Red Light Robber does not support this paper. This paper performs a forensic analysis focusing on driver behavior while ignoring the initial causes. For a treatise on this paper, click on the red light robber image above.

Evaluating the Use of Red Light Running Photographic Enforcement Using Collisions and Red Light Running Violations

Final Report

Presented to the

North Carolina Governors Highway Safety Program

by

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FINAL REPORT

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ABSTRACT

The issue of red light running (RLR) has long been a problem throughout the United States. There is considerable debate within the general public and public agencies regarding the use of photographic enforcement to deter red light violations. Many studies have been conducted on the effectiveness of red light cameras (RLCs) at reducing collisions. However, the question still remains as to whether RLCs actually change driver behavior. Many municipalities across the State of North Carolina have relied on studies conducted in other states or countries to validate rigorous. The need for more thorough study motivated this research effort to help define the effectiveness of RLCs within the City of Raleigh, North Carolina.

Four specific tasks were identified to help in this research effort. First, a literature review was conducted to determine the reported effects of other research efforts throughout the United States and other countries. Various types of studies have been conducted around the world. Of particular interest were studies that were rigorous in nature, such as those using comparison sites. Many studies indicate that RLC enforcement reduces the frequency of collisions at treated intersections. However, there are a limited number of rigorous studies (especially those in the United States and in North Carolina). Analyses that used comparison sites usually did not perform tests to see if comparison sites acted in a similar manner to treatment sites.

Six focus groups were convened in an effort to gather information on attitudes, opinions, and beliefs associated with photographic enforcement to better enhance traffic law enforcement. Two community and four professional focus groups were assembled. Overall, the perception of photographic enforcement was positive. Suggested improvements included enhancing the appeal process, using profit for local government support such as schools or more enforcement, and

placing traffic signals in flashing red and yellow at low volume intersections during early morning hours of operation. The majority of participants agreed that the presence of RLCs would make them more aware of individual driver behavior; however, most of the groups agreed that the range of driver education varied widely and that driver education should be a priority.

In an effort to analyze the effect of RLCs on driver behavior, two types of analyses were completed. The first type of analysis was a before-after collision study. The following three types of improved before-after collision studies were used: accounting for causal factors, a comparison group analysis, and an improved comparison group analysis accounting for the halo-effect. Each of these studies analyzed four categories of collisions including total, red light running related, angle, and rear end. Based on the comparison group study, collisions were effectively reduced by 17%, 22%, 42% and 25%, respectively. In addition to the analysis of collisions, red light running violations were analyzed to see if there was a change in driver behavior related to dangerous violation times (violations considered to possibly cause collisions) greater than two seconds. Using the Chi-Square Test of Independence, the frequency of unsafe red light running violations reduced significantly with a p-value less than 0.001.

Based on these findings, RLCs appear to have a positive effect on driver behavior. Focus groups indicate that overall there is a positive perception of RLCs as a countermeasure to deter red light running. Based on the comparison group collision study, all collision group types decreased considerably. Lastly, red light running violations related to dangerous red light violation times dramatically decreased, providing further justification for the use of RLCs as a red light running countermeasure.

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I. INTRODUCTION

BACKGROUND

Automated photographic enforcement at intersections consists of cameras placed near the intersection to photograph a red light running vehicle. In most cases, the RLC takes a total of three pictures as seen in Figures 1-3 *(1)*: one of the vehicle before it enters the intersection, but across the stop bar clearly showing the red light, a second picture of the vehicle as it continues through the intersection with the red still showing, and a third picture that is a close-up of the vehicle's license plate.

Figures 1-3. Typical Three-Picture Layout of a RLR Violation *(1)*

These pictures show nearly irrefutable evidence that a driver indeed ran the red light. Although RLCs clearly show a RLR violation, many problems have surfaced between the public and the respective municipalities. Collision studies have shown decreases in angle collisions; however, some studies show increases in rear-end collisions. One argument is that the cause-effect relationship of reduced angle collisions does not offset the rise in rear-end collisions caused by the implementation of the RLC. In addition, some members of the community are concerned with "big brother" issues and the right to privacy. Concerns of these types have made RLCs one of the most controversial topics throughout various municipalities in the United States.

This unease and added attention has led this research effort to further investigate the safety benefits, if any, of RLCs, specifically related to North Carolina.

PROJECT OBJECTIVES

This research project aims to answer the question, "Do RLCs change driver behavior by reducing the frequency of collisions and dangerous RLR violations?" Four tasks were identified to help answer this question. These tasks are:

1) A literature review summarizing the findings from previous research.
2) Focus groups to gather information on attitudes, opinions, and beliefs about the use of photographic enforcement to enhance traffic law enforcement.
3) Before-after collision studies for various types of collisions related to RLR violations.
4) The frequencies of dangerous RLR violations were analyzed to identify any driver behavior changes at photo-enforced intersections.

SCOPE

Six focus groups were conducted throughout the state in places such as Wilmington, Raleigh, Greenville, Asheville, and Greensboro. The goal was to gather opinions, attitudes, and beliefs of various community and professional groups around the state of North Carolina.

The before-after collision study was restricted to the City of Raleigh. Collisions were collected within 500 feet of an intersection. Four groups of collisions were studied: total, RLR related, angle, and rear-end. An analysis of these collision groups gives insight into the effectiveness of RLCs at reducing collisions using three different types of studies: accounting for causal factors, using a comparison group, and a comparison group study accounting the halo-

effect. A total of twelve studies were completed (three types of studies for four groups of collisions).

Comparison groups were chosen from a pool of intersections provided by the City. To account for the halo-effect, sites were eliminated that did not meet two specified criteria. The first criterion required that a comparison site be within one mile of a treatment site. The second criterion was that the comparison site must lie on the same corridor as the treated location.

An analysis of potentially dangerous RLR violations was completed using data from two municipalities. From a previous research effort, we were able to obtain data from the Town of Chapel Hill for two treated RLC approaches. These data, in combination with the data obtained from eight treated locations in the City of Raleigh, were useful in determining if driver behavior changed relative to the frequency of unsafe RLR violations.

II. RESEARCH METHODOLOGY

Two types of analyses took place to identify whether or not there were changes in driver behavior related to the countermeasure, RLCs. The intent was to answer the question, "Do red light cameras change driver behavior by reducing collisions and the frequency of dangerous red light running violations?".

PRIMARY ANALYSIS: BEFORE-AFTER COLLISION STUDY

Raleigh's selection process for installing cameras was not the same as that of many municipalities. Most cities and towns chose camera sites primarily based on crash incidence, specifically angle collisions. This was the case for Raleigh; however, a secondary emphasis of disbursement throughout the City was also a priority of town officials *(5)*. This is the primary difference between this study and most others of its type. By adding the second factor of disbursement, sites were not chosen in a top-down fashion with relation to angle collisions. Instead, they were chosen sporadically from a pool of previously identified high angle collision locations. This allowed for a "nearly random" selection of treatment locations. By choosing RLC locations in this manner, we were able to use comparison sites in a similar manner as the City from the same pool of sites. Similarity between the sites was then validated in order to complete the comparison group analysis.

The ability to use good comparison sites makes Raleigh an excellent candidate for analysis of RLCs; however, there are other reasons that make it even better for study. Raleigh's vast roadway system and high traffic volumes make it an excellent choice of study because higher numbers of collisions are likely to occur. In addition, the vast expanse of Raleigh's city limits

and the dispersion of sites allow us to better account for spillover effects caused by the halo-effect in an additional comparison group collision study. Last, traffic volume counts are taken frequently by the City of Raleigh and were used in another study type accounting for causal factors. These three analysis techniques (causal factors, comparison group, and comparison group accounting for halo-effect) are more robust than a simple, naive, before-after study based on trend analysis because there is a pool of sites compared to the treatment sites *(4)*.

SECONDARY ANALYSIS: ANALYSIS OF TIME OF VIOLATION AFTER THE RED BALL INDICATION

In working with the Town of Chapel Hill and the City of Raleigh, we were able to obtain RLR data for many various intersections. Part of this set was data that were collected from a video-validation study that was taped at various intersections throughout the two municipalities *(6)*. The red light violation data were graphed by bins based on the frequency of occurrence. As with the analysis of collisions, the primary goal of this study was to see if there was a significant change in driver behavior. A Chi-Square Test of Independence was used to see whether camera implementation had an effect on decreasing violations greater than two seconds after the onset of the red ball indication *(7)*. This was assumed to be the time that red light running collisions would begin to take place based on previous research *(2,8)*.

III. LITERATURE REVIEW

Alternatives such as photographic enforcement cameras may significantly increase traffic safety awareness, while decreasing the number of many types of collisions. Currently, there is an abundant amount of literature concerning the safety of RLCs. The scope of this review will cover two main components of red light enforcement. First, the reader should obtain an understanding of a properly implemented RLR program. Second, findings from similar research will be given from various studies around the world.

RED LIGHT RUNNING AUTOMATED ENFORCEMENT POLICY

In June 2001, NCSU-ITRE published a report for NCGHSP entitled "A Recommended Policy for Automated Electronic Traffic Enforcement of Red Light Running Violations in North Carolina". The research team conducted an extensive review of RLC systems currently in operation around the country (paying particular attention to those located in North Carolina) in order to evaluate their effectiveness and to suggest possible improvements that could enhance their performance and public acceptance.

After considerable research and field data collection, the NCSU-ITRE research team developed an eight-stage process for implementing RLR countermeasures that is shown below *(2)*.

1. Conduct a traffic engineering study to verify the existence, extent, and causes of the problem
2. If feasible, implement traffic engineering countermeasures
3. Consider implementation of traditional enforcement measures, perhaps with "rat boxes" (explained below)
4. If engineering countermeasures and/or traditional enforcement proves to be unsuccessful or unfeasible, then select appropriate RLC locations

5. Choose a financing arrangement to ensure that public safety will remain the primary goal
6. Conduct a detailed, perpetual public information and educational effort regarding the program
7. Implement RLCs at intersections with the highest potential for crash reduction benefits
8. Monitor camera-controlled intersections, and indeed all countermeasures, for progress over time"

Rat boxes are cheap and easy to install. The boxes have an LED light that is wired into the back of the traffic signal allowing an officer to sit on the other end of the intersection. This is much safer than in the past because it keeps the officer from having to cross opposing traffic. When a commuter illegally runs a red light, the rat box illuminates on the rear of the signal head letting the officer know that he has committed a violation. The officer can then write the citation to the driver, not the owner of the car the driver happens to be in, thus removing any doubt about who is driving the car. In addition, they can account for any personal problems or other various violations that may be the root of the problem. This type of enforcement also allows the officer to have some objectivity when a violation occurs. Rat boxes cost approximately $100 to construct, with associated cost of installation and signing. This simple, yet innovative RLR equipment could be very advantageous, as well as comparatively cheap.

The above plan has been recognized as "an excellent process" by James Bonneson (Texas Transportation Institute, TTI) *(9)*. The NCSU-ITRE research team noted in their final report that North Carolina Senate Bill 741 allows for the use of photographic enforcement for any type of traffic violation (not just RLR), and its use can extend into any area or roadway type. While some of the aforementioned recommendations deal specifically with RLC enforcement, in

general they may all be adapted so that they are applicable to other violations that may be monitored by photo enforcement.

In, "Red-Light Cameras: Effective Enforcement Measures for Intersection Safety" *(10)* published in the March 2003 Institute of Transportation Engineers (ITE) Journal, Leslie Blakey noted that the common guidelines in most any successful RLC program included the following steps:

1. Identifying the safety problem and determining if RLCs are an appropriate solution
2. Identifying and enlisting the support of key players
3. Establishing program goals
4. Evaluating and selecting sites
5. Initiating a multifaceted public awareness campaign prior to program start and continuing it through the life of the program
6. Resolving legislative needs
7. Choosing a camera system and vendor(s) based on the jurisdiction's objectives, priorities and resources
8. Implementing the program using best management practices
9. Predicting, acknowledging and addressing public concerns
10. Evaluating and monitoring the program's success

It is easy to see the similarity between the guidelines from NCSU-ITRE and from Blakey. In her paper, Blakey noted that the most important elements to a well-executed program were steps 1, 3, 4, and 9. The guidelines from NCSU-ITRE and Blakey are very helpful to any enforcement program across the country; however, it was noted by Blakey that RLCs should only be used as a "supplement to good engineering, which is a prerequisite for intersection safety", thus re-enforcing the primary goal as <u>safety</u>.

RED LIGHT RUNNING STATISTICS AND MEDIA REPORTS

In 1998, the Federal Highway Administration (FHWA) reported that approximately 22% of some 1.8 million urban intersection occurred in the U.S. during 1997 *(12)*. In a similar report, the National Highway Traffic Safety Administration (NHTSA) reported that 89,000 crashes, 80,000 injuries, and nearly 10,000 deaths per year were reported in the U.S. from RLR drivers *(13)*. RLR cameras are becoming an increasingly popular safety tool in deterring RLR-related intersection crashes across North Carolina. Cameras have already been installed in Wilmington, Fayetteville, Charlotte, Cary, Chapel Hill, Raleigh, Greensboro, High Point, and other municipalities. According to interviews with many traffic engineers from these areas, popularity mostly stems from the reported safety benefits these cameras have shown in pilot studies across the world and the public's acceptance and awareness of RLR *(14)*.

However, popularity has been degraded in places like Washington, D.C. Mayor Anthony A. Williams, in a September 2002 interview with *The Washington Times*, stated, "We (Washington, D.C.) need to expand the use of traffic cameras because the city needs the money *(15)*." Statements like these alter public opinions of RLC systems because objectives of certain people are skewed. Statements like the one made by Williams clearly alter the perception that RLCs are safety countermeasures, making them appear as money traps.

In Santa Clara County, California, high incident rates at intersections, combined with public awareness, has increased the use of RLR enforcement equipment *(11,21)*. In a recent crackdown on red light runners at 38 intersections in their county, a campaign was initiated to share stories of the victims, families, and survivors who have been affected by red light jumpers. Some of their statements follow.

- "You see people running red lights every day. It's ridiculous. Maybe if they hear our stories, it will hit home." – Bobby Soto, Palo Alto
- "Survivors and their personal experiences can really help people change their behavior and shape public policy. We've seen it with drunk driving, and I think it can be as effective w/ red-light runners." – Paul Gratz, coordinator of the Traffic Safe Communities Network (TSCN), Silicon Valley
- "I always have the feeling that somebody is behind me and that I have to be watching out for all the cars." Terry Clow, Hayward County

During this crackdown in 2000, California's Santa Clara County conducted a simple, naïve, before-after study on RLR cameras effectiveness at reducing collisions. They noted a 60% reduction in RLR violations at one of its high incidence intersections, with 14% and 12% at two others. The previous year, there were 7,000 injuries and 19 deaths reported in Santa Clara alone due to RLR, which shows that in 2000 there was potential for major decreases in RLR violations and related injuries.

However, findings from this study are likely flawed. Although the results from this analysis are quantitatively significant, the study sites in question are not compared to similar sites and adjustments such as traffic volumes are not accounted made. Because this is true, the study was possibly flawed before it even took place because sites were likely high incident areas. Therefore, collisions would have been expected to decrease in the following years, based on previously recorded high volumes of collisions.

Studies of this nature have been performed around the world and are commonplace. A summary of many noteworthy studies across the world should give an indication of what has been found in similar analyses. First, studies done in the United States will be reviewed.

Because RLR cameras have been implemented in other countries long before the U.S., a look at these studies in the following section should provide further insight to possible safety benefits of RLCs.

VARIOUS STUDIES COMPLETED ACROSS THE U.S.

Charlotte, NC

Charlotte was the first city to introduce RLR cameras into North Carolina in August 1998. Since then, many cities and municipalities across North Carolina have followed suit. In the fourth year annual report (August 2001 – July 2002), Charlotte analyzed fourteen continuously operational intersections since 1998 against three years of before data *(17)*. Their report found that after four years, five of the fourteen intersections reported crash reductions of 20% or more. Nine of the fourteen intersections reduced angle collisions by at least 20%. All types of crashes at the fourteen RLC approaches were reduced by 20% or more, and angle collisions at all fourteen intersections approaches decreased by 57%.

RLCs in the Charlotte area appear to cause a decrease in many types of collisions. Previous reviews by the City of Charlotte in previous years indicated more severe reductions at a larger number of intersections *(19)*. This suggests that there is a diminishing effect of the crash reductions as the system ages, which would be expected. Nonetheless, it does indicate that the evaluation period has an effect on the findings in the analysis.

In addition, findings from their annual report suggest the need for further analyses. In their fourth year annual report, there was no mention of rear-end collisions. This is one of the major types of collisions that is likely affected by RLCs. Based on previous analyses by the City of

Charlotte, rear-end collisions at treated intersections were reported to increase by approximately 16% *(19)*. It is possible that rear-end collisions may have increased over the following years. In addition, considering comparison sites to account for seasonality and history effects, or using traffic volumes, would further strengthen the City of Charlotte's study of their RLC system.

Greensboro, NC

A recent study of RLR cameras was conducted by the Urban Transit Institute at North Carolina Agricultural & Technical State University in September 2003 *(18)*. It analyzed the impact of RLCs on crashes at signalized intersections using total, angle, rear-end, and side-swipe collisions, as well as collision severity. The study took place over a forty-five month period, with cameras being introduced at the beginning of the 27th month. It used the maximum likelihood method with Poisson and Negative binomial regression to complete what was termed as an "expanded before-after" analysis using statistical modeling.

The results of the model did not support most findings of other studies that RLCs reduce collisions. Instead, their model suggests that the presence of RLCs may actually be associated with marginal increases in total and angle crashes and decreases for rear end collisions (11%, 8%, and -1%, respectively). This model suggests very counterintuitive findings.

A look at the data the model is based upon supports most of the author's findings. Total collisions did increase from a mean of 16.428 to 16.638 (accidents per month per million ADT) (t stat = 0.113). Angle collisions also increased, with a mean changing from 4.899 to 6.199 (t stat = 1.368). However, rear end collisions contradicted the model showing a change in the mean from 5.036 to 5.28 (t stat = 0.238).

However, as with other studies conducted, there seem to be inherent flaws. First, the model does not appear to fit the data very well. Pseudo R^2 values for nearly all types of collisions were less than 0.2, with some falling below 0.1. This shows a very poor fit. Second, regression-to-the-mean appears to be a setback with this study. A data set consisting of various features, attributes, collisions, etc. of 302 signalized intersections within Greensboro were used in the model. Comparisons were made between RLC sites and all other intersections in this data set, with no regard to how the treated RLC sites were chosen. The fact that RLC sites are usually selected based on high accident rates or the fact that they are known dangerous sites (usually those with multiple lanes and high traffic volumes) bias the model because the remaining comparison sites are likely less dangerous. No tests were done to see if the large comparison group acted in a similar manner to RLC sites. Additionally, with the large data set that was chosen, the halo-effect should compromise the model because the small number of treated intersections affects likely spill over in many of the comparison sites. Lastly, Table 4.3 in the report to Greensboro shows crashes at non-camera sites dropped due to many fewer left-turn collisions. This suggests the improvements may have been at some intersections; however, no explanation was given in the report.

Oxnard, CA

The Insurance Institute for Highway Safety (IIHS) conducted one of the most highly publicized studies of RLCs in 2002 *(20,19)*. They conducted a before-after study of four cities in California: Bakersfield, Oxnard, Santa Barbara, and San Bernardino. All four cities were said to be similar in nature. The study was comprised of three cities acting as comparisons, with

Oxnard acting as the treatment location. Eleven intersection approaches were equipped with RLR cameras at this location in 1997. Data were collected for twenty-nine months for both the before and after periods. Findings from this research concluded that RLR cameras had the following effects:

- reduced collisions by 7%, with injury related crashes being reduced by 29%,
- reduced right angle collisions by 32%, with injury related right angle crashes being reduced by 68%, and
- increased rear end collisions by 3%.

All research findings were found to be statistically significant with the exception of the latter, increased rear-end collisions.

Retting and Kyrychenko concluded that RLCs likely reduce collisions, especially injury crashes, at intersections with signals. Although findings from this study seem to indicate this is indeed true, a flaw exists. The study compares the total collisions of every signalized and non-signalized intersection in both the treatment and control sites, thus assuming that the effects of RLCs are dispersed throughout the city of Oxnard. This assumption, though possible, has not been proven, and is therefore presumptuous at best *(19)*.

San Diego, CA

Recently, the City of San Diego, CA performed before-after analyses of their RLC program consisting of nineteen cameras *(21,19)*. Their analysis used average crash rate per year of right-angle and "ran signal" collisions. Their conclusions noted that right-angle and ran signal collisions decreased by 30%, with an increase in rear-end collisions by 37%. A further

examination of rear-end collisions compared crashes at RLC approaches to those without RLCs to see if results were consistent over the four year period. The research team noted a difference between the treatment and comparison sites, indicating an increase of 14% in rear-end collisions.

The findings from this study are sizeable, but faults still exist. The most noticeable flaw, like most before-after studies, is that comparison sites were not used to account for history biases and seasonality effects. Although the team did compare collisions for camera sites to those without when analyzing rear-end collisions, the comparison sites were not tested for similarity. This likely led to an overestimation in the 14% decrease in rear-end collisions. In addition, considering using factors such as traffic volumes were not included in the analysis.

San Francisco, CA

A 1998 pilot study by Fleck and Smith examined the effectiveness of twenty-five RLCs rotated throughout the city of San Francisco at thirty-five various locations *(2,19)*. No other records were found on the completed analysis following the pilot. The before-after study was simple in nature. It included five years of data in the before period and six months in the after. Fleck and Smith concluded that although there was not enough data to make significant conclusions, there were indicated effects on safety. With only six months of data after inception, results indicated that there was a 9% decrease in injury collisions following RLC inception based on previous trends over the five year period. Traffic volumes and comparison sites were not considered; therefore, many flaws likely exist with the findings presented in this analysis.

Baltimore County, MA

Baltimore County's study was conducted for a total period of two years with seventeen total RLCs *(19)*. Data were provided to McGee and Eccles *(19)* from the county in 2003. The data provided insight into the changes in collisions and property damage over this two year time period. The data suggest the following (n_B, n_A, and n_T are the sample sizes in the before period, after period, and overall, respectively):

- Total crashes decreased by 53% (n_T=256, n_B=174, n_A=82).
- Intersection related crashes decreased by 57% (n_T=174, n_B=122, n_A=52).
- Red light related collisions decreased by 21% (n_T=34, n_B=19, n_A=15).
- Personal injuries decreased by a net of 49% (n_T=104, n_B=69, n_A=35).
- Property damage decreased by 58% (n_T=152, n_B=105, n_A=47).

Due to the number of RLC sites analyzed, there is a sizeable sample over the short duration of the study. However, the results would be more defensible if the study accounted for history biases and seasonality effects. In addition, considering traffic volumes would have helped strengthen the study.

Howard County, MA

Howard County conducted a simple before-after study at twenty-five of its thirty-five camera equipped intersections *(23,19)*. Because cameras were implemented at different times, time periods varied for the analysis period. Results were calculated based on the available information and data collected. Although there were varying time periods, the data set was very large based on the number of RLC locations analyzed. Findings are summarized below.

- Total collisions decreased by 31%.
- Angle collisions decreased by 42%.
- Rear-end collisions decreased by 30%.

Comparison sites would have strengthened this study considerably. The time period, although short, seemed to have a sufficient amount of collision data, although the different time periods analyzed likely caused history and seasonality biases. In addition, considering traffic volumes to supplement their study would have been appropriate.

STUDIES COMPLETED IN VARIOUS COUNTRIES

Photographic enforcement using RLR cameras has been in existence long before it was first used in the U.S. Many studies have been done on the effectiveness of RLR cameras on safety, primarily in the countries of Australia, Great Britain, and Singapore. A look at some research conducted in these countries seems to offer more defensible conclusions than those done in the U.S. based on the types of studies conducted.

Australia

An eight-year study of various RLR related collisions was performed in Melbourne, Australia by South et al. (24,19). It included five years of before and three years of after data. To account for seasonality and historical effects, comparison sites were used (46 treatment vs. 50 comparison). A statistical test was also used to evaluate whether each analysis was statistically significant. Six separate analyses indicated the following:

- Right angle crashes decreased by 32%.
- Right angle (turning) collisions reduced by 25%.
- Left turn – opposing direction collisions increased by 2%.
- Rear-end collisions decreased by 31%.
- Rear-end (turning) crashes increased by 28%.
- Total crashes decreased by nearly 7%.

Right-angle crashes were the only reported type of collisions to show a significant decrease in collisions based on the data. No explanation was offered related to how comparison sites were chosen and no calculation was done to see if comparison sites were indeed similar. All that was noted by the study was that, "sites were as similar as possible based on speeds and geometrics *(24).*" In addition, any effects of the treatment sites spilling over onto comparison sites were apparently not accounted for or explained.

Great Britain

In a 1997 study by H. Fox in Scotland *(25,19)*, total and personal injury collisions were analyzed by severity for signalized intersections and signalized pedestrian crossings. Unlike standard before-after studies, three time periods were examined instead of the usual two periods:

- Before: 30 month data set with no cameras installed
- Interim: 21 month data set with cameras installed and warning tickets issued
- After: 31 month data set with cameras installed, tickets issued, and fines imposed

Collisions were reduced in each of five categories from before-interim-after. Fatal crashes reduced by a total of 67%, serious injury crashes by 40%, slight injury crashes by 28%, and non-injury crashes by 22%. The effect on total collisions was a net decrease of 25%. Comparison

intersections were not used in this study, so the net effect cannot be defined due to the effect of seasonality and history biases. Although the data set was very large, accounting for traffic volumes could have helped strengthen the study's findings.

Singapore

Likely the most prolific user of RLR cameras, Singapore offers a great deal of insight into the safety benefits related to automated enforcement. In a 1997 report by Ng et al. *(26,19)*, a six year before-after study (three years before and after) was described, excluding the first set of cameras implemented in the country (two years prior). This study compared forty-two treatment sites to comparison sites chosen by similar accident counts. Three types of crashes were analyzed over this period of time including angle, rear-end, and total collisions. The results indicated a decrease in angle and total collisions by 8% and 7%, respectively, while rear-end collisions increased by 5%.

Although results show a change in collisions, chi-square tests showed that none of the results were statistically significant. However the researchers did note a sizeable decrease in each of the collision types. Study flaws may have likely skewed the results. Excessive numbers of enforcement cameras throughout Singapore allowed for a large sample (one in every five signalized intersections in Singapore had RLR cameras). However, comparison sites were likely affected by their close proximity to camera-operated approaches.

SUMMARY OF LITERATURE

Many studies have been done across the world related to the possible safety affects of RLR cameras. Cameras lead to reduced angle, side-swipe, and total collisions in most studies. Alternatively, rear-end collisions seem to have varying responses over time due to the presence of cameras. A well thought-out study plan seemed to be lacking in many of the studies we reviewed. In most instances, simple before-after studies were used to analyze RLC systems. Seasonality, historical biases, and regression-to-the-mean likely flawed the results considerably.

In most reports, especially those completed in the United States, comparison sites were not used. When they were used, tests were not performed to see if sites were indeed acting in a similar manner to treatment sites. In all of the studies, regression-to-the-mean was not accounted for because random choice of control sites from a similar pool of treatable sites was not possible. The study we set up should account for as many of these flaws as possible.

IV. FOCUS GROUP FINDINGS

During the months of March to June 2003, NCSU-ITRE conducted six focus groups throughout the State of North Carolina. The focus groups can be broken into two specific types: professional and community. *Professional groups* consisted of various elected officials, traffic and city engineers, law enforcement, fire, or EMS personnel. *Community groups* consisted of representatives from non-traffic engineering establishments such as the Shriners and various collegiate organizations. A total of six focus groups was conducted. A summary of the location and type of each group, when it was conducted, and who mediated is shown in Table 1.

Table 1. Summary of Focus Groups Conducted

Location	Type	Date Completed	Mediator
Greensboro	Community - *Shriner's Club*	3/5/2003	Joe Milazzo
Greenville	Community - *Phi Kappa Tau Fraternity House*	4/23/2003	Jeff Robinette
Wilmington	Professional - *Police, Fire, Traffic Engineers, and City Council*	3/19/2003	Joe Milazzo
Asheville	Professional – *Police*	3/26/2003	Joe Milazzo
Asheville	Professional – *Fire*	3/26/2003	Joe Milazzo
Raleigh	Professional - *Traffic Law Enforcement Committee*	5/13/2003	Joe Milazzo

To ensure consistency, the majority of focus groups were mediated by the same individual. The exception to this was the Greenville location. Jeff Robinette, who acted as the recorder for each of the other five focus groups that were performed, acted as the mediator for this group. The goal of these focus group efforts was to gather information on the attitudes, opinions, and beliefs of professional and community groups concerning the use of photographic enforcement to better enhance traffic law enforcement.

In conducting these focus groups there are three objectives we strived to accomplish. They were:

- To assess participant's perceptions on the purpose and definition of traffic laws and traffic law enforcement.
- To assess participant's perceptions, personal experiences, opinions, and suggestions regarding photographic enforcement programs (including stated goals, surrounding publicity and marketing, etc.).
- To assess the impact of photo enforcement of participant's respect for traffic law enforcement.

Many different viewpoints were given during each of the focus group sessions. Brief overviews of some of the more important findings from these sessions are summarized below. The outline of questions the mediator used as a guide for both groups can be found in Appendix A.

* **Are there violations that an officer would capture that a camera would not, or vice versa?**

The general consensus of both community and professional groups was that officers would be able to catch every type of violation. One group was able to offer an explanation for this stating, "An officer is able to catch every violation. There would not be a law against it if an officer could not enforce it." Everyone agreed that cameras would not be able to catch certain violations that officers would, such as aggressive driving and intoxicated drivers. However, it was pointed out that in applications RLCs can be used, the cameras could record information at an accuracy level that officers cannot, such as time after red.

* **How can red-light-running photographic enforcement be improved?**

Every group had a few suggestions on how to improve red light camera systems. Their ideas ranged from changing the appeal process to how to best implement a program such as this. **All** of the community groups agreed that an additional picture should be taken of the vehicle identifying the driver. This would help solve one of the questions that is routinely raised, "what if someone else is driving my car?"

One community group talked about how the appeal process needs to be changed. The current system is that one must pay the ticket before appealing it. Many citizens felt that the system makes them guilty until proven innocent, thus infringing on their constitutional right of being innocent until proven guilty.

When questioned about yellow times, some expressed frustration that they never know how long a light will be yellow. Some participants suggested making a standardized yellow time across the board for every signal. That way, people are better able to judge whether to stop at a signal or proceed through. No understanding of "lost time" or deceleration rates was ever brought up.

Two ideas were given regarding ticketing policy. The first, which most everyone favored, was to have warning tickets issued for someone's first offense. Many community participants felt that actual tickets should only be given to repeat offenders. Many people also liked the idea of having graduated levels of fines, such as $50 for the first offence, $75 for the second, and so on.

Not surprisingly, most of the community participants showed support for less money generated from the tickets going into the private sector to camera vendors and

operators, and more going back to the local government and schools. The composition of each group altered where they would like to see the money going within the government. Most community groups noted that they would like to see money put into local schools and education programs, or to help fix roads and intersections. Law enforcement professionals preferred to see the money come back to the various public service departments. The police, for instance, said they could use they money to buy new equipment and conduct additional training classes for officers for which they do not currently have available funding.

Some participants, however, thought that a vendor being paid on a per-ticket basis was acceptable. The main exception to this was if the vendor was allowed to set the yellow times and the grace periods after the yellow signals were displayed.

Participants in both community and professional groups expressed their dislike of having to wait on red lights when there is no one at the intersection. They suggested that at hours when there is minimal traffic (after 1:00 AM.), red light cameras should not ticket, and all traffic lights except those with abnormal amounts of traffic should switch to flashing red and yellow.

Professionals who have had experience with camera systems in the past made a couple of recommendations on the best way to implement such programs based on what they have learned.

- Camera systems must be slowly implemented.
- Program leaders should work with the public to have them understand that there is a problem that needs to be corrected.

- Everyone involved with the system must be educated thoroughly on the subject (government, police, and public).
- The police must be the ones who decide whether or not a violation has occurred, not the camera vendor.

One of the focus group members stated, "Do not let the vendor make any decisions for you, responsibility is misplaced if you do." He went on to say that camera vendors are naturally looking to make a profit. If vendors make decisions, they will tend to be supportive of choices that make them money, not necessarily the choices that have the greatest safety benefits.

* **What other traffic laws could be enforced using photography?**
* **Are there other applications for cameras?**

All of the groups acknowledged other possibilities for photographic enforcement and offered suggestions as to where it would be applicable. It was pointed out, and largely agreed upon that, "People get scared over simple DOT surveillance cameras watching them. How would they feel about some other kind of camera?" Speeding, for instance, is an application to photographic enforcement that has already been implemented in such areas as New Zealand, United Kingdom, South East Asia and Washington, D.C. At this time, it is currently being implemented in Charlotte, North Carolina. When asked their opinions about the photographic enforcement of speeding, only partial approval was expressed. The main applications the participants would like to see are in special areas such as work and school zones or in

neighborhood areas, and only during times when people are actually working and during school hours.

Other applications mentioned for photographic enforcement included: driving past a stopped school bus, toll plaza violations, rail-road crossings, HOV lanes, drag racing, illegal left turns, failure to yield to pedestrians, seatbelts, and cutting through parking lots to avoid an intersection. Traffic law violations not amenable to photographic enforcement that was pointed out were lane changing and aggressive driving.

* **What is the biggest benefit to using photographic enforcement over traditional law enforcement?**

Possibly the first response to this question by every professional and community group was that it would provide additional manpower for local police forces. However, many in the groups were quick to caution that, "The cameras are just an additional tool; they should not take over or reduce the number of officers on patrol."

Increased safety for the officers and violators, as well as the public, is another benefit. A safety increase could be credited to the fact that an officer would not have to turn on his lights and interrupt traffic flow through an intersection. Also, making people aware of the seriousness of these types of traffic violations will likely increase safety for the public.

Officers felt that automated enforcement cameras would allow them to spend more time on other activities having a positive influence on the community. Activities pointed out were road checks and community programs. Such activities

allow the officers to interact with the community and educate at the same time. Many felt that by interacting with the community in this manner, they will likely have a more positive image in the public's eye.

* **What is the biggest drawback to using photographic enforcement over traditional law enforcement?**

Only two drawbacks were pointed out. Both disadvantages stemmed from cameras not being able to make traffic stops, but rather dealing with the traffic violation through electronic means. It was noted multiple times that personal contact with the driver is lost when officers are not required to pull over drivers for traffic violations. Also, additional opportunities such as making a driving under the influence (DUI) arrest are lost. Cameras cannot detect if a driver is intoxicated when a violation occurs, but an officer can usually make that distinction.

* **Do you support the use of photographic enforcement in your community?**

Most groups did not agree this question. Some people support the cameras now that they are in place; however, they did not when they were first implemented. Others think that the cameras should be done away with until the problems mentioned above are resolved. Many of the groups were not clear on the advantages and disadvantages of cameras and had trouble making overall decisions.

* **Is the public sufficiently educated about photographic enforcement systems?**
* **What programs could be implemented if not sufficiently educated?**

There is a noticeable difference in how knowledgeable the groups were about photographic enforcement. This was primarily dependent upon whether the areas where participants lived had cameras or not. This indicates that public education programs are having an effect. Some feel that more should be done to educate the public. One community participant said, "People only know what is required to pass their drivers license exam; no one knows how signal light times and yellow times are determined." Suggestions given to help this problem included lessons about the cameras in driver education, or by having information put on the news and various other public resources such as the Internet.

* **Are you more likely to follow traffic laws at locations where photographic enforcement systems are in place?**

The responses to this question were generally the same in all groups. Yes, people are more likely to follow traffic laws at locations with photographic enforcement systems in place, provided there is adequate signage preceding it. One group could not answer for sure, citing congestion as the reason for not being aware or paying attention when systems are in place.

* **What worries, concerns, and/or arguments against photographic enforcement have you heard?**

One concern addressed in our meetings is that people think the ticket will go against their insurance, when in fact it does not. Another worry was what the city

will do with one's personal information when they pay the ticket. Officials claim that these are valid concerns but are nothing to worry about. Current programs have very strict privacy policies, which protect one's personal information, and the tickets are not reported to insurance companies. With better education on the subject these concerns should disappear.

The principal argument made against photographic enforcement is that it violates an individual's rights, in particular the right to face an accuser in a court of law. As noted earlier, one concern is raised that there could have been someone other than the owner driving the car at the time of the violation, bringing up the possibility that another camera should be set up that would capture such information. Although not all cases could be eliminated by including a picture of the driver, it would be helpful in reducing many arguments of this type. This way the owner of the vehicle would know whom to look for to pay for the ticket.

Another argument against photographic enforcement is that the cameras are solely out to generate revenue for the city or vendor. The concern is a legitimate one because revenue-based systems cannot maximize safety when conflicts between revenue and safety exist. Many existing photographic enforcement programs are revising their contracts with vendors as well as changing their policies to eliminate such an argument.

* **Does the existence of photographic enforcement systems increase or decrease citizens' respect for traffic law enforcement?**

One community group stated that the presence of photographic enforcement systems decreased their respect for traffic law enforcement. They claimed that, "people do not appreciate them," and that, "they are not comfortable with the tradeoff of T-bone [angle] collisions with panic breaking rear-end collisions." They also claimed that traditional law enforcement does not create a traffic hazard. Another community group stated the exact opposite, saying that the existence of photographic enforcement systems in their community would "definitely increase" their respect for traffic law enforcement.

Some police officers claimed that photographic enforcement decreases the citizens' respect for traffic law enforcement. They claimed that with photographic enforcement systems in place, face-to-face contact with the public is lost. While other police officers said that it is not photographic enforcement systems that decrease citizens' respect for traffic law enforcement, but rather it is the courts that undermine them. "The courts only want the real big fish, causing the District Attorney to throw out many of the officer's citations."

Officers were quick to point out that when it comes to law enforcement, consistency is very important and the judges need to be more consistent. However, other officers were satisfied with the "big fish" concept. It was pointed out by some officers that, "deals are struck between people for efficiency, but never for you wrongfully writing a citation" and that, "the courts only want the big fish, but a good officer can still fill up his tickets with big violations."

* **Additional Points**

Other thoughts that some groups mentioned were people try to beat red lights to avoid waiting for the next green. If the total light cycle times were trimmed there would be less wait time for the next green, possibly reducing the number of people who try to beat the light. Another group suggested that photographic enforcement signs and placebo cameras could be set up at an area with no actual cameras present, much like dummy police cars along the side of the road, possibly causing a placebo effect.

One professional focus group pointed out that there is greater support for photographic enforcement in cities with cameras in place than in cities without. This suggests that once cameras are in place, they will gain support.

SUMMARY OF FINDINGS FROM FOCUS GROUPS

The purpose of conducting focus groups was to gather information of attitudes, opinions, and beliefs associated with photographic enforcement to better enhance traffic law enforcement. Our findings regarding various focus groups were interesting. Some of the important points include:

- Community and professional group members were concerned that photographic enforcement would not be able to catch driver violations such as aggressive driving or driving under the influence.
- Three major improvements were discussed in many of the various groups. They include:
    - an additional picture to identify the driver of the vehicle,
    - changing the appeals process to account for constitutional rights (innocent until proven guilty), and

    - money generated by photographic enforcement systems should support the community through education or additional enforcement efforts.
- Photographic enforcement of traffic laws other than red light enforcement brought mixed concerns. Most members of community groups said they would like to see photographic speed enforcement in specialized areas such as work zones, school zones, and neighborhoods.
- The biggest benefit to automated enforcement was that manpower could be diverted to other areas of traffic law enforcement.
- The biggest drawback to automated speed enforcement was the loss of ability to have face-to-face contact with drivers.
- The majority of all focus group participants believed that educating the public was a key concern. Many believed that additional efforts should be made to inform drivers of the risk of certain driving behaviors, the technology used to catch a violation of this type, and the penalty for committing the offense.
- Citizens' respect for traffic law enforcement may increase or may decrease with respect to photographic enforcement.

V. CHOICE OF STUDY AND EXPLANATION OF KEY TERMINOLOGY

Before any before-after analysis can take place, an appropriate study technique must be chosen. The data we were able to collect for our collision study (collisions and traffic volumes) allowed us to take two different study approaches, each having certain draw backs, but still better than most analyses of its kind (especially in the United States). Before explaining the two studies, one must have an understanding of why we are using them. Therefore, a review of common before-after studies is provided in this section. This summary is from Professor Ezra Hauer's landmark text "Observational Before-After Studies in Road Safety" *(4).*

COMMON BEFORE-AFTER STUDIES USED IN TRAFFIC SAFETY

Naïve Before-After Study

The norm for most observational collision studies is the simple before-after study (referred to as "naive"). This is also referred to as a trend analysis. The basic model for this study is shown in Chapter 6 of Hauer's book. This study's primary objective is to get a measure of the collision data in the before period at the treated location, use this data to predict what would have happened in the following time period, and compare this prediction to what actually took place in the following time period. Although this study is likely the most commonly used study of its kind, it has the most inherent flaws.

The most common and important flaw is the regression-to-the-mean phenomenon. Study sites, such as intersections with RLR cameras, are usually selected with some bias such as a high number of certain types of collisions. Because of this, it is highly likely that the number of this type of collision will decrease in the following years as it "regresses" back to its mean value.

The only way to account for this phenomenon is to use a control group study; however the comparison group is sometimes used in an attempt to account for this problem. This is proven in many cases by Hauer. Other factors include seasonality and historical affects.

Seasonality bias occurs when the time of year is not accounted for. This is a common problem in many naive before-after studies with limited data in the after period. If data in the after period were collected from November to April of the following year, it is very likely that collisions were higher during these months because weather such as snow and ice would cause traffic problems.

Historical bias occurs when changes on the sites occur sometime during the study period. This is also a common problem with naïve before-after studies. For example, a certain type of arterials in the city may change speed limits from 55 to 45 mph for safety reasons. This could have an effect on collisions after this policy change. Therefore, not accounting for it could bias the study.

