	30	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101349661	12.57
1	6	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101086587	12.58
7	17	2004	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	101236849	12.58
6	23	2005	MOVABLE OBJECT	0	0	0	0	1	5	1	101504352	12.58
11	12	2005	RAN OFF ROAD - RIGHT	0	0	0	1	1	5	1	101607245	12.58
8	7	2009	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102658989	12.66
3	26	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101149509	12.68
4	1	2005	REAR END, SLOW OR STOP	0	0	0	2	2	1	2	101445649	12.68
6	15	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101499676	12.68
3	21	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101990009	12.68
9	24	2007	ANGLE	0	0	0	0	1	1	1	102120151	12.68
5	26	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102332686	12.68
2	5	2010	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	102801373	12.68
3	19	2010	RIGHT TURN, DIFFERENT ROADWAYS	0	0	1	0	1	1	1	102820849	12.68
10	15	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101309484	12.685
4	10	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102007396	12.739
9	17	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102142481	12.761
12	31	2007	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	102229876	12.771
6	24	2010	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102897788	12.771

Table 10.27. continued (US-421 and Sanders Road/SR-1187 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	2	2006	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101845603	12.773
1	14	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101092850	12.78
1	25	2004	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	2	1	3	101101638	12.78
12	18	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	5	1	101365312	12.78
7	6	2005	ANGLE	0	0	0	0	1	1	1	101513422	12.78
8	1	2005	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101530822	12.78
9	10	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101559414	12.78
11	6	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101878764	12.78
3	26	2007	FIXED OBJECT	0	0	0	0	1	1	1	101993552	12.78
11	13	2007	FIXED OBJECT	0	0	0	0	1	1	1	102190357	12.78
11	18	2007	LEFT TURN, SAME ROADWAY	0	0	0	1	1	5	1	102195951	12.78
12	19	2007	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	2	1	1	2	102220968	12.78
3	13	2008	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102283146	12.78
4	18	2008	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	102309226	12.78
4	21	2008	LEFT TURN, SAME ROADWAY	0	0	1	0	1	2	2	102309869	12.78
9	26	2009	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	102681476	12.78
3	11	2010	LEFT TURN, DIFFERENT ROADWAYS	0	0	1	0	2	1	2	102822197	12.78
5	8	2010	LEFT TURN, SAME ROADWAY	0	0	0	0	1	5	1	102858595	12.78
5	23	2004	FIXED OBJECT	0	0	0	1	1	1	1	101194338	12.782
6	25	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101220279	12.785
2	22	2006	REAR END, SLOW OR STOP	0	0	0	0	2	5	3	101682398	12.785
8	10	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101804788	12.786
8	10	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102662698	12.786
1	13	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101385772	12.789
10	15	2009	ANIMAL	0	0	0	0	2	5	3	102696260	12.794
3	31	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101445002	12.799
7	31	2007	REAR END, SLOW OR STOP	0	0	0	0	1	5	2	102102333	12.818

Table 10.27. continued (US-421 and Sanders Road/SR-1187 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	5	2008	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	102361671	12.82
6	4	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101491311	12.827
3	17	2005	REAR END, SLOW OR STOP	0	0	1	1	1	5	2	101435309	12.832
11	25	2009	ANIMAL	0	0	0	0	2	5	2	102732542	12.837
5	2	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102028419	12.843
3	7	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101978746	12.861
12	18	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101073730	12.88
1	20	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101097120	12.88
5	7	2004	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101197573	12.88
6	28	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101222347	12.88
8	24	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101266374	12.88
8	8	2005	REAR END, SLOW OR STOP	0	0	0	2	2	1	2	101535703	12.88
8	23	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101547107	12.88
4	16	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101715661	12.88
6	17	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101763921	12.88
7	1	2006	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101773890	12.88
6	2	2007	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	102055985	12.88
6	16	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102067661	12.88
8	24	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102120519	12.88
8	30	2007	REAR END, SLOW OR STOP	0	0	1	0	1	1	1	102126760	12.88
9	1	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102127113	12.88
9	4	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102129080	12.88
9	20	2007	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	102144602	12.88
9	28	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102079443	12.88
4	29	2008	RAN OFF ROAD - LEFT	0	0	0	0	1	1	1	102315352	12.88
6	20	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102624221	12.88
2	16	2010	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102794070	12.88

Table 10.27. continued (US-421 and Sanders Road/SR-1187 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	25	2010	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102898254	12.88
6	6	2004	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101205176	12.89
10	2	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102153904	12.9
7	31	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102378992	12.9
8	9	2007	REAR END, SLOW OR STOP	0	0	0	3	1	1	1	102110788	12.91
11	16	2005	REAR END, SLOW OR STOP	0	0	0	0	1	2	1	101610208	12.92
11	16	2005	REAR END, SLOW OR STOP	0	0	0	1	1	2	1	101611593	12.92
9	26	2006	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101841224	12.92
9	30	2006	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101844310	12.92
5	21	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102045768	12.92
7	4	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102081641	12.92
1	18	2008	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	102243625	12.92
3	23	2007	FIXED OBJECT	0	0	0	0	1	5	1	101991509	12.93
4	6	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102005026	12.93
10	24	2009	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	102711958	12.93
2	11	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101408046	12.98
2	26	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101420283	12.98
6	25	2005	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	101505381	12.98
7	2	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101510911	12.98
9	24	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101569011	12.98
4	14	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101714052	12.98
5	2	2006	ANIMAL	0	0	0	0	1	5	1	101725904	12.98
1	15	2007	REAR END, SLOW OR STOP	0	0	0	0	1	5	2	101938346	12.98
1	15	2007	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	101938353	12.98
7	20	2007	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	102093895	12.98
2	7	2008	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102257511	12.98
6	24	2010	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	5	1	102902394	12.98

Table 10.27. continued (US-421 and Sanders Road/SR-1187 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	20	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101522443	12.999
6	8	2004	SIDESWIPE, OPPOSITE DIRECTION	0	1	1	0	1	1	5	101206420	13.02
6	25	2006	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101768991	13.02
8	18	2007	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	102116814	13.02
8	15	2009	REAR END, SLOW OR STOP	0	0	0	4	1	1	2	102670056	13.02

Table 10.28. US-421 and Halyburton Memorial Parkway/Veterans Drive Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	28	2006	OVERTURN/ROLLOVER	0	0	0	0	1	1	2	101770893	10.8
5	12	2005	ANGLE	0	0	2	0	1	1	1	101474996	10.82
9	24	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	5	3	101568678	10.82
12	23	2005	FIXED OBJECT	0	0	0	2	1	1	1	101641241	10.82
5	18	2007	OVERTURN/ROLLOVER	0	0	0	0	1	1	1	102042603	10.82
10	26	2003	ANIMAL	0	0	0	0	1	5	1	101025994	10.86
7	31	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101246969	10.87
11	9	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101331389	10.88
8	30	2008	REAR END, TURN	0	1	0	0	1	1	1	102397811	10.88
11	25	2006	REAR END, SLOW OR STOP	0	0	1	1	1	5	1	101896611	10.9
11	25	2006	LEFT TURN, SAME ROADWAY	0	0	0	2	1	5	1	101896691	10.9
4	23	2004	FIXED OBJECT	0	0	0	0	1	1	1	101170500	10.92
10	22	2005	LEFT TURN, SAME ROADWAY	1	0	0	2	1	1	1	101589000	10.92
4	1	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101734333	10.92
5	26	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102332682	10.92
2	27	2010	ANIMAL	0	0	0	0	1	5	1	102803067	10.92
7	20	2008	OVERTURN/ROLLOVER	0	0	0	0	1	5	1	102372133	10.959
3	17	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101434937	10.987
8	11	2006	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101805422	10.995
8	12	2006	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101807050	11
8	30	2008	REAR END, SLOW OR STOP	0	0	0	3	1	1	1	102398399	11.018
7	11	2004	REAR END, SLOW OR STOP	0	0	0	2	2	1	3	101232131	11.02
7	11	2004	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101232393	11.02
1	3	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101377868	11.02
6	11	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101496052	11.02
5	29	2006	REAR END, TURN	0	0	1	0	1	1	1	101740980	11.02
7	15	2006	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101785624	11.02

Table 10.28. continued (US-421 and Halyburton Memorial Parkway/Veterans Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	13	2007	BACKING UP	0	0	0	0	1	1	1	102196274	11.02
8	29	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102667883	11.02
4	24	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102311336	11.05
1	3	2008	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102232334	11.06
4	6	2008	REAR END, SLOW OR STOP	0	0	0	3	1	1	1	102301662	11.06
9	1	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102680585	11.093
5	21	2005	LEFT TURN, SAME ROADWAY	0	0	2	0	1	5	1	101481299	11.1
5	12	2005	OTHER NON-COLLISION	0	0	1	0	1	1	1	101474997	11.101
2	5	2010	REAR END, TURN	0	0	0	0	2	1	2	102784609	11.106
8	31	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	102126238	11.107
5	30	2010	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102875411	11.107
8	7	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101801985	11.11
7	8	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101514878	11.111
7	30	2004	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101245979	11.114
7	3	2005	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	101511736	11.115
5	6	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101728520	11.115
4	9	2010	REAR END, SLOW OR STOP	0	0	0	2	1	4	2	102838444	11.115
7	13	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101517922	11.116
9	15	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	101558873	11.117
9	16	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101564213	11.117
4	23	2005	OVERTURN/ROLLOVER	0	0	0	0	1	1	1	101461235	11.118
5	12	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101732431	11.118
8	31	2009	REAR END, SLOW OR STOP	0	0	0	4	1	1	1	102665796	11.118
8	31	2009	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102665802	11.119
10	8	2003	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101010662	11.12
11	3	2003	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	1	1	1	2	101033620	11.12
12	9	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101064701	11.12

Table 10.28. continued (US-421 and Halyburton Memorial Parkway/Veterans Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	13	2004	FIXED OBJECT	0	0	0	0	2	1	2	101186700	11.12
10	22	2004	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	5	2	101299414	11.12
10	28	2004	HEAD ON	0	0	0	0	1	1	1	101320172	11.12
11	2	2004	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	101326337	11.12
12	13	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101360791	11.12
1	28	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101397564	11.12
2	10	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	1	1	1	1	1	101407085	11.12
2	15	2005	ANGLE	0	0	0	0	1	1	5	101410662	11.12
3	18	2005	FIXED OBJECT	0	0	0	0	1	5	2	101435712	11.12
3	2	2006	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101686851	11.12
4	8	2006	REAR END, TURN	0	0	0	0	2	1	3	101709928	11.12
8	5	2006	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101800873	11.12
11	12	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101884823	11.12
7	18	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102092196	11.12
11	30	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102205078	11.12
12	18	2007	LEFT TURN, SAME ROADWAY	0	0	0	2	1	5	1	102220228	11.12
3	6	2008	REAR END, TURN	0	0	0	0	1	1	1	102277261	11.12
6	19	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102349611	11.12
2	17	2010	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102795228	11.12
3	29	2010	BACKING UP	0	0	0	0	1	4	1	102833652	11.12
11	25	2005	REAR END, TURN	0	0	0	0	1	1	1	101617741	11.122
7	25	2006	REAR END, SLOW OR STOP	0	0	1	0	1	1	1	101792593	11.122
8	17	2006	REAR END, SLOW OR STOP	0	0	0	0	4	1	1	101810101	11.122
11	3	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102711794	11.123
1	10	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101382958	11.124
1	1	2006	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101647233	11.124
3	26	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101993567	11.127

Table 10.28. continued (US-421 and Halyburton Memorial Parkway/Veterans Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	20	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102196828	11.127
4	16	2008	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102307513	11.13
11	24	2004	REAR END, SLOW OR STOP	0	0	0	1	1	5	1	101344861	11.131
9	16	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101563422	11.131
8	8	2004	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101253964	11.15
8	27	2005	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	101550344	11.158
9	29	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102152358	11.165
7	22	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102367227	11.175
1	29	2010	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102778620	11.2
1	17	2005	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	101388076	11.22
4	5	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101448158	11.22
6	6	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101492338	11.22
5	7	2006	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101729440	11.22
6	23	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101767842	11.22
8	19	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101811626	11.22
10	13	2006	REAR END, SLOW OR STOP	0	0	0	1	1	5	2	101855358	11.22
1	9	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101934770	11.22
9	28	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102151349	11.22
8	1	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102648399	11.22
1	13	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101092382	11.25
7	4	2004	REAR END, SLOW OR STOP	0	0	1	5	1	1	2	101226994	11.25
9	8	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102134134	11.25
2	21	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102268874	11.25
8	14	2008	FIXED OBJECT	0	0	0	1	1	1	1	102386975	11.25
3	2	2010	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102819602	11.25
8	28	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101818626	11.27
12	12	2007	SIDESWIPE, SAME DIRECTION	0	0	0	1	2	1	1	102215142	11.312

Table 10.28. continued (US-421 and Halyburton Memorial Parkway/Veterans Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	2	2004	PEDESTRIAN	0	0	1	0	1	5	1	101202111	11.318
4	24	2004	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101171212	11.32
8	21	2008	LEFT TURN, SAME ROADWAY	0	0	1	0	1	5	1	102391271	11.338
1	24	2010	REAR END, SLOW OR STOP	0	0	0	2	1	1	2	102790020	11.341
5	12	2010	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	4	1	102862796	11.341
6	27	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	101507037	11.346
1	10	2005	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101383518	11.347
8	23	2008	ANGLE	0	0	0	2	1	1	1	102391873	11.348
4	17	2004	FIXED OBJECT	0	0	0	1	1	1	1	101165751	11.35
7	1	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	5	1	101224658	11.35
9	18	2004	ANGLE	0	0	1	0	1	1	2	101286988	11.35
10	4	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101300452	11.35
1	12	2005	ANGLE	0	0	0	3	1	5	1	101384719	11.35
2	21	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	1	1	1	2	101416365	11.35
8	31	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	1	1	1	1	101552738	11.35
9	29	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101572190	11.35
9	30	2005	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101572795	11.35
10	6	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	4	2	1	2	101577188	11.35
2	7	2006	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	101672690	11.35
2	24	2006	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	5	1	101682925	11.35
6	8	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101754002	11.35
6	28	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101770888	11.35
8	3	2006	ANGLE	0	0	0	0	1	1	1	101799198	11.35
3	22	2007	ANGLE	0	0	0	2	1	1	1	101990367	11.35
8	26	2007	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	102122569	11.35
5	18	2008	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	2	101478846	11.35
7	18	2008	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102371164	11.35

Table 10.28. continued (US-421 and Halyburton Memorial Parkway/Veterans Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
8	4	2008	ANGLE	0	0	0	1	1	1	1	102381111	11.35
8	23	2009	PEDALCYCLIST	0	0	0	1	1	5	1	102661085	11.35
12	9	2009	FIXED OBJECT	0	0	0	0	2	1	2	102759101	11.35
2	9	2010	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102787019	11.35
3	1	2010	ANGLE	0	0	0	0	1	1	1	102805502	11.35
4	26	2010	ANGLE	0	0	1	1	1	1	2	102855557	11.35
6	23	2010	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102896591	11.35
4	11	2005	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	1	1	1	1	101453046	11.352
9	27	2008	OTHER COLLISION WITH VEHICLE	0	0	0	0	1	1	1	102413715	11.353
11	3	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	5	1	101599560	11.354
12	6	2004	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	2	1	101354556	11.355
1	28	2008	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	5	1	102250611	11.355
8	12	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101539304	11.365
10	29	2007	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	102177346	11.37

Table 10.29. US-17 and NC-211/Green Swamp Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
8	18	2003	Fixed Object	0	0	0	0	3	5	3	100970714	21.57
5	27	2003	Jackknife	0	0	0	0	2	1	2	100906634	21.64
8	10	2006	Fixed Object	0	0	0	0	1	1	1	101804531	21.64
6	16	2007	Sideswipe, Same Direction	0	0	0	0	1	1	1	102066802	21.73
10	16	2004	Animal	0	0	0	0	1	5	1	101309974	21.74
1	24	2005	Rear End, Slow or Stop	0	0	0	1	1	1	1	101393912	21.74
8	1	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101534208	21.74
12	6	2007	Fixed Object	0	0	0	0	1	1	1	102209689	21.74
2	29	2008	Sideswipe, Same Direction	0	0	0	0	1	1	1	102272513	21.74
3	4	2005	Rear End, Turn	0	0	0	0	1	1	1	101424650	21.77
10	4	2006	Left Turn, Different Roadways	0	0	2	0	1	1	1	101846996	21.77
10	6	2006	Other Collision With Vehicle	0	0	0	0	2	1	2	101848012	21.77
7	26	2003	Rear End, Slow or Stop	0	0	0	1	2	1	2	100952416	21.84
2	21	2004	Sideswipe, Same Direction	0	0	0	0	1	1	1	101123247	21.84
4	29	2004	Fixed Object	0	0	3	2	1	1	1	101174887	21.84
11	18	2005	Sideswipe, Same Direction	0	0	0	1	1	2	1	101611959	21.84
2	13	2006	Fixed Object	0	0	0	0	1	1	1	101633643	21.84
6	25	2009	Overturn/Rollover	0	0	0	1	1	3	1	102625660	21.84
8	15	2004	Fixed Object	0	0	0	0	2	5	2	101259071	21.845
7	16	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101519674	21.881
7	8	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102635695	21.892
4	9	2005	Rear End, Slow or Stop	0	0	0	1	1	1	1	101451353	21.897
10	22	2004	Fixed Object	0	0	0	0	1	1	1	101314195	21.904
2	7	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101404553	21.921
10	21	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102442367	21.921
10	12	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101854679	21.931
9	25	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102148399	21.931
7	28	2009	Rear End, Slow or Stop	0	0	0	3	1	1	1	102647678	21.931
12	31	2004	Rear End, Turn	0	0	0	0	1	1	1	101375628	21.932
1	12	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	101933245	21.933
4	16	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102012603	21.934

Table 10.29. continued US-17 and NC-211/Green Swamp Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	6	2009	Rear End, Slow or Stop	0	0	0	1	1	1	1	102588506	21.934
6	18	2003	Rear End, Slow or Stop	0	0	0	1	2	1	3	100923831	21.937
9	26	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101840336	21.937
10	29	2004	Sideswipe, Same Direction	0	0	0	0	1	1	1	101282498	21.938
7	4	2003	Angle	0	0	3	1	1	5	1	100936368	21.94
8	3	2003	Right Turn, Different Roadways	0	0	0	0	1	1	1	100958662	21.94
8	3	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100958656	21.94
10	7	2003	Angle	0	0	0	1	1	5	2	101009441	21.94
11	8	2003	Angle	0	0	0	0	1	5	2	101037718	21.94
11	28	2003	Angle	0	0	2	0	2	5	5	101054926	21.94
1	22	2004	Angle	0	0	0	0	1	5	1	101098253	21.94
4	14	2004	Rear End, Slow or Stop	0	0	0	0	1	1	2	101163264	21.94
4	28	2004	Left Turn, Different Roadways	0	0	0	0	1	1	1	101174245	21.94
5	6	2004	Rear End, Slow or Stop	0	0	0	1	1	1	1	101181704	21.94
8	15	2004	Rear End, Turn	0	0	0	0	2	1	3	101259068	21.94
10	2	2004	Overturn/Rollover	0	0	1	5	1	5	1	101298615	21.94
10	19	2004	Left Turn, Same Roadway	0	0	0	0	1	1	1	101312146	21.94
10	22	2004	Left Turn, Different Roadways	0	0	1	0	1	5	1	101314212	21.94
10	28	2004	Rear End, Slow or Stop	0	0	0	0	1	1	2	101319825	21.94
11	5	2004	Angle	0	0	0	4	1	5	1	101327341	21.94
2	8	2005	Angle	0	0	0	0	1	5	5	101405421	21.94
5	6	2005	Left Turn, Different Roadways	0	0	0	1	2	1	3	101470185	21.94
5	7	2005	Angle	0	0	0	0	1	5	1	101471136	21.94
5	16	2005	Angle	0	0	0	1	1	3	1	101477310	21.94
6	24	2005	Angle	0	0	2	0	1	4	1	101504828	21.94
7	1	2005	Fixed Object	0	0	0	0	1	5	1	101509810	21.94
11	15	2005	Rear End, Slow or Stop	0	0	0	1	1	1	1	101609170	21.94
12	14	2005	Angle	0	0	0	0	1	1	1	101570703	21.94
3	30	2006	Angle	0	0	1	2	1	5	1	101704298	21.94
5	27	2006	Rear End, Slow or Stop	0	0	0	1	1	1	1	101739887	21.94
7	4	2006	Left Turn, Different Roadways	0	0	0	0	1	5	1	101775222	21.94
8	4	2006	Left Turn, Different Roadways	0	0	1	4	1	5	1	101799888	21.94

