

US 64 - NC 49 Corridor Study
(Raleigh to Statesville and Raleigh to Charlotte)

**ROADSIDE ORIGIN-DESTINATION INTERVIEW
TECHNICAL REPORT**

Prepared for



**North Carolina Department of Transportation
Transportation Planning Branch**

Prepared by



May 2004

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TABLE OF CONTENTS

LIST OF FIGURES	iv
LIST OF TABLES	v
1 PREFACE.....	1
2 SURVEY DESIGN APPROACH	1
2.1 METHODOLOGY	1
2.2 SURVEY LOCATIONS	1
2.3 TRAFFIC CONTROL.....	3
2.4 PROPOSED TIME OF OPERATION.....	3
2.5 SURVEY OPERATION	7
2.6 SURVEY INSTRUMENTS	7
2.7 STAFFING.....	7
3 SURVEY RESULTS.....	9
3.1 US 64 (DAVIDSON COUNTY).....	9
3.1.1 Time of Operation.....	9
3.1.2 Field Conditions.....	9
3.1.3 Operational Issues.....	9
3.1.4 Traffic Count and Classification.....	10
3.1.5 Surveys Collected	10
3.1.6 Survey Question Results.....	12
3.2 US 64 (CHATHAM COUNTY).....	20
3.2.1 Time of Operation.....	20
3.2.2 Field Conditions.....	20
3.2.3 Operational Issues.....	20
3.2.4 Traffic Count and Classification.....	21
3.2.5 Surveys Collected	21
3.2.6 Survey Question Results.....	23
3.3 NC 49 (STANLY COUNTY).....	29
3.3.1 Time of Operation.....	29
3.3.2 Field Conditions.....	29
3.3.3 Operational Issues.....	29
3.3.4 Traffic Count and Classification.....	29
3.3.5 Surveys Collected	31
3.3.6 Survey Question Results.....	31

US 64 - NC 49 Corridor Study
(Raleigh to Statesville and Raleigh to Charlotte)

**ROADSIDE ORIGIN-DESTINATION INTERVIEW
TECHNICAL REPORT**

TABLE OF CONTENTS

APPENDICES (under separate cover)

Raw Motorist Survey Forms

US 64 - NC 49 Corridor Study
(Raleigh to Statesville and Raleigh to Charlotte)

**ROADSIDE ORIGIN-DESTINATION INTERVIEW
TECHNICAL REPORT**

TABLE OF CONTENTS

List of Figures

Figure 2-1. Survey Locations Map	2
Figure 2-2. US 64 (Davidson Co.) Traffic Control Plans.....	4
Figure 2-3. US 64 (Chatham Co.) Traffic Control Plans.....	5
Figure 2-4. NC 49 (Stanly Co.) Traffic Control Plans.....	6
Figure 2-5. Motorist Survey.....	8
Figure 3-1. US 64 (Davidson Co.) Survey Site	9
Figure 3-2. Traffic Volume and Classification Data - US 64 (Davidson Co.)	11
Figure 3-3. Vehicle Occupancy Distribution – US 64 (Davidson Co.)	13
Figure 3-4. Distribution of Trips by Purpose – US 64 (Davidson Co.).....	13
Figure 3-5. Trip Origin-Distribution Data for US 64 Eastbound (Davidson Co.).....	16
Figure 3-6. Trip Origin-Distribution Data for US 64 Westbound (Davidson Co.)	17
Figure 3-7. Major Trip Origination-Destination Pairs for US 64 (Davidson Co.)	18
Figure 3-8. Trip Frequency – US 64 (Davidson Co.)	19
Figure 3-9. US 64 (Chatham Co.) Survey Site	20
Figure 3-10. Traffic Volume and Classification Data - US 64 (Chatham Co.)	22
Figure 3-11. Vehicle Occupancy Distribution – US 64 (Chatham Co.).....	23
Figure 3-12. Distribution of Trips by Purpose – US 64 (Chatham Co.).....	23
Figure 3-13. Trip Origin-Distribution Data for US 64 Eastbound (Chatham Co.).....	25
Figure 3-14. Trip Origin-Distribution Data for US 64 Westbound (Chatham Co.)	26
Figure 3-15. Major Trip Origination-Destination Pairs for US 64 (Chatham Co.)	27
Figure 3-16. Trip Frequency – US 64 (Chatham Co.)	28
Figure 3-17. NC 49 (Stanly Co.) Survey Site	29
Figure 3-18. Traffic Volume and Classification Data – NC 49 (Stanly Co.)	30
Figure 3-19. Vehicle Occupancy Distribution – NC 49 (Stanly Co.).....	31
Figure 3-20. Distribution of Trips by Purpose – NC 49 (Stanly Co.).....	32
Figure 3-21. Trip Origin-Distribution Data for NC 49 Northbound (Stanly Co.).....	34
Figure 3-22. Trip Origin-Distribution Data for NC 49 Southbound (Stanly Co.).....	35
Figure 3-23. Major Trip Origination-Destination Pairs for NC 49 (Stanly Co.).....	36
Figure 3-24. Trip Frequency – NC 49 (Stanly Co.).....	37

US 64 - NC 49 Corridor Study
(Raleigh to Statesville and Raleigh to Charlotte)

**ROADSIDE ORIGIN-DESTINATION INTERVIEW
TECHNICAL REPORT**

TABLE OF CONTENTS

List of Tables

Table 2-1. Proposed Timetable	3
Table 3-1. FHWA Vehicle Classifications	12
Table 3-2. Top Five Home-Based Work Origin-Destination Pairs - US 64 (Davidson Co.)	14
Table 3-3. Top Five Home-Based Non-Work Origin-Destination Pairs - US 64 (Davidson Co.).....	14
Table 3-4. Top Five Non-Home-Based Origin-Destination Pairs - US 64 (Davidson Co.)..	14
Table 3-5. Top Five Home-Based Work Origin-Destination Pairs – US 64 (Chatham Co.)	24
Table 3-6. Top Five Home-Based Non-Work Origin-Destination Pairs – US 64 (Chatham Co.).....	24
Table 3-7. Top Five Non-Home-Based Origin-Destination Pairs – US 64 (Chatham Co.)..	24
Table 3-8. Home-Based Work Origin-Destination Pairs - NC 49 (Stanly Co.)	32
Table 3-9. Home-Based Non-Work Origin-Destination Pairs - NC 49 (Stanly Co.)	32
Table 3-10. Non-Home-Based Origin-Destination Pairs - NC 49 (Stanly Co.)	33

1 Preface

The North Carolina Department of Transportation (NCDOT) is conducting a comprehensive study of the US 64 and NC 49 corridors from Raleigh to Statesville and Raleigh to Charlotte. Through the NCDOT's Strategic Highway Corridors planning initiative, herein referred to as the Strategic Highway Corridors Concept, US 64 and NC 49 have been identified as corridors of statewide significance, vital to the State's interest in preserving mobility and connectivity to travel destinations within and just outside of North Carolina. The purpose of the corridor study is to develop an improvement master plan that will enhance the long-term mobility of passengers and freight in the central portion of the State, foster economic growth and development, relieve congestion on I-40 and I-85, promote environmental stewardship, and optimize transportation funding. The master plan will examine the interrelationship between land use and transportation, provide guidance for multi-modal and inter-modal solutions, address financial feasibility, and be conducted with consideration of the National Environmental Policy Act (NEPA) and North Carolina's NEPA/Section 404 merger process.

A comprehensive assessment of the region's transportation system requires inventorying existing conditions, such as travel supply and demand, and using this data to analyze the current system performance and to identify deficiencies. The US 64 – NC 49 Corridor Study will use data from available traffic counts, travel time surveys, origin-destination postcard surveys, roadside origin-destination interview surveys, and video license plate matching surveys in developing a travel demand model for the study area.

The purpose of this report is to document the roadside interview survey design and summarize the survey results.

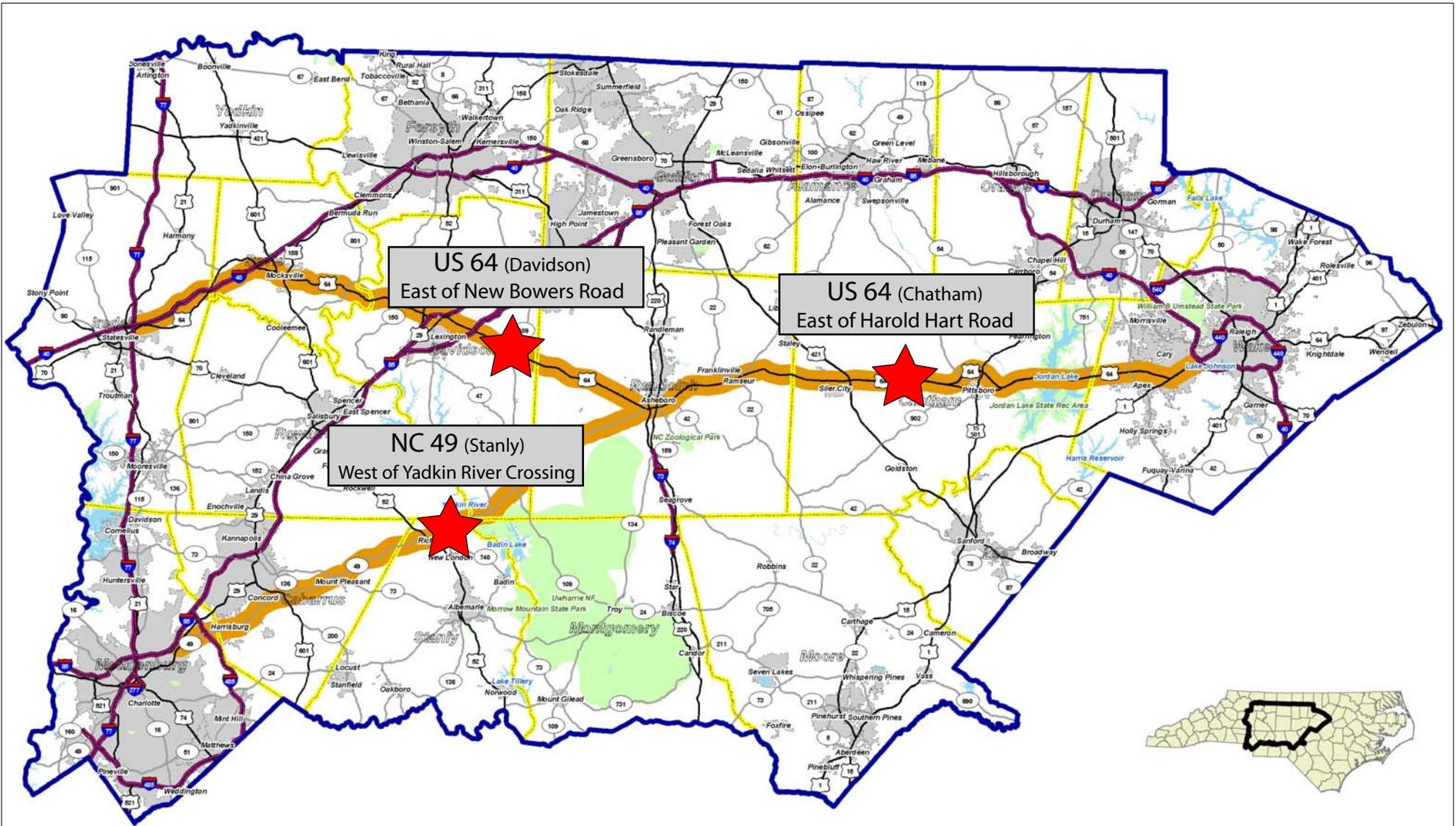
2 Survey Design Approach

2.1 Methodology

The roadside survey was designed to capture the origin, destination, purpose, and frequency of each interviewed motorist's trip as well as the number of people in the vehicle and other routes typically used to make a similar trip. The North Carolina Department of Transportation conducted vehicle classification counts at each survey location in order to determine the sample size of the survey and to allow for expansion of the data. An objective of this study was to interview approximately 10% of the daily traffic at each survey location.

2.2 Survey Locations

Three locations were selected for the roadside interviews: two on US 64 and one on NC 49. A map of these locations is shown in Figure 2-1. The general location of each site was selected based on where travel patterns within the corridor could best be captured.



LEGEND

-  Regional Study Area Boundary
-  Study Corridor
-  Survey Location



US 64 - NC 49
Corridor Study

Survey Locations Map

Figure
2-1

Specific locations were selected based on field site inspections and discussions with NCDOT and the State Highway Patrol to determine where the interviewers would be safest.

All property owners immediately adjacent to the survey sites were informed of the US 64 - NC49 Corridor Study and the date the roadside survey would be conducted.

2.3 Traffic Control

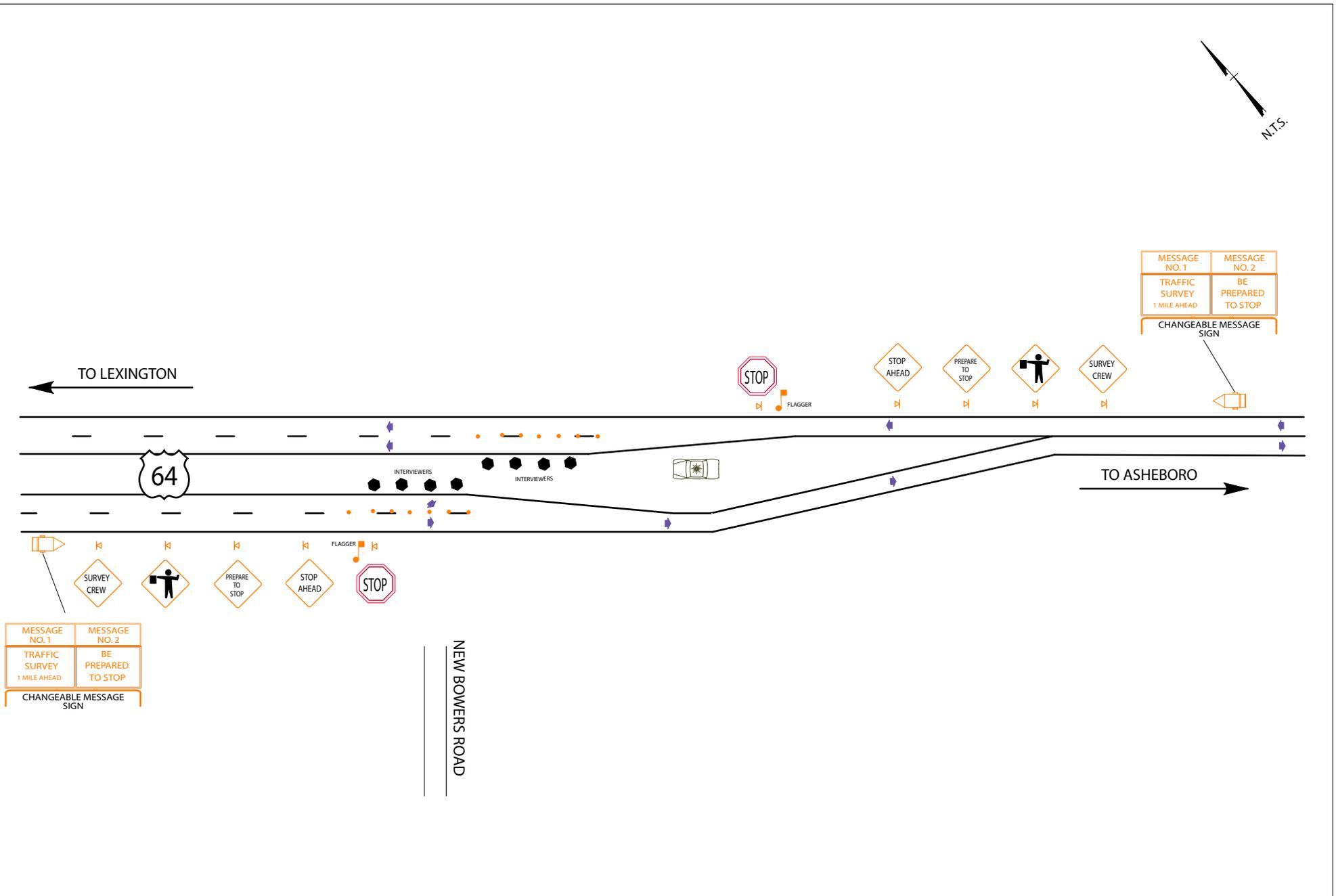
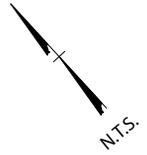
Traffic control plans were developed in coordination with the NCDOT and the State Highway Patrol. A State Trooper was present at all times and appropriate traffic control was in place in order to safely survey motorists while minimizing disruption to the remaining traffic. Depending on the attributes of each site, the proposed method of traffic control varied. As shown in Figures 2-2 and 2-4, the Davidson (US 64) and Stanly County (NC 49) sites did not require a lane closure. A flagger would wave vehicles to the survey area. Since the Chatham County (US 64) site, as shown in Figure 2-3, was located on a four-lane divided section, traffic control was used to merge all traffic into one lane prior to the interview location. Once traffic was channelized to one lane, a flagger was able to safely wave vehicles to the survey location.