Raleigh, NC, as with most cities and municipalities, chose RLC intersections primarily based on the number of angle accidents during 1998-2002. Looking at Table 2 provided by the City of Raleigh, the first two intersections highlighted have RLCs *(5)*. One can see that there are periods of time from 1998-2002 when collisions vary greatly from the mean value. It is difficult to get an accurate understanding, or prediction, of what collisions should be in the following year(s) when a trend is not in place. Because trends like this are hard to predict, we opted to use a better prediction method based on the availability of useful data and sites (causal factors and comparison sites).

Table 2. Top Angle Accident Locations from 1998 – 2002.

98-00 Rank	00-02 Rank	2001 Rank	2002 Rank	98-02 Rank	Signal No.	Rank Order	Treatment (T) or Comparison (C)	Intersection	Total Angle Collisions (1998 – 2002)	Camera Direction	Camera Install Date
1	3	5	8	1	050	1	T	Dawson / South	69	SB	8/11/03
3	4	2	5	2	127	2	C	Person / Edenton	59		
2	6	8	12	3	100	3	T	Wilmington / Morgan	58	NB	9/15/03
4	1	1	23	4	068	4	C	McDowell / Hillsborough	54		
5	5	4	6	5	059	5	T	Dawson / Morgan	47	SB	9/15/03
6	8	12	2	7	069	6	C	McDowell / Morgan	42		
10	2	3	1	6	447	7	T	Cross Link / Proctor / Rock Quarry	42	NB/SB	9/15/03
7	9	7	18	9	353	8	T	Six Forks / Rowan	39	SB	8/11/03
8	7	6	11	8	021	9	C	Hillsborough / Woodburn/Cox	39		
11	12	14	14	10	391	10	C	Brentwood / New Hope Church	33	NB	6/28/04
12	17	18	17	11	396	11	T	Capital / Highwoods	32	NB	9/15/03
14	11	21	10	12	046	12	C	Peace / West	31	WB	6/28/04
16	16	28	4	13	080	13	C	Salisbury / Morgan	30		
23	13	9	13	14	108	14		Blount / Peace	30		
15	20	10	28	16	367	15	C	Falls of Neuse / Millbrook	29		
20	14	15	15	15	034	16		Boylan / Morgan	29		
9	26	26	24	17	575	17	C	Millbrook / Old Wake Forest	28		
22	21	25	7	18	480	18		North Bend / Shanda / Spring Forest	26		
24	24	19	20	22	355	19		Six Forks / Dartmouth	25		
25	18	17	19	21	512	20		Capital / Buffaloe/New Hope Church	25		
27	22	16	16	20	529	21		Poole / I-440 (Outer Loop Off Ramp)	25		
29	10	13	3	19	463	22		New Hope/Millbrook / Capital	25		
13	27	27	26	23	343	23	C	Currituck / Lassiter Mill	24		
17	29	24	29	25	003	24	T	Hillsborough / Dixie/Friendly	23	EB	9/15/03

Prediction Using Control Sites

The best possible method for conducting before-after studies is using treatment and control sites. This method is the most effective study type because it uses sites from a "pool" of intersections selected for some treatment based on the same criteria. The pool of intersection sites is separated at random and is either given a treatment (in our case a RLC) or is assigned as a control site (no RLC). Because the sites are similar in nature, and randomness is used to eliminate selection bias, a comparison can be made between the two groups of intersections in both the before and after period that accounts for any regression-to-the-mean effects. This makes any predictions much more valid than in the naïve before-after study (or any variation) because it is a true experiment, instead of an observation.

For study purposes, our group was not able to use this method. Randomization was not possible with the City of Raleigh. As with most cities, Raleigh wanted the ability to use cameras when and where they thought they were needed. Because we could not use control sites, two studies were used to account for much of the known phenomena that takes place in before-after studies. These studies included a causal factor and comparison group study and are the backbone of our analyses of collisions.

Prediction Using Causal Factors

This prediction method builds on the foundation of a naive before-after study. Just like the naïve study, collisions are collected in the before period. A prediction is then made about ***expected*** number of crashes in the after period and then compared to the ***estimated*** number during that time period (the estimate is the actual number of collisions in the following year in

our case). The difference in the two studies lies in the ability to use additional data in order to make a better prediction, or expectation, of the collisions in the after period.

The two types of data most commonly used in this type of study, and used in ours, are time duration (r_d) and traffic flow (r_{tf}). They are calculated as a ratio of the before period to the after period, in years (or months) and traffic volumes, respectively. The time duration ratio normalizes crash data by fitting time periods of unequal duration. For instance, NCSU-ITRE's study of the Raleigh area has a before time period of sixty-seven months. The data collected thus far in the after period is from a seven month time duration. The ratio would account for this difference in time by taking a ratio of sixty-seven to seven, and multiplying the collisions in the after period by this ratio, thus normalizing them. In addition, it is common that collisions increase as traffic increases, and vice-versa. The traffic flow ratio accounts for this phenomenon using a ratio of the traffic volumes over time, thus accounting for any linear effects of traffic volumes to collisions. Although this effect is not likely a linear relationship between traffic flow and collisions, we assume it to be linear because we do not know the nature of this effect.

These two factors help account for some of the affects on collisions during the study period; however, it does not account for all of them. Because we are using a ratio, the effects of time and traffic volume on collisions are assumed to be linear. Although this may not be exactly true, using this method predicts collisions better than a naïve study because we account for effects that we strongly suspect. By taking the total number of collisions in the before period (κ) and making the necessary adjustments using time (r_d) and traffic flow (r_{tf}), we can approximate the expected number of collisions (π) during any given year. The formula for this is shown below.

$$\pi = \kappa * r_d * r_{tf}$$

The expected number of collisions in the after period will be compared to the estimated number of collisions during that after period (λ).

Prediction Using Comparison Groups

The prediction method using comparison groups is similar to the control experiment mentioned earlier. The advantage of using randomly selected control and treatment sites in a control group study lies in its ability to virtually eliminate the regression-to-the-mean effect. However, this type of study is not the norm because sites are usually chosen on the need for the treatment, and random selection is not possible. Therefore, analysts must rely on their ability to choose sites based on similar characteristics outside of the treated pool of sites. These sites are termed as comparison sites.

The use of comparison sites assumes that influences in safety to the treated group also influence the comparison group. This assumption allows us to make a ratio, similar to that of causal factors mentioned earlier, called the "comparison ratio. When this is used, it assumes a linear relationship between the treatment and comparison sites collisions. This ratio, r_c, is the ratio of the number of after and before collisions of the comparison group. This ratio multiplied by the number of accidents on the treated group in the before period is an indication of what the "expected" number of collisions should be in the after period. The equation is shown below.

$$\pi = \kappa * r_c$$

As with all previously mentioned studies, a comparison is then made between the expected number of collisions and the number of collisions recorded at the treatment sites in the after period (λ).

For this study to best determine the expected number of collisions, properly selected comparison sites must be used. Comparison sites must show similar trends in collisions over time using a "sample odds ratio".

MEASURES OF EFFECTIVENESS AND SIGNIFICANCE TESTING

Before a before-after study can be completed, an understanding of the measures of effectiveness is needed. All before-after studies consist of two primary tasks, prediction (π) and estimation (λ) of the collision effect. Measures of effectiveness based on these two values are discussed in the next section. Statistical significance testing is discussed following this section.

Effect of the Treatment on Safety

There are two measures of effectiveness for a treatment on safety used in our analyses. Following Hauer *(6),* the effect of the treatment on safety is calculated using the expected and actual number of collisions, or π and λ, respectively. The first measure is the reduction in the expected number of collisions, δ. This is calculated as:

$$\delta = \pi - \lambda$$

The variance, VAR $\{\delta\}$, assuming π and λ are statistically independent, is calculated as:

$$VAR\{\delta\} = VAR\{\pi\} + VAR\{\lambda\}$$

The second measure is the index of effectiveness, θ. This is calculated as the ratio of what safety was with the treatment to what it would have been without the treatment, and is calculated as:

$$\theta = (\lambda / \pi) / [1 + VAR\{\pi\} / \pi^2]$$

The variance, VAR {θ}, is calculated as:

$$VAR\{\theta\} = \theta^2 [(VAR\{\lambda\} / \lambda^2 + (VAR\{\pi\) / \pi^2)] / [1 + VAR\{\pi / \pi^2)]^2$$

Both δ and θ will be computed for each analysis.

Significance Testing

Significance testing is used extensively in evaluating confidence in various predictions, especially when certainty of a prediction is in order. However, Hauer noted in a 2003 presentation at NCSU that significance testing should not be used when 1) a best estimation of an effect is needed, and 2) the precision of that estimate was needed. His argument was that the best estimate an analyst can give is the one that the data are telling him or her, and that reporting statistical significance could alter one's belief that a countermeasure may indeed be working *(27)*. Many people reading about studies reporting increases/decreases in collisions may treat studies reporting "no significant change in collisions" as having no effect. The difference lies in the analyst to report significance, not statistical significance because the effect is in fact significant. Therefore, Hauer recommends that significance testing should not be done for before-after studies to eliminate the possibility of the analyst, or those reading the analysis,

ignoring effects that data show. Therefore, we will not do significance testing, but instead will rely on safety effects that the data present to draw conclusions.

VI. DATA COLLECTION AND SITE SELECTION CRITERIA

Collision data used in before-after studies are used in many different ways. Most studies consider using collisions based on injury or type. The following section clarifies the type of collisions used in our analyses and should clarify the assumptions for each group of collisions used.

DATA COLLECTION

The core of the data used in the analysis is the total number of collisions at intersection sites. Because cameras were installed on individual approaches, and not the intersection as a whole, one may question the validity of using the total collisions summed at every approach at each site. Three main factors account for using collisions over the entire intersection are:

- Collisions that occur within the intersection right-of-way are not easily separated by their approach.
- Collision reports do not record or identify what collisions occur due to red light running vehicles.
- The small amount of "after" data limits the ability to separate collision types due to sample size requirements.

Our analyses include four groups of collisions: total collisions, RLR related collisions, angle collisions, and rear-end collisions. RLR related collisions include angle, rear-end (slow or stop), left turn same roadway, and left turn different roadway. As noted above, angle and rear-end collisions are primarily used in studies of this type. However, based on previous literature analyzed at NCSU-ITRE *(2)*, drivers running a red light just after the all red time tend to cause

collisions with left-turning vehicles waiting to finish the permitted phase (sneakers) or with the following left turn phase on the opposing thruway that has just begun. Therefore, our group decided to include these two types of collisions in the category of RLR related collisions.

Because before-after collision studies such as this require large amounts of time to collect large amounts of data in the after period, we recommend that the City of Raleigh complete the analyses conducted by NCSU-ITRE in the coming months. Once a considerable number of collisions are tallied, more significant findings can be made about the cameras' effectiveness at reducing these collisions.

SITE SELECTION

Site selection played an important role in our choice of analysis. A brief description of the site selection criteria is provided in this section to help the reader understand the study choices we made.

Choice of Sites for RLC Enforcement and Comparison

The City of Raleigh, North Carolina was incremental in choosing locations for red light cameras. In various conversations with staff members, an understanding of the process for choosing these sites has been gained *(5)*. This understanding was the backbone for our choice of a comparison group study instead of the Empirical Bayes method which uses "reference" sites. The camera sites selected by the City of Raleigh and comparison sites are shown in Table 3.

The city's first objective was to place red light cameras at intersections where high numbers of angle collisions were taking place. Angle collisions across the city were totaled from 1998 to 2002. A previous study ranked intersections in a similar manner from 1998 to 2000 and was

Table 3. Selected Treatment and Comparison Sites

Rank	Treatment (T) or Comparison (C)	Intersection	Total Angle Collisions (1998 – 2002)	Camera Direction	Camera Install Date
1	T	Dawson / South	69	SB	8/11/03
2	C	Person / Edenton	59		
3	T	Wilmington / Morgan	58	NB	9/15/03
4	C	McDowell / Hillsborough	54		
5	T	Dawson / Morgan	47	SB	9/15/03
6	C	McDowell / Morgan	42		
7	T	Cross Link/Proctor/Rock Quarry	42	NB/SB	9/15/03
8	T	Six Forks / Rowan	39	SB	8/11/03
9	C	Hillsborough / Woodburn/Cox	39		
10	C	Brentwood / New Hope Church	33	NB	6/28/04
11	T	Capital / Highwoods	32	NB	9/15/03
12	C	Peace / West	31	WB	6/28/04
13	C	Salisbury / Morgan	30		
15	C	Falls of Neuse / Millbrook	29		
17	C	Millbrook / Old Wake Forest	28		
23	C	Currituck / Lassiter Mill	24		
24	T	Hillsborough / Dixie/Friendly	23	EB	9/15/03

used as an additional reference to identify if crashes at intersections revealed any trend changes over the following two years. Because red light running violations tend to primarily cause angle collisions, it was believed that this should be the first selection criteria. This is a common selection criterion for many programs of this type.

Second, it was believed that cameras should be placed throughout the city limits to have the highest overall effect. Therefore, a top-down method of choice based on the highest number of angle collisions was not the only criteria. Table 3 ranks intersections by the total number of angle accidents. Ranks 1, 3, 5, 7, 8, 11, and 24 (highlighted) were selected for treatment in order to disperse cameras about the city, so some high-collision sites were passed over.

As noted earlier, we were inclined to perform two before-after studies. The primary reason that a comparison study was chosen was based on this second criterion of disbursement of treatment sites throughout the City of Raleigh. Disbursement allowed our research group to choose sites from the same pool as that of the treated RLC sites. Although the random selection criteria of a control before-after study were not met, it is nearly a perfect representation of this type of study because sites were dispersed in a "nearly random fashion". Table 3 shows that comparison sites were chosen based on the same criteria as that of treatment sites, and were dispersed throughout the city. Ranks 2, 4, 6, 9, 10, 12, 13, 15, 17, and 23 were chosen as comparison sites. Ranks 10 and 12 were not chosen for treatment in our study because neither site was being installed during our selection process. These are used in the comparison group and should not be included in any analyses when data is used following installation of these sites. Sites 14, 16, and 18 – 22 were not chosen because of limited data collection time and resources.

Testing Comparison Sites for Similarity

It was imperative that comparison sites be tested for similarity with the treatment sites. Based on the summary in the previous section, all indications were that the sites should be comparable based on the fact that comparison sites where chosen from a similar pool of sites and the "nearly random" choice of treatment sites. Total collision rates in the before period were plotted in Figure 4 to observe trends over time in both study groups.

From this graph, we notice that collisions seem to be decreasing at a slow rate over the sixty-seven month period for both groups of sites. It is particularly apparent that collisions in both groups do not seem to be following exact patterns of increasing and decreasing spikes in

collisions. However, the decreasing trend does seem to show consistency between the two groups.

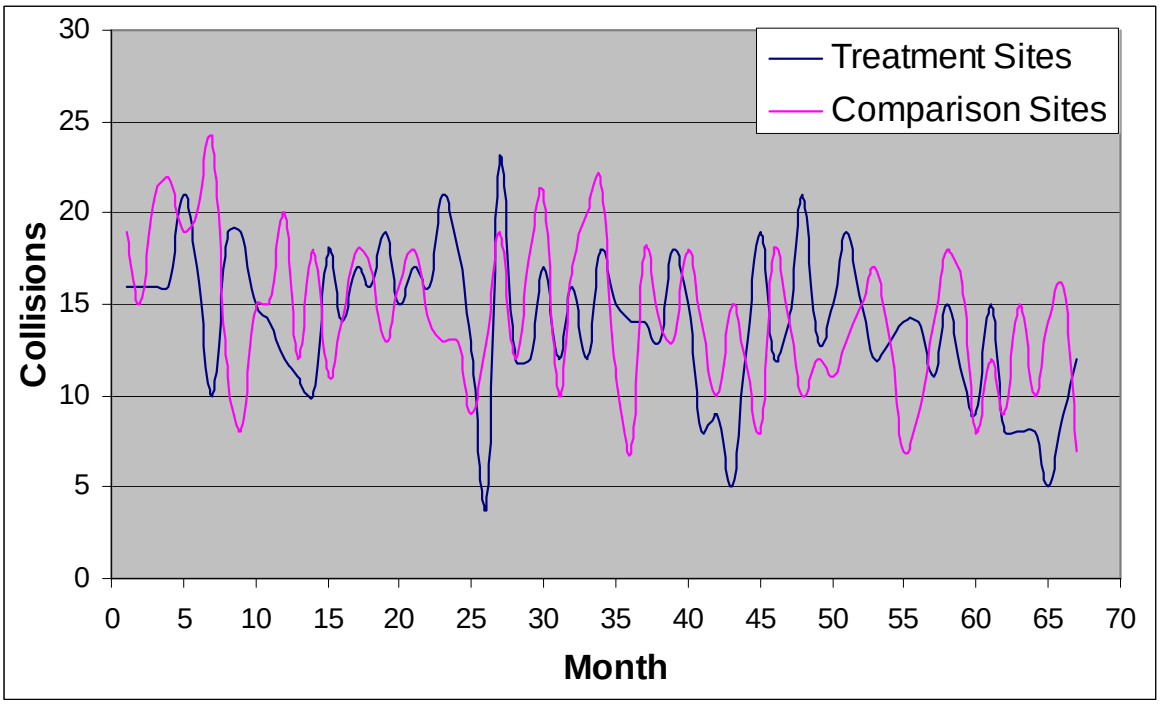

Figure 4. Plot of Total Collisions in the Before Period (Jan. 98 - Jul. 03)

The 'Sample Odds Ratio'

Although trends seen in Figure 4 generally show that the comparison sites follow similar collision patterns to the treatment sites, they were tested to see if they were indeed good candidate sites. The sample odds ratio, denoted with the symbol "*o*", was used to make this determination *(4)*. This test examined collisions in increments (usually one year) leading up to the inception of RLCs in August and September of 2003 for RLC and comparison sites. The equation is shown below.

$$o = \frac{\frac{(KN)}{(LM)}}{\left(1 + \frac{1}{L} + \frac{1}{M}\right)}$$

Where,

K = the collision counts for treatment sites (previous time period)

L = the collision counts for treatment sites (current time period)

M = the collision counts for comparison sites (previous time period)

N = the collision counts for comparison sites (current time period)

The primary indicator of similarity between both groups of sites is total collisions. The first odds ratio calculation for total collisions in Table 4 is shown below for clarity.

$$o = \frac{\frac{(KN)}{(LM)}}{\left(1 + \frac{1}{L} + \frac{1}{M}\right)} = \frac{\frac{(191 * 177)}{(192 * 209)}}{\left(1 + \frac{1}{192} + \frac{1}{209}\right)} = 0.8341$$

Table 4. Calculation of the Odds Ratio Using Total Collisions

Year	Treatment	Comparison	*o*
1998	191	209	
1999	192	177	0.8341
2000	168	179	1.1425
2001	160	164	0.9508
2002	161	153	0.9159
		Average =	**0.9608**
		Standard Deviation =	**0.1306**

The mean of the sample odds ratios should be very close to one for the two groups of sites to be called comparable. The test shown in Table 4 shows the mean equal to 0.9608. The mean of the sample odds ratios is very close to 1, indicating that the comparison and treatment sites acted in similar manner (with respect to total collisions) leading up to the inception of RLCs. Therefore, the comparison group study accounting for changes in total collisions should be suitable because both groups of sites act similarly. Since the treatment and comparison groups seem to follow similar trends in total collisions leading up to implementation of RLCs, changes in total collisions that take place at treatment sites after the RLCs are in use should vary from the trend set by the comparison sites.

An Additional Consideration in Selecting Sites for Analysis: The Halo-Effect

Site selection was an important component of our analyses. Two study configurations were used in our before–after analysis (causal factors and comparison) and each had specific site considerations. However, a phenomenon known as the halo-effect should also be considered. For our purposes, this phenomenon will be understood as the effect of a treated intersection that may disperse its effects on safety at other intersections in the near vicinity. The exact relationship of this phenomenon to nearby intersections is not known; however, it is common knowledge that this does exist for some countermeasures. The criteria used to distinguish which comparison sites were most likely affected follows.

First, the before-after study, analyzing causal factors, used only treatment sites. Th location of cameras was likely a non-factor in the results of this type study. This is because drivers recognizing RLCs, or signs indicating the presence of RLCs at an intersection, drive the same from one treated RLC intersection to any other RLC intersection. In other words, the presence of

a RLC sign at one treatment site has no effect on a nearby treatment intersection with the same sign. We can complete this analysis using the maximum amount of collision data available to us, thus giving the study more validity.

However, the halo-effect compromises the comparison group before-after study. A treatment site located near any other treatment sites will be treated the same for this study as in the causal factor analysis. However, collisions at comparison sites are much more likely to be affected by a nearby treatment location. This is because drivers that recognize RLCs, or signs indicating the presence of RLCs, are likely to be more cautious at nearby intersections than if they had not seen the cameras or signs. Therefore, an extra analysis accounting for this phenomenon will be done to eliminate the possible affects of nearby RLCs on comparison sites.

The question then becomes, "Which sites are applicable for purposes of comparison when trying to eliminate the effects of spillover?" After some discussion, we decided on two criteria for eliminating comparison sites when taking the effect of spillover into account in a secondary comparison group study. The first was a decision to consider eliminating comparison sites within a specified distance. As time and distance from a treated intersection approach increased, the halo-effect was assumed to decrease. A distance of 5280 feet (1 mile) from a treatment site was selected as the first criteria. This was assumed to be the distance that drivers forgot about photographic enforcement and reverted to normal driving habits. This was based on our driver experience in and around photo-enforced municipalities.

The second criterion was in addition to the first. This threshold required that for a halo-effect to be important, a comparison site must be along the same corridor as that of a treated site. This includes all approaches of the site because each is signed with warnings that photographic

enforcement is in place. This appeared to be a valid criterion based on previous experience with RLR intersections in North Carolina. Drivers seem to pay attention when they see signs and/or red light cameras at approaches along a corridor and driving behaviors likely changed for a period of time or distance along the corridor. However, once a driver turned off of the corridor the behavior change was likely minimal at best and therefore the decision was made to keep these comparison corridors.

A Geographical Information System (GIS) map was generated plotting comparison and treatment intersections in our analysis in the Raleigh city limits. Multiple maps can be referenced in Appendix B. Figure 5 shows the distribution of sites throughout central Wake County.

Figure 5. Treatment and Comparison Group Locations - Central Wake County

This map shows each of the treatment and comparison sites dispersion throughout the city. Four of the seven treatment sites and six of the ten comparison sites lie within the I-440 beltline. This ratio is a good balance of dispersion around central Raleigh.

One-mile buffers placed around treated sites show that seven of ten possible comparison sites fall within the first criteria. These include the following:

- Currituck @ Lassiter Mill
- Hillsborough @ Woodburn and Cox
- Peace @ West
- McDowell @ Hillsborough
- Salisbury @ Morgan
- Person @ Edenton
- McDowell @ Morgan

A closer look at each of the sites reveals which of these seven sites meet the second criteria. This criteria states that a comparison site must lie on the same corridor as a treatment corridor within the buffered zone. Figures 6, 7, and 8 show sites located in zones of interest in northern Raleigh and downtown Raleigh, respectively.

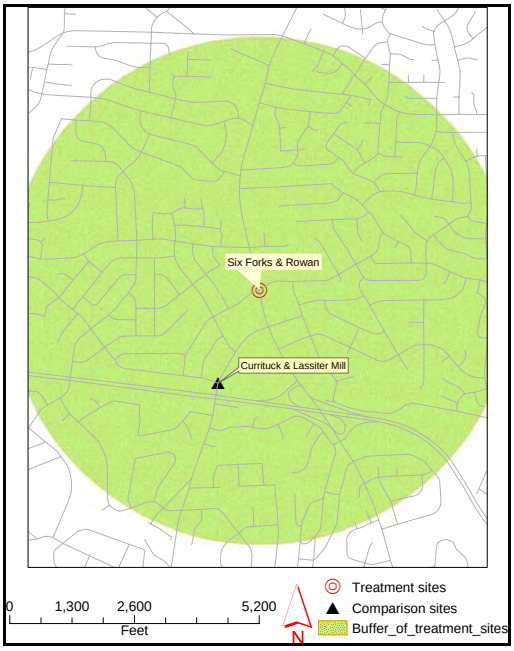

Figure 6. Treatment and Comparison Locations- North Raleigh

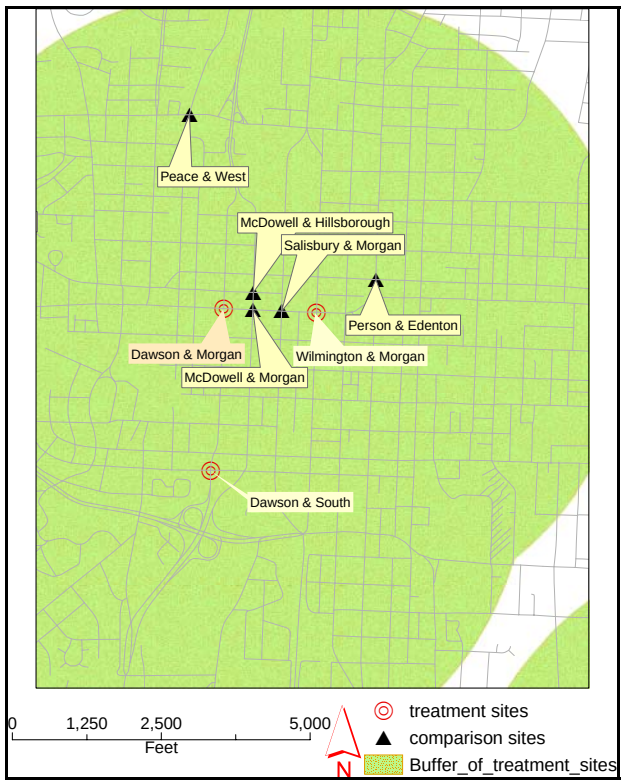

Figure 7. Treatment and Comparison Group Locations - Downtown Raleigh (Morgan Street)

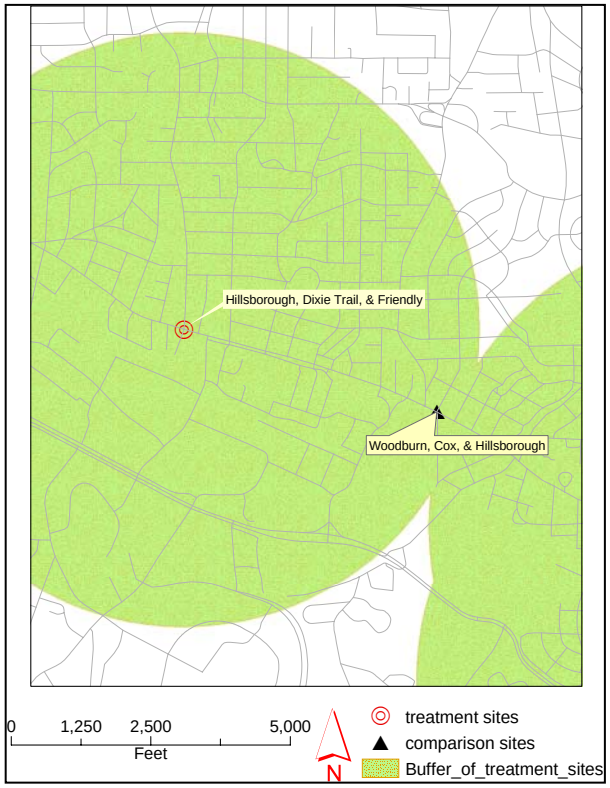

Figure 8. Treatment and Comparison Group Locations – Downtown Raleigh (Hillsborough Street)

Of the five comparison group intersections shown in Figure 7, McDowell at Morgan and Salisbury at Morgan Street are the only two meeting the second criteria. Figure 8 shows the intersection of Woodburn and Cox at Hillsborough Street also meeting the second criteria. Therefore, these three intersections in the comparison group fulfilled the required criteria and will not be included in our analyses that take the halo-effect into account.

VII. PRIMARY ANALYSIS: BEFORE-AFTER COLLISIONS STUDY USING THREE DIFFERENT METHODS

This section estimates the effect of the RLC countermeasure on collisions. Twelve different analyses using three analysis methods and four groups of collisions are used. The analyses were explained in detail in Section V, while the groups of collisions we chose to use is explained in Section VI. A summary of our analysis methodology is shown in Figure 9.

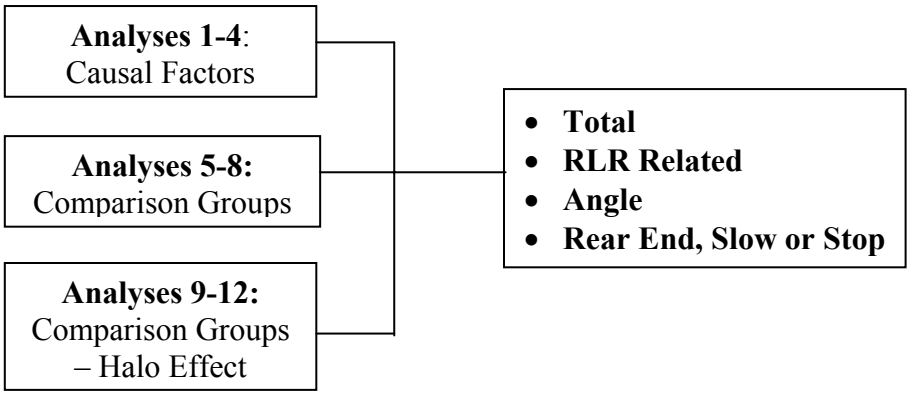

Figure 9. Combinations of Analyses

This summary shows the possible combinations of analyses that our group will be conducting based on Chapters 8 and 9 of Ezra Hauer's text. The difference in study techniques used was interesting and did show some of the problems associated with choice of study. Specific analyses and collision data are located in Appendices C and D, respectively.

ESTIMATION USING CAUSAL FACTORS

Prediction using causal factors is a modification of the simple before-after analysis done by most municipalities in the United States. The modifications lie in the ability of the analyst to account for known properties related to collisions. The analyses in this report account for the

most common two types of factors: time and traffic flow. These were discussed in more detail in Section V.

Taking these two factors into account, all four collision categories were analyzed. The estimated effects are below (note that "σ" means standard deviation).

- Total collisions decreased by 30% (σ = 16%).
- RLR related collisions decreased by 32% (σ = 16%).
- Angle collisions decreased by 51% (σ = 16%).
- Rear-end collisions increased by 2% (σ = 29%).

The estimated effects seem to follow that of most other studies completed in the United States. Collisions seem to decrease when RLCs are in place, with small increases in rear-end collisions. However, the effect of selection bias leading to regression-to-the-mean, maturation, and historical effects likely overestimate the effects RLCs actually have on safety. In addition, seasonality effects (other than changes in traffic volume) likely affect the results of this analysis because weather and driving patterns change over time and we do not have full years of data in the after period. The comparison group analysis should help take into account the majority of these affects.

ESTIMATION USING A COMPARISON GROUP

Prediction using a comparison group accounts for many of the problems associated with many studies using a simple before-after analysis method. It is also an improvement on the prediction method using causal factors because it accounts for flaws such as seasonality factors. Although random selection was not possible, it is possible that some of the effects of regression-

to-the-mean are accounted for in this study. This is because comparison sites were chosen in a "near random" fashion during the site selection process. This type of analysis is discussed in more detail in Section V.

The estimated net effect of RLCs using a comparison group analysis technique is shown below.

- Total collisions decreased by 17% (σ = 16%).
- RLR related collisions decreased by 22% (σ = 17%).
- Angle collisions decreased by 42% (σ = 19%).
- Rear-end collisions decreased by 25% (σ = 32%).

Notice that with the exception of rear-end collisions, the estimated effectiveness of RLCs to reduce collisions is smaller than what was previously reported in the causal factor study. The difference likely reflects a more accurate study technique. Comparison groups do seem to show that rear-end collisions likely decreased by a sizeable percentage contrary to the estimated increase the simpler causal factor study indicates. This is important because most studies summarized in the literature (in particular, naïve before-after studies) show increases in rear-end related collisions.

ESTIMATION USING A COMPARISON GROUP – ACCOUNTING FOR THE HALO-EFFECT

A comparison group study is the best method we have available to account for factors such as seasonality. Previously, we estimated the effect of RLCs using two different methods: using causal factors and a comparison group. The next analysis technique is an attempt to improve on the previous comparison group analysis. As we summarized in Section VIII, little is known

about the effects of RLCs on nearby intersections. However, it is fairly well accepted in the transportation field that there is a spillover effect on nearby intersections. This analysis attempts to remove the majority of spillover effects of RLC sites on comparison intersections. The comparison sites eliminated include Salisbury at Morgan Street, McDowell Street at Morgan Street, and Woodburn/Cox Street at Hillsborough Street based on the previously mentioned criteria in Section VIII.

The estimated net effect of RLCs using a comparison group analysis technique accounting for the halo-effect is shown below.

- Total collisions decreased by 14% (σ = 17%).
- RLR related collisions decreased by 19% (σ = 18%).
- Angle collisions decreased by 35% (σ = 23%).
- Rear-end collisions decreased by 27% (σ = 31%).

Notice that RLCs seem to have less effect on total, RLR related, and angle collisions when taking the halo-effect into account than in previous studies.

While the safety effects of spillover have not been clearly defined, the removal of affected comparison sites appears to increase collision frequency in this particular study because reductions were not as significant. However, this seems to be counterintuitive. Safety effects should spillover from RLC sites into comparison sites in the vicinity. For example, the presence of a RLC sign at a treated intersection should raise driver awareness in the vicinity, thus causing safety to spill over into nearby intersections. Using this logic, removal of the nearby comparison sites in this study should yield higher collision reductions. Smaller sample sizes in the after period could account for some of the slight differences; however, the differences likely occured because the three sites removed were located in the downtown area of Raleigh. The majority of

treatment sites were located in downtown, which is primarily a pre-timed signal system in a grid network. By removing these comparison sites from the study, it is possible that the effectiveness of RLCs have not been properly accounted for. As a result, the halo-effect may be compromised by the ability of the three similar comparison sites to possibly help in predicting the safety of RLCs. Further investigation over the coming months should help in figuring out the validity of this particular study technique.

SUMMARY OF RLC COLLISION ESTIMATES OF EFFECTIVENESS

It's interesting to see the various estimates of RLC effectiveness associated with four groups of collisions. It is particularly apparent that choice of study is very important. Table 5 is a summary of the three analysis techniques used, as well as the four groups of collisions analyzed.

Table 5. Summary Table of Twelve Various Analyses

Collision Group [1]		Analysis Type [2]			Sample Size				δ [3]	σ(δ)	Θ(%) [4]	σ (θ)
					Before RLCs		After RLCs					
		CF	CG	HF	Treatment	Comparison	Treatment	Comparison				
1	Total	√			937		53		27	17	34%	15%
2	RLR Related	√			728		40		22	13	37%	15%
3	Angle	√			345		14		15	7	54%	15%
4	Rear End	√			247		21		0	6	5%	27%
5	Total		√		937	965	53	65	10	11	17%	16%
6	RLR Related		√		728	743	40	51	10	10	22%	17%
7	Angle		√		345	414	14	28	9	6	42%	19%
8	Rear End		√		247	199	21	20	4	10	25%	32%
9	Total			√	937	824	53	53	9	12	16%	17%
10	RLR Related			√	728	638	40	42	9	11	21%	18%
11	Angle			√	345	338	14	20	9	7	42%	21%
12	Rear End			√	247	185	21	19	2	13	28%	40%

[1] Collision Group depends on the type of collision(s) being analyzed

[2] Three different analysis methods took place: CF = Causal Factors, CG = Comparison Group, HF = Comparison Group accounting for Halo-Effect

[3] **δ** is the reduction in the expected number of collisions

[4] **Θ** is the Index of Effectiveness, or ratio of what safety was with RLCs to what it would have been without the RLCs

A total of twelve analyses were conducted. A few of the important points from these studies follows:

- Each analysis showed a decrease in collisions.
- Collision samples could be larger in the after period; however, the safety effect appears sizeable for the majority of the studies completed.
- The comparison group study (Analyses 5-8) appears to be the best choice of analysis. It is more rigorous than the study accounting for causal factors because it accounts for seasonality. In addition, it could be argued that some of the effects of regression-to-the-mean were accounted for in the "nearly random" site selection process.
- At this time, the comparison group study accounting for the halo-effect (Analyses 9-12) appears counterintuitive. Further analyses should be done in the future to see if they are related to small sample sizes or if the removal of the three affected comparison sites in the downtown area actually hurt the analysis.
- Based on the comparison group study (Analyses 5-8), collisions appear to decrease substantially with total, RLR related, angle, and rear-end decreasing by 17%, 22%, 42%, and 25%, respectively.

VIII. SECONDARY ANALYSIS: BEFORE-AFTER EFFECT ON VIOLATION TIME AFTER THE RED BALL INDICATION

The second driver behavior analyzed is the effect RLCs have at reducing the frequency of dangerous red light running violations. This chapter outlines where and how the data were collected, the problems faced during data collection, the analysis method, and the findings.

DATA ACQUISITION

Driver behavior can be affected in a couple of different ways with the implementation of RLCs. In our previous analysis, which is the most frequent measure of safety for RLCs, we analyzed various groups of collisions using three techniques. The types of analysis presented were robust; however, the findings are not convincing at this time due to the sample size. The results showed that there may be a sizeable safety effect related to the inception of RLCs. A second indicator of safety we analyzed was the actual time after the start of the red signal when a violation occurred. Our goal was to see if there was an apparent change in frequency of running red lights during times when RLR is more likely to cause a collision.

We asked the vendor (ACS – Affiliated Computer Services, Inc.) to allow our team to view videotapes from their "video-validation" phase in the Town of Chapel Hill and the City of Raleigh. ACS uses these tapes to validate approaches that the municipality believes to have a high number of RLR violations before installing a RLC. They are usually located at one side of an approach. The camera does not cause distractions because it is not intrusive or easy to see. The tapes show a recording of the signal indication and the stop bar so that violations can be easily seen. These tapes are usually sixteen or twenty-four hour recordings. The tapes contained

all the information we needed to obtain RLR violation times. With some work, this data could be used to help answer the question, "Is there an effect on the violation times happening after the onset of red at RLC approaches?"

Ultimately, any RLC system's primary goal should be to make people aware of red light running at intersections in order to improve overall safety. In theory, the perfect RLC system should eliminate nearly all red light running collisions. The data studied in this section do not include collisions. Instead, data were collected on violation times after the onset of the red ball indication, which should decrease over time as driver behavior changes. In particular we looked at whether violations two seconds or more after the onset of red increased. RLR violations in the before and after periods are located in Appendices E and F, respectively.

STUDY CONCERNS AND ASSUMPTIONS

As with most studies, there were initial concerns about data quality and how to use the data to make significant statements about automated RLCs. Therefore, the issues with our data set are discussed here to give the reader an opportunity to understand where the data came from, as well as an understanding of how issues were dealt with and the assumptions made.

Consistency between the data collected in the before and after periods was a concern. First, to account for limited red light running violation data greater than two seconds in the after period, a total of ten days of data were collected verses one day of data in the before period. This gave us a sample size large enough to draw conclusions. Also related to this problem was the issue of consistency between data collection time periods. Data from the video-validation study in the before period was available for a period of approximately sixteen hours in Chapel Hill and

twenty-four hours in Raleigh. RLR violation data in the after period was available for four months in Chapel Hill and one year in Raleigh. In order to be as consistent as possible, data was deleted from the after period data set that included times of the day not present in the before data set for Chapel Hill. To account for any possible seasonality flaws, RLR violation data was compared during similar time periods in the before and after period.

The second issue deals with the human error factor prevalent in this study. Because the tapes from the before period had to individually viewed, there was a possibility of missing violations at specific times after the red indication. However, this was easily overcome. Videotapes were viewed twice to make sure that no violations were missed. Less than ten percent were missed from the first count to the second. In addition, the probability of missing a violation of any type, dangerous or not, was equal for all groups. A violation taking place an extended period of time after the red signal indication could have been overlooked when fast-forwarding to next phase, while a minimal violation could have been overlooked while moving through the tapes. Because each was possible, any violations that were missed were assumed to be proportional.

Third, RLCs operate under certain constraints. Some of these constraints were easily overcome, while others were not. RLCs in Raleigh and Chapel Hill operate with a 0.3 second grace period. This grace period does not allow the cameras to include violations happening in the first 0.3 seconds of the red time. However, RLR violations in the before period were not easily distinguishable within a tenth of a second. Using two VCR's, we were able to transfer a time stamp over the original tape onto a new tape. Violations could then be manually counted within $1/30^{th}$ of a second.

Fourth, there was the issue of RLC's inherent tendency to go offline due to problems with the system. This meant that any violations during this off-line time period were not recorded. This is easily taken care of because there is an equal probability of a camera going offline during any specific time period. Therefore, we assumed that this would not affect the analysis because the chance of any violation happening during any given time period was equal throughout the day. Additionally, based on the data we received there were no obvious indications of malfunctions that would bias the data set.

Fifth, there was an issue that some intersections consisted of one or more one-way approaches in both directions of travel presented a problem. These specific sites do not allow left-turn-on-red; however, many drivers were taking illegal left turns. The research team, when viewing videotapes, counted each of these infractions. It was not always possible for the City of Raleigh to issue a ticket for this circumstance due to the inability of a picture (not video) to determine whether a driver actually ran the light, and the fact that sometimes drivers did not drive directly over the inductive loops, causing a default speed to be registered. City of Raleigh officials did not issue tickets when there was any doubt, causing some of these infractions not to be counted in the after period. Because this was considered an infraction, we assumed that Raleigh officials were able to catch the majority of these types of violations and that they manually checked when there was doubt.

Finally, the issue of the vendor's speed threshold criteria related to right-turn-on-red (RTOR) vehicles created another problem. This threshold is usually set at 15 mph. When RLR data indicates a violation occurring in a lane allowing RTOR, and the speed is less than the required threshold, a manual check by the vendor occurs. This manual check of the violation should catch

non-RTOR violations. Therefore, vehicles coming to a stop and running the red light, but not turning right on red, should still be accounted for in the after period because the vendor checks for any possible discrepancies related to this type of problem. Based on this understanding, we assumed that all vehicles stopping at the stop bar and leaving are counted as violations, provided they were not turning right on red.

