Wake Transit Plan

A Wake County Transit Investment Strategy Report

Wake TRANSIT

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Contents

Foreword

Our population of more than 1 million grows by 63 people per day, or roughly 23,000 per year. As Wake County continues to grow into one of America's most dynamic and desirable urban areas, the transportation needs and desires of its residents are also growing.

As the population increases, it is triggering a number of impacts:

- Congestion on our roads is worsening, even as additional money is spent to improve and expand the roadway network. Therefore, it is crucial to provide alternatives to car travel.
- The County's real estate market is seeing a significant rise in demand for urban living spaces in places like downtown Raleigh. As more and more people make these areas their home, these areas will become more densely populated, resulting in less dependence on cars and a surge in demand for transit.
- Wake County residents need increased access to jobs, school, medical appointments, and shopping but cannot drive, don't own a car, or choose not to drive. This includes low income individuals, seniors, millennials, and school-aged populations.

People want or need more options. That is exactly what the Wake Transit Plan delivers. Wake County is home to an economically, socially, and demographically diverse population. The goals and needs of residents and employees in the County are equally varied, as revealed through this plan's public outreach process.

The proposed plan addresses those multifaceted perspectives and will help ensure that our community remains one of the best places to live and work in the country. Our ability to get around and connect with others is a significant factor in our high quality of life. This plan is designed to change the face of transportation in Wake County by offering more frequent bus service that covers larger areas and spans longer hours as well as rapid bus service along major transportation corridors and commuter rail linking Garner, Raleigh, NC State University, Cary, Morrisville, Research Triangle Park, Durham, and Duke University.

Expanding the transit system is a strategy that also offers long-term benefits. High quality transit services encourage people who value transit to locate near good transit services. Over time, this increases the "fit" between the transit system and the population, leading to increased ridership growth and housing, offices, and retail environments that provide the full range of lifestyle options the market demands. Enhanced transit can also help Wake County remain competitive in a global economy by making it easier for employees to get to their jobs, thus helping businesses attract and retain talent.

This plan would invest $2.3 billion in the first 10 years of implementation. The primary funding would come from a voter-approved half-cent sales tax increase—which is expected to be placed on the November 2016 ballot—vehicle registration fees, vehicle rental tax revenues, federal and state contributions, existing local revenues that fund current transit services, and fares paid by bus and train customers.

This plan is divided into the following chapters: Section 1 (Background) briefly summarizes the purpose and initiation of this study. Section 2 (Wake Transit Plan) details the transit plan. Section 3 (Existing Conditions) describes the recent population, employment, and transportation trends in the County. Section 4 (Plan Development Process) provides more information on the study process. Section 5 (Implementation and Finance) discusses the implementation and funding strategy for the first 10 years of the plan.

The Transit Plan envisions four "big moves" to connect the region across county lines, connect all Wake County communities to the transit network, provide frequent, reliable urban mobility to the densifying areas of the County, and give enhanced access to transit across Wake County. This will be accomplished by tripling of bus service in Wake County, investing in commuter rail and bus rapid transit infrastructure to enhance speed and reliability for transit customers, and focusing on improving the transit customer experience.

Wake County voters approved a half-cent sales tax advisory referendum to support this plan in November 2016.

1 Background

Background

The Wake Transit Investment Strategy has been a one-year planning process. It reopened a conversation that the County has had in previous years, but with a renewed focus on public engagement and education. The resulting plan is based directly on input from members of the public and strives to create a vision for the most appropriate transit plan for Wake County.

Wake County led the study, along with six other funding partners (see below). Representatives from each municipality, railroad agencies, business advocacy groups, and transit advocacy groups also were invited to participate on the committee that guided technical decisions on the project.

Wake County's funding partners include:

- City of Raleigh/GoRaleigh
- Town of Cary/C-Tran
- GoTriangle
- Capital Area Metropolitan Planning Organization (CAMPO)
- Research Triangle Park
- North Carolina State University
- Raleigh-Durham International Airport (RDU)

About the Reports

This is the third and final report from the Wake County Transit Investment Strategy process. The first two reports, listed below, are available on the study website at www.waketransit.com.

- Wake County's Transit Choices was the first report in the study. It presented information about the region related to transit, including previous transit planning efforts, economic and social data, and current and projected future transportation demand. It explored a range of potential transit tools and how they might be applied. The report then presented a series of questions for Wake County citizens and elected officials to think about when deciding their transit future. This began the conversation about understanding how transit works and the important trade-off decisions that a community must make as it prioritizes funding for transit.
- Wake County Transit Alternatives was the second report. Building on the first report, it described the development of four transit scenarios that reflect potential choices that could be made by Wake County residents. These scenarios were developed following extensive analysis of the reasonableness and feasibility of applying the many potential transit options in Wake County that have been used across the country and around the world.

Transit Planning in Wake County

As a part of this planning process, many Wake County residents and stakeholders expressed ideas to expand the transit network beyond what is proposed in the first 10 years. As transit continues to see success in Wake County, the community will have additional opportunities to build on these successes and consider the best next projects.

Transit visioning and resource allocation will continue to be an important part of the overall transportation planning process. CAMPO updates its Metropolitan Transportation Plan (MTP) every four years. Municipalities revisit their transportation and land use plans regularly, either individually or as part of CAMPO. These local plans incorporate transit as part of the transportation network, include the costs associated with capital improvements, and address zoning related to land uses along the transit corridor.

In addition, public transit providers will regularly revisit the routes, frequencies, and spans of existing services to look for demand and opportunities for changes or expansion. Local planning and transit operating agencies will work with the community to best align transit with population and employment shifts.

Process Overview

(More detail on the study process is in Section 4 of this report.)

The study began with the underlying understanding that there is not one right way to build an enhanced transit system. During development of the Transit Plan, two primary trade-offs were identified:

- Ridership versus coverage. A ridership goal designs a system that would carry the maximum number of people. A coverage goal designs a system to provide access to as broad an area as feasible.
- Infrastructure versus service. An infrastructure goal designs a system where more money is spent on up-front capital expenditures. A service goal allocates more money toward increasing the number of vehicles operating through the system.

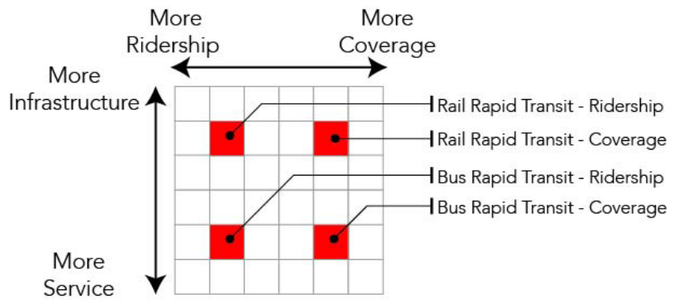


Figure 1: The Four Scenarios

Information about these trade-offs was shared with the public, which was asked to reflect on where Wake County is on the spectrum of each question. The survey results indicated some preference for ridership over coverage (70% ridership, 30% coverage), and a 50/50% split for infrastructure versus service.

Four intentionally different scenarios were developed to demonstrate how the two sets of trade-offs can be applied within Wake County. These four scenarios each represented different points on the ridership/coverage and infrastructure/service spectra, as shown in Figure 1. The final plan was developed using input from both rounds of public outreach, a statistically-valid poll, feedback from a 76-member advisory committee, and a series of small group meetings with stakeholders representing various demographic groups.

As further detailed in Section 4, the County engaged in a broad and inclusive public involvement process including a kickoff meeting in December 2014 as well as over 250 events and meetings throughout 2015 to educate the public and seek their input. Wake County voters approved the half-cent sales tax advisory referendum to support the Wake Transit Plan in November 2016

The following terms will be used in the transit plan:

- Bus Rapid Transit (BRT): A range of speed and reliability improvements such as dedicated busways and fixed stations with off-board fare collectors.
- Commuter Rail Transit (CRT): A train operating on shared tracks with freight and Amtrak vehicles in the freight right-of-way.
- Fixed-route: Transit routes that operate on the same route on a published schedule.
- On-demand: Transit service that varies each trip based on the need of the individual users.

2 Wake Transit Plan

Wake Transit Plan

This section details the enhanced transit plan. It describes each type of service and technology included in the Transit Plan and compares the future services with existing transit service in the County.

Big Moves: Enhanced Transit in Wake County

Wake County has had various forms of transit service over the years, with bus services since the 1950s. Residents in our county have expressed desire for additional transit and an improved rider experience. In response, the anticipated funding incorporated as part of this plan provides sufficient resources to substantially expand and enhance the system. This will allow the County to catch up with current demand, anticipate future demand, and make notable improvements to the user experience (as shown in Figure 2). Wake County is currently in the bottom range of its peers in terms of service hours provided per capita.

The plan makes four big moves—major improvements in four key areas, shown on the next four pages.

As shown in Figure 2, proposed transit plan will change the level of per capita investment in transit relative to peer regions.

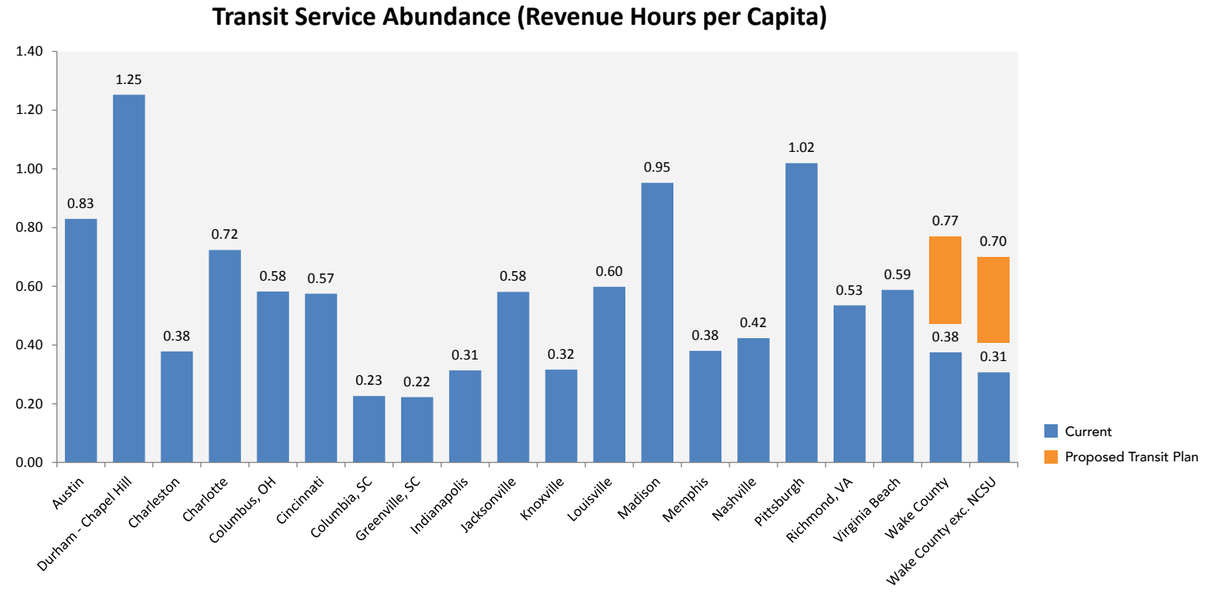


Figure 2: Peer City Transit Abundance (Annual Revenue Hours of Service per Capita)

Big Move 1:
Connect Regionally

Cross-county connections will be strengthened with a variety of bus and rail investments. The Wake County Transit Plan will fund the Wake County share of a new commuter rail in the NCRR corridor. This commuter rail line also could eventually extend to Johnston County to the east, with state, federal, and Johnston County support. The Transit Plan also would enhance the connections to Orange County, RDU, and other key destinations with more frequent express bus routes while providing strong connections to the planned light rail line linking Orange and Durham Counties. Other agencies, including the adjacent counties, would participate in funding the interegional connections.

This figure illustrates major elements of each connection across the region proposed in the first 10 years.

Key Investments:

- 37-mile commuter rail connecting Garner, Raleigh, NCSU, Cary, Morrisville, RTP, Durham, and Duke
- Enhanced connections to RDU and Chapel Hill

Key Benefits	
Today	Proposed with Transit Plan
With today's traffic, if you plan a trip from Durham to Raleigh at 5:00 PM using NC 147 and I-40, an online mapping tool indicates that the trip will take between 35 minutes to 1 hour and 20 minutes. The variation in time and the potential for delay has huge impacts.	Traveling at peak times, the Commuter Rail will travel between Durham and Raleigh on a consistent and reliable 45 minute or less schedule

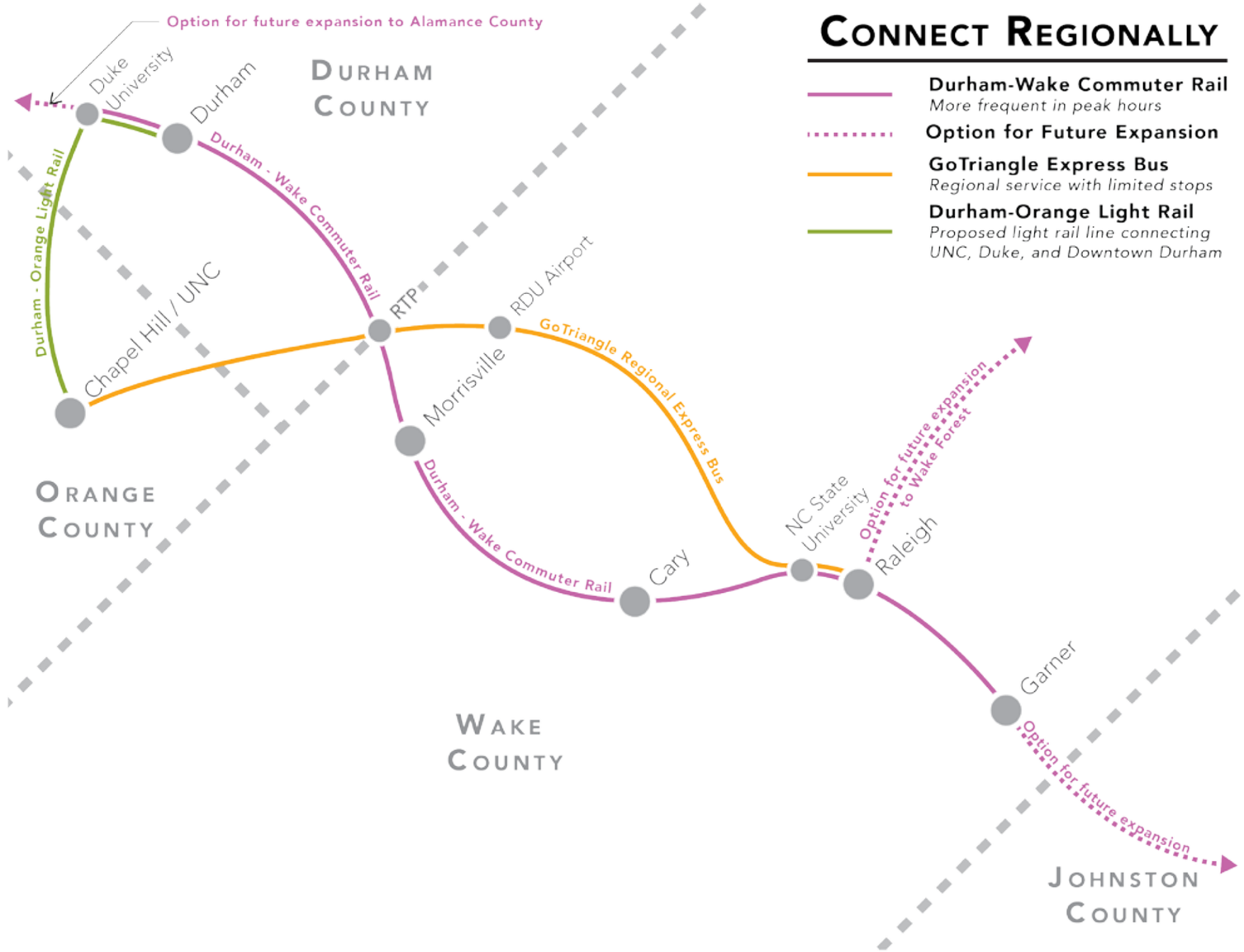


Figure 3: Big Moves: Connect Regionally

Big Move 2:
Connect All Wake County Communities

The new plan will connect all 12 municipalities. This will include links between the communities and downtown Raleigh. New links also are provided between some of the smaller communities for employment, shopping, and medical trips. These connections will be a combination of 30- and 60-minute all day service, peak-only service, and commuter rail.

The proposed plan will connect the twelve municipalities, RTP, the airport and many other major destinations. The figure to the right shows the range of services that will connect the Wake County communities. Thirty-minute all-day services connect to Cary, Morrisville, RTP, the airport, and the Wake Tech campus on the northern edge of Fuquay-Varina. Sixty-minute all-day services connect to Apex, Garner, Knightdale, and Wake Forest. Peak focused services, including the regional commuter rail, are provided to and between other communities and destinations. Additionally, BRT infrastructure such as dedicated busways, will benefit all buses using those routes. As the communities grow and change over time, it is anticipated that the transit connections also will change and grow.

