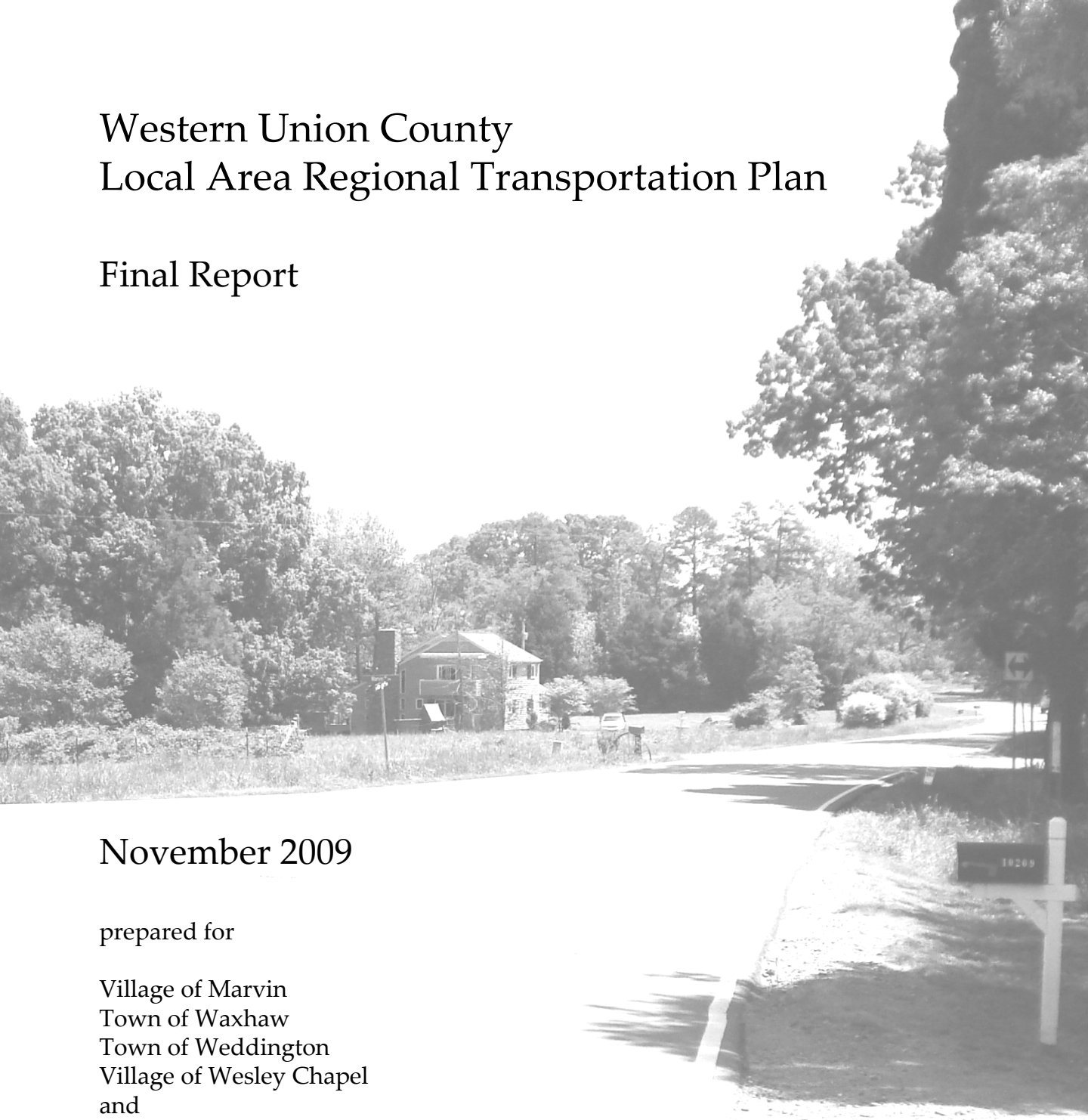
Western Union County
Local Area Regional Transportation Plan

Final Report



November 2009

prepared for

Village of Marvin
Town of Waxhaw
Town of Weddington
Village of Wesley Chapel
and
Centralina Council of Governments
Mecklenburg-Union Metropolitan Planning Organization

by
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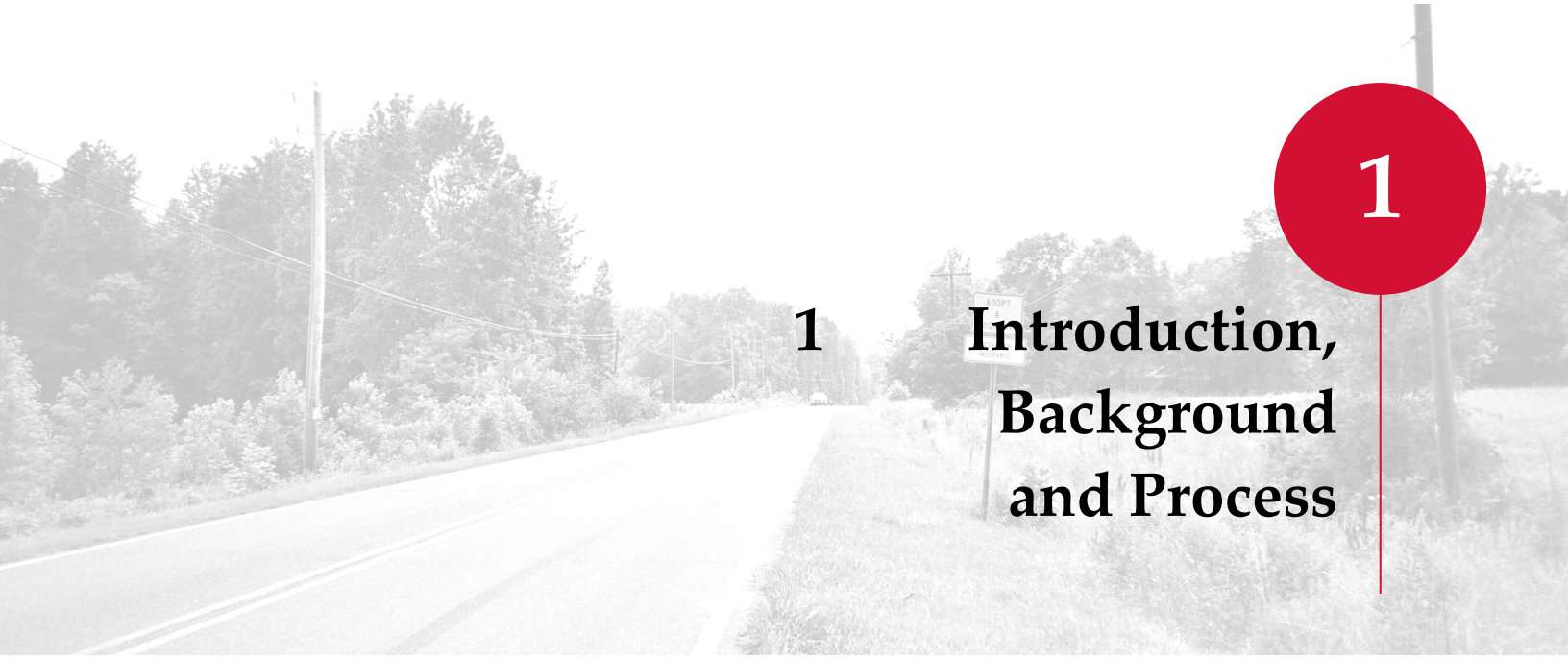

1 Introduction, Background and Process

1.1 Purpose of the Plan

The four member jurisdictions (Village of Marvin, Town of Waxhaw, Town of Weddington, and Village of Wesley Chapel) of the Union County Local Area Regional Transportation Plan (LARTP) Group are collectively and individually feeling the strains of tremendous growth pressure from the greater Charlotte region. As one of the fastest growing counties in the state, Union County is challenged with trying to mitigate the many impacts of this rapid growth, while proactively planning for its future. This is especially true for the towns in the western portion of the county. While growth and development bring many benefits to the community (such as new investment and jobs), they also threaten many of the values the communities want to preserve, particularly their small town character and rich rural heritage. Some of the most immediate and significant impacts felt by area residents are on the region's transportation system. The member jurisdictions of the LARTP Group, together with the Centralina Council of Governments and the Mecklenburg-Union Metropolitan Planning Organization, have collaborated to create a unified transportation plan to put themselves in a position of knowledge and strength when confronting growth, rather than a position of reaction and catching-up.

Past approaches to addressing the long-term transportation needs of the area have emphasized maintaining (or attempting to maintain) reasonable level of service for motorists. While impacts on quality of life have been recognized, the importance of accommodating traffic growth has typically dominated transportation decisions. Functional needs, which are obviously important, often override environmental, aesthetic, and even local economic implications. Widening a road in accordance with traditional design standards to accommodate projected traffic loads is a classic example. In many cases, there is no alternative but to increase the capacity of a road. However, the affected community may not have had an adopted plan to influence how the road is designed. Alternative modes of travel also often have been a secondary consideration, depending on available budgets and other

constraints. New developments are sometimes approved without a true understanding of direct or cumulative impacts on the transportation system, and without considering future mobility challenges. This study offers the opportunity to develop an integrated and forward-thinking transportation and land-use plan.

1.2 Study Area

Figure 1 shows the boundaries of the study area for the LARTP. In general, the study area is comprised of the Village of Marvin, the Town of Waxhaw, the Town of Weddington, and the Village of Wesley Chapel. Because this plan is a study of transportation systems, it is not confined to municipal boundaries. There are a number of locations between municipalities that fall under the jurisdiction of Union County. The plan also considers the area's transportation systems within the broader regional context, with special attention paid to how the LARTP area connects with and is impacted by neighboring Union County and Monroe, Mecklenburg County and Charlotte, and South Carolina to the west.

1.3 Summary of Key Elements

The LARTP is a multimodal plan – it attempts to balance the needs of various modes of transportation, including vehicles, bicycles, pedestrians, and transit. Since the area's roadways are currently experiencing congestion and safety issues, and because those issues are projected to get much worse in the future, the focus of the plan is on roadways and intersections. Creating viable options for using alternative modes may alleviate congestion as well as provide positive health and quality of life benefits for the community.

The key elements of the LARTP are:

- *Roadways* – Includes the Thoroughfare Plan, which plans for the area's long-range roadway needs, and the Intersection Plan, which makes recommendations for capacity and safety improvements for targeted intersections in the study area.
- *Bicycle and Pedestrians* – Opportunities for improving bicycle and pedestrian facilities and amenities are identified.
- *Land Use Policies and Ordinances* – Recommendations are made for new and amended land use policies and ordinances to understand and mitigate impacts of development and promote more efficient land use patterns.

To facilitate discussion and analysis of these elements, this report is organized into the following sections:

- Existing Conditions (Where We Are Now)
- Future Conditions (Where We Are Headed)
- Recommendations (Where We Want To Be), and
- Implementation Plan (How We're Going To Get There)

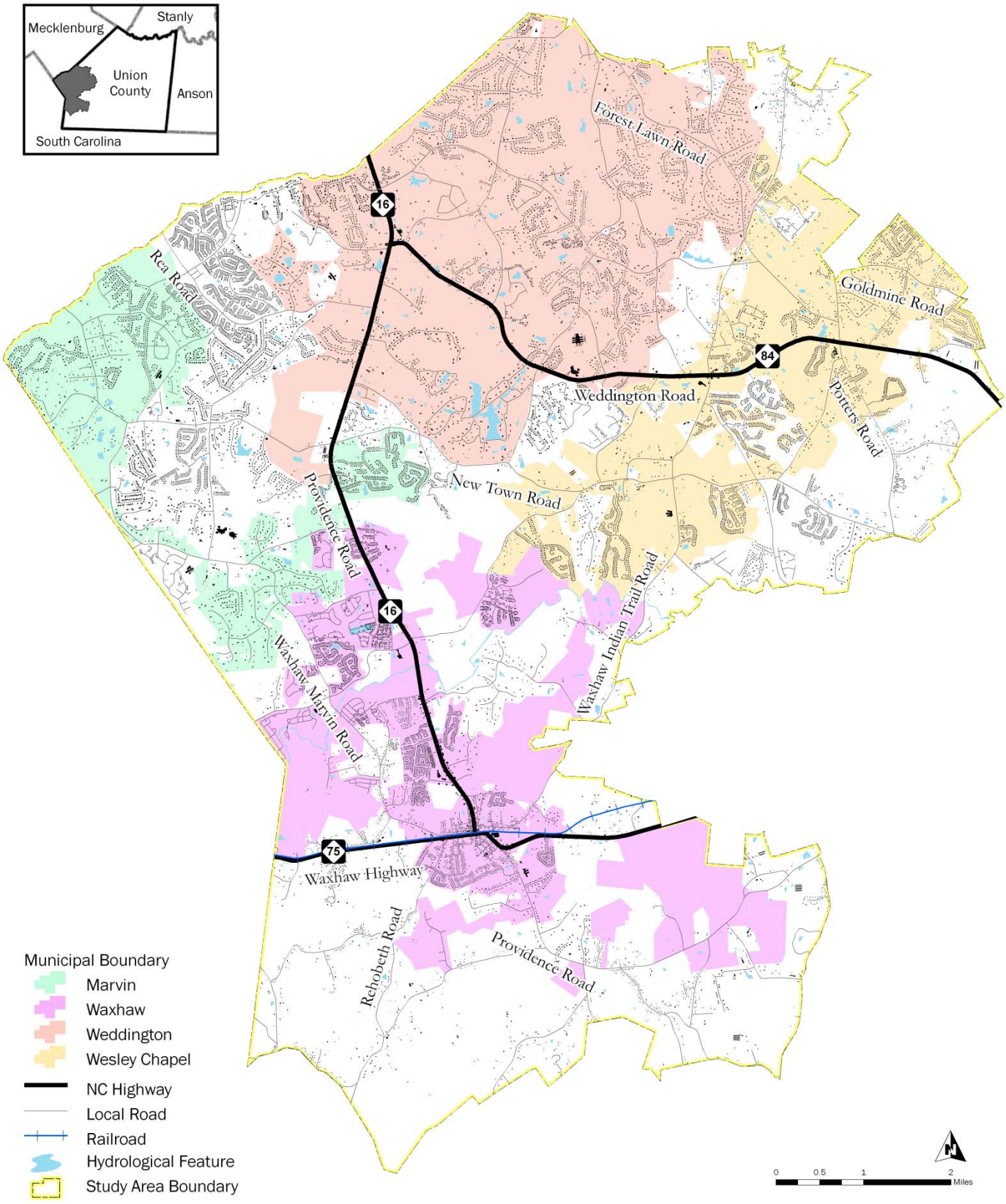

Figure 1: Study Area

Western Union County Local Area Regional Transportation Plan

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1.4 Regional Planning Context

Many transportation planning decisions are carried out at the regional level, especially where federal and state transportation improvement funds are being considered. The four LARTP member jurisdictions fall under the purview of the Mecklenburg-Union Metropolitan Planning Organization (MUMPO), one of seventeen metropolitan planning organizations (MPO) in North Carolina. MPOs are federally-mandated for communities with an urbanized population of greater than 50,000. They are comprised of local government and transportation authorities charged with ensuring that transportation funding is allocated to projects and programs in a "continuing, cooperative and comprehensive" manner. MUMPO serves the greater Charlotte urbanized area, of which western Union County is a part, and has seventeen voting member jurisdictions and bodies. The Village of Marvin is the only municipality of the four in the LARTP study area that is not a voting member of MUMPO because it does not yet meet the minimum population threshold of 5,000.

MUMPO provides a number of services and administers a variety of programs, but perhaps the most visible is development of MUMPO's Long Range Transportation Plan (LRTP). The LRTP is a long-range blueprint for defining the MUMPO region's future transportation needs and developing projects and programs to meet those needs. The LRTP is a comprehensive and multimodal plan, considering roadway, highway, transit, rail, bicycle and pedestrian improvements, as well as other programs designed to offset the impacts of growth. The MUMPO LRTP is a fiscally-constrained plan which includes projects that have been modeled and meet the transportation needs and air quality standards for the MUMPO region. The LRTP is adopted by MUMPO and the North Carolina Department of Transportation (NCDOT) as the long-term mobility blueprint for the MUMPO region.

Another important project at the regional level is development of the MUMPO's Comprehensive Transportation Plan (CTP). The CTP is a relatively new plan developed by the NCDOT that is replacing the traditional thoroughfare plan. Like the LRTP, the CTP is a long-range multimodal plan. But unlike the LRTP, the CTP is not fiscally-constrained. Because it is not fiscally-constrained, the CTP includes more projects than the LRTP.

MUMPO is currently in the process of updating the LRTP and developing the CTP (updating the MUMPO thoroughfare plan). The projects and recommendations developed as part of the Western Union County Local Area Regional Transportation Plan will feed directly into both of these MUMPO plans. Having a unified, adopted plan for this area will be beneficial for the four municipalities as they participate in developing the MUMPO's plans.

1.5 Public and Stakeholder Involvement

The LARTP was developed with a significant amount of public and stakeholder involvement, recognizing that implementation of the plan will require buy-in from stakeholders from each of the four member communities. The following groups and activities were instrumental in development of the LARTP:

Steering Committee: Elected and appointed officials from each of the four member jurisdictions, together with staff and representatives from the development community and other local interests met monthly to develop each of the components of the plan.

Technical Committee: Staff from each of the four member jurisdictions, the Centralina Council of Governments, and the Mecklenburg-Union Metropolitan Planning Organization (MUMPO), met regularly with the consultant team to develop the technical aspects of the plan and "reality check" recommendations.

Public Meetings: Citizens in the study area were invited to participate at various points in the process. Attempts were made to provide information and input opportunities at various locations and settings to reach the widest audience possible. These were the main public events:

- *Public Workshops:* Two public workshops were held in October and November of 2008, one in Wesley Chapel and one in Weddington. Participants worked in small groups to identify issues and discuss potential solutions. They also participated in a key pad polling exercise designed to gauge opinion on a number of transportation and land use concepts (the results of the key pad polling exercise are found in Appendix A).

- *Community Event Booths:* On November 1, 2008, booths were set up at the Waxhaw Farmers Market and the Marvin Chili Cook-Off. Information was distributed about the plan and booth visitors had the opportunity to ask questions and provide feedback similar to the public workshops.

- *Public Meeting:* A public meeting was held May 27, 2009 to present the draft recommendations to the public and get feedback.

Project Website: A project website (www.lartp.org) was developed and maintained to disseminate information and provide another outlet for public comments.

2

2 Existing Conditions: *Where We Are Now*

2.1 Introduction

Union County is the fastest growing county in North Carolina and is one of the ten fastest growing counties in the United States. The western half of the county, and especially those communities adjacent to the Mecklenburg County line, has absorbed most of this growth. While this explosive growth can bring benefits to a community it can also take a tremendous toll on its infrastructure.

The communities within the LARTP study area have a rich rural heritage. The area's roadways were developed for local, rural traffic, with many of today's major thoroughfares developed originally as farm-to-market roads. Now those roads (such as Providence Road/NC 16 and NC 84) are handling significant amounts of not only local traffic, but also commuter traffic, since most of the area's residents do not work within the study area. Many of the area's roads also continue to carry large farm vehicles, which can pose safety concerns as vehicles attempt to pass them on roads with no center turn lanes and narrow or nonexistent shoulders. One of the main challenges facing these communities is developing a transportation system that adequately serves the vehicular needs of their residents and workers without compromising the rural heritage and small-town atmosphere.

This section details the existing transportation conditions in Western Union County, including describing the operating conditions of the existing transportation network in the project vicinity, the surrounding roadway network, weekday AM and PM peak hour traffic volumes, intersection performance, and collision analysis. Additionally, this chapter describes the public bicycle facilities, pedestrian facilities, and the public transit network.

2.2 Travel Characteristics

The communities within the study area include small towns that are rural in nature. While there is travel between different locations within the study area, there is a heavy focus of travel to and from Charlotte, which as a large urban area, attracts trips related to employment, recreation, and shopping. Based on US Census information, shown in Table 1, approximately three-quarters of all residents within the study area work outside the study area, with almost 60 percent working in Charlotte. Given the distance from the study area to outside locations of employment, the average travel time to work for residents living within the study area is approximately 30 minutes.

Table 1: Journey to Work Data

Work Location	Study Area	Monroe	Other Union County	Charlotte	South Carolina	Elsewhere	Average Travel Time to Work
Study Area Residents	26%	0%	3%	57%	6%	9%	31 minutes

Source: US Census (2000)

As shown in Table 2, there are limited mobility options within the study area, as approximately 84% of all residents drive alone to work. Alternative modes, including carpool, walk, bicycle, and transit comprise 11% of all work-related travel. While the Census does not record information on travel mode use for any other trip purposes, anecdotal evidence indicates that an overwhelming majority of travel into, out of, and within the study area occurs via the use of private automobiles. This is based on a combination of the land use patterns in the area, distance between destinations, and the lack of viable alternative transportation options. As such, the primary focus of the following existing conditions sections primarily address vehicle traffic conditions.

Table 2: Travel Mode to Work Data

Travel Mode	Drive Alone	Carpool	Walk/ Bicycle	Transit	Work at Home
Study Area Residents	84%	10%	<1%	<1%	5%

Source: US Census (2000)

2.3 Functional Classification

Different streets in the overall roadway system are designed to perform specific functions with the goal of minimizing traffic and land use conflicts, improving safety, and enhancing mobility. The road classifications described below are based on the definitions used by NCDOT for the Comprehensive Transportation Plan and their Strategic Highway Corridors. The classifications are detailed below and summarized in Table 3.

The main roadway classifications considered for the Western Union County LARTP are Thoroughfares (Major and Minor), Collectors, and Locals. There are possible sub-classifications within each. As higher-level roadways designed to carry more vehicles with more controlled access, there are no roads designated as freeways or expressways in the study area. The current functional classifications in the study area are illustrated in Figure 2. Note that in Figure 2, Boulevards are shown as Major Thoroughfares.

Freeway

Freeways feature characteristics of high mobility and low accessibility, with full control of access. Carrying through traffic and controlling access points are of supreme importance of roadways classified in this category. Typically, freeways have a minimum of four travel lanes, are median-divided facilities, and have posted speed limits of 55 miles per hour or greater. Traffic signals and

driveways are not permitted, as access is only permitted at existing or new grade-separated interchanges.

Expressway

Expressways feature characteristics of high mobility and moderate to low accessibility. Moving through-traffic is an important element; however, access points are allowed, but limited. Traffic signals are not permitted, but driveway connections are permitted. It is recommended that driveways be consolidated if possible, and spaced at least 1,000 feet from one another. Typically, roadways in this category have a minimum of four travel lanes, are median-divided facilities, and have posted speed limits of 55-60 miles per hour.

Boulevard

Boulevards feature characteristics of moderate mobility and low to moderate accessibility. The relationship between mobility and accessibility is more balanced than that of freeways and expressways. Access control may range from limited to no control. Driveway connections are permitted. These conflict points are recommended to be consolidated if at all possible, and spaced at 1,000 feet from one another. While signalized intersections may accommodate all movements, driveways should be restricted to right-in/right-out facilities. Typically, roadways in this category have a median, but may have as few as two lanes. They have posted speed limits of 30-55 miles per hour. Traffic signals are allowed and recommended at ½ mile intervals.

Thoroughfare

Thoroughfares (major and minor) feature characteristics of moderate to low mobility and high accessibility. There is no control of access in the category. Traffic signals are allowed and recommended at ½ mile intervals. Driveways are allowed with full movement, but are still recommended to be consolidated or shared if possible. This category includes all roads with a two-way center left-turn lane, but no roads with medians. Speed limits are posted between 25-55 miles per hour.

Collector

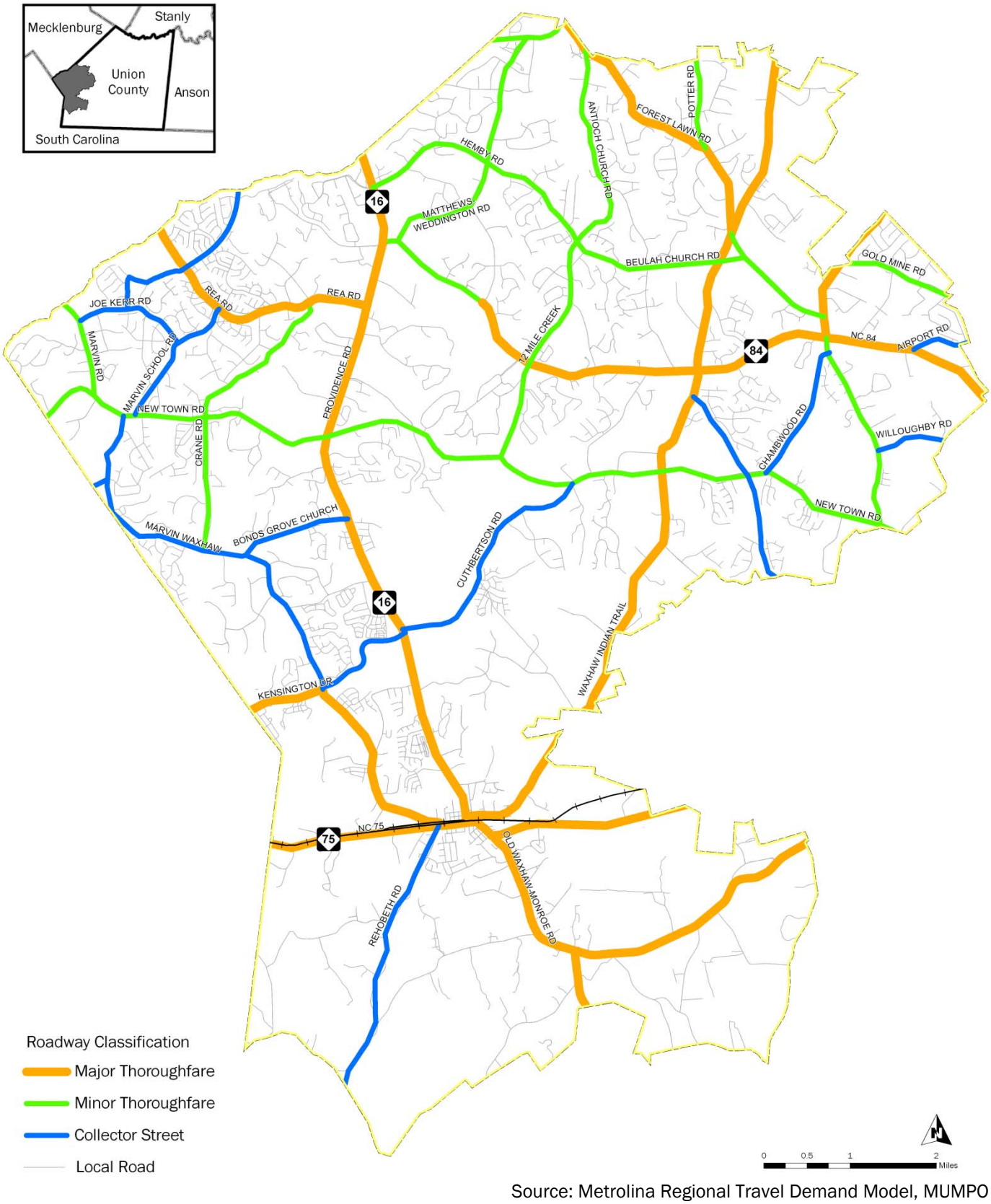
Collector roads feature characteristics of moderate to low mobility and high accessibility, and serve as a link between through-roads and local roads. There is no control of access (i.e. no physical restrictions on access). Traffic signals are allowed, at a recommended minimum spacing of ¼ mile. Driveways are allowed with full movement, but are still recommended to be consolidated or shared if possible. Roadways in this category generally will have neither a center left turn lane nor a median, but may have dedicated left and right turn lanes. Speed limits are regulated at 25-45 miles per hour.

Local Road

Local roads are designed to provide final access to properties, rather than through movements. There is no control of access (i.e. no physical restrictions on access). Traffic signals are allowed, at a recommended minimum spacing of ¼ mile. Driveways are allowed with full movement, but are still recommended to be consolidated or shared if possible. Roadways in this category generally will have neither a center left turn lane nor a median, but have dedicated left and right turn lanes. Speed limits are regulated at 35 miles per hour or less. Some residential neighborhoods have roads that function as “local connectors”. These roads are designed to provide better vehicular access through neighborhoods with more limited access than typical local streets.

Table 3: Facility Type Categories

Functional Purpose						Driveway Spacing				
Facility Classification	Mobility	Access	Cross-Section	Posted Speed Limit	Control of Access	Allowability; Ideal Offset Spacing	Description	Minimum Stem Length	Median Crossovers	Traffic Signals
Freeway	High	Low	4 lanes minimum with median	55 mph or greater	Full	Not Allowed	-	-	Not Allowed	Not Allowed
Expressway	High	Low to moderate	4 lanes minimum with median	45-60 mph	Limited or partial	Not allowed if limited control of access Allowed if partial control of access	If Partial Control of Access: One driveway per Parcel. Consolidate and/or Share Driveways and Limit Access to Connecting Streets or Service Roads; Restrict to Right-in/Right-out only	100 feet	Allowed; 2,000' spacing if >45 mph 1,000' spacing if ≤ 45 mph	Not Allowed
Boulevard	Moderate	Moderate to low	2 lanes minimum with median	30-55 mph	Limited, partial, or no control	Not allowed if limited control of access Allowed if partial control of access	If Partial Control of Access: One driveway per Parcel. Consolidate and/or Share Driveways and Limit Access to Connecting Streets or Service Roads; Restrict to Right-in/Right-out only	100 feet	Allowed; 2,000' spacing if >45 mph 1,000' spacing if ≤ 45 mph	Allowed; 1/2-mile ideal spacing
Thoroughfare	Moderate to low	High	2 lanes minimum without median; includes facilities with two-way left-turn lane	25-55 mph	No	Allowed; 1,000 feet	Consolidate or Share Connections, if possible	100 feet	Not applicable	Allowed; 1/2-mile ideal spacing
Collector	Moderate to low	High	2 lanes minimum without median; includes facilities with two-way left-turn lane	25-45 mph	No	Allowed; 600 feet	Consolidate or Share Connections, if possible	100 feet	Not applicable	Allowed; 1/4-mile minimum spacing
Local	Low	High	2 lanes minimum without median	35 mph or less	No	Allowed; 100 feet	Consolidate or Share Connections, if possible	100 feet	Not applicable	Allowed; 1/4-mile minimum spacing



Source: Metrolina Regional Travel Demand Model, MUMPO

Figure 2: Functional Roadway Classification (2008)

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2.4 Roadway Traffic

Roadway traffic conditions within the study area have rapidly changed over the past ten years. The conversion of the study area from primarily a rural region to one that is more suburban in nature has led to increased daily traffic levels. As shown on Figure 3, the roadways that are most heavily utilized include the following major routes:

- NC 16
- NC 75
- NC 84
- Rea Road
- New Town Road, west of NC 16
- Waxhaw Indian Trail
- Old Waxhaw Monroe
- Forest Lawn Road

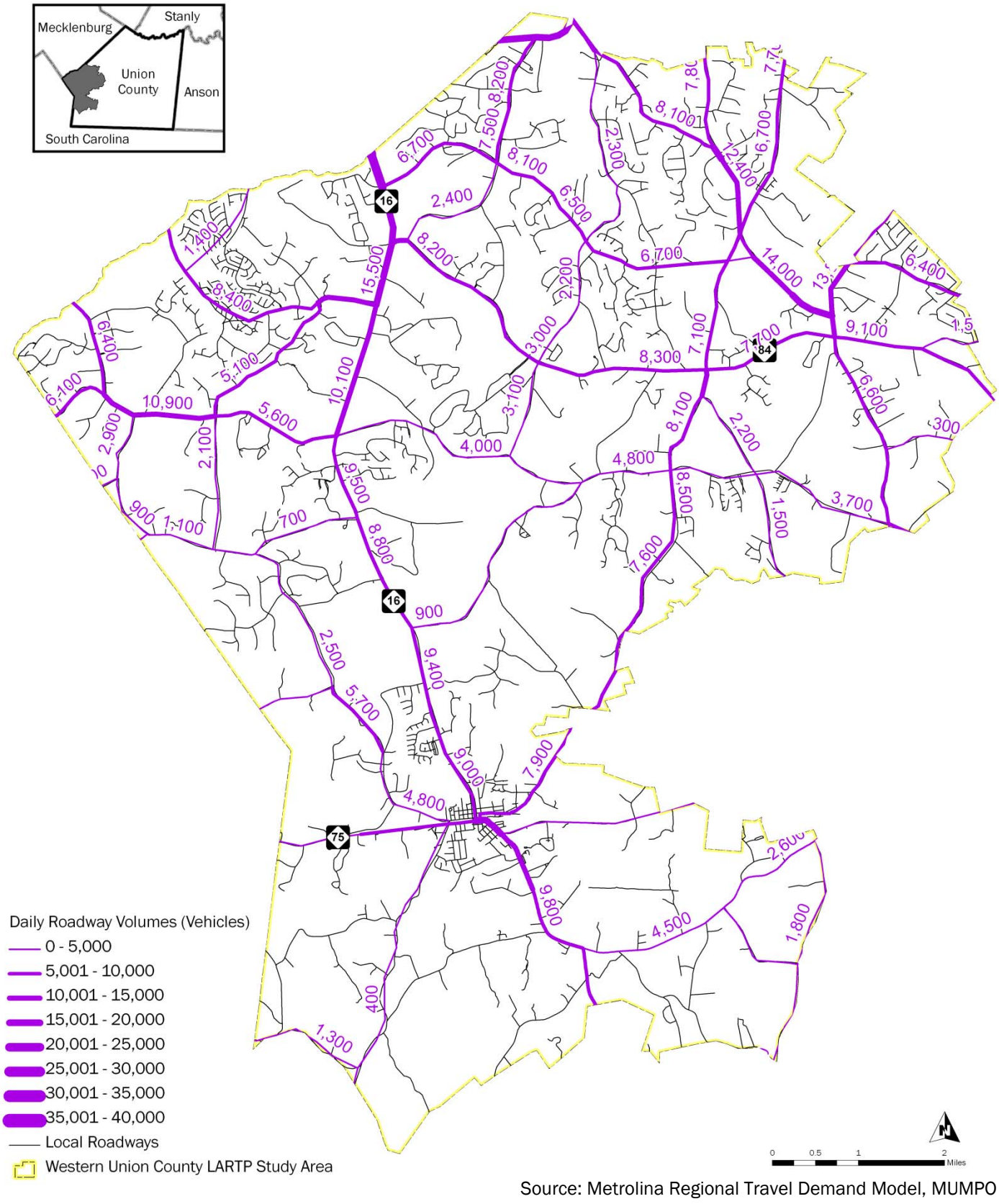
The level of traffic on each of the above roadways is directly related to the proximity to Charlotte, which represents the most predominant destination outside of the study area. For example, NC 16 has approximately 17,800 daily vehicles along the section north of NC 84, while there are only approximately 9,000 daily vehicles along the section north of downtown Waxhaw. Additionally, the geography of the study area, which allows for many parallel east-west roads and fewer north-south options, leads to higher concentrations of traffic along the major north-south roads. Outside of the NC highway system, most of the roadways within the study area were not designed to handle the level of traffic that typical travel along them under current conditions.

2.5 Intersection Traffic

Traffic operations at intersections are typically described in terms of "level of service" (LOS). LOS is a qualitative measure of the effect of several factors on traffic operating conditions including speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort, and convenience. It is generally measured quantitatively in terms of vehicular delay and described using a scale that ranges from LOS A, the best operating conditions, to LOS F, the worst operating conditions. LOS D or better represents "acceptable" operations. LOS E represents "at-capacity" operations. When traffic volumes exceed capacity, stop-and-go conditions result, and operations are designated as LOS F. LOS standards and descriptions for intersections are shown in Table 4.

Table 4: Levels of Service Description for Intersections

Level of Service	Description	Signalized Intersection	Unsignalized Intersection
A	Little or no delay	<= 10 sec.	<= 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.



Source: Metrolina Regional Travel Demand Model, MUMPO

Figure 3: Existing Daily Traffic Volumes

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Weekday morning and evening peak hour intersection turning movement counts were compiled from AM (7:00 to 9:00 AM) and PM peak period data (4:00 to 6:00 PM) at the following intersections within the study area, as shown on Figure 4:

- Antioch Church Road and Beulah Church Road (unsignalized)
- Bonds Grove Church Road and Waxhaw Marvin Road (unsignalized)
- Broome Street and North Main Street (unsignalized)
- Broome Street and South Main Street (signalized)
- Broome Street and McDonald Street/Howie Mine Road (signalized)
- Crane Road and New Town Road (signalized)
- Deal Road and Weddington Road (unsignalized)
- Marvin Road and New Town Road (unsignalized)
- Marvin School Road and New Town Road (unsignalized)
- Potter Road and Forest Lawn Drive (unsignalized)
- New Town Road and Potter Road (unsignalized)
- South Main Street/Old Providence Road and Waxhaw Road (unsignalized)
- Twelve Mile Road and Weddington Road (signalized)
- Waxhaw Marvin Road and Kensington Road (unsignalized)
- Waxhaw Marvin Road and New Town Road (unsignalized)
- Weddington Matthews Road and Tilley Morris Road (unsignalized)
- Potter Road and Wesley Chapel Road (unsignalized)
- Providence Road and Weddington Road (signalized)
- Waxhaw Indian Trail Road and New Town Road (signalized)
- Waxhaw Indian Trail Road and Weddington Road (signalized)

Counts used in this report were collected during October 2008 while local public schools were in session. LOS were calculated at each study intersection for the weekday AM and PM peak hour (see Appendix A for detailed level of service calculations). Figures 5 and 6 show the results of the LOS analysis.

As shown on Figures 5 and 6, all signalized intersections operate at acceptable LOS D or better during both the A.M. and P.M. peak hours. Only two of the six signalized intersections perform at LOS D during either the A.M. or P.M. peak, along Weddington Road at Twelve Mile Creek Road and Weddington Road and Waxhaw Indian Trail Road. The two signalized intersections along New Town Road, at Crane Road and Waxhaw Indian Trail Road, performed best, with LOS B conditions during A.M. and P.M. peak hours in both cases.

Unsignalized intersections within the study area operate at acceptable levels of service during both the A.M. and P.M. peak hours, with a few exceptions. The westbound Howie Mine Road approach to Broome Street in downtown Waxhaw operates at a failing LOS E in the P.M. peak hour, for instance, while the northbound Weddington Matthews Road approach to Tilley Morris Road operates at LOS F during the A.M. peak hour.

Three unsignalized intersection approaches operate at unacceptable LOS (LOS E or F) during both A.M. and P.M. peak hours, namely the southbound Deal Road approach to Weddington Road, the northbound Waxhaw Marvin Road approach to New Town Road and the eastbound Potter Road approach to Wesley Chapel Road. All of these intersections warrant traffic signals according to Manual on Uniform Traffic Control Devices (MUTCD) Peak Hour criteria, which uses travel time

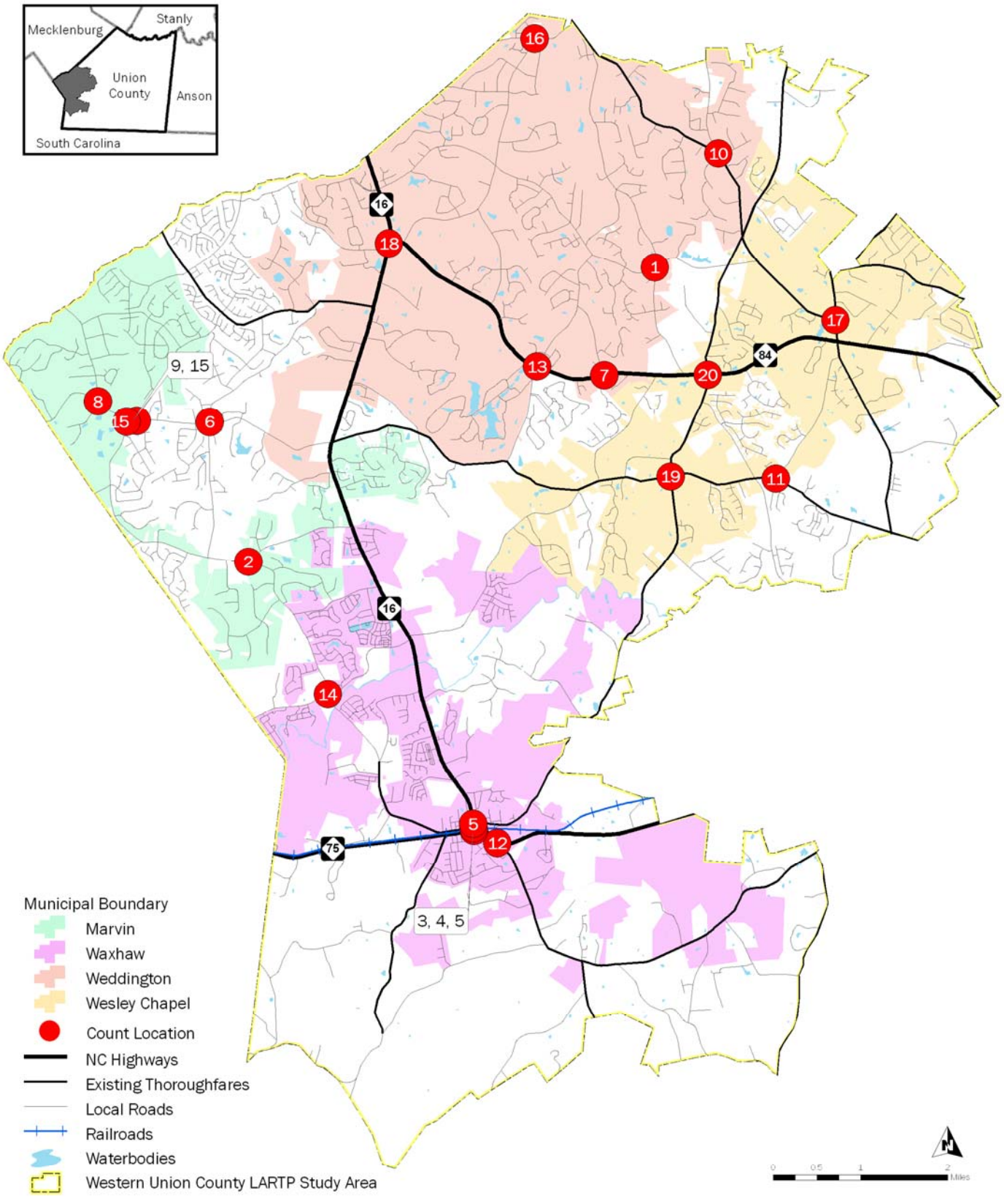

Figure 4: Traffic Count Locations

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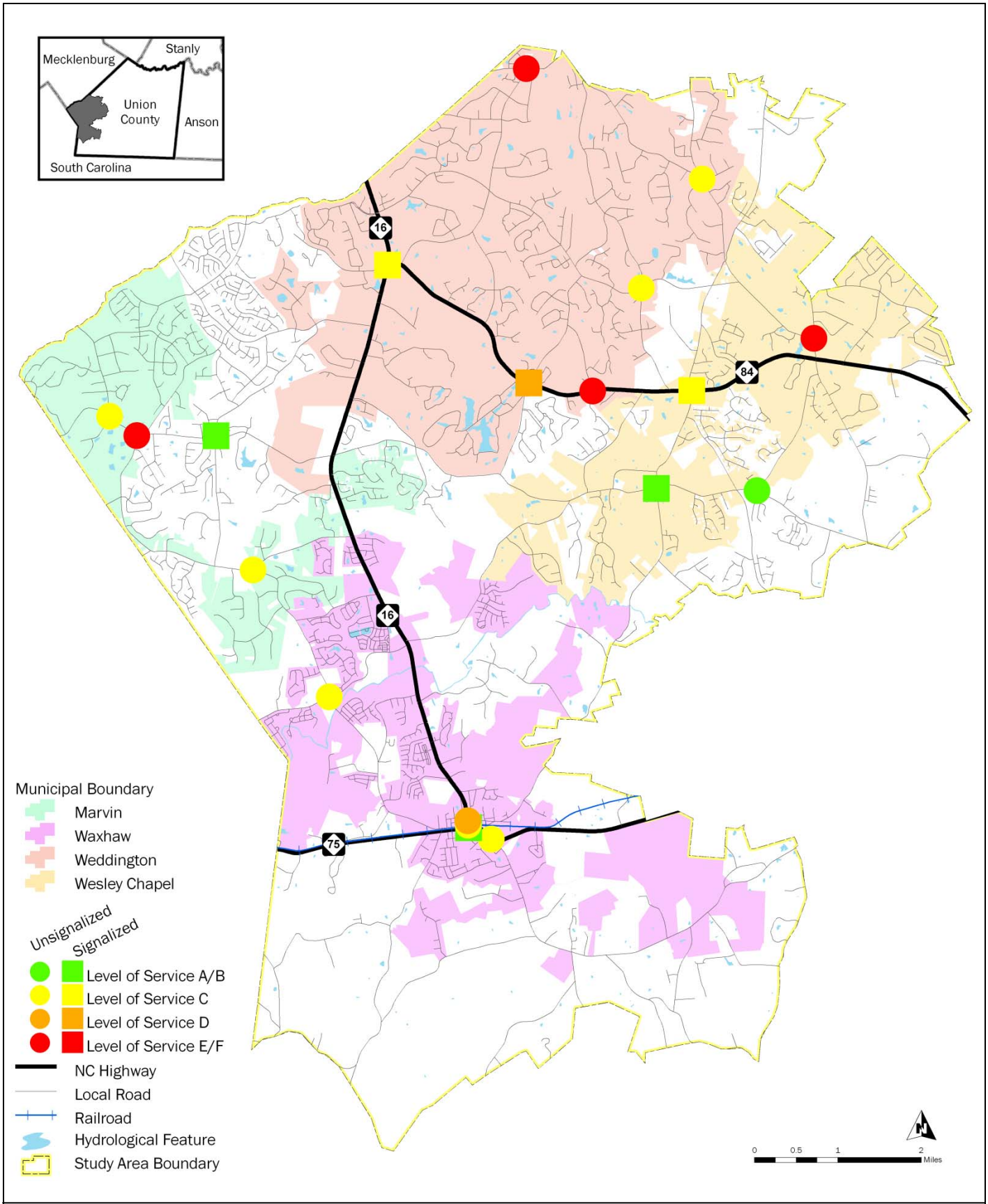

Figure 5: Intersection Level of Service (AM Peak)

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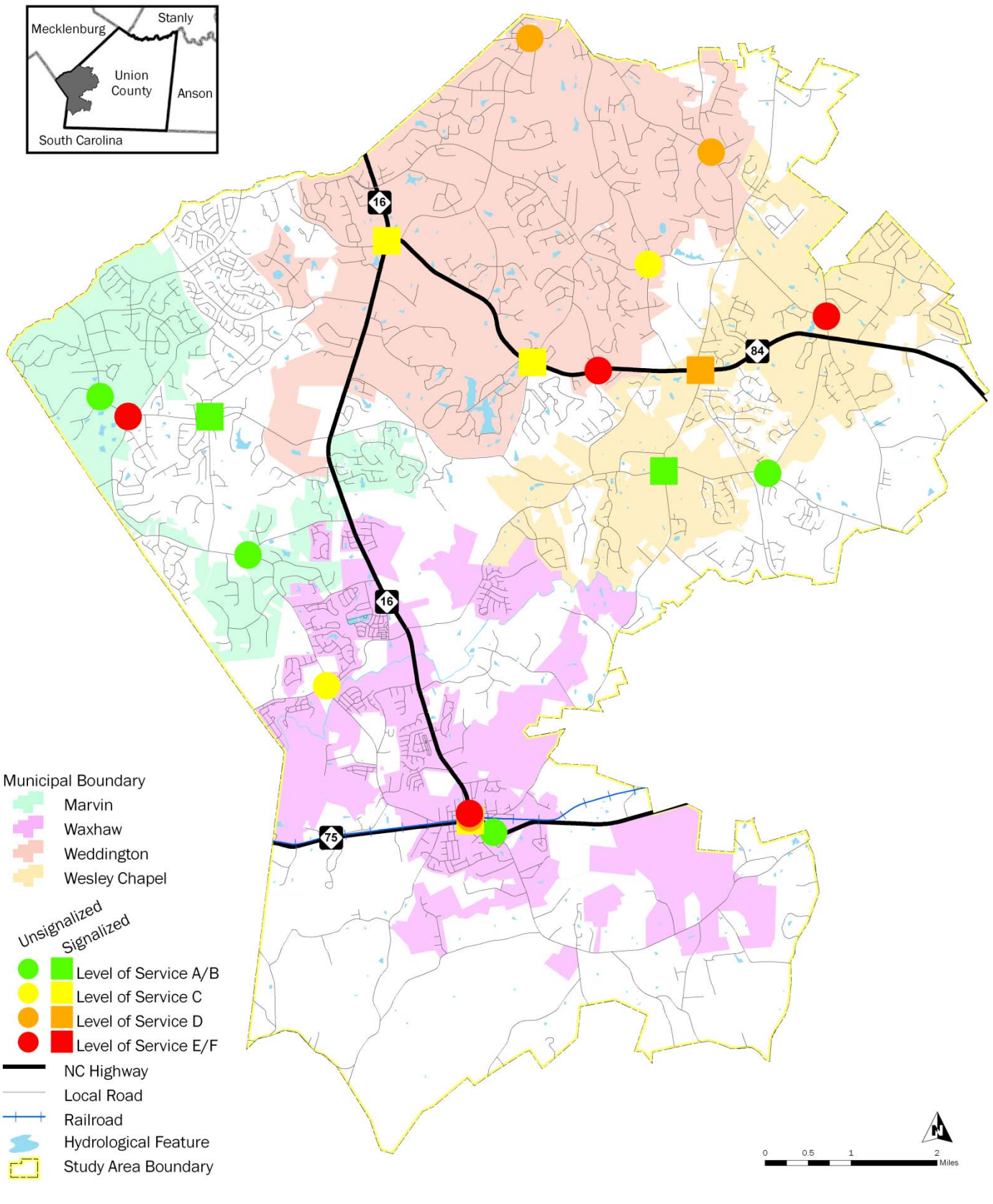

Figure 6: Intersection Level of Service (PM Peak)

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delay, approach volumes, and other factors to determine if the construction of a signalized intersection would provide a benefit to all users of the intersection.

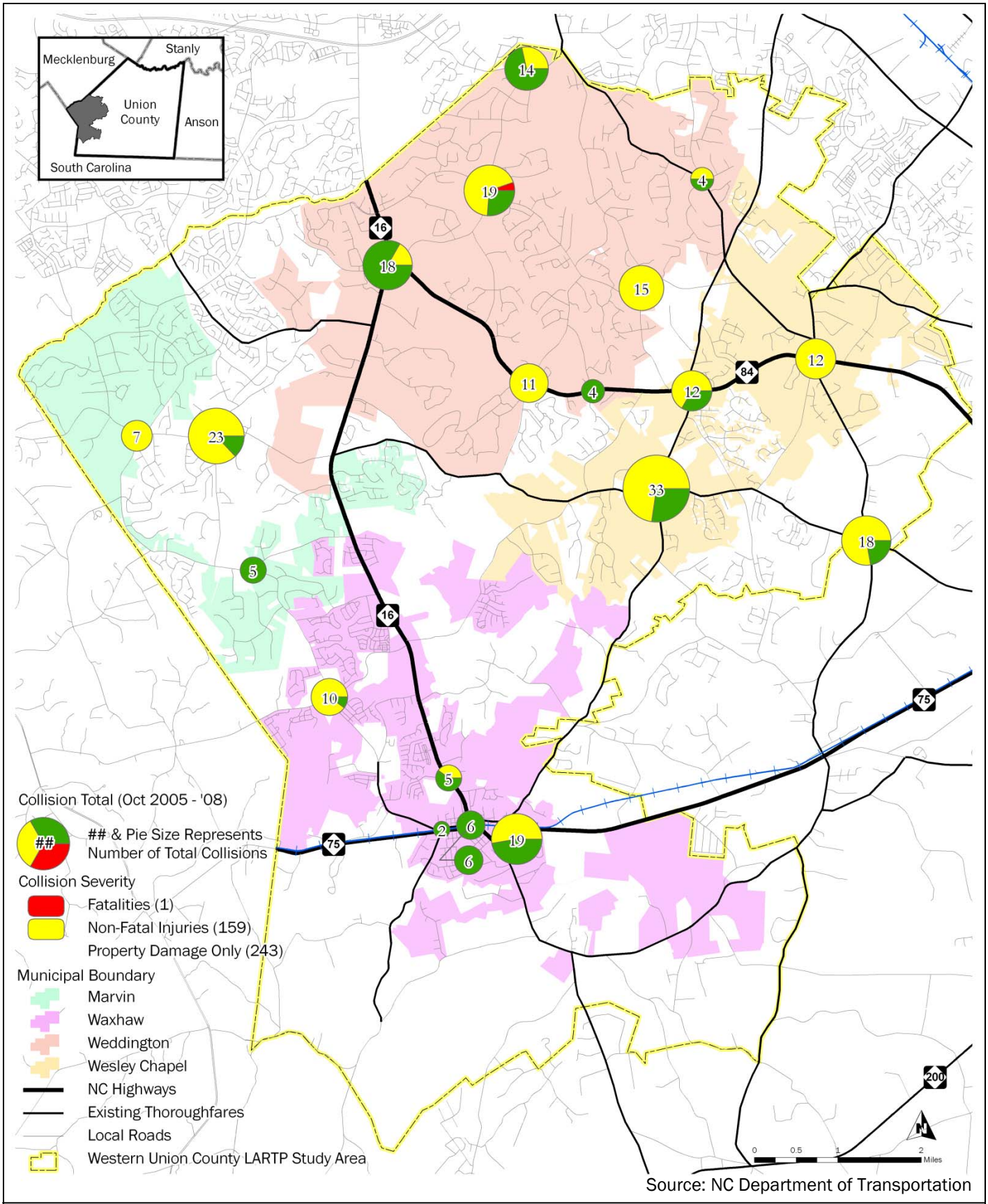
2.6 Traffic Safety

NCDOT collision records for a three-year period (October 2005-October 2008) were analyzed for 20 study area intersections, most of which correspond to the previously identified intersection count sites. As shown in Figure 7, a total of 403 collisions occurred, of which 159 (39.5 percent) were reported as causing non-fatal injuries, 243 (60.3 percent) as causing property damage only and one (0.2 percent) as fatal. Figure 8 depicts the number of accidents at each study area intersection by type; overall, angle, left-turn and rear-end crashes were most common.

The fatal collision occurred at Weddington Matthews Road and Beulah Church Road, an angled intersection of higher-speed two-lane roads with narrow shoulders at which most collisions were angle- or left turn-related. Here, wide right-turn radii may encourage motorists to execute faster turns without paying close attention to approaching traffic, while a hollow along Weddington Matthews Road to the north of the intersection may restrict the visibility of motorists turning left from that road. Also, rear-end collisions may occur due to abrupt deceleration when approaching the intersection.

Several other intersections at which numerous injurious collisions occurred over the three-year period are configured similarly and experienced similar types of collisions, although angles of intersection and surrounding grades vary. In addition to the high travel speeds and scant shoulders, sight distances at some intersections are poor due to trees, shrubbery and tall field grass adjacent to the roads. Such intersections include Waxhaw Indian Trail Road and New Town Road, which recorded the greatest number of injurious collisions (24); Crane Road and New Town Road, where the second-highest number occurred (20), and where a new signal was recently installed; Antioch Church Road and Beulah Church Road, where one collision involved a roadside object; and New Town Road and Potter Road.

Collision patterns at some intersections deviated from those of the overall study area. At Weddington Road and Twelve Mile Creek Road, for instance, right-turn collisions were more common and may be caused by motorists pulling too far into the intersection when seeking a gap in which to turn right. At Waxhaw Marvin Road and Kensington Drive, a greater incidence of head-on and runoff collisions may result from the intersection's odd turn lane configuration. Motorists traveling westbound through the intersection must correct their direction slightly to stay on the road, while those turning from westbound Kensington Drive onto southbound Waxhaw Marvin Road may not anticipate through traffic in the left lane of eastbound Kensington Drive. Finally, collisions tended to be less severe in downtown Waxhaw, perhaps due to lower travel speeds; a greater share of collisions classified as "other" occurred in this area as well.



Source: NC Department of Transportation

Figure 7: Vehicular Collisions (by Severity)

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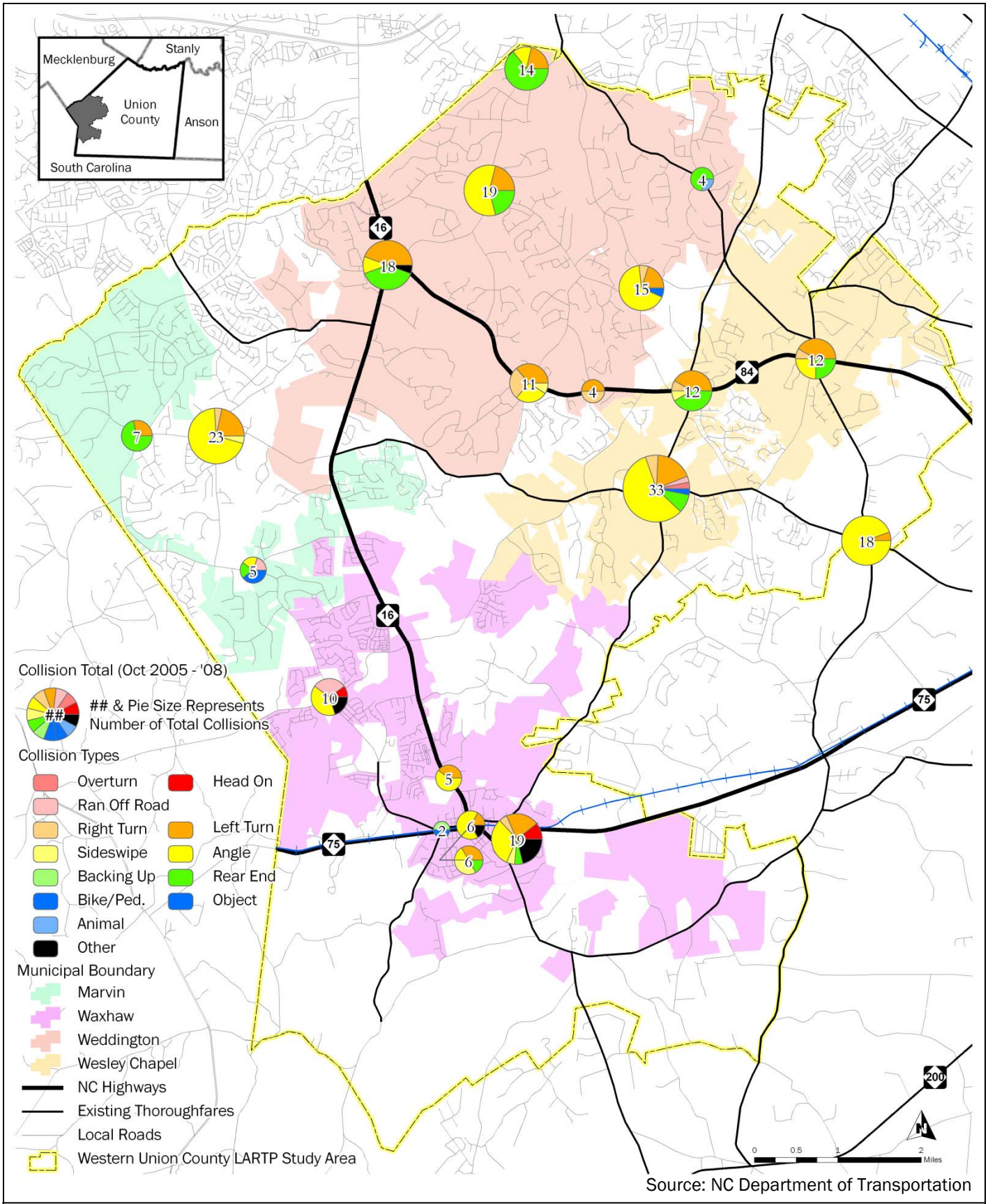

Figure 8: Vehicular Collisions (by Type)

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2.7 Bicycles

As noted previously, the area's rural heritage has played a major role in defining the development of its transportation systems. Just as the rural roads were not originally designed and built to carry today's traffic, they were also not designed to accommodate bicycle users. While advanced bicyclists may ride the roads, perhaps on group rides on weekends, most residents do not bicycle outside their neighborhoods, in large part because there are few dedicated bicycle facilities.

Bicycle Facility Types

There are two general classes of bicycle facilities: on-street (bike lanes, wide outside lanes, wide shoulders) and off-street (greenways and multi-use paths). There are currently no striped and marked on-street bike lanes in the study area. Rea Road west of Providence Road/NC 16 has wide outside lanes that accommodate bicycles on-street, and the new section of Providence Road/NC 16 will have wide outside lanes with striped bike lanes through intersections when completed.

A system of greenway trails can supplement on road bicycle facilities. Greenways often connect points of interest more directly than roadways and are designed for recreational uses. Greenway planning differs from on-street bicycle facility planning, however, because it typically involves developing and adopting a separate greenways master plan. To date, the only adopted greenways plan within the study area is the Village of Marvin Parks and Greenways Master Plan. The Village of Wesley Chapel's Master Plan includes some conceptual locations for potential greenways.

Marvin Greenways

The only existing greenway trail section within the study area is approximately 0.75 miles long, connecting residences along a portion of Joe Kerr Road and Marvin School Road toward Marvin Elementary School. The Marvin Parks and Greenways Master Plan calls for extension of this segment.

Bicycle Riding Clubs

Riding clubs are common recreational activities for urban and suburban communities. The purpose of these clubs is to promote awareness for on-road cycling in the area, demonstrate need for future bicycle facilities, and to meet individuals who share common interests in cycling. The NCDOT lists at least four participating bicycle clubs in the greater Charlotte area, and other internet resources identify meeting locations and information on specific bicycle clubs that regularly ride through the study area on weekends. Clubs with advanced riders often ride in groups on weekends. These advanced groups may take a full lane of traffic while riding and typically travel long distances.

Existing Facilities in Neighboring Jurisdictions

The City of Charlotte Bicycle Plan (2008) indicates several major and minor thoroughfares that are suitable for bicycle facilities, extending into the study area. Mecklenburg County also has an established greenway trail along the Six Mile Creek corridor, which serves as the county boundary between Union and Mecklenburg counties. The existing trail is 0.9 miles long, with future considerations for more than five miles of expansion and further connections with residential areas. Refer to Figure 9 for the existing (dark-green solid line) and potential (light-green dashed line) greenways within neighboring jurisdictions.

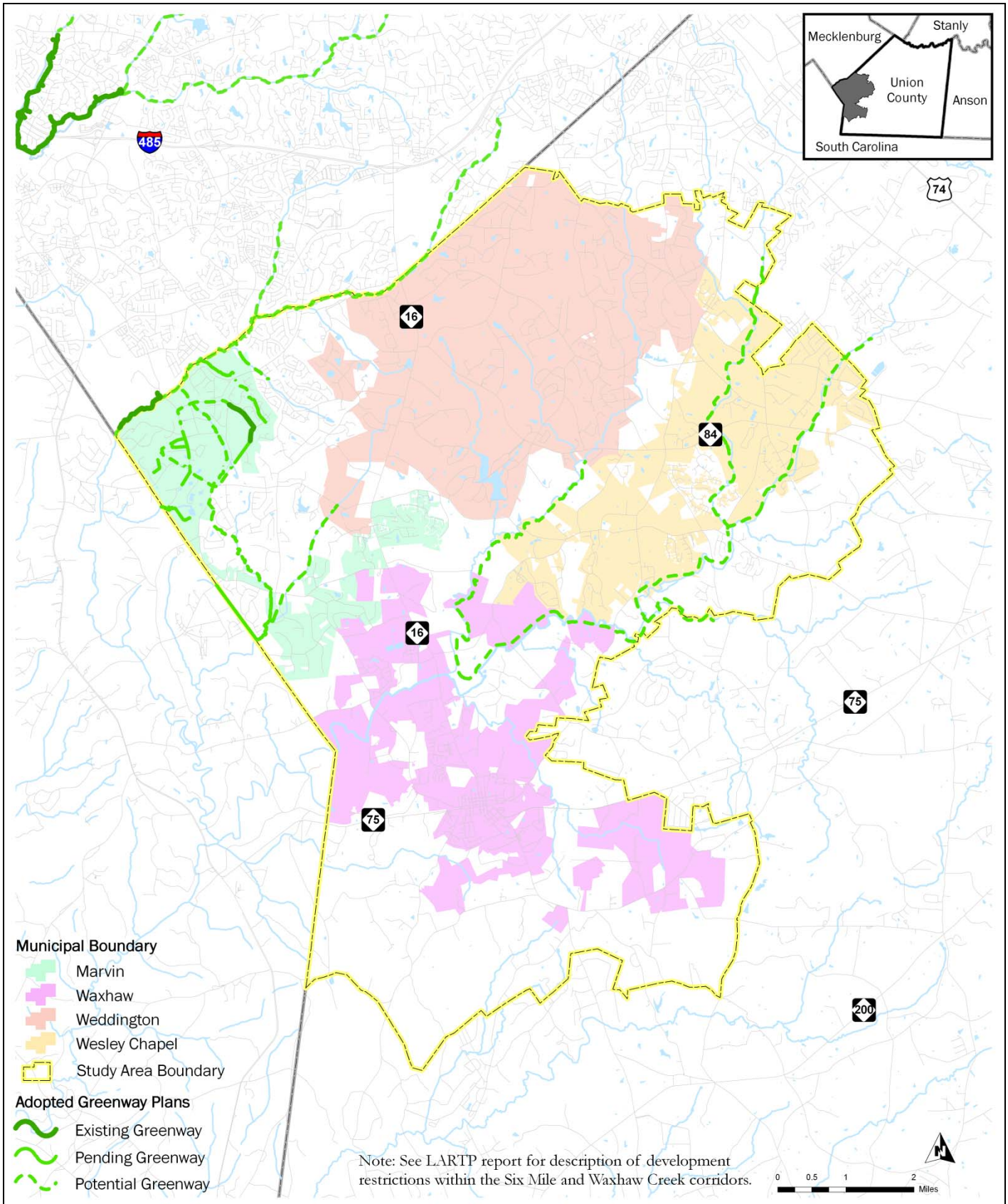

Figure 9: Existing Greenway Facilities

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2.8 Pedestrians

Pedestrian facilities are essential elements of every transportation mode because every type of trip (vehicular, transit, or bicycle) begins and ends with some amount of walking. Pedestrian facilities are important to communities as a measure of walkability, which contributes to the overall health, safety, and quality of life of the community. Pedestrian facilities also serve to connect points of interest that may not be directly connected by roadways or other modes.

Sidewalks

Western Union County is predominantly rural, low-density residential in character. Many of the residential neighborhoods, and especially newer neighborhoods, have sidewalks, but many do not. There are also few sidewalk connections between neighborhoods, making it more difficult to make short walking trips and encouraging driving. Pedestrian connections to local schools from adjacent and nearby neighborhoods are also limited.

Of the four municipalities in the study area, Waxhaw has the most developed downtown area. Downtown Waxhaw has a sidewalk network, as well as a pedestrian bridge over the railroad tracks, that moves people throughout the downtown. Some pieces of that network are incomplete, however, and street crossings, due to high vehicular, truck, and train traffic, can be difficult, especially during the peak hours. There are also stretches of sidewalk on Providence Road/NC 16 to the north of downtown Waxhaw, and the widened section of Providence Road/NC 16 in the northern section of the study area will have sidewalks on both sides.

Intersections

In general, intersections within the study area lack treatments to accommodate pedestrians safely, such as high visibility crosswalks, pedestrians signal heads, and other appropriate signage and markings. Recently improved intersections, such as those along the Providence Road/NC 16 corridor, have incorporated these treatments.

2.9 Transit

Transit options within the study area are limited, as there is no fixed-route service available. However, Union County Transportation operates community transportation service, which is demand-responsive and primarily focused on human and social service agencies. Transit options for work trips include Charlotte Area Transit System (CATS) vanpools (Waxhaw to Airport, 3rd Shift and Indian Trail to Uptown, 1st Shift) and ridesharing opportunities through various Charlotte area websites. Additionally, CATS operates the following bus lines near the northern edge of the study area:

- 43 Local – US 521 @ Ballantyne Corp Plaza
- 61 Express – Hwy 16 @ Promenade Shop Center
- 62 Express – Rea Rd @ St. Matthew Church Park and Ride
- 74 Express – US 74 @ Union Town Center Park and Ride

As is common in non-urban areas, residents of the study area must drive personal vehicles in order to access transit service. Even if fixed-route bus service where available within the study area, the bicycle and pedestrian facilities are limited and would likely still require the use of a personal vehicle to access transit.

3 Future Conditions: *Where We Are Headed*

3.1 Growth

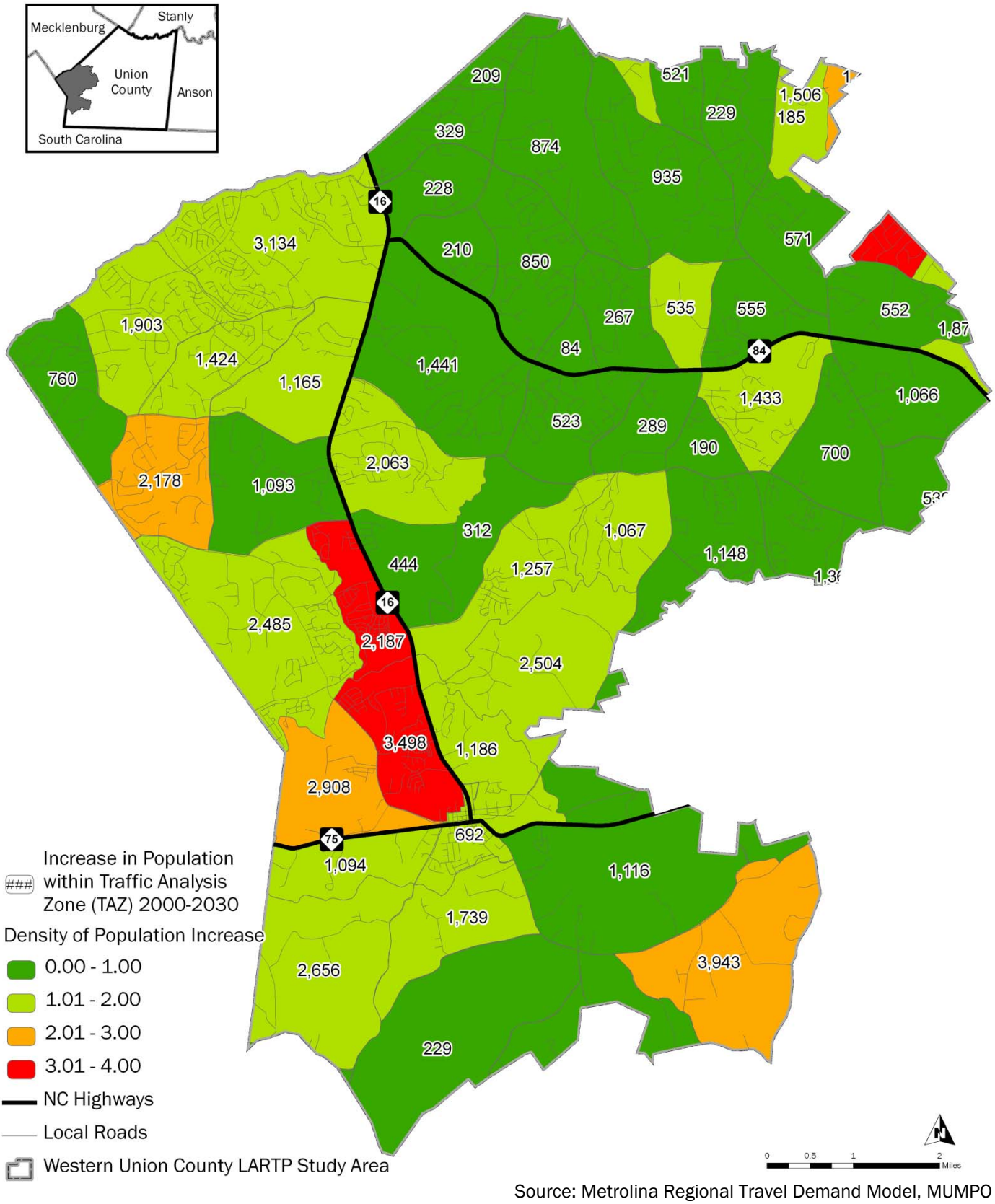
Western Union County has already experienced tremendous growth, which has created some of the transportation conditions detailed in Section 2. As the region continues to grow, and more particularly as Western Union County continues to offer a high quality of life, the issues faced today will become more exaggerated and more difficult to solve.

Figure 10 illustrates the projected change in population from 2000 to 2030. The data is derived from the Metrolina Regional Travel Demand Model and is broken into geographic areas called Traffic Analysis Zones. Figure 11 shows projected change in employment levels for the same time period.

The main points of these figures are:

- Population and employment growth will continue to concentrate along major transportation corridors, particularly along NC 16 and NC 84.
- The southern portion of the study area, and especially Waxhaw, will receive the highest proportionate amount of growth.
- Weddington, and to a lesser extent Wesley Chapel, will have the lowest growth levels.
- Western Union County will continue to be primarily residential, with few significant employment opportunities. The highest concentrations of new employment opportunities are expected to be in the Waxhaw area.

These projections are based on a combination of factors, including approved and anticipated new development, vacant or underdeveloped land, and other constraints, such as environmental features. The land use policies, ordinances, and decisions discussed in Section 5 will have a direct impact on future development patterns.



Source: Metrolina Regional Travel Demand Model, MUMPO

Figure 10: Projected Population Growth

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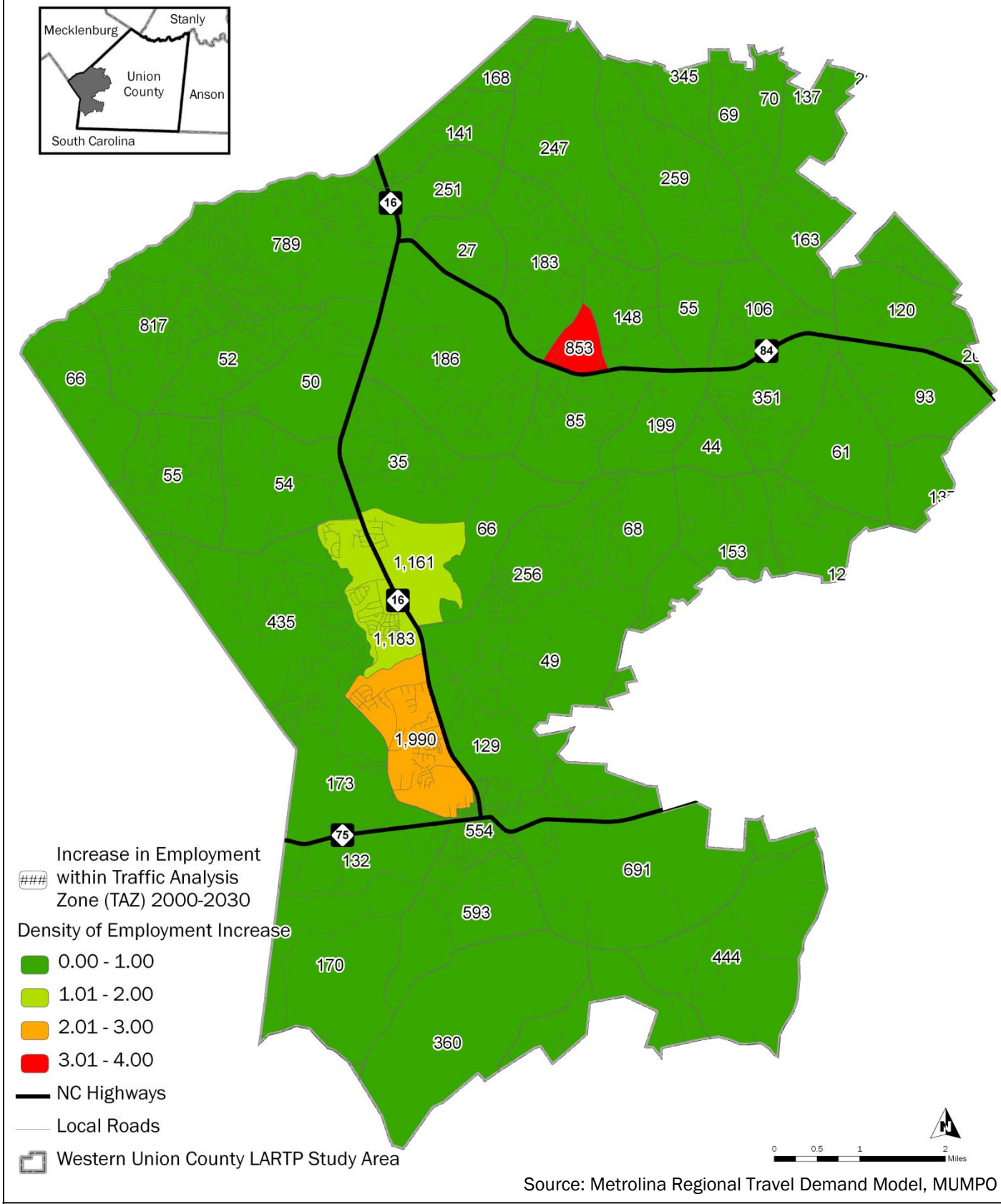

Source: Metrolina Regional Travel Demand Model, MUMPO

Figure 11: Projected Employment Growth

Western Union County Local Area Regional Transportation Plan

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3.2 Roadways

The Mecklenburg-Union County Metropolitan Planning Organization (MUMPO), the lead transportation planning agency for the study area, is charged with developing future transportation plans, including the following:

- Long Range Transportation Plan (LRTP)
- Transportation Improvement Plan (TIP)
- Unified Planning Work Program
- Thoroughfare Plan/Comprehensive Transportation Plan (CTP)

These plans, developed at the local level and balanced with regional needs, are provided to NCDOT, which is responsible for developing statewide TIPs on a seven-year implementation basis. The planned transportation improvements in the area are shown on Figure 12, based on the current MUMPO LRTP and NCDOT 2009-2015 TIP.

As shown, the planned transportation improvements are limited within the study area and focus on the major roadways. While there are some intersection and safety improvements, the main focus is providing additional capacity along the major east-west and north-south NC highways. These roadways handle both local and regional traffic (through the study area) and were identified for inclusion in the MUMPO LRTP and NCDOT TIP based on the desire to enhance regional travel options. It should be noted that the identified improvements do not have guaranteed sources of funding.

As shown on Figure 13, traffic levels will greatly increase within the study area by the year 2030. Daily traffic along the major routes will increase as much as 100%, with some additional traffic attributed to future development within the study area, but predominantly due to increased regional travel though the study area.

The planned widening and new construction projects will help to alleviate some congestion associated with the additional regional travel, but the minor routes and local roads will also experience traffic increases between 50 -100 percent. This traffic is exclusively local to the study area, from future development, or existing traffic that shifts from the major facilities to the minor ones due to the increase in regional traffic. Without the implementation of local roadway and intersection improvements, the existing roadway system in the study area will not be able to handle the future traffic levels.

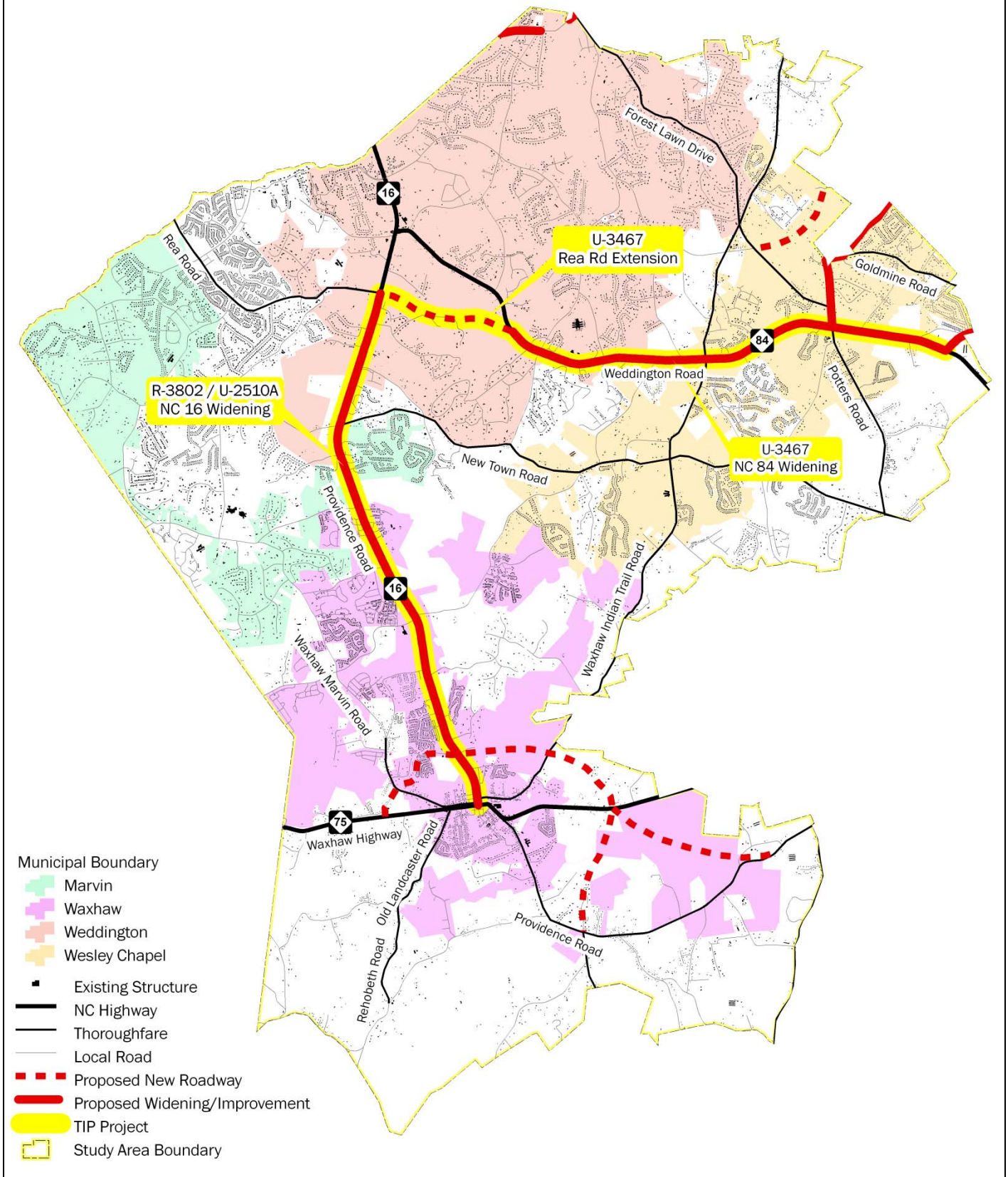

Figure 12: Planned Roadway Projects

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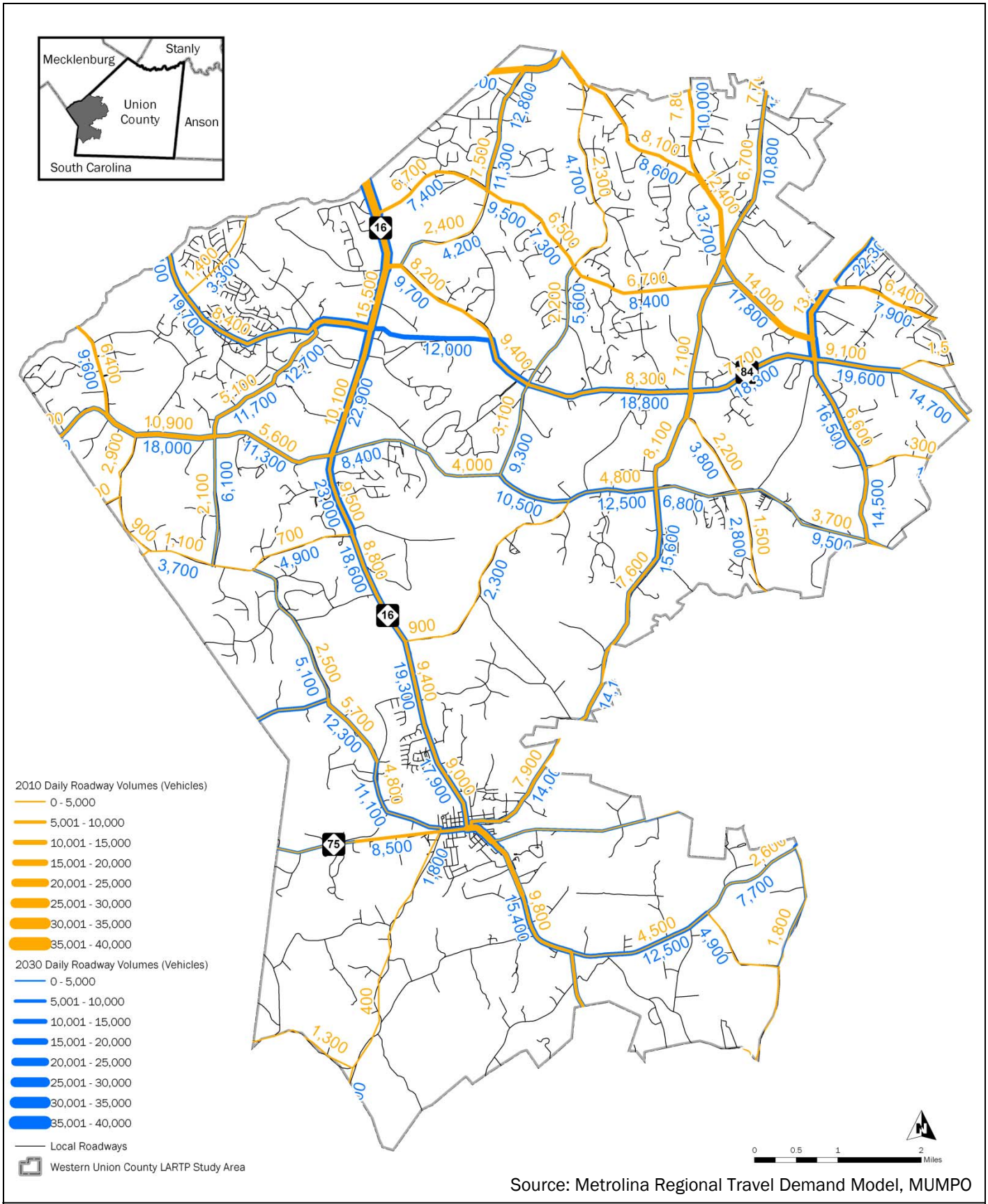

Source: Metrolina Regional Travel Demand Model, MUMPO

Figure 13: Projected Traffic Volumes (2030)

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3.3 Bicycles

On-Street Bicycle Facilities

It is anticipated that on-street bike lanes/wide outside lanes will be included as part of the NC 16 and NC 84 widening projects and the Rea Road Extension project that are part of the TIP and shown in Figure 12. There are also other smaller-scale widening projects in the TIP and MUMPO LRTP that would likely have on-street bicycle facilities, both within the study area and nearby. There are no other planned on-street bicycle facilities planned that are not part of this LARTP project.