CHOICE OF METHOD TO ANALYZE RED LIGHT RUNNING VIOLATIONS

Along with data quality concerns there was an issue of how to analyze the data in the best possible manner. The statistical method we chose to use is the Chi-Square Test of Independence. This method is defined in the following section and an analysis follows.

Chi-Square Test of Independence

The Chi-Square Test of Independence is used to determine if there is a relationship between two nominal variables using a contingency table *(7)*. The two variables we are testing are 1) violation times after red (columns) and 2) whether the violation occurred before or after RLCs were implemented (rows). This test allows the analyst to see whether the frequencies of violation times are contingent on the fact that a camera was in place *(7)*. The null hypothesis is that there is a relationship between violations during both periods of time, or that the expected frequency of running a red light indication before and after two seconds is equal to the observed frequency in the same periods.

The contingency table is set up using frequencies of red light violation occurrence in the before-after period by rows and columns. For our purposes, we chose a 2 x 2 contingency table

with frequencies of red light violations before and after two seconds for two reasons. First, based on previous research, this was believed to be the time after red that a violation could lead to a collision *(1)*. Second, a larger contingency table taking red light running violations for over an additional period of time would have decreased our sample sizes per cell. Table 6 shows the 2 x 2 contingency table. Sample sizes for each group are shown on top, with the expected values of red light running violations shown below in parenthesis. Percentage calculations in the upper-most cells represent the proportion of collisions happening before or after RLCs were in use. The percentage calculation in the bottom-most cell represents the proportion of collisions in one of the two specified time periods.

Table 6. Contingency Table Based on Collision Frequencies in the Before and After Periods

Time Period	0 - 1.99		2.00 - ∞		Total
Before	99 (115.27)	76% 17%	31 (14.73)	24% 42%	130
After	480 (463.73)	92% 83%	43 (59.27)	8% 58%	523
Total	579		74		653

In order to calculate a chi-square value, we must find the expected frequencies for each combination of columns and rows. The expected frequencies are used in the chi-square calculation to see if there is a difference in the expected red light running frequencies versus what actually took place. Because we have two columns dependant on two rows, we calculate four expected values. The formula for the expected frequencies is:

$$Eij = \frac{T_i \times T_j}{N}$$

where E_{ij} is the expected frequency for the cell in the i^{th} row and the j^{th} column, T_i is the total number of subjects in the i^{th} row, T_j is the total number of subjects in the j^{th} column, and N is the total number of subjects in the table. The calculations for the expected values shown in parenthesis in Table 6 are below.

$$E_{11} = \frac{130 \times 579}{653} = 115.27 \qquad E_{12} = \frac{130 \times 74}{653} = 14.73$$

$$E_{21} = \frac{523 \times 579}{653} = 463.73 \qquad E_{22} = \frac{523 \times 74}{653} = 59.27$$

The formula for the Chi-Square Test of Independence is

$$\chi^2_{calculated} = \sum \frac{(E-O)^2}{E}.$$

Calculated for our specific case,

$$\chi^2_{calculated} = \frac{(115.27-99)^2}{115.27} + \frac{(14.73-31)^2}{14.73} + \frac{(463.87-480)^2}{463.87} + \frac{(59.27-43)^2}{59.27} = 25.3$$

Based on chi-square tables with degrees of freedom equal to 1, the associated p-value is less than 0.001. Therefore, we reject the null hypothesis that the expected frequency of running a red light after two seconds equals the observed frequency of the sample.

GENERALIZATIONS BASED ON RED LIGHT RUNNING DATA

Looking at the data could give us some indication of what types of driver behavior changes are taking place with respect to red light running violations. Figure 10 shows the frequency of

red light violations before and after the inception of RLCs. The 85th percentile is shifted extensively from approximately one-second to four seconds.

One of the worst intersections we analyzed in the before period was Capital Boulevard and Highwoods Boulevard where thirteen of the thirty-one, or 42%, of total violations happened after two seconds during a period of one day. Drivers of various types made these violations; however, they primarily consisted of passenger cars and buses in the outermost two lanes. In viewing the videotapes from ACS, the geometry of Capital Boulevard (four through lanes and two left turn bays at a three legged intersection) seems to encourage drivers to run red lights. The perception of drivers seemed to indicate that running the light would not cause them, or opposing left-turning drivers, any harm because they were in the outermost two lanes. In addition long cycle times in this high volume corridor likely caused drivers to make this decision.

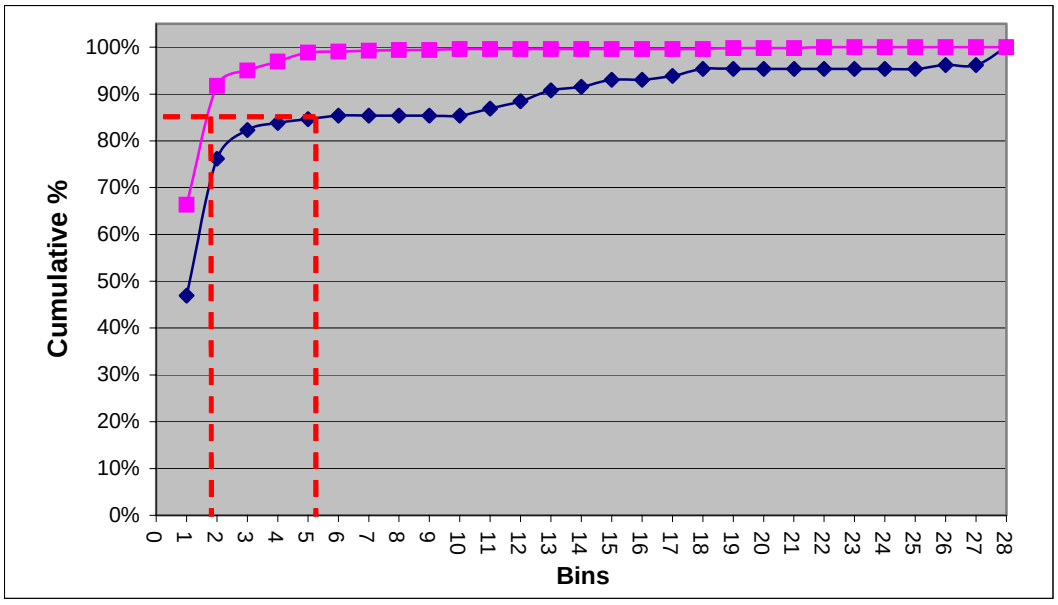

Figure 10. Cumulative Percentage of RLR Violations by Time After Red (in seconds)

The violations occurring at Capital Boulevard and Highwoods Boulevard seemed to change substantially in the after period. Violations greater than the two-second threshold were 6 out of 165 total violations, or approximately 4% of the total violations in the after period over a ten-day period. This drastic change indicates a decrease in dangerous RLR violations since installing RLCs.

Another point of concern is the fact that approximately 85% of drivers are committing violations between 0.3 and one second based on the available data in the before period. Based on observations and studies conducted at ITRE by Milazzo et al., the majority of RLR related collisions do not likely occur until a couple of seconds into the red indication, provided that left-turning vehicles in the opposite direction do not have a permitted indication and are trying to "sneak" through the intersection during the all red portion of the cycle *(2)*. If collisions are taking place two or more seconds after the onset of red (in the situation where permitted lefts are not allowed), then one may ask why agencies are providing such short grace periods or, one may also wonder why agencies do not extend yellow times to allow drivers a longer period to clear the intersection before the onset of red.

Most vendors selling automated enforcement systems allow a grace period of 0.3 seconds. This grace period on a standard 45 mph street (assuming a conservative estimation of the actual speed) allows a distance of approximately twenty feet past the stop bar. Twenty feet is approximately the length of a full size pick-up truck. This is a trivial distance/time to many drivers, which is one of the primary arguments against most current camera systems.

Although these are valid questions, the opposing argument is just as valid. Why should agencies give the driver an extended amount of time to enter during the red signal (or additional

yellow) when standardized, and sometimes conservative, yellow and all-red times are set to allow drivers to stop without a dilemma? Research done by James Bonneson shows that extending yellow times at RLR related intersections was not a safe way to decrease the number of red light running incidents *(29)*. In fact, doing so gave drivers the perception that yellow times were increased at other intersections, and therefore the number of red light running instances actually increased.

SUMMARY OF THE EFFECTIVENESS OF RLCs IN RELATION TO RED LIGHT RUNNING VIOLATIONS

This secondary analysis is new to the standard collision studies usually conducted on RLCs. The contribution that this particular study provides to readers is the first attempt to find a quick measure of effectiveness which could be used to analyze RLR cameras. The idea is similar to that of a conflict study which can collect large amounts of data in a short amount of time at signalized intersections, unlike collisions in a standard before-after study. Future attempts to use this method of analysis should use caution to eliminate as many assumptions as possible during the beginning stages of the analysis.

Based on the analysis, driver behavior appears to have been significantly affected by the percentage of violations greater than two seconds. This violation time was determined to be the likely time that a red light running collision could take place, given that permitted left turns took place at the intersection. The assumptions that had to be made very likely cause some error in the estimation of this effect. The extreme p-value of less than 0.001 indicates that it is very likely that any violations missed would not have changed the outcome of the test. In addition, the simple fact that ten days of violation data were needed in the after period to account for

enough long violation times, compared to that of one day in the before period, provides evidence that there has been a change in driver behavior.

IX. SUMMARY

The goal of this research effort was to determine if the presence of RLCs changed driver behavior by reducing collisions and the number of dangerous RLR violations. Four tasks were identified to help in this endeavor. These included a literature review, conducting focus groups, a before-after collision study, and an analysis of RLR violations.

CONCLUSIONS

Previous literature suggested that automated photographic enforcement at intersections decreased collisions of all types; with the exception of rear-end collisions in certain cases. However, the majority of these studies were flawed. First, most studies were simple and did not account for various phenomenon known to take place in before-after collision studies. More rigorous studies, such as those using comparison groups, were usually flawed because comparison sites were not proven to act similarly.

Six focus groups were conducted across the state in an effort to identity attitudes, opinions, and beliefs of various community and professional group members related to automated photographic enforcement. On the whole, participants' perception of automated enforcement was encouraging. Improvements suggested included improving the appeals process, changing the financial structure to keep profits for local consumption, and placing traffic signals in flashing red and yellow at low volume intersections during early morning hours of operation. Educating the public through driver education and other programs was also recommended. Overall, both community and professional group members agreed that the presence of RLCs would make them more aware of their driver behavior habits.

The primary analysis of driver behavior was a before-after study of collisions. Three analysis techniques were used: accounting for causal factors, using a comparison group, and using an improved comparison group accounting for the halo-effect. The advantage of using a comparison group in any before-after study is that it accounts for the effects of seasonality and history. Also, the site selection process that Raleigh used allowed us to choose sites in a "nearly random" fashion. Therefore, it is likely that some of the effects of regression-to-the-mean were also accounted for.

Currently, we believe the comparison group study is the best indicator of the effectiveness of RLCs. This is because causal factors do not account for seasonality and history and the comparison group study accounting for the halo-effect reduces the sample size even more. Four groups of collisions were analyzed in each of the three analyses and included total, RLR related, angle, and rear-end crashes. Based on the comparison group study, collisions were effectively reduced by 17%, 22%, 42%, and 25%, respectively.

The secondary analysis of driver behavior was a study of dangerous RLR violations. To date, we have seen no analysis of this type, so this provided new insight into the effectiveness of cameras. The Chi-Square Test of Independence was used to determine whether the frequency of violations greater than two seconds reduced when cameras were in place. This test shows these serious RLR violations decreased significantly with a p-value less than 0.001.

RLCs appear to have a positive affect on driver behavior based on findings from previous literature, focus groups, and analyses of collisions and RLR violations. Based on the comparison group study, collisions were reduced in all four categories we examined by sizeable amounts. The sample sizes to this point in the after period are low, but over time, larger sample sizes of

collisions will be available and will improve the before-after collision studies described in this report. Finally, RLR violations greater than two seconds reduced drastically, adding further evidence that automated enforcement cameras increase safety at intersections.

RECOMMENDATIONS FOR CITIES

Cities concerned about safety at intersections with high numbers of red light violations and/or collisions should only consider using automated enforcement if all other engineering countermeasures are exhausted *(1)*.

Should the city wish to conduct a rigorous analysis of their RLC system, random selection of RLC and control sites from a pool of similar sites should be considered to eliminate selection bias leading to regression-to-the-mean. If random selection is not possible, comparison groups should be considered as an alternative study, but only if the pattern of collisions from the comparison sites proves to be similar to the pattern of collisions at RLC sites in the before period. If this analysis method fails, accounting for causal factors should be considered as an alternative.

RECOMMENDATIONS FOR FUTURE RESEARCH

Future research somewhere should include a before-after analysis of collisions using a control group. To date, no studies of this type have been conducted. Although we attempted to account for the effects of regression-to-the-mean in our "nearly random" site selection process, the fact that random selection did not actually occur still leaves some doubt on the true safety effects RLCs have on collisions of any type.

This study of RLCs was more rigorous than most studies conducted at this time because comparison sites were shown to act similarly to RLC sites based on previous collision counts. However, a larger sample size of collisions in the after period would provide a much better indication of the actual effects cameras have on driver behavior in the Raleigh area. We strongly urge the City of Raleigh to continue analyzing their RLCs using the framework we have established. In addition, the comparison group analysis accounting for the halo-effect could prove more useful if the differences in collision effects related to spillover and similar sites could be separated.

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Appendix A:

Focus Group Release and Questions:

Community and Professional

Community Focus Group:

Expanding the Use of Photo Enforcement to Enhance Traffic Safety in North Carolina

University Contact: Joe Milazzo II 919_515-8767 joe_milazzo_ii@ncsu.edu

You are invited to participate in a focus group as part of an ongoing research study.
One of the primary purposes of this focus group is to assess participants' perceptions on the purpose and definition of traffic laws and traffic law enforcement, their personal experiences, opinions and suggestions regarding photo enforcement, and the impact of photo enforcement on participants' respect for traffic law enforcement.

INFORMATION
The following paragraph summarizes the time requirements for the focus group:
The time required for the focus group will depend on the dynamics of the focus group. We expect that the group will last no shorter than 30 minutes and no longer than 2 hours.

RISKS
No material risks to participants are anticipated.

BENEFITS
The information gathered in this focus group, in conjunction with other focus groups and other elements of this research study, should result in the identification of new opportunities and challenges associated with the expansion of photographic traffic enforcement in North Carolina.

CONTACT
If you have questions at any time about the study or the procedures, you may contact Joe Milazzo II, at the Institute for Transportation Research and Education, North Carolina State University at (919) 515-8767. If you feel you have not been treated according to the descriptions in this form, or your rights have been violated during the course of this survey, you may contact Ms. Debra A. Paxton, Officer of the NCSU IRB for the Use of Human Subjects in Research Committee, at (919) 515-4514.

PARTICIPATION
Your participation in this focus group is voluntary. If you do not wish to participate, please feel free to leave.

'COMMUNITY' FOCUS GROUPS

Overview

As North Carolina expands the use of photo enforcement of red light cameras and harmonizes photo enforcement policies statewide, *a critical question is* ***whether or not other traffic violations or behaviors are amenable to photo enforcement****.* We propose a two-year project to **assess the effectiveness of expanding** the use of photo enforcement on user ***safety*** **and** ***respect for traffic law enforcement****.*

Focus Group objectives:

FOCUS GROUP OBJECTIVE 1: Assess your perceptions on the purpose and definition of traffic laws and traffic law enforcement.
FOCUS GROUP OBJECTIVE 2: Assess your personal experiences, opinions, and suggestions regarding photographic enforcement programs
FOCUS GROUP OBJECTIVE 3: Assess the impact of photo enforcement on your respect for traffic law enforcement.

Objective 1: To assess participants' perceptions on the purpose and definition of traffic laws and traffic law enforcement

- **What is a traffic law/violation? Why do we have traffic laws?**
    - *SHP policy, marginal technical violations vs. clear cut + substantial violation
- **What is the purpose of traffic law enforcement?**
- **What is photographic enforcement?**

Objective 2: To assess participants' perceptions, personal experiences, opinions, and suggestions regarding photographic enforcement programs (including stated goals, surrounding publicity and marketing, etc.)

[goals of the RLR programs]

- Do you know the stated goal of photographic enforcement programs?
- Do photo enforcement systems meet their stated goals?
- Are there secondary motives behind implementing photo enforcement systems?
    - Does photo enforcement meet the goals of the secondary motives?
        - Charlotte vs. Cary laws

[how the RLR programs work,]

- How does photographic enforcement work?
- What traffic laws do cameras currently enforce?

[personal experiences with RLR]

- Have you ever been ticketed by a photo enforcement system?
- What law did you violate?
- **Do you agree with your ticket? (not if you like it or not, but are you guilty and would have a police officer have pulled you over for it?)**
- How did you react to the ticket?
- How do you decide what things should be against the law?
- Should behaviors that are against the law, but do not have safety risks carry a penalty?
- Should behaviors that have greatly reduced risks carry the same penalties as those with much higher risks?
- Should behaviors with great risks have bigger penalties?

[how could they be improved]

- Do you support the use of photographic enforcement in your community?
    - Why or why not?
- What kind of public education programs could be conducted about photographic enforcement?
- Do you see the photographic enforcement program changing in the future?
    - Why or why not?
    - In what direction?
- **How can red light running photo enforcement programs be improved?**
    - **If you were in charge, name one thing, no matter how small, that you do differently, the same, or not at all?**
- How do you decide what things should be against the law?
- If the legislature asked us to recreate the highway code from scratch – how would we go about doing it?
- How would we determine what the penalty for each violation would be?

[other violations]

- **What other traffic laws could be photo enforced?**
    - *[ramp metering, school buses, speeding (DC), following too closely]*
    - **Are there and other applications to cameras?**
        - *Road tendencies, homeland security, pedestrians?

Objective 3: To assess the impact of photo enforcement on participants' respect for traffic law enforcement

- **Are you more likely to follow traffic laws at locations with photo enforcement systems in place or locations without?**
    - Why?
- **Does the existence of photo enforcement systems increase or decrease your respect for traffic law enforcement?**
    - Increase for one kind yet decreases for another?
- What is the biggest benefit to using photo enforcement over traditional law enforcement?
- What is the biggest drawback to using traditional law enforcement over photo enforcement?

Leftover questions:

- Do you have any thoughts that were not mentioned in the previous discussion?
- Do you have anything to say that was not covered in the previous discussion?

Professional Focus Group:

Expanding the Use of Photo Enforcement to Enhance Traffic Safety in North Carolina

University Contact: Joe Milazzo II 919_515-8767 joe_milazzo_ii@ncsu.edu

You are invited to participate in a focus group as part of an ongoing research study.
One of the primary purposes of this focus group is to assess participants' perceptions on the purpose and definition of traffic laws and traffic law enforcement, their personal experiences, opinions and suggestions regarding photo enforcement, and the impact of photo enforcement on participants' respect for traffic law enforcement.

INFORMATION
The following paragraph summarizes the time requirements for the focus group:
The time required for the focus group will depend on the dynamics of the focus group. We expect that the group will last no shorter than 30 minutes and no longer than 2 hours.

RISKS
No material risks to participants are anticipated. If you are in an upper management position in a professional department (e.g., lieutenants and higher for police forces) we may use quotations from you in our report of this research. These quotations will be ascribed to your name. If you do not want us to quote you, please let us know and we will either not use a quote from you, or not use your name and department when we refer to the quote in the report.

BENEFITS
The information gathered in this focus group, in conjunction with other focus groups and other elements of this research study, should result in the identification of new opportunities and challenges associated with the expansion of photographic traffic enforcement in North Carolina.

CONTACT
If you have questions at any time about the study or the procedures, you may contact Joe Milazzo II, at the Institute for Transportation Research and Education, North Carolina State University at (919) 515-8767. If you feel you have not been treated according to the descriptions in this form, or your rights have been violated during the course of this survey, you may contact Ms. Debra A. Paxton, Officer of the NCSU IRB for the Use of Human Subjects in Research Committee, at (919) 515-4514.

PARTICIPATION
Your participation in this focus group is voluntary. If you do not wish to participate, please feel free to leave.

_____
Printed Name

_____ _____
Signed Name (professional focus group only) Date

'PROFESSIONAL' FOCUS GROUPS

Overview

As North Carolina expands its use of photo enforcement of red light cameras and harmonizes photo enforcement policies statewide, a critical question is **whether or not other traffic violations or behaviors are amenable to photo enforcement**. We propose a two-year project to **assess the effectiveness of expanding** the use of photo enforcement on user **safety and respect for traffic law enforcement**.

Focus Group Objectives:

FOCUS GROUP OBJECTIVE 1: Assess participants' perceptions on the purpose and definition of traffic laws and traffic law enforcement.
FOCUS GROUP OBJECTIVE 2: Assess participants' perceptions, personal experiences, opinions, and suggestions regarding photographic enforcement programs (including stated goals, surrounding publicity and marketing, etc.)
FOCUS GROUP OBJECTIVE 3: Assess the impact of photo enforcement on participants' respect for traffic law enforcement.

Objective 1: To assess participants' perceptions on the purpose and definition of traffic laws and traffic law enforcement

- **What is traffic law/violation? Why do we have traffic laws?**
    - *SHP policy, marginal technical violations vs. clear cut + substantial violation
- **What is the purpose of traffic law enforcement?**
- **What is photographic enforcement?**

Objective 2: To assess participants' perceptions, personal experiences, opinions, and suggestions regarding photographic enforcement programs (including stated goals, surrounding publicity and marketing, etc.)

- Do you know the stated goal of photographic enforcement programs?
- Do photo enforcement systems meet their stated goals?
- Are there secondary motives behind implementing photo enforcement systems?
    - Does photo enforcement meet the goals of the secondary motives?

[how the photo RLR programs work]

- How does photographic enforcement work?
- What traffic laws do cameras currently enforce?

[personal experiences with photo RLR]

- Have you ever been ticketed by a photo enforcement system? What law did you violate?
- Do you agree with your ticket? (not if you like it or not, but are you guilty)

[enforcement policies]

- Alternatively, have you ever reviewed automated enforcement tickets?
- **Would you have ticketed a vehicle performing the same act if you were on traffic patrol?**
- Are there violations that you would catch that the camera would not? Are there violations that the camera catches that you would let go?
- Have you ever given someone a warning ticket for a marginal violation?
- Have you ever given someone a warning ticket for a substantial one?
- What were the reasons that led you to make that decision?

- Have you ever brought a case to a DA or magistrate that he or she dismissed, that upon reflection you agreed with the reasons for the dismissal? What were those reasons?

[how could they be improved]

- Do you support the use of photographic enforcement in your community?
    - Why or why not?
- Is the public sufficiently educated about photo enforcement systems?
    - What programs could be implicated if not sufficiently educated?
- In what direction do you see the photoE program headed in?
- **How can red light running photo enforcement programs be improved?**
    - **name one thing, no matter how small, that you would do differently or change. Other than the fact that the cameras are not moveable.**
- How do you decide what things should be against the law?
- If the legislature asked us to recreate the highway code from scratch – how would we go about doing it?
- How would we determine what the penalty for each violation would be?
- Should behaviors that are against the law, but do not have safety risks, carry a penalty?
- Should behaviors that have greatly reduced risks carry the same penalties as those with much higher risks? Or reduced penalties?
- Should behaviors with great risks have bigger penalties?

[other violations]

- **What other traffic laws could be photo enforced?**
    - **Are there other applications to cameras?**
        - *Road tendencies, homeland security, pedestrians?

Objective 3: To assess the impact of photo enforcement on participants' respect for traffic law enforcement

- **Are citizens more likely to follow traffic laws at locations with photo enforcement systems in place or locations with traditional law enforcement in place?**
  - Why?
- **Does the existence of photo enforcement systems increase or decrease citizens' respect for traffic law enforcement?**
- **Do you have any concerns about the impact of photo enforcement on traffic enforcement?**
- **What is the biggest benefit to using photo enforcement over traditional law enforcement?**
- **What is the biggest drawback to using traditional law enforcement over photo enforcement?**

Leftover questions:

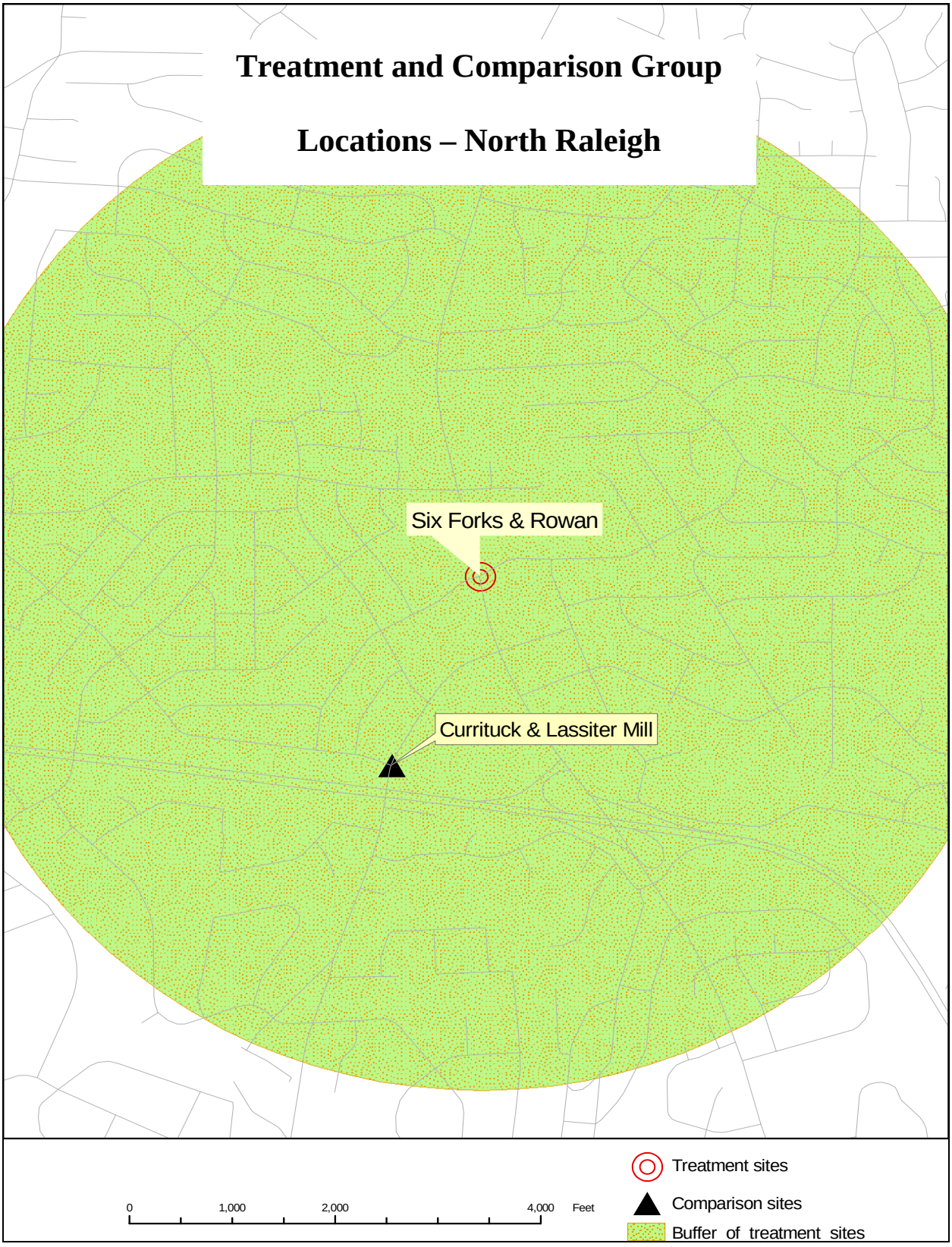
- Do you have any thoughts that were not mentioned in the previous discussion?
- Do you have anything to say that was not covered in the previous discussion?

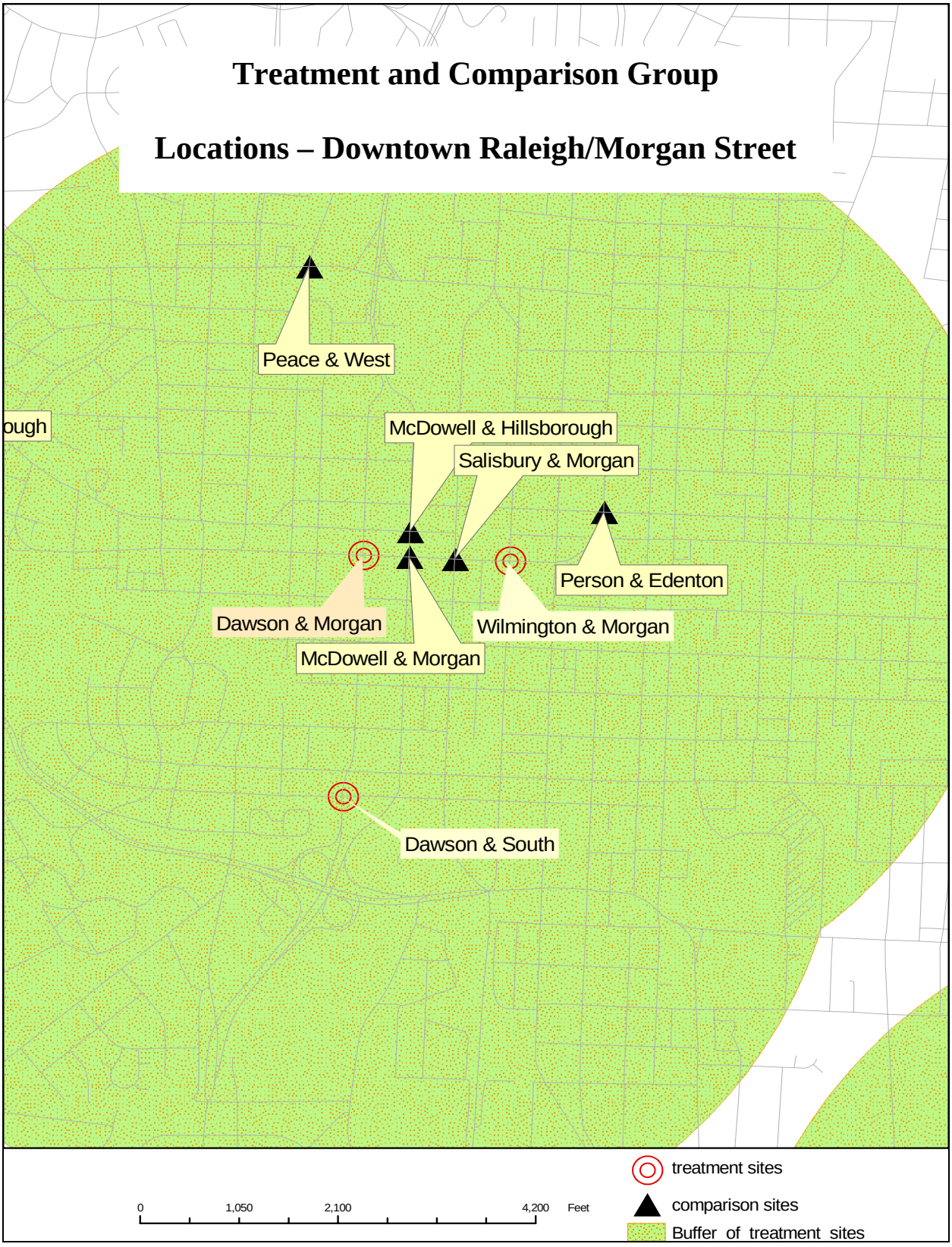
Appendix B:

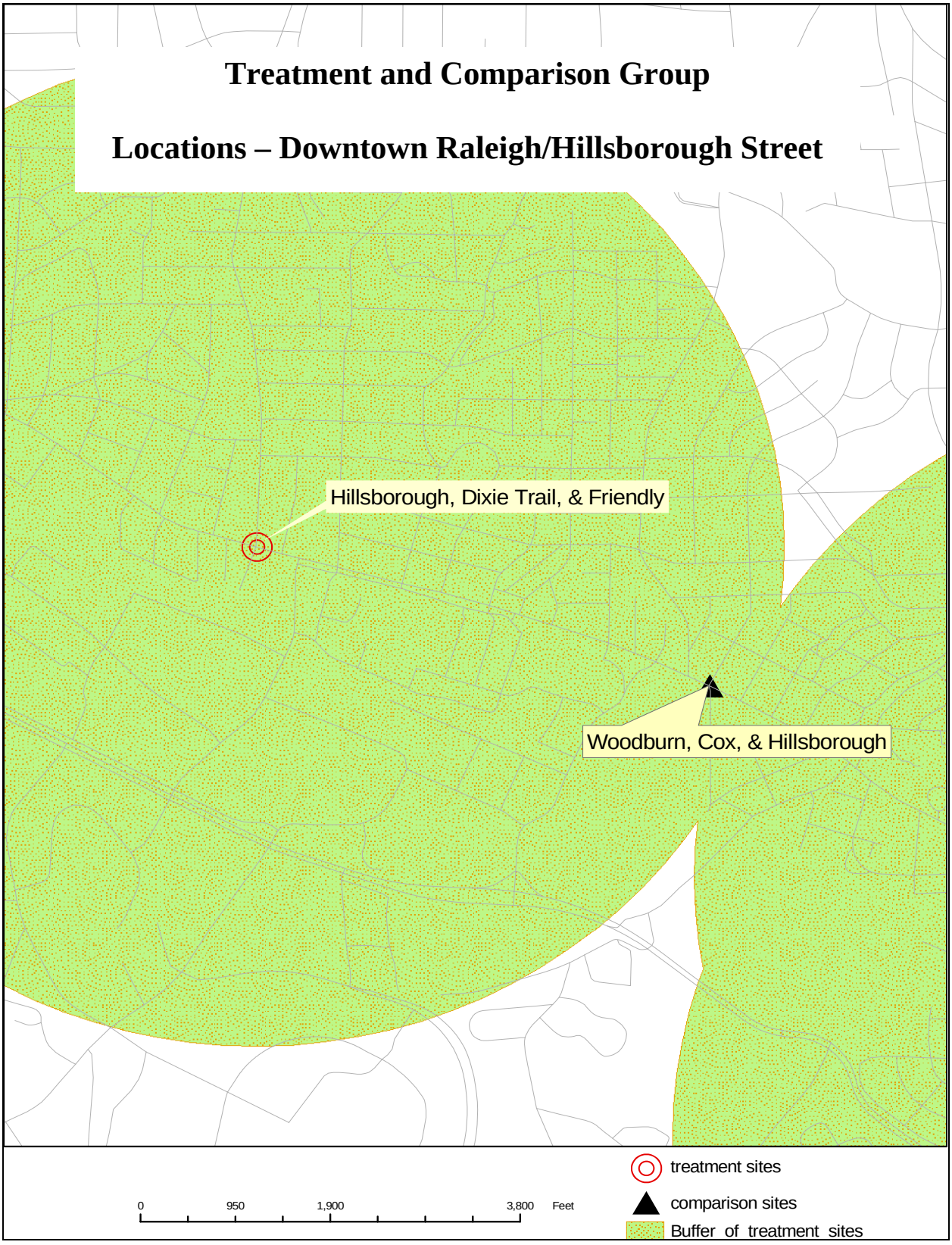
Maps Accounting for

Halo Effect Using ARC-GIS


Treatment and Comparison Group
Locations - Central Wake County
Falls of the Neuse & Millbrook
Millbrook & Old Wake Forest
Six Forks & Rowan
Currituck & Lassiter MS
Brentwood & New Hope Church
Capitol & Highwoods
Hillsborough, Dixie Trail, & Friendly
Needham, Cox, & Hillsborough
Peace & West
McDowell & Hillsborough
Salisbury & Morgan
Person & Edenton
Dawson & Morgan
Harrington & Morgan
McDowell & Morgan
Dawson & South
Cross Link, Proctor, & Rock Quarry
treatment sites
comparison sites
Buffer_of_treatment_sites
0
5,000
10,000
20,000
Feet


Treatment and Comparison Group
Locations – North Raleigh
Six Forks & Rowan
Currituck & Lassiter Mill
0
1,000
2,000
4,000
Feet
Treatment sites
Comparison sites
Buffer of treatment sites


Treatment and Comparison Group
Locations – Downtown Raleigh/Morgan Street
Peace & West
ough
McDowell & Hillsborough
Salisbury & Morgan
Person & Edenton
Dawson & Morgan
Wilmington & Morgan
McDowell & Morgan
Dawson & South
0
1,050
2,100
4,200
Feet
treatment sites
comparison sites
Buffer_of_treatment_sites


Treatment and Comparison Group
Locations – Downtown Raleigh/Hillsborough Street
Hillsborough, Dixie Trail, & Friendly
Woodburn, Cox, & Hillsborough
0
950
1,900
3,800
Feet
treatment sites
comparison sites
Buffer of treatment sites

Appendix C:

Analyses Using Three Study Types:

1. Causal Factors

2. Comparison Group

3. Comparison Group Accounting for Halo-Effect

TOTAL COLLISIONS - NO HALO EFFECT

CHAP 8 - CAUSAL FACTORS

	Treatment
K	937
L	53

Causal Factors		
	r_d =	**0.074627**
d_{before} =	67	
d_{after} =	5	
	r_{tf} =	**1.14**
v =	0.13	
	VAR (r_{tf}) =	**0.0441**
tf_{before} =	2754	
tf_{after} =	3146	

Estimates	
$\lambda_{treatment}$ =	53
$\pi_{treatment}$ =	80
VAR (λ) =	53.0
VAR (π) =	222.5

Effect on Safety	
δ =	27
Θ =	0.66
σ (δ) =	16.6
σ (Θ) =	0.147

Reduction of 27 +/- 16.6 collisions or
reduction of 34% +/- 14.7% from the
expected # of collisions

CHAP 9 - USING A COMPARISON GROUP

	Treatment	Comparison	
K	937	965	M
L	53	65	N

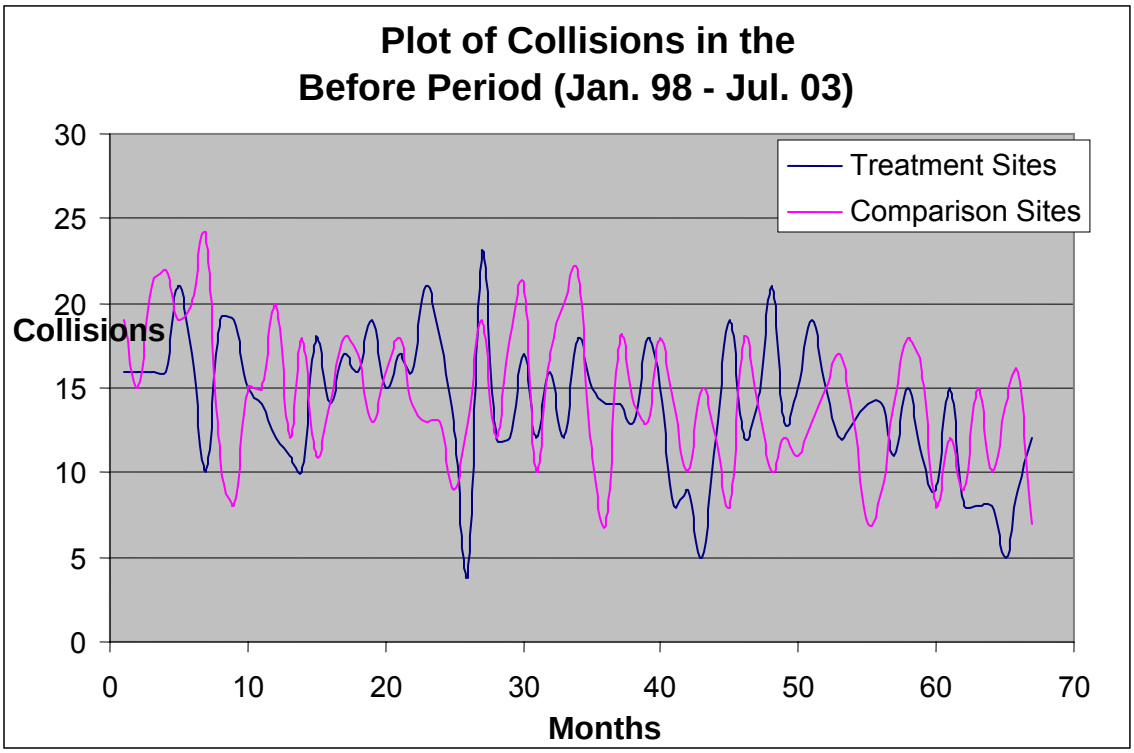
Sample Odds Ratio	
m(*o*) =	0.9608
s^2(*o*) =	0.017061
s(o) =	0.065309
VAR (ω) =	0.000