Key Investments:

- Service to all 12 municipalities
- Service to RDU and RTP
- Service to Durham

Key Benefits:

- Network supports each County community with transit service
- Roadmap for how transit services can grow as communities grow
- Links communities to make multiple trips possible

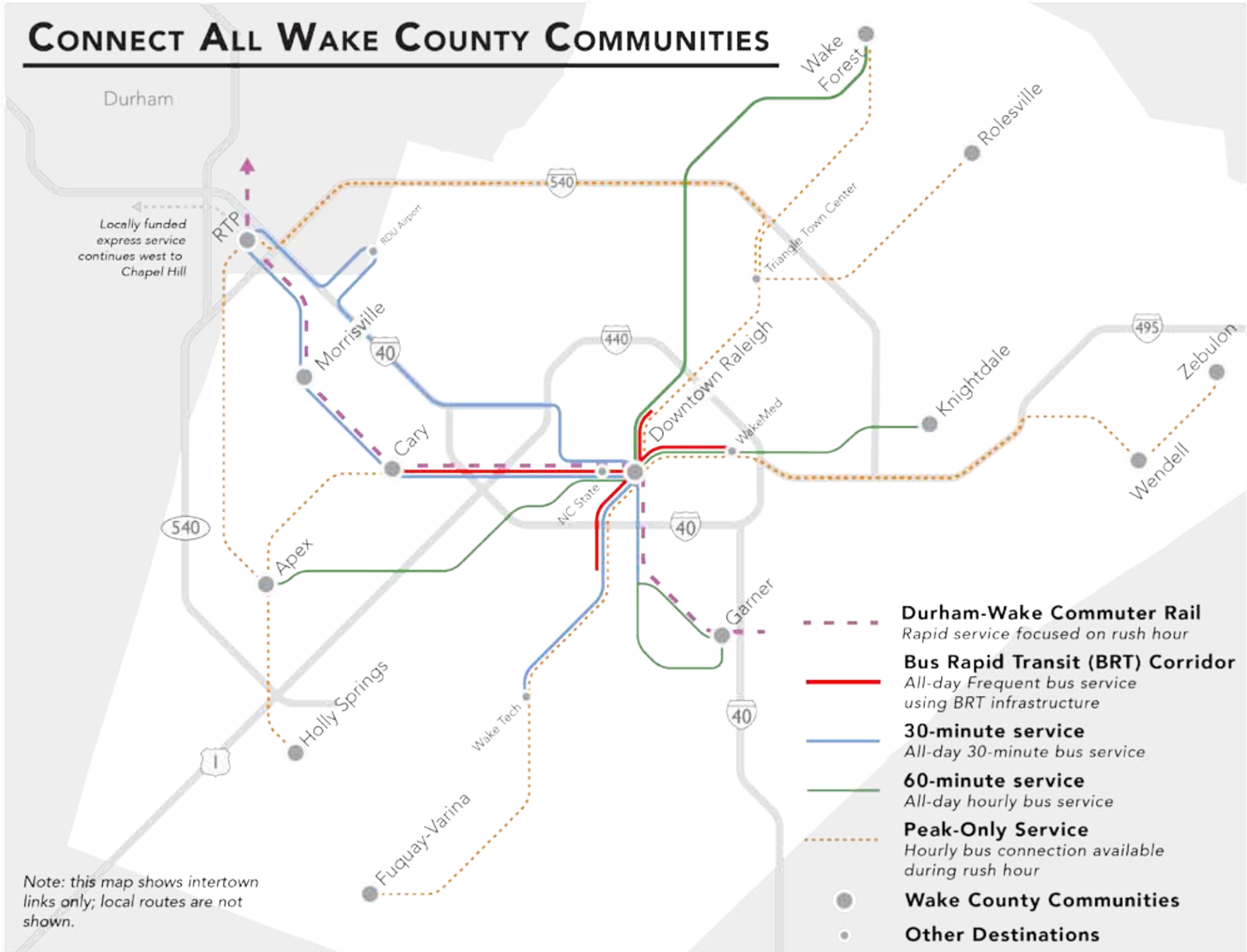


Figure 4: Big Moves: Connect All Wake County Communities

Big Move 3:
Frequent, Reliable Urban Mobility

The size of the frequent network (15 minutes or better all day) in Raleigh and Cary will increase from 17 miles to 83 miles. Weekend and evening service hours will expand throughout the County, which is particularly important to people working in the service sector and other jobs that don't follow a traditional 9-to-5 weekday schedule. BRT improvements along the north, east, south, and west corridors will improve the speed, reliability, and amenities of bus services.

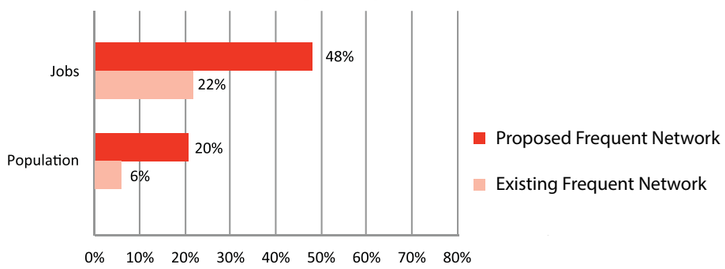
Frequent service follows patterns of high demand (usually characterized by density, walkability, linearity, and proximity).

BRT is a key element of enhancing urban mobility in the Transit Plan. This can comprise many different speed and reliability improvements, including exclusive busways in many locations as well as priority treatment at traffic signals and fixed stations with off-board fare collection to speed boarding.

Key Investments:

- 83 miles of frequent network
- 20 miles of BRT infrastructure

Key Benefit:
Population and Jobs within 3/4 Mile of All-Day Frequent Service



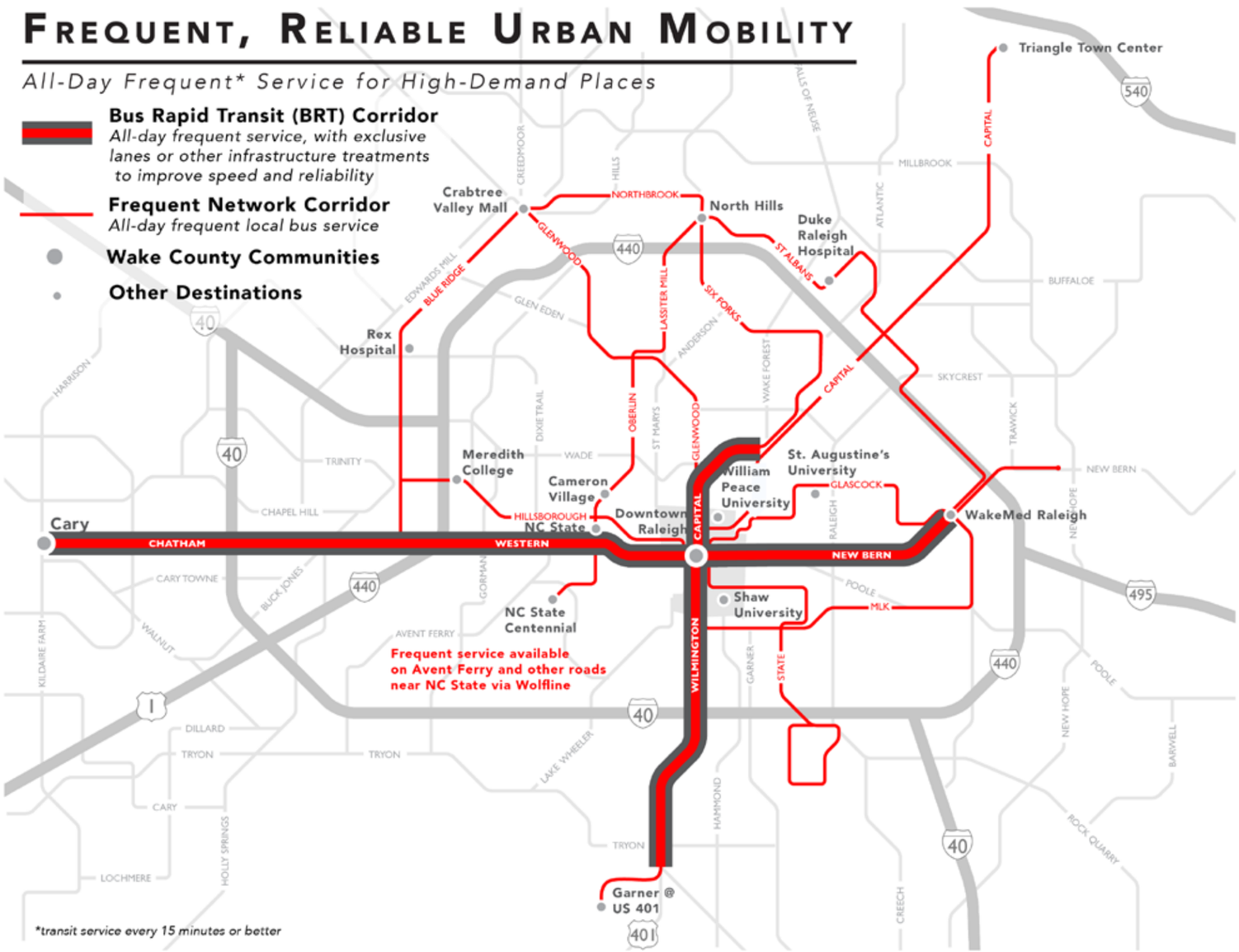


Figure 5: Big Moves: Frequent, Reliable Urban Mobility

Big Move 4:
Enhanced Access to Transit

The Transit Plan will improve fixed-route service by extending the number of hours per day and days per week the transit system operates, increasing frequency and expanding the extents of many fixed routes, especially in Raleigh and Cary. The Transit Plan also will improve non-fixed route paratransit service by increasing funds for TRACS (serving non-urbanized Wake County). Finally, the plan includes a 50% match for towns to establish local services. The towns will work with the County and transit agencies to set the frequency and span of service, and choose the sizes and types of vehicles based on the needs of their residents. The 50% match would be available for the 10 municipalities (other than Raleigh and Cary) that are not currently directly funding transit systems.

The blue areas of the figure to the right represent areas with relatively close access to transit service (within ¾ mile), and the green areas represent municipalities that are eligible for 50% match funding for local service. Wake County TRACS on-demand service is provided in all non-urbanized areas in the County on a prioritized, on-demand basis. The Transit Plan provides additional funding for this service. The plan also includes substantial investment in on-street infrastructure to support bus service across the County, including more and better stops, shelters, and access to stop facilities.

Key Investments:

- 3x bus service
- Increased hours of service across the network
- Increased Saturday and Sunday Service
- Matching funds for community-based transit services

Key Benefits — Hours and Days of Operations Increases	
Today	Proposed with Transit Plan
Some routes don't operate on Saturday and Sunday	All local routes operate 7 days a week
Many routes stop operating at 6:00 PM	Hours of operation extend until midnight or later
Many routes provide infrequent service through midday	Local routes maintain frequency through midday

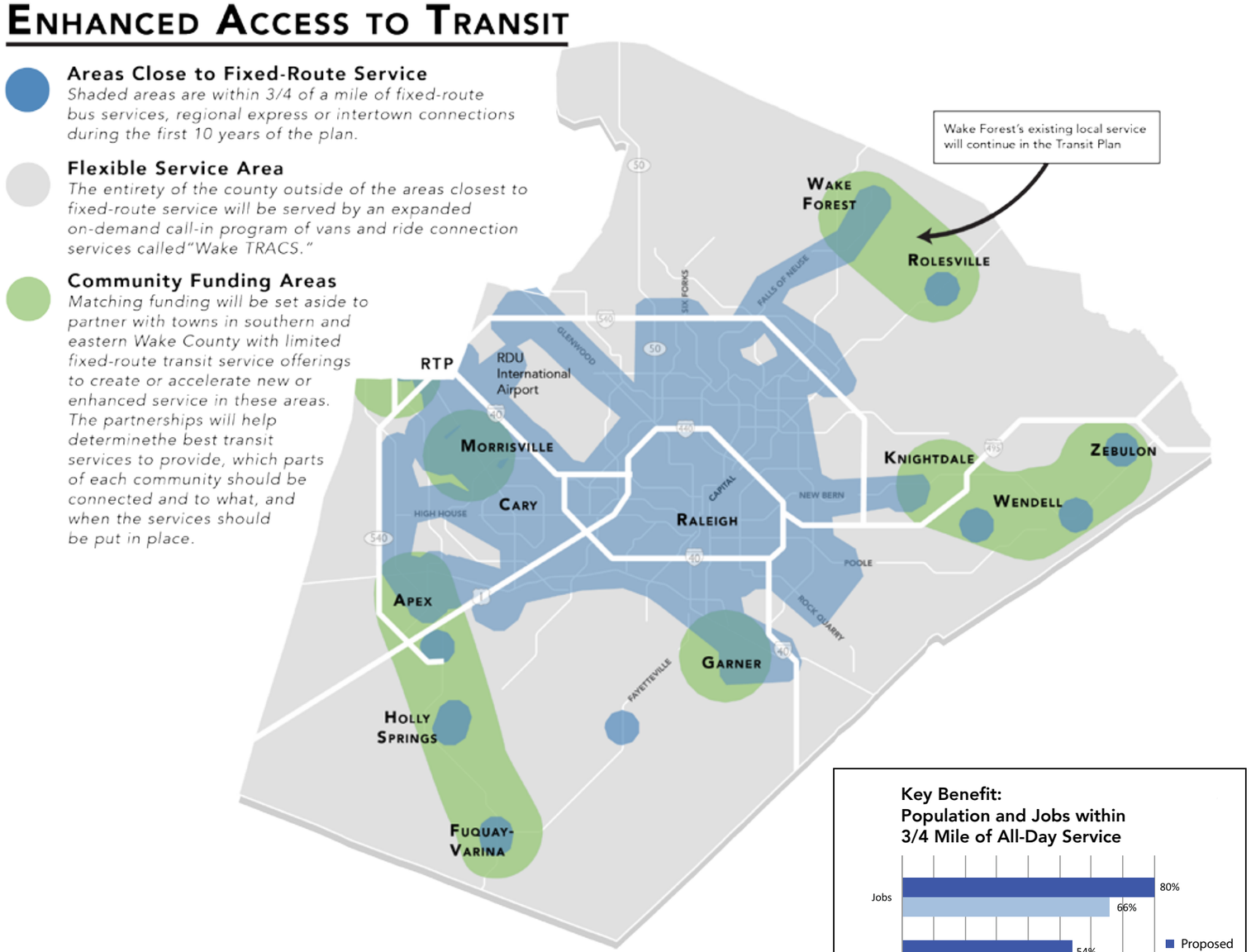
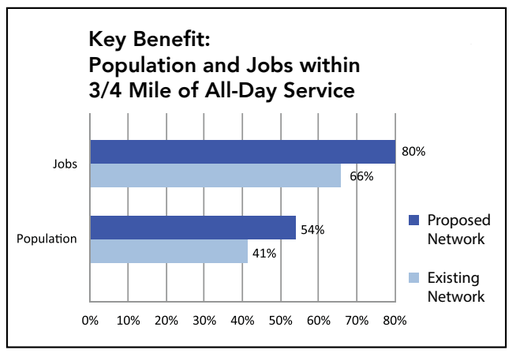


Figure 6: Big Moves: Basic Lifeline Access to Transit



Wake Transit Plan

How the Transit Plan Fits With the Trade-Offs

The Transit Plan balances the trade-offs based on input received during the extensive public outreach periods.

Ridership versus Coverage

The Transit Plan is mindful of the need to balance ridership goals (maximum ridership, fare revenue, vehicle trip reduction) with coverage goals (improved access, including access to every town). The final decision, based on public and Advisory Committee feedback, was to devote about 70% of the Transit Plan's operating dollars to services justified by high ridership and about 30% to coverage services.

- **Ridership-justified routes include commuter rail, key regional express bus lines, and the frequent local bus network in Raleigh and Cary.** These types of services serve areas with high population or employment density and often are designed to bypass congestion and other motorist delays.
- **Coverage routes are generally lower frequency routes that extend across the County, serving lower-density places where high transit ridership is not a realistic outcome.** These services include links to outer towns, coverage of low density areas, paratransit services, and the money set aside for local services. It is understood that the coverage services will not have high ridership as that is not their purpose. Instead, their purpose is to provide basic access across the County, even in areas of low demand.

Infrastructure versus Service

The Transit Plan proposes a balance between major infrastructure investments and abundant bus services. Emphasis is placed on infrastructure that improves the speed and reliability of operations, as this makes service less expensive per mile and, therefore, more abundant for a given budget.

- **Infrastructure investments are primarily focused on the CRT and BRT corridors.** Additional funds also are designated for park and ride lots, bus stops and signs, sidewalks, and other supporting infrastructure.
- **Service-focused expenditures help expand span (the number of hours the transit vehicles operate) across the network.** It also allows for additional frequency on many existing and new routes.

