



GoDurham Short-Range Transit Plan

DRAFT Final Report

April 2019

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EXECUTIVE SUMMARY

This report represents the final element of the GoDurham Short-Range Transit Plan (SRTP) effort. The SRTP serves as a roadmap for the next five years to position the agency for continued financial and operational success. The purpose of this report is to summarize the background conditions in which GoDurham operates, provide a comprehensive evaluation of existing service characteristics and system performance, and make recommendations for the future. The planning process included examining the existing market and operating conditions, engaging in public and stakeholder outreach, developing and refining alternative service scenarios, and recommending a series of next steps necessary for implementing the SRTP.

PROJECT GOALS

The GoDurham SRTP aims to achieve the following six goals, which are frequently cited by riders, stakeholders, and agency staff as key issues to consider for the future of the service:

- **Address on-time performance on key routes.**
- **Simplify route patterns.**
- **Determine opportunities for smaller vehicles or innovative on-demand service.**
- **Increase service to low ridership areas.**
- **Identify opportunities for more direct service.**
- **Develop options for the Bull City Connector.**

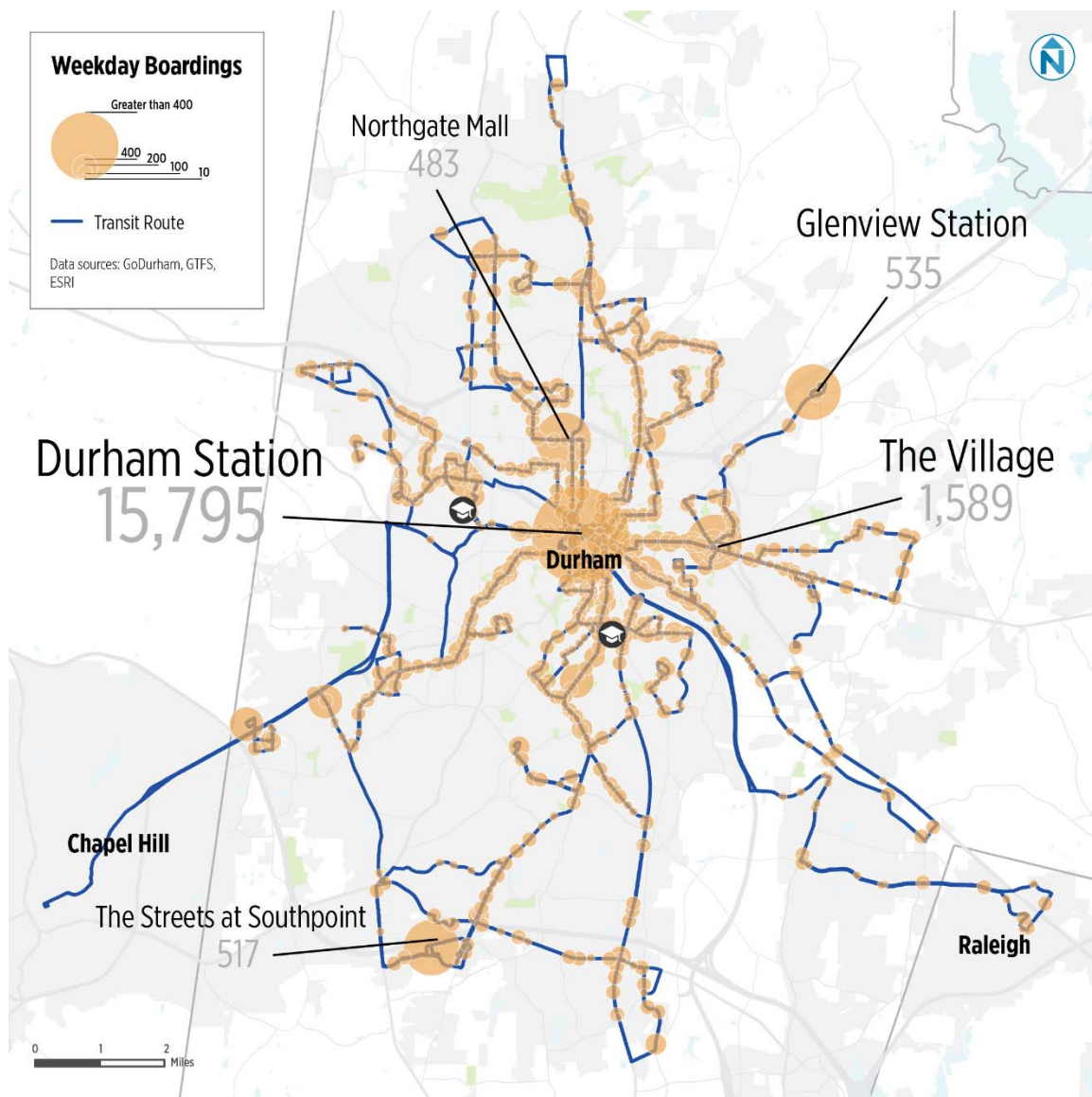
EXISTING CONDITIONS KEY FINDINGS

Key takeaways of this analysis of existing conditions include:

- **GoDurham is a high ridership, mid-sized transit system.** GoDurham's 17 routes saw 6.2 million riders in 2015, a 38% increase over the last 10 years. Investments, such as creating high-frequency corridors with service every 15 minutes, have attracted new users. However, ridership fell slightly over the past two years, which also mirrors national trends.
- **Durham Station anchors the system with nearly 16,000 average weekday boardings.** Other high ridership stops include the Village, Glenview Station (Walmart), the Streets at Southpoint, and the Northgate Mall (Figure ES-1).
- **Most areas in Durham that show high propensity for transit are served by GoDurham.** Propensity to take transit is based on the density of five combined indicators: seniors (ages 65 and up), people with low incomes (less than 200% of the federal poverty line), people with disabilities, rental units, and zero-vehicle households (Figure ES-2). However, many of the high transit propensity area are not directly

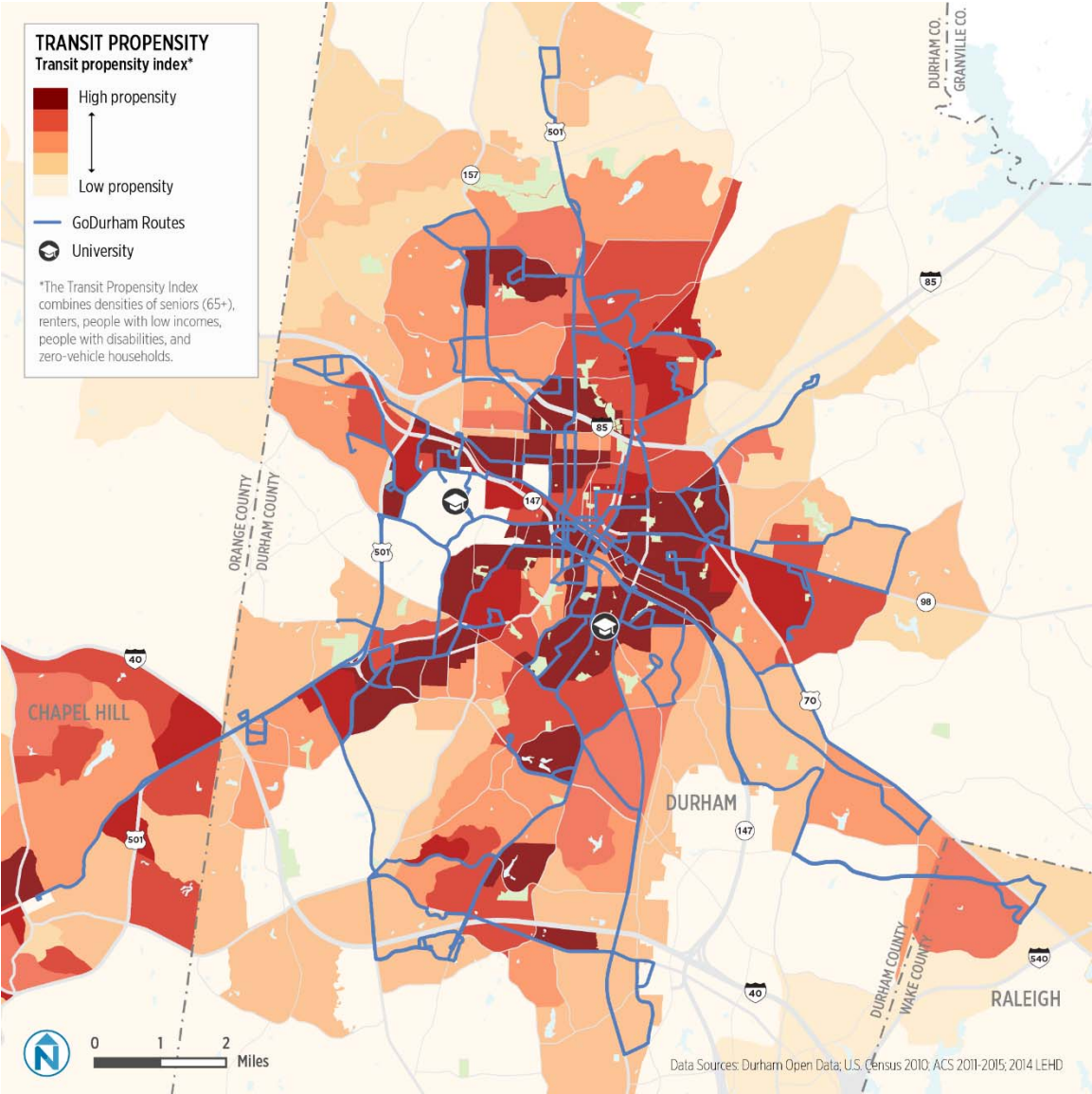
- connected to major employment sites, low-income employment sites, and retail areas. Some potential connections that suggest support for more direct service include North and Northeast Durham to Duke, and East Durham connections to RTP and Southpoint.
- **While overall ridership is excellent, GoDurham's ridership growth may be limited by the existing system design.** In addition to some high-need areas having indirect access, the overall route design may not be attractive to all potential users. Big one-way loops add out-of-direction travel and added travel times. Multiple route branches and alignments that change by time of day and day of week are confusing. Pedestrian access to bus stops is difficult in many neighborhoods. Large areas that have service only have hourly service, which is unattractive.

