RFATS URBANIZED AREA TRANSIT IMPLEMENTATION STUDY

Final Report

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NELSON
NYGAARD

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EXECUTIVE SUMMARY

BACKGROUND AND GOALS

The Rock Hill–Fort Mill Area Transportation Study (RFATS) is the Metropolitan Planning Organization responsible for transportation planning within the urbanized areas of eastern York County and the panhandle of Lancaster County, South Carolina. The RFATS Study Area includes the Rock Hill Urbanized Area, the urbanized areas north of the Catawba River in the City of Tega Cay and the Town of Fort Mill; and the newly urbanized area in the panhandle of Lancaster County.

Transit service in the RFATS area is limited. The Charlotte Area Transit System operates one peak period express route targeted at commuters with work destinations in Charlotte. A demand-response service known as York County Access is operated by the York County Council on Aging, and is jointly sponsored by York County and the City of Rock Hill. There are two types of services provided through the Access program for residents within the Rock Hill Urbanized Area and the rural sections of York County, not otherwise covered by the Charlotte Urbanized Area (i.e., north of the Catawba River). The Ride-to-Work portion of the Access service operates during peak hours for workers who need transportation primarily within the City of Rock Hill. The Essential Services portion of York County Access provides trips for those in York County south of the Catawba River who need rides to the doctor, pharmacies, and grocery stores.

In recent years, RFATS has furthered efforts to identify needs and opportunities for transit service in the region. RFATS adopted the Transit Service Master Plan in 2007 as part of the Major Investment Study, which examined service options between the RFATS Study Area and Charlotte. It drew recommendations from previous studies and presented an integrated set of transit strategies to meet a wide range of transit needs. This effort was further memorialized in the RFATS 2035 Long Range Transportation Plan, adopted in 2013. RFATS pursued the Urbanized Area Transit Implementation Study to further this work by assessing the demand for transit and developing implementable transit options to improve mobility for area residents.

DEVELOPMENT OF SERVICE OPTIONS

The technical team performed an assessment of the RFATS area to identify locations that would potentially be able to support expanded transit service. Key elements of this assessment included analysis of demographic characteristics, evaluation of land use and transportation infrastructure, and identification of activity centers as well as and major employers in the area.

The team also assessed existing transit services in the RFATS Study Area, including the express bus route and demand response program. Ridership data was analyzed for York County Access services to determine the utilization of existing services and to identify where passenger activity is highest.

A market analysis of the RFATS area was completed to assess where expanded transit service could be supported, based on population and employment densities and socioeconomic characteristics. As part of this analysis, two indices were used to measure the underlying demand and need for transit:

- **Transit Potential Index:** Transit service is generally most effective and efficient in areas with high concentrations of people and businesses. The Transit Potential Index measures the likelihood of an area generating substantial transit ridership, and is a composite of the population and employment densities for each census block within the study area.
- **Transit Need Index:** Certain population sub-groups are more likely to use transit than other modes as their primary means of local and regional transportation. Identifying areas with relatively high concentrations of these groups can help determine where the need for transit service is greatest. The Composite Transit Need Index is a composite score assigned to each Census block group based on the concentration of each population subgroup in that area.

Based on these evaluation tools, the technical team developed transit service options that would meet the need and demand for transit in the RFATS Study Area.

RECOMMENDATIONS

Fixed-Route Service

The technical team identified several corridors in the study area that currently meet (or will meet in the near-future) the necessary characteristics to support fixed-route transit service. In particular, the team focused on corridors with multi-family housing, grocery stores, large retailers (Wal-Mart, Target, etc.), hospitals, colleges, and universities. These land uses typically generate ridership throughout the service day, and complement peak-period ridership generators such as high schools and office parks. By contrast, recreational activity centers including parks, stadiums, and movie theaters tend to only generate ridership at limited times, and only on certain days.

The technical team designed seven route options to serve areas within the City of Rock Hill:

- Route 1: Downtown to N. Cherry / Anderson via Piedmont Medical Center
- Route 2A: Downtown to Riverwalk via Winthrop University
- Route 2B: Downtown to Piedmont Medical Center via Winthrop University
- Route 3: Downtown to Galleria via York Technical College
- Route 4: Galleria to N. Cherry / Anderson via Manchester Cinemas Park-and-Ride
- Route 5A: Downtown to Wal-Mart via Clinton College
- Route 5B: Downtown to Wal-Mart via Saluda Street

In addition, the technical team identified a proposed route that would serve the SC 160 Corridor in Fort Mill & Tega Cay. The fast-growing SC 160 Corridor increasingly has the employment and demographic characteristics to support fixed-route transit service, but the area poses transit challenges given its land-use and built environment. In recognition of these challenges, three service alternatives are presented for consideration:

- Route 6A: Efficiency-Focused Approach (more direct)

- Route 6B: Coverage-Focused Approach (less direct to provide easier access by pedestrians)
- Route 6C: Regional Connectivity-Focused Approach (less direct, extends into southern Charlotte)

Each route can be implemented independently of the other routes. However, it is important to note that operating a network of routes can help a system achieve efficiencies of scale, making service more cost effective. One way to achieve this is by interlining service vehicles. Interlining is a common approach to reducing unproductive layover time, by having a single service vehicle operate on more than one route. For example, if several routes are scheduled to operate hourly, but a service vehicle can complete one of the routes in just 20 minutes, it has enough time left over to serve another route that takes 20 or 30 minutes to complete, before returning to its initial route for its next run. This means that a network of routes can operate using fewer total vehicles than it would require without interlining, providing a greater amount of service without a commensurate increase in operating costs.

An added benefit of interlining is the ability to provide "one seat connections" to key destinations that would otherwise require a transfer or that would require several routes to provide redundant service to ensure access to the destinations from all routes.

Demand-Response Service

The technical team also identified opportunities to provide expanded demand-response service in York County. Demand-response service may be a more appropriate transit option in areas without the population and/or employment density to support a minimum level of fixed-route service or for rider groups whose travel, for various reasons, would be easier on a more flexible service.

There are strong operational and customer service reasons for an expansion of York County Access service into the portion of York County north of the Catawba River, and indications that the service would be used by residents of those communities. The Town of Fort Mill received fairly high transit need index scores in the market analysis, and York Count Access staff report regular requests for service by residents of the Tega Cay/Fort Mill area. Restrictions on funding sources are hard to explain to the public, particularly when vehicles are frequently visible where they live. Finally, vehicles are already in the area serving destinations and Medicaid trips, and providing both northbound and southbound trips would improve the productivity of vehicles already in service.

CHAPTER 1 - OVERVIEW OF STUDY AREA

The Rock Hill-Fort Mill Area Transportation Study (RFATS) Metropolitan Planning Organization (MPO) is located in the north-central area of South Carolina approximately 20 miles south of Charlotte, North Carolina and is largely positioned along the I-77 and US 521 corridors. The RFATS region includes the Rock Hill Urbanized Area as well as an overlap of the Charlotte Urbanized Area into northern York and Lancaster counties. As a result, transit planning is a more involved process in these areas and requires thoughtful consideration of both operational and coordination variables.

POPULATION TRENDS

The RFATS Study Area experienced significant population growth between 2000 and 2010, increasing from 132,724 to 200,438 (an addition of 67,714 new residents or 50% of the 2000 population). Current population estimates indicate a total population of 216,901 as of 2014. The majority of the existing population lies within the City of Rock Hill, the Town of Fort Mill, and the City of Tega Cay. The number of households paralleled the growth seen in population, increasing by more than 25% between 2000 and 2010 from 49,717 to 77,012. More than 6,000 additional households have been added to the study area since 2010, and the number of households is estimated to exceed 90,000 by year 2019. A snapshot of the population is presented below. For more information on population trends, please see the Market Analysis presented in Chapter 2.

- **Age:** The study area population is principally made up by those within the working-ages of 25-64, which represents approximately 54% of the total population. As of 2014, the population over the age of 65 increased by nearly 6,000, bringing the total percentage of older adults in the RFATS population to 13.6%. This total is projected to increase by another 2% by 2019.
- **Income:** The median household income within the RFATS Study Area is $55,172. As of 2010, 23,994 residents in 9,432 households lived below the poverty line. Residents living below the poverty line are most likely to reside in the City or Rock Hill, the Catawba Indian Nation, or areas bordering Chester County.
- **Diversity:** As a whole, the RFATS Study Area is less diverse than its neighboring urban hubs of Charlotte, NC, Greenville, SC, and Atlanta, GA. The current population breakdown is approximately 75% white (non-Hispanic) and 19% black. Within the study area, the most diverse area is the City of Rock Hill (55% non-Hispanic white and 38% black).

LAND USE AND TRANSPORTATION INFRASTRUCTURE

Much of the RFATS Study Area is residential. However, as an urbanized area, commercial, industrial, and public/institutional uses are widespread as well. The associated transportation infrastructure includes several major highways and a supporting network of arterial roadways and collector streets. The highway network includes the I-77 Corridor, which runs diagonally through the study area and parallel to US 21. The study area also is partially bordered by US 521 to the east and US 321 to the west. I-77 carries the highest vehicle volume in the study area. According to the Metrolina Regional Travel Demand Model (Metrolina Model), approximately 50,000 vehicles per day travel the corridor at the southern edge of the study area and more than 140,000 vehicles travel the corridor at the North Carolina border. Travel patterns on I-77 are weighted directionally based on time of day – as commuters travel north towards Charlotte, NC. Arterials in the study area with the highest traffic volumes (based on the Metrolina Model), are Celanese Road, SC 160, Cherry Road, Gold Hill Road, US 21, and Dave Lyle Boulevard.

RFATS works closely with regional partners as well as FHWA, FTA, EPA, and SCDOT in planning for and responding to regional growth pressures. In recent years, a number of plans and studies have identified goals, policies, and actions relevant to transit service and infrastructure within the RFATS Study Area. These are outlined in Appendix A.

MAJOR EMPLOYERS

While the City of Charlotte provides a large employment base in the region, several major employers are located within the RFATS Study Area as well. These employers are summarized below.

Major Private Employer	# Employees	Location
Wells Fargo Home Mortgage	2,335	3480 Stateview Blvd. Fort Mill, SC 29715
Red Ventures	1,600	1101 Red Ventures Drive Fort Mill, SC 29707
Duke Power – Catawba Nuclear Station	1,228	4800 Concord Road York, SC 29745
Ross Distribution	919	1000 Retail Drive Fort Mill, SC 29715
CitiFinancial	850	605 Munn Road Fort Mill, SC 29715
Cardinal Health	800	785 Fort Mill Hwy, Fort Mill, SC 29707
U.S. Foodservice, Inc.	735	125 Fort Mill Parkway Fort Mill, SC 29715
Resolute Forrest Products	613	5300 Cureton Ferry Rd. Catawba, SC 29704
Shutterfly	600	1000 Shutterfly Blvd Fort Mill, SC 29730
Schaeffler Group USA, Inc.	558	308 Springhill Farm Road Fort Mill, SC 29715
Domtar (HQ)	430	100 Kingsley Park Drive Fort Mill, SC 29715
Continental Tire the Americas LL	430	1830 Macmillan Park Drive Fort Mill, SC 29707
URS Nuclear	400	3023 HSBC Way, Fort Mill, SC 29715
Physicians Choice Laboratories	364	854 Paragon Way Rock Hill, SC 29730
Daimler Trucks North America	340	2477 Deerfield Drive Fort Mill, SC 29708

Major Private Employer	# Employees	Location
TE Connectivity	320	200 Interconnect Drive Rock Hill, SC 29730
Inspiration Ministries	310	3000 World Reach Drive Indian Land, SC 29707
Mergent, Inc.	305	580 Kingsley Park Drive Fort Mill, SC 29715
West Marine	300	860 Marine Drive Rock Hill, SC 29730
Northern Tool and Equipment, Inc.	300	1850 Banks Road Fort Mill, SC 29715

Employer Sentiment

Nelson\Nygaard contacted several employers in the RFATS area to gauge the level of interest in expanded transit service among management and employees. The aim of this survey was to understand whether transit service (or the lack thereof) has an impact on area employers' ability to attract and retain workers. Additionally, the employers were asked what changes they would like to see regarding public transportation in York and Lancaster counties. The following employers were contacted by the technical team:

- Ross Distribution – Fort Mill
- Britax – Fort Mill
- Cabela's – Fort Mill
- Shutterfly – Fort Mill
- Academy Sports – Rock Hill
- Sam's Club – Rock Hill
- LPL Financial – Fort Mill (future)
- Lash Group – Fort Mill (future)

Each employer was contacted by phone and e-mail (repeatedly, in most cases), but only one fully responded. Most provided only very basic information on the number of employees and shift times. The most complete response was provided by the General Manager of Sam's Club in Rock Hill. The following are the key points made by this employer:

- Some employees currently rely on York County Access to get to work (exact number not given).
- An estimated 5-6% of customers rely on York County Access to get to Sam's Club in Rock Hill.
- Sam's Club does not provide ride-matching or any other type of transportation coordination for employees. Each employee is responsible for arranging their own transportation.
- Transportation issues do occasionally come up at employment and exit interviews.
- The General Manager believes that there would be interest in local transit service in Rock Hill given the amount of retail in the community.

ACTIVITY CENTERS

Within the RFATS Study Area, destinations with concentrations of residential, commercial, and industrial uses can be described as major activity centers. As destinations that the general public needs to access regularly, these activity centers have the potential to be major trip generators. For

the purpose of this study, the activity centers include nodes and corridors with high density housing, medical and social services, civic, recreational, educational, and shopping/retail uses. Many of the larger commercial and retail activity centers in the study area lie in the downtown areas of the bigger communities or along principal arterials such as US 21, US 521, Celanese Road, Dave Lyle Boulevard, SC 5, SC 160, and Cherry Road. These locations are described below.

Old Town/Downtown Rock Hill

Old Town represents the historically significant portions of the City of Rock Hill. Recently, this area has seen an influx of businesses, professional, retail, and dining, as a result of incentives and tax credits that are available for city-center businesses. Old Town also contains Rock Hill City Hall as well as the Old Town Amphitheater.

Fort Mill (Downtown)

Downtown Fort Mill is a historic place, with some of the development on Main Street dating back to the late 1800s and early 1900s. Downtown Fort Mill is anchored by Confederate Park and is home to restaurants, professional office spaces, and boutique gift shops.

Baxter Village

Baxter Village is a mixed-use development located in Fort Mill. The development is anchored by the Baxter Town Center, a retail and commercial center with a YMCA, salons, library, and boutique shops.

Kingsley Village

Kingsley Village is a development similar to Baxter Village in Fort Mill. Multiple companies have invested in building headquarters at the Village. The Kingsley North plan lays out restaurant-retail, commercial, office, and residential development on the 626-acre site.

Dave Lyle Boulevard Corridor

Dave Lyle Boulevard offers multiple developments along both the east and west corridors near I-77 for retail and dining. Rock Hill Galleria Mall and Manchester Village are among the most prominent sites along the corridor. The City of Rock Hill also has invested in a soccer complex that is a part of the larger Manchester Meadows Park, a notable destination for hosting regional events.

Celanese Road Corridor

The Celanese Road Corridor, one of Rock Hill's newest business corridors, was spearheaded by improvements in 2000 that expanded the road from a two-lane road to a seven-lane thoroughfare. The improved corridor now carries more than 35,000 vehicles per day and serves retail, restaurants, and general commercial activity.

Cherry Road Corridor

Cherry Road, Rock Hill's original commercial corridor, lies near I-77. The corridor has anchor retail development and is a center for the community's sports tourism enterprises. Some of these enterprises include multi-purpose fields, sports stadiums, and the Rock Hill Tennis Center.

Gold Hill Commons

Gold Hill Commons, or the Gateway, is located in Fort Mill on I-77 and Gold Hill Road. The mixed-use development includes retail, office space, residential homes, and light industrial space.

Riverwalk

The Riverwalk development is a multi-phased, multi-use community village connected to the Carolina Thread Trail as well as the Cycling and Outdoor Center of the Carolinas. With frontage to the Catawba River, the Riverwalk village concept includes a YMCA, athletic fields, professional space, and residences.

Piedmont Medical Center

The Piedmont Medical Center provides comprehensive medical care to residents of York, Lancaster, and Chester counties. The Medical Center has just under 400 active physicians, and employs 1,400 full- and part-time employees.

Tega Cay Golf and Conference Center

The Tega Cay Golf and Conference Center is approximately 23,000 square feet and has additional investment planned for the near future.

Textile Corridor

The Textile Corridor in Rock Hill is a revitalization project that has been in the works since 2003. The once abandoned textile mill corridor currently has some development: The Courtyard at Winthrop, University Place Apartments, and the Family Trust Credit Union. The properties still have investment potential for commercial and residential uses.

Winthrop University

Winthrop University is located on a 425 acre campus in Rock Hill. With a student population of just over 6,000, the university is also a major public employer in the RFATS region.

Fort Mill Hospital (SC 160 and I-77) – *Future Development*

Fort Mill Hospital will be a full-service sister hospital to Piedmont Medical Center. The hospital is estimated to bring 400 new jobs and over $500,000 per year to the Town of Fort Mill, and almost $750,000 per year to York County. The Fort Mill Hospital is planned to be developed as part of the Kingsley Village development.

Former Knights Stadium – *Future Development*

The former Knights Stadium accommodated just over 10,000 fans and was located in Fort Mill. At the end of the 2013 season, the Knights were moved to the BB&T Ballpark in downtown Charlotte in 2014. The site has since been sold to Cato Corporation, a Charlotte-based clothing retailer that is considering using the site as a distribution center and possibly a development that includes hotels, restaurants, and housing.

CHAPTER 2 – MARKET ANALYSIS

Transit service is generally most effective and efficient in areas with high concentrations of people and businesses. Combining both residential and employment densities yields an index of transit potential. This index shows where the conditions are most suitable for transit service based on the number of jobs and/or people per acre.

The maps in this section use data from the 2010 Census and the 2011 Longitudinal Employment-Household Dynamics Origin-Destination Employment Statistics, both of which are produced by the United States Census Bureau. All data are aggregated by block, a zone structure that the Census Bureau uses to collect demographic information.

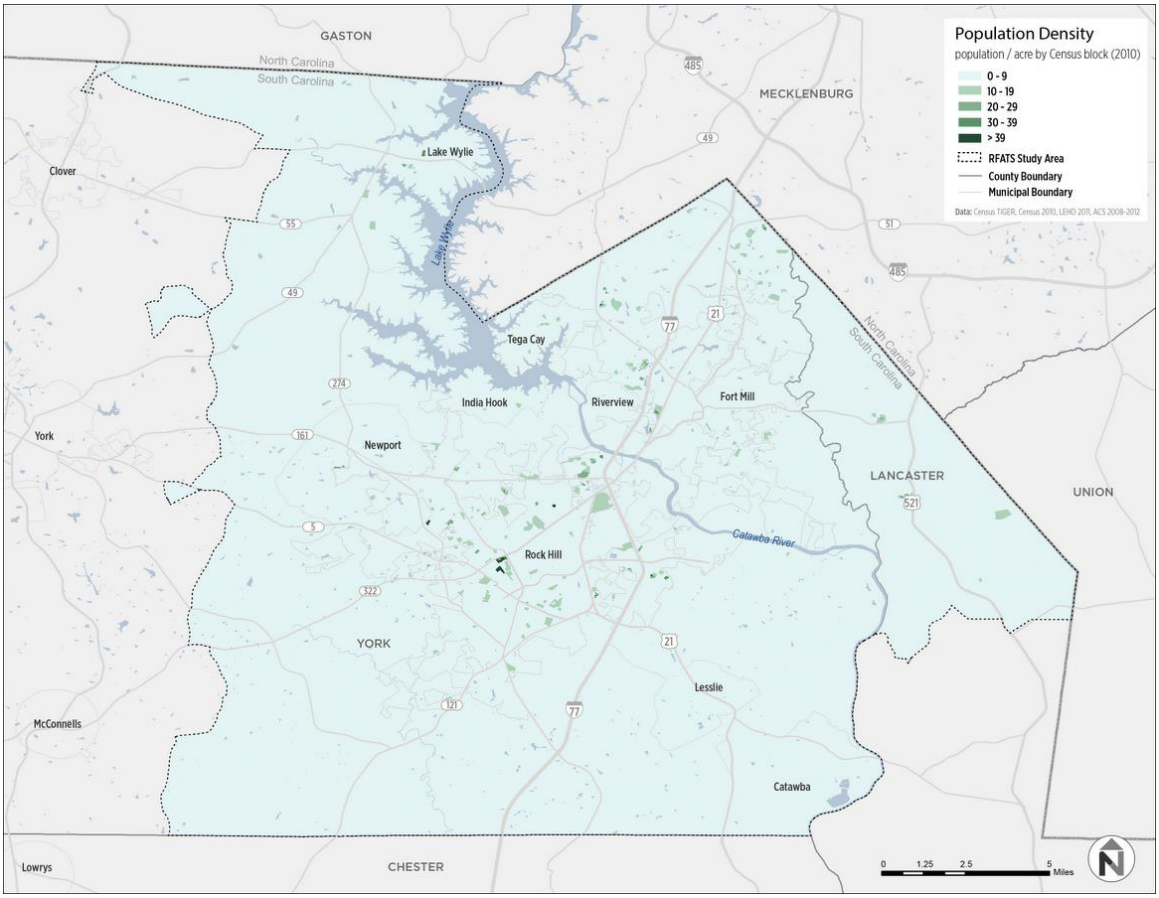
POPULATION DENSITY

The distribution and density of the RFATS Study Area's residential population is a key factor influencing the viability of fixed-route transit service because most riders walk to/from a service vehicle on at least one end of the trip. Higher-density communities have more people within walking distance of service routes, and thus are stronger markets for transit. Together with employment density, population density is the most important determinant of the potential for generating fixed-route transit ridership in a particular area (Figure 2-1).

The reach of transit is generally limited to within ¼ mile of the transit line or station. Thus, the size of the transit market is directly related to the density of development in that area. Additionally, transit service design and service levels are closely related to population density. Areas and corridors with higher densities support higher frequencies, while lower-density communities support other types of transit services, including lower frequency or demand-response modes.

As a general rule, the residential density needed to support low-frequency (one vehicle per hour) fixed-route service is at least four dwelling units per acre. York County's average household size is 2.59 residents, so parts of the study area with 10 or more persons per acre can be considered candidates for fixed-route service.

Figure 2-1 Population Density



As seen in Figure 2-1, several findings are apparent:

- Despite the area's continued urbanization, the study area contains few areas of high population density.
- The majority of areas with 10 or more persons per acre are located in the City of Rock Hill. The largest pocket of very high density blocks (40 or more residents per acre) is located near Winthrop University in the center of Rock Hill.
- Other pockets of transit-supportive population density in Rock Hill are located along Cherry Road; near the intersections of I-77, Cherry Road, and Celanese Road; and in central Rock Hill, north of Albright Road and South Heckle Boulevard.
- Outside of Rock Hill, there are pockets of higher density population along the I-77, US 21, and I -485 corridors in the northern part of York County.
- In general, population density in Lancaster County, as well as the western and southern portions of the RFATS Study Area, is low.

EMPLOYMENT DENSITY

Understanding the size and distribution of area employment (Figure 2-2) is also a critical part of understanding travel demand and markets. This is because nationally, work trips are the most

common type of transit trip. In addition, areas of high employment density typically attract a variety of non-work trips (for goods and services) as well.

Figure 2-2 Employment Density

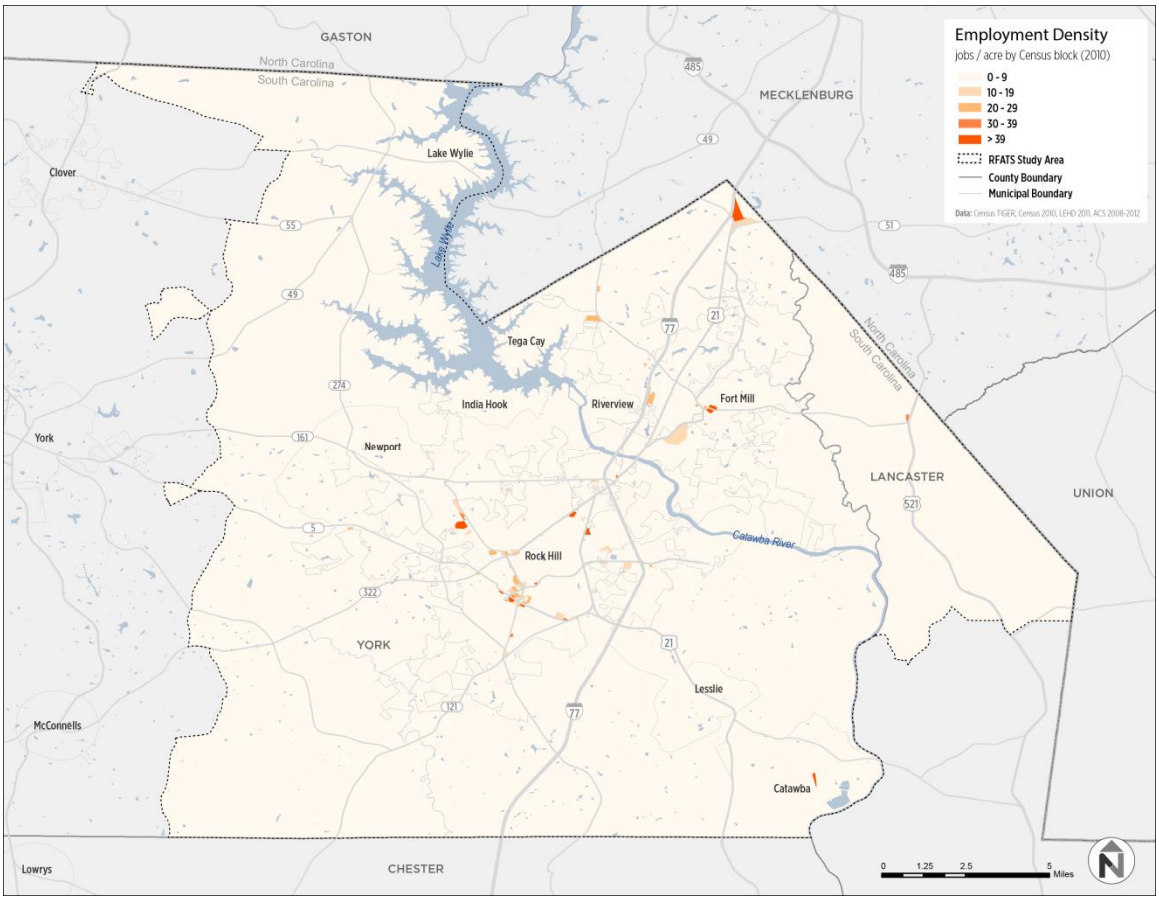


Figure 2-2 reveals several findings:

- Employment is generally centralized in a few key locations in the study area. These locations include along major thoroughfares in the City of Rock Hill (particularly along Main Street), Piedmont Medical Center, offices affiliated with Fort Mill and York County, and office parks located along I-77 and US 21 between Rock Hill and Charlotte.
- In general, outlying communities have very low employment density. Exceptions include the blocks containing the Wal-Mart Supercenter in Tega Cay and the block containing Resolute Forest Products in Catawba.