2.4 Proposed Time of Operation

The surveys were scheduled to be conducted on three consecutive weekdays from 30 minutes after sunrise until 30 minutes before sundown, as shown in Table 2-1.

Table 2-1. Proposed Timetable

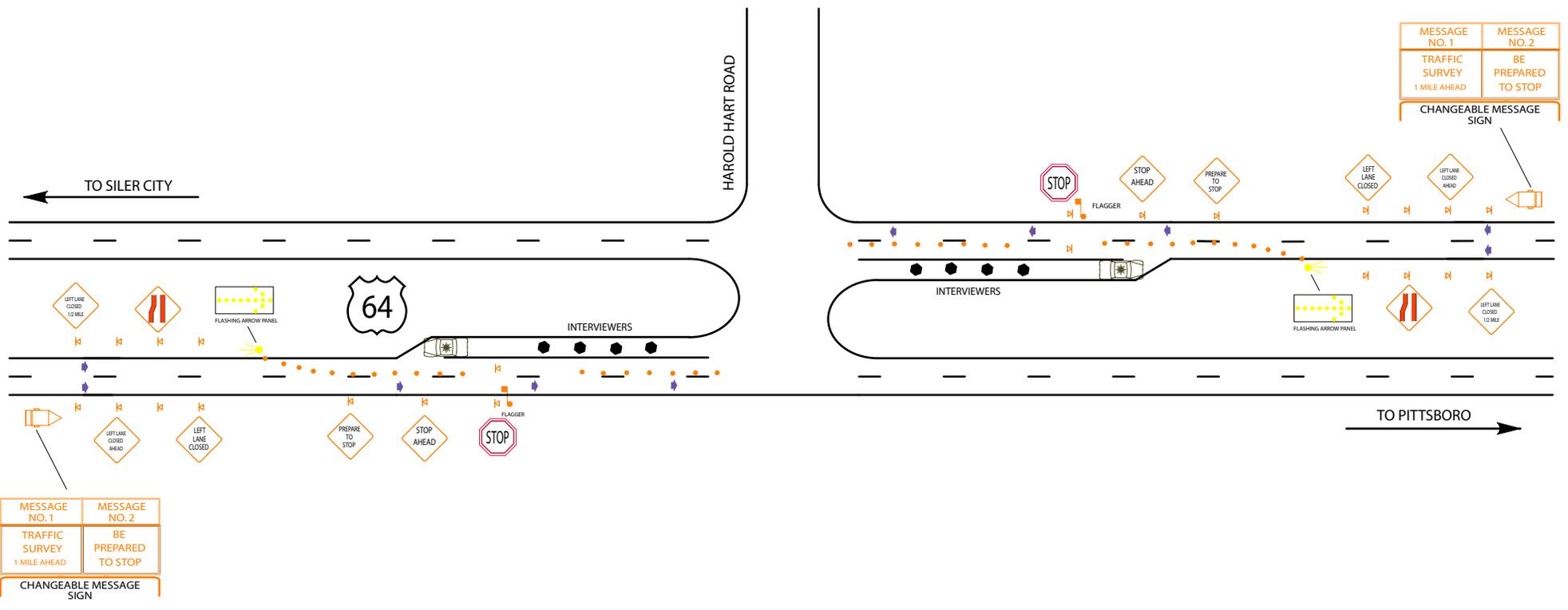
Date	Location	Time
Tuesday, October 14	US 64 (Chatham Co.)	8:00am – 6:30pm
Wednesday, October 15	US 64 (Davidson Co.)	8:00am – 6:30pm
Thursday, October 16	NC 49 (Stanly Co.)	8:00am – 6:30pm



US 64 - NC 49
Corridor Study

US 64 (Davidson Co.) Traffic Control Plan

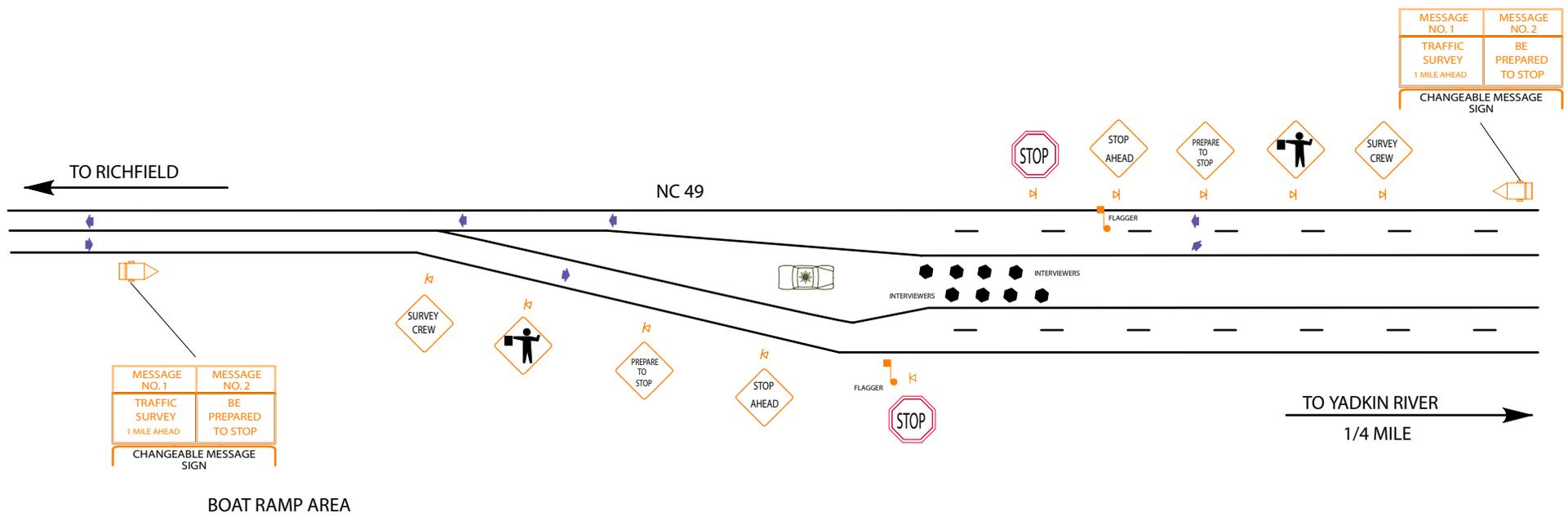
Figure
2-2



US 64 - NC 49
Corridor Study

US 64 (Chatham Co.) Traffic Control Plan

Figure
2-3



US 64 - NC 49
Corridor Study

NC 49 (Stanly Co.) Traffic Control Plan

Figure
2-4

2.5 Survey Operation

The interviewers were stationed in the median and approached the vehicle after it came to a complete stop. When all interviewers were occupied, the remaining traffic was allowed to pass through. Once stopped, each motorist was informed that the survey was being administered on behalf of the North Carolina Department of Transportation and would be brief. The data collector then asked questions to complete the Motorist Survey chart, shown in Figure 2-5. Very few motorists gave the exact street address for their origin or destination, but most gave a city or zip code for the respective location. Those who refused to answer the survey were allowed to pass.

2.6 Survey Instruments

Each interviewer was equipped with a clipboard, 2 pencils, copies of the survey, a copy of the official NCDOT letter explaining the purpose of the survey, and a list of emergency contacts.

2.7 Staffing

Four data collectors were present for each direction of travel during peak hours and at least three were present during off-peak hours.

3 Survey Results

The following subsections provide a summary of actual survey operations and conditions, traffic data, number of surveys collected, and survey question results of each roadside survey location. The “raw” motorist survey forms are provided in an appendix under separate cover.

3.1 US 64 (Davidson County)

3.1.1 Time of Operation

The date and time of the survey conducted on US 64 in Davidson County was Wednesday, October 15, 2003 from 8:00am until 5:35pm. An hour lunch break was taken between 1:00pm and 2:00pm and no data was collected during this time. The surveys were terminated earlier than the planned time of 6:30pm due to the safety risk of the sun being in the motorists’ eyes and shadows covering the site.

3.1.2 Field Conditions

The surveys were conducted on a clear, sunny day. Figure 3-1 provides a photo of the survey site.

Figure 3-1. US 64 (Davidson Co.) Survey Site



3.1.3 Operational Issues

No operational issues or major traffic disruptions occurred during the survey period.

3.1.4 Traffic Count and Classification

The NCDOT conducted a vehicle classification count for a 24-hour period on the same day as the interviews. The count was taken on US 64 east of Smith Farm Road (SR 2015). Figure 3-2 illustrates the 24-hour directional traffic flow by hour. The count categorized all traffic based on Federal Highway Administration (FHWA) vehicle classifications. (see Table 3-1) For the purpose of this document, three broad categories were identified as combination unit trucks, single unit trucks, and passenger vehicles. Passenger vehicles were identified as any non-commercial vehicle with less than 6 tires or a car or pickup with a trailer, which corresponds to FHWA vehicle classifications 1, 2, 3, and 4. Single unit trucks were identified as a commercial vehicle without a trailer that has 6 or more tires or busses, which corresponds to FHWA vehicle classifications 5, 6, and 7. Combination vehicles were identified as multi-unit commercial vehicles, which corresponds to FHWA vehicle classifications 8, 9, 10, 11, 12, and 13.

The traffic count registered 10,219 vehicles traveling on this segment during a 24-hour period and approximately 5,660 during the time the survey was operational. The classification count recorded 81% passenger cars, 4% single unit trucks, and 15% combination trucks over the 24-hour period.

3.1.5 Surveys Collected

The total number of surveys completed for this site was 1,512. Based on the 24-hour traffic count, 14.8% of the total daily traffic and 26.7% of the traffic during the survey was interviewed.

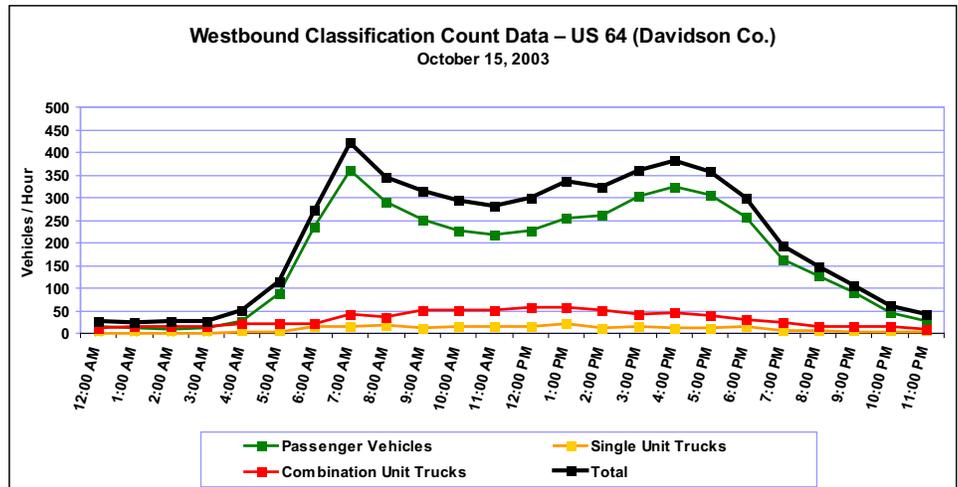
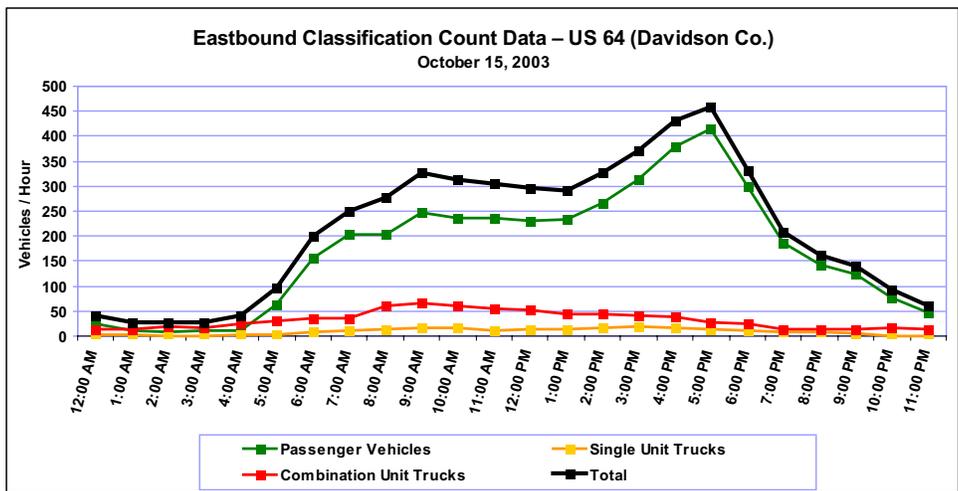
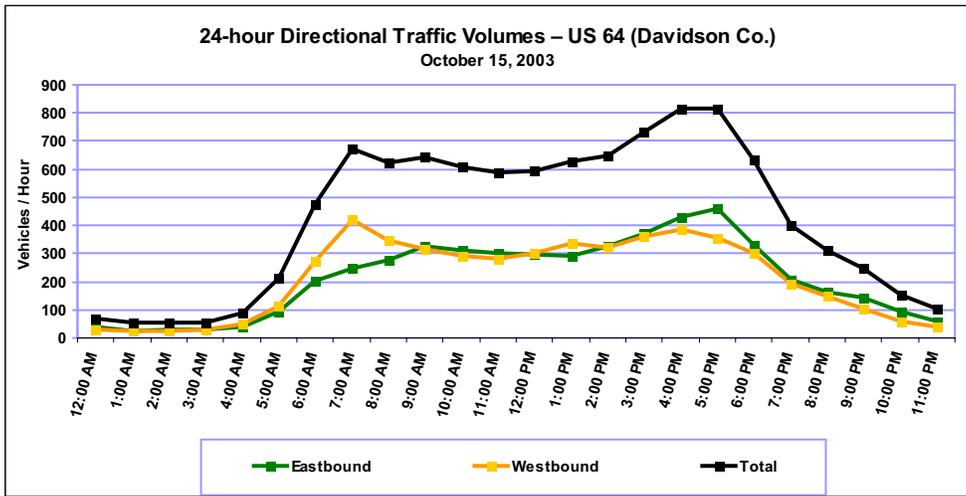