A range of technologies and services are proposed in the Transit Plan. Some of these are part of the existing Wake County transit system, but most are new as described below:

- **Commuter Rail Transit (CRT) is a train operating on shared tracks with freight and Amtrak vehicles in the freight right of way. It is envisioned to operate up to eight trips each way in each direction during the peak hour, with one to two trips during the midday and evening hours.** CRT would be expected to have a speed advantage over bus transit, but would not run as frequently as many bus routes. CRT stations are generally spaced 2-5 miles apart to boost speed of service.
  - » The plan proposes 37 miles of CRT on the NCRR corridor from Garner, Raleigh, NC State, Cary, Morrisville, RTP, and through Durham to Duke University. Approximately two-thirds of the proposed mileage is in Wake County. A financial partnership with Durham County is assumed, so that Wake County will fund only its share. The CRT line from Durham to Garner is planned to be built as one complete project, to provide the greatest usefulness and link to the existing and planned transit network in Durham.
- **Bus Rapid Transit (BRT) includes a range of speed and reliability improvements, including but not limited to dedicated busways, priority treatment at traffic signals, and fixed stations with off board fare collectors to speed boarding.** Frequency is typically 15 minutes or better in the peak and off-peak periods and speed is dependent on the level of capital improvements. Stations are generally located at greater spacing than local bus routes, typically about ¾ miles apart. A simulation of what BRT infrastructure might look like is shown in Figures 7 and 8.
  - » **The Transit Plan includes approximately 20 miles of varying levels of BRT-related infrastructure improvements.** The BRT network would be built incrementally. Four initial BRT routes have been identified in the Transit Plan. Each of these is an independent project, although longer routes that connect to more destinations typically are more successful when applying for federal grants. Within each BRT corridor, some of the improvements can be made incrementally. For example, priority treatment at traffic signals can be implemented separately from dedicated busways, or dedicated busways can be built in phases.
- **Frequent Network.** While all BRT routes are expected to provide frequent transit service, many other bus lines will provide frequent service within the highest density areas of the community, including links among colleges and universities, employment centers, hospitals, dense residential areas and major downtowns. **The plan dramatically increases the Wake County year-round frequent network from 17 miles to 83 miles.**
- **Conventional Local Bus Service. Routes running every 30 to 60 minutes provide coverage across Raleigh and Cary, and any other municipalities that want to help fund such services.** Some of these lines have the potential to grow into Frequent Network services in the future. Where possible, these routes would make timed connections with each other to minimize waiting.
- **Intertown Links, connecting every town in the County to the core, usually with peak express service.**
- **Express bus service, similar to what GoTriangle operates today.** These routes are geared toward commuters during typical rush hours. They travel relatively long distances with few stops along the route.
- **Expanded demand-responsive service, for increased access across the rural area.** Additional funds will be available for TRACS, which provides on-demand paratransit service within unincorporated Wake County. Also, GoRaleigh's 0.75-mile on-demand service areas will widen as the number of routes increases.

BRT Infrastructure Example—Before and After

Figure 7: Typical arterial today

Figure 8: Arterial with potential center-running BRT

How the Transit Plan Fits with Community Input

The enhanced transit plan also looks at other goals emphasized by citizens and elected officials. All these objectives were kept in mind in development of the Transit Plan.

- Rider experience is an important element. Conditions at bus stops will be improved and upgrades will be made to new generations of fare payment and customer information tools.
- Ride reliability and speed will benefit from dedicated transit lanes.
- Frequency was increased on many routes based on conservative speed assumptions, particularly during peak hours.
- The plan includes a popular idea of improving the existing NCRR corridor to create regional commuter rail service, linking Wake and Durham Counties.
- More frequent rail service or increased frequency for commuter rail may be considered as part of Wake County's future transit planning studies along with possible rail service toward Wake Forest and into Johnston County.
- An extensive frequent network would change how people get around the urban core, making it easy to reach many Raleigh and Cary destinations from anywhere in the County.
- High-infrastructure fixed-route transit may promote denser land uses and economic development in combination with real estate demand that is already evident.
- There is a desire to improve connection to major destinations such as universities and colleges, hospitals, the airport, and major employment centers.

How the Transit Plan Measures Success

As with any new transit or expanded transit routes, productivity (ridership per unit of cost or "bang for buck") of the system will be lower when initially compared with the existing system. As new routes are added, ridership will start off slow but will grow as people change their travel pattern. For example, choosing to ride transit rather than drive or share a ride with others. As frequency and span increases, riders will begin to consider using the expanded system for more of their needs. For instance, if transit is available around work shift schedules, it becomes a more viable option for commuting.

Success of the Wake Transit Plan will be measured in a range of ways. Each group of people (riders, transit agencies, municipalities, taxpayers) may prioritize these criteria differently. The key ideas are:

- Ridership
- Coverage
- Spending on Infrastructure
- Customer Service

Key Idea: Ridership

For ridership, fit service to demand (commuter service and frequent network).

One way of measuring the ability of the system to attract riders over time is to examine how many people it reaches. We examined the proposed network's coverage using the same methods used to examine the four alternatives. We conducted a spatial analysis to estimate two important indicators:

- How many people and jobs are near any all-day transit service? This tells us how extensive the total reach (thus coverage) of the system is.
- How many people and jobs are near Frequent Network service? This number tells us how many people are close to the most useful services, which are most competitive with other modes.

Figure 9 shows the percentage of all people and jobs near each of these network tiers. In both cases, the reach of the total network has increased, while the reach of the Frequent Network to jobs has more than doubled, and the population has more than tripled. What's more, not only has the total number of people and jobs near some kind of all-day transit service increased, but compared to today, that transit is likely to come more often, operate for more hours, and run in both directions on the same street.

The County contains a vast range of development types, from dense urban cores to rural areas. These differences imply dramatically different transit needs and demands. The Transit Plan is designed to meet these diverse needs and demands.

Where high or increased ridership is the objective, the transit industry has found the following service types to be most successful:

- Peak-hour Commuter Express service bypassing congestion for access to major employment centers. In this plan, commuter rail and regional express service meet this description. While commuter rail takes over the Raleigh-NC State-RTP-Durham express market in the Transit Plan, express buses remain important to connect RDU to all the major cities of the region and to provide long-distance commuter services within Wake County. GoTriangle will continue to provide express services between Wake County and adjacent major destinations such as RTP, Durham, and Chapel Hill.

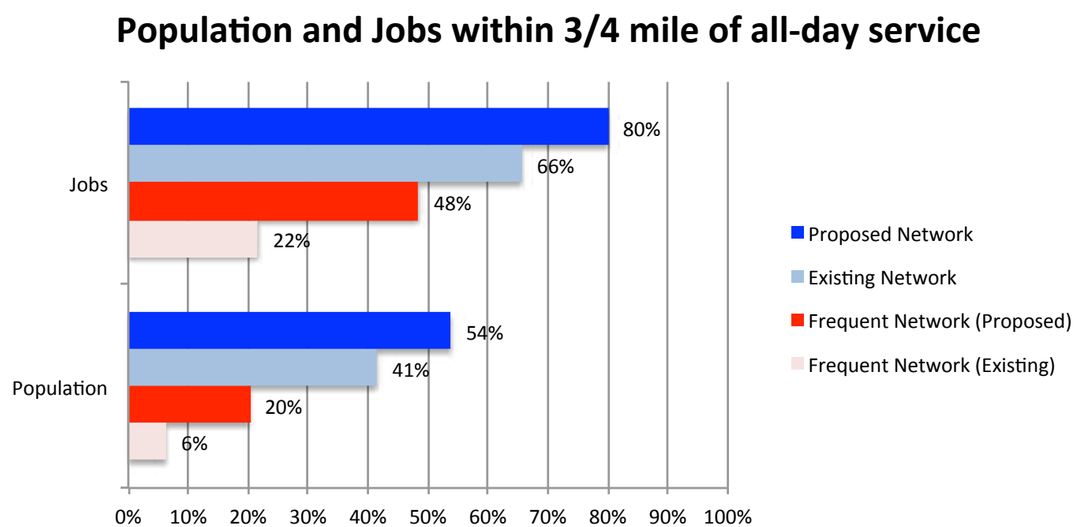


Figure 9: Proposed Network Coverage (Data source: Wake County Population and Employment Projections 2010 Base Year Data)

Figure 10: Transit agency frequent network branding examples from Portland, Minneapolis, and Bellingham, WA

- All-day Frequent Network (service every 15 minutes or better all day, running late into the evening and all weekends) following development patterns that provide an abundant market. These patterns tend to feature:
  - » Density, because higher density means more potential customers around each stop.
  - » Walkability, because transit functions well only where people can walk to the stop.
  - » Linearity, because transit seeks to run the fewest routes possible so it can run the highest frequency possible, which means transit does better when major destinations are arranged in a line so one route can serve them.
  - » Proximity, because crossing long rural gaps to more distant towns makes a service more expensive to run for a given number of riders.

Many transit agencies are now branding their Frequent Networks as a distinctive layer in the larger system. Some examples of transit information system elements incorporating Frequent Network brands are shown above.

Frequent Service has many distinct benefits, including the following:

- It transforms the experience of using transit, from "I have to build my life around the schedule" to "transit is there whenever I need it."
- Where frequent lines cross, transferring between them is fast so frequency is the glue that combines local routes into a network.
- Frequent service to places with other favorable land-use indicators (density, walkability, mixed uses, proximity to established desireable markets) is attractive enough that some people and organizations will make location decisions based on where it is. This improves the fit of the transit network to the geography of people who value it.
- Frequent service by itself generally does not cause land values to escalate in all markets in which it is present. As a result, the Frequent Network is an affordability tool because it can be extensive enough that it is able to serve areas where housing is available at even the lowest price points.
- Larger cities find that Frequent Network service is sufficient to support densification and is made possible, for example, by fewer parking requirements, reflecting the lower car ownership where transit is of high quality.

Although the Frequent Network focuses on Raleigh and Cary, where existing development supports it most, it can be extended in the future as other areas develop the necessary density, walkability, linearity, and proximity. To this end, 30-minute service is provided on many lines across Raleigh, Cary, Morrisville, and Garner that have the potential to grow into frequent services within the next decade. Frequent lines in other places can arise depending on future development activity and local government interest.

Key Idea: Coverage

For coverage, provide essential links and support local initiatives.

Coverage services do not anticipate high ridership, but exist to ensure that all communities are served. Because only 30% of plan resources are devoted to coverage service, the Transit Plan is careful to apportion this service equitably as well as to meet the greatest need. To this end, the plan provides:

- Links from the outer towns not served by other service (all but Raleigh, Cary, Morrisville, and Garner) into the Raleigh-Cary core.
- Lower frequency routes retaining current coverage to lower density parts of Raleigh and Cary (using in part City of Raleigh and Town of Cary funds already devoted to this purpose).
- A match program for towns other than Raleigh and Cary. Under this program, the plan sets sufficient funds to provide half the cost of a local bus service in each town with participating towns paying the other half. Each local government will be free to pursue the program or not.
- Expanded funding for TRACS demand responsive service for lifeline needs to all the rural areas of the County.

Key Idea: Spending on Infrastructure

Capital expenditures improve bus speed and reliability.

CRT is used to define a train focusing primarily on longer-distance travel predominantly for commuters and mostly serving the peak hours. Trains operate on multiple tracks shared with freight and Amtrak services. Commuter rail has speed advantages over bus transit but does not operate at the same level of frequency as most of the bus services in the Transit Plan.

BRT encompasses a wide range of tools that can help keep buses on schedule. The most intensive form of BRT provides dedicated lanes for buses. Other interventions might include:

- Modifications at intersections that allow buses to bypass traffic stopped at signals.
- Signal timing adjustments that give a small advantage to a bus when it is present, an advantage often undetectable by motorists.
- Station-like stops with tools to speed boarding such as ticket machines that allow customers to pay before they board. Some of these stations also provide easier boarding for wheelchairs and other mobility devices.

The Transit Plan envisions that these tools would be deployed along the following corridors, at minimum:

- Western Boulevard between Raleigh and Cary;
- On or near Capital Boulevard between Peace Street and the intersection with Wake Forest Road (this short segment would be used by several converging bus routes from the north)
- Along New Bern Avenue between Raleigh Boulevard and WakeMed
- Along South Wilmington Street between Raleigh and Garner at US 401

In each case, the mix of tools to be used would be based on a segment-by-segment analysis of each street, with the goal of achieving the greatest possible reduction in bus delay at the lowest cost. Where large numbers of boarding passengers are expected, stations or stops would be designed to increase the safety and comfort of waiting passengers.

Key Idea: Enhanced Customer Service

Capital and Service expenditures to enhance the customer experience

The Transit Plan envisions a system in Wake County where the following principals are held up as paramount: Accessibility, Comfort, Security, Reliability, Cleanliness, Courtesy, and Communication/Wayfinding. Funding is provided in the plan to support all of these measures, including enhanced stop amenities, better access to stops, better lighting, new vehicles, more drivers, and additional signage.

Vision for the Future: Beyond 2027

Many Wake County residents and stakeholders participating in this process expressed ideas for more transit beyond the first 10 years. The existing bus system has expanded modestly over the years, based on available funding, as population and demand has grown. It is anticipated that as the enhanced system is implemented and grows in popularity, there will be increased demand for even more transit in Wake County. If the new elements—CRT, BRT, and expanded frequent network—are successful in this next 10 years, the County will be able to leverage that success to apply for additional state and federal funds to expand the infrastructure and continue to increase service.

This Wake Transit Plan does not include a detailed vision after the first 10-year horizon. However, the following elements were heard during the planning and outreach phases of this study:

- Increase service on the routes shown on the Transit Plan as 30-minute headways to add them to the Frequent Network (15 minutes or better).
- Increase service on the routes shown on the plan as 60-minute headways to make them 30-minute routes.
- Add new bus routes within the County.
- Increase frequency and duration of connections to all municipalities.
- Add commuter rail service on the northern (CSX) rail corridor, potentially as far north as Wake Forest (may be constrained due to freight operations).
- Increase frequency on the east-west rail corridor (may be constrained due to freight and Amtrak operations).
- Extend the east-west (NCRR corridor) CRT line past Garner into Johnston County (Wake County funds would be spent only for the County's share), and/or past Durham into Orange and Alamance Counties.
- Extend BRT improvements further along the first four corridors or make additional infrastructure improvements on the initial corridors and add BRT improvements along other candidate corridors.
- Continue to improve bus stops and access to bus stops.

3 Existing Conditions

Existing Conditions

The Wake County area is growing and changing quickly. The Wake County's Transit Choices and Wake County Transit Alternatives reports detail existing conditions in Wake County (Chapter 3), including who lives here, where they live, and how they travel.

Population Growth

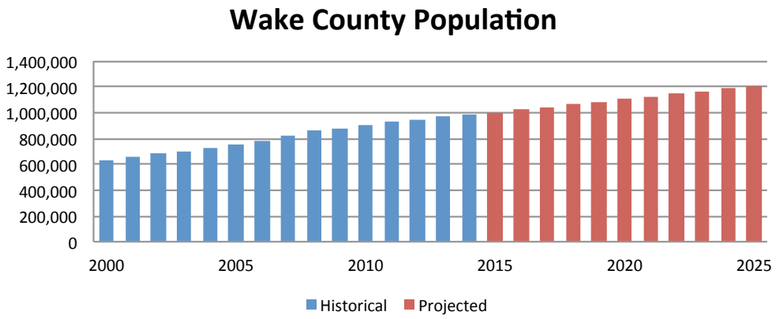


Figure 11: Wake County Population Growth (Data Source: NC OSBM State Demographics, October 2014)

Wake County has more than one million residents today and is expected to add another quarter million in the next 10 years (about the size of the City of Durham). The population is estimated to increase by 63 people every day, including births, deaths, and people moving in and out of the County. If the County grows by 25%, congestion will also increase and alternative modes of transportation such as transit, walking, and cycling will have to play a larger role in how residents get around.

More than half of Wake County's population is between the ages of 18 and 65. They represent two groups that tend to be particularly reliant on public transit.

Population and employment density are critical measures of an area's ability to support transit. Density provides the high concentration of demand that transit thrives on and raises issues of congestion and the need for parking that transit helps address. Density is a critical measure of a place's ability to support transit because it allows us to compare the relative concentration of people in areas of the city. **Where there are more people living or working per unit area, there are more people who can choose to use transit.**

In Wake County, significant population density exists around the center of Raleigh and north of downtown between I-440 and I-540. Smaller pockets of population density are located in Cary and Garner.