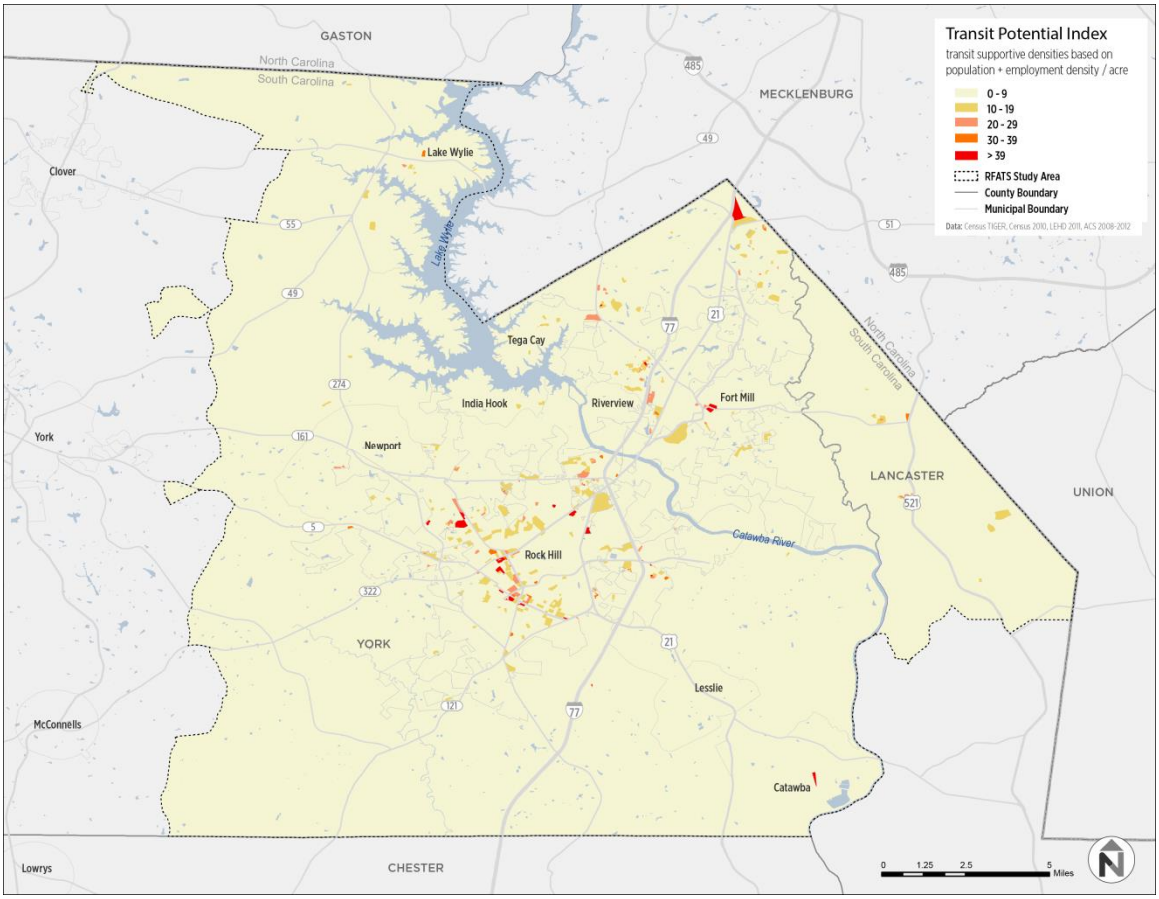
TRANSIT POTENTIAL

Figure 2-3 presents the Transit Potential Index, which is a composite of the population and employment densities for each census block within the study area. A higher Transit Potential Index score points to a higher likelihood of generating substantial transit ridership in a particular census block. Ideally, a fixed-route transit line would link together several cesus blocks with relatively high transit potential, thus forming a strong transit corridor.

Key findings from Figure 2-3 include:

- The majority of blocks with a Transit Potential Index of 10 or more are located within Rock Hill, particularly along Main Street, Oakland Avenue, and Ebenezer Road. There are also a number of blocks with a high composite population and employment density in the northern and eastern portions of the city.
- Several other locations with high transit potential are located in downtown Fort Mill, east Riverview, and along the I-77 Corridor near the North Carolina state line.
- There are also some isolated pockets of relatively high transit potential in Lake Wylie and in Indian Land.

Figure 2-3 Transit Potential Index



TRANSIT NEED

Above all else, public transportation is a mobility tool. Certain population sub-groups are more likely to use transit than other modes as their primary means of local and regional transportation. These groups include residents living below the poverty line, zero-vehicle households, older adults, younger residents, and people with disabilities.

Identifying areas with relatively high concentrations of these groups can help determine where the need for transit service is greatest. To do so, the technical team calculated the percentage of the total population that these demographic groups represent in a given Census block group using data from the 2008-2012 American Community Survey, produced by the U.S. Census Bureau.

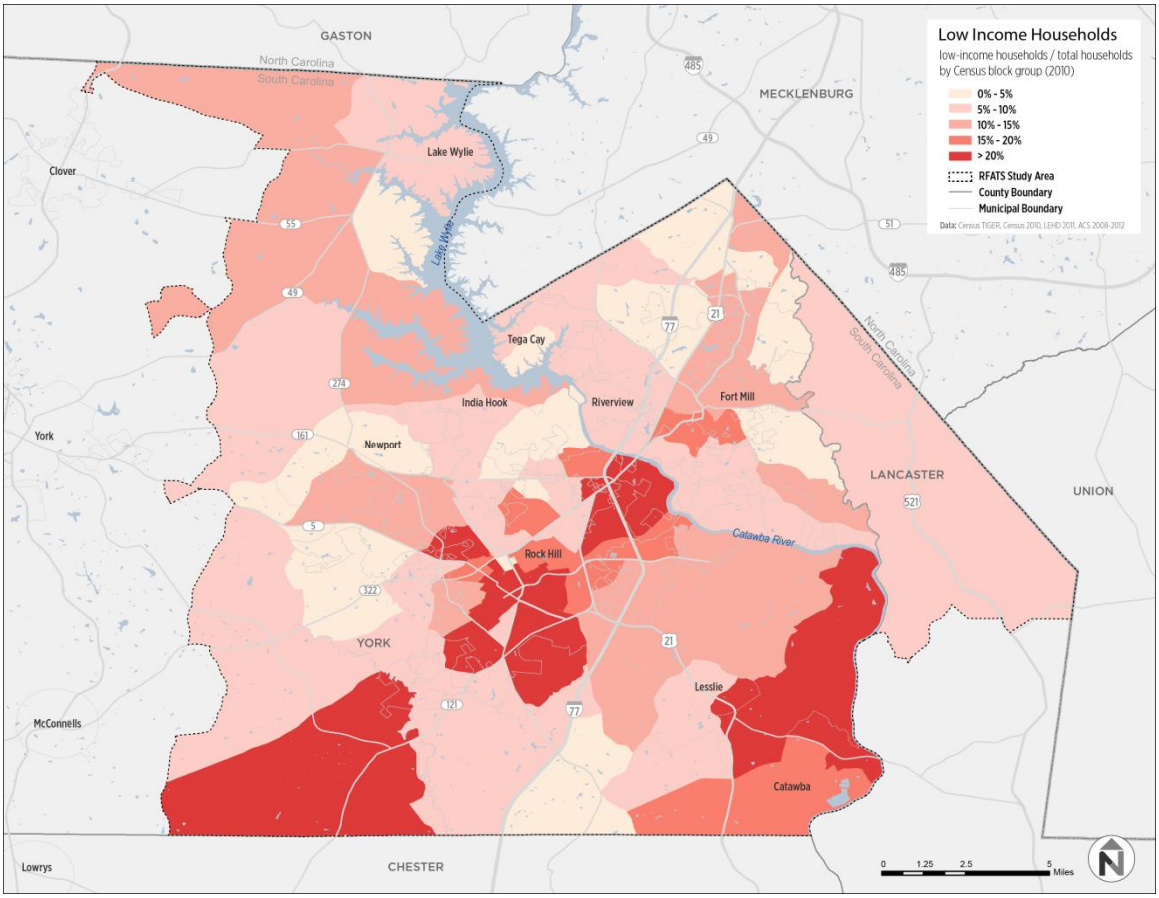
It is important to note that areas that have a high transit needs score will not necessarily be able to support traditional fixed-route transit service, as these areas may score low on the Transit Potential Index. However, it is worth highlighting that the population in such areas, regardless of how limited, does have a high transit need.

Low Income Households

Income status is a strong indicator of a higher-than-average propensity to use transit; people with lower incomes are less likely to be able to afford a private vehicle and thus are more likely to use transit. The technical team used the U.S. Census' classification of poverty status to define and identify low income households. Disposable income is largely a factor of household size and household income and the U.S. Census considers household income and the number of members in the household in classifying a household as in poverty or not. The distribution of households with low incomes is shown in Figure 2-4. Findings include:

- There are a number of block groups in which one fifth of households are low-income. The majority of these block groups are located in the southern and northeastern portions of Rock Hill. Additional block groups with a high percentage of low-income households are located by the Catawba Indian Nation reservation and in the southeast of the RFATS Study Area, bordering Chester County.
- Block groups along the I-77 Corridor between Rock Hill and Charlotte and surrounding Newport have a low percentage of households classified as low-income.

Figure 2-4 Low Income Households

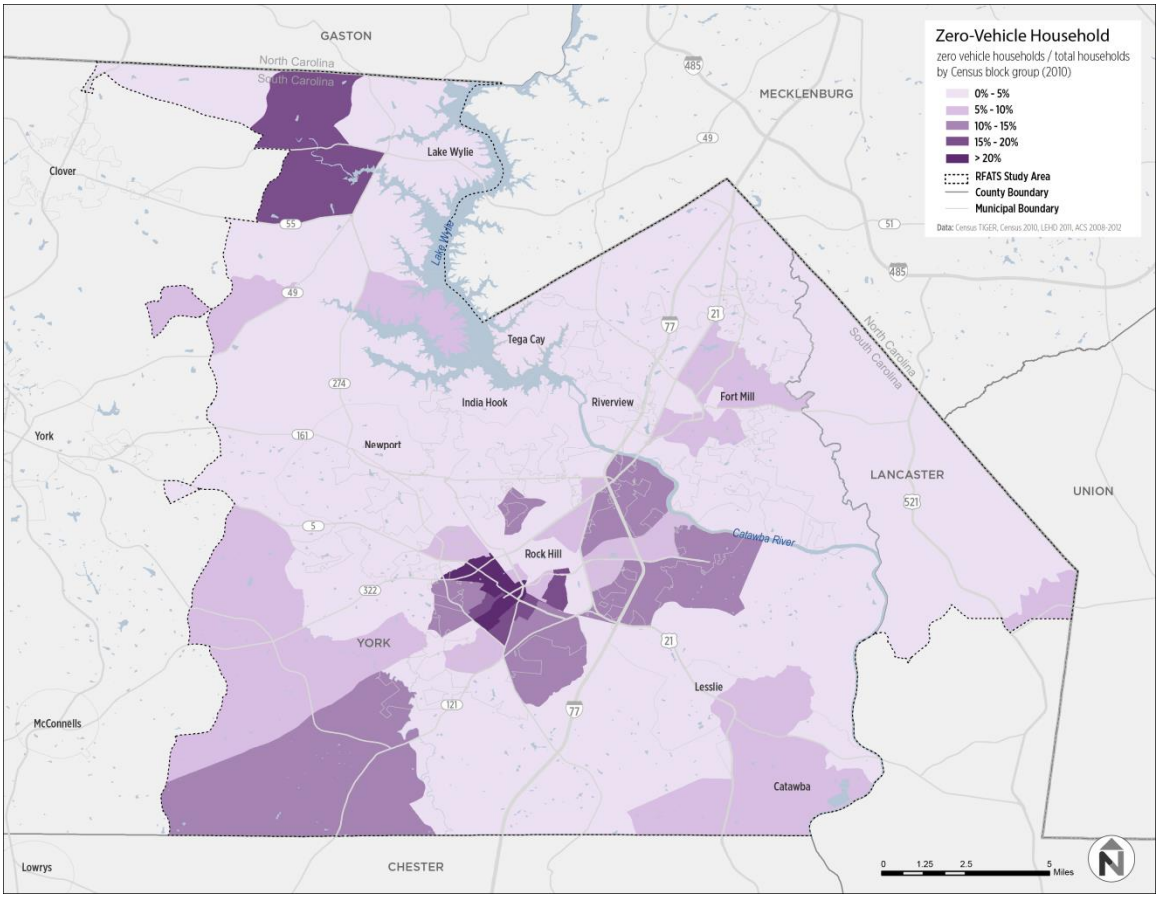


Individuals without Access to a Vehicle

For self-evident reasons, individuals without access to a vehicle represent a particularly strong market for transit. In some cases these residents are car-free by choice, while others are unable to drive for legal or financial reasons. Identifying clusters of this group helps highlight areas that have transit-dependent riders. The distribution of zero-vehicle households is shown in Figure 2-5. Findings include:

- In general, individuals without access to a vehicle are clustered in more densely developed and populated areas. Block groups with a large proportion of zero-vehicle households (over one fifth) are located in Rock Hill, predominantly in the southern portion of the city near Main Street. Block groups with a moderate percentage of households with zero vehicles are scattered throughout the RFATS Study Area.
- Conversely, less densely developed areas generally have significantly fewer individuals without access to a vehicle. The exception to this is the block group west of Lake Wylie bordering North Carolina, which appears to have a high percentage of households without a vehicle.

Figure 2-5 Zero-Vehicle Households



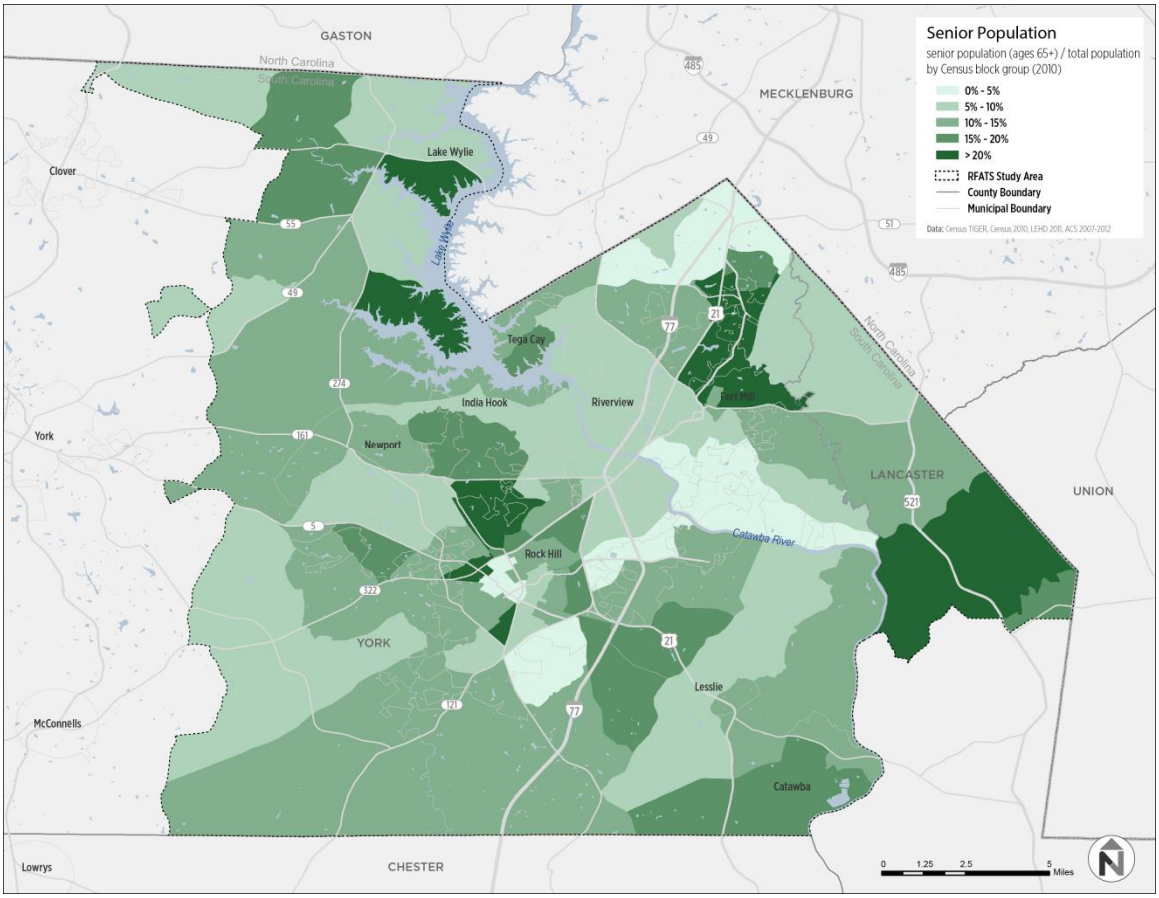
Older Adults

Nationally, older adults (those 65 years and older) are more likely to ride transit than the general population for a variety of health and financial reasons. Older adults are an important market for transit, in part because this demographic group is increasing so dramatically. In 2000, 35 million Americans were aged 65 and over, representing 12.4% of the total population. By 2010, older adults grew to 40 million, or 13.0% of the total population. This trend is expected to continue and accelerate, as the Census Bureau projects older adults will grow to some 70 million people by 2030 and represent 20% of the total population. Understanding the distribution of older adults is therefore important in identifying areas of more transit-dependent riders.

The relative concentration of older adults within the study area is shown in Figure 2-6. Key findings from this figure include:

- There are a number of block groups with large percentages of their population over 65 years old. These block groups are located in the western and southern portions of Rock Hill, in the southern part of the panhandle of Lancaster County, in and adjacent to Fort Mill, and near Lake Wylie.
- Of the transit-dependent groups considered in this market analysis, older adults exhibit less clustering and are more dispersed throughout the market area. This makes older adults, as a group, more difficult to serve with fixed-route service.

Figure 2-6 Older Adults



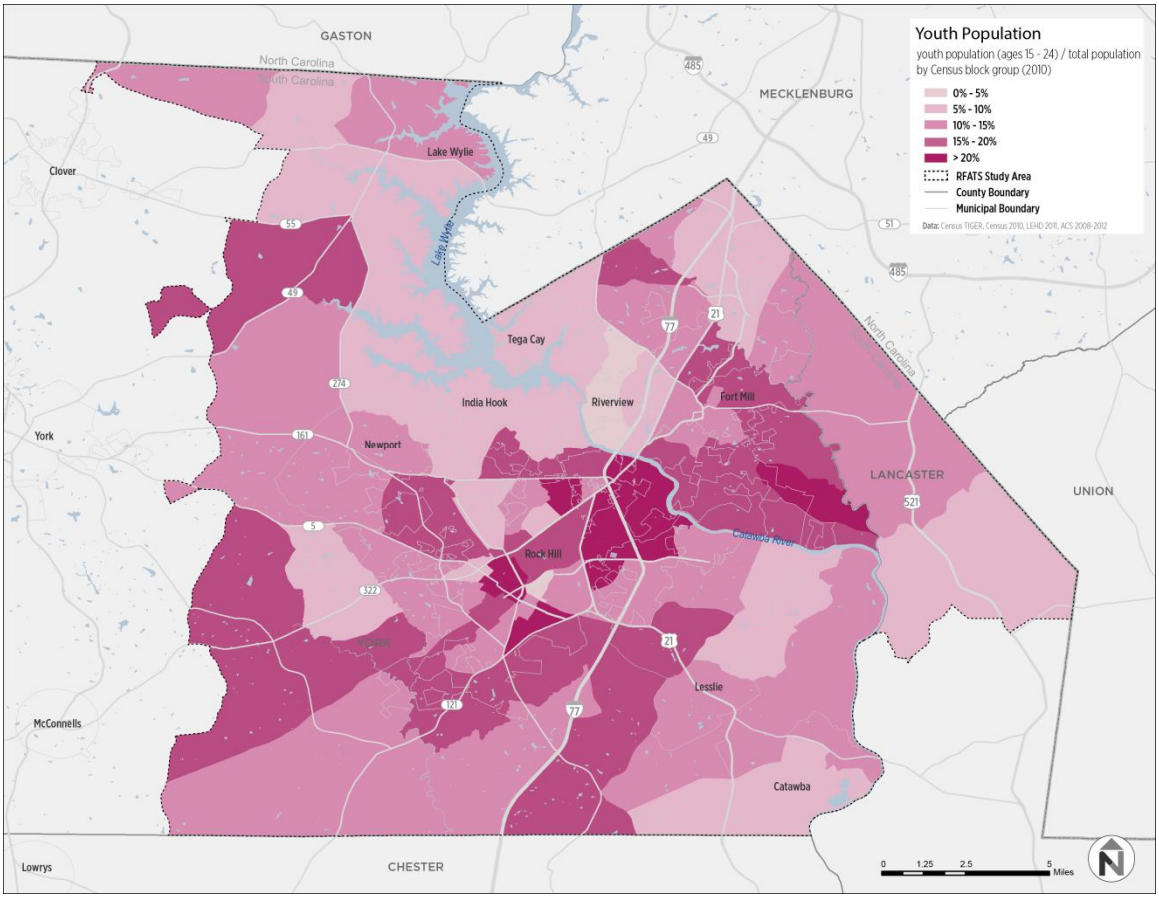
Youth Population

In the same way that older adults are more likely to ride transit than the general population, so are youth populations who either cannot drive or do not own a vehicle. Understanding the distribution of children and young adults is also important for identifying areas of transit-dependent riders.

The relative concentration of individuals age 15 to 24 by census block is shown in Figure 2-7. Key findings from this figure include:

- Overall, the distribution of young adults is spread throughout the RFATS area, although block groups with the highest percentage of young adults are concentrated around Rock Hill.
- There are several locations with a low proportion of youth populations (less than 10%), including Lancaster County, the areas surrounding Lake Wylie and Newport, and the cities of Tega Cay, Riverview, Lesslie, and Catawba.

Figure 2-7 Youth Population



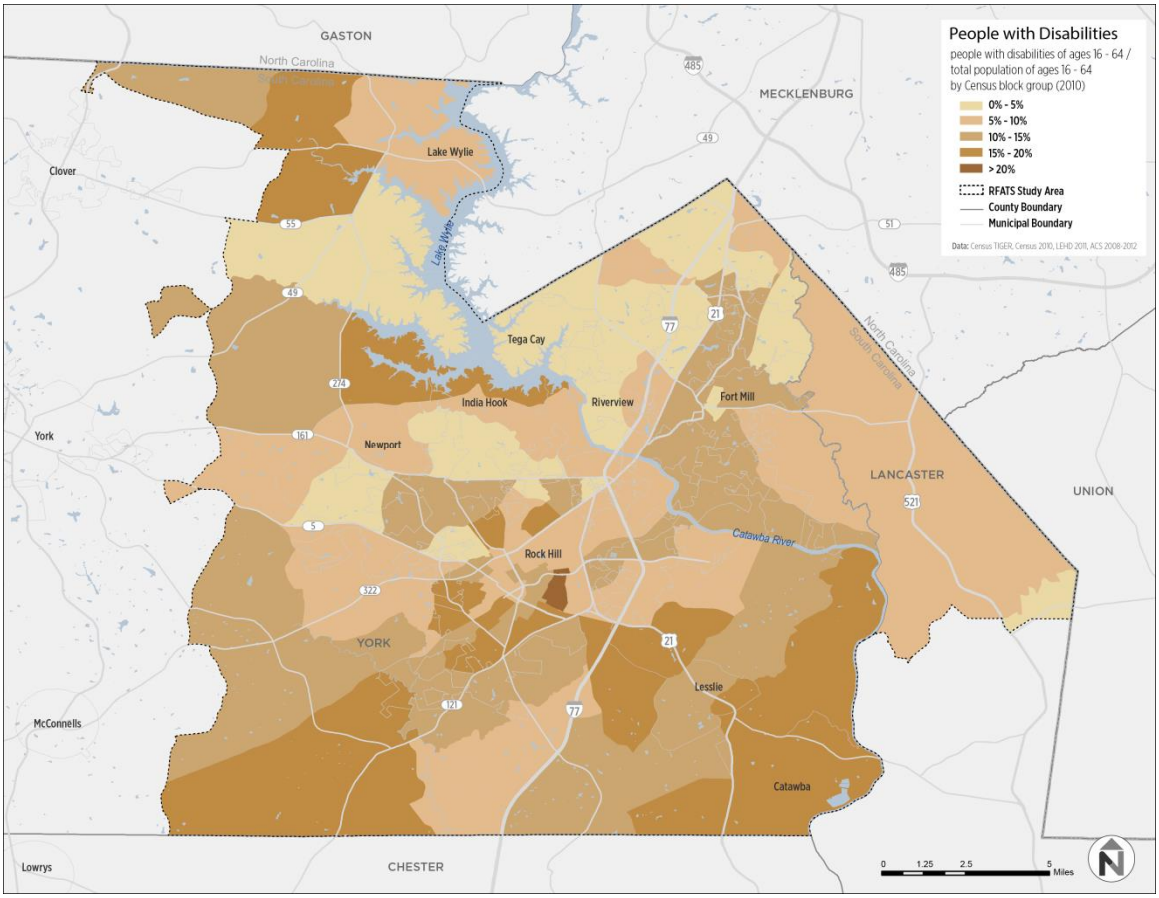
Individuals with Disabilities

Individuals with disabilities are more likely to ride transit than the general population, especially if they are unable to operate a vehicle. As such, understanding the distribution of individuals with disabilities can help identify areas of transit-dependent riders.

The relative concentration of individuals with disabilities by census block is shown in Figure 2-8. Key findings from this figure include:

- Block groups with a higher percentage of residents with a disability are mainly located in the southern portion of the study area, aside from some block groups near Lake Wylie and India Hook. The block group located in the center of Rock Hill intersected by Dave Lyle Boulevard has over a fifth of its residents who have a disability, while multiple block groups in Rock Hill, the southwestern portion of York County, and Catawba contain block groups with between 15% and 20% of residents who have a disability.
- Block groups along the I-77 Corridor between Rock Hill and Charlotte, in Lancaster County, and in Tega Cay generally have low proportions of residents who have a disability.

Figure 2-8 People with Disabilities



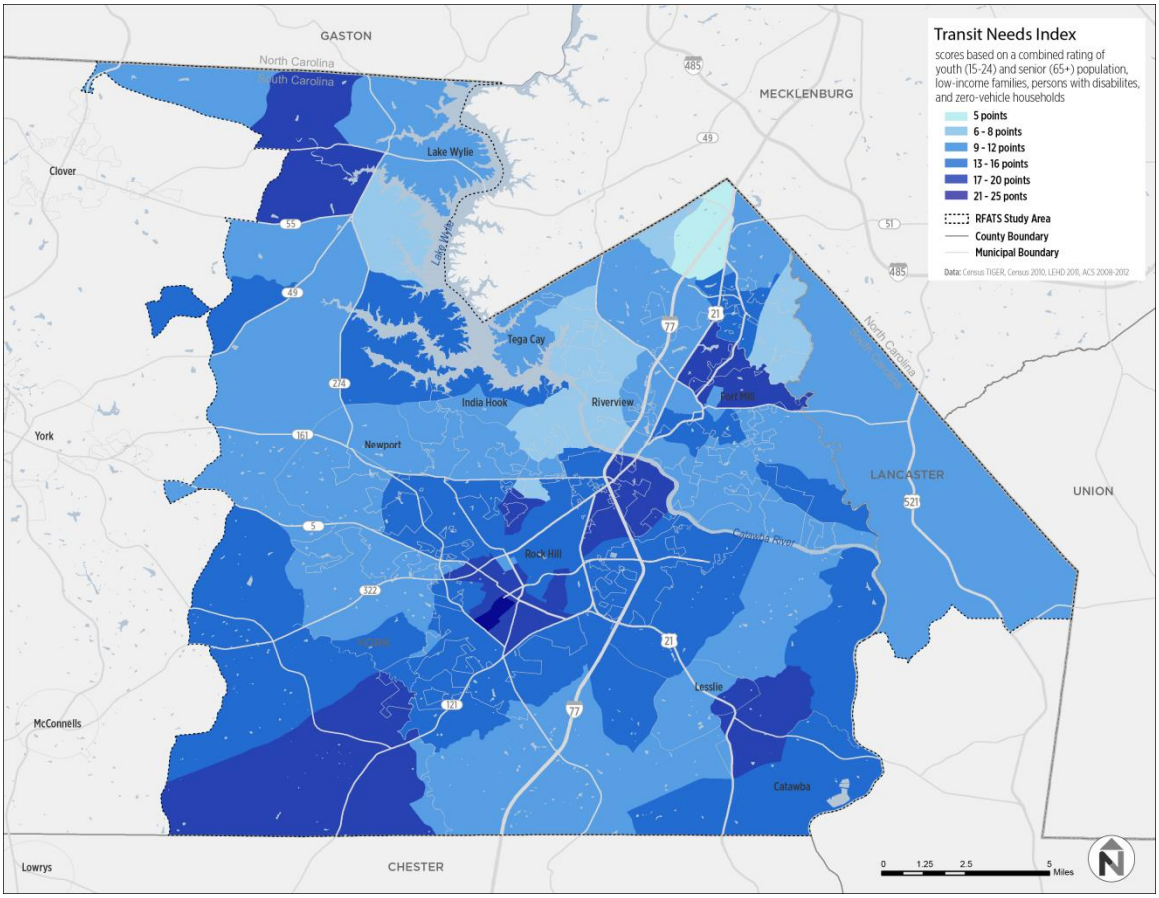
Composite Transit Needs Index

In order to aggregate transit need across all subgroups, a composite score of 1 to 5 was assigned to each census block group based on the concentration of each subgroup in that zone. The highest possible score for a zone was 25, indicating the highest concentration of each of the five population subgroups.