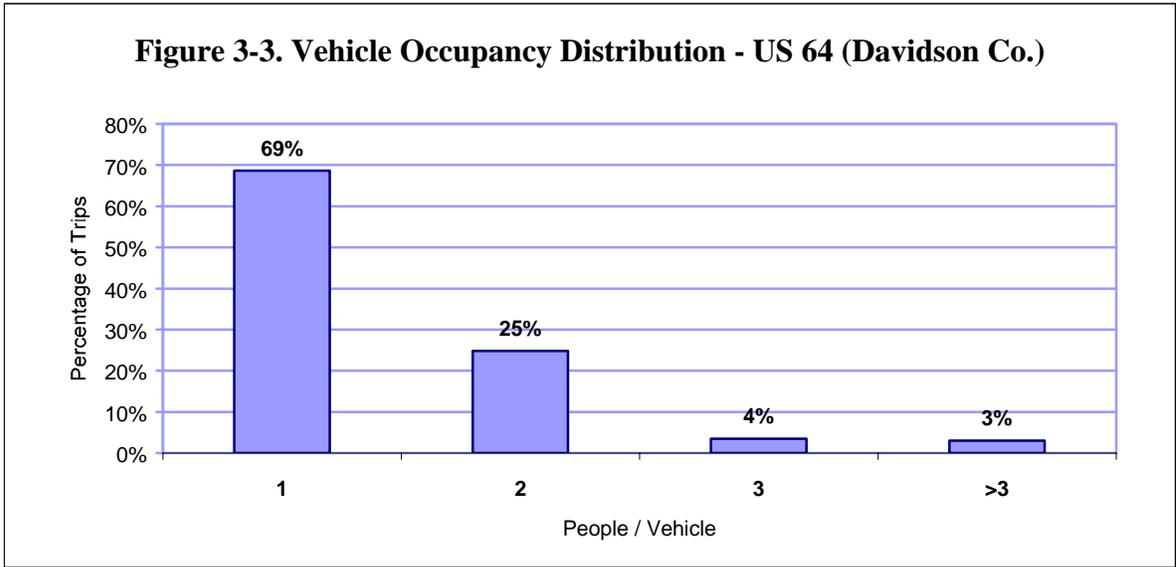
Table 3-1. FHWA Vehicle Classifications

Class	Vehicle Type	Description
1	Motorcycles	This class includes all two- or three-wheeled motorized vehicles. These vehicles typically have a saddle-type of seat and are steered by handlebars rather than a steering wheel. This includes motorcycles, motor scooters, mopeds, motor-powered bicycles and three-wheel motorcycles.
2	Passenger Cars	This class includes all sedans, coupes and station wagons manufactured primarily for the purpose of carrying passengers, including those pulling recreational or other light trailers.
3	Pickups, Vans and other 2-axle, 4-tire Single Unit Vehicles	This class includes all two-axle, four tire vehicles other than passenger cars, which includes pickups, vans, campers, small motor homes, ambulances, minibuses and carryalls. These types of vehicles which are pulling recreational or other light trailers are included.
4	Buses	This class includes all vehicles manufactured as traditional passenger-carrying buses with two axles and six tires or three or more axles. This includes only traditional buses, including school and transit buses, functioning as passenger-carrying vehicles. All two-axle, four tire minibuses should be classified as Class 3. Modified buses should be considered to be trucks and classified appropriately.
5	Two-Axle, Six-Tire Single Unit Trucks	This class includes all vehicles on a single frame, which have two axles and dual rear tires. This includes trucks, camping and recreation vehicles, motor homes, etc.
6	Three-Axle Single Unit Trucks	This class includes all vehicles on a single frame, which have three axles. This includes trucks, camping and recreation vehicles, motor homes, etc.
7	Four or More Axle Single Unit Trucks	This class includes all vehicles on a single frame with four or more axles.
8	Four or Less Axle Single Trailer	This class includes all vehicles with four or less axles consisting of two units, in which the pulling unit is a tractor or single unit truck. .
9	Five-Axle Single Trailer Trucks.	This class includes all five-axle vehicles consisting of tow units in which the pulling unit is a tractor or single unit truck.
10	Six or More Axle Single Trailer Trucks	This class includes all vehicles with six or more axles consisting of two units in which the pulling unit is a tractor or single unit truck.
11	Five or Less Axle Multi-Trailer Trucks	This class includes all vehicles with five or less axles consisting of three or more units in which the pulling unit is a tractor or single unit truck.
12	Six-Axle Multi-Trailer Trucks	This class includes all six-axle vehicles consisting of three or more units in which the pulling unit is a tractor or single unit truck.
13	Seven or More Axle Multi-Trailer Trucks	This class includes all vehicles with seven or more axles consisting of three or more units in which the pulling is a tractor or single unit truck.

3.1.6 Survey Question Results

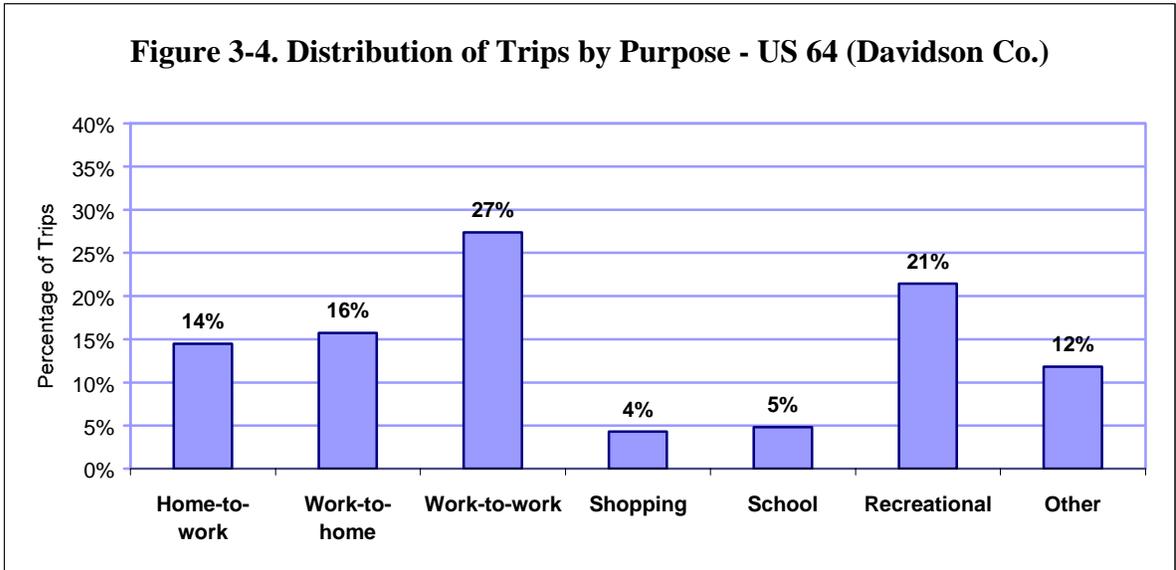
The average vehicle occupancy recorded was 1.4 persons per vehicle. Figure 3-3 shows the vehicle occupancy distribution.

Figure 3-3. Vehicle Occupancy Distribution - US 64 (Davidson Co.)



The trip purpose classification results is illustrated in Figure 3-4. The work-to-work (WW) trip was the most popular purpose, with approximately 27% of motorists making this kind of trip.

Figure 3-4. Distribution of Trips by Purpose - US 64 (Davidson Co.)



Major origination-destination patterns were identified for three trip purposes: home-based-work, home-based-non-work, and non-home-based. The top five origin-destination pairs by trip purpose can be seen in

Table 3-2 through Table 3-4. Most trips, regardless of purpose, were made within the same county of the survey site.

Table 3-2. Top Five Home-Based Work Origin-Destination Pairs - US 64 (Davidson Co.)

Origin County	Destination County	Number of Trips	Percentage of Trips
Davidson NC	Davidson NC	158	10.4%
Davidson NC	Randolph NC	36	2.4%
Randolph NC	Davidson NC	31	2.1%
Forsyth NC	Randolph NC	11	0.7%
Davidson NC	Forsyth NC	9	0.6%
Randolph NC	Mecklenburg NC	9	0.6%

Table 3-3. Top Five Home-Based Non-Work Origin-Destination Pairs - US 64 (Davidson Co.)

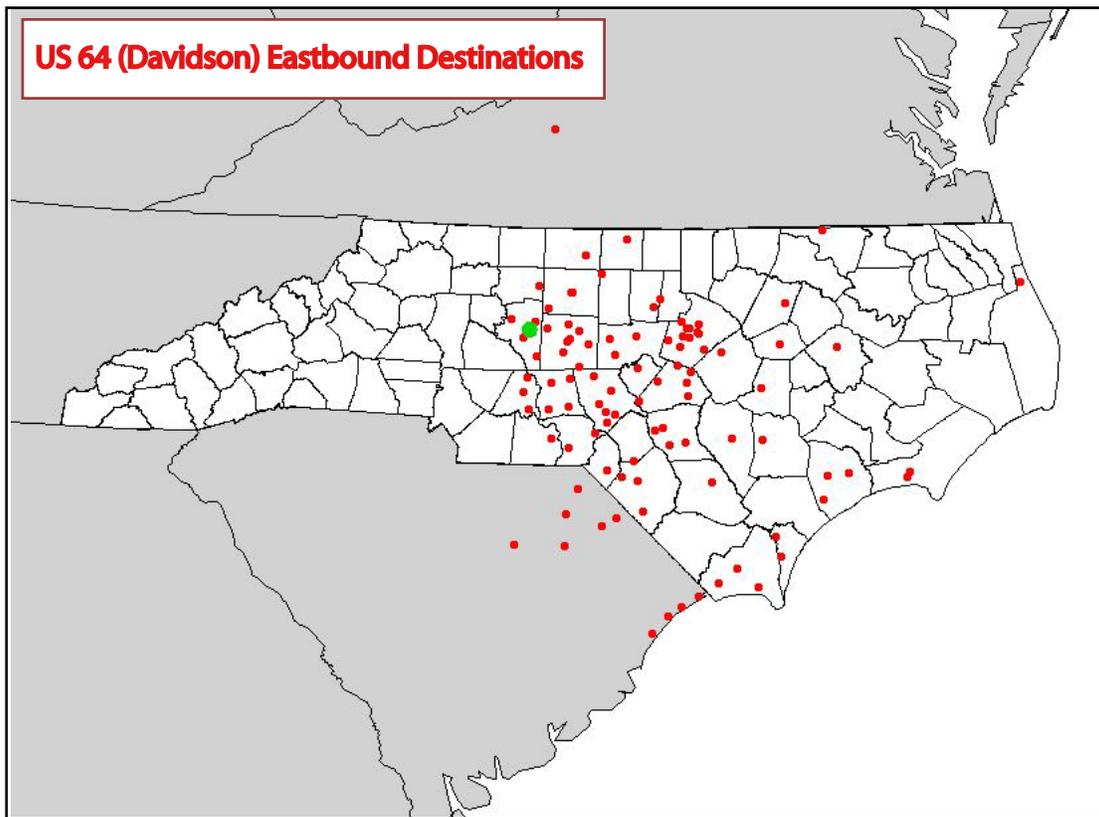
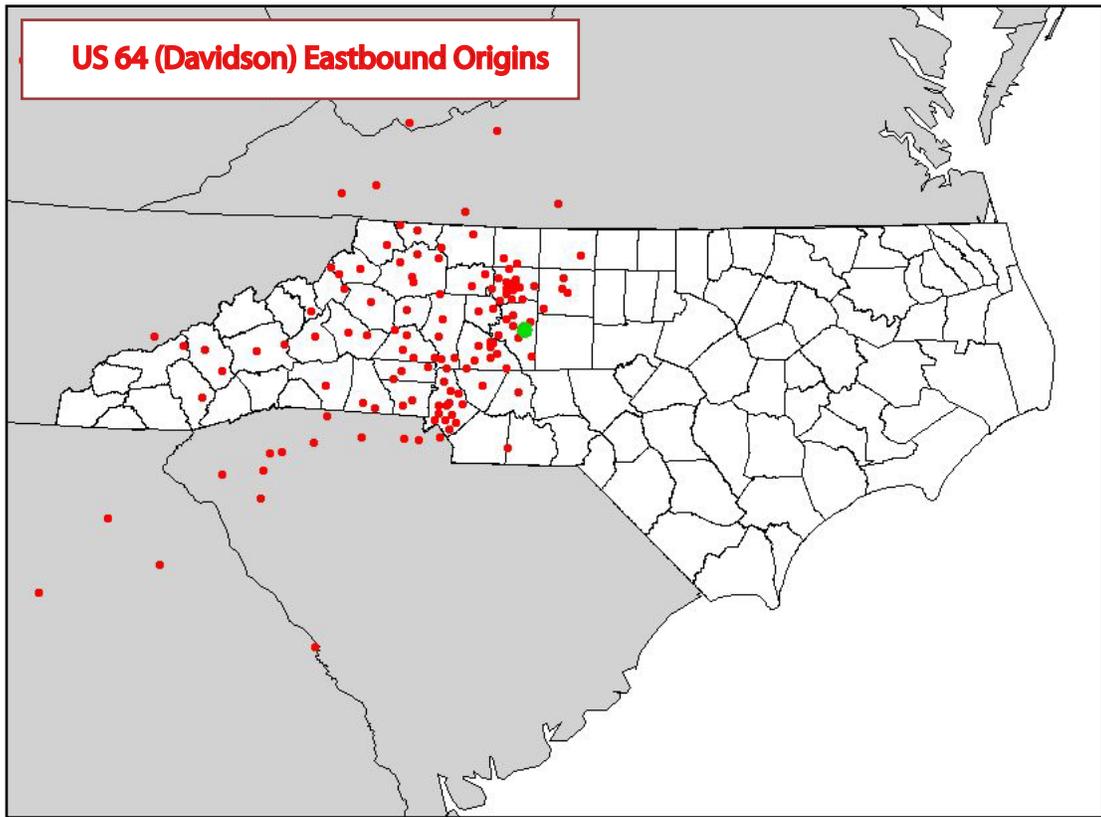
Origin County	Destination County	Number of Trips	Percentage of Trips
Davidson NC	Davidson NC	183	12.1%
Davidson NC	Randolph NC	30	2.0%
Randolph NC	Davidson NC	16	1.1%
Forsyth NC	Randolph NC	14	0.9%
Davidson NC	Forsyth NC	10	0.7%

Table 3-4. Top Five Non-Home-Based Origin-Destination Pairs - US 64 (Davidson Co.)