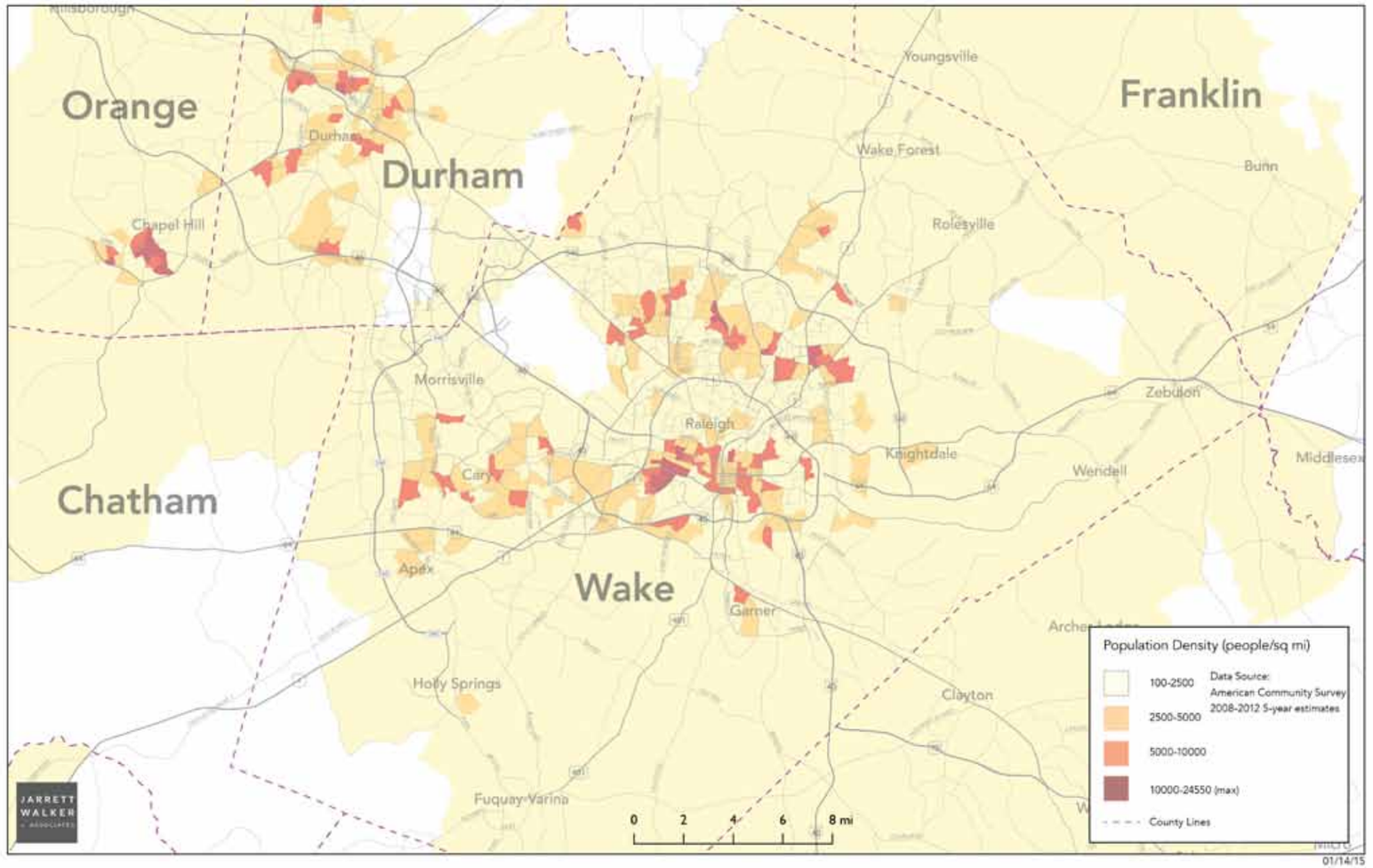


Figure 12: Population Density Map

Employment density is similarly most concentrated in central Raleigh, particularly between downtown and NC State, as well as in the North Hills area. Other major sites of employment density include near Research Triangle Park, several major hospitals/health centers, and along the Capital Boulevard corridor. Future development patterns will likely shift the demand for transit and are guided both by market pressures as well as local zoning and planning documents.

Existing Conditions

Employment Density

Employment density (how many people work in a place per unit area) is most concentrated in central Raleigh, particularly between downtown and NC State. Employment density tells us where people are going to work, but many places with dense employment are also destinations for shoppers, people coming to access services, and other purposes related to the businesses and institutions people are employed by. Other major sites of employment density include near RTP, several major hospitals, and along the Capital Boulevard corridor.

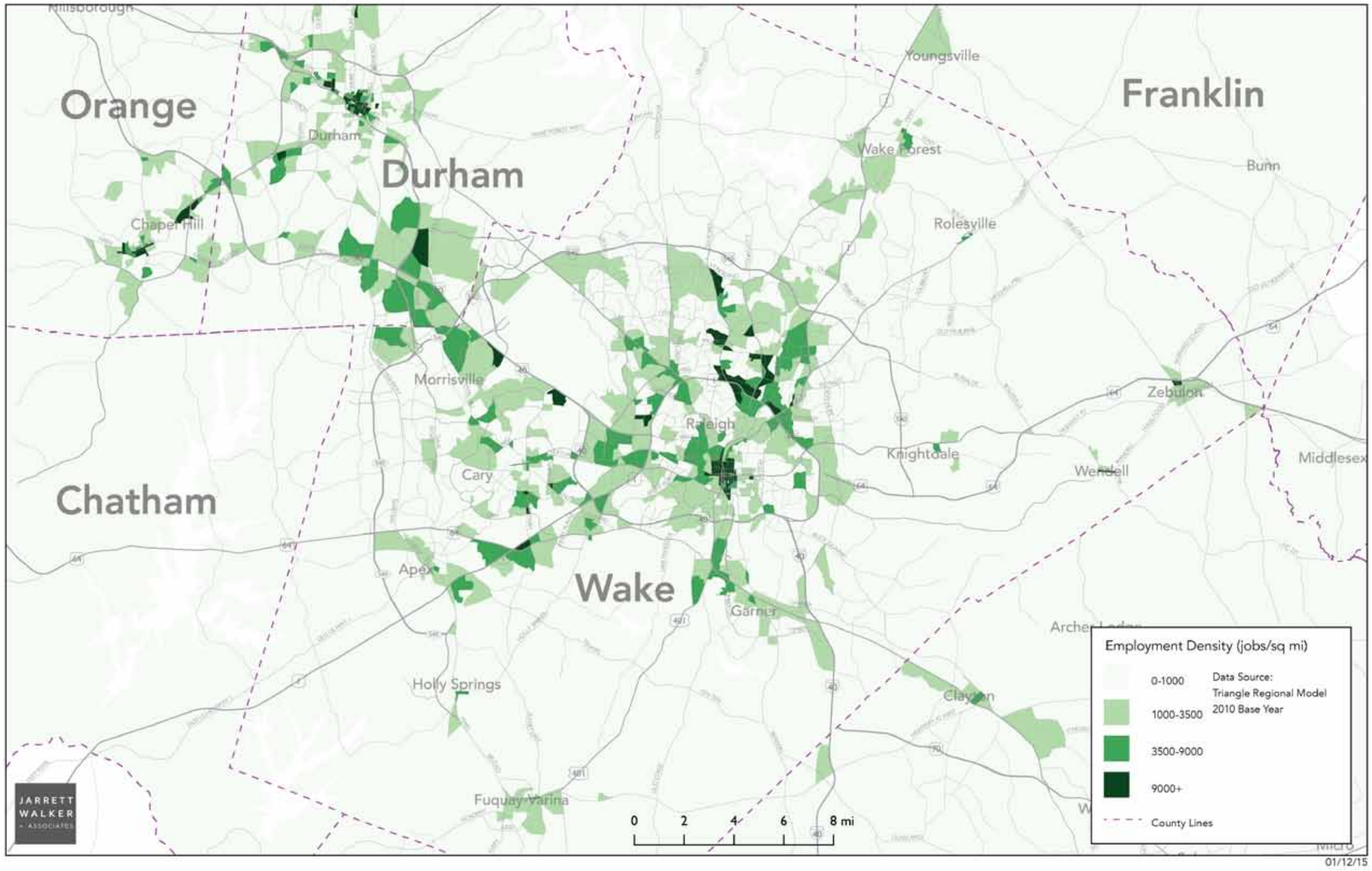


Figure 13: Employment Density Map

Existing Conditions

Socioeconomic Characteristics

Areas with high densities of people in poverty, shown in Figure 14, and zero-car households, shown in Figure 15, are often aligned with transit use, and transit is often asked to focus some of its resources on enhancing mobility for low-income people. For them, transit means access to jobs and opportunities, inadequate transportation is a common barrier to employment.

In Wake County, the highest concentrations of people in poverty are found in census block groups containing public housing developments. More generally, higher densities of people in poverty are found in southwest Raleigh, which is likely influenced by the presence of many NC State students, and the east side of Raleigh between downtown and the I-440 Inner Beltline, as well as northeast Raleigh between I-440 and I-540. A total of 4.6% of households in the County have no vehicles available to them. The largest concentration of zero-car households is in and around downtown Raleigh, and also scattered throughout Wake County, with particularly high rates near Zebulon, Fuquay-Varina, and Garner.

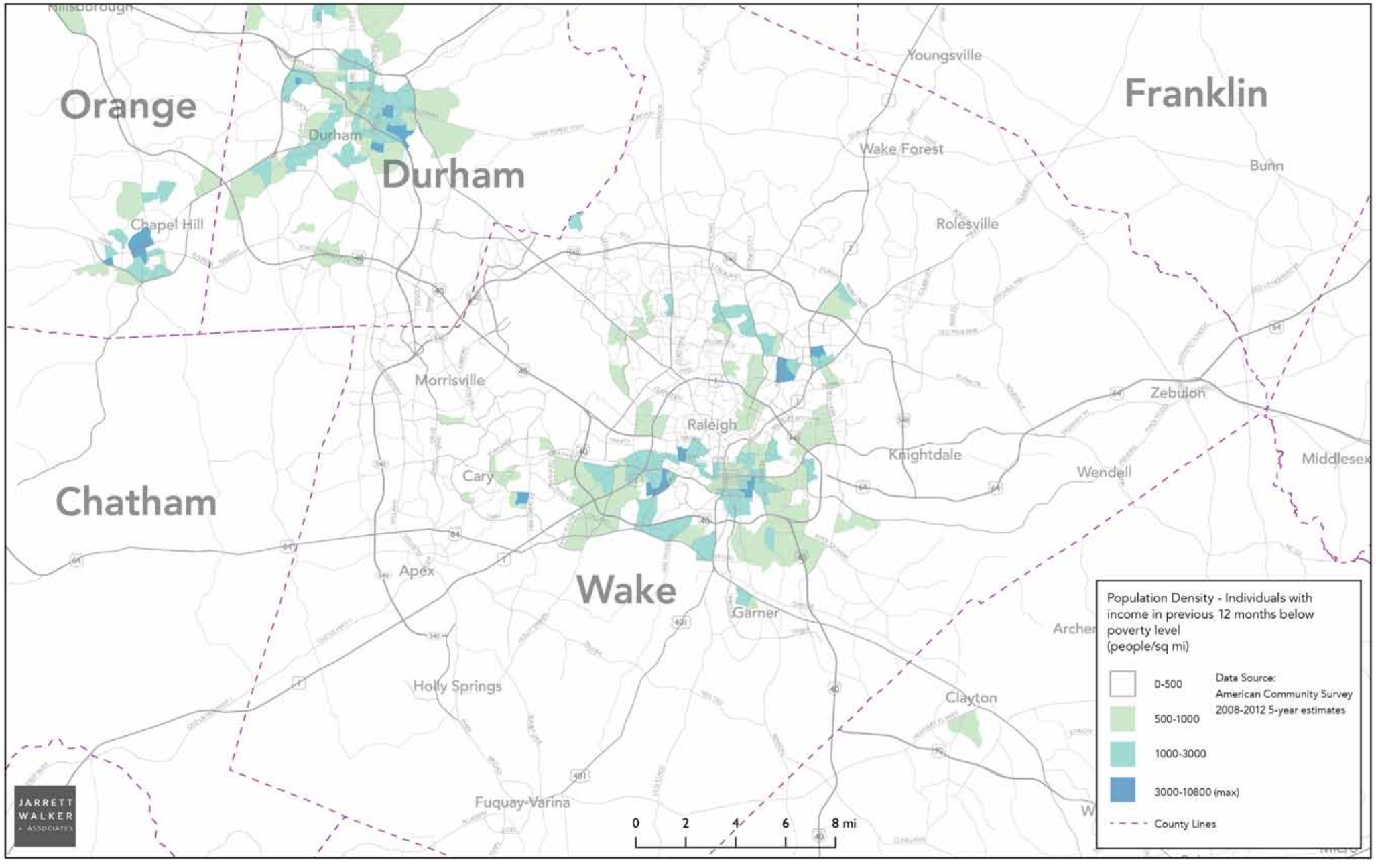


Figure 14: Density of individuals in poverty

Existing Conditions

Some of the areas with higher concentrations of low-income populations also have a high percentage of minority residents (shown in Figure 16). For example, the highest densities of African Americans are found in southeast Raleigh and Garner, with a smaller significant concentration in northeast Raleigh between the two interstate loops. As it grows, Wake County is becoming more racially and ethnically diverse, with a current minority population of 39% within the County. In and of themselves, race and ethnicity are typically not as relevant to transit use. However, since race and ethnicity can be related to other factors, it can be an important element in understanding transit use.