Findings include:

- As shown in Figure 2-9, the location with the highest transit need based on this analysis is the block group in Rock Hill between Dave Lyle Boulevard and Saluda Street running down to Heckle Boulevard.
- Block groups with a relatively high Transit Need Index (17 points or higher) are dispersed throughout the RFATS Study Area. These block groups are located in southern Rock Hill (near the intersection of I-77 and US 21), in Fort Mill, in the southwestern corner of the RFATS Study Area, and west of Lake Wylie.

Figure 2-9 Composite Transit Need Index



CHAPTER 3 - OVERVIEW OF EXISTING TRANSIT SERVICES

There are a handful of public transportation services currently available in the RFATS Study Area. These services include an express bus route operated by the Charlotte Area Transit System (CATS), a feeder bus that connects to the LYNX Blue Line light rail station in Pineville, a number of vanpool vehicles sponsored by CATS, and demand response transportation services in both York and Lancaster counties.This chapter provides an overview of how these services operate and how transit is funded in the study area.

SERVICES AND FACILITIES

CATS – Route 82X

The CATS express bus route 82X is the result of a cost-share arrangement between the City of Rock Hill and CATS, where CATS is contractually responsible for service operation. The route aims to provide an alternative commute option for those who live in the RFATS Study Area and commute to Charlotte for work. The service operates as a weekday peak hour service with several stops largely along the I-77 Corridor:

- Downtown Rock Hill Park & Ride
- Manchester Cinemas (adjacent to I-77)
- Baxter Village in Fort Mill

As of fiscal year (FY) 2014, 82X has an estimated ridership of 65-80 riders per day.

CATS – Route 42

The study area is also served by CATS Route 42, a feeder bus route to the CATS Blue Line light rail system. The route connects Carowinds Boulevard to the I-485 light rail station. Although the route operates during weekdays and weekends, the route only makes stops within the RFATS Study Area during weekday peak periods.

CATS Vanpool "Ride Share" Program

CATS provides a vanpool program that allows 5 to 15 commuters to share a ride to a common destination that is usually not served by regular CATS service. CATS currently sponsors approximately 80 vanpools, providing vans, gas cards, insurance, maintenance, and a Guaranteed Ride Home program. The RFATS Study Area currently has a few vanpools operating to employment destinations including Duke Energy.

York County Access

York County Access is operated by the York County Council on Aging, and is jointly sponsored by York County and the City of Rock Hill. There are two types of services provided through the Access program for residents within the Rock Hill Urbanized Area and the rural sections of York County that are not otherwise covered by the Charlotte Urbanized Area (i.e., north of the Catawba River). The Essential Services portion of York County Access operates Monday to Friday, 6:00 AM to 6:00 PM, providing trips for those who need rides to the doctor, pharmacies, and grocery stores. On a typical weekday, the Essential Services route provides approximately 53 passenger trips in York County. Riders are usually older adults, individuals with disabilities, or those participating in federal social programs. Figure 3-1 and Figure 3-2 below show the distribution of pick-ups and drop-offs for Essential Services and LARS (described in the next section) before 1:00 PM. Only trips before 1:00 PM are shown because most trips are symmetrical and morning pick-up locations are also afternoon drop-off locations. Thus, showing pick-ups and drop-offs for a full service day would result in essentially identical maps.

Figure 3-1 Essential Services and LARS Pick-Ups

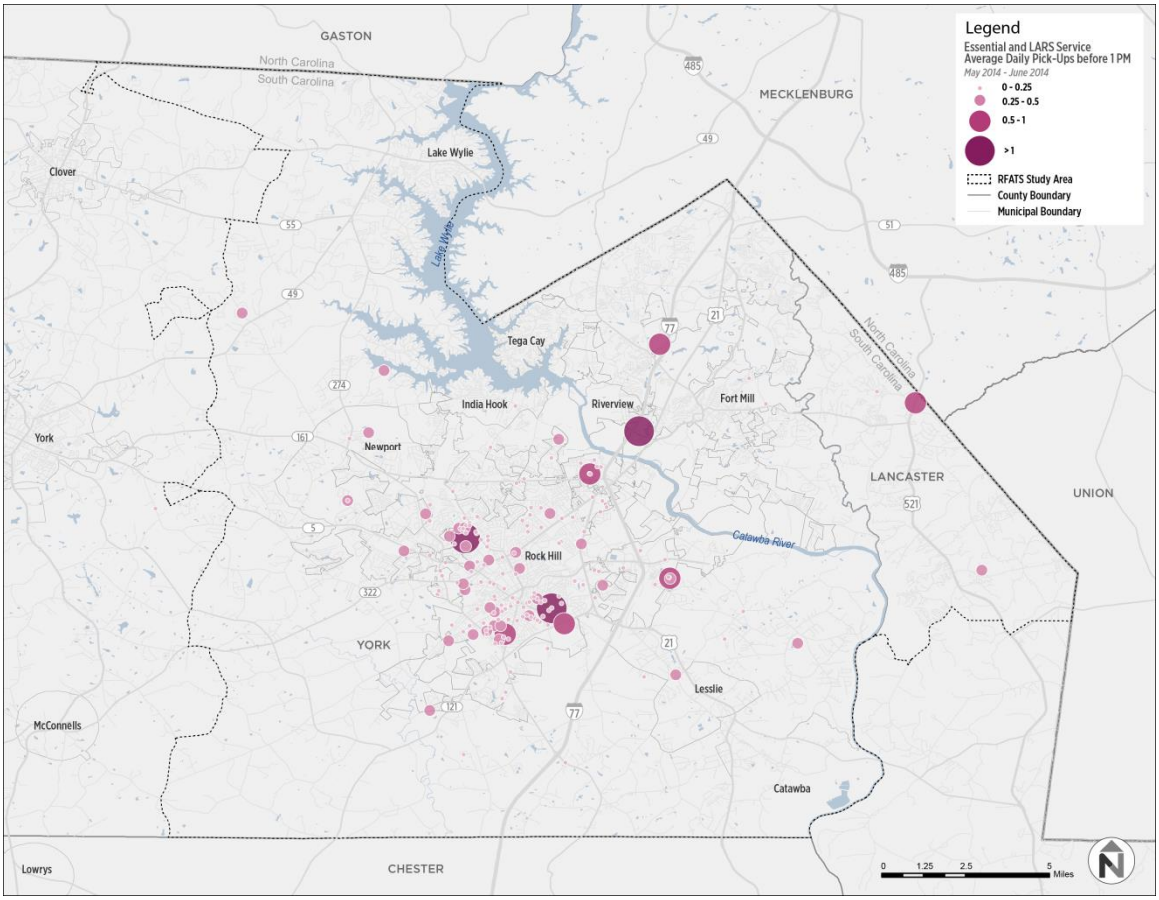
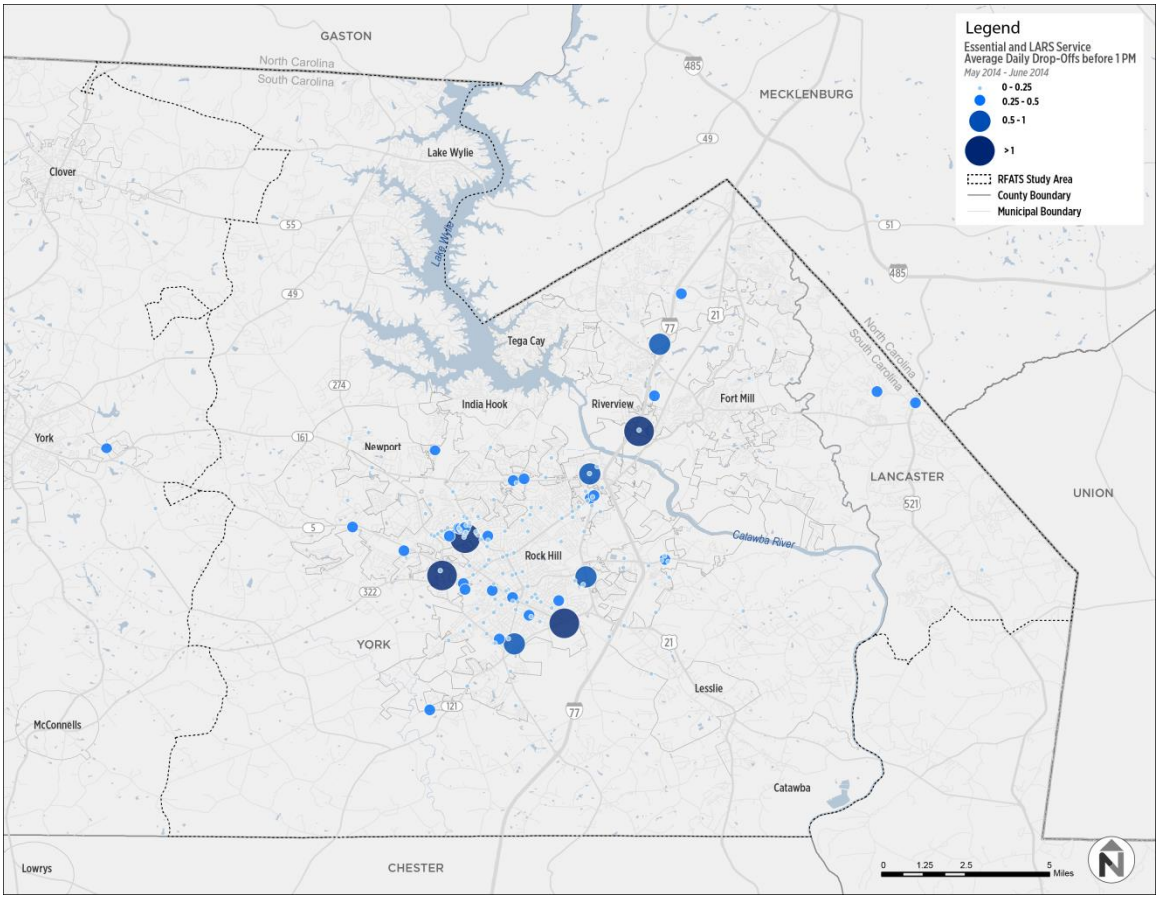


Figure 3-2 Essential Services and LARS Drop-Offs



The "Ride-to-Work" portion of the Access service operates during peak hours for workers who need transportation primarily within the City of Rock Hill. However, as the maps in Figure 3-3 and Figure 3-4 show, trip requests that are outside the city limits but within the Rock Hill Urbanized Area are also accommodated. Forty-three Ride-to-Work passenger trips are provided on a typical weekday.

Figure 3-3 Ride-to-Work Pick-Ups

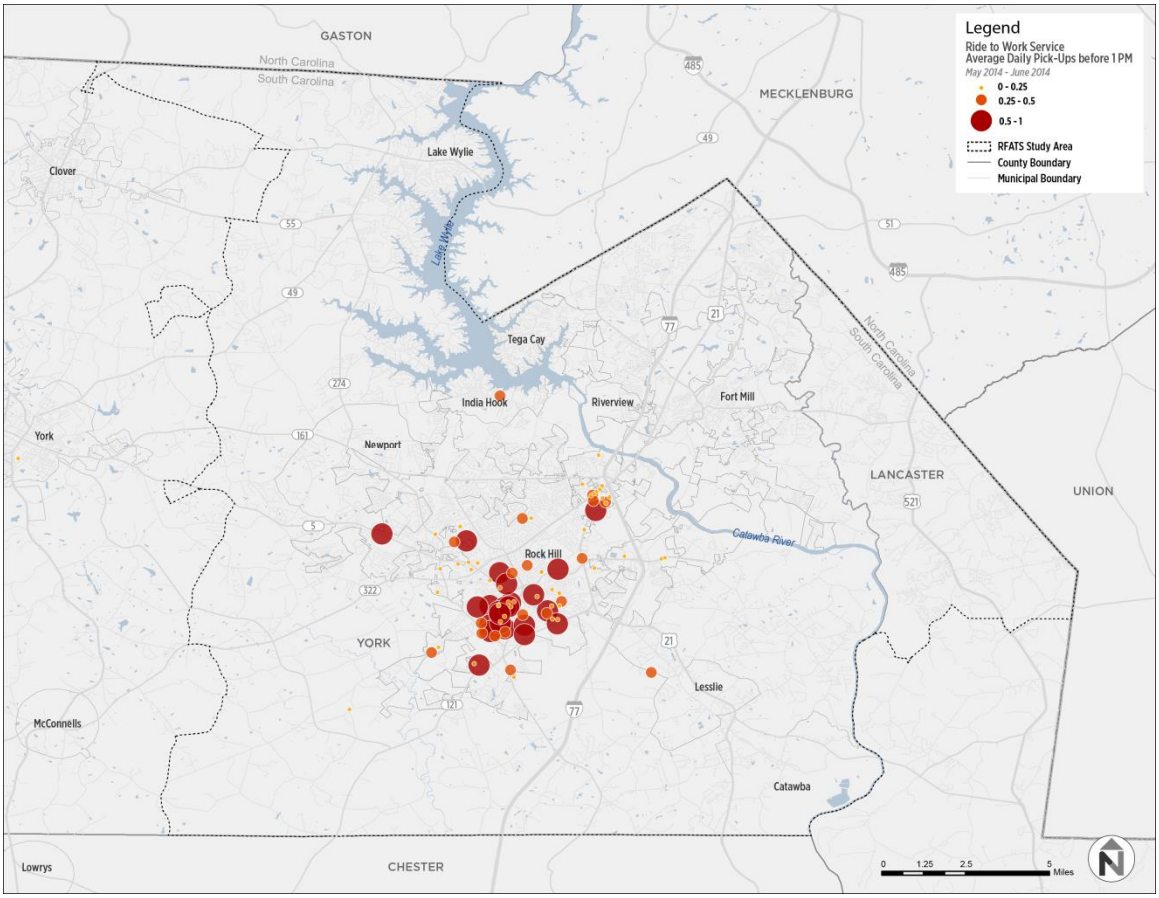
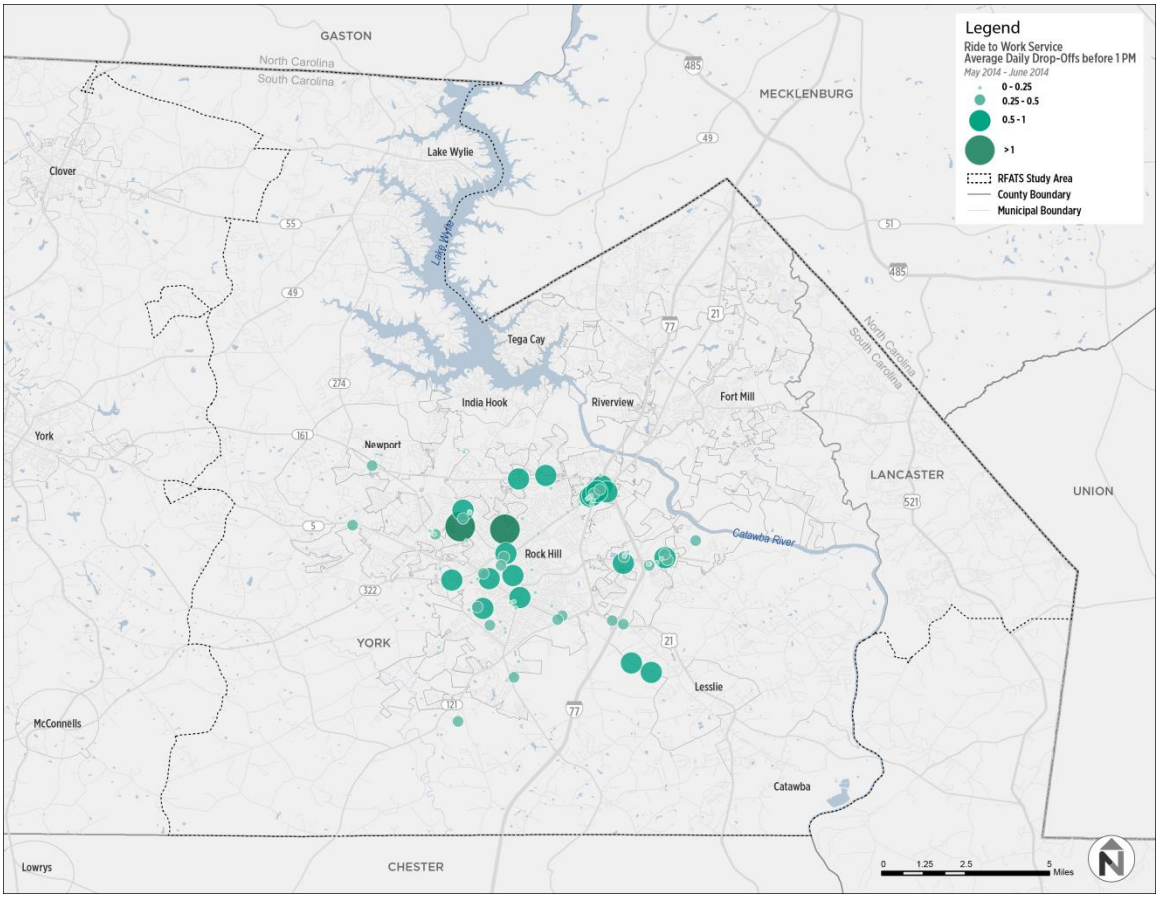


Figure 3-4 Ride-to-Work Drop-Offs



The York County Access program exemplifies the issues that arise from having two designated urbanized areas. Because the City of Tega Cay and the Town of Fort Mill are not in the Rock Hill small urbanized area, nor in the rural section of York County, the service is not available to residents of either community.

Lancaster Area Ride Services (LARS)

The Lancaster Area Ride Service (LARS) is a non-emergency medical transportation system that is operated by the Lancaster County Council on Aging in partnership with the South Carolina Department of Transportation (SCDOT) and Lancaster County. More than 20 local groups helped to spearhead the service, including the J. Mario Sims Foundation, which awarded the start-up costs for the first three years. Operating Monday to Friday from 9:00am to 3:00pm, LARS provides a type of "dial-a-ride" service to Lancaster County residents who do not qualify for Medicaid but do not have transportation alternatives needed to participate in medical-related treatments. The targeted audience for this service accounts for over 13,000 county residents. Currently, different zones within Lancaster County receive different levels of service on top of having a tiered fare service. Currently, intra-county services are $2 per one-way trip, $5 per one-way trip to Rock Hill, and $10 for a one-way trip to Charlotte and Columbia. LARS currently provides fewer than two passenger trips per day within the RFATS Study Area.

FUNDING

Transit funding in the United States is in a state of flux due to new practices, policies, and legislation at the federal level, as well as the lingering effects of the pronounced economic downturn. At the federal level, important changes include the Moving Ahead for Progress in the 21st Century (MAP-21) transportation bill that was signed into law on July 6, 2012. While the new legislation updates federal policy and includes fairly substantial changes at the program level, it was originally authorized for only two years. Extended for ten months beyond its original expiration date, MAP-21 will expire or be extended again at the end of July 2015. In addition, some of the grant funds historically committed to and benefitting transit agencies, most notably congressional earmarks and the American Recovery and Reinvestment Act (ARRA), are no longer available. Uncertainty in federal policy is exacerbated by significant federal budgetary challenges, including prolonged underinvestment in the Highway Trust Fund.

Challenges at the federal level also affect state and local governments, which rely on federal funds for many of their programs and services. Like the federal government, state and local governments are still in the process of recovering from the economic recession, and thus are challenged by lower receipts from state and local taxing programs and reduced support from the federal government.

At the same time, riders, local communities, and elected officials are placing more demands on transit operators, who are responsible for managing a business with cost inputs (hourly wages, fuel, and insurance) that increase annually and are largely out of the operator's control. Successfully navigating this environment involves building on successes, articulating needs, identifying stable funding resources, and capitalizing on opportunities as they arise. Obtaining long-term funding sustainability is a key strategy for the future success and potential expansion of transit availability in the RFATS Study Area.

Expenses and Revenues

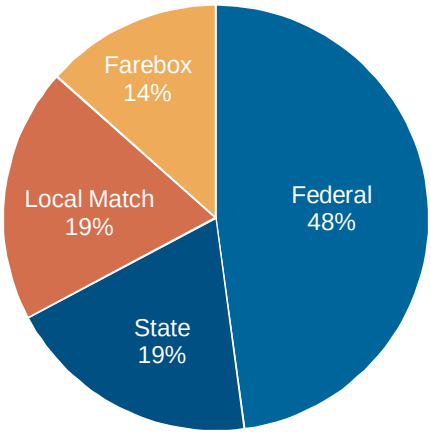
In FY15, approved budgetary funding for York County Access is approximately $290,000 for the urban area service and $228,000 for the rural service. The funding is used primarily to:

- Operate demand-response transit service (73%)
- Maintain agency vehicles and resources (10%)
- Cover expenses related to managing the service (17%)

Transit systems across the United States are primarily funded through a combination of federal and state grant funds as well as local sources. Transit agencies also typically raise revenues through fares, partnerships with institutions, fee-for-service contracts, and advertising. York County Access utilizes the same basic combination of federal, state, and local resources for both its urban and rural services, along with fares paid by users. Federal funds from the Section 5307 program, apportioned to the Rock Hill Urbanized Area, are used to support the Access service that operates in the city and in areas immediately adjacent to the city that are part of the Rock Hill Urbanized Area. Federal funds from the Section 5311 program for rural areas, apportioned to SCDOT and granted to York County, are used to support the rural York County Access service. SCDOT provides funds from state gas tax revenues as match for 5307 and 5311 funds. The state's match may be used for capital and operating expenses; match for 5311 funds may also be used for administrative and technical assistance/planning expenses.

In FY13, federal and state funds accounted for approximately 48% and 19% of York County Access revenues, respectively; local matching funds provided 19% and farebox revenue generated 14% of revenues (Figure 3-5).

Figure 3-5 York County Access Funding Sources (FY13)



The City of Rock Hill currently leases six service vehicles to support York County Access (which were originally funded through the ARRA program back in 2010), and is slated to replace two of these vehicles in FY 15-16 through the FTA 5339 grant program. York County has similarly provided vehicles to support the rural service through the FTA 5339 program as well. Both services utilize 14 passenger cutaway vehicles.

Additionally, the City of Rock Hill supports the CATS 82X route. The City receives FTA Section 5307 operating assistance in the amount of $55,600 and project administration funding in the amount of $8,000, for an annual total of $63,600. The remaining operating assistance is provided through a combination of state and local sources; specifically, SCDOT, CATS, and farebox revenue.

Historical Perspective

Between FY10 and FY13, operating revenues and expenditures on York County Access increased by nearly 125%. This corresponds with an increase in annual service miles, as well as growth in ridership[1].

FY10 – FY13 5307 Urban Services:	Trips = 98% increase
	Mileage = 97% increase
FY10 – FY13 5311 Rural Services:	Trips = 137% increase
	Mileage = 180% increase

[1] According to data derived from City of Rock Hill OpStats from 2009 to 2014.

Annual revenues and expenditures over this period varied slightly, but FY13 revenues were the highest in the service's history and roughly match annual expenditures. The increases in funding from both federal and state sources over this period reflect the continuous growth in ridership and associated service miles.

FY13 saw the first decrease in funding since FY10 (Figure 3-6) and, despite increases in service mileage and ridership, expenditures decreased over FY12 by 7.62%. In both FY12 and FY13 the shortfalls in revenues over expenditures were covered by additional funding contributions from the City of Rock Hill.

Figure 3-6 York County Access Annual Expenditures and Revenues (2010-2013)

City of Rock Hill Transit Funding Actual Expenditures & Revenues by Year Urban & Rural Demand Response				
FY	**2012-2013**	**2011-2012**	**2010-2011**	**2009-2010**
EXPENDITURES				
Admin & Non-Dept	$ 14,048	$ 16,481	$ 2,881	$ 3,028
Vehicle Operations	$ 459,194	$ 495,813	$ 321,875	$ 207,418
Actual Total	**$ 473,242**	**$ 512,294**	**$ 324,756**	**$ 210,446**
REVENUES				
Charges for Services	$ 68,080	$ 56,993	$ 48,083	$ 30,558
Federal Ops Grants	$ 203,027	$ 239,592	$ 176,572	$ 90,432
State Assistance	$ 98,163	$ 86,887	$ 56,744	$ 45,216
Local Match	$ 98,163	$ 86,887	$ 56,744	$ 45,216
Total	**$ 467,432**	**$ 470,359**	**$ 338,143**	**$ 211,422**
Year to Year Change	***-0.62%***	***39.10%***	***59.94%***	

CHAPTER 4 - TRANSIT OPPORTUNITIES

There are many types of transit service. A service can be designed for a very specific user group, such as older adults, students, or commuters (Figure 4-1), or it can be designed to appeal to the general public to the greatest extent possible (Figure 4-2).