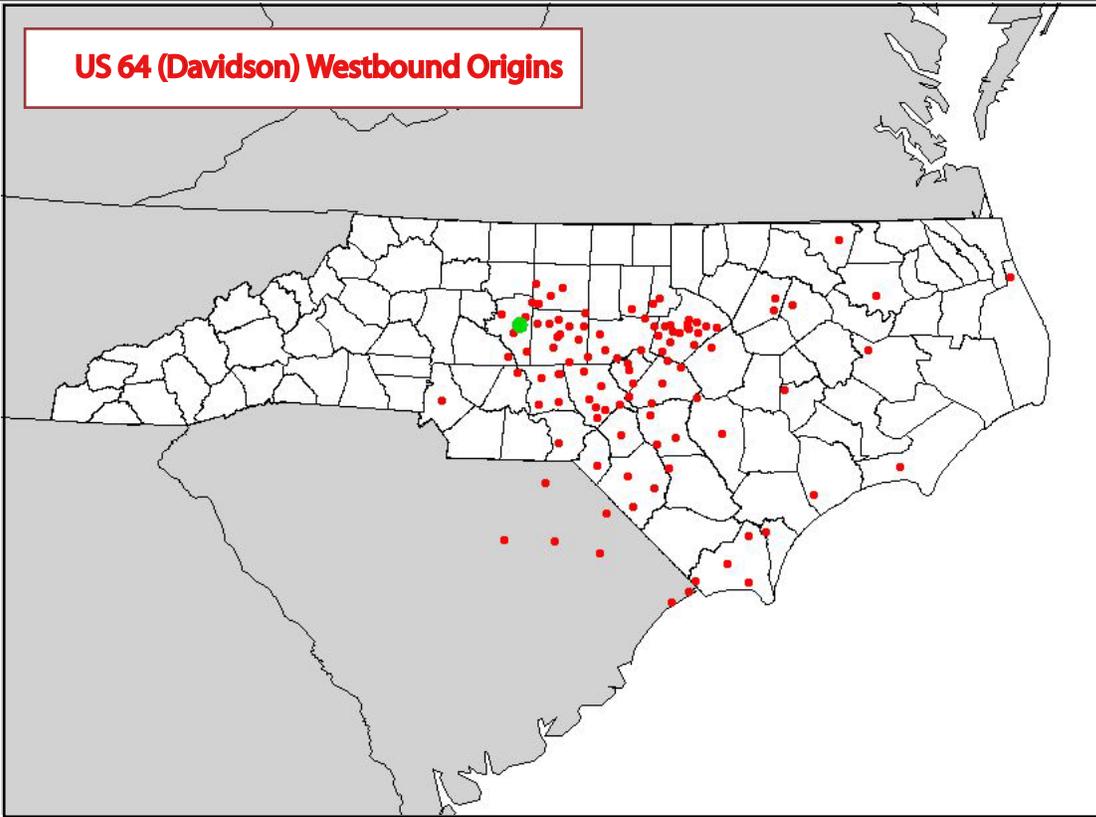
Origin County	Destination County	Number of Trips	Percentage of Trips
Davidson NC	Davidson NC	116	7.7%
Davidson NC	Randolph NC	26	1.7%
Randolph NC	Davidson NC	22	1.5%
Forsyth NC	Randolph NC	10	0.7%
Davidson NC	Forsyth NC	10	0.7%

A graphical representation of origin and destination locations for the drivers interviewed is shown in Figures 3-5 and 3-6.

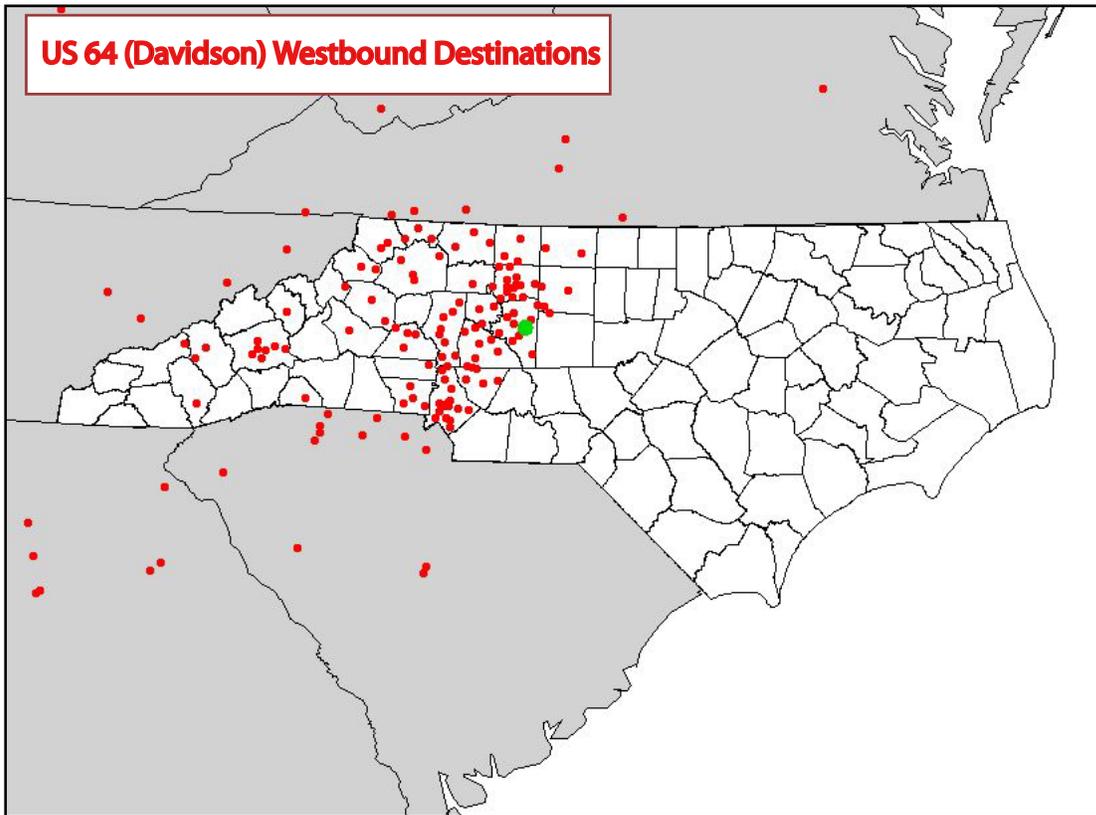
Figure 3-7 illustrates major origination / destination pairs for all trip purposes. Thicker lines connecting the origination and destination counties indicate that that trip pattern was identified as occurring with a high frequency. It is important to note that for this graphic the trip begin and end points were identified by counties. The trip connectors begin and end at county centroid locations, not specific zip codes or addresses.

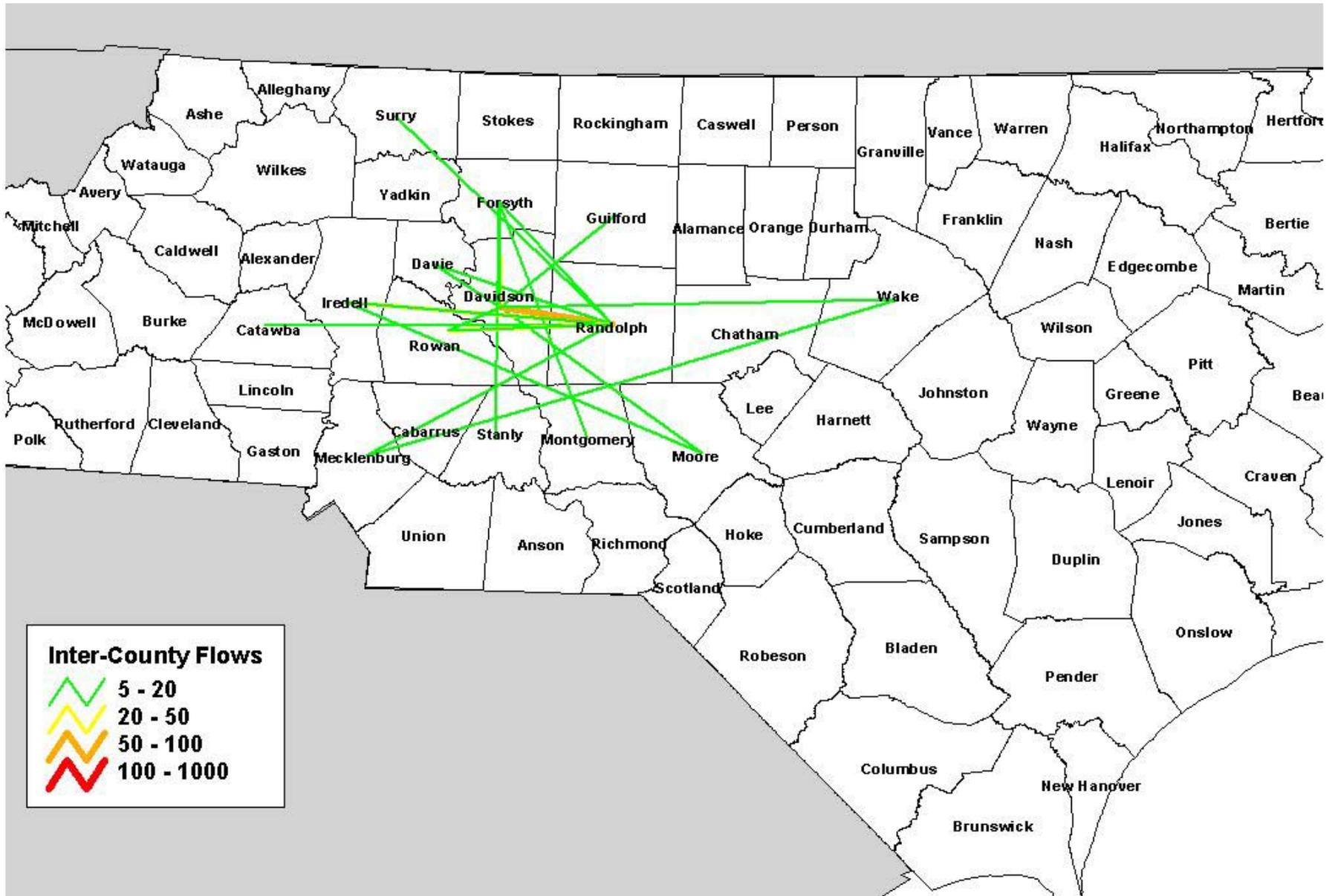


US 64 (Davidson) Westbound Origins



US 64 (Davidson) Westbound Destinations



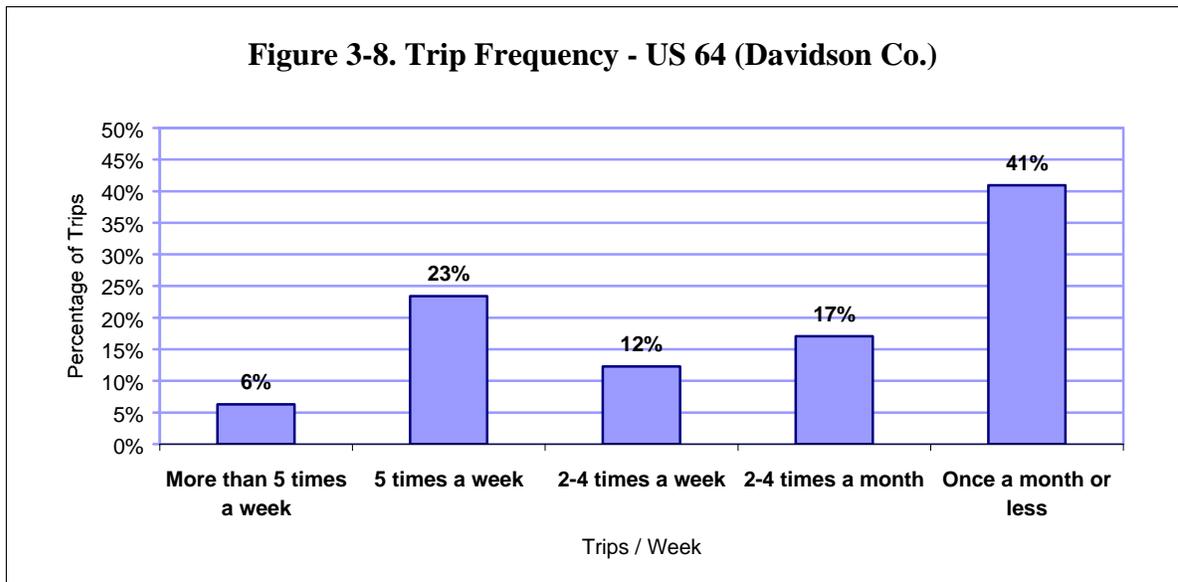


US 64 - NC 49
Corridor Study

Major Trip Origination-Destination Pairs for
US 64 (Davidson Co.)

Figure
3-7

The trip frequency results for the US 64 Davidson County site is illustrated in Figure 3-8. Approximately 23% of the surveyed drivers made the same trip 5 times per week.



Other routes typically used by those interviewed at this survey included Old US 64, Interstate 40, and Interstate 85.

3.2 US 64 (Chatham County)

3.2.1 Time of Operation

The date and time of the survey conducted on US 64 in Chatham County was Tuesday, October 21, 2003 from 8:00am until 6:00pm. The decision to postpone the interviews from the original date of October 14th was made jointly by the NCDOT and the consultant team due to the forecast of rain on the scheduled date. An hour lunch break was taken between 1:00pm and 2:00pm and no data was collected during this time. The surveys were terminated 30 minutes earlier than the planned time of 6:30pm due to reduced visibility caused by the site being covered in shadows.

3.2.2 Field Conditions

The surveys were conducted on a clear, sunny day. Figure 3-9 provides a photo of the survey site.

Figure 3-9. US 64 (Chatham Co.) Survey Site



3.2.3 Operational Issues

No motorists were stopped in the eastbound direction from 12:40pm to 12:45pm to allow the flagger to repair his sign.