Table 10.29. continued US-17 and NC-211/Green Swamp Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
8	26	2006	Angle	0	0	0	0	1	5	1	101816694	21.94
9	6	2006	Left Turn, Different Roadways	0	0	0	0	2	1	3	101825637	21.94
9	16	2006	Left Turn, Different Roadways	0	0	0	2	1	1	1	101833220	21.94
2	9	2007	Rear End, Slow or Stop	0	0	1	0	1	1	1	101956022	21.94
2	21	2007	Rear End, Slow or Stop	0	0	0	0	1	1	2	101964909	21.94
7	17	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102091280	21.94
9	30	2007	Angle	0	0	0	0	1	5	1	102087035	21.94
10	24	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102171359	21.94
12	2	2007	Angle	0	0	0	1	1	1	2	102206447	21.94
1	18	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102243005	21.94
12	6	2008	Rear End, Slow or Stop	0	0	0	1	1	5	2	102483915	21.94
3	21	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102558621	21.94
7	15	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102634798	21.94
8	10	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101537624	21.942
10	17	2005	Rear End, Slow or Stop	0	0	0	1	1	1	1	101585849	21.944
2	17	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101678210	21.944
4	30	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101175782	21.948
3	23	2008	Rear End, Slow or Stop	0	0	0	1	1	5	1	102289102	21.948
1	5	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101379324	21.949
2	12	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102260439	21.949
4	14	2009	Rear End, Slow or Stop	0	0	0	3	2	1	2	102571501	21.949
3	31	2008	Rear End, Slow or Stop	0	0	0	0	1	1	2	102294049	21.951
7	4	2005	Sideswipe, Same Direction	0	0	0	0	1	1	1	101512022	21.954
7	10	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101515724	21.959
10	5	2005	Rear End, Slow or Stop	0	0	0	0	2	1	2	101575680	21.959
12	27	2006	Rear End, Slow or Stop	0	0	0	1	1	1	1	101923961	21.959
10	14	2003	Fixed Object	0	0	0	1	1	1	2	101015313	21.963
3	18	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102558439	21.973
10	2	2003	Right Turn, Different Roadways	0	0	2	1	1	1	1	101007817	21.978
3	7	2005	Rear End, Slow or Stop	0	0	0	1	1	1	1	101427254	22.04
4	2	2005	Fixed Object	0	0	0	0	2	1	2	101446384	22.04
7	30	2005	Rear End, Slow or Stop	0	0	0	2	2	1	2	101529687	22.04

Table 10.29. continued US-17 and NC-211/Green Swamp Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	23	2007	Animal	0	0	0	0	1	5	1	102046824	22.04
1	23	2008	Fixed Object	0	0	1	0	2	5	2	102246609	22.04
11	27	2004	Overturn/Rollover	0	0	0	0	2	5	2	101346891	22.07
1	2	2006	Fixed Object	0	0	0	1	2	1	2	101647583	22.07
11	7	2003	Animal	0	0	0	0	1	5	1	101036993	22.14
4	6	2005	Other Collision With Vehicle	0	0	0	0	1	1	1	101449016	22.14
1	29	2009	Rear End, Slow or Stop	0	0	0	1	1	5	1	102525543	22.14
6	3	2009	Animal	0	0	0	0	1	5	1	102612228	22.14
7	28	2007	Fixed Object	0	0	0	0	3	1	2	102100381	22.17
7	2	2009	Animal	0	0	0	0	1	1	1	102633474	22.196
9	10	2004	Right Turn, Different Roadways	0	0	0	0	1	1	1	101280088	22.22
2	9	2006	Left Turn, Same Roadway	0	0	1	2	1	1	2	101673327	22.22
2	9	2009	Rear End, Turn	0	0	0	0	1	1	1	102532726	22.226
3	15	2004	Sideswipe, Same Direction	0	0	0	2	1	1	1	101141145	22.229
2	27	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102271195	22.232
9	22	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101290195	22.24
2	8	2005	Animal	0	0	0	0	1	5	5	101405415	22.24
8	13	2003	Fixed Object	0	0	0	1	3	1	2	100966834	22.27
7	9	2005	Fixed Object	0	0	0	1	1	5	1	101515227	22.27
8	6	2006	Fixed Object	0	0	1	0	3	1	3	101801230	22.27

Table 10.30. US-17 and SR-1357/Smith Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	11	2004	Left Turn, Same Roadway	0	0	0	0	1	1	1	101208663	14.595
11	18	2005	Rear End, Slow or Stop	0	0	0	0	1	5	1	101722875	14.6
6	19	2007	Other Collision With Vehicle	0	0	0	0	1	1	1	102071081	14.6
10	10	2007	Left Turn, Different Roadways	1	0	4	0	1	1	2	102234041	14.6
6	26	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101769248	14.619
6	4	2006	Rear End, Slow or Stop	0	0	0	1	2	5	5	101744708	14.66
5	8	2003	Left Turn, Same Roadway	0	0	0	1	1	1	1	100891244	14.687
9	2	2004	Fixed Object	0	0	0	0	2	1	2	101272927	14.7
1	20	2005	Fixed Object	0	0	0	0	1	1	1	101378433	14.7
11	4	2005	Rear End, Slow or Stop	0	0	0	1	1	1	1	101600571	14.7
11	25	2006	Left Turn, Different Roadways	0	0	0	0	1	5	1	101896391	14.754
1	11	2009	Left Turn, Different Roadways	0	0	0	2	1	5	1	102492525	14.755
8	19	2003	Ran Off Road - Right	0	0	0	1	2	1	2	100971672	14.756
7	22	2003	Angle	0	0	0	3	1	1	1	100949358	14.76
11	14	2003	Angle	0	0	0	1	1	1	1	101042813	14.76
12	17	2003	Angle	0	0	0	1	1	1	2	101072419	14.76
5	3	2004	Other Collision With Vehicle	0	0	0	0	2	1	3	101263188	14.76
6	30	2004	Fixed Object	0	0	0	0	2	1	2	101223561	14.76
8	22	2004	Angle	0	0	1	0	1	1	1	101263207	14.76
10	25	2004	Angle	0	0	1	4	1	1	1	101317484	14.76
3	15	2005	Head On	0	1	0	1	1	5	1	101433499	14.76
4	21	2005	Angle	0	0	0	0	1	1	1	101459512	14.76
6	28	2005	Angle	0	0	2	1	2	1	3	101507939	14.76
8	8	2005	Angle	0	0	0	0	2	1	2	101535464	14.76
12	9	2005	Left Turn, Different Roadways	0	0	0	1	1	1	1	101629098	14.76
12	30	2005	Left Turn, Same Roadway	1	0	0	0	1	1	1	101645616	14.76
4	3	2006	Ran Off Road - Right	1	0	0	0	1	1	1	101722901	14.76
5	11	2006	Angle	0	0	0	0	1	1	1	101731127	14.76
5	12	2006	Angle	0	1	1	0	1	1	1	101732199	14.76
6	3	2006	Fixed Object	0	0	0	0	1	1	2	101744516	14.76
6	24	2006	Ran Off Road - Left	0	0	0	1	2	1	3	101813610	14.76

Table 10.30. continued US-17 and SR-1357/Smith Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
8	4	2006	Left Turn, Different Roadways	0	0	2	0	1	1	1	101799889	14.76
8	17	2006	Left Turn, Different Roadways	0	0	0	1	1	1	1	101809867	14.76
3	5	2007	Left Turn, Different Roadways	0	0	0	2	1	1	1	101976653	14.76
10	9	2007	Angle	0	0	0	2	1	1	1	102159782	14.76
1	27	2008	Angle	0	0	0	0	1	1	1	102249519	14.76
2	8	2008	Left Turn, Same Roadway	0	0	0	0	1	1	1	102258595	14.76
2	27	2009	Left Turn, Same Roadway	0	0	0	4	1	1	1	102531232	14.76
10	25	2008	Animal	0	0	0	0	2	5	3	102443523	14.96
12	19	2006	Animal	0	0	0	0	1	1	1	101915911	15.06
10	20	2003	Animal	0	0	0	0	1	5	1	101020493	15.1

Table 10.31. US-17 and SR-1318/Mintz Cemetery Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	28	2003	Ran Off Road - Right	0	0	0	0	2	1	3	101027388	8.71
10	11	2006	Sideswipe, Same Direction	0	0	0	0	1	1	1	101853073	8.71
12	12	2007	Movable Object	0	0	0	0	1	5	1	102214563	8.71
6	4	2009	Animal	0	0	0	0	1	5	1	102604445	8.71
6	12	2009	Animal	0	0	0	0	1	5	2	102611439	8.71
8	5	2003	Fixed Object	0	0	1	0	1	1	1	100960259	8.81
8	23	2006	Sideswipe, Same Direction	0	0	0	3	1	1	2	101814544	8.81
1	7	2007	Animal	0	0	0	0	1	5	1	101931660	8.81
4	5	2009	Animal	0	0	0	0	1	5	1	102567601	8.81
7	28	2003	Overturn/Rollover	0	0	1	0	1	5	1	100953630	8.91
7	28	2005	Fixed Object	0	0	0	0	1	1	1	101527245	8.91

Table 10.32. US-17 and SR-1131/Cumbee Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	9	2004	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	3	1	1	1	101304583	18.73
10	24	2005	FIXED OBJECT	0	0	0	0	1	1	1	101590485	18.73
10	6	2003	ANIMAL	0	0	0	0	1	5	1	101008549	18.83
6	24	2004	FIXED OBJECT	0	0	0	1	1	1	1	101218685	18.83
3	22	2005	FIXED OBJECT	0	0	0	1	2	5	2	101438101	18.83
4	6	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101449033	18.83
12	21	2007	ANIMAL	0	0	0	0	1	5	1	102222750	18.83
2	10	2007	FIXED OBJECT	0	0	0	0	1	5	1	101956937	18.93

Table 10.33. US-17 and SR-1136/Red Bug Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	19	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101659275	16.61
7	4	2007	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	5	1	102081129	16.611
9	6	2004	REAR END, TURN	0	0	0	0	2	3	2	101276315	16.625
11	21	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101341657	16.626
1	20	2005	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101390344	16.626
4	4	2008	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102297192	16.628
10	9	2003	LEFT TURN, SAME ROADWAY	0	0	1	2	1	5	1	101011500	16.63
7	30	2004	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	101246065	16.63
11	2	2004	ANGLE	0	0	0	1	1	5	1	101324251	16.63
1	18	2005	REAR END, SLOW OR STOP	0	0	0	0	1	5	1	101388423	16.63
4	22	2005	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	2	1	5	1	101460320	16.63
12	8	2005	ANGLE	0	0	0	0	1	1	2	101628244	16.63
6	9	2006	SIDESWIPE, OPPOSITE DIRECTION	0	0	0	0	1	1	1	101754991	16.63
7	5	2006	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101778146	16.63
10	6	2006	FIXED OBJECT	0	0	0	0	1	5	1	101848018	16.63
10	10	2006	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	3	1	1	1	101852221	16.63
10	4	2007	ANGLE	0	0	0	0	1	1	2	102155613	16.63
11	16	2007	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	1	102193288	16.63
12	3	2007	LEFT TURN, SAME ROADWAY	0	0	0	0	1	5	1	102207600	16.63
12	14	2007	ANGLE	0	0	0	0	1	1	1	102216489	16.63
3	3	2008	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	2	1	1	1	102274513	16.63
3	13	2008	SIDESWIPE, OPPOSITE DIRECTION	0	0	0	0	1	1	1	102282264	16.63
3	2	2009	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102533062	16.63
7	20	2006	REAR END, SLOW OR STOP	0	0	2	0	1	1	1	101788335	16.73
3	20	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	5	1	102558102	16.73
3	20	2009	PARKED MOTOR VEHICLE	0	0	0	0	1	5	1	102558105	16.73
7	21	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102094317	16.76
9	28	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101500828	16.86
4	19	2008	FIXED OBJECT	0	0	0	0	1	5	1	102308561	16.86

Table 10.34. US-74/23 and Hidden Valley Road/SR-1788 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
3	20	2006	Fixed Object	0	0	0	0	3	1	2	101698913	14.38
7	21	1997	Ran Off Road - Right	0	0	0	1	2	2	3	97136752	14.39
1	20	2009	Fixed Object	0	0	0	0	4	5	6	102501823	14.41
9	21	1995	Rear End, Slow or Stop	0	0	0	0	1	1	2	95178083	14.42
12	21	1993	Ran Off Road - Right	0	0	0	0	4	1	1	93211819	14.424
4	14	1996	Ran Off Road - Right	0	0	0	0	1	1	1	96071177	14.44
12	12	1997	Ran Off Road - Left	0	1	0	0	1	5	2	97243311	14.445
3	3	2004	Fixed Object	0	0	0	0	1	5	1	101132370	14.446
1	31	2000	Ran Off Road - Left	0	0	0	1	1	1	1	100021704	14.45
3	31	2004	Fixed Object	0	0	0	0	2	1	2	101153108	14.458
5	29	2003	Fixed Object	0	0	1	0	1	1	2	100908391	14.49
2	21	2000	Movable Object	0	0	0	0	1	1	1	100035343	14.501
11	21	1991	Ran Off Road - Right	0	0	1	0	2	1	3	91167853	14.52
4	14	2005	Ran Off Road - Right	0	0	0	0	1	1	1	101455180	14.52
4	4	2006	Fixed Object	0	1	0	0	1	5	1	101706972	14.52
4	10	1993	Ran Off Road - Right	0	0	0	0	1	1	1	93053818	14.53
10	8	2008	Fixed Object	0	0	0	0	2	1	2	102414688	14.56
8	25	2004	Other Non-Collision	0	0	1	0	1	1	1	101266775	14.59
5	16	2009	Fixed Object	0	0	0	0	2	1	3	102591231	14.62
8	25	2001	Fixed Object	0	0	0	0	2	1	3	100425552	14.64
1	22	1994	Ran Off Road - Right	0	0	1	0	1	1	1	94013626	14.67
9	24	1996	Rear End, Slow or Stop	0	0	0	4	1	1	1	96182041	14.67
5	25	2001	Sideswipe, Same Direction	0	0	0	0	1	1	1	100363618	14.67
4	6	1997	Rear End, Slow or Stop	0	0	1	0	1	1	1	97064067	14.69
8	25	2007	Parked Motor Vehicl	0	0	1	1	1	5	1	102122226	14.71
2	6	2003	Head On	0	0	0	1	5	5	2	100824033	14.72
1	16	2000	Fixed Object	0	0	0	1	4	1	3	100010018	14.81
7	18	2007	Fixed Object	0	0	1	0	1	2	1	102029076	14.81
11	3	2004	Fixed Object	0	0	0	1	2	1	3	101325748	14.82
2	15	1996	Ran Off Road - Right	0	0	0	1	1	1	1	96034400	14.89
7	1	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102352415	14.89

Table 10.34. continued (US-74/23 and Hidden Valley Road/SR-1788 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	15	1991	Ran Off Road - Right	0	0	0	0	1	5	1	91147655	14.94
10	11	1994	Rear End, Slow or Stop	0	0	0	0	1	1	1	94178024	14.94
11	6	1996	Ran Off Road - Right	0	0	2	1	1	1	2	96215055	14.94
12	20	2005	Fixed Object	0	0	1	0	1	5	1	101638849	14.94
9	12	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100990068	14.983
2	27	1998	Rear End, Slow or Stop	0	0	0	0	1	1	1	98038522	14.997
1	13	2006	Fixed Object	0	0	0	1	2	1	2	101655896	15
10	29	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	101028515	15.002
5	27	2004	Rear End, Turn	0	0	0	0	1	5	2	101197367	15.002
3	14	1994	Rear End, Slow or Stop	0	0	0	2	1	1	1	94043848	15.01
6	27	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101506952	15.012
9	7	2002	Sideswipe, Same Direction	0	0	2	0	1	1	1	100704056	15.016
3	7	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101427597	15.019
7	7	2008	Fixed Object	0	0	0	0	1	1	1	102363078	15.019
5	4	2006	Fixed Object	0	0	0	0	1	1	1	101727357	15.02
6	23	2001	Fixed Object	0	0	0	0	1	5	1	100383267	15.026
11	4	2005	Sideswipe, Same Direction	0	0	0	0	1	1	1	101535861	15.035
6	24	1998	Rear End, Turn	0	0	0	1	1	1	1	98118851	15.038
6	20	1991	Left Turn, Same Roadway	0	0	0	0	1	1	2	91084781	15.04
9	20	1991	Left Turn, Same Roadway	0	0	1	0	1	5	1	91133495	15.04
11	25	1991	Angle	0	0	0	0	1	5	1	91170290	15.04
3	6	1992	Angle	0	0	0	0	2	1	2	92031927	15.04
5	19	1992	Angle	0	0	0	0	2	1	3	92071059	15.04
8	10	1992	Angle	0	0	0	0	1	1	1	92115480	15.04
12	23	1992	Angle	0	0	0	2	2	1	3	92198050	15.04
1	28	1993	Angle	0	0	0	0	1	1	1	93013938	15.04
4	28	1993	Rear End, Slow or Stop	0	0	0	0	1	1	1	93064183	15.04
5	7	1993	Left Turn, Different Roadways	0	0	0	1	1	1	1	93069849	15.04
7	14	1993	Rear End, Slow or Stop	0	0	0	1	1	1	1	93107721	15.04
7	27	1993	Left Turn, Same Roadway	0	0	0	0	1	1	1	93115436	15.04
11	16	1993	Angle	0	0	0	1	1	5	2	93186651	15.04
4	4	1994	Angle	0	0	0	1	1	1	1	94056803	15.04