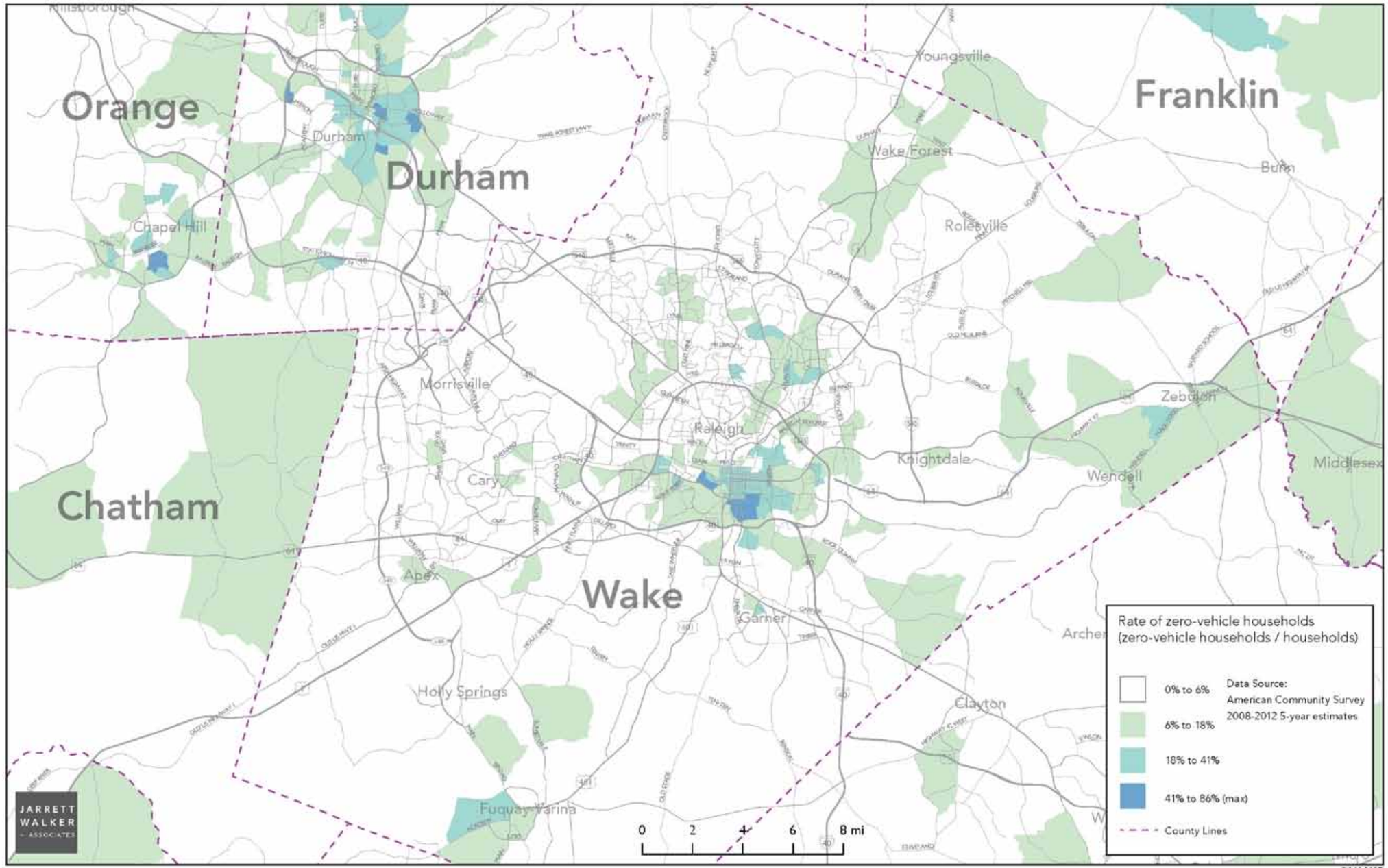


Figure 15: Percentage of households with zero vehicles

Existing Conditions

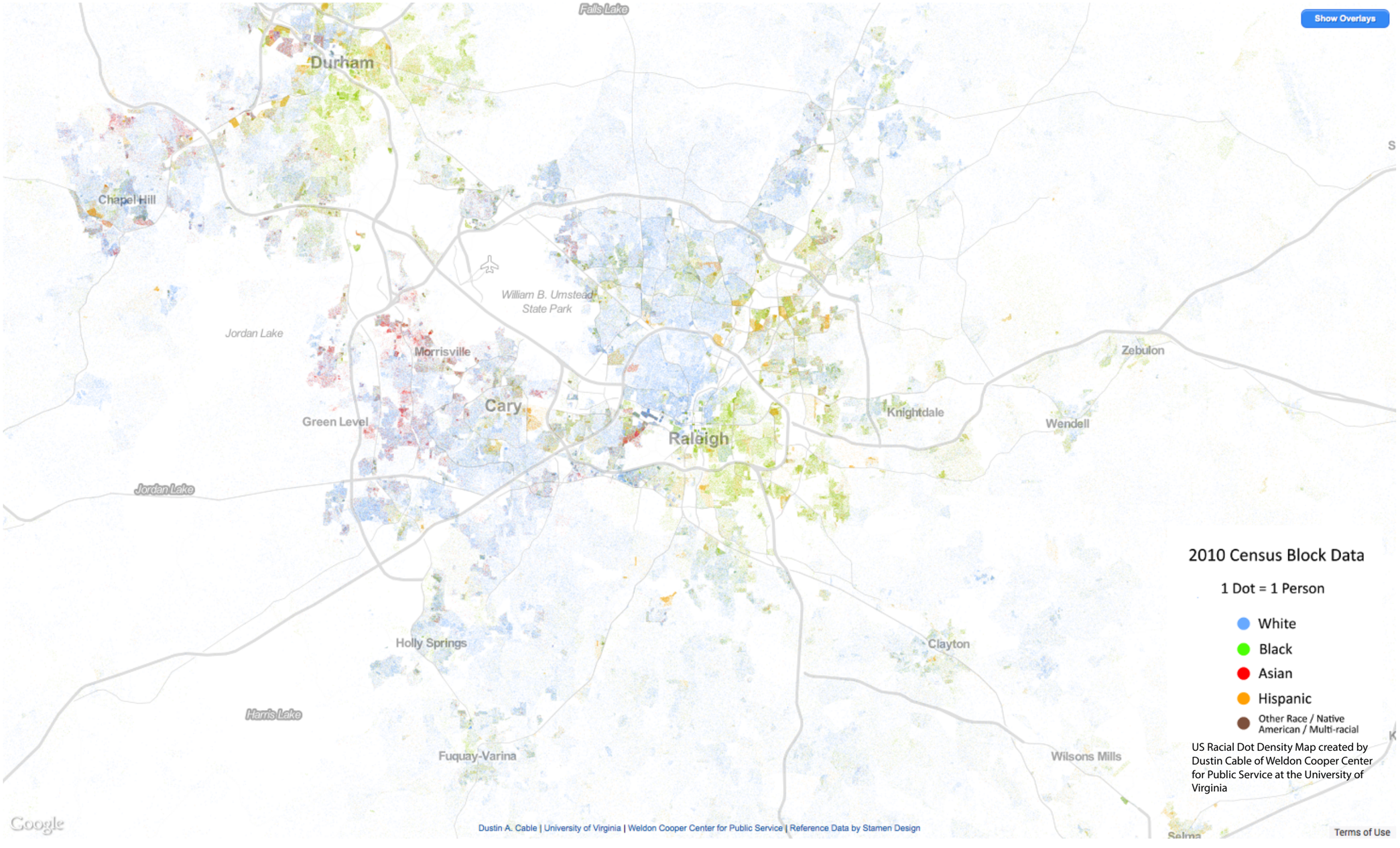


Figure 16: Wake County Racial Dot Density Map (Courtesy of Weldon Cooper Center for Public Service at the University of Virginia)

Existing Conditions

Congestion

Using traffic estimates, it is possible to predict which roads in the County will see the greatest increases in congestion in the coming years. The maps shown in Figure 17 and Figure 18 display the level of congestion drivers experienced in 2010 versus what they can expect to see in 2040. As traffic delays grow along the more heavily congested routes, the people who use them may seek relief in the form of transit. Transit services which can bypass roadway congestion such as commuter rail transit (CRT) or bus rapid transit (BRT) are particularly attractive.

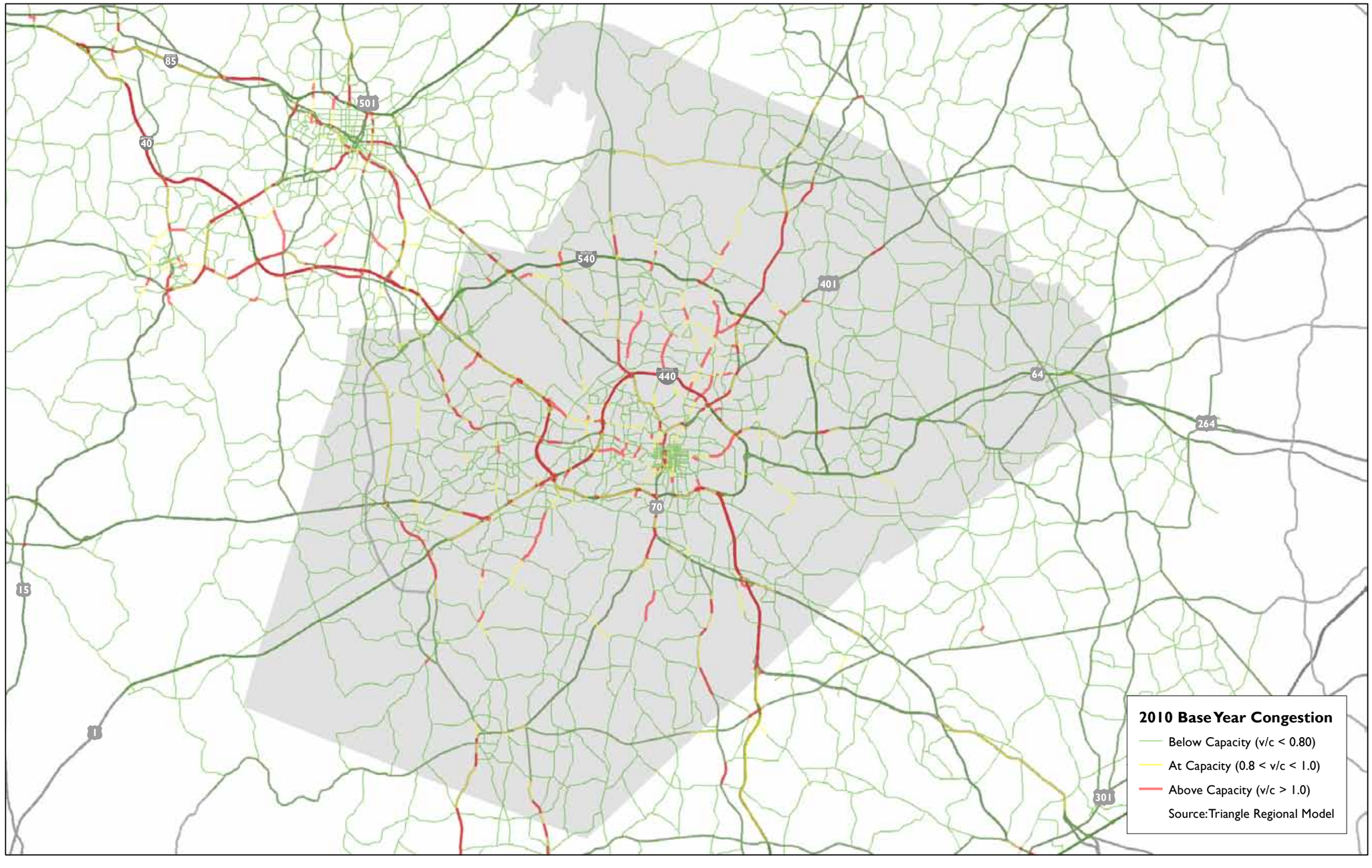


Figure 17: 2010 Congestion Map

Existing Conditions

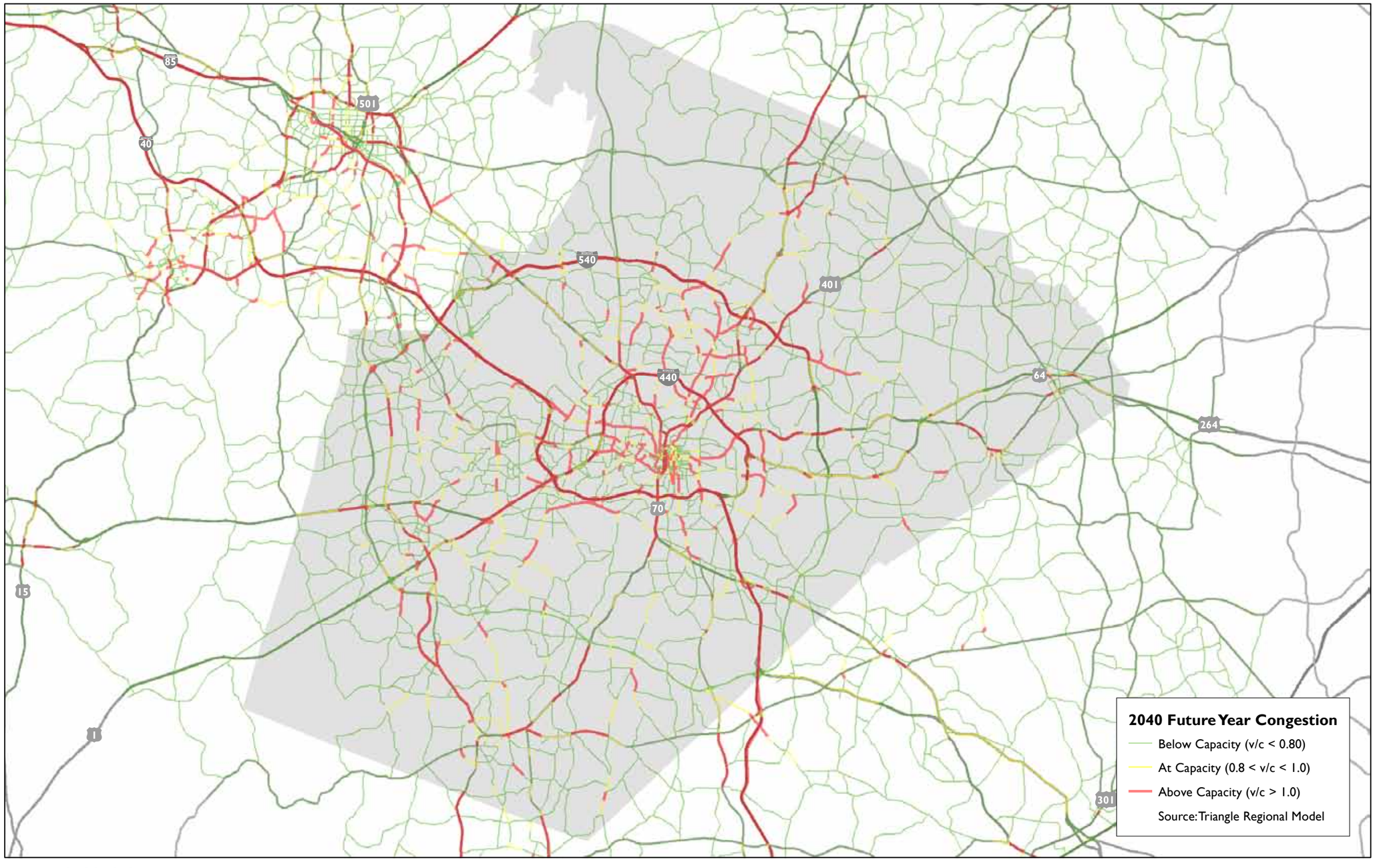


Figure 18: 2040 Congestion Map

Existing Conditions

Transit Commuting

The primary mode of travel in Wake County is the private automobile, although almost one in five commuters makes a different choice. **Transit is currently used by just 1.1% of commuters across the County,** although this number is notably higher in some small areas with higher density, walkability, and transit service.

Along GoRaleigh's existing high-frequency (15-minute) corridors (Capital Boulevard and New Bern Avenue), transit commuter rates exceed the County average, with some at rates greater than 10%. **In residential areas south of NC State with frequent Wolfline service, transit commuter rates are up to 21%. In areas immediately south of downtown Raleigh, between 25 and 50% of commuters travel by transit.**

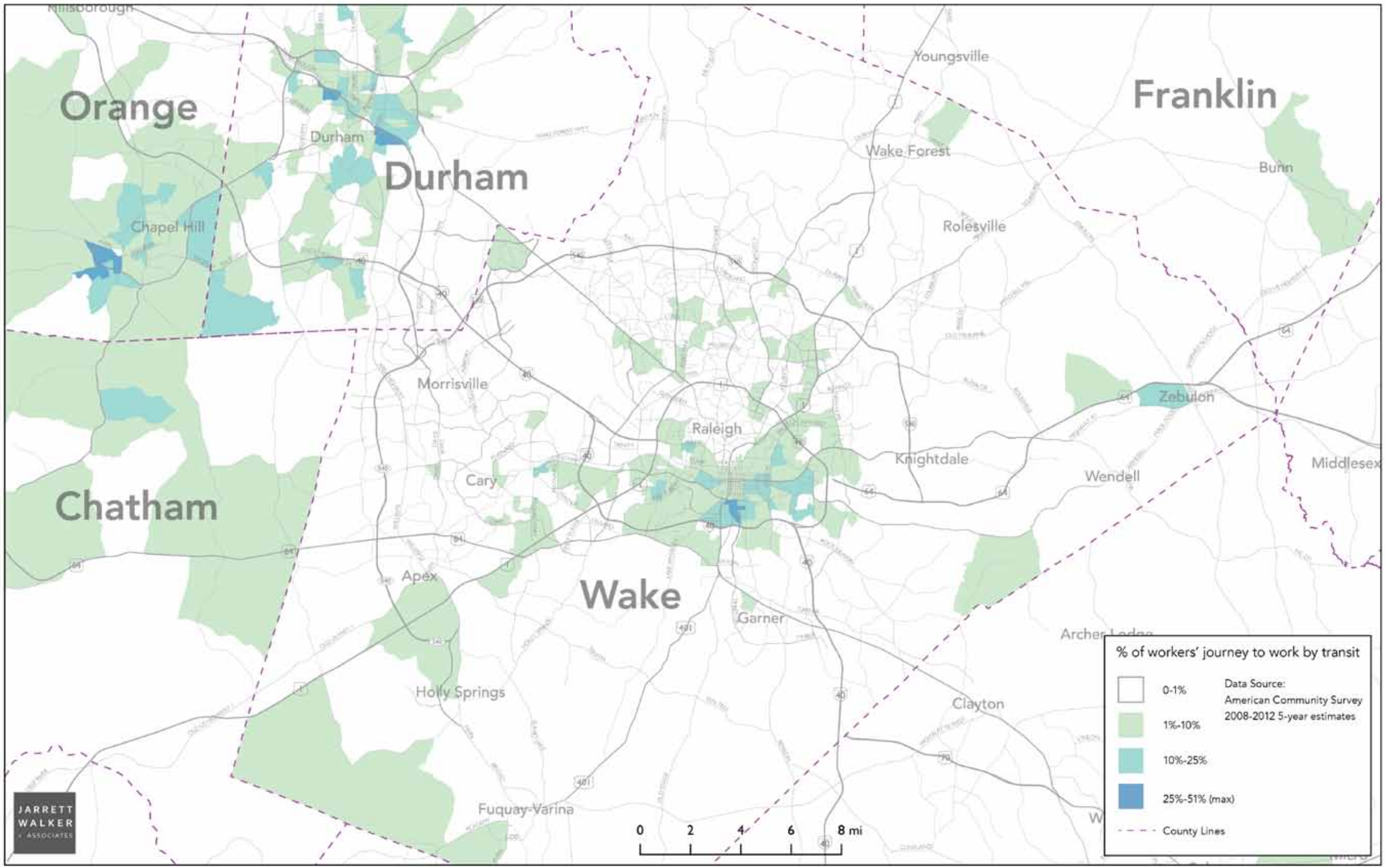


Figure 19: Percentage of workers who travel to work by transit

Existing Conditions

Existing Transit

Buses that operate along established routes, known as fixed-route transit, in Wake County are provided by:

- GoTriangle—for intercity services and links to Durham, Orange, and Johnston Counties
- GoRaleigh—a City of Raleigh service
- C-Tran—a Town of Cary service
- Wolfline—the campus circulation system of NC State. (Wolfline service will not be affected by the Wake County enhanced transit plan and will continue to operate independently, as it does today. Therefore, it is not included in the following descriptions.)