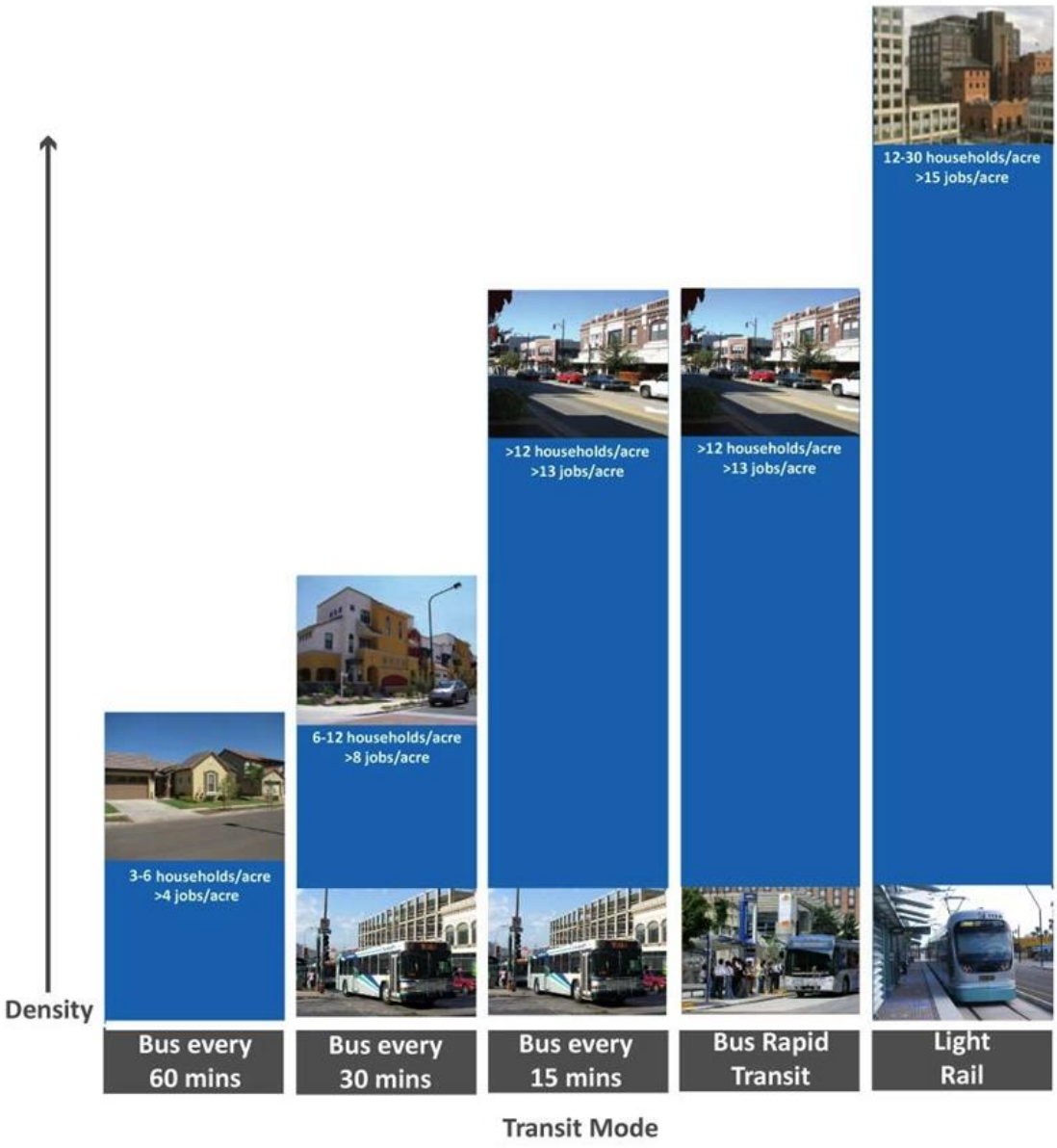
Figure 4-1 Examples of Specialized Public Transportation Services

Figure 4-2 Examples of General Purpose Public Transportation Services

Each service type has its own characteristics and ideal operating environment. For general fixed-route service, density is the key to determining where, when, and even if a route should operate. The more people that live or work within a particular geographic area, the higher level of transit service that the area can support. For example, a community with three to six households per acre can generally produce enough ridership activity to justify hourly bus service, while a community

with higher population density or with a substantial mix of residential and non-residential uses may be able to support higher service frequency (Figure 4-3).

Figure 4-3 Relationship between Population and Employment Densities and Transit Demand



For specialized services that are designed to appeal to a specific user group, density is a less important factor than the presence of a "pain point." For example, if parking is expensive or in short supply at a key regional destination such as a central business district or major university, commuters will tend to seek out alternatives to driving alone. Typical pain points that many communities experience include:

- **Difficult commuting conditions:** This may include long distances, high fuel prices, seasonally dangerous roadway conditions, and parking challenges. Services that may address these issues are commuter buses, vanpools, and ride-share programs.
- **Vulnerable populations:** Mobility can be particularly challenging for residents who are unable or unwilling to drive due to age, health, or economic considerations. Services that may address these issues are community circulators and demand-response services.
- **Job Access:** In some cases, employers are not able to attract or retain suitable employees due to the location of the job opportunity. For potential employees, the cost or effort of reaching a job site may sway their decision in applying for or accepting an open position. Services that may address these issues are vanpools, reverse-commute services, last-mile connectors, and employment-focused demand-response services.

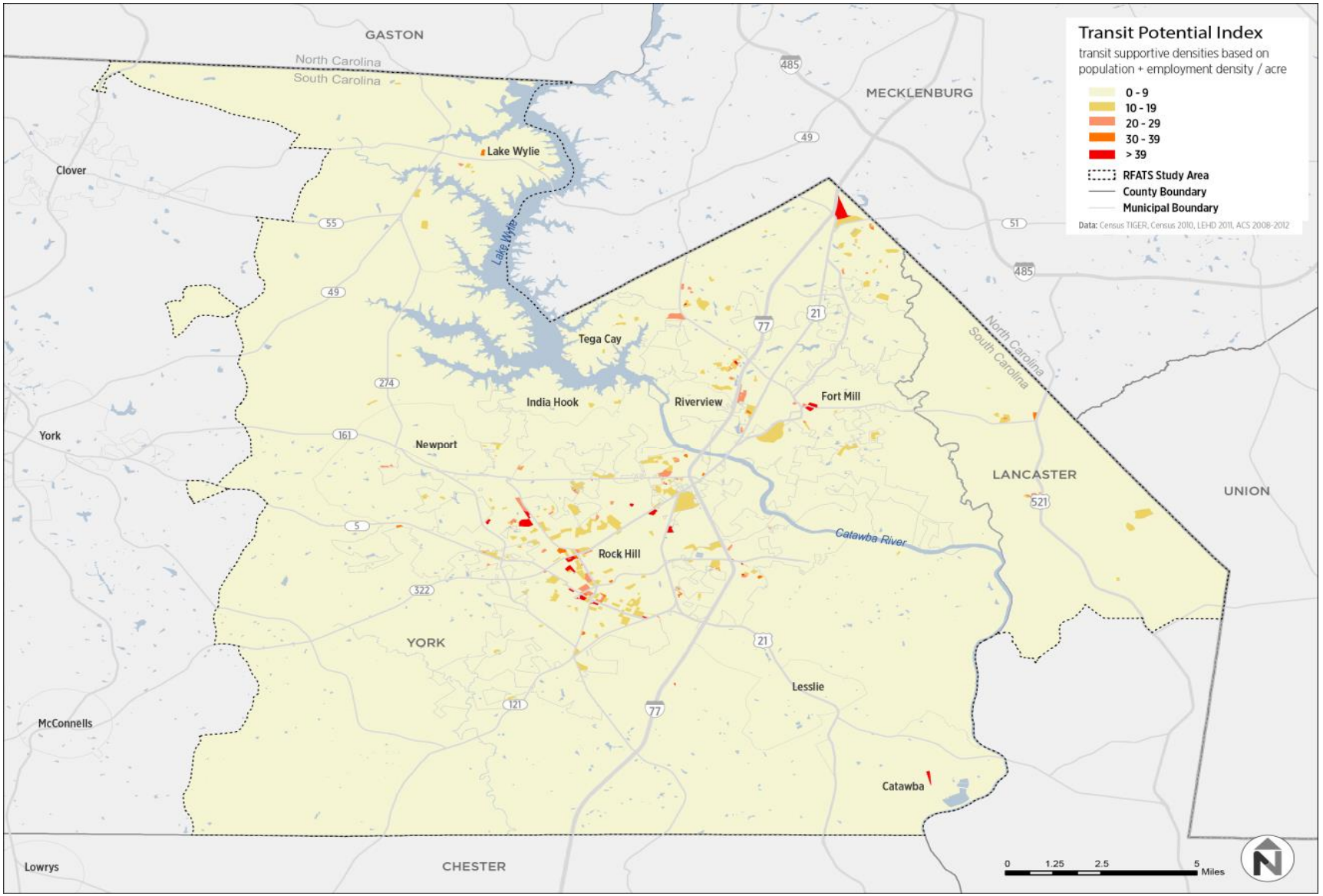
FIXED-ROUTE OPPORTUNITIES

In general, the RFATS Study Area is a low-density environment, but when population and employment density are considered together, several areas emerge as having the potential to support a base-level of general fixed-route service. The largest concentration of census block groups with transit-supportive densities is found in the City of Rock Hill (Figure 4-4).

The SC 160 Corridor, from Kingsley Park in Fort Mill to approximately Gold Hill Road in Tega Cay, can be considered an emerging transit corridor. The corridor has seen significant residential and retail development in recent years, and is now experiencing substantial employment growth, particularly in the 1.5 million square foot Kingsley Park project.

Other pockets of relatively high population and/or employment density can be found in Lake Wylie, Catawba, and other parts of York and Lancaster counties, but they are generally separated by large gaps and lack other characteristics that would allow for strong transit corridors in the short-term. Specifically, good transit corridors have a mix of uses all along their length, and include multiple all-day trip generators. A mix of uses, including residential areas (trip origins) and activity centers (trip destinations), helps ensure that the corridor will, in fact, produce transit trips.

Figure 4-4 Transit Potential Index



The technical team identified several corridors in the study area that currently meet (or will meet in the near-future) the necessary characteristics to support fixed-route transit service. In particular, the team focused on corridors with multi-family housing, grocery stores, large retailers (Wal-Mart, Target, etc.), hospitals, colleges, and universities. These land uses typically generate ridership throughout the service day, and complement peak-period ridership generators such as high schools and office parks. By contrast, recreational activity centers including parks, stadiums, and movie theaters tend to only generate ridership at limited times, and only on certain days.

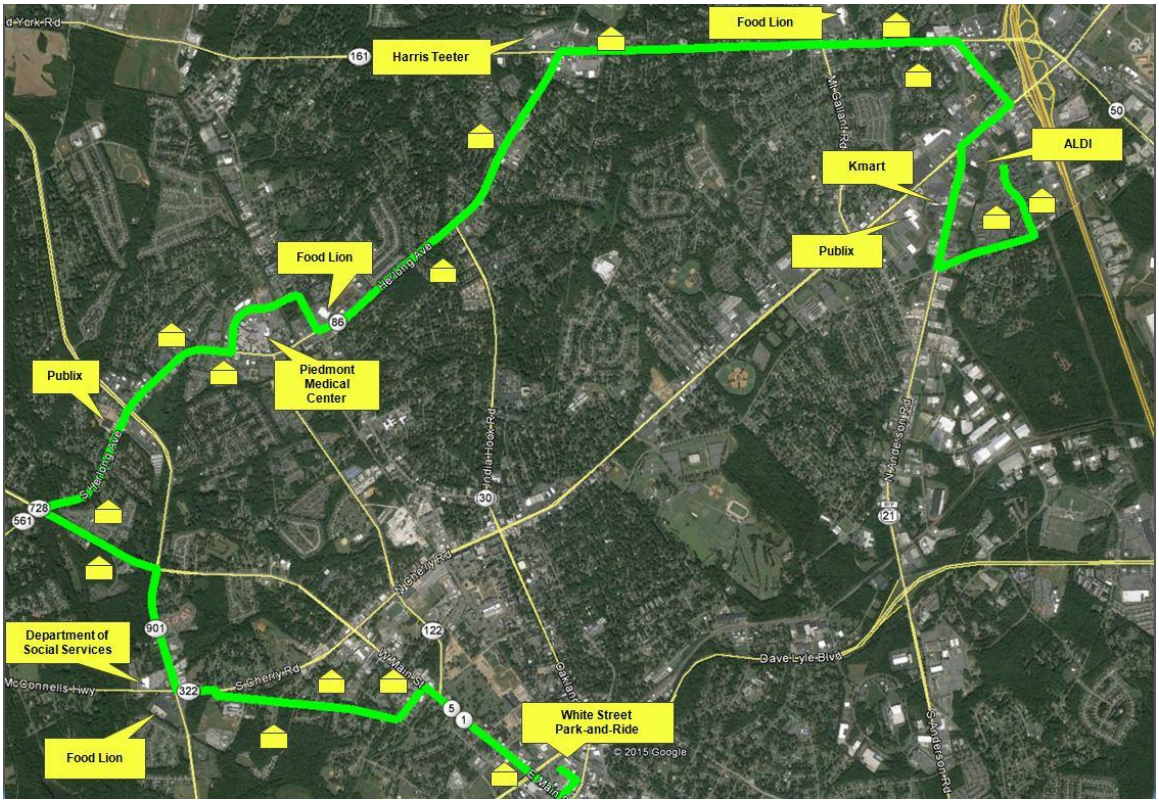
The route descriptions below present an overview of how fixed-route transit service could be provided in the RFATS Study Area. Each route is assumed to operate hourly, for 12 hours per day. These parameters represent a base-level of service, and can be adjusted in the future in response to actual ridership and other service performance measures.

Route 1: Downtown to N. Cherry / Anderson via Piedmont Medical Center

Route 1 is an approximately 11-mile route that begins at the White Street Park-and-Ride in downtown Rock Hill and operates primarily along Main Street, Finley Road, Heckle Boulevard, Herlong Avenue, Celanese Road, and Riverview Road. The route includes a terminal loop consisting of Patriot Parkway, Eden Terrace, Anderson Road, and Cherry Road. Key destinations that would be served by the route include:

- White Street Park-and-Ride
- Food Lion (at McConnells Corner)
- Department of Social Services
- Publix
- Piedmont Medical Center
- Food Lion
- Harris Teeter
- Food Lion (at Mt. Gallant Road)
- ALDI
- Kmart
- Publix
- Several multi-family housing complexes

Figure 4-5 Route 1: Downtown – N. Cherry / Anderson via Piedmont Medical Center

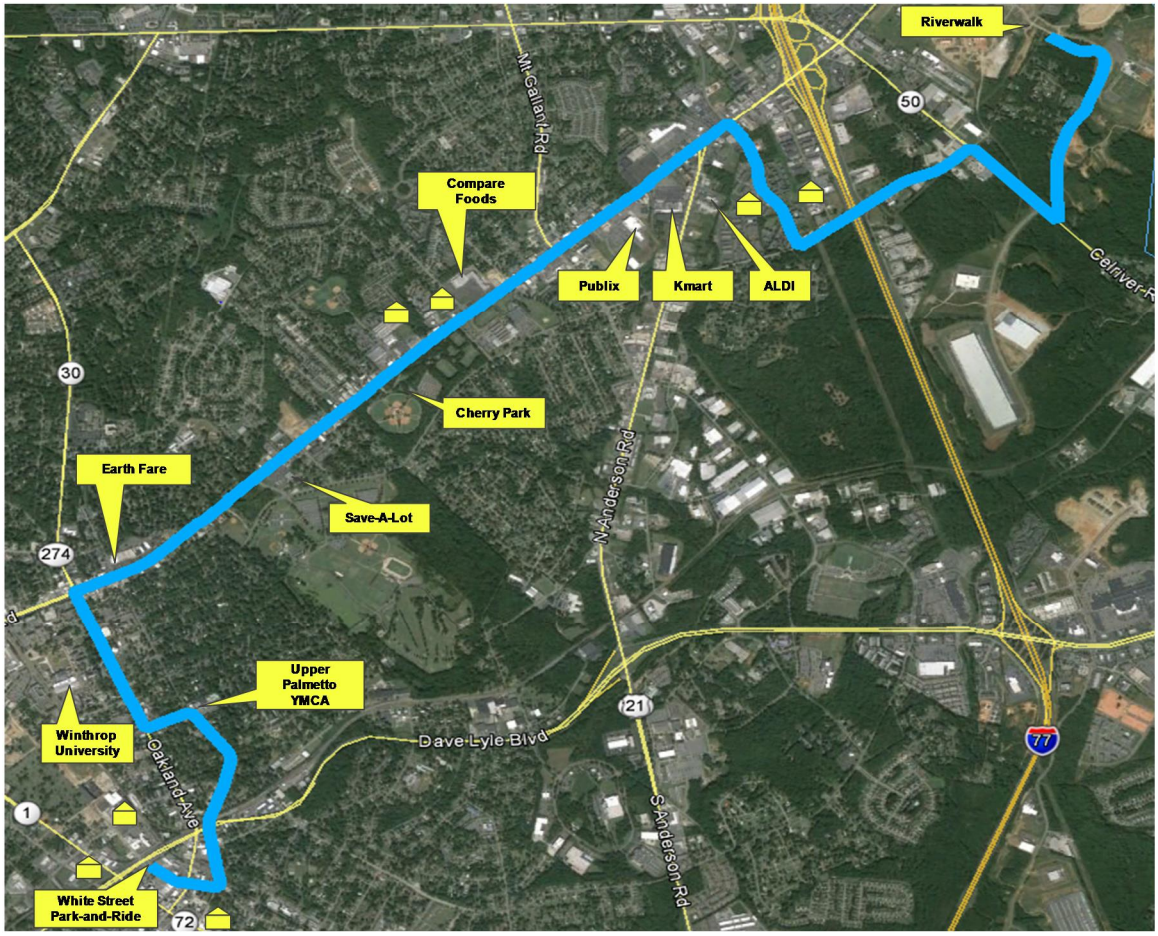


Route 2A: Downtown to Riverwalk via Winthrop University

Route 2A is a seven-mile route that links downtown Rock Hill with Winthrop University, before continuing along Cherry Road to Patriot Parkway and serving a mix of retail destinations and multi-family housing. From Patriot Parkway, the route would continue on to the new Riverwalk mixed-use development, although the exact alignment within the Riverwalk development will depend on the final build-out of the project. Key destinations that would be served by the route include:

- White Street Park-and-Ride
- Upper Palmetto YMCA
- Winthrop University
- Earth Fare
- Save-A-Lot
- Cherry Park
- Compare Foods
- Publix
- Kmart
- ALDI
- Riverwalk
- Several multi-family housing complexes

Figure 4-6 Route 2A: Downtown – Riverwalk via Winthrop University



Alternative Alignments Considered

The technical team also considered serving the Riverwalk development by extending service along N. Cherry Road, rather than the alignment including Patriot Parkway and Eden Terrace. However, this was ultimately not recommended because of the relatively difficult pedestrian environment at the intersection of Patriot Parkway and N. Cherry Road. The multiple apartment complexes along Patriot Parkway are likely to account for a high percentage of trip origins on the proposed Route 2. The ridership potential of the route would suffer if residents of these apartments had to walk along Patriot Parkway to Cherry Road, and in some cases cross Cherry Road (for southbound trips), to reach a Route 2 bus stop. Patriot Parkway, south of Cherry Road, does not currently have sidewalks on either side of the street, and crossing Cherry Road requires pedestrians to cross seven lanes of traffic (see Figure 4-7). Even with traffic signals present, crossing such a wide roadway can be intimidating, if not dangerous, for pedestrians.

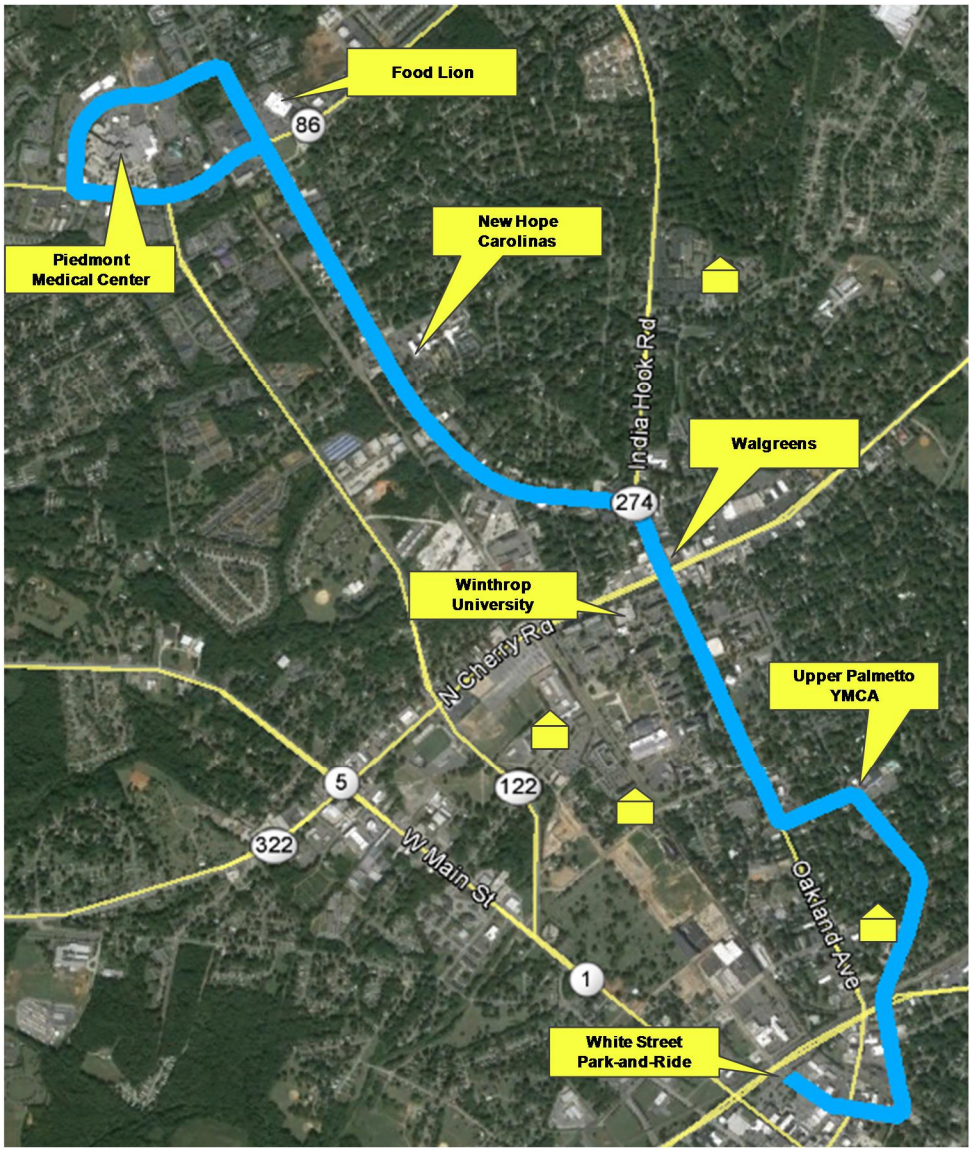
Figure 4-7 Pedestrian Environment at Patriot Parkway and N. Cherry Road

Route 2B: Downtown to Piedmont Medical Center via Winthrop University

Route 2B is a four-mile route that, like Route 2A, links downtown Rock Hill with Winthrop University. However, the route then continues north along Oakland Avenue to the Piedmont Medical Center. Key destinations that would be served by the route include:

- White Street Park-and-Ride
- Upper Palmetto YMCA
- Winthrop University
- Earth Fare
- Wal-Mart
- New Hope Carolinas
- Catawba Mental Health
- Food Lion
- Piedmont Medical Center

Figure 4-8 Route 2B: Downtown – Piedmont Medical Center via Winthrop University



Alternative Alignments Considered

The technical team also considered Constitution Boulevard, rather than Oakland Avenue as a possible alignment for service between the Piedmont Medical Center and downtown Rock Hill. Constitution Boulevard is lined by several large multi-family housing complexes, but their layout relative to the corridor presents a challenging environment for pedestrians. As an example, the large apartment complex at the top of Figure 4-9 is just yards from Constitution Boulevard to its east, but Garden Way, the internal driveway serving the complex, dead-ends at the strip of thick woods separating the complex from Constitution Boulevard. This prevents pedestrians from easily accessing the corridor, and significantly reduces the ridership potential for a route along Constitution Boulevard. Thus, Constitution Boulevard was not recommended for the alignment of Route 2B.

Figure 4-9 Pedestrian Environment in Constitution Boulevard Corridor

Future Alignment Considerations

The City of Rock Hill is currently working with private developers to redevelop a "brownfield" site along West White Street, between Stewart Avenue and Laurel Street. The former industrial sight is set to become a mixed-use development called Knowledge Park. Plans call for three office buildings and university-focused housing for more than 500 students. The size of this development, and the amount of activity it is expected to generate, will require a reevaluation of transit service between downtown and Winthrop University. If the currently proposed alignments are implemented and prove to be strong ridership generators, then a new route should be considered to serve Knowledge Park. If, however, the currently proposed alignments generate less ridership than expected, then service between downtown and Winthrop University can be reconfigured to operate along White Street (serving Knowledge Park) instead of Charlotte Avenue and Oakland Avenue.

Route 3: Downtown to Galleria via York Technical College

Route 3 is a seven-and-a-half mile route that begins at the White Street Park-and-Ride in downtown Rock Hill and terminates at the Rock Hill Galleria. The route operates primarily along Main Street, Cowan Road, S. Anderson Road, Baskins Road, Progress Way, and Dave Lyle Boulevard. The route includes a terminal loop consisting of Springdale Road, Red River Road, and Mangum Road. Key destinations along Route 3 include:

- White Street Park-and-Ride
- Food Lion
- Bi-Lo
- City of Rock Hill Operations Center
- York Technical College
- Manchester Meadows Park and Soccer Complex
- Regal Cinemas and Manchester Park-and-Ride
- Target
- Food Lion
- Wal-Mart
- Rock Hill Galleria
- Several multi-family housing complexes

Figure 4-10 Route 3: Downtown – Galleria via York Technical College

Alternative Alignments Considered

Alternative alignments considered for Route 3 included continuing service along Dave Lyle Boulevard, from Anderson Road to downtown Rock Hill, or operating along Willowbrook Avenue and Dave Lyle Boulevard between Anderson Road and downtown Rock Hill.

Operating Route 3 primarily along Dave Lyle Boulevard would reduce travel times between the Rock Hill Galleria area and downtown Rock Hill, but would also make the service far less accessible to riders as Dave Lyle Boulevard is a difficult environment for pedestrians, with few sidewalks, relatively high speed traffic, and barriers such as dense vegetation and fences separating the corridor from adjacent neighborhoods.

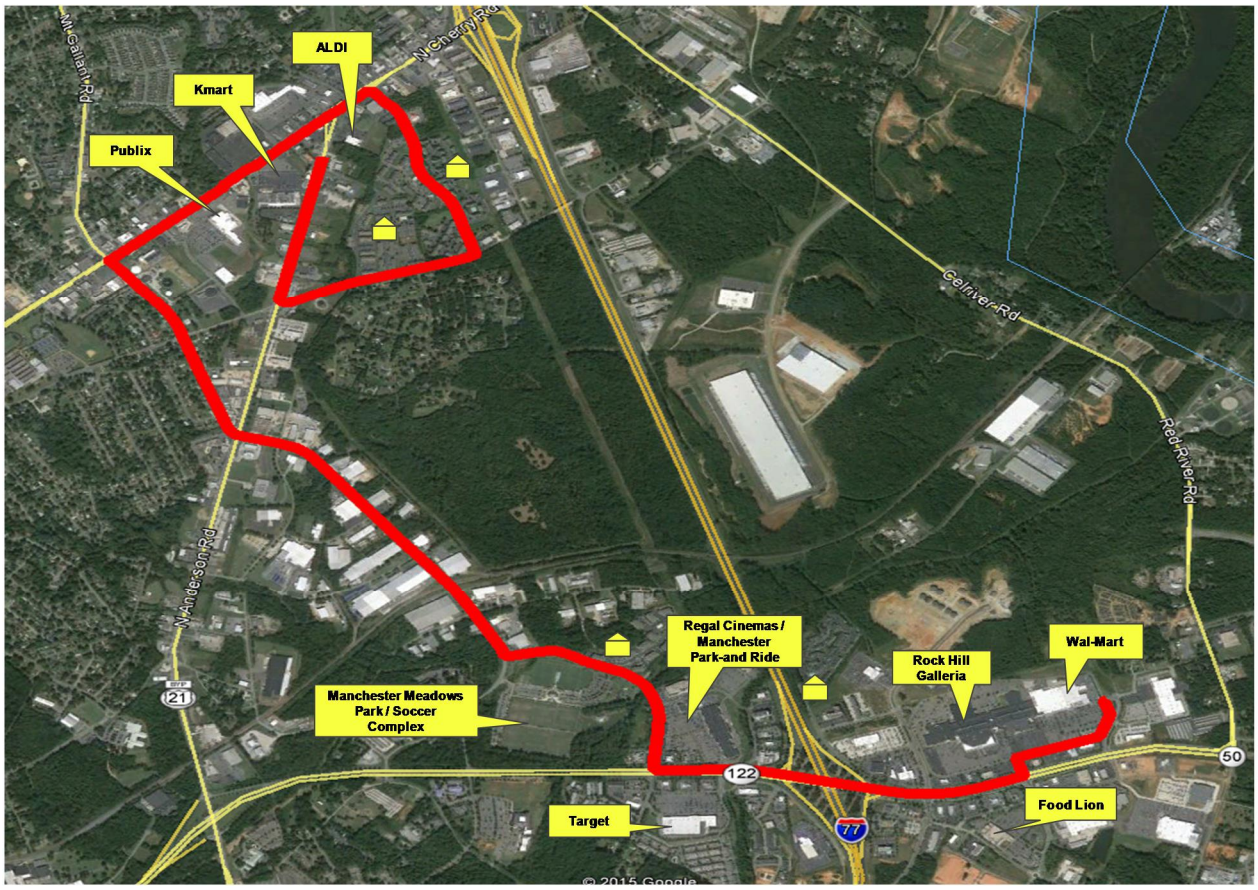
Willowbrook Avenue is a much more accommodating pedestrian environment than Dave Lyle Boulevard, but lacks the diversity of land uses that are found along the combination of Anderson Road, E. Main Street and S. Main Street. The Willowbrook Avenue corridor is primarily residential, while Anderson Road and Main Street include service and retail destinations including two grocery stores that are more likely to generate ridership activity throughout the service day. Finally, the Main Street alignment was selected over Willowbrook Avenue because of its proximity to neighborhoods both north and south of Main, whereas Willowbrook Avenue would leave a large portion of Rock Hill without service coverage (within a ¼ mile).