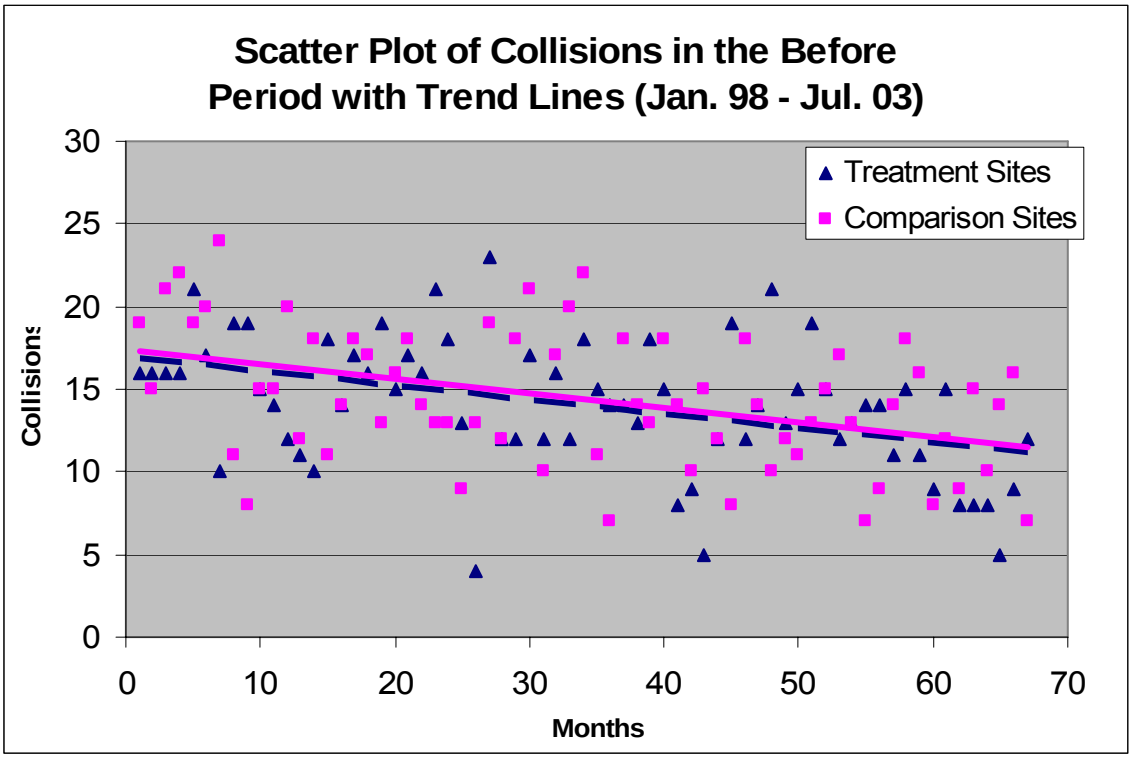
Estimates	
$\lambda_{treatment}$ =	53
r_c =	0.067
π =	63
VAR (λ) =	53
VAR (π) =	70

Effect on Safety	
δ =	10.0
Θ =	0.826
σ (δ) =	11.1
σ (Θ) =	0.158

Reduction of 10 +/- 11.1 collisions or
reduction of 17% +/- 15.8% from the
expected # of collisions

OR =	0.840	**Using the Odds Ratio test, treatments sites were found to**
T =	0.916	**have caused no signifcant changes in accidents**
x =	-16.0	


Plot of Collisions in the Before Period (Jan. 98 - Jul. 03)
Treatment Sites
Comparison Sites
Collisions
Months
0
5
10
15
20
25
30
0
10
20
30
40
50
60
70


Scatter Plot of Collisions in the Before Period with Trend Lines (Jan. 98 - Jul. 03)
Treatment Sites
Comparison Sites
Collisions
Months
0
5
10
15
20
25
30
0
10
20
30
40
50
60
70

RLR RELATED COLLISIONS - NO HALO EFFECT

CHAP 8 - CAUSAL FACTORS

	Treatment
K	728
L	40

Causal Factors		
	r_d =	**0.074627**
d_{before} =	67	
d_{after} =	5	
	r_{tf} =	**1.14**
v =	0.13	
	VAR (r_{tf}) =	**0.0441**
tf_{before} =	2754	
tf_{after} =	3146	

Estimates	
$\lambda_{treatment}$ =	40
$\pi_{treatment}$ =	62
VAR (λ) =	40.0
VAR (π) =	135.5

Effect on Safety	
δ =	22
Θ =	0.63
σ (δ) =	13.2
σ (Θ) =	0.150

Reduction of 22 +/- 13.2 collisions or
reduction of 37% +/- 15.0% from the
expected # of collisions

CHAP 9 - USING A COMPARISON GROUP

	Treatment	Comparison	
K	728	743	M
L	40	51	N

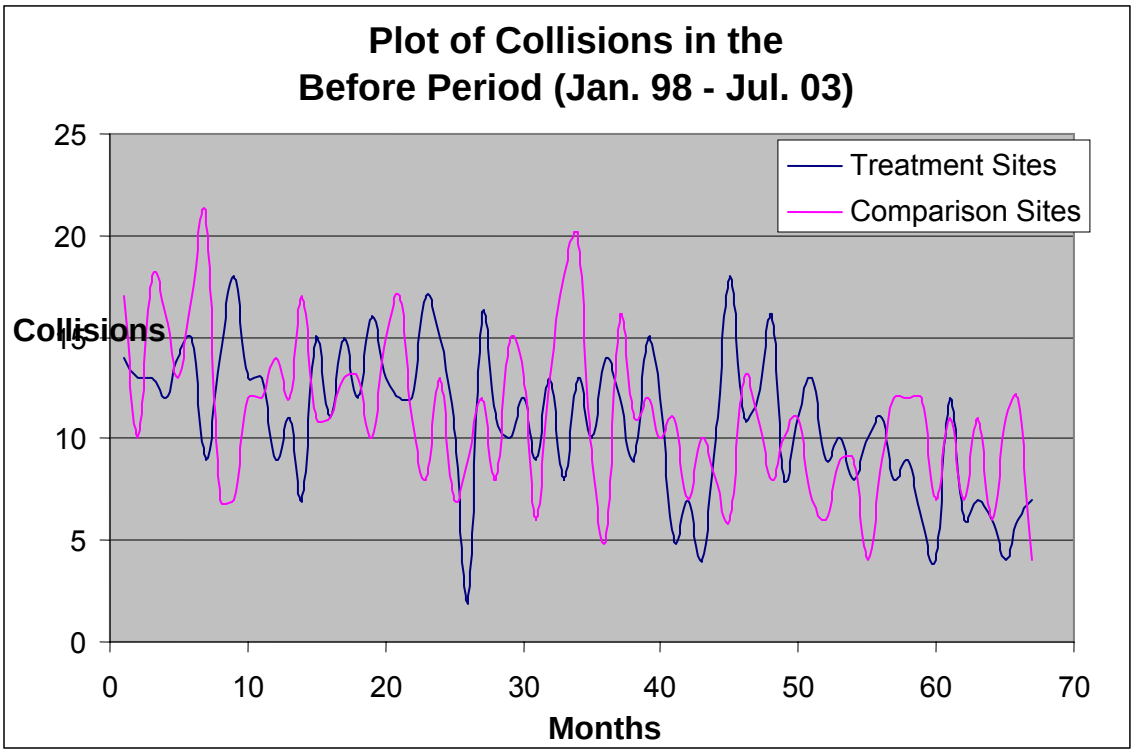
Sample Odds Ratio	
m(*o*) =	0.9804
$s^2(o)$ =	0.008887
s(o) =	0.047135
VAR (ω) =	0.000

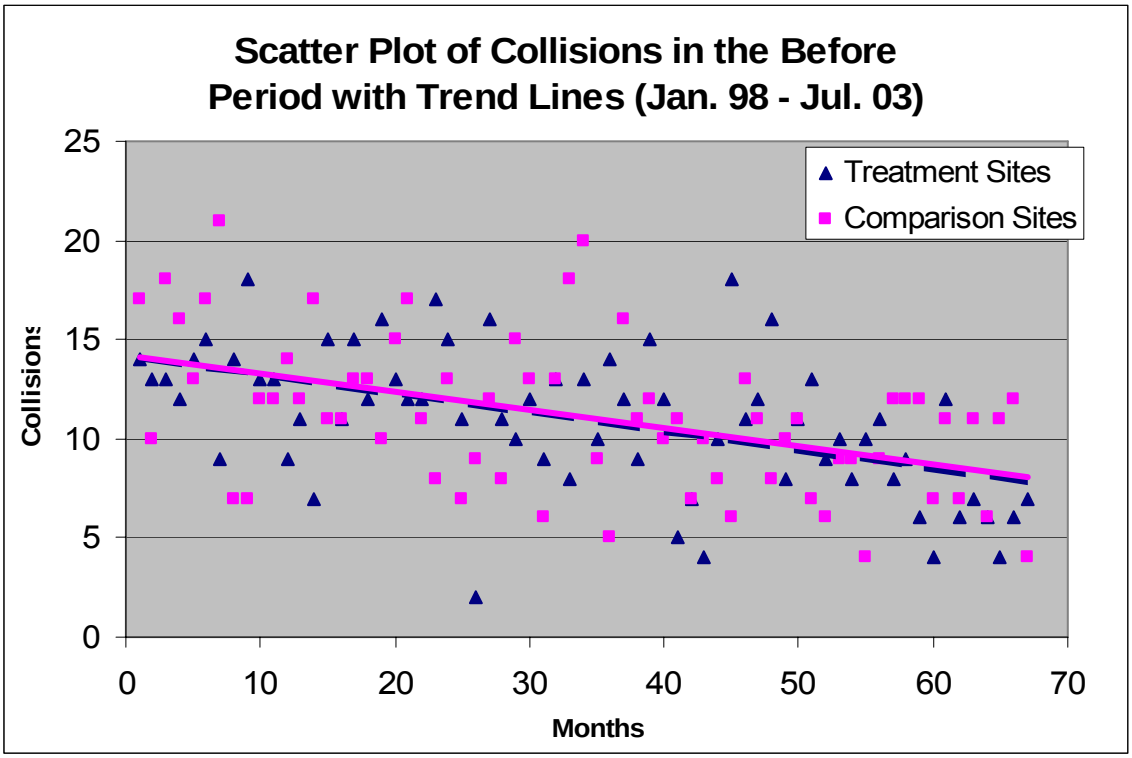
Estimates	
$\lambda_{treatment}$ =	40
r_c =	0.069
π =	50
VAR (λ) =	40
VAR (π) =	56

Effect on Safety	
δ =	9.9
Θ =	0.784
σ (δ) =	9.8
σ (Θ) =	0.171

Reduction of 10 +/- 9.8 collisions or
reduction of 22% +/- 17.1% from the
expected # of collisions

OR =	0.800	**Using the Odds Ratio test, treatments sites were found to**
T =	1.023	**have caused no significant changes in accidents**
x =	-20.0	


Plot of Collisions in the Before Period (Jan. 98 - Jul. 03)
Collisions
Months
Treatment Sites
Comparison Sites
0
5
10
15
20
25
0
10
20
30
40
50
60
70


Scatter Plot of Collisions in the Before Period with Trend Lines (Jan. 98 - Jul. 03)
Collisions
Months
Treatment Sites
Comparison Sites
0
5
10
15
20
25
0
10
20
30
40
50
60
70

ANGLE COLLISIONS - NO HALO EFFECT

CHAP 8 - CAUSAL FACTORS

	Treatment
K	345
L	14

Causal Factors		
	r_d =	**0.074627**
d_{before} =	67	
d_{after} =	5	
	r_{tf} =	**1.14**
v =	0.13	
	VAR (r_{tf}) =	**0.0441**
tf_{before} =	2754	
tf_{after} =	3146	

Estimates	
$\lambda_{treatment}$ =	14
$\pi_{treatment}$ =	29
VAR (λ) =	14.0
VAR (π) =	31.7

Effect on Safety	
δ =	15
Θ =	0.46
σ (δ) =	6.8
σ (Θ) =	0.146

Reduction of 15 +/- 6.8 collisions or
reduction of 54% +/- 14.6% from the
expected # of collisions

CHAP 9 - USING A COMPARISON GROUP

	Treatment	Comparison	
K	345	414	M
L	14	28	N

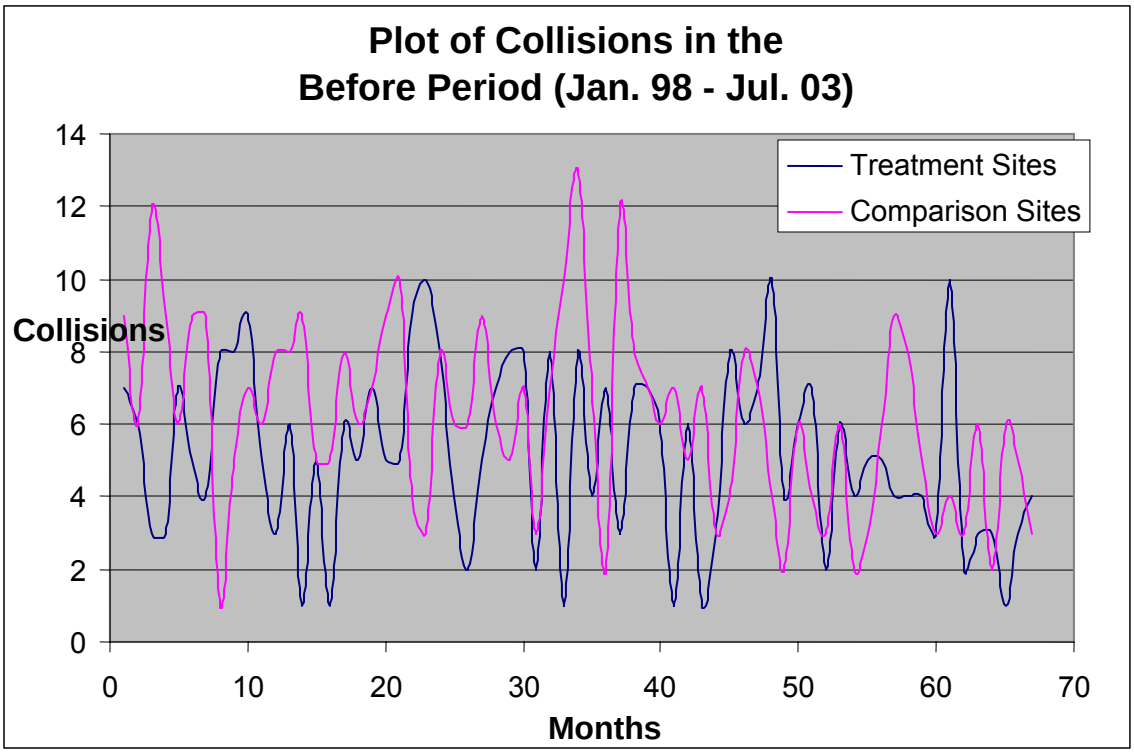
Sample Odds Ratio	
m(*o*) =	0.9288
s^2(*o*) =	0.004811
s(o) =	0.03468
VAR (ω) =	0.000

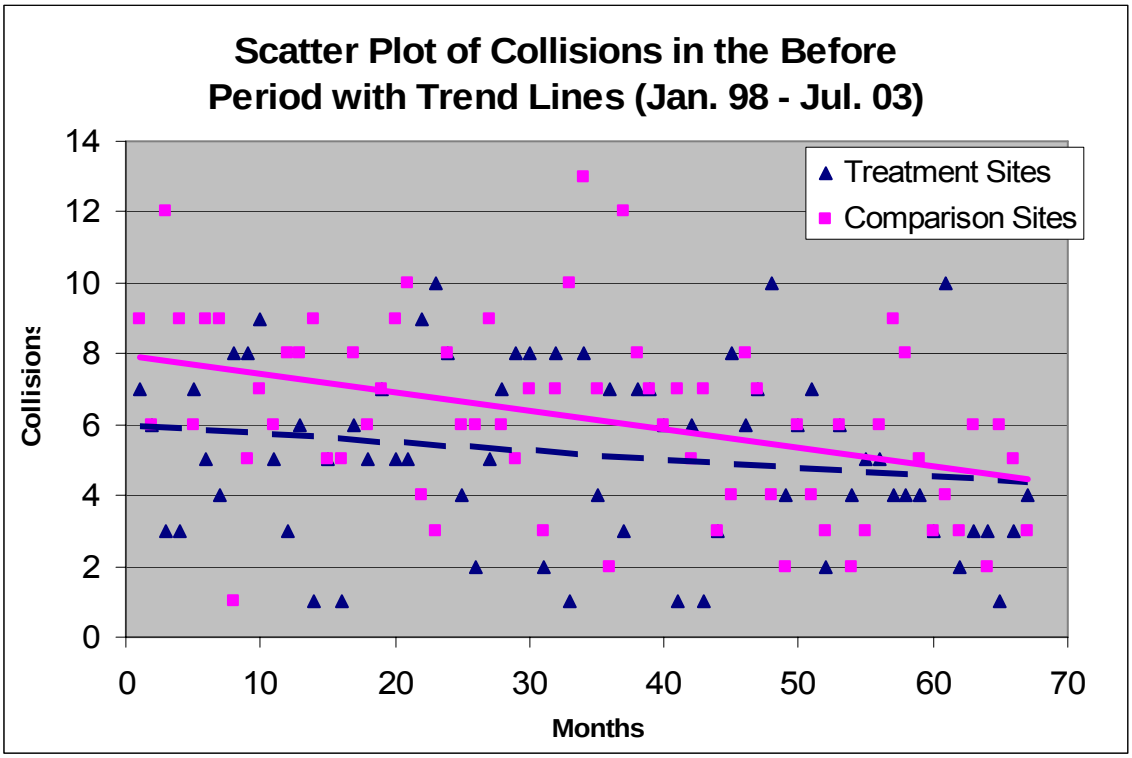
Estimates	
$\lambda_{treatment}$ =	14
r_c =	0.067
π =	23
VAR (λ) =	14
VAR (π) =	22

Effect on Safety	
δ =	9.3
Θ =	0.578
σ (δ) =	6.0
σ (Θ) =	0.194

Reduction of 9 +/- 6.0 collisions or
reduction of 42% +/- 19.4% from the
expected # of collisions

OR =	0.600	**Using the Odds Ratio test, treatments sites were found to**
T =	1.523	**have caused no significant changes in accidents**
x =	-40.0	


Plot of Collisions in the Before Period (Jan. 98 - Jul. 03)
Treatment Sites
Comparison Sites
Collisions
Months
0
2
4
6
8
10
12
14
0
10
20
30
40
50
60
70


Scatter Plot of Collisions in the Before Period with Trend Lines (Jan. 98 - Jul. 03)
Treatment Sites
Comparison Sites
Collisions
Months
0
2
4
6
8
10
12
14
0
10
20
30
40
50
60
70

REAR END COLLISIONS - NO HALO EFFECT

CHAP 8 - CAUSAL FACTORS

	Treatment
K	247
L	21

Causal Factors		
	r_d =	**0.074627**
d_{before} =	67	
d_{after} =	5	
	r_{tf} =	**1.14**
v =	0.13	
	VAR (r_{tf}) =	**0.0441**
tf_{before} =	2754	
tf_{after} =	3146	

Estimates	
$\lambda_{treatment}$ =	21
$\pi_{treatment}$ =	21
VAR (λ) =	21.0
VAR (π) =	16.8

Effect on Safety	
δ =	0
Θ =	0.95
σ (δ) =	6.1
σ (Θ) =	0.268

Reduction of 0 +/- 6.1 collisions or
reduction of 5% +/- 26.8% from the
expected # of collisions

CHAP 9 - USING A COMPARISON GROUP

	Treatment	Comparison	
K	247	199	M
L	21	20	N

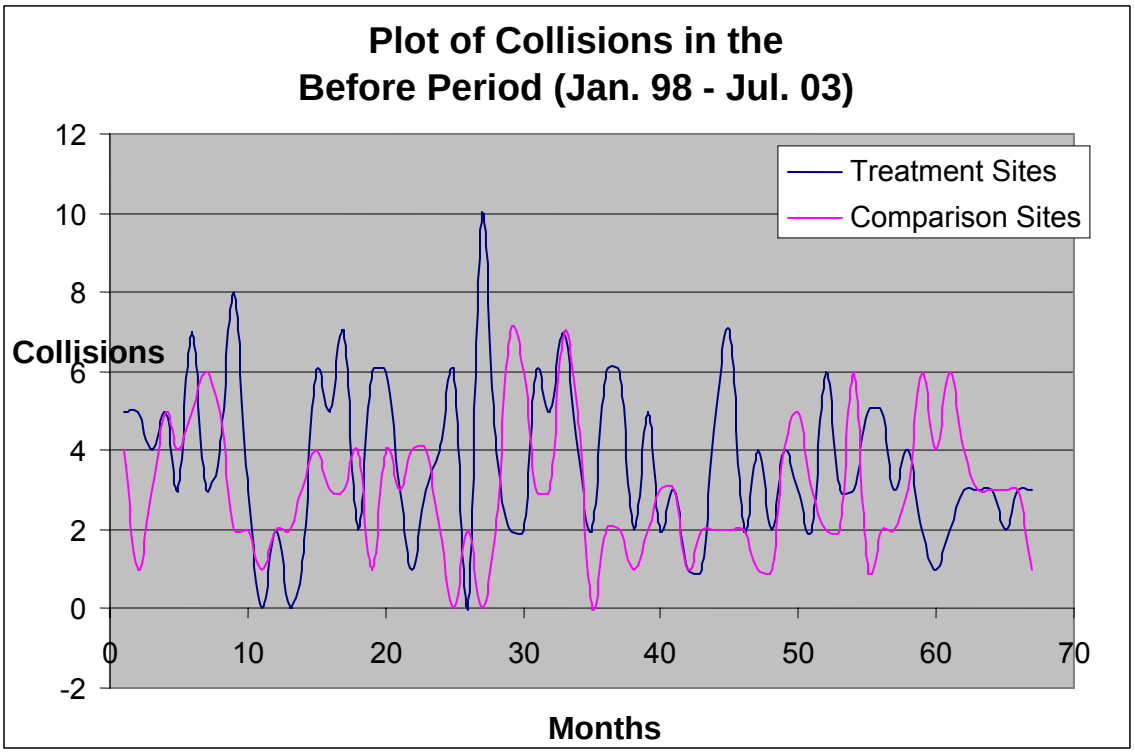
Sample Odds Ratio	
m(*o*) =	1.0459
s^2(*o*) =	0.176577
s(o) =	0.210105
VAR (ω) =	0.070

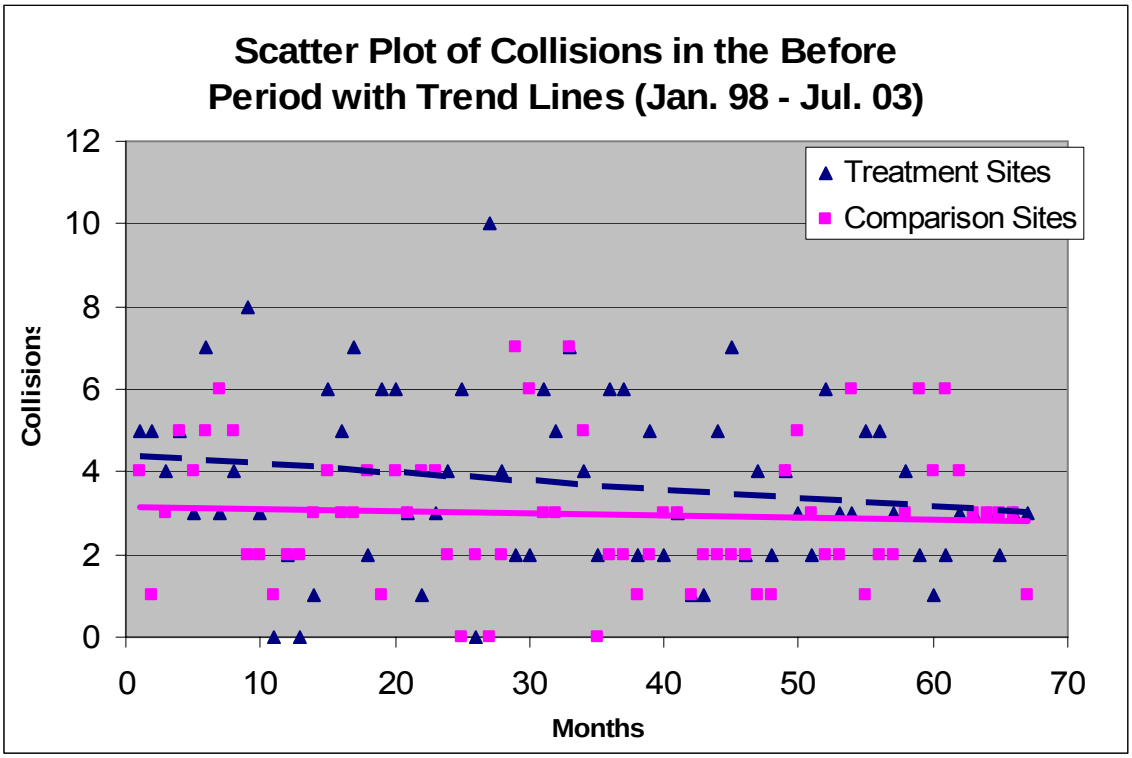
Estimates	
$\lambda_{treatment}$ =	21
r_c =	0.100
π =	25
VAR (λ) =	21
VAR (π) =	79

Effect on Safety	
δ =	3.7
Θ =	0.753
σ (δ) =	10.0
σ (Θ) =	0.316

Reduction of 4 +/- 10.0 collisions or
reduction of 25% +/- 31.6% from the
expected # of collisions

OR =	0.846	**Using the Odds Ratio test, treatments sites were found to**
T =	0.512	**have caused no significant changes in accidents**
x =	-15.4	


Plot of Collisions in the Before Period (Jan. 98 - Jul. 03)
Treatment Sites
Comparison Sites
Collisions
Months
12
10
8
6
4
2
0
-2
0
10
20
30
40
50
60
70


Scatter Plot of Collisions in the Before Period with Trend Lines (Jan. 98 - Jul. 03)
Treatment Sites
Comparison Sites
Collisions
Months
12
10
8
6
4
2
0
0
10
20
30
40
50
60
70

TOTAL COLLISIONS - HALO EFFECT

CHAP 9 - USING A COMPARISON GROUP

	Treatment	Comparison	
K	937	730	M
L	53	48	N

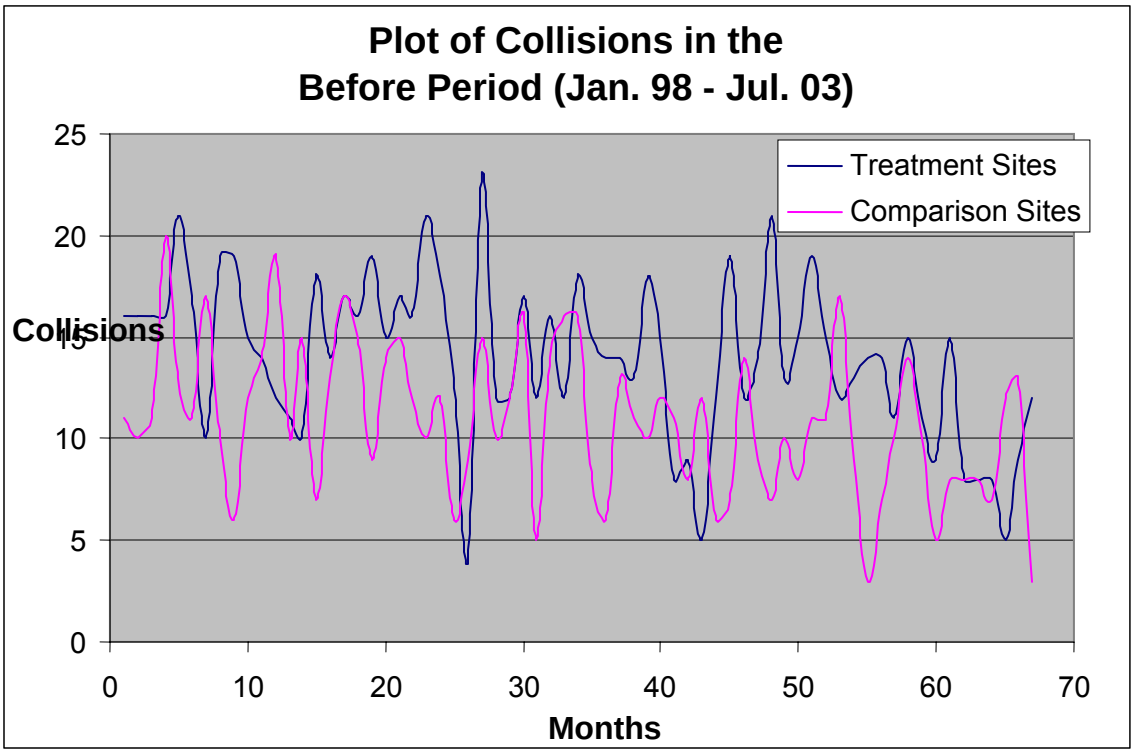
Sample Odds Ratio	
m(*o*) =	0.9580
$s^2(o)$ =	0.001135
s(o) =	0.016847
VAR (ω) =	0.000

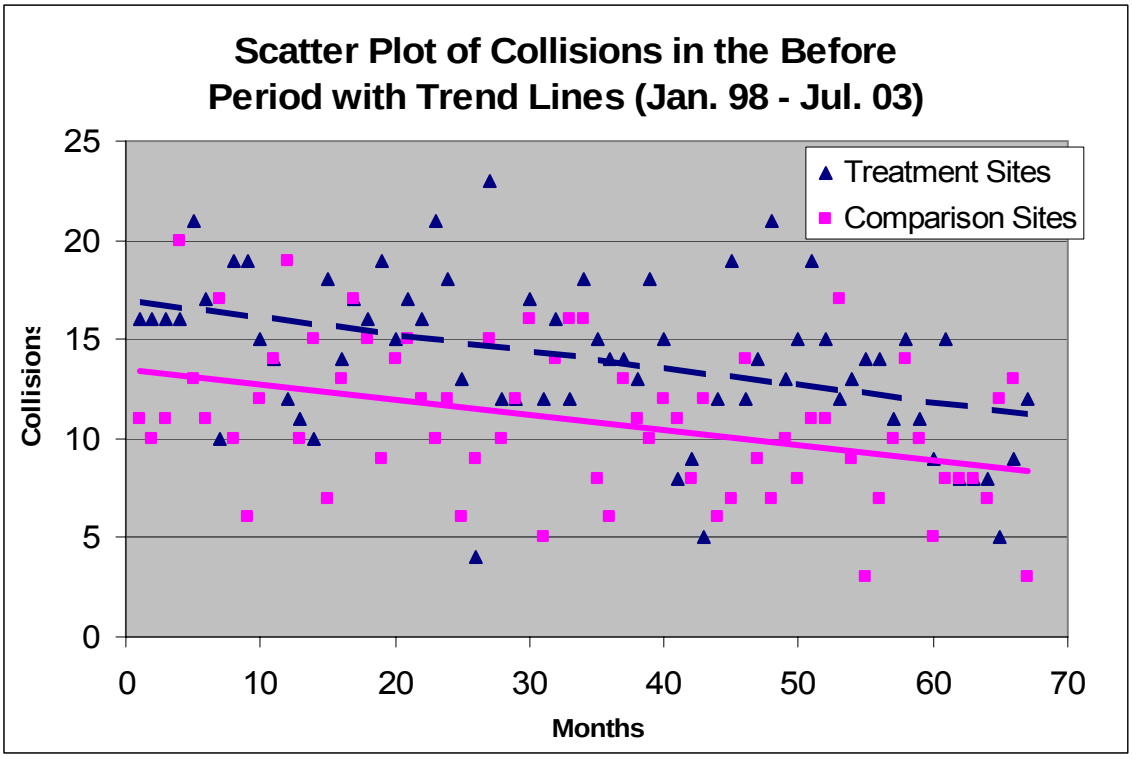
Estimates	
$\lambda_{treatment}$ =	53
r_c =	0.066
π =	62
VAR (λ) =	53
VAR (π) =	88

Effect on Safety	
δ =	8.5
Θ =	0.842
σ (δ) =	11.9
σ (Θ) =	0.173

Reduction of 9 +/- 11.9 collisions or
reduction of 16% +/- 17.3% from the
expected # of collisions

OR =	0.860	**Using the Odds Ratio test, treatments sites were found to**
T =	0.733	**have caused no significant changes in accidents**
x =	-14.0	


Plot of Collisions in the Before Period (Jan. 98 - Jul. 03)
Collisions
Months
Treatment Sites
Comparison Sites
0
5
10
15
20
25
0
10
20
30
40
50
60
70


Scatter Plot of Collisions in the Before Period with Trend Lines (Jan. 98 - Jul. 03)
Collisions
Months
Treatment Sites
Comparison Sites
0
5
10
15
20
25
0
10
20
30
40
50
60
70

RLR RELATED COLLISIONS - HALO EFFECT

CHAP 9 - USING A COMPARISON GROUP

	Treatment	Comparison	
K	728	558	M
L	40	38	N

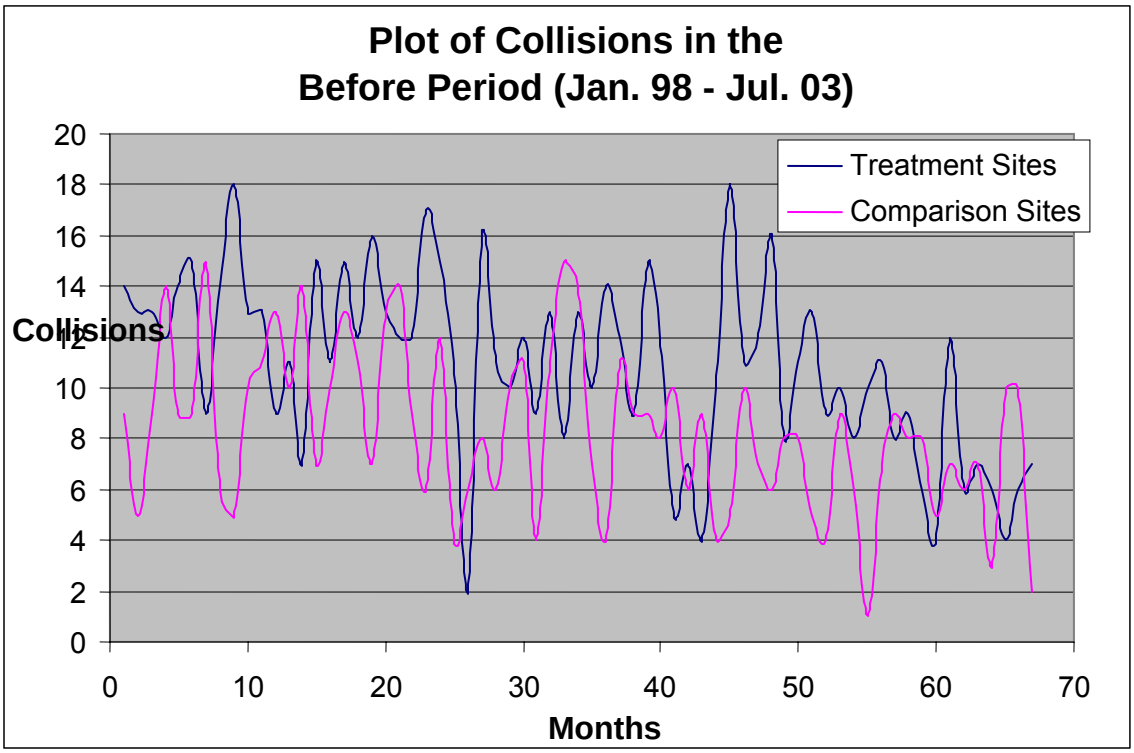
Sample Odds Ratio	
m(*o*) =	0.9842
$s^2(o)$ =	0.005887
s(o) =	0.038365
VAR (ω) =	0.000

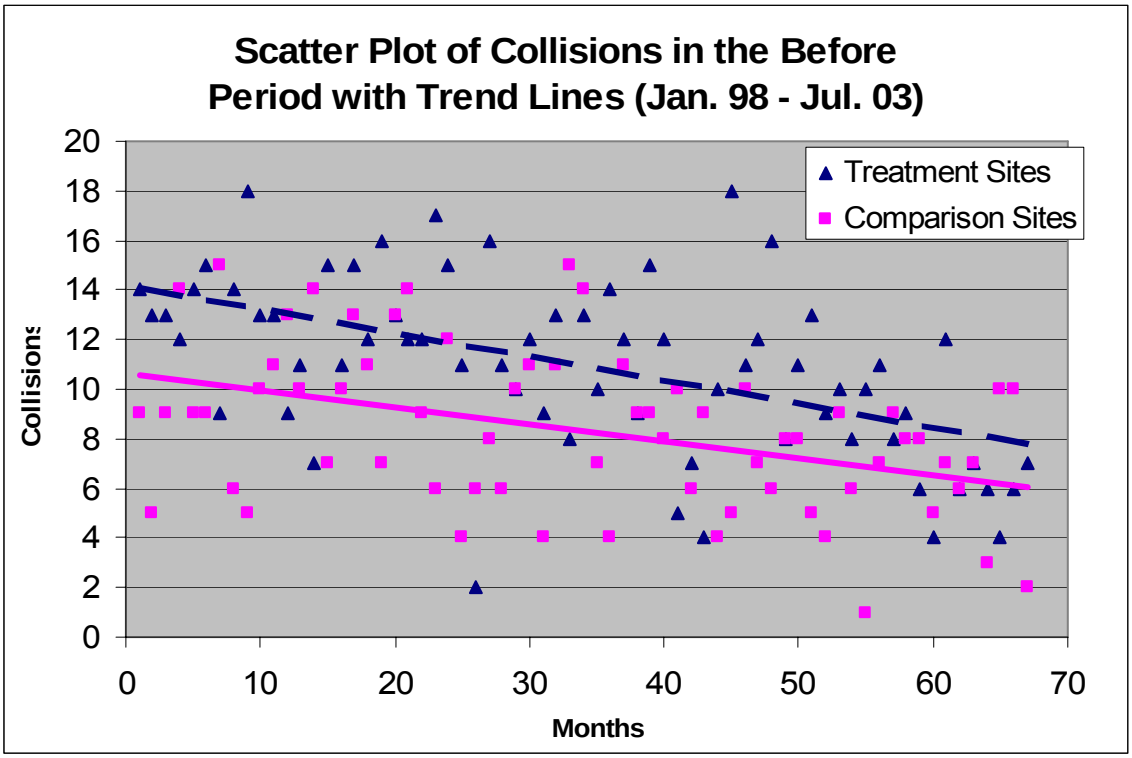
Estimates	
$\lambda_{treatment}$ =	40
r_c =	0.068
π =	49
VAR (λ) =	40
VAR (π) =	72

Effect on Safety	
δ =	9.5
Θ =	0.785
σ (δ) =	10.6
σ (Θ) =	0.183

Reduction of 9 +/- 10.6 collisions or reduction of 21% +/- 18.3% from the expected # of collisions

OR =	0.807	**Using the Odds Ratio test, treatments sites were found to have caused no significant changes in accidents**
T =	0.920	
x =	-19.3	


Plot of Collisions in the Before Period (Jan. 98 - Jul. 03)
Collisions
Months
Treatment Sites
Comparison Sites
0
2
4
6
8
10
12
14
16
18
20
0
10
20
30
40
50
60
70


Scatter Plot of Collisions in the Before Period with Trend Lines (Jan. 98 - Jul. 03)
Collisions
Months
Treatment Sites
Comparison Sites
0
2
4
6
8
10
12
14
16
18
20
0
10
20
30
40
50
60
70

ANGLE COLLISIONS - HALO EFFECT

CHAP 9 - USING A COMPARISON GROUP

	Treatment	Comparison	
K	690	576	M
L	14	19	N

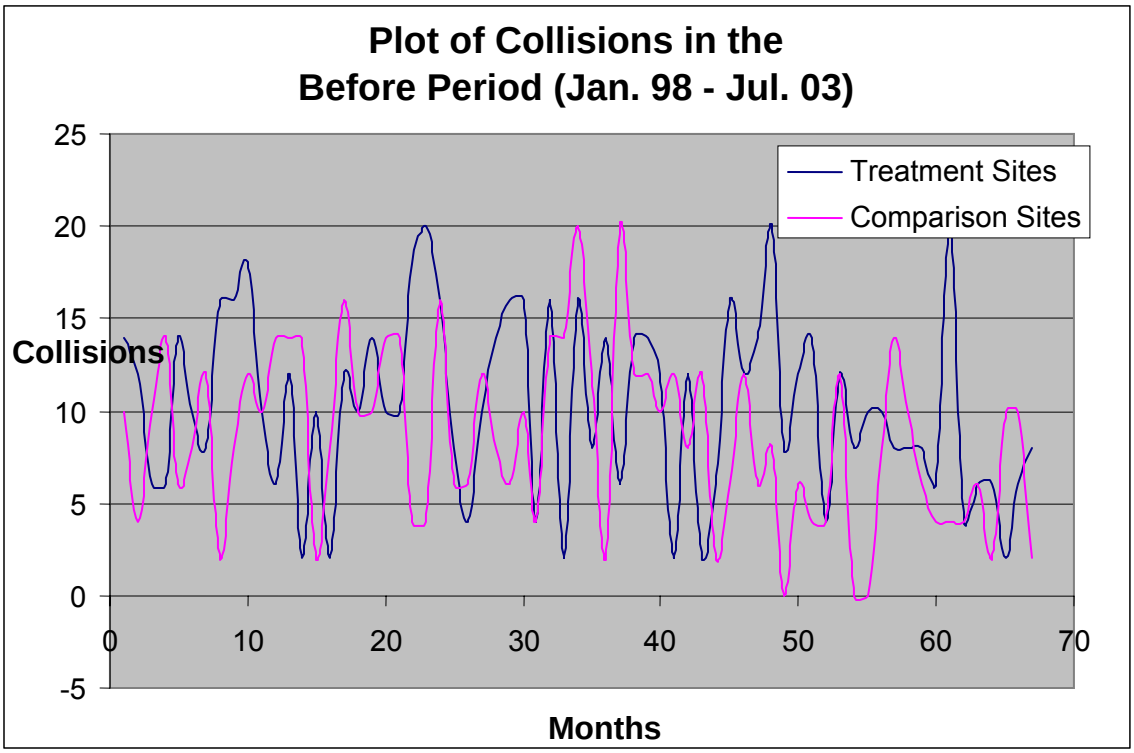
Sample Odds Ratio	
m(*o*) =	0.9408
$s^2(o)$ =	0.038019
s(o) =	0.097493
VAR (ω) =	0.000