The Town of Wake Forest also funds a local circulator, operated by GoRaleigh. Apart from the municipally funded services in Wake Forest, Raleigh, and Cary, there is essentially no local fixed route local transit service. GoTriangle focuses on longer-distance express links.

Paratransit service for persons with disabilities is provided in Raleigh within 0.75-mile of GoRaleigh fixed routes in Raleigh and Wake Forest, and town-wide within Cary. Wake County's TRACS program provides on-demand transit access for

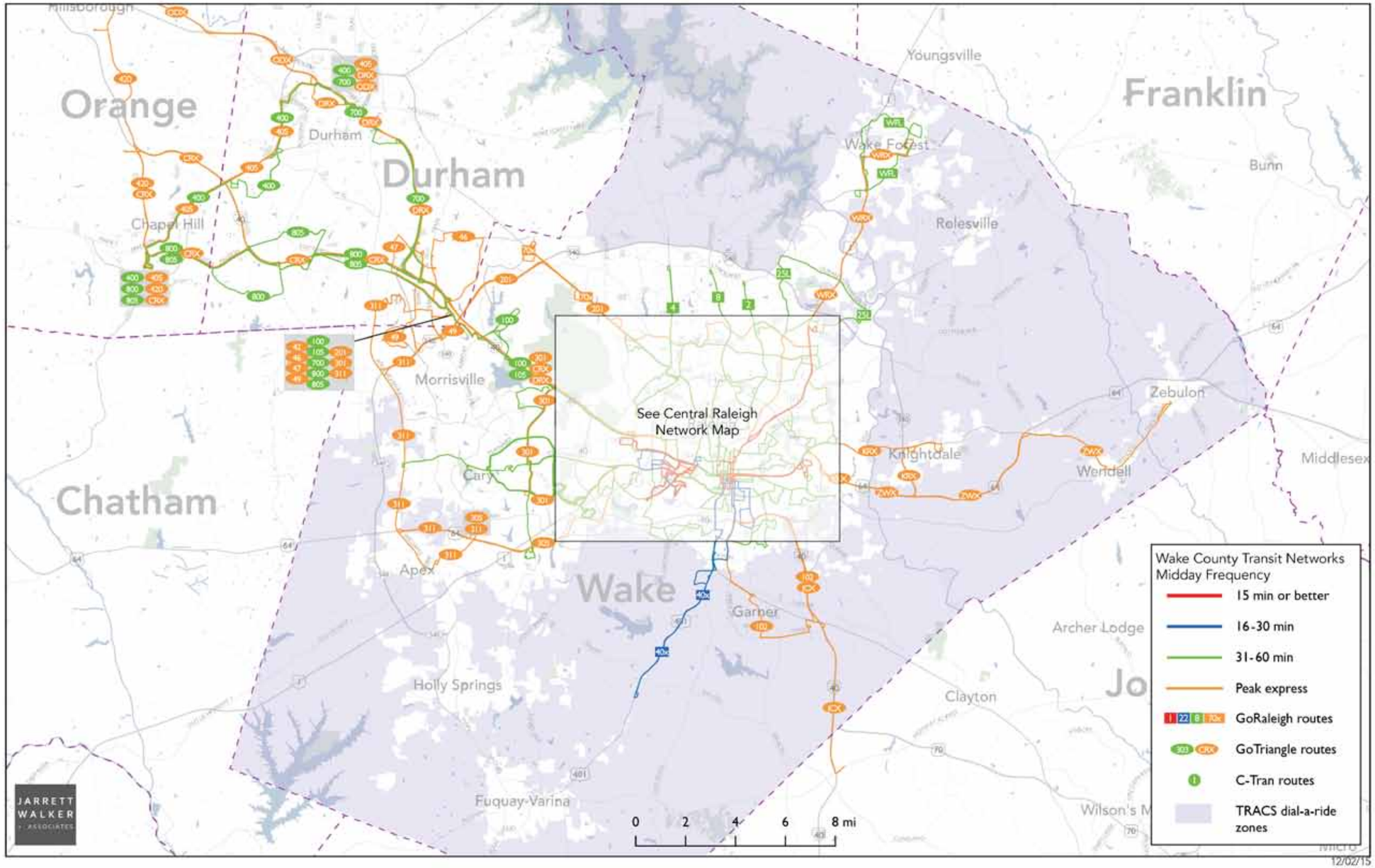


Figure 20: Wake County Transit Frequency Map

Existing Conditions

mobility impaired residents within rural areas of the County and agency-sponsored human services transportation across the County by reservation.

Frequency, a critical determinant of transit's usefulness, is very limited. High frequency service, which comes every 15 minutes, is currently limited to Capital Boulevard, New Bern Avenue, and the Wolfline circulation system within NC State. Other routes provide more frequent services during some weekday periods. Transit routes are shown classified by frequency for Wake County in Figure 20, and for central Raleigh in Figure 21.

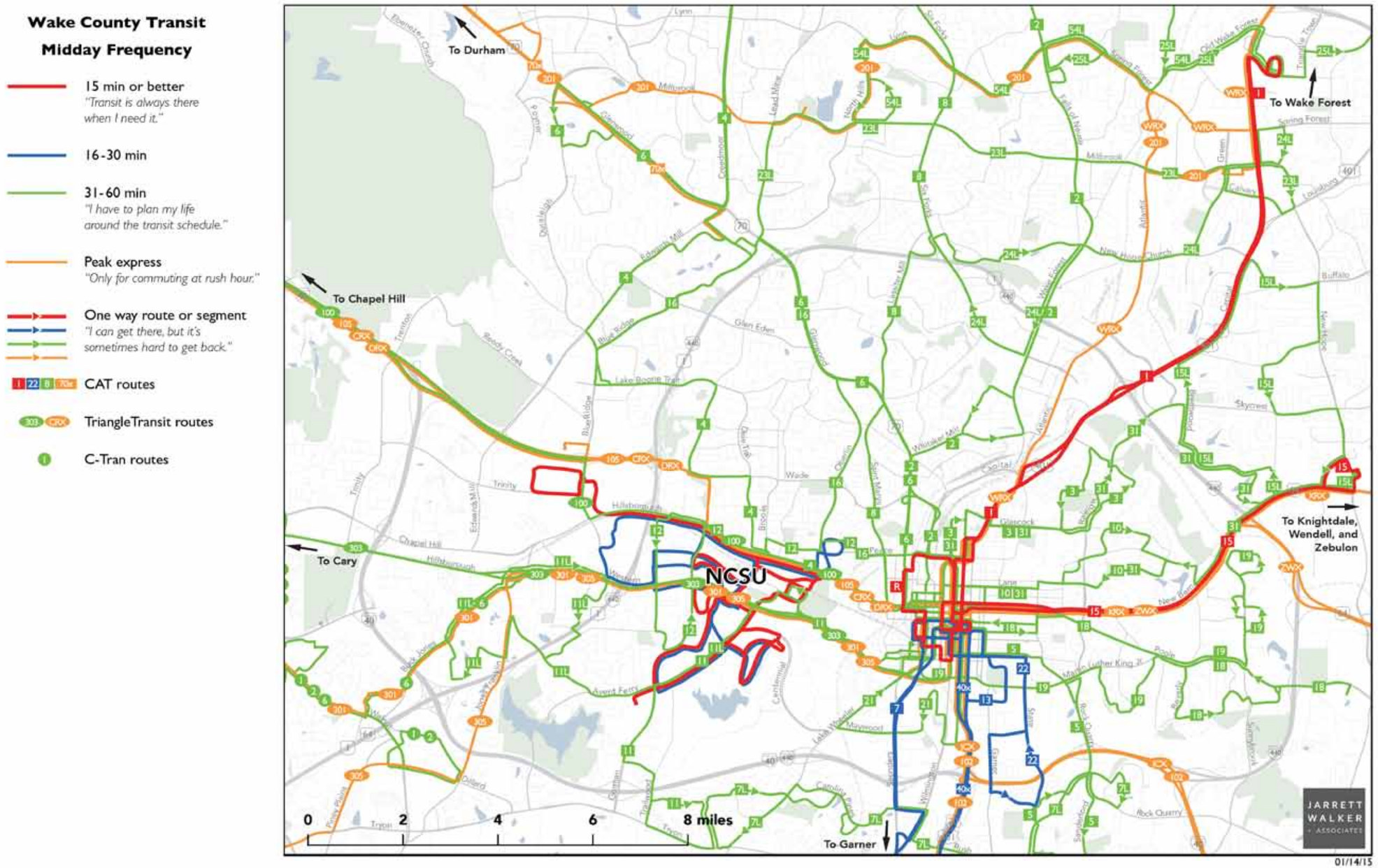


Figure 21: Central Raleigh Transit Frequency Map

Existing Conditions

Ridership by Stop

Figure 22 and Figure 23 show the ridership by stop for each of the four transit agencies. Because the map shows boardings, it does not represent people's actual origins and destinations, only the nearest stop. Areas with sustained residential and employment densities generally correspond with the higher boardings.

These maps are based on existing transit services, not a map of ridership potential. Frequency of service, in particular, is so low that the transit system is not useful for many trips. As a result, current ridership is not an indicator of transit demand. However, it does help show the impacts of service levels, as the concentration of ridership along high-frequency corridors indicates.

At the regional level, the pattern of ridership is clear—central Raleigh, from I-540 in the north to Tryon Road in the south, and from New Hope Road in the east to I-40 in the west, and particularly NC State, account for the great majority of high-ridership stops and corridors. Central Raleigh includes the highest population and employment density in the County, is the largest transit market, and is where the majority of the County's transit ridership is located.

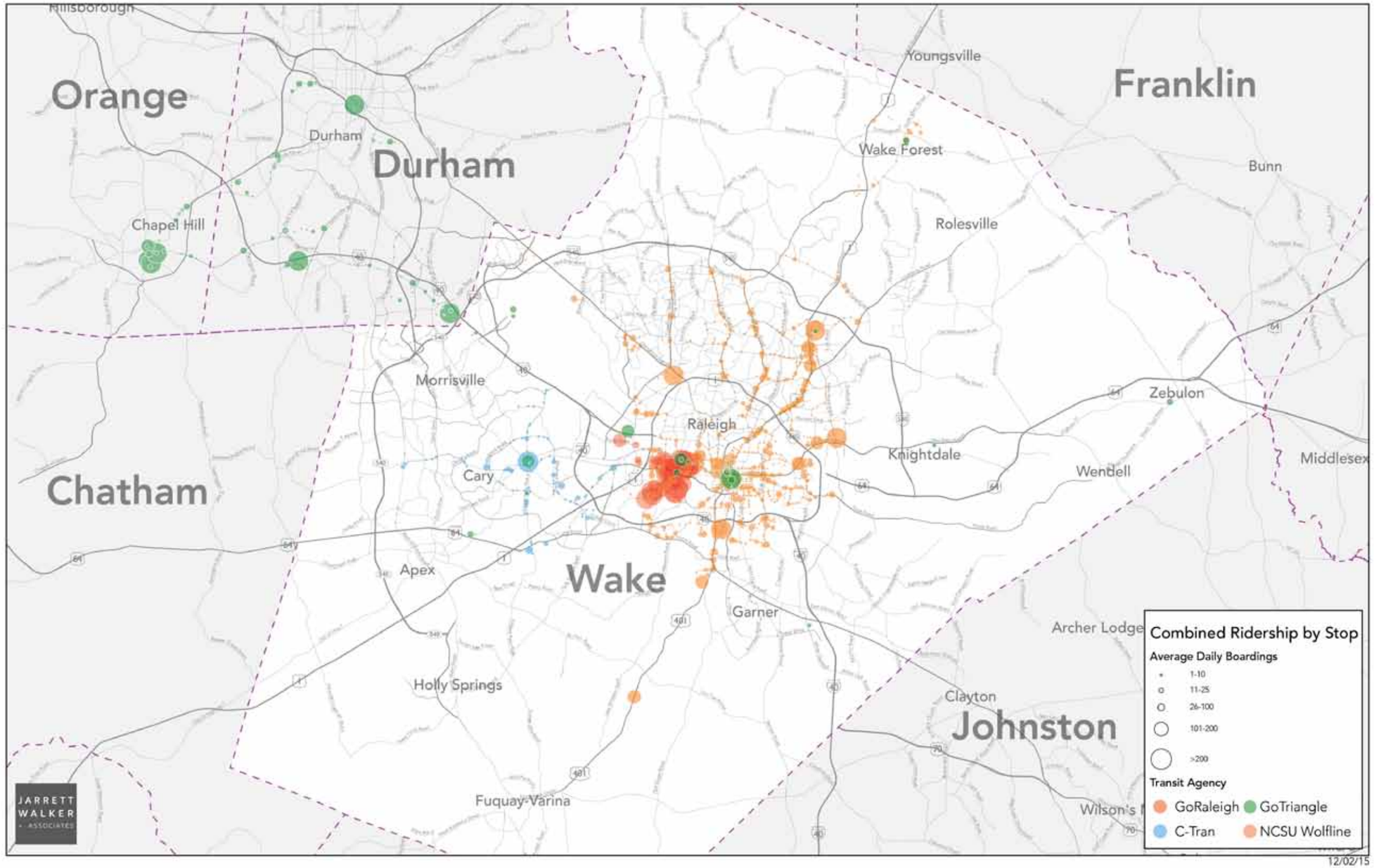


Figure 22: Wake County Stop Ridership

Existing Conditions

Outside of central Raleigh, the other regional centers of Durham and Chapel Hill, as well as the Regional Transit Center, are sites of major activity in Triangle Transit's network.

Downtown Raleigh is a primary destination for riders of GoRaleigh and Triangle Transit, reflecting both its importance as a job center and the large amount of service concentrated here. The radial corridors extending out from downtown are sites of relatively sustained activity, particularly along New Bern, Wake Forest/Capital Boulevard, Lenoir, and Hillsborough.

GoRaleigh and NC State stops around the central academic and housing area of the university campus also enjoy sustained high ridership. West of Gorman Street, ridership drops off, corresponding to the less frequent service available there.

Outside of downtown, GoRaleigh's high ridership stops are most commonly found at major destinations like hospitals, malls, and big-box stores. There are several high-ridership corridors, such as Wake Forest Road/ Falls of Neuse (served by the 2, a top-five 60-minute route in terms of productivity, and the 60-minute route with the second highest average daily ridership), or Capital from Downtown to Triangle Town Center, where there is sustained boarding activity throughout. These corridors generally serve areas of significant population or employment density. Where there are few destinations and little density, transit ridership is rarely substantial.

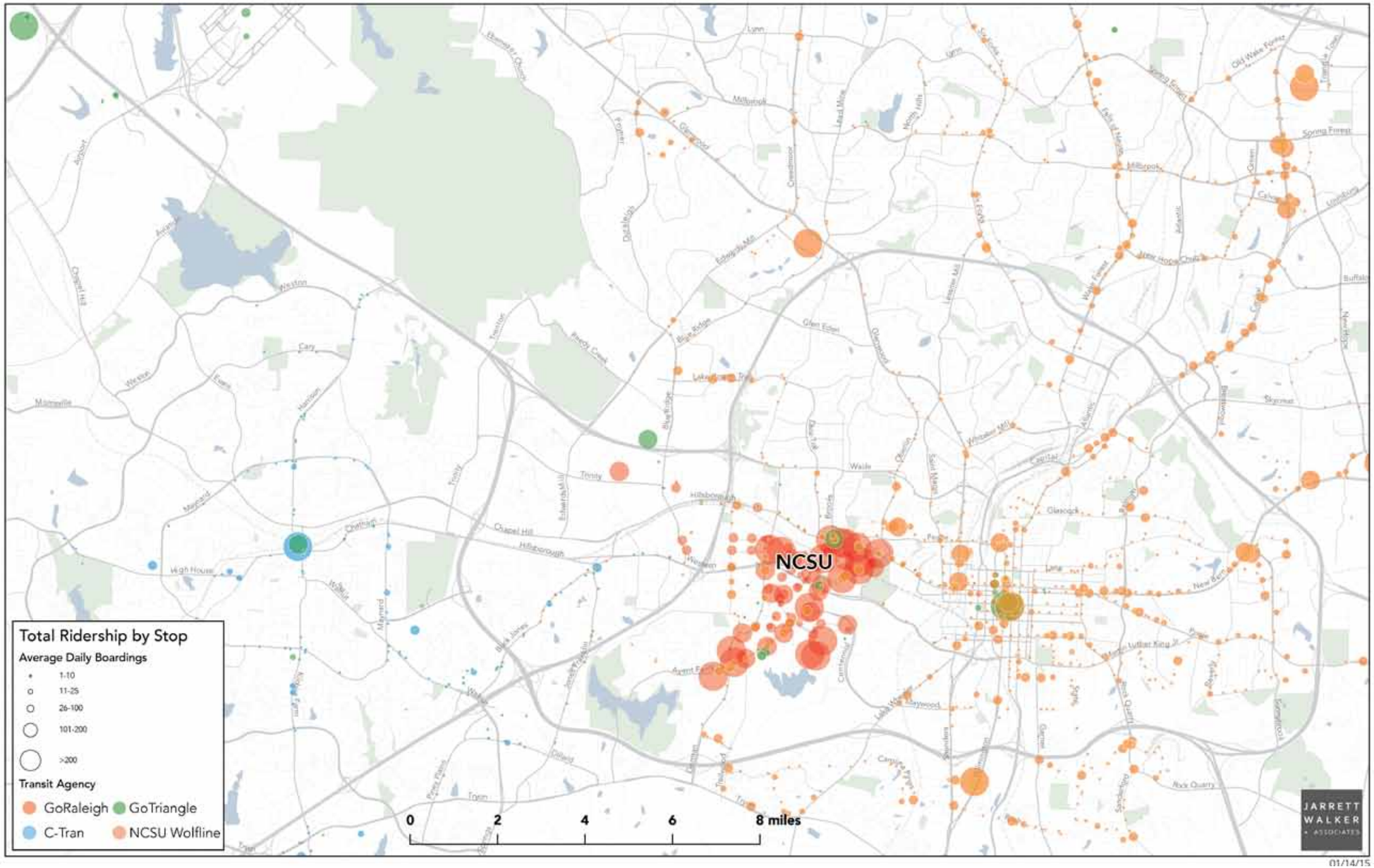


Figure 23: Central Raleigh Stop Ridership

4 Plan Development Process

Plan Development Process

The following section describes the process used to develop the enhanced Wake Transit Plan. More detail about the initial steps (trade-offs, first public input phase, and four scenarios) are detailed in the Wake County Transit Alternatives report.