Figure ES-1 GoDurham System Ridership, Average Weekday Boardings by Stop



Source: GoDurham APC data analysis, September 2016

Figure ES-2 GoDurham Transit Propensity Index



GODURHAM PREFERRED ALTERNATIVE

GoDurham's SRTP seeks to guide the improvement of service over the next several years to better serve existing and potential riders, new developments, and essential services in the community. Three rounds of public outreach were conducted as part of the SRTP process. After hearing from residents through public meetings, conversations about the system, and online surveys, the service planning team developed a Preferred Alternative to best meet the needs of the community. The Preferred Alternative is fiscally constrained and designed for implementation within existing resources.

Key themes of the Preferred Alternative include the following:

- Addressing on-time performance
- Simplifying routes
- Improving frequency of service
- Providing more direct service to popular destinations
- Expanding the number of routes with 15 minute all-day service
- On-demand service to better serve low density areas with mobility needs

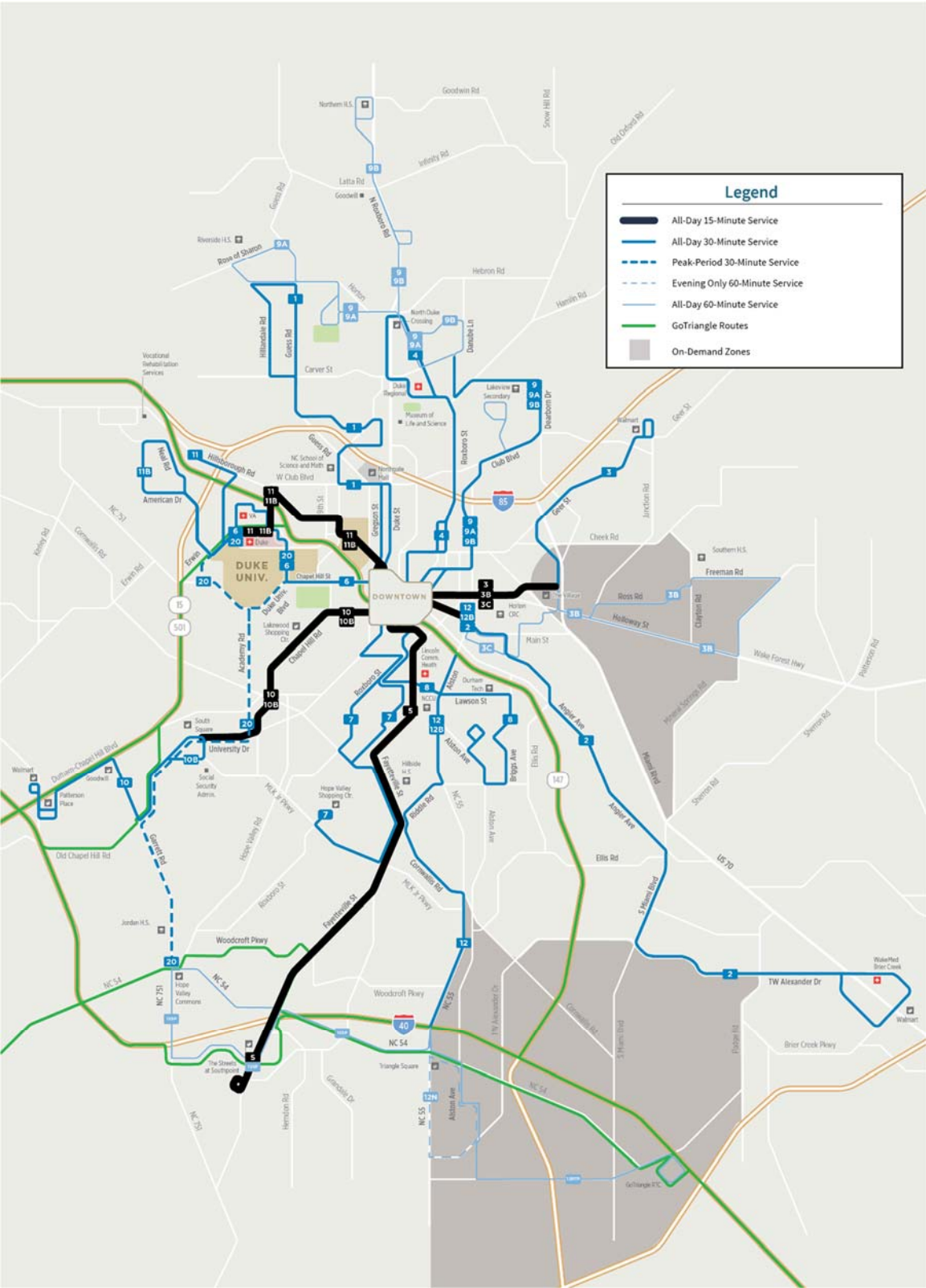
Benefits of the Preferred Alternative include the following:

- 9.3 more miles of very frequent service (every 15 minutes or more all day)
- 12,700 more residents and jobs within a quarter mile of very frequent service
- 16,000 more residents and jobs within a quarter mile of service that operates every 30 minutes or better

Figure ES-3 through Figure ES-5 provide a system map and summary of service proposed as part of the Preferred Alternative.

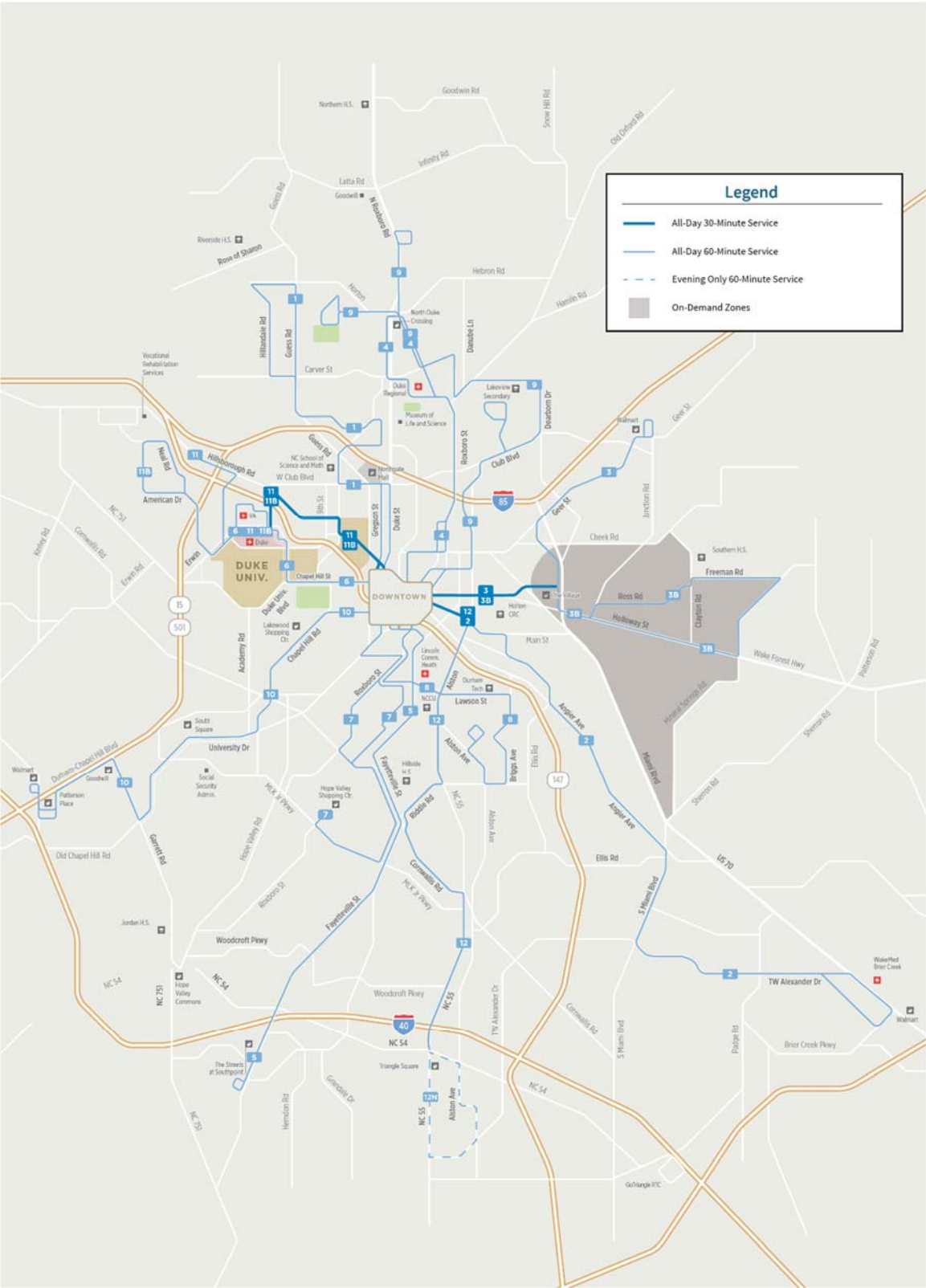
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Figure ES-3 GoDurham Preferred Alternative