Table 10.34. continued (US-74/23 and Hidden Valley Road/SR-1788 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	16	1994	Angle	0	0	0	0	1	1	1	94064381	15.04
9	11	1994	Left Turn, Different Roadways	0	0	0	1	1	1	1	94158063	15.04
9	30	1994	Angle	0	0	0	4	1	1	1	94170607	15.04
11	24	1994	Angle	0	0	0	1	1	2	1	94211595	15.04
12	12	1994	Ran Off Road - Right	0	0	0	0	1	1	1	94224266	15.04
8	14	1995	Angle	0	0	0	0	1	1	1	95151597	15.04
11	23	1995	Left Turn, Different Roadways	0	0	0	0	1	1	1	95229162	15.04
3	25	1996	Angle	0	0	1	1	1	5	1	96058256	15.04
10	7	1996	Left Turn, Same Roadway	0	0	0	0	1	1	2	96161579	15.04
12	22	1996	Not Available	0	2	0	1				96253310	15.04
1	16	1997	Head On	0	0	0	0	2	1	2	97010260	15.04
4	6	1997	Angle	0	1	2	2	1	1	2	97064065	15.04
4	18	1997	Angle	0	0	0	0	1	1	1	97072295	15.04
6	8	1997	Angle	0	1	1	0	1	1	2	97108580	15.04
7	3	1997	Rear End, Slow or Stop	0	0	0	2	1	1	1	97125497	15.04
9	20	1997	Rear End, Slow or Stop	0	0	1	0	1	1	1	97177565	15.04
12	23	1997	Angle	0	0	0	0	1	1	5	97251770	15.04
1	30	1998	Angle	1	0	0	0	1	1	1	98020126	15.04
3	27	1998	Left Turn, Same Roadway	0	0	0	2	1	1	1	98057336	15.04
6	26	1998	Angle	0	0	0	0	1	1	2	98120311	15.04
10	14	1998	Left Turn, Same Roadway	0	0	0	1	1	1	1	98196396	15.04
11	23	1998	Angle	0	0	2	1	1	1	2	98228354	15.04
11	21	2001	Left Turn, Same Roadway	0	0	0	1	1	1	1	100494125	15.04
7	3	2002	Rear End, Slow or Stop	0	0	0	0	1	1	1	100657105	15.04
1	9	2003	Left Turn, Same Roadway	0	0	0	0	1	2	1	100802477	15.04
5	21	2003	Other Collision With Vehicle	1	1	1	0	1	1	2	100901627	15.04
7	30	2003	Left Turn, Different Roadways	0	0	0	0	1	1	2	100955614	15.04
9	8	2003	Left Turn, Same Roadway	0	0	1	0	1	1	1	100987238	15.04
10	16	2003	Other Collision With Vehicle	0	0	0	0	1	1	1	101017624	15.04
2	26	2004	Left Turn, Same Roadway	0	0	0	0	5	1	4	101127311	15.04
4	15	2004	Left Turn, Different Roadways	0	0	0	2	1	1	1	101164259	15.04
8	2	2004	Head On	0	0	0	3	2	1	3	101248381	15.04

Table 10.34. continued (US-74/23 and Hidden Valley Road/SR-1788 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
12	13	2004	Left Turn, Same Roadway	0	0	0	0	1	1	1	101360718	15.04
3	10	2005	Left Turn, Same Roadway	0	0	0	0	1	5	1	101429676	15.04
4	21	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101459662	15.04
5	19	2006	Right Turn, Different Roadways	0	0	1	0	1	1	2	101735962	15.04
12	10	2006	Left Turn, Same Roadway	0	0	0	5	1	1	1	101909215	15.04
12	18	2006	Left Turn, Same Roadway	0	0	0	0	1	1	1	101915392	15.04
12	28	2006	Right Turn, Different Roadways	0	0	0	1	1	1	1	101922829	15.04
2	20	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	101964603	15.04
2	24	2008	Left Turn, Same Roadway	0	1	1	1	1	1	2	102269781	15.04
5	19	2008	Rear End, Slow or Stop	0	0	0	1	1	1	1	102328318	15.04
6	27	2008	Fixed Object	0	0	0	0	1	5	1	102351537	15.04
8	29	2008	Left Turn, Same Roadway	0	0	0	2	1	1	1	102405733	15.04
12	8	2008	Rear End, Slow or Stop	0	0	0	0	1	1	2	102486228	15.04
4	30	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102587420	15.04
5	11	2009	Left Turn, Same Roadway	0	0	2	0	1	5	2	102591420	15.04
5	28	2009	Rear End, Slow or Stop	0	0	0	0	1	1	2	102599949	15.04
4	22	1992	Left Turn, Different Roadways	0	0	0	0	1	1	1	92056217	15.042
9	18	1997	Ran Off Road - Right	0	0	0	2	1	1	1	97155244	15.046
1	23	2002	Sideswipe, Same Direction	0	0	0	0	2	3	3	100543635	15.07
5	23	2004	Fixed Object	0	0	0	0	2	1	3	101194251	15.08
7	30	2007	Fixed Object	0	0	0	1	2	1	2	102101652	15.097
4	22	1992	Ran Off Road - Left	0	0	0	1	1	1	1	92056216	15.14
2	8	1993	Ran Off Road - Right	0	0	0	0	1	2	1	93019683	15.14
7	31	2003	Overturn/Rollover	0	0	2	0	2	1	2	100956309	15.14
2	18	2007	Fixed Object	0	0	0	0	5	5	2	101965580	15.14
7	14	2009	Sideswipe, Same Direction	0	0	0	0	1	1	1	102642063	15.14
7	26	2007	Ran Off Road - Left	0	0	0	1	1	1	2	102098399	15.145
3	20	2007	Fixed Object	0	0	0	0	1	1	2	101988947	15.159
10	23	2007	Fixed Object	0	0	0	0	2	5	2	102170591	15.16
2	6	2008	Sideswipe, Same Direction	0	0	0	1	1	1	1	102256855	15.18
6	21	2008	Fixed Object	0	0	0	0	3	1	3	102347086	15.185
7	21	1991	Ran Off Road - Right	0	1	1	0	2	1	3	91100908	15.189

Table 10.34. continued (US-74/23 and Hidden Valley Road/SR-1788 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
8	27	1994	Parked Motor Vehicl	0	1	2	0	1	5	1	94148109	15.19
10	12	2000	Other Non-Collision	0	0	0	0	1	5	1	100203569	15.19
4	30	2002	Sideswipe, Same Direction	0	0	0	0	1	1	1	100610967	15.2
11	14	2004	Sideswipe, Same Direction	0	0	0	0	1	1	1	101336143	15.21
5	11	2008	Movable Object	0	0	0	0	1	1	1	102323679	15.21
5	9	2003	Left Turn, Same Roadway	0	0	1	2	1	1	1	100892642	15.217
4	17	1993	Right Turn, Same Roadway	0	0	0	0	1	1	1	93058135	15.22
8	7	1998	Left Turn, Different Roadways	0	0	0	0	1	1	1	98148089	15.22
12	9	2003	Sideswipe, Same Direction	0	0	0	0	1	1	2	101064655	15.22
7	30	2004	Rear End, Turn	0	0	0	1	3	1	3	101246360	15.22
7	6	2006	Left Turn, Different Roadways	0	0	1	1	1	1	1	101779042	15.22
1	29	2009	Angle	0	0	0	0	1	1	1	102525632	15.22
12	22	2005	Fixed Object	0	0	0	0	1	1	1	101640485	15.231
1	4	1998	Left Turn, Same Roadway	0	0	0	2	1	5	1	98001775	15.25
1	16	1998	Ran Off Road - Right	0	0	0	1	2	1	3	98010174	15.26
11	19	1994	Pedestrian	0	1	0	0	1	5	1	94107780	15.264
11	6	1993	Fixed Object	0	0	0	1	1	5	2	93180205	15.29
11	11	2002	Jackknife	0	0	0	0	2	5	3	100755901	15.29
10	15	1994	Ran Off Road - Right	0	0	1	3	1	1	1	94181788	15.31
2	28	1994	Angle	0	2	0	0	1	1	1	94035272	15.32
12	7	2000	Fixed Object	0	0	0	1	1	1	1	100247666	15.32
11	12	2003	Sideswipe, Same Direction	0	2	0	0	1	1	1	101042288	15.32
12	2	2006	Fixed Object	0	0	0	1	1	1	1	101902218	15.33
8	9	1998	Ran Off Road - Right	0	0	0	0	2	1	3	98149688	15.34
11	18	2003	Fixed Object	0	0	0	0	3	5	3	101046267	15.38
10	26	1991	Ran Off Road - Right	0	0	0	0	1	5	2	91153780	15.4
8	16	1994	Ran Off Road - Right	0	0	1	0	2	1	3	94140836	15.4
7	28	2000	Fixed Object	0	0	0	0	1	1	1	100148052	15.4
5	8	2002	Overturn/Rollover	0	0	0	1	1	1	1	100616722	15.4
8	20	2000	Sideswipe, Same Direction	0	0	0	0	3	1	3	100164497	15.42
12	12	2003	Fixed Object	0	0	0	1	1	1	1	101067381	15.42
3	22	2004	Fixed Object	0	0	0	0	1	1	1	101146693	15.42

Table 10.34. continued (US-74/23 and Hidden Valley Road/SR-1788 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	12	2007	Fixed Object	2	0	0	0	1	5	2	102136370	15.44
11	9	2007	Other Non-Collision	0	0	0	0	1	1	1	102187304	15.45
6	1	2001	Fixed Object	0	0	0	2	2	5	3	100368516	15.47
12	25	2004	Overturn/Rollover	0	0	0	1	1	1	2	101371588	15.47
12	16	1995	Animal	0	0	1	0	1	5	1	95247124	15.5
9	2	1993	Sideswipe, Same Direction	0	0	0	0	2	1	3	93137000	15.54
7	30	2004	Fixed Object	0	0	0	0	2	1	2	101246341	15.54
7	18	1994	Sideswipe, Same Direction	0	0	0	0	2	1	3	94124380	15.57
3	7	2001	Overturn/Rollover	0	1	0	1	1	5	1	100308898	15.66
12	8	1997	Angle	0	0	0	0	5	5	4	97239814	15.732
2	27	2009	Fixed Object	0	0	0	0	2	1	3	102535455	15.761
1	8	2003	Left Turn, Different Roadways	0	0	0	0	1	5	1	100801933	15.766
12	17	1991	Left Turn, Same Roadway	0	0	0	1	1	1	2	91182352	15.77
6	17	1998	Left Turn, Same Roadway	0	0	2	1	1	1	1	98114070	15.77
5	31	2001	Left Turn, Different Roadways	0	1	1	0	1	1	1	100367545	15.77
3	9	2003	Right Turn, Different Roadways	0	0	2	0	1	1	1	100846645	15.77
9	6	2005	Left Turn, Same Roadway	0	0	0	1	1	1	1	101556585	15.77
6	13	2001	Overturn/Rollover	0	0	0	1	1	1	1	100373273	15.82
4	8	2003	Fixed Object	0	0	0	1	2	1	3	100868300	15.87
7	18	2004	Fixed Object	0	0	0	1	1	1	1	101237398	15.87
9	15	2005	Fixed Object	0	0	0	0	1	1	1	101562249	15.87
11	17	2005	Fixed Object	0	1	0	0	1	5	1	101610860	15.87
9	15	2007	Overturn/Rollover	0	0	0	1	1	1	1	102140725	15.88
8	25	2008	Overturn/Rollover	0	0	0	0	3	1	3	102393973	15.89
11	3	1992	Angle	0	0	0	0	1	5	1	92165827	15.9
5	4	1998	Ran Off Road - Right	0	0	0	0	1	1	2	98083958	15.95
1	19	1994	Ran Off Road - Right	0	1	0	0	1	1	1	94011511	15.97
9	12	2003	Fixed Object	0	0	0	1	1	5	1	100995449	15.97
8	11	2007	Fixed Object	0	0	0	1	1	3	1	102110892	15.97
12	25	2002	Parked Motor Vehicl	0	0	0	0	5	1	4	100793205	15.98
8	31	2001	Jackknife	0	0	0	0	2	1	2	100429946	16.02
10	24	1997	Ran Off Road - Right	0	0	0	0	2	1	3	97202277	16.05

Table 10.34. continued (US-74/23 and Hidden Valley Road/SR-1788 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	29	2007	Fixed Object	0	0	0	1	1	1	1	102025510	16.05
10	2	2005	Fixed Object	0	0	0	0	1	1	1	101574051	16.07
11	25	2008	Fixed Object	0	0	0	0	1	1	1	102456707	16.07
3	14	2009	Fixed Object	0	0	0	0	2	1	2	102553188	16.07
7	8	2009	Movable Object	0	0	0	0	1	1	2	102638230	16.07

Table 10.35. US-74/23 and Mineral Springs Road/SR-1456 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	14	2000	Rear End, Slow or Stop	0	0	0	1	1	1	1	100229925	16.14
3	30	2004	Fixed Object	0	0	0	0	3	1	3	101152377	16.17
1	6	2005	Fixed Object	0	0	1	0	1	5	2	101380060	16.17
7	5	2005	Angle	0	0	0	0	3	1	2	101512675	16.17
6	10	1998	Sideswipe, Same Direction	0	0	0	0	2	1	3	98109571	16.19
12	29	1997	Parked Motor Vehicl	0	0	0	1	5	5	4	97256359	16.2
5	6	1996	Ran Off Road - Right	0	0	0	0	2	1	3	96085901	16.24
6	27	2002	Fixed Object	0	0	0	0	2	1	3	100652005	16.25
12	4	2004	Head On	0	3	0	0	1	1	1	101352856	16.25
9	14	1998	Ran Off Road - Right	0	0	0	0	1	1	1	98175127	16.26
12	12	1996	Rear End, Slow or Stop	0	0	0	0	2	2	3	96244682	16.28
4	14	1996	Ran Off Road - Right	0	0	0	0	1	5	2	96071178	16.3
5	2	1997	Ran Off Road - Right	0	0	0	0	1	1	1	97082705	16.3
8	27	1997	Ran Off Road - Left	0	0	0	0	2	1	3	97161721	16.3
8	21	2003	Fixed Object	0	0	0	0	3	1	3	100973349	16.3
6	1	2008	Fixed Object	0	0	0	0	2	1	2	102336493	16.359
2	17	2001	Fixed Object	0	0	0	1	2	5	3	100297196	16.37
1	16	2003	Rear End, Slow or Stop	0	0	1	1	5	1	2	100822655	16.37
9	18	1996	Sideswipe, Same Direction	0	0	0	0	1	3	5	96177742	16.39
6	19	1998	Ran Off Road - Right	0	0	0	0	2	1	3	98115236	16.4
9	8	1998	Ran Off Road - Right	0	0	0	1	2	1	3	98170732	16.4
5	8	2007	Fixed Object	0	0	0	0	1	5	1	102033619	16.4
7	20	2009	Fixed Object	0	0	0	0	2	2	3	102637795	16.4
7	28	1997	Ran Off Road - Right	0	0	0	1	2	1	3	97141557	16.41
11	18	2003	Fixed Object	0	0	0	0	2	1	2	101046256	16.41
9	16	2004	Fixed Object	0	0	0	1	2	1	2	101284962	16.44
3	14	2008	Overturn/Rollover	0	0	0	0	2	1	2	102283008	16.45
6	13	1997	Ran Off Road - Right	0	0	0	0	2	1	3	97111830	16.47
6	13	1997	Ran Off Road - Right	0	0	0	0	2	1	3	97111829	16.47
1	16	2003	Angle	0	0	0	0	5	1	2	100807296	16.47
1	17	2004	Fixed Object	0	0	1	0	1	5	2	101095080	16.47

Table 10.35. continued (US-74/23 and Mineral Springs Road/SR-1456 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
12	9	2004	Jackknife	0	0	0	0	3	1	2	101315573	16.47
5	28	2009	Fixed Object	0	0	0	1	2	1	2	102600833	16.47
10	24	1997	Ran Off Road - Right	0	0	0	0	2	1	3	97202278	16.49
1	10	1997	Sideswipe, Same Direction	0	0	0	0	5	5	4	97005804	16.5
3	24	1997	Ran Off Road - Left	0	0	0	0	1	1	1	97055394	16.5
2	17	1998	Ran Off Road - Left	0	0	0	1	2	3	3	98032011	16.5
3	20	1998	Ran Off Road - Left	0	0	0	1	2	1	3	98052961	16.5
5	27	1998	Ran Off Road - Right	0	0	0	1	2	1	2	98099340	16.5
12	29	2001	Overturn/Rollover	0	0	1	0	1	1	1	100524950	16.5
6	14	2003	Fixed Object	0	0	1	0	2	1	3	100921275	16.5
11	18	2003	Jackknife	0	0	0	0	2	1	2	101046242	16.5
5	8	2004	Jackknife	0	0	0	0	1	5	1	101183132	16.5
8	12	2004	Fixed Object	1	5	2	0	2	1	3	101256203	16.5
6	12	2005	Fixed Object	0	0	0	1	2	1	3	101496501	16.5
1	11	2006	si	0	0	0	1	2	1	3	101653839	16.5
8	31	2006	Movable Object	0	0	0	0	2	1	3	101820649	16.5
7	13	2008	Fixed Object	0	0	0	0	2	5	3	102349318	16.5
6	11	2006	Fixed Object	0	0	1	0	3	1	3	101757984	16.51
12	28	2007	Fixed Object	0	0	0	0	2	1	2	102227677	16.51
12	28	1998	Ran Off Road - Right	0	0	0	1	2	1	3	98255889	16.52
12	12	2006	Fixed Object	0	0	1	0	1	5	1	101910601	16.52
7	10	1995	Ran Off Road - Right	0	0	0	0	2	1	3	95128136	16.53
10	15	2002	Fixed Object	0	0	0	2	3	5	3	100733200	16.6
11	15	2006	Fixed Object	0	0	0	0	3	1	3	101887309	16.6
4	18	2004	Sideswipe, Same Direction	0	0	0	0	1	1	1	101166823	16.672
2	26	2002	Fixed Object	0	0	2	0	2	1	2	100566477	16.689
8	17	2002	Left Turn, Different Roadways	0	0	0	0	1	1	2	100688205	16.691
4	2	2001	Rear End, Slow or Stop	0	0	0	0	1	1	1	100327444	16.7
8	3	2001	Angle	0	0	0	5	1	3	2	100410508	16.7
10	22	2002	Rear End, Slow or Stop	0	0	1	0	1	1	1	100738530	16.7
5	14	2005	Rear End, Slow or Stop	0	0	1	0	2	1	2	101476304	16.7
12	22	2006	Fixed Object	0	0	0	0	2	1	3	101918603	16.7