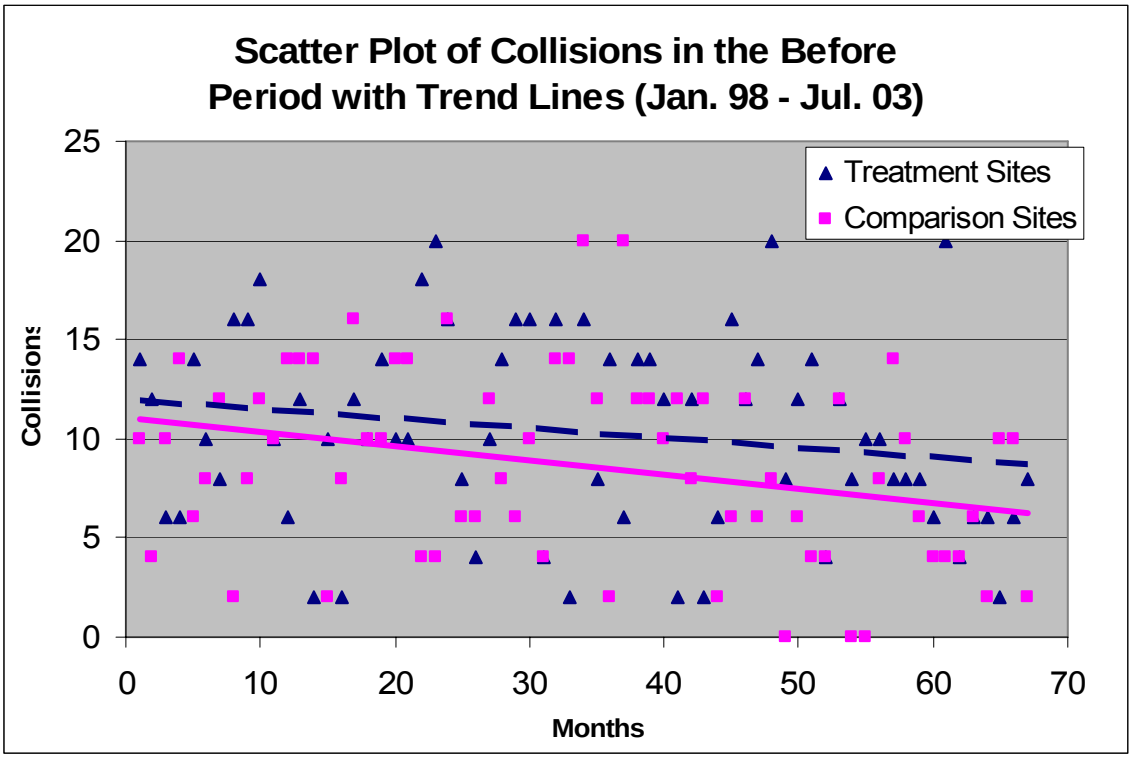
Estimates	
$\lambda_{treatment}$ =	14
r_c =	0.033
π =	23
VAR (λ) =	14
VAR (π) =	29

Effect on Safety	
δ =	8.7
Θ =	0.584
σ (δ) =	6.5
σ (Θ) =	0.208

Reduction of 9 +/- 6.5 collisions or
reduction of 42% +/- 20.8% from the
expected # of collisions

OR =	0.615	**Using the Odds Ratio test, treatments sites were found to**
T =	1.362	**have caused no significant changes in accidents**
x =	-38.5	


Plot of Collisions in the Before Period (Jan. 98 - Jul. 03)
Treatment Sites
Comparison Sites
Collisions
Months
25
20
15
10
5
0
-5
0
10
20
30
40
50
60
70


Scatter Plot of Collisions in the Before Period with Trend Lines (Jan. 98 - Jul. 03)
Treatment Sites
Comparison Sites
Collisions
Months
25
20
15
10
5
0
0
10
20
30
40
50
60
70

REAR END COLLISIONS - HALO EFFECT

CHAP 9 - USING A COMPARISON GROUP

	Treatment	Comparison	
K	247	169	M
L	21	16	N

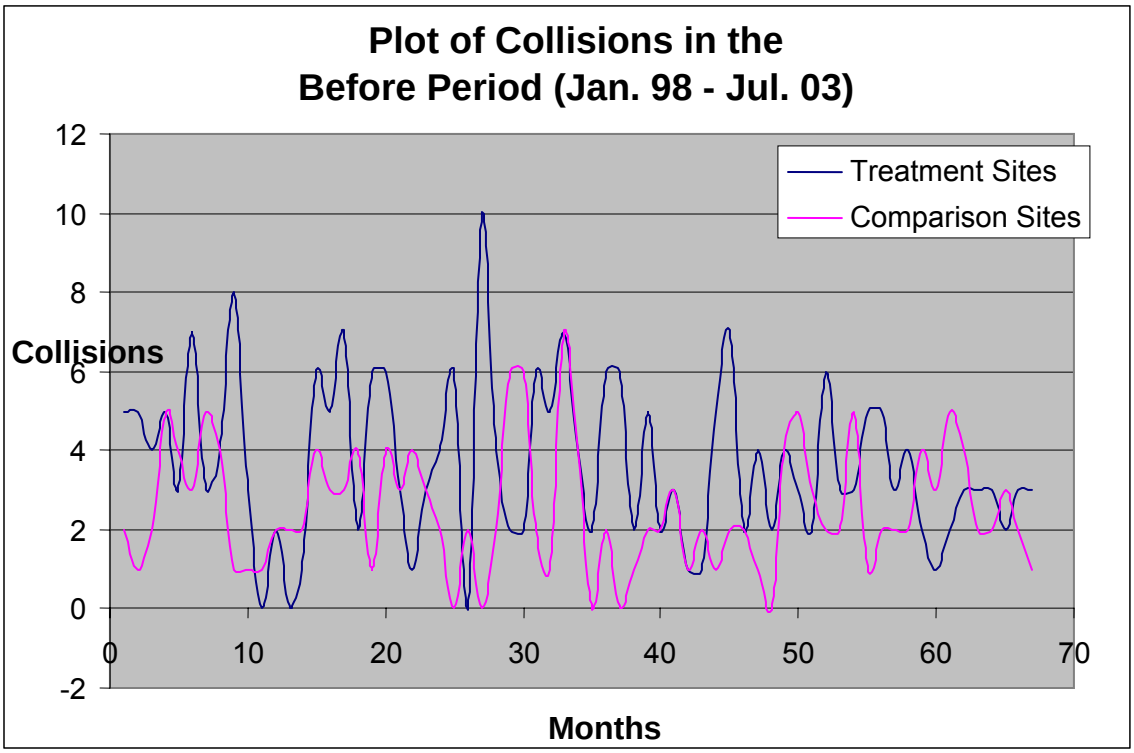
Sample Odds Ratio	
m(*o*) =	1.1091
$s^2(o)$ =	0.301757
s(o) =	0.274662
VAR (ω) =	0.182

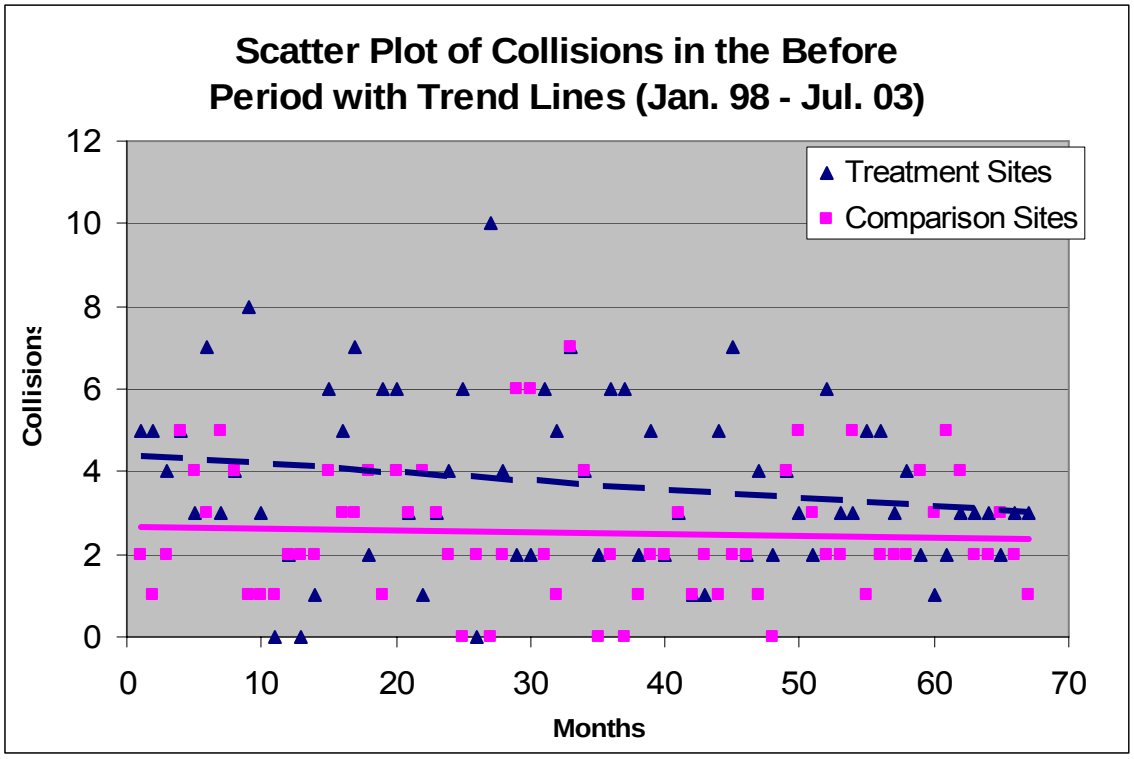
Estimates	
$\lambda_{treatment}$ =	21
r_c =	0.094
π =	23
VAR (λ) =	21
VAR (π) =	137

Effect on Safety	
δ =	2.2
Θ =	0.720
σ (δ) =	12.6
σ (Θ) =	0.396

Reduction of 2 +/- 12.6 collisions or
reduction of 28% +/- 39.6% from the
expected # of collisions

OR =	0.898	**Using the Odds Ratio test, treatments sites were found to**
T =	0.310	**have caused no significant changes in accidents**
x =	-10.2	


Plot of Collisions in the Before Period (Jan. 98 - Jul. 03)
Treatment Sites
Comparison Sites
Collisions
Months
12
10
8
6
4
2
0
-2
0
10
20
30
40
50
60
70


Scatter Plot of Collisions in the Before Period with Trend Lines (Jan. 98 - Jul. 03)
Treatment Sites
Comparison Sites
Collisions
Months
12
10
8
6
4
2
0
0
10
20
30
40
50
60
70

Appendix D:

Collision Data

Approach #1	Approach #2	Month	Day	Year	Accident Type
Dawson	Morgan Street	1	1	1998	Angle
Hillsborough (SR 3007)	Cox and Woodburn	1	1	1998	Left Turn - Same Roadway
Brentwood	New Hope Church	1	2	1998	Angle
Salisbury	Morgan Street	1	2	1998	Angle
Dawson	Morgan Street	1	4	1998	Angle
Capital	Highwoods	1	7	1998	Rear End - Slow or Stop
Dawson	Morgan Street	1	7	1998	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	1	7	1998	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	1	7	1998	Angle
Capital	Highwoods	1	8	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	1	8	1998	Angle
Six Forks Road (SR 1005)	Rowan Street	1	8	1998	Angle
Falls of Neuse	Millbrook	1	10	1998	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	1	11	1998	Left Turn - Same Roadway
Cross Link and Proctor	Rock Quarry	1	12	1998	Angle
Currituck	Lassiter Mill	1	13	1998	Angle
Cross Link and Proctor	Rock Quarry	1	14	1998	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	1	14	1998	Rear End - Slow or Stop
Falls of Neuse	Millbrook	1	16	1998	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	1	16	1998	Left Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	1	17	1998	Rear End - Slow or Stop
Brentwood	New Hope Church	1	20	1998	Left Turn - Same Roadway
Cross Link and Proctor	Rock Quarry	1	21	1998	Angle
McDowell Street	Morgan Street	1	21	1998	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	1	22	1998	Angle
Peace	West	1	23	1998	Angle
Dawson	South	1	25	1998	Angle
Cross Link and Proctor	Rock Quarry	1	26	1998	Angle
Hillsborough (SR 3007)	Cox and Woodburn	1	26	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	1	26	1998	Angle
Hillsborough (SR 3007)	Cox and Woodburn	1	28	1998	Angle
Dawson	Morgan Street	1	29	1998	Right turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	1	29	1998	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	1	30	1998	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	1	31	1998	Left Turn - Different Roadway
Falls of Neuse	Millbrook	2	2	1998	Angle
McDowell Street	Morgan Street	2	2	1998	Angle

McDowell Street	Morgan Street	2	3	1998	Angle
Capital	Highwoods	2	5	1998	Rear End - Slow or Stop
Capital	Highwoods	2	5	1998	Rear End - Slow or Stop
Dawson	South	2	5	1998	Angle
Dawson	Morgan Street	2	5	1998	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	5	1998	Angle
Falls of Neuse	Millbrook	2	6	1998	Sideswipe - Same Direction
Dawson	Morgan Street	2	12	1998	Right Turn - Different Roadway
McDowell Street	Morgan Street	2	12	1998	Left Turn - Different Roadway
Dawson	Morgan Street	2	13	1998	Angle
Dawson	Morgan Street	2	13	1998	Angle
Falls of Neuse	Millbrook	2	14	1998	Rear End - Slow or Stop
Capital	Highwoods	2	15	1998	Rear End - Slow or Stop
Falls of Neuse	Millbrook	2	16	1998	Backing Up
McDowell Street	Morgan Street	2	16	1998	Angle
Wilmington	Morgan Street	2	16	1998	Angle
Capital	Highwoods	2	17	1998	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	2	18	1998	Left Turn - Same Roadway
Capital	Highwoods	2	21	1998	Rear End - Slow or Stop
Salisbury	Morgan Street	2	21	1998	Angle
Brentwood	New Hope Church	2	22	1998	Rear End - Turn
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	22	1998	Left Turn - Same Roadway
Dawson	South	2	23	1998	Angle
McDowell Street	Hillsborough Street	2	23	1998	Sideswipe - Same Direction
Dawson	Morgan Street	2	24	1998	Angle
Falls of Neuse	Millbrook	2	24	1998	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	2	27	1998	Sideswipe - Same Direction
Falls of Neuse	Millbrook	2	28	1998	Sideswipe - Opposite Direction
Hillsborough (SR 3007)	Dixie and Friendly	2	28	1998	Left Turn - Different Roadway
Peace	West	3	2	1998	Angle
Dawson	Morgan Street	3	3	1998	Left Turn - Same Roadway
Hillsborough (SR 3007)	Dixie and Friendly	3	4	1998	Left Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	3	6	1998	Backing Up
Falls of Neuse	Millbrook	3	6	1998	Left Turn - Different Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	6	1998	Angle
Hillsborough (SR 3007)	Cox and Woodburn	3	7	1998	Left Turn - Different Roadway

Dawson	South	3	9	1998	Sideswipe - Same Direction
McDowell Street	Morgan Street	3	9	1998	Angle
McDowell Street	Morgan Street	3	10	1998	Angle
McDowell Street	Morgan Street	3	10	1998	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	3	10	1998	Angle
Six Forks Road (SR 1005)	Rowan Street	3	11	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	3	12	1998	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	3	12	1998	Left Turn - Same Roadway
Hillsborough (SR 3007)	Cox and Woodburn	3	13	1998	Fixed Object
Dawson	Morgan Street	3	14	1998	Angle
Currituck	Lassiter Mill	3	15	1998	Rear End - Slow or Stop
Wilmington	Morgan Street	3	15	1998	Angle
Hillsborough (SR 3007)	Cox and Woodburn	3	16	1998	Angle
Falls of Neuse	Millbrook	3	18	1998	Sideswipe - Same Direction
Peace	West	3	18	1998	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	3	18	1998	Rear End - Slow or Stop
Capital	Highwoods	3	23	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	3	23	1998	Angle
Hillsborough (SR 3007)	Cox and Woodburn	3	24	1998	Angle
McDowell Street	Hillsborough Street	3	25	1998	Angle
Hillsborough (SR 3007)	Dixie and Friendly	3	26	1998	Rear End - Slow or Stop
Wilmington	Morgan Street	3	26	1998	Sideswipe - Same Direction
Capital	Highwoods	3	28	1998	Left Turn - Different Roadway
Falls of Neuse	Millbrook	3	28	1998	Ran off road - Right
Dawson	South	3	29	1998	Angle
Falls of Neuse	Millbrook	3	29	1998	Angle
Dawson	South	3	30	1998	Left Turn - Same Roadway
Falls of Neuse	Millbrook	3	30	1998	Left Turn - Different Roadway
Hillsborough (SR 3007)	Cox and Woodburn	3	30	1998	Angle
Cross Link and Proctor	Rock Quarry	3	31	1998	Left Turn - Different Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	4	2	1998	Angle
McDowell Street	Morgan Street	4	3	1998	Angle
Six Forks Road (SR 1005)	Rowan Street	4	6	1998	Rear End - Slow or Stop
Capital	Highwoods	4	7	1998	Angle
Dawson	South	4	7	1998	Left Turn - Same Roadway
McDowell Street	Hillsborough Street	4	7	1998	Angle
Six Forks Road (SR 1005)	Rowan Street	4	7	1998	Left Turn - Different Roadway
Capital	Highwoods	4	8	1998	Left Turn - Different

					Roadway
McDowell Street	Hillsborough Street	4	9	1998	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	4	10	1998	Sideswipe - Opposite Direction
Capital	Highwoods	4	11	1998	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	4	12	1998	Angle
Capital	Highwoods	4	13	1998	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	4	14	1998	Right turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	4	14	1998	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	4	14	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	4	15	1998	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	4	15	1998	Backing Up
Currituck	Lassiter Mill	4	16	1998	Angle
Dawson	South	4	16	1998	Angle
Peace	West	4	16	1998	Left Turn - Same Roadway
Falls of Neuse	Millbrook	4	17	1998	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	4	18	1998	Left Turn - Same Roadway
Falls of Neuse	Millbrook	4	19	1998	Backing Up
Dawson	Morgan Street	4	21	1998	Sideswipe - Same Direction
Peace	West	4	22	1998	Backing Up
Hillsborough (SR 3007)	Dixie and Friendly	4	23	1998	Angle
Peace	West	4	23	1998	Movable Object
Person Street (SR 2026)	Edenton Street (SR 2298)	4	24	1998	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	4	24	1998	Angle
McDowell Street	Hillsborough Street	4	25	1998	Sideswipe - Same Direction
Dawson	South	4	26	1998	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	4	27	1998	Rear End - Slow or Stop
Wilmington	Morgan Street	4	27	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	4	28	1998	Angle
Peace	West	4	28	1998	Angle
McDowell Street	Hillsborough Street	4	30	1998	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	4	30	1998	Rear End - Slow or Stop
Falls of Neuse	Millbrook	5	1	1998	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	5	1	1998	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	5	2	1998	Angle
Salisbury	Morgan Street	5	2	1998	Other Collision With Vehicle
Hillsborough (SR 3007)	Cox and Woodburn	5	3	1998	Angle
Currituck	Lassiter Mill	5	4	1998	Left Turn - Same Roadway
Dawson	South	5	4	1998	Angle
Dawson	South	5	4	1998	Sideswipe - Same Direction

Hillsborough (SR 3007)	Cox and Woodburn	5	4	1998	Backing Up
Dawson	South	5	6	1998	Rear End - Slow or Stop
Peace	West	5	7	1998	Rear End - Turn
Wilmington	Morgan Street	5	7	1998	Rear End - Slow or Stop
Salisbury	Morgan Street	5	8	1998	Left Turn - Same Roadway
Dawson	South	5	9	1998	Angle
Dawson	South	5	9	1998	Angle
Brentwood	New Hope Church	5	10	1998	Left Turn - Same Roadway
Capital	Highwoods	5	10	1998	Rear End - Turn
Six Forks Road (SR 1005)	Rowan Street	5	11	1998	Left Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	5	11	1998	Sideswipe - Same Direction
Dawson	South	5	12	1998	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	5	15	1998	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	5	15	1998	Left Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	5	16	1998	Ran off road - Right
Salisbury	Morgan Street	5	18	1998	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	5	19	1998	Backing Up
Six Forks Road (SR 1005)	Rowan Street	5	20	1998	Rear End - Slow or Stop
Wilmington	Morgan Street	5	21	1998	Backing Up
Dawson	Morgan Street	5	22	1998	Parked Motor Vehicle
Wilmington	Morgan Street	5	22	1998	Angle
Wilmington	Morgan Street	5	22	1998	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	5	23	1998	Right turn - Same Roadway
Falls of Neuse	Millbrook	5	25	1998	Rear End - Slow or Stop
Wilmington	Morgan Street	5	25	1998	Angle
Six Forks Road (SR 1005)	Rowan Street	5	26	1998	Left Turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	5	27	1998	Angle
Six Forks Road (SR 1005)	Rowan Street	5	28	1998	Right turn - Same Roadway
Brentwood	New Hope Church	5	30	1998	Backing Up
Person Street (SR 2026)	Edenton Street (SR 2298)	5	30	1998	Angle
Cross Link and Proctor	Rock Quarry	5	31	1998	Left Turn - Same Roadway
Salisbury	Morgan Street	5	31	1998	Angle
Dawson	South	6	1	1998	Angle
Hillsborough (SR 3007)	Cox and Woodburn	6	2	1998	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	3	1998	Left Turn - Different Roadway
Currituck	Lassiter Mill	6	4	1998	Angle

Dawson	South	6	4	1998	Rear End - Slow or Stop
Dawson	South	6	4	1998	Angle
Capital	Highwoods	6	5	1998	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	6	1998	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	6	10	1998	Left Turn - Different Roadway
McDowell Street	Morgan Street	6	11	1998	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	6	11	1998	Backing Up
Falls of Neuse	Millbrook	6	12	1998	Rear End - Slow or Stop
Capital	Highwoods	6	13	1998	Left Turn - Same Roadway
Cross Link and Proctor	Rock Quarry	6	13	1998	Angle
Salisbury	Morgan Street	6	14	1998	Angle
Dawson	South	6	16	1998	Left Turn - Same Roadway
Dawson	Morgan Street	6	16	1998	Angle
Capital	Highwoods	6	18	1998	Rear End - Slow or Stop
Dawson	South	6	19	1998	Angle
Capital	Highwoods	6	20	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	6	20	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	6	22	1998	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	6	22	1998	Angle
Dawson	Morgan Street	6	23	1998	Sideswipe - Same Direction
Dawson	Morgan Street	6	23	1998	Sideswipe - Same Direction
McDowell Street	Morgan Street	6	23	1998	Angle
McDowell Street	Morgan Street	6	23	1998	Angle
Falls of Neuse	Millbrook	6	25	1998	Rear End - Turn
Falls of Neuse	Millbrook	6	26	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	6	26	1998	Rear End - Slow or Stop
Dawson	South	6	27	1998	Rear End - Slow or Stop
Falls of Neuse	Millbrook	6	28	1998	Angle
McDowell Street	Hillsborough Street	6	28	1998	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	28	1998	Left Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	6	28	1998	Rear End - Slow or Stop
Salisbury	Morgan Street	6	29	1998	Angle
Salisbury	Morgan Street	6	29	1998	Angle
Capital	Highwoods	7	2	1998	Rear End - Slow or Stop
Peace	West	7	3	1998	Left Turn - Different Roadway
McDowell Street	Hillsborough Street	7	5	1998	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	7	5	1998	Angle
Peace	West	7	6	1998	Left Turn - Different Roadway
Millbrook (SR 2018 and	Old Wake Forest	7	8	1998	Rear End - Slow or Stop

2081)	(SR 2030)				
Currituck	Lassiter Mill	7	10	1998	Angle
McDowell Street	Morgan Street	7	10	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	7	11	1998	Angle
Wilmington	Morgan Street	7	11	1998	Angle
Dawson	South	7	12	1998	Rear End - Slow or Stop
Peace	West	7	13	1998	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	7	13	1998	Rear End - Slow or Stop
Salisbury	Morgan Street	7	13	1998	Angle
Currituck	Lassiter Mill	7	16	1998	Angle
McDowell Street	Morgan Street	7	17	1998	Left Turn - Same Roadway
Brentwood	New Hope Church	7	18	1998	Pedestrian
Brentwood	New Hope Church	7	19	1998	Left Turn - Different Roadway
Capital	Highwoods	7	19	1998	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	7	20	1998	Left Turn - Different Roadway
McDowell Street	Hillsborough Street	7	20	1998	Angle
Brentwood	New Hope Church	7	21	1998	Angle
Salisbury	Morgan Street	7	21	1998	Angle
Peace	West	7	22	1998	Rear End - Slow or Stop
Dawson	Morgan Street	7	23	1998	Left Turn - Same Roadway
Peace	West	7	23	1998	Angle
Wilmington	Morgan Street	7	25	1998	Angle
Falls of Neuse	Millbrook	7	27	1998	Sideswipe - Opposite Direction
Currituck	Lassiter Mill	7	28	1998	Left Turn - Different Roadway
Dawson	South	7	28	1998	Angle
Hillsborough (SR 3007)	Cox and Woodburn	7	28	1998	Left Turn - Different Roadway
Dawson	South	7	29	1998	Angle
Six Forks Road (SR 1005)	Rowan Street	7	30	1998	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	7	31	1998	Fixed Object
Hillsborough (SR 3007)	Dixie and Friendly	8	1	1998	Rear End - Slow or Stop
Falls of Neuse	Millbrook	8	2	1998	Right Turn - Different Roadway
Dawson	South	8	4	1998	Angle
Peace	West	8	6	1998	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	8	9	1998	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	8	10	1998	Angle
McDowell Street	Hillsborough Street	8	14	1998	Rear End - Slow or Stop
Dawson	South	8	15	1998	Angle
Dawson	South	8	16	1998	Angle
Capital	Highwoods	8	17	1998	Angle

Falls of Neuse	Millbrook	8	18	1998	Backing Up
Capital	Highwoods	8	19	1998	Right turn - Same Roadway
Peace	West	8	19	1998	Rear End - Slow or Stop
Peace	West	8	20	1998	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	8	22	1998	Left Turn - Same Roadway
Dawson	South	8	22	1998	Sideswipe - Same Direction
Capital	Highwoods	8	23	1998	Rear End - Slow or Stop
Capital	Highwoods	8	23	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	8	23	1998	Rear End - Slow or Stop
Capital	Highwoods	8	24	1998	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	8	25	1998	Rear End - Slow or Stop
Wilmington	Morgan Street	8	25	1998	Angle
Six Forks Road (SR 1005)	Rowan Street	8	26	1998	Left Turn - Same Roadway
Dawson	Morgan Street	8	27	1998	Angle
Hillsborough (SR 3007)	Dixie and Friendly	8	28	1998	Backing Up
Capital	Highwoods	8	29	1998	Rear End - Slow or Stop
Dawson	South	8	29	1998	Sideswipe - Same Direction
Dawson	South	8	30	1998	Angle
Dawson	South	8	30	1998	Ran off road - Right
Falls of Neuse	Millbrook	8	31	1998	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	9	1	1998	Left Turn - Different Roadway
Capital	Highwoods	9	3	1998	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	9	4	1998	Rear End - Slow or Stop
Dawson	South	9	4	1998	Rear End - Slow or Stop
Dawson	South	9	5	1998	Angle
Dawson	South	9	6	1998	Angle
Hillsborough (SR 3007)	Dixie and Friendly	9	6	1998	Angle
Six Forks Road (SR 1005)	Rowan Street	9	8	1998	Rear End - Slow or Stop
Dawson	Morgan Street	9	11	1998	Left Turn - Same Roadway
Dawson	South	9	12	1998	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	9	12	1998	Angle
Cross Link and Proctor	Rock Quarry	9	14	1998	Angle
Currituck	Lassiter Mill	9	14	1998	Angle
Hillsborough (SR 3007)	Cox and Woodburn	9	14	1998	Rear End - Slow or Stop
Capital	Highwoods	9	17	1998	Rear End - Slow or Stop
Capital	Highwoods	9	17	1998	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	9	18	1998	Rear End - Slow or Stop
Capital	Highwoods	9	19	1998	Angle
Dawson	South	9	20	1998	Angle
Dawson	South	9	20	1998	Angle
Salisbury	Morgan Street	9	21	1998	Angle
McDowell Street	Hillsborough Street	9	22	1998	Sideswipe - Same Direction

Capital	Highwoods	9	24	1998	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	9	25	1998	Angle
Peace	West	9	25	1998	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	26	1998	Angle
Dawson	Morgan Street	9	28	1998	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	10	2	1998	Right turn - Same Roadway
McDowell Street	Hillsborough Street	10	3	1998	Left Turn - Same Roadway
Hillsborough (SR 3007)	Cox and Woodburn	10	4	1998	Rear End - Slow or Stop
Dawson	Morgan Street	10	5	1998	Right turn - Same Roadway
Dawson	South	10	7	1998	Angle
Dawson	South	10	8	1998	Angle
Capital	Highwoods	10	9	1998	Rear End - Slow or Stop
Currituck	Lassiter Mill	10	9	1998	Angle
Salisbury	Morgan Street	10	11	1998	Angle
Falls of Neuse	Millbrook	10	12	1998	Ran off road - Left
Dawson	South	10	16	1998	Angle
McDowell Street	Hillsborough Street	10	16	1998	Left Turn - Same Roadway
Wilmington	Morgan Street	10	16	1998	Angle
Capital	Highwoods	10	17	1998	Rear End - Slow or Stop
Dawson	South	10	17	1998	Angle
Dawson	South	10	18	1998	Angle
Falls of Neuse	Millbrook	10	18	1998	Left Turn - Same Roadway
Falls of Neuse	Millbrook	10	19	1998	Rear End - Slow or Stop
Dawson	Morgan Street	10	20	1998	Angle
Six Forks Road (SR 1005)	Rowan Street	10	20	1998	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	10	21	1998	Angle
Six Forks Road (SR 1005)	Rowan Street	10	21	1998	Angle
Dawson	South	10	22	1998	Angle
Cross Link and Proctor	Rock Quarry	10	24	1998	Left Turn - Different Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	10	24	1998	Angle
Peace	West	10	27	1998	Angle
McDowell Street	Morgan Street	10	28	1998	Sideswipe - Same Direction
Falls of Neuse	Millbrook	10	30	1998	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	10	30	1998	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	10	30	1998	Angle
Cross Link and Proctor	Rock Quarry	11	2	1998	Left Turn - Different Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	11	2	1998	Angle
Cross Link and Proctor	Rock Quarry	11	3	1998	Left Turn - Same Roadway
Peace	West	11	3	1998	Angle

Dawson	South	11	4	1998	Angle
Currituck	Lassiter Mill	11	5	1998	Left Turn - Same Roadway
Dawson	South	11	5	1998	Angle
Dawson	Morgan Street	11	5	1998	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	11	6	1998	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	11	9	1998	Left Turn - Same Roadway
Capital	Highwoods	11	10	1998	Angle
Capital	Highwoods	11	11	1998	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	11	1998	Left Turn - Different Roadway
Brentwood	New Hope Church	11	12	1998	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	11	12	1998	Left Turn - Different Roadway
McDowell Street	Morgan Street	11	14	1998	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	14	1998	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	17	1998	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	19	1998	Left Turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	20	1998	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	11	21	1998	Fixed Object
Currituck	Lassiter Mill	11	22	1998	Left Turn - Same Roadway
Wilmington	Morgan Street	11	23	1998	Angle
Capital	Highwoods	11	24	1998	Left Turn - Same Roadway
Falls of Neuse	Millbrook	11	25	1998	Angle
McDowell Street	Hillsborough Street	11	27	1998	Sideswipe - Same Direction
Dawson	South	11	29	1998	Left Turn - Same Roadway
Cross Link and Proctor	Rock Quarry	11	30	1998	Backing Up
Falls of Neuse	Millbrook	11	30	1998	Angle
Falls of Neuse	Millbrook	12	1	1998	Left Turn - Different Roadway
Hillsborough (SR 3007)	Dixie and Friendly	12	2	1998	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	12	3	1998	Rear End - Slow or Stop
Peace	West	12	3	1998	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	12	4	1998	Sideswipe - Same Direction
Hillsborough (SR 3007)	Dixie and Friendly	12	6	1998	Left Turn - Same Roadway
McDowell Street	Morgan Street	12	6	1998	Angle
Dawson	South	12	8	1998	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	12	9	1998	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	12	11	1998	Rear End - Slow or Stop
Millbrook (SR 2018 and	Old Wake Forest	12	11	1998	Left Turn - Same Roadway

2081)	(SR 2030)				
Six Forks Road (SR 1005)	Rowan Street	12	11	1998	Rear End - Slow or Stop
Capital	Highwoods	12	13	1998	Left Turn - Same Roadway
Currituck	Lassiter Mill	12	13	1998	Angle
Dawson	South	12	15	1998	Angle
Falls of Neuse	Millbrook	12	15	1998	Sideswipe - Same Direction
Peace	West	12	15	1998	Right Turn - Different Roadway
Capital	Highwoods	12	16	1998	Sideswipe - Same Direction
Currituck	Lassiter Mill	12	16	1998	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	12	16	1998	Angle
Wilmington	Morgan Street	12	16	1998	Angle
Wilmington	Morgan Street	12	16	1998	Sideswipe - Same Direction
Currituck	Lassiter Mill	12	17	1998	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	12	17	1998	Angle
Currituck	Lassiter Mill	12	18	1998	Pedestrian
Capital	Highwoods	12	19	1998	Left Turn - Same Roadway
Falls of Neuse	Millbrook	12	20	1998	Left Turn - Same Roadway
Capital	Highwoods	12	22	1998	Sideswipe - Same Direction
Falls of Neuse	Millbrook	12	22	1998	Sideswipe - Same Direction
Peace	West	12	23	1998	Movable Object
Six Forks Road (SR 1005)	Rowan Street	12	23	1998	Left Turn - Same Roadway
Currituck	Lassiter Mill	12	29	1998	Left Turn - Different Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	1	1	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	1	1	1999	Left Turn - Different Roadway
Capital	Highwoods	1	2	1999	Left Turn - Different Roadway
Brentwood	New Hope Church	1	5	1999	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	1	8	1999	Angle
Peace	West	1	11	1999	Angle
Currituck	Lassiter Mill	1	12	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	1	12	1999	Angle
Capital	Highwoods	1	13	1999	Angle
Dawson	South	1	13	1999	Angle
Dawson	Morgan Street	1	13	1999	Angle
Dawson	Morgan Street	1	15	1999	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	1	15	1999	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	1	15	1999	Rear End - Slow or Stop

Salisbury	Morgan Street	1	18	1999	Left Turn - Same Roadway
Salisbury	Morgan Street	1	23	1999	Angle
Wilmington	Morgan Street	1	23	1999	Angle
Wilmington	Morgan Street	1	23	1999	Angle
Brentwood	New Hope Church	1	24	1999	Angle
Capital	Highwoods	1	24	1999	Left Turn - Same Roadway
Hillsborough (SR 3007)	Dixie and Friendly	1	24	1999	Left Turn - Same Roadway
Falls of Neuse	Millbrook	1	25	1999	Left Turn - Different Roadway
McDowell Street	Hillsborough Street	1	30	1999	Angle
Dawson	Morgan Street	2	2	1999	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	2	4	1999	Angle
Capital	Highwoods	2	6	1999	Left Turn - Same Roadway
Currituck	Lassiter Mill	2	6	1999	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	7	1999	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	2	8	1999	Left Turn - Different Roadway
Dawson	Morgan Street	2	9	1999	Sideswipe - Same Direction
Brentwood	New Hope Church	2	10	1999	Overturn - Rollover
Six Forks Road (SR 1005)	Rowan Street	2	15	1999	Rear End - Slow or Stop
Falls of Neuse	Millbrook	2	16	1999	Left Turn - Different Roadway
Falls of Neuse	Millbrook	2	16	1999	Angle
Hillsborough (SR 3007)	Dixie and Friendly	2	16	1999	Left Turn - Same Roadway
Hillsborough (SR 3007)	Cox and Woodburn	2	16	1999	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	2	17	1999	Angle
Salisbury	Morgan Street	2	17	1999	Angle
McDowell Street	Hillsborough Street	2	18	1999	Left Turn - Same Roadway
Peace	West	2	18	1999	Left Turn - Different Roadway
McDowell Street	Morgan Street	2	19	1999	Angle
Hillsborough (SR 3007)	Dixie and Friendly	2	21	1999	Angle
Capital	Highwoods	2	22	1999	Left Turn - Different Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	2	22	1999	Angle
Falls of Neuse	Millbrook	2	23	1999	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	2	23	1999	Left Turn - Different Roadway
McDowell Street	Hillsborough Street	2	24	1999	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	26	1999	Left Turn - Same Roadway
Capital	Highwoods	2	27	1999	Other non-collision
McDowell Street	Hillsborough Street	2	27	1999	Angle
Six Forks Road (SR	Rowan Street	2	27	1999	Other non-collision

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Falls of Neuse	Millbrook	3	1	1999	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	3	3	1999	movable object
Hillsborough (SR 3007)	Dixie and Friendly	3	3	1999	Rear End - Slow or Stop
McDowell Street	Morgan Street	3	3	1999	Angle
Peace	West	3	3	1999	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	3	4	1999	Angle
Currituck	Lassiter Mill	3	6	1999	Rear End - Slow or Stop
Wilmington	Morgan Street	3	6	1999	Angle
Hillsborough (SR 3007)	Dixie and Friendly	3	8	1999	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	3	9	1999	Angle
Capital	Highwoods	3	14	1999	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	3	14	1999	Left Turn - Same Roadway
Dawson	Morgan Street	3	15	1999	Angle
Dawson	Morgan Street	3	16	1999	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	17	1999	Left Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	3	17	1999	Rear End - Slow or Stop
Dawson	Morgan Street	3	19	1999	Fixed Object
Hillsborough (SR 3007)	Dixie and Friendly	3	19	1999	Left Turn - Different Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	20	1999	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	3	20	1999	Angle
Hillsborough (SR 3007)	Dixie and Friendly	3	21	1999	Rear End - Slow or Stop
McDowell Street	Morgan Street	3	22	1999	Angle
Cross Link and Proctor	Rock Quarry	3	25	1999	Head On
Capital	Highwoods	3	26	1999	Left Turn - Same Roadway
Capital	Highwoods	3	26	1999	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	3	26	1999	Left Turn - Different Roadway
Capital	Highwoods	3	27	1999	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	3	29	1999	Angle
Peace	West	3	30	1999	Angle
Capital	Highwoods	4	1	1999	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	4	1	1999	Left Turn - Different Roadway
Currituck	Lassiter Mill	4	1	1999	Left Turn - Different Roadway
McDowell Street	Hillsborough Street	4	1	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	4	1	1999	Rear End - Slow or Stop
Wilmington	Morgan Street	4	1	1999	Angle
Cross Link and Proctor	Rock Quarry	4	4	1999	Left Turn - Different Roadway
Falls of Neuse	Millbrook	4	4	1999	Left Turn - Different

					Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	4	7	1999	Angle
Wilmington	Morgan Street	4	7	1999	Parked Motor Vehicle
Falls of Neuse	Millbrook	4	9	1999	Left Turn - Same Roadway
Falls of Neuse	Millbrook	4	10	1999	Rear End - Slow or Stop
Currituck	Lassiter Mill	4	11	1999	Head On
Capital	Highwoods	4	12	1999	Rear End - Slow or Stop
Dawson	Morgan Street	4	12	1999	Left Turn - Same Roadway
Brentwood	New Hope Church	4	13	1999	Angle
Capital	Highwoods	4	13	1999	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	4	20	1999	Left Turn - Different Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	4	20	1999	Rear End - Slow or Stop
Falls of Neuse	Millbrook	4	23	1999	Rear End - Slow or Stop
McDowell Street	Morgan Street	4	24	1999	Angle
Capital	Highwoods	4	26	1999	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	4	26	1999	Angle
Wilmington	Morgan Street	4	27	1999	Right turn - Same Roadway
McDowell Street	Hillsborough Street	4	29	1999	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	4	29	1999	Sideswipe - Same Direction
Capital	Highwoods	4	30	1999	Left Turn - Different Roadway
Wilmington	Morgan Street	4	30	1999	Parked Motor Vehicle
Brentwood	New Hope Church	5	1	1999	Angle
Brentwood	New Hope Church	5	1	1999	Angle
McDowell Street	Hillsborough Street	5	1	1999	Angle
McDowell Street	Hillsborough Street	5	3	1999	Angle
Wilmington	Morgan Street	5	3	1999	Angle
Wilmington	Morgan Street	5	4	1999	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	5	5	1999	Rear End - Slow or Stop
Salisbury	Morgan Street	5	6	1999	Sideswipe - Same Direction
Peace	West	5	7	1999	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	5	7	1999	Angle
Capital	Highwoods	5	8	1999	Angle
Hillsborough (SR 3007)	Dixie and Friendly	5	10	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	5	10	1999	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	5	11	1999	Ran off road - Right
Brentwood	New Hope Church	5	14	1999	Angle
Falls of Neuse	Millbrook	5	14	1999	Head On
Hillsborough (SR 3007)	Dixie and Friendly	5	14	1999	Angle
Peace	West	5	14	1999	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	5	14	1999	Rear End - Slow or Stop

Brentwood	New Hope Church	5	16	1999	Rear End - Slow or Stop
Brentwood	New Hope Church	5	16	1999	Rear End - Slow or Stop
Currituck	Lassiter Mill	5	16	1999	Angle
Peace	West	5	16	1999	Left Turn - Same Roadway
Capital	Highwoods	5	17	1999	Left Turn - Different Roadway
Capital	Highwoods	5	17	1999	Rear End - Slow or Stop
Dawson	Morgan Street	5	17	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	5	17	1999	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	5	20	1999	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	5	22	1999	Rear End - Slow or Stop
Currituck	Lassiter Mill	5	25	1999	Angle
Falls of Neuse	Millbrook	5	25	1999	Rear End - Slow or Stop
Capital	Highwoods	5	28	1999	Left Turn - Same Roadway
Capital	Highwoods	5	28	1999	Rear End - Slow or Stop
Falls of Neuse	Millbrook	5	28	1999	Right turn - Same Roadway
Capital	Highwoods	5	30	1999	Angle
McDowell Street	Hillsborough Street	6	2	1999	Left Turn - Same Roadway
Dawson	Morgan Street	6	3	1999	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	3	1999	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	6	3	1999	Parked Motor Vehicle
Falls of Neuse	Millbrook	6	4	1999	Angle
Falls of Neuse	Millbrook	6	4	1999	Sideswipe - Same Direction
Falls of Neuse	Millbrook	6	4	1999	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	6	4	1999	Angle
McDowell Street	Hillsborough Street	6	5	1999	Angle
Falls of Neuse	Millbrook	6	6	1999	Rear End - Slow or Stop
Salisbury	Morgan Street	6	9	1999	Left Turn - Same Roadway
Capital	Highwoods	6	10	1999	Sideswipe - Same Direction
McDowell Street	Morgan Street	6	10	1999	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	10	1999	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	10	1999	Rear End - Slow or Stop
Dawson	Morgan Street	6	11	1999	Left Turn - Different Roadway
Capital	Highwoods	6	13	1999	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	6	13	1999	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	6	13	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	6	13	1999	Sideswipe - Same Direction
Six Forks Road (SR 1005)	Rowan Street	6	15	1999	Sideswipe - Same Direction