Off-Street Bicycle Facilities and Greenways

Village of Marvin

The Village of Marvin adopted its Parks and Greenways Master Plan in March 2008, identifying trails as either Tier I (8 miles of trails) , or Tier II (16 miles of trails). Tier I trails serve as the backbone of the proposed greenway system, whereas the Tier II trails would serve as connectors and loop trails. Greenway trail widths recommended by this plan range from 8' to 12' to accommodate bicyclists, pedestrians, and horses. These trails are illustrated on Figure 14.

Village of Wesley Chapel

The Village of Wesley Chapel Master Plan included concepts for a greenway system. While not a formally adopted greenway plan, the concepts are useful in planning for potential future facilities. These potential greenway corridors are illustrated on Figure 14.

Carolina Thread Trail

The Carolina Thread Trail is a plan for a regional, 15-county greenway trail network, centering on Charlotte and Mecklenburg County. The concept is to link regional parks, green space, and attractions by a series of greenway trails, and "weaving communities together." Since the organization is regional, and the trail alignments are meant to be conceptual at this stage, the exact locations of possible future trails have not been determined. All representations of the Carolina Thread Trail (see Figure 14) within this report and study area are conceptually illustrated.

3.4 Pedestrians

Similar to the planned on-street bicycle improvements in Section 3.3, sidewalks and intersection improvements are planned for the study area's TIP and LRTP projects. The four municipalities are also working with the NCDOT on spot intersection improvement projects to enhance pedestrian and vehicular safety. The Town of Waxhaw was recently awarded a federal stimulus grant to make improvements to the intersection of NC 16 and NC 75 in downtown Waxhaw.

3.5 Transit

There are no plans for extending mass transit into the study area, although planned future Charlotte transit extensions would come closer to the study area (to Matthews) and make it easier for Western Union County residents to use transit. An express shuttle from Waxhaw to downtown Charlotte has been discussed but is not currently funded.

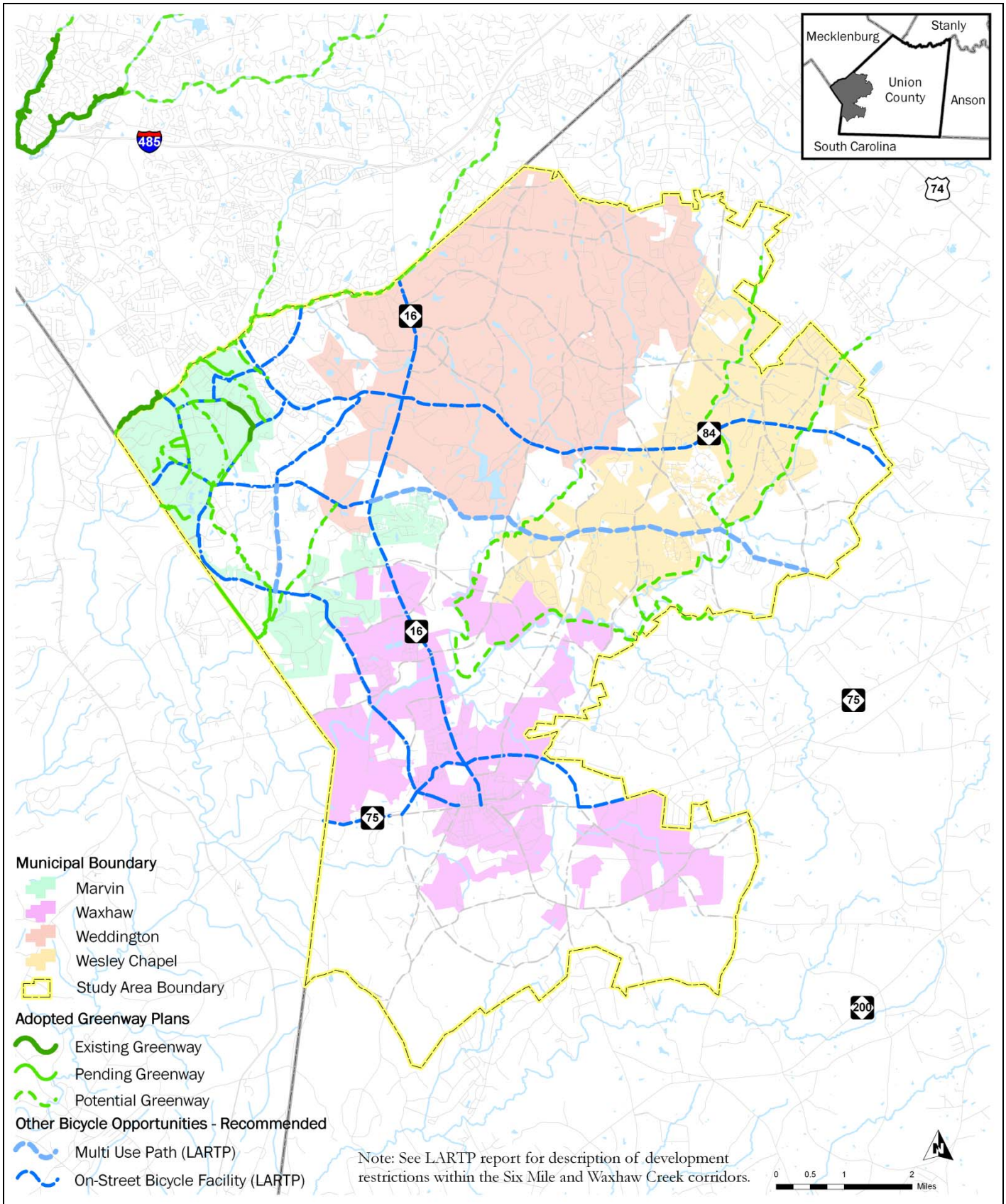

Figure 14: Planned Bicycle and Greenway Facilities

Western Union County Local Area Regional Transportation Plan

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4 Recommendations: *Where We Want To Be*

4.1 Introduction

This section provides recommended roadway, intersection, bicycle, pedestrian, and transit improvements that provide short-term fixes for current problems and long-term solutions for future concerns. The recommendations are brought together in Section 6 (Implementation Plan).

4.2 Thoroughfare Plan

The recommended Thoroughfare Plan is illustrated in Figure 15. The Thoroughfare Plan was developed through an iterative process that involved: analysis of existing and projected traffic volumes and roadway capacities; analysis of existing and projected intersection conditions; examination of the functional classification system (described in Section 2); analysis of environmental issues and other constraints; and discussion, analysis, and review by the project's Technical and Steering Committees.

The Thoroughfare Plan is a system plan – it is intended to improve roadway conditions across the entire study area. While the local needs of each of the four jurisdictions were an important part of the plan, the overriding concern was to develop a plan that benefited the study area as a whole. The plan also recognizes that the majority of the proposed roadway projects are not isolated within a single jurisdiction. Indeed, the nature of thoroughfares is that they are cross-jurisdictional.

It is also important to remember that thoroughfare plans are long-range plans. The purpose of the plan is to comprehensively identify and define future roadway needs. It is recognized that not all of these projects can be built in the short-term. But having these projects on an adopted thoroughfare plan can:

- Help communities work cooperatively to solve issues of joint concern;
- Identify right-of-way needs to help plan and fund roadway improvements that are part of new development;

- Raise the profile of regionally significant projects in the regional transportation planning process; and
- Help create common expectations among local leaders, the development community, and residents and property owners.

Individual projects on the Thoroughfare Plan (Figure 15) are identified by numbers which correspond to project descriptions on the recommendations table. The map illustrates three general roadway classifications applicable to the study area: Boulevards; Major Thoroughfares; and Minor Thoroughfares. The characteristics of these roadways types are described in detail in Section 2 of this report. The Thoroughfare Plan does not include local roads, which are primarily streets in residential neighborhoods.

Within each of the roadway classifications are three levels of projects:

- *Existing* – Roadway facilities that are not recommended to be improved. They are shown as solid lines on the map to show how the recommended improvements tie into the broader system.
- *Needs Improvement* – Roadway facilities that need to be improved for capacity, safety, or system continuity. The improvement to the facility may be widening, other operational strategies, increasing the level of access control along the facility, or a combination of improvements and strategies. "Needs Improvement" does not refer to the maintenance needs of existing facilities.
- *Recommended* – Roadway facilities on new location that are needed in the future. It is important to note that the projects shown as "Recommended" on the map (with dashed lines) are conceptual alignments drawn to show needed connections and general locations. Further detailed design and engineering will be required to determine precise locations and alignments as those projects draw closer to development.

Figures 16 – 19 show the same Thoroughfare Plan magnified for each of the four municipalities.

Project Prioritization

Table 5 details each of the recommended roadway projects on the Thoroughfare Plan map and prioritizes each as either High, Medium, or Low Priority projects. It is important for future planning purposes to prioritize projects in order to maximize limited funding opportunities and ensure that the highest impact projects receive first focus. The table is expanded further in Section 6 (Implementation Plan).

Following Table 5, Figure 20 illustrates the project prioritization. In general, the High Priority projects include the widening projects of the major NC routes (NC 16, NC 84, and NC 75/Waxhaw Parkway). As the major existing and future travel routes, these projects need to be improved first to improve through travel and allow the secondary roads to function as they are intended. The Medium Priority projects are those that, when, improved, will provide viable alternatives to driving on the major routes, for both through and local trips. These include major east-west routes, such as New Town Road, and north-south routes, such as Waxhaw-Indian Trail, and may include new and existing collector streets that help connect local roads to the major routes. The Low Priority projects are typically projects of local importance that may not have the same regional benefits as the High and Medium Priority projects.

Table 5: Recommended Thoroughfare Plan Projects (Prioritized)

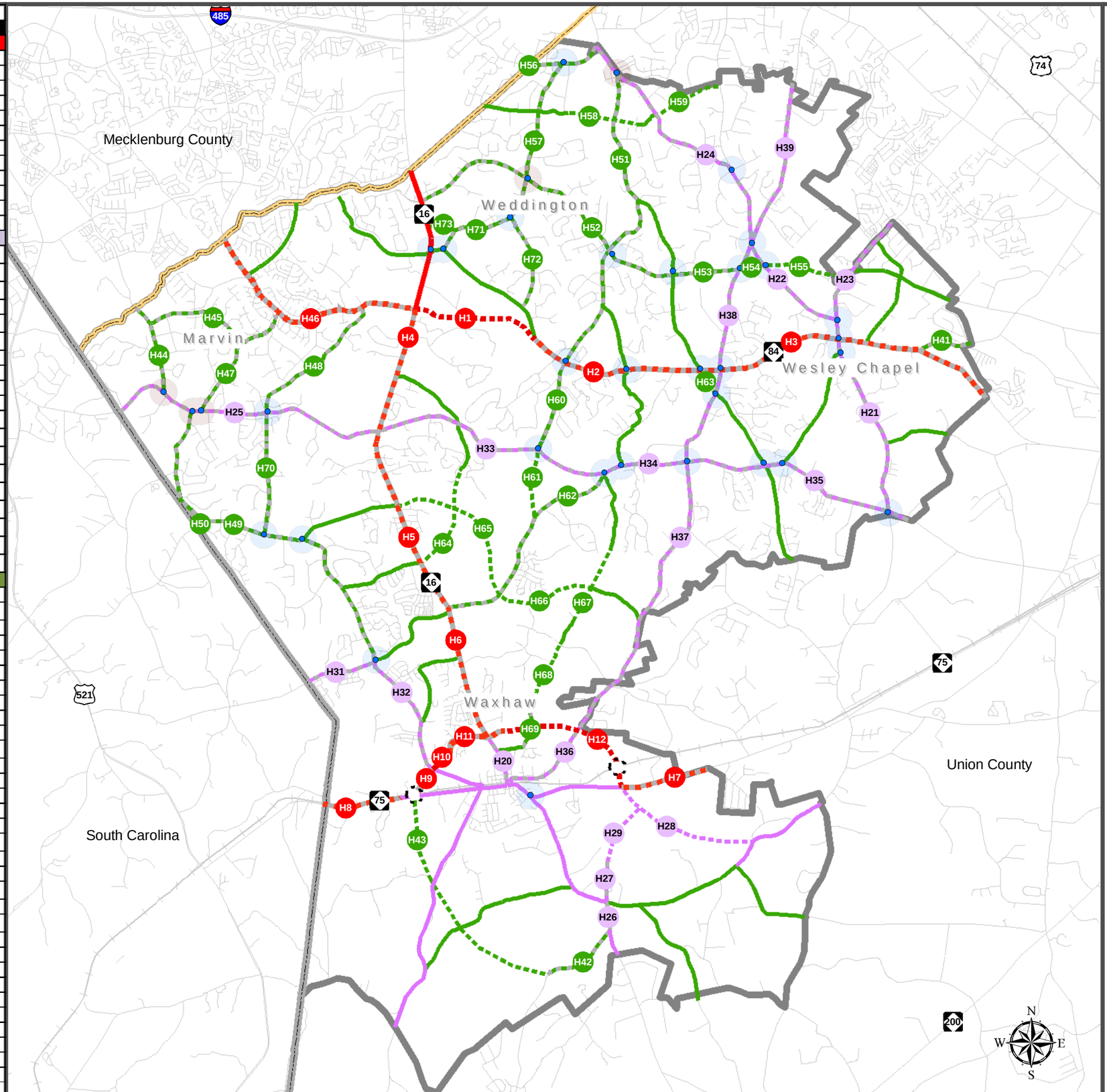
Map ID	Facility and Section	From	To	Description
High Priority Projects				
H1	NC 84 Relocation (Rea Rd Extension)	NC 16 / Providence Road(SR1392)	NC 84 / Weddington Road	Construct 4-lane boulevard
H2	NC 84 / Monroe-Weddington Road / Weddington Road	NC 84 Relocation	Waxhaw-Indian Trail Road (SR 1008)	Widen to 4-lane boulevard
H3	NC 84 / Monroe-Weddington Road / Weddington Road	Waxhaw-Indian Trail Road (SR 1008)	Study Area Boundary East	Widen to 4-lane boulevard
H4	NC 16 (Providence Rd)	Rea Road Extension / NC 84	New Town Road (SR 1315)	Widen to 4-lane boulevard
H5	NC 16 (Providence Rd)	New Town Road (SR 1315)	Cuthbertson Road (SR 1321)	Widen to 4-lane boulevard
H6	NC 16 (Providence Rd)	Cuthbertson Road (SR 1321)	Waxhaw Parkway (N)	Widen to 4-lane boulevard
H7	NC 75 / Waxhaw Highway	Waxhaw Parkway	Study Area Boundary East	Widen to 4-lane boulevard
H8	NC 75 / Waxhaw Highway	Study Area Boundary West	Helms Road (SR 1300)	Widen to 4-lane boulevard
H9	Helms Road (SR 1300)	NC 75 / Main Street	Waxhaw-Marvin Road (SR 1301)	Widen to 4-lane boulevard
H10	Waxhaw Parkway (W)	Waxhaw-Marvin Road (SR 1301)	Existing Waxhaw Parkway (NW)	Construct 4-lane boulevard
H11	Waxhaw Parkway (N)	Existing end of road	Existing end of road	Widen to 4-lane boulevard
H12	Waxhaw Parkway (N)	Existing end of road	NC 75 / Main Street / Waxhaw Highway	Construct 4-lane boulevard
H20	NC 16 (Providence Rd)	Waxhaw Parkway (N)	NC 75 / Main Street / Waxhaw Highway	Add turn lanes, widen shoulder and improve geometrics as appropriate; employ context-sensitive design
H56	Tilley Morris Road (SR 1345)	Study Area Boundary	Matthews-Weddington Road (SR 1344)	Widen to 2 lanes, w/ median, bike lane
H58	Amanda Drive Extension	End of road	Walden Lane	Construct 2-lane facility
Medium Priority Projects				
H21	S Potter Road (SR 1162)	NC 84 / Weddington Road	New Town Road (SR 1315)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H22	Potter Road (SR 1346)	Waxhaw-Indian Trail Road (SR 1008)	Wesley Chapel Road (SR 1377)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H23	Wesley Chapel Road (SR 1377)	Old Charlotte Highway (SR 1009)	NC 84	Widen to 4 lanes w/median
H24	Forest Lawn Drive (SR 1358) and Potters Road (SR 1357)	Study Area Boundary North	Wesley Chapel Road (SR 1377)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H25	New Town Road (SR 1315)	Study Area Boundary West	Providence Road (SR 1117)	Widen to add shoulder and bike lanes; preserve ROW for future widening
H31	Kensington Drive (SR 1305)	Waxhaw Marvin Road (SR 1301)	State Line	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H32	Waxhaw Marvin Road (SR 1301)	Helms Road (SR 1300)	Kensington Drive (SR 1305)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate; add bike lanes

H36	Waxhaw-Indian Trail Road (SR 1008)	NC 16 / N Broome Street	Bond Grove Church Road (SR 1307)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H37	Waxhaw-Indian Trail Road (SR 1008)	Bond Grove Church Road (SR 1307)	New Town Road (SR 1315)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H38	Waxhaw-Indian Trail Road (SR 1008)	New Town Road (SR 1315)	Beulah Church Road (SE 1346)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H39	Waxhaw-Indian Trail Road (SR 1008)	Beulah Church Road (SE 1346)	Study Area Boundary North	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H41	Airport Road (SR 1349)	Goldmine Road (SR 1162)	NC 84	Widen to 4 lanes w/ median, bike lane
H49	Waxhaw Marvin Rd (SR 1307)	New Town Road (SR 1315)	Kensington Drive (SR 1305)	Add bike lanes
H57	Matthews-Weddington Road (SR 1344)	Hemby Road (SR 1346)	Antioch Church Road (SR1338)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
Low Priority Projects				
H26	Providence Road (SR 1117)	Davis Road (SR 1113)	Old Waxhaw Monroes Rd/ Old Providence Road (SR 1111)	Preserve ROW for future Boulevard
H27	Waxhaw Parkway	Waxhaw Parkway (E)	Old Waxhaw Monroes Rd/ Old Providence Road (SR 1111)	Preserve ROW for future Boulevard
H28	Waxhaw Parkway connector	NC 75 (E)	Old Waxhaw-Monroe Road (SR 1111)	Construct new 2-lane connector to Waxhaw Parkway
H29	Waxhaw Parkway (E)	Waxhaw Parkway connector	Waxhaw Parkway (S)	Construct new 2-lane facility
H33	New Town Road (SR 1315)	Providence Road (SR 1117)	12 Mile Creek Road (SR 1341)	Widen shoulder and construct off-street multi-use path; preserve ROW for future widening
H34	New Town Road (SR 1315)	12 Mile Creek Road (SR 1341)	Waxhaw-Indian Trail Road (SR 1008)	Widen shoulder and construct off-street multi-use path; preserve ROW for future widening
H35	New Town Road (SR 1315)	Waxhaw-Indian Trail Road (SR 1008)	Study Area Boundary East	Widen shoulder and construct off-street multi-use path; preserve ROW for future widening
H42	Davis Road (SR 1113)	Shady Oak Lane / Waxhaw Parkway	Providence Road (SR 1117)	Add turn lanes, widen shoulder and improve geometrics as appropriate
H43	Waxhaw Parkway (SW)	NC 75 / Waxhaw Highway	Davis Road (SR 1113)	Construct 2-lane facility
H44	Marvin Road (SR 1312)	County Boundary	New Town Road (SR 1315)	Add bike lanes/widen shoulder as appropriate, add sidewalks
H45	Joe Kerr Road (SR 1313)	Marvin Road (SR 1312)	Marvin School Rd (SR 1316)	Add bike lanes/widen shoulder as appropriate
H46	Rea Rd	Mecklenburg County Line	NC 16 (Providence Rd)	Add sidewalks
H47	Marvin School Rd (SR 1316)	Rea Rd	New Town Road (SR 1315)	Add bike lanes/widen shoulder as appropriate, add sidewalks
H48	Crane Rd (SR1309)	Rea Rd	New Town Road (SR 1315)	Add bike lanes/widen shoulder as appropriate

H50	Stacey Howie Rd (SR 1311)	Study Area Boundary West	Waxhaw Marvin Rd (SR 1307)	Add bike lanes/widen shoulder as appropriate
H51	Antioch Church Road (SR1338) / Huntington Rd (SR 1347)	Forest Lawn Drive (SR 1348)	Beulah Church Road (SR 1346)	Add turn lanes, widen shoulder and improve geometrics as appropriate
H52	Hemby Rd (SR 1346)	Providence Road (SR1117)	12 Mile Creek Road (SR 1341)	Widen shoulder and improve geometrics as appropriate
H53	Beulah Church Road Extension (SR 1346)	12 Mile Creek Road (SR 1341)	Waxhaw-Indian Trail Road (SR 1008)	Widen shoulder and improve geometrics as appropriate
H54	Beulah Church Road Extension (SR 1346)	Waxhaw-Indian Trail Road (SR 1008)	Potters Road (SR 1357)	Widen shoulder and improve geometrics as appropriate
H55	Beulah Church Road (SE 1346)	Goldmine Rd (SR 1162)/ Wesley Chapel Road (SR 1377)	Potters Road (SR 1357)	Construct 2-lane facility
H59	Walden Lane	Forest Lawn Road (SR 1358)	Potters Road (SR 1357)	Construct 2-lane facility
H60	12 Mile Creek Road (SR 1341)	Beulah Church Road (SR 1346)	New Town Road (SR 1315)	Add turn lanes, widen shoulder and improve geometrics as appropriate
H61	12 Mile Creek Road (SR 1341)	Cuthbertson Road (SR 1321)	New Town Road (SR 1315)	Construct 2-lane facility
H62	Cuthbertson Road (SR 1321)	NC 16 / Providence Road S	New Town Road (SR 1315)	Add turn lanes, widen shoulder and improve geometrics as appropriate
H63	Billy Howey Road (SR 1329)	NC84 / Weddington Road	Waxhaw Indian Trail (SR 1008)	Construct 2-lane facility
H64	Grey Byrum Road (SR 1306)	NC 16 / Providence Road S	Broomes Old Mill Road (SR 1320)	Construct 2-lane facility
H65	Bond Grove Church Road (SR 1307)	NC 16 / Providence Road S	Cuthbertson Road (SR 1321)	Construct 2-lane facility
H66	Bond Grove Church Road (SR 1307)	Cuthbertson Road (SR 1321)	Howie Mine Church Road (SR 1323)	Construct 2-lane facility
H67	Green View Drive	End of road	Farm Creek Road	Construct 2-lane facility
H68	Blythe Mill Rd Ext (SR 1303)	End of Road	Grover Roger Rd (SR 1324)	Construct 2-lane facility
H69	Blythe Mill Rd (SR 1303)	Southecliff Dr	End of Road	Widen shoulder and improve geometrics as appropriate
H70	Crane Rd (SR1309)	New Town Road (SR 1315)	Waxhaw Marvin Rd (SR 1307)	Add off-street multi-use path, add bike lanes, widen shoulders as appropriate
H71	Matthews-Weddington Road (SR 1344)	Hemby Road (SR 1346)	NC 84 (Weddington Rd)	Upgrade to standard 2-lanes w/ shoulders
H72	Cox Rd (SR 1343)	Weddington Matthews Rd (SR 1344)	NC 84 (Weddington Rd)	Upgrade to standard 2-lanes w/ shoulders
H73	Weddington Town Center Northern Access Road (new)	NC 16 (Providence Rd), north of NC 84	Weddington Matthews Rd (SR 1344)	Construct 2-lane facility

Project Key

ID	Description
Boulevards	
H1	Construct 4-lane boulevard
H2	Widen to 4-lane boulevard
H3	Widen to 4-lane boulevard
H4	Widen to 4-lane boulevard
H5	Widen to 4-lane boulevard
H6	Widen to 4-lane boulevard
H7	Widen to 4-lane boulevard
H8	Widen to 4-lane boulevard
H9	Widen to 4-lane boulevard
H10	Construct 4-lane boulevard
H11	Widen to 4-lane boulevard
H12	Construct 4-lane boulevard
Other Major Thoroughfares	
H20	Add turn lanes, widen shoulder and improve geometrics as appropriate; employ context-sensitive design
H21	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H22	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H23	Widen to 4 lanes w/median
H24	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H25	Widen to add shoulder and bike lanes; preserve ROW for future widening
H26	Preserve ROW for future Boulevard
H27	Preserve ROW for future Boulevard
H28	Construct new 2-lane connector to Waxhaw Parkway
H29	Construct new 2-lane facility
H31	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H32	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate; add bike lanes
H33	Widen shoulder and construct off-street multi-use path; preserve ROW for future widening
H34	Widen shoulder and construct off-street multi-use path; preserve ROW for future widening
H35	Widen shoulder and construct off-street multi-use path; preserve ROW for future widening
H36	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H37	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H38	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H39	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
Minor Thoroughfares	
H41	Widen to 4 lanes w/ median, bike lane
H42	Add turn lanes, widen shoulder and improve geometrics as appropriate
H43	Construct 2-lane facility
H44	Add bike lanes, widen shoulders as appropriate, add sidewalks
H45	Add bike lanes, widen shoulders as appropriate
H46	Add sidewalkss
H47	Add bike lanes, widen shoulders as appropriate, add sidewalks
H48	Add bike lanes, widen shoulders as appropriate
H49	Add bike lanes, widen shoulders as appropriate
H50	Add bike lanes, widen shoulders as appropriate
H51	Add turn lanes, widen shoulder and improve geometrics as appropriate
H52	Widen shoulder and improve geometrics as appropriate
H53	Widen shoulder and improve geometrics as appropriate
H54	Widen shoulder and improve geometrics as appropriate
H55	Construct 2-lane facility
H56	Widen to 2 lanes, w/ median, bike lane
H57	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate
H58	Construct 2-lane facility
H59	Construct 2-lane facility
H60	Add turn lanes, widen shoulder and improve geometrics as appropriate
H61	Construct 2-lane facility
H62	Add turn lanes, widen shoulder and improve geometrics as appropriate
H63	Construct 2-lane facility
H64	Construct 2-lane facility
H65	Construct 2-lane facility
H66	Construct 2-lane facility
H67	Construct 2-lane facility
H68	Construct 2-lane facility
H69	Widen shoulder and improve geometrics as appropriate
H70	Add off-street multi-use path, add bike lanes, widen shoulders as appropriate
H71	Upgrade to standard 2-lanes w/ shoulders
H72	Upgrade to standard 2-lanes w/ shoulders
H73	Construct 2-lane facility



Highway Map

Western Union County Local Area Regional Transportation Plan

FINAL DRAFT

Plan date: June 22, 2009

Boulevards
- Existing
- Needs Improvement
- Recommended *

Other Major Thoroughfares
- Existing
- Needs Improvement
- Recommended *

Minor Thoroughfares
- Existing
- Needs Improvement
- Recommended *

* Alignments shown for recommended new roads are conceptual. Further analysis will be required as projects develop.

- Recommended Intersection Improvement
- Recommended Roundabouts
- Existing Interchange
- Proposed Interchange
- Existing Grade Separation
- Proposed Grade Separation

0 0.25 0.5 1 1.5 2 2.5 Miles

Figure 15

Refer to LARTP document for more details

Highway Map

Western Union County Local Area Regional Transportation Plan

Village of Marvin

Plan date: June 22, 2009

Boulevards
- Existing
- Needs Improvement
- Recommended *

Other Major Thoroughfares
- Existing
- Needs Improvement
- Recommended *

Minor Thoroughfares
- Existing
- Needs Improvement
- Recommended *

* Alignments shown for recommended new roads are conceptual. Further analysis will be required as projects develop.

- Recommended Intersection Improvement
- Recommended Roundabouts
- Existing Interchange
- Proposed Interchange
- Existing Grade Separation
- Proposed Grade Separation
- H — Project ID (See project list for details)

0 0.25 0.5 1 Miles

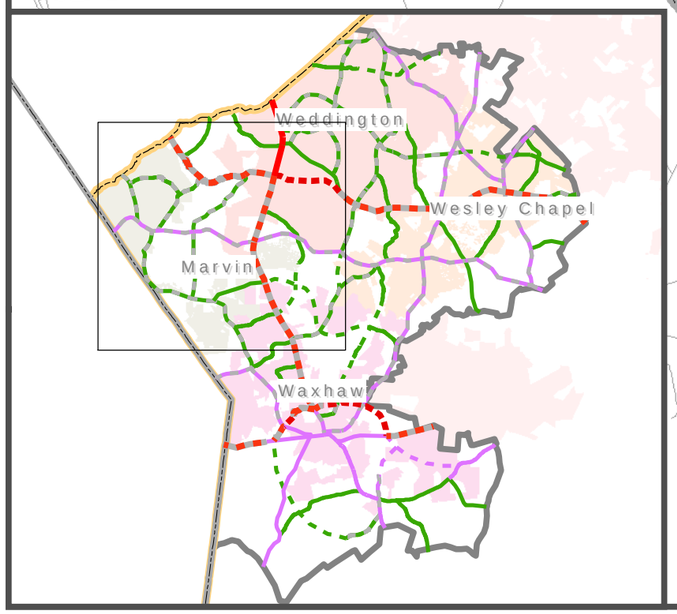
Figure 16

Refer to LARTP document for more details

Mecklenburg County

South Carolina

Marvin



Highway Map

Western Union County Local Area Regional Transportation Plan

Town of Waxhaw

Plan date: June 22, 2009

Boulevards
- Existing
- Needs Improvement
- Recommended *

Other Major Thoroughfares
- Existing
- Needs Improvement
- Recommended *

Minor Thoroughfares
- Existing
- Needs Improvement
- Recommended *

* Alignments shown for recommended new roads are conceptual. Further analysis will be required as projects develop.

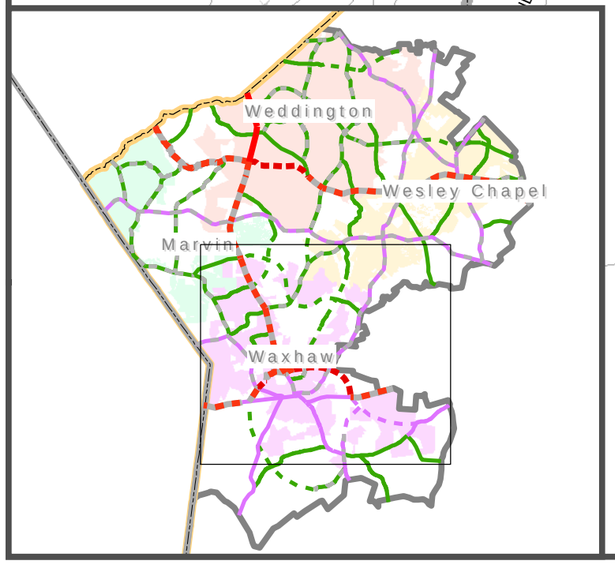
- Recommended Intersection Improvement
- Recommended Roundabouts
- Existing Interchange
- Proposed Interchange
- Existing Grade Separation
- Proposed Grade Separation
- H — Project ID (See project list for details)

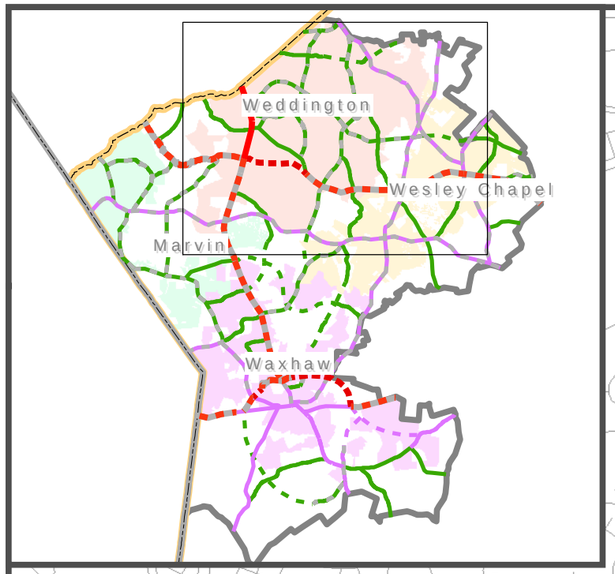
0 0.25 0.5 1 Miles

N W E S

Figure 17

Refer to LARTP document for more details





Highway Map

Western Union County Local Area Regional Transportation Plan

Town of Weddington

Plan date: May 27, 2009

Boulevards
- Existing
- Needs Improvement
- Recommended *

Other Major Thoroughfares
- Existing
- Needs Improvement
- Recommended *

Minor Thoroughfares
- Existing
- Needs Improvement
- Recommended *

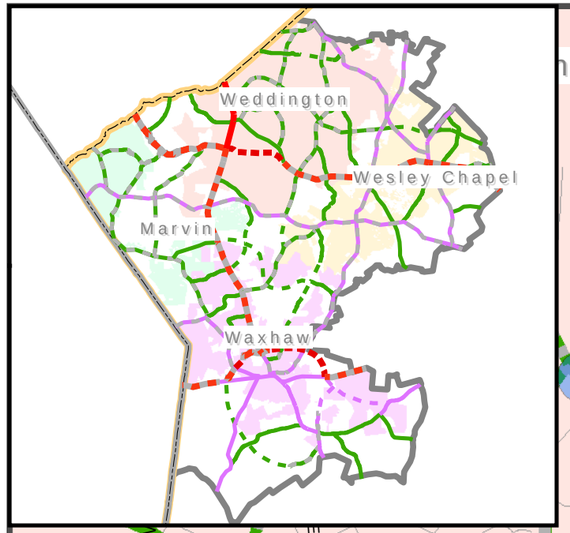
* Alignments shown for recommended new roads are conceptual. Further analysis will be required as projects develop.

- Recommended Intersection Improvement
- Recommended Roundabouts
- Existing Interchange
- Proposed Interchange
- Existing Grade Separation
- Proposed Grade Separation
- H — Project ID (See project list for details)

0 0.25 0.5 1 Miles

Figure 18

Refer to LARTP document for more details



Highway Map

Western Union County Local Area Regional Transportation Plan

Village of Wesley Chapel

Plan date: May 27, 2009

Boulevards
- Existing
- Needs Improvement
- Recommended *

Other Major Thoroughfares
- Existing
- Needs Improvement
- Recommended *

Minor Thoroughfares
- Existing
- Needs Improvement
- Recommended *

* Alignments shown for recommended new roads are conceptual. Further analysis will be required as projects develop.

- Recommended Intersection Improvement
- Recommended Roundabouts
- Existing Interchange
- Proposed Interchange
- Existing Grade Separation
- Proposed Grade Separation
- H — Project ID (See project list for details)

0 0.25 0.5 1 Miles

Figure 19

Refer to LARTP document for more details

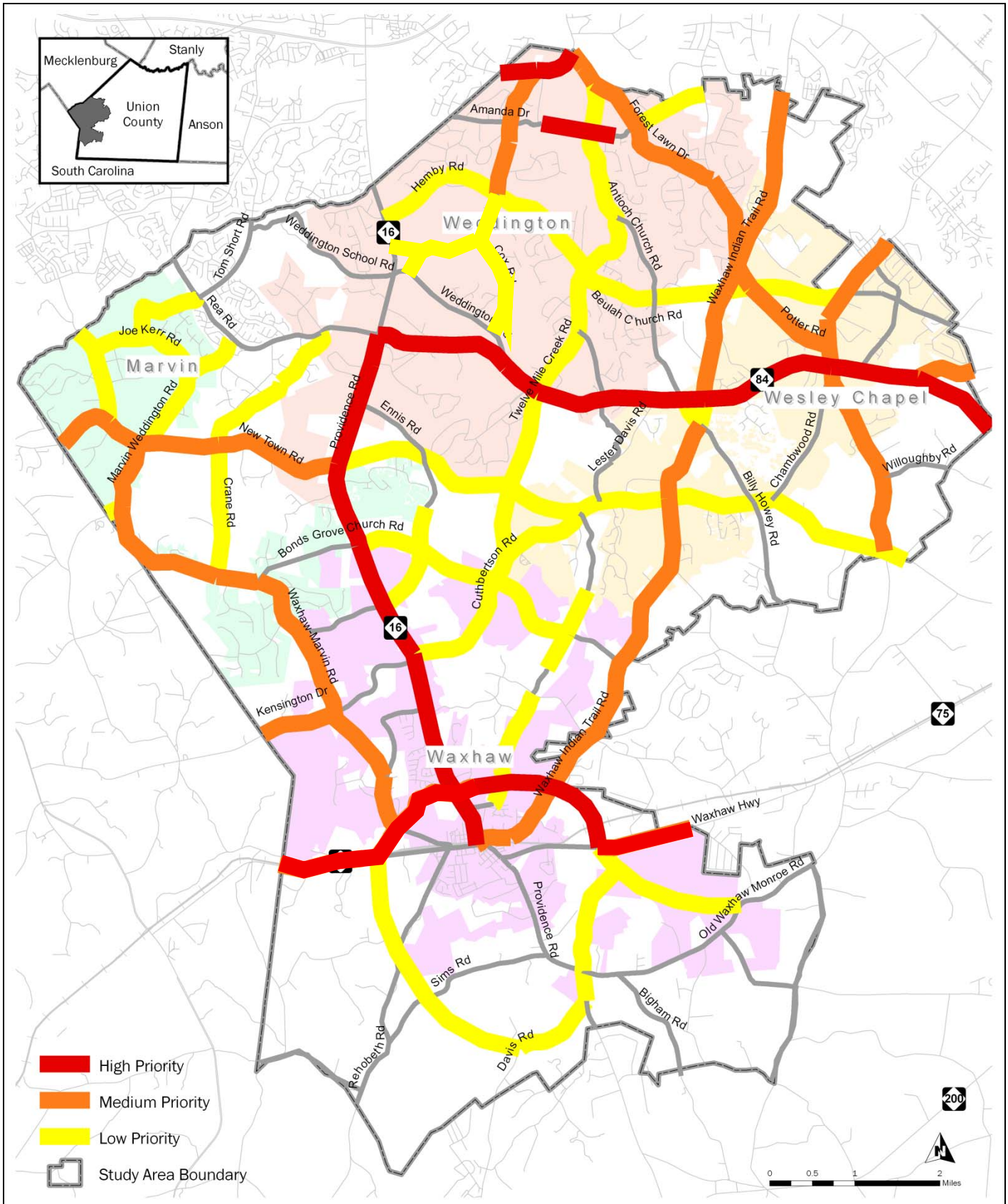


Figure 20: Thoroughfare Plan Priorities

Western Union County Local Area Regional Transportation Plan

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Street Design

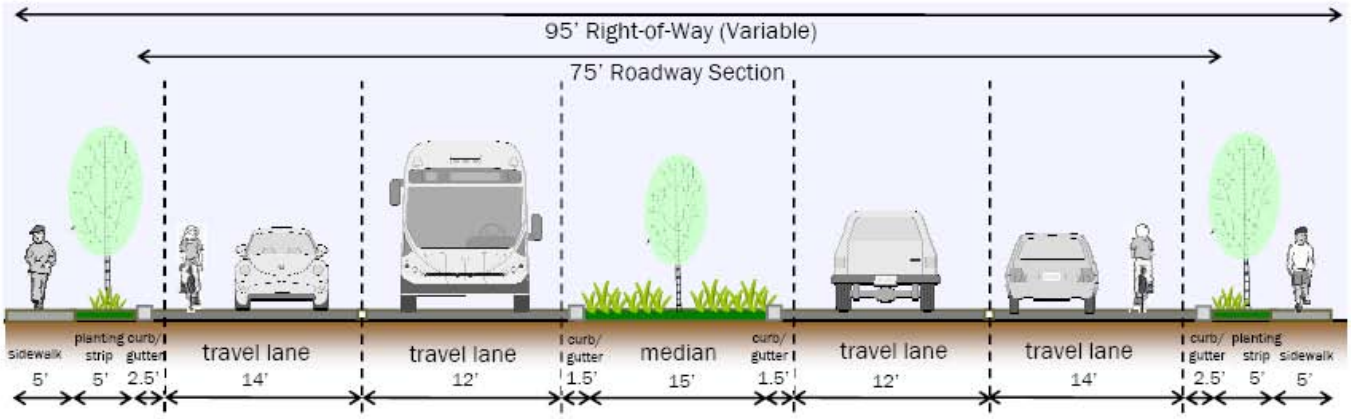
While the location of future roadway improvements is obviously critical, just as important is defining the design, character, and other attributes of those roadways. The cross-sections illustrated in Figure 21 detail five general types of roadways recommended in the Thoroughfare Plan:

- 4-Lane Divided with Wide Outside Lanes (Boulevard)
- 3-Lanes with Wide Outside Lanes
- 2-Lanes with Bike Lanes
- 2-Lanes with Paved Shoulders
- 2-Lanes with Off-Street Multi-Use Path

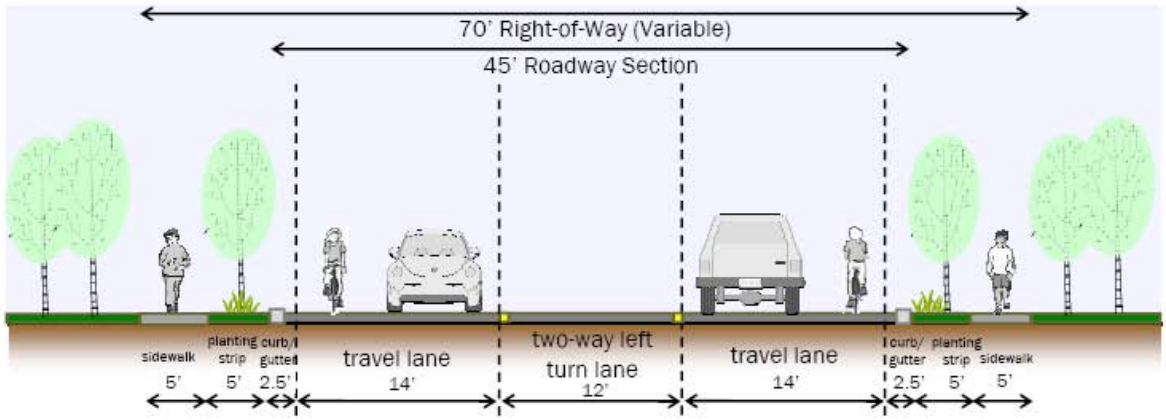
The cross-sections are designed to be multimodal, accommodating vehicles, bicycles, and pedestrians within the same right-of-way. Bicycles are either accommodated in wide outside lanes, striped bike lanes, paved shoulders, or a separate multi-use path (each is described in more detail in Section 4.4). Pedestrians are accommodated either on sidewalks or multi-use paths. It is recognized that in some locations with rural 2-lane roads it may not be feasible to have sidewalks on one or both sides of the road.

These cross-sections are intended to be customized to individual projects according to local context and conditions. The right-of-way requirements are useful especially in working with the development community in building new roadways and making improvements to existing roadways.

A. 4-Lane Divided with Wide Outside Lanes (Boulevard)



B. 3-Lanes with Wide Outside Lanes



C. 2-Lanes with Bike Lanes

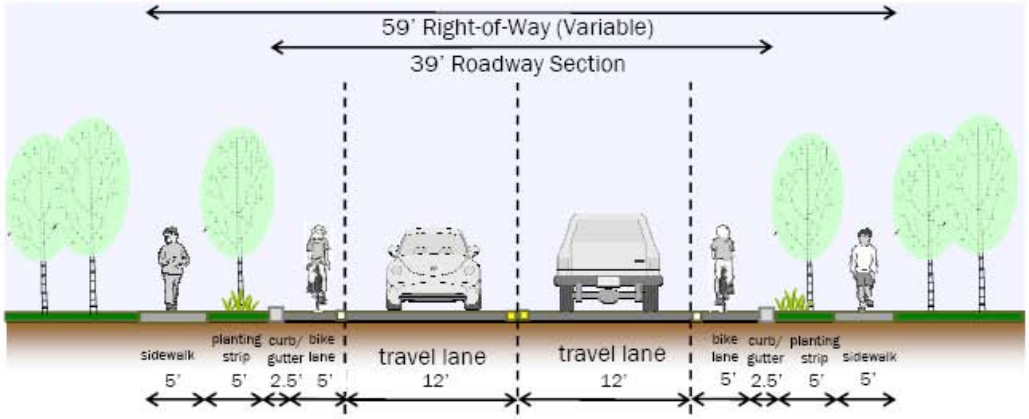


Figure 21: Typical Cross-Sections

Western Union County Local Area Regional Transportation Plan

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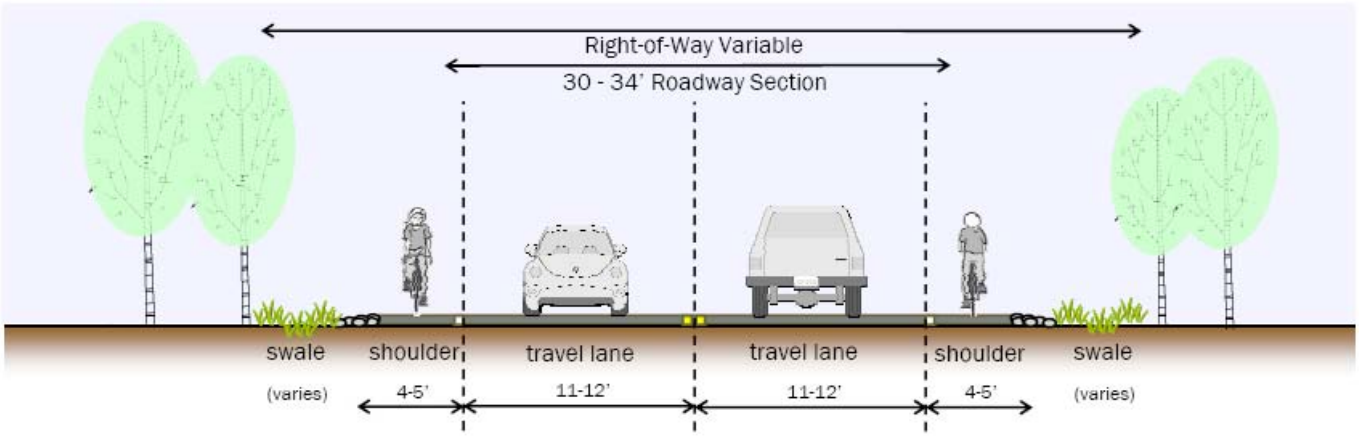
D. 2-Lanes with Paved Shoulders



E. 2-Lanes with Off-street Multi-Use Path

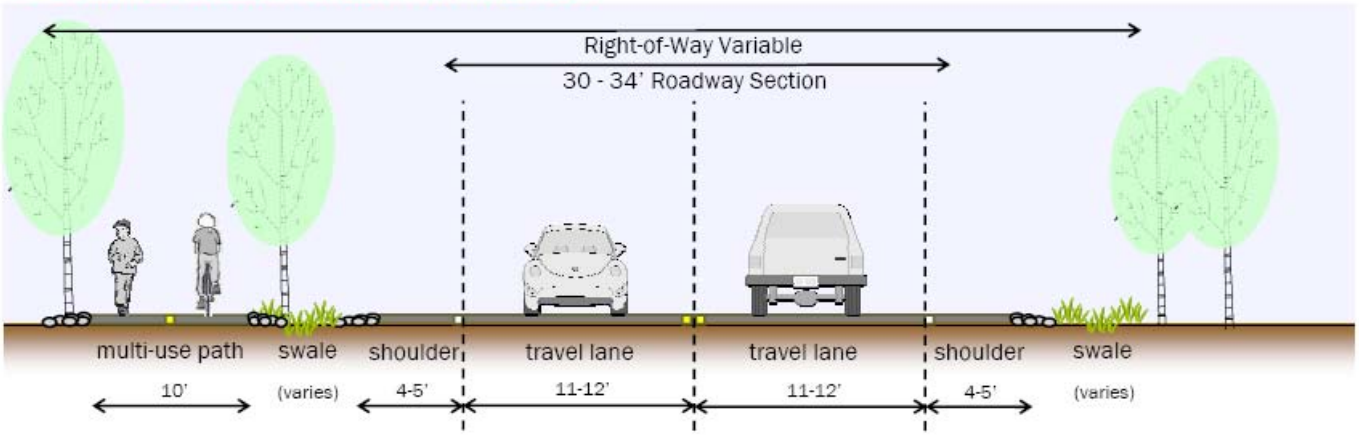


Figure 21b: Typical Cross-Sections

Western Union County Local Area Regional Transportation Plan

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4.3 Intersection Plan

An important companion to the Thoroughfare Plan is the Intersection Plan, illustrated in Figure 22 and detailed below in Table 6. As shown in Section 2, some of today's intersections have capacity and safety issues while others are projected to have more serious issues in the future. These issues have a major impact on the overall function of the region's roadway network. Intersection improvements have two benefits over major roadway improvement projects; 1) they can have immediate impacts on improving capacity and safety without having to go through the same extensive planning, design, and funding process as road widening and new roads, and 2) they are considerably more cost-effective. While intersection improvements may not cure all of the system's capacity deficiencies in the long-term, they are an effective tool for making immediate short-term improvements.

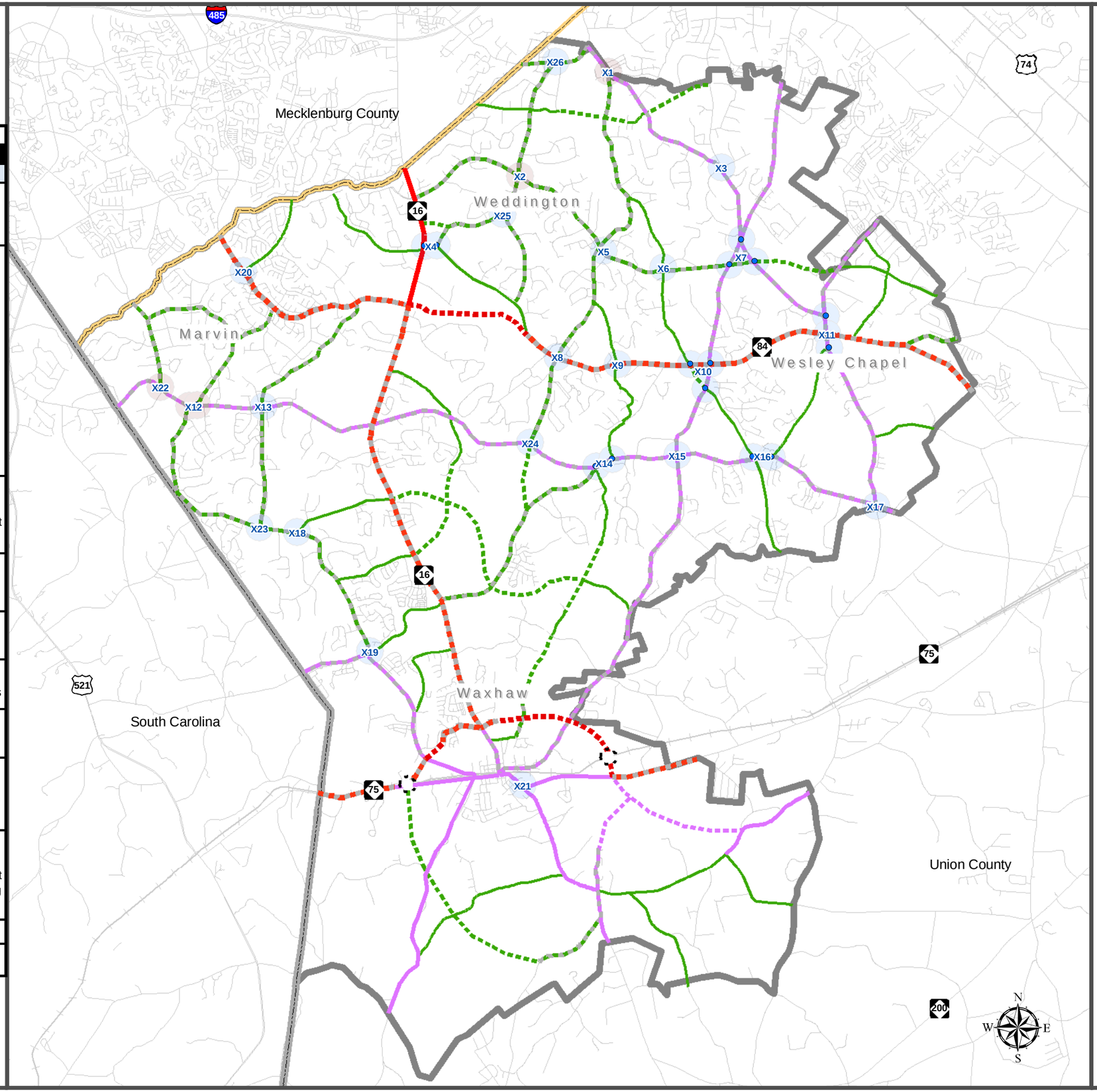
There are a variety of types of potential intersection improvements, including: adding turn lanes, improving signal timing and coordination, access management, realigning offset intersections, making geometric and sight distance improvements to enhance safety, and in some locations, installing roundabouts. Similar to the roadway projects, intersection projects were prioritized into High, Medium, and Low Priority projects for ease of implementation.

Table 6: Recommended Intersection Projects (Prioritized)

ID	Intersection	Description
High Priority Projects		
X2	Weddington-Matthews Road @ Hemby Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted); consider installing roundabout
X4	Weddington Road @ Weddington Matthews Road & @ Providence Road; Providence Road @ Weddington School Road	Improve intersections & coordinate operations; manage access & permitted movements; re-align/consolidate if feasible
X6	Beulah Church Road and Antioch Church Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)
X8	NC 84 / Weddington Road @Twelve Mile Creek Road	Improve intersection; coordinate with Baron Hills and Skytop Road intersections
X10	NC 84 / Weddington Road @ Waxhaw-Indian Trail Road, & @ Antioch Church Road; Waxhaw-Indian Trail Road @ Billy Howey Road	Improve intersections & coordinate operations; manage access
X12	New Town Road @ Marvin School Road; Waxhaw-Marvin Rd @ New Town Rd	Improve intersections & coordinate operations; manage access & permitted movements; re-align/consolidate adjacent intersections if feasible, consider installing roundabout or pair of roundabouts
X14	New Town Road from Cuthbertson Road to Will Plyler Road; Cuthberson Road @ Farm Creek Road	Improve intersections & coordinate operations; manage access & permitted movements; re-align/consolidate where feasible
X15	New Town Road and Waxhaw Indian Trail Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)
X18	Waxhaw-Marvin Road @ Bonds Grove Church Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)

X21	NC 75 @ Old Providence Road, & @ McCain Street	Improve intersections & coordinate operations; manage access & permitted movements; re-align/consolidate where feasible
X26	Weddington-Matthews Road @ Tilley Morris Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)
Medium Priority Projects		
X7	Waxhaw-Indian Trail Road @ Beulah Church Road, & @ Potters Road; Beulah Church Road @ Potters Road	Improve intersections & coordinate operations; manage access & permitted movements
X9	NC 84 / Weddington Road @ Deal Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)
X11	Wesley Chapel Road @ NC 84 / Weddington Road, & @ Potters Road; Potters Road @ Chambwood Road	Improve intersections & coordinate operations; manage access; consider connecting Antioch Church & Billy Howey Roads
X16	New Town Road @ Billy Howey Road, & @ Chambwood Road	Improve intersections & coordinate operations; manage access
X17	New Town Road @ South Potter Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)
X19	Kensington Drive @ Waxhaw-Marvin Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)
X20	Rea Rd @ Tom Short Rd	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)
X22	New Town Road @ Marvin Road, & @ Meadowlark Lane	Consider installing roundabout
X24	New Town Road @ Twelve Mile Creek Rd	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)
Low Priority Projects		
X1	Antioch Church Road @ Forest Lawn Drive	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted); consider installing roundabout
X3	Potter Road and Forest Lawn Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)
X5	Beulah Church Road @ 12 Mile Creek Road, & @ Huntington Road	Improve intersections & coordinate operations; realign/combine into single intersection
X13	New Town Road and Crane Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)
X23	Waxhaw Marvin Road @ Crane Road	Improve intersections; sight distance and safety improvements
X25	Weddington-Matthews Road @ Cox Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)

Project Key	
ID	Description
Intersection Improvements	
X1	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted); consider installing roundabout
X2	
X3	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)
X6	
X9	
X13	
X15	
X17	
X18	
X19	
X24	
X25	
X26	
X20	
X4	Improve intersections & coordinate operations; manage access & permitted movements; re-align/ consolidate adjacent intersections if feasible
X14	
X21	
X5	Improve intersections & coordinate operations; realign/combine into single intersection
X7	Improve intersections & coordinate operations; manage access & permitted movements
X8	Improve intersection; coordinate with Baron Hills and Skytop Road intersections
X10	Improve intersections & coordinate operations; manage access
X16	
X11	Improve intersections & coordinate operations; manage access; consider connecting Antioch Church & Billy Howey Roads
X12	Improve intersections & coordinate operations; manage access & permitted movements; re-align/consolidate adjacent intersections if feasible, consider installing roundabout or pair of roundabouts
X22	Consider installing roundabout
X23	Improve intersections; sight distance and safety improvements



Intersection Map

Western Union County Local Area Regional Transportation Plan

FINAL DRAFT

Plan date: June 22, 2009

Boulevards
- Existing
- Needs Improvement
- Recommended *

Other Major Thoroughfares
- Existing
- Needs Improvement
- Recommended *

Minor Thoroughfares
- Existing
- Needs Improvement
- Recommended *

* Alignments shown for recommended new roads are conceptual. Further analysis will be required as projects develop.

- Recommended Intersection Improvement
- Recommended Intersection Roundabouts
- Existing Interchange
- Proposed Interchange
- Existing Grade Separation
- Proposed Grade Separation

0 0.25 0.5 1 1.5 2 2.5 Miles

Figure 22

Refer to LARTP document for more details

4.4 Bicycle Recommendations

As noted in Section 2, the LARTP study area has been developed with rural roadways and lacks significant on-street and off-street bicycle facilities. One of the challenges of planning bicycle facilities in areas like Western Union County is attempting to balance the needs of bicyclists and making bicycling a viable alternative to driving with the strong desire to maintain the rural heritage of the community and its transportation system. It is recognized that formal bicycle facilities may not be appropriate on all Western Union County roadways. This Plan enhances bicycling, both for recreational and travel purposes, in two main ways: by developing on-street bicycle facilities (see types below) along major corridors (eg, NC 16, NC 84, Waxhaw Parkway, and in the Village of Marvin), and by proposing targeted off-street improvements, such as a multi-use path along New Town Road (see thoroughfare plan in Figure 15 and street cross-sections in Figure 21).

In order to understand the recommended bicycle improvements it may be helpful to first understand the different types of bicycle users and the various facilities that can accommodate them.

Typical Bicycle Users

There are three general categories of bicyclists:

- *Advanced:* The advanced cyclist may represent the smallest population group, however they will ride the greatest number of miles per year and will likely be advocates for cycling opportunities at all skill levels. This category of cyclist feels comfortable traveling along thoroughfares that are predominantly automobile-oriented, at higher vehicular speed and volume.

- *Basic:* The basic cyclist is less confident or experienced as the advanced, and would therefore prefer to ride along on-street facilities with lower vehicular speed, or off-road path facilities. This category of rider will typically represent a greater population than then advanced, however will not ride as many miles or be as vocal in regards to community bicycle facilities and amenities.

- *Children*: The child cyclist has limited speed, vision, and overall comfort with regard to riding along with vehicles. This category of riders will represent the greatest population, however they will ride the smallest number of miles, and typically choose off-road multi-use path facilities or subdivision sidewalks to ride along.

Bicycle Facility Types

Different types of facilities are designed to accommodate the three general categories of users. The following are common facility types and may be appropriately applied in the study area:

Wide outside lanes

These types of facilities are generally preferred by the advanced cyclists because they allow the rider to operate within the lane, as a vehicle, at the posted speed limit. This facility is not striped, and may or may not include a curb and gutter. The typical outer lane minimum width is 14' for a multi-lane roadway, or 15' minimum width for a two-lane roadway, and does not include the width of a curb

and gutter. Because the cyclist is allowed to operate as a vehicle, this type of facility is only recommended for roadways with moderate vehicle speeds for safety.

Paved shoulders / Bike lanes
These types of facilities may provide improved bicycle safety and comfort by dedicating a (preferred) minimum 4' of pavement, generally with striping, along the roadway. While bike lanes and paved shoulders are different facility types, they are included together here for application in this study area. Basic and advanced cyclist users may prefer this type of facility because of the perceived added rider safety and comfort. There are a variety of design standards for bike lanes, depending on the local context.

Signed bike routes
This facility type includes the installation of signage along lower speed or volume (neighborhood) roadways that would otherwise not warrant extra pavement or striping. These facilities may not always provide direct routes for cyclists, and therefore may not be preferred by advanced cyclists. The signs are cost-effective treatments for slowing vehicular traffic along a neighborhood street, improving rider safety, and even improving wayfinding between neighborhood links and greenway trails.

Shared lane markings
This type of pavement marking is also commonly referred to as a "Share the road arrow" or its contraction, "Sharrow." This application is used in combination with either a wide outside lane or a striped bike lane in order to clearly indicate that bicycle riders are encouraged to ride 'here,' and in this direction. Sharrows may also be used to increase vehicular awareness of cyclists along roads that do not meet the preferred minimum lane width of 14'.

Multi-use paths
This type of facility is a separated, paved pathway that is generally a 10' wide minimum width, and excludes motorized vehicles through the use of gates or bollards. Multi-use paths are shared use, mixing bicycle riders of all user groups with pedestrians, and usually located within the roadway right-of-way. This type of facility can be utilized by all types of users, however may not be preferred by an advanced cyclist, who may still choose to ride with traffic at a moderate posted speed limit. Amenities such as benches, wayfinding signage, managed vegetation (shade), or designated restroom locations are common along this type of facility. Frequent curb-cuts for driveways or intersections should be minimized or bypassed, if possible, so that the flow of cyclists along the path is maintained.

<u>Ancillary bicycle facilities</u>
There are additional considerations for improving bicycling, which extend beyond the on- or off-street paved facilities. These ancillary facilities would include bicycle parking and/or storage lockers, bike racks on transit buses, shower facilities within office buildings, or bike-friendly storm drain inlets and railroad crossing treatments.

Bicycle parking
Bicycles, much like vehicles, need a place to park upon reaching a destination. Many bicyclists prefer covered parking locations to uncovered ones, if available. Considerations for location, capacity, security, and design should all be weighed when selecting and installing bike parking.

Complementary facilities for bike commuters

When specifically accommodating bicycle commuters, there are considerations to be made for transit providers to include bicycle racks on buses. Some racks are front-mounted on the bus, while other designs convert seating in the rear of the bus or train to accommodate a small bike rack. This type of amenity will allow commuters to shorten the distance between a fixed bus stop location and their office destination, and increase transit ridership potential. Additionally the inclusion of changing and shower facilities at work support bicycle commuting possibilities.

Retrofit roadway opportunities

On-street barriers to bicycling include non-bicycle-friendly storm drain inlets, uneven railroad crossings, and road debris collection along the curb and shoulder of roadways. Resources through the Association of Pedestrian and Bicycle Professionals and other state or federal organizations provide design specifications that help communities design retrofit solutions to many of these problems.

Recommendations

Bicycle facilities are recommended as part of the Thoroughfare Plan (see Figure 15), which includes roadway improvements with wide outside lanes, bike lanes, paved shoulders, and multi-use paths.

Aside from these facilities, there are also a variety of off-street bicycling opportunity areas, primarily in the form of greenways. Figure 23 illustrates some of these opportunities. The recommendations that are part of the Thoroughfare Plan are shown in two shades of blue, and potential greenway opportunities are shown in shades of green.

Potential greenway trail opportunities include major stream corridors within the study area, such as Twelve Mile, Six Mile, or even Waxhaw Creeks. Larger streams provide greater regional connectivity, accessing more places and people. They should also pose fewer development conflicts with respect to land use zoning, non-buildable lands and soils, proximity to existing structures, and even cost. Additional potential greenway trail opportunities exist along minor stream corridors to connect residential areas, parks, schools, or additional recreational destinations.

Major opportunities for bicycle improvements

- Boulevard roadway projects with wide outside lanes
- New Town Road and Crane Road roadway projects with off road multi-use path construction
- Major and minor thoroughfare roadway projects within and near the Village of Marvin
- Major stream corridor areas, such as Twelve Mile Creek and Waxhaw Creek
- Minor stream corridor areas connecting to (a) on-road bike facilities, (b) major stream corridor opportunity areas, or (c) adjacent municipality facilities.

Constraints

Development of greenway trail facilities can be constrained by numerous factors, including social, environmental, financial, and land use issues. Within the Six Mile Creek and Waxhaw Creek watersheds there is a federally-listed endangered species (Carolina Heelsplitter), which places additional development restrictions within all supporting creeks, streams, tributaries and other riparian areas of the watershed. A development buffer of 100' for all riparian areas, and 200' of riparian areas with an associated 100-year FEMA-designated floodplain has been imposed to protect the water quality and this species. The development of a greenway trail is subject to these development restrictions, however is listed as "potentially allowable" by the NC Department of the

Environment and Natural Resources (DENR) – Division of Water Quality (DWQ) through a permitting process. These water quality protection rules have the effect of decreasing the total amount of developable land surrounding streams, however, they may also increase the potential for greenway trail construction as part of a land conservation and water quality preservation effort.

Other recommendations

The four member communities may also wish to consider adopting policies that support bicycle travel as noted in the "Ancillary Bicycle Facilities" section. These may include provision of shower and locker facilities in employment centers, better bike parking, and other amenities. These policies can be adopted as part of the Land Use Policies and Ordinances in Section 5.

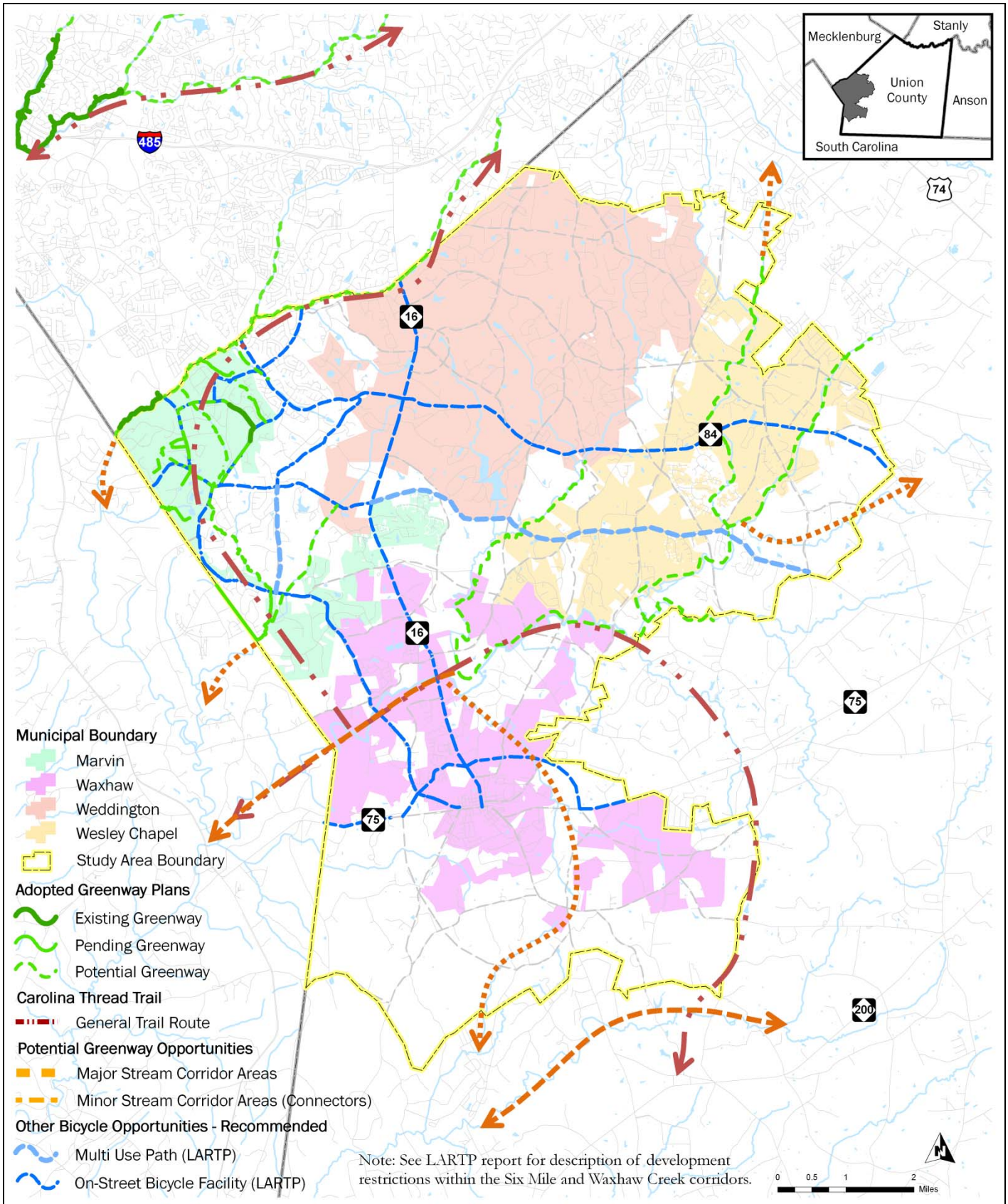


Figure 23: Bicycle and Greenway Opportunities

Western Union County Local Area Regional Transportation Plan

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4.5 Pedestrian Recommendations

Creating walkable communities is an important objective of any transportation plan, whether rural, suburban, or urban. Developing comprehensive and connected pedestrian systems can add numerous quality of life benefits to a community, in addition to providing another alternative to trips made by car.

Major elements of walkable community

Sidewalks
One measure of a walkable community is the existence of connected sidewalks. Sidewalks are sometimes constructed as required by local development ordinances as lands are subdivided and developed. This can lead to a disconnected pattern of new and old sidewalks throughout an area. Recording, assessing, maintaining, and connecting sidewalks is an important process for filling in "missing links" in the sidewalk system and enhancing pedestrian connectivity.

Safe intersections
Intersection crossings are common conflict points between pedestrians and vehicles. The Intersection Plan that is part of this study makes recommendations for specific intersection improvements to enhance safety and increase capacity.

Connected systems
Walkability is also a reflection of the general connectivity between pedestrian systems and facilities. Physical barriers or gaps between constructed pedestrian facilities are major obstacles to the walking. When faced with such obstacles the options are generally to (a) walk in unsafe conditions, such as along roadways, or (b) select an alternative mode of transportation, typically driving. The emphasis should be on connecting pedestrian facilities and allowing them to work as a system rather than individual components.

Intermodal connectivity
Combining modes of transportation is another measure of walkability. This would include developing locations with considerations for not only vehicles, but also for pedestrians, bicycles, and transit. Some examples would include a development with:

- Vehicular considerations (parking, access, signage, traffic signals, turn lanes)
- Pedestrian considerations (connected sidewalks, direct routing, curb cuts and ramps, signage, lighting)
- Bicycle considerations (bicycle parking, curb cuts and ramps, access paths)
- Transit considerations (pick up/drop off location, signage, shelter, lighting)

The ultimate goal of intermodal connectivity would be a reduction in the number of single-purpose and single-occupant vehicular trips made within a community. The benefits would be reduced traffic congestion along roads, increased safety and efficiency of the entire system, improved air and water quality, and a better quality of life for citizens.

Recommendations

Recommended pedestrian improvements include:

- Implement sidewalk improvements as part of roadway improvement projects on the Thoroughfare Plan
- Implement intersection improvements as part of Intersection Plan
- Develop a local sidewalk ranking system that identifies needed sidewalk projects and ranks them on a series of measurable criteria. Projects would be built as funding sources become available.

4.6 Transit

The LARTP does not include recommendations for new mass transit service into the study area or local transit service within the study area. As the area continues to grow and the roadway system continues to develop, some transit along major corridors may be viable. The Steering Committee agreed that the most effective transit solution may be development of park-and-ride lots in targeted commercial areas within the study area to connect commuters to the Charlotte metro area and its various existing and planned mass transit options. The mechanism for developing these park-and-ride lots is detailed in Section 5 (Land Use Policies and Ordinances).

5

5 Land Use Connections: *Policies and Ordinances*

Transportation systems are built to provide opportunities for the movement of people and vehicles from one destination to another. The manner in which land is developed and designed along transportation routes plays a critical role in the effectiveness and efficiency of the transportation system. And the reverse is also true – the design and development of transportation systems affect land use patterns and the quality and character of developed areas and in turn directly affect quality of life.

5.1 Considering the Linkage Between Land Use and Transportation Planning

One of the steps in the LARTP planning process has been to assess the linkage between transportation and land use planning in the western Union County study area and to identify ways to better coordinate planning efforts to achieve the desired goals in western Union County: decrease road congestion, provide safer roads and intersections, maintain rural character, provide safe routes for bicyclists, pedestrians, and others.

The ways in which the four towns and the county develop their land directly impacts the local transportation network, including roadways and alternative modes such as transit, cycling, and walking. For example, development along NC 16/Providence Road, when combined with the high volume of through trips, has led to a decrease in the level of service along this corridor, particularly creating congestion during peak commuting hours. The land use plans of the four participating municipalities have played and will continue to play a critical role in determining the future transportation needs within the LARTP study area. These land use plans are discussed in this chapter.

This chapter also provides a look outside of the study area to other North Carolina communities that have experienced similar growth and transportation issues. In particular, the transportation and land use planning efforts in Matthews, Huntersville, Cary and Charlotte, North Carolina, were reviewed to learn about the planning strategies in place in these communities and the lessons they have learned from implementation.

Considering the current and future conditions of the LARTP planning area, the lessons learned from similarly situated North Carolina communities, and the implementation tools feasible for

implementing this planning effort, this chapter goes on to provide recommendations for ordinance amendments for the four LARTP jurisdictions. This includes model ordinance language provided in the appendix to this plan. For consistency of planning and implementation in this local area, it is recommended that these standards should be as consistent as possible throughout the planning area.

5.2 Land Use Planning in the Study Area

Union County has been one of the fastest growing counties in the state and the nation over the last decade. And much of that growth has taken place within this study area. The table below shows available population estimates for 1990, 2000, and 2007 for the four participating LARTP municipalities and Union County as a whole. Each municipality has seen steady population growth since 1990.

Table 7: Population Growth

	1990	2000	1990-2000 % Change	2007**	2000-2007 % Change
Marvin*	--	1,039	--	--	--
Waxhaw	1,294	2,625	103%	--	--
Weddington	3,803	6,696	76%	--	--
Wesley Chapel*	--	2,549	--	--	--
Union County	84,210	123,677	47%	182,344	47%

Source: U.S. Census Bureau (1990, 2000); North Carolina State Office of Budget and Management (2007)
*Note that the Villages of Marvin and Wesley Chapel incorporated after the 1990 census and therefore do not have population estimates for that year.
**Accurate population estimates for 2007 for these municipalities are not currently available. The upcoming census will establish more accurate population figures for tracking growth.

Growth has slowed in recent years due to infrastructure constraints in Union County and the national economic downturn, but is expected to continue into the future. As illustrated in figures 10 and 11 shown previously, population growth is expected to occur throughout the study area with a focus along the NC-16 corridor in the Town of Waxhaw, north of Waxhaw Marvin Road near the state border, and south of Old Waxhaw Monroe Road at the southeast corner of the study area. Employment is expected to be focused along NC-16 within Waxhaw, along with a small pocket of employment along NC-84 between Twelve Mile Creek and Deal Roads.

To prepare for future growth, all four communities have prepared plans to establish community visions, set goals for guiding new development, address needs for new infrastructure, and improve the character and quality of life in each respective community.

- **The Town of Weddington adopted its Land Use Plan in 2002**. The plan articulates the varied interests within the community and sets out a series of community goals, including planning for new low-density single-family residences and subdivisions, protecting open spaces and rural character within the community, and coordinating with neighboring jurisdictions on future infrastructure needs.

- **The Village of Marvin adopted its Land Use Plan in 2004**. Goals of the plan include maintaining its small town character and low-density land use pattern, preserving open spaces, providing new opportunities for recreation, and planning for community-oriented commercial developments to serve Village residents. The plan calls for the future Village Center to be

located in the vicinity of the existing Town Hall on New Town Road between Marvin Road and Marvin School Road.

- **Wesley Chapel adopted its 2030 Vision Master Plan in 2008**. The goals of the plan focus on protecting rural character, focusing more intense development with new housing options around a new Village Center to serve as the "heart of the community", and maintaining the rural character in the outer areas of the community through lower density subdivision designs.

- **The Town of Waxhaw adopted its 2030 Comprehensive Plan in 2009**. The plan sets a course for creating a more compact development form, increasing housing choices, coordinating the provision of new infrastructure with new development and population growth, increasing transportation options (bicycle, pedestrian, and transit), focusing commercial development within the heart of the community (downtown), improving community access to parks, greenways, and open spaces, and participating in regional coordination for infrastructure.

- **Union County is also preparing a Comprehensive Plan**. This plan acknowledges and plans for development around the municipalities and along major transportation corridors, such as Highway 74 and the future Highway 74 Bypass, and seeks to protect rural and lower density residential areas in the remainder of the county.

As map on the next page illustrates, the future land use plans for the four towns and Union County set out a course for a predominantly low-density residential land use pattern surrounding small town centers within the study area. The majority of the denser development is likely to occur in and around the Town of Waxhaw where more dense development patterns already exist and where the new Waxhaw Comprehensive Plan encourages new development.

5.3 Community Case Studies

There are communities in North Carolina that have experienced similar growth pressures and land use/transportation planning needs as western Union County. The Steering Committee for the LARTP selected three high growth municipalities that have undertaken proactive planning approaches in the last decade (Cary, Huntersville, and Matthews, North Carolina) and one model road corridor (Ardrey Kell Road in Charlotte, North Carolina) to investigate and ask the following four questions:

- How have these communities managed impending growth?
- How do they plan for and fund infrastructure needs?
- How do they address the land use / transportation nexus?
- Have they been successful at accommodating growth and maintaining community character?

These case studies take a look at high-growth communities that are working to preserve their historic small town and rural character while accommodating new development and necessary transportation infrastructure improvements. Plans and ordinances from these communities were reviewed and planners from each community were interviewed. A summary of these findings is provided here and the full case study report is found in the appendix.

- **Planning Coordination with Neighboring Jurisdictions.** Each community interviewed worked closely with neighboring jurisdictions to coordinate land use planning, adopt

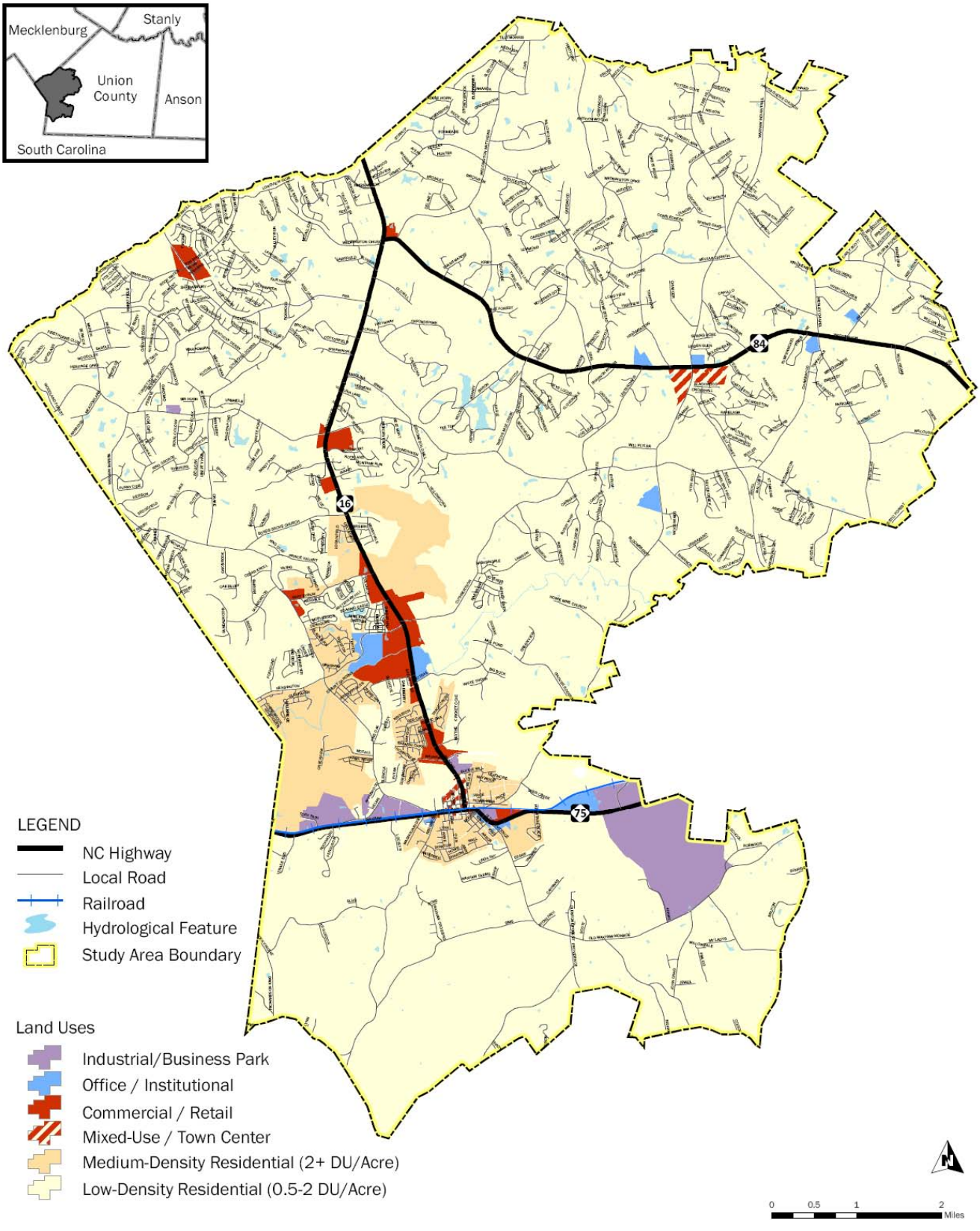


Figure 24: Municipal and County Land Use Plans

Western Union County Local Area Regional Transportation Plan

MARTIN ALEXIOU BRYSON

annexation agreements, and develop infrastructure improvement plans. This was a common theme across these communities and a necessity for planning success.

- **Implementing Plans into Ordinances.** The Town of Huntersville has developed twelve small area plans focused around key corridor areas. These small area plans are drafted in such a manner that they can be directly implemented into the local zoning ordinance following adoption of the plan. The Town of Cary has also implemented key land use policies by revising residential zoning in rural areas to ensure rural character through density and design provisions. The Town of Matthews has the authority from the North Carolina General Assembly to use conditional zoning. This tool allows the local government and planners to uphold local land use policies by working with developers to develop solutions to site specific issues that may not be addressed directly in the zoning and subdivision ordinances.

- **Focus Land Use Planning Along Key Corridors.** One way to ensure the coordination of transportation and land use planning is to focus planning efforts along key corridors. Matthews has developed a highway overlay zone for NC-51 to establish consistent access management, streetscape, landscaping, land use, and parking standards along this developing corridor. Huntersville uses the small area planning process and focuses on key growth corridors.

- **Use of Official Maps.** All three communities ensure the coordination of their transportation plans and land use plans through official maps, including official zoning and thoroughfare maps. Matthews actually depicts thoroughfare plans on its official zoning map to reinforce the connections.

- **The Importance of Connectivity.** These communities stressed the importance of creating connected communities. Matthews is currently working through its Downtown Master Planning effort to retroactively create more connectivity in downtown by developing new intersections and connecting roads. Huntersville uses traditional town planning principles that organize centers of development around existing and planned road and transit infrastructure, ensuring internal and external connectivity to activity centers and residential areas.

- **Commitment to Planning.** Given the growth challenges facing each of these communities, a commitment to planning is critical to achieving success. Huntersville hired a transportation planner and a liaison planner that works across the land use and transportation departments to ensure consistency of planning efforts. The Town creates an annual list of priority transportation improvement projects, including sidewalks and bikeways, and uses local general funds and bonds to fund projects. Cary and Matthews have also used general funds and bonds to fund local transportation projects and to provide bridge funding to the North Carolina Department of Transportation for state initiated projects needing funding assistance.