Table 10.35. continued (US-74/23 and Mineral Springs Road/SR-1456 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	11	2007	Fixed Object	0	0	0	1	2	5	2	102007809	16.7
3	4	2008	Fixed Object	0	0	0	0	2	1	2	102275644	16.7
8	26	2008	Fixed Object	0	0	0	0	3	3	3	102393963	16.7
6	25	2004	Fixed Object	0	0	0	0	2	1	2	101220202	16.709
9	13	1998	Ran Off Road - Right	0	0	2	0	1	3	1	98174504	16.78
8	18	1996	Ran Off Road - Right	0	0	1	0	1	1	1	96155226	16.8
3	30	2001	Fixed Object	0	0	1	0	1	1	1	100325399	16.8
1	29	2005	Fixed Object	0	0	0	0	5	1	2	101397956	16.8
5	20	2005	Overturn/Rollover	0	0	0	0	2	1	2	101480623	16.8
5	26	2005	Fixed Object	0	0	0	0	1	5	1	101484268	16.8
3	20	2007	Fixed Object	0	0	1	0	1	1	2	101988959	16.8
9	2	2007	Fixed Object	0	0	0	0	1	1	1	102127525	16.8
11	9	2000	Fixed Object	0	0	0	0	2	1	2	100225647	16.81
5	8	2002	Fixed Object	0	0	0	1	1	1	1	100616730	16.81
12	9	1997	Ran Off Road - Right	0	0	0	0	5	5	3	97240758	16.82
4	29	1997	Ran Off Road - Right	0	1	0	0	1	1	1	97080515	16.85
4	29	1997	Rear End, Slow or Stop	0	0	0	1	1	1	1	97080514	16.87
11	23	2003	Rear End, Slow or Stop	0	0	0	1	1	1	1	101051034	16.87
5	15	1996	Ran Off Road - Left	0	0	1	0	2	5	3	96091820	16.9
12	23	1998	Ran Off Road - Right	0	0	0	0	2	1	3	98252429	16.9
8	17	2007	Sideswipe, Same Direction	0	0	0	0	1	1	1	102115507	16.9
4	13	2004	Rear End, Turn	0	0	0	0	1	1	2	101162575	16.961
12	12	2005	Right Turn, Different Roadways	0	0	0	0	1	5	2	101631464	16.97
1	19	2009	Fixed Object	0	0	0	0	5	5	4	102518607	16.97
4	1	2009	Head On	0	0	0	0	1	1	1	102561362	16.97
11	21	2003	Rear End, Turn	0	0	0	0	1	1	1	101049373	16.979
10	26	2005	Rear End, Slow or Stop	0	0	0	0	1	5	1	101592465	16.989
11	24	2003	Rear End, Slow or Stop	0	0	0	0	2	5	3	101051984	17.22
1	3	2005	Rear End, Slow or Stop	0	0	0	0	1	1	2	101648357	17.22
11	21	2005	Rear End, Slow or Stop	0	0	0	0	2	1	2	101615004	17.22
9	10	2007	Fixed Object	0	0	1	0	1	1	1	102135069	17.257
11	4	2007	Left Turn, Different Roadways	0	0	0	0	1	1	1	102182988	17.311

Table 10.35. continued (US-74/23 and Mineral Springs Road/SR-1456 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	9	2009	Animal	0	0	0	0	1	5	1	102513620	17.311
7	4	1997	Left Turn, Same Roadway	0	0	0	3	1	1	1	97126189	17.32
9	24	1997	Angle	0	0	0	0	2	1	3	97180178	17.32
4	4	2009	Sideswipe, Same Direction	0	0	0	1	1	1	1	102568906	17.32
6	12	2003	Rear End, Slow or Stop	0	0	0	1	1	1	2	100919712	17.42
10	18	2003	Movable Object	0	0	0	0	1	1	1	101019491	17.42
1	2	2009	Fixed Object	0	0	1	0	5	5	4	102506859	17.54
7	11	2002	Fixed Object	0	0	0	0	2	1	2	100661594	17.6
4	24	2009	Other Non-Collision	0	0	1	0	1	1	1	102582673	17.635
7	9	2002	Left Turn, Same Roadway	0	0	2	0	1	1	1	100660230	17.72
10	25	2002	Left Turn, Same Roadway	0	0	0	1	2	1	3	100740637	17.73
10	24	2006	Fixed Object	0	0	0	0	1	1	1	101865266	17.73
2	26	2007	Right Turn, Same Roadway	0	0	0	0	1	1	1	101972551	17.73
11	22	2008	Left Turn, Same Roadway	0	0	0	1	1	4	1	102526955	17.73
12	31	2002	Fixed Object	0	0	0	0	3	5	2	100796807	17.77
8	13	2005	Fixed Object	0	0	0	0	2	1	2	101539816	17.81

Table 10.36. US-23/441 and Mockingbird Lane/Macktown Gap Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	31	2002	Overturn/Rollover	0	0	0	0	1	2	1	100746401	9.3
6	24	2003	Fixed Object	0	0	0	0	1	1	1	100928702	9.35
7	6	2003	Sideswipe, Same Direction	0	0	0	0	1	1	2	100937643	9.35
8	29	2003	Angle	0	0	0	1	1	1	1	100979503	9.4
10	6	2006	Left Turn, Different Roadways	0	0	0	0	1	1	1	101848110	9.4
3	3	2007	Overturn/Rollover	0	0	0	2	1	1	1	101975149	9.4
9	26	2002	Left Turn, Different Roadways	0	0	0	0	1	1	1	100718268	9.5
10	24	2002	Left Turn, Different Roadways	0	0	0	0	1	1	2	100740227	9.5
10	10	2003	Left Turn, Same Roadway	0	0	0	0	1	1	2	101012816	9.5
2	15	2004	Backing Up	0	0	0	0	2	1	2	101119004	9.5
6	21	2004	Right Turn, Different Roadways	0	0	0	0	2	1	2	101216727	9.5
2	12	2005	Right Turn, Same Roadway	0	0	0	0	1	1	1	101408639	9.5
6	14	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102065586	9.5
4	11	2004	Rear End, Slow or Stop	0	0	0	1	1	1	2	101161067	9.613
5	9	2003	Rear End, Turn	0	0	0	1	1	1	1	100892480	9.614
9	14	2002	Rear End, Slow or Stop	0	0	0	1	2	1	2	100709262	9.615
5	9	2006	Other Non-Collision	0	0	0	0	1	1	1	101720438	9.616
3	7	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101690343	9.618
9	5	2002	Rear End, Slow or Stop	0	0	0	0	1	1	1	100702549	9.62
10	7	2002	Left Turn, Same Roadway	0	0	0	0	1	1	1	100726472	9.62
12	30	2002	Angle	0	1	1	0	1	4	1	100796128	9.62
7	14	2003	Angle	0	0	1	0	1	1	2	100943641	9.62
8	8	2003	Left Turn, Same Roadway	0	0	0	0	2	1	3	100962972	9.62
9	9	2003	Left Turn, Same Roadway	0	0	2	1	1	1	2	100987873	9.62
11	17	2003	Fixed Object	0	0	0	1	2	4	2	101045342	9.62
5	8	2004	Left Turn, Same Roadway	0	0	0	0	2	5	3	101183133	9.62
5	9	2004	Rear End, Turn	0	0	0	0	1	1	2	101183732	9.62
5	11	2004	Rear End, Slow or Stop	0	0	0	1	2	1	3	101185319	9.62
9	8	2004	Right Turn, Same Roadway	0	0	0	0	1	5	1	101278716	9.62
1	13	2005	Left Turn, Same Roadway	0	0	0	1	2	3	2	101384999	9.62
3	23	2005	Rear End, Turn	0	0	0	0	1	1	1	101440229	9.62

Table 10.36. continued (US-23/441 and Mockingbird Lane/Macktown Gap Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
5	13	2005	Left Turn, Same Roadway	0	0	0	0	1	1	1	101475390	9.62
6	26	2005	Left Turn, Same Roadway	0	0	0	0	1	1	1	101506187	9.62
7	19	2005	Left Turn, Same Roadway	0	0	1	0	1	4	2	101522083	9.62
7	30	2005	Left Turn, Same Roadway	0	0	0	0	1	1	1	101529145	9.62
9	10	2005	Left Turn, Same Roadway	0	0	0	0	1	1	1	101559367	9.62
11	10	2005	Angle	0	0	1	2	1	1	1	101605645	9.62
11	23	2005	Left Turn, Same Roadway	0	0	0	0	1	4	1	101616958	9.62
7	28	2006	Movable Object	0	0	0	0	1	1	1	101795455	9.62
7	29	2006	Backing Up	0	0	0	1	1	5	1	101795805	9.62
10	21	2006	Left Turn, Same Roadway	0	0	1	2	1	1	1	101862572	9.62
11	15	2006	Left Turn, Same Roadway	0	0	0	1	2	4	2	101867233	9.62
4	14	2009	Rear End, Slow or Stop	0	0	0	0	2	1	3	102578040	9.62
7	16	2009	Angle	0	0	0	1	1	1	1	102642069	9.62
9	14	2002	Fixed Object	0	0	0	0	2	1	3	100709255	9.623
12	22	2005	Rear End, Slow or Stop	0	0	0	2	1	1	1	101640493	9.626
10	20	2002	Rear End, Slow or Stop	0	0	0	0	3	1	2	100737324	9.627
12	23	2002	Fixed Object	0	0	0	0	2	4	2	101077701	9.628
3	27	2006	Sideswipe, Same Direction	0	0	0	0	1	1	1	101694721	9.634
8	2	2006	Sideswipe, Same Direction	0	0	0	0	1	1	1	101798458	9.639
9	17	2002	Jackknife	0	0	0	0	2	1	2	100711885	9.644
7	9	2004	Fixed Object	0	0	0	0	2	2	3	101230710	9.667
5	28	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101198121	9.677
4	4	2003	Fixed Object	0	0	0	0	1	5	3	100865038	9.72
9	9	2003	Other Collision With Vehicle	0	0	0	0	1	1	1	100987872	9.72
6	8	2004	Fixed Object	0	0	0	0	2	1	2	101206839	9.72
1	4	2009	Rear End, Slow or Stop	0	0	0	1	1	5	1	102498299	9.72

Table 10.37. US-23/74 and SR-1156/Timberlake Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	10	2003	Fixed Object	0	0	0	1	2	5	3	100940638	23.002
1	15	2005	Left Turn, Different Roadways	0	0	1	0	1	2	2	101386904	23.01
2	9	2005	Angle	1	0	0	2	2	1	2	101406420	23.01
10	7	2005	Fixed Object	0	0	0	0	2	2	3	101578790	23.01
11	12	2005	Left Turn, Different Roadways	0	0	0	1	1	1	1	101607095	23.01
5	21	2006	Angle	0	0	0	0	2	1	1	101737148	23.01
6	11	2007	Fixed Object	0	0	0	0	1	5	1	102063610	23.01
10	28	2002	Fixed Object	0	0	0	0	3	1	2	100743564	23.12
5	21	2007	Fixed Object	0	0	0	0	1	1	1	102044156	23.12
12	2	2002	Movable Object	0	0	0	0	1	1	1	100772891	23.15
11	29	2003	Fixed Object	0	0	0	0	5	1	2	101056039	23.21
4	2	2005	Fixed Object	0	0	0	1	5	1	2	101446552	23.21
11	11	2004	Rear End, Slow or Stop	0	0	0	1	2	1	3	101332326	23.25
8	19	2005	Sideswipe, Same Direction	0	0	0	0	1	5	1	101544104	23.25
12	18	2003	Fixed Object	0	0	0	0	6	2	4	101073654	23.348
11	24	2002	Left Turn, Same Roadway	0	0	1	2	1	1	1	100767343	23.41
2	7	2003	Left Turn, Same Roadway	0	0	3	0	5	1	2	100826329	23.41
4	2	2005	Fixed Object	0	0	0	0	5	1	2	101446560	23.41
7	21	2005	Angle	0	0	0	0	2	1	2	101522993	23.41
4	29	2006	Other Non-Collision	0	0	0	0	1	1	2	101724058	23.41
6	18	2007	Fixed Object	0	0	0	1	1	1	1	102068469	23.42
12	4	2003	Sideswipe, Opposite Direction	0	0	0	0	6	1	4	101059898	23.45
9	25	2006	Rear End, Slow or Stop	0	0	0	0	1	1	1	101840145	23.45
5	23	2007	Fixed Object	0	0	0	0	1	1	1	101997361	23.45
11	29	2003	Fixed Object	0	0	0	1	4	1	2	101056034	23.51
11	29	2003	Parked Motor Vehicl	0	1	1	0	5	1	2	101056048	23.51
1	15	2005	Rear End, Slow or Stop	0	0	0	0	1	5	1	101386897	23.52
1	18	2005	Fixed Object	0	0	0	0	1	1	2	101388603	23.61
1	17	2009	Ran Off Road - Right	0	0	0	0	4	5	6	102497697	23.62
3	1	2009	Fixed Object	0	0	0	0	5	1	4	102546617	23.65
10	15	2002	Backing Up	0	0	0	0	2	1	3	100733168	23.72

Table 10.38. US-74/441 and Bradley Branch Road/SR-1404 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	20	2003	Overturn/Rollover	0	1	1	0	1	1	1	100996313	5.03
5	9	2003	Rear End, Slow or Stop	0	0	0	1	1	1	1	100892486	5.13
5	19	2004	Rear End, Turn	0	0	0	0	1	1	1	101190919	5.13
7	17	2006	Fixed Object	0	0	0	0	1	5	1	101786761	5.13
1	23	2003	Fixed Object	0	0	0	1	5	1	4	100813083	5.21
1	23	2003	Fixed Object	0	0	0	0	5	1	4	100813081	5.23
1	23	2003	Fixed Object	0	0	0	0	5	1	4	100813085	5.23
4	29	2003	Fixed Object	0	0	0	0	2	1	2	100884240	5.23
9	20	2003	Rear End, Turn	0	0	0	0	1	1	1	100996319	5.23
4	11	2004	Sideswipe, Same Direction	0	0	0	0	2	1	3	101161074	5.23
4	3	2006	Fixed Object	0	0	0	0	3	1	3	101706453	5.23
10	1	2006	Overturn/Rollover	0	0	0	0	1	5	1	101844946	5.23
10	8	2005	Overturn/Rollover	0	0	1	0	1	1	1	101579929	5.273
7	15	2005	Fixed Object	0	0	0	0	1	2	2	101519398	5.3
5	22	2005	Left Turn, Same Roadway	0	0	3	0	1	1	1	101481711	5.33

Table 10.39. US-74/441 and Wilmont Cemetery Road/SR-1534 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	27	2002	Fixed Object	0	0	0	0	2	4	2	100742652	3.86
4	16	2006	Rear End, Slow or Stop	0	0	0	4	1	5	1	100874775	3.901
6	3	2004	Rear End, Slow or Stop	0	0	0	0	1	1	2	101202707	3.902
5	15	2003	Left Turn, Different Roadways	0	0	0	1	1	1	1	100897127	3.94
7	5	2003	Rear End, Slow or Stop	0	0	0	2	2	1	1	100937172	3.94
7	27	2003	Left Turn, Same Roadway	0	0	2	0	1	1	1	100953821	3.94
9	21	2003	Left Turn, Different Roadways	0	0	0	0	1	1	2	100996949	3.94
1	3	2005	Left Turn, Same Roadway	0	0	0	3	1	1	1	101380488	3.94
1	19	2005	Left Turn, Different Roadways	0	0	0	2	1	1	2	101389555	3.94
4	9	2005	Fixed Object	0	0	0	0	1	5	1	101451706	3.94
4	23	2005	Backing Up	0	0	0	0	1	1	1	101461197	3.94
4	28	2005	Right Turn, Same Roadway	0	0	0	0	2	1	3	101464671	3.94
6	22	2005	Fixed Object	0	0	1	0	1	1	2	101503616	3.94
3	9	2006	Rear End, Slow or Stop	0	0	0	1	2	5	2	101691479	3.94
7	27	2006	Overturn/Rollover	0	0	0	1	1	1	1	101793786	3.94
3	5	2007	Ran Off Road - Right	0	0	0	1	1	1	1	101977072	3.94
1	2	2009	Angle	0	0	0	2	4	1	3	102506900	3.94
6	4	2009	Right Turn, Different Roadways	0	0	0	1	1	1	2	102617822	3.94
5	20	2006	Sideswipe, Same Direction	0	0	0	0	1	1	2	101736750	3.949
10	27	2006	Rear End, Slow or Stop	0	0	0	1	2	1	3	101868544	3.978
6	25	2007	Left Turn, Same Roadway	0	0	0	0	1	1	1	102073578	4.016
8	22	2003	Fixed Object	0	0	0	2	3	1	3	100974237	4.04
8	22	2003	Rear End, Slow or Stop	0	0	0	0	1	1	2	100974238	4.19
9	23	2002	Overturn/Rollover	0	2	0	0	1	1	2	100715888	4.24
4	6	2003	Fixed Object	0	0	0	1	2	1	3	100866675	4.24
4	17	2009	Fixed Object	0	0	0	0	1	1	1	102578035	4.33

Table 10.40. US-23/74 and Blanton Branch Road/SR-1709 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	18	2004	Sideswipe, Same Direction	0	0	0	0	1	1	1	101166823	16.672
5	14	2005	Rear End, Slow or Stop	0	0	1	0	2	1	2	101476304	16.7
12	22	2006	Fixed Object	0	0	0	0	2	1	3	101918603	16.7
4	11	2007	Fixed Object	0	0	0	1	2	5	2	102007809	16.7
6	25	2004	Fixed Object	0	0	0	0	2	1	2	101220202	16.709
1	29	2005	Fixed Object	0	0	0	0	5	1	2	101397956	16.8
5	20	2005	Overturn/Rollover	0	0	0	0	2	1	2	101480623	16.8
5	26	2005	Fixed Object	0	0	0	0	1	5	1	101484268	16.8
3	20	2007	Fixed Object	0	0	1	0	1	1	2	101988959	16.8
11	23	2003	Rear End, Slow or Stop	0	0	0	1	1	1	1	101051034	16.87
4	13	2004	Rear End, Turn	0	0	0	0	1	1	2	101162575	16.961
12	12	2005	Right Turn, Different Roadways	0	0	0	0	1	5	2	101631464	16.97
1	19	2009	Fixed Object	0	0	0	0	5	5	4	102518607	16.97
4	1	2009	Head On	0	0	0	0	1	1	1	102561362	16.97
11	21	2003	Rear End, Turn	0	0	0	0	1	1	1	101049373	16.979
10	26	2005	Rear End, Slow or Stop	0	0	0	0	1	5	1	101592465	16.989

Table 10.41. US-74 and Murdock Street/Church Street Crash Data

Month	Day	Year	Crash Type	F	A	B	C	R	L	W	Crash ID	MP
10	31	2006	ANIMAL	0	0	0	0	1	5	2	101873260	5.66
2	12	2003	REAR END, SLOW OR STOP	0	0	1	0	1	5	2	100828505	5.681
9	29	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101844002	5.685
6	24	2009	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102632744	5.686
6	9	2005	REAR END, SLOW OR STOP	0	0	0	4	1	1	1	101494422	5.695
8	9	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101536903	5.695
6	25	2006	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101768876	5.695
8	31	2007	REAR END, SLOW OR STOP	0	0	1	0	1	1	1	102126644	5.696
2	19	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100834603	5.7
4	19	2003	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100877390	5.7
5	1	2004	ANGLE	0	0	0	2	1	1	2	101177134	5.7
6	16	2004	PEDALCYCLIST	0	0	0	1	1	1	1	101212945	5.7
7	11	2004	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101232431	5.7
8	15	2004	ANGLE	0	0	0	2	2	1	3	101259486	5.7
9	3	2004	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	2	101274239	5.7
6	3	2005	ANGLE	0	0	0	0	1	1	2	101490511	5.7
8	30	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101552219	5.7
2	11	2006	REAR END, SLOW OR STOP	0	0	1	1	2	1	2	101675399	5.7
5	26	2006	ANGLE	0	0	1	1	1	1	1	101739805	5.7
8	23	2006	ANGLE	0	0	1	0	1	1	2	101799763	5.7
10	24	2006	ANGLE	0	0	0	0	1	1	1	101865555	5.7
11	17	2006	ANGLE	0	0	0	2	1	1	1	101890398	5.7
3	7	2007	ANGLE	0	0	1	0	1	1	1	101978403	5.7
5	8	2007	ANGLE	0	0	1	1	1	1	2	102033758	5.7
9	16	2007	ANGLE	0	0	1	2	1	1	1	102141522	5.7
9	19	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102075402	5.7
10	1	2007	BACKING UP	0	0	0	0	1	1	1	102153626	5.7
10	13	2007	REAR END, SLOW OR STOP	0	0	0	3	1	4	1	102163386	5.7
8	7	2008	REAR END, SLOW OR STOP	0	0	0	1	2	1	2	102365398	5.7
8	14	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102393939	5.7
8	21	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102391346	5.7