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Figure ES-4 GoDurham Preferred Alternative: Nights and Sundays



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Figure ES-5 Preferred Alternative Service Summary

Route	Service Summary	Frequency: Proposed Weekday	Frequency: Proposed Night/Sunday	Service Span: Preferred Alternative
1	Durham Station to Northgate Mall, Costco, and Hillandale Road.	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
2	Durham Station to East Durham, Bethesda, and Briar Creek via Angier Ave, S Miami Blvd, and TW Alexander Dr. Night and Sunday service do not serve Briar Creek.	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
3	15 minute service between Durham Station and Wellons Village. Branch to Walmart operates every 30 minutes. Service to Southern High and Taylor St/Driver St is hourly. Night and Sunday service operates every 30 minutes between Durham Station and Wellons Village. Branches to Walmart and Southern High are hourly.	15/30/60	30/60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
4	Durham Station to North Duke Crossing via Roxboro St and N Roxboro Rd.	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
5	Route 5 connects Durham Station and the Streets at Southpoint via Fayetteville Road. Route 5 would no longer enter the Streets at Southpoint, instead the route would terminate just south of the shopping center.	15	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
6	Durham Station to Duke University Hospital, Durham VA Medical Center via Chapel Hill St, Erwin Rd, and Crest St.	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
7	No change from today. Durham Station to MLK Jr Parkway and S Roxboro Street.	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
8	No change from today. Durham Station to American Tobacco Campus, Lincoln Community Health Center, NCCU, Durham Technical Community College, and Unity Village	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
9	Durham Station to North Duke Crossing via Club Blvd, Dearborn Dr, and Carver St. Branches to Riverside High School and Northern High School operate hourly; 30 minute service between Durham Station and Carver St.	30/60	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
10	Durham Station to Lakewood, South Square, Walmart, and Patterson Place. No service to James St or north of University Dr. 15 minute service between Durham Station and South Square; 30 minute service between South Square and Walmart.	15/30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
11	Durham Station to Duke East Campus, Duke University Hospital, Durham VA Medical Center, American Village, and Hillsborough. 15 minute service between Durham Station and Duke University Hospital, 30 minute service for branches between Duke University Hospital, Hillsborough, and American Village.	15/30	30/60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
12	Durham Station to East Durham, NCCU, Triangle Village Shopping Center, with branches to the Streets at Southpoint and RTP. 30 minute service to Triangle Village, 60 minute service for branches to RTP and the Streets at Southpoint. Hourly night and Sunday service between Falls Pointe Apartments and downtown Durham only.	30/60	60	5:30 AM - 12:30 AM 6:30 AM - 9:30 PM (Sun)
20	Hope Valley Commons to South Square and Duke University Hospital via Garrett Rd, University Dr, Academy Rd, and Duke University Blvd.	30	-	6:30 AM - 10:00 AM; 3:00 PM - 7:00 PM (Mon-Fri)

GODURHAM SERVICE EXPANSION CONCEPTS

The technical analysis and public outreach conducted during the SRTP revealed that there were significantly more demands on transit than could be accommodated within the existing budget. This document summarizes expansion concepts that would reflect community needs and desires, as well as leading to improved system utilization. Additional resources would be required for the expansion concepts. The highlights of the cost-unconstrained service expansion concepts include:

- **Extended High Frequency Service Network:** New destinations with service every 15 minutes would include Patterson Place, Streets at Southpoint, Duke/VA Hospital, E. Main Street (to Alston Ave) and North Duke Crossing
- **Simplified Service:** Fewer route variations and deviations
- **More frequent weekday & Saturday service:** All routes operate every 30 minutes or better
- **Extended Evening Service:** 30-minute service would end at 10 p.m. instead of 7 p.m.
- **Expanded Sunday Service:** Most routes would operate the same frequency on Sundays as on weekdays and Saturdays
- **More Direct Service to Major Destinations:**
 - Connecting South Durham and North Durham to Duke/VA Hospital
 - Connecting East Durham/The Village to NCCU
 - Connecting more neighborhoods in South Durham to South Square
 - Connecting East Durham neighborhoods to RTP
 - Service to the Museum of Life and Science
- **On-Demand Zones:**
 - On-Demand Zones incentivize the use of on-demand services, which can be agency-operated or partnerships with private providers such as Uber, Lyft, or taxis. Trips within or between zones are subsidized.
 - Potential zones include low-density areas throughout the edges of the service area
 - This service can also provide service after regular bus service stops operating, including between midnight and 4:30 a.m.
- **Supporting Capital Facilities**
 - Enhanced bus facilities at the Village, North Duke Crossing, and by MLK/Fayetteville Road to make connecting buses easier
 - New park-and-rides to improve service access
 - Bus Stop Enhancements
 - Sidewalk access improvements

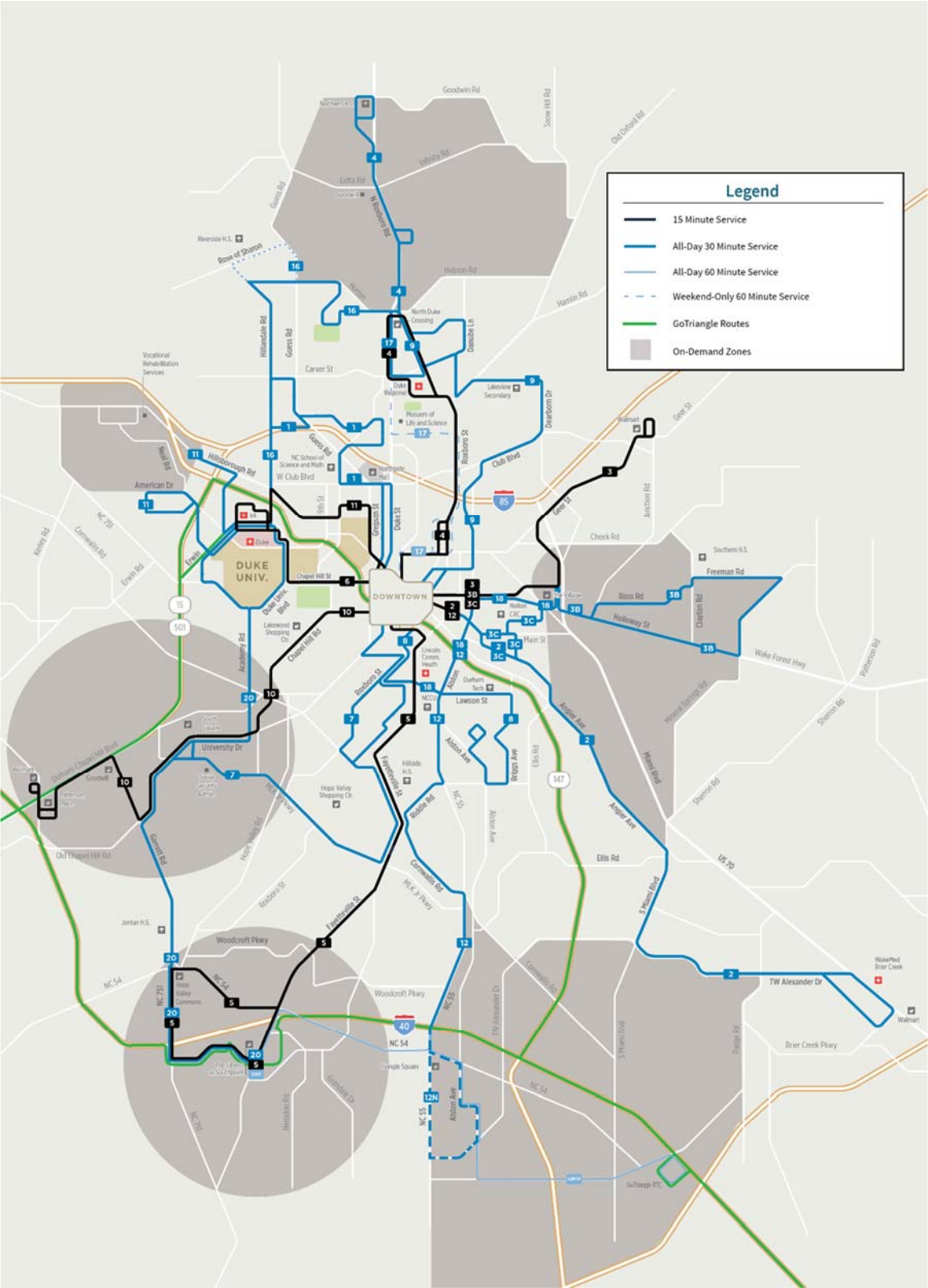
Benefits of the GoDurham expansion concepts include the following:

- 29.4 more miles of very frequent service (every 15 minute or more all day)
- 91,000 more residents and jobs within a quarter mile of very frequent service
- 146,000 more residents and jobs within a quarter mile of service that operates every 30 minutes or better

A map of the proposed expansion concepts is shown in Figure ES-6, and proposed span and frequency are available in Figure ES-7.

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Figure ES-6 GoDurham Service Expansion Concepts



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Figure ES-7 Expansion Concepts Proposed Span and Frequency

Route	Frequency: Preferred Alternative Proposed Weekday	Frequency: Preferred Alternative Proposed Night/Sunday	Service Span: Preferred Alternative	Frequency: Expansion Concepts Proposed Weekday	Frequency: Expansion Concepts Proposed Night/Sunday	Service Span: Expansion Concepts
1	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
2	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
3	15/30/60	30/60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15/30	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
4	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15/30	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
5	15	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
6	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
7	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
8	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
9	30/60	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
10	15/30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
11	15/30	30/60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15/30	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
12	30/60	60	5:30 AM - 12:30 AM 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
16	-	-	-	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
17	-	-	-	60	60	8:00 AM - 6:00 PM (Sat) 8:00 AM - 6:00 PM (Sun)
18	-	-	-	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
20	30	-	6:30 AM - 10:00 AM; 3:00 PM - 7:00 PM (Mon-Fri)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)

1 INTRODUCTION

This report represents the final element of the GoDurham Short-Range Transit Plan (SRTP) effort. The SRTP serves as a roadmap for the next five years to position the agency for continued financial and operational success. The purpose of this report is to summarize the background conditions in which GoDurham operates, provide a comprehensive evaluation of existing service characteristics and system performance, and make recommendations for the future. The planning process included examining the existing market and operating conditions, engaging in public and stakeholder outreach, developing and refining alternative service scenarios, and recommending a series of next steps necessary for implementing the SRTP.

Project Goals

The GoDurham SRTP aims to achieve the following six goals, which are frequently cited by riders, stakeholders, and agency staff as key issues to consider for the future of the service:

- **Address on-time performance on key routes.**
- **Simplify route patterns.**
- **Determine opportunities for smaller vehicles or innovative on-demand service.**
- **Increase service to low ridership areas.**
- **Identify opportunities for more direct service.**
- **Develop options for the Bull City Connector.**

Report Organization

In addition to this Introduction, the document consists of six chapters, as well as seven appendices, which are summarized below:

- **Chapter 2** considers a variety of local planning efforts for the GoDurham service area.
- **Chapter 3** evaluates socioeconomic and demographic conditions within the GoDurham service area to better understand transit demand and service gaps.
- **Chapter 4** provides an overview of trends in GoDurham fixed-route service, including recent operational and performance data.
- **Chapter 5** provides detailed information for existing GoDurham routes.
- **Chapter 6** presents the fiscally-constrained Preferred Alternative, which includes recommended changes in service and alignment for individual routes.
- **Chapter 7** contains service expansion concepts to guide the future of GoDurham service.
- **Appendix A** provides a series of ridership maps for existing service.

- **Appendix B** provides route summary tables and charts that give insight into existing passenger loads, boardings, and alightings.
- **Appendix C** contains online survey results from an outreach effort conducted early in the SRTP planning process.
- **Appendix D** includes information about two service concepts that were provided to the public to generate feedback and inform the Preferred Alternative.
- **Appendix E** includes an analysis of removed stops resulting from the Preferred Alternative as of February 2018.
- **Appendix F** provides suggested service guidelines and performance measures for GoDurham service.
- **Appendix G** includes a presentation given to City of Durham and Durham County stakeholders on February 23, 2018 to provide a high-level overview and summary of the GoDurham SRTP project.