- **Private Investments in Transportation Infrastructure.** Huntersville has adopted a Transportation Impact Assessment ordinance that establishes transportation level of service standards and a process for developments meeting a certain threshold to assess impacts on the transportation system and mitigate those impacts through infrastructure improvements or others means. The town designed the Ordinance to not only ensure that transportation impacts were addressed before developments were completed, but also uses it as a tool to guide

development to targeted areas. Cary has adopted an Adequate Public Facilities Ordinance that requires that adequate public transportation facilities are in place to service a new development before it is constructed. The town also uses developer impact fees to pay for development of new water/sewer and transportation infrastructure.

- **Standards for Design.** Huntersville has adopted design guidelines that interpret plans and guide developers in designing for street connectivity, streetscape improvements, building and parking placement and orientation, and other design factors. Cary's zoning ordinance includes standards for rural collectors and rural thoroughfares to ensure that roads in rural areas are more in keeping with the agricultural and rural context. The Ardrey Kell Road in Charlotte was designed to provide "complete streets" within a rural and suburban development context, including sidewalks, wide development setbacks in rural areas, build-to lines in more densely developed areas, and internally accessed commercial sites to ensure road capacity through managed access.

There is much to learn from communities that have been through similar growth periods. These ideas, combined with examination of the current policy and regulatory framework in Western Union County, can help create a foundation for coordinated land use planning.

5.4 Ordinance Review

Land use ordinances are one of the most powerful tools that local governments have to shape future growth and development within their community. These zoning and subdivision ordinances provide specific standards for new development and redevelopment, and typically guide the amount of land that can be developed on a site, uses for the site, required site improvements, and design features.

Marvin, Weddington, and Wesley Chapel each have individual sets of zoning and subdivision regulations. Waxhaw combines them into a unified development ordinance. Each community individually uses these ordinances to guide development. These four sets of regulations share some commonalities, but are generally lacking in consistency in terms of the types of standards and specific requirements. Key recommendations for implementation of the LARTP are to improve land use regulations within the key transportation corridors that serve and connect the municipalities, and to achieve more consistency in regulations among the jurisdictions for the rules that apply to each of these corridors.

Following are descriptions of the transportation related land use regulations that are currently in place for the four participating western Union County municipalities. Table 8 at the end of this section summarizes these ordinance provisions.

<u>Marvin</u>
The Village of Marvin has provisions in its Zoning and Subdivision Ordinances relevant to the LARTP as follows:

- **Access Management:** Standards for street development are addressed, but do not include access management standards. Provisions include coordination with existing streets, and for large track subdivisions the alignment of streets, and street access. (See Article IV, Section 7 of the Subdivision Ordinance.)

- **Improvements and Right-of-Way Dedications:** Arterial, major and minor collectors, and local streets are to be reserved in compliance with official street plans. Standard regulations for local streets required as part of subdivision also addressed. (See Article IV of the Subdivision Ordinance.)

- **Cul-de-sacs:** Standards for development of cul-de-sacs, including maximum abutting lots and minimum radii are addressed, but do not include standards for limiting use of cul-de-sacs or requiring connectivity within subdivisions. (See Article IV, Section 3 of the Subdivision Ordinance.)

- **Tree Protection:** An independent Tree Protection Ordinance addresses exterior perimeter and interior planting requirements, street tree requirements, parking lot tree requirements, permit requirements for removal of trees, identification of existing trees as part of permit applications, replacement requirements for removed trees, and protection of root zones during construction. (See Tree Protection Ordinance.)

- **Streetscape Improvements:** Sidewalks, pedestrian crosswalks, and green strips (i.e., sidewalk yards) are required of major subdivisions. (See Article V, Section 9 of the Subdivision Ordinance.)

- **Landscaping and Buffers:** Screening and landscaping provisions are provided. Planting strips are required for office and business zoned that abut major or minor thoroughfares and are to be adjacent to the street right-of-way. (See Section 4.2 of the Zoning Ordinance.)

- **Existing Corridor Overlay Zoning Districts:** A Commercial Corridor District addresses retail and office developments in designated areas along Rea Road and NC 16. (See Section 5.6 of the Zoning Ordinance.)

Waxhaw

The Town of Waxhaw has provisions in its Unified Development Ordinance relevant to the LARTP as follows:

- **Access Management:** Street provisions include coordination of streets and greenways, access to adjacent properties, and street intersections, and points of ingress and egress. Access management standards are not included. (See Section 18.9.2 and Section 18.9.7.)

- **Improvements and Right-of-Way Dedications:** Development and conveyance of local streets and public right-of-way are required. (See Section 18-10-1.)

- **Requirements for Street Stub-outs:** When deemed relevant by the Town Administrator, Planning Board, or Board of Commissioners, street stub-outs may be required during as part of the subdivision process. (See Section 18.9.2.1.)

- **Requirements for Cul-de-Sacs:** Standards for development of cul-de-sacs, including maximum length and minimum radii are addressed, but do not include standards for limiting use of cul-de-sacs or requiring connectivity within subdivisions. (See Section 18.9.2.12.)

- **Tree Protection:** Tree preservation provisions include requirements for permits prior to removing trees, along with criteria for determining whether or not a permit for removal may be granted. There are special protections for designated canopy, understory, and Heritage trees, and provisions for protection of trees during construction and requirement of street trees in subdivisions. (See Section 9.21.)

- **Streetscape Improvements:** Sidewalks are required in all zoning districts. Streetscapes for non-residential and multi-family buildings are regulated by standards included in the newly adopted Architectural Design Standards. (See Section 18.91.6 and Section 9.23(V).)

- **Landscaping and Buffers Along Roadways:** Landscape Plans are required for each site plan and screening/buffering requirements are provided between certain zoning districts and along the perimeters of certain lots for office/industrial/commercial uses. These requirements are not necessarily required to provide landscaping along public roadways. (See Section 9.8.)

- **Existing Corridor Overlay Zoning Districts:** A Thoroughfare Protection Overlay District addresses lot width, parking, and front building setbacks (Section 6.4 of the Waxhaw Zoning Ordinance).

Weddington

The Town of Weddington has provisions relevant to the LARTP in its Zoning and Subdivision Ordinances as follows:

- **Access Management:** Basic standards for streets developed as part of a subdivision are provided, but do not include access management standards such as minimum distances between driveways. (See Section 46.76.)

- **Improvements and Right-of-Way Dedications:** Public right-of-ways for major and minor thoroughfares shown on the MUMPO Thoroughfare Plan as adopted by the Town of Weddington must be reserved by the property owner. (See Section 46-76(j)(6).)

- **Requirements for Street Stub-outs:** When deemed relevant by the Town Council, street stub-outs may be required during as part of the subdivision process. (See Section 46-76(e).)

- **Requirements for Cul-de-Sacs:** Standards for development of cul-de-sacs, including maximum length and minimum radii are addressed, but do not include standards for limiting use of cul-de-sacs or requiring connectivity within subdivisions. (See Section 46-76(g).)

- **Tree Protection:** Trees are required as part of the thoroughfare buffering requirement. (See Section 46-76(d).)

- **Landscaping and Buffers:** Vegetated buffers are required alongside and rear lot lines abutting major and minor thoroughfares and specific standards set out how this is can be accomplished. (See Section 46-76(d).)

Wesley Chapel

The Village of Wesley Chapel has provisions relevant to the LARTP in its Zoning and Subdivision Ordinances as follows:

- **Access Management:** Basic standards for streets developed as part of a subdivision are provided, but do not include access management standards such as minimum distances between driveways. (See Section 405.10.)

- **Improvements and Right-of-Way Dedications:** Public right-of-ways for major and minor thoroughfares shown on the Union County Thoroughfare Plan as adopted by the Village of Wesley Chapel must be reserved by the property owner. (See Section 405.10.)

- **Requirements for Street Stub-outs:** When deemed relevant by the Village Council, street stub-outs may be required during as part of the subdivision process. (See Section 405.10.)

- **Requirements for Cul-de-Sacs:** Standards for development of cul-de-sacs, including maximum length and minimum radii are addressed, but do not include standards for limiting use of cul-de-sacs or requiring connectivity within subdivisions. (See Section 405.7.)

- **Tree Protection:** Retention of existing vegetation is encouraged during the subdivision process. The incorporation of mature trees in buffer zones may be considered favorably in the event of a waiver for thoroughfare buffering requirements. (See Section 404.)

- **Streetscape Improvements:** Sidewalks are required as part of the subdivision process and bicycle improvements are encouraged. (See Section 405.8.)

- **Landscaping and Buffers:** Vegetated buffers are required alongside and rear lot lines abutting major and minor thoroughfares. (See Section 405.4.)

Table 8: Ordinance Provisions by Municipality

Ordinance Provisions	LARTP Communities			
	Marvin	Waxhaw	Weddington	Wesley Chapel
Access Management	Basic street standards – no requirements for minimum distance between driveways	Basic street standards – no requirements for minimum distance between driveways	Basic street standards – no requirements for minimum distance between driveways	Basic street standards – no requirements for minimum distance between driveways
Transportation Impact Assessments	--	--	--	--
Right-of-Way (ROW) Dedication	Required for thoroughfares and local streets on official street plans	Required for thoroughfares and local streets on official street plans	Required for major and minor thoroughfares on MUMPO Thoroughfare Plan and local streets	Required for major and minor thoroughfares on Union County Thoroughfare Plan and local streets
Internal Access Requirements for Commercial Developments	--	--	--	--
Requirements for Street Stub-outs	--	Can be required by Administrator, Planning Board, or BOC Action	Can be required by Council Action	Can be required by Council Action
Requirements for Cul-de-sacs	Basic standards for design – no limitations on use	Basic standards for design – no limitations on use	Basic standards for design – no limitations on use	Basic standards for design – no limitations on use
Tree Protection	Tree Protection Ordinance	Tree Preservation – Standards and Permit Requirements	Required as part of buffering requirements	Encourage retention of existing vegetation; trees required in buffer areas
Streetscape Improvements	Sidewalks, crosswalks, planting strips required for major subdivisions	Sidewalks required in all districts and sidewalks and planting strips provided in all subdivisions; design guidelines for multi-family and non-residential	--	Sidewalks required in subdivisions; bicycle improvements encouraged
Landscaping and Buffers along Roadways	Office and Business Zones require planting strips along ROW	Landscape Plans with each Site Plan	Buffers along thoroughfares required	Buffers along thoroughfares required for subdivisions
Corridor Overlay Districts	CCD District addresses Retail/Office Development along Rea Rd/NC 16	Thoroughfare Protection Overlay District addresses design standards along NC 16	--	--

5.5 Policy Recommendations

Based on the lessons learned from other communities, including the case studies described above, and review of best planning practices for rural high growth communities, a list of land use planning principles and policy recommendations follows.

The following principles are suggested here as key components of a transportation strategy for this study area. Policy recommendations are offered for consideration under each principle.

- **Retain the rural and small town character of towns and villages through managed development.** The municipalities should continue to undertake managed development approaches that allow the village/town to provide for expected new growth and development over the next 20 years while maintaining the rural nature and character of western Union County. Non-residential developments should be located and designed in a manner that upholds the rural character of the area.

- **Ensure that public infrastructure improvements (such as transportation improvements and extension of water and sewer services) are consistent with future land use plans**. Development of new roads and sewer infrastructure can be a trigger for additional growth and development. Adoption of Capital Improvement Plans that take a long-term approach to capital improvements at the local level and agreements with Union County regarding the extension of public services are two tools that can help ensure coordination of public improvements with local land use goals and policies.

- **Guide development of new commercial and employment centers to locations that can maximize the existing roadway capacity, provide better accessibility to services and goods to local residents, encourage alternative transportation (pedestrian, bicycle, and future bus/transit) access to the development, and maintain the rural character of western Union County**. A common pattern in the LARTP study area is to develop commercial businesses and retail centers along the major transportation corridors, particularly along NC-16. Traffic congestion is a daily occurrence because this road is used both for regional commuting into Charlotte as well as for local trips to commercial centers. Providing retail opportunities in specific centers, such as the planned Wesley Chapel Village Center can alleviate traffic demand on NC 16 and other roads while also creating better accessibility to goods and services for residents. Commercial and employment centers should be designed at a scale that is in keeping with the character of the municipality and, to the extent possible, should be designed to encourage use of any future bus/transit service that may be provided within the study area in the future.

- **Encourage development of master planned commercial/employment centers.** Centers should be designed as "campuses" that integrate the development of multiple uses and structures into a cohesive framework, provide for multi-modal access to centers and between uses within centers, manage access to and from adjoining thoroughfares, and provide buffers between adjacent uses.

- **Provide pedestrian and bicycle accessibility within and between adjoining neighborhoods.** Residents of western Union County have expressed interest in having additional opportunities for walking, biking, and general recreation in close proximity to their homes. New

developments should be designed to provide internal accessibility for multiple modes of transportation throughout the development, and particularly to points of interests, such as parks and schools.

- **Protect rural open spaces.** Protecting undeveloped farmlands and open spaces through private conservation easements or public acquisition of lands are two tools for ensuring that rural character is truly protected in western Union County.

These should be considered by all four municipalities and Union County when updating land use and comprehensive plans in the LARTP study area.

5.6 Ordinance Recommendations

In addition to adoption of policies and land use plans to guide decision-making and influence the form of new development and redevelopment within the study area, some of the land use – transportation objectives of this initiative can be accomplished through regulatory requirements. Following is a table that summarizes potential ordinance provisions and model ordinances recommended for consideration.

Table 9: Recommended Ordinance Provisions

Ordinance Provision	Summary Description
1. Definitions of Roads	Define characteristics of various classifications of roadways, such as arterial, collector, and local streets, mirroring the classification system in the LARTP.
2. Transportation Purpose Statement	E.g.: *"In accordance with the Local Area Regional Transportation Plan developed in collaboration with and adopted by the Village of Marvin, the Town of Waxhaw, the Town of Weddington, and the Village of Wesley Chapel on <date>, the provisions of this section are intended to ensure: (a) an integrated system of roads that provides safe and efficient traffic circulation; (b) the efficient movement of through traffic by providing an interconnected system of roads; (c) uncomplicated road layouts so that emergency service personnel, public service personnel and visitors can find their way to and from destinations; and (d) controlled access to thoroughfares."*
3. ROW Dedication Provisions	Require dedication of right-of-way, either new or expansion, for all new residential and non-residential development, as called for in LARTP cross-sections.
4. TIA Threshold, Process, Information Requriements	Requires development of a Transportation Impact Analysis (TIA) for subdivisions and all other development proposals for which 100 peak hour trips are generated by the proposed development. The municipality has options for the TIA procedures: (1) the applicant prepares the TIA and submits the TIA with the development application and (if necessary) pays a fee to the municipality for review of the TIA, or (2) the municipality estimates the cost to develop and review the TIA for a particular application, the applicant pays the TIA fee, and municipality arranges for preparation and review. TIAs should project additions to average daily trips and peak hour trips, estimate current and projected levels of service (LOS), include roadway improvement and right-of-way dedication needs that comply with cross-sections in the LARTP, and consider non-automobile modes, including bicycle, pedestrian, and transit needs.
5. Incorporation/Reference of Street Cross-Sections in Ordinance	Incorporates the cross sections from the LARTP for various street types, including public right-of-way, number of lanes, lane width, planting requirements, sidewalks, etc.) within the ordinance. This provision can also be implemented by reference to the LARTP cross-sections.

6. Access Management, Driveway Spacing and Non-Residential Connectivity	Addresses access management, driveway spacing, and connectivity requirements.
7. Bicycle and Parking Amenities	Require bike racks to serve bicycle commuters for developments of a certain threshold and encourages development of additional bicycle facilities, such as on-site shower facilities.
8. Parking Fund Payments-in-Lieu	This provision includes an option for new developments to substitute payments into a parking fund for provision of some or all required off-street parking, with funds to be used to help fund improvements such as park-and-ride lots. These types of provisions are often used in downtowns and town center areas.
9. Transit-Oriented Development Standards	Model ordinances to provide examples for implementation of transit-oriented development districts and standards, such as minimum densities, transit-friendly building design/orientation, and walkways/bikeways in designated transit-oriented locations.
10. Transportation Management Plan Requirements	Model ordinance requires all non-residential developments to provide employer-sponsored and managed Transportation Management Plans (TMP), to encourage employees and patrons to walk, bike, and take transit instead of relying on automobiles for mobility. Similar provisions could also be adopted to specify a threshold (e.g., developments that will employ 100 or more employees) that would trigger requirements for TMPs.

Sample ordinance language for each of these suggested provisions is included in Appendix C. Achieving consistency among the jurisdictions for regulatory treatment of land use and roadway corridors that traverse multiple communities is most important in the following areas:

- Definitions of roads
- Cross-section and ROW requirements
- Traffic Impact Analysis required information
- Access management provisions

Each of the four communities needs to determine which of these provisions is acceptable to include in the regulatory array for that community.

6 Implementation Plan: *How We're Going To Get There*

6.1 The Key: Implementation

One of the primary purposes of developing the LARTP was to give the four member communities the information, data, and plans to effectively solve today's problems and plan for tomorrow's. The recommendations in the previous section go a long way toward accomplishing this end. But those recommendations would be relatively worthless without an effective tool to implement them. The Implementation Plan in this section creates a unified and comprehensive approach to working on these problems both as a group of communities with common issues and as local communities planning for local needs.

6.2 Funding

The LARTP is a long-range plan with a variety of projects which will be implemented over time through use of various funding options. While some of the large-scale projects will be constructed with federal and state funds distributed through the regional planning process, others will be built with local funds and through cooperation with the development community.

- *Transportation Improvement Program (TIP):* The state's Transportation Improvement Program supports local and regionally significant transportation projects through funding sources that include Federal Aid Construction Funds and State Construction Funds.
- *Transportation Bonds:* Transportation bonds are a traditional funding mechanism for local communities throughout North Carolina. Voters in communities of all sizes vote to improve their transportation system through self-assessment.
- *NCDOT Division Funds:* Each of the NCDOT division offices has discretionary funds to make transportation improvements for small-scale projects. Each of the four LARTP member communities has taken advantage of these funds, which are good sources of funding for projects like intersection improvements and access management projects.
- *Developer Contributions:* It is common for the development community to make contributions or construct improvements as part of the development approval process. While developers

of new projects are typically not responsible for fixing existing deficiencies, they can help mitigate the potential impacts on the transportation system by their development.

- *State Street-Aid (Powell Bill) Funds:* Annually, state street-aid (Powell Bill) allocations are made to eligible and qualified incorporated municipalities. Powell Bill funds are used only for maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities, or for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways.
- *Enhancement Grants and Congestion Management and Air Quality (CMAQ) Funds:* These two funding sources are applicable to a variety of project types, but can be especially beneficial when applied to bicycle and pedestrian projects, greenway development, and beautification and streetscape enhancement projects.
- *Other Funding Sources:* These may include federal stimulus funds (may not be available in the long-term), impact fees (not currently widely used in North Carolina), and funds from non-profit or private organizations (such as *Active Living By Design*) intended to support planning and development of non-vehicular transportation systems. Other sources also include county-wide sales taxes, land transfer taxes, and targeted programs such as *Safe Routes to School*.

6.3 Implementation Plan

Implementation Plan - Improvements

The Implementation Plan on the following pages is the blueprint for making the various recommended improvements detailed in the LARTP. As shown in the Implementation Plan, some projects will require coordination among jurisdictions as well as coordination with regional transportation planning partners. Others are projects that will likely be part of future development proposals. And still others are projects that will be locally-determined and developed. The implementation plan for roadway projects is detailed in Table 10 and for intersections in Table 11.

Implementation Plan – Policies and Regulations

Section 5 identifies policy and ordinance changes that would promote mobility within this study area through land use policies and regulations. In addition to pursuing funding for roadway and intersection improvements as recommended above, the four participating municipalities should consider two additional areas for action:

- *Policy Statements:* The municipalities should consider adopting policies to serve as guides to decision-making. One good way to do that would be to select policies from those offered in Section 5 and incorporate those into local municipal land use plans via amendment of those plans.

- *Ordinance Amendments:* Section 5 offers a series of regulatory approaches to land use management that could be incorporated into local municipal zoning and subdivision ordinances. Appendix 3 offers specific model language that could be built into local ordinances.

Table 10: Implementation Plan - Recommended Roadway Projects

Map ID	Facility and Section	From	To	Description	Recommended ROW (ft)	Recommended Cross-Section	Affected Municipality[1]				Potential Funding Source[2]	Comments
High Priority Projects							Mar	Wax	Wed	WCh		
H1	NC 84 Relocation (Rea Rd Extension)	NC 16 / Providence Road(SR1392)	NC 84 / Weddington Road	Construct 4-lane boulevard	95	A	*		**	*	TIP	Current TIP project
H2	NC 84 / Monroe-Weddington Road / Weddington Road	NC 84 Relocation	Waxhaw-Indian Trail Road (SR 1008)	Widen to 4-lane boulevard	95	A			**	*	TIP	Current TIP project, unfunded
H3	NC 84 / Monroe-Weddington Road / Weddington Road	Waxhaw-Indian Trail Road (SR 1008)	Study Area Boundary East	Widen to 4-lane boulevard	95	A			*	**	TIP	Current TIP project, unfunded
H4	NC 16 (Providence Rd)	Rea Road Extension / NC 84	New Town Road (SR 1315)	Widen to 4-lane boulevard	95	A	*	*	*		TIP	Current TIP project, unfunded
H5	NC 16 (Providence Rd)	New Town Road (SR 1315)	Cuthbertson Road (SR 1321)	Widen to 4-lane boulevard	95	A	*	*	*		TIP	Current TIP project, unfunded
H6	NC 16 (Providence Rd)	Cuthbertson Road (SR 1321)	Waxhaw Parkway (N)	Widen to 4-lane boulevard	95	A		**			TIP	Current TIP project, unfunded
H7	NC 75 / Waxhaw Highway	Waxhaw Parkway	Study Area Boundary East	Widen to 4-lane boulevard	95	A		**			TIP	
H8	NC 75 / Waxhaw Highway	Study Area Boundary West	Helms Road (SR 1300)	Widen to 4-lane boulevard	95	A		**			TIP	
H9	Helms Road (SR 1300)	NC 75 / Main Street	Waxhaw-Marvin Road (SR 1301)	Widen to 4-lane boulevard	95	A		**			TIP; local bond; developer	
H10	Waxhaw Parkway (W)	Waxhaw-Marvin Road (SR 1301)	Existing Waxhaw Parkway (NW)	Construct 4-lane boulevard	95	A		**			TIP; local bond; developer	
H11	Waxhaw Parkway (N)	Existing end of road	Existing end of road	Widen to 4-lane boulevard	95	A		**			TIP; local bond; developer	
H12	Waxhaw Parkway (N)	Existing end of road	NC 75 / Main Street / Waxhaw Highway	Construct 4-lane boulevard	95	A		**			TIP; local bond; developer	
H20	NC 16 (Providence Rd)	Waxhaw Parkway (N)	NC 75 / Main Street / Waxhaw Highway	Add turn lanes, widen shoulder and improve geometrics as appropriate; employ context-sensitive design	95	A		**			TIP; local bond	Employ context-sensitive design to preserve character of Downtown Waxhaw; construction of Waxhaw Parkway lessens need for 4-lane section
H56	Tilley Morris Road (SR 1345)	Study Area Boundary	Matthews-Weddington Road (SR 1344)	Widen to 2 lanes, w/ median, bike lane	59	C			**		TIP	Current TIP project
H58	Amanda Drive Extension	End of road	Walden Lane	Construct 2-lane facility	34	D			**		TIP; developer	
Medium Priority Projects							Mar	Wax	Wed	WCh		
H21	S Potter Road (SR 1162)	NC 84 / Weddington Road	New Town Road (SR 1315)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate	70	B				**	TIP; local bond; developer	
H22	Potter Road (SR 1346)	Waxhaw-Indian Trail Road (SR 1008)	Wesley Chapel Road (SR 1377)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate	70	B			*	**	TIP; local bond; developer	
H23	Wesley Chapel Road (SR 1377)	Old Charlotte Highway (SR 1009)	NC 84	Widen to 4 lanes w/median	95	A				**	TIP; local bond; developer	
H24	Forest Lawn Drive (SR 1358) and Potters Road (SR 1357)	Study Area Boundary North	Wesley Chapel Road (SR 1377)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate	70	B			**		TIP; local bond; developer	
H25	New Town Road (SR 1315)	Study Area Boundary West	Providence Road (SR 1117)	Widen to add shoulder and bike lanes; preserve ROW for future widening	59	C	**				TIP; local bond; developer	Main artery of potential Marvin Town Center development; employ context-sensitive design to reflect uses, streetscape, and walkability
H31	Kensington Drive (SR 1305)	Waxhaw Marvin Road (SR 1301)	State Line	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate	70	B	*	**			TIP; local bond; developer	
H32	Waxhaw Marvin Road (SR 1301)	Helms Road (SR 1300)	Kensington Drive (SR 1305)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate; add bike lanes	70	B		**			TIP; local bond; developer	

Map ID	Facility and Section	From	To	Description	Recommended ROW (ft)	Recommended Cross-Section	Affected Municipality[1]				Potential Funding Source[2]	Comments
H36	Waxhaw-Indian Trail Road (SR 1008)	NC 16 / N Broome Street	Bond Grove Church Road (SR 1307)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate	70	B		**			TIP; local bond; developer	
H37	Waxhaw-Indian Trail Road (SR 1008)	Bond Grove Church Road (SR 1307)	New Town Road (SR 1315)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate	70	B		**			TIP; local bond; developer	
H38	Waxhaw-Indian Trail Road (SR 1008)	New Town Road (SR 1315)	Beulah Church Road (SE 1346)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate	70	B			*	**	TIP; local bond; developer	
H39	Waxhaw-Indian Trail Road (SR 1008)	Beulah Church Road (SE 1346)	Study Area Boundary North	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate	70	B			**	**	TIP; local bond; developer	
H41	Airport Road (SR 1349)	Goldmine Road (SR 1162)	NC 84	Widen to 4 lanes w/ median, bike lane	95	A				**	TIP	Current TIP project
H49	Waxhaw Marvin Rd (SR 1307)	New Town Road (SR 1315)	Kensington Drive (SR 1305)	Add bike lanes	59	C	*	**			local bond; CMAQ	
H57	Matthews-Weddington Road (SR 1344)	Hemby Road (SR 1346)	Antioch Church Road (SR1338)	Widen to 3 lanes, add shoulders, turn lanes and improve geometrics as appropriate	70	B			**		TIP; local bond; developer	
Low Priority Projects							Mar	Wax	Wed	WCh		
H26	Providence Road (SR 1117)	Davis Road (SR 1113)	Old Waxhaw Monroes Rd/ Old Providence Road (SR 1111)	Preserve ROW for future Boulevard	95	A		**			local bond; developer	
H27	Waxhaw Parkway	Waxhaw Parkway (E)	Old Waxhaw Monroes Rd/ Old Providence Road (SR 1111)	Preserve ROW for future Boulevard	95	A		**			local bond; developer	
H28	Waxhaw Parkway connector	NC 75 (E)	Old Waxhaw-Monroe Road (SR 1111)	Construct new 2-lane connector to Waxhaw Parkway	34	D		**			local bond; developer	
H29	Waxhaw Parkway (E)	Waxhaw Parkway connector	Waxhaw Parkway (S)	Construct new 2-lane facility	34	D		**			local bond; developer	
H33	New Town Road (SR 1315)	Providence Road (SR 1117)	12 Mile Creek Road (SR 1341)	Widen shoulder and construct off-street multi-use path; preserve ROW for future widening	95	E	*		**		local bond; CMAQ	
H34	New Town Road (SR 1315)	12 Mile Creek Road (SR 1341)	Waxhaw-Indian Trail Road (SR 1008)	Widen shoulder and construct off-street multi-use path; preserve ROW for future widening	95	E		*	*	**	local bond; CMAQ	
H35	New Town Road (SR 1315)	Waxhaw-Indian Trail Road (SR 1008)	Study Area Boundary East	Widen shoulder and construct off-street multi-use path; preserve ROW for future widening	95	E				**	local bond; CMAQ	
H42	Davis Road (SR 1113)	Shady Oak Lane / Waxhaw Parkway	Providence Road (SR 1117)	Add turn lanes, widen shoulder and improve geometrics as appropriate	34	D		**			local bond; developer	
H43	Waxhaw Parkway (SW)	NC 75 / Waxhaw Highway	Davis Road (SR 1113)	Construct 2-lane facility	34	D		**			local bond; developer	
H44	Marvin Road (SR 1312)	County Boundary	New Town Road (SR 1315)	Add bike lanes/widen shoulder as appropriate, add sidewalks	59	C	**				local bond; CMAQ	
H45	Joe Kerr Road (SR 1313)	Marvin Road (SR 1312)	Marvin School Rd (SR 1316)	Add bike lanes/widen shoulder as appropriate	59	C	**				local bond; CMAQ	
H46	Rea Rd	Mecklenburg County line	NC 16 (Providence Rd)	Add sidewalks	59	C	**				local bond; CMAQ	
H47	Marvin School Rd (SR 1316)	Rea Rd	New Town Road (SR 1315)	Add bike lanes/widen shoulder as appropriate, add sidewalks	59	C	**				local bond; CMAQ	
H48	Crane Rd (SR1309)	Rea Rd	New Town Road (SR 1315)	Add bike lanes/widen shoulder as appropriate	59	C	**				local bond; CMAQ	
H50	Stacey Howie Rd (SR 1311)	Study Area Boundary West	Waxhaw Marvin Rd (SR 1307)	Add bike lanes/widen shoulder as appropriate	59	C	**				local bond; CMAQ	

Map ID	Facility and Section	From	To	Description	Recommended ROW (ft)	Recommended Cross-Section	Affected Municipality[1]				Potential Funding Source[2]	Comments
H51	Antioch Church Road (SR1338) / Huntington Rd (SR 1347)	Forest Lawn Drive (SR 1348)	Beulah Church Road (SR 1346)	Add turn lanes, widen shoulder and improve geometrics as appropriate	34	D			**		local bond; developer	
H52	Hemby Rd (SR 1346)	Providence Road (SR1117)	12 Mile Creek Road (SR 1341)	Widen shoulder and improve geometrics as appropriate	34	D			**		local bond; developer	
H53	Beulah Church Road Extension (SR 1346)	12 Mile Creek Road (SR 1341)	Waxhaw-Indian Trail Road (SR 1008)	Widen shoulder and improve geometrics as appropriate	34	D			**	*	local bond; developer	
H54	Beulah Church Road Extension (SR 1346)	Waxhaw-Indian Trail Road (SR 1008)	Potters Road (SR 1357)	Widen shoulder and improve geometrics as appropriate	34	D			*	**	local bond; developer	
H55	Beulah Church Road (SE 1346)	Goldmine Rd (SR 1162)/ Wesley Chapel Road (SR 1377)	Potters Road (SR 1357)	Construct 2-lane facility	34	D			*	**	developer	
H59	Walden Lane	Forest Lawn Road (SR 1358)	Potters Road (SR 1357)	Construct 2-lane facility	34	D			**		developer	
H60	12 Mile Creek Road (SR 1341)	Beulah Church Road (SR 1346)	New Town Road (SR 1315)	Add turn lanes, widen shoulder and improve geometrics as appropriate	34	D			**	*	local bond; developer	
H61	12 Mile Creek Road (SR 1341)	Cuthbertson Road (SR 1321)	New Town Road (SR 1315)	Construct 2-lane facility	34	D		**		**	developer	
H62	Cuthbertson Road (SR 1321)	NC 16 / Providence Road S	New Town Road (SR 1315)	Add turn lanes, widen shoulder and improve geometrics as appropriate	34	D		**		**	local bond; developer	
H63	Billy Howey Road (SR 1329)	NC84 / Weddington Road	Waxhaw Indian Trail (SR 1008)	Construct 2-lane facility	34	D				**	developer	
H64	Grey Byrum Road (SR 1306)	NC 16 / Providence Road S	Broomes Old Mill Road (SR 1320)	Construct 2-lane facility	34	D		**			developer	
H65	Bond Grove Church Road (SR 1307)	NC 16 / Providence Road S	Cuthbertson Road (SR 1321)	Construct 2-lane facility	34	D		**			developer	
H66	Bond Grove Church Road (SR 1307)	Cuthbertson Road (SR 1321)	Howie Mine Church Road (SR 1323)	Construct 2-lane facility	34	D		**			developer	
H67	Green View Drive	End of road	Farm Creek Road	Construct 2-lane facility	34	D		**			developer	
H68	Blythe Mill Rd Ext (SR 1303)	End of Road	Grover Roger Rd (SR 1324)	Construct 2-lane facility	34	D		**			developer	
H69	Blythe Mill Rd (SR 1303)	Southecliff Dr	End of Road	Widen shoulder and improve geometrics as appropriate	34	D		**			local bond; developer	
H70	Crane Rd (SR1309)	New Town Road (SR 1315)	Waxhaw Marvin Rd (SR 1307)	Add off-street multi-use path, add bike lanes, widen shoulders as appropriate	60	E	**				local bond; CMAQ	Multi-use path in connection with school development
H71	Matthews-Weddington Road (SR 1344)	Hemby Road (SR 1346)	NC 84 (Weddington Rd)	Upgrade to standard 2-lanes w/ shoulders	34	D			**		local bond; developer	
H72	Cox Rd (SR 1343)	Weddington MatthewsRd (SR 1344)	NC 84 (Weddington Rd)	Upgrade to standard 2-lanes w/ shoulders	34	D			**		local bond; developer	
H73	Weddington Town Center Northern Access Road (new)	NC 16 (Providence Rd), north of NC 84	Weddington Mattews Rd (SR 1344)	Construct 2-lane facility	34	D			**		local bond; developer	Conceptual alignment only; to be further defined as part of Weddington Town Center Master Plan process

Notes:

1. Mar = Marvin; Wax = Waxhaw; Wed = Weddington; WCh = Wesley Chapel; ** = Primary jurisdiction affected by improvements; * = Secondary jurisdiction affected by improvements

2. Since many projects cross multiple jurisdictions and may involve multiple funding sources, cooperation among municipalities, Union County, and the NCDOT will be critical. This is especially important as the recommended cross-sections are applied in different jurisdictions within the same project. To the extent feasible, similar cross-sections, treatments, and other roadway and intersection facilities should be standardized within project limits.

3. Projects are not ranked within priority levels.

Table 11: Implementation Plan - Recommended Intersection Projects

ID	Intersection	Description	Affected Municipality[1]				Potential Funding Source	Comments
High Priority Projects			Mar	Wax	Wed	WCh		
X2	Weddington-Matthews Road @ Hemby Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted); consider installing roundabout			*		Multiple sources (NCDOT Division funds; bonds; developer contributions; CMAQ; Enhancement Grants)	
X4	Weddington Road @ Weddington Matthews Road & @ Providence Road; Providence Road @ Weddington School Road	Improve intersections & coordinate operations; manage access & permitted movements; re-align/consolidate if feasible			*			Component of potential Town Center
X6	Beulah Church Road and Antioch Church Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)			*	*		
X8	NC 84 / Weddington Road @Twelve Mile Creek Road	Improve intersection; coordinate with Baron Hills and Skytop Road intersections			*			
X10	NC 84 / Weddington Road @ Waxhaw-Indian Trail Road, & @ Antioch Church Road; Waxhaw-Indian Trail Road @ Billy Howey Road	Improve intersections & coordinate operations; manage access				*		
X12	New Town Road @ Marvin School Road; Waxhaw-Marvin Rd @ New Town Rd	Improve intersections & coordinate operations; manage access & permitted movements; re-align/consolidate adjacent intersections if feasible, consider installing roundabout or pair of roundabouts	*					Component of potential Town Center; potential gateway
X14	New Town Road from Cuthbertson Road to Will Plyler Road; Cuthberson Road @ Farm Creek Road	Improve intersections & coordinate operations; manage access & permitted movements; re-align/consolidate where feasible				*		School site
X15	New Town Road and Waxhaw Indian Trail Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)				*		
X18	Waxhaw-Marvin Road @ Bonds Grove Church Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)	*	*				
X21	NC 75 @ Old Providence Road, & @ McCain Street	Improve intersections & coordinate operations; manage access & permitted movements; re-align/consolidate where feasible		*				Downtown Waxhaw; high pedestrian activity
X26	Weddington-Matthews Road @ Tilley Morris Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)			*			
Medium Priority Projects			Mar	Wax	Wed	WCh		
X7	Waxhaw-Indian Trail Road @ Beulah Church Road, & @ Potters Road; Beulah Church Road @ Potters Road	Improve intersections & coordinate operations; manage access & permitted movements			*	*	Multiple sources (NCDOT Division funds; bonds; developer contributions; CMAQ; Enhancement Grants)	
X9	NC 84 / Weddington Road @ Deal Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)			*	*		School site
X11	Wesley Chapel Road @ NC 84 / Weddington Road, & @ Potters Road; Potters Road @ Chambwood Road	Improve intersections & coordinate operations; manage access; consider connecting Antioch Church & Billy Howey Roads				*		
X16	New Town Road @ Billy Howey Road, & @ Chambwood Road	Improve intersections & coordinate operations; manage access				*		
X17	New Town Road @ South Potter Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)				*		
X19	Kensington Drive @ Waxhaw-Marvin Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)		*				School site
X20	Rea Rd @ Tom Short Rd	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)	*					
X22	New Town Road @ Marvin Road, & @ Meadowlark Lane	Consider installing roundabout	*					Component of potential Town Center; potential gateway
X24	New Town Road @ Twelve Mile Creek Rd	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)			*	*		
Low Priority Projects			Mar	Wax	Wed	WCh		
X1	Antioch Church Road @ Forest Lawn Drive	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted); consider installing roundabout			*		Multiple sources (NCDOT Division funds; bonds; developer contributions; CMAQ; Enhancement Grants)	
X3	Potter Road and Forest Lawn Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)			*			School site
X5	Beulah Church Road @ 12 Mile Creek Road, & @ Huntington Road	Improve intersections & coordinate operations; realign/combine into single intersection			*			School site
X13	New Town Road and Crane Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)	*					School site
X23	Waxhaw Marvin Road @ Crane Road	Improve intersections; sight distance and safety improvements	*					
X25	Weddington-Matthews Road @ Cox Road	Improve intersection (turn lanes, signalization/timing, channelization, etc -- as warranted)			*			

Notes:

1. Mar = Marvin; Wax = Waxhaw; Wed = Weddington; WCh = Wesley Chapel
2. Projects are not ranked within priority levels.

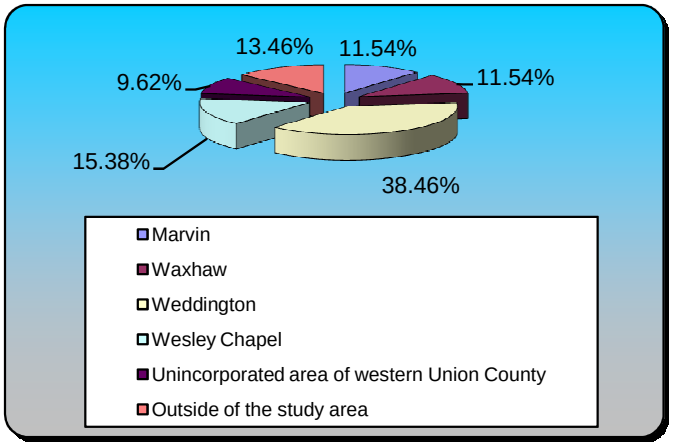
Appendix A

Key Pad Polling Results

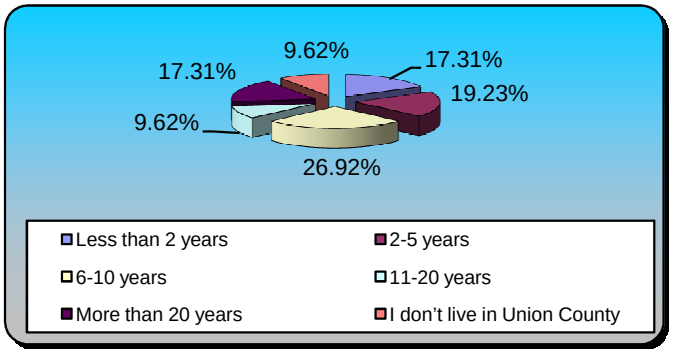
Western Union County - Local Area Regional Transportation Plan Poll

Combined Poll Results from Oct/Nov 2008 Public Outreach Activities

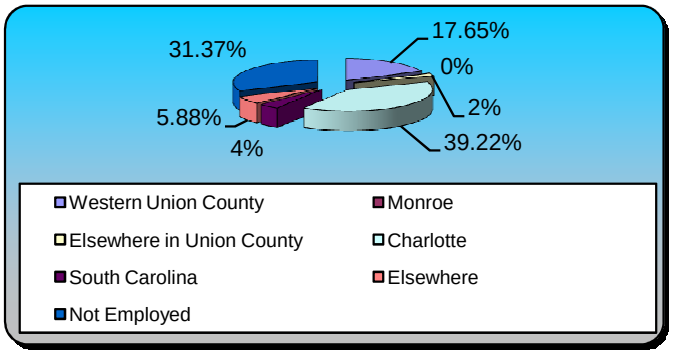
Where do you live?	Responses	
Marvin	6	11.54%
Waxhaw	6	11.54%
Weddington	20	38.46%
Wesley Chapel	8	15.38%
Unincorporated area of western Union County	5	9.62%
Outside of the study area	7	13.46%
Totals	**52**	**100%**



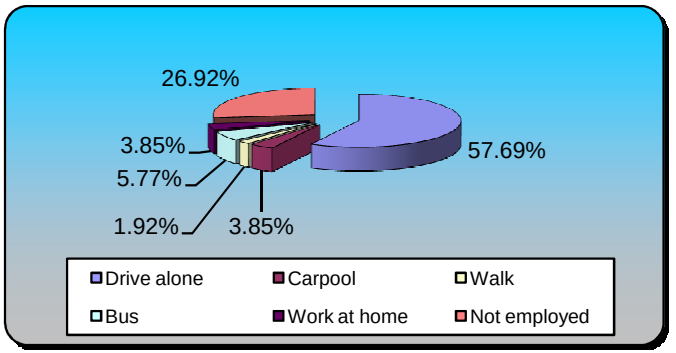
How long have you lived in Union County?	Responses	
Less than 2 years	9	17.31%
2-5 years	10	19.23%
6-10 years	14	26.92%
11-20 years	5	9.62%
More than 20 years	9	17.31%
I don't live in Union County	5	9.62%
Totals	**52**	**100%**



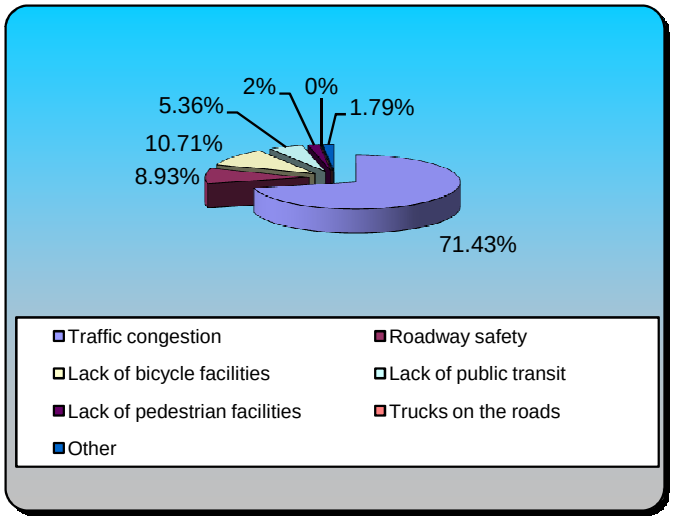
If you are employed, where is your employer located?	Responses	
Western Union County	9	17.65%
Monroe	0	0%
Elsewhere in Union County	1	2%
Charlotte	20	39.22%
South Carolina	2	4%
Elsewhere	3	5.88%
Not Employed	16	31.37%
Totals	**51**	**100%**



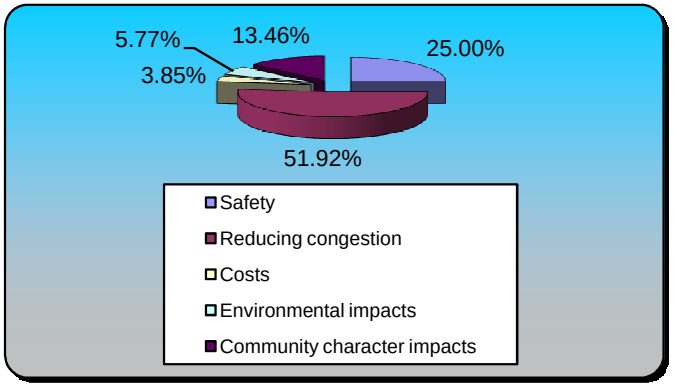
If you are employed, how do you get to work?	Responses	
Drive alone	30	57.69%
Carpool	2	3.85%
Walk	1	1.92%
Bus	3	5.77%
Work at home	2	3.85%
Not employed	14	26.92%
Totals	**52**	**100%**



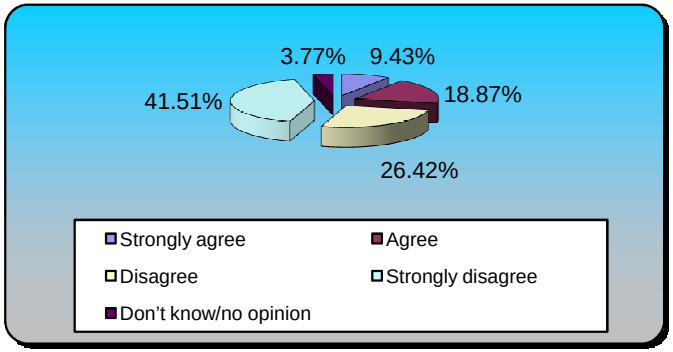
The biggest transportation challenge in Western Union County is?	Responses	
Traffic congestion	40	71.43%
Roadway safety	5	8.93%
Lack of bicycle facilities	6	10.71%
Lack of public transit	3	5.36%
Lack of pedestrian facilities	1	2%
Trucks on the roads	0	0%
Other	1	1.79%
Totals	**56**	**100%**



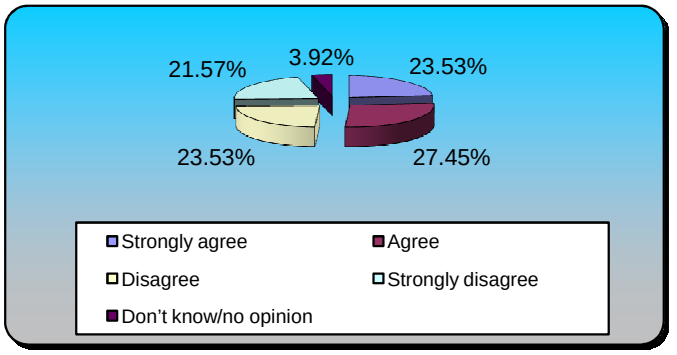
What is the most important factor when considering transportation improvements?	Responses	
Safety	13	25.00%
Reducing congestion	27	51.92%
Costs	2	3.85%
Environmental impacts	3	5.77%
Community character impacts	7	13.46%
Totals	**52**	**100%**



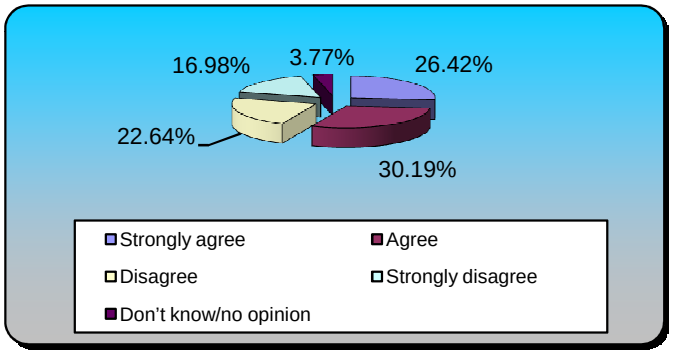
Preserving the rural character of the area's roads and corridors is more important than widening roads to relieve traffic congestion.	Responses	
Strongly agree	5	9.43%
Agree	10	18.87%
Disagree	14	26.42%
Strongly disagree	22	41.51%
Don't know/no opinion	2	3.77%
Totals	**53**	**100%**



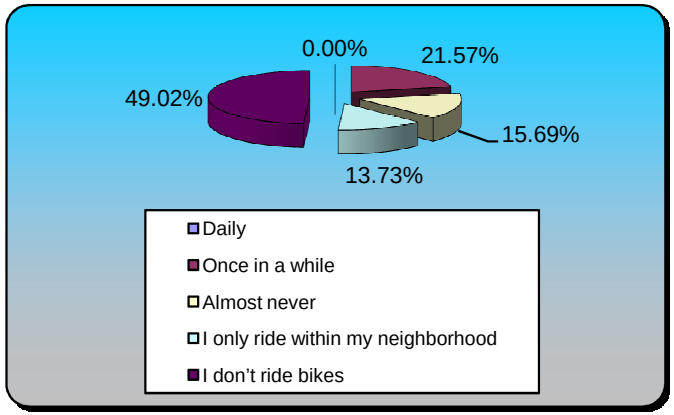
Western Union County should have local transit service.	**Responses**	
Strongly agree	12	23.53%
Agree	14	27.45%
Disagree	12	23.53%
Strongly disagree	11	21.57%
Don't know/no opinion	2	3.92%
Totals	**51**	**100%**



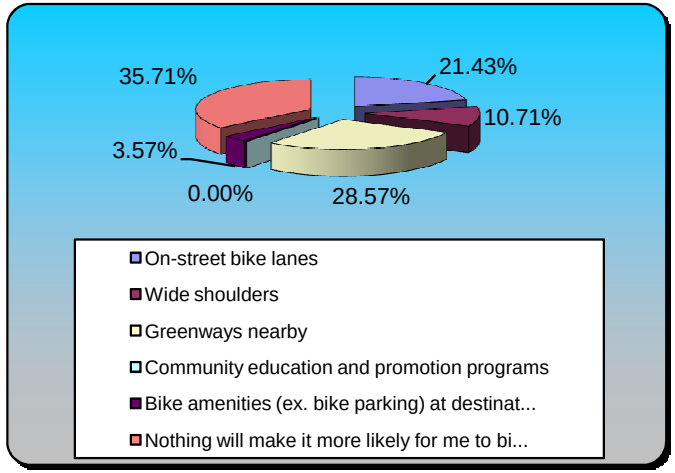
Every neighborhood should have sidewalks.	**Responses**	
Strongly agree	14	26.42%
Agree	16	30.19%
Disagree	12	22.64%
Strongly disagree	9	16.98%
Don't know/no opinion	2	3.77%
Totals	**53**	**100%**



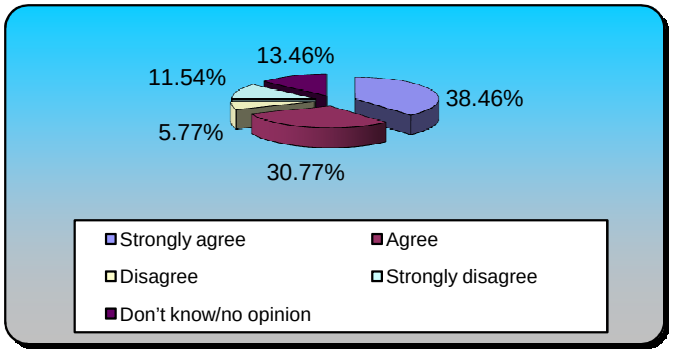
How often do you ride a bike outside your neighborhood?	Responses	
Daily	0	0.00%
Once in a while	11	21.57%
Almost never	8	15.69%
I only ride within my neighborhood	7	13.73%
I don't ride bikes	25	49.02%
Totals	**51**	**100%**



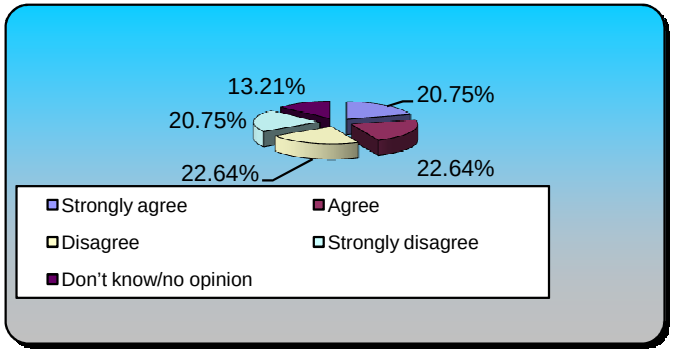
Which of these would be most likely to get you to ride a bike more?	Responses	
On-street bike lanes	12	21.43%
Wide shoulders	6	10.71%
Greenways nearby	16	28.57%
Community education and promotion programs	0	0.00%
Bike amenities (ex. bike parking) at destinat...	2	3.57%
Nothing will make it more likely for me to bi...	20	35.71%
Totals	**56**	**100%**



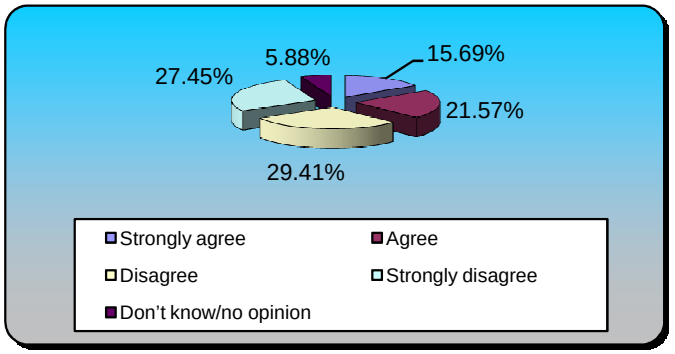
Developing greenways and multi-use paths is more important than developing bike facilities (ex. bike lanes) on the road.	**Responses**	
Strongly agree	20	38.46%
Agree	16	30.77%
Disagree	3	5.77%
Strongly disagree	6	11.54%
Don't know/no opinion	7	13.46%
Totals	**52**	**100%**



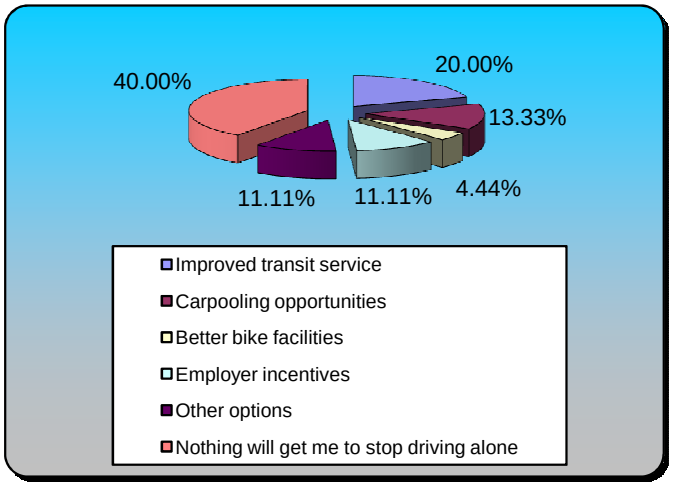
New neighborhoods should be designed so that streets connect to other neighborhoods.	**Responses**	
Strongly agree	11	20.75%
Agree	12	22.64%
Disagree	12	22.64%
Strongly disagree	11	20.75%
Don't know/no opinion	7	13.21%
Totals	**53**	**100%**



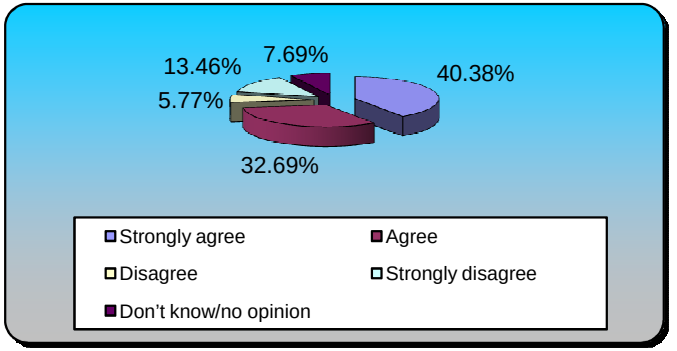
New streets should be constructed to connect existing neighborhoods to each other.	**Responses**	
Strongly agree	8	15.69%
Agree	11	21.57%
Disagree	15	29.41%
Strongly disagree	14	27.45%
Don't know/no opinion	3	5.88%
Totals	**51**	**100%**



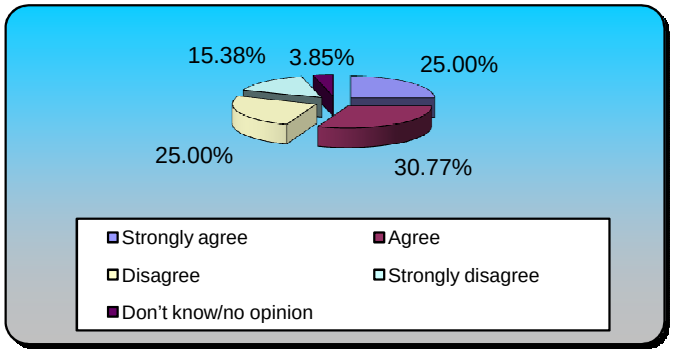
If you currently drive alone to work, which of these options would be most likely to get you to not drive alone.	**Responses**	
Improved transit service	9	20.00%
Carpooling opportunities	6	13.33%
Better bike facilities	2	4.44%
Employer incentives	5	11.11%
Other options	5	11.11%
Nothing will get me to stop driving alone	18	40.00%
Totals	**45**	**100%**



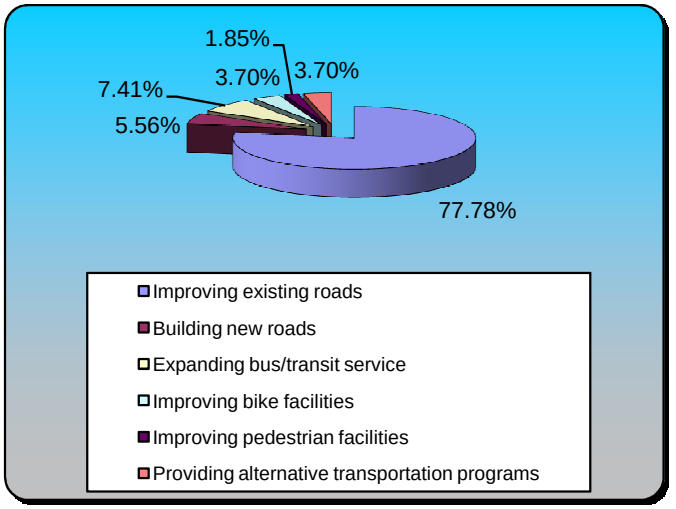
New commercial development should be concentrated along major transportation corridors.	**Responses**	
Strongly agree	21	40.38%
Agree	17	32.69%
Disagree	3	5.77%
Strongly disagree	7	13.46%
Don't know/no opinion	4	7.69%
Totals	**52**	**100%**



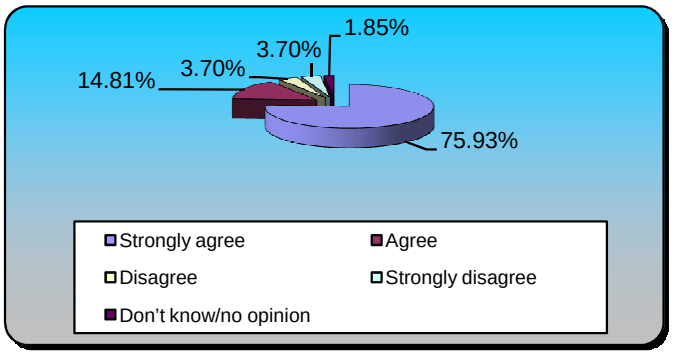
Transportation improvements should focus on the main roadway corridors (along NC routes) rather than on local, rural roads.	**Responses**	
Strongly agree	13	25.00%
Agree	16	30.77%
Disagree	13	25.00%
Strongly disagree	8	15.38%
Don't know/no opinion	2	3.85%
Totals	**52**	**100%**



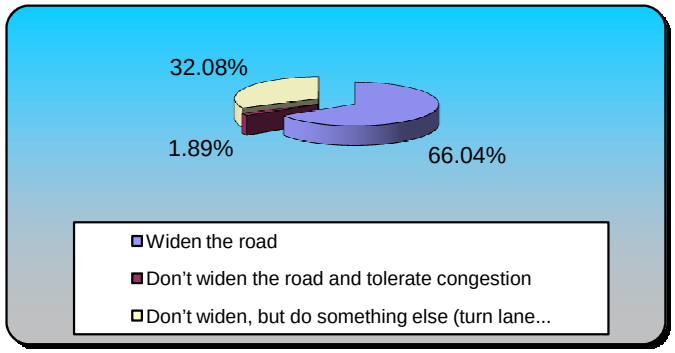
Which of these should be the highest priority for spending limited transportation funding?	Responses	
Improving existing roads	42	77.78%
Building new roads	3	5.56%
Expanding bus/transit service	4	7.41%
Improving bike facilities	2	3.70%
Improving pedestrian facilities	1	1.85%
Providing alternative transportation programs	2	3.70%
Totals	**54**	**100%**



Developers should pay for transportation improvements related to their developments.	Responses	
Strongly agree	41	75.93%
Agree	8	14.81%
Disagree	2	3.70%
Strongly disagree	2	3.70%
Don't know/no opinion	1	1.85%
Totals	**54**	**100%**



If you had to choose between widening a major road versus tolerating more congestion in order to keep the existing character of the road intact, which would you choose?	Responses	
Widen the road	35	66.04%
Don't widen the road and tolerate congestion	1	1.89%
Don't widen, but do something else (turn lane...	17	32.08%
Totals	**53**	**100%**



Appendix B

Traffic Study Data

Traffic Count Data

Martin/Alexiou/Bryson, PLLC
4000 WestChase Boulevard, Suite 530
Raleigh, North Carolina 27607
p: 919.829.0328 f: 919.829.0329

File Name : 01 - Antioch&Beulah
Site Code : 00000001
Start Date : 10/16/2008
Page No : 1

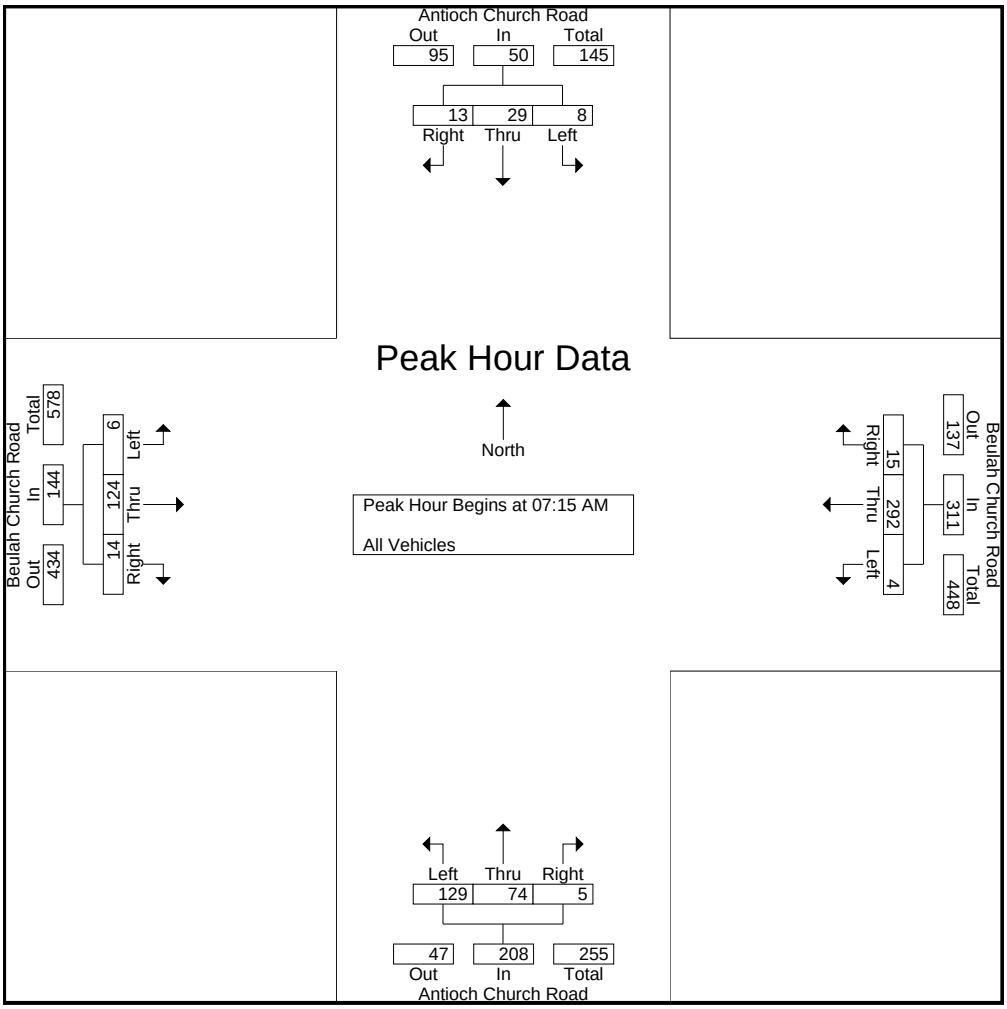
Groups Printed- All Vehicles

	Antioch Church Road Southbound				Beulah Church Road Westbound				Antioch Church Road Northbound				Beulah Church Road Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	1	8	6	0	0	65	3	0	24	8	2	0	1	27	2	0	0	147	147
07:15 AM	2	9	5	0	0	75	3	0	30	12	1	0	1	33	2	0	0	173	173
07:30 AM	2	10	3	0	1	84	4	0	35	17	0	0	1	39	3	0	0	199	199
07:45 AM	1	6	4	0	1	79	7	0	34	23	1	0	2	29	6	0	0	193	193
Total	6	33	18	0	2	303	17	0	123	60	4	0	5	128	13	0	0	712	712
08:00 AM	3	4	1	0	2	54	1	0	30	22	3	0	2	23	3	0	0	148	148
08:15 AM	4	9	0	0	1	55	3	0	19	20	2	0	4	24	2	0	0	143	143
08:30 AM	2	8	3	0	0	56	3	0	24	18	0	2	5	28	6	0	2	153	155
08:45 AM	3	4	0	0	0	38	3	0	19	21	3	0	0	17	1	0	0	109	109
Total	12	25	4	0	3	203	10	0	92	81	8	2	11	92	12	0	2	553	555
09:00 AM	3	4	0	0	2	25	2	0	18	18	3	1	3	19	1	2	3	98	101
BREAK																			
Total	3	4	0	0	2	25	2	0	18	18	3	1	3	19	1	2	3	98	101
BREAK																			
11:00 AM	1	2	2	0	2	10	2	0	4	5	2	0	0	13	0	0	0	43	43
11:15 AM	1	11	2	0	0	17	5	1	9	8	2	0	2	14	4	0	1	75	76
11:30 AM	2	9	0	0	3	13	3	1	5	14	0	0	4	12	5	0	1	70	71
11:45 AM	3	5	1	0	0	14	1	1	6	7	1	0	0	17	1	0	1	56	57
Total	7	27	5	0	5	54	11	3	24	34	5	0	6	56	10	0	3	244	247
12:00 PM	4	6	2	0	1	10	1	0	5	11	3	0	0	19	2	0	0	64	64
12:15 PM	2	6	0	0	1	18	1	0	4	5	3	0	2	32	3	2	2	77	79
12:30 PM	5	6	2	0	0	14	4	0	6	10	0	0	4	12	3	0	0	66	66
12:45 PM	0	8	3	0	3	13	1	0	4	6	0	0	1	16	4	0	0	59	59
Total	11	26	7	0	5	55	7	0	19	32	6	0	7	79	12	2	2	266	268
BREAK																			
04:00 PM	7	16	2	0	0	21	1	1	6	11	2	0	0	50	10	0	1	126	127
04:15 PM	5	21	2	0	0	14	0	0	6	10	1	0	3	51	8	0	0	121	121
04:30 PM	4	24	1	0	3	14	4	0	5	7	0	0	1	25	10	0	0	98	98
04:45 PM	6	24	4	0	0	23	2	0	2	7	0	0	2	38	14	0	0	122	122
Total	22	85	9	0	3	72	7	1	19	35	3	0	6	164	42	0	1	467	468
05:00 PM	5	27	3	0	5	26	2	0	9	9	1	0	4	39	7	1	1	137	138
05:15 PM	8	19	1	0	2	37	4	0	7	10	4	0	3	45	10	1	1	150	151
05:30 PM	5	34	3	0	5	40	7	0	12	6	1	0	1	54	9	0	0	177	177
05:45 PM	7	33	5	0	2	29	3	0	14	11	0	0	2	37	9	0	0	152	152
Total	25	113	12	0	14	132	16	0	42	36	6	0	10	175	35	2	2	616	618
Grand Total	86	313	55	0	34	844	70	4	337	296	35	3	48	713	125	6	13	2956	2969
Apprch %	18.9	68.9	12.1		3.6	89	7.4		50.4	44.3	5.2		5.4	80.5	14.1				
Total %	2.9	10.6	1.9		1.2	28.6	2.4		11.4	10	1.2		1.6	24.1	4.2		0.4	99.6	

Martin/Alexiou/Bryson, PLLC
4000 WestChase Boulevard, Suite 530
Raleigh, North Carolina 27607
p: 919.829.0328 f: 919.829.0329

File Name : 01 - Antioch&Beulah
Site Code : 00000001
Start Date : 10/16/2008
Page No : 2

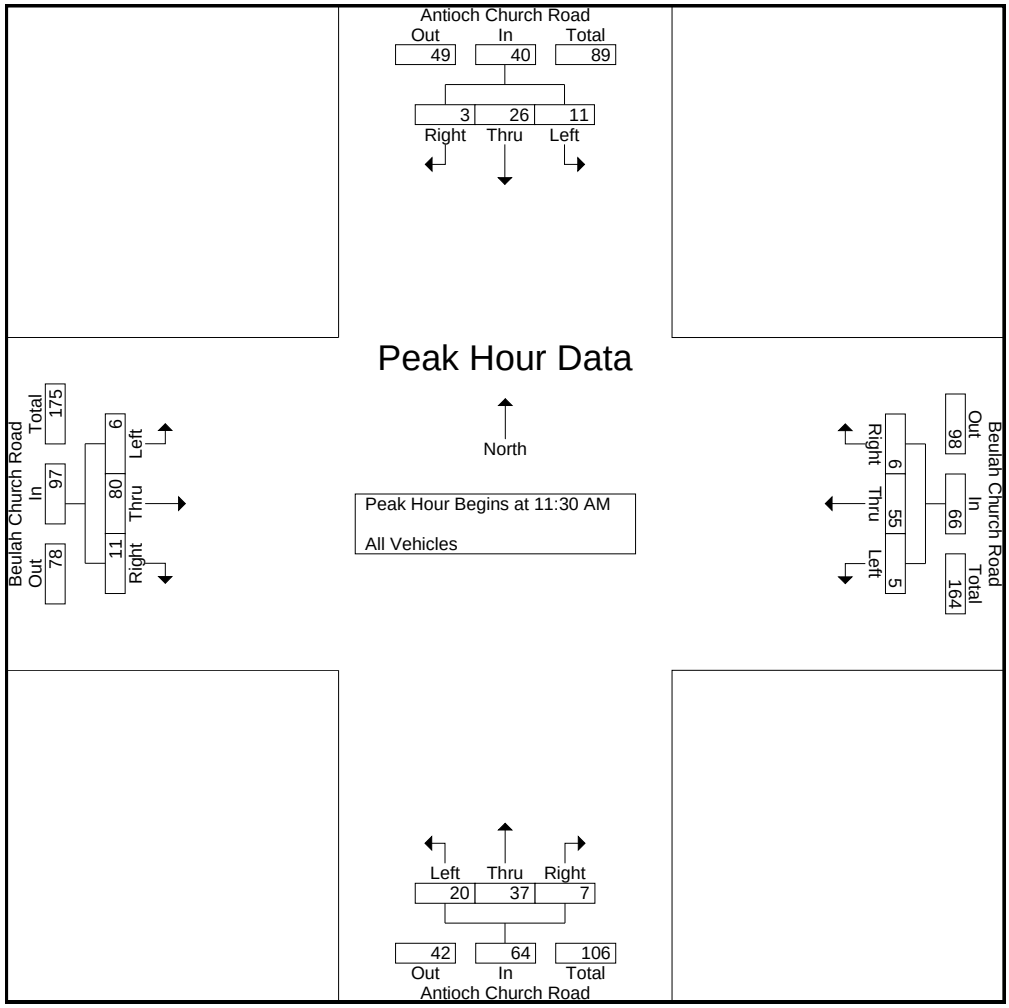
	Antioch Church Road Southbound				Beulah Church Road Westbound				Antioch Church Road Northbound				Beulah Church Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	2	9	**5**	**16**	0	75	3	78	30	12	1	43	1	33	2	36	173
07:30 AM	2	**10**				**84**	4	**89**	**35**	17	0	52	1	**39**	3	**43**	**199**
07:45 AM	1	6	4	11	1	79	**7**	87	34	**23**		**58**	**2**	29	**6**	37	193
08:00 AM	**3**	4	1	8	**2**	54	1	57	30	22	**3**						
Total Volume	**8**	**29**	**13**	**50**	**4**	**292**	**15**	**311**	**129**	**74**	**5**	**208**	**6**	**124**	**14**	**144**	**713**
% App. Total	**16**	**58**	**26**		**1.3**	**93.9**	**4.8**		**62**	**35.6**	**2.4**		**4.2**	**86.1**	**9.7**		
PHF	**.667**	**.725**	**.650**	**.781**	**.500**	**.869**	**.536**	**.874**	**.921**	**.804**	**.417**	**.897**	**.750**	**.795**	**.583**	**.837**	**.896**



Martin/Alexiou/Bryson, PLLC
4000 WestChase Boulevard, Suite 530
Raleigh, North Carolina 27607
p: 919.829.0328 f: 919.829.0329

File Name : 01 - Antioch&Beulah
Site Code : 00000001
Start Date : 10/16/2008
Page No : 3

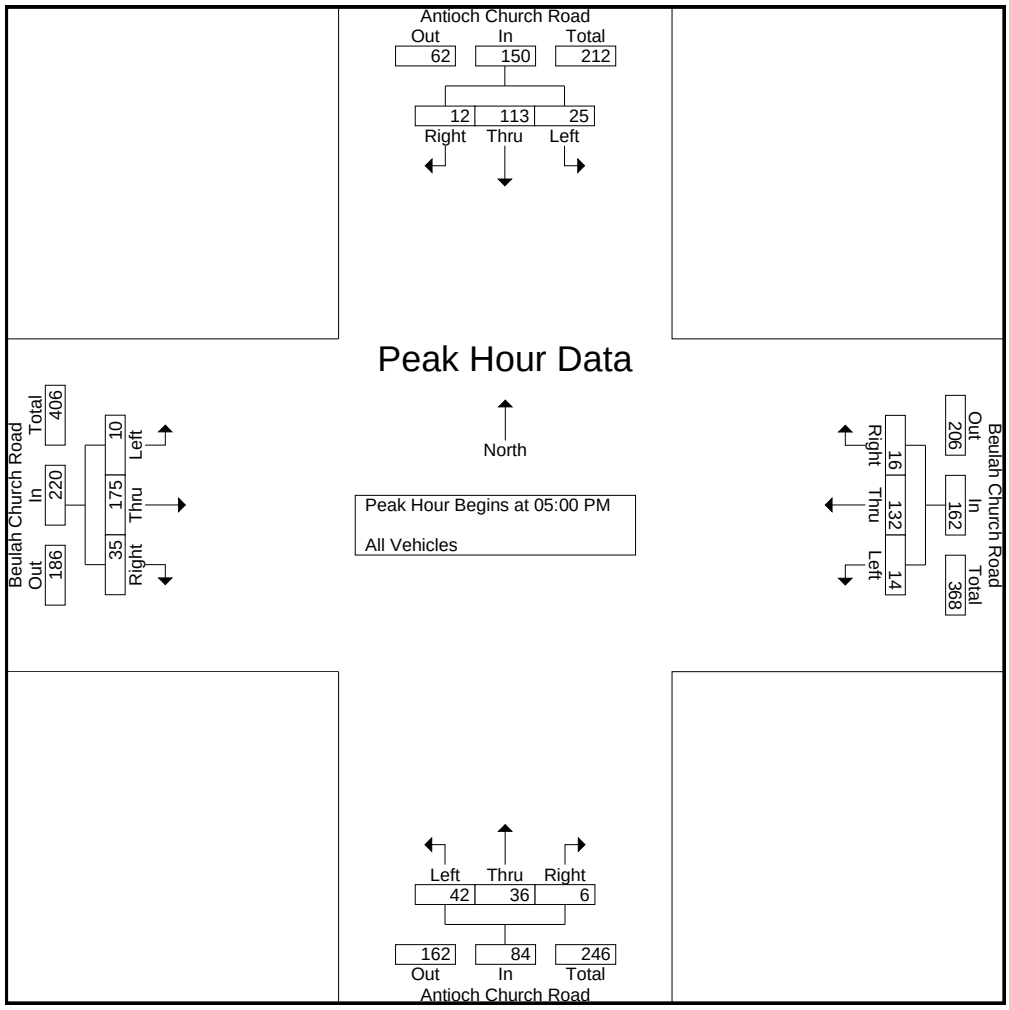
	Antioch Church Road Southbound				Beulah Church Road Westbound				Antioch Church Road Northbound				Beulah Church Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:30 AM																	
11:30 AM	2	**9**			**3**	13	**3**	19	5	**14**		**19**	**4**	12	**5**	21	70
11:45 AM	3	5	1	9	0	14	1	15	**6**	7	1	14	0	17	1	18	56
12:00 PM	**4**	6	**2**	**12**	1	10	1	12	5	11	**3**						
12:15 PM	**2**	**6**	**0**	**8**	**1**	**18**	1	**20**	4	5	3	12	2	**32**	3	**37**	**77**
Total Volume	11	26	3	40	5	55	6	66	20	37	7	64	6	80	11	97	267
% App. Total	27.5	65	7.5		7.6	83.3	9.1		31.2	57.8	10.9		6.2	82.5	11.3		
PHF	.688	.722	.375	.833	.417	.764	.500	.825	.833	.661	.583	.842	.375	.625	.550	.655	.867



Martin/Alexiou/Bryson, PLLC
4000 WestChase Boulevard, Suite 530
Raleigh, North Carolina 27607
p: 919.829.0328 f: 919.829.0329

File Name : 01 - Antioch&Beulah
Site Code : 00000001
Start Date : 10/16/2008
Page No : 4

	Antioch Church Road Southbound				Beulah Church Road Westbound				Antioch Church Road Northbound				Beulah Church Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	5	27	3	35	**5**	26	2	33	9	9	1	19	**4**	39	7	50	137
05:15 PM	**8**	19	1	28	2	37	4	43	7	10	**4**				**10**	58	150
05:30 PM	5	**34**				**40**	**7**	**52**	12	6	1	19	1	**54**	9	**64**	**177**
05:45 PM	7	33	**5**	**45**	2	29	3	34	**14**	**11**		**25**	2	37	9	48	152
Total Volume	25	113	12	150	14	132	16	162	42	36	6	84	10	175	35	220	616
% App. Total	16.7	75.3	8		8.6	81.5	9.9		50	42.9	7.1		4.5	79.5	15.9		
PHF	.781	.831	.600	.833	.700	.825	.571	.779	.750	.818	.375	.840	.625	.810	.875	.859	.870



Martin/Alexiou/Bryson, PLLC
4000 WestChase Boulevard, Suite 530
Raleigh, North Carolina 27607
p: 919.829.0328 f: 919.829.0329

File Name : 01 - Antioch&Beulah
Site Code : 00000001
Start Date : 10/16/2008
Page No : 1

Groups Printed- Pedestrians

	Antioch Church Road Southbound				Beulah Church Road Westbound				Antioch Church Road Northbound				Beulah Church Road Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
08:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
BREAK																	
Grand Total	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Apprch %	0	100	0	0	0	0	0	0	0	100	0	0	0	0	0	0	
Total %	0	50	0	0	0	0	0	0	0	50	0	0	0	0	0	0	

Martin/Alexiou/Bryson, PLLC
4000 WestChase Boulevard, Suite 530
Raleigh, North Carolina 27607
p: 919.829.0328 f: 919.829.0329

File Name : 01 - Antioch&Beulah
Site Code : 00000001
Start Date : 10/16/2008

Groups Printed- Bicycles

	Antioch Church Road Southbound				Beulah Church Road Westbound				Antioch Church Road Northbound				Beulah Church Road Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
BREAK																	
Total	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
BREAK																	
12:00 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
BREAK																	
12:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	4
BREAK																	
04:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	4
04:45 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	0	4	0	0	0	0	0	0	0	3	0	0	7
BREAK																	
Grand Total	0	2	0	0	0	4	0	0	0	2	0	0	0	4	0	0	12
Apprch %	0	100	0	0	0	100	0	0	0	100	0	0	0	100	0	0	
Total %	0	16.7	0	0	0	33.3	0	0	0	16.7	0	0	0	33.3	0	0	

Martin/Alexiou/Bryson, PLLC
4000 WestChase Boulevard, Suite 530
Raleigh, North Carolina 27607
p: 919.829.0328 f: 919.829.0329

File Name : 02 - BondsGrove&Waxhaw
Site Code : 20080602
Start Date : 10/14/2008
Page No : 1

Groups Printed- All Vehicles

	Bond Grove Church Road Southbound				Waxhaw Marvin Road Westbound				No Approach Northbound				Waxhaw Marvin Road Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	107	0	0	76	2	1	0	0	0	0	14	21	0	0	1	220	221
07:15 AM	0	0	101	0	0	80	4	1	0	0	0	0	39	28	0	0	1	252	253
07:30 AM	3	0	64	1	0	101	0	0	0	0	0	0	39	31	0	1	2	238	240
07:45 AM	0	0	97	1	0	100	1	0	0	0	0	0	20	37	0	0	1	255	256
Total	3	0	369	2	0	357	7	2	0	0	0	0	112	117	0	1	5	965	970
08:00 AM	2	0	44	1	0	55	1	1	0	0	0	0	7	27	0	0	2	136	138
08:15 AM	1	0	48	0	0	67	3	0	0	0	0	0	15	22	0	0	0	156	156
08:30 AM	3	0	31	1	0	54	1	0	0	0	0	0	19	33	0	3	4	141	145
08:45 AM	2	0	10	1	0	49	7	1	0	0	0	0	20	24	0	1	3	112	115
Total	8	0	133	3	0	225	12	2	0	0	0	0	61	106	0	4	9	545	554
BREAK																			
11:00 AM	2	0	13	0	0	20	2	1	0	0	0	0	11	21	0	1	2	69	71
11:15 AM	0	0	13	0	0	28	3	1	0	0	0	0	9	21	0	0	1	74	75
11:30 AM	1	0	11	0	0	29	4	1	0	0	0	0	12	16	0	0	1	73	74
11:45 AM	1	0	9	0	0	24	0	1	0	0	0	0	9	26	0	0	1	69	70
Total	4	0	46	0	0	101	9	4	0	0	0	0	41	84	0	1	5	285	290
12:00 PM	5	0	10	0	0	21	4	0	0	0	0	0	11	28	0	1	1	79	80
12:15 PM	2	0	14	1	0	29	5	0	0	0	0	0	11	17	0	0	1	78	79
12:30 PM	0	0	14	0	0	23	9	0	0	0	0	0	15	26	0	0	0	87	87
12:45 PM	5	0	13	0	0	39	5	0	0	0	0	0	17	21	0	0	0	100	100
Total	12	0	51	1	0	112	23	0	0	0	0	0	54	92	0	1	2	344	346
BREAK																			
04:00 PM	7	0	15	0	0	36	3	1	0	0	0	0	27	75	0	0	1	163	164
04:15 PM	6	0	10	0	0	26	3	0	0	0	0	0	32	70	0	1	1	147	148
04:30 PM	4	0	19	1	0	39	5	0	0	0	0	0	18	64	0	0	1	149	150
04:45 PM	2	0	18	0	0	41	4	0	0	0	0	0	27	57	0	0	0	149	149
Total	19	0	62	1	0	142	15	1	0	0	0	0	104	266	0	1	3	608	611
05:00 PM	4	0	23	0	0	43	5	0	0	0	0	0	34	77	0	0	0	186	186
05:15 PM	2	0	17	1	0	32	3	0	0	0	0	0	32	86	0	0	1	172	173
05:30 PM	2	0	22	0	0	27	2	0	0	0	0	0	55	77	0	0	0	185	185
05:45 PM	8	0	22	0	0	35	5	0	0	0	0	0	38	76	0	0	0	184	184
Total	16	0	84	1	0	137	15	0	0	0	0	0	159	316	0	0	1	727	728
Grand Total	62	0	745	8	0	1074	81	9	0	0	0	0	531	981	0	8	25	3474	3499
Apprch %	7.7	0	92.3		0	93	7		0	0	0		35.1	64.9	0				
Total %	1.8	0	21.4		0	30.9	2.3		0	0	0		15.3	28.2	0		0.7	99.3	