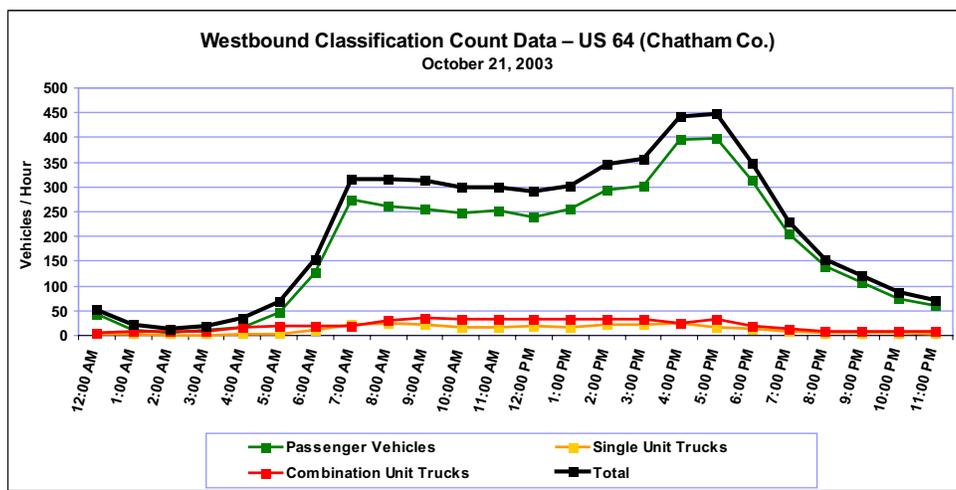
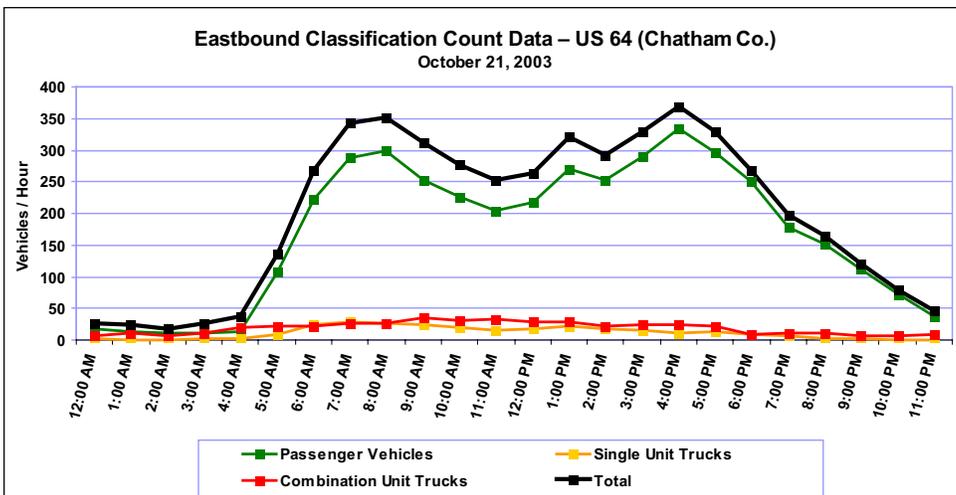
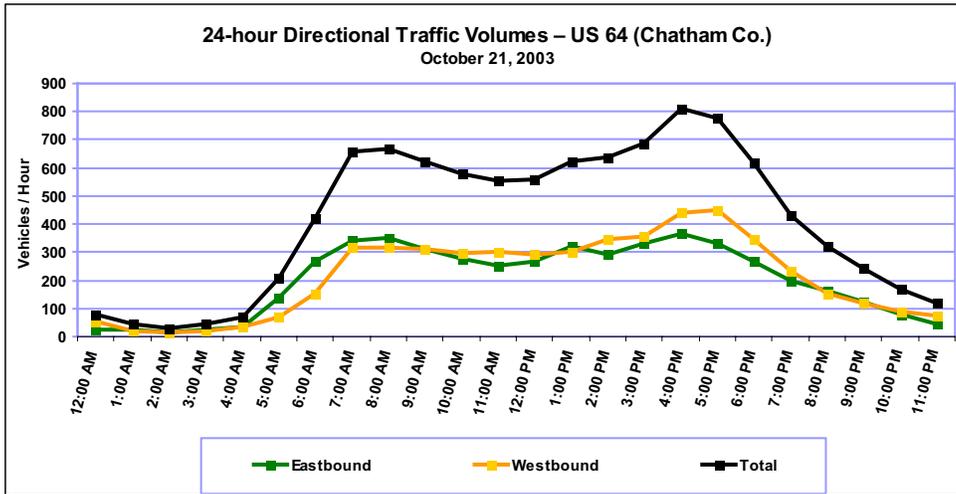
3.2.4 Traffic Count and Classification

The NCDOT conducted a vehicle classification count for a 24-hour period on the same day as the interview. The count was taken on US 64 east of Harold Hart Road. Figure 3-10 illustrates the 24-hour directional traffic flow by hour. The count categorized all traffic based on FHWA vehicle classifications (see Table 3-1). For the purpose of this document, three broad categories were identified as combination unit trucks, single unit trucks, and passenger vehicles. Passenger vehicles were identified as any non-commercial vehicle with less than 6 tires or a car or pickup with a trailer, which corresponds to Federal Highway Administration (FHWA) vehicle classifications 1, 2, 3, and 4. Single unit trucks were identified as a commercial vehicle without a trailer that has 6 or more tires or busses, which corresponds to FHWA vehicle classifications 5, 6, and 7. Combination vehicles were identified as multi-unit commercial vehicles, which corresponds to FHWA vehicle classifications 8, 9, 10, 11, 12, and 13.

The traffic count registered 9,964 vehicles traveling on this segment during the 24-hour period and 6,507 vehicles during the time the survey was operational. The classification count recorded 85% passenger cars, 5% single unit trucks, and 10% combination trucks over the 24-hour period.

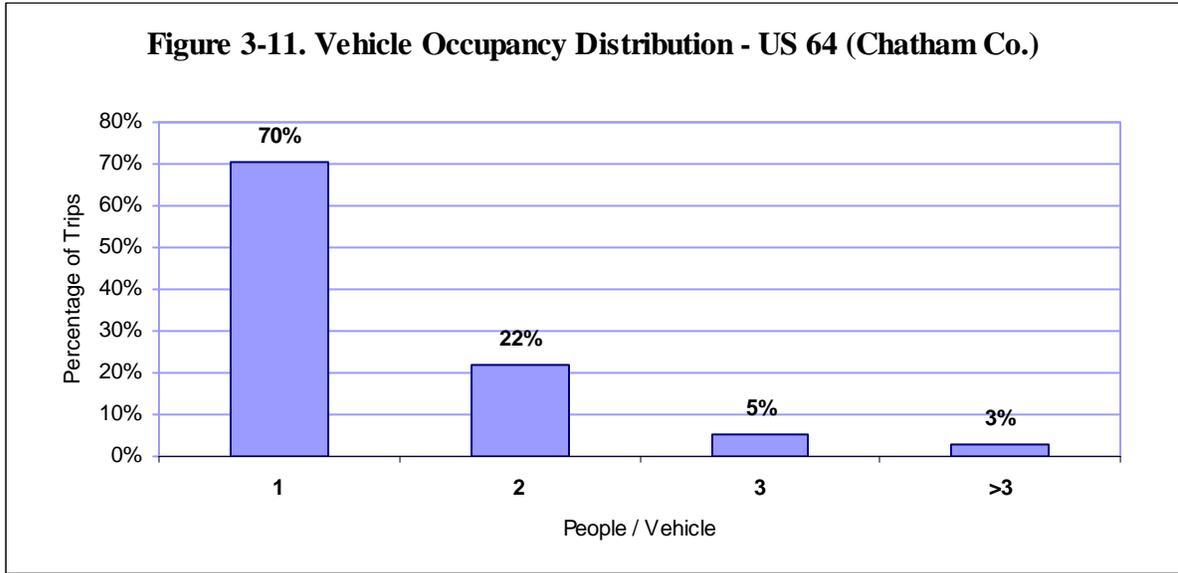
3.2.5 Surveys Collected

The total number of surveys completed for this site was 1,855. Based on the 24-hour traffic count, 18.6% of the total daily traffic and 28.5% of the traffic during the survey was interviewed.

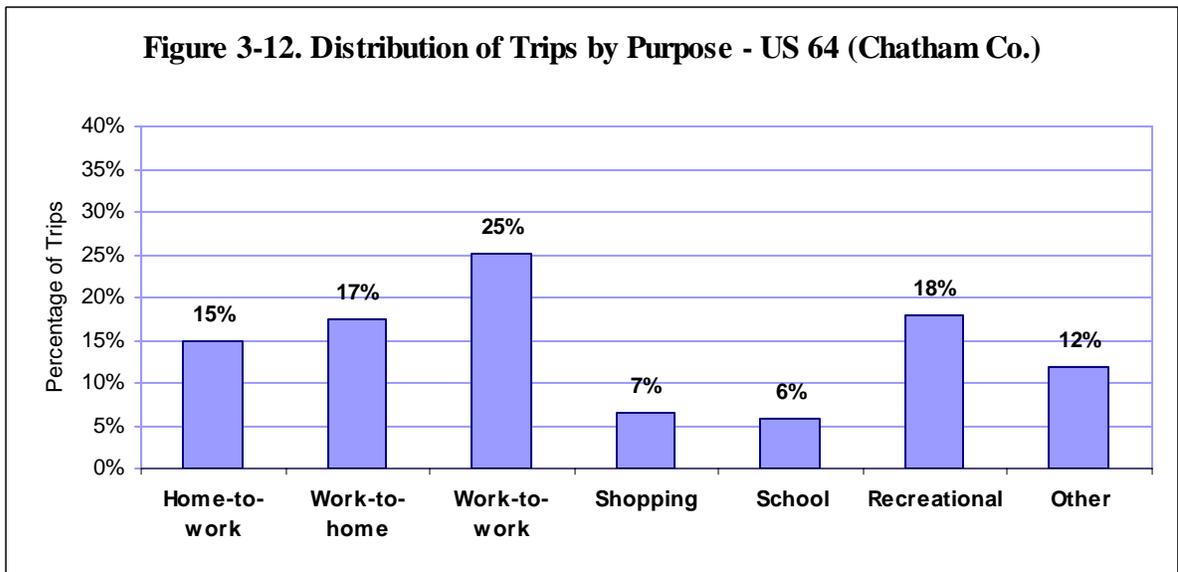


3.2.6 Survey Question Results

The average vehicle occupancy recorded at the US 64 Chatham County survey site was 1.4 people per vehicle. Figure 3-11 shows the vehicle occupancy distribution.



The trip purpose classification results for the US 64 Chatham County site is illustrated in Figure 3-12. The work-to-work (WW) trip was the most popular purpose, with approximately 25% of motorists making this kind of trip.



Major origination-destination patterns were identified for three trip purposes: home-based-work, home-based-non-work, and non-home-based. The top five origin-destination pairs by

trip purpose are shown in 3-5 through Table 3-7. Most trips, regardless of purpose, were made within the same county of the survey site.

Table 3-5. Top Five Home-Based Work Origin-Destination Pairs – US 64 (Chatham Co.)

Origin County	Destination County	Number of Trips	Percentage of Trips
Chatham NC	Chatham NC	169	9.1%
Randolph NC	Wake NC	34	1.8%
Chatham NC	Wake NC	26	1.4%
Wake NC	Chatham NC	26	1.4%
Wake NC	Guilford NC	25	1.3%

Table 3-6. Top Five Home-Based Non-Work Origin-Destination Pairs – US 64 (Chatham Co.)

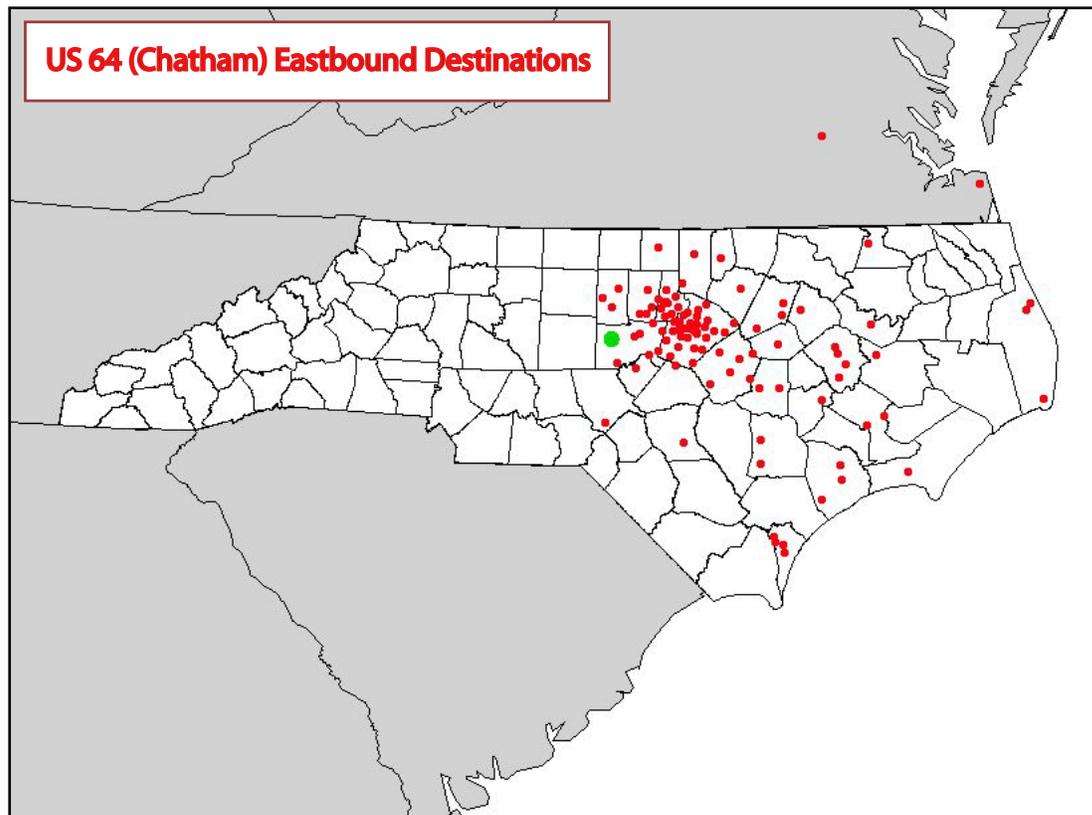
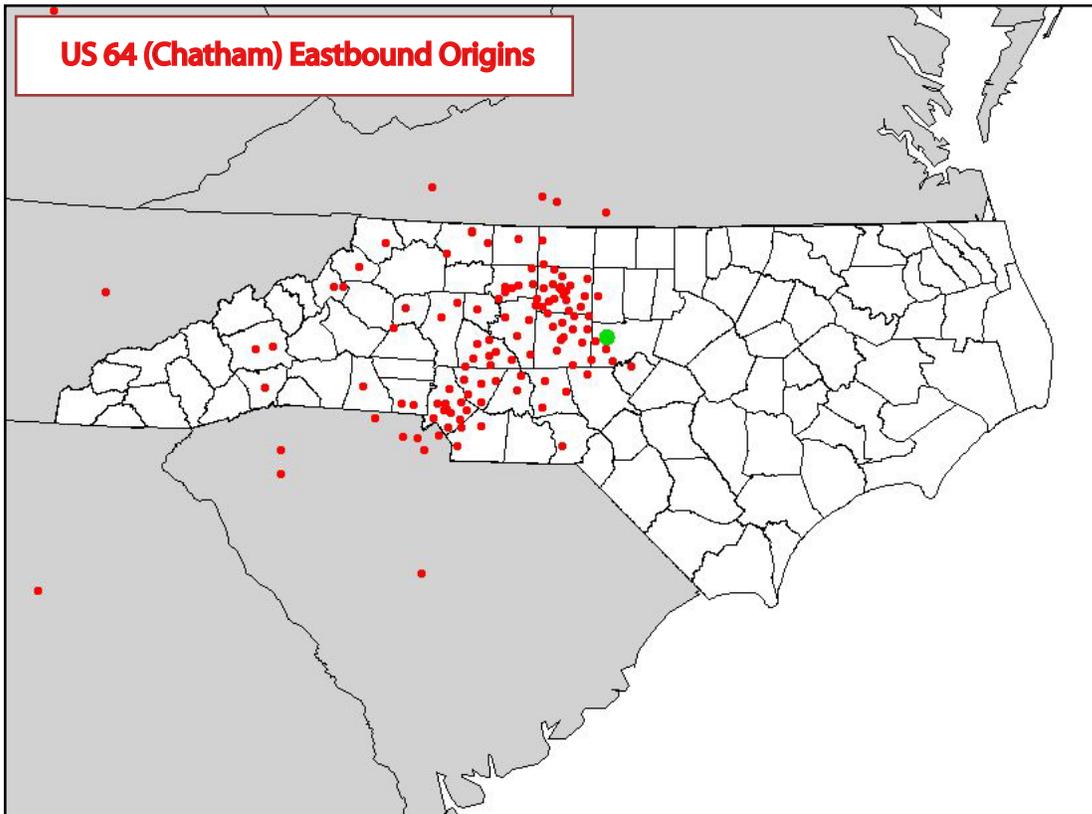
Origin County	Destination County	Number of Trips	Percentage of Trips
Chatham NC	Chatham NC	209	11.3%
Randolph NC	Wake NC	56	3.0%
Wake NC	Randolph NC	25	1.3%
Wake NC	Chatham NC	18	1.0%
Chatham NC	Wake NC	16	0.9%

Table 3-7. Top Five Non-Home-Based Origin-Destination Pairs – US 64 (Chatham Co.)