Route 4: Galleria to N. Cherry/Anderson via Manchester Cinemas Park-and-Ride

Route 4 is an approximately six-mile route between Rock Hill Galleria and a terminal loop consisting of Patriot Parkway, Eden Terrace, Anderson Road, and Cherry Road. The route operates primarily along Dave Lyle Boulevard, John Ross Parkway, Mt. Gallant Road, and N. Cherry Road. Key destinations along the route include:

- Rock Hill Galleria
- Wal-Mart
- Food Lion
- Target
- Regal Cinemas and Manchester Park-and-Ride
- Manchester Meadows Park and Soccer Complex
- Publix
- Kmart
- ALDI
- Several multi-family housing complexes

Figure 4-11 Route 4: Galleria – N. Cherry / Anderson via Manchester Cinemas Park-and-Ride



Alternative Alignments Considered

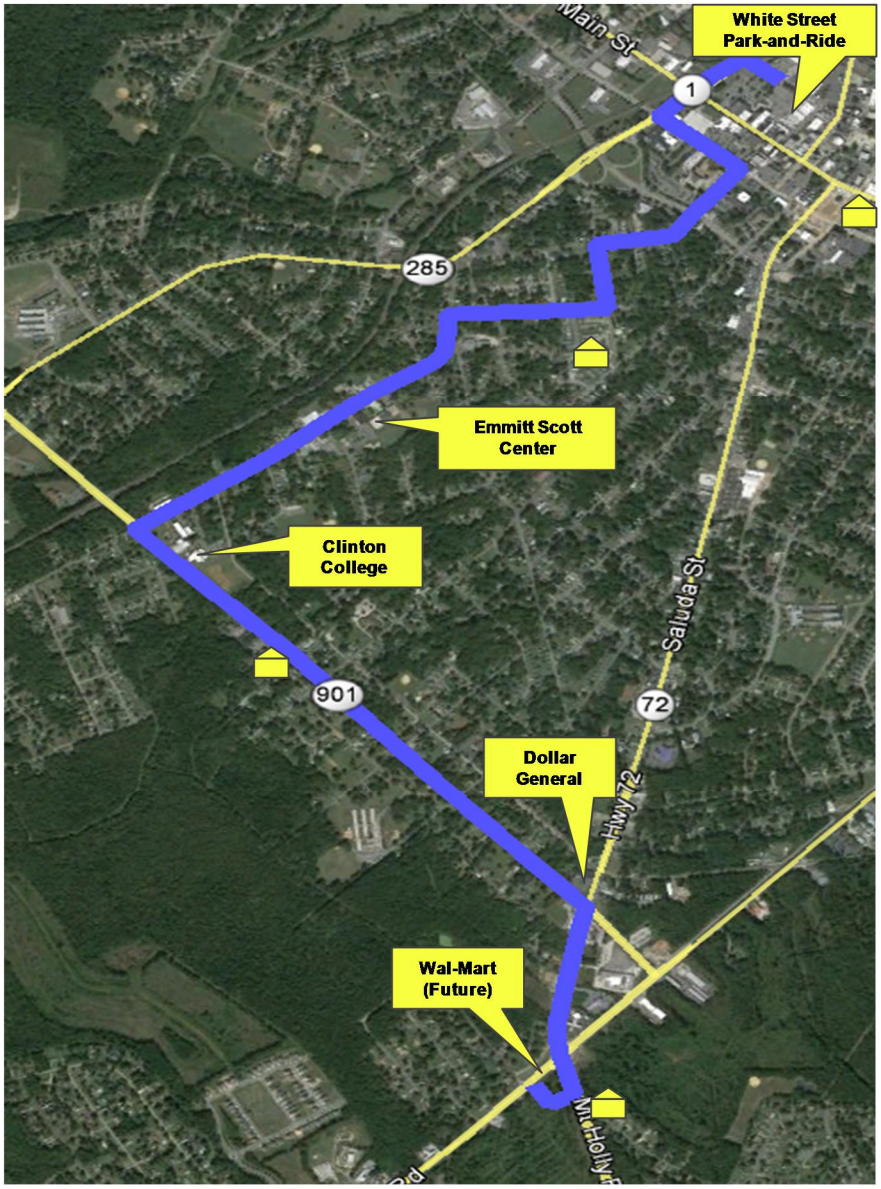
One alternative alignment was considered for Route 4. It involved routing buses along N. Anderson Road from Mt. Gallant Road to the terminal loop including Patriot Parkway and Eden Terrace, rather than continuing on Mt. Gallant Road across Anderson Road to Cherry Road before completing the terminal loop along Patriot and Eden Terrace. Ultimately, it was determined that the Cherry Road alignment would provide more and better access to retail destinations including Publix. This would be particularly important if Rock Hill service was phased in and Route 4 were to go into service before Route 2, which would also serve retail destinations along Cherry Road.

Route 5A: Downtown to Wal-Mart via Clinton College

Route 5A is a three-and-a-half mile route intended to link the White Street Park-and-Ride in downtown Rock Hill with a new Wal-Mart planned for the intersection of Saluda Street, Mount Holly Road and Albright Road. The route would operate primarily along Dave Lyle Boulevard, Black Street, Hampton Street, Moore Street, Whitner Street, Crawford Road, and Heckle Boulevard. Key destinations along the route include:

- White Street Park-and-Ride
- Emmett Scott Recreation Center
- Clinton College
- Dollar General
- Wal-Mart (Future)
- Several multi-family housing complexes

Figure 4-12 Route 5A: Downtown – Wal-Mart via Clinton College

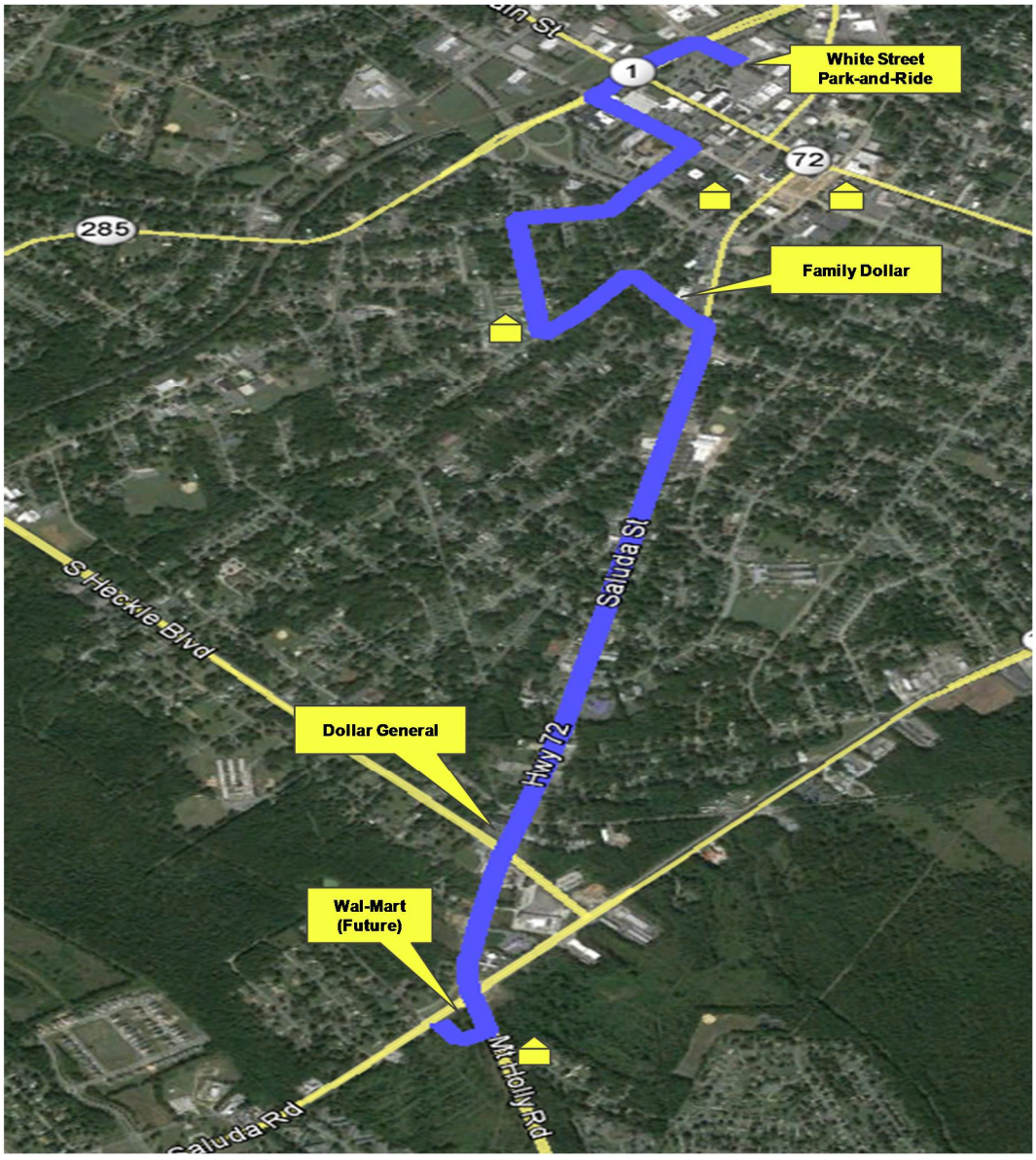


Route 5B: Downtown to Wal-Mart via Saluda Street

Route 5B is a three mile route that also links the White Street Park-and-Ride in downtown Rock Hill with the new Wal-Mart planned for the intersection of Saluda Street, Mount Holly Road and Albright Road, but unlike Route 5A, it does not serve Clinton College. Instead, the route would operate primarily along Saluda Street, after serving several multi-family housing complexes on Moore Street. Key destinations along the route include:

- White Street Park-and-Ride
- Family Dollar
- Dollar General
- Wal-Mart (Future)
- Several multi-family housing complexes

Figure 4-13 Route 5B: Downtown – Wal-Mart via Saluda Street



Route 6: SC 160 Corridor

Route 6 would operate along the fast-growing SC 160 Corridor. The strong growth in residential, retail, and commercial activity in this corridor have created an environment that would likely support a base-level of fixed-route transit service. However, the corridor's land use presents challenges as well. In particular, the large set-back of key destinations such as Shutterfly and Wal-Mart from SC 160 will require either long walking distances for passengers or lengthy deviations for buses serving the corridor.

While route deviations are sometimes necessary to bring transit service within a reasonable proximity of key destinations, they also extend the overall length of a route. As a result, more vehicles may be required to maintain a desired service frequency for a circuitous route than for a more streamlined alignment.

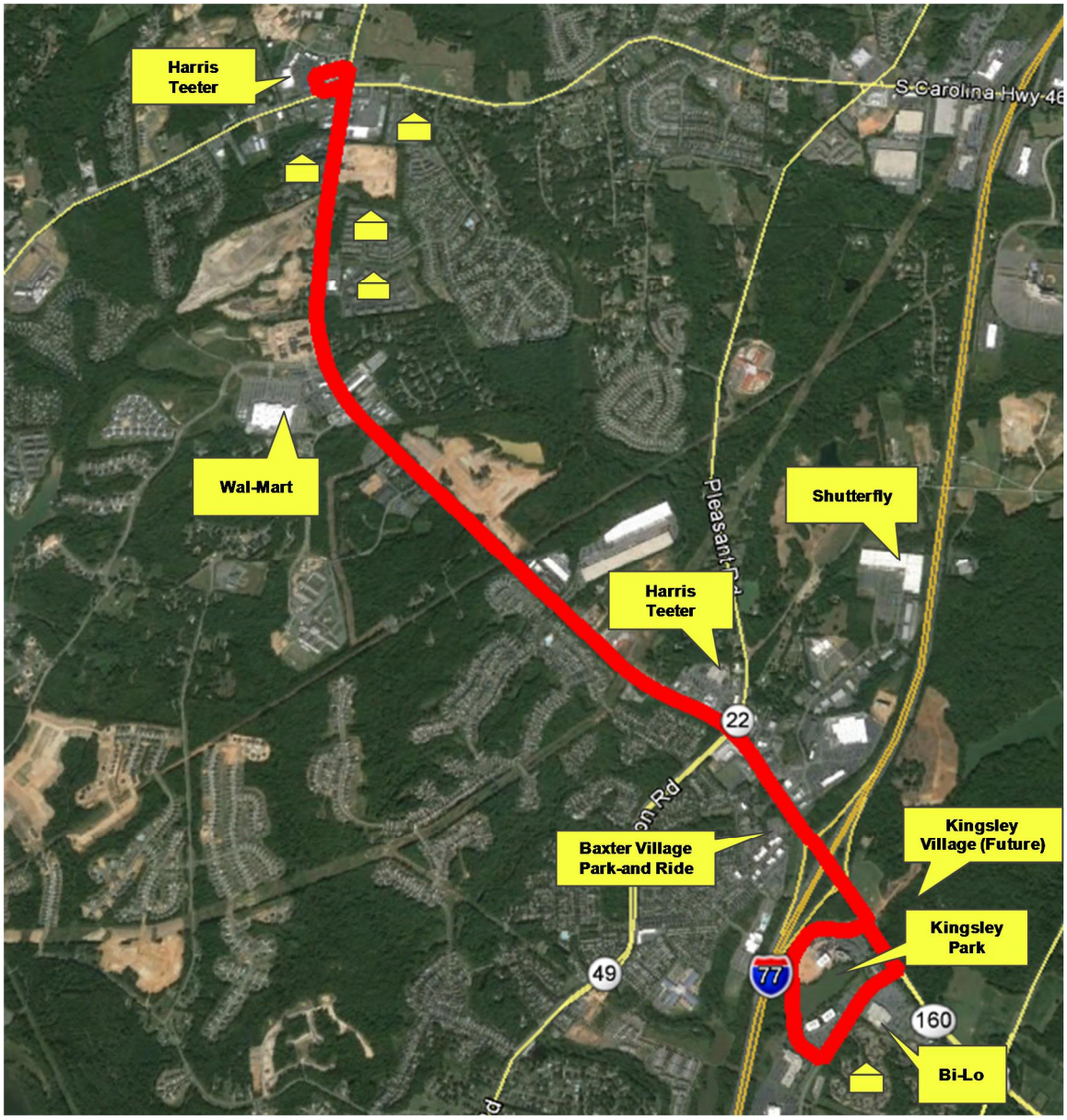
Three alternative alignments (6A, 6B, and 6C) can be considered for Route 6. The alignments are described below, and the implications of each on cost and ridership are discussed later in this chapter.

Route 6A: Efficiency-Focused Approach

Route 6A would provide the most direct routing between Kingsley Park and Gold Hill Road. Buses would not deviate from SC 160, except to complete terminal loops at each end of the route. This 4.5 mile route would allow service to operate hourly with just one vehicle, thus minimizing operating cost and maximizing service efficiency. Key destinations along the route include:

- Bi-Lo
- Kingsley Park
- Kingsley Village (Future)
- Baxter Village Park-and-Ride
- Harris Teeter (Two Locations)
- Wal-Mart
- Several multi-family housing complexes

Figure 4-14 Route 6A: Kingsley Park – Gold Hill Road



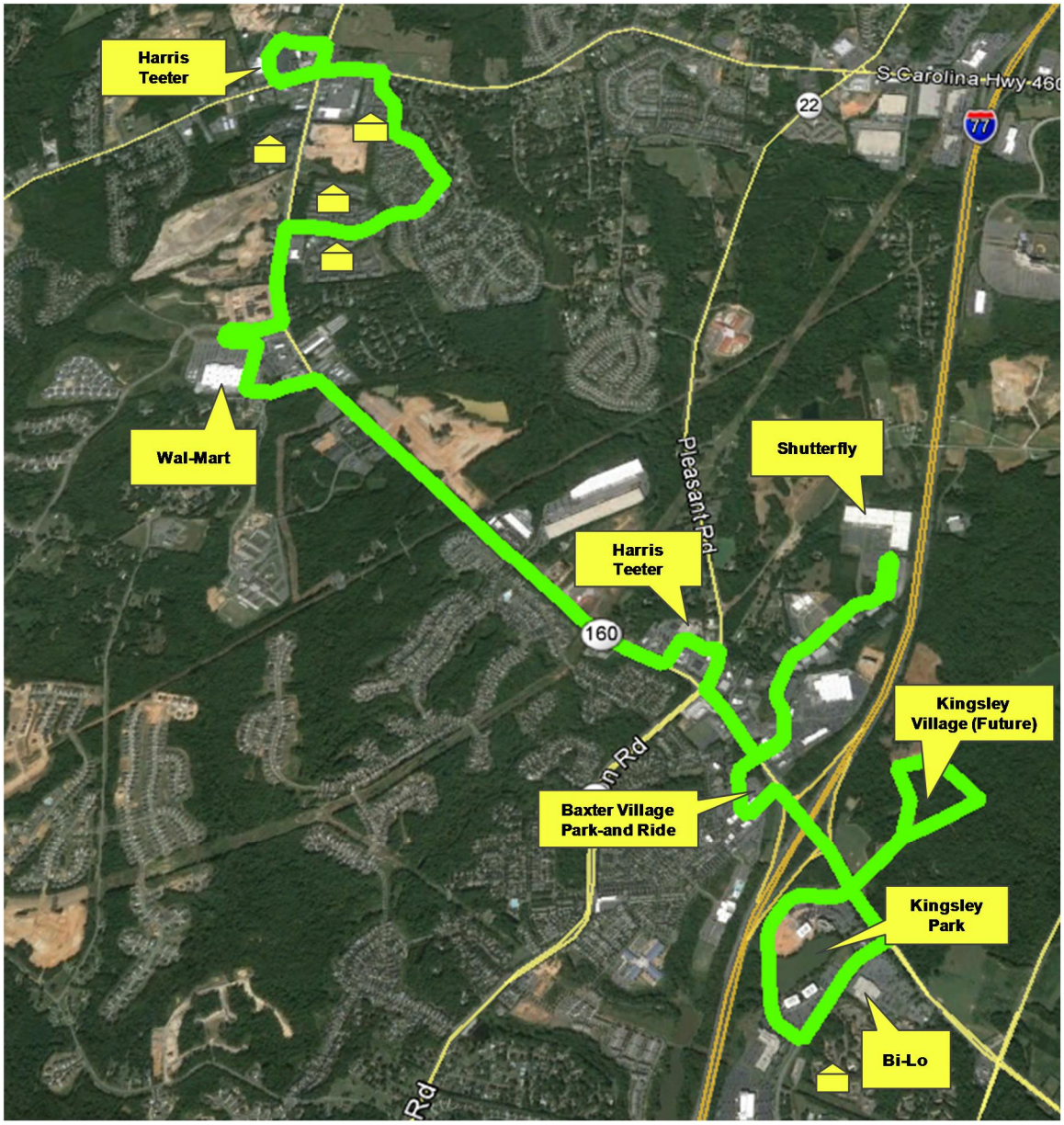
Route 6B: Coverage-Focused Approach

Like Route 6A, Route 6B would operate between Kingsley Park and Gold Hill Road. However, the route would also include several deviations from SC 160 in order to provide closer access to key destinations. These deviations would add approximately four miles to the route, compared to Route 6A, and would require two buses operating concurrently to maintain hourly service frequency.

Key destinations along the route include:

- Bi-Lo
- Kingsley Park
- Kingsley Village (Future)
- Baxter Village Park-and-Ride
- Shutterfly
- Harris Teeter (Two Locations)
- Wal-Mart
- Several multi-family housing complexes

Figure 4-15 Route 6B: Kingsley Park – Gold Hill Road via Shutterfly



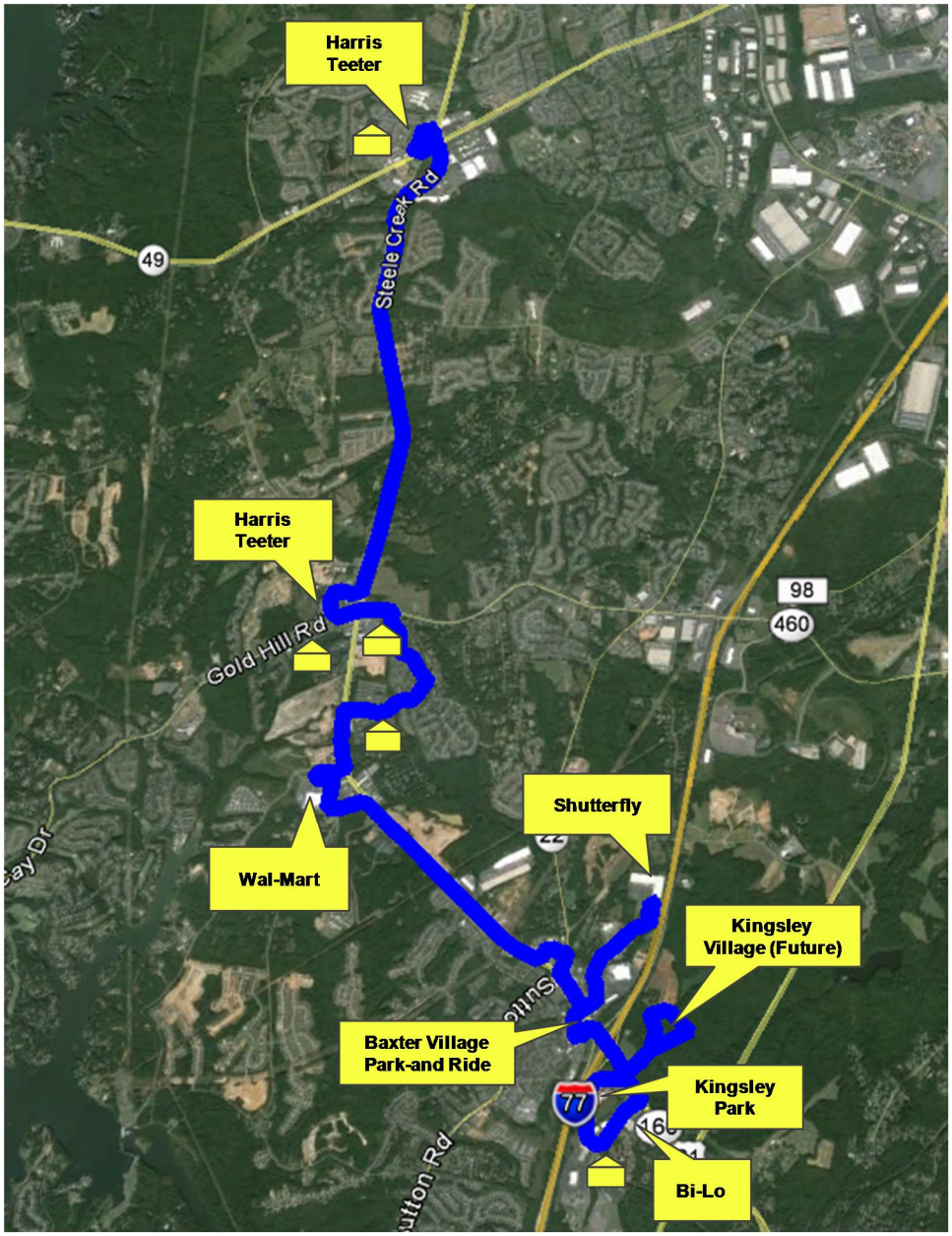
Route 6C: Regional Connectivity-Focused Approach

Route 6C is based on the alignment described for Route 6B, but with an extension to the Steelcroft Shopping Center on South Tryon Street in Charlotte. Extending service to southeast Charlotte would create transfer opportunities between the proposed Route 6 and CATS routes 41x and 56. These connections are important for RFATS Study Area commuters traveling into Charlotte, and will be increasingly important as developments such as Kingsley Park attract more and more "reverse commuters" from Charlotte and Mecklenburg County.

The extension of Route 6 to the Steelcroft Shopping Center would create a 12-mile route requiring two vehicles to maintain hourly service frequency. Key destinations along the route include:

- Bi-Lo
- Kingsley Park
- Kingsley Village (Future)
- Baxter Village Park-and-Ride
- Shutterfly
- Harris Teeter (Three Locations)
- Wal-Mart
- Several multi-family housing complexes
- Connections to CATS routes 41x and 56

Figure 4-16 Route 6C: Kingsley Park – Steelcroft Shopping Center



Assessing Ridership and Productivity Potential

To estimate the ridership potential of each of the transit routes described above, the technical team considered existing Access ridership and the likely transit mode share of work trips in the RFATS Study Area.

Demand-response riders are the most likely early adopters of fixed-route service, as they are already accustomed to using public transportation, and may in fact be transit-dependent. Experience in other communities suggests that unless transit service is very frequent (every 15 minutes or better), choice riders usually limit their transit use to predictable work trips. Thus, the estimated number of initial daily transit trips taken by choice riders is directly related to the proximity of the proposed routes to jobs. According to the latest available census data, the transit mode share for work commuters in North Carolina is 1.1%. In South Carolina, the transit mode share is 0.7%. For the purpose of ridership estimation, an average of the North Carolina and South Carolina transit mode shares (or 0.9%) was generally applied to the potential fixed-routes identified for the RFATS area. One exception is Route 6C, which would serve southeast Charlotte. A transit mode share of 1.1% was used to estimate ridership on this route.

Rock Hill Ridership and Productivity Projections

Most transit users are willing to walk up to ¼ mile to access a bus stop. The table below shows the current daily Access ridership within a ¼ mile buffer of each of the five proposed Rock Hill routes. In addition, the table shows the number of jobs and associated work trips within the same buffer.

To calculate the projected daily ridership, it is assumed that approximately half of the existing Access trips would be made by fixed-route service if it were available, while the other half of riders would continue to use Access due to various disabilities. It is also assumed that riders making work trips will typically make two trips per day by transit – one trip to work and one from work.