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File Name : 02 - BondsGrove&Waxhaw
Site Code : 20080602
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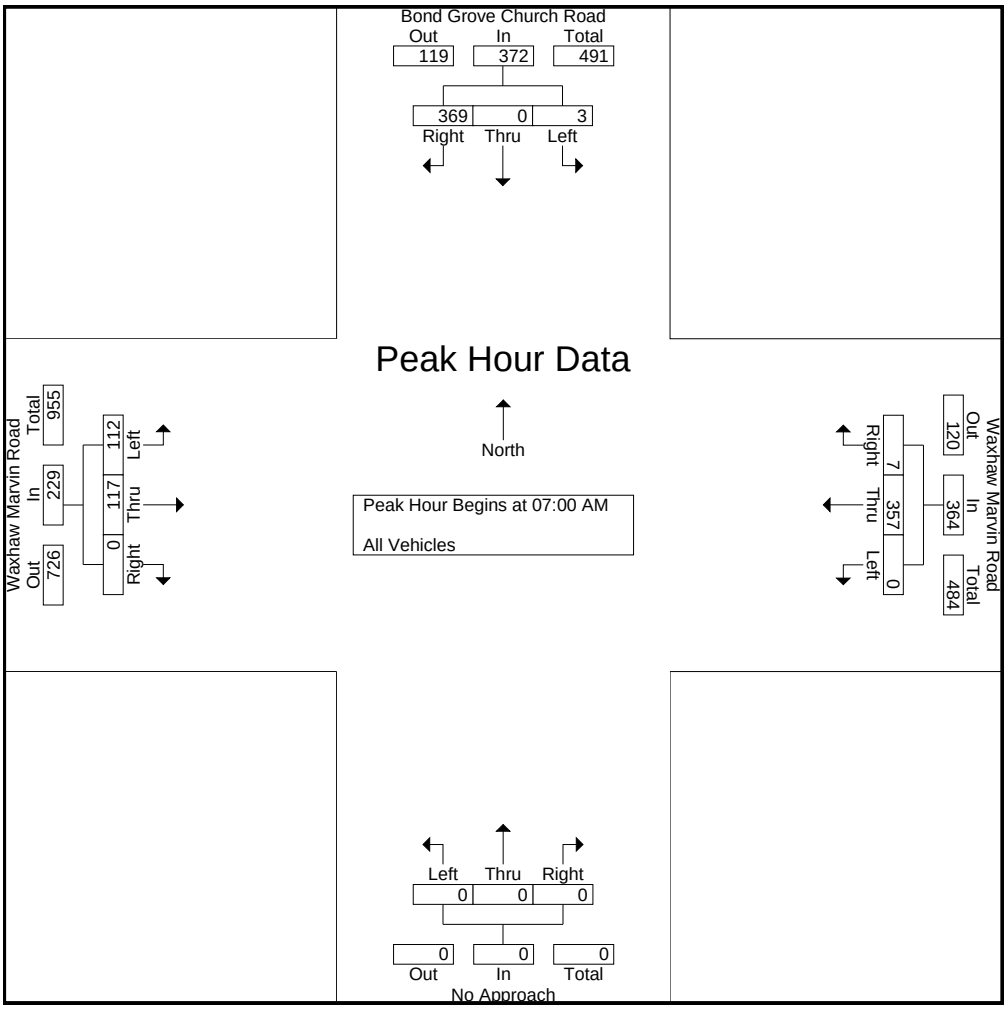
	Bond Grove Church Road Southbound				Waxhaw Marvin Road Westbound				No Approach Northbound				Waxhaw Marvin Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	**107**	**107**	0	76	2	78	0	0	0	0	14	21	0	35	220
07:15 AM	0	0	101	101	0	80	**4**	84	0	0	0	0	**39**	28	0	67	252
07:30 AM	**3**	0	64	67	0	**101**	0	**101**	0	0	0	0	39	31	0	**70**	238
07:45 AM	0	0	97	97	0	100	1	101	0	0	0	0	20	**37**	0	57	**255**
Total Volume	3	0	369	372	0	357	7	364	0	0	0	0	112	117	0	229	965
% App. Total	0.8	0	99.2		0	98.1	1.9		0	0	0		48.9	51.1	0		
PHF	.250	.000	.862	.869	.000	.884	.438	.901	.000	.000	.000	.000	.718	.791	.000	.818	.946



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File Name : 02 - BondsGrove&Waxhaw
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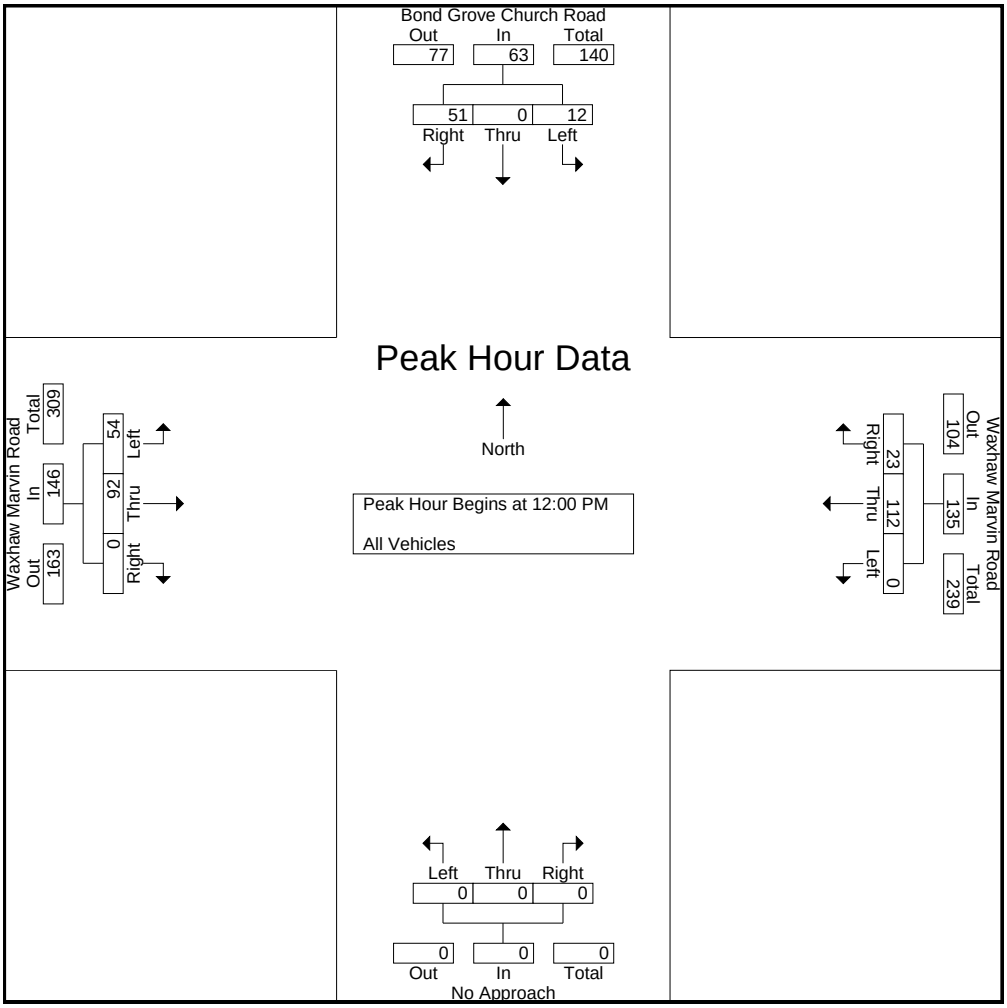
	Bond Grove Church Road Southbound				Waxhaw Marvin Road Westbound				No Approach Northbound				Waxhaw Marvin Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	**5**	0	10	15	0	21	4	25	0	0	0	0	11	**28**	0	39	79
12:15 PM	2	0	**14**														
12:30 PM	**0**	**0**	**14**	**14**	**0**	**23**	**9**	32	0	0	0	0	15	26	0	**41**	87
12:45 PM	5	0	13	**18**	0	**39**	5	**44**	0	0	0	0	**17**	21	0	38	**100**
Total Volume	12	0	51	63	0	112	23	135	0	0	0	0	54	92	0	146	344
% App. Total	19	0	81		0	83	17		0	0	0		37	63	0		
PHF	.600	.000	.911	.875	.000	.718	.639	.767	.000	.000	.000	.000	.794	.821	.000	.890	.860



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File Name : 02 - BondsGrove&Waxhaw
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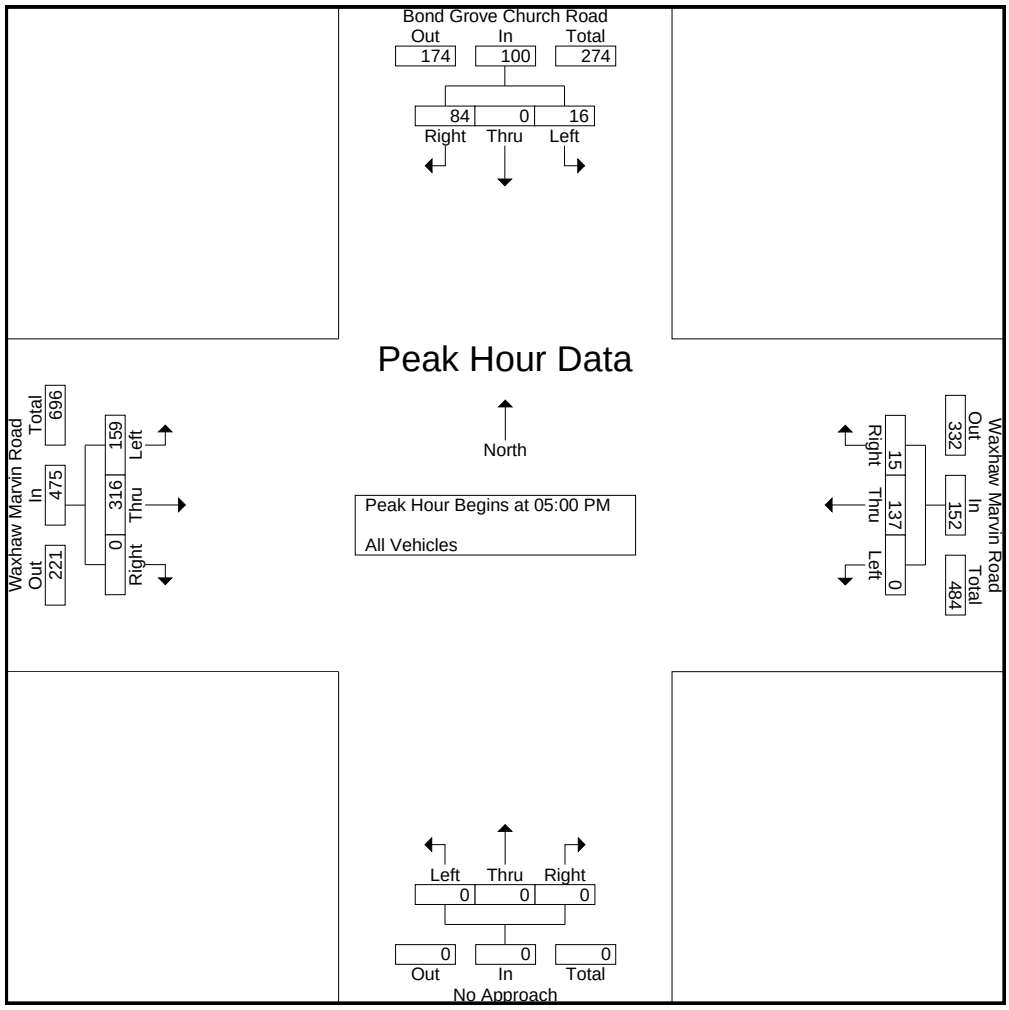
	Bond Grove Church Road Southbound				Waxhaw Marvin Road Westbound				No Approach Northbound				Waxhaw Marvin Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	4	0	**23**			**43**	**5**	**48**	0	0	0	0	34	77	0	111	**186**
05:15 PM	2	0	17	19	0	32	3	35	0	0	0	0	32	**86**	0	118	172
05:30 PM	2	0	22	24	0	27	2	29	0	0	0	0	**55**	77	0	**132**	185
05:45 PM	**8**	0	22	**30**	0	35	5	40	0	0	0	0	38	76	0	114	184
Total Volume	16	0	84	100	0	137	15	152	0	0	0	0	159	316	0	475	727
% App. Total	16	0	84		0	90.1	9.9		0	0	0		33.5	66.5	0		
PHF	.500	.000	.913	.833	.000	.797	.750	.792	.000	.000	.000	.000	.723	.919	.000	.900	.977



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File Name : 02 - BondsGrove&Waxhaw
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Groups Printed- Bicycles

	Bond Grove Church Road Southbound				Waxhaw Marvin Road Westbound				No Approach Northbound				Waxhaw Marvin Road Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
11:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
11:30 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
11:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2
Total	0	0	1	0	0	3	0	0	0	0	0	0	1	0	0	0	5
BREAK																	
04:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
BREAK																	
Total	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	3
BREAK																	
05:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
BREAK																	
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
Grand Total	0	0	1	0	0	5	0	0	0	0	0	0	2	2	0	0	10
Apprch %	0	0	100	0	0	100	0	0	0	0	0	0	50	50	0	0	
Total %	0	0	10	0	0	50	0	0	0	0	0	0	20	20	0	0	

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Site Code : 00000003
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Groups Printed- All Vehicles

	NC 16 (Broome Street) Southbound				North Main Street Westbound				NC 16 (Broome Street) Northbound				North Main Street Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	146	3	0	2	0	0	0	0	104	0	3	2	1	1	0	3	259	262
07:15 AM	0	81	5	0	0	0	0	0	2	135	4	2	4	0	1	0	2	232	234
07:30 AM	0	95	3	4	1	1	0	0	1	123	2	2	4	0	1	0	6	231	237
07:45 AM	0	96	1	2	0	0	0	0	0	113	5	1	2	1	1	0	3	219	222
Total	0	418	12	6	3	1	0	0	3	475	11	8	12	2	4	0	14	941	955
08:00 AM	0	72	1	0	0	1	2	0	2	89	3	1	0	1	2	0	1	173	174
08:15 AM	0	70	4	1	0	1	2	0	2	112	2	1	4	2	1	0	2	200	202
08:30 AM	0	64	7	0	0	0	0	0	0	97	0	1	3	0	4	1	2	175	177
08:45 AM	0	69	4	0	0	1	0	0	0	80	0	1	8	1	3	0	1	166	167
Total	0	275	16	1	0	3	4	0	4	378	5	4	15	4	10	1	6	714	720
BREAK																			
11:00 AM	5	53	7	4	0	3	10	0	2	53	0	2	13	5	1	0	6	152	158
11:15 AM	4	71	4	1	0	0	2	0	0	70	1	2	3	0	0	0	3	155	158
11:30 AM	2	82	4	2	1	0	0	0	4	59	2	1	3	4	0	0	3	161	164
11:45 AM	1	78	6	3	0	1	2	0	2	95	6	2	2	0	1	0	5	194	199
Total	12	284	21	10	1	4	14	0	8	277	9	7	21	9	2	0	17	662	679
12:00 PM	0	68	5	1	0	0	2	0	1	97	0	3	4	2	2	0	4	181	185
12:15 PM	4	75	7	0	0	1	1	0	3	73	2	1	3	1	0	0	1	170	171
12:30 PM	0	92	4	0	0	1	1	0	2	77	0	1	2	0	0	0	1	179	180
12:45 PM	0	86	9	2	2	1	3	0	4	97	2	0	4	2	1	0	2	211	213
Total	4	321	25	3	2	3	7	0	10	344	4	5	13	5	3	0	8	741	749
BREAK																			
04:00 PM	0	67	12	0	1	0	0	0	4	54	4	1	3	1	0	0	1	146	147
04:15 PM	0	138	6	0	1	0	0	0	2	112	0	0	3	4	3	0	0	269	269
04:30 PM	0	119	9	2	1	1	2	0	6	87	0	0	7	3	2	0	2	237	239
04:45 PM	4	133	4	1	1	2	0	0	2	94	3	0	5	2	1	0	1	251	252
Total	4	457	31	3	4	3	2	0	14	347	7	1	18	10	6	0	4	903	907
05:00 PM	0	143	6	1	2	1	1	0	0	92	4	0	4	0	5	0	1	258	259
05:15 PM	2	170	3	1	1	0	4	0	1	101	4	1	2	0	1	0	2	289	291
05:30 PM	0	158	10	0	0	1	0	0	5	108	6	1	4	1	2	0	1	295	296
05:45 PM	0	180	9	0	0	2	0	0	1	120	4	1	4	4	2	0	1	326	327
Total	2	651	28	2	3	4	5	0	7	421	18	3	14	5	10	0	5	1168	1173
Grand Total	22	2406	133	25	13	18	32	0	46	2242	54	28	93	35	35	1	54	5129	5183
Apprch %	0.9	93.9	5.2		20.6	28.6	50.8		2	95.7	2.3		57.1	21.5	21.5				
Total %	0.4	46.9	2.6		0.3	0.4	0.6		0.9	43.7	1.1		1.8	0.7	0.7		1	99	

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File Name : 03 - Broome&NorthMain
Site Code : 00000003
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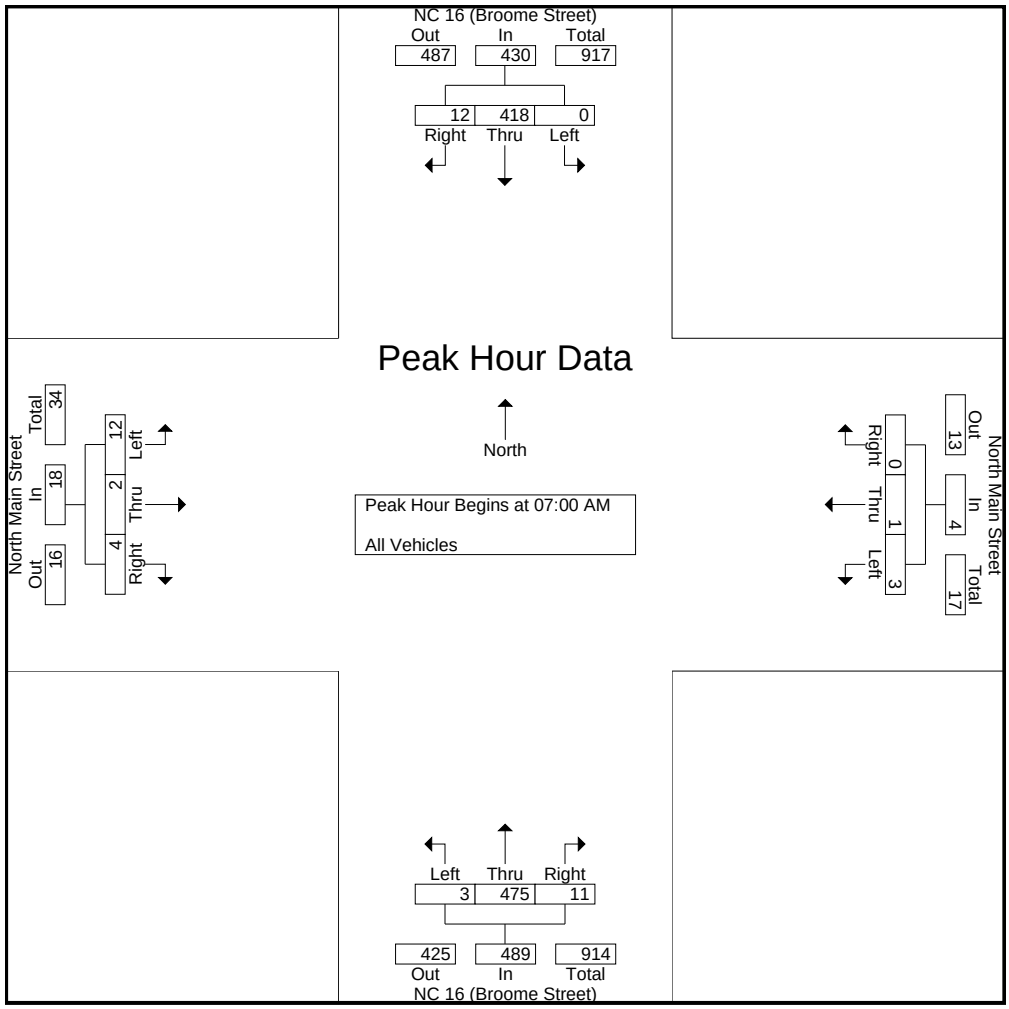
	NC 16 (Broome Street) Southbound				North Main Street Westbound				NC 16 (Broome Street) Northbound				North Main Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	**146**		**149**	**2**	0	0	**2**	0	104	0	104	2	**1**	**1**	4	**259**
07:15 AM	0	81	**5**						**2**	**135**		**141**	**4**	0	1	**5**	232
07:30 AM	0	95	3	98	1	**1**	0	2	1	123	2	126	4	0	1	5	231
07:45 AM	0	96	1	97	0	0	0	0	0	113	**5**						
Total Volume	**0**	**418**	**12**	**430**	**3**	**1**	**0**	**4**	**3**	**475**	**11**	**489**	**12**	**2**	**4**	**18**	**941**
% App. Total	**0**	**97.2**	**2.8**		**75**	**25**	**0**		**0.6**	**97.1**	**2.2**		**66.7**	**11.1**	**22.2**		
PHF	**.000**	**.716**	**.600**	**.721**	**.375**	**.250**	**.000**	**.500**	**.375**	**.880**	**.550**	**.867**	**.750**	**.500**	**1.000**	**.900**	**.908**



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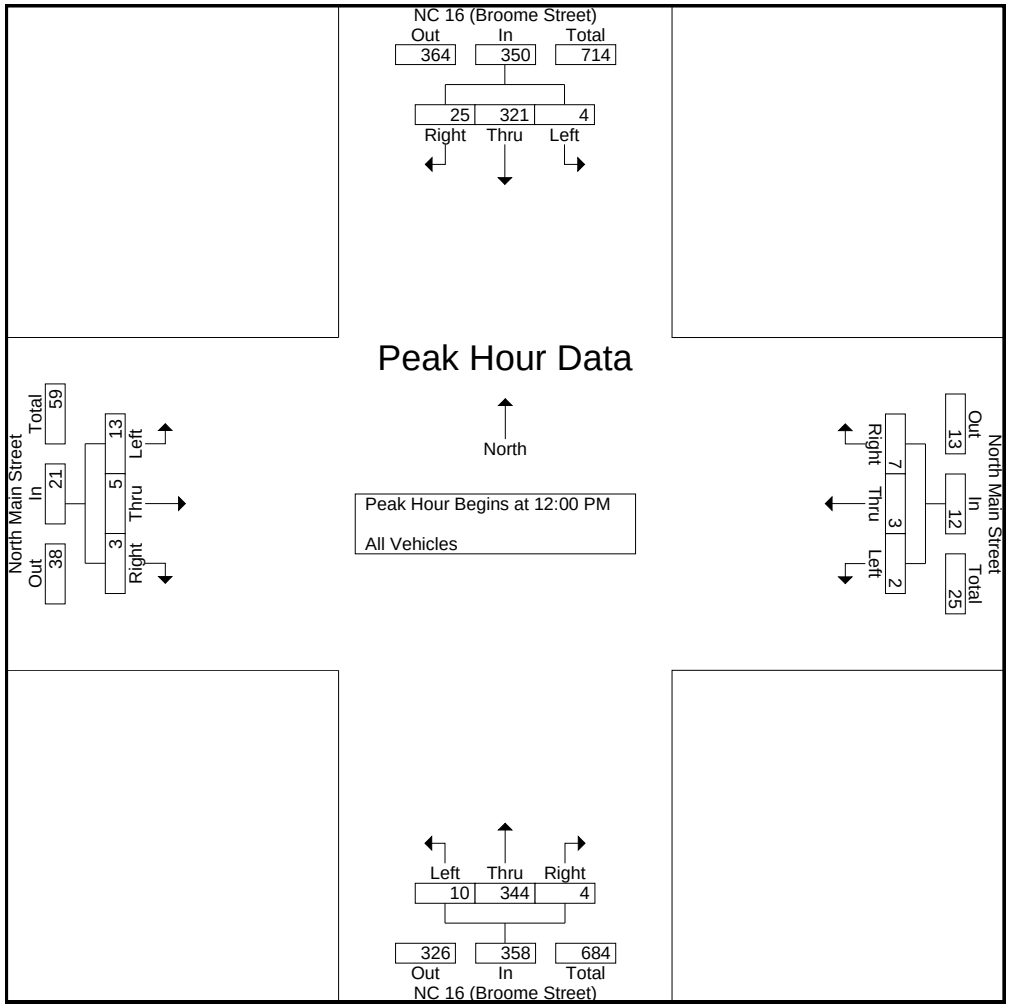
	NC 16 (Broome Street) Southbound				North Main Street Westbound				NC 16 (Broome Street) Northbound				North Main Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	68	5	73	0	0	2	2	1	**97**			**4**	**2**	**2**	**8**	181
12:15 PM	**4**	75	7	86	0	**1**	1	2	3	73	**2**						
12:30 PM	**0**	**92**	**4**	**96**	0	1	1	2	2	77	0	79	2	0	0	2	179
12:45 PM	0	86	**9**		**2**	1	**3**	**6**	**4**	97	2	**103**	4	2	1	7	**211**
Total Volume	4	321	25	350	2	3	7	12	10	344	4	358	13	5	3	21	741
% App. Total	1.1	91.7	7.1		16.7	25	58.3		2.8	96.1	1.1		61.9	23.8	14.3		
PHF	.250	.872	.694	.911	.250	.750	.583	.500	.625	.887	.500	.869	.813	.625	.375	.656	.878



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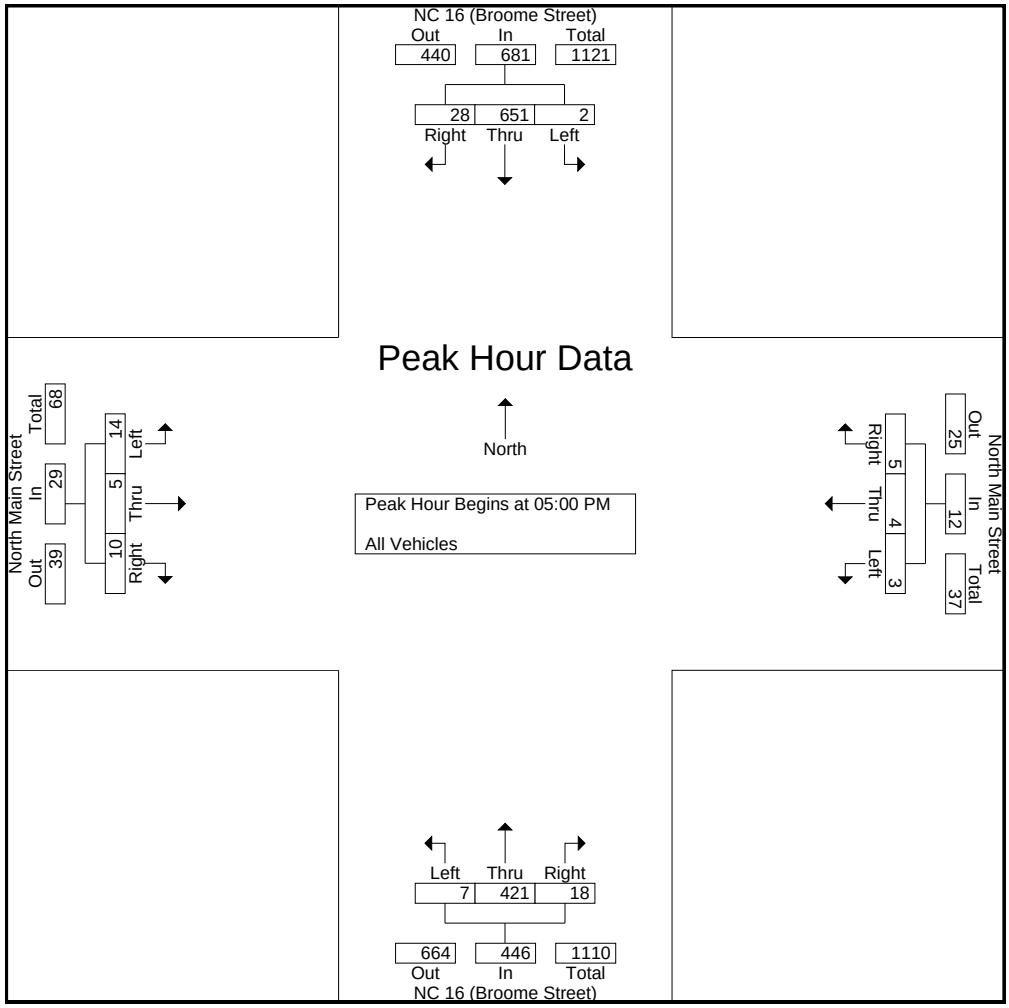
	NC 16 (Broome Street) Southbound				North Main Street Westbound				NC 16 (Broome Street) Northbound				North Main Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	143	6	149	**2**	1	1	4	0	92	4	96	**4**	0	**5**	9	258
05:15 PM	**2**	170	3	175	1	0	**4**	**5**	1	101	4	106	2	0	1	3	289
05:30 PM	0	158	**10**						**5**	108	**6**						
05:45 PM	**0**	**180**	9	**189**	0	**2**	0	2	1	**120**	**4**	**125**	4	**4**	2	**10**	**326**
Total Volume	2	651	28	681	3	4	5	12	7	421	18	446	14	5	10	29	1168
% App. Total	0.3	95.6	4.1		25	33.3	41.7		1.6	94.4	4		48.3	17.2	34.5		
PHF	.250	.904	.700	.901	.375	.500	.313	.600	.350	.877	.750	.892	.875	.313	.500	.725	.896



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Groups Printed- Pedestrians

	NC 16 (Broome Street) Southbound				North Main Street Westbound				NC 16 (Broome Street) Northbound				North Main Street Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
12:15 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	10	0	0	14
12:30 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
12:45 PM	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0	0	6
Total	0	6	0	0	0	4	0	0	0	4	0	0	0	10	0	0	24
BREAK																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6
04:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	0	0	0	1	0	0	0	1	0	0	0	6	0	0	10
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Total	0	2	0	0	0	1	0	0	0	2	0	0	0	2	0	0	7
Grand Total	0	10	0	0	0	7	0	0	0	7	0	0	0	18	0	0	42
Apprch %	0	100	0	0	0	100	0	0	0	100	0	0	0	100	0	0	
Total %	0	23.8	0	0	0	16.7	0	0	0	16.7	0	0	0	42.9	0	0	

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Groups Printed- Bicycles

	NC 16 (Broome Street) Southbound				North Main Street Westbound				NC 16 (Broome Street) Northbound				North Main Street Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
11:15 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
BREAK																	
Total	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
BREAK																	
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
BREAK																	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Grand Total	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	4
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	75	0	0	0	0	0	0	0	25	0	0	

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Groups Printed- All Vehicles

	Broome Street Southbound				South Main Street Westbound				Broome Street Northbound				South Main Street Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	106	3	9	0	0	76	104	4	3	13	0	0	22	49	1	4	8	386	394
07:15 AM	48	5	21	0	0	81	108	6	6	24	1	0	20	50	0	5	11	364	375
07:30 AM	55	2	24	2	0	93	93	6	8	11	0	0	19	52	1	1	9	358	367
07:45 AM	48	4	30	3	0	79	109	4	1	7	1	0	19	41	2	7	14	341	355
Total	257	14	84	5	0	329	414	20	18	55	2	0	80	192	4	17	42	1449	1491
08:00 AM	57	0	26	3	1	61	96	3	0	3	1	0	23	36	1	3	9	305	314
08:15 AM	48	1	13	2	0	50	80	1	1	4	0	0	29	28	1	2	5	255	260
08:30 AM	30	2	23	0	0	46	76	8	2	1	1	0	30	35	0	2	10	246	256
08:45 AM	44	3	16	2	0	37	77	5	0	3	0	0	31	27	0	3	10	238	248
Total	179	6	78	7	1	194	329	17	3	11	2	0	113	126	2	10	34	1044	1078
BREAK																			
11:00 AM	61	4	33	1	0	27	51	3	1	5	0	0	27	17	1	2	6	227	233
11:15 AM	57	6	26	4	0	30	51	2	1	6	0	0	26	25	1	0	6	229	235
11:30 AM	71	1	40	3	0	32	68	3	2	4	0	0	27	22	1	3	9	268	277
11:45 AM	55	2	19	1	2	21	63	9	0	0	2	0	19	30	1	2	12	214	226
Total	244	13	118	9	2	110	233	17	4	15	2	0	99	94	4	7	33	938	971
12:00 PM	72	3	29	1	0	27	78	2	2	6	0	0	24	29	1	1	4	271	275
12:15 PM	64	4	28	3	0	29	99	1	1	3	0	0	30	32	1	2	6	291	297
12:30 PM	68	1	32	3	1	30	62	3	0	4	1	0	23	21	1	3	9	244	253
12:45 PM	69	1	31	1	0	20	75	3	1	7	0	0	27	30	1	8	12	262	274
Total	273	9	120	8	1	106	314	9	4	20	1	0	104	112	4	14	31	1068	1099
BREAK																			
04:00 PM	113	2	42	1	0	37	82	3	1	6	0	0	32	66	1	3	7	382	389
04:15 PM	74	3	46	1	0	35	87	2	1	6	0	0	21	68	1	3	6	342	348
04:30 PM	92	3	35	1	1	40	82	1	2	5	0	0	29	54	0	7	9	343	352
04:45 PM	126	5	30	1	1	27	74	1	1	7	1	0	23	59	0	2	4	354	358
Total	405	13	153	4	2	139	325	7	5	24	1	0	105	247	2	15	26	1421	1447
05:00 PM	89	1	30	2	0	46	72	3	2	15	3	0	24	49	2	3	8	333	341
05:15 PM	130	3	27	1	0	38	64	0	0	5	1	0	26	83	0	6	7	377	384
05:30 PM	112	2	29	3	0	47	69	0	0	12	0	0	28	70	1	0	3	370	373
05:45 PM	109	5	38	1	0	49	66	2	1	5	2	0	25	81	1	0	3	382	385
Total	440	11	124	7	0	180	271	5	3	37	6	0	103	283	4	9	21	1462	1483
Grand Total	1798	66	677	40	6	1058	1886	75	37	162	14	0	604	1054	20	72	187	7382	7569
Apprch %	70.8	2.6	26.6		0.2	35.9	63.9		17.4	76.1	6.6		36	62.8	1.2				
Total %	24.4	0.9	9.2		0.1	14.3	25.5		0.5	2.2	0.2		8.2	14.3	0.3		2.5	97.5	

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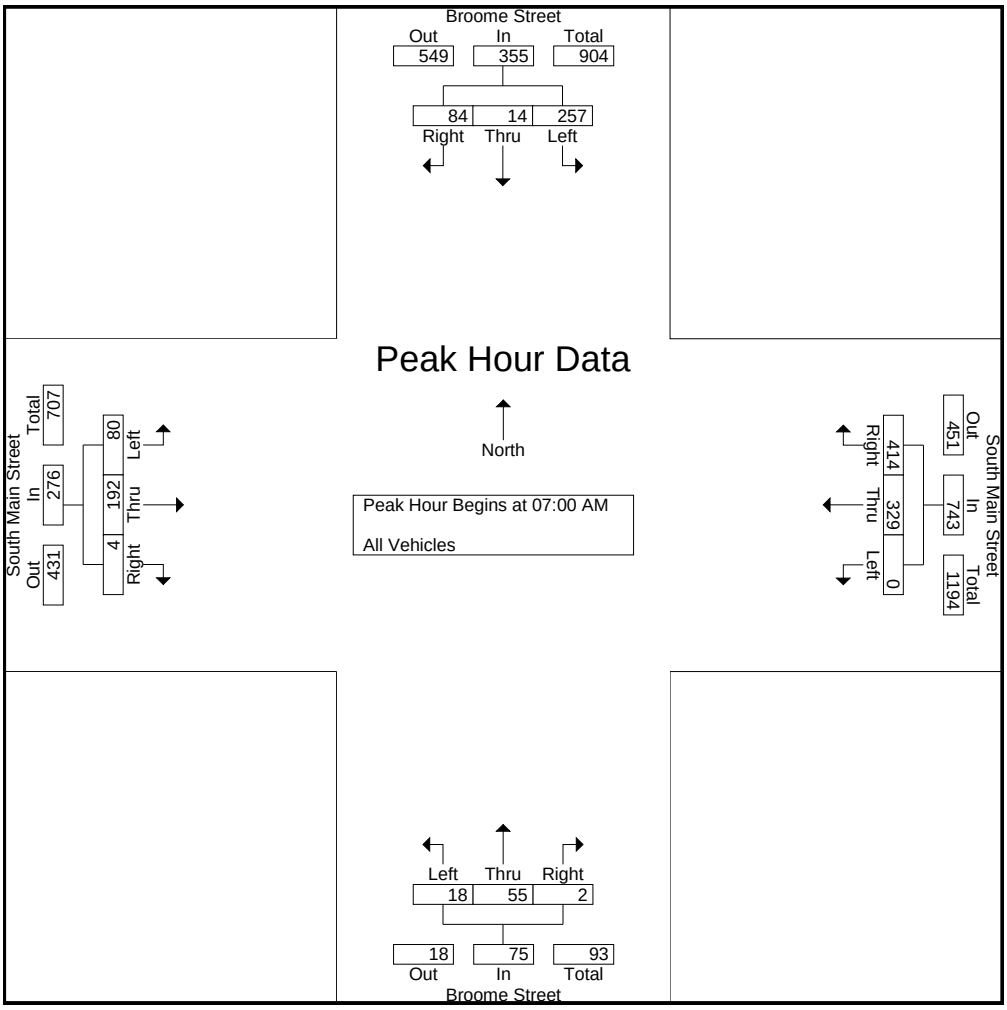
	Broome Street Southbound				South Main Street Westbound				Broome Street Northbound				South Main Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**106**	3	9	**118**	0	76	104	180	3	13	0	16	**22**	49	1	**72**	**386**
07:15 AM	48	**5**						**189**	6	**24**	**1**	**31**	20	50	0	70	364
07:30 AM	55	2	24	81	0	**93**	93	186	**8**	11	0	19	19	**52**	1	72	358
07:45 AM	48	4	**30**				**109**	188	1	7	1	9	19	41	**2**	62	341
Total Volume	257	14	84	355	0	329	414	743	18	55	2	75	80	192	4	276	1449
% App. Total	72.4	3.9	23.7		0	44.3	55.7		24	73.3	2.7		29	69.6	1.4		
PHF	.606	.700	.700	.752	.000	.884	.950	.983	.563	.573	.500	.605	.909	.923	.500	.958	.938



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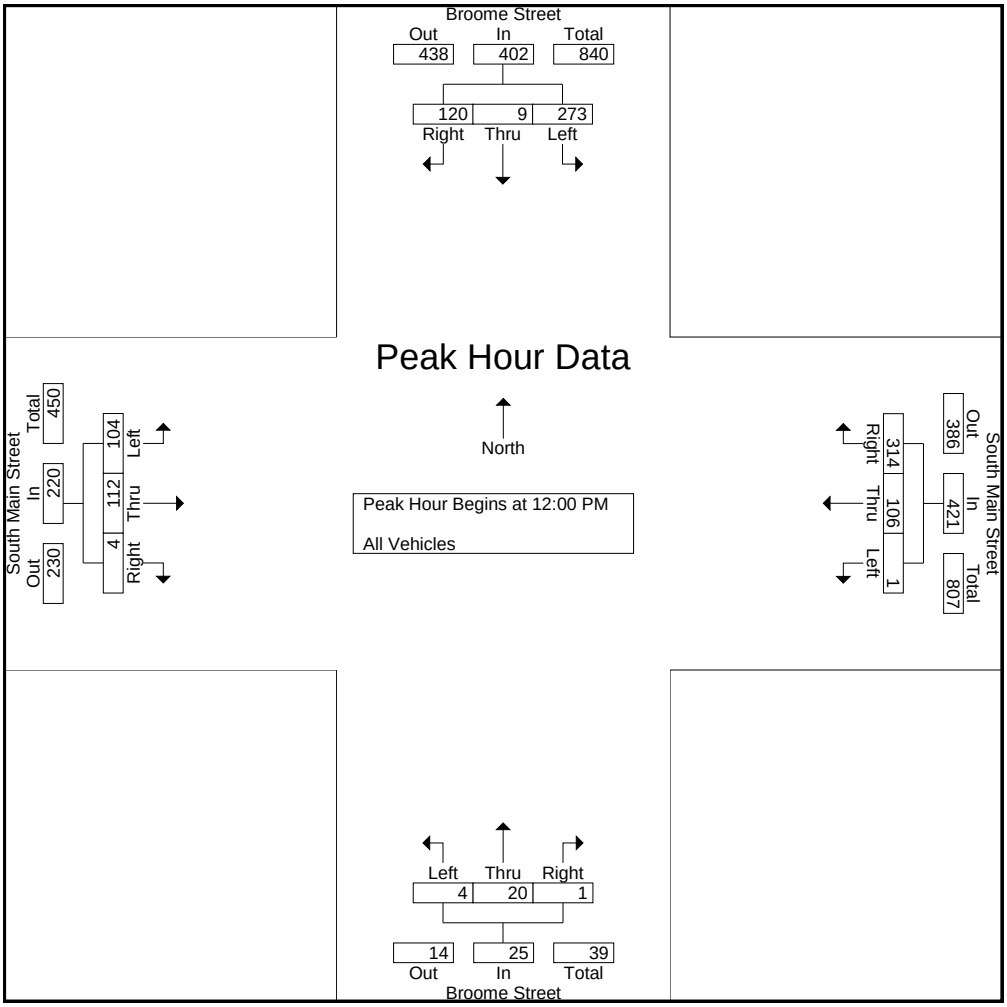
	Broome Street Southbound				South Main Street Westbound				Broome Street Northbound				South Main Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	**72**	3	29	**104**	0	27	78	105	**2**	6	0	**8**	24	29	**1**	54	271
12:15 PM	64	**4**					**99**	**128**	1	3	0	4	**30**	**32**	1	**63**	**291**
12:30 PM	68	1	**32**		**1**	**30**	62	93	0	4	**1**						
12:45 PM	**69**	**1**	**31**	**101**	**0**	**20**	**75**	**95**	**1**	**7**	**0**	**8**	**27**	**30**	**1**	**58**	**262**
Total Volume	**273**	**9**	**120**	**402**	**1**	**106**	**314**	**421**	**4**	**20**	**1**	**25**	**104**	**112**	**4**	**220**	**1068**
% App. Total	**67.9**	**2.2**	**29.9**		**0.2**	**25.2**	**74.6**		**16**	**80**	**4**		**47.3**	**50.9**	**1.8**		
PHF	**.948**	**.563**	**.938**	**.966**	**.250**	**.883**	**.793**	**.822**	**.500**	**.714**	**.250**	**.781**	**.867**	**.875**	**1.000**	**.873**	**.918**



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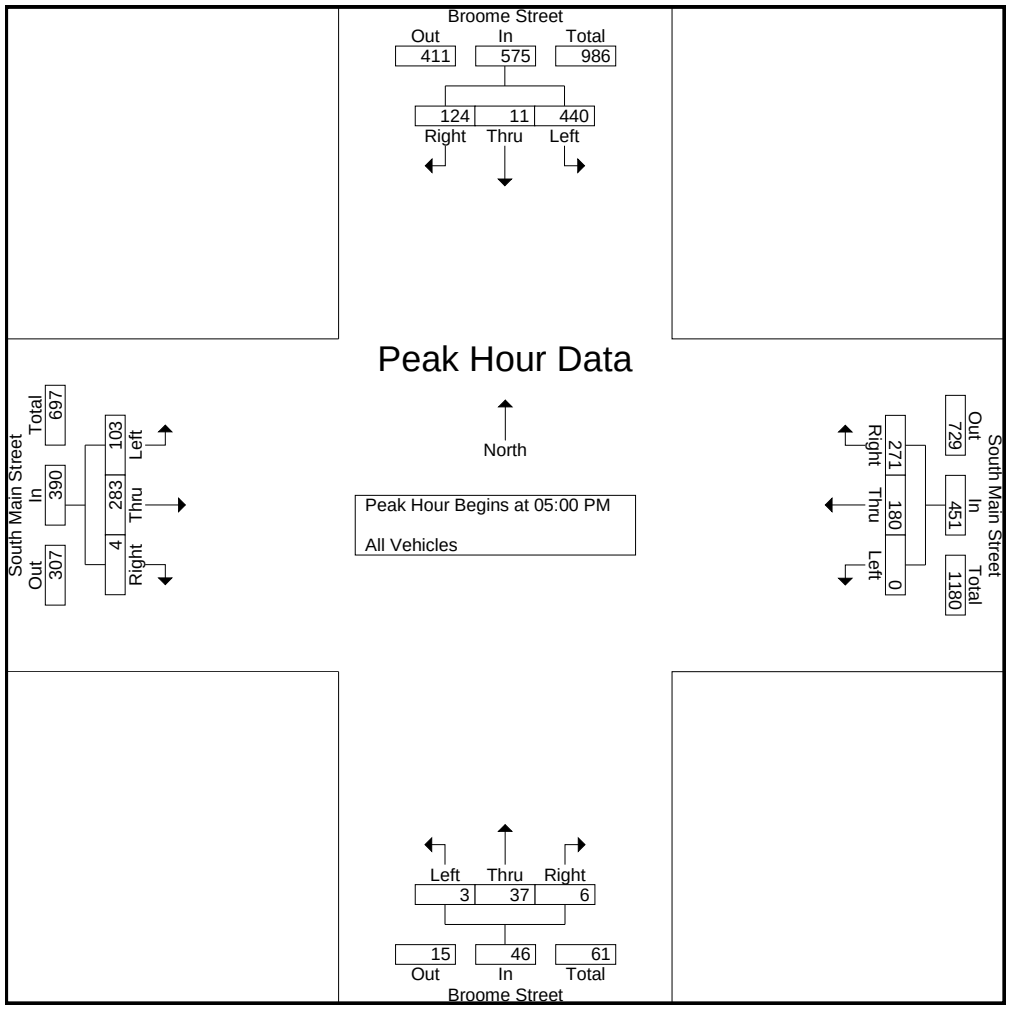
	Broome Street Southbound				South Main Street Westbound				Broome Street Northbound				South Main Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	89	1	30	120	0	46	**72**	**118**	**2**	**15**	**3**	**20**	24	49	**2**	75	333
05:15 PM	**130**	3	27	**160**	0	38	64	102	0	5	1	6	26	**83**	0	**109**	377
05:30 PM	112	2	29	143	0	47	69	116	0	12	0	12	**28**	70	1	99	370
05:45 PM	109	**5**	**38**			**49**	66	115	1	5	2	8	25	81	1	107	**382**
Total Volume	440	11	124	575	0	180	271	451	3	37	6	46	103	283	4	390	1462
% App. Total	76.5	1.9	21.6		0	39.9	60.1		6.5	80.4	13		26.4	72.6	1		
PHF	.846	.550	.816	.898	.000	.918	.941	.956	.375	.617	.500	.575	.920	.852	.500	.894	.957



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Groups Printed- Pedestrians

	Broome Street Southbound				South Main Street Westbound				Broome Street Northbound				South Main Street Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:30 AM	0	0	0	0	0	2	0	0	0	1	0	0	0	1	0	0	4
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	3	0	0	0	1	0	0	0	4	0	0	8
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
08:30 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	0	4
08:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
Total	0	1	0	0	0	4	0	0	0	0	0	0	0	3	0	0	8
BREAK																	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
11:15 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
BREAK																	
11:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	4
Total	0	0	0	0	0	3	0	0	0	1	0	0	0	5	0	0	9
12:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0	4
12:30 PM	0	0	0	0	0	11	0	0	0	2	0	0	0	3	0	0	16
12:45 PM	0	4	0	0	0	6	0	0	0	2	0	0	0	8	0	0	20
Total	0	6	0	0	0	18	0	0	0	6	0	0	0	11	0	0	41
BREAK																	
04:30 PM	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	4
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
Total	0	0	0	0	0	2	0	0	0	3	0	0	0	1	0	0	6
BREAK																	
05:30 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
BREAK																	
Total	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
Grand Total	0	7	0	0	0	34	0	0	0	11	0	0	0	24	0	0	76
Apprch %	0	100	0	0	0	100	0	0	0	100	0	0	0	100	0	0	
Total %	0	9.2	0	0	0	44.7	0	0	0	14.5	0	0	0	31.6	0	0	

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Groups Printed- Bicycles

	Broome Street Southbound				South Main Street Westbound				Broome Street Northbound				South Main Street Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
11:45 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
BREAK																	
12:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
Total	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
BREAK																	
05:15 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	2	0	0	4
BREAK																	
Total	0	1	0	0	0	0	0	0	0	1	0	0	0	2	0	0	4
Grand Total	0	1	0	0	0	4	0	0	0	2	0	0	0	3	0	0	10
Apprch %	0	100	0	0	0	100	0	0	0	100	0	0	0	100	0	0	
Total %	0	10	0	0	0	40	0	0	0	20	0	0	0	30	0	0	

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Groups Printed- All Vehicles

	NC 16 (Broome Street) Southbound				Howie Mine Road Westbound				NC 16 (Broome Street) Northbound				McDonald Street Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	5	122	3	0	12	6	8	0	1	120	10	0	0	0	1	0	0	288	288
07:15 AM	10	87	2	1	9	1	18	0	1	130	11	1	2	0	1	0	2	272	274
07:30 AM	7	81	1	2	15	4	17	0	3	119	16	1	1	0	0	0	3	264	267
07:45 AM	5	69	1	1	9	2	18	0	4	93	5	1	1	1	0	0	2	208	210
Total	27	359	7	4	45	13	61	0	9	462	42	3	4	1	2	0	7	1032	1039
08:00 AM	6	47	0	1	11	3	0	0	1	94	7	2	1	1	0	0	3	171	174
08:15 AM	8	62	0	0	9	2	9	0	0	123	11	1	4	0	1	0	1	229	230
08:30 AM	8	53	2	1	8	1	15	0	1	85	10	0	2	1	2	0	1	188	189
08:45 AM	16	85	1	0	10	1	18	0	0	88	10	5	2	0	0	0	5	231	236
Total	38	247	3	2	38	7	42	0	2	390	38	8	9	2	3	0	10	819	829
BREAK																			
11:00 AM	4	82	2	2	8	1	7	0	1	77	5	1	0	3	0	0	3	190	193
11:15 AM	10	80	3	2	13	2	11	0	0	92	6	3	0	1	1	0	5	219	224
11:30 AM	18	83	3	2	4	1	13	0	1	76	4	2	3	2	0	0	4	208	212
11:45 AM	11	98	1	2	7	2	12	0	0	93	5	2	1	0	2	0	4	232	236
Total	43	343	9	8	32	6	43	0	2	338	20	8	4	6	3	0	16	849	865
12:00 PM	10	99	1	0	6	4	16	0	1	110	9	2	3	2	1	0	2	262	264
12:15 PM	9	106	6	3	5	4	19	0	1	110	4	3	2	2	1	0	6	269	275
12:30 PM	13	96	3	1	9	0	17	0	2	100	4	1	3	0	2	0	2	249	251
12:45 PM	19	115	2	3	7	2	12	0	1	74	5	0	4	0	2	0	3	243	246
Total	51	416	12	7	27	10	64	0	5	394	22	6	12	4	6	0	13	1023	1036
BREAK																			
04:00 PM	19	126	0	1	6	1	16	0	1	106	12	0	0	0	3	0	1	290	291
04:15 PM	20	129	5	2	10	4	9	0	1	96	16	0	0	5	0	0	2	295	297
04:30 PM	16	109	4	0	7	5	12	0	0	77	11	0	3	3	2	0	0	249	249
04:45 PM	10	144	1	1	11	7	12	0	1	113	12	0	3	3	2	0	1	319	320
Total	65	508	10	4	34	17	49	0	3	392	51	0	6	11	7	0	4	1153	1157
05:00 PM	16	151	2	0	9	7	12	0	1	76	14	0	1	0	4	0	0	293	293
05:15 PM	22	128	1	3	10	2	7	0	5	100	12	0	0	1	3	0	3	291	294
05:30 PM	16	141	0	0	13	5	5	0	1	83	14	0	0	2	2	0	0	282	282
05:45 PM	13	126	1	1	7	8	11	0	2	95	13	0	2	0	1	0	1	279	280
Total	67	546	4	4	39	22	35	0	9	354	53	0	3	3	10	0	4	1145	1149
Grand Total	291	2419	45	29	215	75	294	0	30	2330	226	25	38	27	31	0	54	6021	6075
Apprch %	10.6	87.8	1.6		36.8	12.8	50.3		1.2	90.1	8.7		39.6	28.1	32.3				
Total %	4.8	40.2	0.7		3.6	1.2	4.9		0.5	38.7	3.8		0.6	0.4	0.5		0.9	99.1	

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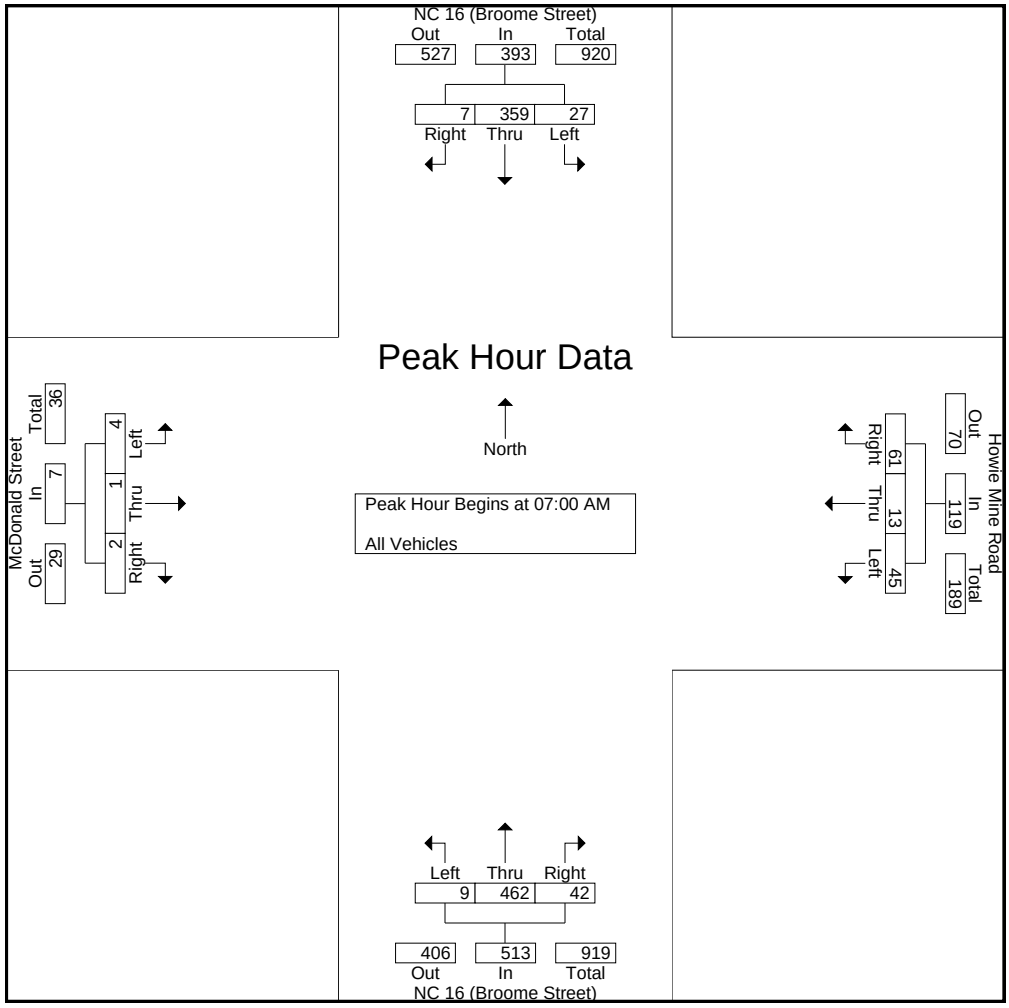
	NC 16 (Broome Street) Southbound				Howie Mine Road Westbound				NC 16 (Broome Street) Northbound				McDonald Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	5	**122**	**3**	**130**	12	**6**	8	26	1	120	10	131	0	0	**1**	1	**288**
07:15 AM	**10**	87	2	99	9	1	**18**	28	1	**130**		**142**	**2**	0	1	**3**	272
07:30 AM	7	81	1	89	**15**	4	17	**36**	3	119	**16**						
07:45 AM	**5**	**69**	**1**	**75**	**9**	**2**	**18**	**29**	**4**	93	5	102	1	**1**	0	2	208
Total Volume	27	359	7	393	45	13	61	119	9	462	42	513	4	1	2	7	1032
% App. Total	6.9	91.3	1.8		37.8	10.9	51.3		1.8	90.1	8.2		57.1	14.3	28.6		
PHF	.675	.736	.583	.756	.750	.542	.847	.826	.563	.888	.656	.903	.500	.250	.500	.583	.896



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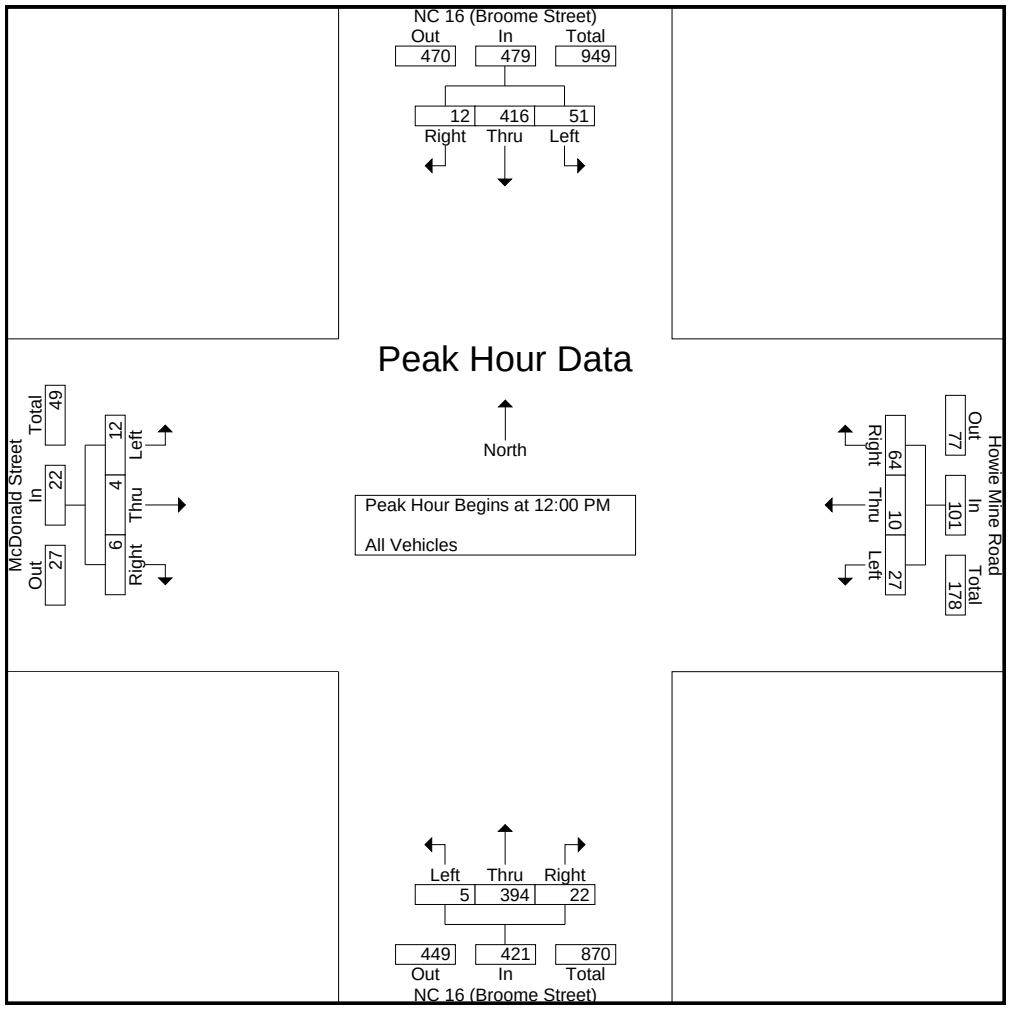
p: 919.829.0328 f: 919.829.0329

File Name : 05 - Broome&HowieMine
Site Code : 00000005
Start Date : 10/15/2008
Page No : 3

	NC 16 (Broome Street) Southbound				Howie Mine Road Westbound				NC 16 (Broome Street) Northbound				McDonald Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	10	99	1	110	6	**4**	16	26	1	**110**	**9**	**120**	3	**2**	1	**6**	262
12:15 PM	9	106	**6**				**19**	**28**	1	110	4	115	2	2	1	5	**269**
12:30 PM	13	96	3	112	**9**	0	17	26	**2**	100	4	106	3	0	**2**	5	249
12:45 PM	**19**	**115**		**136**	7	2	12	21	1	74	5	80	**4**	0	2	6	243
Total Volume	51	416	12	479	27	10	64	101	5	394	22	421	12	4	6	22	1023
% App. Total	10.6	86.8	2.5		26.7	9.9	63.4		1.2	93.6	5.2		54.5	18.2	27.3		
PHF	.671	.904	.500	.881	.750	.625	.842	.902	.625	.895	.611	.877	.750	.500	.750	.917	.951



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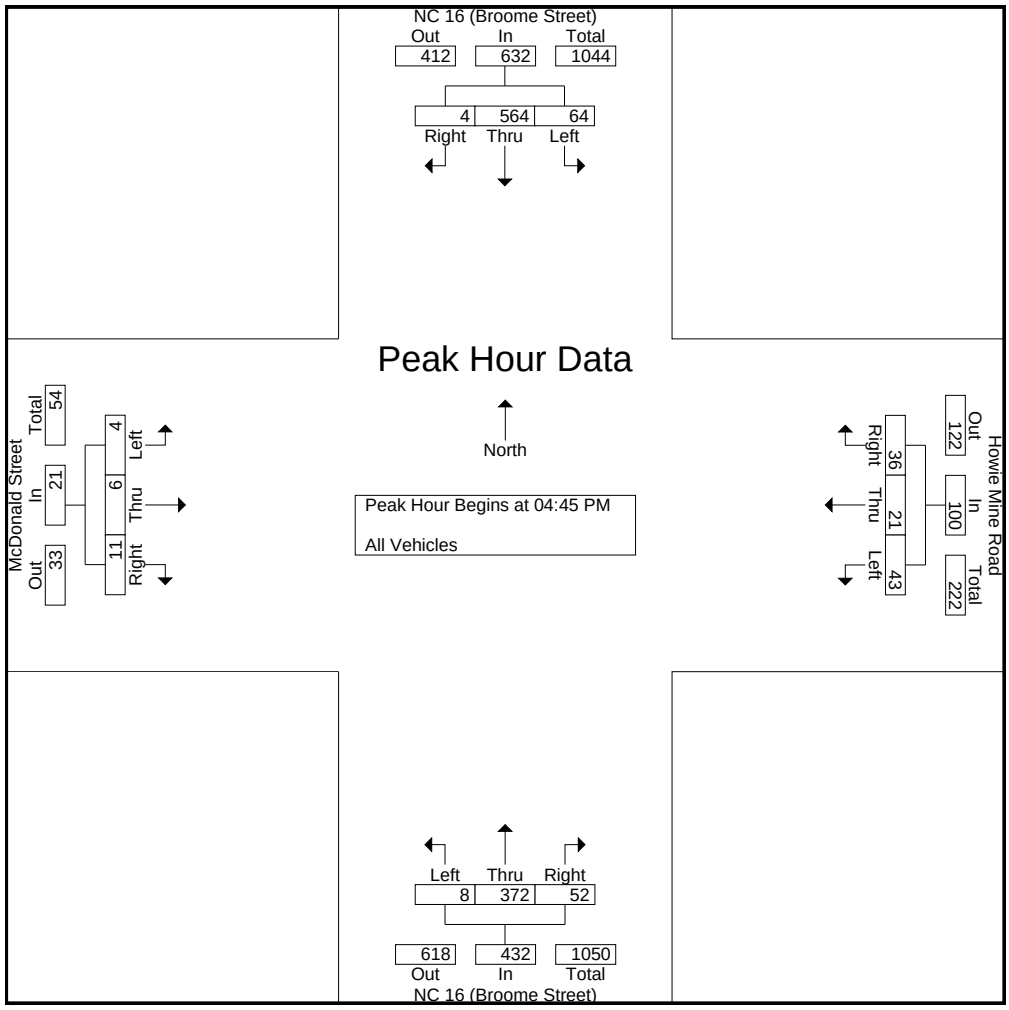
File Name : 05 - Broome&HowieMine
Site Code : 00000005
Start Date : 10/15/2008
Page No : 4

	NC 16 (Broome Street) Southbound				Howie Mine Road Westbound				NC 16 (Broome Street) Northbound				McDonald Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	10	144	1	155	11	**7**	**12**	**30**	1	**113**		**126**	**3**	**3**	2	**8**	**319**
05:00 PM	16	**151**	**2**	**169**	9	7	12	28	1	76	**14**				**4**	5	293
05:15 PM	**22**	128	1	151	10	2	7	19	**5**	100	12	117	0	1	3	4	291
05:30 PM	16	141	0	157	**13**	5	5	23	1	83	14	98	0	2	2	4	282
Total Volume	64	564	4	632	43	21	36	100	8	372	52	432	4	6	11	21	1185
% App. Total	10.1	89.2	0.6		43	21	36		1.9	86.1	12		19	28.6	52.4		
PHF	.727	.934	.500	.935	.827	.750	.750	.833	.400	.823	.929	.857	.333	.500	.688	.656	.929



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File Name : 05 - Broome&HowieMine
Site Code : 00000005
Start Date : 10/15/2008
Page No : 1

Groups Printed- Pedestrians

	NC 16 (Broome Street) Southbound				Howie Mine Road Westbound				NC 16 (Broome Street) Northbound				McDonald Street Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
07:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
07:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	3	0	0	0	1	0	0	0	0	0	0	0	5	0	0	9
BREAK																	
08:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3
Total	0	0	0	0	0	0	0	0	0	4	0	0	0	2	0	0	6
BREAK																	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
11:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
11:45 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Total	0	2	0	0	0	2	0	0	0	0	0	0	0	4	0	0	8
12:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	0	4
12:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
Total	0	2	0	0	0	4	0	0	0	0	0	0	0	4	0	0	10
BREAK																	
04:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3
04:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	2	0	0	7
BREAK																	
Total	0	2	0	0	0	6	0	0	0	1	0	0	0	3	0	0	12
BREAK																	
05:15 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	1	0	0	0	3	0	0	0	1	0	0	5
Total	0	1	0	0	0	1	0	0	0	6	0	0	0	1	0	0	9
Grand Total	0	10	0	0	0	14	0	0	0	11	0	0	0	19	0	0	54
Apprch %	0	100	0	0	0	100	0	0	0	100	0	0	0	100	0	0	
Total %	0	18.5	0	0	0	25.9	0	0	0	20.4	0	0	0	35.2	0	0	

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File Name : 05 - Broome&HowieMine
Site Code : 00000005
Start Date : 10/15/2008

Groups Printed- Bicycles

	NC 16 (Broome Street) Southbound				Howie Mine Road Westbound				NC 16 (Broome Street) Northbound				McDonald Street Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
07:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
BREAK																	
11:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
12:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
BREAK																	
Total	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
BREAK																	
04:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
BREAK																	
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
05:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	3
Grand Total	0	1	0	0	0	4	0	0	0	2	0	0	0	2	0	0	9
Apprch %	0	100	0	0	0	100	0	0	0	100	0	0	0	100	0	0	
Total %	0	11.1	0	0	0	44.4	0	0	0	22.2	0	0	0	22.2	0	0	

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File Name : 06 - Crane&NewTown
Site Code : 20080666
Start Date : 10/14/2008
Page No : 1

Groups Printed- All Vehicles

	New Town Road Southbound				Crane Road Westbound				New Town Road Northbound				Crane Road Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	28	4	1	12	79	1	0	21	25	6	0	8	18	21	1	2	223	225
07:15 AM	0	55	23	0	23	64	3	0	30	40	12	0	5	15	23	0	0	293	293
07:30 AM	1	82	6	0	13	56	3	0	34	31	16	0	10	15	35	2	2	302	304
07:45 AM	1	94	11	0	19	57	2	1	44	70	8	1	6	21	38	1	3	371	374
Total	2	259	44	1	67	256	9	1	129	166	42	1	29	69	117	4	7	1189	1196
08:00 AM	0	38	12	0	8	58	2	0	28	35	10	0	3	15	19	1	1	228	229
08:15 AM	0	28	7	1	11	44	4	0	24	41	11	0	5	15	17	0	1	207	208
08:30 AM	1	13	5	0	4	40	3	2	30	50	11	0	7	15	14	5	7	193	200
08:45 AM	2	6	6	0	7	37	2	2	14	31	8	2	8	15	6	0	4	142	146
Total	3	85	30	1	30	179	11	4	96	157	40	2	23	60	56	6	13	770	783
BREAK																			
11:00 AM	1	11	5	0	2	9	1	0	5	17	3	0	6	14	2	1	1	76	77
11:15 AM	2	4	6	1	0	15	6	1	7	10	2	0	6	13	8	1	3	79	82
11:30 AM	0	9	2	0	2	12	1	0	5	11	2	0	4	14	4	2	2	66	68
11:45 AM	0	10	3	0	2	28	4	2	6	7	5	5	4	20	3	0	7	92	99
Total	3	34	16	1	6	64	12	3	23	45	12	5	20	61	17	4	13	313	326
12:00 PM	2	7	3	0	4	15	4	1	6	9	2	0	1	22	6	0	1	81	82
12:15 PM	1	13	11	1	4	18	4	1	4	13	3	0	6	26	7	0	2	110	112
12:30 PM	5	10	2	0	2	11	9	0	8	18	5	0	9	24	8	1	1	111	112
12:45 PM	4	15	3	0	3	13	5	0	1	25	3	0	5	23	7	2	2	107	109
Total	12	45	19	1	13	57	22	2	19	65	13	0	21	95	28	3	6	409	415
BREAK																			
04:00 PM	6	29	4	1	5	25	0	0	32	61	11	0	10	32	11	0	1	226	227
04:15 PM	5	37	6	1	6	25	2	0	10	29	8	0	15	43	9	0	1	195	196
04:30 PM	8	37	6	1	3	18	5	0	14	27	4	0	12	36	14	3	4	184	188
04:45 PM	1	34	7	0	12	18	4	1	16	40	14	0	9	53	19	0	1	227	228
Total	20	137	23	3	26	86	11	1	72	157	37	0	46	164	53	3	7	832	839
05:00 PM	9	43	3	2	8	21	6	0	14	48	14	0	7	38	20	0	2	231	233
05:15 PM	6	52	10	0	3	19	5	0	12	49	8	0	10	52	7	1	1	233	234
05:30 PM	0	29	10	0	8	7	3	0	12	32	5	0	11	76	15	0	0	208	208
05:45 PM	3	41	12	0	8	23	1	0	17	24	4	0	7	53	18	0	0	211	211
Total	18	165	35	2	27	70	15	0	55	153	31	0	35	219	60	1	3	883	886
Grand Total	58	725	167	9	169	712	80	11	394	743	175	8	174	668	331	21	49	4396	4445
Apprch %	6.1	76.3	17.6		17.6	74.1	8.3		30	56.6	13.3		14.8	56.9	28.2				
Total %	1.3	16.5	3.8		3.8	16.2	1.8		9	16.9	4		4	15.2	7.5		1.1	98.9	

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File Name : 06 - Crane&NewTown
Site Code : 20080666
Start Date : 10/14/2008
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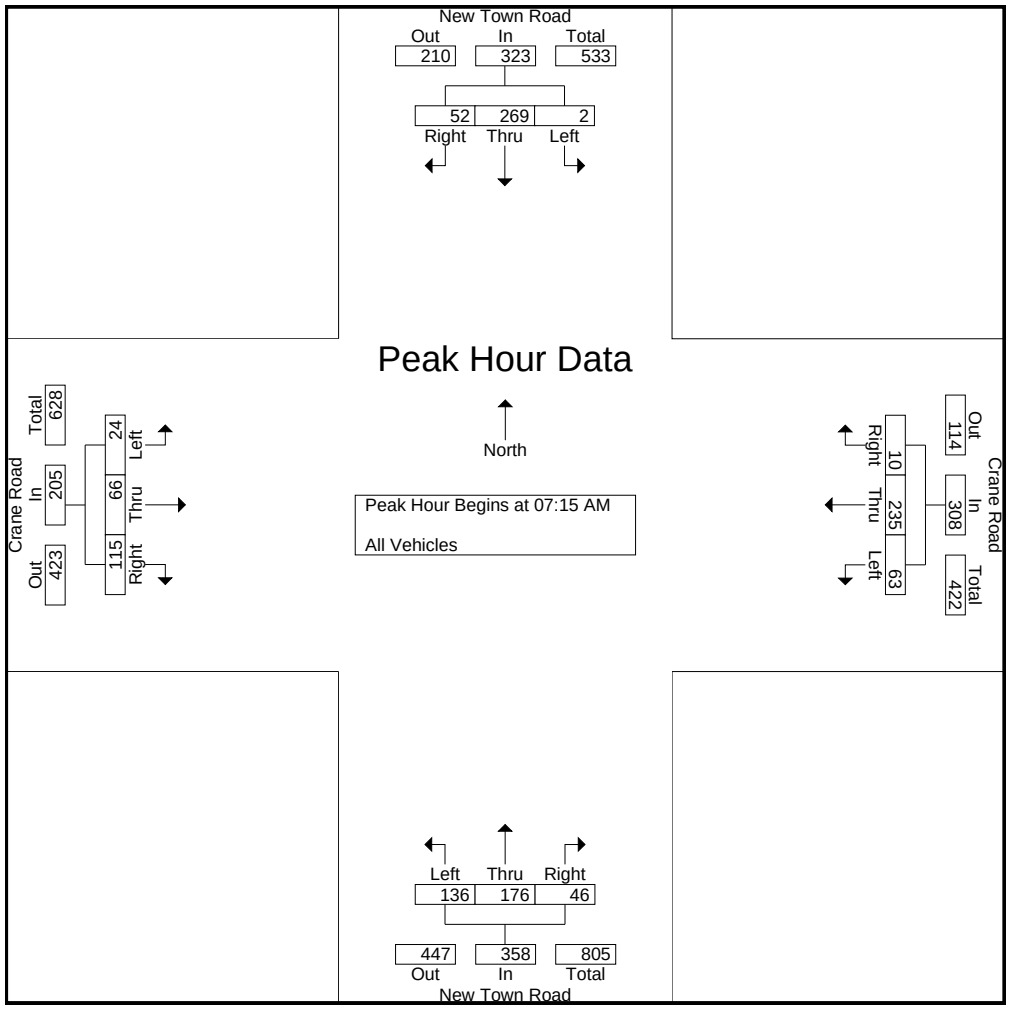
	New Town Road Southbound				Crane Road Westbound				New Town Road Northbound				Crane Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	55	**23**		**23**	**64**	**3**	**90**	30	40	12	82	5	15	23	43	293
07:30 AM	**1**	82	6	89	13	56	3	72	34	31	**16**		**10**	15	35	60	302
07:45 AM	1	**94**		**106**	19	57	2	78	**44**	**70**		**122**	6	**21**	**38**	**65**	**371**
08:00 AM	0	38	12	50	8	58	2	68	28	35	10	73	3	15	19	37	228
Total Volume	2	269	52	323	63	235	10	308	136	176	46	358	24	66	115	205	1194
% App. Total	0.6	83.3	16.1		20.5	76.3	3.2		38	49.2	12.8		11.7	32.2	56.1		
PHF	.500	.715	.565	.762	.685	.918	.833	.856	.773	.629	.719	.734	.600	.786	.757	.788	.805



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File Name : 06 - Crane&NewTown
Site Code : 20080666
Start Date : 10/14/2008
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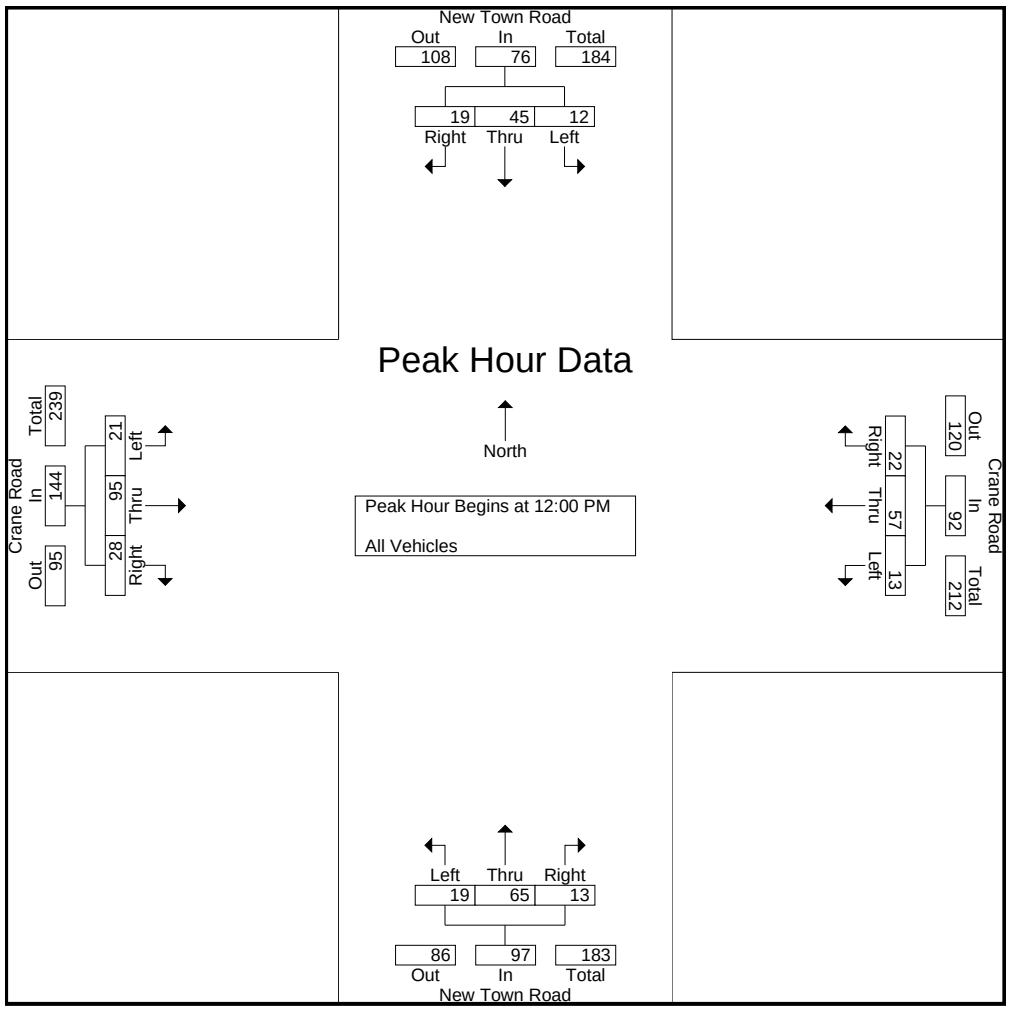
	New Town Road Southbound				Crane Road Westbound				New Town Road Northbound				Crane Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	2	7	3	12	**4**	15	4	23	6	9	2	17	1	22	6	29	81
12:15 PM	1	13	**11**	**25**	4	**18**	4	**26**	4	13	3	20	6	**26**	7	39	110
12:30 PM	**5**	10	2	17	2	11	**9**	22	**8**	18	**5**	**31**	**9**	24	**8**	**41**	**111**
12:45 PM	4	**15**								**25**							
Total Volume	**12**	**45**	**19**	**76**	**13**	**57**	**22**	**92**	**19**	**65**	**13**	**97**	**21**	**95**	**28**	**144**	**409**
% App. Total	**15.8**	**59.2**	**25**		**14.1**	**62**	**23.9**		**19.6**	**67**	**13.4**		**14.6**	**66**	**19.4**		
PHF	**.600**	**.750**	**.432**	**.760**	**.813**	**.792**	**.611**	**.885**	**.594**	**.650**	**.650**	**.782**	**.583**	**.913**	**.875**	**.878**	**.921**



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File Name : 06 - Crane&NewTown
Site Code : 20080666
Start Date : 10/14/2008
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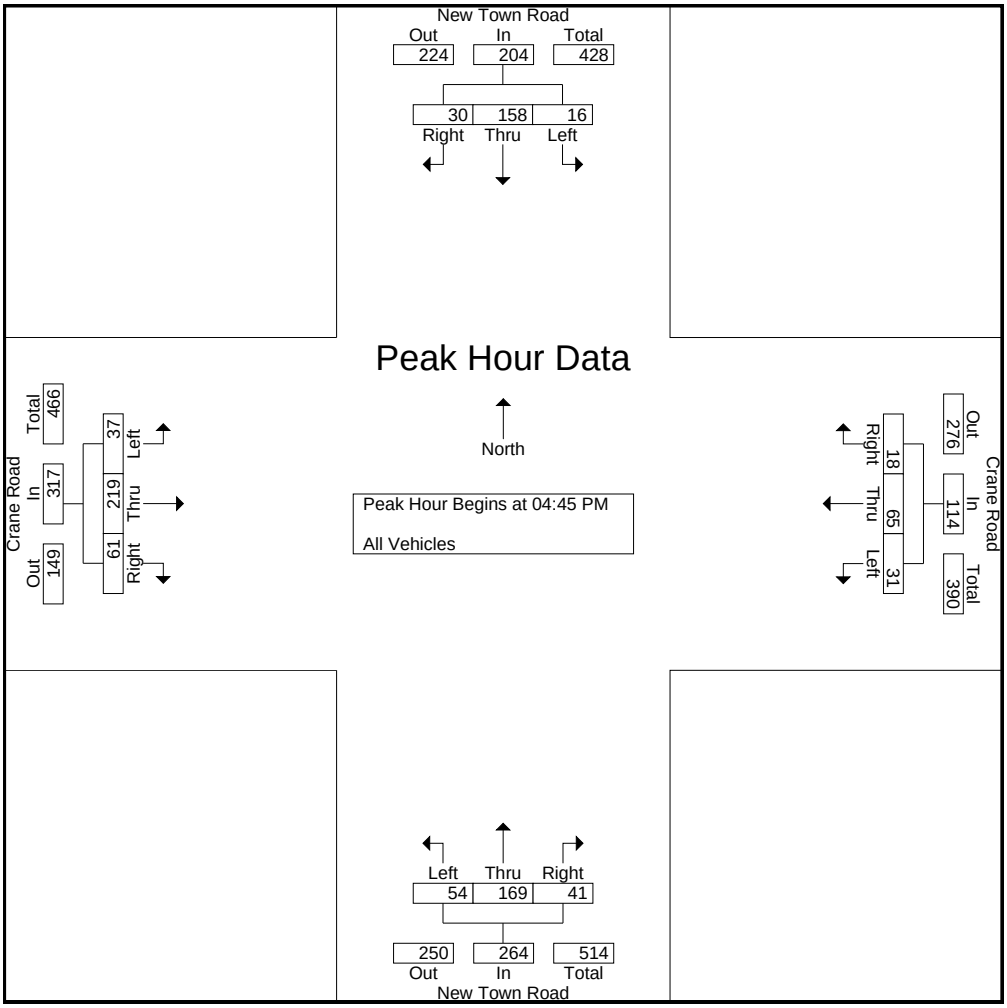
	New Town Road Southbound				Crane Road Westbound				New Town Road Northbound				Crane Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	1	34	7	42	**12**	18	4	34	**16**	40	**14**						
05:00 PM	**9**	43	3	55	8	**21**	**6**	**35**	14	48	14	**76**	7	38	**20**	65	231
05:15 PM	6	**52**	**10**	**68**	3	19	5	27	12	**49**							**233**
05:30 PM	0	29	10	39	8	7	3	18	12	32	5	49	**11**	**76**	15	**102**	208
Total Volume	16	158	30	204	31	65	18	114	54	169	41	264	37	219	61	317	899
% App. Total	7.8	77.5	14.7		27.2	57	15.8		20.5	64	15.5		11.7	69.1	19.2		
PHF	.444	.760	.750	.750	.646	.774	.750	.814	.844	.862	.732	.868	.841	.720	.763	.777	.965



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File Name : 07 - Weddington&Deal
Site Code : 00000007
Start Date : 10/16/2008
Page No : 1

Groups Printed- All Vehicles

	Deal Road Southbound				NC 84 (Monroe Weddington Road) Westbound				Deal Road Northbound				NC 84 (Monroe Weddington Road) Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	6	0	8	0	0	189	8	1	0	0	0	0	9	54	0	0	1	274	275
07:15 AM	10	0	21	0	0	183	20	3	6	1	1	0	9	93	1	1	4	345	349
07:30 AM	8	0	34	0	0	178	15	1	0	1	1	0	9	132	3	1	2	381	383
07:45 AM	8	0	21	0	1	166	27	2	1	0	0	0	17	136	1	3	5	378	383
Total	32	0	84	0	1	716	70	7	7	2	2	0	44	415	5	5	12	1378	1390
08:00 AM	17	0	10	0	0	101	38	1	1	2	1	0	18	115	1	1	2	304	306
08:15 AM	25	1	4	0	0	100	34	1	1	3	0	0	6	74	1	3	4	249	253
08:30 AM	58	2	17	0	0	102	49	1	2	2	0	0	12	76	0	1	2	320	322
08:45 AM	8	0	1	0	0	99	9	1	2	0	0	0	3	82	1	6	7	205	212
Total	108	3	32	0	0	402	130	4	6	7	1	0	39	347	3	11	15	1078	1093
BREAK																			
11:00 AM	3	1	2	0	0	83	3	3	0	0	1	0	0	77	3	0	3	173	176
11:15 AM	4	0	1	0	1	67	9	5	1	0	1	0	2	70	1	4	9	157	166
11:30 AM	1	0	2	0	1	76	6	1	0	0	0	0	0	75	1	1	2	162	164
11:45 AM	1	0	1	0	0	78	2	4	1	0	0	1	6	60	0	1	6	149	155
Total	9	1	6	0	2	304	20	13	2	0	2	1	8	282	5	6	20	641	661
12:00 PM	7	0	0	0	1	64	4	3	2	0	0	0	3	86	0	3	6	167	173
12:15 PM	3	0	2	0	0	86	4	2	0	1	2	1	2	87	3	2	5	190	195
12:30 PM	6	0	2	0	0	74	1	4	0	0	0	0	0	81	0	6	10	164	174
12:45 PM	4	0	5	0	1	73	5	0	0	0	0	0	3	73	1	3	3	165	168
Total	20	0	9	0	2	297	14	9	2	1	2	1	8	327	4	14	24	686	710
BREAK																			
04:00 PM	50	1	15	0	4	86	19	4	0	0	1	0	7	153	3	3	7	339	346
04:15 PM	20	1	7	0	2	115	8	2	0	0	2	1	7	143	0	0	3	305	308
04:30 PM	12	0	6	0	3	109	11	1	1	0	4	2	4	155	5	3	6	310	316
04:45 PM	18	0	14	0	1	112	9	2	0	0	3	0	8	198	3	0	2	366	368
Total	100	2	42	0	10	422	47	9	1	0	10	3	26	649	11	6	18	1320	1338
05:00 PM	20	0	8	0	3	108	14	0	2	2	3	2	5	196	4	0	2	365	367
05:15 PM	14	2	2	0	3	155	16	1	1	2	1	0	7	189	1	1	2	393	395
05:30 PM	16	2	3	0	0	150	25	0	1	0	4	0	7	200	1	0	0	409	409
05:45 PM	15	1	4	0	7	132	45	1	0	0	3	0	6	194	0	2	3	407	410
Total	65	5	17	0	13	545	100	2	4	4	11	2	25	779	6	3	7	1574	1581
Grand Total	334	11	190	0	28	2686	381	44	22	14	28	7	150	2799	34	45	96	6677	6773
Apprch %	62.4	2.1	35.5		0.9	86.8	12.3		34.4	21.9	43.8		5	93.8	1.1				
Total %	5	0.2	2.8		0.4	40.2	5.7		0.3	0.2	0.4		2.2	41.9	0.5		1.4	98.6	