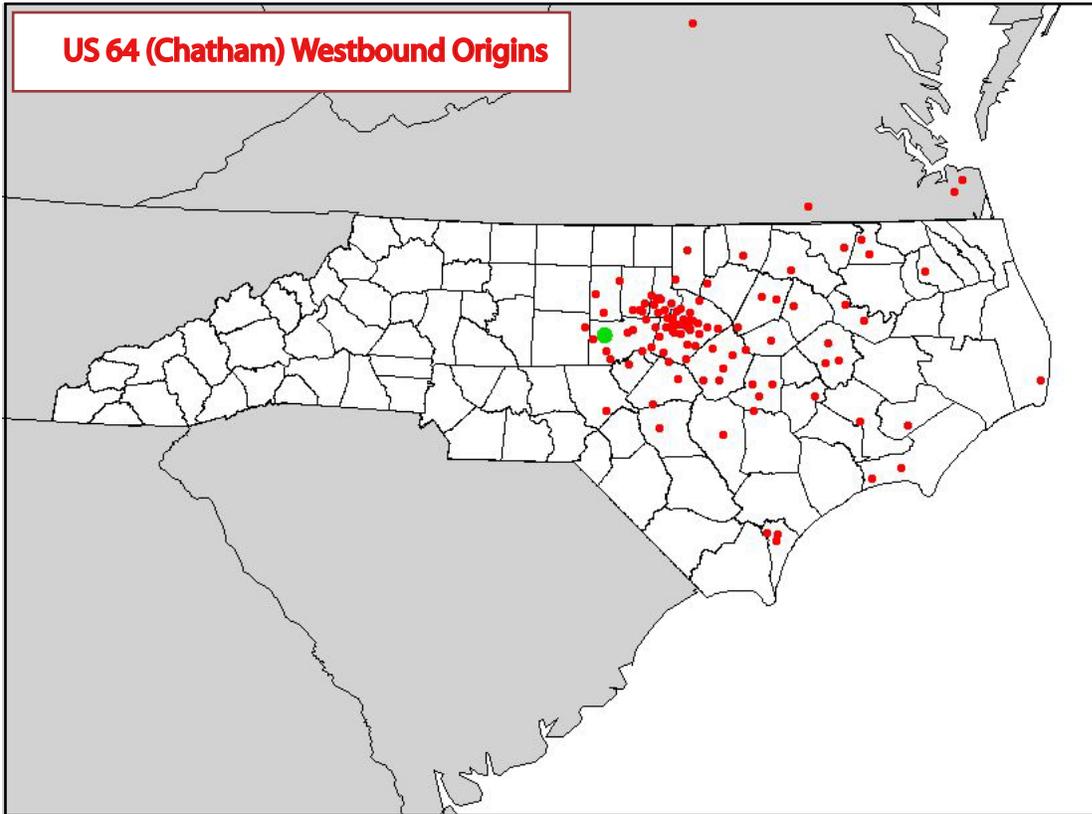
Origin County	Destination County	Number of Trips	Percentage of Trips
Chatham NC	Chatham NC	198	10.7%
Wake NC	Randolph NC	38	2.0%
Chatham NC	Wake NC	24	1.3%
Randolph NC	Wake NC	23	1.2%
Wake NC	Chatham NC	22	1.2%

A graphical representation of origin and destination locations for the drivers interviewed is shown in Figures 3-13 and 3-14.

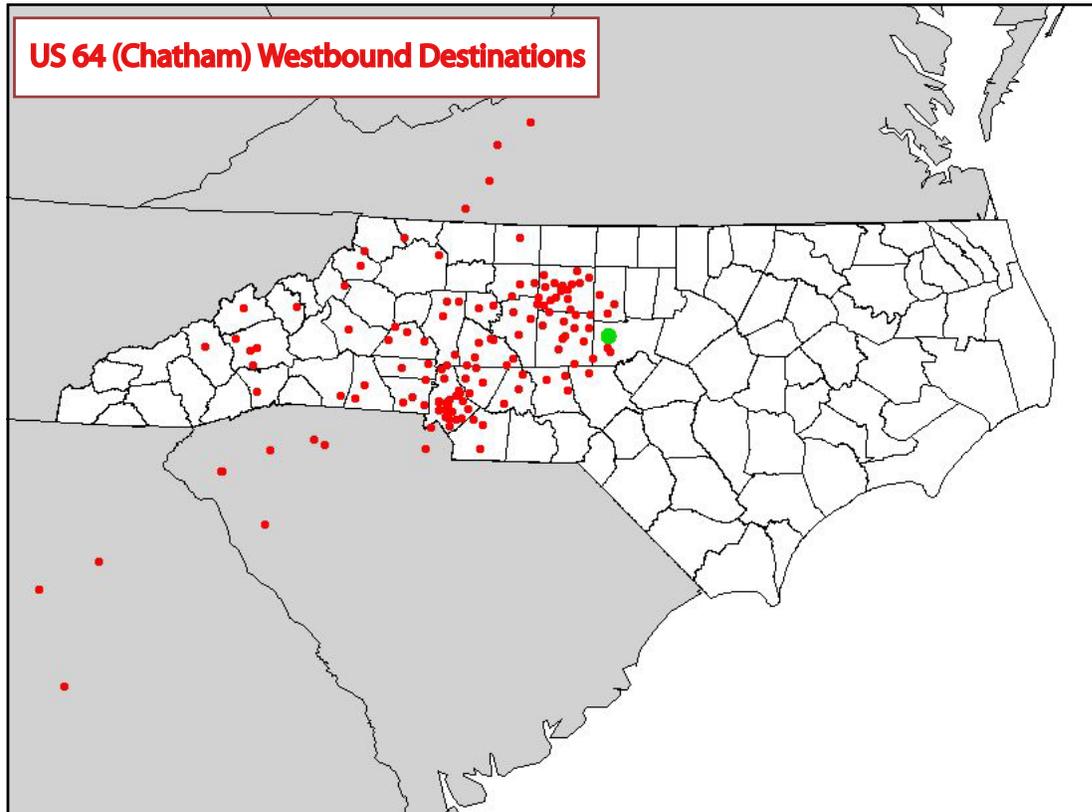
Figure 3-15 illustrates major origination / destination pairs for all trip purposes. Thicker lines connecting the origination and destination counties indicate that that trip pattern was identified as occurring with a high frequency. It is important to note that for this graphic the trip begin and end points were identified by counties. The trip connectors begin and end at county centroid locations, not specific zip codes or addresses.

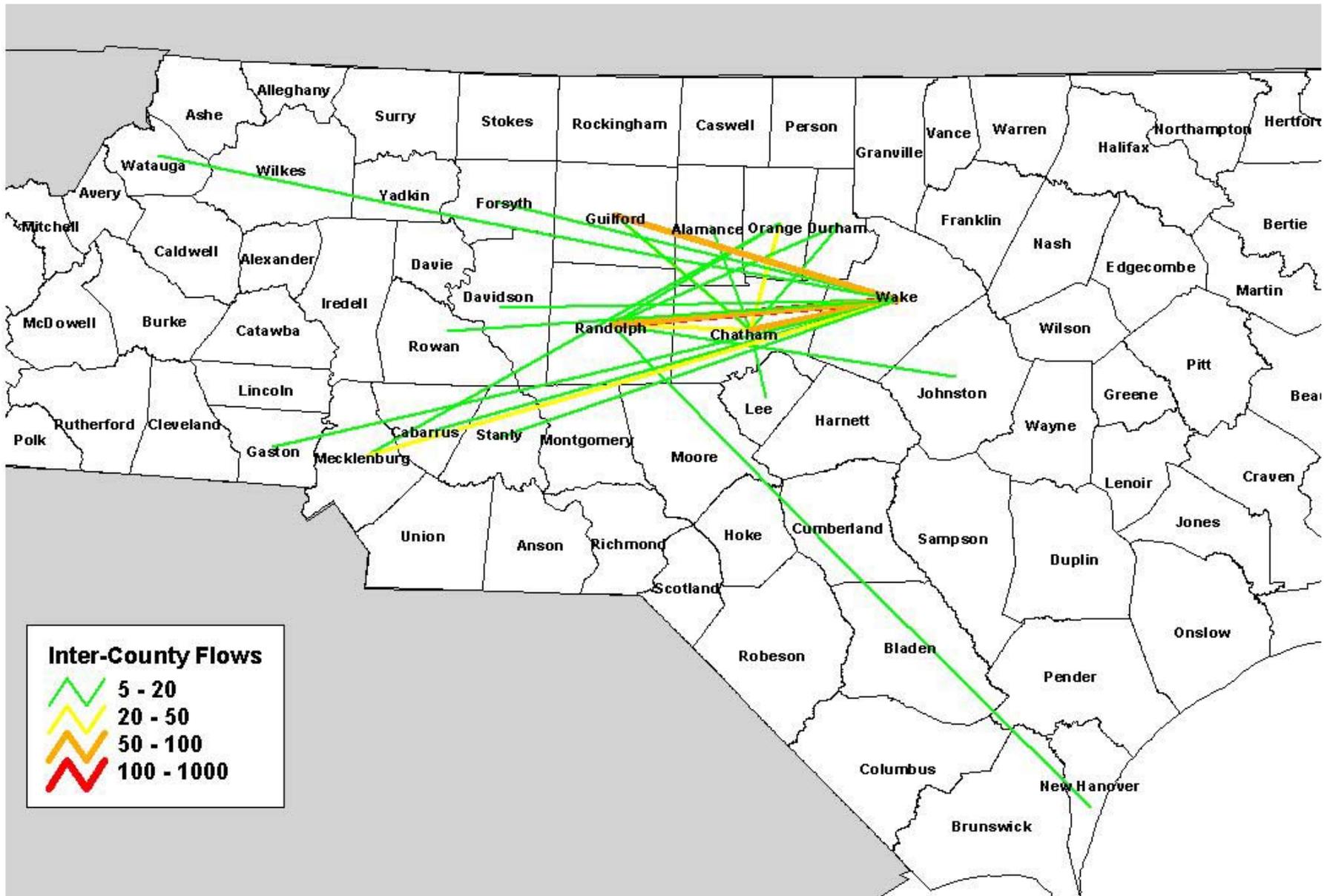


US 64 (Chatham) Westbound Origins



US 64 (Chatham) Westbound Destinations



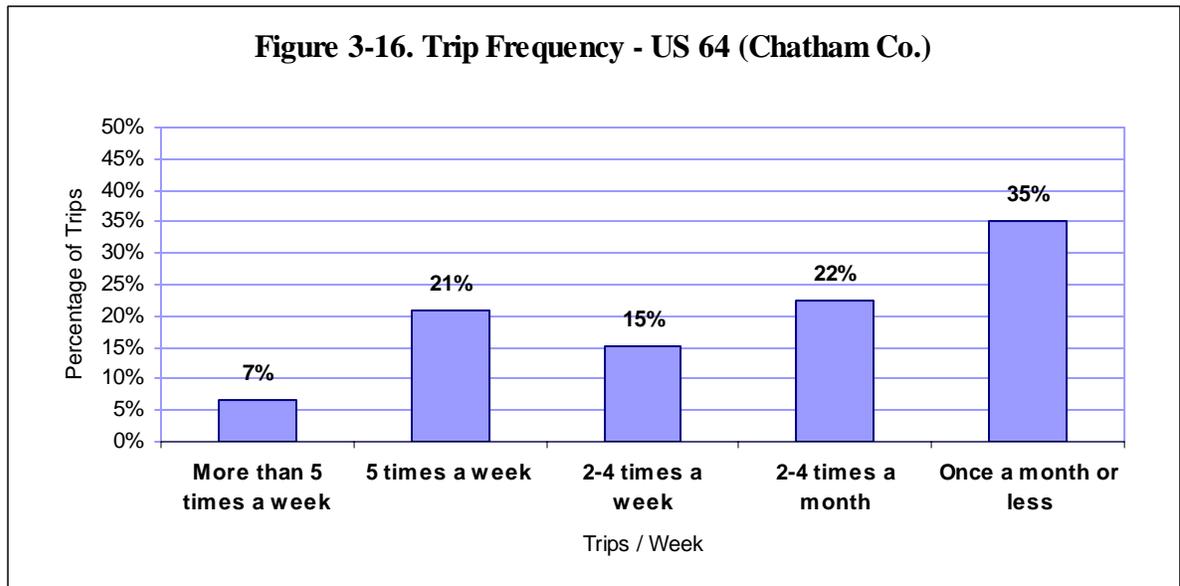


US 64 - NC 49
Corridor Study

Major Trip Origination-Destination Pairs for
US 64 (Chatham Co.)

Figure
3-15

The trip frequency results for the US 64 Chatham County site is illustrated in Figure 3-16. Approximately 21% of the surveyed drivers made the same trip 5 times per week.



Other routes typically used by those interviewed at this survey included Interstate 40 and Interstate 85.

3.3 NC 49 (Stanly County)

3.3.1 Time of Operation

The date and time of the survey conducted on NC 49 was Thursday, October 16, 2003 from 8:15am until 5:50pm. An hour lunch break was taken between 1:00pm and 2:00pm and no data was collected during this time. The surveys were terminated 40 minutes earlier than the planned time of 6:30pm due to the safety risk of the sun being in the motorists' eyes.

3.3.2 Field Conditions

The survey was conducted on a clear, sunny day. Figure 3-17 provides a photo of the survey site.