Figure 4-17 Projected Daily Ridership of Rock Hill Routes

Route	Access Trips	Jobs	Jobs x 0 .9% (Transit Mode Share)	Projected Daily Work Trips by Transit	Projected Daily Ridership
1	22	10,692	96	192	203
2A[2]	11	8,657	78	156	161
2B	10	10,409	94	187	192
3	12	9,734	88	175	181
4	8	8,314	75	150	154
5A[3]	14	4,054	36	73	80
5B[3]	11	4,316	39	78	83

[2] Riverwalk ridership estimates based on population and employment levels at analogous projects in Rock Hill; Employment levels based on The Commons at Winthrop; population levels based on residences along Springdale Road near Rock Hill Galleria

[3] New Wal-Mart ridership estimates based on Access ridership at two existing Wal-Mart stores in Rock Hill

Ridership figures alone are not enough to measure the effectiveness of a transit service, as they do not give a sense of how much effort and investment is required to generate the ridership. Measuring passengers per revenue hour is a useful way to show how efficiently a route is generating ridership. This metric is essentially a measure of return on investment. Revenue hours are a function of hours or service and the number of vehicles required to maintain a desired service frequency. For example, if a route requires two hours to complete a round trip, two vehicles would be needed to provide hourly service frequency.

The table in Figure 4-18 shows how revenue hours and productivity were estimated for each of potential Rock Hill routes. These estimates rely on several assumptions:

- Assumed 13 mph average operating speed
- Assumed 12 hours of service per weekday
- Assumed hourly service frequency

Figure 4-18 Projected Productivity of Rock Hill Routes

Route	Round Trip Miles	Estimated Speed (MPH)	Run Time + 10%	Even Cycle	Layover Time	Service Frequency	Peak Vehicles	Service Hours	Revenue Hours	Projected Passengers per Revenue Hour
1	22.8	13	1:55	2:00	0:14	1:00	2.0	12:00	24:00	8
2A	15.0	13	1:16	2:00	0:50	1:00	2.0	12:00	24:00	7
2B	8.6	13	0:43	1:00	0:20	1:00	1:0	12:00	24:00	16
3	15.2	13	1:17	2:00	0:49	1:00	2.0	12:00	24:00	8
4	11.4	13	0:57	1:00	0:07	1:00	1.0	12:00	12:00	13
5A	6.8	13	0:34	1:00	0:28	1:00	1.0	12:00	12:00	7
5B	6.0	13	0:30	1:00	0:32	1:00	1.0	12:00	12:00	7

As an industry best practice, 10% is added to the running time for each route to allow drivers to "recover" between runs and ensure on-time performance. In addition, it is an industry best practice to operate at clock-face frequencies, meaning that buses serve each stop at the same number of minutes past the hour, every hour. For example, buses running every 30 or 60 minutes will result in a clock-face schedule that looks like this: 7:00, 7:30, 8:00, 8:30, etc, or 7:00, 8:00, 9:00, etc. By contrast, a bus running every 45 minutes will result in a non-clock-face schedule that looks like this: 7:00, 7:45, 8:30, 9:15, etc. In general, people can easily remember repeating patterns, but have difficulty remembering irregular sequences.

Interlining and Efficiencies of Scale

While clock-face frequencies make service easier for passengers to remember and understand, the practice can also result in excess layover time because buses that could run every 50 minutes, for example, are instead scheduled at every 60 minutes, with 10 unproductive minutes of layover. A common approach to reducing unproductive layover time is to "interline" routes. Interlining means that a single bus operates on more than one route. For example, if several routes are scheduled to operate hourly, but a bus can complete one of the routes in just 20 minutes, it has

enough time left over to serve another route that takes 20 or 30 minutes to complete, before returning to its initial route for its next run.

In short, interlining is an example of efficiencies of scale. With this in mind and based on input provided by the technical team, initial service implementation for the recommended routes within the City of Rock Hill should focus on linking the following key destinations:

- Downtown Rock Hill
- Rock Hill Galleria (and near-by retail)
- York Technical College
- Saluda Street Corridor (including new Wal-Mart)
- Winthrop University
- Piedmont Medical Center

A network consisting of Routes 2B, 3, and 5B (see Figure 4-19), could provide service to all of these destinations, and also achieve efficiencies of scale. For example Route 2B and Route 5B each require just one vehicle to maintain hourly service frequency, but Route 3 requires two vehicles operating currently. If the three routes are implemented without interlining, the network would require four total vehicles. If, however, the routes are implemented as an interlined circuit, where each bus transitions from one route to the next, the total number of vehicles required to provide hourly service on each route is three (see Figure 4-20).

Figure 4-19 Potential Network Consisting of Routes 2B, 3, and 5B

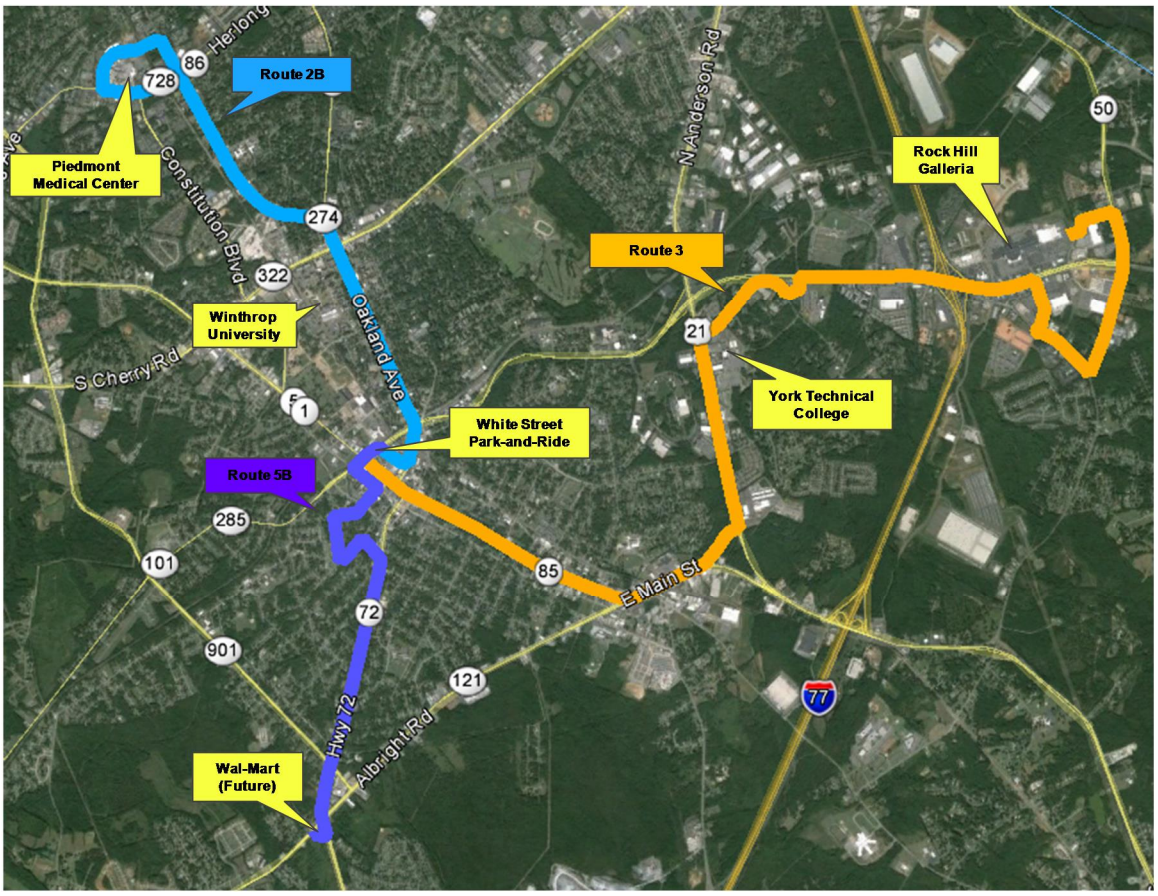


Figure 4-20 Projected Productivity of Rock Hill Routes with Interlining

Route Combination	Round Trip Miles	Estimated Speed	Run Time + 10%	Even Cycle	Layover Time	Service Frequency	Peak Vehicles	Service Hours	Revenue Hours	Projected Passengers per Revenue Hour
2B + 3 +5B	29.8	13	2:31	3:00	0:42	1:00	3.0	12:00	36:00	13

At 36 revenue hours per day, the three-route network operating with three vehicles would result in an annual operating cost of $459,000 (assuming 255 service days per year, and an hourly operating cost of $50 per revenue hour). By comparison, a network with four buses would have an annual operating cost of $612,000.

An added benefit of interlining is the ability to provide "one seat connections" to key destinations that would otherwise require a transfer or that would require several routes to provide redundant service to ensure access to the destinations from all routes. For example, in the three-route network described above, Route 2B would directly serve Rock Hill City Hall. If this route were then interlined with Route 3, buses would change their destination sign along Main Street, near Wells Fargo Bank, and continue southeast along Main Street toward Fountain Park and other destinations. Passengers who were on the bus as it was operating on Route 2B could simply stay on as it continues to Route 3 (although bus drivers would be instructed to count these "through passengers" as transfers to ensure an accurate count of total ridership on each individual route).

SC 160 Corridor Ridership and Productivity Projections

While planned developments in the SC 160 Corridor could bring 5,000 or more new jobs to York County, a more conservative estimate of 2,000 additional jobs was used to estimate near-term ridership potential. Access service is generally not available in this corridor, so employment and likely transit mode share were the primary factors used to estimate ridership for each of the Route 6 alternatives (Figure 4-21).

Figure 4-21 Projected Daily Ridership of SC 160 Corridor Route Alternatives

Route	Access Trips	Current Jobs	Projected Jobs[4]	Jobs x 0 .9% (Transit Mode Share)	Projected Daily Work Trips by Transit	Projected Daily Ridership
6A	0	4,969	6,969	63	125	125
6B	1	5,713	7,713	69	139	139
6C[5]	1	6,013	8,013	88	176	177

Determining the most appropriate of the three alternatives for Route 6 is a matter of priorities. For example, Route 6A would generate the lowest total ridership of the group, but with only one vehicle needed to maintain hourly service frequency, it would be the lowest cost option and also result in the highest ridership per revenue hour (Figure 4-19).

[4] Assumes 2,000 near-term jobs in the Kingsley Village area

[5] North Carolina transit mode shore of 1.1% used

Both Route 6B and Route 6C would require two vehicles for hourly service frequency. Route 6B would result in excessive layover time, which would reduce the route's productivity, but the extra time could also be used to provide demand-response "flex" service (described later in this chapter).

Route 6C would generate the highest total ridership by facilitating regional connections, but it also presents a variety of challenges regarding funding and jurisdictional boundaries as buses would operate across county, MPO, and state lines.

Figure 4-22 Projected Productivity of SC 160 Corridor Route Alternatives

Route	Round Trip Miles	Estimated Speed	Run Time + 10%	Even Cycle	Layover Time	Service Frequency	Peak Vehicles	Service Hours	Revenue Hours	Projected Passengers per Revenue Hour
6A	9.0	13	0:45	1:00	0:23	1:00	1.0	12:00	12:00	10
6B	17.2	13	1:27	2:00	0:40	1:00	2.0	12:00	24:00	6
6C	23.6	13	1:59	2:00	0:11	1:00	2.0	12:00	24:00	7

The annual operating cost for service in the SC 160 Corridor would range from approximately $153,000 to $306,000, depending on which service scenario is implemented. Route 6A would offer the lower annual cost, while Routes 6B and 6C would both have the same higher operating cost.

Service Guidelines

A new transit route's full ridership and productivity potential may not be achieved in its first year of service but, over time, fixed-route transit service in small urban environments tends to gravitate towards eight passengers per revenue hour if the service is well designed. Based on ridership estimates, both the Rock Hill network and SC 160 Corridor service have the potential to meet or exceed this level of productivity, putting them among the top of the peer systems reviewed for this study (Figure 4-23).

Figure 4-23 Service Productivity Case Studies

System	Location	Population	Years of Fixed-Route Service	Routes	Passengers per Revenue Hour
C-Tran	Cary, NC	136,627	9	5	9
Best Friend Express	Aiken, SC	29,884	8	3	4
Franklin Transit	Franklin, TN	68,886	> 10	3	4
TAPS	McKinney, TX	131,882	> 10	2	4
TAPS	Allen, TX	84,387	1	2	3

The range of ridership per revenue hour seen among the peer systems helps illustrate the importance of service design in achieving both ridership and productivity goals. There are several transit design principles that, if followed, result in transit service that is easy to use and intuitive to understand (i.e. the conditions required to maximize ridership). Overall, the key is simplicity.

For people to use transit it must be perceived as simple and accessible. More specifically, the following approach is recommended:

- **Service Should Operate at Regular Intervals**: In general, people can easily remember repeating patterns, but have difficulty remembering irregular sequences.
- **Routes Should Operate Along a Direct Path**: The fewer directional changes a route makes, the easier it is to understand. Circuitous alignments are disorienting and difficult to remember.
- **Routes Should be Symmetrical**: Routes should operate along the same alignment in both directions to make it easy for riders to know how to get back to where they came from.
- **Routes Should Serve Well Defined Markets**: To make service easy to understand and to eliminate service duplication, routes should be developed to serve clearly defined markets.
- **Service Should be Well Coordinated**: At major transfer locations, schedules should be coordinated to the greatest extent possible to minimize connection times.

Of the peer systems evaluated for this study, C-Tran and the TAPS service in Allen most closely adhere to these principles. While the Allen service is still very new and only caries three passengers per revenue hour, the C-Tran service is carrying nine passengers per revenue hour after nearly a decade of operation. Appendix B includes detailed case studies of the services referenced in Figure 4-20.

Service Standards

Service standards are a benchmark by which service performance is evaluated. There is no uniform set of national transit service standards. Instead, service standards adopted by transit systems reflect the goals and objectives of the communities they serve.

Goals and objectives provide a "vision" for a transit system, whereas service standards provide a formal, quantifiable structure by which to assess progress toward that vision. By regularly monitoring service performance, and comparing performance against adopted standards, the staff of a transit system can identify service inefficiencies, reliability issues, and negative trends, in a timely manner, and take corrective action as needed. Typical service performance metrics include:

- **Operating Cost per Passenger:** Calculated by dividing all operating and administrative costs by total passengers. The subsidy per passenger is a further refinement of this measure and is calculated by subtracting farebox revenue from gross operating and administrative costs and dividing by total passengers. This measure is useful when service cuts or enhancements are being considered and justified.
- **Operating Cost per Revenue Hour:** Calculated by dividing all operating and administrative costs by the total number of vehicle revenue hours (with revenue hours defined as time when the vehicle is actually in passenger service).
- **Passengers per Revenue Hour:** Calculated by dividing the total number of passengers by the total number of vehicle revenue hours. The number of passengers per hour is a good measure of service productivity.
- **Farebox Recovery Ratio:** Calculated by dividing all farebox revenue by total operating and administrative costs. Farebox recovery is a measure of both system efficiency and productivity.

These metrics are largely consistent with operating and cost data already required for NTD reporting. Other performance measures are useful indicators of service quality and reliability. These include the following:

- **On-Time Performance:** Measured by comparing actual bus departure and arrival times to scheduled times.
- **Passenger Complaints:** Records the number of passenger complaints that are submitted in writing or verbally conveyed to the transit agency. This is typically measured as number of complaints divided by 500 or 1,000 passengers.
- **Preventable Accidents per Revenue Mile:** Calculated by dividing the number of preventable accidents by revenue miles.
- **Road Calls per Revenue Mile:** Measures the condition of transit vehicles and the reliability of the service and is calculated by dividing the number of road calls by revenue miles.
- **Service Denials:** This measure is applicable only for demand-response service such as York County Access, and is the number of trips requested that cannot be fulfilled because of other trips already booked.

For transit systems that do not have established service standards, it is often useful to refer to the service standards of peer systems as a guide. Figure 4-24 below outlines the service standards of three peer systems, how they were developed, and how they are monitored and addressed.

Figure 4-24 Service Standards of Peer Systems

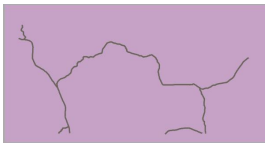
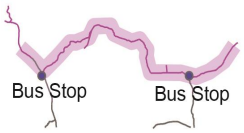
	C-Tran	Best Friend Express	Franklin Transit
Service Standards	▪ On-time performance ▪ Vehicle load ▪ Bus stop amenities based on ridership ▪ Service coverage	▪ On-time performance ▪ Trip denials ▪ Customer reservation experiences ▪ Rider reports	▪ Vehicle load ▪ Vehicle headway ▪ On-time performance
Basis of service standards	▪ Reviewed peer system standards and customized to local service area context	▪ Derived from FTA regulations, customer service expectations, and other information about best practices	▪ Based on peer data and recommendations by staff to the Franklin Transit Authority Board
Frequency of service review	▪ Service and standards are revisited every three years	▪ Service reservation experiences and rider reports are reviewed quarterly ▪ Monthly reports and service trends are reviewed on an annual basis	▪ Service is reviewed against standards annually ▪ Standards themselves are reviewed every three years
Implications if standards are not met	▪ Develop strategies to improve on-time performance of underperforming route	▪ Contract cancellation if contractor fails to meet standards and correct failures	▪ Notification of Franklin Transit Board ▪ Recommendations to fix and monitor service
Party responsible for setting, reviewing, or revising standards	▪ Transit Services Administrator is responsible for	▪ LSCOG staff set, review, and revise standards. LSCOG is currently in	▪ Staff revise and recommend changes to the standards. Franklin

	C-Tran	Best Friend Express	Franklin Transit
	reviewing standards ▪ Cary Town Council must approve service and standards every three years, as presented by Transit Services Administrator	the process of forming a stakeholder group to help set customer service standards and prioritize service enhancements.	Transit Board reviews and sets the standards.

In general, service performance can be measured at the system-level or at the route level. At the system level, these measures are useful for peer comparisons, while at the route level, the measures can help identify underperforming routes, trips, or stops.

If a route is consistently under-performing or over-performing based on adopted service standards, then a different service approach should be considered. Figure 4-25 illustrates how different service models have different productivity expectations. If, for example, a demand-response service is yielding 4-5 passengers per hour, it may benefit from adding a couple of time points and transitioning to flex service. On the other hand, if a fixed-route service is carrying 7 or fewer passengers, then transitioning to flex or deviated fixed-route may be more appropriate.

Figure 4-25 Service Guidelines (For Small Urban and Rural Environments)

	Demand-Responsive	Anchored Flex Route	Deviated Fixed-Route	Fixed-Route
				
Description	Residents within a certain geographic area may call to schedule a curb-to-curb trip. Service may be open to the general public, people with disabilities, or clients of particular services.	Anchored Flex routes have two fixed time points (usually at major activity centers or connection points to other transit services). Passengers who live between the time points may call to request a curbside pick-up. The operator takes the most direct route between time points to pick up the passenger.	Service runs along a published alignment. Passengers living a certain distance from this route may call to request a curbside pick-up. Since the route is specified, the bus must return to the point where it left the route after a deviation.	A set route and schedule are published and open to the general public.
Passengers per Revenue Hour	2-3	3-5	5-8	8-10
Benefit	In rural areas with dispersed destinations, demand-response service provides the ability to serve a large geographic area.	Anchored Flex service combines the accessibility features of demand-response with the scheduled reliability of fixed-route service.	In lower-demand areas where deviations can be accommodated, the agency effectively provides both fixed and ADA service with one vehicle.	This type of service typically provides the fastest travel times between points, which makes service attractive to choice riders.
Challenge	Demand-response has high cost per trip as clients are typically traveling long distances.	To accommodate flex pick-ups, the travel time between time points must be a factor longer than direct travel.	In rural areas with sparse road networks, accommodating out-and-back deviations may add significant travel time.	Fixed service means the agency must also provide ADA paratransit.

Bus Stop Placement

As a general rule, bus stops should be placed at an interval of 6-8 stops per mile for local service. However, the exact location of each stop involves the consideration of several factors including customer safety, accessibility, and traffic operations. Ideally, all stops would be served by ADA-compliant sidewalks, near crosswalks, and adjacent to major transit trip generators. However, in most communities, existing land use patterns present challenges both to service design and bus stop placement. Sidewalks may not always be present, even in key corridors with major destinations. Long blocks may require multiple mid-block stops and long walk distances to access crosswalks, and deep building setbacks may put pressure on transit operators to provide time-consuming route deviations into driveways or parking lots. Thus it is key to work closely with the relevant departments of each entity that has jurisdiction over the rights-of-way being used for transit service to ensure that stops are placed both where they are needed and where they are safe, and that complementary pedestrian improvements are considered in the roadway planning and maintenance processes.

Over time, certain stops will prove to be heavily used, while others will experience light to moderate passenger activity. At heavily used stops, passenger amenities such as shelters and benches can further enhance the passenger experience for existing riders, and create a more inviting image for prospective transit users. Shelters and other amenities improve both the visibility and perception of transit service in a community, which can help drive further ridership growth. A secondary consideration for shelter installation is the presence of sensitive population groups such as older adults or small children. In these cases, passenger amenities are often installed even if ridership volumes are relatively light compared to other stops.

DEMAND-RESPONSE SERVICE OPPORTUNITIES

As mentioned earlier, demand-response service may be a more appropriate transit option in areas without the population and/or employment density to support a minimum level of fixed-route service or for rider groups whose travel, for various reasons, would be easier on a more flexible service. Opportunities for expanding the demand-response service currently provided in the RFATS area are discussed below.

Existing Services

Demand-response service in the RFATS Study Area is provided through the York County Access program and the Lancaster Area Ride Service or LARS. Within York County there are two types of service provided through the Access program—one for residents within the Rock Hill Urbanized Area and a second provided in the rural sections of York County not covered by the Charlotte Urbanized Area (i.e., north of the Catawba River).

Within the Rock Hill Urbanized Area, the Ride-to-Work program operates during peak hours for workers who need transportation, primarily within the City of Rock Hill. In both the Rock Hill Urbanized Area and the rural sections of the county, an Essential Services program provides trips for medical appointments, shopping, and other basic mobility needs. Ride-to-Work and Essential Services are both operated by the York County Council on Aging.

Funding from FTA's Formula Program for Urbanized Areas (Section 5307) and Formula Program for Rural Areas (Section 5311) are used to support the services provided in each area. Although trips originating in the section of York County north of the Catawba River are not available to residents of that area, some destinations for Essential Services trips, such as dialysis centers, are located in that section of the county. In addition, the York County Council on Aging operates non-emergency medical transportation for Medicaid recipients throughout the county on the same vehicles used for Essential Services trips.

Access service is not provided in the portion of York County north of the river because that area is part of the Charlotte Urbanized Area. As explained below, neither Section 5311 rural area funds nor Section 5307 funds that are apportioned to the Rock Hill Urbanized Area may be used for service in the Charlotte Urbanized Area.

In Lancaster County, LARS provides service in the rural portions of the county not otherwise covered by the Charlotte Urbanized Area. Although the newly urbanized designation has been implemented in the panhandle, LARS continues to provide service in this area in an effort to avoid a service disruption – given that service availability predated the urbanized designation. It is important to emphasize that although transitional funding support is being made available by SCDOT, a permanent funding source will be needed on a longer term basis for the same reasons applicable to York County north of the Catawba River (i.e., trips originating within the Charlotte Urbanized Area must be supported by funding apportioned to that area).

Potential for Expanded York County Access Service

There are two indicators of transit service need in the area north of the river. First, the Town of Fort Mill received fairly high transit need index scores in the market analysis discussed in Chapter 2 (Figure 4-26). In particular, the percentages of older adults, youth, and low-income households — groups that are typically represented among transit users — were higher than average in some block groups. While the number of people in those groups may not be high and therefore not

enough to support fixed-route service, there is a mobility need that could be addressed by demand-response service or some other flexible service alternative.

Second, York County Access staff reports that they receive regular requests for service from residents of the Tega Cay/Fort Mill area. These requests have not been tracked in the past, so the number and frequency are unknown, but they do suggest that expanded York County Access service would be used by residents in that area.

Apart from the indication of transit need in communities north of the Catawba River, there are two compelling reasons to consider expansion of York County Access into a county-wide service. First, funding source restrictions on the area that can be served are very difficult to explain to community residents who are seeking rides to medical appointments, shopping centers, or other important destinations. Second, Access vehicles are in the area daily serving destinations in Fort Mill for residents of the Rock Hill Urbanized Area as well as the rural portions of the county (Figure 4-27). There is excess capacity on most vehicles that drop passengers off at a dialysis center on Rivercrossing Drive, for example, and then return to the Rock Hill area, and make the trip back later to pick up the dialysis patients. As a point of reference, it should be noted that the Access vehicles (as part of coordinated transit service) are providing services to this area for Medicaid trips as well. With funding from the appropriate source, that capacity could be used to provide service for residents of Fort Mill and surrounding communities. The visibility of Access vehicles in the area makes it even more difficult to explain to residents why they are unable to use the service.

In summary, there are strong operational and customer service reasons for an expansion of York County Access service into the portion of York County north of the Catawba River, and indications that the service would be used by residents of those communities. The concept for the expanded service is to utilize existing capacity on the vehicles that now transport urbanized area or Medicaid customers to that area and add vehicles in the future as needed to meet demand.

Potential Funding Sources

Currently, funds from FTA's Section 5311 program are used to support Access service in the rural sections of York County. Funds from FTA's Section 5307 formula program are used for the service provided to residents of the Rock Hill Urbanized Area. Funds from both of these programs must be matched by other federal funds (with some restrictions), state funds, and/or local funds.

FTA apportions formula funds on the basis of geographic area; funds are specifically calculated, using each program's statutory formula, for each large and small urban area as well as the rural sections of each state. Although there are provisions in some funding programs that allow for the transfer of funds from one geographic category to others, in general, funds must be spent in the geographic area for which they have been apportioned. Thus, 5307 funds apportioned for the Rock Hill Urbanized Area and 5311 funds for the rural portions of York and Lancaster Counties cannot be spent on service provided in those sections of the counties that are part of the Charlotte Urbanized Area.

However, funds that have been apportioned to the Charlotte Urbanized Area that extend into South Carolina may be able to be utilized in York and Lancaster Counties under certain conditions (e.g., capital versus operating assistance, type of service), based on guidance contained in MAP-21 and as explained in more detail below.

Section 5307: Formula Assistance for Urbanized Areas

The Section 5307 program requirements are somewhat complex. Several important aspects of the program that are relevant to the expansion of service into the northern portion of York County are described below.

Division of Funds in Multi-State Areas

FTA expects local entities to 1) choose a designated recipient or recipients for the 5307 funds in each UZA and 2) develop a fair and mutually agreeable method for sub-allocating the apportionment among recipients in UZAs that cross state lines. For multi-state UZAs in federal fiscal year (FFY) 2014, FTA first determined the amount to be apportioned to the UZA as a whole, based on statutory 5307 formula factors, and then determined each state's share based on its population in relation to the population of the entire urbanized area. The amounts allocated by FTA to each state in a multi-state UZA may be used as the basis for determining each state's share, but funds may be sub-allocated using a different method that addresses local needs, as long as it is fair and rational.

FTA's notice of FFY 2014 apportionments in the Federal Register on March 10, 2014 included specific allocations to North Carolina and South Carolina. South Carolina's portion of the funds for that year was $938,850.

FTA's 5307 guidance describes certain requirements for the process of designating recipients and sub-allocating funds among designated recipients (and direct recipients) in urbanized areas that cross state lines. For York County and Lancaster County to access a share of the 5307 funds for the Charlotte UZA, representatives of the three areas must agree on a fair methodology for sub-allocating the 5307 dollars. The parties must agree on a mutually acceptable basis for dividing the UZA's 5307 funds between them each year, and inform FTA of the decision in a 'split letter.'[6] RFATS is currently involved in the sub-allocation process with the Charlotte Regional Transportation Planning Organization (CRTPO). A bi-state agreement between the two MPOs outlines a sub-allocation formula covering the UZA's 5307 funding.