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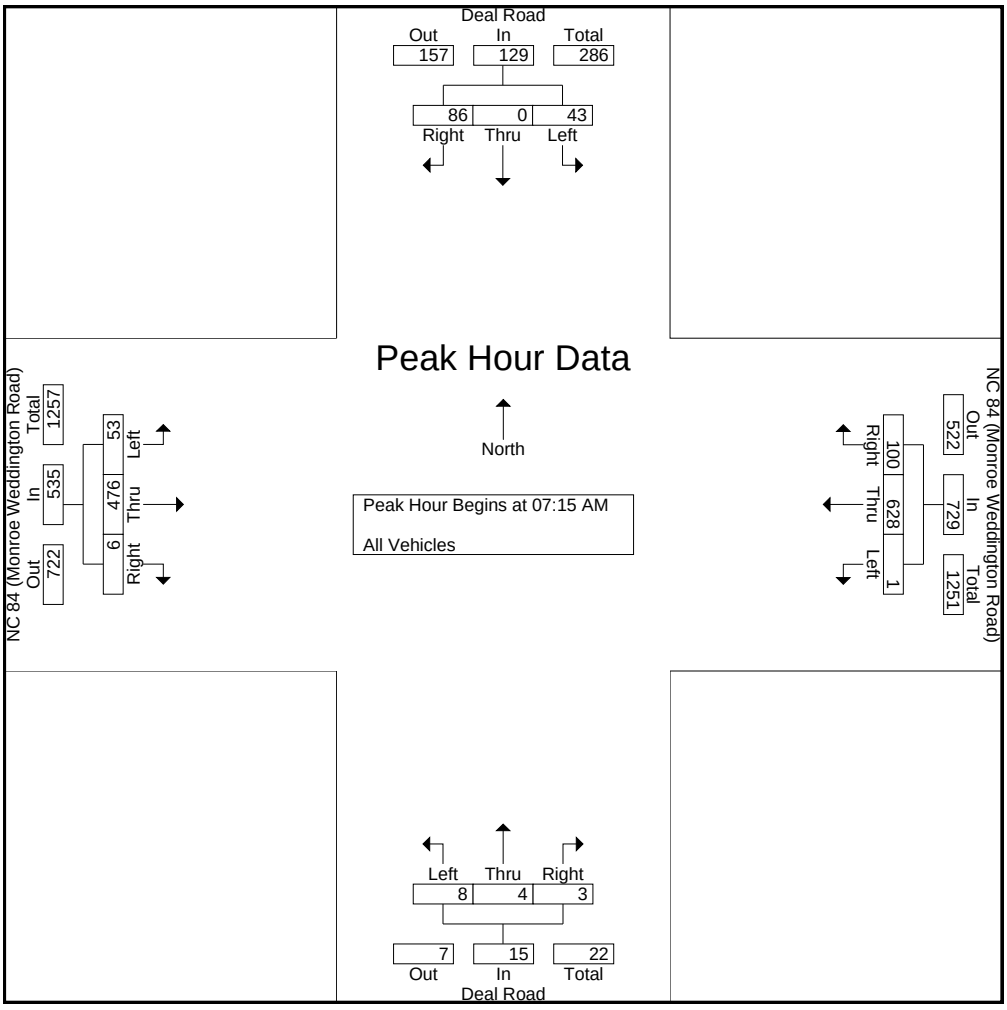
File Name : 07 - Weddington&Deal
Site Code : 00000007
Start Date : 10/16/2008
Page No : 2

	Deal Road Southbound				NC 84 (Monroe Weddington Road) Westbound				Deal Road Northbound				NC 84 (Monroe Weddington Road) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	10	0	21	31	0	**183**	20	**203**	**6**	1	**1**	**8**	9	93	1	103	345
07:30 AM	8	0	**34**	**42**	0	178	15	193	0	1	1	2	9	132	**3**	144	**381**
07:45 AM	8	0	21	29	**1**	166	27	194	1	0	0	1	17	**136**	1	**154**	378
08:00 AM	**17**	0	10	27	0	101	**38**	139	1	**2**			**18**	115	1	134	304
Total Volume	43	0	86	129	1	628	100	729	8	4	3	15	53	476	6	535	1408
% App. Total	33.3	0	66.7		0.1	86.1	13.7		53.3	26.7	20		9.9	89	1.1		
PHF	.632	.000	.632	.768	.250	.858	.658	.898	.333	.500	.750	.469	.736	.875	.500	.869	.924



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File Name : 07 - Weddington&Deal
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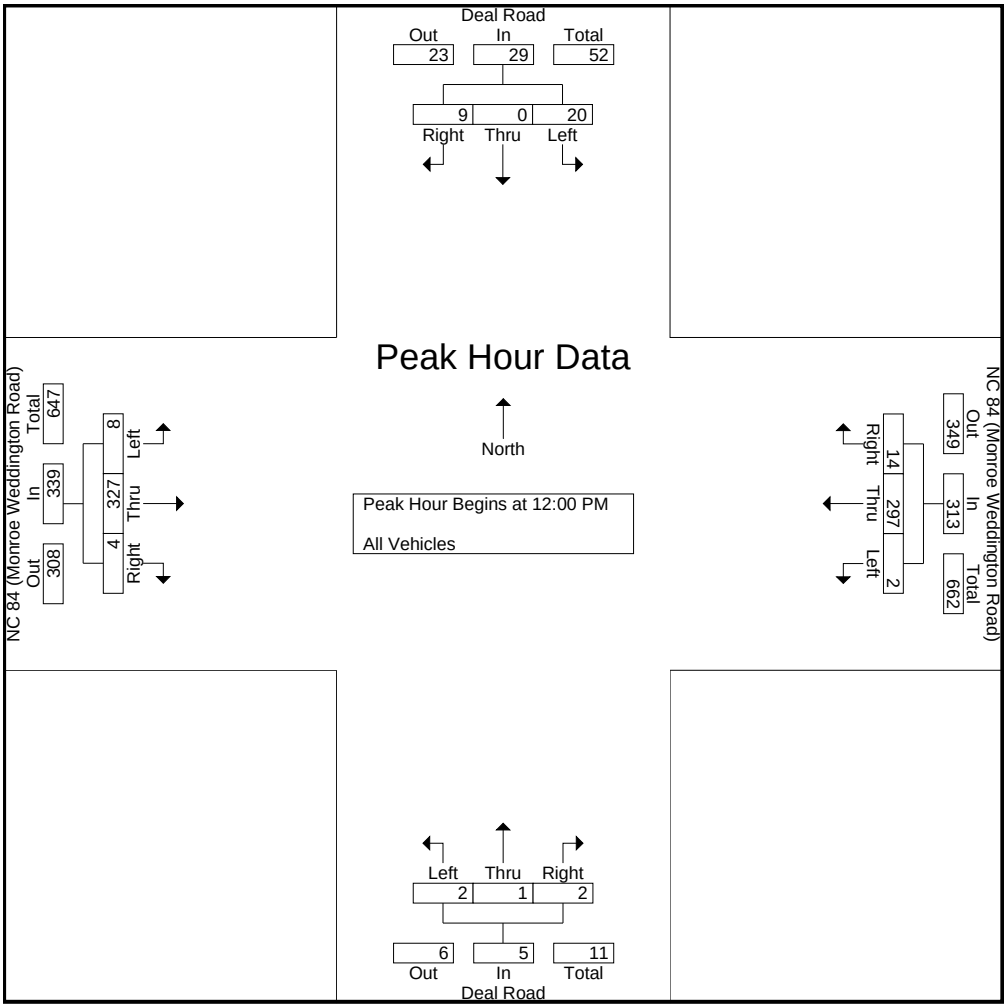
	Deal Road Southbound				NC 84 (Monroe Weddington Road) Westbound				Deal Road Northbound				NC 84 (Monroe Weddington Road) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	**7**	0	0	7	**1**	64	4	69	**2**	0	0	2	**3**	86	0	89	167
12:15 PM	3	0	2	5	0	**86**	4	**90**	0	**1**	**2**	**3**	2	**87**	**3**	**92**	**190**
12:30 PM	6	0	2	8	0	74	1	75	0	0	0	0	0	81	0	81	164
12:45 PM	4	0	**5**	**9**	1	73	**5**	79	0	0	0	0	3	73	1	77	165
Total Volume	20	0	9	29	2	297	14	313	2	1	2	5	8	327	4	339	686
% App. Total	69	0	31		0.6	94.9	4.5		40	20	40		2.4	96.5	1.2		
PHF	.714	.000	.450	.806	.500	.863	.700	.869	.250	.250	.250	.417	.667	.940	.333	.921	.903



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File Name : 07 - Weddington&Deal
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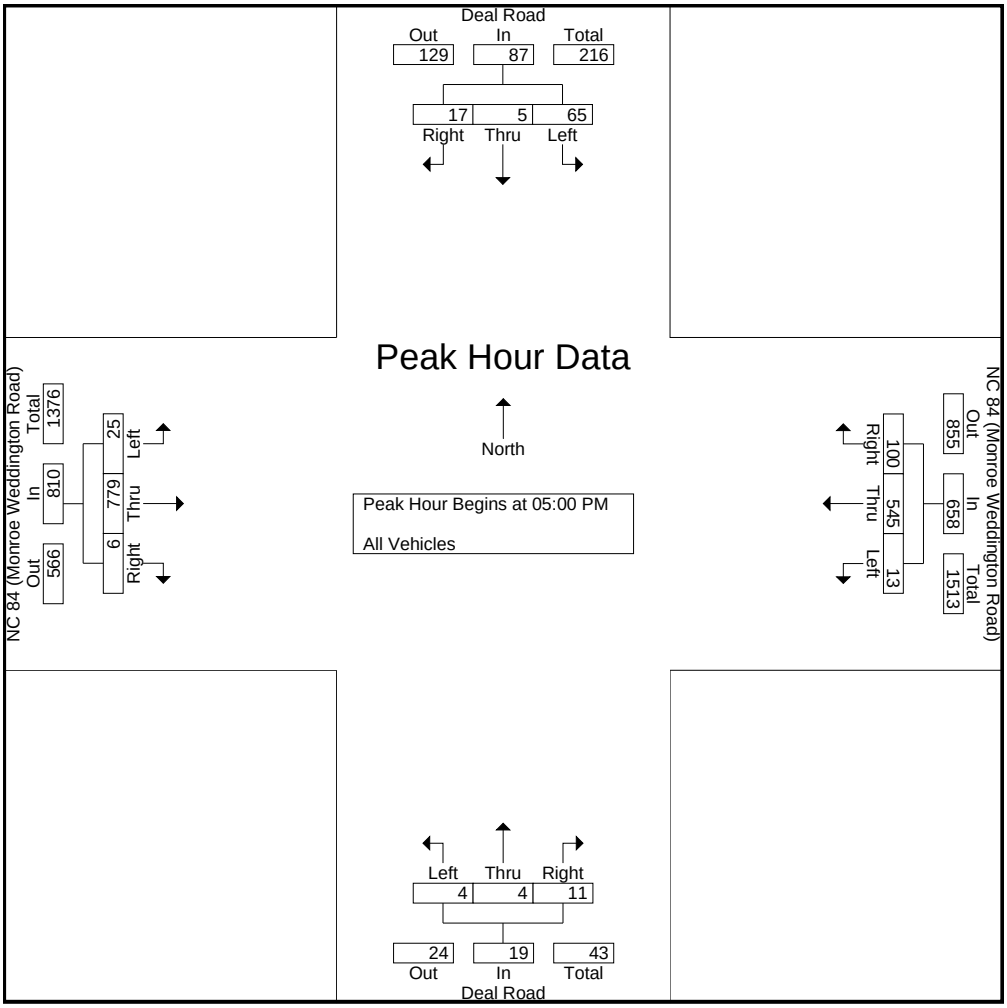
	Deal Road Southbound				NC 84 (Monroe Weddington Road) Westbound				Deal Road Northbound				NC 84 (Monroe Weddington Road) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**20**	0	**8**	**28**	3	108	14	125	**2**	**2**		**7**	5	196	**4**	205	365
05:15 PM	14	**2**				**155**	16	174	1	2	1	4	**7**	189	1	197	393
05:30 PM	16	2	3	21	0	150	25	175	1	0	**4**			**200**	1	**208**	**409**
05:45 PM	15	1	4	20	**7**	132	**45**	**184**	0	0	3	3	6	194	0	200	407
Total Volume	65	5	17	87	13	545	100	658	4	4	11	19	25	779	6	810	1574
% App. Total	74.7	5.7	19.5		2	82.8	15.2		21.1	21.1	57.9		3.1	96.2	0.7		
PHF	.813	.625	.531	.777	.464	.879	.556	.894	.500	.500	.688	.679	.893	.974	.375	.974	.962



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File Name : 08 - Marvin&NewTown
Site Code : 20080668
Start Date : 10/14/2008
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Groups Printed- All Vehicles

	Marvin Road Southbound			New Town Road Westbound			Private Driveway Northbound			New Town Road Eastbound			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	18	0	4	1	81	111	0	0	0	2	25	0	242
07:15 AM	25	0	1	1	83	137	0	0	0	1	27	0	275
07:30 AM	35	0	2	0	80	101	0	0	1	5	21	0	245
07:45 AM	23	0	6	0	75	104	0	0	0	2	38	0	248
Total	101	0	13	2	319	453	0	0	1	10	111	0	1010
08:00 AM	12	2	2	0	66	100	0	0	0	5	17	0	204
08:15 AM	16	0	12	0	52	88	0	0	0	3	23	1	195
08:30 AM	19	0	4	0	55	90	0	0	0	6	21	0	195
08:45 AM	31	0	6	0	43	70	0	0	0	5	19	0	174
Total	78	2	24	0	216	348	0	0	0	19	80	1	768
BREAK													
11:00 AM	16	0	3	0	22	27	1	0	0	4	19	0	92
11:15 AM	14	0	3	0	37	23	0	0	0	7	21	0	105
11:30 AM	20	0	4	0	27	30	0	0	0	5	24	0	110
11:45 AM	29	0	4	0	32	21	0	0	0	7	21	0	114
Total	79	0	14	0	118	101	1	0	0	23	85	0	421
12:00 PM	38	0	1	0	45	22	0	0	0	5	28	0	139
12:15 PM	30	0	7	0	29	31	0	0	0	9	30	0	136
12:30 PM	28	0	7	0	18	23	0	0	0	3	19	0	98
12:45 PM	22	0	4	0	16	27	0	0	0	8	28	1	106
Total	118	0	19	0	108	103	0	0	0	25	105	1	479
BREAK													
04:00 PM	56	0	4	0	30	37	0	0	0	6	48	0	181
04:15 PM	57	0	4	0	47	27	0	0	0	5	60	0	200
04:30 PM	68	0	6	0	34	38	0	0	0	3	62	0	211
04:45 PM	71	0	5	0	27	42	0	0	0	4	55	0	204
Total	252	0	19	0	138	144	0	0	0	18	225	0	796
05:00 PM	90	0	4	0	32	35	0	0	0	3	51	0	215
05:15 PM	103	0	6	0	27	25	0	0	0	10	72	0	243
05:30 PM	88	0	2	0	21	40	0	0	0	4	95	0	250
05:45 PM	92	1	4	0	30	30	0	0	0	8	86	0	251
Total	373	1	16	0	110	130	0	0	0	25	304	0	959
Grand Total	1001	3	105	2	1009	1279	1	0	1	120	910	2	4433
Apprch %	90.3	0.3	9.5	0.1	44.1	55.9	50	0	50	11.6	88.2	0.2	
Total %	22.6	0.1	2.4	0	22.8	28.9	0	0	0	2.7	20.5	0	

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File Name : 08 - Marvin&NewTown
Site Code : 20080668
Start Date : 10/14/2008
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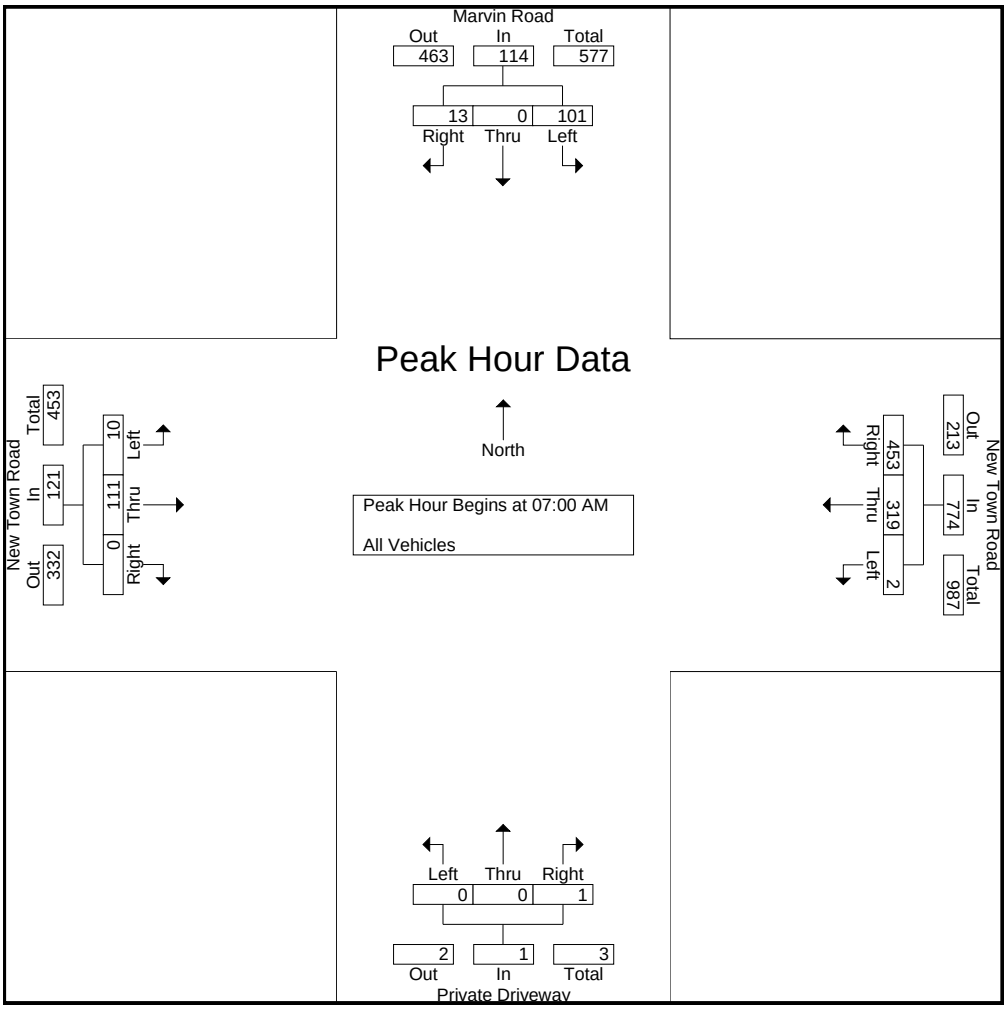
	Marvin Road Southbound				New Town Road Westbound				Private Driveway Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	18	0	4	22	**1**	81	111	193	0	0	0	0	2	25	0	27	242
07:15 AM	25	0	1	26	1	**83**	**137**	**221**	0	0	0	0	1	27	0	28	**275**
07:30 AM	**35**	0	2	**37**	0	80	101	181	0	0	**1**	**1**	**5**	21	0	26	245
07:45 AM	23	0	**6**											**38**	0	**40**	248
Total Volume	101	0	13	114	2	319	453	774	0	0	1	1	10	111	0	121	1010
% App. Total	88.6	0	11.4		0.3	41.2	58.5		0	0	100		8.3	91.7	0		
PHF	.721	.000	.542	.770	.500	.961	.827	.876	.000	.000	.250	.250	.500	.730	.000	.756	.918



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File Name : 08 - Marvin&NewTown
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Start Date : 10/14/2008
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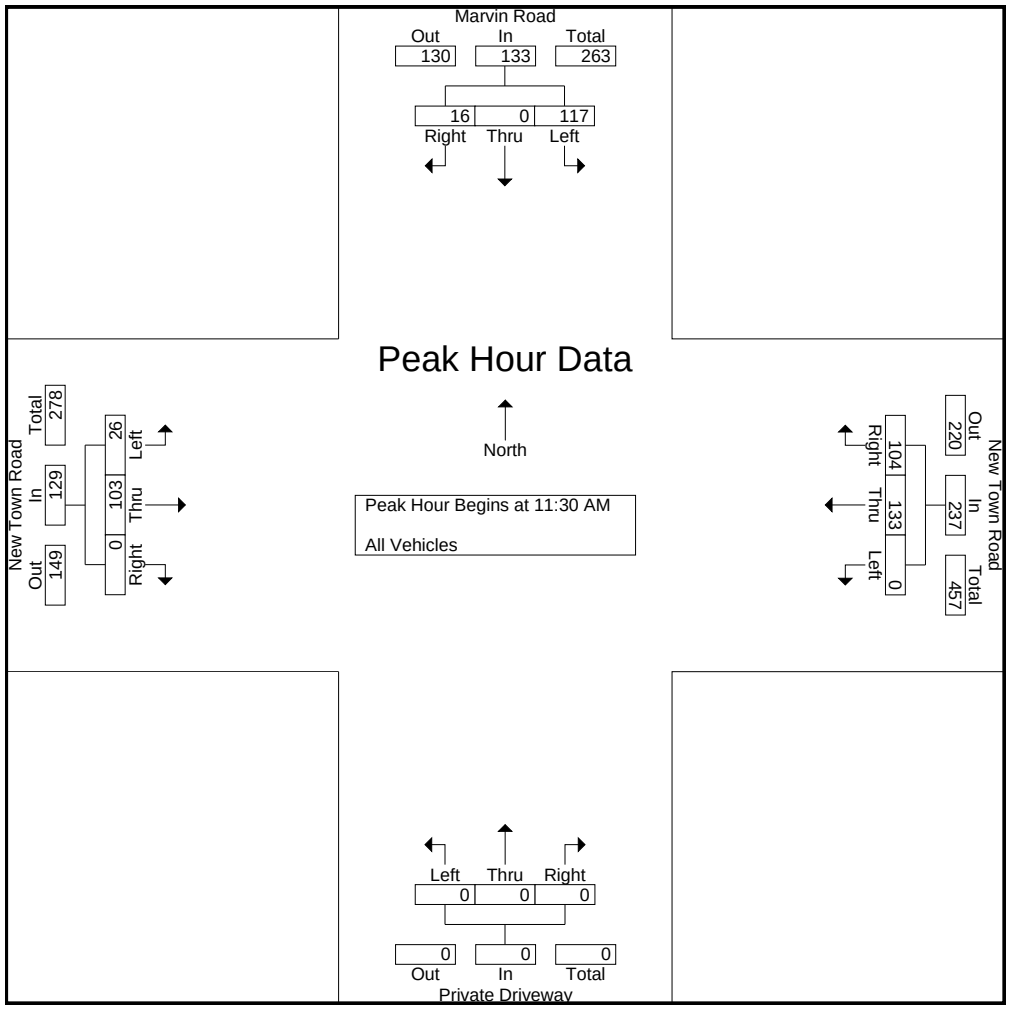
	Marvin Road Southbound				New Town Road Westbound				Private Driveway Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:30 AM																	
11:30 AM	20	0	4	24	0	27	30	57	0	0	0	0	5	24	0	29	110
11:45 AM	29	0	4	33	0	32	21	53	0	0	0	0	7	21	0	28	114
12:00 PM	**38**	0	1	**39**	0	**45**	22	**67**	0	0	0	0	5	28	0	33	**139**
12:15 PM	30	0	**7**				**31**	60	0	0	0	0	**9**	**30**	0	**39**	136
Total Volume	117	0	16	133	0	133	104	237	0	0	0	0	26	103	0	129	499
% App. Total	88	0	12		0	56.1	43.9		0	0	0		20.2	79.8	0		
PHF	.770	.000	.571	.853	.000	.739	.839	.884	.000	.000	.000	.000	.722	.858	.000	.827	.897



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File Name : 08 - Marvin&NewTown
Site Code : 20080668
Start Date : 10/14/2008
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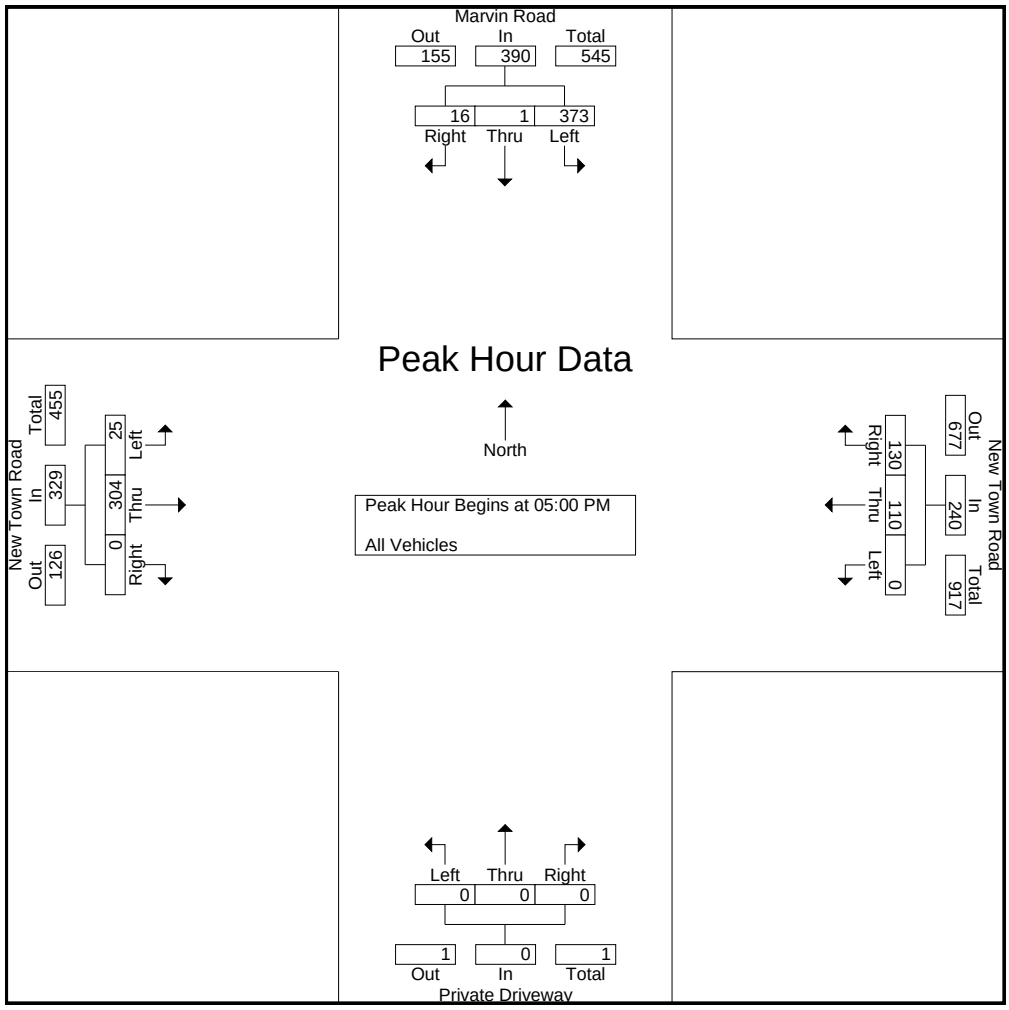
	Marvin Road Southbound				New Town Road Westbound				Private Driveway Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	90	0	4	94	0	**32**	35	**67**	0	0	0	0	3	51	0	54	215
05:15 PM	**103**	0	**6**	**109**	0	27	25	52	0	0	0	0	**10**	72	0	82	243
05:30 PM	88	0	2	90	0	21	**40**	61	0	0	0	0	4	**95**	0	**99**	250
05:45 PM	92	**1**															**251**
Total Volume	373	1	16	390	0	110	130	240	0	0	0	0	25	304	0	329	959
% App. Total	95.6	0.3	4.1		0	45.8	54.2		0	0	0		7.6	92.4	0		
PHF	.905	.250	.667	.894	.000	.859	.813	.896	.000	.000	.000	.000	.625	.800	.000	.831	.955



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File Name : 09 - NewTown&Meadowlark
Site Code : 20080669
Start Date : 10/15/2008
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Groups Printed- All Vehicles

	Private Driveway Southbound				New Town Road Westbound				Meadowlark Road Northbound				New Town Road Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	195	0	2	1	0	2	0	0	55	0	1	3	253	256
07:15 AM	0	0	0	0	0	229	0	1	2	0	0	0	0	41	1	2	3	273	276
07:30 AM	0	0	0	0	0	192	0	0	0	0	1	0	0	60	1	5	5	254	259
07:45 AM	0	0	0	0	2	165	0	1	0	0	3	0	0	51	0	1	2	221	223
Total	0	0	0	0	2	781	0	4	3	0	6	0	0	207	2	9	13	1001	1014
08:00 AM	0	0	0	0	0	177	0	0	0	0	1	0	0	53	0	3	3	231	234
08:15 AM	0	0	0	0	0	151	0	2	0	0	2	0	0	53	1	2	4	207	211
08:30 AM	0	0	0	0	1	136	0	1	2	0	1	0	0	38	0	2	3	178	181
08:45 AM	0	0	0	0	0	101	0	1	1	0	1	0	0	44	1	1	2	148	150
Total	0	0	0	0	1	565	0	4	3	0	5	0	0	188	2	8	12	764	776
BREAK																			
11:00 AM	0	0	0	0	1	50	1	6	0	0	0	0	1	49	0	2	8	102	110
11:15 AM	0	0	0	0	0	44	0	2	0	0	0	0	0	51	0	6	8	95	103
11:30 AM	0	0	0	0	0	53	0	2	0	0	1	0	0	38	1	2	4	93	97
11:45 AM	0	0	0	0	0	62	0	1	1	0	1	0	0	38	1	2	3	103	106
Total	0	0	0	0	1	209	1	11	1	0	2	0	1	176	2	12	23	393	416
12:00 PM	0	0	0	0	1	56	0	2	0	0	0	0	0	49	3	2	4	109	113
12:15 PM	0	0	0	0	1	63	0	5	0	0	1	0	0	56	2	1	6	123	129
12:30 PM	0	0	0	0	0	53	0	4	3	0	0	0	0	60	0	3	7	116	123
12:45 PM	0	0	0	0	0	52	6	5	1	0	1	0	0	44	1	2	7	105	112
Total	0	0	0	0	2	224	6	16	4	0	2	0	0	209	6	8	24	453	477
BREAK																			
04:00 PM	0	0	0	0	0	63	0	0	0	0	1	0	0	102	1	0	0	167	167
04:15 PM	0	0	0	0	3	68	0	1	1	0	0	0	0	107	0	1	2	179	181
04:30 PM	0	0	0	0	1	62	0	1	0	0	0	0	0	120	2	1	2	185	187
04:45 PM	0	0	0	0	1	59	0	0	1	0	0	0	0	146	1	0	0	208	208
Total	0	0	0	0	5	252	0	2	2	0	1	0	0	475	4	2	4	739	743
05:00 PM	0	0	0	0	0	84	0	0	0	0	0	0	0	146	0	0	0	230	230
05:15 PM	0	0	0	0	2	72	0	0	1	0	0	0	0	165	0	1	1	240	241
05:30 PM	0	0	0	0	2	66	0	1	0	0	0	0	0	175	2	0	1	245	246
05:45 PM	0	0	0	0	0	75	0	0	1	0	1	0	0	152	3	0	0	232	232
Total	0	0	0	0	4	297	0	1	2	0	1	0	0	638	5	1	2	947	949
Grand Total	0	0	0	0	15	2328	7	38	15	0	17	0	1	1893	21	40	78	4297	4375
Apprch %	0	0	0		0.6	99.1	0.3		46.9	0	53.1		0.1	98.9	1.1				
Total %	0	0	0		0.3	54.2	0.2		0.3	0	0.4		0	44.1	0.5		1.8	98.2	

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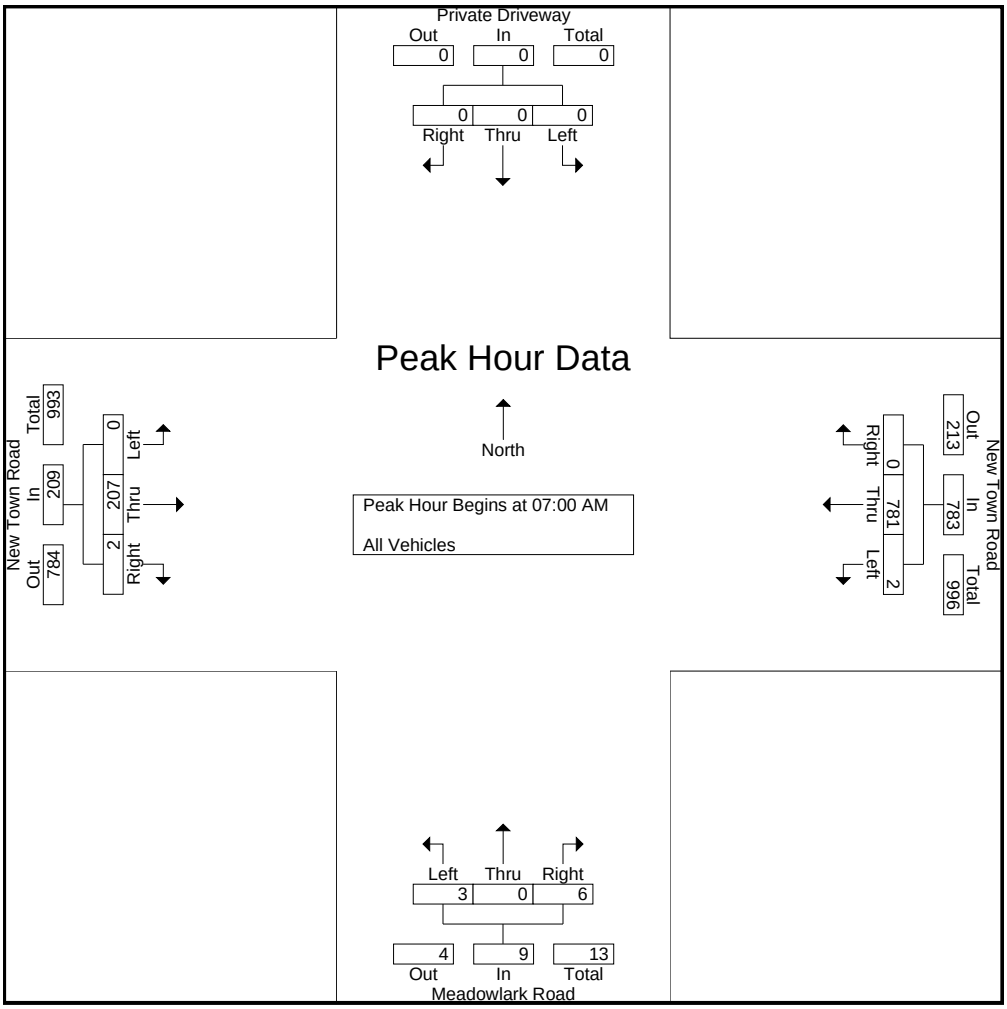
p: 919.829.0328 f: 919.829.0329

File Name : 09 - NewTown&Meadowlark
Site Code : 20080669
Start Date : 10/15/2008
Page No : 2

	Private Driveway Southbound				New Town Road Westbound				Meadowlark Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	195	0	195	1	0	2	**3**	0	55	0	55	253
07:15 AM	0	0	0	0	0	**229**	0	**229**	**2**	0	0	2	0	41	**1**	42	**273**
07:30 AM	0	0	0	0	0	192	0	192	0	0	1	1	0	**60**	1	**61**	254
07:45 AM	0	0	0	0	**2**	165	0	167	0	0	**3**						
Total Volume	**0**	**0**	**0**	**0**	**2**	**781**	**0**	**783**	**3**	**0**	**6**	**9**	**0**	**207**	**2**	**209**	**1001**
% App. Total	**0**	**0**	**0**		**0.3**	**99.7**	**0**		**33.3**	**0**	**66.7**		**0**	**99**	**1**		
PHF	**.000**	**.000**	**.000**	**.000**	**.250**	**.853**	**.000**	**.855**	**.375**	**.000**	**.500**	**.750**	**.000**	**.863**	**.500**	**.857**	**.917**



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File Name : 09 - NewTown&Meadowlark
Site Code : 20080669
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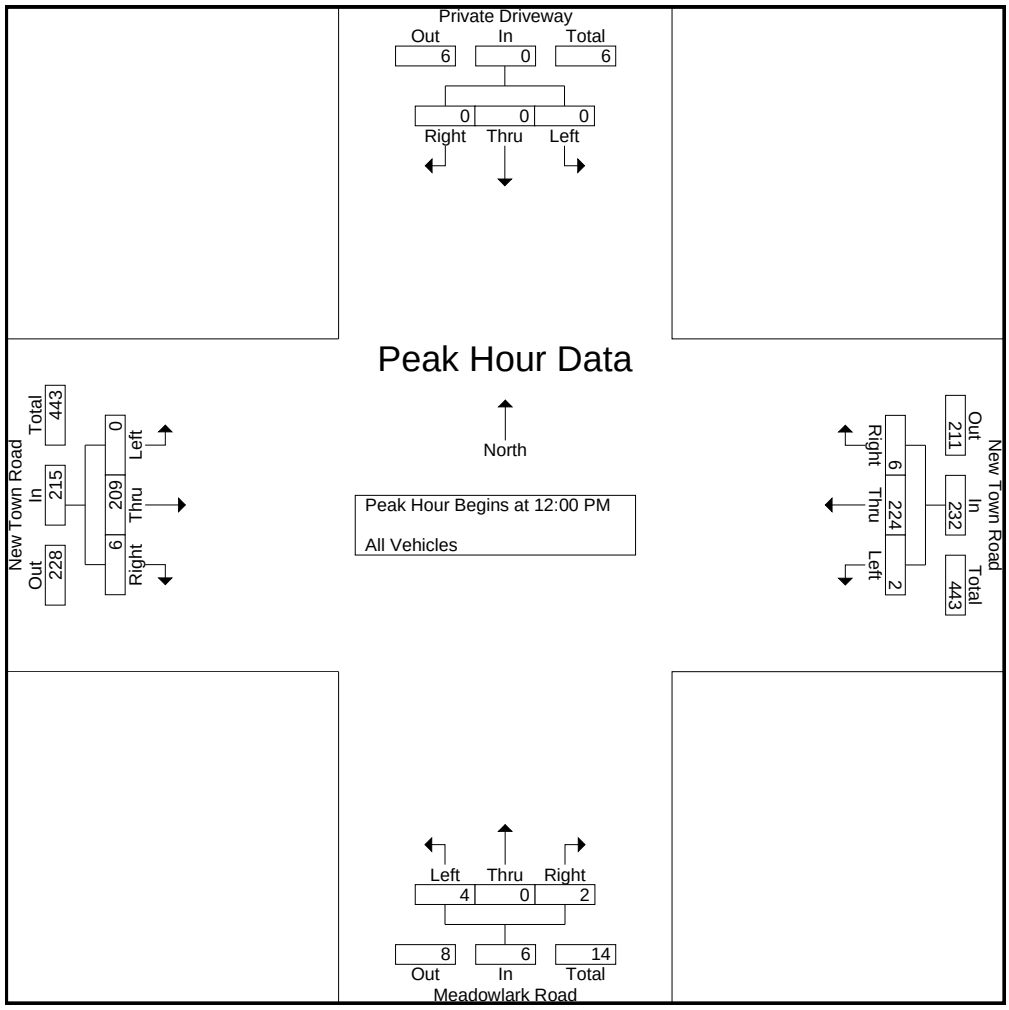
Page No : 3

	Private Driveway Southbound				New Town Road Westbound				Meadowlark Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	0	0	0	**1**	56	0	57	0	0	0	0	0	49	**3**	52	109
12:15 PM	0	0	0	0	1	**63**	0	**64**	0	0	**1**						**123**
12:30 PM	0	0	0	0	0	53	0	53	**3**	0	0	**3**	0	**60**	0	**60**	116
12:45 PM	0	0	0	0	0	52	**6**	58	1	0	1	2	0	44	1	45	105
Total Volume	0	0	0	0	2	224	6	232	4	0	2	6	0	209	6	215	453
% App. Total	0	0	0		0.9	96.6	2.6		66.7	0	33.3		0	97.2	2.8		
PHF	.000	.000	.000	.000	.500	.889	.250	.906	.333	.000	.500	.500	.000	.871	.500	.896	.921



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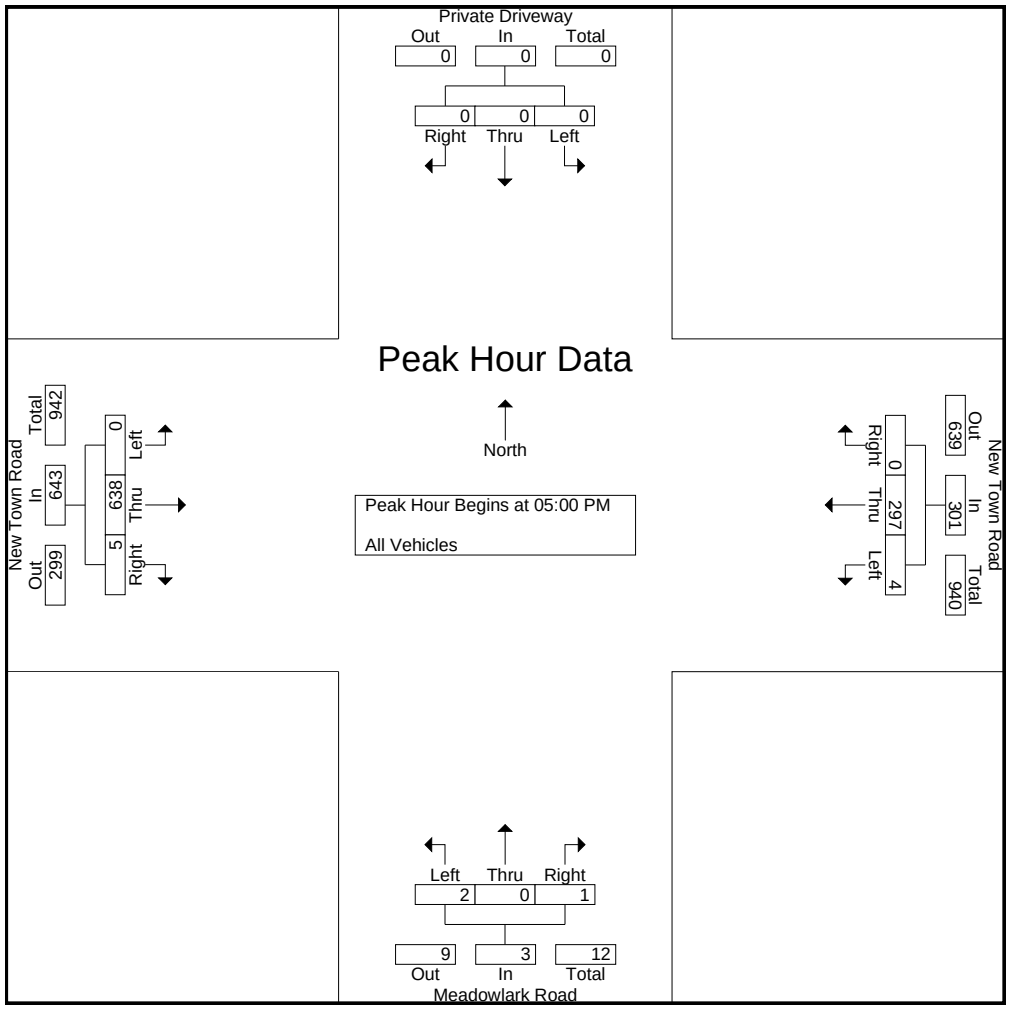
File Name : 09 - NewTown&Meadowlark
Site Code : 20080669
Start Date : 10/15/2008
Page No : 4

	Private Driveway Southbound				New Town Road Westbound				Meadowlark Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	**84**	0	**84**	0	0	0	0	0	146	0	146	230
05:15 PM	0	0	0	0	**2**	72	0	74	**1**	0	0	1	0	165	0	165	240
05:30 PM	0	0	0	0	2	66	0	68	0	0	0	0	0	**175**	2	**177**	**245**
05:45 PM	0	0	0	0	0	75	0	75	1	0	**1**	**2**	0	152	**3**	155	232
Total Volume	0	0	0	0	4	297	0	301	2	0	1	3	0	638	5	643	947
% App. Total	0	0	0		1.3	98.7	0		66.7	0	33.3		0	99.2	0.8		
PHF	.000	.000	.000	.000	.500	.884	.000	.896	.500	.000	.250	.375	.000	.911	.417	.908	.966



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File Name : 10 - Potters&ForestLawn
Site Code : 00000010
Start Date : 10/14/2008
Page No : 1

Groups Printed- All Vehicles

	Potters Road Southbound				Private Driveway Westbound				Potters Road Northbound				Forest Lawn Drive Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	26	21	0	0	0	0	0	38	117	0	0	7	0	27	0	0	236	236
07:15 AM	0	37	13	0	0	0	0	0	27	132	0	1	13	0	27	0	1	249	250
07:30 AM	0	52	9	1	0	0	0	0	42	169	0	1	17	0	23	0	2	312	314
07:45 AM	0	42	11	2	0	0	0	0	52	174	0	0	4	0	19	0	2	302	304
Total	0	157	54	3	0	0	0	0	159	592	0	2	41	0	96	0	5	1099	1104
08:00 AM	0	38	5	0	0	0	0	0	50	152	0	2	3	0	11	1	3	259	262
08:15 AM	0	39	10	1	0	0	0	0	44	133	0	1	3	0	18	0	2	247	249
08:30 AM	0	40	3	0	0	0	0	0	40	121	0	1	2	0	15	0	1	221	222
08:45 AM	0	29	5	3	0	0	0	0	28	60	0	2	3	0	13	2	7	138	145
Total	0	146	23	4	0	0	0	0	162	466	0	6	11	0	57	3	13	865	878
BREAK																			
11:00 AM	0	35	5	1	0	0	0	0	8	39	0	1	2	0	7	1	3	96	99
11:15 AM	0	23	5	0	0	0	0	0	17	31	0	0	3	0	12	1	1	91	92
11:30 AM	1	25	4	1	0	0	0	0	13	34	0	0	5	0	9	0	1	91	92
11:45 AM	0	33	10	0	0	0	0	0	15	46	0	1	5	0	13	0	1	122	123
Total	1	116	24	2	0	0	0	0	53	150	0	2	15	0	41	2	6	400	406
12:00 PM	0	43	4	1	0	0	0	0	18	33	0	1	4	0	13	0	2	115	117
12:15 PM	0	33	3	1	0	0	0	0	16	31	0	0	6	0	17	0	1	106	107
12:30 PM	0	29	4	0	0	0	0	0	17	35	0	0	4	0	15	0	0	104	104
12:45 PM	0	34	2	0	0	0	0	0	12	24	0	2	2	0	19	0	2	93	95
Total	0	139	13	2	0	0	0	0	63	123	0	3	16	0	64	0	5	418	423
BREAK																			
04:00 PM	0	85	4	0	0	0	0	0	16	55	0	0	9	0	35	1	1	204	205
04:15 PM	0	84	8	0	0	0	0	0	20	47	0	0	7	0	38	0	0	204	204
04:30 PM	0	83	9	1	0	0	0	0	16	39	0	1	12	0	36	0	2	195	197
04:45 PM	0	100	3	0	0	0	0	0	17	56	0	0	6	0	48	0	0	230	230
Total	0	352	24	1	0	0	0	0	69	197	0	1	34	0	157	1	3	833	836
05:00 PM	0	111	3	0	0	0	0	0	18	39	0	0	3	0	76	0	0	250	250
05:15 PM	0	132	10	0	0	0	0	0	24	47	0	1	6	0	59	0	1	278	279
05:30 PM	0	150	9	0	0	0	0	0	20	42	0	0	8	0	49	0	0	278	278
05:45 PM	0	139	4	0	0	0	0	0	21	46	0	0	4	0	64	0	0	278	278
Total	0	532	26	0	0	0	0	0	83	174	0	1	21	0	248	0	1	1084	1085
Grand Total	1	1442	164	12	0	0	0	0	589	1702	0	15	138	0	663	6	33	4699	4732
Apprch %	0.1	89.7	10.2		0	0	0		25.7	74.3	0		17.2	0	82.8				
Total %	0	30.7	3.5		0	0	0		12.5	36.2	0		2.9	0	14.1		0.7	99.3	

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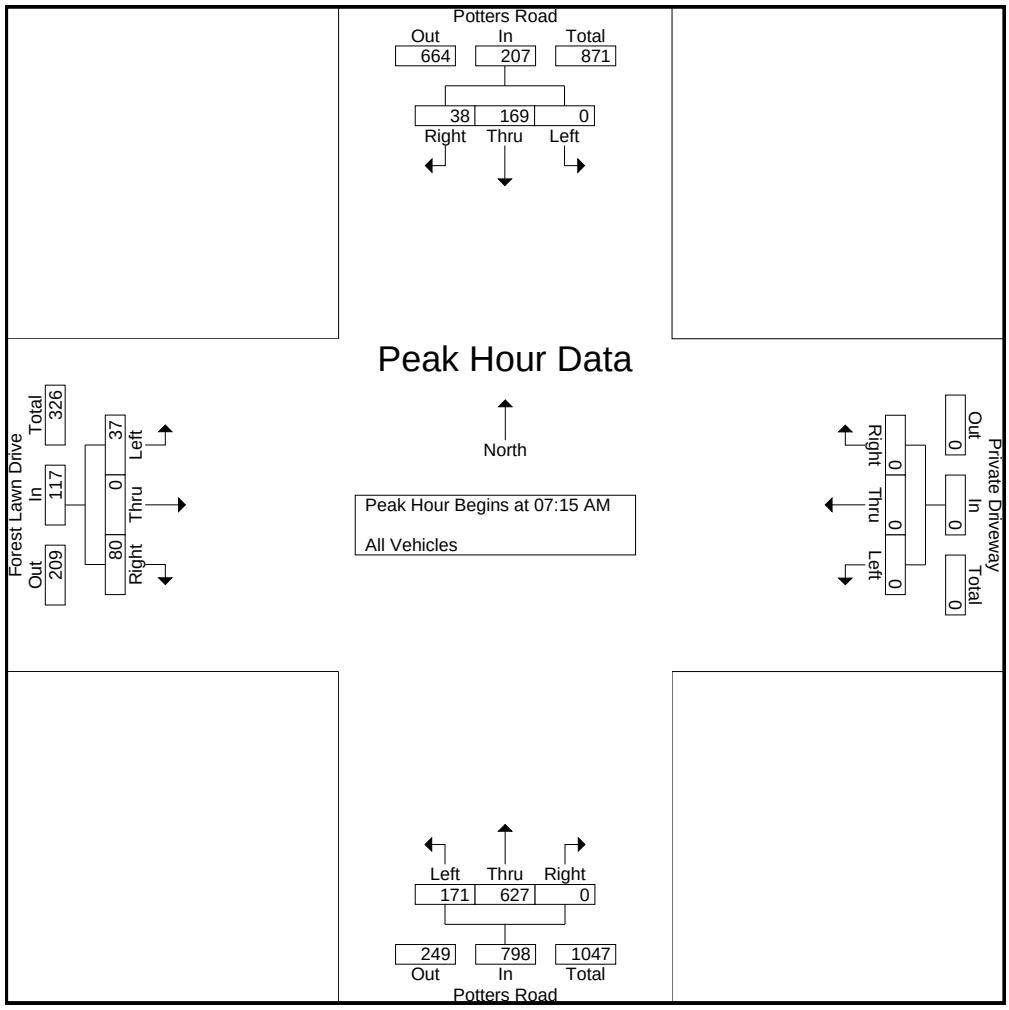
File Name : 10 - Potters&ForestLawn
Site Code : 00000010
Start Date : 10/14/2008
Page No : 2

	Potters Road Southbound				Private Driveway Westbound				Potters Road Northbound				Forest Lawn Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	37	**13**												**27**	**40**	249
07:30 AM	0	**52**		**61**	0	0	0	0	42	169	0	211	**17**	0	23	40	**312**
07:45 AM	0	42	11	53	0	0	0	0	**52**	**174**		**226**	4	0	19	23	302
08:00 AM	0	38	5	43	0	0	0	0	50	152	0	202	3	0	11	14	259
Total Volume	0	169	38	207	0	0	0	0	171	627	0	798	37	0	80	117	1122
% App. Total	0	81.6	18.4		0	0	0		21.4	78.6	0		31.6	0	68.4		
PHF	.000	.813	.731	.848	.000	.000	.000	.000	.822	.901	.000	.883	.544	.000	.741	.731	.899



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File Name : 10 - Potters&ForestLawn
Site Code : 00000010
Start Date : 10/14/2008
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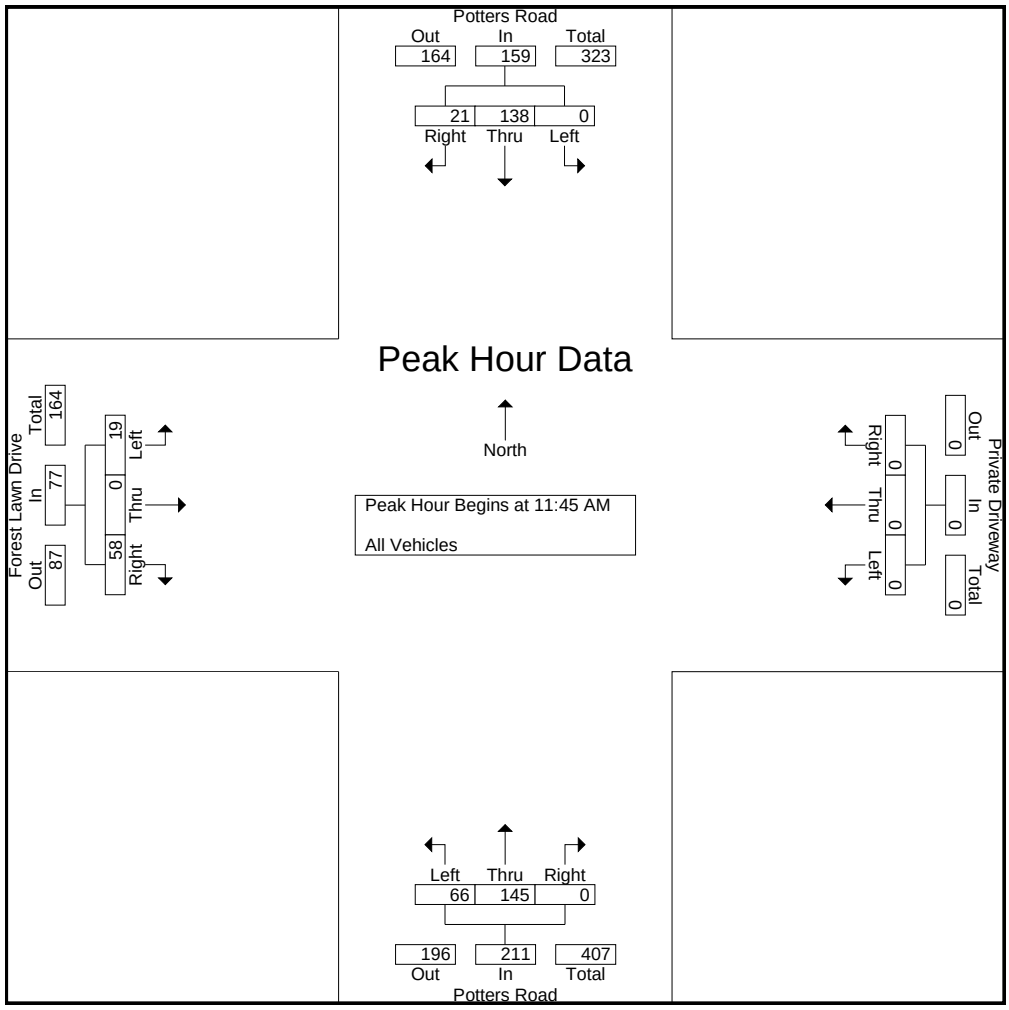
	Potters Road Southbound				Private Driveway Westbound				Potters Road Northbound				Forest Lawn Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:45 AM																	
11:45 AM	0	33	**10**							**46**		**61**	5	0	13	18	**122**
12:00 PM	0	**43**		**47**	0	0	0	0	**18**	33	0	51	4	0	13	17	115
12:15 PM	0	33	3	36	0	0	0	0	16	31	0	47	**6**	0	**17**	**23**	106
12:30 PM	0	29	4	33	0	0	0	0	17	35	0	52	4	0	15	19	104
Total Volume	0	138	21	159	0	0	0	0	66	145	0	211	19	0	58	77	447
% App. Total	0	86.8	13.2		0	0	0		31.3	68.7	0		24.7	0	75.3		
PHF	.000	.802	.525	.846	.000	.000	.000	.000	.917	.788	.000	.865	.792	.000	.853	.837	.916



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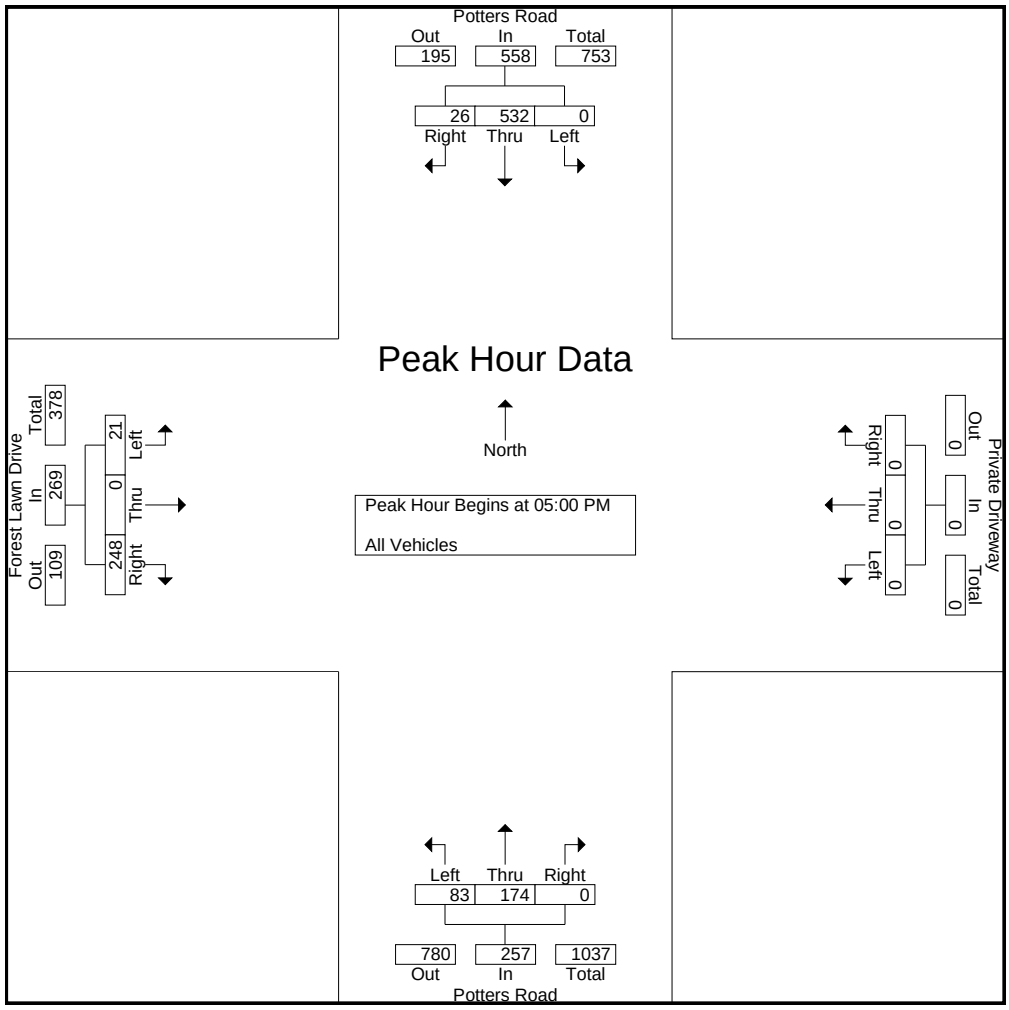
File Name : 10 - Potters&ForestLawn
Site Code : 00000010
Start Date : 10/14/2008
Page No : 4

	Potters Road Southbound				Private Driveway Westbound				Potters Road Northbound				Forest Lawn Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	111	3	114	0	0	0	0	18	39	0	57	3	0	**76**	**79**	250
05:15 PM	0	132	**10**						**24**	**47**		**71**	6	0	59	65	**278**
05:30 PM	0	**150**		**159**	0	0	0	0	20	42	0	62	**8**	0	49	57	278
05:45 PM	0	139	4	143	0	0	0	0	21	46	0	67	4	0	64	68	278
Total Volume	0	532	26	558	0	0	0	0	83	174	0	257	21	0	248	269	1084
% App. Total	0	95.3	4.7		0	0	0		32.3	67.7	0		7.8	0	92.2		
PHF	.000	.887	.650	.877	.000	.000	.000	.000	.865	.926	.000	.905	.656	.000	.816	.851	.975



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File Name : 10 - Potters&ForestLawn
Site Code : 00000010
Start Date : 10/14/2008

Groups Printed- Bicycles

	Potters Road Southbound				Private Driveway Westbound				Potters Road Northbound				Forest Lawn Drive Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
BREAK																	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
BREAK																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
BREAK																	
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	33.3	66.7	0	
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	33.3	66.7	0	

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File Name : 11 - Potters&NewTown
Site Code : 20080611
Start Date : 10/16/2008
Page No : 1

Groups Printed- All Vehicles

	Potters Road Southbound				New Town Road Westbound				Potters Road Northbound				New Town Road Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	12	1	0	0	30	4	0	1	30	2	1	0	11	0	0	1	91	92
07:15 AM	1	7	3	0	1	18	11	2	0	30	0	0	0	17	1	0	2	89	91
07:30 AM	2	14	3	1	2	31	5	0	6	32	0	0	3	23	1	0	1	122	123
07:45 AM	2	13	1	0	0	25	10	1	4	33	1	0	1	22	3	0	1	115	116
Total	5	46	8	1	3	104	30	3	11	125	3	1	4	73	5	0	5	417	422
08:00 AM	0	13	2	0	0	25	6	0	1	20	3	0	1	14	0	1	1	85	86
08:15 AM	3	9	5	1	0	17	3	0	2	25	2	1	0	31	1	1	3	98	101
08:30 AM	3	11	2	0	1	13	6	1	1	16	1	0	1	12	1	0	1	68	69
08:45 AM	1	10	7	0	1	15	9	0	1	12	0	0	2	12	1	0	0	71	71
Total	7	43	16	1	2	70	24	1	5	73	6	1	4	69	3	2	5	322	327
BREAK																			
11:00 AM	3	11	1	0	1	6	2	1	1	7	2	0	2	6	0	0	1	42	43
11:15 AM	3	11	2	1	0	9	1	0	0	9	2	0	3	10	0	1	2	50	52
11:30 AM	2	5	0	1	0	6	2	0	0	13	0	0	1	12	1	0	1	42	43
11:45 AM	2	14	0	0	1	5	2	2	2	9	2	0	2	7	1	1	3	47	50
Total	10	41	3	2	2	26	7	3	3	38	6	0	8	35	2	2	7	181	188
12:00 PM	4	12	0	1	0	10	2	1	1	9	0	1	2	7	0	0	3	47	50
12:15 PM	6	15	1	0	0	13	7	1	0	8	1	0	1	7	2	0	1	61	62
12:30 PM	0	14	2	1	1	9	2	0	1	8	2	0	6	7	7	0	1	59	60
12:45 PM	4	13	2	1	0	13	4	0	0	14	3	0	1	6	0	0	1	60	61
Total	14	54	5	3	1	45	15	2	2	39	6	1	10	27	9	0	6	227	233
BREAK																			
04:00 PM	9	19	3	0	2	12	5	1	4	7	1	1	0	16	1	0	2	79	81
04:15 PM	6	29	2	0	2	12	2	0	1	12	2	0	5	26	1	0	0	100	100
04:30 PM	12	27	1	0	0	8	7	0	3	12	2	0	1	29	1	3	3	103	106
04:45 PM	7	30	3	1	1	16	3	0	1	11	2	0	1	25	1	0	1	101	102
Total	34	105	9	1	5	48	17	1	9	42	7	1	7	96	4	3	6	383	389
05:00 PM	13	23	4	0	5	21	5	2	1	9	3	1	4	29	2	0	3	119	122
05:15 PM	5	37	4	0	3	31	1	0	2	18	1	0	3	22	4	0	0	131	131
05:30 PM	9	23	2	0	2	16	6	0	2	26	2	0	2	39	4	0	0	133	133
05:45 PM	9	22	4	0	0	16	4	0	4	17	1	0	1	17	1	0	0	96	96
Total	36	105	14	0	10	84	16	2	9	70	7	1	10	107	11	0	3	479	482
Grand Total	106	394	55	8	23	377	109	12	39	387	35	5	43	407	34	7	32	2009	2041
Apprch %	19.1	71	9.9		4.5	74.1	21.4		8.5	83.9	7.6		8.9	84.1	7				
Total %	5.3	19.6	2.7		1.1	18.8	5.4		1.9	19.3	1.7		2.1	20.3	1.7		1.6	98.4	

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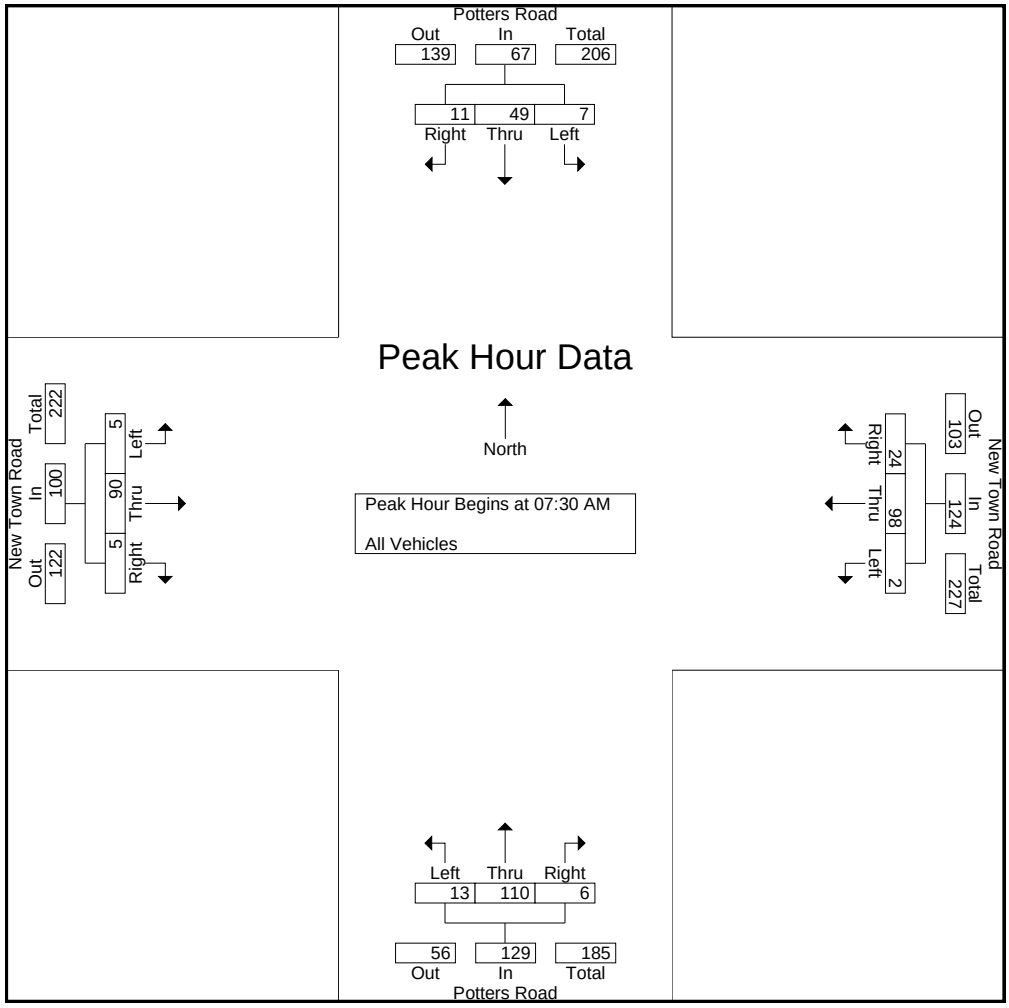
	Potters Road Southbound				New Town Road Westbound				Potters Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	2	**14**		**19**	**2**	**31**	5	**38**	**6**	32	0	**38**	**3**	23	1	27	**122**
07:45 AM	2	13	1	16	0	25	**10**	35	4	**33**					**3**	26	115
08:00 AM	0	13	2	15	0	25	6	31	1	20	**3**						
08:15 AM	**3**	9	**5**	**17**	**0**	**17**	**3**	**20**	**2**	**25**	**2**	**29**	**0**	**31**	1	**32**	98
Total Volume	7	49	11	67	2	98	24	124	13	110	6	129	5	90	5	100	420
% App. Total	10.4	73.1	16.4		1.6	79	19.4		10.1	85.3	4.7		5	90	5		
PHF	.583	.875	.550	.882	.250	.790	.600	.816	.542	.833	.500	.849	.417	.726	.417	.781	.861



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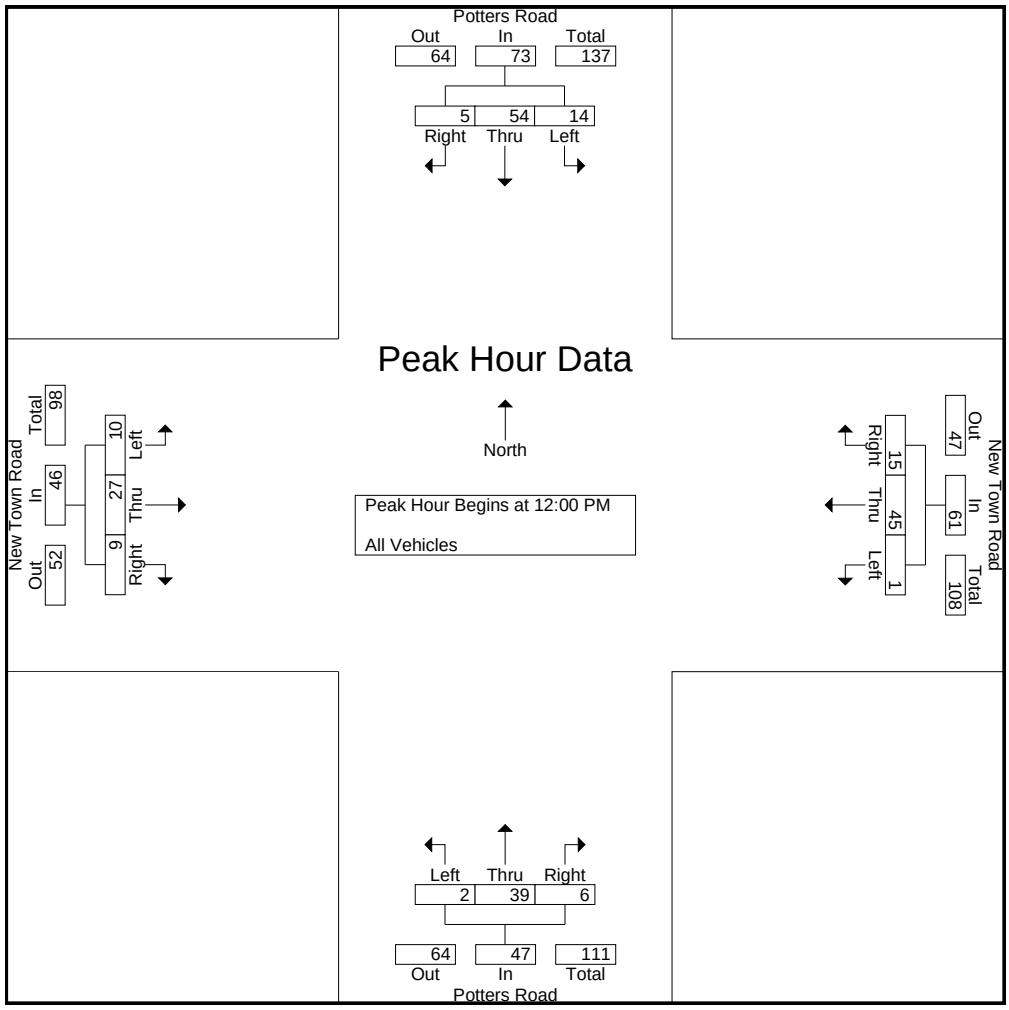
	Potters Road Southbound				New Town Road Westbound				Potters Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	4	12	0	16	0	10	2	12	**1**	9	0	10	2	**7**	0	9	47
12:15 PM	**6**	**15**		**22**	0	**13**	**7**	**20**	0	8	1	9	1	7	2	10	**61**
12:30 PM	0	14	**2**		**1**	9	2	12	1	8	2	11	**6**	7	**7**	**20**	59
12:45 PM	4	13	2	19	0	13	4	17	0	**14**	**3**	**17**	1	6	0	7	60
Total Volume	14	54	5	73	1	45	15	61	2	39	6	47	10	27	9	46	227
% App. Total	19.2	74	6.8		1.6	73.8	24.6		4.3	83	12.8		21.7	58.7	19.6		
PHF	.583	.900	.625	.830	.250	.865	.536	.763	.500	.696	.500	.691	.417	.964	.321	.575	.930



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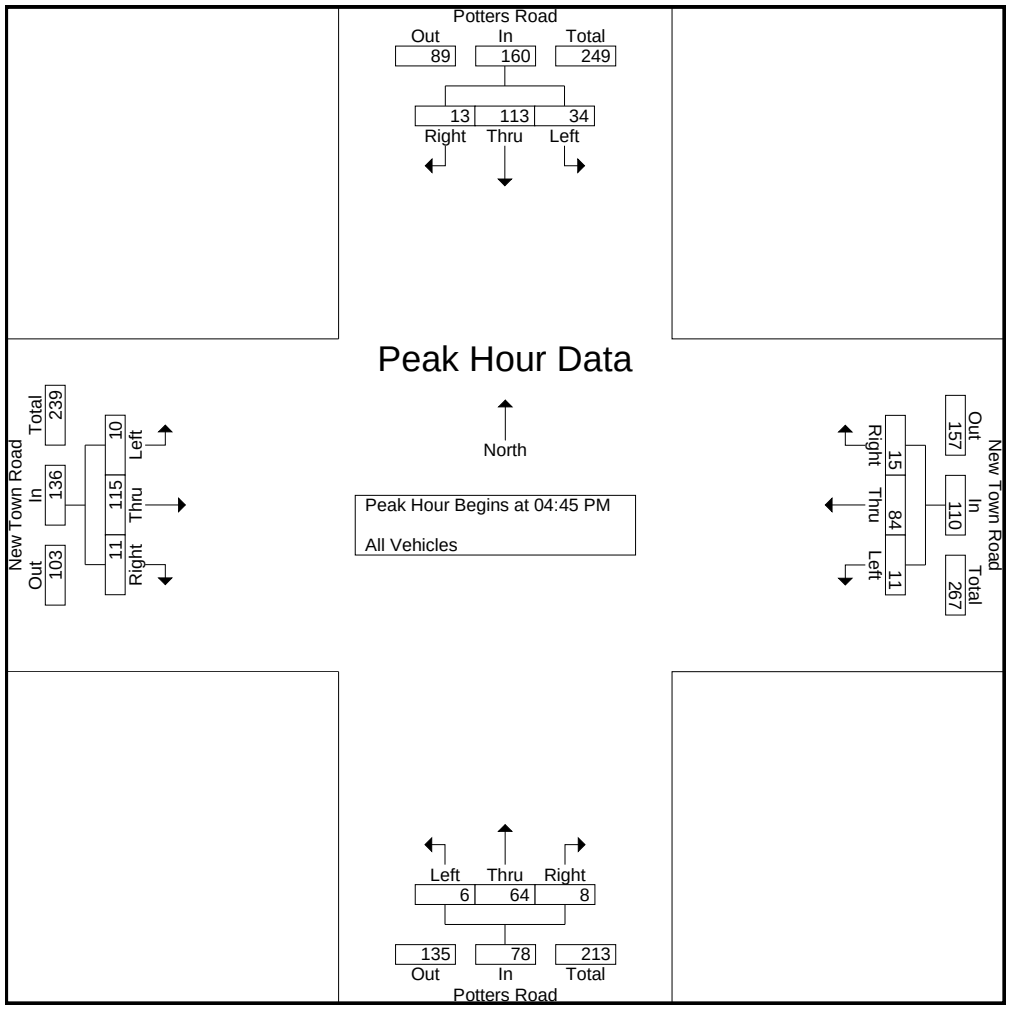
	Potters Road Southbound				New Town Road Westbound				Potters Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	7	30	3	40	1	16	3	20	1	11	2	14	1	25	1	27	101
05:00 PM	**13**	23	**4**		**5**	21	5	31	1	9	**3**		**4**	29	2	35	119
05:15 PM	5	**37**		**46**	3	**31**	1	**35**	**2**	18	1	21	3	22	**4**	29	131
05:30 PM	9	23	2	34	2	16	**6**	24	2	**26**		**30**	2	**39**	4	**45**	**133**
Total Volume	34	113	13	160	11	84	15	110	6	64	8	78	10	115	11	136	484
% App. Total	21.2	70.6	8.1		10	76.4	13.6		7.7	82.1	10.3		7.4	84.6	8.1		
PHF	.654	.764	.813	.870	.550	.677	.625	.786	.750	.615	.667	.650	.625	.737	.688	.756	.910



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Groups Printed- Bicycles

	Potters Road Southbound				New Town Road Westbound				Potters Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
12:00 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
BREAK																	
Total	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
BREAK																	
Grand Total	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
Apprch %	0	0	100	0	0	0	100	0	0	0	0	0	0	0	0	0	
Total %	0	0	50	0	0	0	50	0	0	0	0	0	0	0	0	0	

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Groups Printed- All Vehicles

	RailRoad Walkway Bridge Southbound				South Main Street Westbound				South Providence Street Northbound				South Main Street Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	168	0	5	2	0	0	0	0	116	7	4	9	293	302
07:15 AM	0	0	0	0	1	143	0	5	1	0	1	0	0	98	7	2	7	251	258
07:30 AM	0	0	0	0	0	196	1	5	4	0	0	0	0	100	9	0	5	310	315
07:45 AM	0	0	0	0	0	166	0	2	1	0	2	0	0	93	9	4	6	271	277
Total	0	0	0	0	1	673	1	17	8	0	3	0	0	407	32	10	27	1125	1152
08:00 AM	0	0	0	0	1	141	0	1	3	0	1	0	0	94	5	2	3	245	248
08:15 AM	0	0	0	0	0	144	0	3	3	0	0	0	0	72	1	4	7	220	227
08:30 AM	0	1	0	0	0	119	0	5	3	0	2	0	0	85	3	1	6	213	219
08:45 AM	0	0	0	0	0	98	0	4	4	0	1	0	0	79	3	3	7	185	192
Total	0	1	0	0	1	502	0	13	13	0	4	0	0	330	12	10	23	863	886
BREAK																			
11:00 AM	0	0	0	0	0	74	0	3	6	0	0	0	0	69	8	3	6	157	163
11:15 AM	0	0	0	0	0	82	0	1	2	0	0	0	0	92	6	3	4	182	186
11:30 AM	0	0	0	0	3	65	0	2	3	0	0	0	0	58	11	0	2	140	142
11:45 AM	0	1	0	0	0	72	0	3	4	0	0	0	0	79	2	4	7	158	165
Total	0	1	0	0	3	293	0	9	15	0	0	0	0	298	27	10	19	637	656
12:00 PM	0	0	0	0	3	100	0	7	4	0	0	0	0	70	8	2	9	185	194
12:15 PM	0	0	0	0	2	95	0	1	2	0	0	0	0	74	3	2	3	176	179
12:30 PM	0	0	0	0	2	81	0	3	6	0	3	0	0	86	3	2	5	181	186
12:45 PM	0	0	0	0	2	88	0	4	0	0	0	0	0	79	5	2	6	174	180
Total	0	0	0	0	9	364	0	15	12	0	3	0	0	309	19	8	23	716	739
BREAK																			
04:00 PM	0	0	0	0	2	84	0	0	6	1	1	0	0	152	3	2	2	249	251
04:15 PM	0	0	0	0	0	98	0	1	6	0	1	0	0	150	3	7	8	258	266
04:30 PM	0	0	0	0	3	117	0	1	4	0	1	0	0	155	4	2	3	284	287
04:45 PM	0	0	0	0	1	112	3	1	4	0	1	0	0	182	10	2	3	313	316
Total	0	0	0	0	6	411	3	3	20	1	4	0	0	639	20	13	16	1104	1120
05:00 PM	0	0	0	0	1	113	0	1	4	0	1	0	0	195	10	2	3	324	327
05:15 PM	0	0	0	0	0	135	1	2	2	0	2	0	0	172	8	2	4	320	324
05:30 PM	0	0	0	0	2	111	0	0	4	0	6	0	0	195	11	5	5	329	334
05:45 PM	0	0	0	0	11	169	0	2	0	0	0	0	0	194	8	6	8	382	390
Total	0	0	0	0	14	528	1	5	10	0	9	0	0	756	37	15	20	1355	1375
Grand Total	0	2	0	0	34	2771	5	62	78	1	23	0	0	2739	147	66	128	5800	5928
Apprch %	0	100	0		1.2	98.6	0.2		76.5	1	22.5		0	94.9	5.1				
Total %	0	0	0		0.6	47.8	0.1		1.3	0	0.4		0	47.2	2.5		2.2	97.8	

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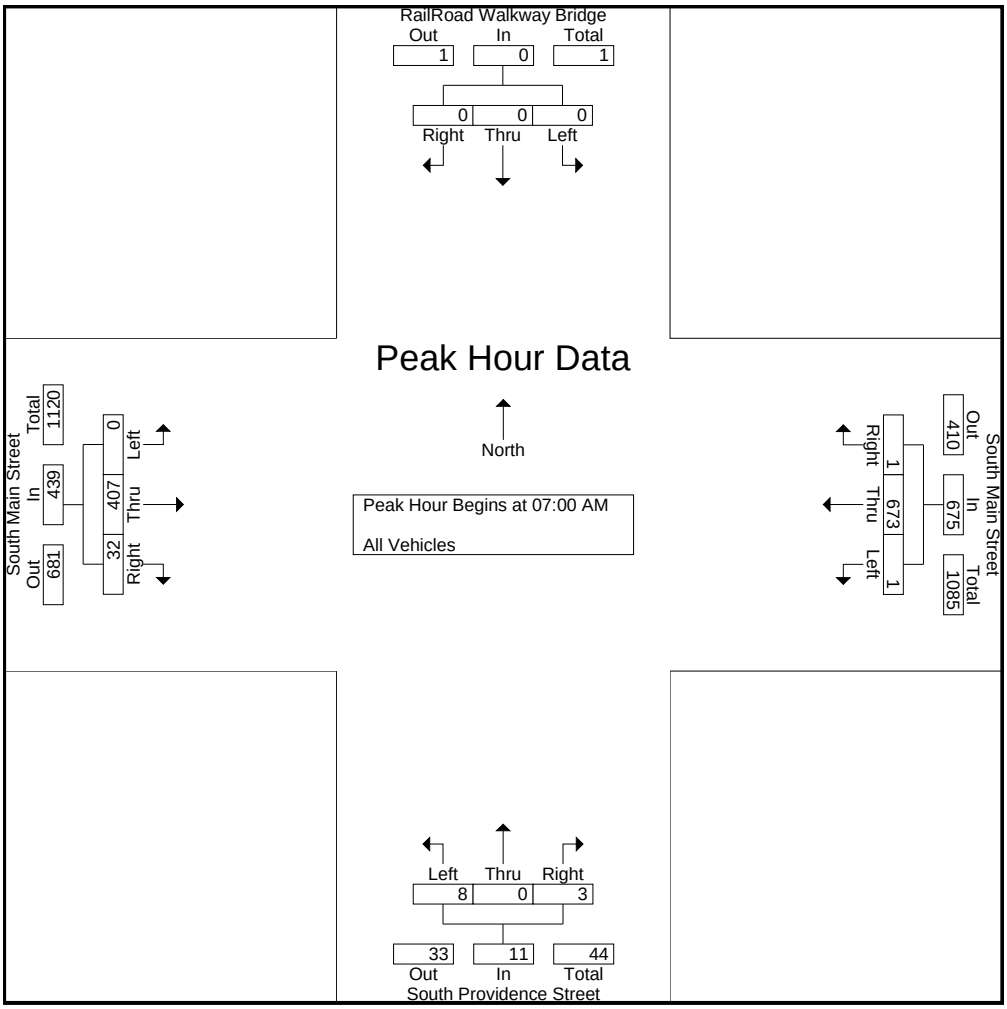
	RailRoad Walkway Bridge Southbound				South Main Street Westbound				South Providence Street Northbound				South Main Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	168	0	168	2	0	0	2	0	**116**	7	**123**	293
07:15 AM	0	0	0	0	**1**	143	0	144	1	0	1	2	0	98	7	105	251
07:30 AM	0	0	0	0	0	**196**	**1**	**197**	**4**	0	0	**4**	0	100	**9**	109	**310**
07:45 AM	0	0	0	0	0	166	0	166	1	0	**2**						
Total Volume	**0**	**0**	**0**	**0**	**1**	**673**	**1**	**675**	**8**	**0**	**3**	**11**	**0**	**407**	**32**	**439**	**1125**
% App. Total	**0**	**0**	**0**		**0.1**	**99.7**	**0.1**		**72.7**	**0**	**27.3**		**0**	**92.7**	**7.3**		
PHF	**.000**	**.000**	**.000**	**.000**	**.250**	**.858**	**.250**	**.857**	**.500**	**.000**	**.375**	**.688**	**.000**	**.877**	**.889**	**.892**	**.907**