Trade-Offs

The study began with the understanding that there is not one "right way" to build an enhanced transit system. During development of the Transit Plan, two primary trade-offs were identified:

- Ridership versus coverage. A ridership goal designs a system that would carry the maximum number of people. This would focus on serving areas where the built environment meets the necessary conditions for high ridership, which are strong density and continuity. A coverage goal designs a system to provide access to as broad an area as feasible. It would focus on serving every municipality and area of the County, even if at very low frequency and at the expense of areas with greater ridership opportunity.
- Infrastructure versus service. An infrastructure goal designs a system where more money is spent on up-front capital expenditures such as dedicated bus lanes, rail infrastructure or nicer vehicles. Some of this funding competes, to a degree, with the annual funding of operations, so a lower quantity of service can result, creating a tradeoff between infrastructure and service. The trade-off is mitigated if the infrastructure is focused on making service faster and more reliable, because faster service costs less per mile to operate.

Public Input

A great deal of emphasis was placed on helping stakeholders and the public to think about these inevitable trade-offs. A widespread public outreach program gathered feedback on these trade-offs from citizens representing the diverse socioeconomic and demographic reaches of the County. Following a formal kick-off presentation attended by over 500 people at the Convention Center in downtown Raleigh on December 8, 2014, project team representatives spoke to over 250 groups and events across the County and collected comments from approximately 4,300 people living and working in Wake County. Education was a critical element of this first phase of the public engagement process, and the presentation given at these meetings covered transit planning basics as well as information about Wake County.

In addition to broad engagement, the project team specifically targeted existing transit riders during the survey process. Small group meetings were held with Latino, African American, senior, and millennial residents to better understand the needs and dynamics specific to those populations. The survey results indicated some preference for ridership over coverage (70% ridership, 30% coverage), and a 50/50 split for infrastructure versus service.

While events and online engagement are valuable tools in the outreach process and provide unique opportunities to educate the public as they are engaged, the population interacting with the plan in this way is a self-selected group, so its views do not reflect the views of all voters. Therefore, a statistically-valid survey of 550 likely voters in Wake County was conducted October 5-8, 2015 by Fallon Research to reach out to a broader cross-section of the County population. Pollsters asked specific questions about transit in the County, including direct questions about the ridership-coverage trade-off. The poll results indicated a more balanced preference for both ridership and coverage focuses. Voters also were asked about their opinions on commuter rail service, bus rapid transit, and the extensive expansion of existing bus services.

Finally, a 76-member Advisory Committee met four times through the year. The committee was comprised of a diverse demographic mix of Wake County residents representing public officials, business owners, transit riders, students, and others. The group was given detailed information about the process, public input results, and issues and opportunities. Attendees helped sketch networks that reflected the various priorities of those in the County, and voted at key decision points to guide the design team.

The public indicated generally strong support for investment in BRT, CRT, and expanded bus service. In particular, they stated consistently strong support for bus service expansion. Of note, the respondents to the statistically-valid survey (the most accurate indicator of overall public opinion) indicated that although they largely don't use transit today, many indicated they likely would use an enhanced system. Over 85% of this same group also indicated that people benefit from enhanced transit, even if they do not use it themselves.

Corridor Assessment

Transit planning should not only consider where we are. It must also look ahead to where the County will be by considering anticipated future patterns of transit-conducive development. Accordingly, a detailed "transit suitability analysis" was conducted that looked at both 2010 and projected 2040 conditions for population, employment, zero-car households, income, congestion, and major activity centers across Wake County. It looked at existing congestion levels, existing trip frequency and design of land uses. This analysis developed mapping and numeric scoring for potential enhanced transit routes to allow for a detailed comparison of corridors and their likelihood toward transit ridership both now and in the future. This evaluation helped inform the planning process, as alternative corridors for both infrastructure and service were considered. Further details on the transit suitability analysis can be found in the appendix of the Wake County Transit Alternatives report.

Four Scenarios

Rather than building one transit plan based on the first round of input, four intentionally different scenarios were developed to demonstrate how the two sets of trade-offs might be applied within Wake County. This gave citizens a second opportunity to consider their priorities at a second public presentation at the Convention Center on May 11, 2015. Similar presentations were given in every municipality and across the County.

Once shown the potential practical applications of the different trade-offs, people were again asked to give their opinions on the best direction for the County's transit future. People did not vote on a particular scenario; rather, it was communicated that these four were simply demonstrations of potential combinations of the trade-offs.

When the four scenarios were developed, rail rapid transit (RRT) was proposed as a rail option that would operate with 15-minute frequencies within the existing rail right-of-way. After further analysis and coordination with North Carolina Railroad (NCRR) Company, it was determined that RRT was not feasible within its Wake County corridor at this time due to operational and physical constraints.

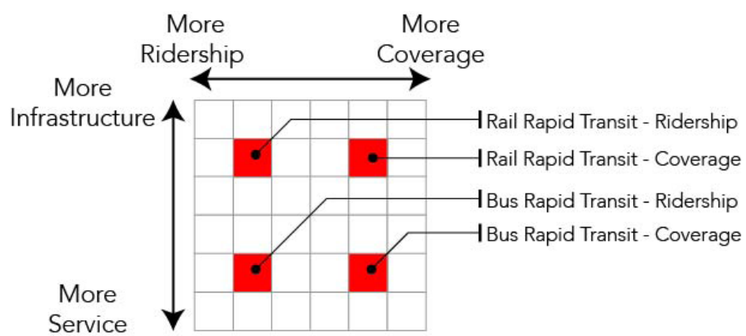


Figure 24: The Four Scenarios

5 Plan Implementation and Finance

Plan Implementation and Finance

Implementation

The existing transit providers in Wake County have provided guidance and funding to help develop this enhanced transit plan. All current services will be expanded as part of this plan and several new services will be added. The transit agency responsible for operating and managing each element of the Transit Plan will be determined during the next phase of planning and design, and will depend on geographic location, type of technology, cost, and anticipated efficiencies. Participating parties will enter into a formal agreement defining roles, responsibilities, and cost sharing for individual projects as they are pursued. Wake County and its partners have developed extensive governance structures to support successful plan implementation. These structures require transparency, create a venue for all Wake County municipalities to be engaged and establish the GoTriangle Board of Trustees and the Executive Board of CAMPO as the joint governing boards for Wake Transit.

The schedule of capital projects within the next 10 years is dependent on multiple factors, including successful grant awards. The planning and design process may begin for the infrastructure projects (the CRT corridor and the four BRT corridors) simultaneously, or it may be phased. Through that process, the corridors will be prioritized based on feasibility and cost. Individual projects or groups of projects will be submitted for federal grants and State Transportation Improvement Program (STIP) funding.

Since BRT can be built incrementally, improvements—–such as new buses, signal prioritization, off-board fare collection, level-boarding stations, or dedicated busways—can be built in phases. For example, the initial project may include dedicated busways on 50% of the corridor and additional lane-miles of dedicated busways will be added in future years as those sections of road are widened, redeveloped, or as additional funds become available. Corridors that are anticipated to have high ridership and fewer physical constraints (thereby lowering impacts and costs) are likely to move faster through the federal funding process.

To create a more useful commuter rail project, the CRT line was assumed to extend from Garner to Durham as part of the first phase. A line ending at RTP, and therefore almost entirely in Wake County, was considered. However, successful commuter rail services running only during peak hours rely heavily on a major dense employment center within walking distance of stations. While NC State and downtown Raleigh provide his to a degree, our analysis concluded that downtown Durham and Duke University also need to be on the line to generate strong two-way demand sufficient for the line to succeed.

The planning and design of this extensive rail project can take longer than the BRT corridors because the CRT line would need to be designed and then constructed as one project, rather than incrementally. The project will be a collaboration of many partners, notably the federal and state governments, Durham County, the North Carolina Railroad Company, and municipalities and communities involved in station planning. The success of this project is dependent on the collaboration of the involved parties.

The first few years of the Wake Transit Plan involve significant design and further study for projects that require significant investment. This is to balance careful use of tax payer dollars with thoughtful investment in transit. The Transit Plan's approach is to use strategic leveraging of federal and state funds, combined with existing and new sources of local funding, to deliver projects that connect regionally, connect Wake County's communities, provide frequent urban mobility, and link local service. The implementation of those projects and the timing of them will evolve as the design and study reveals new information.

After successful approval of the half-cent sales tax advisory referendum, funds wll be collected starting in the Spring of 2017. Some operating items in the Transit Plan will be noticeable fairly soon, such as including increasing weekend and evening service and some increases in midday frequency. Other items, like new routes or peak service increases, will be phased in as new buses are acquired and operations are deployed.

Small capital projects, such as adding bus stops along new routes, can be done during the Transit Plan's initial years. The transit budget allocates funds toward a range of capital improvements, such as bus stops and stations, nicer buses and park-and-ride lots. Many adjacent improvements, such as additional sidewalks, would be paid for by local programs.

The transit partners will work together to develop a detailed implementation plan that will identify and prioritize new enhanced bus service and facilities. Detailed studies will be conducted for larger capital projects. The outcome of these studies will impact project implementation. However, existing service will continue to operate and enhanced service will begin to deploy while larger projects are studied and gradually constructed.

Financial Plan Details

The Wake Transit Plan is fiscally constrained and is contingent on a variety of assumptions. The assumptions will evolve as information is modified and projections are updated to reflect actual results. The projects included in the Transit Plan will continue to be studied and new information may influence their cost and timing. Additionally, overall inflation assumptions, availability of local sources of revenue and growth assumptions, competition for federal funding for projects and successful access to capital markets, and regional partnerships will continue to influence the overall financial outlook of the Transit Plan. The following sections detail current assumptions.

Sources of Revenue

Half-Cent Sales Tax for Transit (Article 43)

The largest recurring local revenue source is a half-cent local option sales tax as authorized by NCGS Chapter 105 Article 43. Wake County voters approved a half-cent sales tax advisory referendum as required by this statute in November 2016. Collection of this tax began on April 1, 2017.

To project sales tax dollars that would be available, actual Wake County Article 39 gross revenues for fiscal year 2015 served as the base, less 10% as Article 39 is charged on food purchases which are prohibited to be taxed as part of Article 43. Then, it was assumed that the local sales tax revenue would be half of that amount, as Article 39 is one cent and Article 43 is one half cent. Using the County's same assumption for sales tax growth that is used in the County's debt and capital financial model, this amount was grown annually by 4%. Accordingly, the alternatives include an assumption that the half-cent sales tax revenue available for new transit would be $78.5 million in FY 2018 and would grow by 4% annually thereafter.

Other Local Revenue Sources

Increases to vehicle registration fees also are included in the assumptions for local revenue sources. Prior to Plan adoption, GoTriangle collected a fee of $5 per registration throughout Wake, Durham, and Orange Counties. That funding supports transit activities in this three-county service area. This fee is now increases by $3, for a total of $8. Second, a new $7 vehicle registration fee has be assessed by the Board of Commissioners, as authorized by NCGS 105-509. Together, the vehicle registration fees would generate approximately $8.5 million a year in fiscal year 2018 and are projected to grow 2% a year thereafter.

Plan Implementation and Finance

The vehicle rental tax also is included as a revenue source in the transit plan. GoTriangle currently levies a 5% tax on vehicle rentals in Wake, Durham, and Orange Counties. GoTriangle's Board of Trustees has an existing policy that 50% of rental revenues are dedicated to expanding transit options in the region, while the other 50% is used by GoTriangle for operations and capital needs of the current system. To determine the amount allocated to each county, GoTriangle dedicates vehicle rental revenues based on percent of total population. GoTriangle's current allocation percentages are 68% for Wake County, 21.5% for Durham County, and 10.5% in Orange County. As such, the Wake County portion of all vehicle rental revenues is, compared to the total collected, 34%. The transit plan includes an assumption that rental car tax revenue available for new transit programs would be $3.6 million in FY 2018, which would grow by 2.5% annually.

The transit plan also includes local revenues from the City of Raleigh, Town of Cary, and GoTriangle for existing bus operations. Local bus operations in those jurisdictions would continue and bus operations in the transit plan were designed considering those existing resources. Accordingly, the transit plan assumes that the local contribution from each agency would equal approximately $15 million in 2018 and this contribution would increase at 2.5% each year, the assumed rate of operating inflation. The transit plan also includes existing federal and state funds allocated directly to existing bus operations equaling approximately $6.2 million.

Federal and State Contributions

The Wake Transit Plan assumes federal and or state funding for many planned projects. Significant federal funds are assumed for the capital costs for both CRT and BRT—50% of the capital costs are assumed to be federally funded. For BRT, the projects are assumed to successfully compete through the FTA Capital Improvement Program New Starts, Small Starts, and Core Capacity Improvement grant programs such that overall, the BRT projects included in the transit plan will, on average, receive 50% federal funds (estimated at $173.5 million). For commuter rail, it is assumed that, through a regional partnership by extending the line into neighboring counties, the project would successfully compete for 50% federal funding (estimated at $443.3 million, the Wake County share included in the Financial Plan). Approximately $24 million of federal funds towards the acquisition of buses are included in the plan, which could also be used towards bus maintenance.

Federal funds towards operating expenses also are assumed in the Wake Transit Plan. Starting in 2026, approximately $1.8 million annually is programmed in federal operating revenue towards BRT services. Starting in 2029, approximately $6 million annually is programmed in federal operating revenue towards commuter rail services. Another $1.9 million in additional federal funding for bus operations is planned starting in 2019, which increases to approximately $3.2 million as increased local bus service roughly triples by 2027.

State funds are primarily limited to operating fund support for bus operations, BRT, and commuter rail operations once those services are in place. To be fiscally conservative, the Wake Transit Plan does not include state funds towards the capital costs for BRT and commuter rail; however the County and its partners would work to achieve such funding towards the projects or components in the projects. The transit plan does include $6 million of state capital funds towards the acquisition of buses between 2018 and 2025. Starting in fiscal year 2024, approximately $1.3 million annually is programmed in state operating revenue towards BRT services and starting in 2027 approximately $4 million is programmed in state operating revenue towards commuter rail services. No additional state funds, beyond the current $1.2 million annually in existing state funding for local bus services are programmed for local bus operating support.

Farebox Revenue

Farebox revenue varies by type of service. For local bus service, including BRT, a 24% farebox recovery ratio was used for ridership routes, 10% for coverage routes, 3% for intertown routes, and 0% for local service match. Ridership estimates will be refined for commuter rail during future studies. The current plan assumes farebox revenue of 20% of operating expenses.

Long-Term Bond Proceeds

Shown as revenues, with corresponding debt service expenses, certain capital projects are debt funded. Commuter rail is 40% debt funded, BRT is 15.5% debt funded, and bus infrastructure projects are 31% debt funded. A portion of future projects modeled from 2028 to 2037 are also assumed to be funded with debt.

By using long-term debt, it is important that the model adhere to several key metrics, including adequate operating and capital fund balances to demonstrate sufficient liquidity to rating agencies and the capital markets. The Wake Transit Plan was developed within the context of adhering to two key measures: 1) maintaining near-term capacity to service debt from recurring net revenues, and 2) gross debt service coverage. Given the transit plan's focus on capital and significantly increasing local bus service, a key measure for the transit plan is a projection of the ongoing ability to pay annual debt service given projected revenue, planned capital, and recurring operating expenses. The transit plan maintains net debt service coverage of revenues less operating expenses greater than 1.25 times annual debt service and maintains a gross debt service coverage of revenues more than three times annual debt service expenses. These are simply modeled at this time. As governance discussions occur, these metrics and calculations will be revisited and updated.