An appropriate entity could be identified as a second designated recipient for the South Carolina share of the funds; alternatively, CATS could remain the sole designated recipient, but identify a South Carolina entity as a direct recipient of funds, enabling direct application for funding to FTA. Some of the federal requirements that a recipient of 5307 funds must meet, over and above requirements that are associated with being a subrecipient of Section 5311 funds through SCDOT include:

- Grant applications, reporting, and requests for payment through FTA's online TEAM (TrAMS beginning in FFY16) and ECHO systems
- Direct reporting to the National Transit Database (NTD)
- Participation in a triennial review of compliance with federal transit program requirements
- Provision of a half-fare discount for older adults and people with disabilities during non-peak hours of fixed-route service

[6] Federal Transit Administration Circular 9030.1E, Urbanized Area Formula Program: Program Guidance and Application Instructions, January 16, 2014.

Figure 4-26 Transit Needs Index

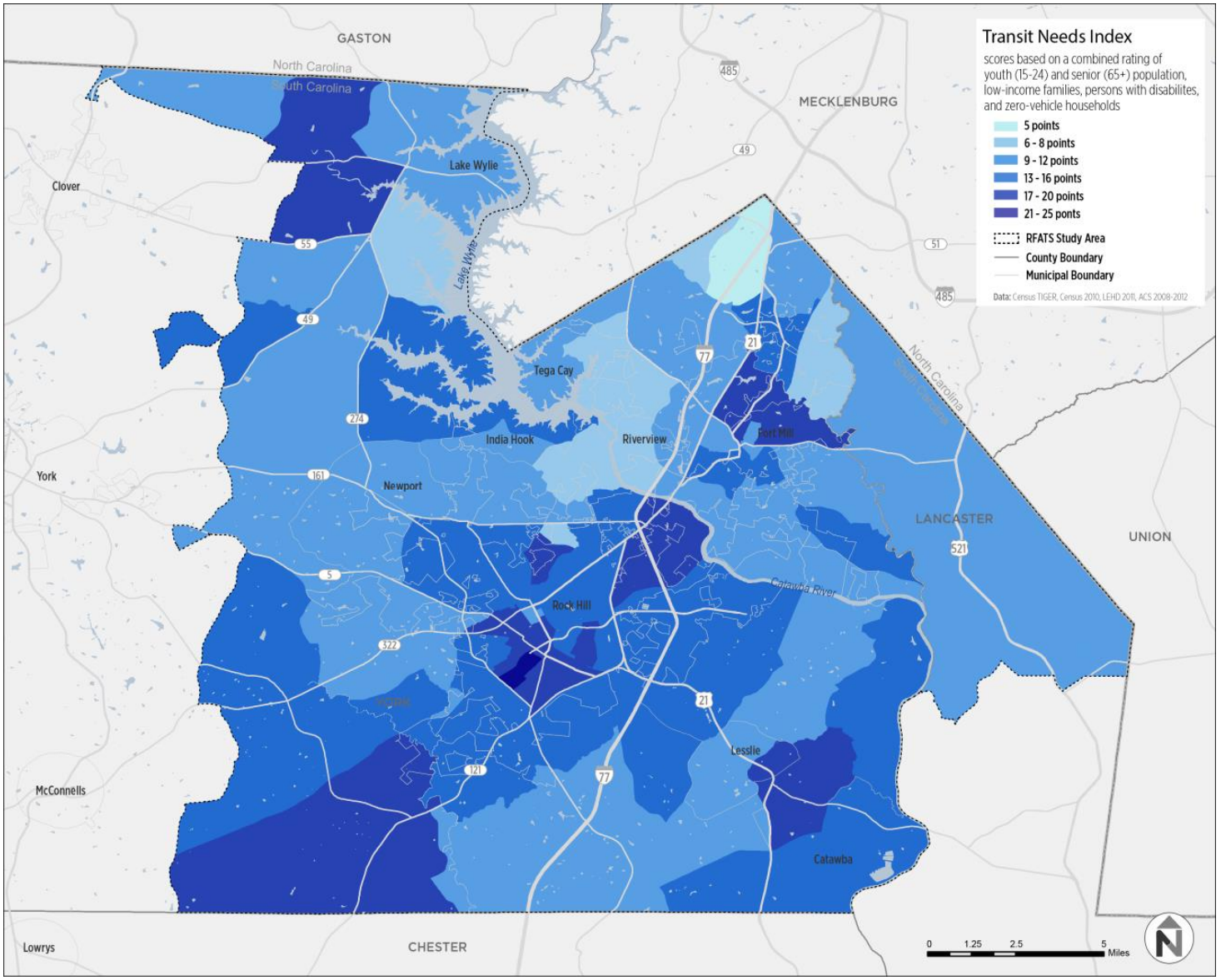
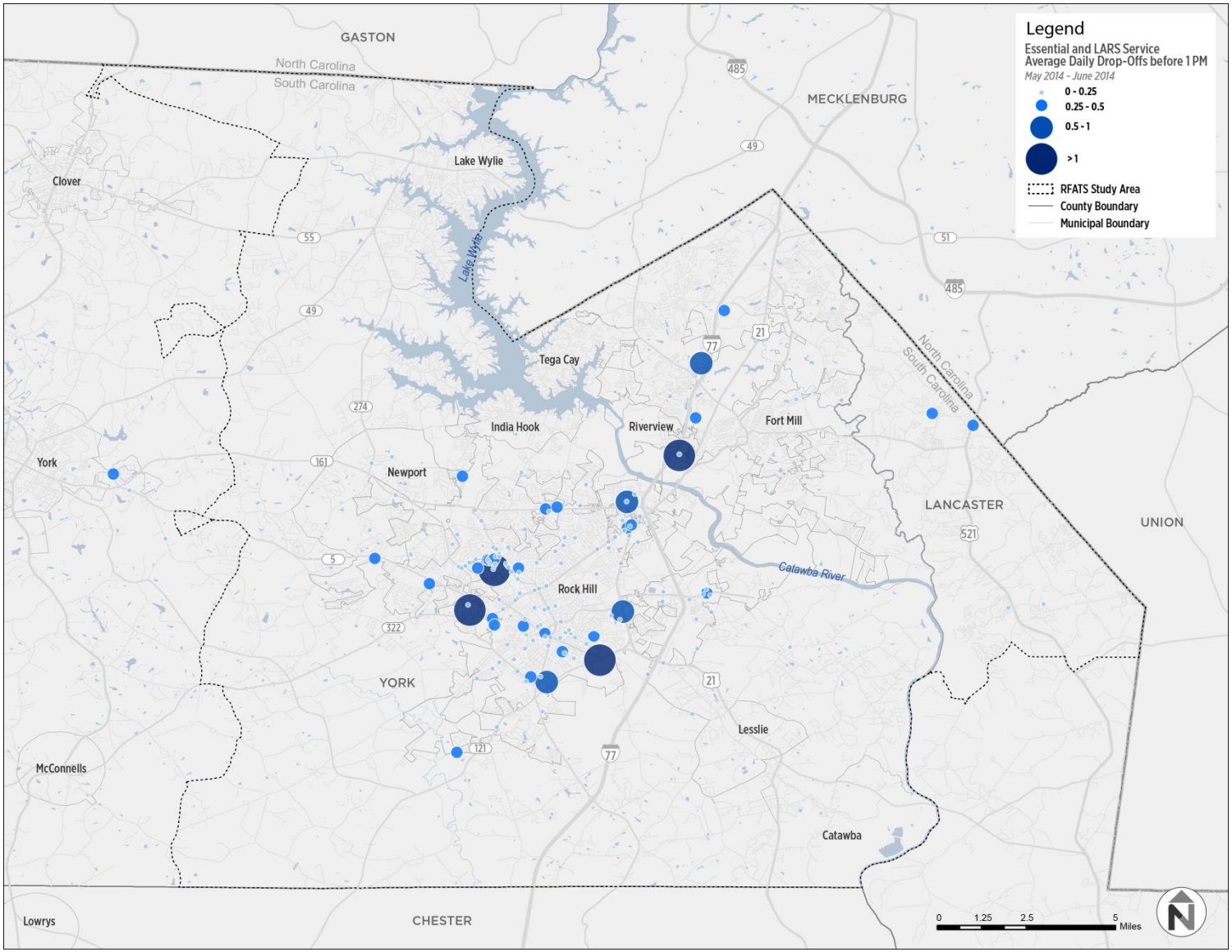


Figure 4-27 York County Access Drop-Offs



- Establishment of a drug-free workplace and an ongoing drug awareness program for employees
- Development of a cost allocation process for urban and rural area expenses if both 5307 and 5311 funds are used
- Participation in the region's metropolitan and statewide transportation planning process

Eligible Expenses

Section 5307 funds may be used for capital and certain preventive maintenance expenses in urbanized areas of all sizes, at a federal share of 80% of net project expenses (for some specific types of projects, the federal share increases to 85% or 90%). Funds may only be used for operating expenses in small UZAs or in large urbanized areas where 100 vehicles or fewer operate in peak-hour fixed-route service. If 76-100 vehicles are used, up to 50% of an area's annual 5307 apportionment may be applied to operating expenses. If 75 or fewer vehicles are in operation, up to 75% of the apportionment may be used for operating expenses. The federal share of operating expenses is 50%.

Public transportation operators are required by the Americans with Disabilities Act (ADA) to provide complementary paratransit service for individuals who are unable to use an accessible fixed-route system because of a disability. ADA paratransit service requires an eligibility determination process and must be comparable to fixed-route service with respect to a number of service characteristics, including service area, days and hours of service, fares, response time, allowable trip purposes, and capacity constraints. Up to 10% of an area's annual 5307 apportionment may be used for ADA paratransit operating expenses, at a federal share of 80%.

Finally, projects and services formerly eligible under the Job Access and Reverse Commute program, which was repealed in MAP-21, are now eligible activities for 5307 funding. To qualify as a job access and reverse commute project, a service must meet a number of requirements, but in general, services are eligible if they are designed to connect welfare recipients and individuals with low incomes to jobs, training, child care, and other related services, or to transport residents of urban or rural areas to suburban employment locations. Several examples of eligible types of service are listed in the 5307 program circular, including demand-response van service. Planning, operating and capital expenses may be covered with 5307 funds in urbanized areas of all sizes, regardless of the number of vehicles in operation during peak hours.

If fixed-route service was implemented in the northern part of York County, part of the Charlotte large UZA, many fewer than 100 vehicles would be in operation during peak hours so operating expenses would be an eligible use for 5307 funds. However, those funds could only be used to support the operation of fixed-route services and the associated ADA paratransit services or the planning, operating, and capital expenses of job access and reverse commute services. General public demand-response services in the northern section of York County or the Lancaster County panhandle would not be eligible for 5307 expenses as the program is currently structured. A technical correction in the next federal transportation program reauthorization legislation could change that, but the timing of reauthorization remains unclear. MAP-21 expires on July 31, 2015, but may be extended again if sources of funding for a long-term transportation bill are not identified by that time.

Section 5310: Enhanced Mobility of Seniors and Individuals with Disabilities

Section 5310 has historically been a capital assistance program focused on aiding non-profit organizations and others with the purchase of vehicles for service to older adults and people with

disabilities. Funds were apportioned to and administered by each state. MAP-21 made significant changes to the program. Funding for large urban areas is now apportioned separately, and a designated recipient must be identified in each area to administer those funds (states still receive and administer the funds for small urban and rural areas). The responsibilities of the designated recipient include:

- Preparing a program management plan
- Ensuring that selected projects are included in a local public transit-human service transportation coordination plan
- Project solicitation and development of a program of projects (the selection of projects may be, but is not required to be, competitive)
- Distributing funds to selected subrecipients
- Overseeing use of the funds by subrecipients
- Project reporting

To ensure that the original purpose of the program is not lost due to the inclusion of new eligible activities (described below), 5310 regulations require at least 55% of an area's apportionment to be spent on traditional 5310 capital assistance projects (including contracting for service) by traditional 5310 subrecipients. Capital projects may include contracting for service. Eligible subrecipients are primarily nonprofit organizations, but also states or local governmental authorities in some circumstances.

MAP-21 also folded activities eligible under the former New Freedom Program, Section 5317, into the revised 5310 program. These activities include projects that go beyond the requirements of the ADA, projects designed to increase access to fixed-route services for older adults and people with disabilities, alternatives to public transportation for older adults and people with disabilities, and projects that address the needs of the target populations when public transportation is unavailable, inappropriate, or insufficient. No more than 45% of an area's apportionment may be spent on such projects.

In FFY 2014, the apportionment for the Charlotte UZA, both North Carolina and South Carolina portions, was $778,869. Unlike the 5307 apportionment, that amount was not broken down by FTA into specific portions for each state.

As with the Charlotte UZA's 5307 funding, the language in the bi-state agreement provides guidance on the conditions needed to secure a share of the area's 5310 funding. As outlined in the agreement, 5310 funds are not available for sub-allocation, but South Carolina entities would be eligible to compete with other groups in the Charlotte UZA for 5310 funding for specific projects.

Two case study examples, illustrating how other areas have worked together to split an urbanized area's funding apportionment, are provided on the following page.

Shared Funding Model

Lower Savannah Council of Governments (LSCOG)

LSCOG serves a six-county area in southwestern South Carolina that includes Aiken County. Among other transportation responsibilities, LSCOG operates fixed-route and demand-response service in the urbanized portion of Aiken County. The fixed-route service goes by the name of Best Friend Express; the complementary ADA paratransit service is known as Dial-A-Ride. Both services are operated under contract to LSCOG by the Aiken Area Council on Aging.

LSCOG funds services in the urbanized portion of Aiken County in partnership with the Metropolitan Planning Organization (MPO) and transit provider in the Augusta, GA urbanized area, which includes the urbanized parts of Aiken County. Section 5307 funding for the area is shared by South Carolina and Georgia. Augusta-Richmond County is the designated recipient for the funds, and LSCOG is a direct recipient for the South Carolina portion. The annual split of funding between the two states follows the amounts published by FTA for each state in its annual grant program apportionment tables. For FFY 2014, the South Carolina portion was $740,212, an increase over previous years (the Georgia portion of the funds was slightly over $2 million).

LSCOG was also the designated recipient for the South Carolina portion of the Augusta UZA's Section 5316 and 5317 funds before those programs were repealed by MAP-21 (5316 eligible activities have been rolled into the 5307 and 5311 programs, as 5317 eligible activities have been added to the 5310 program). LSCOG is working to become the designated recipient for the South Carolina portion of the Section 5310 funds, but has hit some obstacles to that process. LSCOG has historically used 5310 funds for vehicle replacements and the purchase of service for the Best Friend Express and Dial-A-Ride services.

Section 5311 funds are used by the Aiken Area Council on Aging to finance the demand response service it provides in the rural sections of Aiken County.

This case study example is instructive because it shows how a planning organization in South Carolina has successfully obtained a share of federal funding apportioned to a multi-state urbanized area from several different grant programs to provide transportation services for its local residents.

Shared Funding Model

Boston Urbanized Area

The Boston urbanized area includes nine designated recipients in three states: the Massachusetts Bay Transportation Authority (MBTA, the public transit provider in the greater Boston area), the Rhode Island Public Transit Authority (RIPTA), six regional transit authorities (RTAs) in Massachusetts, and the New Hampshire Department of Transportation.

One RTA administers the annual process to sub-allocate the UZA's 5307 funding, in accordance with a Memorandum of Understanding (MOU) that the parties sign every year.

Prior to 2000, the MBTA received all of the Boston UZA's 5307 funds. Following the 2000 U.S. Census, the parties agreed to split the funding—90% of the funds to the MBTA and the remaining 10% divided among the other subrecipients according to population.

Since 2000, a new RTA has been formed, and its share of the funding has come from the MBTA's 90%. The parties have not yet adjusted the agreed-upon split to reflect changes in the service area populations of each entity in the 2010 Census.

The Boston UZA's designated recipients are not satisfied that the present shares are completely equitable nor that they adequately address priorities among types of projects for which the 5307 funds will be used, and they are considering changes to the sub-allocation methodology. The two key points to take away from this case study example, other than the relatively large number of designated recipients that share the Boston UZA's funding, are 1) the parties have agreed on a sub-allocation methodology and have committed to follow that process until they develop a better approach, and 2) the locally determined methodology does not rely on the amounts per state published by FTA in its annual apportionment tables.[7]

[7] Transit Cooperative Research Program Synthesis 113, Sub-allocating FTA Section 5307 Funds among Multiple Recipients in Metropolitan Areas, Transportation Research Board, 2014.

Expanding Access Service: Challenges

In summary, there are several challenges associated with expanding York County Access service into the currently unserved northern part of the county and continuing the LARS service that operates in the Lancaster County panhandle:

- Federal funding, a major and critical financial component of current and future transit service in the RFATS area, is allocated to specific geographic areas. Funds must be spent in the area to which they are allocated: Section 5307 small urbanized area funding in the City of Rock Hill, Section 5311 funding in the rural sections of York County, and Section 5307 for the Charlotte large urbanized area in the northern section of York County and the Lancaster County panhandle.
- The rules associated with Section 5307 funding for large urbanized areas are complex. Interstate cooperation will be required between North Carolina and South Carolina to divide 5307 funds apportioned to the Charlotte UZA, and a suitable entity must be identified to receive and administer South Carolina's share of the funding. There are restrictions on the type of services and types of expenses that 5307 funds can be used to cover.
- Section 5310 funds that could be used in the northern section of York County and in the Lancaster County panhandle are apportioned to the Charlotte UZA. CATS is currently the designated recipient for those funds, and is responsible for selecting the projects that will be funded each year. South Carolina entities must compete annually with other groups in the UZA to obtain funding.
- For all sources of federal funding—Sections 5307, 5310 and 5311—matching funds are required. The required non-federal share varies by funding program and type of project or service, but ranges from 10% to 50%. Sources of matching funds may include state funds, local funds, other federal non-DOT sources (such as Medicaid funding for transportation services) and contract revenues from human service agencies or other entities.

The outcomes of meeting and resolving these challenges, however, will be 1) the establishment of a county-wide demand-response transportation service that can provide basic mobility now for all residents of York County and evolve over time to complement a growing fixed-route network, and 2) continuation of LARS service in the panhandle section of Lancaster County.

Overall Approach to Demand-Response Service

The service concept for expanding demand-response service in the RFATS Study Area is to:

- Utilize current available capacity on the vehicles operated by York County Council on Aging when they are north of the Catawba River either: 1) dropping off or picking up residents of other parts of the county at destinations, or 2) serving Medicaid trips, to provide York County Access Essential Services trips for residents of that area
- Add vehicles as needed to meet demand in the section of the county north of the river
- Add required ADA paratransit service to complement fixed routes as they are implemented

In the short term, Ride-to-Work and Essential Services in the City of Rock Hill would continue. Over time, however, those services would be scaled back as fixed routes come into service and meet the needs of many of the Ride-to-Work and Essential Services riders. Remaining riders, who

would be unable to use the new fixed-route services because of a disability, would be transitioned over time to the new ADA paratransit service.

Potential funding sources for operating and capital expenses associated with the expanded Essential Services and continued LARS service include Section 5310 funding from the Charlotte UZA to support service for older adults and people with disabilities, and possibly Section 5307 funds from the Charlotte UZA if an employment or reverse commute component were part of the service. Potential funding sources for ADA paratransit service, both operating and capital expenses, include Section 5307 funds for the Rock Hill UZA and the Charlotte UZA.

OTHER SERVICE OPPORTUNITIES

Fixed-route and ADA paratransit services form the core of most transit systems in the United States, but other service types including vanpools, shuttles, and express services are often used to complement the core system and/or to fill specific service gaps. The following section presents case studies and possible applications for additional service types in the RFATS Study Area.

Vanpool Service

Geographic service restrictions, like those encountered by residents of northern York and Lancaster Counties, are not limited to demand-response service. Among the most common such examples found nation-wide are the rules governing vanpool service. Vanpool programs that are operated by transit agencies usually require vanpool routes to either begin or end within the transit agency's service area. These rules mean that both suburb-to-city and city-to-suburb commutes are eligible for vanpool service, while suburb-to-suburb trips usually are not.

CATS currently sponsors approximately 80 vanpools, with 9 beginning or ending in the RFATS Study Area. Vanpools typically consist of a group of eight to 15 people who live and work in close proximity to each other and share similar commuting schedules. Vanpools usually serve destinations or commute times that cannot be accommodated by other transit service. This includes multiple-shift work environments such as hospitals and call-centers, and remote industrial facilities such as mills and power plants. The CATS vanpools with destinations in the RFATS Study Area are serving employers such as Duke Energy and Metrolina Greenhouses in York and Shutterfly in Fort Mill. In fact, Duke Energy has several vanpools coming from different parts of Charlotte but none from Rock Hill, for example, as this route would not be eligible under the CATS vanpool policy.

The case study on the following page highlights the experience of Douglas County, GA, which has developed a highly successful vanpool program that is customized to the commuting needs of Douglas County residents. However, another approach would be to find a way to "piggy-back" on the existing CATS vanpool program. For example, if enough demand exists to form a vanpool serving an origin and destination within the RFATS Study Area, RFATS could potentially reimburse CATS for the subsidy amount not covered by the vanpool participants themselves. In cases where vanpools originate in northern York and Lancaster Counties, funding could come from the portion of Charlotte area 5307 funds distributed to South Carolina (as discussed in the Demand-Response section above).

County-Sponsored Vanpool Service

Douglas County, GA

Douglas County Rideshare (DCR) is a commuter-oriented transit service that carries passengers to and from major employment destinations in the Atlanta metropolitan area. Douglas County is located about 20 miles west of Atlanta, and most residents commute into Atlanta and to other major destinations in the region. In the mid-1980s, Douglas County began looking into alternative transportation options to get residents to major employment centers. Funding was secured from the Georgia Department of Transportation to launch a ridesharing program in 1986, which evolved into the current DCR program that provides vanpool, rideshare, and other commuting options.

DCR began with two vanpools, and has grown since then. Today, DCR operates 57 vanpool routes and has 500 regular daily riders. The vanpools carry approximately 180,000 passenger trips per year. DCR is a relatively unique system in that it is a publically operated vanpool program with a wide subscribership; by comparison, many other vanpool programs are operated by private vendors under contract to public agencies who assist with marketing and ride matching.

Major vanpool destinations include Downtown and Midtown Atlanta, Decatur/Emory University area, the Perimeter Center area, and Alpharetta. Vanpools also operate to other destinations within the metropolitan area, and three vanpool routes serve destinations in Alabama. Vanpools accommodate a variety of work schedules during weekdays, with most departing Douglas County between 5:00 a.m. and 7:00 a.m. and start the return trip between 2:30 p.m. and 5:00 p.m. Two vanpools operate seven days a week to Atlanta and serve workers on second- and third-shift schedules.

DCR's annual operating and administrative costs are approximately $700,000. Because DCR is a public entity, vanpool participants only pay for the cost for service, with no profit for DCR. The operating cost of the service – including insurance, gas, maintenance, and repairs – is covered by rider fares, while administrative costs are contributed by Douglas County general funding. In addition, vanpool drivers are not employees, but rather are DCR users themselves who volunteer to drive in lieu of paying a fare, which keeps costs low. Vanpool fares vary based on travel distance, and currently range between $85 and $190 per month.

Capital costs such as van purchases are funded using a combination of 80% Section 5307 and 5311 grant funds, 10% GDOT funds, and 10% local funds. Douglas County Rideshare maintains a fleet of 79 15-passenger vans for vanpool service. New vehicles typically cost $24,000-$30,000.

The recently-constructed Douglas County Transportation Center is DCR's main transit center, park-and-ride, and administrative facility. The Douglas County Transportation Center is owned by DCR and was built with funding from federal, state, and county sources. The Transportation Center is also served by GRTA Xpress commuter bus routes. Additionally, DCR also makes use of 10 park-and-ride facilities, of which 5 are owned by GRTA, Douglas County Rideshare, or GDOT, and 5 are owned by private businesses but used with permission by DCR vanpools.

Reverse Commute and Last-Mile Connections

The situation described previously, where York County Access vehicles deliver passengers to dialysis appointments in Fort Mill, but must return back to Rock Hill (or other communities south of the Catawba River) empty is known as "dead-heading." Dead-heading reduces the productivity of any transit service because it consumes revenue hours but produces no ridership.

CATS 82X buses currently dead-head from Charlotte to York County in the mornings to provide northbound express service from Rock Hill and Fort Mill to Charlotte, and again dead-head from York County to Charlotte in the evenings after passengers from Charlotte disembark in Fort Mill and Rock Hill.

Destinations like Duke Energy and Shutterfly have attracted workers from the Charlotte region for quite some time, but as discussed previously, these sites are best served by vanpools. In recent years, however, the Kingsley Park area of Fort Mill has attracted several regional headquarters and thousands of jobs (with traditional "9:00 to 5:00" work shifts). Given that many of the new jobs in Kingsley Park are relocated from Charlotte, there is likely an existing reverse-commute market from Charlotte to Fort Mill. Making 82x dead-head trips available for passengers could accommodate this travel pattern.

Two options can be considered to provide reverse-commute service on Route 82X. The first is to serve Kingsley Park in the reverse-commute direction while Baxter Village would continue to be served for "forward" commute service. The other option is to serve the Baxter Village Park & Ride in both directions and develop a "last mile" connection service between Baxter Village and Kingsley Park.

Either service approach would add travel time (and thus cost) to Route 82X, as it adds an extra stop in the reverse-commute direction. This can potentially be off-set by reducing the number stops in Rock Hill. If local fixed-route service is implemented in Rock Hill, it may not be necessary to serve both the White Street Park-and-Ride and the Manchester Cinemas Park-and-Ride. The location of the White Street site, almost four miles from I-77, adds significant travel time to Route 82X. If this connection is served by the proposed Rock Hill Route 3, Route 82X resources could be reinvested in providing reverse-commute service, or even a mid-day trip to and from Charlotte.

Alternating between Kingsley Park and the Baxter Village Park-and-Ride on inbound and outbound trips is the simplest and lowest cost solution to providing reverse-commute service to York County. However, providing service to Baxter Village Park-and-Ride only helps strengthen the facility as a transit hub. Over time, several routes could spawn from the Park-and-Ride location, including last-mile connectors to Kingsley Village and Shutterfly, and local service along the SC 160 Corridor.

While Kingsley Park is currently an employment destination only, plans are in the works for a residential component called Kingsley Village. A shuttle across I-77 could connect to jobs in Kingsley Park, and eventually residents to transit services at the Baxter Village Park-and-Ride. In addition, if the service were to operate in the mid-day, it could link workers in Kingsley Park to retail and restaurant destinations in Baxter Village. In some cases, these mid-day connections make the difference in a commuter's decision to leave their car at home or not.

Last-mile connection services are often designed around the mobility needs of a specific employer or group of employers. As such they are often funded, at least in part, by employers or developers, but a variety of funding arrangements can be considered. The case study below describes a last-

mile connector between a suburban light rail station and an office park in the Dallas area that has been operating under a variety of funding arrangements since its inception.