Table 10.41. continued (US-74 and Murdock Street/Church Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	9	2004	REAR END, SLOW OR STOP	0	0	0	1	3	1	2	101089702	5.705
7	1	2006	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101773978	5.708
3	28	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	101994976	5.709
10	23	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102427265	5.715
8	30	2007	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	102125211	5.724
7	23	2008	REAR END, SLOW OR STOP	0	0	0	1	2	1	3	102353917	5.8
8	12	2004	FIXED OBJECT	0	0	0	1	2	5	2	101257078	5.83
4	24	2006	REAR END, SLOW OR STOP	0	0	0	3	3	1	3	101723207	5.83
10	26	2005	ANGLE	0	0	0	0	1	1	1	101592584	5.921
8	28	2004	BACKING UP	0	0	0	0	1	1	1	101269510	5.93
9	10	2004	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101280521	5.93
11	27	2004	REAR END, SLOW OR STOP	0	0	0	4	2	5	2	101324210	5.93
11	28	2004	LEFT TURN, SAME ROADWAY	0	0	0	2	1	5	1	101348085	5.93
11	29	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101348871	5.93
4	13	2005	ANGLE	0	0	0	0	2	1	3	101454527	5.93
5	17	2005	BACKING UP	0	0	0	0	1	1	1	101478431	5.93
6	2	2005	ANGLE	0	0	1	1	1	1	2	101489868	5.93
6	17	2005	ANGLE	0	1	0	2	1	1	1	101500550	5.93
10	1	2005	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	101573779	5.93
11	23	2005	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	4	1	101617100	5.93
6	15	2006	ANGLE	0	2	0	1	1	1	1	101763436	5.93
8	30	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	3	1	101819844	5.93
10	27	2006	ANGLE	0	0	1	1	2	1	3	101868809	5.93
12	21	2006	ANGLE	0	0	0	0	1	1	1	101918001	5.93
12	28	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101923690	5.93
7	13	2007	PEDESTRIAN	0	0	0	1	1	5	1	102088045	5.93
8	1	2007	LEFT TURN, SAME ROADWAY	0	1	0	2	1	1	1	102103171	5.93
10	1	2007	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	4	1	1	1	102153618	5.93
7	2	2008	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	1	1	2	102359302	5.93
11	6	2008	ANGLE	0	0	0	1	1	1	1	102481354	5.93
12	16	2008	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	2	102473429	5.93
1	17	2009	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	3	1	5	1	102518094	5.93

Table 10.41. continued (US-74 and Murdock Street/Church Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	7	2003	REAR END, TURN	0	0	0	0	1	1	2	101009422	5.968
5	6	2004	ANGLE	0	0	0	0	1	1	1	101181460	6.03
8	3	2005	OTHER NON-COLLISION	0	0	1	0	1	1	1	101458835	6.03
3	16	2009	REAR END, SLOW OR STOP	0	0	0	0	1	5	2	102558716	6.03

Table 10.42. US-401 and Orlando Street Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	21	2005	ANGLE	0	0	0	1	2	5	3	101566602	9.18
2	2	2003	REAR END, SLOW OR STOP	0	0	0	3	1	6	1	100820886	9.338
11	6	2004	ANGLE	0	0	1	1	1	1	1	101329003	9.34
3	8	2006	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	1	1	1	1	101690964	9.34
5	10	2006	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	2	1	1	1	101730894	9.34
12	23	2003	ANGLE	0	1	1	3	1	1	1	101077873	9.363

Table 10.43. NC-214 and Spearman Road/SR-1806 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	7	2004	Other Collision With Vehicle	0	0	0	0	1	5	1	101324200	16.97
6	9	2009	Left Turn, Different Roadways	0	0	0	1	1	1	5	102608171	17.132
8	9	2002	Rear End, Slow or Stop	0	0	0	2	1	1	1	100682001	17.14
6	17	2008	Rear End, Slow or Stop	0	0	3	0	1	1	1	102348995	17.14
4	1	2009	Angle	0	0	0	2	2	1	3	102561147	17.14
2	4	2004	Rear End, Slow or Stop	0	0	1	1	1	1	1	101109841	17.21

Table 10.44. NC-214 and 9th Street Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	5	2001	Left Turn, Same Roadway	0	0	1	2	1	4	1	100480732	14.97
5	31	2009	Left Turn, Different Roadways	0	1	0	0	1	1	2	102601758	14.97
3	31	2003	Pedestrian	0	0	1	0	1	4	1	100861884	15.31
8	17	2007	Left Turn, Same Roadway	0	0	1	0	1	1	1	102115367	15.32
3	11	2006	Left Turn, Same Roadway	0	0	0	0	1	1	1	101692783	15.37
9	13	2008	Animal	0	0	0	0	1	3	1	102392303	15.37
2	11	2009	Animal	0	0	0	0	1	4	1	102533835	15.37
12	9	2008	Animal	0	0	0	0	1	5	1	102485418	15.413

Table 10.45. NC-24 and Blizzardtown Road/SR-1702 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	29	2002	ANGLE	0	0	0	1	1	3	1	100770909	22.18
4	29	2003	OVERTURN/ROLLOVER	0	0	1	0	1	5	1	100884053	22.18
1	16	2004	ANGLE	0	0	0	2	1	1	1	101094141	22.18
9	19	2004	ANGLE	0	0	0	0	1	5	1	101287405	22.18
1	14	2006	ANGLE	0	0	1	2	1	1	2	101656445	22.18
6	28	2006	ANGLE	0	0	0	0	2	1	2	101770789	22.18
4	11	2009	ANGLE	0	0	2	2	1	1	1	102565481	22.18
12	8	2004	ANIMAL	0	0	0	0	1	5	1	101355895	22.28
11	10	2005	ANIMAL	0	0	0	0	1	5	1	101605457	22.28
11	10	2006	ANIMAL	0	0	0	0	1	5	1	101882706	22.38
12	23	2003	ANIMAL	0	0	0	0	1	1	1	101077553	22.48

Table 10.46. NC-24 and Koonce Fork Road/SR-1238 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	29	2005	Fixed Object	0	0	0	1	1	1	1	101486658	3.19
4	30	2007	Fixed Object	0	0	0	0	1	5	1	102026333	3.19
2	4	2006	Fixed Object	0	0	0	0	1	1	7	101670541	3.284
10	22	2003	Parked Motor Vehicl	0	1	0	0	1	1	1	101034400	3.29
11	4	2003	Animal	0	0	0	0	1	5	1	101034532	3.3
8	14	2004	Fixed Object	0	0	0	0	3	1	3	101258745	3.3
6	28	2006	Sideswipe, Same Direction	0	0	0	0	1	1	1	101770912	3.39
6	19	2002	Rear End, Turn	0	0	0	1	1	1	2	100646437	3.44
9	17	2003	Sideswipe, Same Direction	0	0	0	0	1	1	1	100993422	3.46
7	19	2002	Sideswipe, Same Direction	0	0	0	0	1	1	1	100667311	3.54
11	17	2002	Ran Off Road - Left	0	0	0	0	2	5	3	100761749	3.64
2	15	2003	Other Collision With Vehicle	0	0	0	0	1	5	1	100830783	3.64
5	15	2003	Angle	0	0	0	2	2	1	2	100897291	3.64
12	2	2003	Angle	1	0	1	1	1	1	1	101058349	3.64
11	25	2004	Angle	0	0	0	5	1	1	1	101345868	3.64
7	19	2006	Backing Up	0	0	0	0	1	1	1	101787990	3.64
11	26	2006	Angle	0	0	0	0	1	5	1	101897637	3.64
3	6	2009	Rear End, Slow or Stop	0	0	0	1	1	5	1	102549926	3.7
7	11	2002	Left Turn, Different Roadways	0	0	0	0	1	1	2	100661690	3.8
9	16	2002	Angle	0	0	0	0	2	1	2	100711378	3.8
10	12	2002	Angle	0	0	0	0	1	1	1	100731120	3.8
12	1	2002	Animal	0	0	0	0	1	5	1	100772395	3.8
5	21	2003	Left Turn, Same Roadway	0	0	0	2	1	4	1	100901791	3.8
8	1	2003	Rear End, Turn	0	0	0	0	2	1	3	100956857	3.8
8	22	2003	Right Turn, Same Roadway	0	0	0	0	1	1	1	100974423	3.8
6	29	2004	Left Turn, Different Roadways	0	0	0	0	1	1	1	101223273	3.8
7	8	2004	Sideswipe, Same Direction	0	0	0	0	1	1	1	101229952	3.8
11	14	2004	Animal	0	0	0	0	1	5	1	101336174	3.8
11	24	2004	Left Turn, Different Roadways	0	0	0	1	2	1	3	101301084	3.8
6	18	2005	Left Turn, Different Roadways	0	0	1	1	1	1	1	101501809	3.8
12	25	2005	Left Turn, Same Roadway	0	0	2	2	2	2	1	101643224	3.8

Table 10.46. continued (NC-24 and Koonce Fork Road/SR-1238 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
12	15	2006	Left Turn, Different Roadways	0	0	1	1	1	1	2	101914212	3.8
4	11	2008	Left Turn, Different Roadways	0	0	1	1	1	2	2	102301741	3.8
7	19	2008	Right Turn, Same Roadway	0	0	1	1	1	2	2	102371609	3.8
10	15	2008	Animal	0	0	0	0	1	1	1	102442270	3.8
11	22	2008	Animal	0	0	0	0	1	5	1	102468277	3.8
2	17	2009	Rear End, Slow or Stop	0	0	0	2	1	1	1	102538339	3.8
5	14	2009	Left Turn, Different Roadways	0	0	0	1	1	1	2	102591497	3.8
6	12	2009	Angle	0	0	0	0	1	5	1	102611458	3.8
3	30	2003	Sideswipe, Same Direction	0	0	0	0	2	2	3	100861467	3.819
7	18	2008	Left Turn, Different Roadways	0	0	1	1	1	1	2	102371177	3.851
8	1	2008	Left Turn, Different Roadways	0	0	0	1	1	1	1	102378614	3.859
7	3	2002	Angle	0	0	0	0	1	5	1	100656667	3.9
6	30	2005	Sideswipe, Same Direction	0	0	0	0	1	1	2	101509376	3.9
3	21	2008	Other Collision With Vehicle	0	0	0	0	1	1	1	102287440	3.9
3	25	2008	Fixed Object	0	0	2	0	1	5	1	102290651	3.9
9	30	2008	Rear End, Turn	0	0	0	1	1	1	1	102406822	4
7	8	2009	Animal	0	0	0	0	1	5	2	102630594	4

Table 10.47. US-1 and ValleyviewRoad/SR-1857 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	14	2002	Other Non-Collision	0	0	0	0	1	1	1	100758888	14.11
7	28	2004	Other Non-Collision	0	0	0	0	1	1	2	101244584	14.11
11	4	2006	Fixed Object	0	0	0	0	1	5	1	101877091	14.11
12	7	2007	Animal	0	0	0	0	1	5	1	102210815	14.11
6	9	2008	Animal	0	0	0	0	1	5	1	102342706	14.11
1	25	2009	Animal	0	0	0	0	1	5	1	102501758	14.11
2	19	2009	Sideswipe, Same Direction	0	0	0	0	1	1	1	102541160	14.11
7	18	2009	Rear End, Slow or Stop	0	0	1	0	1	5	1	102636026	14.11
11	23	2003	Left Turn, Same Roadway	0	0	6	1	1	5	1	101051757	14.21
4	14	2004	Fixed Object	0	0	1	0	2	5	2	101163610	14.21
1	10	2008	Animal	0	0	0	0	1	1	2	102237339	14.21
11	30	2008	Rear End, Slow or Stop	0	0	0	0	2	5	3	102456100	14.21
10	3	2007	Rear End, Slow or Stop	0	0	0	1	1	1	1	102154980	14.22
12	14	2000	Ran Off Road - Right	0	0	1	0	2	1	3	100243037	14.223
5	26	2009	Sideswipe, Opposite Direction	0	0	0	3	2	1	3	102607408	14.23
12	16	2003	Animal	0	0	0	0	1	5	1	101071800	14.31
12	30	2004	Sideswipe, Same Direction	0	0	0	0	1	1	1	101375239	14.31
3	25	2005	Sideswipe, Same Direction	0	0	0	0	1	5	1	101440874	14.31
5	29	2008	Fixed Object	0	0	0	0	1	1	1	102303818	14.31
11	1	2008	Sideswipe, Same Direction	0	0	0	0	1	5	1	102432977	14.31
11	18	2001	Fixed Object	0	0	1	0	1	5	1	100491925	14.4
11	3	2008	Sideswipe, Same Direction	0	0	1	0	2	1	2	102451748	14.4
7	3	2001	Sideswipe, Same Direction	0	0	0	0	1	1	1	100390386	14.41
11	5	2003	Animal	0	0	0	0	1	5	1	101035369	14.41
2	14	2005	Left Turn, Different Roadways	0	0	1	1	2	1	3	101410002	14.41
10	30	2006	Movable Object	0	0	0	0	1	1	1	101871865	14.41
11	18	2007	Animal	0	0	0	0	1	5	1	102195924	14.41
6	11	2003	Other Non-Collision	0	0	0	1	2	1	2	100919539	14.428
4	7	2007	Fixed Object	0	0	0	0	1	1	1	102005250	14.43
11	14	2006	Animal	0	0	0	0	1	5	1	101886474	14.51
12	10	2008	Sideswipe, Same Direction	0	0	0	0	2	5	2	102468002	14.51

Table 10.47. continued (US-1 and ValleyviewRoad/SR-1857 Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	13	2000	Ran Off Road - Right	0	1	1	0	1	1	1	100181554	14.65
10	6	2001	Other Non-Collision	0	0	0	0	2	1	1	100456776	14.71
2	25	2003	Rear End, Slow or Stop	0	0	0	2	1	1	2	100838281	14.71

Table 10.48. US-1 and Causey Road/Grant Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	11	2003	Rear End, Slow or Stop	0	0	0	2	1	1	1	100871357	16.97
5	15	2003	Animal	0	0	0	0	2	5	3	100897259	16.97
12	11	2007	Animal	0	0	0	0	1	5	1	102213931	16.97
11	26	2008	Animal	0	0	0	0	1	5	1	102455080	16.97
12	26	2008	Animal	0	0	0	0	1	5	1	102501346	16.97
6	20	2003	Fixed Object	0	0	0	1	1	1	1	100925981	17.01
4	1	2005	Fixed Object	0	0	0	0	1	5	2	101445637	17.086
8	11	2004	Fixed Object	0	0	0	1	1	5	1	101255921	17.098
11	13	2006	Animal	0	0	0	0	1	5	1	101885500	17.108
4	18	2007	Rear End, Slow or Stop	0	0	0	2	1	1	1	102014495	17.11
8	19	2007	Overturn/Rollover	0	1	0	0	1	1	1	102116947	17.11
11	13	2002	Animal	0	0	0	0	2	5	3	100758097	17.13

Table 10.49. NC-87 and SR-1145/Martin Luther King Drive Crash Data

Month	Day	Year	Crash Type								Crash ID	MP
				F	A	B	C	R	L	W		
11	3	2006	Left Turn, Different Roadways	0	0	0	0	1	1	1	101875833	25.824
4	19	2001	Angle	0	1	0	3	1	1	1	100338641	25.83
4	26	2001	Angle	0	0	0	0	1	1	1	100343278	25.83
9	30	2001	Angle	0	0	1	4	1	1	1	100451966	25.83
4	5	2002	Angle	0	0	0	2	1	1	1	100593032	25.83
7	27	2002	Angle	0	0	0	0	1	1	1	100672966	25.83
4	2	2003	Angle	0	0	0	0	1	1	1	100863188	25.83
5	4	2003	Angle	9	9	9	1	1	1	1	100888243	25.83
11	3	2003	Angle	0	0	0	3	1	1	1	101032898	25.83
4	9	2004	Angle	0	1	2	0	1	1	1	101159364	25.83
5	4	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101179278	25.83
6	26	2004	Angle	0	1	0	1	2	1	3	101220732	25.83
8	4	2004	Angle	0	0	0	3	1	1	1	101250791	25.83
1	20	2005	Angle	0	0	1	1	1	1	1	101390333	25.83
3	8	2005	Angle	0	0	0	2	1	1	1	101428085	25.83
3	11	2005	Angle	0	0	0	2	1	1	1	101430062	25.83
3	14	2005	Animal	0	0	0	0	1	5	1	101431945	25.83
4	8	2005	Angle	0	0	0	0	1	1	1	101450268	25.83
7	11	2005	Angle	0	0	0	0	1	1	2	101517542	25.83
9	27	2005	Angle	0	0	0	0	1	1	1	101570844	25.83
10	12	2005	Angle	0	0	2	0	1	1	2	101582440	25.83
11	27	2006	Angle	0	0	3	0	1	1	1	101908654	25.83
12	1	2006	Angle	0	0	0	0	2	1	2	101902967	25.83
12	1	2006	Angle	0	0	0	0	2	1	2	101903086	25.83
4	4	2007	Left Turn, Different Roadways	0	0	0	0	1	1	1	101968422	25.83
4	27	2007	Angle	0	0	1	0	1	1	1	102024119	25.83
5	14	2007	Angle	0	0	1	6	1	1	1	102038401	25.83
6	20	2007	Angle	0	0	1	2	1	1	1	102069717	25.83
7	3	2007	Angle	0	0	0	2	1	1	1	102089105	25.83
7	16	2007	Angle	0	0	1	7	1	1	1	102090465	25.83
9	3	2007	Angle	0	0	1	6	1	1	1	102131736	25.83

Table 10.49. continued (NC-87 and SR-1145/Martin Luther King Drive Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
12	8	2007	Sideswipe, Same Direction	0	0	0	4	1	1	1	102211740	25.83
2	25	2008	Angle	0	0	0	1	1	1	1	102269840	25.83
10	5	2008	Angle	0	0	0	2	1	1	1	102423021	25.83
1	27	2009	Angle	0	0	1	1	1	1	1	102504007	25.83
2	20	2009	Angle	0	0	0	0	1	1	1	102540358	25.83
4	9	2009	Angle	0	0	0	0	1	1	1	102564786	25.83
6	18	2009	Angle	0	0	0	0	1	1	1	102615732	25.83
6	1	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101200925	25.865