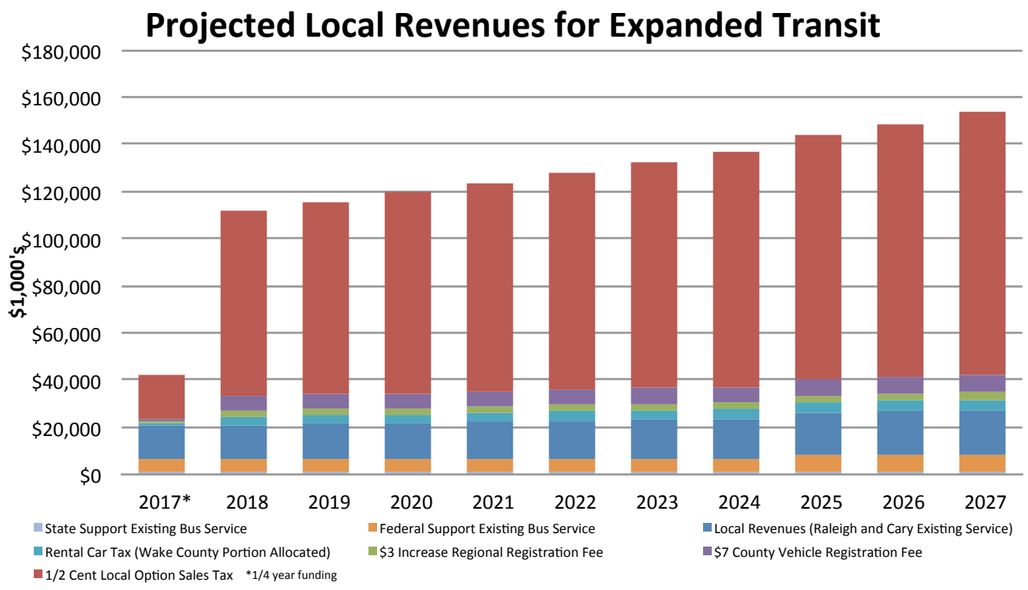


Figure 25: Projected Local Revenues for Expanded Transit

Plan Implementation and Finance

Planned Expenditures

Planned Expenditures and Inflation

To ensure fiscal constraint, the Wake Transit Plan includes inflation estimates for project estimates and operating costs. Project estimates for BRT, commuter rail, bus infrastructure, and buses were estimated in 2015 dollars. Then, projects were programmed according to planned project schedules, and then escalated to year of expenditure using an inflation factor of 4%. Local bus operating hours were calculated in 2015 dollars, and then escalated at 2.5%. Operating costs for commuter rail and BRT were estimated in 2015 dollars, and then inflated to the year the projects would begin, again using an inflation factor of 2.5%. The Wake Transit Plan contemplates a total of $1.6 billion of capital projects by 2027. A summary of all capital expenditures is shown in Figure 26.

Commuter Rail Capital Expenditures

The Commuter Rail capital expenditures include the Wake County share of commuter rail. The Transit Plan proposes up to eight trains in each peak with two mid-day and two in the evening, in each direction (8-2-8-2) . The final service hours and frequencies will be determined during the future alternatives analysis. To be conservative, included in the fiscal plan is an estimated 8-2-8-2 commuter rail service which would operate from West Durham to Garner within the existing Norfolk Southern Railroad corridor (owned by NCRR Company) by adding additional tracks and facilities. This would continue to be studied and refined during the first years of the Transit Plan, to confirm if this is the most viable approach and is subject to funds from our partners and successful federal funding.

BRT Capital Expenditures

The BRT Capital Expenditures include four BRT corridors totaling $347 million between 2018 and 2023 as shown below. Dollars programmed including planning and design, construction, and acquisition of vehicles for the corridors.

Other Capital Expenditures

Significant resources are allocated for capital infrastructure to support a rapidly increasing local bus network. Bus infrastructure, which includes transfer stations, park and ride lots, bus stop improvements, bus maintenance facilities, sidewalk access and streetside facilities, and other improvements, is programmed for $208 million between 2018 and 2024. A summary of these items is shown below.

Moreover, $114 million is allocated towards the acquisition and replacement of busses for local bus service between 2018 and 2026, which represents 116 buses.

Also included in other capital is $24.37 million of locally funded grade separation match funds allocated between 2018 and 2022.

Between 2025 and 2027, $35 million is available for future projects. Between 2028 and 2037, other capital includes two components: bus replacement totaling $180 million and future projects totaling $264.5 million.

Debt Service and Debt Service Reserve Fund

As debt is issued for capital projects, principal and interest will be paid on these projects. These dollars represent the corresponding debt service on commuter rail, BRT, and various bus infrastructure projects that are required during the first 20 years of the Wake Transit Plan.

Operating Fund Balance Allocation

To ensure adequate operating liquidity, the Wake Transit Plan was developed with a target of that the operating fund balance would have a minimum fund balance equal to 25% of annual sales tax revenues. The dollars shown are the minimum allocation to meet this requirement.

Capital Fund Balance Allocation

To demonstrate credit strength to manage risk, the Wake Transit Plan also was developed with a target of having a capital fund balance of 5% of capital projects cost. This capital fund balance is over and above individual capital budgets which may have their own project contingencies. Maintaining sufficient liquidity during construction activity is an important credit strength for rating agencies. The capital fund balance allocation is timed to when significant debt issuances would begin for capital projects funded in the Wake County Transit Plan.

Operating Expenses

There are five categories of operating expenses combined. The first is local bus service, which increases from $22 million in FY 2018 to $85 million in FY 2027. Added to that is BRT service, beginning in the model in 2024. Other operating funds include maintenance and operations for bus facilities and other related bus operations such as small town local service matching funds, paratransit service, and other professional services. Finally, commuter rail is shown starting in 2027, and adds an additional $20 million of operating expenses. All operating expenses are grown at 2.5% to account for inflation. The model assumes that by 2027, $129.3 million of operating will be in place and a total of $166 million of operating expenses will be incurred including allocations to fund balance and debt service expenses. A summary of 2027 local operating costs is shown in Figure 27.

Capital Funded Through 2027 (with Federal, State, Local Support)*	$ (thousands)
Commuter Rail	$886,500
Bus Rapid Transit	$347,000
Bus Acquisition	$114,700
Bus Infrastructure	$208,400
Other Capital Projects	$24,500
Future Projects	$35,000
Total	**$1,616,100**

* Capital costs reflect 2015 estimates inflated to year of expenditure by 4% each year

Figure 26: Capitol Cost Summary

Local Service Operating Costs in 2027 **	$ (thousands)
Local Bus Network	$85,300
BRT	$14,500
Commuter Rail	$20,100
Other Bus Operations	$7,100
Maintenance and Operations	$2,300
Total	**$129,337**

**Operating costs reflect 2015 estimates inflated to year of expenditure by 2.5% each year

Figure 27: Local Service Operating Costs in 2027

Plan Implementation and Finance

REVENUES														EXPENDITURES								
Fiscal Year Ending	1/2 Cent Sales Tax	$3 Increase Regional Car Registration	$7 Wake Car Registration	Portion of Regional Rental Car Tax Avail for Wake Transit Plan	Federal Funds2	State Funds3	**Long-Term Bond Proceeds4**	**Short-Term Debt Principal**	**Excess Capital Projects Fund (Inflows) and Outflows**	**Existing Local Revenues for Bus Operations**	**Existing State Support for Bus Operations**	**Farebox Revenue6**	**Annual Revenues**	**BRT Capital Expenditures**	**Commuter Rail Capital Expenditures**	**Other Capital Expenditures7**	**Debt Service & Debt Service Reserve Fund**	**Operating Fund Balance Allocation**	**Capital Fund Balance Allocation**	**Operating Expenses**	**Total Expenses**	**Fiscal Year Ending**
6/30/2017	18,893	621	1,449	878	5,000	-				14,594	1,200	3,764	46,398	-	-	-	-	18,893	5,866	21,640	46,398	6/30/20171
6/30/2018	78,593	2,534	5,912	3,598	19,803	1,000	-	-	(51,602)	14,959	1,200	3,858	79,855	8,405	13,197	15,669	-	756	14,297	27,531	79,855	6/30/2018
6/30/2019	81,737	2,584	6,030	3,688	47,351	918	38,461	-	5,559	15,333	1,200	4,323	207,185	24,897	48,541	66,330	6,317	786	20,163	40,151	207,185	6/30/2019
6/30/2020	85,006	2,636	6,151	3,780	52,606	827	50,975	-	29,796	15,717	1,200	5,508	254,202	28,854	56,640	83,067	11,224	817	40,325	33,274	254,202	6/30/2020
6/30/2021	88,406	2,689	6,274	3,874	91,977	794	64,844	40,000	1,950	16,110	1,200	6,758	324,877	75,635	88,633	60,769	17,070	850	-	41,920	284,877	6/30/2021
6/30/2022	91,943	2,743	6,400	3,971	153,621	620	102,145	-	(8,104)	16,512	1,200	8,094	379,144	140,785	147,623	50,041	29,716	884	-	50,095	419,144	6/30/2022
6/30/2023	95,620	2,798	6,528	4,071	142,204	716	107,126	-	22,221	16,925	1,200	9,469	408,877	68,432	195,827	48,597	36,578	919	-	58,522	408,877	6/30/2023
6/30/2024	99,445	2,853	6,658	4,172	76,623	1,943	59,765	(9,000)	(13,969)	17,348	1,200	14,138	261,178	-	133,510	9,672	36,243	956	-	80,797	261,178	6/30/2024
6/30/2025	103,423	2,911	6,791	4,277	102,044	2,001	80,454	(1,000)	(5,738)	17,782	1,200	15,747	329,891	-	183,653	11,616	43,140	994	-	90,487	329,891	6/30/2025
6/30/2026	107,560	2,969	6,927	4,384	19,250	1,416	8,316	(30,000)	19,843	18,226	1,200	17,402	177,492	-	18,983	19,611	37,396	1,034	-	100,468	177,492	6/30/2026
6/30/2027	111,862	3,028	7,066	4,493	9,997	3,457	-	-	555	18,682	1,200	22,846	183,186	-	-	17,000	35,773	1,076	-	129,337	183,186	6/30/2027
6/30/2028	116,337	3,089	7,207	4,606	10,228	3,543	26,624	-	(221)	19,149	1,200	23,417	215,178	-	-	41,000	40,489	1,119	-	132,571	215,178	6/30/2028
6/30/2029	120,990	3,150	7,351	4,721	16,291	3,632	6,656	-	476	19,628	1,200	24,003	208,097	-	-	29,955	39,044	1,163	-	137,935	208,097	6/30/2029
6/30/2030	125,830	3,213	7,498	4,839	16,464	3,723	16,640		(7,934)	20,119	1,200	24,603	216,194	-	-	31,017	41,334	1,210	-	142,632	216,194	6/30/2030
6/30/2031	130,863	3,278	7,648	4,960	16,637	3,816	-		7,872	20,622	1,200	25,218	222,113	-	-	34,295	39,695	1,258	-	146,864	222,113	6/30/2031
6/30/2032	136,097	3,343	7,801	5,084	16,811	3,911	37,717		(338)	21,137	1,200	25,848	258,612	-	-	60,496	46,374	1,309	-	150,433	258,612	6/30/2032
6/30/2033	141,541	3,410	7,957	5,211	16,953	4,009	-		(16)	21,666	1,200	26,494	228,425	-	-	28,615	42,657	1,361	-	155,792	228,425	6/30/2033
6/30/2034	147,203	3,478	8,116	5,341	17,007	4,109	68,778		(5,882)	22,207	1,200	27,157	298,715	-	-	82,920	54,838	1,415	-	159,542	298,715	6/30/2034
6/30/2035	153,091	3,548	8,278	5,475	17,062	4,212	-		6,345	22,762	1,200	27,836	249,810	-	-	33,243	48,060	1,472	-	167,035	249,810	6/30/2035
6/30/2036	159,215	3,619	8,444	5,611	17,092	4,317	39,936		(122)	23,331	1,200	28,532	291,175	-	-	63,537	55,133	1,531	-	170,975	291,175	6/30/2036
6/30/2037	165,583	3,691	8,613	5,752	17,122	4,425	13,312		99	23,915	1,200	29,245	272,957	-	-	40,098	53,554	1,592	-	177,713	272,957	6/30/2037
Total	**$2,359,237**	**$62,185**	**$145,099**	**$92,783**	**$882,145**	**$53,390**	**$721,749**	**$-**	**$789**	**$396,725**	**$25,200**	**$374,258**	**$5,113,561**	**$347,008**	**$886,607**	**$827,550**	**$714,635**	**$41,396**	**$80,650**	**$2,215,715**	**$5,113,561**	

1 Assumes 1/4 Year Funding with November 2016 Referendum
2. Assumes 50% Federal Funding of BRT and Commuter Rail Capital Project Cost. Includes BRT and Commuter Rail Federal Operating Funds, and Federal Bus Operating Funds
3. Assumes no state contribution for capital except bus replacement; state operating support for bus operating, BRT, and commuter rail.
4. Rail 30 Year Amortization at 5.25%; BRT and Other Capital 20 Year Amortization at 4.75%. Commuter rail 40% debt funded 2019 -2026. BRT 15.5% debt funded 2019 - 2023. 31% of Bus Infrastructure debt funded 2019-2024.
5. Excludes interest on short-term debt, which is included in debt service.
6. Assumes 24% Farebox Recovery Ratio for Ridership Scenario; 10% for Coverage; 3% Inter-town; 0% for no-fare for with an annual increase in farebox revenue of 2.5% beginning in FY 2019
7. Funds to be allocated to bus purchases for expanded bus routes, bus replacements, stations, sidewalk improvements and bus access, and other capital costs such as maintenance facilities. Also includes future projects to be identified $35 M between 2025 -2027 and $264.5 M between 2028 - 2037.

Figure 28: 20-Year Summary of Revenue and Expenditures

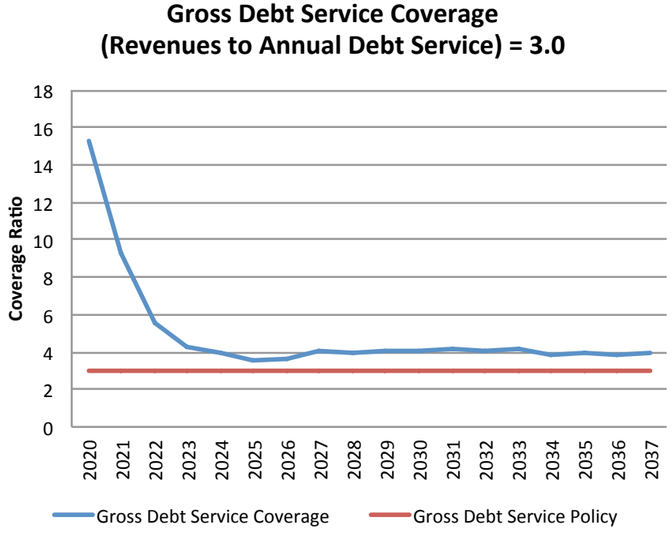


Figure 29: Gross Debt Service Coverage Chart

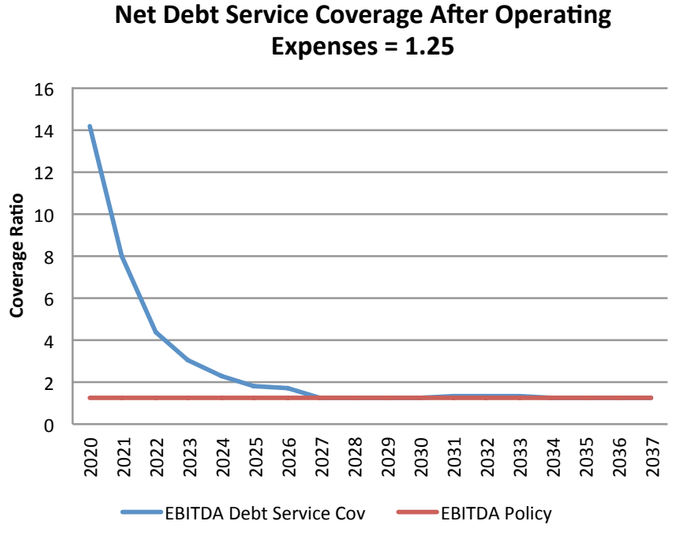


Figure 30: Net Debt Service Coverage Chart

20-Year Expenditure Summary

Wake Transit Plan 2017 - 2037*		
BRT Capital and Operations, Enhanced Bus Network Operations, Bus Acquisition and Bus Infrastructure	$2,949,773	58%
Commuter Rail Capital and Operations	1,582,549	31%
Future Capital Projects and Operating	459,193	9%
Fund Balance Allocation	122,046	2%
Total	**$5,113,561**	**100%**

*Allocation includes debt service

Figure 31: Local Service Operating Costs in 2027