Currituck	Lassiter Mill	6	16	1999	Head On
Dawson	Morgan Street	6	16	1999	Left Turn - Same Roadway
Peace	West	6	16	1999	Left Turn - Same Roadway
Falls of Neuse	Millbrook	6	21	1999	Sideswipe - Same Direction
Capital	Highwoods	6	22	1999	Left Turn - Same Roadway
Capital	Highwoods	6	22	1999	Angle
Capital	Highwoods	6	25	1999	Angle
Cross Link and Proctor	Rock Quarry	6	25	1999	Angle
Cross Link and Proctor	Rock Quarry	6	28	1999	Sideswipe - Same Direction
Hillsborough (SR 3007)	Dixie and Friendly	6	28	1999	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	6	28	1999	Angle
Capital	Highwoods	6	30	1999	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	7	1	1999	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	7	1	1999	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	7	3	1999	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	7	3	1999	Sideswipe - Same Direction
Six Forks Road (SR 1005)	Rowan Street	7	3	1999	Pedacyclist
McDowell Street	Hillsborough Street	7	4	1999	Angle
Cross Link and Proctor	Rock Quarry	7	5	1999	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	7	6	1999	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	7	6	1999	Angle
Dawson	Morgan Street	7	8	1999	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	7	11	1999	Left Turn - Different Roadway
Dawson	Morgan Street	7	12	1999	Angle
McDowell Street	Morgan Street	7	12	1999	Angle
Hillsborough (SR 3007)	Cox and Woodburn	7	13	1999	Left Turn - Different Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	7	13	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	7	13	1999	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	7	13	1999	Angle
Dawson	Morgan Street	7	15	1999	Sideswipe - Same Direction
McDowell Street	Morgan Street	7	15	1999	Backing Up
Capital	Highwoods	7	20	1999	Rear End - Slow or Stop
Falls of Neuse	Millbrook	7	20	1999	Angle
Currituck	Lassiter Mill	7	21	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	7	23	1999	Rear End - Slow or Stop
Capital	Highwoods	7	24	1999	Angle
Dawson	Morgan Street	7	25	1999	Left Turn - Same Roadway

Hillsborough (SR 3007)	Cox and Woodburn	7	27	1999	Angle
Wilmington	Morgan Street	7	28	1999	Angle
Capital	Highwoods	7	29	1999	Angle
Hillsborough (SR 3007)	Dixie and Friendly	7	30	1999	Angle
McDowell Street	Hillsborough Street	7	30	1999	Angle
Falls of Neuse	Millbrook	7	31	1999	Rear End - Slow or Stop
Wilmington	Morgan Street	7	31	1999	Right Turn - Different Roadway
Capital	Highwoods	8	2	1999	Angle
Currituck	Lassiter Mill	8	2	1999	Angle
McDowell Street	Hillsborough Street	8	2	1999	Angle
McDowell Street	Hillsborough Street	8	2	1999	Angle
Hillsborough (SR 3007)	Dixie and Friendly	8	3	1999	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	8	6	1999	Right Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	8	6	1999	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	8	7	1999	Rear End - Slow or Stop
Capital	Highwoods	8	9	1999	Left Turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	8	11	1999	Angle
Cross Link and Proctor	Rock Quarry	8	13	1999	Angle
Capital	Highwoods	8	15	1999	Left Turn - Same Roadway
Hillsborough (SR 3007)	Dixie and Friendly	8	15	1999	Rear End - Slow or Stop
Capital	Highwoods	8	16	1999	Sideswipe - Same Direction
McDowell Street	Morgan Street	8	16	1999	Angle
Hillsborough (SR 3007)	Cox and Woodburn	8	17	1999	Angle
Peace	West	8	17	1999	Rear End - Slow or Stop
Wilmington	Morgan Street	8	17	1999	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	8	18	1999	Angle
Falls of Neuse	Millbrook	8	19	1999	Angle
McDowell Street	Hillsborough Street	8	19	1999	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	8	20	1999	Left Turn - Same Roadway
Cross Link and Proctor	Rock Quarry	8	21	1999	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	8	23	1999	Rear End - Slow or Stop
Brentwood	New Hope Church	8	25	1999	Rear End - Slow or Stop
Capital	Highwoods	8	25	1999	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	8	25	1999	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	8	27	1999	Angle
Wilmington	Morgan Street	8	29	1999	Angle
Capital	Highwoods	8	30	1999	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	8	31	1999	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	9	1	1999	Angle

Capital	Highwoods	9	2	1999	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	9	3	1999	Angle
Hillsborough (SR 3007)	Cox and Woodburn	9	4	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	9	4	1999	Angle
Wilmington	Morgan Street	9	6	1999	Angle
Wilmington	Morgan Street	9	6	1999	Sideswipe - Same Direction
Dawson	Morgan Street	9	8	1999	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	11	1999	Left Turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	11	1999	Left Turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	11	1999	Sideswipe - Same Direction
Six Forks Road (SR 1005)	Rowan Street	9	11	1999	Left Turn - Same Roadway
McDowell Street	Morgan Street	9	13	1999	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	13	1999	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	13	1999	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	13	1999	Rear End - Slow or Stop
Falls of Neuse	Millbrook	9	14	1999	Left Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	9	14	1999	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	9	15	1999	Left Turn - Different Roadway
McDowell Street	Hillsborough Street	9	15	1999	Angle
Hillsborough (SR 3007)	Dixie and Friendly	9	16	1999	Angle
Hillsborough (SR 3007)	Dixie and Friendly	9	17	1999	Angle
Falls of Neuse	Millbrook	9	18	1999	Rear End - Slow or Stop
Dawson	Morgan Street	9	20	1999	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	9	21	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	9	21	1999	Rear End - Slow or Stop
Brentwood	New Hope Church	9	22	1999	Angle
Wilmington	Morgan Street	9	22	1999	Right Turn - Different Roadway
Currituck	Lassiter Mill	9	24	1999	Angle
Capital	Highwoods	9	25	1999	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	9	26	1999	Rear End - Slow or Stop
Capital	Highwoods	9	27	1999	Left Turn - Different Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	27	1999	Left Turn - Different Roadway
Person Street (SR	Edenton Street (SR	9	27	1999	Angle

2026)	2298)				
Dawson	Morgan Street	9	29	1999	Rear End - Turn
Dawson	Morgan Street	10	6	1999	Angle
Falls of Neuse	Millbrook	10	6	1999	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	10	6	1999	Angle
Brentwood	New Hope Church	10	7	1999	Sideswipe - Same Direction
Capital	Highwoods	10	8	1999	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	10	8	1999	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	10	11	1999	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	10	11	1999	Angle
Brentwood	New Hope Church	10	12	1999	Rear End - Slow or Stop
Wilmington	Morgan Street	10	13	1999	Angle
Wilmington	Morgan Street	10	13	1999	Angle
Currituck	Lassiter Mill	10	16	1999	Angle
Falls of Neuse	Millbrook	10	17	1999	Rear End - Slow or Stop
Brentwood	New Hope Church	10	18	1999	Left Turn - Different Roadway
McDowell Street	Morgan Street	10	18	1999	Angle
Falls of Neuse	Millbrook	10	19	1999	Right Turn - Different Roadway
Brentwood	New Hope Church	10	21	1999	Angle
Capital	Highwoods	10	21	1999	Angle
Falls of Neuse	Millbrook	10	21	1999	Right turn - Same Roadway
Brentwood	New Hope Church	10	22	1999	Rear End - Slow or Stop
Brentwood	New Hope Church	10	23	1999	Left Turn - Different Roadway
Capital	Highwoods	10	24	1999	Head On
Dawson	South	10	24	1999	Angle
Brentwood	New Hope Church	10	25	1999	Rear End - Slow or Stop
Capital	Highwoods	10	27	1999	Sideswipe - Same Direction
Hillsborough (SR 3007)	Dixie and Friendly	10	27	1999	Angle
Capital	Highwoods	10	28	1999	Angle
Hillsborough (SR 3007)	Dixie and Friendly	10	29	1999	
Hillsborough (SR 3007)	Dixie and Friendly	10	30	1999	Sideswipe - Same Direction
Salisbury	Morgan Street	10	31	1999	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	11	2	1999	Sideswipe - Same Direction
Wilmington	Morgan Street	11	2	1999	Angle
Hillsborough (SR 3007)	Cox and Woodburn	11	4	1999	Rear End - Slow or Stop
Salisbury	Morgan Street	11	4	1999	Angle
Brentwood	New Hope Church	11	5	1999	Angle
Falls of Neuse	Millbrook	11	5	1999	Sideswipe - Same Direction
Capital	Highwoods	11	6	1999	Left Turn - Same Roadway
Six Forks Road (SR	Rowan Street	11	6	1999	Rear End - Slow or Stop

1005)					
Capital	Highwoods	11	8	1999	Left Turn - Different Roadway
McDowell Street	Morgan Street	11	10	1999	Ran off road - Left
Six Forks Road (SR 1005)	Rowan Street	11	10	1999	Left Turn - Different Roadway
Capital	Highwoods	11	12	1999	Angle
Cross Link and Proctor	Rock Quarry	11	12	1999	Left Turn - Different Roadway
Dawson	South	11	12	1999	Angle
McDowell Street	Hillsborough Street	11	12	1999	Rear End - Slow or Stop
Wilmington	Morgan Street	11	12	1999	Angle
Brentwood	New Hope Church	11	13	1999	Right Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	11	14	1999	Rear End - Slow or Stop
Dawson	South	11	15	1999	Angle
Falls of Neuse	Millbrook	11	15	1999	Left Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	11	16	1999	Angle
Wilmington	Morgan Street	11	16	1999	Parked Motor Vehicle
Capital	Highwoods	11	17	1999	Sideswipe - Same Direction
Brentwood	New Hope Church	11	22	1999	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	11	22	1999	Angle
Wilmington	Morgan Street	11	22	1999	Parked Motor Vehicle
McDowell Street	Hillsborough Street	11	23	1999	Angle
Brentwood	New Hope Church	11	24	1999	Right Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	11	24	1999	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	11	26	1999	Rear End - Slow or Stop
Wilmington	Morgan Street	11	27	1999	Angle
Wilmington	Morgan Street	11	27	1999	Angle
Currituck	Lassiter Mill	11	29	1999	Rear End - Slow or Stop
Dawson	Morgan Street	11	30	1999	Angle
Capital	Highwoods	12	3	1999	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	12	3	1999	Angle
Brentwood	New Hope Church	12	4	1999	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	12	5	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	12	5	1999	Rear End - Slow or Stop
Brentwood	New Hope Church	12	7	1999	Angle
Brentwood	New Hope Church	12	7	1999	Angle
Hillsborough (SR 3007)	Dixie and Friendly	12	7	1999	Pedacyclist
Falls of Neuse	Millbrook	12	8	1999	Angle
Peace	West	12	10	1999	Angle
Dawson	Morgan Street	12	12	1999	Angle
Wilmington	Morgan Street	12	12	1999	Parked Motor Vehicle
Capital	Highwoods	12	13	1999	Rear End - Slow or Stop

Capital	Highwoods	12	14	1999	Angle
McDowell Street	Hillsborough Street	12	15	1999	Left Turn - Same Roadway
Wilmington	Morgan Street	12	16	1999	Angle
Cross Link and Proctor	Rock Quarry	12	17	1999	Angle
Falls of Neuse	Millbrook	12	17	1999	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	12	17	1999	Left Turn - Same Roadway
Capital	Highwoods	12	18	1999	Left Turn - Same Roadway
McDowell Street	Hillsborough Street	12	18	1999	Angle
Cross Link and Proctor	Rock Quarry	12	19	1999	Left Turn - Same Roadway
Dawson	South	12	20	1999	Backing Up
Hillsborough (SR 3007)	Dixie and Friendly	12	20	1999	Angle
Six Forks Road (SR 1005)	Rowan Street	12	21	1999	Rear End - Slow or Stop
Wilmington	Morgan Street	12	25	1999	Angle
Dawson	South	12	27	1999	Angle
Falls of Neuse	Millbrook	12	28	1999	Rear End - Slow or Stop
Capital	Highwoods	12	29	1999	Angle
Salisbury	Morgan Street	12	30	1999	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	12	31	1999	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	1	1	2000	Angle
Hillsborough (SR 3007)	Dixie and Friendly	1	4	2000	Rear End - Slow or Stop
McDowell Street	Morgan Street	1	4	2000	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	1	5	2000	Left Turn - Different Roadway
Peace	West	1	5	2000	Right Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	1	5	2000	Rear End - Slow or Stop
Wilmington	Morgan Street	1	6	2000	Angle
Cross Link and Proctor	Rock Quarry	1	8	2000	Angle
Dawson	Morgan Street	1	9	2000	Left Turn - Same Roadway
Wilmington	Morgan Street	1	10	2000	Sideswipe - Same Direction
Dawson	Morgan Street	1	12	2000	Other Collision With Vehicle
Hillsborough (SR 3007)	Cox and Woodburn	1	14	2000	Angle
Hillsborough (SR 3007)	Dixie and Friendly	1	15	2000	Rear End - Slow or Stop
Capital	Highwoods	1	17	2000	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	1	17	2000	Angle
Falls of Neuse	Millbrook	1	19	2000	Angle
Six Forks Road (SR 1005)	Rowan Street	1	21	2000	Angle
McDowell Street	Morgan Street	1	22	2000	Angle
Capital	Highwoods	1	23	2000	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	1	24	2000	Rear End - Slow or Stop
Peace	West	1	29	2000	Parked Motor Vehicle

Capital	Highwoods	1	31	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	2	2	2000	Left Turn - Same Roadway
Wilmington	Morgan Street	2	3	2000	Angle
Capital	Highwoods	2	4	2000	Other non-collision
Falls of Neuse	Millbrook	2	6	2000	Rear End - Turn
Currituck	Lassiter Mill	2	7	2000	Rear End - Slow or Stop
Dawson	South	2	9	2000	Angle
Hillsborough (SR 3007)	Cox and Woodburn	2	10	2000	Angle
Currituck	Lassiter Mill	2	12	2000	Angle
Hillsborough (SR 3007)	Dixie and Friendly	2	12	2000	Rear End - Turn
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	13	2000	Angle
Salisbury	Morgan Street	2	13	2000	Pedacyclist
McDowell Street	Hillsborough Street	2	16	2000	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	2	17	2000	Angle
Salisbury	Morgan Street	2	17	2000	Angle
Brentwood	New Hope Church	2	21	2000	Angle
Falls of Neuse	Millbrook	2	23	2000	Right turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	29	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	3	1	2000	Sideswipe - Same Direction
Dawson	Morgan Street	3	3	2000	Rear End - Slow or Stop
Falls of Neuse	Millbrook	3	3	2000	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	3	3	2000	Angle
Wilmington	Morgan Street	3	3	2000	Angle
Capital	Highwoods	3	4	2000	Rear End - Slow or Stop
Dawson	Morgan Street	3	4	2000	Sideswipe - Same Direction
Brentwood	New Hope Church	3	5	2000	Angle
Capital	Highwoods	3	7	2000	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	8	2000	Left Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	3	8	2000	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	9	2000	Head on
Wilmington	Morgan Street	3	9	2000	Parked Motor Vehicle
Hillsborough (SR 3007)	Cox and Woodburn	3	10	2000	Left Turn - Different Roadway
Dawson	Morgan Street	3	11	2000	Rear End - Slow or Stop
Capital	Highwoods	3	12	2000	Angle
Cross Link and Proctor	Rock Quarry	3	13	2000	Left Turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	14	2000	Angle
McDowell Street	Morgan Street	3	15	2000	Angle
Brentwood	New Hope Church	3	16	2000	Angle
Brentwood	New Hope Church	3	16	2000	Other Collision With Vehicle
Currituck	Lassiter Mill	3	16	2000	Left Turn - Same Roadway

Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	16	2000	Angle
Hillsborough (SR 3007)	Dixie and Friendly	3	17	2000	Ran off road - Right
Person Street (SR 2026)	Edenton Street (SR 2298)	3	17	2000	Angle
Capital	Highwoods	3	20	2000	Sideswipe - Same Direction
Dawson	Morgan Street	3	21	2000	Sideswipe - Same Direction
Salisbury	Morgan Street	3	21	2000	Angle
Wilmington	Morgan Street	3	21	2000	Angle
Six Forks Road (SR 1005)	Rowan Street	3	22	2000	Rear End - Slow or Stop
Brentwood	New Hope Church	3	26	2000	Right Turn - Different Roadway
Dawson	Morgan Street	3	26	2000	Angle
Falls of Neuse	Millbrook	3	26	2000	Angle
Dawson	Morgan Street	3	27	2000	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	3	27	2000	Sideswipe - Same Direction
Six Forks Road (SR 1005)	Rowan Street	3	27	2000	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	3	27	2000	Rear End - Slow or Stop
Dawson	Morgan Street	3	28	2000	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	3	28	2000	Rear End - Slow or Stop
Dawson	Morgan Street	3	29	2000	Fixed Object
Hillsborough (SR 3007)	Dixie and Friendly	3	30	2000	Pedestrian
Falls of Neuse	Millbrook	3	31	2000	Sideswipe - Opposite Direction
Hillsborough (SR 3007)	Dixie and Friendly	4	3	2000	Sideswipe - Same Direction
Falls of Neuse	Millbrook	4	5	2000	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	4	5	2000	Rear End - Slow or Stop
Capital	Highwoods	4	6	2000	Rear End - Slow or Stop
Falls of Neuse	Millbrook	4	6	2000	Sideswipe - Same Direction
Dawson	South	4	8	2000	Angle
McDowell Street	Morgan Street	4	8	2000	Angle
Capital	Highwoods	4	14	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	4	15	2000	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	4	15	2000	Ran off road - Right
Wilmington	Morgan Street	4	15	2000	Angle
Currituck	Lassiter Mill	4	16	2000	Angle
Capital	Highwoods	4	19	2000	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	4	19	2000	Parked Motor Vehicle
Cross Link and Proctor	Rock Quarry	4	20	2000	Angle
Falls of Neuse	Millbrook	4	20	2000	Sideswipe - Same Direction

McDowell Street	Morgan Street	4	20	2000	Angle
Falls of Neuse	Millbrook	4	21	2000	Angle
McDowell Street	Hillsborough Street	4	23	2000	Angle
Dawson	South	4	25	2000	Angle
Dawson	Morgan Street	4	25	2000	Angle
Six Forks Road (SR 1005)	Rowan Street	4	25	2000	Rear End - Slow or Stop
Capital	Highwoods	4	27	2000	Rear End - Slow or Stop
Dawson	South	4	29	2000	Angle
Brentwood	New Hope Church	5	1	2000	Rear End - Slow or Stop
Falls of Neuse	Millbrook	5	2	2000	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	5	2	2000	Angle
McDowell Street	Hillsborough Street	5	4	2000	Left Turn - Different Roadway
Hillsborough (SR 3007)	Dixie and Friendly	5	5	2000	Angle
Wilmington	Morgan Street	5	6	2000	Angle
Wilmington	Morgan Street	5	7	2000	Angle
Dawson	Morgan Street	5	10	2000	Angle
Falls of Neuse	Millbrook	5	10	2000	Angle
Falls of Neuse	Millbrook	5	13	2000	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	5	13	2000	Left Turn - Same Roadway
McDowell Street	Hillsborough Street	5	13	2000	Angle
Hillsborough (SR 3007)	Cox and Woodburn	5	17	2000	Angle
Capital	Highwoods	5	18	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	5	19	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	5	19	2000	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	5	19	2000	Sideswipe - Same Direction
Dawson	South	5	20	2000	Angle
Hillsborough (SR 3007)	Cox and Woodburn	5	20	2000	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	5	21	2000	Sideswipe - Same Direction
Capital	Highwoods	5	22	2000	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	5	22	2000	Angle
Salisbury	Morgan Street	5	23	2000	Rear End - Slow or Stop
Wilmington	Morgan Street	5	23	2000	Angle
McDowell Street	Morgan Street	5	25	2000	Angle
Hillsborough (SR 3007)	Cox and Woodburn	5	26	2000	Left Turn - Same Roadway
McDowell Street	Hillsborough Street	5	30	2000	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	5	30	2000	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	5	30	2000	Angle
Hillsborough (SR 3007)	Dixie and Friendly	5	31	2000	Sideswipe - Same Direction
Dawson	Morgan Street	6	1	2000	Fixed Object
Falls of Neuse	Millbrook	6	1	2000	Angle

McDowell Street	Hillsborough Street	6	1	2000	Angle
Salisbury	Morgan Street	6	1	2000	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	2	2000	Rear End - Slow or Stop
McDowell Street	Morgan Street	6	3	2000	Sideswipe - Same Direction
Capital	Highwoods	6	4	2000	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	6	6	2000	Angle
Dawson	South	6	7	2000	Angle
Dawson	Morgan Street	6	7	2000	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	7	2000	Backing Up
Capital	Highwoods	6	8	2000	Rear End - Turn
Capital	Highwoods	6	8	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	6	8	2000	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	6	9	2000	Angle
McDowell Street	Hillsborough Street	6	9	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	6	10	2000	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	10	2000	Rear End - Slow or Stop
Wilmington	Morgan Street	6	10	2000	Angle
Wilmington	Morgan Street	6	11	2000	Angle
Capital	Highwoods	6	13	2000	Sideswipe - Same Direction
Peace	West	6	13	2000	Angle
Falls of Neuse	Millbrook	6	14	2000	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	6	14	2000	Angle
Brentwood	New Hope Church	6	15	2000	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	6	16	2000	Angle
Cross Link and Proctor	Rock Quarry	6	18	2000	Angle
Dawson	South	6	18	2000	Other Collision With Vehicle
Falls of Neuse	Millbrook	6	22	2000	Backing Up
Falls of Neuse	Millbrook	6	22	2000	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	6	23	2000	Left Turn - Different Roadway
Salisbury	Morgan Street	6	23	2000	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	6	24	2000	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	28	2000	Sideswipe - Same Direction
Salisbury	Morgan Street	6	28	2000	Right turn - Same Roadway
Wilmington	Morgan Street	6	28	2000	Angle
Capital	Highwoods	6	29	2000	Left Turn - Different Roadway
Falls of Neuse	Millbrook	6	29	2000	Right turn - Same Roadway
Capital	Highwoods	7	4	2000	Angle
Cross Link and Proctor	Rock Quarry	7	5	2000	Rear End - Slow or Stop
Falls of Neuse	Millbrook	7	7	2000	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	7	8	2000	Rear End - Slow or Stop

Falls of Neuse	Millbrook	7	8	2000	Rear End - Slow or Stop
Capital	Highwoods	7	11	2000	Backing Up
Dawson	South	7	11	2000	Angle
Salisbury	Morgan Street	7	11	2000	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	7	12	2000	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	7	13	2000	Angle
Salisbury	Morgan Street	7	14	2000	Right turn - Same Roadway
Cross Link and Proctor	Rock Quarry	7	16	2000	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	7	17	2000	Rear End - Slow or Stop
Salisbury	Morgan Street	7	19	2000	Angle
Capital	Highwoods	7	21	2000	Rear End - Slow or Stop
Dawson	South	7	23	2000	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	7	24	2000	Left Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	7	28	2000	Rear End - Slow or Stop
McDowell Street	Morgan Street	7	28	2000	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	7	29	2000	Rear End - Slow or Stop
Brentwood	New Hope Church	7	31	2000	Angle
Salisbury	Morgan Street	7	31	2000	Backing Up
Hillsborough (SR 3007)	Dixie and Friendly	8	4	2000	Angle
Capital	Highwoods	8	5	2000	Backing Up
Peace	West	8	5	2000	Angle
Six Forks Road (SR 1005)	Rowan Street	8	7	2000	Sideswipe - Opposite Direction
Cross Link and Proctor	Rock Quarry	8	8	2000	Angle
Falls of Neuse	Millbrook	8	8	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	8	8	2000	Parked Motor Vehicle
McDowell Street	Hillsborough Street	8	8	2000	Angle
Peace	West	8	10	2000	Angle
Salisbury	Morgan Street	8	11	2000	Ran off road - Right
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	8	12	2000	Angle
Capital	Highwoods	8	14	2000	Angle
Dawson	South	8	15	2000	Angle
Falls of Neuse	Millbrook	8	15	2000	Right Turn - Different Roadway
Hillsborough (SR 3007)	Dixie and Friendly	8	16	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	8	16	2000	Angle
Six Forks Road (SR 1005)	Rowan Street	8	16	2000	Angle
McDowell Street	Hillsborough Street	8	17	2000	Left Turn - Same Roadway
Hillsborough (SR 3007)	Cox and Woodburn	8	18	2000	Rear End - Slow or Stop
Falls of Neuse	Millbrook	8	22	2000	Left Turn - Same Roadway
Falls of Neuse	Millbrook	8	22	2000	Sideswipe - Same Direction
Capital	Highwoods	8	23	2000	Rear End - Slow or Stop

Cross Link and Proctor	Rock Quarry	8	23	2000	Fixed Object
Dawson	South	8	23	2000	Angle
Falls of Neuse	Millbrook	8	23	2000	Left Turn - Different Roadway
Capital	Highwoods	8	25	2000	Rear End - Slow or Stop
Capital	Highwoods	8	25	2000	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	8	26	2000	Angle
Dawson	Morgan Street	8	27	2000	Angle
Peace	West	8	27	2000	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	8	28	2000	Angle
Salisbury	Morgan Street	8	29	2000	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	8	29	2000	Rear End - Slow or Stop
Dawson	Morgan Street	9	4	2000	Angle
Hillsborough (SR 3007)	Dixie and Friendly	9	4	2000	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	9	4	2000	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	5	2000	Rear End - Slow or Stop
Falls of Neuse	Millbrook	9	8	2000	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	9	8	2000	Left Turn - Different Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	9	9	2000	Angle
McDowell Street	Hillsborough Street	9	10	2000	Sideswipe - Same Direction
Falls of Neuse	Millbrook	9	12	2000	Angle
Capital	Highwoods	9	13	2000	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	9	15	2000	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	15	2000	Rear End - Slow or Stop
Capital	Highwoods	9	16	2000	Rear End - Slow or Stop
Falls of Neuse	Millbrook	9	16	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	9	16	2000	Angle
McDowell Street	Morgan Street	9	16	2000	Angle
Hillsborough (SR 3007)	Dixie and Friendly	9	17	2000	Sideswipe - Same Direction
Capital	Highwoods	9	19	2000	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	9	19	2000	Angle
McDowell Street	Hillsborough Street	9	19	2000	Angle
McDowell Street	Hillsborough Street	9	20	2000	Angle
Capital	Highwoods	9	21	2000	Right turn - Same Roadway
Capital	Highwoods	9	22	2000	Rear End - Slow or Stop
Brentwood	New Hope Church	9	23	2000	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	9	23	2000	Head On
Hillsborough (SR 3007)	Cox and Woodburn	9	23	2000	Backing Up
Brentwood	New Hope Church	9	27	2000	Angle
Cross Link and Proctor	Rock Quarry	9	28	2000	Rear End - Slow or Stop
Falls of Neuse	Millbrook	9	28	2000	Rear End - Slow or Stop

Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	29	2000	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	9	30	2000	Rear End - Slow or Stop
Falls of Neuse	Millbrook	9	30	2000	Angle
Wilmington	Morgan Street	10	2	2000	Angle
Wilmington	Morgan Street	10	2	2000	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	10	3	2000	Angle
Cross Link and Proctor	Rock Quarry	10	4	2000	Sideswipe - Same Direction
Six Forks Road (SR 1005)	Rowan Street	10	4	2000	Right Turn - Different Roadway
Brentwood	New Hope Church	10	5	2000	Rear End - Slow or Stop
Falls of Neuse	Millbrook	10	5	2000	Angle
Cross Link and Proctor	Rock Quarry	10	6	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	10	6	2000	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	10	6	2000	Rear End - Slow or Stop
Brentwood	New Hope Church	10	8	2000	Angle
McDowell Street	Hillsborough Street	10	9	2000	Sideswipe - Same Direction
Dawson	Morgan Street	10	10	2000	Left Turn - Different Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	10	10	2000	Angle
Six Forks Road (SR 1005)	Rowan Street	10	11	2000	Rear End - Slow or Stop
Dawson	Morgan Street	10	12	2000	Angle
Salisbury	Morgan Street	10	12	2000	Angle
Peace	West	10	13	2000	Angle
Salisbury	Morgan Street	10	13	2000	Rear End - Slow or Stop
Salisbury	Morgan Street	10	14	2000	Angle
Falls of Neuse	Millbrook	10	15	2000	Angle
McDowell Street	Hillsborough Street	10	15	2000	Angle
McDowell Street	Hillsborough Street	10	16	2000	Angle
McDowell Street	Morgan Street	10	16	2000	Left Turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	10	16	2000	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	10	16	2000	Angle
Wilmington	Morgan Street	10	16	2000	Angle
Cross Link and Proctor	Rock Quarry	10	17	2000	Angle
Dawson	South	10	18	2000	Sideswipe - Same Direction
Hillsborough (SR 3007)	Dixie and Friendly	10	19	2000	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	10	19	2000	Angle
McDowell Street	Hillsborough Street	10	20	2000	Rear End - Slow or Stop
Dawson	South	10	21	2000	Sideswipe - Same Direction
McDowell Street	Morgan Street	10	22	2000	Angle
Capital	Highwoods	10	23	2000	Rear End - Slow or Stop
Dawson	Morgan Street	10	23	2000	Angle

Peace	West	10	23	2000	Fixed Object
Capital	Highwoods	10	31	2000	Angle
Hillsborough (SR 3007)	Cox and Woodburn	10	31	2000	Left Turn - Same Roadway
McDowell Street	Hillsborough Street	10	31	2000	Angle
Hillsborough (SR 3007)	Cox and Woodburn	11	2	2000	Left Turn - Same Roadway
Brentwood	New Hope Church	11	4	2000	Angle
Peace	West	11	5	2000	Angle
Dawson	South	11	6	2000	Other Collision With Vehicle
Capital	Highwoods	11	9	2000	Left Turn - Same Roadway
Capital	Highwoods	11	10	2000	Sideswipe - Same Direction
Currituck	Lassiter Mill	11	11	2000	Angle
Dawson	Morgan Street	11	12	2000	Angle
Hillsborough (SR 3007)	Dixie and Friendly	11	12	2000	Left Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	11	13	2000	Angle
Cross Link and Proctor	Rock Quarry	11	14	2000	Left Turn - Different Roadway
Capital	Highwoods	11	15	2000	Rear End - Slow or Stop
Capital	Highwoods	11	18	2000	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	11	18	2000	Other Collision With Vehicle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	19	2000	Sideswipe - Same Direction
McDowell Street	Morgan Street	11	20	2000	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	11	20	2000	Angle
Cross Link and Proctor	Rock Quarry	11	21	2000	Angle
McDowell Street	Hillsborough Street	11	22	2000	Angle
Hillsborough (SR 3007)	Cox and Woodburn	11	25	2000	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	25	2000	Angle
Capital	Highwoods	11	26	2000	Left Turn - Different Roadway
Dawson	South	11	27	2000	Sideswipe - Same Direction
Falls of Neuse	Millbrook	11	29	2000	Left Turn - Different Roadway
Dawson	South	11	30	2000	Sideswipe - Same Direction
Hillsborough (SR 3007)	Dixie and Friendly	11	30	2000	Angle
Cross Link and Proctor	Rock Quarry	12	1	2000	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	12	5	2000	Left Turn - Different Roadway
Dawson	South	12	5	2000	Angle
Hillsborough (SR 3007)	Cox and Woodburn	12	6	2000	Angle
Dawson	Morgan Street	12	7	2000	Rear End - Slow or Stop
Falls of Neuse	Millbrook	12	13	2000	Sideswipe - Same Direction
Wilmington	Morgan Street	12	16	2000	Angle
Dawson	South	12	17	2000	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	12	18	2000	Rear End - Slow or Stop

Six Forks Road (SR 1005)	Rowan Street	12	18	2000	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	12	18	2000	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	12	19	2000	Rear End - Slow or Stop
Peace	West	12	19	2000	Left Turn - Different Roadway
Wilmington	Morgan Street	12	19	2000	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	12	21	2000	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	12	22	2000	Angle
Capital	Highwoods	12	25	2000	Angle
Wilmington	Morgan Street	12	28	2000	Angle
Cross Link and Proctor	Rock Quarry	12	29	2000	Angle
McDowell Street	Hillsborough Street	12	30	2000	Sideswipe - Same Direction
Dawson	South	12	31	2000	Angle
Capital	Highwoods	1	2	2001	Rear End - Slow or Stop
Falls of Neuse	Millbrook	1	2	2001	Angle
Capital	Highwoods	1	4	2001	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	1	5	2001	Angle
Cross Link and Proctor	Rock Quarry	1	7	2001	Sideswipe - Opposite Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	1	10	2001	Angle
Cross Link and Proctor	Rock Quarry	1	11	2001	Angle
Brentwood	New Hope Church	1	13	2001	Angle
Capital	Highwoods	1	14	2001	Left Turn - Same Roadway
Falls of Neuse	Millbrook	1	15	2001	Angle
McDowell Street	Hillsborough Street	1	16	2001	Fixed Object
Cross Link and Proctor	Rock Quarry	1	18	2001	Left Turn - Different Roadway
Falls of Neuse	Millbrook	1	19	2001	Angle
Hillsborough (SR 3007)	Cox and Woodburn	1	19	2001	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	1	19	2001	Left Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	1	19	2001	Rear End - Slow or Stop
Dawson	Morgan Street	1	20	2001	Left Turn - Different Roadway
Hillsborough (SR 3007)	Cox and Woodburn	1	20	2001	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	1	21	2001	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	1	21	2001	Angle
Dawson	Morgan Street	1	22	2001	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	1	23	2001	Angle
Salisbury	Morgan Street	1	24	2001	Left Turn - Same Roadway
Capital	Highwoods	1	26	2001	Sideswipe - Same Direction

Dawson	Morgan Street	1	26	2001	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	1	26	2001	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	1	26	2001	Pedestrian
Cross Link and Proctor	Rock Quarry	1	27	2001	Angle
Falls of Neuse	Millbrook	1	27	2001	Angle
McDowell Street	Morgan Street	1	28	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	1	29	2001	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	1	30	2001	Angle
McDowell Street	Hillsborough Street	2	1	2001	Left Turn - Same Roadway
Hillsborough (SR 3007)	Dixie and Friendly	2	2	2001	Pedestrian
Six Forks Road (SR 1005)	Rowan Street	2	2	2001	Angle
Salisbury	Morgan Street	2	4	2001	Angle
Peace	West	2	6	2001	Left Turn - Different Roadway
Dawson	Morgan Street	2	7	2001	Angle
Hillsborough (SR 3007)	Cox and Woodburn	2	7	2001	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	8	2001	Angle
Hillsborough (SR 3007)	Dixie and Friendly	2	9	2001	Angle
Falls of Neuse	Millbrook	2	10	2001	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	2	11	2001	Angle
Wilmington	Morgan Street	2	11	2001	Angle
Dawson	South	2	12	2001	Angle
Capital	Highwoods	2	13	2001	Sideswipe - Same Direction
Brentwood	New Hope Church	2	19	2001	Angle
Hillsborough (SR 3007)	Cox and Woodburn	2	19	2001	Right Turn - Different Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	2	19	2001	Angle
Capital	Highwoods	2	21	2001	Sideswipe - Same Direction
Dawson	South	2	21	2001	Rear End - Slow or Stop
Peace	West	2	21	2001	Angle
Brentwood	New Hope Church	2	22	2001	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	2	22	2001	Other non-collision
Peace	West	2	22	2001	Angle
Brentwood	New Hope Church	2	23	2001	Right Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	2	23	2001	Angle
Dawson	Morgan Street	2	24	2001	Angle
Cross Link and Proctor	Rock Quarry	2	25	2001	Rear End - Slow or Stop
Capital	Highwoods	3	1	2001	Rear End - Slow or Stop
Brentwood	New Hope Church	3	2	2001	Angle

Falls of Neuse	Millbrook	3	2	2001	Angle
McDowell Street	Morgan Street	3	2	2001	Left Turn - Same Roadway
Capital	Highwoods	3	3	2001	Left Turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	4	2001	Rear End - Slow or Stop
Capital	Highwoods	3	5	2001	Angle
Capital	Highwoods	3	8	2001	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	3	8	2001	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	3	8	2001	Angle
Cross Link and Proctor	Rock Quarry	3	10	2001	Left Turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	10	2001	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	3	10	2001	Angle
Brentwood	New Hope Church	3	12	2001	Angle
Dawson	Morgan Street	3	12	2001	Right turn - Same Roadway
Cross Link and Proctor	Rock Quarry	3	13	2001	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	3	14	2001	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	3	15	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	3	15	2001	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	3	16	2001	Angle
Cross Link and Proctor	Rock Quarry	3	17	2001	Angle
Dawson	Morgan Street	3	17	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	3	17	2001	Rear End - Slow or Stop
Wilmington	Morgan Street	3	17	2001	Right turn - Same Roadway
Hillsborough (SR 3007)	Cox and Woodburn	3	18	2001	Angle
McDowell Street	Morgan Street	3	18	2001	Left Turn - Different Roadway
Falls of Neuse	Millbrook	3	20	2001	Sideswipe - Same Direction
Dawson	Morgan Street	3	25	2001	Angle
Cross Link and Proctor	Rock Quarry	3	29	2001	Angle
Falls of Neuse	Millbrook	3	29	2001	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	3	30	2001	Angle
McDowell Street	Hillsborough Street	4	1	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	4	1	2001	Left Turn - Different Roadway
Falls of Neuse	Millbrook	4	2	2001	Right Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	4	2	2001	Sideswipe - Same Direction
Salisbury	Morgan Street	4	3	2001	Pedestrian
Cross Link and Proctor	Rock Quarry	4	4	2001	Left Turn - Same Roadway
Falls of Neuse	Millbrook	4	4	2001	Sideswipe - Same Direction
McDowell Street	Morgan Street	4	6	2001	Pedacyclist

Cross Link and Proctor	Rock Quarry	4	9	2001	Angle
Hillsborough (SR 3007)	Cox and Woodburn	4	10	2001	Sideswipe - Opposite Direction
Brentwood	New Hope Church	4	11	2001	Rear End - Slow or Stop
Capital	Highwoods	4	11	2001	Angle
Brentwood	New Hope Church	4	14	2001	Right Turn - Different Roadway
Dawson	Morgan Street	4	15	2001	Angle
Capital	Highwoods	4	17	2001	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	4	17	2001	Angle
Hillsborough (SR 3007)	Dixie and Friendly	4	18	2001	Fixed Object
Hillsborough (SR 3007)	Cox and Woodburn	4	20	2001	Rear End - Slow or Stop
Falls of Neuse	Millbrook	4	23	2001	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	4	23	2001	Angle
Capital	Highwoods	4	24	2001	Left Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	4	24	2001	Angle
McDowell Street	Hillsborough Street	4	24	2001	Angle
Wilmington	Morgan Street	4	24	2001	Other Collision With Vehicle
Brentwood	New Hope Church	4	25	2001	Rear End - Slow or Stop
Capital	Highwoods	4	25	2001	Left Turn - Different Roadway
McDowell Street	Morgan Street	4	25	2001	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	4	25	2001	Angle
Falls of Neuse	Millbrook	4	27	2001	Left Turn - Different Roadway
McDowell Street	Morgan Street	4	27	2001	Sideswipe - Same Direction
Dawson	South	4	29	2001	Angle
Capital	Highwoods	4	30	2001	Rear End - Slow or Stop
Dawson	South	4	30	2001	Angle
Capital	Highwoods	5	2	2001	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	5	3	2001	Rear End - Slow or Stop
McDowell Street	Morgan Street	5	4	2001	Angle
Dawson	South	5	5	2001	Angle
McDowell Street	Hillsborough Street	5	8	2001	Angle
Falls of Neuse	Millbrook	5	9	2001	Left Turn - Same Roadway
Cross Link and Proctor	Rock Quarry	5	10	2001	Sideswipe - Opposite Direction
Falls of Neuse	Millbrook	5	10	2001	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	5	11	2001	Backing Up
Falls of Neuse	Millbrook	5	11	2001	Rear End - Slow or Stop
McDowell Street	Morgan Street	5	11	2001	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	5	12	2001	Rear End - Slow or Stop
Millbrook (SR 2018 and	Old Wake Forest	5	13	2001	Angle