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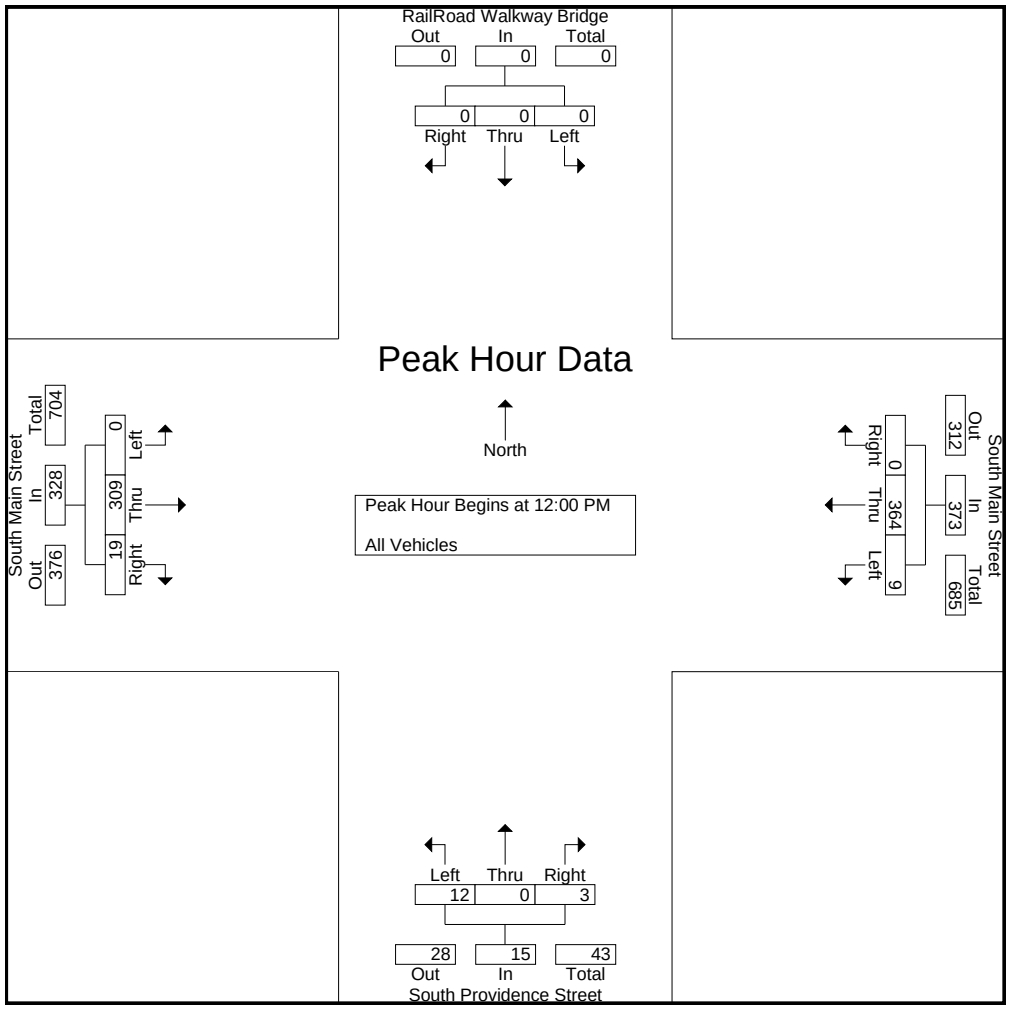
	RailRoad Walkway Bridge Southbound				South Main Street Westbound				South Providence Street Northbound				South Main Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	0	0	0	**3**	**100**	0	**103**	4	0	0	4	0	70	**8**	78	**185**
12:15 PM	0	0	0	0	2	95	0	97	2	0	0	2	0	74	3	77	176
12:30 PM	0	0	0	0	2	81	0	83	**6**	0	**3**	**9**	0	**86**	3	**89**	181
12:45 PM	0	0	0	0	2	88	0	90	0	0	0	0	0	79	5	84	174
Total Volume	0	0	0	0	9	364	0	373	12	0	3	15	0	309	19	328	716
% App. Total	0	0	0		2.4	97.6	0		80	0	20		0	94.2	5.8		
PHF	.000	.000	.000	.000	.750	.910	.000	.905	.500	.000	.250	.417	.000	.898	.594	.921	.968



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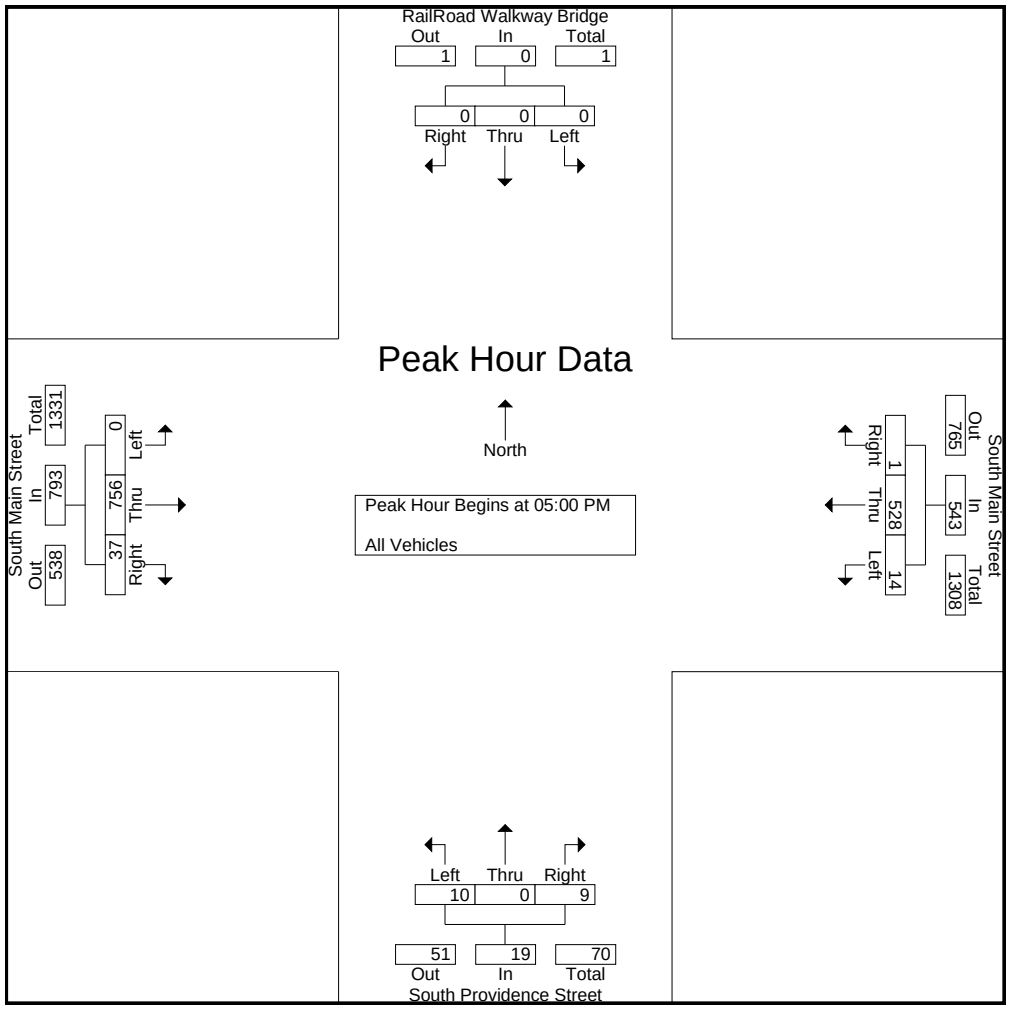
	RailRoad Walkway Bridge Southbound				South Main Street Westbound				South Providence Street Northbound				South Main Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	1	113	0	114	**4**	0	1	5	0	**195**	10	205	324
05:15 PM	0	0	0	0	0	135	**1**	136	2	0	2	4	0	172	8	180	320
05:30 PM	0	0	0	0	2	111	0	113	4	0	**6**	**10**	0	195	**11**	**206**	329
05:45 PM	0	0	0	0	**11**	**169**	0	**180**	0	0	0	0	0	194	8	202	**382**
Total Volume	0	0	0	0	14	528	1	543	10	0	9	19	0	756	37	793	1355
% App. Total	0	0	0		2.6	97.2	0.2		52.6	0	47.4		0	95.3	4.7		
PHF	.000	.000	.000	.000	.318	.781	.250	.754	.625	.000	.375	.475	.000	.969	.841	.962	.887



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Groups Printed- Pedestrians

	RailRoad Walkway Bridge Southbound				South Main Street Westbound				South Providence Street Northbound				South Main Street Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
07:30 AM	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	4
07:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	3	0	0	0	1	0	0	0	5	0	0	10
08:00 AM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
08:15 AM	0	1	0	0	0	2	0	0	0	1	0	0	0	2	0	0	6
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
08:45 AM	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	4
Total	0	3	0	0	0	3	0	0	0	4	0	0	0	3	0	0	13
BREAK																	
11:00 AM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
BREAK																	
11:45 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
12:00 PM	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	6
12:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
BREAK																	
Total	0	4	0	0	0	1	0	0	0	3	0	0	0	1	0	0	9
BREAK																	
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
BREAK																	
04:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
BREAK																	
Total	0	0	0	0	0	2	0	0	0	1	0	0	0	1	0	0	4
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
BREAK																	
05:30 PM	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	6
BREAK																	
Total	0	3	0	0	0	0	0	0	0	4	0	0	0	0	0	0	7
Grand Total	0	18	0	0	0	9	0	0	0	13	0	0	0	10	0	0	50
Apprch %	0	100	0	0	0	100	0	0	0	100	0	0	0	100	0	0	
Total %	0	36	0	0	0	18	0	0	0	26	0	0	0	20	0	0	

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Groups Printed- Bicycles

	RailRoad Walkway Bridge Southbound				South Main Street Westbound				South Providence Street Northbound				South Main Street Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
BREAK																	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
BREAK																	
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
04:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	3
BREAK																	
05:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	6
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	50	0	0	0	0	0	0	0	50	0	0	

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Groups Printed- All Vehicles

	Twelve Mile Road Southbound				NC 84 (Monroe Weddington Road) Westbound				Twelve Mile Road Northbound				NC 84 (Monroe Weddington Road) Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	14	3	18	0	3	136	21	0	35	20	0	0	42	77	12	0	0	381	381
07:15 AM	37	16	45	0	6	130	33	1	32	17	10	1	47	83	8	0	2	464	466
07:30 AM	54	3	15	0	8	108	24	0	37	8	39	0	4	113	11	1	1	424	425
07:45 AM	68	5	9	0	7	102	39	0	33	8	70	0	5	166	18	1	1	530	531
Total	173	27	87	0	24	476	117	1	137	53	119	1	98	439	49	2	4	1799	1803
08:00 AM	10	6	13	0	5	154	13	1	45	8	5	0	13	73	6	1	2	351	353
08:15 AM	9	12	9	0	2	86	11	3	40	12	2	2	16	76	12	2	7	287	294
08:30 AM	8	14	11	0	9	106	10	2	30	10	4	0	9	67	20	3	5	298	303
08:45 AM	2	1	2	0	4	91	2	5	28	6	6	0	3	56	17	2	7	218	225
Total	29	33	35	0	20	437	36	11	143	36	17	2	41	272	55	8	21	1154	1175
BREAK																			
11:00 AM	3	2	6	0	5	68	3	3	19	3	3	1	4	64	8	2	6	188	194
11:15 AM	4	2	6	0	1	79	4	0	29	1	5	2	1	62	8	5	7	202	209
11:30 AM	4	4	3	0	4	77	6	2	25	1	3	2	6	70	14	3	7	217	224
11:45 AM	2	4	8	0	7	74	4	3	20	3	2	1	2	71	11	4	8	208	216
Total	13	12	23	0	17	298	17	8	93	8	13	6	13	267	41	14	28	815	843
12:00 PM	0	6	3	0	2	62	4	0	21	5	2	0	8	70	14	3	3	197	200
12:15 PM	5	3	6	0	3	66	5	5	21	3	3	1	6	72	19	3	9	212	221
12:30 PM	4	4	9	0	3	52	3	1	24	8	0	1	4	50	9	0	2	170	172
12:45 PM	8	5	8	1	3	65	2	2	19	5	1	0	4	65	18	2	5	203	208
Total	17	18	26	1	11	245	14	8	85	21	6	2	22	257	60	8	19	782	801
BREAK																			
04:00 PM	34	23	27	0	5	93	9	1	16	7	9	0	5	146	28	2	3	402	405
04:15 PM	11	6	4	0	5	100	10	2	25	6	7	1	7	136	10	2	5	327	332
04:30 PM	12	5	4	0	1	127	9	0	31	9	4	2	3	136	16	1	3	357	360
04:45 PM	6	5	1	0	7	101	8	1	29	4	3	0	4	151	22	0	1	341	342
Total	63	39	36	0	18	421	36	4	101	26	23	3	19	569	76	5	12	1427	1439
05:00 PM	8	7	3	0	6	107	5	1	32	8	5	0	9	141	24	0	1	355	356
05:15 PM	14	5	9	0	3	113	14	0	29	7	7	0	9	170	19	1	1	399	400
05:30 PM	21	13	9	0	2	110	12	0	36	8	1	0	7	180	18	0	0	417	417
05:45 PM	26	12	12	0	5	117	24	0	27	9	9	0	11	194	14	0	0	460	460
Total	69	37	33	0	16	447	55	1	124	32	22	0	36	685	75	1	2	1631	1633
Grand Total	364	166	240	1	106	2324	275	33	683	176	200	14	229	2489	356	38	86	7608	7694
Apprch %	47.3	21.6	31.2		3.9	85.9	10.2		64.5	16.6	18.9		7.4	81	11.6				
Total %	4.8	2.2	3.2		1.4	30.5	3.6		9	2.3	2.6		3	32.7	4.7		1.1	98.9	

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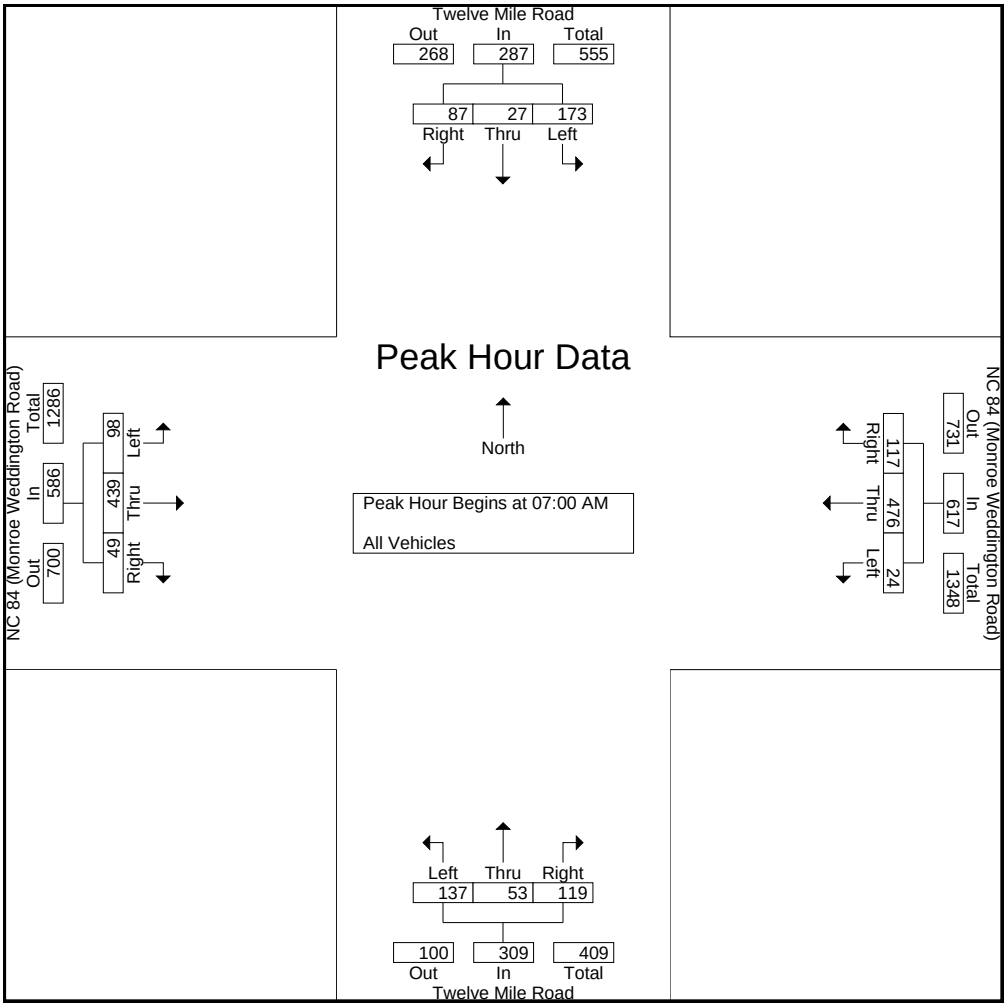
	Twelve Mile Road Southbound				NC 84 (Monroe Weddington Road) Westbound				Twelve Mile Road Northbound				NC 84 (Monroe Weddington Road) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	14	3	18	35	3	**136**	21	160	35	**20**							
07:15 AM	**37**	**16**	**45**	**98**	6	130	33	**169**	32	17	10	59	**47**	83	8	138	464
07:30 AM	54	3	15	72	**8**	108	24	140	**37**	8	39	84	4	113	11	128	424
07:45 AM	**68**	5	9	82	7	102	**39**	148	33	8	**70**	**111**	5	**166**	**18**	**189**	**530**
Total Volume	173	27	87	287	24	476	117	617	137	53	119	309	98	439	49	586	1799
% App. Total	60.3	9.4	30.3		3.9	77.1	19		44.3	17.2	38.5		16.7	74.9	8.4		
PHF	.636	.422	.483	.732	.750	.875	.750	.913	.926	.663	.425	.696	.521	.661	.681	.775	.849



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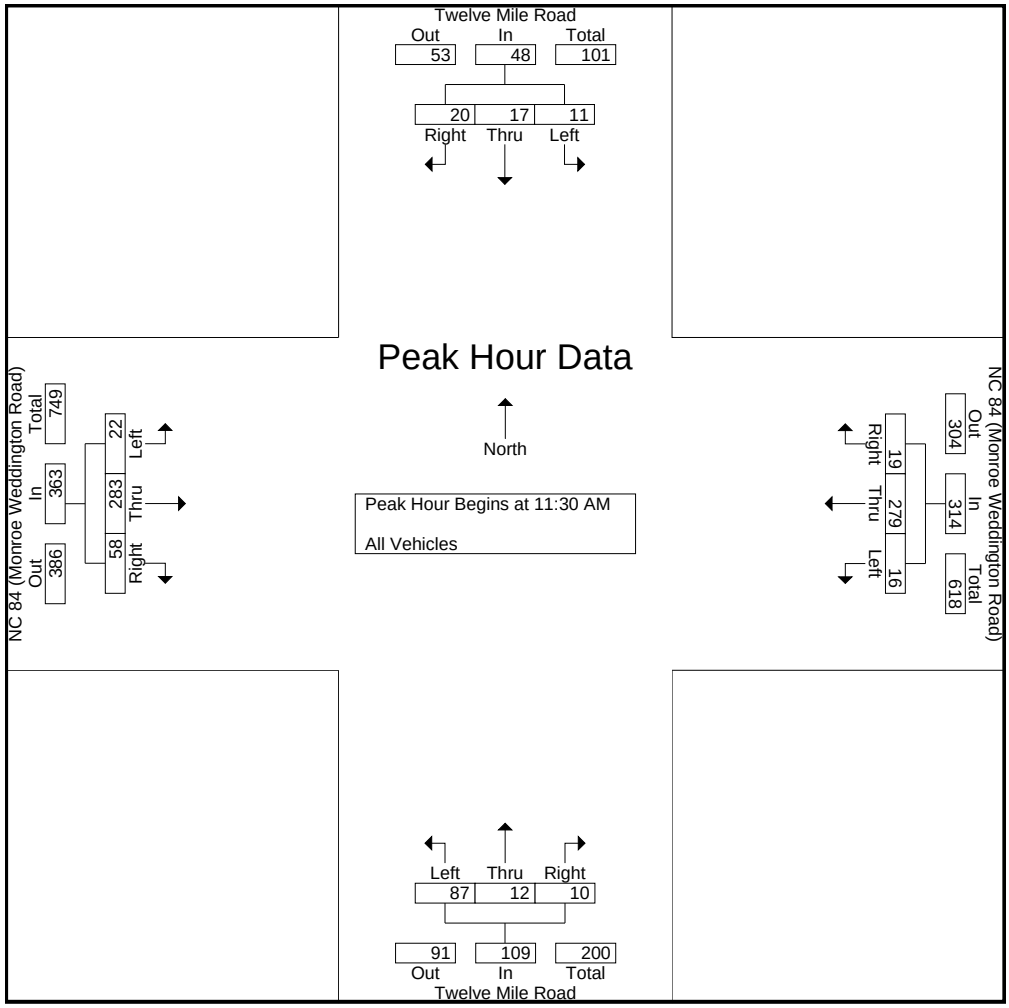
	Twelve Mile Road Southbound				NC 84 (Monroe Weddington Road) Westbound				Twelve Mile Road Northbound				NC 84 (Monroe Weddington Road) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:30 AM																	
11:30 AM	4	4	3	11	4	**77**	**6**	**87**	**25**	1	**3**	**29**	6	70	14	90	**217**
11:45 AM	2	4	**8**	**14**	**7**	74	4	85	20	3	2	25	2	71	11	84	208
12:00 PM	0	**6**								**5**			**8**	70	14	92	197
12:15 PM	**5**	3	6	14	3	66	5	74	21	3	3	27	6	**72**	**19**	**97**	212
Total Volume	11	17	20	48	16	279	19	314	87	12	10	109	22	283	58	363	834
% App. Total	22.9	35.4	41.7		5.1	88.9	6.1		79.8	11	9.2		6.1	78	16		
PHF	.550	.708	.625	.857	.571	.906	.792	.902	.870	.600	.833	.940	.688	.983	.763	.936	.961



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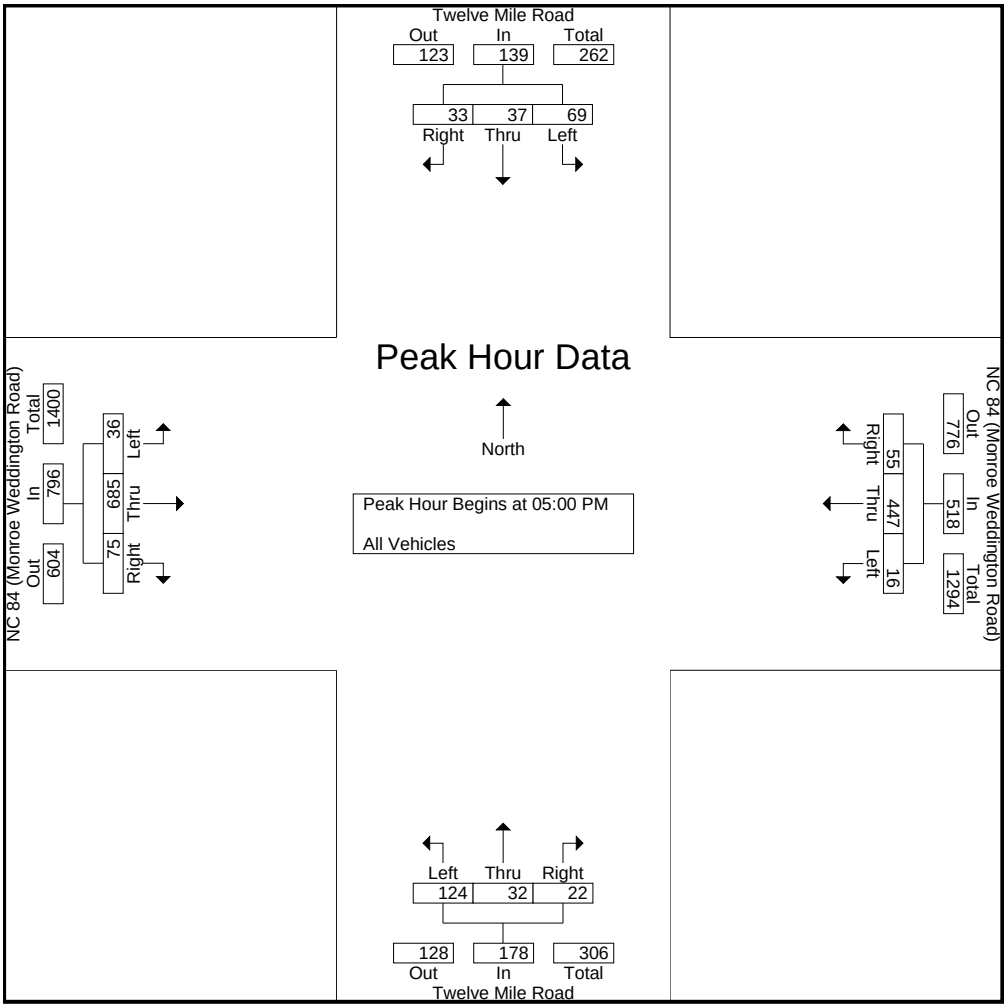
	Twelve Mile Road Southbound				NC 84 (Monroe Weddington Road) Westbound				Twelve Mile Road Northbound				NC 84 (Monroe Weddington Road) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	8	7	3	18	**6**	107	5	118	32	8	5	**45**	9	141	**24**	174	355
05:15 PM	14	5	9	28	3	113	14	130	29	7	7	43	9	170	19	198	399
05:30 PM	21	**13**							**36**	8	1	45	7	180	18	205	417
05:45 PM	**26**	12	**12**	**50**	5	**117**	**24**	**146**	27	**9**	**9**		**11**	**194**	14	**219**	**460**
Total Volume	69	37	33	139	16	447	55	518	124	32	22	178	36	685	75	796	1631
% App. Total	49.6	26.6	23.7		3.1	86.3	10.6		69.7	18	12.4		4.5	86.1	9.4		
PHF	.663	.712	.688	.695	.667	.955	.573	.887	.861	.889	.611	.989	.818	.883	.781	.909	.886



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Groups Printed- Pedestrians

	Twelve Mile Road Southbound				NC 84 (Monroe Weddington Road) Westbound				Twelve Mile Road Northbound				NC 84 (Monroe Weddington Road) Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
11:30 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
BREAK																	
Total	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
BREAK																	
Grand Total	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	50	0	0	0	0	0	0	0	50	0	0	

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Groups Printed- All Vehicles

	Waxhaw Marvin Road Southbound				Kensington Drive Westbound				Waxhaw Marvin Road Northbound				Kensington Drive Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	4	2	40	0	1	42	6	0	17	19	1	0	13	19	7	0	0	171	171
07:15 AM	3	15	37	0	4	62	3	0	32	21	4	0	43	55	16	0	0	295	295
07:30 AM	4	6	4	0	2	26	10	0	6	32	5	0	10	26	11	0	0	142	142
07:45 AM	6	14	6	1	2	10	12	0	3	40	2	0	4	13	3	0	1	115	116
Total	17	37	87	1	9	140	31	0	58	112	12	0	70	113	37	0	1	723	724
08:00 AM	5	19	6	0	2	9	13	0	3	29	4	0	8	3	3	1	1	104	105
08:15 AM	9	13	7	0	1	8	2	0	4	30	4	1	3	9	2	0	1	92	93
08:30 AM	7	12	5	0	2	8	11	0	3	14	1	0	9	10	2	0	0	84	84
08:45 AM	4	9	7	0	1	14	6	0	1	24	1	0	6	10	6	0	0	89	89
Total	25	53	25	0	6	39	32	0	11	97	10	1	26	32	13	1	2	369	371
BREAK																			
11:00 AM	6	9	3	0	1	15	13	0	2	18	0	1	3	15	3	1	2	88	90
11:15 AM	10	6	2	0	3	14	6	1	2	8	4	0	4	8	1	0	1	68	69
11:30 AM	12	11	5	1	1	10	10	0	4	7	4	0	3	15	2	0	1	84	85
11:45 AM	7	13	2	0	6	7	8	0	6	8	2	0	3	9	3	0	0	74	74
Total	35	39	12	1	11	46	37	1	14	41	10	1	13	47	9	1	4	314	318
12:00 PM	13	19	5	0	1	13	11	0	8	5	1	0	2	15	5	1	1	98	99
12:15 PM	12	15	8	1	5	10	10	0	4	18	1	0	3	16	1	0	1	103	104
12:30 PM	5	7	0	0	0	15	12	0	12	26	4	0	4	14	6	0	0	105	105
12:45 PM	4	11	6	0	5	11	15	0	5	13	3	0	4	6	3	0	0	86	86
Total	34	52	19	1	11	49	48	0	29	62	9	0	13	51	15	1	2	392	394
BREAK																			
04:00 PM	8	24	1	0	21	26	2	0	2	12	7	0	2	21	6	1	1	132	133
04:15 PM	8	18	12	0	18	32	7	1	1	15	8	0	2	11	3	0	1	135	136
04:30 PM	6	29	10	0	18	21	8	0	3	17	10	0	6	16	3	0	0	147	147
04:45 PM	19	15	10	0	5	9	9	0	8	27	2	0	5	23	3	0	0	135	135
Total	41	86	33	0	62	88	26	1	14	71	27	0	15	71	15	1	2	549	551
05:00 PM	23	32	10	1	5	14	11	0	5	18	4	0	7	25	11	0	1	165	166
05:15 PM	21	31	5	0	6	10	18	0	9	16	2	0	10	19	3	0	0	150	150
05:30 PM	22	36	5	0	6	12	10	0	3	21	2	0	8	15	8	0	0	148	148
05:45 PM	17	30	6	0	9	7	9	0	8	13	5	0	3	20	13	0	0	140	140
Total	83	129	26	1	26	43	48	0	25	68	13	0	28	79	35	0	1	603	604
Grand Total	235	396	202	4	125	405	222	2	151	451	81	2	165	393	124	4	12	2950	2962
Apprch %	28.2	47.5	24.2		16.6	53.9	29.5		22.1	66	11.9		24.2	57.6	18.2				
Total %	8	13.4	6.8		4.2	13.7	7.5		5.1	15.3	2.7		5.6	13.3	4.2		0.4	99.6	

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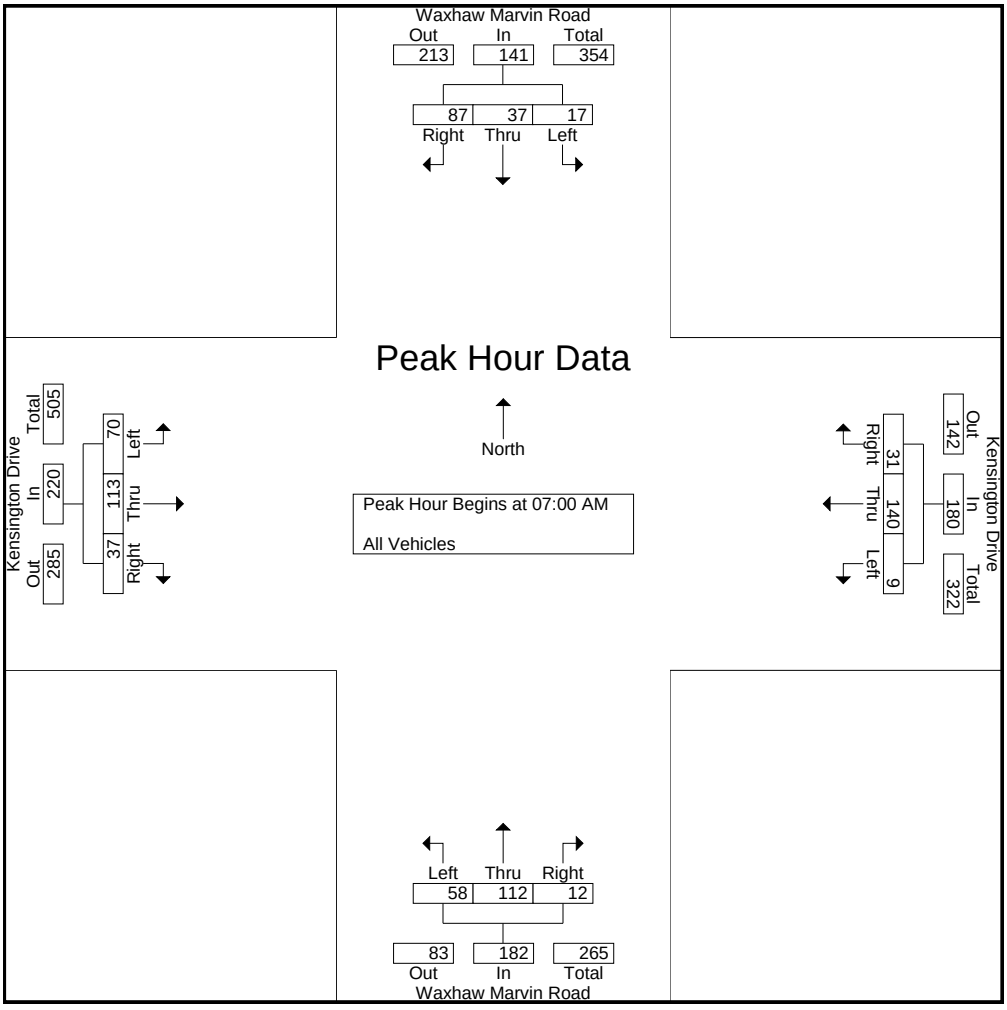
	Waxhaw Marvin Road Southbound				Kensington Drive Westbound				Waxhaw Marvin Road Northbound				Kensington Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	4	2	**40**														
07:15 AM	**3**	**15**	**37**	**55**	**4**	**62**	3	**69**	**32**	21	4	**57**	**43**	**55**	**16**	**114**	**295**
07:30 AM	4	6	4	14	2	26	10	38	6	32	**5**						
07:45 AM	**6**	14	6	26	2	10	**12**	24	3	**40**	**2**	**45**	**4**	**13**	**3**	**20**	**115**
Total Volume	**17**	**37**	**87**	**141**	**9**	**140**	**31**	**180**	**58**	**112**	**12**	**182**	**70**	**113**	**37**	**220**	**723**
% App. Total	**12.1**	**26.2**	**61.7**		**5**	**77.8**	**17.2**		**31.9**	**61.5**	**6.6**		**31.8**	**51.4**	**16.8**		
PHF	**.708**	**.617**	**.544**	**.641**	**.563**	**.565**	**.646**	**.652**	**.453**	**.700**	**.600**	**.798**	**.407**	**.514**	**.578**	**.482**	**.613**



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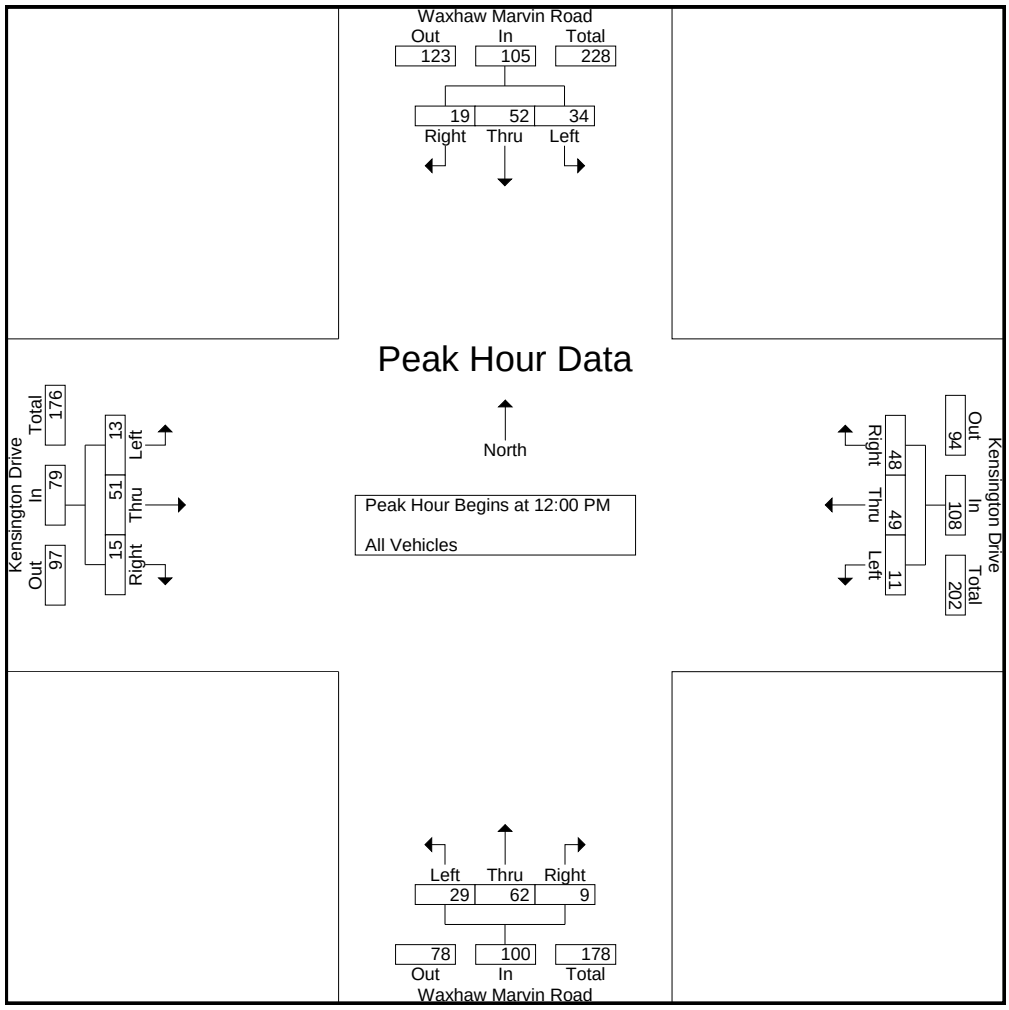
	Waxhaw Marvin Road Southbound				Kensington Drive Westbound				Waxhaw Marvin Road Northbound				Kensington Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	**13**	**19**		**37**	1	13	11	25	8	5	1	14	2	15	5	22	98
12:15 PM	12	15	**8**		**5**	10	10	25	4	18	1	23	3	**16**	1	20	103
12:30 PM	5	7	0	12	0	**15**	12	27	**12**	**26**	**4**	**42**	**4**	14	**6**	**24**	**105**
12:45 PM	4	11	6	21	5	11	**15**	**31**	5	13	3	21	4	6	3	13	86
Total Volume	34	52	19	105	11	49	48	108	29	62	9	100	13	51	15	79	392
% App. Total	32.4	49.5	18.1		10.2	45.4	44.4		29	62	9		16.5	64.6	19		
PHF	.654	.684	.594	.709	.550	.817	.800	.871	.604	.596	.563	.595	.813	.797	.625	.823	.933



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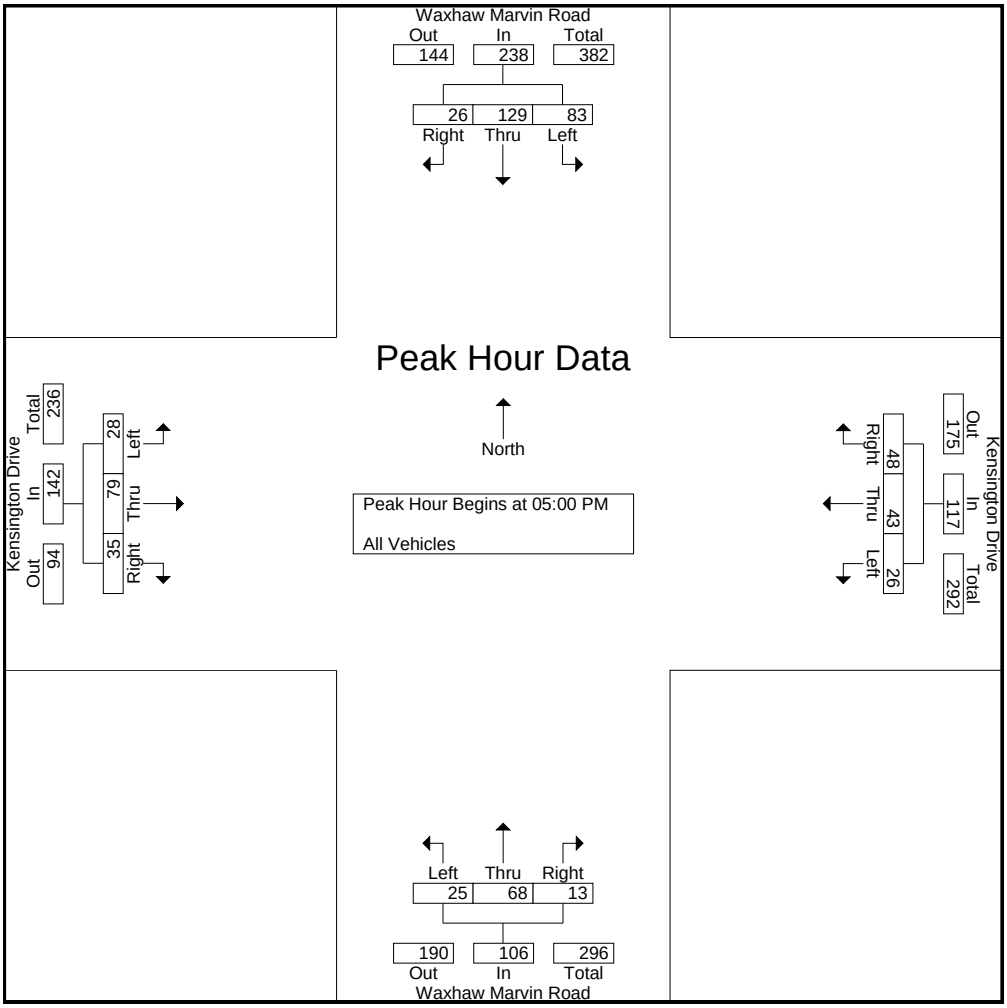
	Waxhaw Marvin Road Southbound				Kensington Drive Westbound				Waxhaw Marvin Road Northbound				Kensington Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**23**	32	**10**	**65**	5	**14**	11	30	5	18	4	**27**	7	**25**	11	**43**	**165**
05:15 PM	21	31	5	57	6	10	**18**	**34**	**9**	16	2	27	**10**	19	3	32	150
05:30 PM	22	**36**								**21**							
05:45 PM	**17**	**30**	**6**	**53**	**9**	7	9	25	8	13	**5**	**26**	**3**	**20**	**13**	36	140
Total Volume	83	129	26	238	26	43	48	117	25	68	13	106	28	79	35	142	603
% App. Total	34.9	54.2	10.9		22.2	36.8	41		23.6	64.2	12.3		19.7	55.6	24.6		
PHF	.902	.896	.650	.915	.722	.768	.667	.860	.694	.810	.650	.981	.700	.790	.673	.826	.914



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File Name : 14 - Marvin&Kensingtons
Site Code : 20080614
Start Date : 10/14/2008
Page No : 1

Groups Printed- Pedestrians

	Waxhaw Marvin Road Southbound				Kensington Drive Westbound				Waxhaw Marvin Road Northbound				Kensington Drive Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
11:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
11:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	3
BREAK																	
12:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
BREAK																	
Total	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
BREAK																	
Grand Total	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4
Apprch %	0	0	0	0	0	0	0	0	0	50	50	0	0	0	0	0	
Total %	0	0	0	0	0	0	0	0	0	50	50	0	0	0	0	0	

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File Name : 14 - Marvin&Kensingtons
Site Code : 20080614
Start Date : 10/14/2008
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Groups Printed- Bicycles

	Waxhaw Marvin Road Southbound				Kensington Drive Westbound				Waxhaw Marvin Road Northbound				Kensington Drive Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
04:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
BREAK																	
04:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Total	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	4
BREAK																	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
BREAK																	
Total	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
Grand Total	0	0	0	0	0	1	1	0	0	0	0	0	3	1	0	0	6
Apprch %	0	0	0	0	0	50	50	0	0	0	0	0	75	25	0	0	
Total %	0	0	0	0	0	16.7	16.7	0	0	0	0	0	50	16.7	0	0	

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File Name : 15 - Marvin&NewTown
Site Code : 00806615
Start Date : 10/16/2008
Page No : 1

Groups Printed- All Vehicles

	Private Driveway Southbound				New Town Road Westbound				Waxhaw Marvin Road Northbound				New Town Road Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	12	87	0	0	83	0	22	1	0	38	19	0	1	261	262
07:15 AM	0	0	0	0	12	134	0	0	74	1	30	0	0	26	21	1	1	298	299
07:30 AM	0	0	0	0	12	94	0	0	81	0	39	1	0	33	19	2	3	278	281
07:45 AM	0	0	0	0	15	92	0	0	83	0	33	2	0	30	13	1	3	266	269
Total	0	0	0	0	51	407	0	0	321	1	124	4	0	127	72	4	8	1103	1111
08:00 AM	0	0	0	0	8	41	0	0	38	0	18	0	0	18	12	0	0	135	135
08:15 AM	0	0	0	0	19	71	0	0	56	0	31	1	0	30	22	1	2	229	231
08:30 AM	0	0	0	0	10	65	0	0	51	0	27	0	0	25	19	2	2	197	199
08:45 AM	0	0	0	0	20	52	0	3	58	0	32	0	0	20	17	0	3	199	202
Total	0	0	0	0	57	229	0	3	203	0	108	1	0	93	70	3	7	760	767
BREAK																			
11:00 AM	0	0	0	0	14	31	0	5	33	0	10	4	0	40	15	3	12	143	155
11:15 AM	0	0	0	0	11	32	0	0	23	0	15	3	0	27	25	3	6	133	139
11:30 AM	0	0	0	0	16	28	0	2	27	0	19	0	0	26	26	0	2	142	144
11:45 AM	0	0	0	0	10	32	0	3	21	0	20	1	0	22	27	2	6	132	138
Total	0	0	0	0	51	123	0	10	104	0	64	8	0	115	93	8	26	550	576
12:00 PM	0	0	0	0	15	36	1	5	22	0	12	0	0	23	21	3	8	130	138
12:15 PM	0	0	0	0	19	25	0	2	21	0	12	1	0	35	28	2	5	140	145
12:30 PM	0	0	0	0	17	22	0	1	30	0	25	5	0	27	23	1	7	144	151
12:45 PM	0	0	0	0	17	22	0	0	35	0	22	3	0	28	22	0	3	146	149
Total	0	0	0	0	68	105	1	8	108	0	71	9	0	113	94	6	23	560	583
BREAK																			
04:00 PM	0	0	0	0	28	45	0	2	26	0	22	1	0	58	49	0	3	228	231
04:15 PM	0	0	0	0	30	25	0	0	30	0	26	3	0	57	63	0	3	231	234
04:30 PM	0	0	0	0	33	44	0	2	30	0	15	1	0	49	60	0	3	231	234
04:45 PM	0	0	0	0	33	28	0	1	26	0	14	0	0	74	74	0	1	249	250
Total	0	0	0	0	124	142	0	5	112	0	77	5	0	238	246	0	10	939	949
05:00 PM	0	0	0	0	39	45	0	1	23	0	17	0	0	87	57	0	1	268	269
05:15 PM	0	0	0	0	39	46	0	0	13	0	15	0	0	87	74	0	0	274	274
05:30 PM	0	0	0	0	34	30	0	0	35	0	33	0	0	82	88	0	0	302	302
05:45 PM	0	1	0	0	30	35	0	0	33	0	14	0	0	83	67	0	0	263	263
Total	0	1	0	0	142	156	0	1	104	0	79	0	0	339	286	0	1	1107	1108
Grand Total	0	1	0	0	493	1162	1	27	952	1	523	27	0	1025	861	21	75	5019	5094
Apprch %	0	100	0		29.8	70.2	0.1		64.5	0.1	35.4		0	54.3	45.7				
Total %	0	0	0		9.8	23.2	0		19	0	10.4		0	20.4	17.2		1.5	98.5	

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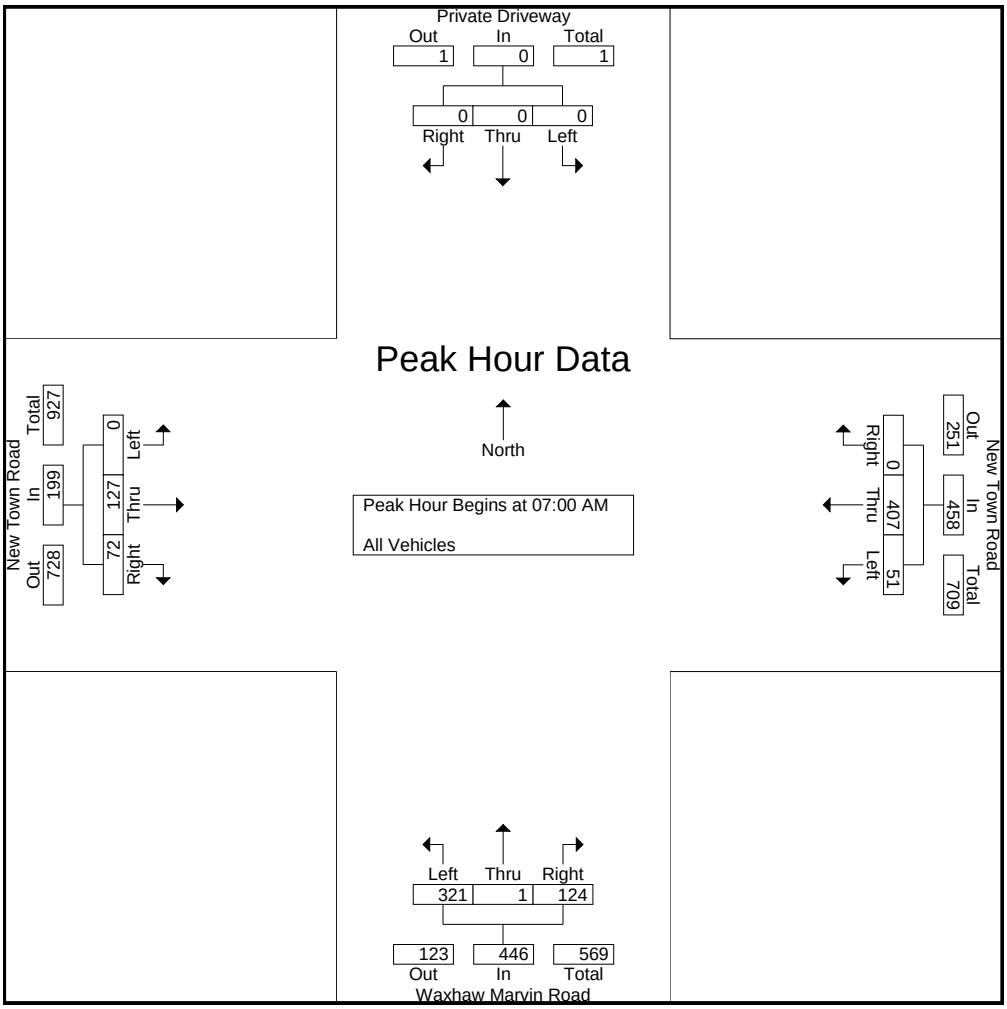
File Name : 15 - Marvin&NewTown
Site Code : 00806615
Start Date : 10/16/2008
Page No : 2

	Private Driveway Southbound				New Town Road Westbound				Waxhaw Marvin Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	12	87	0	99	**83**	0	22	105	0	**38**	19	**57**	261
07:15 AM	0	0	0	0	12	**134**	0	**146**	74	**1**					**21**	47	**298**
07:30 AM	0	0	0	0	12	94	0	106	81	0	**39**	**120**	0	33	19	52	278
07:45 AM	0	0	0	0	**15**	92	0	107	83	0	33	116	0	30	13	43	266
Total Volume	0	0	0	0	51	407	0	458	321	1	124	446	0	127	72	199	1103
% App. Total	0	0	0		11.1	88.9	0		72	0.2	27.8		0	63.8	36.2		
PHF	.000	.000	.000	.000	.850	.759	.000	.784	.967	.250	.795	.929	.000	.836	.857	.873	.925



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File Name : 15 - Marvin&NewTown
Site Code : 00806615
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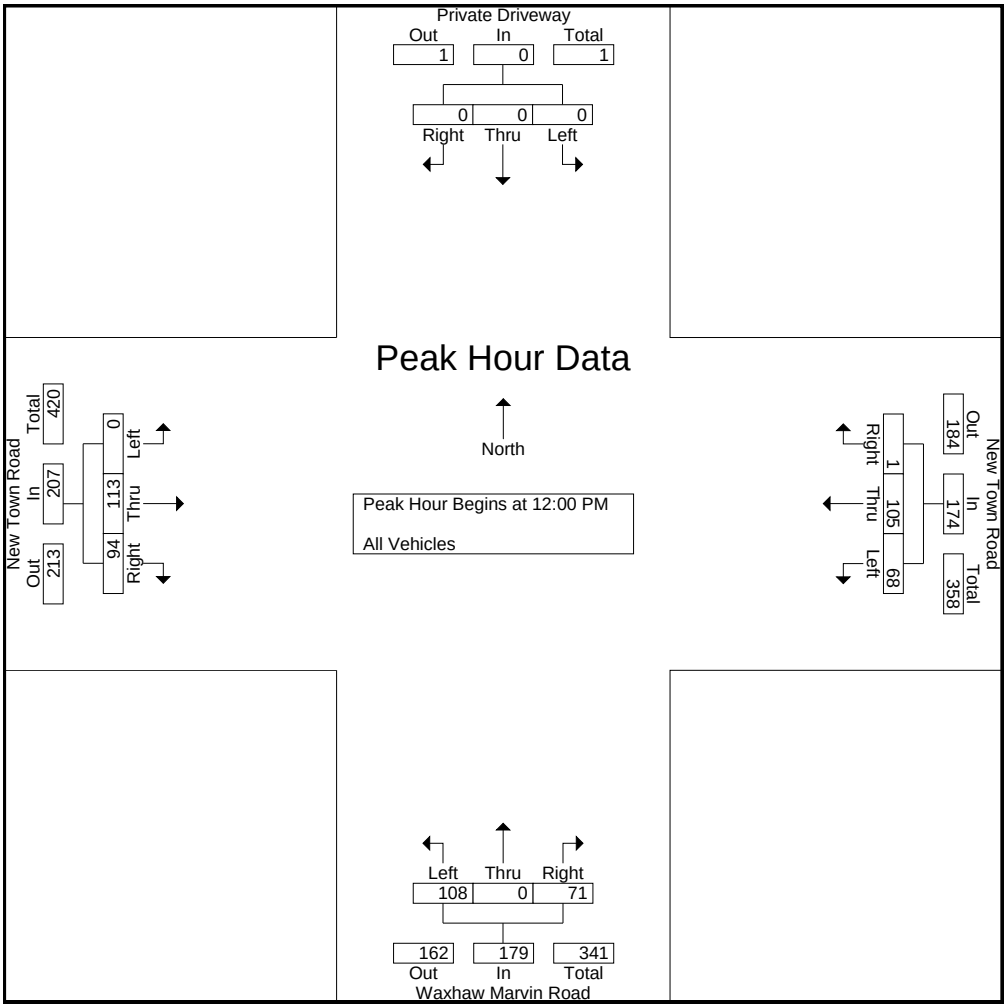
	Private Driveway Southbound				New Town Road Westbound				Waxhaw Marvin Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	0	0	0	15	**36**	**1**	**52**	22	0	12	34	0	23	21	44	130
12:15 PM	0	0	0	0	**19**	25	0	44	21	0	12	33	0	**35**	**28**	**63**	140
12:30 PM	0	0	0	0	17	22	0	39	30	0	**25**						
12:45 PM	**0**	**0**	**0**	**0**	**17**	**22**	**0**	**39**	**35**	0	22	**57**	0	28	22	50	**146**
Total Volume	0	0	0	0	68	105	1	174	108	0	71	179	0	113	94	207	560
% App. Total	0	0	0		39.1	60.3	0.6		60.3	0	39.7		0	54.6	45.4		
PHF	.000	.000	.000	.000	.895	.729	.250	.837	.771	.000	.710	.785	.000	.807	.839	.821	.959



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File Name : 15 - Marvin&NewTown
Site Code : 00806615
Start Date : 10/16/2008
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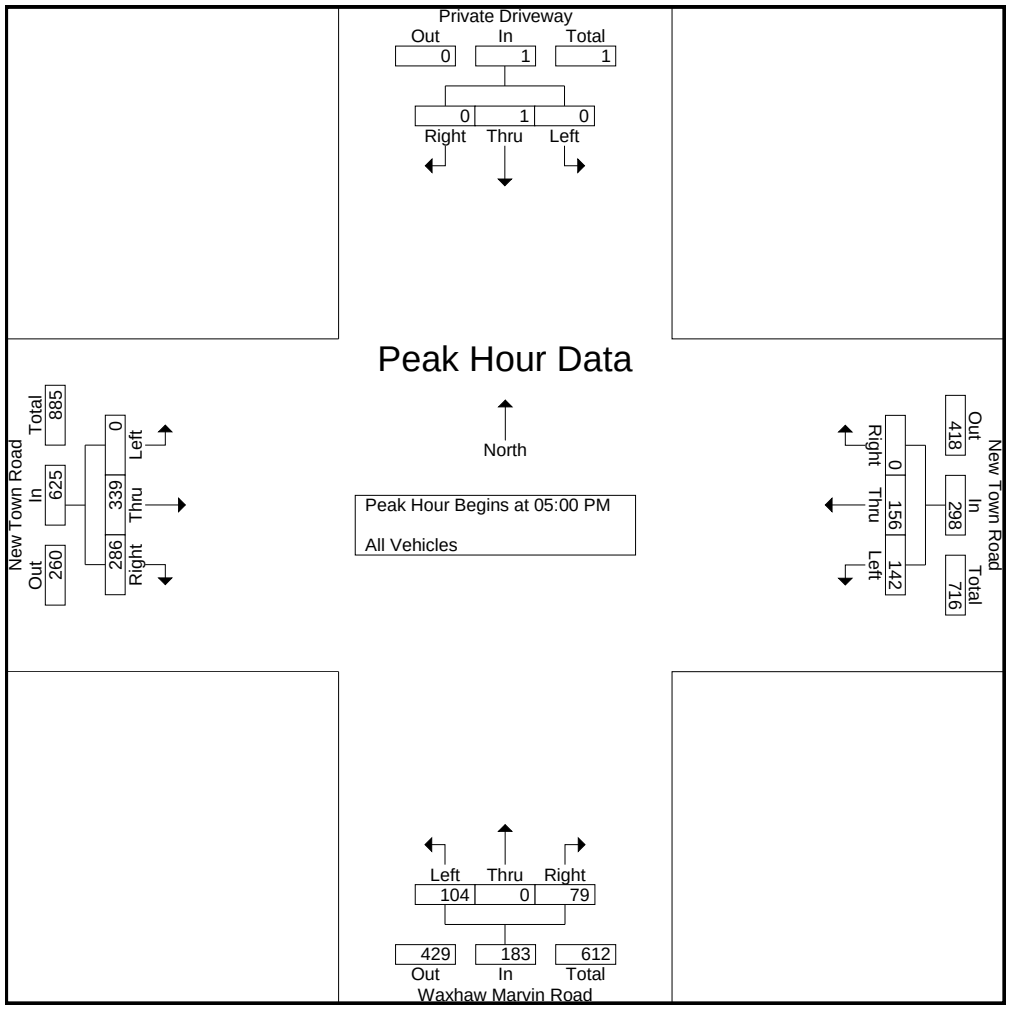
	Private Driveway Southbound				New Town Road Westbound				Waxhaw Marvin Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	**39**	45	0	84	23	0	17	40	0	**87**	57	144	268
05:15 PM	0	0	0	0	39	**46**	0	**85**	13	0	15	28	0	87	74	161	274
05:30 PM	0	0	0	0	34	30	0	64	**35**	0	**33**	**68**	0	82	**88**	**170**	**302**
05:45 PM	0	**1**		**1**	30	35	0	65	33	0	14	47	0	83	67	150	263
Total Volume	0	1	0	1	142	156	0	298	104	0	79	183	0	339	286	625	1107
% App. Total	0	100	0		47.7	52.3	0		56.8	0	43.2		0	54.2	45.8		
PHF	.000	.250	.000	.250	.910	.848	.000	.876	.743	.000	.598	.673	.000	.974	.813	.919	.916



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File Name : 16 - Weddington&TilleyMorris
Site Code : 00000016
Start Date : 10/15/2008
Page No : 1

Groups Printed- All Vehicles

	Private Driveway Southbound				Tilley Morris Road Westbound				Weddington Matthews Road Northbound				Tilley Morris Road Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	27	92	0	2	71	0	45	0	0	18	6	1	3	259	262
07:15 AM	0	0	0	0	21	97	0	2	87	0	52	0	0	22	9	0	2	288	290
07:30 AM	0	0	0	0	27	88	1	1	24	0	57	0	0	26	13	0	1	236	237
07:45 AM	0	0	0	0	45	86	1	1	78	0	51	0	0	40	6	0	1	307	308
Total	0	0	0	0	120	363	2	6	260	0	205	0	0	106	34	1	7	1090	1097
08:00 AM	0	0	0	0	23	85	0	1	55	0	47	0	0	34	13	1	2	257	259
08:15 AM	0	0	0	0	41	88	0	3	38	0	55	0	1	33	12	0	3	268	271
08:30 AM	0	0	0	0	42	89	1	1	47	0	41	0	1	20	8	0	1	249	250
08:45 AM	0	0	0	0	37	73	0	1	45	0	47	0	0	24	16	0	1	242	243
Total	0	0	0	0	143	335	1	6	185	0	190	0	2	111	49	1	7	1016	1023
BREAK																			
11:00 AM	2	0	0	0	16	46	1	3	26	0	27	1	0	24	12	0	4	154	158
11:15 AM	0	1	0	1	33	25	1	1	20	0	39	1	0	31	14	0	3	164	167
11:30 AM	0	0	1	0	15	39	0	1	15	0	35	0	0	40	14	0	1	159	160
11:45 AM	1	0	0	0	20	49	0	0	9	0	31	2	1	38	9	0	2	158	160
Total	3	1	1	1	84	159	2	5	70	0	132	4	1	133	49	0	10	635	645
12:00 PM	1	0	0	0	22	31	0	2	9	0	21	1	0	28	18	0	3	130	133
12:15 PM	1	0	3	0	25	36	2	0	16	0	27	1	0	28	8	0	1	146	147
12:30 PM	0	1	1	0	29	38	0	4	12	2	23	2	2	26	14	1	7	148	155
12:45 PM	0	0	2	0	34	42	0	1	17	0	31	0	1	33	15	0	1	175	176
Total	2	1	6	0	110	147	2	7	54	2	102	4	3	115	55	1	12	599	611
BREAK																			
04:00 PM	0	1	0	0	30	36	1	0	16	0	41	1	1	68	33	0	1	227	228
04:15 PM	2	1	1	0	47	38	0	0	22	1	33	1	0	68	33	0	1	246	247
04:30 PM	0	0	1	0	38	33	0	0	22	0	41	1	1	74	31	0	1	241	242
04:45 PM	0	0	2	0	40	37	0	2	17	1	30	0	0	105	44	0	2	276	278
Total	2	2	4	0	155	144	1	2	77	2	145	3	2	315	141	0	5	990	995
05:00 PM	0	0	2	0	45	43	0	0	18	1	37	0	0	99	60	0	0	305	305
05:15 PM	1	1	1	0	41	42	2	0	16	0	33	0	1	106	84	0	0	328	328
05:30 PM	2	0	0	0	48	35	1	0	15	0	46	0	1	132	74	0	0	354	354
05:45 PM	1	0	0	0	40	38	1	1	9	1	36	0	3	95	46	0	1	270	271
Total	4	1	3	0	174	158	4	1	58	2	152	0	5	432	264	0	1	1257	1258
Grand Total	11	5	14	1	786	1306	12	27	704	6	926	11	13	1212	592	3	42	5587	5629
Apprch %	36.7	16.7	46.7		37.4	62.1	0.6		43	0.4	56.6		0.7	66.7	32.6				
Total %	0.2	0.1	0.3		14.1	23.4	0.2		12.6	0.1	16.6		0.2	21.7	10.6		0.7	99.3	

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Site Code : 00000016
Start Date : 10/15/2008
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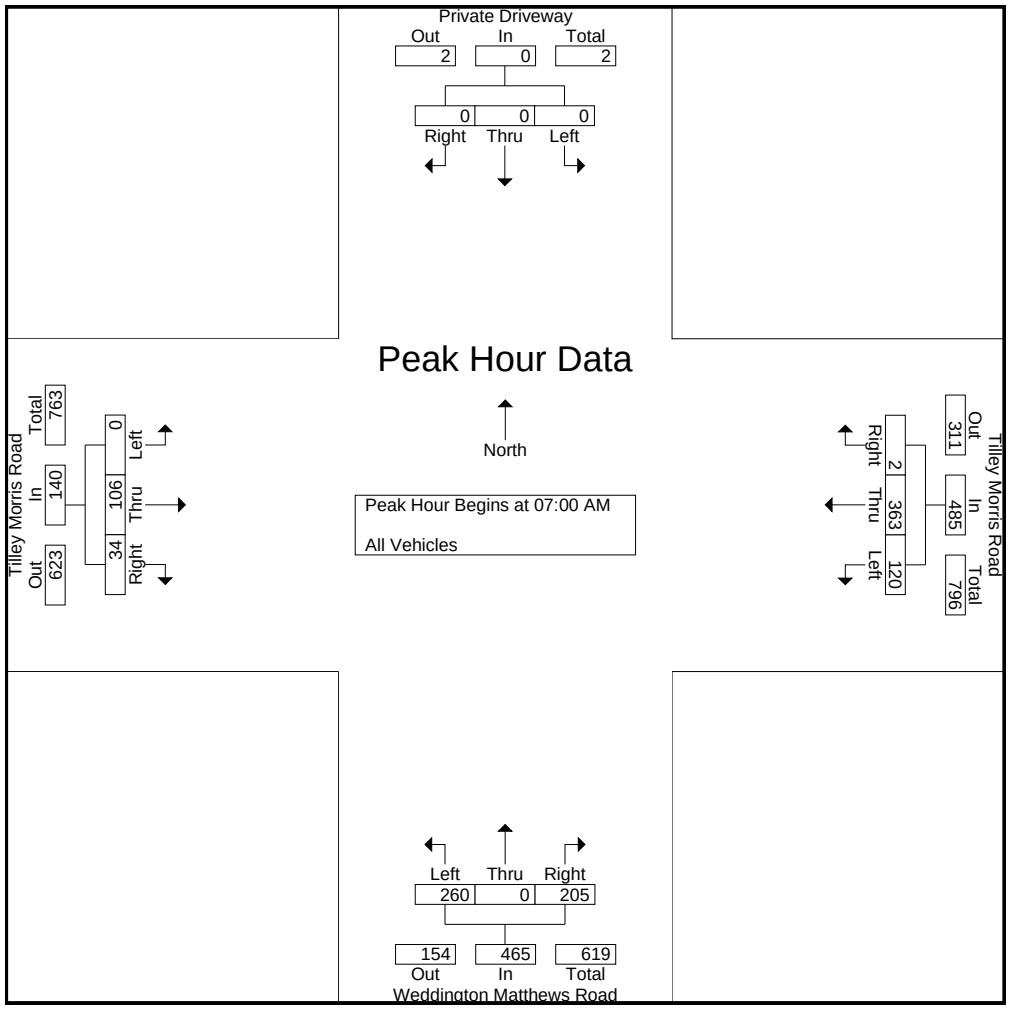
	Private Driveway Southbound				Tilley Morris Road Westbound				Weddington Matthews Road Northbound				Tilley Morris Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	27	92	0	119	71	0	45	116	0	18	6	24	259
07:15 AM	0	0	0	0	21	**97**	0	118	**87**	0	52	**139**	0	22	9	31	288
07:30 AM	0	0	0	0	27	88	**1**	116	24	0	**57**				**13**	39	236
07:45 AM	0	0	0	0	**45**	86	1	**132**	78	0	51	129	0	**40**	6	**46**	**307**
Total Volume	0	0	0	0	120	363	2	485	260	0	205	465	0	106	34	140	1090
% App. Total	0	0	0		24.7	74.8	0.4		55.9	0	44.1		0	75.7	24.3		
PHF	.000	.000	.000	.000	.667	.936	.500	.919	.747	.000	.899	.836	.000	.663	.654	.761	.888



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File Name : 16 - Weddington&TilleyMorris
Site Code : 00000016
Start Date : 10/15/2008
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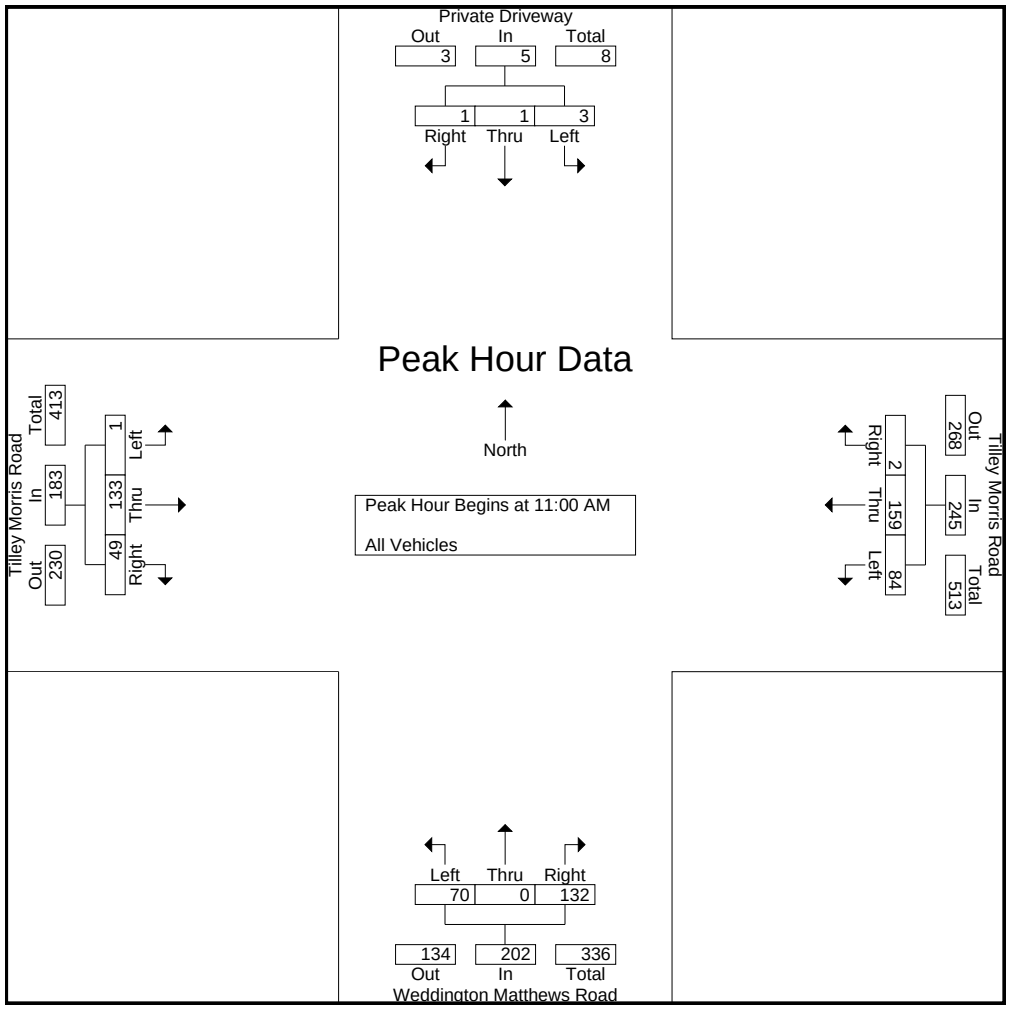
	Private Driveway Southbound				Tilley Morris Road Westbound				Weddington Matthews Road Northbound				Tilley Morris Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00 AM																	
11:00 AM	**2**	0	0	**2**	16	46	**1**	63	**26**	0	27	53	0	24	12	36	154
11:15 AM	0	**1**			**33**	25	1	59	20	0	**39**	**59**	0	31	**14**	45	**164**
11:30 AM	0	0	**1**											**40**	14	**54**	159
11:45 AM	1	0	0	1	20	**49**	0	**69**	9	0	31	40	**1**	38	9	48	158
Total Volume	3	1	1	5	84	159	2	245	70	0	132	202	1	133	49	183	635
% App. Total	60	20	20		34.3	64.9	0.8		34.7	0	65.3		0.5	72.7	26.8		
PHF	.375	.250	.250	.625	.636	.811	.500	.888	.673	.000	.846	.856	.250	.831	.875	.847	.968



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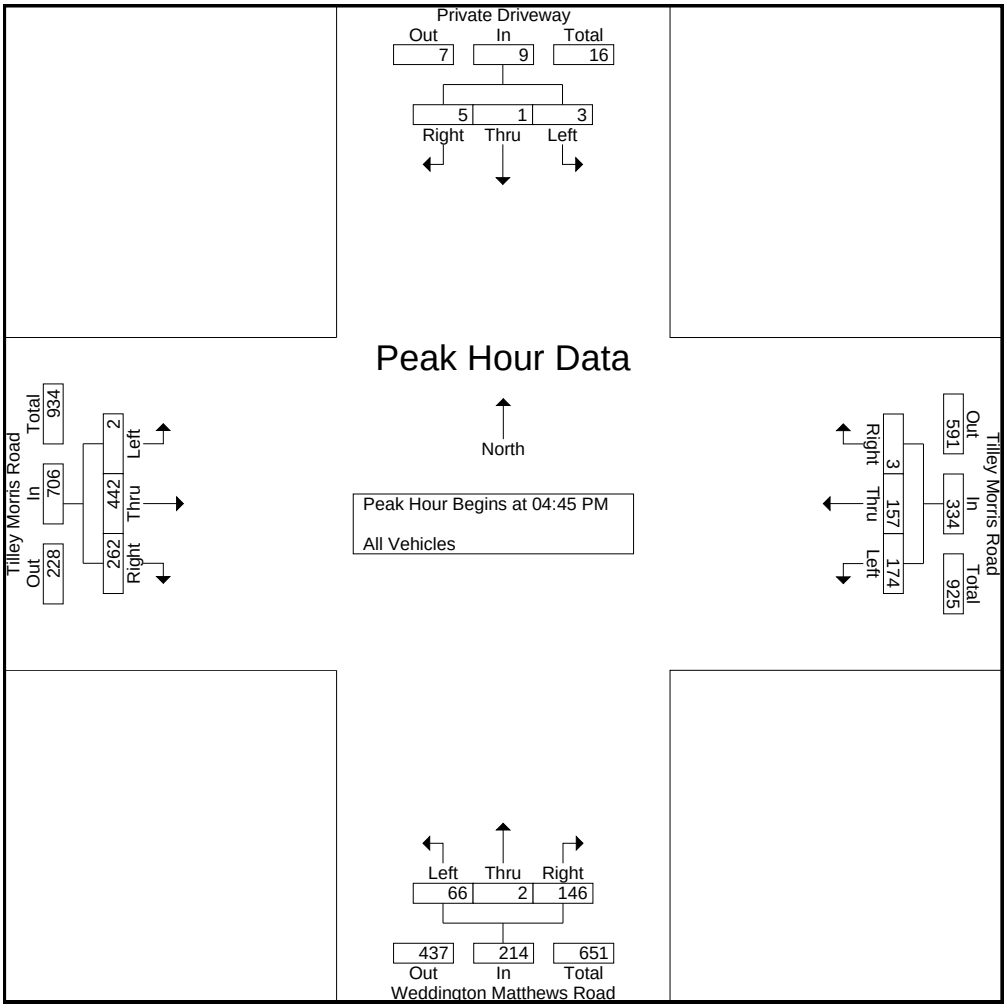
	Private Driveway Southbound				Tilley Morris Road Westbound				Weddington Matthews Road Northbound				Tilley Morris Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	**2**							**1**							
05:00 PM	**0**	**0**	**2**	**2**	**45**	**43**	0	**88**	**18**	1	37	56	0	99	60	159	305
05:15 PM	1	**1**		**3**	41	42	**2**	85	16	0	33	49	**1**	106	**84**	191	328
05:30 PM	**2**	0	0	2	**48**	35	1	84	15	0	**46**	**61**	1	**132**	74	**207**	**354**
Total Volume	3	1	5	9	174	157	3	334	66	2	146	214	2	442	262	706	1263
% App. Total	33.3	11.1	55.6		52.1	47	0.9		30.8	0.9	68.2		0.3	62.6	37.1		
PHF	.375	.250	.625	.750	.906	.913	.375	.949	.917	.500	.793	.877	.500	.837	.780	.853	.892



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File Name : 16 - Weddington&TilleyMorris
Site Code : 00000016
Start Date : 10/15/2008
Page No : 1

Groups Printed- Bicycles

	Private Driveway Southbound				Tilley Morris Road Westbound				Weddington Matthews Road Northbound				Tilley Morris Road Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
12:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
Total	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
04:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
Total	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
Grand Total	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Apprch %	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

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File Name : 17 - WesleyChapel&Potter
Site Code : 00000017
Start Date : 10/13/2008
Page No : 1

Groups Printed- All Vehicles

	Wesley Chapel Road Southbound				Private Driveway Westbound				Wesley Chapel Road Northbound				Potter Road Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	40	50	0	0	0	0	0	62	43	0	0	6	0	29	0	0	230	230
07:15 AM	0	65	56	2	0	0	0	0	90	54	0	0	18	0	37	1	3	320	323
07:30 AM	0	50	48	0	0	0	0	0	79	72	0	0	39	0	29	1	1	317	318
07:45 AM	0	48	56	3	0	0	0	0	89	57	0	0	22	0	20	1	4	292	296
Total	0	203	210	5	0	0	0	0	320	226	0	0	85	0	115	3	8	1159	1167
08:00 AM	0	47	49	0	0	0	0	0	69	42	0	0	22	0	21	0	0	250	250
08:15 AM	0	54	43	0	0	0	0	0	70	34	0	1	20	0	25	0	1	246	247
08:30 AM	0	32	21	0	0	0	0	0	53	26	0	0	10	0	19	2	2	161	163
08:45 AM	0	38	16	1	0	0	0	0	52	23	0	0	3	0	12	0	1	144	145
Total	0	171	129	1	0	0	0	0	244	125	0	1	55	0	77	2	4	801	805
BREAK																			
11:00 AM	0	38	9	1	0	0	0	0	17	22	0	0	12	0	22	0	1	120	121
11:15 AM	0	25	10	0	0	0	0	0	12	19	0	0	13	0	13	0	0	92	92
11:30 AM	0	23	11	0	0	0	0	0	14	23	0	0	4	0	13	1	1	88	89
11:45 AM	0	27	8	0	0	0	0	0	17	22	0	0	8	0	16	0	0	98	98
Total	0	113	38	1	0	0	0	0	60	86	0	0	37	0	64	1	2	398	400
12:00 PM	0	31	11	0	0	0	0	0	12	17	0	0	5	0	12	0	0	88	88
12:15 PM	0	25	9	0	0	0	0	0	19	30	0	0	7	0	11	0	0	101	101
12:30 PM	0	27	11	0	0	0	0	0	24	21	0	1	16	0	20	0	1	119	120
12:45 PM	0	42	19	0	0	0	0	0	17	36	0	1	15	0	19	0	1	148	149
Total	0	125	50	0	0	0	0	0	72	104	0	2	43	0	62	0	2	456	458
BREAK																			
04:00 PM	0	44	26	0	0	0	0	0	23	46	0	2	34	0	46	1	3	219	222
04:15 PM	0	24	16	0	0	0	0	0	30	55	0	0	30	0	51	0	0	206	206
04:30 PM	0	53	22	0	0	0	1	0	17	48	0	1	33	1	57	0	1	232	233
04:45 PM	0	48	24	0	0	0	0	0	33	48	0	0	37	0	51	1	1	241	242
Total	0	169	88	0	0	0	1	0	103	197	0	3	134	1	205	2	5	898	903
05:00 PM	0	59	28	0	0	0	0	0	21	52	0	0	40	0	69	0	0	269	269
05:15 PM	0	70	27	0	0	0	0	0	49	47	0	0	44	0	62	0	0	299	299
05:30 PM	0	60	25	0	0	0	0	0	30	60	1	0	60	1	61	0	0	298	298
05:45 PM	0	44	25	1	0	0	0	0	23	46	0	0	48	0	79	0	1	265	266
Total	0	233	105	1	0	0	0	0	123	205	1	0	192	1	271	0	1	1131	1132
Grand Total	0	1014	620	8	0	0	1	0	922	943	1	6	546	2	794	8	22	4843	4865
Apprch %	0	62.1	37.9		0	0	100		49.4	50.5	0.1		40.7	0.1	59.2				
Total %	0	20.9	12.8		0	0	0		19	19.5	0		11.3	0	16.4		0.5	99.5	

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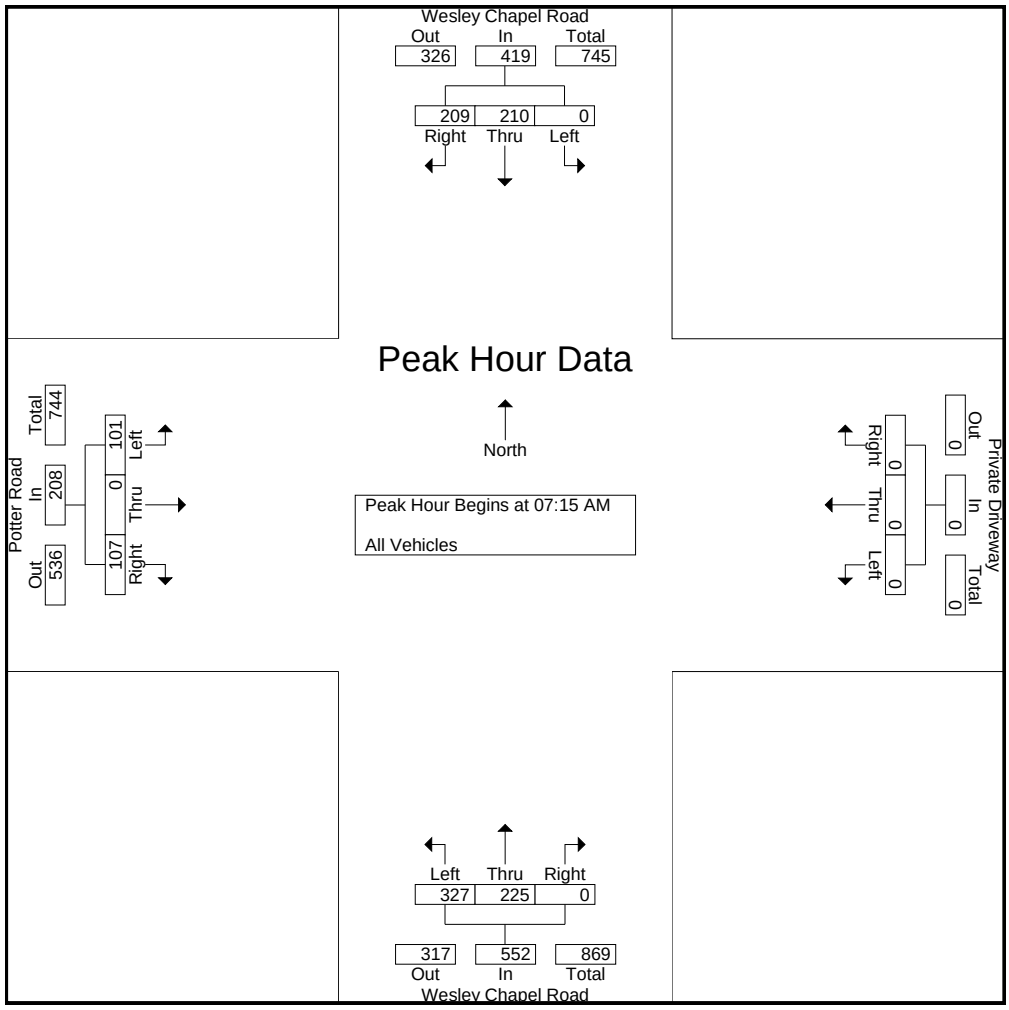
File Name : 17 - WesleyChapel&Potter
Site Code : 00000017
Start Date : 10/13/2008
Page No : 2