Table 10.50. NC-87 and SR-1155/Cromartie Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	10	2002	Rear End, Turn	0	0	0	0	2	1	3	100728262	27.88
1	10	2005	Angle	0	0	2	1	1	1	1	101382906	27.88
11	3	2006	Angle	0	0	0	2	1	1	1	101875834	27.88
4	21	2007	Angle	0	0	0	3	1	5	1	102017651	27.88
2	21	2008	Angle	0	0	0	0	2	5	3	102267145	27.88
2	26	2008	Fixed Object	0	0	0	0	1	5	1	102270548	27.88
10	3	2008	Angle	0	0	0	3	1	1	1	102419579	27.88
12	28	2008	Angle	0	0	0	2	1	5	1	102503607	27.88
9	28	2007	Fixed Object	0	0	0	0	1	1	1	102150655	28.08
8	26	2008	Fixed Object	0	0	0	0	2	1	3	102393273	28.08

Table 10.51. NC-210 and 5th Street Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
3	19	2005	Angle	0	0	1	1	1	5	1	101346348	37.815
8	28	2004	Left Turn, Different Roadways	0	0	0	0	1	1	1	101130199	37.817
12	3	2007	Rear End, Slow or Stop	0	0	0	1	1	4	1	102146340	37.819
1	23	2002	Angle	0	0	0	0	2	1	3	100543990	37.83
8	24	2002	Left Turn, Same Roadway	0	0	0	1	1	1	1	100692903	37.832
10	24	2008	Right Turn, Same Roadway	0	0	0	0	2	4	2	102430630	37.84
11	12	2008	Angle	0	0	0	2	1	1	2	102442529	37.845
10	24	2007	Rear End, Slow or Stop	0	0	0	2	2	1	2	102172120	37.86
6	26	2004	Left Turn, Same Roadway	0	0	0	2	1	1	2	101220558	37.87
12	9	2006	Pedestrian	0	0	0	1	1	4	1	101862901	37.882
3	21	2002	Ran Off Road - Right	0	0	0	0	2	1	3	100582397	37.892
1	28	2004	Overturn/Rollover	0	0	0	0	4	4	9	101104764	37.901
12	5	2006	Rear End, Slow or Stop	0	0	0	0	1	4	1	101859094	37.908
11	12	2004	Left Turn, Different Roadways	0	0	0	2	2	1	3	101222089	37.91
5	20	2008	Rear End, Slow or Stop	0	0	0	2	2	4	3	102318362	37.91
6	14	2008	Ran Off Road - Left	0	0	1	0	1	1	1	102339620	37.91
6	5	2009	Left Turn, Different Roadways	0	0	0	1	1	1	1	102614436	37.91
6	9	2009	Rear End, Slow or Stop	0	0	0	0	2	1	2	102623314	37.91
2	26	2004	Fixed Object	0	0	0	0	5	1	4	101126085	37.926
1	4	2005	Rear End, Slow or Stop	0	0	0	2	1	2	1	101259267	37.929
1	23	2003	Ran Off Road - Right	0	0	0	0	5	1	4	100812015	37.938
9	2	2002	Other Non-Collision	0	0	0	0	1	1	1	100702217	37.949
1	19	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	101982864	37.96
12	27	2004	Left Turn, Different Roadways	0	0	0	0	4	1	2	101239482	38.03
12	27	2004	Rear End, Slow or Stop	0	0	0	2	4	4	4	101242338	38.03
12	27	2004	Rear End, Slow or Stop	0	0	0	0	4	4	4	101242343	38.03
2	17	2006	Backing Up	0	0	0	0	1	1	1	101637944	38.03
2	20	2006	Left Turn, Different Roadways	0	0	0	0	1	1	1	101628752	38.03
12	20	2006	Left Turn, Same Roadway	0	0	4	0	1	4	1	101871091	38.03
8	24	2007	Left Turn, Same Roadway	0	0	0	0	1	1	1	102047268	38.03
11	27	2007	Angle	0	0	0	0	1	4	1	102117149	38.03
12	2	2007	Rear End, Slow or Stop	0	0	0	1	2	4	3	102122415	38.03

Table 10.51. continued (NC-210 and 5th Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	30	2008	Right Turn, Different Roadways	0	0	0	0	1	1	1	102166910	38.03
3	6	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102210368	38.03
6	21	2008	Backing Up	0	0	0	0	1	1	1	102333824	38.03
7	9	2008	Rear End, Slow or Stop	0	0	0	2	2	2	3	102343910	38.03
2	14	2009	Ran Off Road - Right	0	0	0	0	2	1	3	102524661	38.03
3	19	2009	Rear End, Slow or Stop	0	0	0	1	1	1	1	102556506	38.06
7	5	2008	PARKED MOTOR VEHICLE	0	0	0	0	2	1	2	102340573	38.062

Table 10.52. NC-210 and Weaver Street Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
7	17	2009	Rear End, Slow or Stop	0	0	0	3	1	1	1	102643891	3.73
11	12	2004	Left Turn, Same Roadway	0	0	0	0	2	2	2	101239013	3.739
1	30	2009	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102511464	37.49
3	1	2003	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100841077	37.493
2	11	2005	RIGHT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101282224	37.493
10	9	2002	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	100727479	37.502
4	14	2003	REAR END, SLOW OR STOP	0	0	0	4	1	1	1	100872832	37.502
3	22	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101318016	37.502
12	15	2005	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	101594939	37.502
2	20	2008	BACKING UP	0	0	0	0	1	1	1	102189004	37.502
7	8	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102344661	37.502
6	27	2002	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100651709	37.503
1	27	2009	ANGLE	0	0	0	0	1	1	2	102510837	37.51
4	5	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100329782	37.512
11	2	2002	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100747796	37.512
10	22	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101556043	37.512
7	6	2009	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102627109	37.513
11	12	2004	REAR END, SLOW OR STOP	0	0	0	1	2	4	2	101238154	37.521
1	26	2006	ANGLE	0	0	0	0	1	1	1	101637938	37.521
12	18	2007	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102138831	37.521
12	20	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102139788	37.521
7	23	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100669456	37.522
11	18	2003	ANGLE	0	0	0	0	1	2	1	101045649	37.522
5	31	2005	ANGLE	0	0	0	0	1	1	1	101386549	37.523
12	22	2001	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100530705	37.526
12	27	2004	OTHER COLLISION WITH VEHICLE	0	0	0	0	4	5	4	101258600	37.526
4	18	2005	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101343588	37.526
1	14	2006	LEFT TURN, SAME ROADWAY	0	0	3	2	1	4	1	101591180	37.526
3	22	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	2	102222004	37.53
7	28	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102360084	37.53
7	28	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102360083	37.53
6	13	2009	PARKED MOTOR VEHICLE	0	0	0	0	1	1	1	102619927	37.53

Table 10.52. continued (NC-210 and Weaver Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	23	2002	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	100627202	37.531
6	21	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100647403	37.531
8	17	2002	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	100687845	37.531
10	24	2002	REAR END, SLOW OR STOP	0	0	0	0	2	1	2	100739886	37.531
10	18	2003	ANGLE	0	0	1	0	1	1	2	101014486	37.531
5	27	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	101249647	37.531
1	11	2005	REAR END, SLOW OR STOP	0	0	0	0	1	4	1	101253741	37.531
7	13	2009	Rear End, Slow or Stop	0	0	0	0	2	1	2	102633001	37.537
11	12	2004	Rear End, Slow or Stop	0	0	0	1	2	4	2	101238154	37.541
1	26	2006	Angle	0	0	0	0	1	1	1	101637938	37.541
12	20	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102139788	37.541
5	31	2005	Angle	0	0	0	0	1	1	1	101386549	37.543
12	22	2001	Rear End, Slow or Stop	0	0	0	0	1	1	1	100530705	37.546
12	27	2004	Other Collision With Vehicle	0	0	0	0	4	5	4	101258600	37.546
8	17	2002	Sideswipe, Same Direction	0	0	0	1	1	1	2	100687841	37.547
3	22	2008	Sideswipe, Same Direction	0	0	0	0	1	1	2	102222004	37.55
6	21	2002	Sideswipe, Same Direction	0	0	0	0	1	1	1	100647331	37.551
6	21	2002	Rear End, Slow or Stop	0	0	0	0	1	1	1	100647403	37.551
8	17	2002	Rear End, Slow or Stop	0	0	0	0	1	1	1	100687845	37.551
10	24	2002	Rear End, Slow or Stop	0	0	0	0	2	1	2	100739886	37.551
5	27	2004	Sideswipe, Same Direction	0	0	0	0	1	1	1	101249647	37.551
1	11	2005	Rear End, Slow or Stop	0	0	0	0	1	4	1	101253741	37.551
3	27	2005	Rear End, Slow or Stop	0	0	0	0	2	4	3	101320464	37.551
4	2	2003	Rear End, Slow or Stop	0	0	0	0	1	2	1	100863083	37.552
12	18	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101234258	37.555
1	10	2002	Sideswipe, Same Direction	0	0	0	0	1	1	1	100535166	37.556
2	14	2006	Sideswipe, Same Direction	0	0	0	0	1	1	1	101626427	37.556
7	4	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102021439	37.556
9	9	2007	Rear End, Slow or Stop	0	0	0	2	1	1	1	102057391	37.556
9	12	2004	Rear End, Slow or Stop	0	0	1	2	1	4	1	101141880	37.557
10	17	2004	Rear End, Slow or Stop	0	0	0	1	1	1	1	101222094	37.557
8	15	2007	Rear End, Slow or Stop	0	0	0	0	1	1	2	102039249	37.557

Table 10.52. continued (NC-210 and Weaver Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
8	26	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102674515	37.557
10	14	2002	Rear End, Slow or Stop	0	0	0	1	1	4	1	100732065	37.558
12	26	2004	Rear End, Slow or Stop	0	0	0	0	5	1	4	101246608	37.558
1	31	2005	Rear End, Slow or Stop	0	0	0	0	1	4	1	101270503	37.558
5	29	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101383984	37.558
1	30	2005	Left Turn, Different Roadways	0	0	0	1	1	4	1	101274441	37.559
6	27	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102007525	37.559
9	26	2007	Rear End, Slow or Stop	0	0	0	0	1	4	1	102074900	37.559
5	2	2001	Rear End, Turn	0	0	0	0	1	1	1	100347573	37.56
5	19	2001	Pedalcyclist	0	0	0	0	1	1	1	100359273	37.56
5	28	2001	Angle	1	0	1	3	2	1	2	100365612	37.56
6	20	2001	Rear End, Slow or Stop	0	0	0	0	1	1	1	100380774	37.56
9	28	2001	Rear End, Slow or Stop	0	0	0	0	1	1	1	100465015	37.56
10	27	2001	Angle	0	0	0	1	1	4	1	100498577	37.56
10	28	2001	Head On	0	0	0	0	1	1	1	100499318	37.56
11	3	2001	Rear End, Slow or Stop	0	0	0	0	1	1	9	100487040	37.56
11	29	2001	Rear End, Slow or Stop	0	0	0	0	1	1	1	100510830	37.56
12	4	2001	Left Turn, Different Roadways	0	0	1	0	1	4	1	100510866	37.56
12	13	2001	Left Turn, Different Roadways	0	0	0	2	2	4	5	100512335	37.56
3	3	2002	Left Turn, Different Roadways	0	0	1	1	1	4	1	100911260	37.56
3	29	2002	Left Turn, Same Roadway	0	0	0	0	1	4	1	100599187	37.56
5	23	2002	Left Turn, Same Roadway	0	0	0	0	1	1	1	100627202	37.56
5	24	2002	Angle	0	0	0	3	1	4	1	101195194	37.56
6	1	2002	Unknown	0	0	0	0	1	4	1	100633803	37.56
7	23	2002	Rear End, Slow or Stop	0	0	0	0	1	1	1	100669456	37.56
8	3	2002	Rear End, Slow or Stop	0	0	0	0	1	1	1	100677638	37.56
10	24	2002	Backing Up	0	0	0	1	2	1	3	100739874	37.56
10	25	2002	Left Turn, Different Roadways	0	0	0	1	2	1	3	100740594	37.56
11	4	2002	Sideswipe, Same Direction	0	0	0	0	1	4	1	100749247	37.56
12	21	2002	Rear End, Slow or Stop	0	0	0	0	1	1	1	100789797	37.56
1	13	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100804695	37.56
1	23	2003	Angle	0	0	0	0	5	1	4	100812007	37.56

Table 10.52. continued (NC-210 and Weaver Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
1	23	2003	Sideswipe, Same Direction	0	0	0	0	5	1	4	100812013	37.56
1	23	2003	Rear End, Slow or Stop	0	0	0	0	5	1	4	100812012	37.56
4	4	2003	Angle	0	0	0	0	1	1	1	100865462	37.56
5	24	2003	Sideswipe, Same Direction	0	0	0	0	1	1	1	100904649	37.56
8	11	2003	Angle	0	0	0	1	1	1	1	100965530	37.56
8	16	2003	Rear End, Slow or Stop	0	0	0	1	1	2	1	100969278	37.56
8	21	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100972992	37.56
9	7	2003	Left Turn, Same Roadway	0	0	0	0	1	4	2	100986285	37.56
9	25	2003	Rear End, Slow or Stop	0	0	0	1	1	1	1	100999889	37.56
10	16	2003	Rear End, Slow or Stop	0	0	0	1	1	1	1	101016827	37.56
10	18	2003	Angle	0	0	1	0	1	1	2	101014486	37.56
11	2	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	101032116	37.56
11	3	2003	Left Turn, Same Roadway	0	0	0	0	1	1	1	101032714	37.56
11	14	2003	Left Turn, Same Roadway	0	0	0	0	1	4	1	101042627	37.56
11	18	2003	Angle	0	0	0	0	1	2	1	101045649	37.56
11	23	2003	Rear End, Slow or Stop	0	0	0	2	1	1	1	101050749	37.56
12	4	2003	Rear End, Slow or Stop	0	0	0	0	2	1	3	101059502	37.56
12	11	2003	Other Collision With Vehicle	0	0	0	1	1	1	1	101066269	37.56
12	30	2003	Left Turn, Same Roadway	0	0	0	0	1	2	1	101081486	37.56
1	3	2004	Left Turn, Same Roadway	0	0	0	0	1	1	1	101084063	37.56
1	23	2004	Angle	0	0	0	0	1	3	1	101098675	37.56
1	28	2004	Rear End, Slow or Stop	0	0	0	4	4	4	1	101105761	37.56
3	9	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101137149	37.56
3	10	2004	Left Turn, Different Roadways	0	0	0	0	1	1	1	101138366	37.56
3	11	2004	Left Turn, Same Roadway	0	0	0	2	1	1	1	101138570	37.56
3	12	2004	Rear End, Slow or Stop	0	0	0	1	1	1	1	101139323	37.56
4	8	2004	Rear End, Slow or Stop	0	0	1	0	1	1	1	101159072	37.56
4	15	2004	Other Collision With Vehicle	0	0	2	0	1	1	1	101163868	37.56
5	18	2004	Angle	0	0	0	0	1	1	1	101189835	37.56
5	18	2004	Angle	0	0	0	0	1	1	1	101189842	37.56
6	20	2004	Left Turn, Different Roadways	0	0	0	4	1	1	1	101217465	37.56
6	26	2004	Left Turn, Different Roadways	0	0	1	0	2	4	2	101220562	37.56

Table 10.52. continued (NC-210 and Weaver Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
6	27	2004	Left Turn, Different Roadways	0	0	0	0	1	1	1	101221588	37.56
7	6	2004	Rear End, Slow or Stop	0	0	0	1	1	1	1	101228690	37.56
8	2	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101130201	37.56
8	8	2004	Left Turn, Same Roadway	0	0	0	0	1	4	1	101147992	37.56
10	1	2004	Rear End, Slow or Stop	0	0	0	1	1	1	1	101213027	37.56
10	3	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101167557	37.56
10	13	2004	Right Turn, Different Roadways	0	0	0	0	1	1	1	101174567	37.56
10	18	2004	Rear End, Slow or Stop	0	0	0	0	1	4	1	101195575	37.56
11	14	2004	Right Turn, Different Roadways	0	0	0	0	1	4	1	101217362	37.56
11	17	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101206509	37.56
12	14	2004	Left Turn, Different Roadways	0	0	0	0	1	2	2	101230075	37.56
12	26	2004	Left Turn, Same Roadway	0	0	0	0	4	4	6	101261612	37.56
12	26	2004	Rear End, Slow or Stop	0	0	0	0	4	4	1	101242333	37.56
12	31	2004	Rear End, Slow or Stop	0	0	0	0	1	1	1	101242949	37.56
1	3	2005	Left Turn, Different Roadways	0	0	0	0	1	4	1	101260355	37.56
2	12	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101282226	37.56
2	15	2005	Ran Off Road - Left	0	0	0	0	1	4	5	101291236	37.56
2	15	2005	Left Turn, Same Roadway	0	0	0	0	1	4	1	101287493	37.56
2	21	2005	Angle	0	0	0	0	2	4	3	101294221	37.56
2	23	2005	Left Turn, Same Roadway	0	0	0	0	1	1	1	101295559	37.56
3	11	2005	Head On	0	0	0	4	1	1	1	101307766	37.56
3	14	2005	Left Turn, Different Roadways	0	0	2	0	1	1	1	101346337	37.56
3	16	2005	Left Turn, Same Roadway	0	0	0	1	2	1	3	101314465	37.56
3	20	2005	Head On	0	0	0	0	1	4	2	101327665	37.56
4	4	2005	Left Turn, Same Roadway	0	0	0	2	1	4	1	101331259	37.56
4	18	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101343588	37.56
4	22	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101349027	37.56
5	24	2005	Angle	0	0	0	0	1	1	1	101382466	37.56
6	11	2005	Angle	0	0	1	2	1	4	1	101397495	37.56
6	23	2005	Rear End, Turn	0	0	0	0	1	1	1	101428855	37.56
7	10	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101424979	37.56
7	10	2005	Rear End, Slow or Stop	0	0	0	0	1	1	2	101421081	37.56

Table 10.52. continued (NC-210 and Weaver Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
9	20	2005	Left Turn, Same Roadway	0	0	2	0	1	1	1	101481334	37.56
10	8	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101499657	37.56
10	15	2005	Left Turn, Same Roadway	0	0	0	0	1	1	1	101544273	37.56
11	9	2005	Backing Up	0	0	0	0	1	1	1	101532585	37.56
11	11	2005	Rear End, Slow or Stop	0	0	0	4	1	4	1	101541280	37.56
12	24	2005	Left Turn, Same Roadway	0	0	0	0	1	4	1	101570572	37.56
1	9	2006	Left Turn, Same Roadway	0	0	0	0	1	1	1	101594941	37.56
1	13	2006	Right Turn, Different Roadways	0	0	0	0	2	4	3	101591178	37.56
1	14	2006	Left Turn, Same Roadway	0	0	3	2	1	4	1	101591180	37.56
2	1	2006	Left Turn, Same Roadway	0	0	0	0	1	1	1	101613990	37.56
2	25	2006	Left Turn, Same Roadway	0	0	0	0	1	1	1	101640881	37.56
1	18	2007	Rear End, Slow or Stop	0	0	0	3	2	4	3	101899012	37.56
1	22	2007	Rear End, Slow or Stop	0	0	0	0	1	1	2	101898977	37.56
3	1	2007	lef	0	0	0	1	2	4	3	101935838	37.56
4	22	2007	Left Turn, Different Roadways	0	0	1	0	1	4	1	101986016	37.56
5	26	2007	Angle	0	0	0	0	1	4	1	101984724	37.56
6	17	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102007519	37.56
6	17	2007	Right Turn, Different Roadways	0	0	0	0	1	4	1	101996320	37.56
8	2	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102030057	37.56
8	6	2007	Angle	0	0	0	0	1	1	1	102032669	37.56
8	11	2007	Left Turn, Different Roadways	1	0	0	0	1	4	1	102040709	37.56
8	20	2007	Left Turn, Different Roadways	0	0	0	0	1	1	1	102107366	37.56
9	25	2007	Left Turn, Different Roadways	0	0	0	0	1	1	1	102073685	37.56
11	1	2007	Rear End, Slow or Stop	0	0	0	1	1	4	1	102099280	37.56
11	13	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102110495	37.56
12	13	2007	Angle	0	0	0	0	1	1	1	102133150	37.56
12	18	2007	Rear End, Slow or Stop	0	0	0	1	1	1	1	102138831	37.56
12	29	2007	Angle	0	0	0	4	1	2	1	102141968	37.56
1	7	2008	Rear End, Slow or Stop	0	0	0	0	1	2	1	102151904	37.56
2	27	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102196929	37.56
3	28	2008	Angle	0	0	0	0	1	4	1	102247936	37.56
4	10	2008	Sideswipe, Same Direction	0	0	0	0	1	1	1	102272462	37.56