Last-Mile Connector

Richardson, TX

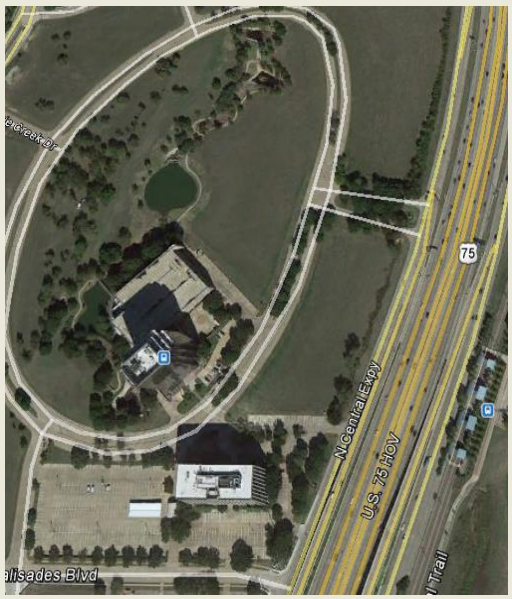
Dallas Area Rapid Transit (DART) operates a Site-Specific Shuttle program, where the agency partners with governmental entities, educational institutions, and major employers to support shuttle service to employees. These shuttles often serve as first- and last-mile connections between DART light rail stations and employment sites.

The Galatyn Park Station E-Shuttle is one example of this program. The shuttle serves a large office building that is located directly across a major freeway from the Galatyn Park light rail station (Figure 4-28, Left). Walking from the station to the building is challenging due to the hostile pedestrian environment, but a one-way trip on the shuttle takes only seven minutes. DART originally partnered with the owner of the office building to provide the shuttle service, sharing the operating costs. However, the building owner became unable to contribute during the recession, and the City of Richardson took over the partnership, investing in the shuttle as a way to incentivize transit-oriented development (TOD) and encourage businesses to locate in the Galatyn Park station area (Figure 4-28, Right).

The Galatyn Park shuttle currently operates every 20 minutes during the AM and PM peak periods, and carries up to 200 riders per day. The total cost for the shuttle is $128,000 per year; the City of Richardson funds half of this cost from its general fund budget, and DART contributes the other half. The City contracts with a private operator for the service.

Other government entities that participate in the Site-Specific Shuttle program have used funding from their local general funds, federal Job Access and Reverse Commute grants, and contributions from special purpose districts or quasi-public entities, such as a local chamber of commerce.

Figure 4-28 Last-Mile Connection and TOD Plans



APPENDIX A

Summary of Relevant Plans and Studies

Geography	Date	Plan Purpose	Relevant Recommendations
CONNECT Our Future: Vibrant Communities—Robust Region			
Greater Charlotte 14-county bi-state region	On-going	This plan will serve as a regional growth framework developed through extensive community engagement of counties, businesses, non-profits, and other organizations. The framework will focus on job growth and quality of life improvements. *The plan is supported by a $4.9 mil HUD Sustainable Communities Grant and $3 mil local public and private-matching resources.*	At *RealityCheck2050,* the June 2013 outreach event for CONNECT Our Future, participants showed support for increasing light rail and commuter rail transit, repairing and increasing capacity of existing lines, and improving existing roads. Participants also noted the need for alternative modes of transportation through additional investment in infrastructure.
RFATS 2035 Long-Range Transportation Plan (LRTP)			
RFATS	2013	This plan documents multimodal transportation planning for the RFATS region. The plan includes a long-term financial plan and is in compliance with the federal transportation bill, MAP-21.	The RFATS LRTP's recommendations align with the RFATS Transit Service Master Plan: *Bus Rapid Transit (BRT)* *Express Bus Service* *Demand Response Service* *Streetcar* *Special Events Trolley*

Geography	Date	Plan Purpose	Relevant Recommendations
RFATS Transit Service Master Plan			
RFATS	2007	RFATS completed a Major Investment Study – the Rock Hill-York County-Charlotte Rapid Transit Study (the RYC Study). This study examined the connections from the RFATS Study Area to Charlotte. A key result of this study was the adoption of a Transit Service Master Plan. This plan draws on a range of transit infrastructure and service proposals that had been made in previous studies as well as the proposal from the rapid transit study itself. The Transit Service Master Plan provides an integrated set of transit proposals that together would meet a wide range of transit needs with the RFATS Study Area.	See RFATS LRTP Recommendations.
Catawba Region Human Services Transportation Coordination Plan (HSTCP)			
Regional	2007	The goal of the HSTCP was to develop an effective and coordinated transit service network for the region as well as ensure compliance with federal public transit funding requirements of SAFETEA-LU.	The Catawba HSTCP established a coordination plan with three parts: 1) inventory of services and needs; 2) strategies and actions; and 3) plan implementation. More importantly, the HSTCP created a list of factors to consider when evaluating funding priorities for potential projects. *Capital v. operational assistance* *Eligibility requirements, demand* *Service reliability, schedule adherence*

Geography	Date	Plan Purpose	Relevant Recommendations
Rock Hill Transit Implementation Plan			
Rock Hill	2005	The purpose of this plan was to present recommended transit service alternatives for Rock Hill as well as a plan for initial implementation of transit service availability.	The Transit Implementation Plan included continuing and expanded express bus service from Rock Hill to Charlotte as well as exploring fixed-route and / or demand response services for the Rock Hill area.
Rock Hill Streetcar Feasibility Study			
Rock Hill	2012	The Rock Hill Streetcar Feasibility Study was framed by the core values stated in Vision 2020 and considers what the Streetcar can do for the community.	The Rock Hill Streetcar aims to *Connect Old Town to ultimately encourage infill development, sustainable neighborhoods, and connectivity*.
Vision 2020 Comprehensive Plan / Area Master Plans			
Rock Hill	2010	Vision 2020 aimed to provide a comprehensive, vision- and policy-based framework to guide Rock Hill's future.	Vision 2020 aims to: *Develop multimodal transportation facilities* *Coordinate transportation goals with potential future transit corridors (i.e. Cherry Road)* *Increase local bus service and explore future BRT opportunities*
Fort Mill Comprehensive Plan			
Fort Mill	2008	The Fort Mill Comprehensive Plan was updated in 2012 to incorporate new growth management techniques to consider the unanticipated implications and impacts of the recession.	The Fort Mill Comprehensive Plan reiterates the locally preferred alternative, BRT along US-21 connecting the RFATS Study Area to the I-485 CATS light rail line, which was identified during the Rock Hill – York County Rapid Transit Study.

Geography	Date	Plan Purpose	Relevant Recommendations
Tega Cay Comprehensive Plan			
Tega Cay	2008	The Tega Cay Comprehensive Plan 2008-2018 is a ten-year vision for the City's future.	The Tega Cay Comprehensive Plan aims to expand mass transit and connections to Charlotte, NC.
Lancaster County Transit Feasibility Study			
Panhandle of Lancaster County	2008	This plan looked at transit service gaps in the county, ultimately determining that a significant percentage of the population did not have access to the transit options needed for regular access to medical services.	The Lancaster County Transit Feasibility Study aimed to publish the framework for the Lancaster Area Ride Service (LARS).
US 521 Corridor Study			
Panhandle of Lancaster County	2010	The US 521 corridor study offers recommendations, an action plan, as well as direction on ways to implement ideas identified in the study. The study provides preferred development patterns, design qualities, and transportation systems for the community.	This study recommended increasing multimodal travel choices by: *Working with CATS to develop an express route to Charlotte from the Indian Land area* *Working to develop a fixed-route bus service or circulator service* *Work to potentially extend the LYNX Blue line into the county*
Lancaster County Comprehensive Plan			
Panhandle of Lancaster County	2010	The Lancaster County Comprehensive Plan took a closer look at a snapshot of the existing community profile to guide the County to create a future that aligned with community values.	The plan included transit-related recommendations that aligned with the Lancaster Transit Feasibility Study. *Encourage public transit options in the County—more specifically, LARS.*

APPENDIX B

Peer Case Studies

Cary, North Carolina

Population: 136,627

More than one UZA? No

Closest Metro Region: Raleigh-Cary MSA

Transit Service: C-Tran

Background

In 2001, the Town of Cary began offering door-to-door demand response service for people with disabilities and adults over the age of 60. The Town opened the service to the general public in 2002, but high demand for rides conflicted with the ability to serve older adults and people with disabilities. The Town launched fixed route service in 2005, and door-to-door service resumed serving only older adults and riders with disabilities.

Fixed-Route Service

Cary began C-Tran service with five fixed routes: four routes radiating north, south, east, and west of downtown Cary along major corridors, and one clockwise loop that travels around downtown along Maynard Drive, a major ring road. C-Tran later added a sixth route that operates counter-clockwise on Maynard, and extended their east and west routes. C-Tran operates fixed-route service Monday through Saturday beginning at 6 a.m., and recently extended their service hours from 8 p.m. to 10 p.m. The radial routes operate every 30 minutes, except during midday (9 a.m.

to 3 p.m.) when service is hourly; the two loop routes run every hour. In downtown Cary, C-Tran's radial routes converge at Cary Train Station, the Amtrak stop for the Town of Cary. Bus routes operate on a pulsed schedule, so that vehicle arrivals at the station coincide on the hour and half-hour, making transfers easy and convenient for riders traveling across town.

C-Tran passengers can connect to Triangle Transit routes 301, 303, 305, and 311 with service to Raleigh, Apex, and the Regional Transit Center at Research Triangle Park. Connection is also available from Route 6 to Raleigh's Capital Area Transit (CAT) Route 11L at the Plaza West shopping center.

C-Tran's annual budget is approximately $4 million. Most of C-Tran's funding comes from the Town of Cary's general fund ($1.5 million) and Federal Transit Administration 5307 grant funding ($1.3 million). In addition, C-Tran receives about $500,000 from Town of Cary vehicle license fees, $300,000 in passenger fare revenue, and $190,000 in grant funding from the State of North Carolina. C-Tran's fixed-route services are provided through a turnkey contract, originally with First Transit and currently with MV Transportation.

Unlike nearby cities in the Triangle, Cary does not have a major university, and it is a comparatively affluent town with a smaller low-income population relative to its neighbors. However, C-Tran ridership has grown steadily, and the system currently carries about 1,000 passenger trips per day, an 8% increase over the previous year. The first few years of operation saw 5-7 passengers per revenue hour, but that has increased to an average of 10-14 passengers per revenue hour on some routes.

C-Tran currently has a fleet of 29 total vehicles. Cary began fixed-route service using 14-passenger light transit vehicles, and added three 16-passenger vehicles when the system approached 500 passengers per day. They are currently in the process of ordering 32-foot buses to add to the fleet. Vehicles were originally equipped with manual fareboxes, but C-Tran upgraded to electronic fareboxes in 2011.

	Fixed Route	Demand Response
Annual Ridership	301,867	40,997
Annual Revenue Hours	32,000	27,000
Ridership per Revenue Hour	9.43	1.52

Demand-Response Service

C-Tran provides door-to-door demand response service for people with disabilities and adults over age 60 only. Service operates throughout the town, and even travels to points outside of town, particularly medical facilities and other key destinations in the region. In 2008, C-Tran adopted a tiered pricing system for its door-to-door service that is more closely related to distance:

- **Tier 1:** trips within ¾-mile of fixed route corridors ($2.50, double the fixed route cash fare)
- **Tier 2:** Trips anywhere within town limits ($4.00)
- **Tier 3:** Out-of-town trips (Raleigh, Durham, Chapel Hill, Apex, and Morrisville) ($6.00 or higher, pricing based on geography)

Aiken, South Carolina

Population: 29,884

More than one UZA? No

Closest Metro Region: Augusta, GA

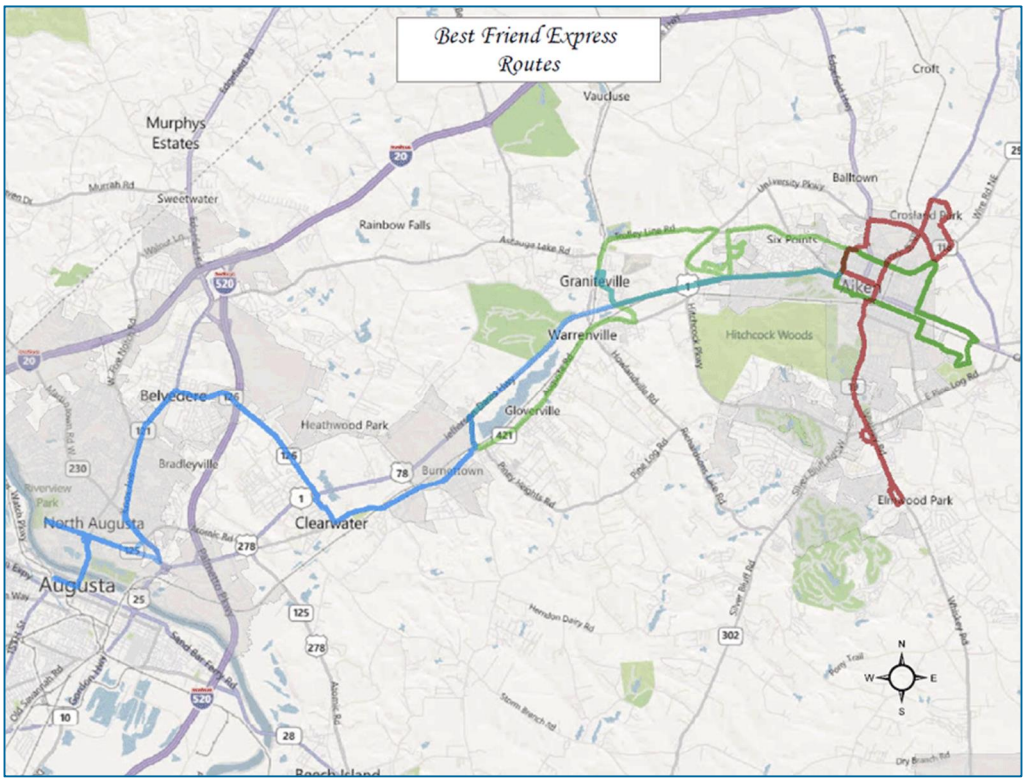
Transit Service: Best Friend Express

Background

The South Carolina Department of Transportation (SCDOT) designated the Lower Savannah Council of Governments (LSCOG) as the Regional Transit Management Agency (RTMA) for the six-county Lower Savannah region. LSCOG is the coordination agency for transit services among the local agencies that provide transportation for the region.

In its role as the Mobility Manager for the region, LSCOG provides transportation information and assistance for residents throughout the six-county area and takes trip requests for the public transit services operated in Allendale and Bamberg Counties. The organization has also facilitated the planning and implementation of public transit services in several counties outside of Aiken.

In Aiken County, LSCOG manages the Best Friend Express, which provides fixed route and complementary paratransit service in the urbanized section of the county—the Cities of Aiken and North Augusta and the Midland Valley area. The Aiken Area Council on Aging is the operator of the system.



Fixed-Route and Dial-A-Ride Service

The Best Friend Express is Aiken County's public transit service, serving the urbanized portion of the county. Service on the fixed routes begins at approximately 7:00 a.m. and runs until 7:00 p.m., Monday through Friday, and is based on two-hour circular routes. The buses are ADA-compliant and can carry up to 20 passengers. In addition to serving riders at fixed-route stops, Best Friend Express buses can be flagged down at any time for pick-up.

The Best Friend Express system currently includes three routes: Blue, Green, and Red. The Blue Route serves North Augusta and the Green Route serves Aiken Metro. The Red Route is the Aiken Express. The Blue Route is a circular route that travels from North Augusta to Aiken Technical College every two hours. This bus also connects with Augusta Public Transit, the Augusta, GA transit system. Connections are also provided between the Best Friend Express fixed routes and the rural fixed route service operated by the Aiken Area Council on Aging using 5311 funding.

Dial-A-Ride ADA paratransit service is provided for individuals who are unable to use the fixed route Best Friend Express system due to a disability.

The Best Friend Express offers rates from $1.00 for older adults (age 60 and over) and people with disabilities to $1.50 for students and $2.00 for adults. The one-way Dial-A-Ride fare is $3.00.

Operating Statistics

The LSCOG currently operates three buses and six demand-response vehicles during peak service on the Best Friend Express. The most recent National Transit Database (2012 NTD) indicates that approximately 23,800 unlinked fixed route trips and 3,500 unlinked demand-response trips were provided on the Best Friend Express, as shown in the table below.

In that year, the fixed route service carried 3.52 trips per revenue hour, a measure of service productivity. The demand-response service carried 2.69 passenger trips per revenue hour.

	Fixed Route	Demand Response
Annual Ridership	23,788	3,536
Annual Revenue Hours	6,757	1,313
Annual Vehicle Revenue Hours	6,800	1,300
Annual Vehicle Revenue Miles	114,100	22,100
Riders per Revenue Hour	3.52	2.69

Budget and Funding Sources

According to the 2012 NTD, operating expenses on the fixed route Best Friend Express and Dial-A-Ride services totaled $318,500. Funds applied to those expenses include $102,400 from FTA's Urbanized Area Formula Program (Section 5307), $48,700 in state assistance, and $130,900 from local Aiken County funding sources. In that reporting year, LSCOG used a total of $155,200 in capital funding for the service--$95,600 from the 5307 program and $19,600 from local funds.

LSCOG funds services in the urbanized portion of Aiken County in partnership with the Metropolitan Planning Organization (MPO) and transit provider in the Augusta, GA urbanized area (UZA), which includes the urbanized parts of Aiken County. Section 5307 funding for the area is shared by South Carolina and Georgia. Augusta-Richmond County is the designated recipient for the funds, and LSCOG is a direct recipient for the South Carolina portion. The annual split of funding between the two states follows the amounts published by FTA for each state in its annual grant program apportionment tables. For federal FY2014, the South Carolina portion was $740,212, an increase over previous years (the Georgia portion of the funds was slightly over $2 million).

LSCOG was the designated recipient for the South Carolina portion of the Augusta UZA's Section 5316 and 5317 funds before those programs were repealed by MAP-21 (5316 eligible activities have been rolled into the 5307 and 5311 programs; 5317 eligible activities have been added to the 5310 program). LSCOG is working to become the designated recipient for the South Carolina portion of the Section 5310 funds, but has hit some obstacles to that process. LSCOG has historically used 5310 funds for vehicle replacements and the purchase of service for the Best Friend Express and Dial-A-Ride services.

Section 5311 funds are used by the Aiken Area Council on Aging, which operates the Best Friend Express and Dial-A-Ride services under contract to LSCOG, to finance the demand response service it provides in the rural sections of Aiken County.

Franklin, Tennessee

Population: 68,886

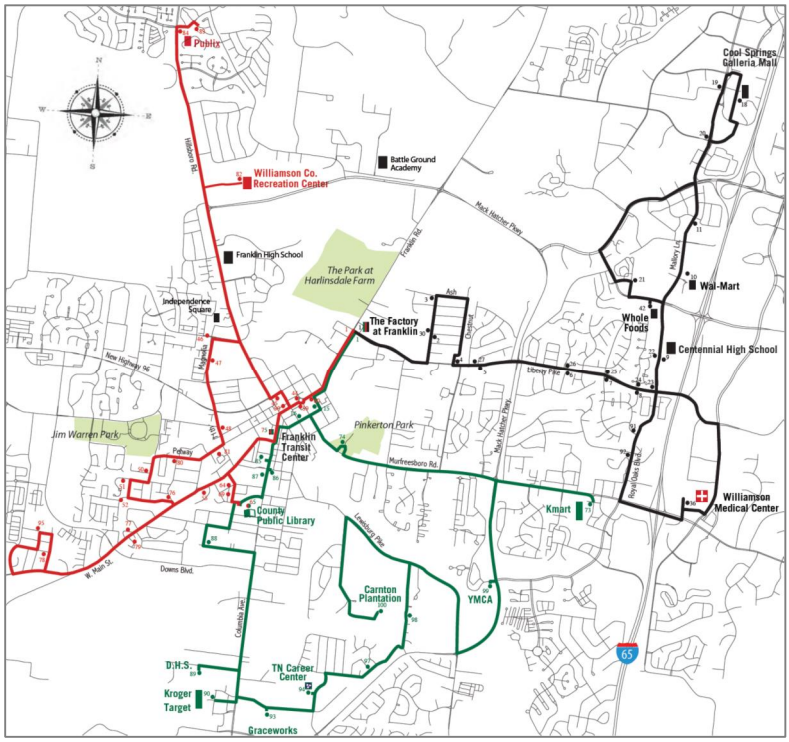
More than one UZA? No

Closest Metro Region: Nashville-Davidson--Murfreesboro--Franklin MSA

Transit Service: Franklin Transit

Background

The Transportation Management Association (TMA) Group manages and operates service for the Franklin Transit Authority in the City of Franklin, Tennessee. The TMA Group provides purchased transportation services in the form of demand response and bus services for Franklin Transit Authority.



Fixed-Route Service

Franklin currently runs three fixed routes:

- **West Bound to Franklin** – Monday to Friday from 6 a.m. to 5 p.m. and Saturdays from 8 a.m. to 5 p.m.
- **East Bound to Cool Springs** – Monday to Friday from 7 a.m. to 6 p.m. and Saturdays from 9 a.m. to 6 p.m.
- **South Bound to Colombia Avenue** – Monday to Friday from 8 a.m. to 4 p.m.

All three routes maintain one-hour frequencies, and they connect every hour on the hour at The Factory at Franklin, allowing for seamless transfers between routes. However, route alignments

are relatively circuitous, traveling along several different streets over the course of a trip. In addition, routes are not all bidirectional. The South Bound route is a large one-way loop, which means passengers must travel along the entire alignment in order to complete a round trip. The West Bound route travels along different alignments for a large share of its outbound and inbound trips, so that riders cannot necessarily get back on the bus where they got off.

Franklin riders can connect to the Nashville MTA system by taking the 91X express bus that originates at the Williamson Square Kroger. This bus is provided by the Regional Transportation Authority of Middle Tennessee. The 91X stop at the Williamson Square Kroger is located about a half-mile walk north from the Watson Glen Shopping Center stop on the South Bound route, or about a one-mile walk west from the Williamson Medical Center stop on the East Bound route.

The Franklin Transit Authority's annual budget is approximately $1.8 million: $850,000 comes from the City of Franklin and $624,000 from Federal Transportation Administration grant funding. The Franklin Transit Authority receives approximately $67,200 in fare revenues and $260,000 in funding from the state of Tennessee. The Franklin Transit Authority operates four vehicles during peak hour service through a purchased transportation contract with TMA.

The City of Franklin is a fairly affluent town in Tennessee, with a median income of $79,894, which is approximately 181% higher than the state median income. Franklin Transit ridership is currently 50,000 annual unlinked trips, which are approximately 60% fixed-route and 40% demand-response. In terms of service effectiveness, the Franklin Transit Authority currently operates at 4 passenger trips per vehicle revenue hour for the fixed-route service and 2 passengers per revenue hour for demand-response.

The Franklin Transit Authority has a fleet of 10 vehicles, with 5 for fixed-route service and 5 for demand-response service. Most recently, the Franklin Transit Authority has installed security cameras on vehicles, added a new southbound route, and expanded its driver training program.

	Fixed Route	Demand Response
Annual Ridership	29,511	20,516
Annual Revenue Hours	6,864	11,195
Riders per Revenue Hour	4.30	1.83

Demand-Response Service

The Franklin Transit Authority provides a demand-response service program called Transit on Demand (TODD). The service provides pre-arranged curb-to-curb pick-up and drop-off service as well as all-day, same-day access to Franklin's fixed route. All TODD vehicles are ADA-accessible and can accommodate anywhere from eight to twelve passengers. TODD fares are zone-based and directly related to distance from the fixed-route corridor:

- **Zone 2:** trips within 3/4-mile of fixed route corridors ($5.00 round trip/$4.00 for ADA-eligible or 65+)
- **Zone 3:** trips within City limits of Franklin and general area beyond fixed transit route ($6.00 round trip/$4.00 for ADA-eligible or 65+)

Collin County, Texas

Population: 788,580 (City of McKinney: 131,882; City of Allen: 84,387)

More than one UZA? Yes

Closest Metro Region: Dallas-Fort Worth-Arlington MSA

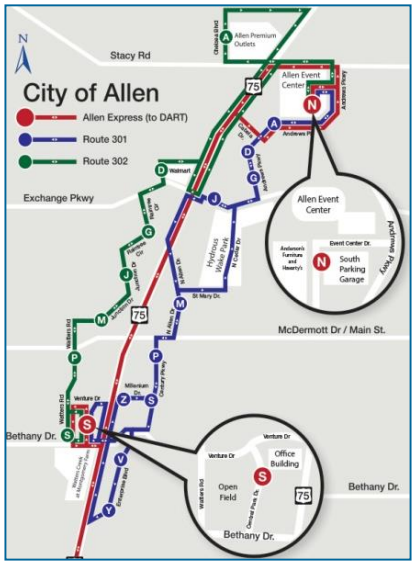
Transit Service: TAPS Public Transit

Background

Texoma Area Paratransit System, or TAPS Public Transit, has provided demand-response transportation services to north central Texas since 1986. TAPS has been largely successful and has grown to a fleet of over one hundred buses and vans serving a seven-county area, and continues to expand service to new areas. In 2013, TAPS began operating service in Collin County, just north of Dallas. The TAPS service area includes the rural areas of the county, north and east of the City of Plano, while Plano is served by Dallas Area Rapid Transit (DART) light rail and bus service. In addition to paratransit service, TAPS operates fixed route services in the Collin County cities of McKinney and Allen. Service is oriented around connections to employment destinations, including major companies, shopping/retail destinations, and medical facilities.

McKinney

In McKinney, TAPS took over operations for the existing transit system in July 2013, which consists of two bus routes: Route 100 (Blue Route) and Route 300 (Red Route). Both routes operate as large one-way loops, which means that riders must travel along the entire alignment to complete a round trip. The routes operate with a frequency of 80 minutes throughout the day, and both routes begin and end at the same time at the TAPS Main Terminal. Between January and August 2014, fixed-route service in McKinney carried 3,990 passenger trips, and the service continues to grow at a rapid pace; TAPS is currently planning to expand the service in McKinney from two to seven fixed routes. TAPS also operates the Commuter Connect, an express route that travels between McKinney and the DART light rail station in Plano, with morning and afternoon peak service on weekdays.



Allen

Fixed-route service in Allen is new, having just been launched by TAPS in November 2013. The two routes – Route 301 and Route 302 – operate from 5:30 a.m. until 11:45 p.m. on weekdays, with abbreviated hours on Saturdays and Sundays. The 301 and 302 are both bidirectional, north-south routes, traveling between the North Hub and South Hub stations. Both routes operate with one-hour frequencies, completing a southbound trip in 30 minutes and a northbound trip every 30 minutes. Schedules are coordinated so that both routes connect at the North Hub and

South Hub stations, departing the North Hub every hour on the hour and departing the South Hub every hour on the half-hour. The two routes are primarily designed to serve as employment-based circulators, fostering access to employment within the city of Allen. Year-to-date ridership for 2014 reached 19,398 passenger trips in August.

In addition to the two local routes, there is an express route that connects riders in Allen to the DART light rail station in Plano. Weekday express service operates hourly, with service blocks at 5:15 a.m. – 9:15 a.m., 3:15 p.m. – 8:15 p.m., and 10:00 p.m. – midnight. Service also operates throughout the day on weekends with an abbreviated schedule. Express service allows employees living in the Dallas area to commute to retail and other jobs in Collin County, as well as employees living in the County to commute into Dallas via DART.

Service Planning

In designing the new services for Allen and McKinney, TAPS staff were able to measure existing paratransit trips to identify where there was existing demand for transit. The ability to determine whether and where to locate transit service based on available geolocation data was invaluable for route planning.

	McKinney	Allen
Passenger Trips	3,990	19,398
Revenue Hours	1,131	7,719
Passengers per Revenue Hour	3.53	2.51

Note: All figures are for January-August 2014

Operating costs for fixed-route, commuter shuttle, and demand-response services in the City of McKinney totaled about $4.9 million in FY 2014. About 50% of the operating funds (about $2.47 million) come from Federal 5307 grant funds; $100,000 is from the City of McKinney, and the remainder of funding is from TAPS.