	Wesley Chapel Road Southbound				Private Driveway Westbound				Wesley Chapel Road Northbound				Potter Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**65**	**56**	**121**	0	0	0	0	**90**	54	0	144	18	0	**37**	55	**320**
07:30 AM	0	50	48	98	0	0	0	0	79	**72**		**151**	**39**	0	29	**68**	317
07:45 AM	0	48	56	104	0	0	0	0	89	57	0	146	22	0	20	42	292
08:00 AM	0	47	49	96	0	0	0	0	69	42	0	111	22	0	21	43	250
Total Volume	0	210	209	419	0	0	0	0	327	225	0	552	101	0	107	208	1179
% App. Total	0	50.1	49.9		0	0	0		59.2	40.8	0		48.6	0	51.4		
PHF	.000	.808	.933	.866	.000	.000	.000	.000	.908	.781	.000	.914	.647	.000	.723	.765	.921



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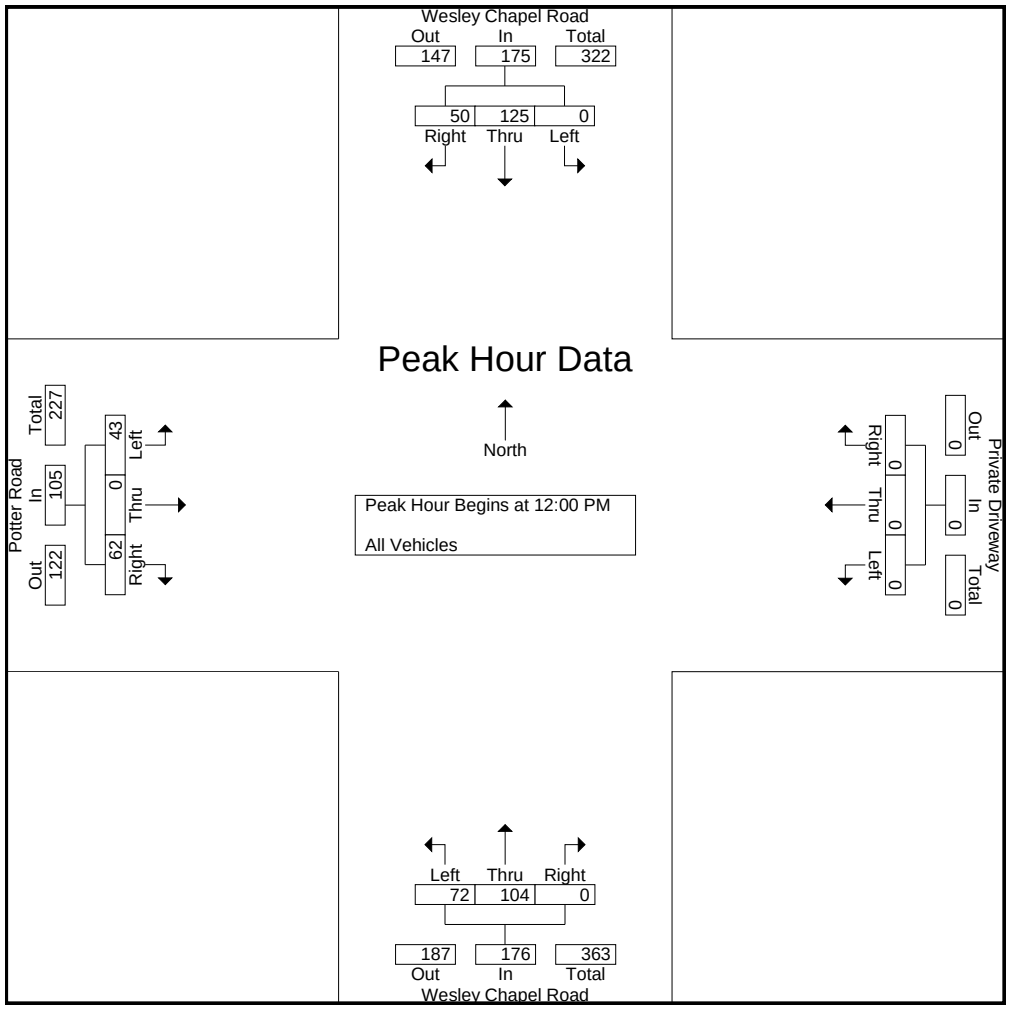
File Name : 17 - WesleyChapel&Potter
Site Code : 00000017
Start Date : 10/13/2008

	Wesley Chapel Road Southbound				Private Driveway Westbound				Wesley Chapel Road Northbound				Potter Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	0	31	11	42	0	0	0	0	12	17	0	29	5	0	12	17	88
12:15 PM	0	25	9	34	0	0	0	0	19	30	0	49	7	0	11	18	101
12:30 PM	0	27	11	38	0	0	0	0	**24**	21	0	45	**16**	0	**20**	**36**	119
12:45 PM	0	**42**	**19**	**61**	0	0	0	0	17	**36**		**53**	15	0	19	34	**148**
Total Volume	0	125	50	175	0	0	0	0	72	104	0	176	43	0	62	105	456
% App. Total	0	71.4	28.6		0	0	0		40.9	59.1	0		41	0	59		
PHF	.000	.744	.658	.717	.000	.000	.000	.000	.750	.722	.000	.830	.672	.000	.775	.729	.770



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File Name : 17 - WesleyChapel&Potter
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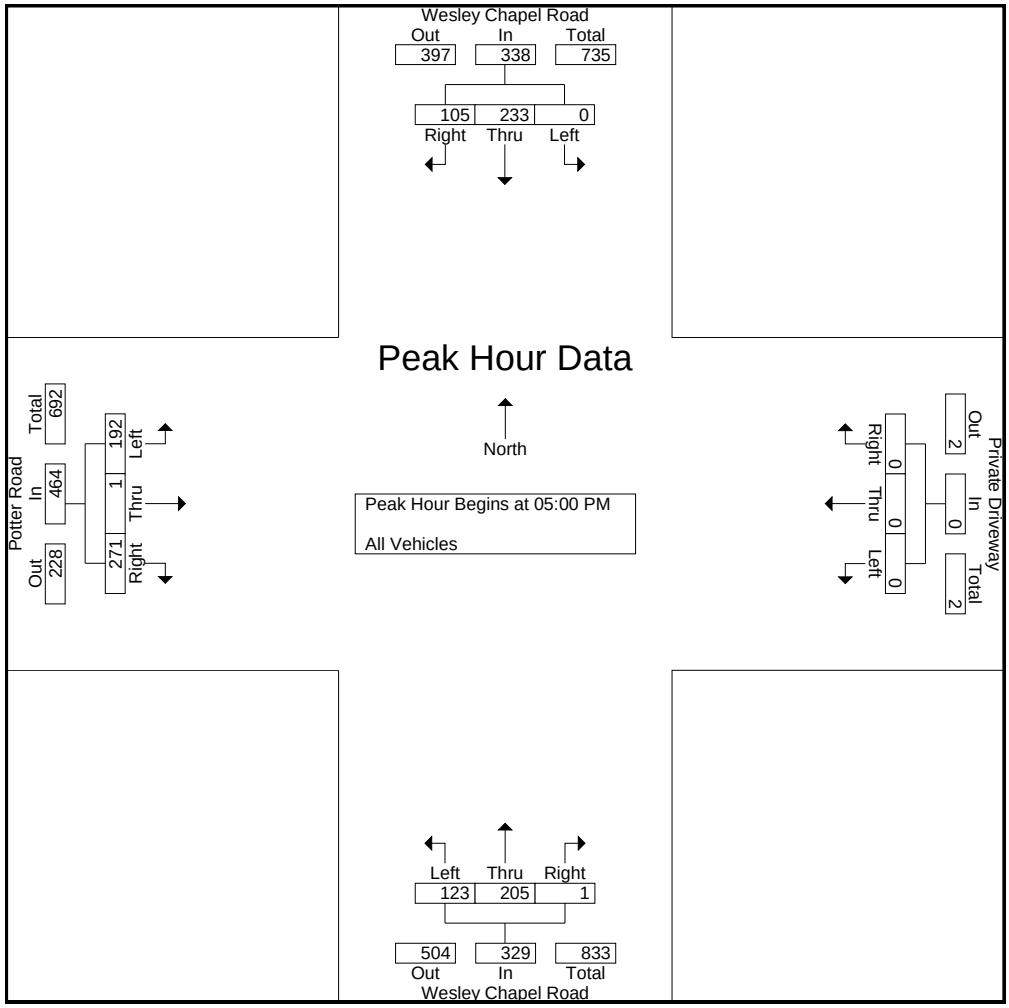
	Wesley Chapel Road Southbound				Private Driveway Westbound				Wesley Chapel Road Northbound				Potter Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	59	**28**														
05:15 PM	**0**	**70**	**27**	**97**	0	0	0	0	**49**	47	0	**96**	44	0	62	106	**299**
05:30 PM	0	60	25	85	0	0	0	0	30	**60**	**1**		**60**	**1**	61	122	298
05:45 PM	0	44	25	69	0	0	0	0	23	46	0	69	48	0	**79**	**127**	265
Total Volume	0	233	105	338	0	0	0	0	123	205	1	329	192	1	271	464	1131
% App. Total	0	68.9	31.1		0	0	0		37.4	62.3	0.3		41.4	0.2	58.4		
PHF	.000	.832	.938	.871	.000	.000	.000	.000	.628	.854	.250	.857	.800	.250	.858	.913	.946



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File Name : 17 - WesleyChapel&Potter
Site Code : 00000017
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Groups Printed- Pedestrians

	Wesley Chapel Road Southbound				Private Driveway Westbound				Wesley Chapel Road Northbound				Potter Road Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
BREAK																	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
BREAK																	
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	

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File Name : 17 - WesleyChapel&Potter
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Groups Printed- Bicycles

	Wesley Chapel Road Southbound				Private Driveway Westbound				Wesley Chapel Road Northbound				Potter Road Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
12:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
Total	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
BREAK																	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
BREAK																	
Grand Total	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
Apprch %	0	100	0	0	0	0	0	0	0	0	0	0	0	100	0	0	
Total %	0	50	0	0	0	0	0	0	0	0	0	0	0	50	0	0	

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File Name : 18 - Providence&Weddington
Site Code : 00000018
Start Date : 10/14/2008
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Groups Printed- All Vehicles

	Providence Road Southbound				Weddington Chapel Road Westbound				Providence Road Northbound				Private Driveway Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	61	65	0	2	113	0	75	1	0	103	58	6	3	6	0	0	9	484	493
07:15 AM	46	90	1	3	113	1	73	2	0	97	80	1	4	8	0	0	6	513	519
07:30 AM	59	102	0	2	118	3	55	1	0	123	75	4	4	7	0	0	7	546	553
07:45 AM	59	99	0	6	103	0	44	4	0	118	65	5	2	5	0	0	15	495	510
Total	225	356	1	13	447	4	247	8	0	441	278	16	13	26	0	0	37	2038	2075
08:00 AM	44	92	1	0	109	3	59	2	0	112	65	4	1	3	0	0	6	489	495
08:15 AM	44	107	5	10	109	4	36	3	0	111	67	6	5	11	0	0	19	499	518
08:30 AM	33	84	0	7	103	4	72	1	1	120	61	3	2	5	1	0	11	486	497
08:45 AM	49	92	0	4	62	1	27	2	0	125	54	9	21	20	21	0	15	472	487
Total	170	375	6	21	383	12	194	8	1	468	247	22	29	39	22	0	51	1946	1997
BREAK																			
11:00 AM	43	80	1	5	46	0	63	2	0	116	50	11	2	0	0	0	18	401	419
11:15 AM	32	88	1	8	67	0	61	3	0	105	48	5	3	0	0	0	16	405	421
11:30 AM	49	83	0	6	50	0	57	6	0	99	48	10	0	0	0	0	22	386	408
11:45 AM	44	78	0	5	49	1	50	4	0	102	52	7	0	0	0	0	16	376	392
Total	168	329	2	24	212	1	231	15	0	422	198	33	5	0	0	0	72	1568	1640
12:00 PM	35	81	0	4	50	0	52	1	0	89	45	3	2	1	1	0	8	356	364
12:15 PM	52	102	2	8	84	1	49	3	0	104	49	6	0	0	1	0	17	444	461
12:30 PM	36	83	0	3	77	1	44	1	0	114	51	4	1	1	1	0	8	409	417
12:45 PM	42	132	0	6	65	0	35	4	0	101	43	11	11	16	32	0	21	477	498
Total	165	398	2	21	276	2	180	9	0	408	188	24	14	18	35	0	54	1686	1740
BREAK																			
04:00 PM	88	129	1	4	89	0	60	4	0	102	83	5	2	2	0	0	13	556	569
04:15 PM	80	108	0	4	76	0	57	1	0	105	89	5	5	3	2	0	10	525	535
04:30 PM	83	117	0	4	87	2	56	3	0	92	97	2	3	2	0	0	9	539	548
04:45 PM	75	123	1	3	88	0	65	4	0	93	88	4	6	10	0	0	11	549	560
Total	326	477	2	15	340	2	238	12	0	392	357	16	16	17	2	0	43	2169	2212
05:00 PM	86	99	1	2	93	1	72	2	0	78	106	1	5	2	0	0	5	543	548
05:15 PM	73	100	8	3	86	1	92	0	0	92	109	4	8	3	0	0	7	572	579
05:30 PM	81	106	1	1	104	0	70	1	0	81	115	3	3	5	0	0	5	566	571
05:45 PM	84	111	0	0	102	2	61	0	0	96	124	1	3	10	0	0	1	593	594
Total	324	416	10	6	385	4	295	3	0	347	454	9	19	20	0	0	18	2274	2292
Grand Total	1378	2351	23	100	2043	25	1385	55	1	2478	1722	120	96	120	59	0	275	11681	11956
Apprch %	36.7	62.7	0.6		59.2	0.7	40.1		0	59	41		34.9	43.6	21.5				
Total %	11.8	20.1	0.2		17.5	0.2	11.9		0	21.2	14.7		0.8	1	0.5		2.3	97.7	

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File Name : 18 - Providence&Weddington
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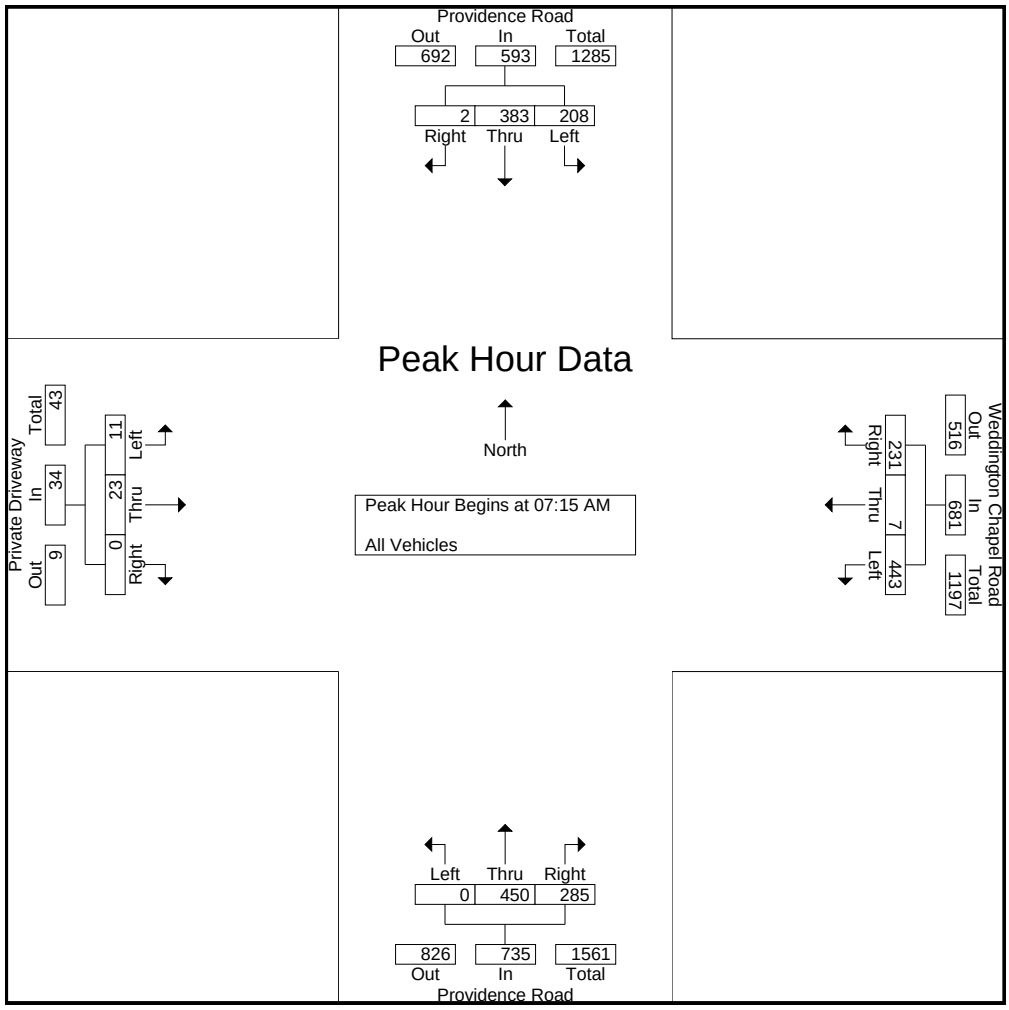
	Providence Road Southbound				Weddington Chapel Road Westbound				Providence Road Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	46	90	**1**				**73**	**187**	0	97	**80**		**4**	**8**	0	**12**	513
07:30 AM	**59**	**102**		**161**	**118**	**3**	55	176	0	**123**		**198**	4	7	0	11	**546**
07:45 AM	59	99	0	158	103	0	44	147	0	118	65	183	2	5	0	7	495
08:00 AM	44	92	1	137	109	3	59	171	0	112	65	177	1	3	0	4	489
Total Volume	208	383	2	593	443	7	231	681	0	450	285	735	11	23	0	34	2043
% App. Total	35.1	64.6	0.3		65.1	1	33.9		0	61.2	38.8		32.4	67.6	0		
PHF	.881	.939	.500	.921	.939	.583	.791	.910	.000	.915	.891	.928	.688	.719	.000	.708	.935



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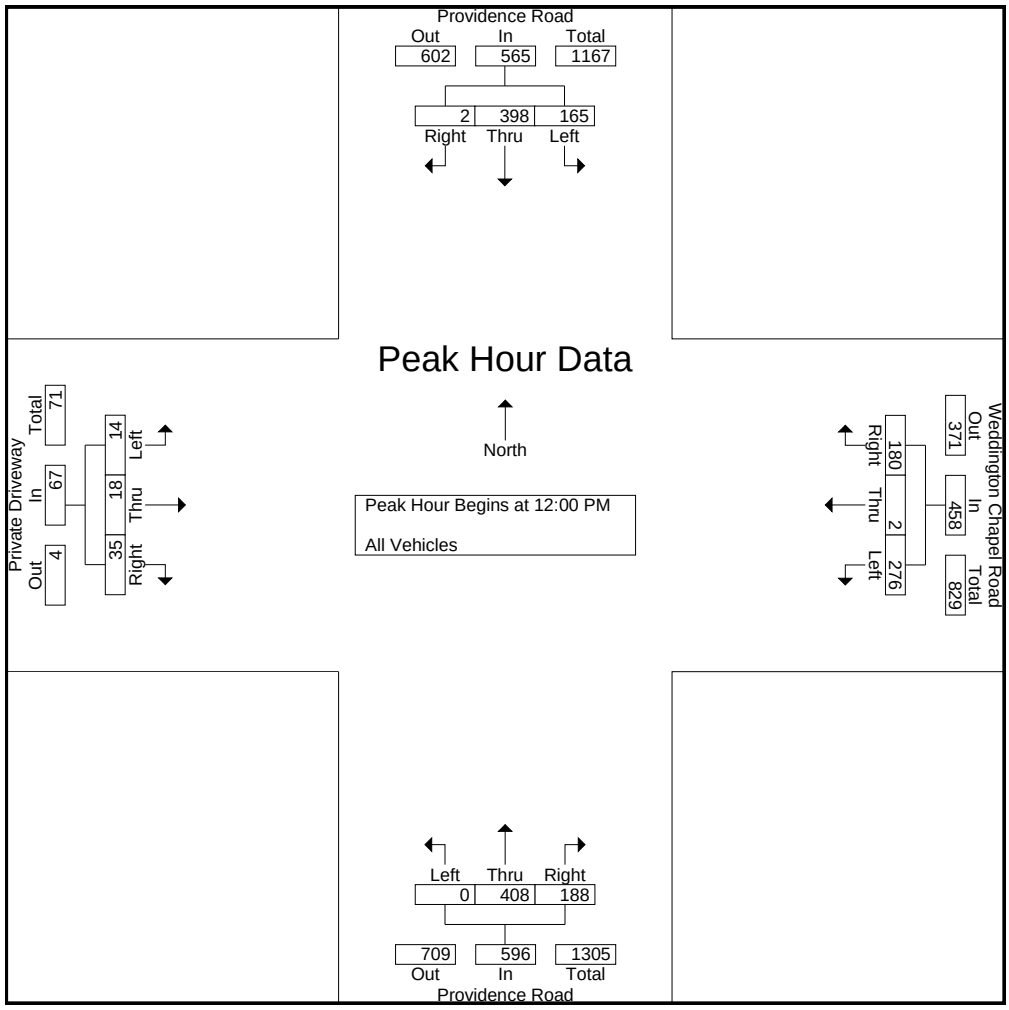
	Providence Road Southbound				Weddington Chapel Road Westbound				Providence Road Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	35	81	0	116	50	0	**52**	102	0	89	45	134	2	1	1	4	356
12:15 PM	**52**	102	**2**		**84**	**1**	49	**134**	0	104	49	153	0	0	1	1	444
12:30 PM	36	83	0	119	77	1	44	122	0	**114**	**51**	**165**	1	1	1	3	409
12:45 PM	42	**132**		**174**	65	0	35	100	0	101	43	144	**11**	**16**	**32**	**59**	**477**
Total Volume	165	398	2	565	276	2	180	458	0	408	188	596	14	18	35	67	1686
% App. Total	29.2	70.4	0.4		60.3	0.4	39.3		0	68.5	31.5		20.9	26.9	52.2		
PHF	.793	.754	.250	.812	.821	.500	.865	.854	.000	.895	.922	.903	.318	.281	.273	.284	.884



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File Name : 18 - Providence&Weddington
Site Code : 00000018
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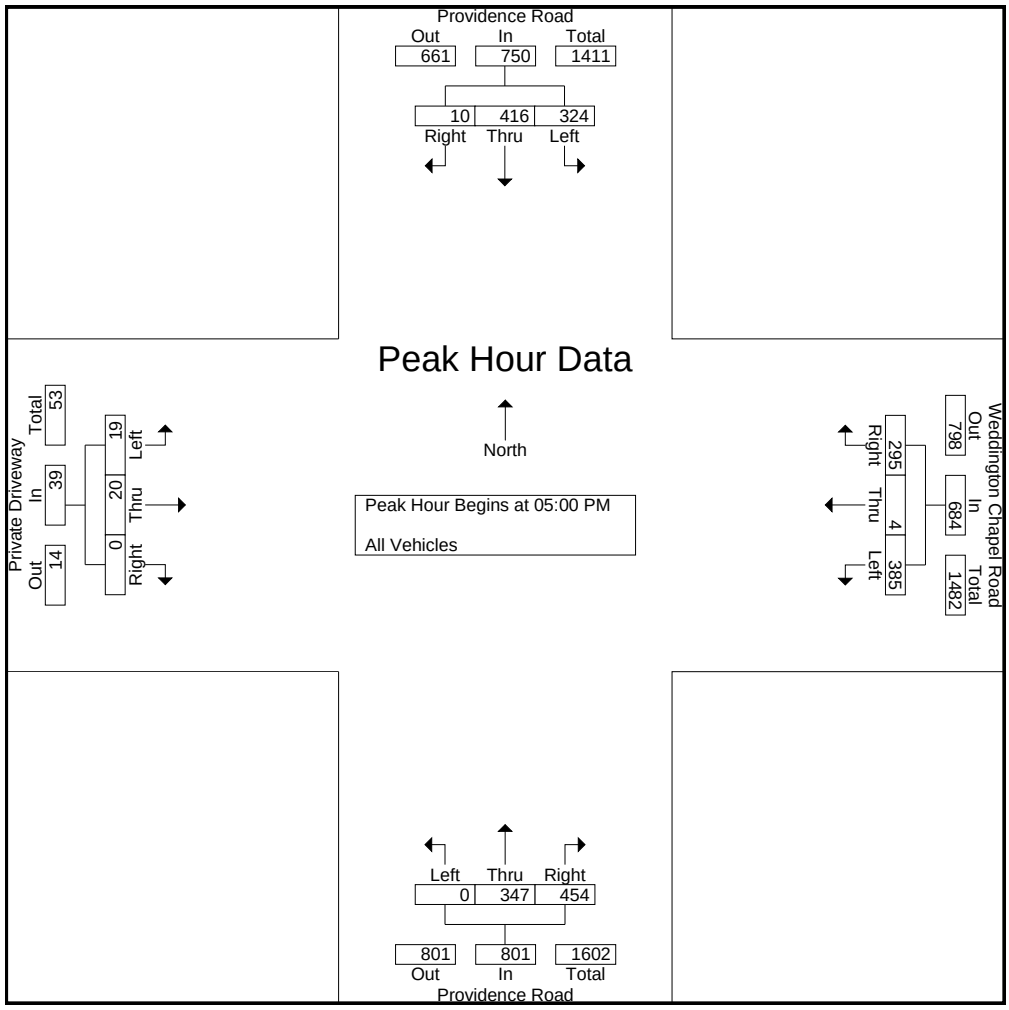
	Providence Road Southbound				Weddington Chapel Road Westbound				Providence Road Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**86**	99	1	186	93	1	72	166	0	78	106	184	5	2	0	7	543
05:15 PM	73	100	**8**				**92**	**179**	0	92	109	201	**8**	3	0	11	572
05:30 PM	81	106	1	188	**104**	0	70	174	0	81	115	196	3	5	0	8	566
05:45 PM	84	**111**		**195**	102	**2**	61	165	0	**96**	**124**	**220**	3	**10**	0	**13**	**593**
Total Volume	324	416	10	750	385	4	295	684	0	347	454	801	19	20	0	39	2274
% App. Total	43.2	55.5	1.3		56.3	0.6	43.1		0	43.3	56.7		48.7	51.3	0		
PHF	.942	.937	.313	.962	.925	.500	.802	.955	.000	.904	.915	.910	.594	.500	.000	.750	.959



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File Name : 18 - Providence&Weddington
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Groups Printed- Pedestrians

	Providence Road Southbound				Weddington Chapel Road Westbound				Providence Road Northbound				Private Driveway Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
07:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
BREAK																	
08:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
BREAK																	
Total	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
BREAK																	
Grand Total	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4
Apprch %	0	100	0	0	0	0	0	0	0	100	0	0	0	0	0	0	
Total %	0	50	0	0	0	0	0	0	0	50	0	0	0	0	0	0	

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File Name : 19 - WaxhawIndian&NewTown
Site Code : 20080619
Start Date : 10/15/2008
Page No : 1

Groups Printed- All Vehicels

	Waxhaw Indian Trail Road Southbound				New Town Road Westbound				Waxhaw Indian Trail Road Northbound				New Town Road Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	45	9	0	49	41	10	0	18	63	15	0	5	6	20	0	0	281	281
07:15 AM	0	47	10	1	46	42	15	0	30	74	40	1	10	15	30	0	2	359	361
07:30 AM	5	21	19	1	15	51	12	0	12	56	15	0	9	23	5	1	2	243	245
07:45 AM	5	24	19	1	5	58	2	0	12	43	4	0	17	21	3	1	2	213	215
Total	10	137	57	3	115	192	39	0	72	236	74	1	41	65	58	2	6	1096	1102
08:00 AM	3	23	14	0	5	36	11	1	6	26	5	0	20	8	3	1	2	160	162
08:15 AM	2	23	16	0	9	33	4	0	6	29	3	0	7	18	4	0	0	154	154
08:30 AM	3	26	18	1	2	25	5	0	1	31	2	1	8	5	12	0	2	138	140
08:45 AM	2	20	8	0	10	25	7	0	10	30	4	0	14	15	3	1	1	148	149
Total	10	92	56	1	26	119	27	1	23	116	14	1	49	46	22	2	5	600	605
BREAK																			
11:00 AM	3	23	7	0	8	13	3	0	0	19	4	1	10	7	2	2	3	99	102
11:15 AM	3	16	9	2	2	14	6	1	2	18	0	0	5	13	1	0	3	89	92
11:30 AM	3	16	12	0	7	13	7	1	4	24	2	0	7	3	2	2	3	100	103
11:45 AM	3	26	11	2	3	14	5	0	1	20	2	0	9	12	6	1	3	112	115
Total	12	81	39	4	20	54	21	2	7	81	8	1	31	35	11	5	12	400	412
12:00 PM	8	22	12	1	2	12	6	0	0	12	7	0	7	5	0	3	4	93	97
12:15 PM	10	20	4	0	5	16	3	1	5	25	2	1	8	8	2	0	2	108	110
12:30 PM	6	27	11	0	2	9	9	0	1	16	5	0	7	8	3	0	0	104	104
12:45 PM	4	26	10	0	6	10	4	0	1	31	2	0	15	9	3	2	2	121	123
Total	28	95	37	1	15	47	22	1	7	84	16	1	37	30	8	5	8	426	434
BREAK																			
04:00 PM	8	26	11	0	5	13	5	1	4	39	7	1	11	21	8	0	2	158	160
04:15 PM	11	26	17	0	8	18	11	0	6	33	7	0	19	16	7	2	2	179	181
04:30 PM	6	46	12	0	6	16	5	0	8	40	7	0	15	18	8	0	0	187	187
04:45 PM	7	56	9	0	7	16	7	0	6	30	10	0	15	22	8	0	0	193	193
Total	32	154	49	0	26	63	28	1	24	142	31	1	60	77	31	2	4	717	721
05:00 PM	5	42	13	0	6	18	7	1	6	42	9	0	26	28	4	0	1	206	207
05:15 PM	12	48	16	0	9	19	7	0	3	33	10	0	18	39	4	0	0	218	218
05:30 PM	11	39	16	0	9	11	12	0	1	32	9	0	20	34	7	0	0	201	201
05:45 PM	7	44	11	0	10	21	9	0	7	48	8	0	23	49	8	1	1	245	246
Total	35	173	56	0	34	69	35	1	17	155	36	0	87	150	23	1	2	870	872
Grand Total	127	732	294	9	236	544	172	6	150	814	179	5	305	403	153	17	37	4109	4146
Apprch %	11	63.5	25.5		24.8	57.1	18.1		13.1	71.2	15.7		35.4	46.8	17.8				
Total %	3.1	17.8	7.2		5.7	13.2	4.2		3.7	19.8	4.4		7.4	9.8	3.7		0.9	99.1	

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Site Code : 20080619
Start Date : 10/15/2008
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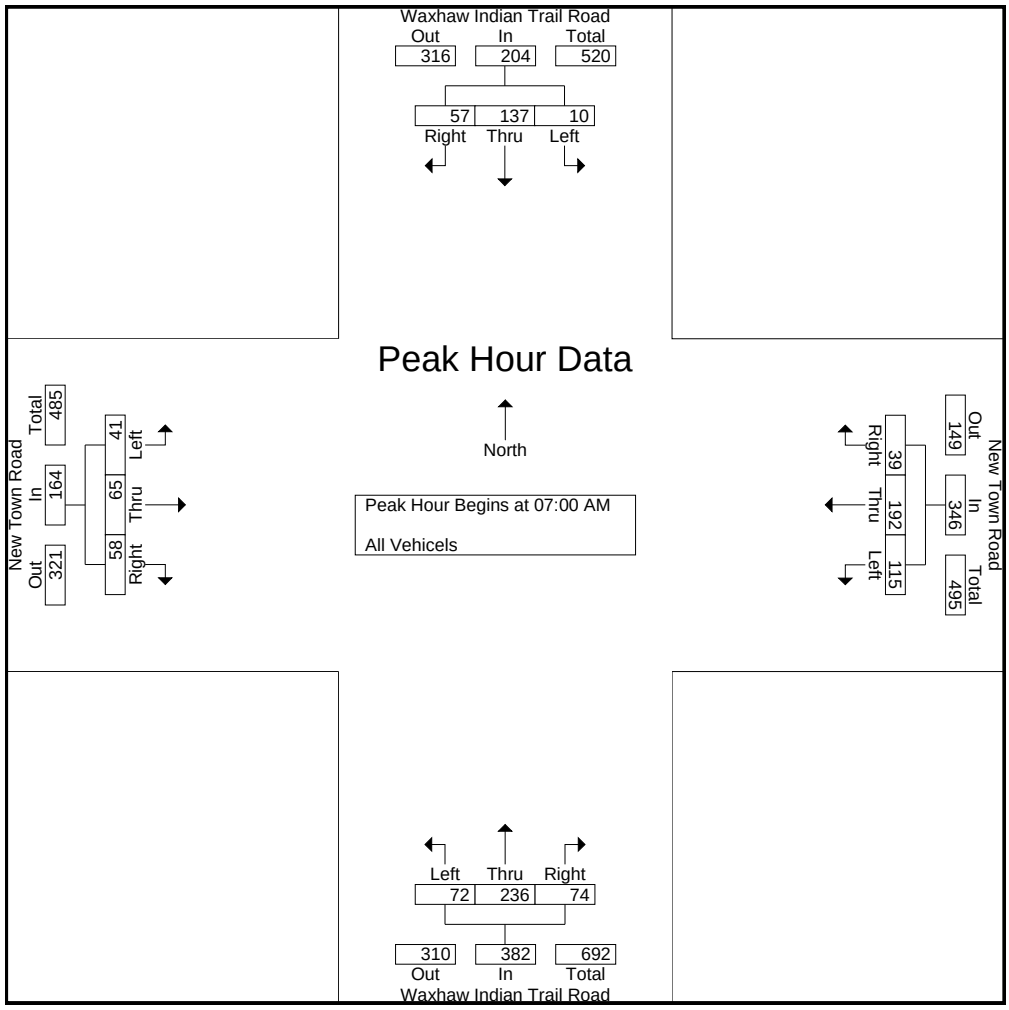
	Waxhaw Indian Trail Road Southbound				New Town Road Westbound				Waxhaw Indian Trail Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	45	9	54	**49**	41	10	100	18	63	15	96	5	6	20	31	281
07:15 AM	0	**47**		**57**	46	42	**15**	**103**	**30**	**74**	**40**	**144**	10	15	**30**	**55**	**359**
07:30 AM	**5**	21	**19**											**23**	5	37	243
07:45 AM	5	24	19	48	5	**58**	2	65	12	43	4	59	**17**	21	3	41	213
Total Volume	10	137	57	204	115	192	39	346	72	236	74	382	41	65	58	164	1096
% App. Total	4.9	67.2	27.9		33.2	55.5	11.3		18.8	61.8	19.4		25	39.6	35.4		
PHF	.500	.729	.750	.895	.587	.828	.650	.840	.600	.797	.463	.663	.603	.707	.483	.745	.763



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File Name : 19 - WaxhawIndian&NewTown
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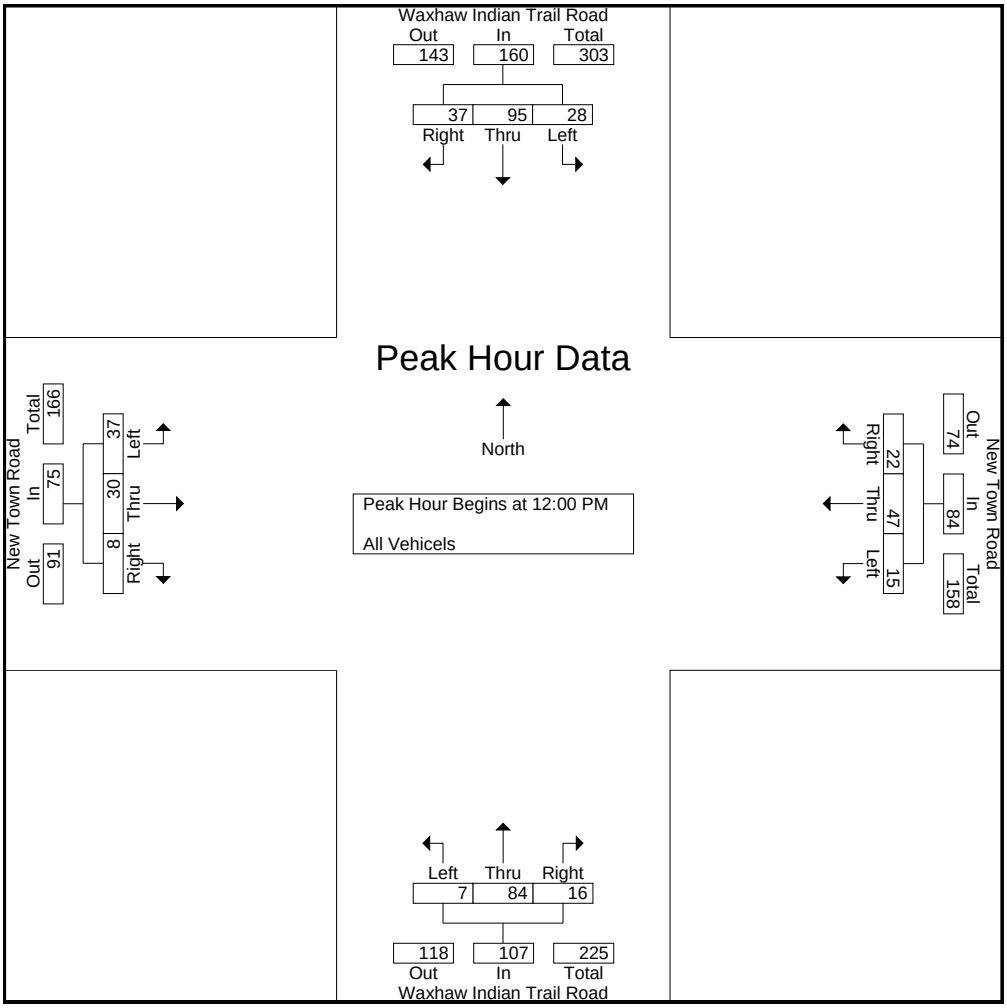
	Waxhaw Indian Trail Road Southbound				New Town Road Westbound				Waxhaw Indian Trail Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	8	22	**12**								**7**						
12:15 PM	**10**	20	4	34	5	**16**	3	**24**	**5**	25	2	32	8	8	2	18	108
12:30 PM	6	**27**		**44**	2	9	**9**	20	1	16	5	22	7	8	**3**	18	104
12:45 PM	4	26	10	40	**6**	10	4	20	1	**31**		**34**	**15**	**9**	3	**27**	**121**
Total Volume	28	95	37	160	15	47	22	84	7	84	16	107	37	30	8	75	426
% App. Total	17.5	59.4	23.1		17.9	56	26.2		6.5	78.5	15		49.3	40	10.7		
PHF	.700	.880	.771	.909	.625	.734	.611	.875	.350	.677	.571	.787	.617	.833	.667	.694	.880



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File Name : 19 - WaxhawIndian&NewTown
Site Code : 20080619
Start Date : 10/15/2008
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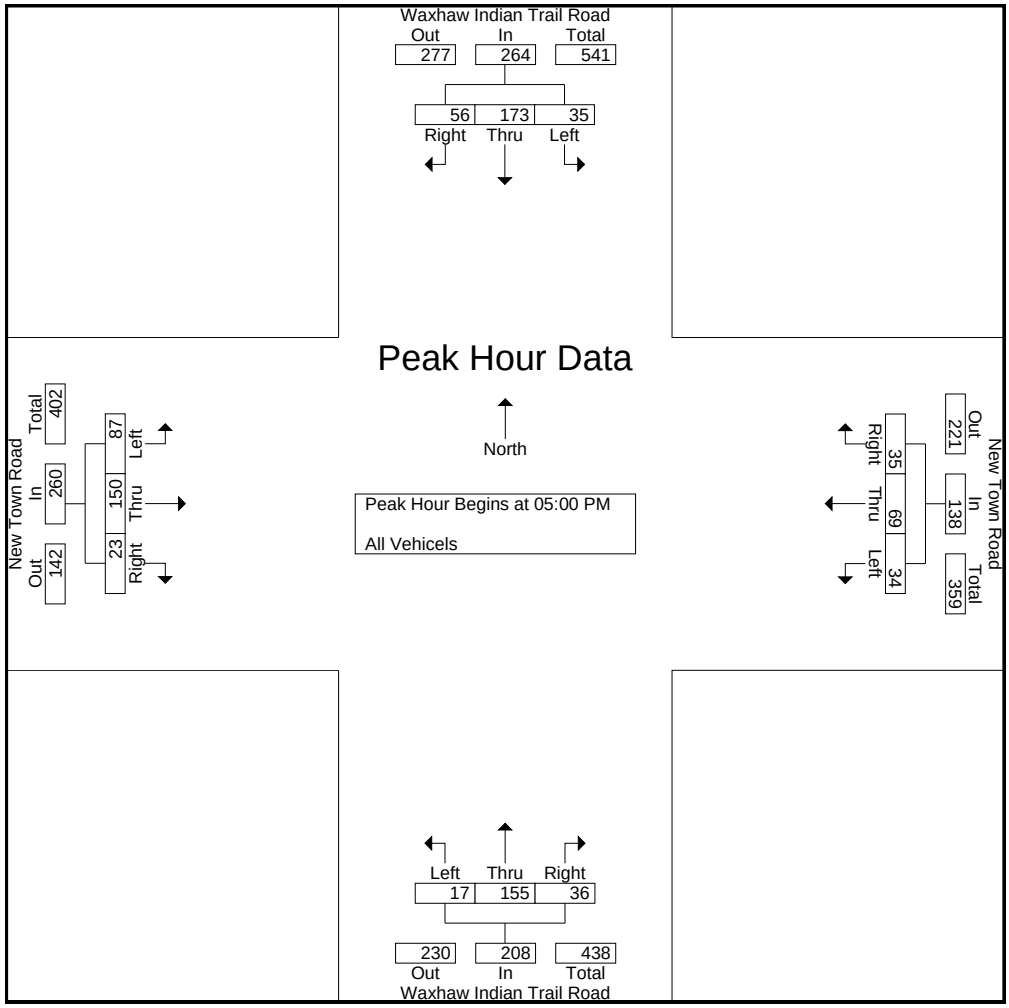
	Waxhaw Indian Trail Road Southbound				New Town Road Westbound				Waxhaw Indian Trail Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	5	42	13	60	6	18	7	31	6	42	9	57	**26**	28	4	58	206
05:15 PM	**12**	**48**	**16**	**76**	9	19	7	35	3	33	**10**						
05:30 PM	**11**	**39**	**16**	**66**	**9**	**11**	**12**	32	1	32	9	42	20	34	7	61	201
05:45 PM	7	44	11	62	**10**	**21**	9	**40**	**7**	**48**		**63**	23	**49**	**8**	**80**	**245**
Total Volume	35	173	56	264	34	69	35	138	17	155	36	208	87	150	23	260	870
% App. Total	13.3	65.5	21.2		24.6	50	25.4		8.2	74.5	17.3		33.5	57.7	8.8		
PHF	.729	.901	.875	.868	.850	.821	.729	.863	.607	.807	.900	.825	.837	.765	.719	.813	.888



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File Name : 19 - WaxhawIndian&NewTown
Site Code : 20080619
Start Date : 10/15/2008
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Groups Printed- Bicycles

	Waxhaw Indian Trail Road Southbound				New Town Road Westbound				Waxhaw Indian Trail Road Northbound				New Town Road Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
11:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
12:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
04:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
Grand Total	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
Apprch %	50	50	0	0	0	100	0	0	0	0	0	0	0	0	0	0	
Total %	33.3	33.3	0	0	0	33.3	0	0	0	0	0	0	0	0	0	0	

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File Name : 20 - Waxham&Weddington
Site Code : 20080620
Start Date : 10/17/2008
Page No : 1

Groups Printed- All Vehicles

	Waham Indian Trail Road Southbound				NC 84 (Monroe Wedington Road) Westbound				Waham Indian Trail Road Northbound				NC 84 (Monroe Wedington Road) Eastbound						
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	10	22	11	0	21	120	2	0	80	72	12	0	4	53	11	0	0	418	418
07:15 AM	12	13	23	1	15	153	7	0	82	83	24	0	10	66	18	1	2	506	508
07:30 AM	5	36	22	1	24	150	4	2	87	93	18	0	17	100	24	0	3	580	583
07:45 AM	6	30	21	0	13	109	4	2	74	95	22	0	11	112	15	1	3	512	515
Total	33	101	77	2	73	532	17	4	323	343	76	0	42	331	68	2	8	2016	2024
08:00 AM	6	23	8	0	16	77	6	1	60	52	16	1	17	106	44	0	2	431	433
08:15 AM	9	34	17	2	19	114	5	2	66	53	11	0	8	67	21	1	5	424	429
08:30 AM	5	35	20	0	20	91	5	1	64	62	9	0	7	88	34	1	2	440	442
08:45 AM	9	31	11	0	15	61	8	3	51	49	21	0	13	62	19	6	9	350	359
Total	29	123	56	2	70	343	24	7	241	216	57	1	45	323	118	8	18	1645	1663
BREAK																			
11:00 AM	4	20	6	0	12	44	3	3	34	41	12	3	9	67	18	2	8	270	278
11:15 AM	5	25	3	0	5	38	3	4	24	23	11	1	7	44	8	3	8	196	204
11:30 AM	8	32	6	1	9	54	6	2	35	32	13	0	12	47	13	3	6	267	273
11:45 AM	6	39	5	0	11	47	8	6	39	32	6	0	6	49	13	0	6	261	267
Total	23	116	20	1	37	183	20	15	132	128	42	4	34	207	52	8	28	994	1022
12:00 PM	4	27	3	3	14	31	4	0	32	35	12	1	9	35	17	3	7	223	230
12:15 PM	8	26	9	0	17	49	3	1	27	38	8	0	11	69	25	2	3	290	293
12:30 PM	11	38	4	3	12	41	4	2	28	32	8	1	14	51	32	2	8	275	283
12:45 PM	5	26	11	2	20	49	6	0	40	22	7	2	12	68	17	0	4	283	287
Total	28	117	27	8	63	170	17	3	127	127	35	4	46	223	91	7	22	1071	1093
BREAK																			
04:00 PM	12	68	24	0	19	77	7	0	45	27	11	1	19	118	57	1	2	484	486
04:15 PM	14	56	5	0	10	61	9	0	37	41	23	0	22	131	57	4	4	466	470
04:30 PM	20	66	13	1	23	80	5	1	37	30	18	1	14	111	42	1	4	459	463
04:45 PM	14	73	20	0	35	82	5	0	55	32	23	0	12	116	52	1	1	519	520
Total	60	263	62	1	87	300	26	1	174	130	75	2	67	476	208	7	11	1928	1939
05:00 PM	15	107	14	0	23	78	4	0	44	39	18	1	18	134	58	0	1	552	553
05:15 PM	14	102	18	0	30	135	9	0	51	53	27	0	12	117	54	1	1	622	623
05:30 PM	24	107	28	0	25	108	6	4	61	47	25	0	14	128	60	1	5	633	638
05:45 PM	12	80	17	0	33	109	7	0	94	44	29	1	17	162	50	2	3	654	657
Total	65	396	77	0	111	430	26	4	250	183	99	2	61	541	222	4	10	2461	2471
Grand Total	238	1116	319	14	441	1958	130	34	1247	1127	384	13	295	2101	759	36	97	10115	10212
Apprch %	14.2	66.7	19.1		17.4	77.4	5.1		45.2	40.9	13.9		9.4	66.6	24.1				
Total %	2.4	11	3.2		4.4	19.4	1.3		12.3	11.1	3.8		2.9	20.8	7.5		0.9	99.1	

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File Name : 20 - Waxham&Weddington
Site Code : 20080620
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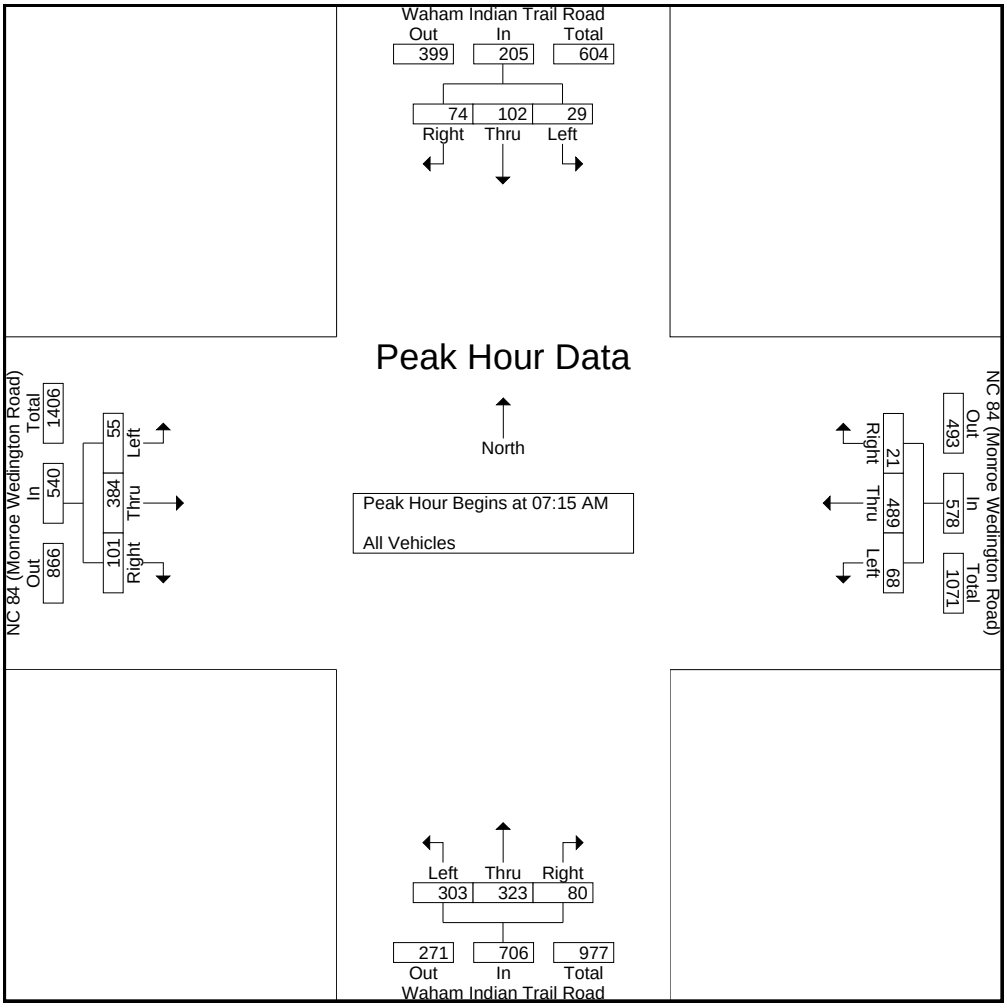
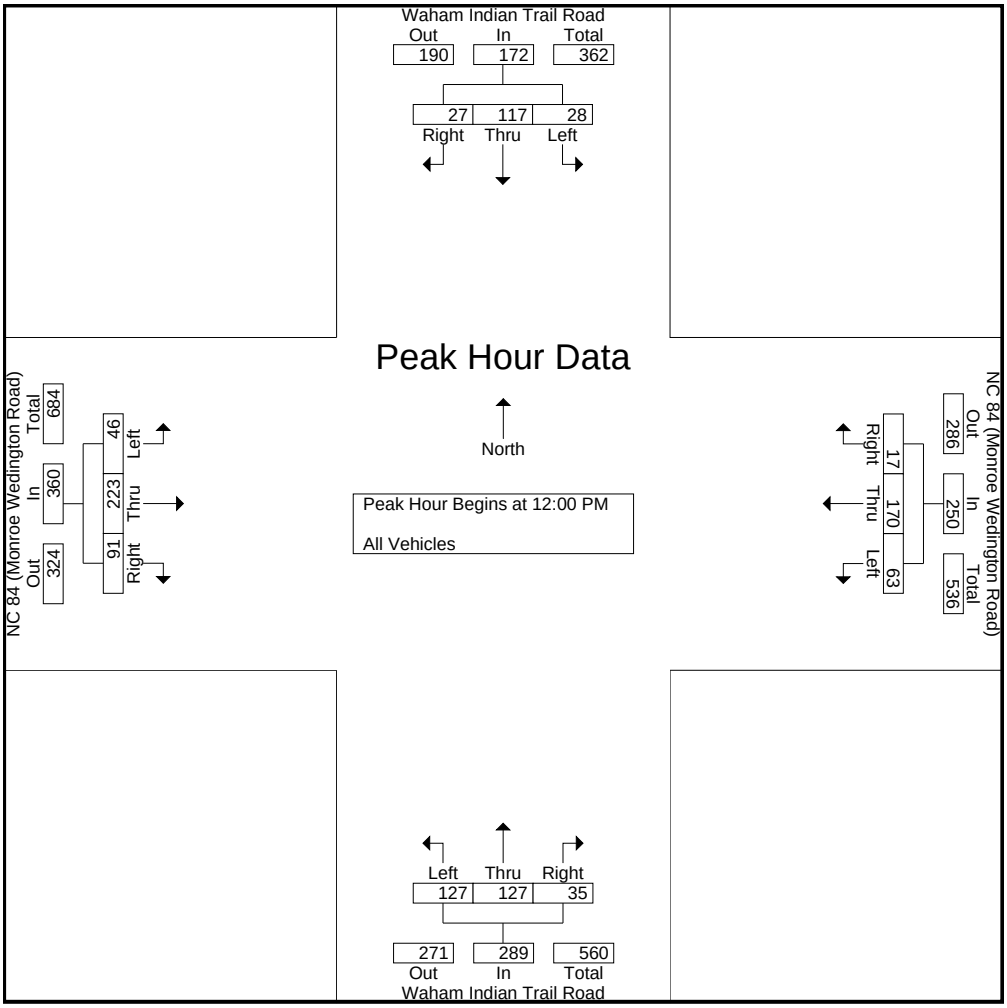
	Waham Indian Trail Road Southbound				NC 84 (Monroe Wedington Road) Westbound				Waham Indian Trail Road Northbound				NC 84 (Monroe Wedington Road) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**12**	13	**23**			**153**	**7**	175	82	83	**24**						
07:30 AM	**5**	**36**	**22**	**63**	**24**	150	4	**178**	**87**	93	18	**198**	**17**	100	24	141	**580**
07:45 AM	6	30	21	57	13	109	4	126	74	**95**				**112**	15	138	512
08:00 AM	6	23	8	37	16	77	6	99	60	52	16	128	17	106	**44**	**167**	431
Total Volume	29	102	74	205	68	489	21	578	303	323	80	706	55	384	101	540	2029
% App. Total	14.1	49.8	36.1		11.8	84.6	3.6		42.9	45.8	11.3		10.2	71.1	18.7		
PHF	.604	.708	.804	.813	.708	.799	.750	.812	.871	.850	.833	.891	.809	.857	.574	.808	.875



Martin/Alexiou/Bryson, PLLC
4000 WestChase Boulevard, Suite 530
Raleigh, North Carolina 27607
p: 919.829.0328 f: 919.829.0329

File Name : 20 - Waxham&Weddington
Site Code : 20080620
Start Date : 10/17/2008
Page No : 3

	Waham Indian Trail Road Southbound				NC 84 (Monroe Wedington Road) Westbound				Waham Indian Trail Road Northbound				NC 84 (Monroe Wedington Road) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	4	27	3	34	14	31	4	49	32	35	**12**	**79**	9	35	17	61	223
12:15 PM	8	26	9	43	17	**49**	3	69	27	**38**				**69**	25	**105**	**290**
12:30 PM	**11**	**38**		**53**	12	41	4	57	28	32	8	68	**14**	51	**32**	97	275
12:45 PM	5	26	**11**		**20**	49	**6**	**75**	**40**	22	7	69	12	68	17	97	283
Total Volume	28	117	27	172	63	170	17	250	127	127	35	289	46	223	91	360	1071
% App. Total	16.3	68	15.7		25.2	68	6.8		43.9	43.9	12.1		12.8	61.9	25.3		
PHF	.636	.770	.614	.811	.788	.867	.708	.833	.794	.836	.729	.915	.821	.808	.711	.857	.923



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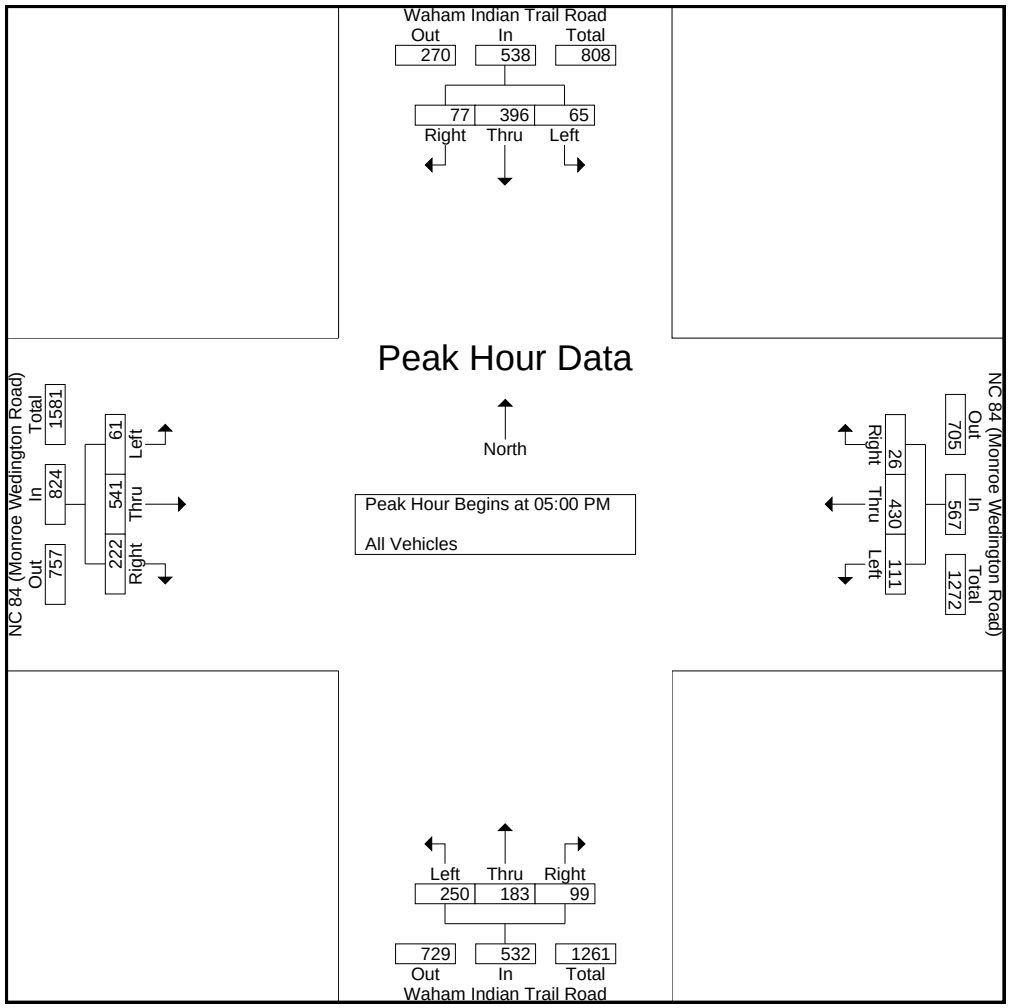
File Name : 20 - Waxham&Weddington
Site Code : 20080620
Start Date : 10/17/2008
Page No : 4

	Waham Indian Trail Road Southbound				NC 84 (Monroe Wedington Road) Westbound				Waham Indian Trail Road Northbound				NC 84 (Monroe Wedington Road) Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	15	**107**											**18**	134	58	210	552
05:15 PM	14	102	18	134	30	**135**	**9**	**174**	51	**53**							
05:30 PM	**24**	107	**28**	**159**	25	108	6	139	61	47	25	133	14	128	**60**	202	633
05:45 PM	12	80	17	109	**33**	109	7	149	**94**	44	**29**	**167**	17	**162**	50	**229**	**654**
Total Volume	65	396	77	538	111	430	26	567	250	183	99	532	61	541	222	824	2461
% App. Total	12.1	73.6	14.3		19.6	75.8	4.6		47	34.4	18.6		7.4	65.7	26.9		
PHF	.677	.925	.688	.846	.841	.796	.722	.815	.665	.863	.853	.796	.847	.835	.925	.900	.941



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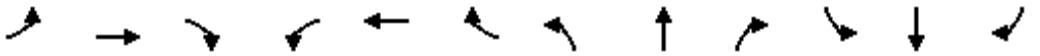
File Name : 20 - Waxham&Weddington
Site Code : 20080620
Start Date : 10/17/2008
Page No : 1

Groups Printed- Pedestrians

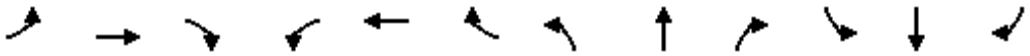
	Waham Indian Trail Road Southbound				NC 84 (Monroe Wedington Road) Westbound				Waham Indian Trail Road Northbound				NC 84 (Monroe Wedington Road) Eastbound				
Start Time	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Left	Thru	Right	Trks	Int. Total
BREAK																	
08:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
Total	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
BREAK																	
05:30 PM	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	6
BREAK																	
Total	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	6
Grand Total	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	7
Apprch %	0	100	0	0	0	100	0	0	0	0	0	0	0	0	0	0	
Total %	0	14.3	0	0	0	85.7	0	0	0	0	0	0	0	0	0	0	

Level of Service Analysis Data



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	192	4	0	329	414	18	55	2	257	14	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-4%			2%			-2%	
Total Lost time (s)		5.0			4.9	4.9		4.6			5.4	5.4
Lane Util. Factor		1.00			1.00	1.00		1.00			1.00	1.00
Frt		1.00			1.00	0.85		1.00			1.00	0.85
Flt Protected		0.99			1.00	1.00		0.99			0.95	1.00
Satd. Flow (prot)		1746			1900	1615		1816			1796	1599
Flt Permitted		0.80			1.00	1.00		0.90			0.68	1.00
Satd. Flow (perm)		1418			1900	1615		1649			1275	1599
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	89	213	4	0	366	460	20	61	2	286	16	93
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	306	0	0	366	460	0	83	0	0	302	93
Heavy Vehicles (%)	6%	6%	6%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)		17.3			17.4	17.4		15.8			15.0	15.0
Effective Green, g (s)		17.3			17.4	17.4		15.8			15.0	15.0
Actuated g/C Ratio		0.41			0.41	0.41		0.37			0.35	0.35
Clearance Time (s)		5.0			4.9	4.9		4.6			5.4	5.4
Vehicle Extension (s)		3.0			3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)		575			774	658		610			448	562
v/s Ratio Prot					0.19							
v/s Ratio Perm		0.22				c0.28		0.05			c0.24	0.06
v/c Ratio		0.53			0.47	0.70		0.14			0.67	0.17
Uniform Delay, d1		9.6			9.3	10.5		8.9			11.8	9.5
Progression Factor		1.00			1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2		1.0			0.5	3.3		0.1			4.0	0.1
Delay (s)		10.6			9.7	13.7		9.0			15.8	9.7
Level of Service		B			A	B		A			B	A
Approach Delay (s)		10.6			12.0			9.0			14.3	
Approach LOS		B			B			A			B	

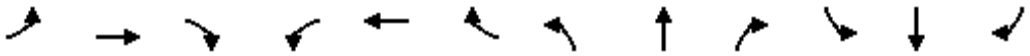
Intersection Summary			
HCM Average Control Delay	12.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	42.7	Sum of lost time (s)	10.3
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	66	115	63	235	10	136	176	46	2	269	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-3%			-1%			-2%	
Total Lost time (s)	5.8	5.8		6.0	6.0		5.6	5.6		5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.99		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1702		1796	1879		1778	1814		1787	1836	
Flt Permitted	0.59	1.00		0.63	1.00		0.53	1.00		0.61	1.00	
Satd. Flow (perm)	1114	1702		1194	1879		999	1814		1139	1836	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	27	73	128	70	261	11	151	196	51	2	299	58
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	27	201	0	70	272	0	151	247	0	2	357	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	12.7	12.7		12.5	12.5		11.4	11.4		11.3	11.3	
Effective Green, g (s)	12.7	12.7		12.5	12.5		11.4	11.4		11.3	11.3	
Actuated g/C Ratio	0.36	0.36		0.35	0.35		0.32	0.32		0.32	0.32	
Clearance Time (s)	5.8	5.8		6.0	6.0		5.6	5.6		5.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	399	609		420	662		321	583		363	584	
v/s Ratio Prot		0.12			c0.14			0.14			c0.19	
v/s Ratio Perm	0.02			0.06			0.15			0.00		
v/c Ratio	0.07	0.33		0.17	0.41		0.47	0.42		0.01	0.61	
Uniform Delay, d1	7.5	8.3		7.9	8.7		9.6	9.5		8.3	10.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.2	0.4		1.1	0.5		0.0	1.9	
Delay (s)	7.6	8.6		8.1	9.1		10.7	10.0		8.3	12.1	
Level of Service	A	A		A	A		B	A		A	B	
Approach Delay (s)		8.5			8.9			10.3			12.1	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	35.5	Sum of lost time (s)	11.7
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

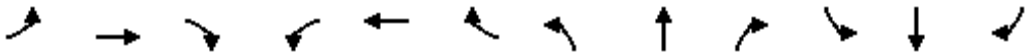
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	439	49	24	476	117	137	53	119	173	27	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			1%			2%			-2%	
Total Lost time (s)	5.5	6.2		5.5	6.2			5.5			5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.97			0.95			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1787	1853		1761	1799			1710			1751	
Flt Permitted	0.14	1.00		0.33	1.00			0.74			0.61	
Satd. Flow (perm)	258	1853		612	1799			1287			1108	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	109	488	54	27	529	130	152	59	132	192	30	97
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	109	542	0	27	659	0	0	343	0	0	319	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	45.4	39.2		38.2	35.6			26.5			26.5	
Effective Green, g (s)	45.4	39.2		38.2	35.6			26.5			26.5	
Actuated g/C Ratio	0.53	0.46		0.45	0.42			0.31			0.31	
Clearance Time (s)	5.5	6.2		5.5	6.2			5.5			5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	248	850		308	749			399			343	
v/s Ratio Prot	c0.03	c0.29		0.00	c0.37							
v/s Ratio Perm	0.20			0.04				0.27			c0.29	
v/c Ratio	0.44	0.64		0.09	0.88			0.86			0.93	
Uniform Delay, d1	14.7	17.7		13.9	23.0			27.8			28.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.2	1.6		0.1	11.5			16.6			31.1	
Delay (s)	15.9	19.3		14.0	34.5			44.4			59.7	
Level of Service	B	B		B	C			D			E	
Approach Delay (s)		18.7			33.7			44.4			59.7	
Approach LOS		B			C			D			E	

Intersection Summary			
HCM Average Control Delay	34.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	85.5	Sum of lost time (s)	23.4
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

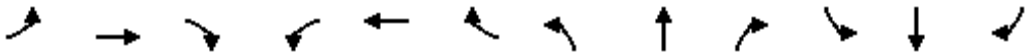
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	23	0	443	7	231	0	450	285	208	383	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			-5%			5%	
Total Lost time (s)		6.6		5.7	5.7	6.4		7.2	5.7	6.4	6.4	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.95	1.00	0.97	0.95	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95	0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1834		1673	1679	1575		3628	1623	3347	3448	
Flt Permitted		0.98		0.95	0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1834		1673	1679	1575		3628	1623	3347	3448	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	26	0	492	8	257	0	500	317	231	426	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	38	0	251	249	257	0	500	317	231	428	0
Turn Type	Split			Split		pm+ov	Prot		pm+ov	Prot		
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		4.3		16.4	16.4	25.7		15.6	32.0	9.3	32.1	
Effective Green, g (s)		4.3		16.4	16.4	25.7		15.6	32.0	9.3	32.1	
Actuated g/C Ratio		0.06		0.23	0.23	0.36		0.22	0.45	0.13	0.45	
Clearance Time (s)		6.6		5.7	5.7	6.4		7.2	5.7	6.4	6.4	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		110		384	385	566		792	726	435	1548	
v/s Ratio Prot		c0.02		c0.15	0.15	0.06		c0.14	0.10	c0.07	0.12	
v/s Ratio Perm						0.10			0.10			
v/c Ratio		0.35		0.65	0.65	0.45		0.63	0.44	0.53	0.28	
Uniform Delay, d1		32.2		25.0	24.9	17.5		25.3	13.6	29.1	12.4	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.9		4.0	3.7	0.6		1.6	0.4	1.2	0.1	
Delay (s)		34.1		28.9	28.6	18.1		27.0	14.0	30.3	12.5	
Level of Service		C		C	C	B		C	B	C	B	
Approach Delay (s)		34.1			25.2			21.9			18.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	71.5	Sum of lost time (s)	25.9
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

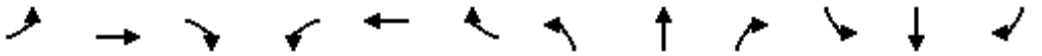
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	65	58	115	192	39	72	236	74	10	137	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-4%			-3%			-4%			-2%	
Total Lost time (s)		5.9			5.8			5.9			5.7	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.95			0.98			0.97			0.96	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1787			1832			1833			1806	
Flt Permitted		0.85			0.82			0.89			0.97	
Satd. Flow (perm)		1538			1523			1638			1755	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	46	72	64	128	213	43	80	262	82	11	152	63
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	182	0	0	384	0	0	424	0	0	226	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		15.6			15.7			15.1			15.3	
Effective Green, g (s)		15.6			15.7			15.1			15.3	
Actuated g/C Ratio		0.37			0.37			0.36			0.36	
Clearance Time (s)		5.9			5.8			5.9			5.7	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		565			563			582			632	
v/s Ratio Prot												
v/s Ratio Perm		0.12			c0.25			c0.26			0.13	
v/c Ratio		0.32			0.68			0.73			0.36	
Uniform Delay, d1		9.7			11.3			11.9			10.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			3.4			4.5			0.3	
Delay (s)		10.0			14.7			16.5			10.3	
Level of Service		A			B			B			B	
Approach Delay (s)		10.0			14.7			16.5			10.3	
Approach LOS		A			B			B			B	

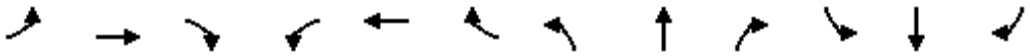
Intersection Summary			
HCM Average Control Delay	13.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	42.5	Sum of lost time (s)	11.7
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	384	101	68	489	21	303	323	80	29	102	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.15	1.00	1.00	0.46	1.00	1.00	0.49	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	278	3539	1583	865	1863	1583	920	1863	1583	970	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	61	427	112	76	543	23	337	359	89	32	113	82
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	61	427	112	76	543	23	337	359	89	32	113	82
Turn Type	pm+pt		pm+ov	pm+pt		Perm	pm+pt		pm+ov	pm+pt		Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	32.1	26.8	38.9	32.1	26.8	26.8	37.3	26.3	31.6	22.2	18.2	18.2
Effective Green, g (s)	32.1	26.8	38.9	32.1	26.8	26.8	37.3	26.3	31.6	22.2	18.2	18.2
Actuated g/C Ratio	0.36	0.30	0.43	0.36	0.30	0.30	0.41	0.29	0.35	0.25	0.20	0.20
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	186	1049	804	360	552	469	493	542	676	274	375	319
v/s Ratio Prot	c0.02	0.12	0.02	0.01	c0.29		c0.09	0.19	0.01	0.01	0.06	
v/s Ratio Perm	0.10		0.05	0.06		0.01	c0.19		0.05	0.02		0.05
v/c Ratio	0.33	0.41	0.14	0.21	0.98	0.05	0.68	0.66	0.13	0.12	0.30	0.26
Uniform Delay, d1	21.9	25.4	15.6	19.7	31.6	22.7	19.8	28.2	20.0	26.2	30.7	30.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.3	0.1	0.3	33.9	0.0	3.9	6.3	0.1	0.2	2.1	1.9
Delay (s)	23.0	25.7	15.7	20.0	65.5	22.7	23.7	34.4	20.1	26.4	32.8	32.3
Level of Service	C	C	B	B	E	C	C	C	C	C	C	C
Approach Delay (s)		23.6			58.6			28.2			31.7	
Approach LOS		C			E			C			C	

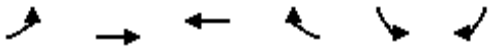
Intersection Summary			
HCM Average Control Delay	36.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.4	Sum of lost time (s)	21.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	124	14	4	292	15	129	74	5	8	29	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	138	16	4	324	17	143	82	6	9	32	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	341			153			531	509	146	547	508	333
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	341			153			531	509	146	547	508	333
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			66	82	99	98	93	98
cM capacity (veh/h)	1218			1427			423	463	902	382	464	709

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	160	346	231	56
Volume Left	7	4	143	9
Volume Right	16	17	6	14
cSH	1218	1427	442	491
Volume to Capacity	0.01	0.00	0.52	0.11
Queue Length 95th (ft)	0	0	74	10
Control Delay (s)	0.4	0.1	21.7	13.3
Lane LOS	A	A	C	B
Approach Delay (s)	0.4	0.1	21.7	13.3
Approach LOS			C	B

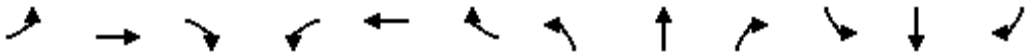
Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	112	117	357	7	3	369
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	124	130	397	8	3	410
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	404				779	401
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	404				779	401
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				99	37
cM capacity (veh/h)	1154				325	649

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	254	404	413
Volume Left	124	0	3
Volume Right	0	8	410
cSH	1154	1700	644
Volume to Capacity	0.11	0.24	0.64
Queue Length 95th (ft)	9	0	116
Control Delay (s)	4.7	0.0	20.0
Lane LOS	A		C
Approach Delay (s)	4.7	0.0	20.0
Approach LOS			C

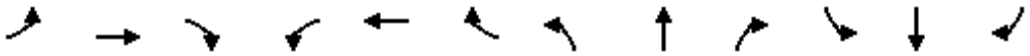
Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	2	4	3	1	0	3	475	11	0	418	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	2	4	3	1	0	3	528	12	0	464	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								177				
pX, platoon unblocked												
vC, conflicting volume	1012	1018	471	1017	1018	534	478			540		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1012	1018	471	1017	1018	534	478			540		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	99	99	98	100	100	100			100		
cM capacity (veh/h)	216	237	593	212	236	546	1084			1028		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	20	4	543	478
Volume Left	13	3	3	0
Volume Right	4	0	12	13
cSH	255	218	1084	1028
Volume to Capacity	0.08	0.02	0.00	0.00
Queue Length 95th (ft)	6	2	0	0
Control Delay (s)	20.3	21.9	0.1	0.0
Lane LOS	C	C	A	
Approach Delay (s)	20.3	21.9	0.1	0.0
Approach LOS	C	C		

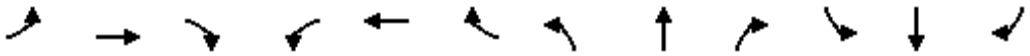
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	38.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	1	2	45	13	61	9	462	42	27	359	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	1	2	50	14	68	10	513	47	30	399	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								438				
pX, platoon unblocked												
vC, conflicting volume	1094	1043	403	1022	1023	537	407			560		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1094	1043	403	1022	1023	537	407			560		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	100	76	94	88	99			97		
cM capacity (veh/h)	155	221	648	207	227	544	1152			1011		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	132	570	437
Volume Left	4	50	10	30
Volume Right	2	68	47	8
cSH	209	307	1152	1011
Volume to Capacity	0.04	0.43	0.01	0.03
Queue Length 95th (ft)	3	52	1	2
Control Delay (s)	22.9	25.3	0.2	0.9
Lane LOS	C	D	A	A
Approach Delay (s)	22.9	25.3	0.2	0.9
Approach LOS	C	D		

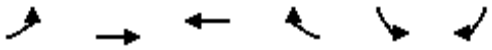
Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	48.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	53	476	6	1	628	100	8	4	3	43	0	86
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	59	529	7	1	698	111	9	4	3	48	0	96
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	809			536			1442	1458	529	1408	1409	753
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	809			536			1442	1458	529	1408	1409	753
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			89	96	99	55	100	77
cM capacity (veh/h)	817			1032			80	120	550	106	128	409

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	59	529	7	1	809	17	143
Volume Left	59	0	0	1	0	9	48
Volume Right	0	0	7	0	111	3	96
cSH	817	1700	1700	1032	1700	108	210
Volume to Capacity	0.07	0.31	0.00	0.00	0.48	0.15	0.68
Queue Length 95th (ft)	6	0	0	0	0	13	107
Control Delay (s)	9.8	0.0	0.0	8.5	0.0	44.4	52.7
Lane LOS	A			A		E	F
Approach Delay (s)	1.0			0.0		44.4	52.7
Approach LOS						E	F

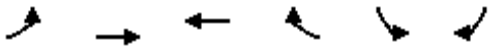
Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	59.1%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	10	111	319	453	101	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	123	354	503	112	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	858				752	606
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	858				752	606
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				70	97
cM capacity (veh/h)	783				373	497

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	134	858	127
Volume Left	11	0	112
Volume Right	0	503	14
cSH	783	1700	384
Volume to Capacity	0.01	0.50	0.33
Queue Length 95th (ft)	1	0	35
Control Delay (s)	0.9	0.0	18.9
Lane LOS	A		C
Approach Delay (s)	0.9	0.0	18.9
Approach LOS			C

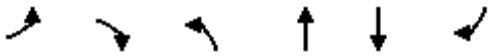
Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

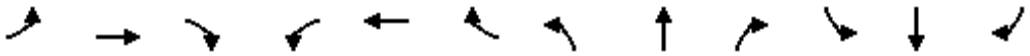
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	37	80	171	627	169	38
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	41	89	190	697	188	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1286	209	230			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1286	209	230			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	74	89	86			
cM capacity (veh/h)	156	831	1338			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	130	887	230
Volume Left	41	190	0
Volume Right	89	0	42
cSH	351	1338	1700
Volume to Capacity	0.37	0.14	0.14
Queue Length 95th (ft)	42	12	0
Control Delay (s)	21.2	3.3	0.0
Lane LOS	C	A	
Approach Delay (s)	21.2	3.3	0.0
Approach LOS	C		

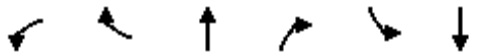
Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	90	5	2	98	24	13	110	6	7	49	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	100	6	2	109	27	14	122	7	8	54	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	136			106			280	254	103	308	243	122
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	136			106			280	254	103	308	243	122
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	81	99	99	92	99
cM capacity (veh/h)	1449			1486			619	646	952	543	653	926

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	111	138	143	74
Volume Left	6	2	14	8
Volume Right	6	27	7	12
cSH	1449	1486	653	671
Volume to Capacity	0.00	0.00	0.22	0.11
Queue Length 95th (ft)	0	0	21	9
Control Delay (s)	0.4	0.1	12.1	11.0
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	0.1	12.1	11.0
Approach LOS			B	B

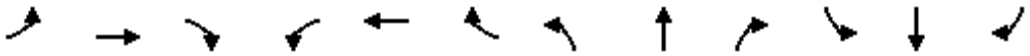
Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	23.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	1	673	8	3	407	32
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	748	9	3	452	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	951	11			12	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	951	11			12	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	30			72	
cM capacity (veh/h)	206	1068			1607	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	749	12	488
Volume Left	1	0	452
Volume Right	748	3	0
cSH	1061	1700	1607
Volume to Capacity	0.71	0.01	0.28
Queue Length 95th (ft)	155	0	29
Control Delay (s)	16.1	0.0	7.7
Lane LOS	C		A
Approach Delay (s)	16.1	0.0	7.7
Approach LOS	C		

Intersection Summary			
Average Delay	12.7		
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	70	113	37	9	140	31	58	112	12	17	37	87
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	78	126	41	10	156	34	64	124	13	19	41	97
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	499	394	89	491	436	131	138			138		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	499	394	89	491	436	131	138			138		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	75	96	97	68	96	96			99		
cM capacity (veh/h)	334	512	968	363	485	918	1446			1446		

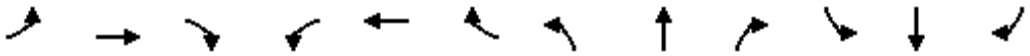
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	203	41	10	190	202	157
Volume Left	78	0	10	0	64	19
Volume Right	0	41	0	34	13	97
cSH	425	968	363	530	1446	1446
Volume to Capacity	0.48	0.04	0.03	0.36	0.04	0.01
Queue Length 95th (ft)	63	3	2	40	3	1
Control Delay (s)	21.0	8.9	15.2	15.5	2.7	1.0
Lane LOS	C	A	C	C	A	A
Approach Delay (s)	19.0		15.5		2.7	1.0
Approach LOS	C		C			

Intersection Summary				
Average Delay	10.5			
Intersection Capacity Utilization	49.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	127	72	51	407	321	124
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	141	80	57	452	357	138
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			221		747	181
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			221		747	181
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		2	84
cM capacity (veh/h)			1348		365	862

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	221	509	494
Volume Left	0	57	357
Volume Right	80	0	138
cSH	1700	1348	435
Volume to Capacity	0.13	0.04	1.14
Queue Length 95th (ft)	0	3	447
Control Delay (s)	0.0	1.3	116.5
Lane LOS		A	F
Approach Delay (s)	0.0	1.3	116.5
Approach LOS			F

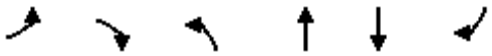
Intersection Summary			
Average Delay	47.6		
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	106	34	120	363	2	260	0	205	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	118	38	133	403	2	289	0	228	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	406			156			807	809	137	807	826	403
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	406			156			807	809	137	807	826	403
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			91			0	100	75	100	100	100
cM capacity (veh/h)	1153			1425			279	285	912	209	279	647

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	156	537	2	289	228	0
Volume Left	0	133	0	289	0	0
Volume Right	38	0	2	0	228	0
cSH	1153	1425	1700	279	912	1700
Volume to Capacity	0.00	0.09	0.00	1.04	0.25	0.00
Queue Length 95th (ft)	0	8	0	277	25	0
Control Delay (s)	0.0	2.7	0.0	104.4	10.3	0.0
Lane LOS		A		F	B	A
Approach Delay (s)	0.0	2.6		62.9		0.0
Approach LOS				F		A

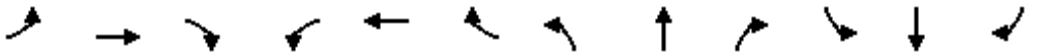
Intersection Summary				
Average Delay	28.0			
Intersection Capacity Utilization	57.8%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	101	107	327	225	210	209
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	112	119	363	250	233	232
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1326	349	466			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1326	349	466			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	2	83	67			
cM capacity (veh/h)	115	694	1096			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	231	613	466
Volume Left	112	363	0
Volume Right	119	0	232
cSH	201	1096	1700
Volume to Capacity	1.15	0.33	0.27
Queue Length 95th (ft)	285	37	0
Control Delay (s)	158.7	7.4	0.0
Lane LOS	F	A	
Approach Delay (s)	158.7	7.4	0.0
Approach LOS	F		

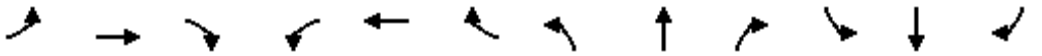
Intersection Summary			
Average Delay	31.5		
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	283	4	0	180	271	3	37	6	440	11	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-4%			2%			-2%	
Total Lost time (s)		5.0			4.9	4.9		4.6			5.4	5.4
Lane Util. Factor		1.00			1.00	1.00		1.00			1.00	1.00
Frt		1.00			1.00	0.85		0.98			1.00	0.85
Flt Protected		0.99			1.00	1.00		1.00			0.95	1.00
Satd. Flow (prot)		1818			1900	1615		1805			1794	1599
Flt Permitted		0.85			1.00	1.00		0.98			0.69	1.00
Satd. Flow (perm)		1557			1900	1615		1769			1305	1599
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	114	314	4	0	200	301	3	41	7	489	12	138
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	432	0	0	200	301	0	51	0	0	501	138
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)		15.2			15.3	15.3		21.8			21.0	21.0
Effective Green, g (s)		15.2			15.3	15.3		21.8			21.0	21.0
Actuated g/C Ratio		0.33			0.33	0.33		0.47			0.45	0.45
Clearance Time (s)		5.0			4.9	4.9		4.6			5.4	5.4
Vehicle Extension (s)		3.0			3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)		508			624	530		828			588	721
v/s Ratio Prot					0.11							
v/s Ratio Perm		c0.28				0.19		0.03			c0.38	0.09
v/c Ratio		0.85			0.32	0.57		0.06			0.85	0.19
Uniform Delay, d1		14.6			11.7	12.9		6.8			11.4	7.7
Progression Factor		1.00			1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2		12.9			0.3	1.4		0.0			11.4	0.1
Delay (s)		27.5			12.0	14.3		6.8			22.8	7.8
Level of Service		C			B	B		A			C	A
Approach Delay (s)		27.5			13.4			6.8			19.6	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	46.6	Sum of lost time (s)	10.4
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