Table 10.52. continued (NC-210 and Weaver Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
4	14	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102266605	37.56
5	18	2008	Rear End, Slow or Stop	0	0	0	0	1	4	1	102304841	37.56
7	8	2008	Left Turn, Same Roadway	0	0	0	0	2	4	3	102355524	37.56
7	25	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102355526	37.56
7	28	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102360084	37.56
7	28	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102360083	37.56
8	7	2008	Rear End, Slow or Stop	0	0	0	0	1	1	1	102372926	37.56
8	13	2008	Angle	0	0	0	0	2	1	2	102369053	37.56
10	3	2008	Angle	0	0	0	0	1	1	1	102410560	37.56
11	1	2008	Rear End, Slow or Stop	0	0	0	0	1	3	1	102464948	37.56
11	7	2008	Left Turn, Same Roadway	0	0	0	2	1	1	1	102438088	37.56
11	30	2008	Left Turn, Different Roadways	0	0	0	0	2	4	3	102460467	37.56
12	6	2008	Left Turn, Same Roadway	0	0	1	0	2	4	3	102473954	37.56
1	16	2009	Rear End, Slow or Stop	0	0	0	1	1	4	1	102497849	37.56
3	4	2009	Angle	0	0	0	0	1	1	1	102537878	37.56
3	21	2009	Left Turn, Same Roadway	0	0	0	0	1	4	1	102553631	37.56
3	27	2009	Angle	0	0	0	1	2	1	3	102556513	37.56
3	28	2009	Sideswipe, Same Direction	0	0	0	0	1	1	1	102558912	37.56
4	8	2009	Left Turn, Different Roadways	0	0	0	0	1	1	1	102566801	37.56
7	6	2009	Left Turn, Same Roadway	0	0	0	0	1	4	1	102636141	37.56
7	14	2009	Right Turn, Different Roadways	0	0	0	0	1	1	1	102635931	37.56
8	6	2009	Rear End, Slow or Stop	0	0	0	1	1	1	1	102671954	37.56
8	21	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102674361	37.56
9	1	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102674034	37.56
12	29	2004	Rear End, Slow or Stop	0	0	0	0	2	4	1	101242335	37.562
7	26	2002	Rear End, Slow or Stop	0	0	0	0	2	1	3	100672804	37.563
8	2	2002	Rear End, Slow or Stop	0	0	0	0	1	1	1	100676706	37.564
6	3	2002	Rear End, Slow or Stop	0	0	0	0	1	1	1	100635084	37.565
7	16	2003	Rear End, Slow or Stop	0	0	0	0	1	1	1	100945473	37.568
9	18	2004	Rear End, Slow or Stop	0	0	0	0	2	1	2	101147993	37.569
12	9	2004	Angle	0	0	0	0	2	1	2	101238537	37.569
3	18	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101315466	37.569

Table 10.52. continued (NC-210 and Weaver Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	12	2007	Sideswipe, Same Direction	0	0	0	0	1	1	2	101973073	37.569
7	3	2001	Rear End, Slow or Stop	0	0	0	0	1	1	1	100389956	37.571
10	10	2003	Angle	0	0	0	0	2	1	2	101012155	37.574
4	14	2005	Rear End, Slow or Stop	0	0	0	0	1	1	2	101343585	37.574
1	14	2009	Rear End, Slow or Stop	0	0	0	0	1	4	1	102497790	37.575
4	26	2002	Sideswipe, Same Direction	0	0	0	0	1	1	1	100607905	37.578
4	22	2005	Ran Off Road - Right	0	0	1	0	2	4	2	101349030	37.598
11	5	2004	Left Turn, Different Roadways	0	0	0	0	1	1	1	101197405	37.6
12	18	2004	Right Turn, Different Roadways	0	0	0	0	1	1	1	101234244	37.6
5	31	2005	Right Turn, Different Roadways	0	0	0	0	1	1	1	101386551	37.6
7	12	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101419742	37.607
9	17	2009	Sideswipe, Same Direction	0	0	0	0	1	1	2	102674938	37.617
9	20	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102692798	37.617
11	16	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102114696	37.625
4	23	2004	Angle	0	0	0	1	1	1	1	101170828	37.636
10	17	2007	Rear End, Slow or Stop	0	0	0	1	1	1	1	102089698	37.653
1	14	2009	Left Turn, Different Roadways	0	0	0	0	1	4	1	102497791	37.655
9	23	2003	Left Turn, Different Roadways	0	0	0	0	1	1	1	100999265	37.66
9	18	2009	Rear End, Slow or Stop	0	0	0	1	1	1	2	102676142	37.66
9	18	2009	Rear End, Slow or Stop	0	0	0	0	1	1	1	102684370	37.66
5	28	2004	Left Turn, Same Roadway	0	0	0	1	1	1	1	101198485	37.682
5	24	2004	Angle	0	0	0	0	1	1	1	101195204	37.692
10	10	2001	Fixed Object	0	0	0	0	1	1	1	100485025	37.702
2	18	2002	Angle	0	0	0	0	1	1	1	100561080	37.702
11	9	2008	Rear End, Slow or Stop	0	0	0	1	1	4	1	102443761	37.71
8	7	2001	Rear End, Slow or Stop	0	0	0	0	1	1	1	100420456	37.711
10	24	2003	Left Turn, Different Roadways	0	0	0	0	1	1	1	101023635	37.711
1	12	2005	Rear End, Slow or Stop	0	0	0	0	1	1	2	101258599	37.711
12	22	2004	Angle	0	0	0	1	1	4	1	101238541	37.712
4	30	2003	Rear End, Turn	0	0	0	0	1	1	1	100884688	37.716
8	13	2004	Angle	0	0	0	0	2	4	3	101148002	37.717
8	22	2003	Left Turn, Different Roadways	0	0	1	1	1	4	1	100973719	37.72

Table 10.52. continued (NC-210 and Weaver Street Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	19	2003	Rear End, Slow or Stop	0	0	0	2	2	2	3	101046559	37.72
9	8	2004	Right Turn, Different Roadways	0	0	0	0	1	1	2	101233644	37.72
1	27	2005	Left Turn, Different Roadways	0	0	0	0	1	1	1	101270495	37.72
5	30	2007	Rear End, Slow or Stop	0	0	0	1	1	1	1	101983757	37.72
7	13	2007	Left Turn, Different Roadways	0	0	0	0	1	1	1	102036582	37.72
7	13	2007	Left Turn, Same Roadway	0	0	0	0	1	1	1	102015103	37.72
11	27	2007	Angle	0	0	0	0	1	1	1	102134775	37.72
2	12	2008	Left Turn, Different Roadways	0	0	0	0	1	4	2	102189009	37.72
3	27	2008	Left Turn, Different Roadways	0	0	0	0	1	1	1	102228597	37.72
5	18	2008	Left Turn, Same Roadway	0	0	0	0	1	1	1	102294379	37.72
10	24	2008	Angle	0	0	0	0	2	1	3	102431005	37.72
12	31	2008	Left Turn, Different Roadways	0	0	0	0	1	1	1	102482855	37.72
1	10	2002	Rear End, Slow or Stop	0	0	0	0	1	1	1	100537009	37.722
2	10	2003	Rear End, Slow or Stop	0	0	0	0	2	1	2	100826592	37.722
5	30	2003	Left Turn, Same Roadway	0	0	0	0	1	1	1	100908758	37.722
2	5	2009	Ran Off Road - Right	0	0	0	0	1	4	1	102521224	37.722
3	14	2005	Angle	0	0	1	0	1	1	1	101314454	37.723
2	23	2009	Left Turn, Different Roadways	0	0	0	0	1	1	1	102527221	37.724
8	29	2009	Angle	0	0	0	1	1	1	1	102672669	37.726
3	23	2007	Sideswipe, Same Direction	0	0	0	1	1	2	1	101951923	37.727
11	21	2007	Rear End, Slow or Stop	0	0	0	1	1	1	1	102126418	37.727
7	7	2001	Pedalcyclist	0	0	1	0	1	4	1	100392514	37.729
11	20	2005	Rear End, Slow or Stop	0	0	0	0	1	1	1	101591177	37.729
2	5	2009	Movable Object	0	0	0	0	1	4	1	102521225	37.729
10	19	2004	Rear End, Slow or Stop	0	0	0	1	1	1	1	101180241	37.731
9	6	2007	Rear End, Slow or Stop	0	0	0	0	1	1	1	102071912	37.757
11	8	2003	Rear End, Slow or Stop	0	0	0	0	1	2	1	101038206	37.759
11	18	2007	Left Turn, Different Roadways	0	0	0	0	1	4	1	102114703	37.76
11	19	2007	Angle	0	0	0	0	1	1	1	102113950	37.76
3	22	2008	Left Turn, Same Roadway	0	0	2	0	1	1	1	102288715	37.76
10	29	2008	Left Turn, Same Roadway	0	0	0	0	1	1	1	102446845	37.764

Table 10.53. NC-87 and County Line Road/SR-2257 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
3	23	2008	ANIMAL	0	0	0	0	1	5	1	102289111	48.73
1	6	2010	FIXED OBJECT	0	0	0	0	1	5	1	102759913	48.75
2	8	2006	FIXED OBJECT	0	0	1	0	1	5	1	101633659	48.83
5	29	2008	OTHER NON-COLLISION	0	0	1	0	1	1	1	102334230	48.85
2	17	2004	ANIMAL	0	0	0	0	1	5	1	101120461	0
12	14	2005	ANIMAL	0	0	0	0	1	5	1	101632986	0
4	15	2007	FIXED OBJECT	0	0	0	0	3	1	3	102011720	0
2	17	2004	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	0	6	5	6	101120470	0.04
2	7	2010	SIDESWIPE, SAME DIRECTION	0	0	0	0	4	5	1	102784556	0.04
1	7	2007	OVERTURN/ROLLOVER	0	0	0	0	1	1	1	101931718	0.133
4	30	2008	ANIMAL	0	0	0	0	1	5	1	102315825	0.14
10	30	2004	FIXED OBJECT	0	0	0	0	1	1	1	101322146	0.6

Table 10.54. NC-87 and Tobermory Road/SR-1303 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	21	2005	ANIMAL	0	0	0	0	1	5	5	101587476	47.93
7	5	2009	FIXED OBJECT	0	0	0	0	1	5	1	102635370	47.93
2	25	2005	ANIMAL	0	0	0	0	1	1	1	101419482	48.03
1	16	2004	ANIMAL	0	0	0	0	1	5	1	101093991	48.13
1	21	2006	ANIMAL	0	0	0	0	1	5	1	101661133	48.13
8	22	2006	ANGLE	0	0	0	1	1	2	1	101814120	48.23
3	16	2007	REAR END, TURN	0	0	0	0	2	1	3	101984514	48.23
11	18	2007	ANIMAL	0	0	0	0	1	1	1	102195090	48.33
7	18	2008	ANIMAL	0	0	0	0	1	5	1	102370340	48.43
4	18	2010	FIXED OBJECT	0	0	0	1	1	5	1	102843872	48.53
6	6	2006	REAR END, SLOW OR STOP	0	0	0	2	1	1	1	101758904	48.63

Table 10.55. NC-24 and Downing Road/SR-1834 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
5	23	2004	FIXED OBJECT	0	0	0	3	2	1	2	101194177	17.02
7	25	2006	FIXED OBJECT	0	0	0	0	2	1	2	101792419	17.22
12	20	2009	FIXED OBJECT	0	0	1	0	1	5	1	102754821	17.251
10	19	2004	LEFT TURN, DIFFERENT ROADWAYS	0	0	0	3	1	1	1	101312196	17.33
10	28	2004	REAR END, SLOW OR STOP	0	0	0	3	1	5	1	101319920	17.33
1	25	2005	LEFT TURN, SAME ROADWAY	0	0	0	0	1	1	1	101394767	17.33
6	27	2005	FIXED OBJECT	0	0	0	0	1	5	1	101506803	17.33
11	7	2005	ANIMAL	0	0	0	0	1	1	5	101602968	17.33
1	15	2006	ANGLE	0	0	1	1	1	1	1	101656836	17.33
8	17	2006	RIGHT TURN, DIFFERENT ROADWAYS	0	0	0	1	1	1	1	101809894	17.33
9	21	2006	ANGLE	0	0	2	3	1	1	1	101837244	17.33
6	3	2007	ANGLE	0	0	0	4	1	1	2	102053937	17.33
6	15	2007	ANGLE	0	0	0	0	1	1	1	102066020	17.33
8	25	2007	ANGLE	1	0	3	0	1	5	1	102121808	17.33
8	27	2007	ANGLE	0	0	0	0	2	3	2	102122956	17.33
9	18	2007	ANGLE	0	0	0	0	1	1	1	102143179	17.33
8	30	2008	REAR END, TURN	0	0	0	0	1	4	1	102397726	17.33
10	7	2006	SIDESWIPE, SAME DIRECTION	0	0	0	0	2	1	2	101849787	17.43
3	25	2008	OVERTURN/ROLLOVER	0	0	1	0	1	1	1	102238033	17.63

Table 10.56. NC-87 and Wilmington Highway/Doc Bennett Road Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
2	26	2004	FIXED OBJECT	0	0	0	1	5	1	4	101126893	8.02
3	25	2007	FIXED OBJECT	0	0	0	1	1	5	1	101992728	8.02
7	5	2004	LEFT TURN, SAME ROADWAY	0	0	2	1	1	1	1	101227648	8.04
12	13	2006	LEFT TURN, SAME ROADWAY	0	0	0	0	1	5	2	101912330	8.04
7	14	2009	LEFT TURN, SAME ROADWAY	0	0	0	1	1	1	1	102635658	8.04
12	26	2004	FIXED OBJECT	0	0	0	0	4	5	2	101372044	8.046
11	13	2003	ANIMAL	0	0	0	0	1	5	1	101042595	8.06
10	18	2007	FIXED OBJECT	0	0	0	0	1	5	1	102166392	8.068
2	1	2007	FIXED OBJECT	0	0	0	1	5	1	4	101949844	8.116
12	26	2004	FIXED OBJECT	0	0	0	0	4	5	2	101372013	8.14
12	26	2004	FIXED OBJECT	0	0	0	0	4	5	2	101372014	8.14
8	5	2005	REAR END, SLOW OR STOP	0	0	0	1	1	5	5	101533483	8.14
8	13	2009	REAR END, SLOW OR STOP	0	0	0	1	3	1	3	102652751	8.14
9	14	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102140481	8.19
1	27	2004	FIXED OBJECT	0	0	0	0	4	5	2	101103800	8.23
4	12	2008	FIXED OBJECT	0	0	0	0	1	5	1	102303439	8.28
2	17	2004	ANIMAL	0	0	0	1	1	5	1	101120479	8.36
11	24	2007	ANIMAL	0	0	0	0	1	5	1	102199866	8.38
9	28	2006	ANGLE	0	0	0	1	1	1	2	101827707	8.48
10	23	2006	LEFT TURN, SAME ROADWAY	0	0	0	2	1	5	1	101864406	8.48
3	27	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	101993869	8.48
10	18	2007	REAR END, SLOW OR STOP	0	0	0	0	1	1	1	102166399	8.48
8	7	2009	ANGLE	0	0	0	0	1	5	1	102658449	8.48
9	5	2009	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	5	1	102675406	8.48
10	2	2009	FIXED OBJECT	0	0	0	0	1	1	1	102694703	8.48
10	24	2009	FIXED OBJECT	0	2	0	1	1	5	1	102705152	8.48
2	26	2004	SIDESWIPE, SAME DIRECTION	0	0	0	0	5	1	4	101126839	8.487
1	5	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	2	5	3	101085748	8.489
2	3	2005	ANIMAL	0	0	0	1	2	5	2	101401935	8.53
11	21	2004	FIXED OBJECT	0	0	0	0	1	1	1	101341761	8.58
11	24	2009	ANIMAL	0	0	0	0	1	5	1	102746774	8.58
12	31	2009	SIDESWIPE, SAME DIRECTION	0	0	0	1	1	5	1	102758274	8.594

Table 10.56. continued (NC-87 and Wilmington Highway/Doc Bennett Road Crash Data)

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
10	3	2005	REAR END, SLOW OR STOP	0	0	1	0	1	5	1	101501857	8.93

Table 10.57. NC-87 and Thrower Road/SR-2245 Crash Data

Month	Day	Year	Crash Type	Injury				Condition			Crash ID	MP
				F	A	B	C	R	L	W		
11	11	2009	ANGLE	0	0	0	1	2	5	3	102718812	3.94
5	28	2010	REAR END, SLOW OR STOP	0	0	0	0	2	1	3	102874894	3.94
3	23	2010	REAR END, SLOW OR STOP	0	0	0	1	1	1	1	102821237	3.97
3	7	2010	ANIMAL	0	0	0	0	1	5	1	102809458	4.07
8	27	2009	ANGLE	0	0	0	2	1	1	1	102665051	4.33
12	26	2006	ANIMAL	0	0	0	0	1	5	1	101921766	4.69
1	22	2008	ANGLE	0	0	0	0	1	5	1	102172645	4.69
2	25	2008	ANGLE	0	0	0	2	1	2	1	102269896	4.69
3	5	2008	SIDESWIPE, SAME DIRECTION	0	0	0	0	1	1	1	102276165	4.69
4	12	2008	REAR END, SLOW OR STOP	0	0	0	0	1	1	2	102303474	4.69
6	7	2008	OVERTURN/ROLLOVER	0	0	0	0	1	1	1	102344291	4.69
7	20	2005	ANIMAL	0	0	0	0	1	1	1	101522260	4.719
7	4	2008	FIXED OBJECT	0	0	0	1	1	5	1	102361099	4.73
5	22	2007	ANIMAL	0	0	0	0	1	5	1	102045994	4.79
8	18	2008	ANIMAL	0	0	0	0	1	3	1	102390224	4.79
12	14	2007	FIXED OBJECT	0	0	1	0	1	5	1	102216557	4.797
11	13	2003	ANIMAL	0	0	0	0	1	5	1	101042600	4.8
10	26	2009	ANIMAL	0	0	0	0	1	5	1	102703068	4.802
8	31	2006	OVERTURN/ROLLOVER	0	0	0	0	2	5	2	101820452	4.827
9	30	2004	LEFT TURN, SAME ROADWAY	0	0	0	0	1	3	5	101296726	4.83
11	9	2004	ANIMAL	0	0	0	0	1	1	1	101330970	4.83
12	24	2004	FIXED OBJECT	0	0	0	0	1	5	1	101371041	4.83
9	17	2005	LEFT TURN, SAME ROADWAY	0	0	0	2	1	1	1	101563765	4.83
4	1	2010	ANIMAL	0	0	0	0	1	5	1	102842672	4.89
3	3	2010	REAR END, SLOW OR STOP	0	0	0	1	1	1	2	102814664	4.93

10.3 Resident, Commuter, and Business Survey

10.3.1 Resident Survey

Figure 10.31 shows the initial letter mailed to residents explaining the survey, Figure 10.32 shows the cover letter that accompanied the survey packet, and Figure 10.33 shows the residential survey. Figure 10.31 shows the reminder letter for those residents who did not complete the initial survey.