2081)	(SR 2030)				
Person Street (SR 2026)	Edenton Street (SR 2298)	5	17	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	5	22	2001	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	5	24	2001	Angle
McDowell Street	Hillsborough Street	5	25	2001	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	5	27	2001	Angle
Capital	Highwoods	5	29	2001	Left Turn - Same Roadway
Falls of Neuse	Millbrook	5	29	2001	Angle
Capital	Highwoods	5	30	2001	Fixed Object
Hillsborough (SR 3007)	Cox and Woodburn	5	31	2001	Parked Motor Vehicle
Dawson	Morgan Street	6	2	2001	Angle
McDowell Street	Hillsborough Street	6	2	2001	Angle
Capital	Highwoods	6	7	2001	Other non-collision
Cross Link and Proctor	Rock Quarry	6	9	2001	Angle
Capital	Highwoods	6	13	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	6	13	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	6	14	2001	Sideswipe - Same Direction
Hillsborough (SR 3007)	Dixie and Friendly	6	17	2001	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	6	17	2001	Angle
Salisbury	Morgan Street	6	18	2001	Backing Up
McDowell Street	Morgan Street	6	19	2001	Angle
Capital	Highwoods	6	22	2001	Angle
Cross Link and Proctor	Rock Quarry	6	25	2001	Angle
Brentwood	New Hope Church	6	26	2001	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	26	2001	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	6	27	2001	Angle
Falls of Neuse	Millbrook	6	28	2001	Left Turn - Different Roadway
Brentwood	New Hope Church	6	29	2001	Sideswipe - Same Direction
Peace	West	6	29	2001	Fixed Object
Brentwood	New Hope Church	7	1	2001	Rear End - Slow or Stop
Capital	Highwoods	7	5	2001	Left Turn - Different Roadway
Dawson	Morgan Street	7	5	2001	Left Turn - Same Roadway
Peace	West	7	5	2001	Fixed Object
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	7	8	2001	Left Turn - Same Roadway
Salisbury	Morgan Street	7	10	2001	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	7	16	2001	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	7	16	2001	Angle

Hillsborough (SR 3007)	Dixie and Friendly	7	17	2001	Angle
Hillsborough (SR 3007)	Cox and Woodburn	7	18	2001	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	7	18	2001	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	7	18	2001	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	7	18	2001	Angle
Brentwood	New Hope Church	7	20	2001	Angle
McDowell Street	Hillsborough Street	7	22	2001	Ran off road - Left
McDowell Street	Hillsborough Street	7	27	2001	Angle
Capital	Highwoods	7	28	2001	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	7	28	2001	Sideswipe - Opposite Direction
McDowell Street	Hillsborough Street	7	29	2001	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	7	31	2001	Sideswipe - Same Direction
Capital	Highwoods	8	6	2001	Left Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	8	6	2001	Rear End - Slow or Stop
Capital	Highwoods	8	7	2001	Rear End - Slow or Stop
Capital	Highwoods	8	7	2001	Rear End - Slow or Stop
Wilmington	Morgan Street	8	7	2001	Angle
Wilmington	Morgan Street	8	8	2001	Parked Motor Vehicle
Capital	Highwoods	8	9	2001	Rear End - Slow or Stop
Salisbury	Morgan Street	8	10	2001	Rear End - Slow or Stop
Wilmington	Morgan Street	8	12	2001	Angle
Capital	Highwoods	8	14	2001	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	8	14	2001	Left Turn - Different Roadway
McDowell Street	Morgan Street	8	15	2001	Right turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	8	15	2001	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	8	15	2001	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	8	16	2001	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	8	22	2001	Rear End - Slow or Stop
McDowell Street	Morgan Street	8	24	2001	Ran off road - Right
McDowell Street	Hillsborough Street	8	25	2001	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	8	25	2001	Left Turn - Same Roadway
Cross Link and Proctor	Rock Quarry	8	27	2001	Sideswipe - Opposite Direction
Hillsborough (SR 3007)	Cox and Woodburn	8	28	2001	Angle
Capital	Highwoods	8	29	2001	Left Turn - Different Roadway
Falls of Neuse	Millbrook	8	29	2001	Angle
Hillsborough (SR 3007)	Dixie and Friendly	8	31	2001	Angle

Dawson	South	9	1	2001	Angle
Dawson	Morgan Street	9	1	2001	Angle
Capital	Highwoods	9	3	2001	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	9	6	2001	Left Turn - Different Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	9	6	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	9	7	2001	Other Collision With Vehicle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	8	2001	Rear End - Slow or Stop
Brentwood	New Hope Church	9	9	2001	Sideswipe - Same Direction
Capital	Highwoods	9	10	2001	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	9	13	2001	Left Turn - Different Roadway
Falls of Neuse	Millbrook	9	13	2001	Other non-collision
Dawson	South	9	14	2001	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	9	14	2001	Angle
Cross Link and Proctor	Rock Quarry	9	15	2001	Rear End - Slow or Stop
Capital	Highwoods	9	17	2001	Rear End - Slow or Stop
Capital	Highwoods	9	18	2001	Rear End - Slow or Stop
Dawson	Morgan Street	9	22	2001	Angle
McDowell Street	Morgan Street	9	23	2001	Angle
Wilmington	Morgan Street	9	23	2001	Angle
Dawson	Morgan Street	9	25	2001	Angle
Hillsborough (SR 3007)	Dixie and Friendly	9	26	2001	Angle
McDowell Street	Hillsborough Street	9	26	2001	Angle
Capital	Highwoods	9	27	2001	Rear End - Slow or Stop
Dawson	South	9	27	2001	Angle
Brentwood	New Hope Church	9	28	2001	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	9	28	2001	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	9	28	2001	Left Turn - Same Roadway
Peace	West	10	1	2001	Angle
Capital	Highwoods	10	3	2001	Angle
Cross Link and Proctor	Rock Quarry	10	3	2001	Rear End - Slow or Stop
Brentwood	New Hope Church	10	4	2001	Angle
Cross Link and Proctor	Rock Quarry	10	4	2001	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	10	5	2001	Angle
McDowell Street	Hillsborough Street	10	6	2001	Sideswipe - Same Direction
Brentwood	New Hope Church	10	9	2001	Left Turn - Different Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	10	9	2001	Left Turn - Different Roadway
Brentwood	New Hope Church	10	12	2001	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	10	12	2001	Sideswipe - Same Direction
Six Forks Road (SR	Rowan Street	10	12	2001	Angle

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Six Forks Road (SR 1005)	Rowan Street	10	13	2001	Angle
McDowell Street	Hillsborough Street	10	15	2001	Angle
McDowell Street	Hillsborough Street	10	16	2001	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	10	17	2001	Left Turn - Same Roadway
Falls of Neuse	Millbrook	10	17	2001	Angle
Cross Link and Proctor	Rock Quarry	10	18	2001	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	10	18	2001	Angle
Salisbury	Morgan Street	10	18	2001	Angle
Hillsborough (SR 3007)	Cox and Woodburn	10	19	2001	Left Turn - Same Roadway
Dawson	Morgan Street	10	21	2001	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	10	22	2001	Rear End - Slow or Stop
Dawson	Morgan Street	10	23	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	10	23	2001	Left Turn - Different Roadway
Hillsborough (SR 3007)	Cox and Woodburn	10	24	2001	Angle
Falls of Neuse	Millbrook	10	25	2001	Angle
McDowell Street	Morgan Street	10	26	2001	Sideswipe - Same Direction
Six Forks Road (SR 1005)	Rowan Street	10	28	2001	Left Turn - Different Roadway
Falls of Neuse	Millbrook	10	31	2001	Rear End - Slow or Stop
McDowell Street	Morgan Street	11	1	2001	Right Turn - Different Roadway
Brentwood	New Hope Church	11	2	2001	Rear End - Turn
Six Forks Road (SR 1005)	Rowan Street	11	2	2001	Rear End - Slow or Stop
Wilmington	Morgan Street	11	2	2001	Angle
Falls of Neuse	Millbrook	11	6	2001	Left Turn - Different Roadway
Hillsborough (SR 3007)	Dixie and Friendly	11	8	2001	Angle
Hillsborough (SR 3007)	Cox and Woodburn	11	10	2001	Angle
Hillsborough (SR 3007)	Cox and Woodburn	11	12	2001	Angle
Cross Link and Proctor	Rock Quarry	11	13	2001	Angle
Cross Link and Proctor	Rock Quarry	11	13	2001	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	11	13	2001	Left Turn - Same Roadway
Falls of Neuse	Millbrook	11	15	2001	Sideswipe - Same Direction
Wilmington	Morgan Street	11	17	2001	Rear End - Slow or Stop
Capital	Highwoods	11	19	2001	Rear End - Turn
Hillsborough (SR 3007)	Dixie and Friendly	11	19	2001	Angle
Wilmington	Morgan Street	11	21	2001	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	22	2001	Angle
McDowell Street	Hillsborough Street	11	23	2001	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	11	24	2001	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	11	25	2001	Fixed Object

Falls of Neuse	Millbrook	11	26	2001	Left Turn - Same Roadway
Hillsborough (SR 3007)	Cox and Woodburn	11	26	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	11	26	2001	Angle
Wilmington	Morgan Street	11	26	2001	Rear End - Slow or Stop
Brentwood	New Hope Church	11	27	2001	Angle
Dawson	South	11	28	2001	Left Turn - Same Roadway
Capital	Highwoods	11	29	2001	Angle
McDowell Street	Morgan Street	11	29	2001	Angle
Falls of Neuse	Millbrook	12	1	2001	Angle
McDowell Street	Hillsborough Street	12	3	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	12	4	2001	Sideswipe - Same Direction
Wilmington	Morgan Street	12	4	2001	Sideswipe - Same Direction
Peace	West	12	7	2001	Left Turn - Different Roadway
Six Forks Road (SR 1005)	Rowan Street	12	7	2001	Angle
Dawson	South	12	9	2001	Angle
Cross Link and Proctor	Rock Quarry	12	11	2001	Angle
Wilmington	Morgan Street	12	13	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	12	15	2001	Angle
Hillsborough (SR 3007)	Cox and Woodburn	12	16	2001	Left Turn - Different Roadway
Capital	Highwoods	12	17	2001	Rear End - Turn
Hillsborough (SR 3007)	Dixie and Friendly	12	17	2001	Left Turn - Same Roadway
McDowell Street	Hillsborough Street	12	17	2001	Sideswipe - Same Direction
McDowell Street	Morgan Street	12	17	2001	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	12	17	2001	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	12	19	2001	Left Turn - Different Roadway
Dawson	Morgan Street	12	19	2001	Angle
Cross Link and Proctor	Rock Quarry	12	20	2001	Left Turn - Different Roadway
Salisbury	Morgan Street	12	20	2001	Fixed Object
Cross Link and Proctor	Rock Quarry	12	21	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	12	21	2001	Rear End - Slow or Stop
Brentwood	New Hope Church	12	24	2001	Angle
Capital	Highwoods	12	24	2001	Angle
Capital	Highwoods	12	24	2001	Angle
Six Forks Road (SR 1005)	Rowan Street	12	24	2001	Left Turn - Different Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	12	28	2001	Left Turn - Same Roadway
Wilmington	Morgan Street	12	28	2001	Angle

Wilmington	Morgan Street	12	29	2001	Other Collision With Vehicle
Falls of Neuse	Millbrook	12	30	2001	Angle
Cross Link and Proctor	Rock Quarry	12	31	2001	Backing Up
Brentwood	New Hope Church	1	2	2002	Rear End - Slow or Stop
Brentwood	New Hope Church	1	2	2002	Rear End - Slow or Stop
Dawson	South	1	2	2002	Angle
Dawson	Morgan Street	1	2	2002	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	1	9	2002	Angle
Capital	Highwoods	1	10	2002	Angle
Falls of Neuse	Millbrook	1	11	2002	Sideswipe - Same Direction
Brentwood	New Hope Church	1	12	2002	Left Turn - Different Roadway
Capital	Highwoods	1	12	2002	Rear End - Slow or Stop
Peace	West	1	12	2002	Left Turn - Same Roadway
Currituck	Lassiter Mill	1	15	2002	Left Turn - Different Roadway
Capital	Highwoods	1	17	2002	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	1	17	2002	Rear End - Turn
Six Forks Road (SR 1005)	Rowan Street	1	17	2002	Sideswipe - Same Direction
Six Forks Road (SR 1005)	Rowan Street	1	17	2002	Sideswipe - Same Direction
Brentwood	New Hope Church	1	19	2002	Fixed Object
McDowell Street	Hillsborough Street	1	19	2002	Rear End - Slow or Stop
Capital	Highwoods	1	21	2002	Rear End - Slow or Stop
Salisbury	Morgan Street	1	22	2002	Angle
Capital	Highwoods	1	23	2002	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	1	24	2002	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	1	25	2002	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	1	26	2002	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	1	26	2002	Left Turn - Same Roadway
Dawson	South	1	28	2002	Sideswipe - Same Direction
Falls of Neuse	Millbrook	2	1	2002	Angle
Capital	Highwoods	2	2	2002	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	2	2002	Rear End - Slow or Stop
Brentwood	New Hope Church	2	3	2002	Rear End - Slow or Stop
Dawson	Morgan Street	2	9	2002	Left Turn - Same Roadway
Falls of Neuse	Millbrook	2	9	2002	Rear End - Slow or Stop
Capital	Highwoods	2	10	2002	Rear End - Slow or Stop
Capital	Highwoods	2	10	2002	Sideswipe - Same Direction
Wilmington	Morgan Street	2	11	2002	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	13	2002	Angle
Hillsborough (SR 3007)	Cox and Woodburn	2	14	2002	Angle

Cross Link and Proctor	Rock Quarry	2	15	2002	Left Turn - Same Roadway
Dawson	Morgan Street	2	17	2002	Angle
Six Forks Road (SR 1005)	Rowan Street	2	17	2002	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	2	19	2002	Movable Object
Brentwood	New Hope Church	2	21	2002	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	2	22	2002	Rear End - Slow or Stop
McDowell Street	Morgan Street	2	22	2002	Angle
Dawson	Morgan Street	2	23	2002	Angle
Hillsborough (SR 3007)	Dixie and Friendly	2	23	2002	Sideswipe - Same Direction
Dawson	South	2	25	2002	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	25	2002	Rear End - Slow or Stop
Dawson	Morgan Street	2	27	2002	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	2	27	2002	Angle
Dawson	South	2	28	2002	Angle
Salisbury	Morgan Street	2	28	2002	Angle
Capital	Highwoods	3	1	2002	Rear End - Slow or Stop
Dawson	Morgan Street	3	1	2002	Left Turn - Same Roadway
Falls of Neuse	Millbrook	3	1	2002	Ran off road - Right
McDowell Street	Morgan Street	3	1	2002	Angle
Capital	Highwoods	3	2	2002	Right turn - Same Roadway
Cross Link and Proctor	Rock Quarry	3	2	2002	Angle
Falls of Neuse	Millbrook	3	2	2002	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	3	3	2002	Parked Motor Vehicle
Currituck	Lassiter Mill	3	5	2002	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	5	2002	Ran off road - Left
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	6	2002	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	3	6	2002	Sideswipe - Same Direction
Dawson	Morgan Street	3	12	2002	Sideswipe - Same Direction
Wilmington	Morgan Street	3	13	2002	Angle
Six Forks Road (SR 1005)	Rowan Street	3	14	2002	Angle
Falls of Neuse	Millbrook	3	15	2002	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	3	17	2002	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	17	2002	Sideswipe - Same Direction
Dawson	Morgan Street	3	19	2002	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	3	21	2002	Angle
Hillsborough (SR 3007)	Dixie and Friendly	3	21	2002	Backing Up
Capital	Highwoods	3	22	2002	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	3	23	2002	Angle
McDowell Street	Morgan Street	3	23	2002	Angle

Cross Link and Proctor	Rock Quarry	3	24	2002	Left Turn - Same Roadway
Brentwood	New Hope Church	3	25	2002	Sideswipe - Opposite Direction
Capital	Highwoods	3	26	2002	Angle
Cross Link and Proctor	Rock Quarry	3	27	2002	Left Turn - Same Roadway
Capital	Highwoods	3	28	2002	Left Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	3	28	2002	Angle
Dawson	Morgan Street	3	28	2002	Sideswipe - Same Direction
Peace	West	3	31	2002	Fixed Object
Cross Link and Proctor	Rock Quarry	4	1	2002	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	4	1	2002	Sideswipe - Same Direction
Six Forks Road (SR 1005)	Rowan Street	4	1	2002	Angle
Capital	Highwoods	4	2	2002	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	4	2	2002	Left Turn - Same Roadway
Hillsborough (SR 3007)	Dixie and Friendly	4	2	2002	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	4	2	2002	Fixed Object
Dawson	Morgan Street	4	3	2002	Right turn - Same Roadway
Brentwood	New Hope Church	4	5	2002	Other non-collision
Brentwood	New Hope Church	4	7	2002	Fixed Object
Dawson	Morgan Street	4	8	2002	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	4	8	2002	Angle
Peace	West	4	10	2002	Movable Object
Six Forks Road (SR 1005)	Rowan Street	4	10	2002	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	4	11	2002	Angle
Brentwood	New Hope Church	4	16	2002	Rear End - Slow or Stop
Falls of Neuse	Millbrook	4	16	2002	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	4	17	2002	Rear End - Slow or Stop
Peace	West	4	17	2002	Backing Up
Salisbury	Morgan Street	4	17	2002	Left Turn - Same Roadway
Falls of Neuse	Millbrook	4	18	2002	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	4	21	2002	Rear End - Slow or Stop
McDowell Street	Morgan Street	4	21	2002	Ran off road - Right
Falls of Neuse	Millbrook	4	23	2002	Rear End - Turn
Person Street (SR 2026)	Edenton Street (SR 2298)	4	24	2002	Angle
Six Forks Road (SR 1005)	Rowan Street	4	24	2002	Rear End - Slow or Stop
Capital	Highwoods	4	26	2002	Sideswipe - Same Direction
Dawson	Morgan Street	4	26	2002	Sideswipe - Same Direction
Salisbury	Morgan Street	4	26	2002	Angle
Capital	Highwoods	4	27	2002	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	5	1	2002	Left Turn - Same Roadway
Cross Link and Proctor	Rock Quarry	5	2	2002	Angle

Brentwood	New Hope Church	5	4	2002	Angle
Cross Link and Proctor	Rock Quarry	5	5	2002	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	5	6	2002	Backing Up
McDowell Street	Hillsborough Street	5	7	2002	Right turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	5	7	2002	Angle
Falls of Neuse	Millbrook	5	8	2002	Rear End - Slow or Stop
Capital	Highwoods	5	9	2002	Rear End - Slow or Stop
Brentwood	New Hope Church	5	10	2002	Left Turn - Different Roadway
McDowell Street	Hillsborough Street	5	10	2002	Angle
Six Forks Road (SR 1005)	Rowan Street	5	10	2002	Angle
Cross Link and Proctor	Rock Quarry	5	11	2002	Angle
McDowell Street	Hillsborough Street	5	11	2002	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	5	11	2002	Sideswipe - Same Direction
Falls of Neuse	Millbrook	5	13	2002	Rear End - Slow or Stop
Wilmington	Morgan Street	5	14	2002	Rear End - Slow or Stop
Dawson	Morgan Street	5	16	2002	Angle
Capital	Highwoods	5	17	2002	Sideswipe - Same Direction
Falls of Neuse	Millbrook	5	17	2002	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	5	17	2002	Angle
Peace	West	5	22	2002	Sideswipe - Same Direction
Brentwood	New Hope Church	5	24	2002	Angle
Brentwood	New Hope Church	5	24	2002	Parked Motor Vehicle
Dawson	Morgan Street	5	24	2002	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	5	28	2002	Right Turn - Different Roadway
Capital	Highwoods	5	29	2002	Angle
Capital	Highwoods	5	29	2002	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	5	30	2002	Angle
Dawson	Morgan Street	6	5	2002	Angle
Dawson	Morgan Street	6	6	2002	Right turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	7	2002	Left Turn - Same Roadway
Brentwood	New Hope Church	6	8	2002	Rear End - Slow or Stop
Dawson	Morgan Street	6	8	2002	Sideswipe - Same Direction
Brentwood	New Hope Church	6	10	2002	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	6	10	2002	Right turn - Same Roadway
McDowell Street	Hillsborough Street	6	10	2002	Sideswipe - Same Direction
Falls of Neuse	Millbrook	6	14	2002	Backing Up
McDowell Street	Hillsborough Street	6	14	2002	Rear End - Slow or Stop
Brentwood	New Hope Church	6	16	2002	Rear End - Slow or Stop
Dawson	Morgan Street	6	17	2002	Rear End - Slow or Stop
Salisbury	Morgan Street	6	17	2002	Angle

Dawson	Morgan Street	6	19	2002	Angle
Capital	Highwoods	6	21	2002	Angle
Cross Link and Proctor	Rock Quarry	6	21	2002	Sideswipe - Same Direction
Hillsborough (SR 3007)	Dixie and Friendly	6	21	2002	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	21	2002	Rear End - Slow or Stop
Wilmington	Morgan Street	6	21	2002	Angle
McDowell Street	Morgan Street	6	22	2002	Rear End - Slow or Stop
Capital	Highwoods	6	25	2002	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	6	25	2002	Right Turn - Different Roadway
Hillsborough (SR 3007)	Cox and Woodburn	6	26	2002	Angle
Cross Link and Proctor	Rock Quarry	6	27	2002	Left Turn - Same Roadway
Capital	Highwoods	6	28	2002	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	28	2002	Ran off road - Right
Salisbury	Morgan Street	7	9	2002	Sideswipe - Same Direction
Six Forks Road (SR 1005)	Rowan Street	7	10	2002	Rear End - Slow or Stop
Wilmington	Morgan Street	7	10	2002	Angle
Cross Link and Proctor	Rock Quarry	7	11	2002	Backing Up
McDowell Street	Hillsborough Street	7	11	2002	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	7	13	2002	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	7	15	2002	Sideswipe - Same Direction
Capital	Highwoods	7	16	2002	Rear End - Slow or Stop
Dawson	South	7	16	2002	Angle
Hillsborough (SR 3007)	Cox and Woodburn	7	16	2002	Angle
Hillsborough (SR 3007)	Dixie and Friendly	7	17	2002	Rear End - Slow or Stop
Capital	Highwoods	7	20	2002	Angle
Capital	Highwoods	7	24	2002	Sideswipe - Same Direction
McDowell Street	Morgan Street	7	24	2002	Angle
McDowell Street	Morgan Street	7	25	2002	Angle
Falls of Neuse	Millbrook	7	28	2002	Rear End - Slow or Stop
Capital	Highwoods	7	29	2002	Rear End - Slow or Stop
Capital	Highwoods	7	29	2002	Angle
Six Forks Road (SR 1005)	Rowan Street	7	29	2002	Angle
Six Forks Road (SR 1005)	Rowan Street	7	29	2002	Sideswipe - Same Direction
Dawson	Morgan Street	7	30	2002	Sideswipe - Same Direction
Capital	Highwoods	8	1	2002	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	8	2	2002	Angle
Dawson	South	8	3	2002	Left Turn - Same Roadway
Cross Link and Proctor	Rock Quarry	8	5	2002	Angle
Dawson	South	8	6	2002	Angle
Falls of Neuse	Millbrook	8	7	2002	Rear End - Slow or Stop

Salisbury	Morgan Street	8	7	2002	Angle
Dawson	Morgan Street	8	8	2002	Right turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	8	8	2002	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	8	9	2002	Angle
Dawson	South	8	10	2002	Fixed Object
Falls of Neuse	Millbrook	8	10	2002	Angle
Brentwood	New Hope Church	8	14	2002	Left Turn - Same Roadway
Currituck	Lassiter Mill	8	15	2002	Angle
Hillsborough (SR 3007)	Dixie and Friendly	8	21	2002	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	8	23	2002	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	8	24	2002	Rear End - Slow or Stop
Capital	Highwoods	8	28	2002	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	8	29	2002	Angle
Wilmington	Morgan Street	8	29	2002	Rear End - Slow or Stop
Falls of Neuse	Millbrook	8	30	2002	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	8	30	2002	Angle
Dawson	South	8	31	2002	Angle
Dawson	Morgan Street	9	1	2002	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	1	2002	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	9	1	2002	Angle
Peace	West	9	3	2002	Angle
Salisbury	Morgan Street	9	3	2002	Right turn - Same Roadway
Peace	West	9	5	2002	Right Turn - Different Roadway
Brentwood	New Hope Church	9	6	2002	Angle
Falls of Neuse	Millbrook	9	7	2002	Angle
Salisbury	Morgan Street	9	10	2002	Angle
Dawson	South	9	14	2002	Rear End - Slow or Stop
Dawson	South	9	16	2002	Overturn - Rollover
Dawson	Morgan Street	9	16	2002	Angle
Hillsborough (SR 3007)	Dixie and Friendly	9	16	2002	Angle
McDowell Street	Hillsborough Street	9	17	2002	Angle
McDowell Street	Morgan Street	9	19	2002	Angle
Cross Link and Proctor	Rock Quarry	9	21	2002	Left Turn - Same Roadway
Dawson	South	9	21	2002	Rear End - Slow or Stop
Dawson	South	9	21	2002	Sideswipe - Same Direction
Falls of Neuse	Millbrook	9	21	2002	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	9	21	2002	Sideswipe - Same Direction
Brentwood	New Hope Church	9	25	2002	Angle
Capital	Highwoods	9	27	2002	Rear End - Slow or Stop
Peace	West	9	27	2002	Angle
Salisbury	Morgan Street	9	27	2002	Left Turn - Same Roadway

Wilmington	Morgan Street	9	28	2002	Angle
Capital	Highwoods	10	1	2002	Sideswipe - Same Direction
Falls of Neuse	Millbrook	10	1	2002	Sideswipe - Same Direction
Capital	Highwoods	10	2	2002	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	10	3	2002	Angle
McDowell Street	Morgan Street	10	3	2002	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	10	4	2002	Pedestrian
McDowell Street	Hillsborough Street	10	4	2002	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	10	6	2002	Sideswipe - Opposite Direction
Falls of Neuse	Millbrook	10	10	2002	Angle
McDowell Street	Morgan Street	10	11	2002	Angle
McDowell Street	Morgan Street	10	11	2002	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	10	12	2002	Sideswipe - Same Direction
Peace	West	10	12	2002	Angle
Cross Link and Proctor	Rock Quarry	10	13	2002	Rear End - Slow or Stop
Wilmington	Morgan Street	10	14	2002	Rear End - Slow or Stop
Dawson	South	10	15	2002	Angle
Dawson	Morgan Street	10	15	2002	Left Turn - Different Roadway
McDowell Street	Hillsborough Street	10	15	2002	Angle
Peace	West	10	16	2002	Left Turn - Same Roadway
Brentwood	New Hope Church	10	19	2002	Right Turn - Different Roadway
Hillsborough (SR 3007)	Dixie and Friendly	10	20	2002	Sideswipe - Same Direction
Capital	Highwoods	10	21	2002	Rear End - Slow or Stop
Falls of Neuse	Millbrook	10	22	2002	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	10	22	2002	Right turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	10	25	2002	Angle
Dawson	South	10	26	2002	Sideswipe - Same Direction
Brentwood	New Hope Church	10	28	2002	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	10	28	2002	Angle
Capital	Highwoods	10	29	2002	Right turn - Same Roadway
Dawson	Morgan Street	10	30	2002	Angle
Falls of Neuse	Millbrook	10	30	2002	Angle
Six Forks Road (SR 1005)	Rowan Street	10	30	2002	Angle
Hillsborough (SR 3007)	Dixie and Friendly	10	31	2002	Sideswipe - Same Direction
Dawson	South	11	1	2002	Angle
Falls of Neuse	Millbrook	11	1	2002	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	11	4	2002	Rear End - Slow or Stop
Peace	West	11	4	2002	Left Turn - Same Roadway
Hillsborough (SR 3007)	Dixie and Friendly	11	5	2002	Sideswipe - Same Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	11	6	2002	Angle

Salisbury	Morgan Street	11	7	2002	Right Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	11	8	2002	Angle
Dawson	Morgan Street	11	8	2002	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	11	9	2002	Angle
Dawson	Morgan Street	11	10	2002	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	11	10	2002	Angle
Hillsborough (SR 3007)	Cox and Woodburn	11	11	2002	Angle
McDowell Street	Morgan Street	11	11	2002	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	11	16	2002	Ran off road - Left
Capital	Highwoods	11	18	2002	Right Turn - Different Roadway
Capital	Highwoods	11	18	2002	Sideswipe - Same Direction
McDowell Street	Morgan Street	11	19	2002	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	11	20	2002	Rear End - Slow or Stop
Capital	Highwoods	11	22	2002	Angle
Hillsborough (SR 3007)	Cox and Woodburn	11	22	2002	Fixed Object
McDowell Street	Morgan Street	11	23	2002	Rear End - Slow or Stop
Falls of Neuse	Millbrook	11	24	2002	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	25	2002	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	11	25	2002	Rear End - Slow or Stop
Dawson	Morgan Street	11	27	2002	Right turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	29	2002	Sideswipe - Opposite Direction
Hillsborough (SR 3007)	Cox and Woodburn	12	3	2002	Rear End - Slow or Stop
Dawson	Morgan Street	12	6	2002	Sideswipe - Same Direction
Wilmington	Morgan Street	12	9	2002	Angle
Brentwood	New Hope Church	12	10	2002	Angle
Peace	West	12	13	2002	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	12	16	2002	Angle
McDowell Street	Hillsborough Street	12	17	2002	Rear End - Slow or Stop
Capital	Highwoods	12	19	2002	Angle
Dawson	Morgan Street	12	20	2002	Sideswipe - Same Direction
Falls of Neuse	Millbrook	12	20	2002	Rear End - Slow or Stop
McDowell Street	Morgan Street	12	20	2002	Backing Up
Cross Link and Proctor	Rock Quarry	12	22	2002	Sideswipe - Opposite Direction
Salisbury	Morgan Street	12	23	2002	Angle
Six Forks Road (SR 1005)	Rowan Street	12	27	2002	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	12	29	2002	Sideswipe - Same Direction
Wilmington	Morgan Street	12	29	2002	Sideswipe - Same Direction
Falls of Neuse	Millbrook	12	31	2002	Angle

Capital	Highwoods	1	1	2003	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	1	1	2003	Angle
Cross Link and Proctor	Rock Quarry	1	1	2003	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	1	1	2003	Rear End - Slow or Stop
Dawson	South	1	3	2003	Rear End - Slow or Stop
Dawson	Morgan Street	1	4	2003	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	1	4	2003	Sideswipe - Same Direction
McDowell Street	Morgan Street	1	6	2003	Left Turn - Same Roadway
Capital	Highwoods	1	8	2003	Angle
Dawson	South	1	8	2003	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	1	9	2003	Rear End - Slow or Stop
Capital	Highwoods	1	10	2003	Angle
Brentwood	New Hope Church	1	11	2003	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	1	11	2003	Rear End - Slow or Stop
Dawson	South	1	14	2003	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	1	14	2003	Rear End - Slow or Stop
Wilmington	Morgan Street	1	14	2003	Angle
Cross Link and Proctor	Rock Quarry	1	16	2003	Head On
Currituck	Lassiter Mill	1	17	2003	Angle
Wilmington	Morgan Street	1	17	2003	Sideswipe - Same Direction
Dawson	South	1	20	2003	Sideswipe - Same Direction
Falls of Neuse	Millbrook	1	24	2003	Angle
Hillsborough (SR 3007)	Cox and Woodburn	1	24	2003	Angle
Hillsborough (SR 3007)	Cox and Woodburn	1	26	2003	Rear End - Slow or Stop
Hillsborough (SR 3007)	Cox and Woodburn	1	26	2003	Angle
Wilmington	Morgan Street	1	26	2003	Angle
Dawson	Morgan Street	1	29	2003	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	1	2003	Sideswipe - Opposite Direction
Brentwood	New Hope Church	2	3	2003	Rear End - Slow or Stop
McDowell Street	Morgan Street	2	4	2003	Angle
Cross Link and Proctor	Rock Quarry	2	5	2003	Angle
Cross Link and Proctor	Rock Quarry	2	7	2003	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	8	2003	Rear End - Slow or Stop
Brentwood	New Hope Church	2	9	2003	Rear End - Slow or Stop
Capital	Highwoods	2	10	2003	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	10	2003	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	2	12	2003	Angle
Hillsborough (SR 3007)	Dixie and Friendly	2	14	2003	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	2	14	2003	Left Turn - Different Roadway

Six Forks Road (SR 1005)	Rowan Street	2	14	2003	Sideswipe - Same Direction
Falls of Neuse	Millbrook	2	18	2003	Pedestrian
Person Street (SR 2026)	Edenton Street (SR 2298)	2	20	2003	Angle
Dawson	Morgan Street	2	22	2003	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	2	22	2003	Angle
McDowell Street	Hillsborough Street	3	1	2003	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	3	1	2003	Angle
Brentwood	New Hope Church	3	2	2003	Left Turn - Different Roadway
Capital	Highwoods	3	5	2003	Rear End - Slow or Stop
Dawson	South	3	5	2003	Sideswipe - Same Direction
Falls of Neuse	Millbrook	3	6	2003	Sideswipe - Same Direction
McDowell Street	Morgan Street	3	11	2003	Backing Up
Hillsborough (SR 3007)	Cox and Woodburn	3	13	2003	Fixed Object
Hillsborough (SR 3007)	Cox and Woodburn	3	16	2003	Angle
McDowell Street	Hillsborough Street	3	16	2003	Angle
Capital	Highwoods	3	17	2003	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	3	19	2003	Left Turn - Same Roadway
Salisbury	Morgan Street	3	20	2003	Parked Motor Vehicle
Salisbury	Morgan Street	3	20	2003	Rear End - Slow or Stop
Wilmington	Morgan Street	3	21	2003	Angle
Hillsborough (SR 3007)	Cox and Woodburn	3	23	2003	Angle
Hillsborough (SR 3007)	Cox and Woodburn	3	24	2003	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	27	2003	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	3	27	2003	Left Turn - Same Roadway
Capital	Highwoods	3	28	2003	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	3	28	2003	Angle
Cross Link and Proctor	Rock Quarry	3	30	2003	Angle
Falls of Neuse	Millbrook	3	30	2003	Rear End - Slow or Stop
Dawson	South	4	4	2003	Other non-collision
Dawson	Morgan Street	4	5	2003	Sideswipe - Same Direction
McDowell Street	Morgan Street	4	5	2003	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	4	5	2003	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	4	6	2003	Other Collision With Vehicle
Cross Link and Proctor	Rock Quarry	4	7	2003	Angle
Salisbury	Morgan Street	4	7	2003	Angle
Falls of Neuse	Millbrook	4	10	2003	Sideswipe - Same Direction
Capital	Highwoods	4	11	2003	Rear End - Slow or Stop
McDowell Street	Morgan Street	4	11	2003	Left Turn - Different

					Roadway
Dawson	South	4	13	2003	Angle
Capital	Highwoods	4	19	2003	Rear End - Slow or Stop
Falls of Neuse	Millbrook	4	20	2003	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	4	22	2003	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	4	24	2003	Parked Motor Vehicle
Dawson	South	4	25	2003	Angle
McDowell Street	Hillsborough Street	4	28	2003	Sideswipe - Same Direction
Falls of Neuse	Millbrook	4	29	2003	Rear End - Slow or Stop
Peace	West	5	2	2003	**Backing Up**
Hillsborough (SR 3007)	Cox and Woodburn	5	3	2003	Angle
Falls of Neuse	Millbrook	5	5	2003	Rear End - Slow or Stop
Peace	West	5	7	2003	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	5	8	2003	Angle
Dawson	Morgan Street	5	12	2003	Sideswipe - Same Direction
Capital	Highwoods	5	13	2003	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	5	13	2003	Angle
Cross Link and Proctor	Rock Quarry	5	14	2003	Angle
Falls of Neuse	Millbrook	5	16	2003	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	5	17	2003	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	5	17	2003	Sideswipe - Same Direction
Capital	Highwoods	5	19	2003	Left Turn - Same Roadway
McDowell Street	Hillsborough Street	5	20	2003	Left Turn - Same Roadway
Salisbury	Morgan Street	5	21	2003	Sideswipe - Same Direction
Falls of Neuse	Millbrook	5	22	2003	Rear End - Slow or Stop
Brentwood	New Hope Church	5	23	2003	Angle
Falls of Neuse	Millbrook	5	29	2003	Left Turn - Different Roadway
McDowell Street	Hillsborough Street	5	31	2003	Angle
Brentwood	New Hope Church	6	1	2003	Left Turn - Different Roadway
McDowell Street	Hillsborough Street	6	2	2003	Left Turn - Same Roadway
Peace	West	6	3	2003	Sideswipe - Same Direction
Dawson	Morgan Street	6	4	2003	Angle
Six Forks Road (SR 1005)	Rowan Street	6	4	2003	Angle
Salisbury	Morgan Street	6	5	2003	Right turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	6	7	2003	Sideswipe - Opposite Direction
Person Street (SR 2026)	Edenton Street (SR 2298)	6	7	2003	Angle
McDowell Street	Hillsborough Street	6	8	2003	Angle
Cross Link and Proctor	Rock Quarry	6	9	2003	Angle
Falls of Neuse	Millbrook	6	9	2003	Angle
McDowell Street	Hillsborough Street	6	9	2003	Angle

Capital	Highwoods	6	10	2003	Sideswipe - Same Direction
Capital	Highwoods	6	15	2003	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	6	19	2003	Angle
Hillsborough (SR 3007)	Cox and Woodburn	6	20	2003	Rear End - Slow or Stop
Capital	Highwoods	6	23	2003	Sideswipe - Same Direction
Capital	Highwoods	6	23	2003	Rear End - Slow or Stop
Falls of Neuse	Millbrook	6	23	2003	Rear End - Slow or Stop
Capital	Highwoods	6	25	2003	Sideswipe - Same Direction
Falls of Neuse	Millbrook	6	25	2003	Rear End - Slow or Stop
McDowell Street	Morgan Street	6	26	2003	Left Turn - Same Roadway
Peace	West	6	26	2003	Left Turn - Different Roadway
Capital	Highwoods	6	27	2003	Rear End - Slow or Stop
Peace	West	6	28	2003	Pedestrian
McDowell Street	Morgan Street	7	1	2003	Sideswipe - Same Direction
Wilmington	Morgan Street	7	1	2003	Angle
Wilmington	Morgan Street	7	1	2003	Pedestrian
Dawson	Morgan Street	7	5	2003	Sideswipe - Same Direction
Brentwood	New Hope Church	7	7	2003	Right Turn - Different Roadway
Capital	Highwoods	7	7	2003	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	7	8	2003	Rear End - Slow or Stop
Dawson	Morgan Street	7	9	2003	Angle
Hillsborough (SR 3007)	Dixie and Friendly	7	11	2003	Head On
Hillsborough (SR 3007)	Cox and Woodburn	7	11	2003	Angle
Cross Link and Proctor	Rock Quarry	7	15	2003	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	7	20	2003	Angle
Six Forks Road (SR 1005)	Rowan Street	7	20	2003	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	7	23	2003	Sideswipe - Same Direction
Salisbury	Morgan Street	7	28	2003	Angle
Capital	Highwoods	7	29	2003	Right turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	7	30	2003	Angle
Dawson	South	7	31	2003	Angle
Hillsborough (SR 3007)	Cox and Woodburn	7	31	2003	Fixed Object
Brentwood	New Hope Church	8	1	2003	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	8	2	2003	Angle
Falls of Neuse	Millbrook	8	2	2003	Fixed Object
Capital	Highwoods	8	4	2003	Sideswipe - Same Direction
Capital	Highwoods	8	8	2003	Rear End - Slow or Stop
Capital	Highwoods	8	8	2003	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	8	10	2003	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	8	13	2003	Angle

Six Forks Road (SR 1005)	Rowan Street	8	15	2003	Rear End - Slow or Stop
Falls of Neuse	Millbrook	8	18	2003	Backing Up
Six Forks Road (SR 1005)	Rowan Street	8	18	2003	Left Turn - Different Roadway
Dawson	South	8	21	2003	Rear End - Slow or Stop
Salisbury	Morgan Street	8	21	2003	Angle
Six Forks Road (SR 1005)	Rowan Street	8	21	2003	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	8	22	2003	Left Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	8	23	2003	Fixed Object
Capital	Highwoods	8	26	2003	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	8	26	2003	Rear End - Slow or Stop
Peace	West	8	28	2003	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	8	29	2003	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	8	29	2003	Angle
Cross Link and Proctor	Rock Quarry	8	31	2003	Rear End - Slow or Stop
Salisbury	Morgan Street	9	3	2003	Angle
Six Forks Road (SR 1005)	Rowan Street	9	4	2003	Rear End - Slow or Stop
Wilmington	Morgan Street	9	4	2003	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	9	8	2003	Left Turn - Same Roadway
Capital	Highwoods	9	9	2003	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	9	2003	Angle
Dawson	Morgan Street	9	11	2003	Sideswipe - Same Direction
Falls of Neuse	Millbrook	9	11	2003	Rear End - Slow or Stop
Dawson	Morgan Street	9	12	2003	Rear End - Slow or Stop
Capital	Highwoods	9	14	2003	Angle
McDowell Street	Morgan Street	9	14	2003	Rear End - Slow or Stop
Hillsborough (SR 3007)	Dixie and Friendly	9	16	2003	Pedacyclist
Brentwood	New Hope Church	9	17	2003	Angle
Capital	Highwoods	9	17	2003	Angle
McDowell Street	Morgan Street	9	18	2003	Angle
Wilmington	Morgan Street	9	18	2003	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	9	19	2003	Rear End - Slow or Stop
Capital	Highwoods	9	21	2003	Sideswipe - Same Direction
McDowell Street	Hillsborough Street	9	22	2003	Sideswipe - Same Direction
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	9	23	2003	Angle
Capital	Highwoods	9	24	2003	Rear End - Slow or Stop
Falls of Neuse	Millbrook	9	24	2003	Angle
Cross Link and Proctor	Rock Quarry	9	26	2003	Rear End - Slow or Stop