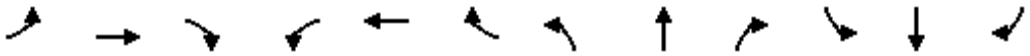
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	219	61	31	65	18	54	169	41	16	158	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-3%			-1%			-2%	
Total Lost time (s)	5.8	5.8		6.0	6.0		5.6	5.6		5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1820		1796	1829		1778	1817		1787	1837	
Flt Permitted	0.70	1.00		0.57	1.00		0.63	1.00		0.61	1.00	
Satd. Flow (perm)	1312	1820		1080	1829		1174	1817		1153	1837	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	41	243	68	34	72	20	60	188	46	18	176	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	41	311	0	34	92	0	60	234	0	18	209	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	16.2	16.2		16.0	16.0		8.0	8.0		7.9	7.9	
Effective Green, g (s)	16.2	16.2		16.0	16.0		8.0	8.0		7.9	7.9	
Actuated g/C Ratio	0.46	0.46		0.45	0.45		0.22	0.22		0.22	0.22	
Clearance Time (s)	5.8	5.8		6.0	6.0		5.6	5.6		5.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	597	828		485	822		264	408		256	408	
v/s Ratio Prot		c0.17			0.05			c0.13			0.11	
v/s Ratio Perm	0.03			0.03			0.05			0.02		
v/c Ratio	0.07	0.38		0.07	0.11		0.23	0.57		0.07	0.51	
Uniform Delay, d1	5.5	6.4		5.6	5.7		11.3	12.3		10.9	12.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.1		0.4	1.9		0.1	1.1	
Delay (s)	5.5	6.7		5.6	5.7		11.7	14.2		11.1	13.2	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		6.5			5.7			13.7			13.1	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	35.6	Sum of lost time (s)	11.4
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

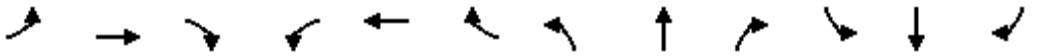
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	685	75	16	447	55	124	32	22	69	37	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			1%			2%			-2%	
Total Lost time (s)	5.5	6.2		5.5	6.2			5.5			5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.98			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1787	1854		1761	1823			1753			1777	
Flt Permitted	0.31	1.00		0.12	1.00			0.72			0.78	
Satd. Flow (perm)	584	1854		215	1823			1299			1414	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	40	761	83	18	497	61	138	36	24	77	41	37
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	40	844	0	18	558	0	0	198	0	0	155	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	40.3	36.7		37.5	35.3			15.9			15.9	
Effective Green, g (s)	40.3	36.7		37.5	35.3			15.9			15.9	
Actuated g/C Ratio	0.56	0.51		0.52	0.49			0.22			0.22	
Clearance Time (s)	5.5	6.2		5.5	6.2			5.5			5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	387	945		159	894			287			312	
v/s Ratio Prot	c0.01	c0.46		0.00	0.31							
v/s Ratio Perm	0.05			0.06				c0.15			0.11	
v/c Ratio	0.10	0.89		0.11	0.62			0.69			0.50	
Uniform Delay, d1	8.1	15.9		12.3	13.5			25.8			24.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	10.7		0.3	1.4			6.8			1.2	
Delay (s)	8.3	26.6		12.6	14.8			32.5			25.8	
Level of Service	A	C		B	B			C			C	
Approach Delay (s)		25.8			14.8			32.5			25.8	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

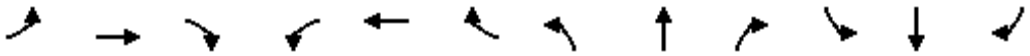
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	20	0	385	4	295	0	347	454	324	416	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			1%			-5%			5%	
Total Lost time (s)		6.6		5.7	5.7	6.4		7.2	5.7	6.4	6.4	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.95	1.00	0.97	0.95	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95	0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1818		1673	1678	1575		3628	1623	3347	3439	
Flt Permitted		0.98		0.95	0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1818		1673	1678	1575		3628	1623	3347	3439	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	21	22	0	428	4	328	0	386	504	360	462	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	43	0	214	218	328	0	386	504	360	473	0
Turn Type	Split			Split		pm+ov	Prot		pm+ov	Prot		
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)		4.3		15.2	15.2	24.0		13.7	28.9	8.8	29.7	
Effective Green, g (s)		4.3		15.2	15.2	24.0		13.7	28.9	8.8	29.7	
Actuated g/C Ratio		0.06		0.22	0.22	0.35		0.20	0.43	0.13	0.44	
Clearance Time (s)		6.6		5.7	5.7	6.4		7.2	5.7	6.4	6.4	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		115		375	376	557		732	691	434	1504	
v/s Ratio Prot		c0.02		0.13	0.13	0.08		0.11	c0.16	c0.11	0.14	
v/s Ratio Perm						0.13			0.15			
v/c Ratio		0.37		0.57	0.58	0.59		0.53	0.73	0.83	0.31	
Uniform Delay, d1		30.5		23.4	23.5	17.9		24.2	16.2	28.8	12.5	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.0		2.1	2.2	1.6		0.7	3.9	12.4	0.1	
Delay (s)		32.6		25.5	25.7	19.5		24.9	20.1	41.2	12.6	
Level of Service		C		C	C	B		C	C	D	B	
Approach Delay (s)		32.6			23.0			22.2			24.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	67.9	Sum of lost time (s)	24.4
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

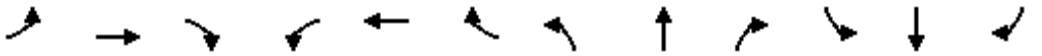
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	150	87	34	69	35	17	155	36	35	173	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-4%			-3%			-4%			-2%	
Total Lost time (s)		5.9			5.8			5.9			5.7	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.95			0.97			0.98			0.97	
Flt Protected		1.00			0.99			1.00			0.99	
Satd. Flow (prot)		1806			1804			1848			1816	
Flt Permitted		0.96			0.86			0.95			0.92	
Satd. Flow (perm)		1742			1567			1759			1682	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	26	167	97	38	77	39	19	172	40	39	192	62
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	290	0	0	154	0	0	231	0	0	293	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		13.3			13.4			11.3			11.5	
Effective Green, g (s)		13.3			13.4			11.3			11.5	
Actuated g/C Ratio		0.37			0.37			0.31			0.32	
Clearance Time (s)		5.9			5.8			5.9			5.7	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		637			577			546			531	
v/s Ratio Prot												
v/s Ratio Perm		c0.17			0.10			0.13			c0.17	
v/c Ratio		0.46			0.27			0.42			0.55	
Uniform Delay, d1		8.8			8.1			10.0			10.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			0.2			0.5			1.2	
Delay (s)		9.3			8.3			10.5			11.6	
Level of Service		A			A			B			B	
Approach Delay (s)		9.3			8.3			10.5			11.6	
Approach LOS		A			A			B			B	

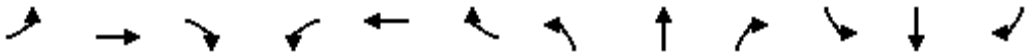
Intersection Summary			
HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	36.4	Sum of lost time (s)	11.6
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	541	222	111	430	26	250	183	99	65	396	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.18	1.00	1.00	0.26	1.00	1.00	0.16	1.00	1.00	0.63	1.00	1.00
Satd. Flow (perm)	328	3539	1583	478	1863	1583	306	1863	1583	1174	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	68	601	247	123	478	29	278	203	110	72	440	86
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	68	601	247	123	478	29	278	203	110	72	440	86
Turn Type	pm+pt		pm+ov	pm+pt		Perm	pm+pt		pm+ov	pm+pt		Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	28.2	22.7	31.7	32.8	25.0	25.0	36.1	27.1	34.9	29.1	23.6	23.6
Effective Green, g (s)	28.2	22.7	31.7	32.8	25.0	25.0	36.1	27.1	34.9	29.1	23.6	23.6
Actuated g/C Ratio	0.31	0.25	0.35	0.36	0.27	0.27	0.40	0.30	0.38	0.32	0.26	0.26
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	189	882	672	283	511	434	266	554	728	411	483	410
v/s Ratio Prot	0.02	0.17	0.04	c0.04	c0.26		c0.10	0.11	0.01	0.01	0.24	
v/s Ratio Perm	0.09		0.12	0.12		0.02	c0.31		0.06	0.05		0.05
v/c Ratio	0.36	0.68	0.37	0.43	0.94	0.07	1.05	0.37	0.15	0.18	0.91	0.21
Uniform Delay, d1	23.8	30.9	22.2	20.7	32.3	24.4	23.3	25.2	18.4	22.0	32.7	26.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	2.2	0.3	1.1	24.6	0.1	67.5	1.9	0.1	0.2	23.9	1.2
Delay (s)	25.0	33.1	22.5	21.8	56.8	24.5	90.8	27.1	18.5	22.2	56.6	27.6
Level of Service	C	C	C	C	E	C	F	C	B	C	E	C
Approach Delay (s)		29.7			48.5			55.4			48.3	
Approach LOS		C			D			E			D	

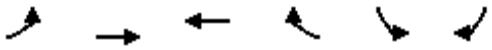
Intersection Summary			
HCM Average Control Delay	43.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	91.1	Sum of lost time (s)	21.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	175	35	14	132	16	42	32	6	25	113	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	194	39	16	147	18	47	36	7	28	126	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	164			233			499	432	214	447	442	156
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	164			233			499	432	214	447	442	156
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			88	93	99	94	75	99
cM capacity (veh/h)	1414			1334			377	507	826	482	500	890

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	244	180	89	167
Volume Left	11	16	47	28
Volume Right	39	18	7	13
cSH	1414	1334	440	515
Volume to Capacity	0.01	0.01	0.20	0.32
Queue Length 95th (ft)	1	1	19	35
Control Delay (s)	0.4	0.8	15.2	15.3
Lane LOS	A	A	C	C
Approach Delay (s)	0.4	0.8	15.2	15.3
Approach LOS			C	C

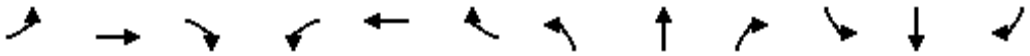
Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	159	316	137	15	16	84
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	177	351	152	17	18	93
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	169				865	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	169				865	161
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				94	89
cM capacity (veh/h)	1409				284	884

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	528	169	111
Volume Left	177	0	18
Volume Right	0	17	93
cSH	1409	1700	660
Volume to Capacity	0.13	0.10	0.17
Queue Length 95th (ft)	11	0	15
Control Delay (s)	3.5	0.0	11.5
Lane LOS	A		B
Approach Delay (s)	3.5	0.0	11.5
Approach LOS			B

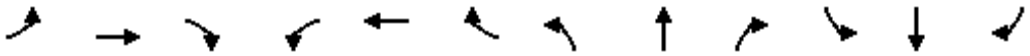
Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	5	10	3	4	5	7	421	18	2	651	28
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	6	11	3	4	6	8	468	20	2	723	31
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								177				
pX, platoon unblocked												
vC, conflicting volume	1244	1247	739	1251	1252	478	754			488		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1244	1247	739	1251	1252	478	754			488		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	97	97	98	97	99	99			100		
cM capacity (veh/h)	145	172	417	141	170	588	856			1075		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	32	13	496	757
Volume Left	16	3	8	2
Volume Right	11	6	20	31
cSH	194	225	856	1075
Volume to Capacity	0.17	0.06	0.01	0.00
Queue Length 95th (ft)	15	5	1	0
Control Delay (s)	27.2	22.0	0.3	0.1
Lane LOS	D	C	A	A
Approach Delay (s)	27.2	22.0	0.3	0.1
Approach LOS	D	C		

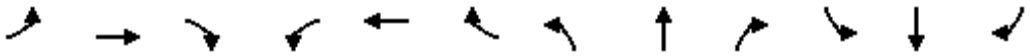
Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	47.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	6	11	43	21	36	8	372	52	64	564	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	7	12	48	23	40	9	413	58	71	627	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								438				
pX, platoon unblocked												
vC, conflicting volume	1283	1260	629	1247	1233	442	631			471		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1283	1260	629	1247	1233	442	631			471		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	96	97	64	86	93	99			93		
cM capacity (veh/h)	112	158	482	134	164	615	951			1091		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	23	111	480	702
Volume Left	4	48	9	71
Volume Right	12	40	58	4
cSH	217	197	951	1091
Volume to Capacity	0.11	0.56	0.01	0.07
Queue Length 95th (ft)	9	76	1	5
Control Delay (s)	23.5	44.7	0.3	1.7
Lane LOS	C	E	A	A
Approach Delay (s)	23.5	44.7	0.3	1.7
Approach LOS	C	E		

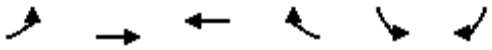
Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	78.0%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	779	6	13	545	100	4	4	11	65	5	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	866	7	14	606	111	4	4	12	72	6	19
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	717			872			1577	1667	866	1626	1618	661
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	717			872			1577	1667	866	1626	1618	661
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			94	95	97	2	94	96
cM capacity (veh/h)	884			773			78	92	353	73	98	462

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	28	866	7	14	717	21	97
Volume Left	28	0	0	14	0	4	72
Volume Right	0	0	7	0	111	12	19
cSH	884	1700	1700	773	1700	151	89
Volume to Capacity	0.03	0.51	0.00	0.02	0.42	0.14	1.08
Queue Length 95th (ft)	2	0	0	1	0	12	162
Control Delay (s)	9.2	0.0	0.0	9.7	0.0	32.7	204.8
Lane LOS	A			A		D	F
Approach Delay (s)	0.3			0.2		32.7	204.8
Approach LOS						D	F

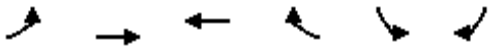
Intersection Summary				
Average Delay	11.9			
Intersection Capacity Utilization	59.2%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	37	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	41	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				96	98
cM capacity (veh/h)	1623				1023	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	59
Volume Left	0	0	41
Volume Right	0	0	18
cSH	1700	1700	1041
Volume to Capacity	0.00	0.00	0.06
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

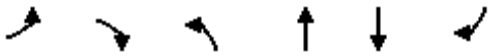
Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

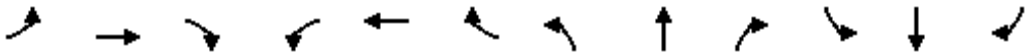
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	21	248	83	174	532	26
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	276	92	193	591	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	983	606	620			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	983	606	620			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	45	90			
cM capacity (veh/h)	249	497	960			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	299	286	620
Volume Left	23	92	0
Volume Right	276	0	29
cSH	461	960	1700
Volume to Capacity	0.65	0.10	0.36
Queue Length 95th (ft)	113	8	0
Control Delay (s)	26.0	3.6	0.0
Lane LOS	D	A	
Approach Delay (s)	26.0	3.6	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	115	11	11	84	15	6	64	8	34	113	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	128	12	12	93	17	7	71	9	38	126	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	110			140			359	291	134	327	288	102
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110			140			359	291	134	327	288	102
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	88	99	93	79	98
cM capacity (veh/h)	1480			1443			489	610	915	558	612	954

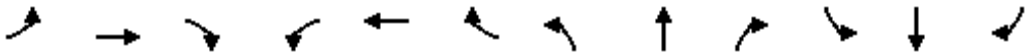
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	151	122	87	178
Volume Left	11	12	7	38
Volume Right	12	17	9	14
cSH	1480	1443	619	617
Volume to Capacity	0.01	0.01	0.14	0.29
Queue Length 95th (ft)	1	1	12	30
Control Delay (s)	0.6	0.8	11.8	13.2
Lane LOS	A	A	B	B
Approach Delay (s)	0.6	0.8	11.8	13.2
Approach LOS			B	B

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	14	528	0	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	587	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	46			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	602	0	0
Volume Left	16	0	0
Volume Right	587	0	0
cSH	1083	1700	1700
Volume to Capacity	0.56	0.00	0.00
Queue Length 95th (ft)	89	0	0
Control Delay (s)	12.4	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.4	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	12.4		
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	28	79	35	26	43	48	25	68	13	83	129	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	31	88	39	29	48	53	28	76	14	92	143	29
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	558	488	158	563	495	83	172			90		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	558	488	158	563	495	83	172			90		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	80	96	91	89	95	98			94		
cM capacity (veh/h)	359	442	888	333	438	977	1405			1505		

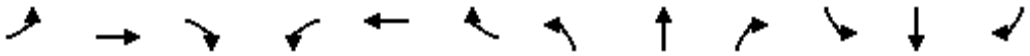
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	119	39	29	101	118	264
Volume Left	31	0	29	0	28	92
Volume Right	0	39	0	53	14	29
cSH	417	888	333	618	1405	1505
Volume to Capacity	0.29	0.04	0.09	0.16	0.02	0.06
Queue Length 95th (ft)	29	3	7	15	2	5
Control Delay (s)	17.1	9.2	16.8	12.0	1.9	3.0
Lane LOS	C	A	C	B	A	A
Approach Delay (s)	15.1		13.1		1.9	3.0
Approach LOS	C		B			

Intersection Summary				
Average Delay	7.6			
Intersection Capacity Utilization	38.7%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	339	286	142	156	104	79
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	377	318	158	173	116	88
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			694		1024	536
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			694		1024	536
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		46	84
cM capacity (veh/h)			901		215	545

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	694	331	203
Volume Left	0	158	116
Volume Right	318	0	88
cSH	1700	901	291
Volume to Capacity	0.41	0.18	0.70
Queue Length 95th (ft)	0	16	121
Control Delay (s)	0.0	5.7	41.7
Lane LOS		A	E
Approach Delay (s)	0.0	5.7	41.7
Approach LOS			E

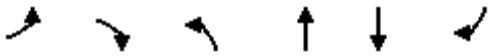
Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	442	262	174	157	3	66	2	146	3	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	491	291	193	174	3	73	2	162	3	1	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	178			782			1208	1206	637	1203	1348	174
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178			782			1208	1206	637	1203	1348	174
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			77			43	98	66	96	99	99
cM capacity (veh/h)	1398			836			129	141	477	86	116	869

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	784	368	3	76	162	10
Volume Left	2	193	0	73	0	3
Volume Right	291	0	3	0	162	6
cSH	1398	836	1700	130	477	183
Volume to Capacity	0.00	0.23	0.00	0.58	0.34	0.05
Queue Length 95th (ft)	0	22	0	73	37	4
Control Delay (s)	0.0	6.9	0.0	65.7	16.4	25.8
Lane LOS	A	A		F	C	D
Approach Delay (s)	0.0	6.8		32.0		25.8
Approach LOS				D		D

Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	76.4%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	192	271	123	205	233	105
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	213	301	137	228	259	117
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	818	317	376			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	818	317	376			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	30	58	88			
cM capacity (veh/h)	306	723	1183			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	514	364	376
Volume Left	213	137	0
Volume Right	301	0	117
cSH	462	1183	1700
Volume to Capacity	1.11	0.12	0.22
Queue Length 95th (ft)	440	10	0
Control Delay (s)	106.2	3.9	0.0
Lane LOS	F	A	
Approach Delay (s)	106.2	3.9	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	44.7		
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

Appendix C: Possible Ordinance Provisions, Draft Sample Language, and Model Ordinances Related to Transportation Management

The following possible ordinance provisions are intended to serve as a menu of options from which the LARTP communities can choose from in updating their ordinances as part of the LARTP implementation. While the four communities share many community character traits, each community has a unique development context and may require tailored solutions. The options provided in this appendix are intended to serve as a starting point for updating local ordinances. Model ordinance language provided here will need to be revised to fit the specific context of individual ordinances and development contexts.

The information provided in this appendix comes in two forms: draft model ordinance language and example model ordinances. For those provisions which are likely to be dealt with in a similar way among the four communities, model ordinance language has been provided in the first section. The second section addresses development issues that will likely require language crafted for each specific community context. For these issues, examples of model ordinances that have been adopted in other communities are provided and serve as a starting point for updating the development ordinances of the LARTP communities.

MODEL ORDINANCE PROVISIONS

1. Definitions of Roads

This provision defines characteristics of various classifications of roadways, such as major and minor thoroughfares, collectors, and local streets, mirroring the classification system in the LARTP. A description of the intent of the roadway classifications, including the character and nature of the road types, should be included in this ordinance provision.

Sample Language

The characteristics, cross-sections, definitions, and classifications of roadways shall be as designated in the Local Area Regional Transportation Plan, as adopted by the municipality.

In addition, local ordinances can include the specific definitions of these road classifications within the "Definitions" section of the development ordinance.

2. Transportation Purpose Statement

This provision states the reason, intent, and justification for regulations that are to follow.

Sample Language

In accordance with the Local Area Regional Transportation Plan developed in collaboration with and adopted by the Village of Marvin, the Town of Waxhaw, the Town of Weddington, and the Village of Wesley Chapel on <date>, the provisions of this section are intended to ensure: (a) an integrated system of roads that provides safe and efficient traffic circulation; (b) the efficient movement of through traffic by providing an interconnected system of roads; (c) uncomplicated road layouts so that emergency service personnel, public service personnel and visitors can find their way to and from destinations; and (d) controlled access to thoroughfares.

3. Right-of-Way Dedication Provisions

This provision requires dedication of public right-of-way, either new or expanded, for all new residential and non-residential development, as called for in LARTP cross-sections.

Sample Language

Where a proposed development application includes any part of a street or thoroughfare, or includes frontage on a designated street or thoroughfare as indicated on Figure 15: Highway Map of the Local Area Regional Transportation Plan, right-of-way shall be dedicated in the location and configuration shown and described for that classification of roadway in Figures 21 and 21b of the Local Area Regional Transportation Plan. This

right-of-way area shall be as measured from the centerline of the existing or proposed street or thoroughfare. Any yard setbacks applicable to the development shall be measured from the boundary line that divides the parcel and the dedicated right-of-way.

4. Transportation Impact Analysis (Threshold, Process, Information Requirements)

This provision requires development of a Transportation Impact Analysis (TIA) for subdivisions and all other development proposals for which 100 peak hour trips are generated by the proposed development. The municipality has options for the TIA procedures: (1) the applicant prepares the TIA and submits the TIA with the development application and (if necessary) pays a fee to the municipality for review of the TIA, or (2) the municipality estimates the cost to develop and review the TIA for a particular application, the applicant pays the TIA fee, and municipality arranges for preparation and review. TIAs should project additions to average daily trips and peak hour trips, estimate current and projected levels of service (LOS), include roadway improvement and right-of-way dedication needs that comply with cross-sections in the LARTP, and consider non-automobile modes, including bicycle, pedestrian, and transit needs.

Sample Language

(A) Applicability

(1) TIA Required for Development Generating Over One Hundred Peak Hour Trips
A Traffic Impact Analysis (TIA) shall be required for any proposed development or multiple phases of development (i.e., contiguous tracts under the same ownership) anticipated to generate more than one hundred (100) peak hour directional trips. Peak hour trips shall be measured as defined in the most recent edition of the Institute of Transportation Engineer's *Trip Generation Manual.*

(2) Redevelopment
In the case of redevelopment, trip generation will be defined as the number of net new trips generated by the proposed use beyond the trips generated by the previous use.

(3) Exemptions
For projects that are not estimated to generate more than one hundred (100) peak hour directional trips, TIA requirements can be waived upon providing a brief technical memorandum to the municipality describing the reasons why the TIA should not be required, including projections of peak hour trips, street capacity issues (LOS), and other issues relevant to the exemption.

(B) TIA Submission for Projects with Cumulative Impacts
A TIA shall be required for development projects that do not otherwise meet the thresholds for submission of a TIA if the application is for a project that:

(1) Shares Features with Other Developments
Shares features such as site access, common ownership, or other infrastructure with nearby undeveloped property for which future development can be reasonably anticipated;

(2) Can be Expected to Exceed Threshold
When complete, the cumulative impact of the overall development can be expected to exceed the threshold for preparation of a TIA; and

(3) Localized Safety or Capacity Conditions
A TIA may also be required for projects with at least one of the following characteristics:

(a) The project is located in the vicinity of a high accident location per Figures 7 and 8 in the adopted Local Area Regional Transportation Plan;
(b) The project abuts a major thoroughfare;
(c) The project includes highway improvements that are in the Transportation Improvement Program; or
(d) When involvement with an active roadway construction project is necessary.

(C) Procedure

(1) The TIA shall be submitted along with applications for a Preliminary Plat for Subdivision, Major Site Plan, Planned Development, Rezoning, and Conditional Use Permit. [Alternate: The municipality shall prepare or have prepared a written Traffic Impact Analysis for applicable projects, with cost of preparation of analysis and/or review of the TIA made a component of the development application fee.]

(2) The applicant shall be required to participate in a pre-submittal conference with the municipality and the engineering firm preparing the TIA to establish the study area, trip distribution, traffic counts, approved developments in the area, pass-by and internal capture percentages, and any other questions specific to the TIA. The municipality may choose to not accept TIAs prepared without a pre-submittal conference.

(3) The TIA shall, at a minimum:

(a) ***Estimate the Traffic Generated***
Estimate the peak hour traffic that will be generated as a result of the proposed development. Trips should be estimated for all uses located within the development using the standard Institute of Transportation Engineer's *Trip Generation Manual*, including pass-by trips, internal trip assumptions, and trip distribution assumptions;

(b) ***Evaluate Site Access***
Evaluate site access, sight distance, and internal circulation;

(c) ***Evaluate Existing Capacity***
Evaluate the ability of the street network to support the proposed development;

(d) ***Identify Specific Improvements***
Identify specific improvements to the street network that are necessary in order to support the traffic anticipated to be generated by the proposed development and any adjacent areas being analyzed, such as intersection improvements, signalization, turning lanes, etc.;

(e) ***Identify Non-Automobile Modes***
Identify specific improvements or facilities provided for bicyclists and pedestrians to support non-vehicular access and access to and within the proposed project; and

(f) ***Recommendations for Improvements***
Include recommendations for site access and transportation improvements or mitigation measures needed to maintain traffic flow to, from, within, and adjacent to the proposed development at an acceptable and safe level of service. Any recommendations for roadway improvements should identify

potential funding sources for improvements and relevant public right-of-way dedications.

Provided in the table below are examples of the Transportation Impact Analysis threshold requirements adopted by North Carolina communities. This list provides examples from communities of a similar nature or population to those in western Union County and does not include all communities in North Carolina that have adopted TIA ordinance provisions.

Table C-1: Examples of TIA Thresholds Adopted by North Carolina Communities

Jurisdiction	Peak Trips	Daily Trips	Other
City of Hendersonville	100	1000	
Town of Apex	100	1000	
Town of Indian Trail	200	2000	
Town of Knightdale	150		
Town of Matthews			*Residential:* 50 or more dwelling units *Non-residential:* covering more than 2 acres, or including more than three building lots, or providing an assembly area for more than 400 persons, or involving office or sales floor area over 20,000 square feet, or within 150 lineal feet of any intersection of two designated thoroughfares, or within 500 lineal feet of any public road intersection currently operating as a level of service D or E, or involving service or delivery vehicles in excess of 1 ton
Town of Mooresville	100	500	
Town of Shallote		800	

5. Incorporation/Reference of Street Cross-Sections in Ordinance

This provision incorporates the cross sections from the LARTP for various street types, including public right-of-way, number of lanes, lane width, planting requirements, sidewalks, etc.) within the ordinance. This provision can also be implemented by reference to the LARTP cross-sections.

Sample Language

Proposed developments adjoining an area within which Figure 15: Highway Map, in the adopted Local Area Regional Transportation Plan (hereinafter referred to as "LARTP") recommends improvements to an existing road or development of a new street are required to reserve public right-of-way consistent with the detailed cross-sections for the subject street type per Figures 21 and 21b in the LARTP and may be required to make improvements, if deemed appropriate.

6. Access Management, Driveway Spacing and Non-Residential Development Connectivity

This provision addresses access management, driveway spacing, and connectivity requirements.

Sample Language

(A) Driveway Spacing and Access Management Standards

Driveway spacing and access management standards shall be required for developments adjoining major and minor thoroughfares and shall be consistent with the North Carolina Department of Transportation's *Policy on Street and Driveway Access to North Carolina*

Highways, July 2003. [The municipality is not limited by the *Policy on Street and Driveway Access to North Carolina Highways* and may choose to exceed these standards.]

(B) External Street Connectivity

(1) The arrangement of streets in a development shall provide for the alignment and continuation of existing or proposed streets into adjoining lands in those cases in which the adjoining lands are undeveloped and could possibly be developed in the future or in which the adjoining lands are developed and include opportunities for such connections.

(2) Street rights-of-way shall be extended to or along adjoining property boundaries such that a roadway connection or street stub shall be provided for development at least every one thousand-five hundred (1,500) feet for each direction (north, south, east, and west) in which development abuts undeveloped lands.

(3) At all locations where streets terminate with no street connection, but a future connection is planned or accommodated, a sign shall be installed at the location with the words "FUTURE ROAD CONNECTION" to inform property owners.

(4) Stub street terminations shall be designed to allow for adequate emergency vehicle access, including adequate turning radii required per local fire department standards for vehicular access.

(5) The Final Plat for Subdivision shall identify all stub streets and include a notation that all street stubs are intended for connection with future streets on adjoining undeveloped property.

(C) Access to Individual Lots

(1) Access to Thoroughfares (Major and Minor)
Individual lots abutting major and minor thoroughfares are encouraged to achieve access through the use of shared driveways, alleyways, or parallel access streets. Direct access onto major and minor thoroughfares from individual lots with lot frontages of less than 300 feet is discouraged.

(2) Limited Access to Collector Streets
Unless no alternative means of access exists, such as alleys or parallel access streets, and it is unreasonable or impractical to require an alternative means of access, direct driveway access to collector streets shall be limited to lots containing multiple family dwellings, commercial, and industrial and related uses, provided that driveway separation of two hundred (200) linear feet or more per street side is maintained.

(D) Sidewalks

(1) Internal Pedestrian Access
All multi-family, public and institutional, commercial, and industrial and related uses shall provide at least one (1) improved internal pedestrian access to connect all new buildings to existing or planned sidewalks in the adjacent public right-of-way.

7. Bicycle Amenities

This provision requires bike racks to serve bicycle commuters for developments of a certain threshold and encourages development of additional bicycle facilities, such as on-site shower facilities, and bicycle-friendly drain grates.

Sample Language

(A) Bicycle Parking Requirement

All developments containing surface parking areas with 35 or more spaces shall provide bicycle parking facilities, which shall comply with the following standards:

(1) Bicycle parking spaces shall be conveniently located, but in no case shall such facilities be located farther than 100 linear feet from the primary building entrance;

(2) Bicycle parking spaces shall be provided at the following rates:

(a) One bicycle parking space per every ten off-street parking spaces within downtown and town center districts;

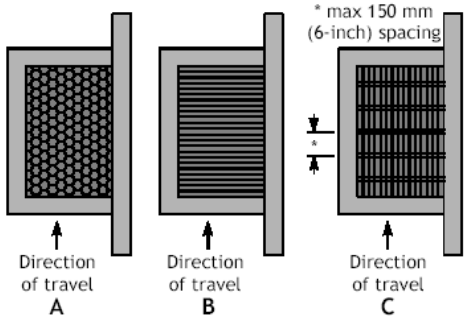
(b) One bicycle parking space per every 20 off-street parking spaces in all other districts; and

(3) Bicycle facilities shall include a rack or other device to enable bicycles to be secured; and

(4) All non-residential developments are encouraged to provide shower facilities for building users at the rate of 0.2% shower stalls per building occupant as measured at peak building activity periods.

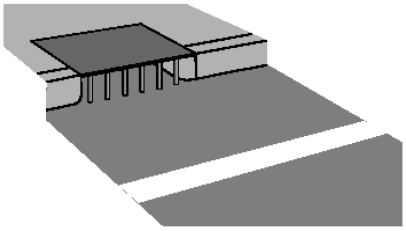
(B) Drain Grates

Per FHWA guidelines, care must be taken to ensure that drainage grates are bicycle-safe. If not, a bicycle wheel may fall into a slot in the grate, causing the bicyclist to fall. Replacing existing grates with bicycle-safe grates (see A and B in figure below, preferred methods) or welding thin metal straps across the grate perpendicular to the direction of travel (see C in figure below, alternate method) is required. These should be checked periodically to ensure that the straps remain in place.



Source: Oregon Bicycle and Pedestrian Plan

Note that grates with bars perpendicular to the roadway must not be placed at curb cuts, as wheelchairs could get caught in the slots. The most effective way to avoid drainage grate problems is to eliminate them entirely with the use of inlets in the curb face (see figure below). If a street-surface grate is required for drainage, care must be taken to ensure that the grate is flush with the road surface. Inlets should be raised after a pavement overlay to within 6 mm (0.25 in) of the new surface. If this is not possible or practical, the pavement must taper into drainage inlets so they do not cause an abrupt edge at the inlet.



Source: Oregon Bicycle and Pedestrian Plan

8. Parking Fund Payments-in-Lieu

This provision includes an option for new developments to substitute payments into a parking fund for provision of some or all required off-street parking, with funds to be used to help fund improvements such as park-and-ride lots. These types of provisions are often used in downtowns and town center areas.

Sample Language

Upon proposal by an applicant, the municipality may determine that a payment-in-lieu of providing required parking is an appropriate form of compliance with the off-street parking standards in this ordinance. When a payment-in-lieu is identified as an option, the payment amount shall be proportional to the cost of land and construction required to produce the required number of parking spaces. Payments so made to the municipality shall be used for constructing transportation-related improvements in the municipality.

MODEL ORDINANCES

9. Transit-Oriented Development Standards

The following model ordinances provide examples for implementation of transit-oriented development districts and standards, such as minimum densities, transit-friendly building design/orientation, and walkways/bikeways in designated transit-oriented locations.

Summary of Ordinance Provision

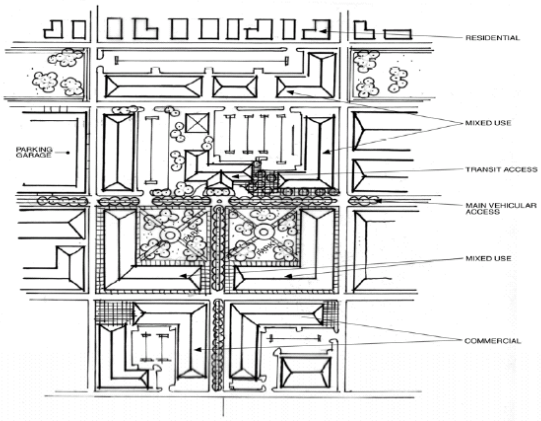
Chapel Hill, North Carolina has adopted a zoning district to be applied in areas intended for transit-oriented development (TOD). Land uses in the district are to be designed in a manner that reinforces transit use through increased densities, limit conflicts between pedestrians and vehicles, provide pedestrian amenities, and generally support transit use.

The TOD District is separated into two sub-districts:

- Transit-Oriented Development Core (TOD-C) can be designated in areas where 50% of the land area within the proposed district lies within ¼ mile of a transit station or bus boarding location.
- Transit-Oriented Development Periphery (TOD-P) can be designated in areas between ¼ and ½ mile of a transit station or bus boarding location as long as it adjoins an area designated as TOD-C.

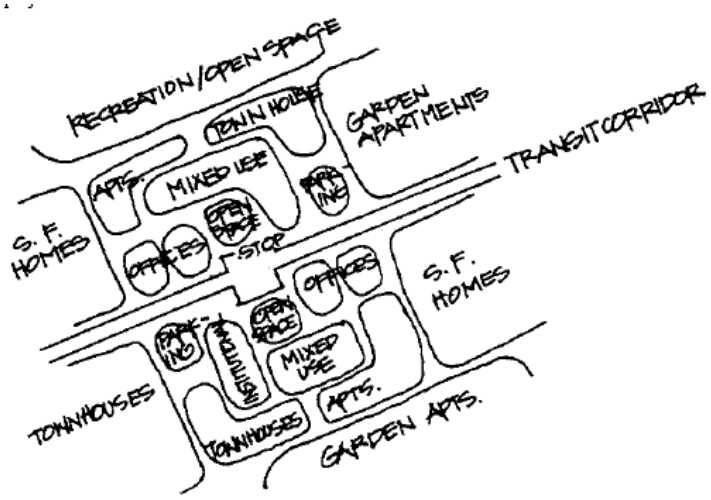
See the following link for the full TOD ordinance.
http://townhall.townofchapelhill.org/ABC/northern_area/background/tod_lumo_extract.pdf

3.5.4 Transit Oriented Development District



Huntersville, North Carolina, has adopted zoning districts for Transit-Oriented Development-Residential (TOD-R) and Transit-Oriented Development-Employment (TOD-E). The TOD-R district is established to support higher density residential communities that include a mix of retail, restaurant, service, and small employment uses within a pedestrian village format. The TOD-E is established to accommodate general office uses and offices support services in a pedestrian setting. Specific uses are allowed and allowed through a special use permit in each district according to the use's compatibility with the districts. Specific site design, block structure, parking, floor area ratios, and other design aspects are outlined in the ordinance.

See the following link for the full TOD ordinance.
http://www.huntersville.org/Planning%20Info/ZoningOrdinance0309.pdf



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10. Transportation Management Plan Requirements

This model ordinance requires all non-residential developments to provide employer-sponsored and managed Transportation Management Plans (TMP), to encourage employees and patrons to walk, bike, and take transit instead of relying on automobiles for mobility. Similar provisions could also be adopted to specify a threshold (e.g., developments that will employ 100 or more employees) that would trigger requirements for TMPs .

Summary of Ordinance Provision

The Town of Chapel Hill requires a Transportation Management Plan (TMP) be developed as part of all non-residential development proposals. The TMP is a stipulation of the Special Use Permit or Site Plan approval process and is submitted as part of the Zoning Compliance Permit. The following travel demand measures and incentives are recommended for inclusion in Chapel Hill's TMP:

- Subsidized transit fares, distribution of transit service schedule and other information;
- Staggered work hours and flextime programs;
- Installation of bicycle racks, lockers and shower facilities to encourage people to bike or walk to work;
- Informal rideshare matching program;
- Funding for programs such as purchase of bicycles for employee use;
- Installation of bus shelters and similar amenities to enhance transit use;
- Parking management program including parking charges or designated rideshare/carpool spaces;
- Installation of transit information display and its continued maintenance; and
- Other measures: lunchroom facilities, direct deposit of paychecks, and employee use of company mailroom facilities.

Other options for inclusion in a Transportation Management Plan program can include:

- Carpool drop-off areas
- Shuttle service to mass transit

See the following link for the full Chapel Hill TMP ordinance.
http://www.ci.chapel-hill.nc.us/DocumentView.asp?DID=223

Appendix D

Community Case Study Report

Western Union County ◆ Local Area Regional Transportation Plan (LARTP)

Land Use and Transportation Planning Case Study Report

March, 2009

CLARION ASSOCIATES

www.lartp.org

Contents

Special thanks go to the planners that helped provide the planning intelligence used to prepare this report.

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- Bjorn Hansen, Transportation Program Coordinator, Centralina Council of Governments
- Kathi Ingrish, Planning Director, Town of Matthews
- Kent Main, Planning Coordinator for Economic Development, Charlotte-Mecklenburg Planning Department
- Scott Ramage, Principal Planner, Town of Cary

OVERVIEW

BACKGROUND

This is a report to the four member jurisdictions (Village of Marvin, Town of Weddington, Town of Waxhaw, and Village of Wesley Chapel) of the Western Union County Local Area Regional Transportation Plan (LARTP) Group. As part of one of the fastest growing counties in the country, these municipalities have undertaken a planning effort to address the impacts of rapid growth and proactively plan for the future. Together with the Centralina Council of Governments, the member jurisdictions of the LARTP Group have collaborated to create a unified transportation plan for the study area (see figure to the right). The intent of the planning effort is to develop a common framework for guiding future transportation and corresponding land use decisions within the four jurisdictions. This effort is timely and corresponds with the update to the Union County Comprehensive Plan, development of the Waxhaw Comprehensive Plan, and other local planning efforts.

Project Study Area

PURPOSE

One of the steps in this planning process is to assess the linkage between transportation planning and land use planning in the study area and to identify ways to better coordinate planning efforts to achieve the desired goals in western Union County: decrease road congestion, provide safer roads and intersections, maintain rural character, provide safe routes for bicyclists and pedestrians, and others. The way in which the four towns and the county develop their land directly impacts the local transportation network, including roadways and alternative modes such as transit, bicycles, and pedestrians. For example, development along NC-16/Providence Road has led to a decrease in the level of service along this corridor, particularly during peak hours. This part of the planning process assesses different ways that these communities can manage land use to better use the existing transportation system and identifies public and private methods to improve and enhance the system.

For this initiative, the Steering Committee chose to look outside the study area and learn from the planning practices of other communities that have experienced similar growth and transportation issues. In particular, the committee suggested that the planning team learn more about transportation and land use planning in Matthews, Huntersville, and Cary, North Carolina, specifically focusing on new ideas and lessons learned that could inform the Steering Committee as it develops the implementation strategies for this planning effort. In addition, the planning team reviewed the development of the Ardrey Kell Road Corridor in Charlotte, NC. This report provides case studies from these communities focusing on a few key questions:

- How have these communities managed impending growth?
- How do they plan for and fund transportation infrastructure needs?
- How do they address the land use / transportation nexus?
- Have they been successful at accommodating growth and maintaining community character?

The final section of this report draws upon the lessons learned from these communities and provides implementation recommendations for the Steering Committee to consider.

MATTHEWS, NC CASE STUDY

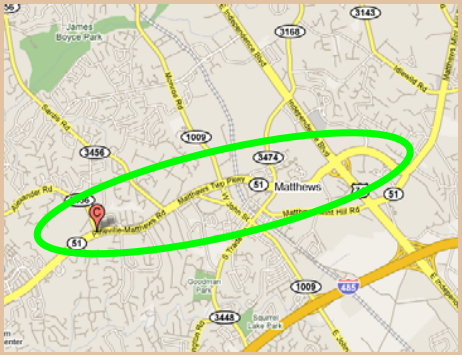
BACKGROUND

The Town of Matthews is located in southeastern Mecklenburg County and borders the City of Charlotte, the Town of Mint Hill, and Union County (including the Towns of Stallings and Indian Trail). As part of an agreement each municipality in Mecklenburg County has with Charlotte, Matthews has a defined area, known as its Sphere of Influence, from which it can annex. The town's Sphere of Influence and ETJ (extraterritorial jurisdiction) share the same boundary, providing the town the ability to manage and plan for growth within its defined growth area. The town also has an annexation agreement with the Town of Stallings. Through the early 1980s, the town had predominantly relied on voluntary annexations, but by the mid-1980s it began using involuntary annexations to incorporate complete phases of developments at a single time. Through this process the town limits have grown substantially since 1986.

Matthews experienced a wave of growth in the 1980s and 1990s, providing almost two decades of planning to learn from.

Matthews experienced a wave of growth in the 1980s and 1990s. The town's population in 1980 was 1,648. By 2000 it grew to 22,127 and continues to grow, although at a slower rate. This growth coincided with the location of several major employers locating in the area. The majority of land in the community is dedicated to residential uses, with commercial and employment uses located along the main road corridors, such as Independence Blvd/US-74, Trade Street, and Pineville-Matthews Rd/NC-51. While the town has not reached full buildout, it has few remaining parcels left to develop, often with significant transportation and environmental constraints.

The town's land use planning is guided by its 2002 Land Use Plan. This is a policy-based plan that is implemented by amendments to the zoning ordinance. The town has plans to develop a Future Land Use Plan in the fall of 2009 and is currently undertaking an update to its Unified Development Ordinance. Matthews recently adopted bicycle and pedestrian plans. The town adopts the MUMPOs (Mecklenburg-Union Metropolitan Planning Organization) Thoroughfare Plan as its own and uses this to guide road planning. Much of the town's current transportation planning efforts focus on creating better connectivity in developed areas, such as retrofitting downtown to provide better accessibility and mobility, improving existing roads, and providing more pedestrian and bicycle facilities.



The NC-51 Corridor has been identified by Matthews as a priority for protecting traffic flow and the natural environment.

The Land Use Plan focuses on the connection between land use and transportation planning in key corridors. Through its zoning ordinance, the town has focused higher traffic volume commercial and employment development to main transportation corridors. Public support is critical to these efforts. When there was no support for the proposed Sardis-Weddington Connector because it would bisect existing residential neighborhoods, the town built an alternative - Fullwood Road. Recently, the town has focused attention on the transportation and land use planning along the NC-51 corridor. This corridor has rerouted traffic around the north side of downtown, providing easy access from businesses and neighborhoods to an I-485 interchange and away from downtown. The town's Land Use Plan (2002) identified this as a priority focus area for protecting traffic flow as well as the natural environment found in the corridor.

A light rail transit line paralleling the existing railroad line and connecting into Uptown Charlotte has been discussed for many years. Several studies have been conducted for the Southeast Transit corridor. Currently, the transit planning continues and may eventually result in a new light rail line or a BRT (bus rapid transit) line linking Matthews to Charlotte.

PLANNING PRACTICES

Matthews employs several land use planning tools that reinforce transportation planning objectives.

Special Highway Overlay Zone

To protect the traffic flow and the natural character along the NC-51 corridor, the Town of Matthews adopted a Special Highway Overlay Zone. This zoning district acts as an overlay on top of the base zoning districts that lie in the corridor and includes more restrictive measures for lands within the district. The boundary for the district is tied to the designated right-of-way as identified in the town's Thoroughfare Plan. As the plan is updated and right-of-way is expanded, the overlay zone is also amended. Provisions in the overlay zone include the following.

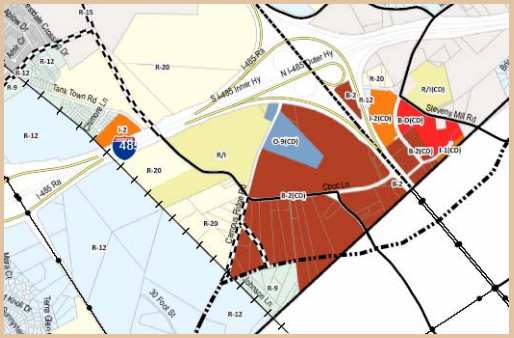
Properties within a 50-1000 buffer of the road right-of-way along NC-51 are regulated by Special Highway Overlay Zone provisions.

- **Natural Areas Protection.** The purpose of this provision is to provide a natural protective buffer area on both sides of the roadway to reduce the visual impact of development in the corridor and protect natural areas. All properties within the overlay zone are required to have a natural buffer area along the NC-51 road frontage. This buffer, or setback, ranges from a 30 foot to 25 foot buffer, depending upon whether it is accessed directly from the highway (30 foot) or by a service road (25 foot). All streets that connect to NC-51 are also required to have a 25 foot natural buffer within the overlay boundary.
- **Landscaping.** All non-single family developments within this area are required to develop a landscaping plan for areas within the protected buffer area and interior to the development. The ordinance provides specific provisions for the type, size, and location of landscaping materials that are used in both locations. Trees within the required protective buffer area that are of a certain type and measure either 3 caliper inches or 4 feet in height or greater are required to be protected. In addition, a 20 foot buffer is required of all non-residential uses abutting a residential use or zoned area. The landscaping must buffer the uses with at least a 75% opaque year round landscaping material. The ordinance provides specific options for complying with this provision.
- **Access Control.** Access control refers to access management. This provision limits the number of driveways and streets intersecting the road with the goal of having no more than one per every 500 feet. Given the fact that some parcels have less than 500 feet of road frontage, the minimum required distance between driveways is 200 feet. The town encourages landowners of adjacent smaller lots to develop plans to share driveways. In some instances, these driveways can be larger than a single driveway permit allows, depending on NC-DOT approval.
- **Land Use.** Land uses within the corridor are the same as those allowed under the base zoning district. Towards the center of the town, these uses are primarily commercial, employment and multi-family with lower-density residential uses at the periphery.
- **Impervious Surface and Stormwater Management.** Development within the overlay zone is limited to an impervious surface (rooftops, walkways, and paving) of 75%. Stormwater retention is required on all lots.
- **Parking.** Parking for all non-residential sites in the overlay zone has to be located to the side and rear of all principal structures. Parking cannot be any closer to the highway than the principal structures on the lot or 60 feet, whichever is less. Applicants can apply for exemptions and specific conditions for exemption are outlined in the ordinance.

Conditional Zoning

The Town of Matthews has been given the authority by the N.C. General Assembly to use conditional zoning. Under this statute, the town's zoning ordinance can include conditional districts in which site plans and individual development conditions are imposed. Conditional zoning allows local governments to tailor development regulations when rezoning to a more intensive land use. This zoning tool provides an opportunity for the town to negotiate with developers to require better access management, connectivity with adjacent uses and roadways, greenways, sidewalks, road improvements, and other features within the development.

In North Carolina, land may only be placed in a conditional zone upon petition by all landowners to be included in the rezoning. The enabling statute limits the types of conditions that may be imposed on the new zone to (1) those that address the conformance of the development and use of the site to city or county ordinances and officially adopted plans, and (2) those that address the impacts reasonably expected to be generated from the development or use of the site. To comply with N.C. statutory provisions, the local planning board must state in writing how the rezoning to a conditional zoning district complies with the municipality's comprehensive plan and the deciding body must state its reasons for voting to rezone to a conditional zoning district. The conditions agreed to by the petitioning landowner(s) are then legally binding on both the landowner(s) and local government, providing stability for the landowners' investment interests.[1] Matthews has agreed to conditional zoning for residential, business, office, and industrial zoning districts. This tool allows the town greater flexibility in meeting their community goals as outlined in their land use, bicycle, and pedestrian plans.



Hatch marked lines designate proposed minor and major thoroughfares near the new CPCC campus in southern Matthews near I-485.

Thoroughfare Plan

Once a roadway is included within the town's Thoroughfare Plan, the town can then use this plan to require dedication of right-of-way as part of the development approval process. Existing and proposed major and minor thoroughfares are designated on the town's zoning map to further reinforce the importance of these roadway corridors. Using the conditional zoning process, the town can also request that the developer convey land to the town and construct portions of future thoroughfares.

TRANSPORTATION FUNDING

Matthews has historically had political and community support to fund transportation improvements with local funding.

- **Bonds.** In 2004, Matthews passed a local bond referendum to allocate $5.5 million for specified road projects and $5 million for park & recreation projects.
- **Funding Partnerships.** Matthews has joined Mecklenburg County to finance development of a two mile segment of the 4-Mile Creek greenway. This project has been ten years in the making and will connect an elementary school, a community center, Squirrel Lake Park, Trade Street near Arthur Goodwin Park, and a neighborhood through the protection and enhancement of 4-mile creek stream buffers.
- **Dedicated Annual Funding .** For a number of years, Matthews has dedicated general fund revenues annually to construct one sidewalk project along a main corridor. In conjunction with sidewalks built as requirements of new development, this funding source has helped to build a network of sidewalks, particularly focused on filling in the gaps between sidewalk segments developed as a condition of new development.

[1] This discussion was taken from "Conditional Zoning in North Carolina" a paper authored by Erin Wynia of the N.C. Coastal Resources Law, Planning and Policy Center in March 2007.

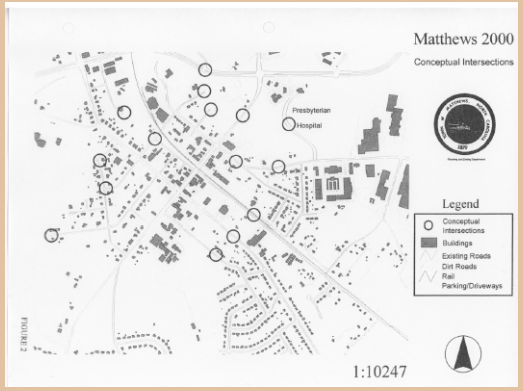
- **Tax Increment Financing (TIF).** The town is now considering use of a TIF to fund road and streetscape improvements in designated areas of town. In addition, developers are considering using a synthetic TIF to fund property improvements. Developers would borrow against the future taxes paid on a property, assuming a certain property tax value in the future. This is a tool that is not used in many communities in North Carolina and should be fully vetted before entering into such an agreement.

LESSONS LEARNED

Three decades of land use and roadway planning in a high growth environment have led to many lessons learned in Matthews.

- Plan now – implementation takes much time and effort.
- Road projects have been a stimulus for new development. Whether proposed or under construction, new roads and connections necessitate changes in zoning and land use policies to manage development and maintain levels of service.
- Start public improvement projects as soon as possible; costs will almost always increase the longer you wait to break ground. The main road project funded by the 2004 bond was stalled and is now estimated to cost more than double the original estimate.
- Local governments should understand what the state can and will do to improve the local transportation system and the timeline for those improvements. Any other priorities should be taken up locally.

A new mixed-use development provides connectivity between downtown and NC-51. The project includes a natural buffer along the highway frontage.



Matthews Downtown Master Plan designates "conceptual intersections" with circles where new road connections will be made in the future.

- A comprehensive transportation plan that includes bikeways, pedestrian paths, roads, and transit is ideal. This coordinates all of these modes into one document and makes it easier to understand, easier to set community priorities, and easier to work with developers to negotiate development exactions.
- Connectivity is the key to a healthy transportation system. The town is working to create more connectivity in already developed areas, such as the downtown. The downtown master plan identifies locations for new intersections and the town is using this to work with landowners to develop new connector roads.

HUNTERSVILLE, NC CASE STUDY

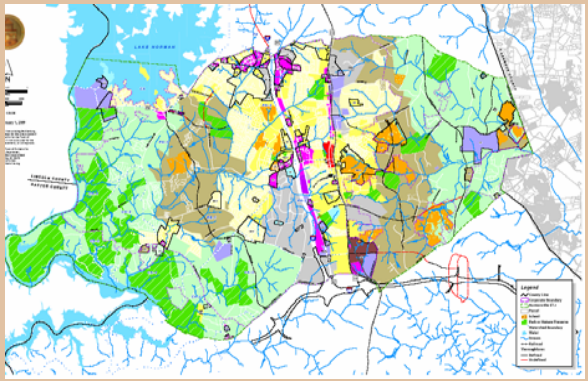
BACKGROUND

The Town of Huntersville is located in northern Mecklenburg County south of Cornelius and north of Charlotte. It lies along I-77, just twelve miles north of Charlotte's center city. Once an agricultural community with a small textile mill and a commercial area along the railroad, Huntersville has grown significantly, expanding its planning jurisdiction (ETJ) and corporate limits to include approximately 64 square miles. The town's growth in population has been significant in the last two decades. In 1990, its population totaled 3,014. This grew to 24,960 by 2000 and current studies estimate the town's population at 44,500. Residential development in the town has almost doubled since 2000. Like Matthews, Huntersville partnered with Charlotte to adopt an annexation agreement that designates the town's growth area. The town has adopted a similar agreement with the Town of Cornelius. Approximately 12% of the town's planning area is within its ETJ and is generally more rural in character. Huntersville has considered annexing the balance of its jurisdiction and currently accepts voluntary annexations from within its ETJ.

Huntersville's proximity to Charlotte, Lake Norman, major roadways, and future transit has resulted in intense growth since 1990.

The main road corridors of I-77, US-21, and NC-115 run parallel and north/south through the central areas of town. The majority of development within the community is located along these main corridors. More rural areas in the ETJ straddle the urbanizing areas to the east and west. The town has made a concerted effort to focus and guide development along the central parts of the community to develop more sustainably, build on the city's historic development pattern in a way that provides density for future transit use, and to preserve rural areas to the east and west. The town's fundamental planning principles focus on the following.

- Proactively guiding development in a sustainable and efficient manner by creating an "edge" which marks the line between "town" and "country".
- Concentrating higher-density development where existing highways and future rail lines are located to ensure an efficient transportation system and proximity to centers of activity.
- Employing traditional town planning principles that promote new and infill development in the town's urbanized area, anchoring the town on a proposed rapid rail corridor along the north-south rail spur.
- Planning for streets as the fundamental building blocks of the community to create an interconnected system that offers inviting public places and that respects the pedestrian and accommodates the automobile.
- Developing a transit-supportive community that offers many options for mitigating traffic and moving throughout town and the larger region.
- Viewing each new development proposal within the larger context including its impacts on the transportation network and other public facilities.
- Requiring a high-quality built environment that includes excellence in building design, streetscapes, pedestrian amenities, preservation of special places, and enhancement of community distinctiveness.

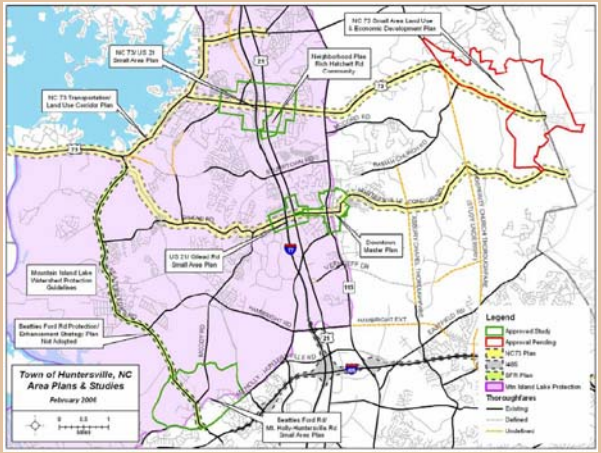


The traditional town planning approach focuses development towards the center city areas near main road and rail corridors and away from rural areas on the periphery of town.

Land use and transportation planning are always undertaken simultaneously in Huntersville. A Community Plan provides the overall vision for the community and a series of small area plans provide the framework for guiding growth, design, and public improvements in targeted corridors. Like Matthews, Huntersville does not have a town-wide future land use plan and instead implements the recommendations of its 12 small area plans directly into its development ordinances. This "quilt" approach to planning has enabled the town to create highly detailed plans for targeted areas in the community. The town takes a unique approach to encouraging density – it has no density caps in areas targeted for development, such as in downtown, transit oriented development locations, and neighborhood residential areas. Instead, the town relies on the market and local culture to determine what density of development is appropriate. The town has been happy with the products of this approach - Montreat Park, Rosedale, and Birkdale Village are all higher density mixed-use developments that achieve community goals.

In 1996, the Town of Huntersville revised its development ordinance to employ the principles of traditional town planning. The ordinance is both a performance based and form based code that contains urban design standards, such as requiring that buildings face the street and are accented with sidewalks and street trees. The zoning ordinance includes nine general districts: three residential districts, three mixed-use districts, and three commercial districts.

The town's approach to transportation focuses on expanding multi-modal opportunities and dispersing traffic by emphasizing the connectivity of streets so that travelers may have multiple routes to destinations. In 2007, the town adopted a Comprehensive Transportation Plan that incorporates its thoroughfare plan, greenway, bicycle, and pedestrian plans into one. As new regional plans are developed, Huntersville adopts MUMPOs thoroughfare plan as its own. Huntersville is currently partnering with Charlotte and the five other municipalities in Mecklenburg County to develop an integrated transit/land use plan for rapid transit.



Small area plans guide development and design along targeted corridors in Huntersville.

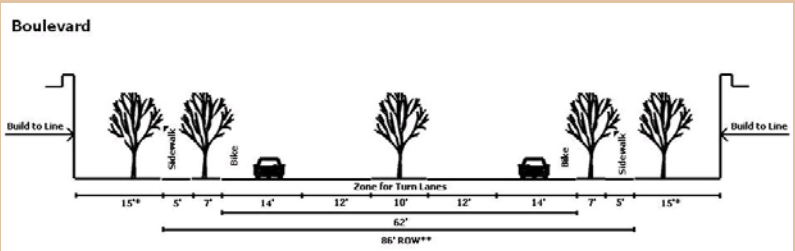
PLANNING TOOLS

Transportation Planning Resources

Huntersville has made a concerted effort to conduct local level transportation planning and to provide staff capacity to undertake these efforts. The town hired a transportation planner in the 1990s as development activities began to increase. The town also employs a traffic engineer who was formerly with the Charlotte Department of Transportation and a principal planner that serves as a liaison between land use and transportation planning. The town develops an annual list of priority transportation improvement projects. In 2008, the town identified ten priority projects and completed five. This year the town has expanded that list to include sixteen priority projects. Decisions on transportation improvements made by the town are guided by a methodology that identifies the amount of funding that will be applied to various types of projects (i.e., maintenance, new roads, pedestrian facilities, etc.)

Development Review – Focus on Transportation

The Town of Huntersville uses three planning tools to exact transportation improvements from private developers during the development review process and to guide the specific designs of these improvements. These tools include the Streets section of the Huntersville Zoning Ordinance, the town's Thoroughfare Plan, and the town's Transportation Impact Assessment Ordinance.



Huntersville's Zoning Ordinance provides illustrations of street cross-sections that specify the exact configurations of street improvements by type of road. A boulevard cross-section is shown here.

- The Streets section of the Huntersville **Zoning Ordinance** focuses on street connectivity and designing streets to provide a pedestrian-scale environment that is conducive to walking and biking. Provisions within the ordinance are designed to address rural and urban environments differently. For example, urban type districts are required to provide sidewalks on both sides of the street and in rural districts, sidewalks may only be required on one side of the street.

- The town uses its **Thoroughfare Plan** as an official map that designates where future road, bike, pedestrian, and greenway improvements will be made. If a developer has proposed a development on a site that includes portions of a future road, the town will require, at a minimum, that the road right-of-way will be reserved. Another option is for the landowner to designate the right-of-way and convey the land to the town. A final option is for the landowner to convey the land and develop the transportation infrastructure.

- Adopted in 2008, the town's **Transportation Impact Assessment Ordinance** sets out specific provisions for 1) the assessment of transportation impacts from new developments that are expected to generate a minimum number of vehicle trips within a defined impact area, 2) the level of service that is required on roadways within individual zoning districts, and 3) the forms of mitigation that are to be employed to maintain the existing level of service on impacted roadways. This ordinance provides the town with an opportunity to assess more holistically the transportation impacts that a single development can have on the transportation system.

The Transportation Impact Assessment Ordinance requires that all developments that are expected to generate 50 or more peak hour trips or an average daily total of 500 or more trips (based on the current edition of the ITE Trip Generation Manual) to conduct a transportation impact assessment of the project. Based on the size, type, and uses within the proposed development, an "impact area" is defined. This impact area identifies the segments of the road network that will be assessed for impacts from the development. These assessments take into account any planned travel demand management techniques employed in the project. For example, a mixed-use project may actually receive a credit (i.e., increase road capacity estimates) for a roadway in the impact area as many residents will have access to uses that will not require vehicle trips. For redevelopment projects, the transportation impact assessment focuses on new trips generated by the development.

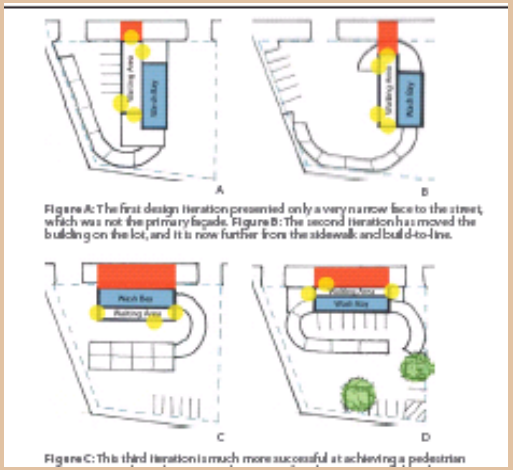
The town has established minimum levels of service (LOS) for roads by zoning district, ranging from "C" (better flowing traffic) to "E" (more traffic and less flow). The town center and transit-oriented development district have an LOS "E," the rural and traditional residential districts have an LOS "C," and all other districts have an LOS "D". This may seem counter-intuitive as the town has essentially allowed for lower levels of service in areas of higher density development and intensive road use; however, this is by design. These levels of service help to reinforce the town's vision for land use by encouraging development to occur in the central areas where road mitigation requirements are less costly and transit will be provided in the future, and discouraging it from occurring in the rural areas where road mitigations requirements may be more costly. Mitigation is a requirement of development approval if the TIA results show a decrease in LOS in the impact area. Mitigation can come from the developer in the form of the provision or funding of

pavement widening, turn lanes, median islands, access controls, traffic signalization, or other improvements. It is important to note that LOS standards are set based on the existing level of service in the town. If the town wishes to improve the LOS on a roadway, it can not require a developer to mitigate beyond the established LOS. However, the town can work with the developer to make improvements that will increase the LOS, and will likely require public investment.

Design Guidelines

Huntersville's Design Guidelines Manual bridges the gap between the standards outlined in the town's Zoning Ordinance and the vision expressed in the town's plans. It provides a graphic representation that complements the zoning ordinance and helps to interpret its regulatory provisions. Examples of design recommendations included in the Design Guidelines Manual include the following.

- Connectivity should be created within and between developments. The zoning ordinance requires street stubs to be built to adjoining properties.
- Streets should be enclosed by buildings to create public spaces. The setbacks of buildings from streets will be dependent upon the context (downtown, neighborhood, rural, etc.) Larger setbacks can be allowed in urban settings as along as a row of maturing street trees aligns the edge of the street.
- Parking should be placed behind or to the side of buildings.
- Buildings should be designed to respect the human scale, including the character of pedestrian entrances along streets. Any uses that disregard the human scale should be buffered, such as big box retail, commercial communication towers, junkyards, outdoor storage, etc.
- The Rural District (R) encourages the development of neighborhoods and rural developments that set aside significant natural vistas and landscape features for permanent conservation. Development types associated with the Rural District are farms, the conservation subdivision, the farmhouse cluster, and the residential neighborhood.



One section of the Design Guidelines Manual shows the progression of a car wash site design. The final approved plan "D" creates a pedestrian environment along the main street frontage by placing parking and wash bay circulation to the rear of the site and away from the road.

TRANSPORTATION FUNDING

The Town of Huntersville has invested a significant amount of resources to transportation and land use planning, including the development of 12 highly detailed corridor and small area plans, hiring professional transportation and land use planning staff, and public investments in transportation infrastructure. The town has partnered with the North Carolina Department of Transportation to assist in roadway building. Development of the full NC-73 roadway, a strategic east-west corridor in the town, was on the town's Thoroughfare Plan. In 2005, the town wished to pursue development of NC-73 roadway segments; however, the North Carolina Department of Transportation didn't have the funding at the time to move forward with the project. The town provided bridge funding to the state allowing them to develop the road and was later reimbursed through state transportation funds. A local developer also contributed money to the development of this road. Currently, the town has a project that is high on the list of potential federal stimulus package projects. The town is also considering using bonds to pay for priority road improvements.

LESSONS LEARNED

A focus on the land use and transportation nexus in Huntersville has provided many learning opportunities. Lessons learned from these experiences include the following.

- If a local government doesn't designate where dense development will go, then it will likely result in a haphazard development pattern that may impact the character of the community. The best way to preserve areas within a community is to have alternative choices for more dense development to locate and to set up zoning ordinance and road planning to reinforce that model.
- Developers don't wait for a thoroughfare plan to be adopted. It is important to put in place a thoroughfare plan and amend local ordinances accordingly to ensure that developers will provide their fair-share of needed improvements.
- Make sure that all plans become a reality. Huntersville has a good success rate at taking recommendations from small area plans and incorporating them into local ordinances.

Road standards in Huntersville include wide shoulders or bike lanes and sidewalks on both sides of the road.

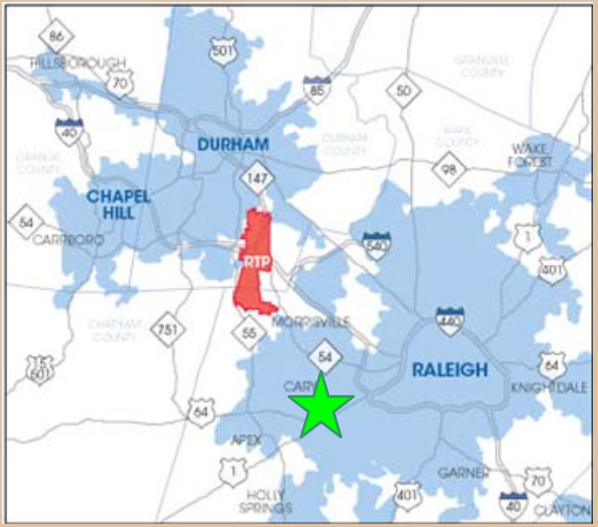
Density is focused in the central core of the town proximate to main thoroughfares and away from the rural areas on the periphery.

- Build in the linkage between transportation and land use planning in town plans and reinforce this linkage through staff responsibilities.
- Pick transportation improvement priorities and focus on them. Don't bite off more than you can chew or it will likely lead to a low success rate.
- Always think about the long-range impacts of decisions. Community opposition to street connectivity between several neighborhoods in Huntersville led to the town not requiring these connections. Now some residents have limited access and have to drive more than a mile of neighborhood streets to get from their home to a main roadway. This is not only an inconvenience to residents, but delays response times of emergency responders to these areas.
- It is critical to work with the county to develop consistent standards for development that may one day be within municipal limits.

CARY, NC CASE STUDY

BACKGROUND

Cary is located in the heart of the Research Triangle metropolitan area near Raleigh, Durham, and the Research Triangle Park (RTP). Cary's proximity to these employment centers, three prominent universities, freight and passenger rail, and to interstates and regional thoroughfares, has led to significant growth over the last two decades. The town had a population of 25,000 in the early 1980s. By 1990, the population had almost doubled to 43,000. Current estimates project that the town's population is more than 132,000.



Cary's unique location at the heart of the Research Triangle Region has made a fertile ground for both residential and employment development.

In the 1980s, Cary qualified for a three mile ETJ extension that expanded the planning jurisdiction of the town to the west of NC-55 to include historically rural/agricultural areas. Many landowners within this area were opposed to being within Cary's jurisdiction and wanted to maintain the rural community character west of town. In 2000, Cary and other municipalities in Wake County participated in a joint planning effort that set out primary and secondary growth areas for the municipalities and strategies for coordinating extension of services and transportation improvements. This regional planning effort has been a critical step at managing growth within Wake County. Today, the town is essentially "landlocked" by neighboring jurisdictions and the Swift Creek Land Management Area, an impaired stream corridor.

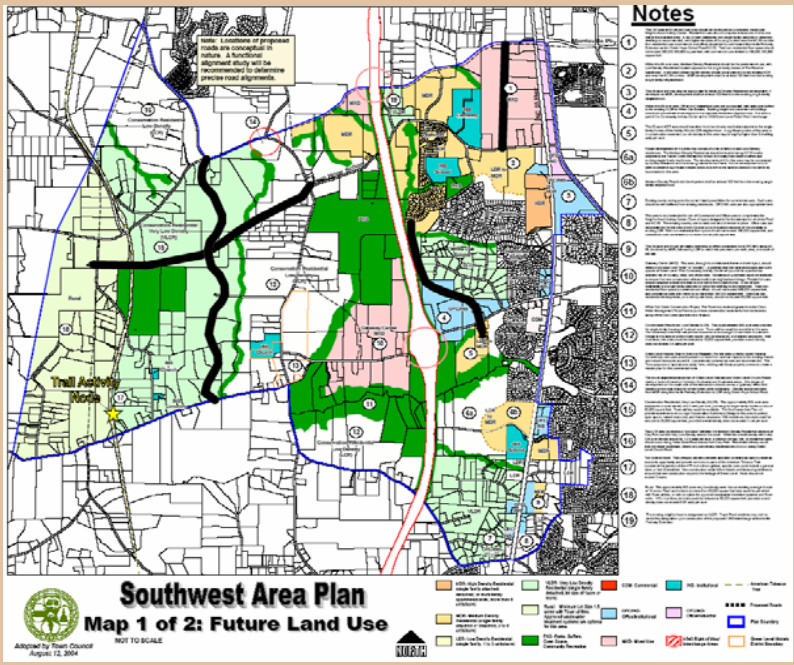
Cary uses a tiered system of plans to direct growth and development in the town. In 2000, the town adopted a community-wide Growth Management Plan that provides goals and policies for directing several aspects of growth in the community: 1) rate and timing, 2) location, 3) amount and density, 4) cost, and 5) quality. This document provides the policies and implementation strategies for coordinating the provision of public facilities and services with new development. The town's Land Use Plan, adopted in 1996 and revised in 2003, articulates goals and objectives for development in the town. Like Huntersville, the town's land use plan focuses on creating a density transition from the more dense central parts of the community to the more rural areas towards the west. This plan is further expanded through several small area plans that focus on quadrants of the town. This case study focuses on the Southwest Area Plan that includes areas within the town's corporate limits and ETJ that have historically been more rural in character and are bound by areas just east of NC-55 westward to the Chatham County border. This area is the focus for several large transportation improvements: the development of the I-540 corridor, three I-540 interchanges, and road improvements to provide capacity for projected traffic flowing through the region.

Cary is the third largest member of the Capital Area Metropolitan Planning Organization (CAMPO). Using CAMPO's regional transportation planning model, Cary undertakes its own transportation planning and analysis to develop plans for transportation system improvements. In 2001, the town adopted a Comprehensive Transportation Plan that includes all modes of transportation, including greenways and bike lanes. These plans were then incorporated into CAMPO's Long Range Plan. The town is currently in the process of updating its Comprehensive Transportation Plan and will include pedestrian, bicycle, transit, and street elements.

PLANNING TOOLS

Southwest Area Plan

The Southwest Area Plan (SWAP) is a master plan for more than 5,700 acres in the southwestern portion of the Town of Cary's planning area. This plan is a policy document which establishes the long-range vision and recommendations for future land uses, transportation, parks, open space, and the environment in that area. This area lies within a geologic region which contains soils that are poor in permeability, limiting the application of septic systems in some locations. Much of the nine square miles within the planning area have historically been in agricultural use with rural homes and farmsteads. The largely undeveloped Green Level area lies within the planning area. This is one of the last expansive rural landscapes in the vicinity of the Research Triangle Park. It is one of three historic districts within Cary's planning jurisdiction that are on the National Register of Historic Places.



The original vision for the Southwest Area Plan was to maintain rural character. Development of suburban subdivisions in the area has changed the area and may require a new land use planning approach.

Driven by community concerns for the area, the focus of the Southwest Area Plan is to preserve rural character in the community and to protect natural and cultural resources, such as the Jordan Lake watershed. The plan focuses services and development around NC-55 and I-540, the main north-south corridors in the planning area, located in the eastern portion of the planning area and away from more rural areas to the west. It sets out a density gradient that transitions from higher density land uses in the east to rural density land uses in the west.

The American Tobacco Trail serves to some extent as an urban growth boundary on the western side of the planning area. All areas west of the trail are slated to remain rural. The plan is complemented by the Rural Landscape Preservation Project -- an effort to identify key natural and cultural areas for protection and to educate landowners on the tools available to them to protect the important character of their lands.

The Southwest Area Plan sets out several implementation actions that the town has undertaken. One of the most critical steps for protecting rural areas was the adoption of the **Conservation Residential Overlay Zoning District** which includes three subdistricts. This ordinance is applied on top of the R40 base zoning district that results in a density of one acre or less. The three overlay zoning subdistricts include:

- Conservation Residential - Low Density (1.0 acre gross density),
- Conservation Residential - Very Low Density (0.5 acre gross density), and
- Rural (0.5 acre gross density).

New clustered subdivisions in southwest Cary do not have curb, gutter and sidewalks, and instead use swales to manage stormwater runoff.

The overlay zoning district provided an alternative to the traditional subdivision often called the "Conservation Subdivision." With this new tool, developers can increase their net yield on a property for permanently protecting primary and secondary open spaces. In addition, developers must incorporate low-impact development and stormwater best management practices (such as swales and rain gardens) in their developments. For every acre of primary open space protected, developers can develop between 5 and 10 additional units, depending on the quality and character of the open space. For every acre of secondary primary open space protected, developers can develop 5 additional units. Because the ordinance includes a maximum gross density for each of the three overlay subdistricts, this limits a developer's ability to actually develop all the bonus units available. The town is currently working to amend this provision to make the ratio of open space to bonus units more feasible.

The plan also called for new town standards for thoroughfare and collector road design to permit the construction of **"rural collectors" and "rural thoroughfares"** within the planning area. These alternative designs call for collector and thoroughfare roadways to be built without curb and gutter or sidewalks in order for the roadways to be more compatible with the existing rural landscape and to use low-impact development techniques to manage stormwater runoff along roadways. Greenways and wide shoulders on rural collectors and thoroughfares provide transportation alternatives in this area.

When the Southwest Area Plan was being developed, many landowners were not interested in selling or subdividing their property for new development and the focus was on maintaining rural character in this area. Times have changed, and many landowners are now more interested in developing their properties. Much of the new development that has been built in this area has resulted in a more suburban type character. The vision for the area may be changing. This area is no longer experienced as solely rural and is becoming more suburban in character with each new residential neighborhood. Staff planners determined that what most residents want in the area is not necessarily rural development, but to limit visibility from the main thoroughfares into new residential developments. The town is considering adoption of an 80 foot streetscape buffer from thoroughfares to achieve this goal. If adopted, front setbacks would be applied in addition to the streetscape buffer. There are concerns that at some point in the future, existing neighborhoods will want suburban amenities, such as sidewalks and street lights. If this occurs, the town will have missed its chance to have developers assist in the development and construction of these types of amenities.

Developers add wide shoulders along rural collectors and thoroughfares in the Southwest Planning Area to provide an opportunity for bicyclists to share the road.

Transportation Funding

Because CAMPOs funding cannot pay for all of Cary's priority projects, the town has found it necessary to provide funding to build roads and make improvements to achieve its transportation goals. For example, the town has invested in a red light synchronization system that improves traffic flow and has widened and built sections of road that link developer built segments. The town has used bonds and general funds to make these improvements. When Davis Drive, a road exiting off of I-40, needed widening and the state didn't have the funds to undertake the project, the town lent the state the money until such time that it could pay back the town from state transportation funds.

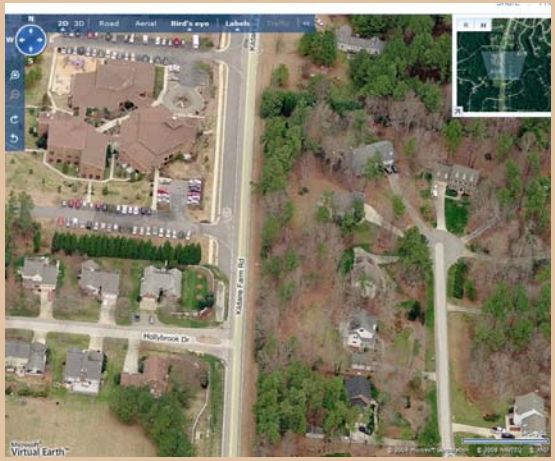
There are three main sources from which the Town of Cary receives funding or transportation improvements from developers: exactions at the time of rezoning, adequate public facilities exactions, and impact fees.

- **Exactions.** Developers are required to dedicate right-of-way to the town for any planned transportation improvements shown on the town's Comprehensive Transportation Plan and to construct these improvements. This is often called a developer exaction.
- **Adequate Public Facilities Ordinance.** In addition, the town has an Adequate Public Facilities Ordinance. This ordinance requires that adequate public transportation facilities are in place to service a new development before it is constructed, often in the form of traffic signal and intersection improvements. This ordinance is applied by zone and may result in a developer making improvements to move forward with their development if an area is underserved.
- **Impact Fees.** The town also has authority from the North Carolina General Assembly to assess road and water/sewer impact fees on new developments. These fees are determined based upon an impact fee methodology that generates the number of new users that will require water/sewer and road capacity. Fees are then applied to offset those impacts. This is a tool granted to only a few municipalities in the state.

LESSONS LEARNED

Lessons learned from land use and transportation planning in Cary include the following.

- Development will happen. Communities need to be realistic about what type of development you want, what you want it to look like, and where you want it to go. The community's land use plan and ordinances need to reinforce the vision. The original vision for the Southwest Area may be changing based on changing property owner interests and the type of new development in the area.
- Reducing development densities along some roadways will not necessarily reduce future capacity demands on the road. During the Comprehensive Transportation Plan update process, the town identified regional transportation impacts along main thoroughfares, such as NC-55, that would require road improvements. The community supported dropping the density of development along the corridor to reduce demand on the road. Because the majority of traffic through this area is regional commuter traffic, lowering development densities had little effect on improving road capacity.
- It is critical to work with neighboring jurisdictions to plan for areas of joint interest. Part of south Wake County abuts Cary to the east. This area has particularly good soils and many subdivisions have been developed under the county's R-40 zoning. The original plan for this area was rural, but current development patterns are more suburban in character. Some of these areas are now within the town's planning jurisdiction and the town is now left with trying to retrofit rural roads and infrastructure to meet evolving suburban expectations.
- Impervious surface is something to consider when trying to articulate what "rural" means for a community. Communities are wise to think not just about minimum lot sizes and low-impact development techniques, but should also think about the amount of hardscape within a development and how it will affect the character of the area.



Residential development in south Wake County may be more suburban than originally intended.

- When developing clustered subdivision alternatives, make sure that bonus densities are feasible given all the developments standards (i.e., setbacks, minimum lot size, etc.) This is an excellent tool for protecting critical open spaces, stream corridors, and historic properties. However, developers may not use the tool if density bonuses cannot be realistically achieved. Also, make sure that the required ratio of bonus densities to protected open space will have the result that is intended. Cary learned that the conservation subdivision option did not result in protection of enough open space and that it is now hard to distinguish these developments from conventional subdivisions. The proposed revised ordinance lowers the density bonus in order to achieve more open space protection.

ARDREY KELL ROAD (CHARLOTTE, NC) CASE STUDY

BACKGROUND

Ardrey Kell Road is an NC-DOT maintained two lane road in southeast Mecklenburg that runs east-west between NC-16/Providence Road and Bridge Hampton Club Drive, just north of the LARTP study area. The road connects US-521 and NC-16 and has intersections with Tom Short Road, Rea Road, and Community House Road. It is estimated that the road carries 10,000-15,000 vehicles per day. Ardrey Kell serves one regional park, two Charlotte-Mecklenburg schools, four shopping centers and approximately 2,000 dwelling units. Speed limits along the roadway range from 35-45 miles per hour.

Development of the road was a priority for Charlotte-Mecklenburg. Ardrey Kell was completed in 2002 and links several individual road segments, many built by developers of large tract residential neighborhoods along the corridor. The county's "hook" for rezoning approvals along the corridor was developer investment in road corridor improvements.

Following Charlotte's centers/corridors/wedges land use planning approach, the corridor has been designed to cluster non-residential development at specific nodes or intersections as opposed to strip commercial development with undifferentiated retail along the corridor. Many of the neighborhoods along the corridor are designed to connect to adjoining roads and neighborhoods, creating greater connectivity throughout the corridor.

Non-residential standards along the corridor include "build to" instead of "setbacks" from the road. Note the curb cut and the right-in / right-out access to the development.

Sidewalks built by the developer are used by local residents. Street trees and bike lanes line the corridor and provide a buffer between pedestrian areas and the road.

MUMPOs Thoroughfare Plan calls for Ardrey Kell Road to extend across Providence Road to Kelly Morris Road. The right-of-way for this segment of the corridor is not yet dedicated to NC-DOT.

DESIGN

Roadway design standards along Ardrey Kell include the following.

- "Build to" instead of "setback" requirements for commercial development along the road.
- Right in / right out (no left turns) access at some intersections, such as Ardrey Kell and Marvin Road.
- Sidewalks are built by the developer. They are frequently used and link neighborhoods to destinations like schools and commercial centers.

- Street trees and sidewalks line much of the corridor. 95% of it has paved shoulders or bike lanes.
- Preserved mature trees and natural swales protect the rural character along the corridor.
- Commercial sites are internally accessed.
- East of Rea Road, right-of-way is preserved for future road widening.
- The 3-lane cross section is common. It preserves capacity and may reduce accidents.

LESSONS LEARNED

The greatest traffic problems along the corridor are located at Pineville-Matthews Road and Rea Road where cul-de-sac neighborhoods have only one main road that funnels neighborhood traffic to Ardrey Kell. This creates public safety concerns if this access point becomes blocked.

The 3-lane cross section preserves capacity and may reduce accidents.

Internal access to commercial developments allows free flowing traffic along the corridor. Note that the road is still only 2-lanes at this intersection.

Protected right-of-way on the right side of the road is used as buffer yards for adjacent developments. Mature trees are protected along the corridor.

RECOMMENDATIONS

Based on the current conditions in the LARTP planning area and consideration of the land use and transportation planning tools outlined in this report, the planning team recommends that the LARTP Steering Committee consider including the following strategies as part of the LARTP implementation program. It is recommended that these standards should be consistent throughout the planning area and be adopted by all participating jurisdictions.

1. **Upgrade access management standards** (e.g., requirement to have shared driveways on adjacent lots, required stub-outs to vacant property when land is developed).
2. **Require Transportation Impact Assessments** and mitigation for projects generating a threshold number of trips.
3. **Require dedication of right-of-way and construction of improvements as conditions of development approval**, including construction of sidewalks and bike lanes/wide shoulders.
4. **Adopt development standards** that require:
   - Internal access for commercial developments located at nodes or intersections, along with connectivity to adjacent developments.
   - Encourage/require stub-outs of residential streets to undeveloped adjacent properties, along with notification provisions for purchasers of property and/or posting of signs.
   - Limited use of cul-de-sacs.
   - Tree protection requirements along major arterials to include:
     - Required identification of significant trees and tree stands.
     - Enhanced requirements for vegetative buffers along major arterials (wider buffers, with enhanced preservation/planting requirements).
     - Enhanced provisions for protection, during construction, of trees identified for saving.
5. **Prepare corridor overlay zoning districts for key roads that traverse multiple jurisdictions**. Include baseline standards to be considered for adoption by each jurisdiction involved.
6. Work with the Charlotte Area Transit System to **identify locations for park and ride lots**, and pursue funding options to develop such lots in advance of future transit.
7. Work with NCDOT to **enhance coordination of signal timing**.
8. **Identify changes to future land use patterns that would enhance use of transit** and possibilities for shortening / combining automobile trips.
9. **Work with the Union County School System to identify sites for new school facilities** that will avoid adding peak-hour congestion to already congested areas, and that offer opportunities for walking / biking to school.
10. **Encourage mixed-use development in key locations**, such as downtown areas and activity nodes.
11. **Consider formalized joint planning activities with neighboring jurisdictions** to coordinate development activity and share information.
12. **Develop small area plans and corridor plans** to study land use and transportation issues at a more detailed level.