CURRENT RESIDENT
123 Main St.
Somewhere, NC 12345

Greetings,

North Carolina State University is conducting research sponsored by the North Carolina Department of Transportation to evaluate the effects of superstreets. A superstreet is an intersection design that prohibits direct left-turn and through movements from the side streets. Instead, the left turns from the side streets are made by turning right onto the main road then making a u-turn using a one-way median opening, as shown by the dotted line in the diagram below; through movements across the main road are done in a similar manner, as shown by the dashed line in the diagram.

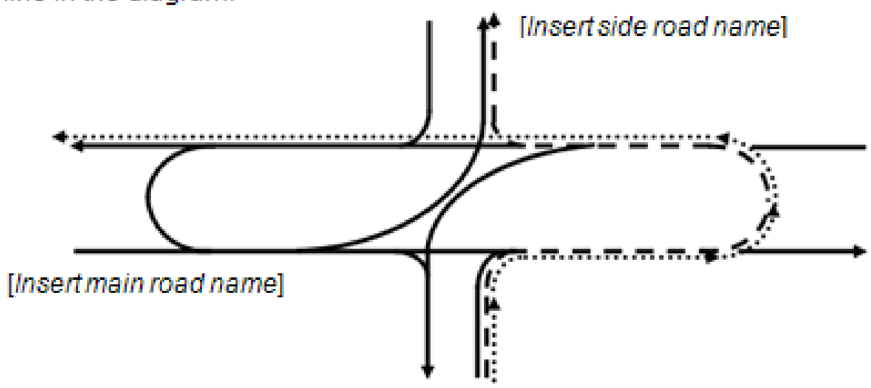


Figure 1. Basic superstreet design

We are gathering opinions from residents that live near a superstreet to better understand how well the design is working. A superstreet is located near you at the intersection of [*insert road name*] and [*insert road name*]. **A short, one-page questionnaire will be arriving in the mail shortly, and will include a return envelope with pre-paid postage for your convenience.** You have been selected to represent your neighbors in this survey – your opinion is of great value.

Please help us by taking a few minutes to participate in this study by completing and returning the survey form when you receive it. All participants and responses will remain anonymous. If you have any questions please contact the study director, Dr. Joseph Hummer at (919) 515-7733 or hummer@ncsu.edu.

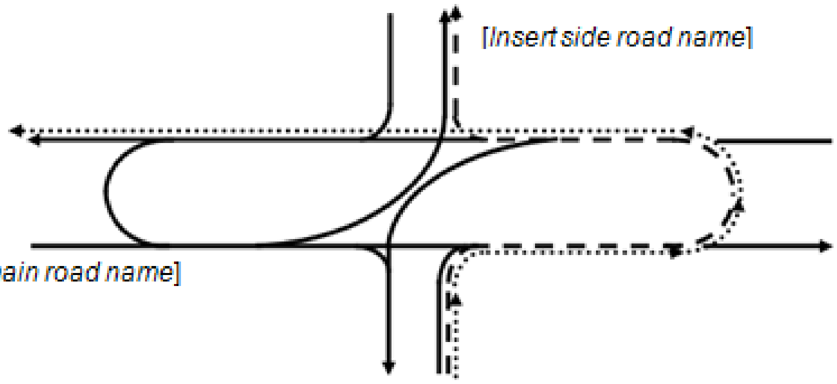
Thank you!

Figure 10.31. Initial Letter Mailed to Residents Explaining the Survey

CURRENT RESIDENT
123 Main St.
City, NC 12345

Greetings,

North Carolina State University is conducting research sponsored by the North Carolina Department of Transportation to evaluate the effects of superstreets. A superstreet is an intersection design that prohibits direct left-turn and through movements from the side streets. Instead, the left turns from the side streets are made by turning right onto the main road then making a u-turn using a one-way median opening, as shown by the dotted line in the diagram below; through movements across the main road are done in a similar manner, as shown by the dashed line in the diagram.



As you may recall from our previous letter, we are gathering opinions from nearby residents to better understand how well the design is working. A superstreet is located near you at the intersection of [*insert road name*] and [*insert road name*]. **To ensure we have a good cross-section of the population, please help us by having the licensed driver – at least 16 years of age – within the household who will be celebrating the next birthday answer the following brief survey questions found on the back of this letter.**

When you are finished please place this survey in the mail using the enclosed envelope and pre-paid postage. If you have any questions contact the study director, Dr. Joseph Hummer at (919) 515-7733 or hummer@ncsu.edu. All participants and responses will remain anonymous.

Thank you for your help with this important research!

Figure 10.32. Cover Letter that Accompanied the Survey Packet

RESIDENT SURVEY

1. How long have you, personally, lived near this intersection?
   - ☐ Less than 1 year ☐ 1 – 3 years ☐ 4 – 10 years ☐ More than 10 years

2. How often do you, personally, drive this section of road?
   - ☐ Daily ☐ Weekly ☐ Monthly ☐ Few times a year

3. How does navigation through the superstreet compare to a typical intersection?
   - ☐ Easier/less confusing ☐ The same ☐ More difficult/more confusing

4. Had you heard about the superstreet concept before it was built at your location?
   - ☐Yes ☐ No

   If yes, what was your opinion on the superstreet concept before it was build at your location?
   - ☐ Positive opinion ☐ Neutral opinion ☐ Negative opinion
   - ☐ Did not know enough about superstreets to form an opinion

5. Did you live here and have your driver's license prior to the construction of the superstreet? ***If no, skip ahead to question 10. If yes, proceed with survey.***
   - ☐ Yes ☐ No (***skip to question 10***)

6. How do you, personally, feel the superstreet has affected your ability to safely navigate the roadway compared to the previous roadway design?
   - ☐ Positively ☐ Negatively ☐ Same

7. How do you, personally, feel the superstreet has affected property values in your area?
   - ☐ Positively ☐ Negatively ☐ Same ☐Don't know – I rent

8. How was travel time through this section of roadway affected during the construction period?
   - ☐ Less travel time ☐ No change ☐ More travel time

9. What differences, if any, have you, personally, experienced in travel time since the opening of the superstreet?
   - ☐ Less travel time ☐ No change ☐ More travel time

10. What differences, if any, have you, personally, noticed in the number of stopped vehicles waiting to make a safe maneuver since the opening of the superstreet?
    - ☐ More stopped vehicles ☐ No change ☐ Fewer stopped vehicles

11. Please select your age range:
    - ☐ 16-29 ☐ 30-49 ☐ 50-65 ☐ 66 or above

12. Please select your gender:
    - ☐ Male ☐ Female

In the space below, please provide any additional thoughts you may have regarding superstreets. This may include comments related to topics covered in this questionnaire or you may address topics not covered in this survey.

Please place this form in the enclosed envelope and mail it back to us.
Thank you!

Figure 10.33. Survey Mailed to Residents Living Near Superstreets

CURRENT RESIDENT
123 Main St.
City, NC 12345

Greetings,

By now you should have received notice of a research study North Carolina State University is doing for the North Carolina Department of Transportation on the effects of superstreets. To remind you, a superstreet is an intersection design that prohibits direct left-turn and through movements from the side streets. Instead, the left turns from the side streets are made by turning right onto the main road then making a u-turn using a one-way median opening, as shown by the dotted line in the diagram below; through movements across the main road are done in a similar manner, as shown by the dashed line in the diagram.

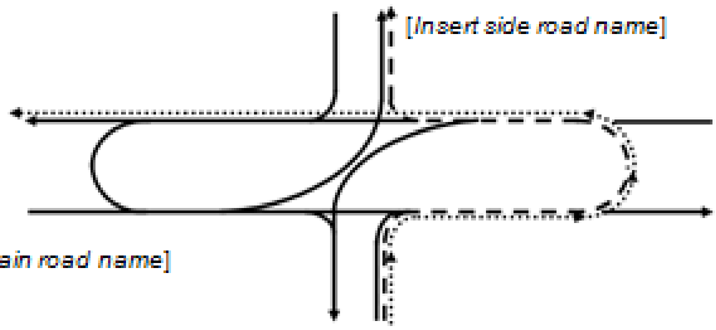


Figure 1. Basic superstreet design

Our records show that you have not returned our survey. We would like to remind you that you have been selected to represent your neighbors in the study, and your opinion is very important in helping us understand how well the design is working. If in fact you have returned the survey, we thank you for your participation!

For your convenience, we will be mailing you another survey packet. Please take the time to fill out the short questionnaire. As a reminder, a superstreet is located near you at the intersection of [*insert road name*] and [*insert road name*]. All participants and responses will remain anonymous. If you have any questions please contact the study director, Dr. Joseph Hummer, at (919) 515-7733 or hummer@ncsu.edu.

Thank you for your help with this important research!

Figure 10.34. Reminder Letter Mailed to Residents Who had Not Responded to the Initial Survey

10.3.2 Commuter Survey

Figure 10.35 shows the initial introductory statement emailed to UNC-CH faculty and staff explaining the survey, and Figure 10.36 shows the commuter survey. Figure 10.37 shows the reminder email for those faculty and staff that did not complete the initial survey.

Greetings,

North Carolina State University is conducting research sponsored by the North Carolina Department of Transportation to evaluate the effects of superstreets. A superstreet is an intersection design that prohibits direct left-turn and through movements from the side streets. Instead, the left turns from the side streets are made by turning right onto the main road then making a U-turn using a one-way median opening; through movements across the main road are done in a similar manner.

The team are gathering opinions from University of North Carolina faculty and staff to better understand how well the design is working. A superstreet is located near the UNC-CH campus at the intersection of US-15/501 and Europa Dr. / Erwin Rd. This intersection is located just north of the Franklin St./US-15/501 split and 1.2 miles west of I-40. Many UNC-CH faculty and staff commute to work through that intersection. **Please help us evaluate the superstreet by answering the following brief survey questions found below. It will take approximately 3 minutes to complete this survey.**

Please fill out the survey using the following steps:

1. Reply to this email by clicking "Reply"
2. Place an "X" before the answer that best fits your opinion for each question
3. When you are finished please email this survey back to Sarah Ott at seott@ncsu.edu

If you have any questions about the survey or superstreets contact the study director, Dr. Joseph Hummer at (919) 515-7733 or hummer@ncsu.edu. All participant identification and particular responses will remain anonymous in our reports and publications.

Thank you for your help with this important research!

Figure 10.35. Initial Introductory Statement Emailed to UNC-CH Faculty and Staff

UNC-CH FACULTY AND STAFF SURVEY

1. How long have you worked in Chapel Hill?
   _ Less than 1 year
   _ 1 – 3 years
   _ 4 – 10 years
   _ More than 10 years
   _ I don't work in Chapel Hill

2. How often do you, personally, drive on US-15/501 at Europa Dr. / Erwin Rd.?
   _ Daily
   _ Weekly
   _ Monthly
   _ Few times a year
   _ Never

   If your answer to Question 2 is "Never", please skip to Question 11

3. How do you drive through the intersection of US-15/501 and Europa Dr./Erwin Rd. into town most often?
   _ As a through driver on US-15/501 without turning onto Europa Dr. or Erwin Rd.
   _ Turning from US-15/501 onto Europa Dr. or Erwin Rd.
   _ Turning from Europa Dr. or Erwin Rd. onto US-15/501

4. How do you drive through the intersection of US-15/501 and Europa Dr./Erwin Rd. out of town most often?
   _ As a through driver on US-15/501 without turning onto Europa Dr. or Erwin Rd.
   _ Turning from US-15/501 onto Europa Dr. or Erwin Rd.
   _ Turning from Europa Dr. or Erwin Rd. onto US-15/501

5. How does navigation through the superstreet compare to a typical intersection?
   _ Easier/less confusing
   _ The same
   _ More difficult/more confusing

6. Had you heard about the superstreet concept before it was built at US-15/501?
   _ Yes
   _ No

   If yes, what was your opinion on the superstreet concept before it was built at US-15/501?
   _ Positive opinion
   _ Neutral opinion
   _ Negative opinion
   _ Did not know enough about superstreets to form an opinion

Figure 10.36. Survey Emailed to UNC-CH Faculty and Staff

7. How do you, personally, feel the superstreet has affected your ability to safely navigate the roadway compared to the previous roadway design?
    _ Positively
    _ Negatively
    _ Same

8. How was travel time through this section of roadway affected during the superstreet construction period?
    _ Less travel time
    _ No change
    _ More travel time

9. What differences, if any, have you, personally, experienced in travel time since the opening of the superstreet?
    _ Less travel time
    _ No change
    _ More travel time

10. What differences, if any, have you, personally, noticed in the number of stopped vehicles waiting to make a safe maneuver since the opening of the superstreet?
    _ More stopped vehicles
    _ No change
    _ Fewer stopped vehicles

11. Please select your age range:
    _ 18-29
    _ 30-49
    _ 50-65
    _ 66 or above

12. Please select your gender:
    _ Male
    _ Female

In the space below, please provide any additional thoughts you may have regarding superstreets. This may include comments related to topics covered in this questionnaire or you may address topics not covered in this survey.

Thank you!

Figure 10.36. continued

Greetings,

By now you should have received notice of a research study North Carolina State University is doing for the North Carolina Department of Transportation on the effects of superstreets. To remind you, a superstreet is an intersection design that prohibits direct left-turn and through movements from the side streets. Instead, the left turns from the side streets are made by turning right onto the main road then making a U-turn using a one-way median opening; through movements across the main road are done in a similar manner.

Our records show that you have not returned our survey. The team would like to remind you that you have been selected to represent your fellow commuters in the study, and your opinion is very important in helping us understand how well the design is working. If in fact you have returned the survey, the team thank you for your participation! For your convenience, another survey is included in this email. Please take the time to fill out the short questionnaire. As a reminder, a superstreet is located near the UNC-CH campus at the intersection of US-15/501 and Europa Dr./Erwin Rd. This intersection is located just north of the Franklin St. / US-15/501 split and 1.2 miles west of I-40.

Please fill out the survey using the following steps:

1. Reply to this email by clicking "Reply"
2. Place an "X" before the answer that best fits your opinion for each question
3. When you are finished please email this survey back to Sarah Ott at seott@ncsu.edu

If you have any questions about the survey or superstreets contact the study director, Dr. Joseph Hummer at (919) 515-7733 or hummer@ncsu.edu. All participant identification and particular responses will remain anonymous in our reports and publications.

Thank you for your help with this important research!

Figure 10.37. Reminder Email Sent to Faculty and Staff Who had not Responded to the Initial Survey

10.3.3 Business Survey

The team conducted business surveys at two signalized superstreet locations through personal interviews. Figure 10.38 shows the business survey.

Economic Effects of Access Management - Median Design on US-15/501

The North Carolina Department of Transportation (NCDOT) is conducting an analysis of the economic effect of access management techniques through a research project at NC State University. In particular, this project will document the effect of the median modification (an access management technique) that occurred on the roadway adjacent to your business. The research team is asking each business to complete the following questionnaire. Your answers will be kept anonymous and data will be summarized so that the analysis and report will in no way disclose data on your specific company. The research team thanks you in advance for filling out this brief survey. Your time is valuable, and the answers you give will help NCDOT further understand the effects of access management techniques.

Contact Information

***Note: This survey should be completed by an individual who has been at this location or familiar with its operations since 2008.**

Name:	
Organization:	
Phone Number:	
Mailing Address:	
Email Address:	
Website:	

1 When did this business begin operations at this location, if known? Month ________ Year ________
When did you begin your employment at this location? Month ________ Year ________
What is your job title? ____________________

2 How would you classify this bus
_ Local (one location) _ Local (multiple locations) _ Regional Chain
_ National Chain _ Other (please specify) _______________

3 Please rank the following considerations in ascending order from 1 to 6 (with 1 as the most important) that you think customers use when selecting a business of your type, please assign **each number only once**:
Accessiblity to Store ________
Customer Service ________
Distance to Travel ________
Hours of Operation
Product Price
Product Quality ________

4 What percentage of your customers do you believe are customers who did **NOT** intend to stop at your particular business at the beginning of their trip?
_ 0% to 20% _ 21% to 40% _ 41% to 60% _ 61% to 80% _ 81% to 100%

Figure 10.38. Business Survey

5 What are your approximate number of sales transactions/patrons?

For an average week ________ sales transactions / patrons (please circle which value you reported)

For an average Satur ________ sales transactions / patrons (please circle which value you reported)

6 Has your expected monthly revenue pattern changed since 2008?
_ Yes _ No

If you answered YES, please describe why you think the fluctuation occurred (List all applicable reasons).

____

____

Are you familiar with the fact that the median design of the main roadway alongside your business changed
7 in 2008?
_ Yes _ No

If yes, please turn to the next page to complete the survey.
If no, please return the survey, thank you for your time and effort.
8 Were you in favor of the roadway modifications before construction?
_ Yes _ No
Why or Why Not?: ______________________________

____

9 Did your business experience a change in the number of **regular** customers **during construction** on the project?

_ Decrease _ No Change _ Increase

Following the **completion of the project**, has your business experienced a change in the number of **regular** customers?

_ Decrease _ No Change _ Increase

10 Do you feel that the **installation of the raised median** has made the following parameters better, worse, or about the same as before the median project was constructed?

Figure 10.38. continued

a. Traffic Congestion	_ Better	_ Worse	_ Stayed about the same
b. Traffic Safety	_ Better	_ Worse	_ Stayed about the same
c. Number of Customers per Day	_ Better	_ Worse	_ Stayed about the same
d. Gross Sales	_ Better	_ Worse	_ Stayed about the same
e. Property Value	_ Better	_ Worse	_ Stayed about the same
f. Customer Satisfaction with Access to Store	_ Better	_ Worse	_ Stayed about the same
g. Delivery Convenience	_ Better	_ Worse	_ Stayed about the same

11 What was your involvement in the public hearing and public meeting process for this median project?
_ Attended several meetings   _ Attended one meeting   _ No involvement
_ Not aware of any public hearings or meetings

12 Please share any additional thoughts on the median project adjacent to your business. This may include thoughts on the survey questions or other thoughts on median treaments and their impacts you might have.

___

___

___

Please return this completed form to Daniel Findley via one of the following methods:

Email: Daniel_Findley@ncsu.edu
Fax: 919-515-8898
Mail: ITRE
Access Management Survey
Centennial Campus Box 8601
Raleigh, NC 27695-8601

If you have any questions, comments or concerns regarding this study please call Mr. Bob Foyle with the Institute for Transportation Research and Education at NC State at (919) 515-8580.

End of Survey - Thank you for taking the time to complete this survey!

Figure 10.38. continued