Figure 3-17. NC 49 (Stanly Co.) Survey Site

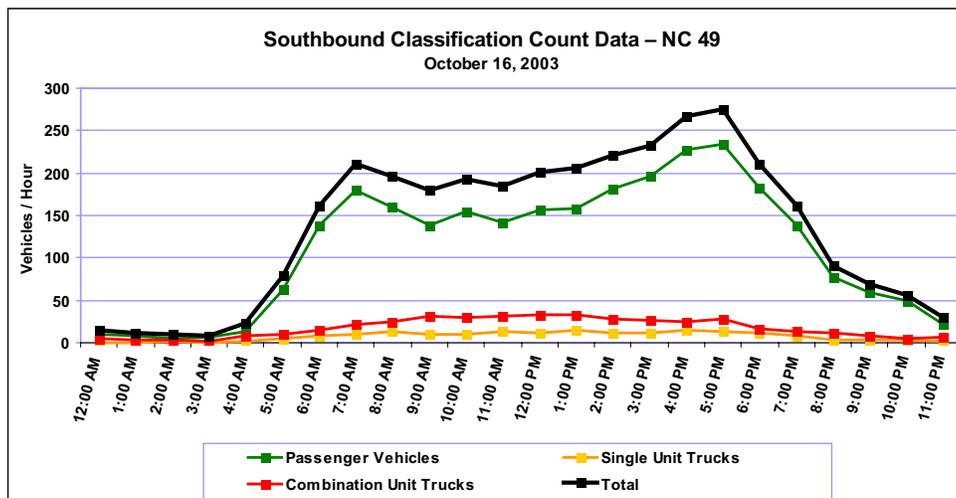
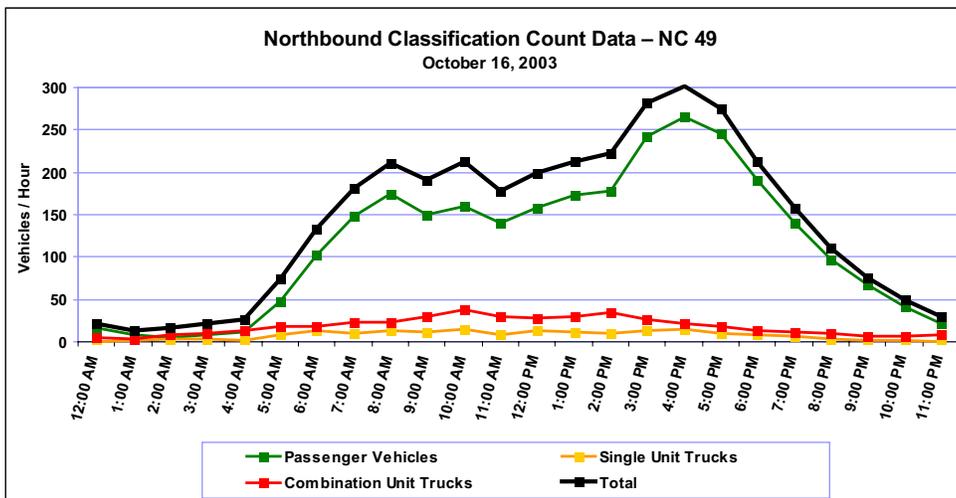
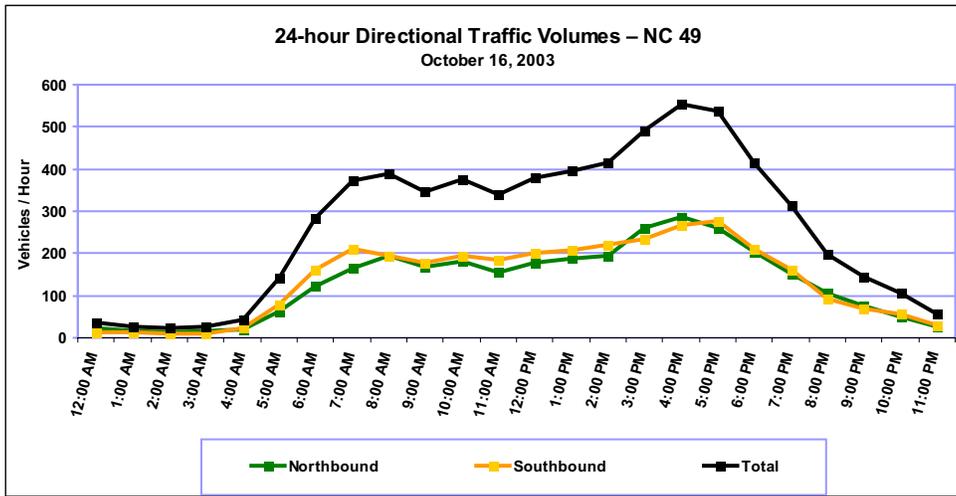


3.3.3 Operational Issues

No operational issues or major traffic disruptions occurred during the survey period.

3.3.4 Traffic Count and Classification

The NCDOT conducted a vehicle classification count for a 24-hour period on the same day as the interviews. The count was taken on NC 49 North of Tucker Town Road (SR 2543). Figure 3-18 illustrates the 24-hour directional traffic flow by hour. The count categorized all traffic based on FHWA vehicle classifications (see Table 3-1). For the purpose of this document, three broad categories were identified as combination unit trucks, single unit trucks, and passenger vehicles.



Passenger vehicles were identified as any non-commercial vehicle with less than 6 tires or a car or pickup with a trailer, which corresponds to Federal Highway Administration (FHWA) vehicle classifications 1, 2, 3, and 4. Single unit trucks were identified as a commercial vehicle without a trailer that has 6 or more tires or busses, which corresponds to FHWA vehicle classifications 5, 6, and 7. Combination vehicles were identified as multi-unit commercial vehicles, which corresponds to FHWA vehicle classifications 8, 9, 10, 11, 12, and 13.

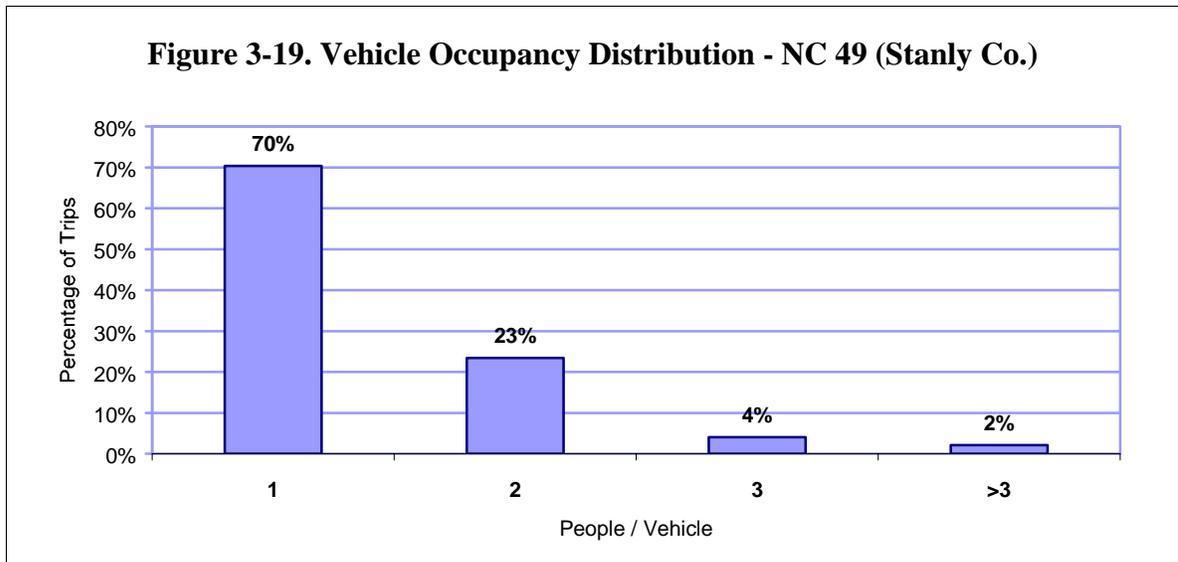
The traffic count registered 6,708 vehicles traveling on this segment during the 24-hour period and approximately 3,832 during the time the survey was operational. The classification count recorded 82% passenger cars, 5% single unit trucks, and 13% combination trucks over the 24-hour period.

3.3.5 Surveys Collected

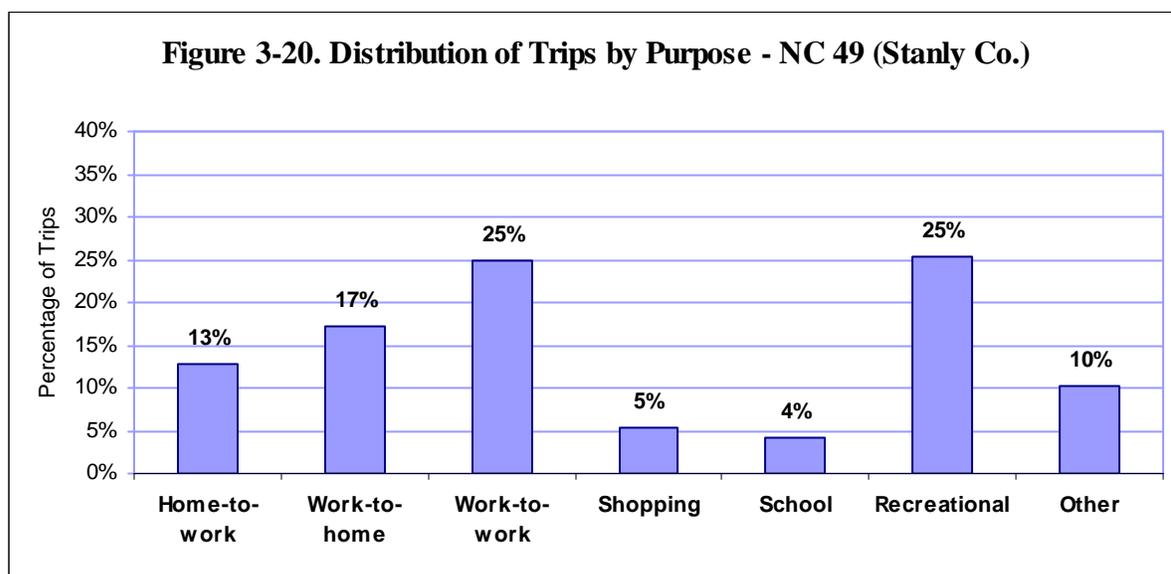
The total number of surveys completed for this site was 1,519. Based on the 24-hour traffic count, 22.6% of the total daily traffic and 39.6% of the traffic during the survey was interviewed.

3.3.6 Survey Question Results

The average vehicle occupancy recorded at the NC 49 Stanly County survey site was 1.4 people per vehicle. Figure 3-19 provides the vehicle occupancy distribution.



The trip purpose classification results for the NC 49 site is illustrated in Figure 3-20. Recreational and work-to-work were the most popular purposes, with approximately 25% of motorists making each of these kinds of trips.



Major origination-destination patterns were identified for three trip purposes: home-based-work, home-based-non-work, and non-home-based. The top five origin-destination pairs by trip purpose are shown in 3-8 through Table 3-10. As expected, most trips, regardless of purpose, were made within the same county of the survey site.

Table 3-8. Home-Based Work Origin-Destination Pairs - NC 49 (Stanly Co.)

Origin County	Destination County	Number of Trips	Percentage of Trips
Stanly NC	Stanly NC	49	3.2%
Davidson NC	Stanly NC	27	1.8%
Stanly NC	Davidson NC	24	1.6%
Mecklenburg NC	Wake NC	18	1.2%
Mecklenburg NC	Randolph NC	17	1.1%

Table 3-9. Home-Based Non-Work Origin-Destination Pairs - NC 49 (Stanly Co.)

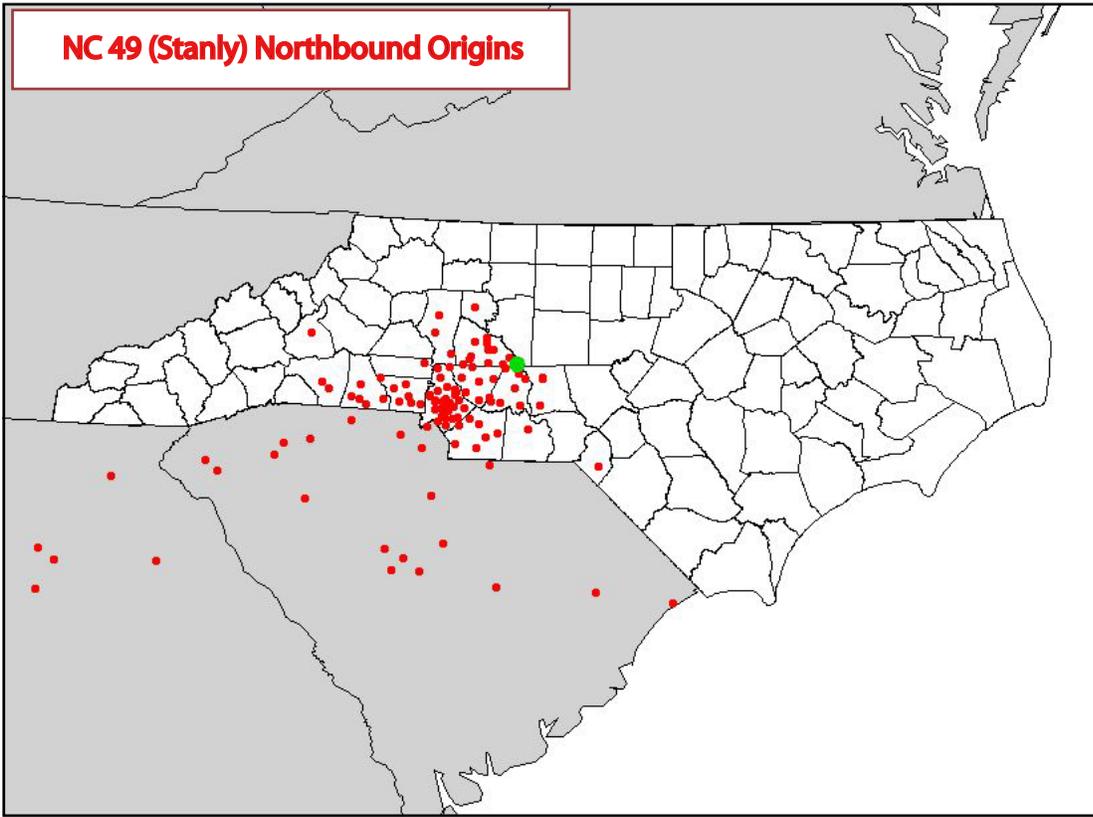
Origin County	Destination County	Number of Trips	Percentage of Trips
Stanly NC	Stanly NC	70	4.6%
Mecklenburg NC	Wake NC	28	1.8%
Rowan NC	Stanly NC	25	1.6%
Davidson NC	Stanly NC	24	1.6%
Stanly NC	Davidson NC	24	1.6%
Stanly NC	Rowan NC	24	1.6%

Table 3-10. Non-Home-Based Origin-Destination Pairs - NC 49 (Stanly Co.)