Cross Link and Proctor	Rock Quarry	9	26	2003	Angle
Capital	Highwoods	9	28	2003	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	9	28	2003	Left Turn - Different Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	10	1	2003	Angle
Falls of Neuse	Millbrook	10	2	2003	Rear End - Slow or Stop
Capital	Highwoods	10	4	2003	Rear End - Slow or Stop
Capital	Highwoods	10	8	2003	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	10	8	2003	Left Turn - Same Roadway
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	10	8	2003	Rear End - Slow or Stop
Capital	Highwoods	10	9	2003	Angle
McDowell Street	Morgan Street	10	14	2003	Angle
McDowell Street	Morgan Street	10	15	2003	Angle
Peace	West	10	15	2003	Rear End - Slow or Stop
Capital	Highwoods	10	16	2003	Rear End - Slow or Stop
Falls of Neuse	Millbrook	10	17	2003	Rear End - Slow or Stop
Brentwood	New Hope Church	10	18	2003	Sideswipe - Same Direction
Capital	Highwoods	10	19	2003	Rear End - Slow or Stop
Falls of Neuse	Millbrook	10	19	2003	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	10	21	2003	Angle
Cross Link and Proctor	Rock Quarry	10	23	2003	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	10	25	2003	Rear End - Slow or Stop
Brentwood	New Hope Church	10	28	2003	Rear End - Slow or Stop
Capital	Highwoods	10	29	2003	Sideswipe - Same Direction
Falls of Neuse	Millbrook	10	29	2003	Rear End - Slow or Stop
Capital	Highwoods	10	30	2003	Angle
Cross Link and Proctor	Rock Quarry	10	31	2003	Angle
McDowell Street	Morgan Street	11	1	2003	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	1	2003	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	11	1	2003	Sideswipe - Same Direction
Six Forks Road (SR 1005)	Rowan Street	11	5	2003	Right Turn - Different Roadway
Hillsborough (SR 3007)	Dixie and Friendly	11	6	2003	Rear End - Slow or Stop
Salisbury	Morgan Street	11	7	2003	Angle
Capital	Highwoods	11	8	2003	Sideswipe - Same Direction
Six Forks Road (SR 1005)	Rowan Street	11	10	2003	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	11	11	2003	Angle
Cross Link and Proctor	Rock Quarry	11	12	2003	Rear End - Slow or Stop
Capital	Highwoods	11	15	2003	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	11	16	2003	Angle
McDowell Street	Hillsborough Street	11	17	2003	Angle
Wilmington	Morgan Street	11	18	2003	Angle

Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	19	2003	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	11	21	2003	Angle
McDowell Street	Hillsborough Street	11	23	2003	Rear End - Slow or Stop
Salisbury	Morgan Street	11	23	2003	Angle
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	11	24	2003	Ran off road - Right
Peace	West	11	24	2003	Sideswipe - Same Direction
Cross Link and Proctor	Rock Quarry	11	26	2003	Left Turn - Different Roadway
Cross Link and Proctor	Rock Quarry	12	1	2003	Right Turn - Different Roadway
Dawson	Morgan Street	12	1	2003	Rear End - Slow or Stop
Falls of Neuse	Millbrook	12	1	2003	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	12	1	2003	Angle
Capital	Highwoods	12	4	2003	Right turn - Same Roadway
McDowell Street	Morgan Street	12	4	2003	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	12	4	2003	Angle
McDowell Street	Hillsborough Street	12	5	2003	Angle
McDowell Street	Morgan Street	12	6	2003	Angle
Falls of Neuse	Millbrook	12	7	2003	Left Turn - Same Roadway
Hillsborough (SR 3007)	Cox and Woodburn	12	8	2003	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	12	8	2003	Angle
Cross Link and Proctor	Rock Quarry	12	10	2003	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	12	10	2003	Angle
Six Forks Road (SR 1005)	Rowan Street	12	10	2003	Rear End - Slow or Stop
Brentwood	New Hope Church	12	11	2003	Right Turn - Different Roadway
Capital	Highwoods	12	11	2003	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	12	12	2003	Angle
Capital	Highwoods	12	15	2003	Rear End - Slow or Stop
McDowell Street	Hillsborough Street	12	15	2003	Left Turn - Same Roadway
Six Forks Road (SR 1005)	Rowan Street	12	19	2003	Rear End - Slow or Stop
Dawson	South	12	20	2003	Angle
McDowell Street	Morgan Street	12	20	2003	Angle
Six Forks Road (SR 1005)	Rowan Street	12	21	2003	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	12	23	2003	Angle
Six Forks Road (SR 1005)	Rowan Street	12	24	2003	Rear End - Slow or Stop
Dawson	South	12	25	2003	Angle
Dawson	South	12	27	2003	Angle

Hillsborough (SR 3007)	Cox and Woodburn	12	29	2003	Angle
Currituck	Lassiter Mill	12	31	2003	Head On
Cross Link and Proctor	Rock Quarry	1	4	2004	Overturn - Rollover
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	1	4	2004	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	1	5	2004	Rear End - Slow or Stop
Person Street (SR 2026)	Edenton Street (SR 2298)	1	7	2004	Angle
Person Street (SR 2026)	Edenton Street (SR 2298)	1	7	2004	Backing Up
Salisbury	Morgan Street	1	7	2004	Parked Motor Vehicle
Falls of Neuse	Millbrook	1	8	2004	Left Turn - Same Roadway
Peace	West	1	9	2004	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	1	12	2004	Left Turn - Same Roadway
Person Street (SR 2026)	Edenton Street (SR 2298)	1	12	2004	Angle
Cross Link and Proctor	Rock Quarry	1	16	2004	Rear End - Slow or Stop
Six Forks Road (SR 1005)	Rowan Street	1	16	2004	Right turn - Same Roadway
Cross Link and Proctor	Rock Quarry	1	20	2004	Left Turn - Same Roadway
Hillsborough (SR 3007)	Cox and Woodburn	1	23	2004	Rear End - Slow or Stop
Falls of Neuse	Millbrook	1	28	2004	Rear End - Slow or Stop
Falls of Neuse	Millbrook	1	30	2004	Sideswipe - Same Direction
Hillsborough (SR 3007)	Dixie and Friendly	1	30	2004	Right Turn - Different Roadway
McDowell Street	Hillsborough Street	1	30	2004	Angle
Cross Link and Proctor	Rock Quarry	1	31	2004	Angle
Capital	Highwoods	2	2	2004	Rear End - Slow or Stop
Millbrook (SR 2018 and 2081)	Old Wake Forest (SR 2030)	2	3	2004	Rear End - Slow or Stop
Falls of Neuse	Millbrook	2	6	2004	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	2	7	2004	Sideswipe - Same Direction
Hillsborough (SR 3007)	Cox and Woodburn	2	7	2004	Rear End - Slow or Stop
Wilmington	Morgan Street	2	7	2004	Sideswipe - Same Direction
McDowell Street	Morgan Street	2	8	2004	Angle
Falls of Neuse	Millbrook	2	10	2004	Sideswipe - Same Direction
McDowell Street	Morgan Street	2	11	2004	Fixed Object
Person Street (SR 2026)	Edenton Street (SR 2298)	2	12	2004	Angle
Capital	Highwoods	2	13	2004	Rear End - Slow or Stop
Cross Link and Proctor	Rock Quarry	2	14	2004	Left Turn - Different Roadway
Hillsborough (SR 3007)	Dixie and Friendly	2	15	2004	Rear End - Slow or Stop
Wilmington	Morgan Street	2	15	2004	Angle
Salisbury	Morgan Street	2	17	2004	Pedestrian
Falls of Neuse	Millbrook	2	20	2004	Angle
Falls of Neuse	Millbrook	2	21	2004	Angle

Person Street (SR 2026)	Edenton Street (SR 2298)	2	22	2004	Angle
Wilmington	Morgan Street	2	24	2004	Parked Motor Vehicle
Wilmington	Morgan Street	2	24	2004	Backing Up
Hillsborough (SR 3007)	Dixie and Friendly	2	25	2004	Rear End - Slow or Stop
Peace	West	2	25	2004	Angle
Brentwood	New Hope Church	2	26	2004	Angle
Dawson	Morgan Street	2	27	2004	Other non-collision
Falls of Neuse	Millbrook	2	27	2004	Rear End - Slow or Stop

Appendix E:

Red Light Running Violation Data:

Before Period

Approach at Intersection	App. Entering Time	Violation Times	Notes
15/501 NB @ Sage Rd.	6:47	0.30	
15/501 NB @ Sage Rd.	6:54	0.40	
15/501 NB @ Sage Rd.	7:14	0.80	
15/501 NB @ Sage Rd.	7:19	0.70	
15/501 NB @ Sage Rd.	7:39	0.70	
15/501 NB @ Sage Rd.	8:24	1.50	
15/501 NB @ Sage Rd.	8:32	0.40	
15/501 NB @ Sage Rd.	9:17	0.30	
15/501 NB @ Sage Rd.	9:49	1.00	
15/501 NB @ Sage Rd.	10:52	0.90	
15/501 NB @ Sage Rd.	10:54	1.60	
15/501 NB @ Sage Rd.	11:39	0.30	
15/501 NB @ Sage Rd.	11:49	0.70	
15/501 NB @ Sage Rd.	11:54	0.90	
15/501 NB @ Sage Rd.	12:54	0.40	
15/501 NB @ Sage Rd.	15:22	0.60	
15/501 NB @ Sage Rd.	15:56	0.50	
15/501 NB @ Sage Rd.	16:55	1.00	
15/501 NB @ Sage Rd.	17:14	0.30	
15/501 NB @ Sage Rd.	17:32	0.90	
15/501 NB @ Sage Rd.	19:20	0.40	
15/501 NB @ Sage Rd.	19:42	0.70	
15/501 NB @ Sage Rd.	19:47	0.40	
15/501 NB @ Sage Rd.	21:00	1.20	
15/501 NB @ Sage Rd.	21:50	0.60	
Airport Rd @ Estes Rd.	7:56	1.30	
Airport Rd @ Estes Rd.	10:15	0.40	
Airport Rd @ Estes Rd.	12:18	0.30	
Airport Rd @ Estes Rd.	13:15	1.50	
Airport Rd @ Estes Rd.	14:20	0.40	
Airport Rd @ Estes Rd.	14:42	0.40	
Airport Rd @ Estes Rd.	16:55	1.30	
Airport Rd @ Estes Rd.	16:58	0.60	
Airport Rd @ Estes Rd.	17:01	0.50	
Capital @ Highwoods	13:23:57	1.20	right most lane
Capital @ Highwoods	20:08:53	1.30	
Capital @ Highwoods	8:48:48	1.30	
Capital @ Highwoods	14:35:50	1.30	right most lane
Capital @ Highwoods	14:34:02	14.00	
Capital @ Highwoods	6:36:52	1.50	
Capital @ Highwoods	14:34:02	1.50	right most lane
Capital @ Highwoods	10:41:58	1.60	semi truck

Capital @ Highwoods	14:17:57	11.00	
Capital @ Highwoods	5:01:03	11.40	right most lane
Capital @ Highwoods	16:06:42	14.00	right most lane
Capital @ Highwoods	14:17:57	16.00	right most lane
Capital @ Highwoods	19:45:31	2.00	
Capital @ Highwoods	23:22:31	2.90	small moving van
Capital @ Highwoods	17:31:02	25.00	right most lane
Capital @ Highwoods	14:17:57	29.00	anticipating green light
Capital @ Highwoods	16:58:01	30.00	leaving just before green - right most lane
Capital @ Highwoods	2:39:50	30.00	Sheriff (No emergency)
Capital @ Highwoods	16:43:21	31.00	Bus - right most lane
Capital @ Highwoods	16:58:01	34.00	leaving just before green - right most lane
Crosslink/Proctor/Rock Quarry (NB)	6:42:54	0.50	
Crosslink/Proctor/Rock Quarry (NB)	7:43:50	0.60	
Crosslink/Proctor/Rock Quarry (NB)	11:56:15	0.80	
Crosslink/Proctor/Rock Quarry (NB)	17:37:19	0.80	
Crosslink/Proctor/Rock Quarry (NB)	6:42:54	1.10	
Crosslink/Proctor/Rock Quarry (SB)	17:38:34	0.30	Small moving van
Crosslink/Proctor/Rock Quarry (SB)	7:39:51	0.40	
Crosslink/Proctor/Rock Quarry (SB)	15:09:14	0.40	
Crosslink/Proctor/Rock Quarry (SB)	17:14:34	0.40	
Crosslink/Proctor/Rock Quarry (SB)	16:38:34	0.80	
Crosslink/Proctor/Rock Quarry (SB)	17:26:34	0.80	
Crosslink/Proctor/Rock Quarry (SB)	16:34:33	1.00	
Crosslink/Proctor/Rock Quarry (SB)	6:29:35	1.10	
Crosslink/Proctor/Rock Quarry (SB)	17:46:34	2.80	
Dawson @ Morgan	6:59:20	0.70	left turn on red (one way street)
Dawson @ Morgan	14:42:06	0.90	
Dawson @ Morgan	6:54:54	1.40	
Dawson @ Morgan	13:17:32	1.80	
Dawson @ Morgan	15:11:17	1.90	
Dawson @ Morgan	6:37:34	10.50	Police car(No emergency)
Dawson @ Morgan	7:16:51	10.60	left turn on red (one way street)

Dawson @ Morgan	2:21:01	12.00	right turn allowed here?
Dawson @ Morgan	14:48:16	12.00	left turn on red (one way street)
Dawson @ Morgan	18:04:12	12.00	left turn on red (one way street)
Dawson @ Morgan	17:35:32	13.00	left turn on red (one way street)
Dawson @ Morgan	22:15:02	17.00	left turn on red (one way street)
Hillsborough @ Dixie Trail	18:50:31	0.30	
Hillsborough @ Dixie Trail	8:47:49	0.40	
Hillsborough @ Dixie Trail	14:19:51	0.40	
Hillsborough @ Dixie Trail	17:19:03	0.40	
Hillsborough @ Dixie Trail	13:27:51	0.50	
Hillsborough @ Dixie Trail	14:38:31	0.50	
Hillsborough @ Dixie Trail	10:13:12	0.60	
Hillsborough @ Dixie Trail	14:18:32	0.80	
Hillsborough @ Dixie Trail	15:10:32	0.90	
Hillsborough @ Dixie Trail	9:38:33	1.00	
Hillsborough @ Dixie Trail	10:21:13	1.10	
Hillsborough @ Dixie Trail	15:58:04	1.20	
Hillsborough @ Dixie Trail	7:21:11	1.70	
Hillsborough @ Dixie Trail	8:47:51	2.20	large ice truck
Hillsborough @ Dixie Trail	8:47:54	4.60	
New Hope Church @ Brentwood	13:19:39	0.40	
New Hope Church @ Brentwood	17:44:31	0.40	
New Hope Church @ Brentwood	21:32:46	0.40	
New Hope Church @ Brentwood	21:06:09	0.50	
New Hope Church @ Brentwood	21:42:55	0.60	
New Hope Church @ Brentwood	13:01:00	0.70	
New Hope Church @ Brentwood	14:24:59	0.70	
New Hope Church @ Brentwood	21:09:15	0.80	
New Hope Church @ Brentwood	23:33:19	0.90	
New Hope Church @ Brentwood	12:44:40	1.00	
New Hope Church @ Brentwood	17:12:03	1.20	
New Hope Church @ Brentwood	10:21:16	1.70	
New Hope Church @ Brentwood	14:08:41	2.10	
New Hope Church @ Brentwood	13:38:21	2.20	
Peace @ West	9:12:58	0.40	
Peace @ West	8:06:18	0.70	
Peace @ West	17:17:13	0.70	
Peace @ West	17:57:37	0.70	
Peace @ West	15:58:34	1.00	
Peace @ West	16:23:54	1.00	
Peace @ West	13:05:23	1.10	
Peace @ West	16:37:14	1.20	
Peace @ West	11:34:23	1.30	
Peace @ West	16:47:55	1.30	
Peace @ West	9:02:19	1.40	
Peace @ West	11:40:14	1.50	

Peace @ West	8:06:19	1.70	
Peace @ West	15:06:09	1.90	
Peace @ West	12:47:54	2.10	
Peace @ West	14:53:20	2.80	
Peace @ West	19:11:08	3.20	
Peace @ West	11:58:56	3.30	small moving van
Six Forks @ Rowan	19:46:08	17.00	
Six Forks @ Rowan	14:51:52	0.80	
Six Forks @ Rowan	13:01:56	5.00	

Appendix F:

Red Light Running Violation Data:

After Period

Approach at Intersection	App. Entering Time	Violation Time after Red
Crosslink/Proctor/Rock Quarry (SB)	12:38	0.30
Crosslink/Proctor/Rock Quarry (SB)	14:40	4.60
Crosslink/Proctor/Rock Quarry (SB)	18:18	0.30
Crosslink/Proctor/Rock Quarry (NB)	18:30	1.50
Crosslink/Proctor/Rock Quarry (NB)	12:38	0.30
Crosslink/Proctor/Rock Quarry (NB)	21:14	1.20
Crosslink/Proctor/Rock Quarry (NB)	20:51	1.80
New Hope Church @ Brentwood	13:49	1.00
New Hope Church @ Brentwood	17:20	0.50
New Hope Church @ Brentwood	17:02	0.80
New Hope Church @ Brentwood	16:55	0.40
New Hope Church @ Brentwood	16:47	1.20
New Hope Church @ Brentwood	13:21	0.50
New Hope Church @ Brentwood	20:31	0.60
New Hope Church @ Brentwood	14:49	0.40
New Hope Church @ Brentwood	16:34	0.30
New Hope Church @ Brentwood	18:02	0.60
New Hope Church @ Brentwood	16:12	1.00
New Hope Church @ Brentwood	13:32	0.30
New Hope Church @ Brentwood	19:07	1.70
New Hope Church @ Brentwood	22:32	0.90
New Hope Church @ Brentwood	13:19	1.50
New Hope Church @ Brentwood	13:49	1.20
New Hope Church @ Brentwood	23:45	0.70
New Hope Church @ Brentwood	21:09	4.00
New Hope Church @ Brentwood	17:30	0.80
New Hope Church @ Brentwood	16:30	0.70
New Hope Church @ Brentwood	8:52	0.40
New Hope Church @ Brentwood	5:28	0.30
New Hope Church @ Brentwood	22:18	0.40
New Hope Church @ Brentwood	16:55	0.50
New Hope Church @ Brentwood	17:27	0.80
New Hope Church @ Brentwood	16:17	0.30
New Hope Church @ Brentwood	14:45	1.00
New Hope Church @ Brentwood	16:07	0.70
New Hope Church @ Brentwood	8:39	0.80
New Hope Church @ Brentwood	0:21	4.00
Hillsborough @ Dixie Trail	21:03	0.30

Hillsborough @ Dixie Trail	7:03	1.50
Hillsborough @ Dixie Trail	9:01	1.50
Hillsborough @ Dixie Trail	15:30	0.70
Hillsborough @ Dixie Trail	22:14	0.70
Hillsborough @ Dixie Trail	14:24	1.00
Hillsborough @ Dixie Trail	14:30	0.50
Hillsborough @ Dixie Trail	10:06	1.50
Hillsborough @ Dixie Trail	12:27	0.90
Hillsborough @ Dixie Trail	22:19	3.90
Hillsborough @ Dixie Trail	15:32	0.30
Hillsborough @ Dixie Trail	12:54	0.90
Hillsborough @ Dixie Trail	20:41	0.30
Hillsborough @ Dixie Trail	7:46	0.80
Hillsborough @ Dixie Trail	14:45	0.90
Hillsborough @ Dixie Trail	13:22	0.40
Hillsborough @ Dixie Trail	11:36	1.10
Hillsborough @ Dixie Trail	0:33	3.90
Hillsborough @ Dixie Trail	16:59	0.40
Hillsborough @ Dixie Trail	14:45	0.60
Hillsborough @ Dixie Trail	8:48	0.40
Hillsborough @ Dixie Trail	6:10	0.30
Hillsborough @ Dixie Trail	17:49	0.40
Hillsborough @ Dixie Trail	12:22	0.90
Hillsborough @ Dixie Trail	8:38	1.20
Hillsborough @ Dixie Trail	8:09	1.20
Hillsborough @ Dixie Trail	15:08	0.60
Hillsborough @ Dixie Trail	14:19	1.70
Hillsborough @ Dixie Trail	15:42	0.30
Hillsborough @ Dixie Trail	11:49	0.90
Hillsborough @ Dixie Trail	19:12	0.30
Hillsborough @ Dixie Trail	17:54	1.00
Hillsborough @ Dixie Trail	16:09	0.30
Hillsborough @ Dixie Trail	19:06	0.90
Hillsborough @ Dixie Trail	11:12	0.80
Hillsborough @ Dixie Trail	11:16	0.80
Hillsborough @ Dixie Trail	14:16	0.40
Hillsborough @ Dixie Trail	7:41	1.10
Hillsborough @ Dixie Trail	7:06	0.30
Hillsborough @ Dixie Trail	8:08	0.40
Hillsborough @ Dixie Trail	17:54	1.30
Hillsborough @ Dixie Trail	21:44	0.70
Hillsborough @ Dixie Trail	22:46	0.30
Peace @ West	21:17	0.30
Peace @ West	18:50	0.60
Peace @ West	14:41	1.90
Peace @ West	18:09	0.70

Peace @ West	11:49	0.90
Peace @ West	16:48	0.30
Peace @ West	19:29	0.70
Peace @ West	7:37	1.30
Peace @ West	20:38	1.20
Peace @ West	6:33	0.40
Peace @ West	12:37	0.90
Peace @ West	18:53	1.30
Peace @ West	21:25	0.60
Peace @ West	22:24	1.40
Peace @ West	14:56	0.50
Peace @ West	14:00	0.70
Peace @ West	19:44	0.30
Peace @ West	19:34	1.50
Peace @ West	18:46	2.20
Peace @ West	17:55	0.40
Peace @ West	18:42	0.70
Peace @ West	0:03	3.90
Peace @ West	16:39	1.20
Peace @ West	18:21	1.10
Peace @ West	22:51	3.90
Peace @ West	8:48	1.90
Peace @ West	13:04	1.50
Peace @ West	10:07	0.90
Peace @ West	8:38	0.70
Peace @ West	18:13	0.50
Six Forks @ Rowan	10:58	0.70
Six Forks @ Rowan	16:21	0.50
Six Forks @ Rowan	13:03	0.60
Six Forks @ Rowan	19:05	0.70
Six Forks @ Rowan	16:54	0.40
Six Forks @ Rowan	15:40	1.40
Six Forks @ Rowan	6:42	0.40
Six Forks @ Rowan	11:42	1.90
Six Forks @ Rowan	10:22	0.40
Six Forks @ Rowan	7:05	0.90
Six Forks @ Rowan	12:27	1.10
Six Forks @ Rowan	15:47	0.70
Six Forks @ Rowan	13:35	0.80
Six Forks @ Rowan	10:41	0.80
Six Forks @ Rowan	20:43	0.90
Six Forks @ Rowan	18:25	0.70
Six Forks @ Rowan	13:43	1.90
Six Forks @ Rowan	19:15	0.40
Six Forks @ Rowan	7:57	0.50
Six Forks @ Rowan	18:23	0.40

Six Forks @ Rowan	16:47	1.20
Six Forks @ Rowan	16:17	0.60
Six Forks @ Rowan	12:03	0.70
Six Forks @ Rowan	9:33	0.60
Six Forks @ Rowan	16:46	1.00
Six Forks @ Rowan	18:10	1.00
Six Forks @ Rowan	16:26	1.00
Six Forks @ Rowan	14:59	0.50
Six Forks @ Rowan	10:23	1.50
Six Forks @ Rowan	20:35	0.30
Six Forks @ Rowan	11:57	0.40
Six Forks @ Rowan	14:27	0.30
Six Forks @ Rowan	19:01	1.20
Six Forks @ Rowan	8:55	4.20
Six Forks @ Rowan	9:59	4.00
Dawson @ Morgan	15:13	0.40
Dawson @ Morgan	17:09	0.90
Dawson @ Morgan	17:14	0.40
Dawson @ Morgan	13:26	0.30
Dawson @ Morgan	16:20	0.30
Dawson @ Morgan	17:13	0.60
Dawson @ Morgan	7:56	1.20
Dawson @ Morgan	15:53	1.00
Dawson @ Morgan	14:56	0.40
Dawson @ Morgan	15:37	0.70
Dawson @ Morgan	13:09	0.50
Dawson @ Morgan	16:01	0.80
Dawson @ Morgan	14:21	0.30
Dawson @ Morgan	14:48	1.00
Dawson @ Morgan	11:46	0.90
Dawson @ Morgan	15:34	0.80
Dawson @ Morgan	19:25	0.30
Dawson @ Morgan	11:01	0.30
Dawson @ Morgan	16:29	4.00
Dawson @ Morgan	15:27	1.80
Dawson @ Morgan	20:39	0.30
Dawson @ Morgan	13:40	0.50
Dawson @ Morgan	8:20	0.60
15/501 NB @ Sage Rd.	10:18:52	1.37
15/501 NB @ Sage Rd.	11:31:21	0.76
15/501 NB @ Sage Rd.	14:11:21	0.46
15/501 NB @ Sage Rd.	19:07:22	0.41
15/501 NB @ Sage Rd.	20:35:28	0.42
15/501 NB @ Sage Rd.	9:31:24	1.08
15/501 NB @ Sage Rd.	10:43:54	0.61
15/501 NB @ Sage Rd.	15:31:51	0.43

15/501 NB @ Sage Rd.	20:50:09	1.1
15/501 NB @ Sage Rd.	21:36:07	1.22
15/501 NB @ Sage Rd.	7:03:56	0.33
15/501 NB @ Sage Rd.	9:28:55	0.43
15/501 NB @ Sage Rd.	11:13:51	0.35
15/501 NB @ Sage Rd.	12:08:53	1.96
15/501 NB @ Sage Rd.	12:16:21	0.38
15/501 NB @ Sage Rd.	15:42:57	0.4
15/501 NB @ Sage Rd.	18:14:29	0.67
15/501 NB @ Sage Rd.	19:56:53	0.44
15/501 NB @ Sage Rd.	20:54:15	0.62
15/501 NB @ Sage Rd.	20:58:52	0.67
15/501 NB @ Sage Rd.	8:39:01	0.69
15/501 NB @ Sage Rd.	11:58:56	0.78
15/501 NB @ Sage Rd.	13:58:55	0.53
15/501 NB @ Sage Rd.	7:46:32	2.38
15/501 NB @ Sage Rd.	8:19:01	1.51
15/501 NB @ Sage Rd.	11:16:27	2.97
15/501 NB @ Sage Rd.	11:23:55	1.02
15/501 NB @ Sage Rd.	14:06:24	0.33
15/501 NB @ Sage Rd.	14:08:54	0.46
15/501 NB @ Sage Rd.	9:51:31	0.36
15/501 NB @ Sage Rd.	9:56:31	0.41
15/501 NB @ Sage Rd.	12:11:31	0.31
15/501 NB @ Sage Rd.	19:12:42	0.68
15/501 NB @ Sage Rd.	17:05:25	0.34
15/501 NB @ Sage Rd.	18:32:21	0.51
15/501 NB @ Sage Rd.	8:03:53	1.19
Hillsborough @ Dixie Trail	13:43	1
Hillsborough @ Dixie Trail	10:00	0.3
Hillsborough @ Dixie Trail	18:50	0.3
Hillsborough @ Dixie Trail	14:38	0.3
Hillsborough @ Dixie Trail	12:35	0.8
Hillsborough @ Dixie Trail	9:15	0.5
Hillsborough @ Dixie Trail	1:16	1.5
Hillsborough @ Dixie Trail	7:48	1
Hillsborough @ Dixie Trail	9:58	6.2
Hillsborough @ Dixie Trail	8:09	1.1
Hillsborough @ Dixie Trail	9:01	0.4
Hillsborough @ Dixie Trail	9:11	0.5
Hillsborough @ Dixie Trail	21:09	1.7
Hillsborough @ Dixie Trail	17:19	0.5
Hillsborough @ Dixie Trail	7:59	0.3
Hillsborough @ Dixie Trail	21:06	0.4
Hillsborough @ Dixie Trail	16:57	0.6
Hillsborough @ Dixie Trail	3:35	3.9

Hillsborough @ Dixie Trail	14:37	0.9
Hillsborough @ Dixie Trail	3:40	3.9
Hillsborough @ Dixie Trail	1:32	3.9
Hillsborough @ Dixie Trail	3:25	0.7
Hillsborough @ Dixie Trail	10:50	0.3
Hillsborough @ Dixie Trail	15:55	0.4
Hillsborough @ Dixie Trail	18:33	0.3
Hillsborough @ Dixie Trail	17:37	0.3
Hillsborough @ Dixie Trail	8:46	0.9
Hillsborough @ Dixie Trail	5:31	3.9
Hillsborough @ Dixie Trail	16:14	0.4
Hillsborough @ Dixie Trail	8:10	2
Hillsborough @ Dixie Trail	13:52	0.6
Hillsborough @ Dixie Trail	12:55	0.6
Hillsborough @ Dixie Trail	6:01	1.5
Hillsborough @ Dixie Trail	15:01	0.8
Hillsborough @ Dixie Trail	19:09	1
Hillsborough @ Dixie Trail	14:24	0.5
Hillsborough @ Dixie Trail	22:10	9.3
New Hope Church @ Brentwood	16:10	0.9
New Hope Church @ Brentwood	12:27	1
New Hope Church @ Brentwood	15:18	1
New Hope Church @ Brentwood	21:20	0.7
New Hope Church @ Brentwood	7:27	0.3
New Hope Church @ Brentwood	22:29	0.3
New Hope Church @ Brentwood	13:04	0.5
New Hope Church @ Brentwood	1:58	0.4
New Hope Church @ Brentwood	16:54	0.4
New Hope Church @ Brentwood	10:30	0.4
New Hope Church @ Brentwood	8:43	0.5
New Hope Church @ Brentwood	16:10	0.8
New Hope Church @ Brentwood	13:25	0.5
New Hope Church @ Brentwood	22:14	0.9
New Hope Church @ Brentwood	10:38	0.4
New Hope Church @ Brentwood	21:15	0.8
New Hope Church @ Brentwood	0:08	1.1
New Hope Church @ Brentwood	9:55	0.4
New Hope Church @ Brentwood	7:24	0.6
New Hope Church @ Brentwood	16:45	0.7
New Hope Church @ Brentwood	10:41	1.2
New Hope Church @ Brentwood	17:20	0.3
New Hope Church @ Brentwood	12:42	0.4
New Hope Church @ Brentwood	21:37	0.3
New Hope Church @ Brentwood	23:11	4
New Hope Church @ Brentwood	21:25	1.4
New Hope Church @ Brentwood	13:49	0.8

New Hope Church @ Brentwood	18:19	1
New Hope Church @ Brentwood	11:41	0.4
New Hope Church @ Brentwood	9:41	0.5
New Hope Church @ Brentwood	14:22	1.6
New Hope Church @ Brentwood	22:25	0.6
New Hope Church @ Brentwood	12:03	0.3
New Hope Church @ Brentwood	20:23	1.2
New Hope Church @ Brentwood	16:32	0.8
New Hope Church @ Brentwood	16:14	0.3
New Hope Church @ Brentwood	16:07	0.3
New Hope Church @ Brentwood	18:30	0.5
New Hope Church @ Brentwood	18:17	2
New Hope Church @ Brentwood	17:46	0.5
New Hope Church @ Brentwood	0:07	0.6
New Hope Church @ Brentwood	18:19	0.5
New Hope Church @ Brentwood	15:12	0.7
Peace @ West	9:09	1.3
Peace @ West	14:08	0.4
Peace @ West	16:31	0.4
Peace @ West	12:14	1.4
Peace @ West	1:13	0.5
Peace @ West	12:33	0.3
Peace @ West	21:11	2.2
Peace @ West	13:55	0.3
Peace @ West	0:49	1.1
Peace @ West	19:24	0.3
Peace @ West	13:34	0.7
Peace @ West	6:44	1.2
Peace @ West	17:32	2.1
Peace @ West	9:33	0.3
Peace @ West	15:21	1.2
Peace @ West	18:23	0.4
Peace @ West	8:14	0.4
Peace @ West	12:25	5.2
Peace @ West	11:09	1.5
Peace @ West	11:53	0.3
Peace @ West	16:51	0.3
Peace @ West	14:09	1.6
Peace @ West	22:32	0.6
Peace @ West	15:21	1.6
Peace @ West	12:21	0.6
Peace @ West	19:06	0.5
Peace @ West	13:57	0.4
Peace @ West	15:58	0.5
Peace @ West	17:28	1.9
Peace @ West	18:55	1.2

Peace @ West	23:04	3.9
Peace @ West	11:36	0.4
Peace @ West	1:46	1.3
Peace @ West	15:15	1.3
Peace @ West	9:22	1.3
Peace @ West	23:26	1.7
Peace @ West	12:15	1
Peace @ West	16:28	1.7
Peace @ West	16:20	0.9
Peace @ West	19:54	0.6
Peace @ West	13:19	0.9
Peace @ West	6:18	0.7
Peace @ West	15:10	0.9
Peace @ West	16:39	1.5
15/501 NB @ Sage Rd.	8:36:22	0.45
15/501 NB @ Sage Rd.	9:28:52	0.83
15/501 NB @ Sage Rd.	10:06:19	2.51
15/501 NB @ Sage Rd.	12:16:17	0.32
15/501 NB @ Sage Rd.	12:16:19	2.76
15/501 NB @ Sage Rd.	8:58:55	0.9
15/501 NB @ Sage Rd.	9:13:56	1.63
15/501 NB @ Sage Rd.	12:08:50	0.38
15/501 NB @ Sage Rd.	12:56:20	1.04
15/501 NB @ Sage Rd.	9:51:20	0.6
15/501 NB @ Sage Rd.	10:43:50	1.37
15/501 NB @ Sage Rd.	11:33:50	1.46
15/501 NB @ Sage Rd.	11:41:19	0.61
15/501 NB @ Sage Rd.	13:51:17	0.9
15/501 NB @ Sage Rd.	17:00:13	0.42
15/501 NB @ Sage Rd.	20:06:26	0.48
Airport Rd @ Estes Rd.	9:21:18	0.31
Airport Rd @ Estes Rd.	16:31:57	0.31
Airport Rd @ Estes Rd.	17:17:17	0.65
Airport Rd @ Estes Rd.	8:27:20	0.41
Airport Rd @ Estes Rd.	12:36:57	0.56
Airport Rd @ Estes Rd.	14:40:25	0.41
Airport Rd @ Estes Rd.	17:22:35	0.74
Airport Rd @ Estes Rd.	8:45:21	0.96
Airport Rd @ Estes Rd.	14:33:57	0.46
Airport Rd @ Estes Rd.	18:21:33	18.31
Airport Rd @ Estes Rd.	18:21:37	21.66
Airport Rd @ Estes Rd.	17:27:55	1.12
Capital @ Highwoods	6:44	1.20
Capital @ Highwoods	9:01	0.30
Capital @ Highwoods	13:16	0.60
Capital @ Highwoods	19:47	0.60

Capital @ Highwoods	19:23	0.30
Capital @ Highwoods	11:08	1.30
Capital @ Highwoods	20:47	0.80
Capital @ Highwoods	0:39	1.40
Capital @ Highwoods	7:57	1.10
Capital @ Highwoods	20:33	0.30
Capital @ Highwoods	13:02	0.70
Capital @ Highwoods	8:10	0.70
Capital @ Highwoods	15:07	0.80
Capital @ Highwoods	20:32	0.40
Capital @ Highwoods	15:07	1.90
Capital @ Highwoods	12:05	0.40
Capital @ Highwoods	13:21	0.80
Capital @ Highwoods	19:43	0.60
Capital @ Highwoods	19:36	1.90
Capital @ Highwoods	15:43	1.80
Capital @ Highwoods	19:08	0.80
Capital @ Highwoods	13:00	0.60
Capital @ Highwoods	13:58	1.10
Capital @ Highwoods	20:23	2.70
Capital @ Highwoods	21:07	2.00
Capital @ Highwoods	19:55	1.50
Capital @ Highwoods	7:29	0.60
Capital @ Highwoods	13:59	1.00
Capital @ Highwoods	12:20	0.40
Capital @ Highwoods	0:40	1.40
Capital @ Highwoods	15:29	3.60
Crosslink/Proctor/Rock Quarry (NB)	20:57	0.5
Crosslink/Proctor/Rock Quarry (NB)	15:28	0.3
Crosslink/Proctor/Rock Quarry (NB)	19:42	0.4
Crosslink/Proctor/Rock Quarry (NB)	7:27	1.1
Dawson @ Morgan	15:55	1.5
Dawson @ Morgan	13:58	0.3
Dawson @ Morgan	8:54	0.5
Dawson @ Morgan	14:36	2.4
Dawson @ Morgan	15:27	0.3
Dawson @ Morgan	17:40	0.7
Dawson @ Morgan	8:08	0.6
Dawson @ Morgan	16:46	1
Dawson @ Morgan	7:13	0.9
Dawson @ Morgan	0:36	4
Dawson @ Morgan	19:06	0.7
Dawson @ Morgan	16:45	0.7

Dawson @ Morgan	23:50	0.7
Dawson @ Morgan	16:02	0.9
Dawson @ Morgan	17:57	0.8
Dawson @ Morgan	8:14	0.4
Dawson @ Morgan	18:19	0.5
Dawson @ Morgan	15:30	0.6
Dawson @ Morgan	8:34	1
Dawson @ Morgan	9:47	0.3
Dawson @ Morgan	16:42	2.3
Dawson @ Morgan	17:01	0.7
Dawson @ Morgan	13:14	0.7
Dawson @ Morgan	10:33	0.9
Dawson @ Morgan	12:15	2
Crosslink/Proctor/Rock Quarry (SB)	12:32	1.1
Crosslink/Proctor/Rock Quarry (SB)	14:09	0.5
Crosslink/Proctor/Rock Quarry (SB)	14:10	0.3
Crosslink/Proctor/Rock Quarry (SB)	16:40	0.3
Crosslink/Proctor/Rock Quarry (SB)	14:11	2.7
Six Forks @ Rowan	14:55	0.5
Six Forks @ Rowan	11:09	0.3
Six Forks @ Rowan	11:47	0.9
Six Forks @ Rowan	10:35	1
Six Forks @ Rowan	18:33	0.4
Six Forks @ Rowan	15:33	0.3
Six Forks @ Rowan	17:24	0.6
Six Forks @ Rowan	9:18	0.4
Six Forks @ Rowan	11:11	1
Six Forks @ Rowan	23:56	0.4
Six Forks @ Rowan	11:49	1.5
Six Forks @ Rowan	10:59	0.6
Six Forks @ Rowan	10:33	0.6
Six Forks @ Rowan	14:27	0.6
Six Forks @ Rowan	15:43	0.3
Six Forks @ Rowan	8:45	0.3
Six Forks @ Rowan	16:47	0.4
Six Forks @ Rowan	18:29	0.5
Six Forks @ Rowan	16:35	0.5
Six Forks @ Rowan	13:31	0.4
Six Forks @ Rowan	6:51	0.9
Six Forks @ Rowan	8:41	0.7
Six Forks @ Rowan	13:03	1.1
Six Forks @ Rowan	13:19	0.3

Six Forks @ Rowan	9:11	0.6
Six Forks @ Rowan	11:37	1.1
Six Forks @ Rowan	17:02	0.3
Six Forks @ Rowan	11:21	0.4
Six Forks @ Rowan	14:59	0.3
Six Forks @ Rowan	14:29	0.4
Six Forks @ Rowan	12:01	0.6
Six Forks @ Rowan	20:39	1.5
Six Forks @ Rowan	16:06	0.3
Six Forks @ Rowan	16:32	0.7
Six Forks @ Rowan	7:59	2.2
Six Forks @ Rowan	8:45	0.9
Six Forks @ Rowan	17:20	0.4
Six Forks @ Rowan	16:44	0.9
Capital @ Highwoods	11:47	0.70
Capital @ Highwoods	22:33	0.40
Capital @ Highwoods	10:56	0.60
Capital @ Highwoods	16:16	0.50
Capital @ Highwoods	14:14	1.00
Capital @ Highwoods	17:41	0.8
Capital @ Highwoods	10:36	1.4
Capital @ Highwoods	9:09	0.9
Capital @ Highwoods	18:45	1.3
Capital @ Highwoods	1:56	0.5
Capital @ Highwoods	15:14	0.4
Capital @ Highwoods	16:31	1
Capital @ Highwoods	14:45	0.5
Capital @ Highwoods	13:00	0.3
Capital @ Highwoods	20:35	1
Capital @ Highwoods	23:04	0.3
Capital @ Highwoods	13:54	1.9
Capital @ Highwoods	14:39	0.3
Capital @ Highwoods	5:35	0.9
Capital @ Highwoods	10:54	2
Capital @ Highwoods	12:57	0.5
Capital @ Highwoods	7:05	1
Capital @ Highwoods	11:54	0.6
Capital @ Highwoods	20:51	1.2
Capital @ Highwoods	0:28	0.5
Capital @ Highwoods	11:57	4.6
Capital @ Highwoods	10:27	0.6
Capital @ Highwoods	18:10	0.6
Capital @ Highwoods	14:24	1
Capital @ Highwoods	10:24	1.3
Capital @ Highwoods	23:17	1.9
Capital @ Highwoods	19:04	0.3

Capital @ Highwoods	20:24	0.5
Capital @ Highwoods	19:39	4.9
Capital @ Highwoods	14:15	1.1
Capital @ Highwoods	23:51	1.1
Capital @ Highwoods	15:47	1.3
Capital @ Highwoods	17:27	1.6
Capital @ Highwoods	14:45	0.4
Capital @ Highwoods	6:30	0.5
Capital @ Highwoods	2:05	0.9
Capital @ Highwoods	14:21	1.9
Capital @ Highwoods	21:12	1
Capital @ Highwoods	21:54	0.3
Capital @ Highwoods	21:00	0.5
Capital @ Highwoods	12:30	0.7
Capital @ Highwoods	18:27	0.7
Capital @ Highwoods	22:12	0.7
Capital @ Highwoods	18:06	1.3
Capital @ Highwoods	13:14	1.2
Capital @ Highwoods	14:08	0.5
Capital @ Highwoods	13:50	0.8
Capital @ Highwoods	14:53	0.4
Capital @ Highwoods	10:50	1.3
Capital @ Highwoods	9:56	0.7
Capital @ Highwoods	16:11	0.9
Capital @ Highwoods	14:05	0.3
Capital @ Highwoods	20:53	0.3
Capital @ Highwoods	12:05	0.6
Capital @ Highwoods	15:56	0.7
Capital @ Highwoods	18:47	0.3
Capital @ Highwoods	17:08	7.9
Capital @ Highwoods	7:13	0.5
Capital @ Highwoods	22:12	1.4