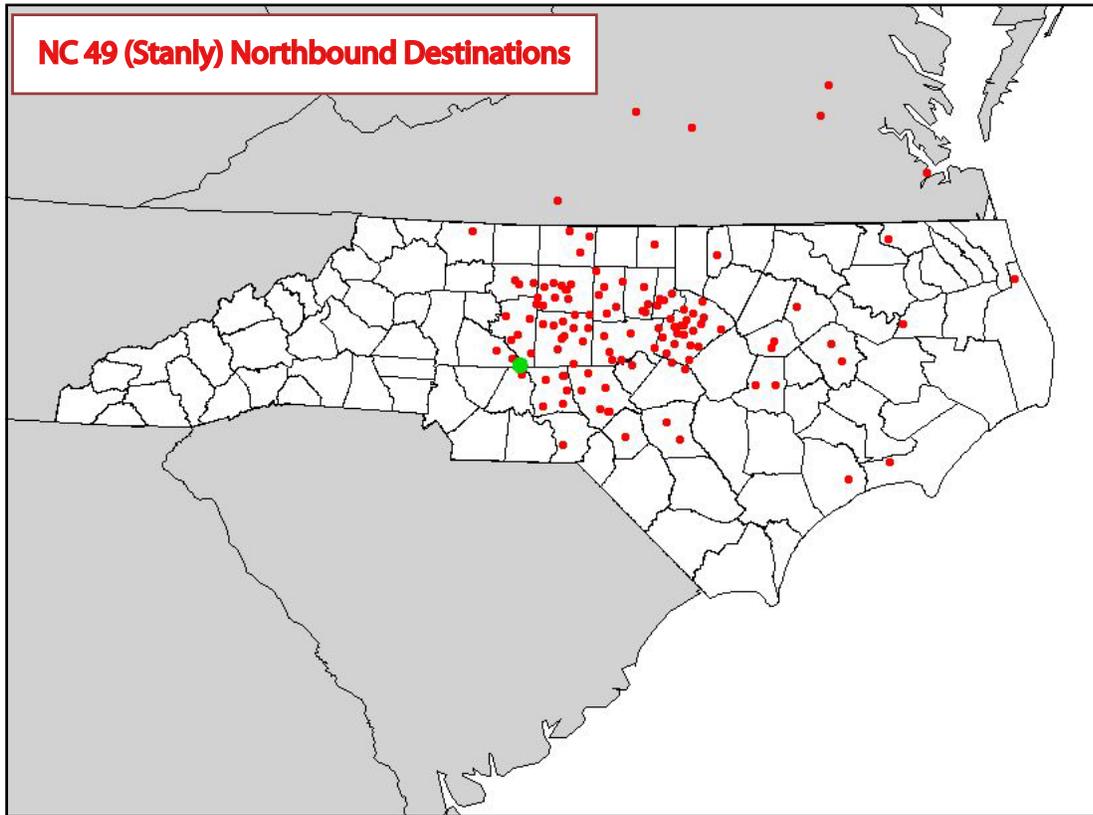
Origin County	Destination County	Number of Trips	Percentage of Trips
Stanly NC	Stanly NC	46	3.0%
Davidson NC	Stanly NC	35	2.3%
Stanly NC	Rowan NC	27	1.8%
Randolph NC	Mecklenburg NC	20	1.3%
Stanly NC	Davidson NC	19	1.3%

A graphical representation of origin and destination locations for the drivers interviewed at the NC 49 survey site in Stanly County is shown in Figures 3-21 and 3-22. Figure 3-23 illustrates major origination / destination pairs for all trip purposes. Thicker lines connecting the origination and destination counties indicate that that trip pattern was identified as occurring with a high frequency. It is important to note that for this graphic the trip begin and end points were identified by counties. The trip connectors begin and end at county centroid locations, not specific zip codes or addresses.

NC 49 (Stanly) Northbound Origins



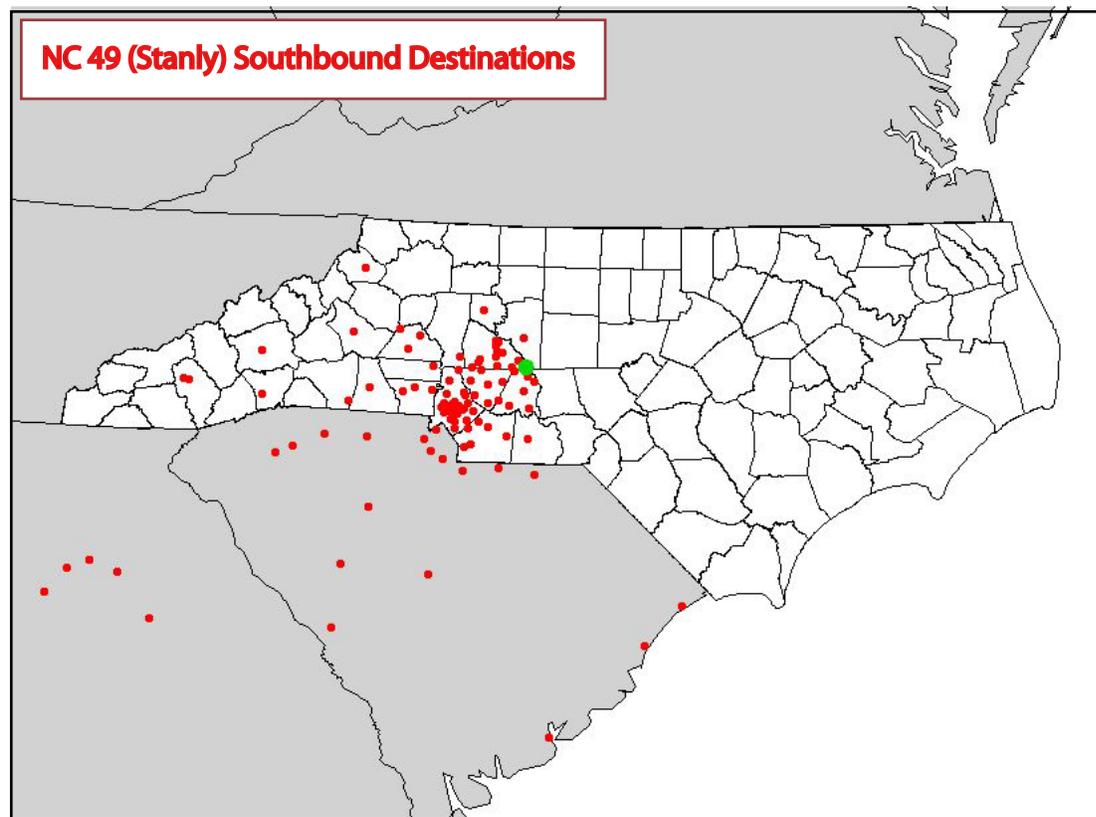
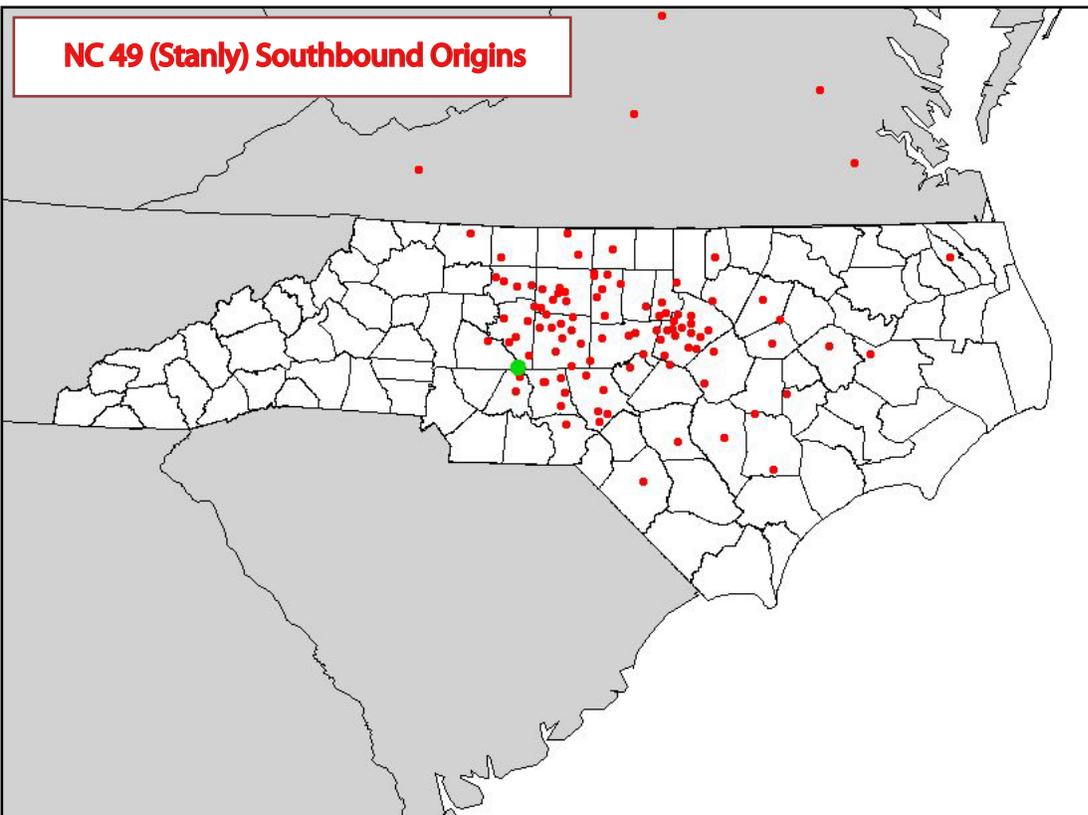
NC 49 (Stanly) Northbound Destinations

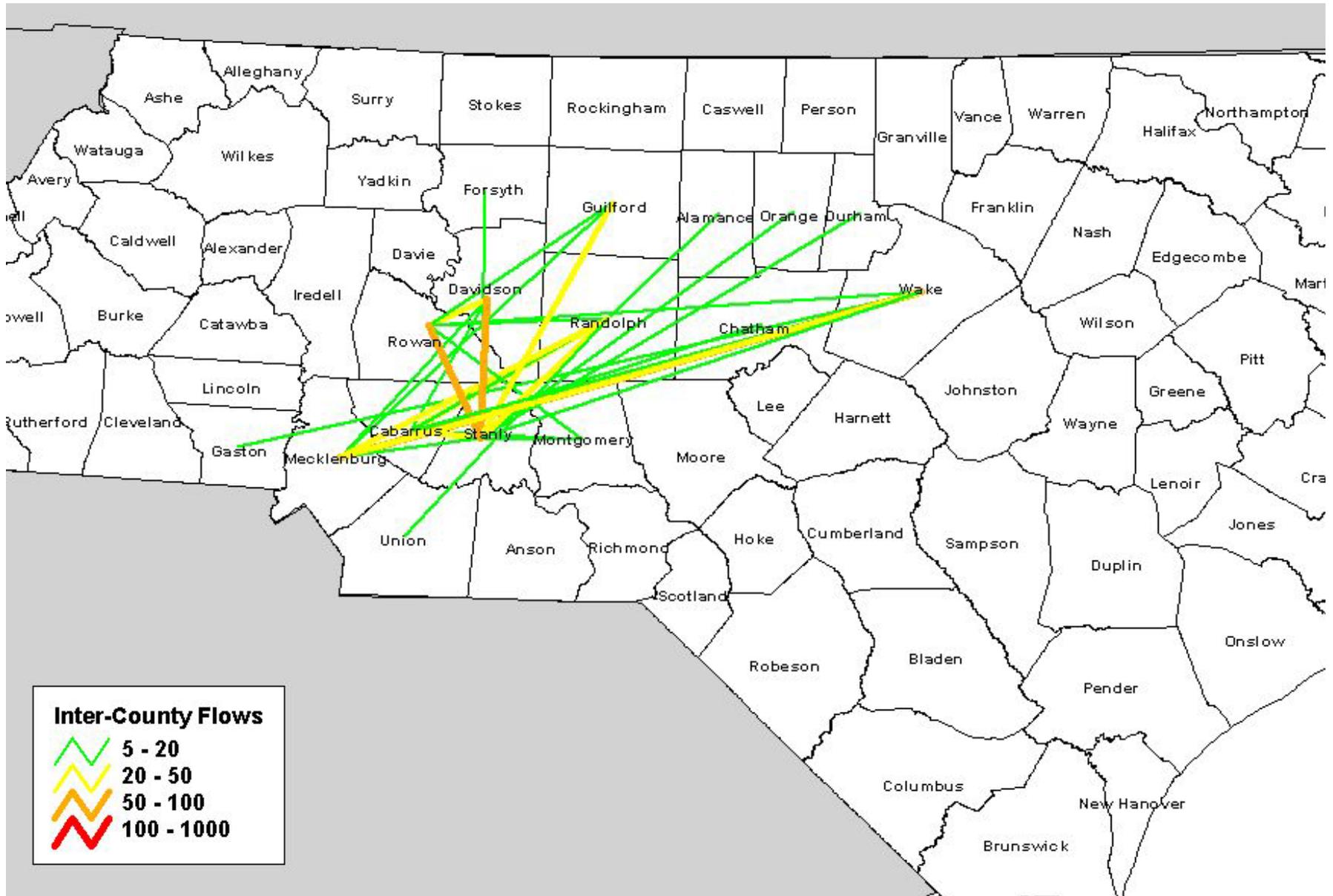


US 64 - NC 49
Corridor Study

Trip Origin and Destination Distribution for
NC 49 Northbound (Stanly Co.)

Figure
3-21



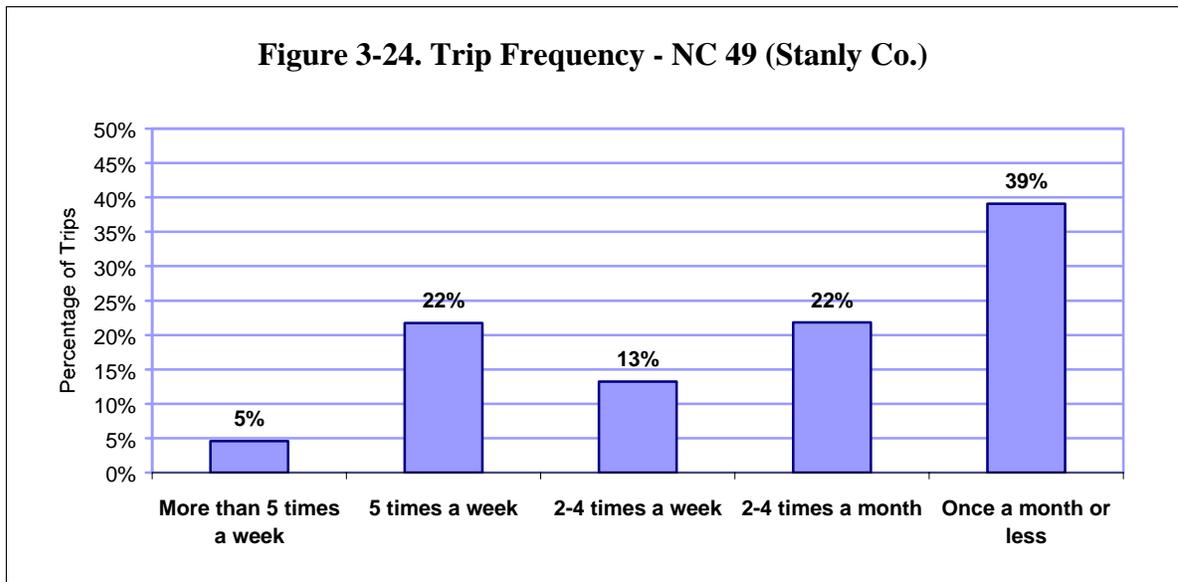


US 64 - NC 49
Corridor Study

Major Trip Origination-Destination Pairs for
NC 49 (Stanly Co.)

Figure
3-23

The trip frequency results for the NC 49 Stanly County site is illustrated in Figure 3-24. Approximately 22% of the surveyed drivers made the same trip 5 times per week.



Other routes typically used by those interviewed at this survey included Interstate 40, Interstate 85, US 220, NC 24, and NC 27.