2 REVIEW OF PLANS

Current transit planning efforts in the Durham-Chapel Hill metro area exist within a broader planning context that has evolved over time. This chapter reviews that planning context, beginning with county investment plans produced in the early 2010s and through recently-approved transit plans. Findings from this chapter contextualize future transit planning work in Orange and Durham Counties by enumerating the region’s planning goals, highlighting consistent visions, and identifying unfulfilled objectives of the planning process to inform the development of the SRTP and ensure alignment with project goals. The six primary documents reviewed in this chapter are:

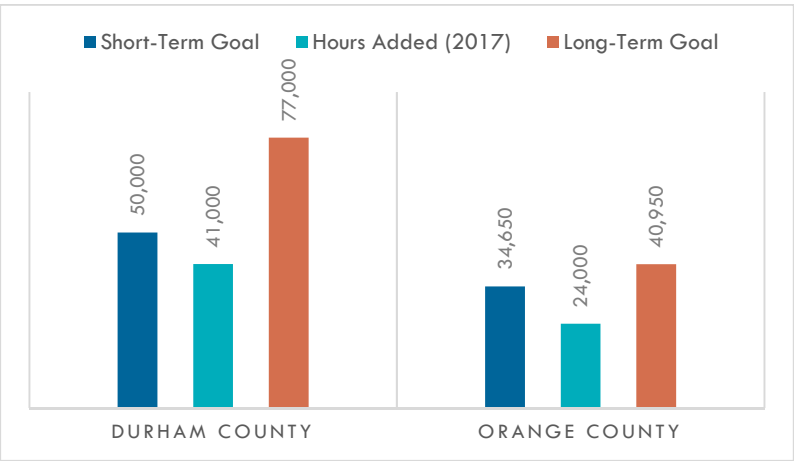
- Durham County Bus & Rail Investment Plan (2011)
- Orange County Bus & Rail Investment Plan (2012)
- Designing Better Bus Service in Durham (2012)
- Duke and Durham Coordinated Transit Study (2015)
- Durham County Transit Plan (2017)
- Orange County Transit Plan (2017)

KEY FINDINGS

The following are key findings from the Durham and Orange County plan review:

- Significant progress has been made towards adding bus service in Durham and Orange Counties. The original BRIPs called for short-term additions of 50,000 annual hours and 34,650 hours added in the counties, respectively. As of 2017, Durham and Orange Counties have added 41,000 hours and 24,000 hours of service, respectively.

Figure 2-1 Bus Service Hours Added (2017)



- Drawbacks in state and federal funds for projects in the County BRIPs have shifted more funding responsibility onto local tax district revenue, changing the calculus of project delivery for bus service, light rail, commuter rail, and BRT plans.
- The Durham-Orange light rail project has completed important environmental evaluation and is now in design and engineering phases. Although the project has incurred a two-year delay, important alterations to the route have been made and a cost-sharing agreement executed.
- Serving the Duke University and Duke Medical Center community is of key concern to the region.
- The North-South BRT project, although delayed, is proceeding through regulatory hurdles, with a goal of achieving Small Starts grant funding.

Unfulfilled Objectives

Although the 2017 transit plans developed by both Durham and Orange Counties represent solid progress on local and regional transit goals, two key objectives of the plan remain delayed and unfulfilled.

- Bus facilities and supportive infrastructure have not been implemented in Durham County and have been making slow progress in Orange County. Projects that are planned but remain unexecuted include bus shelters, real-time passenger information systems, sidewalk improvements, transit signal priority, and general pedestrian accessibility improvements.
- Although planning funds continue to be committed towards the vision of the Wake-Durham commuter rail, significant challenges remain for the region to deliver this improvement.

PLAN REVIEW

This plan review focuses on six plans for developing transit in Durham: the Durham County Bus & Rail Service Investment Plan (2011), the Orange County Bus & Rail Investment Plan (2012), the Designing Better Bus Service in Durham (2012), the Duke and Durham Coordinated Transit Study (2015), the Durham County Transit Plan (2017), and the Orange County Transit Plan (2017). The Bus & Rail Service Investment Plans (BRIPs) for both Durham and Orange County outline expansions of bus service in the Orange-Durham County area, while also planning for the development of new light rail and commuter rail service in both the Chapel Hill-Durham corridor and the greater Research Triangle. The more comprehensive Designing Better Bus Service plan outlines three funding scenarios for improvement of Durham Area Transit Authority (DATA, today known as GoDurham), and gives system recommendations. The Duke and Durham Coordinated Transit Study (2015) focuses on enhancing cooperation and efficiency amongst three transit providers for the Duke University and Duke Medical Center community. The updated county transit plans (2017) review progress on the BRIPs and chart both short and long-term transit planning for the region.

Durham County Bus & Rail Investment Plan (2011)

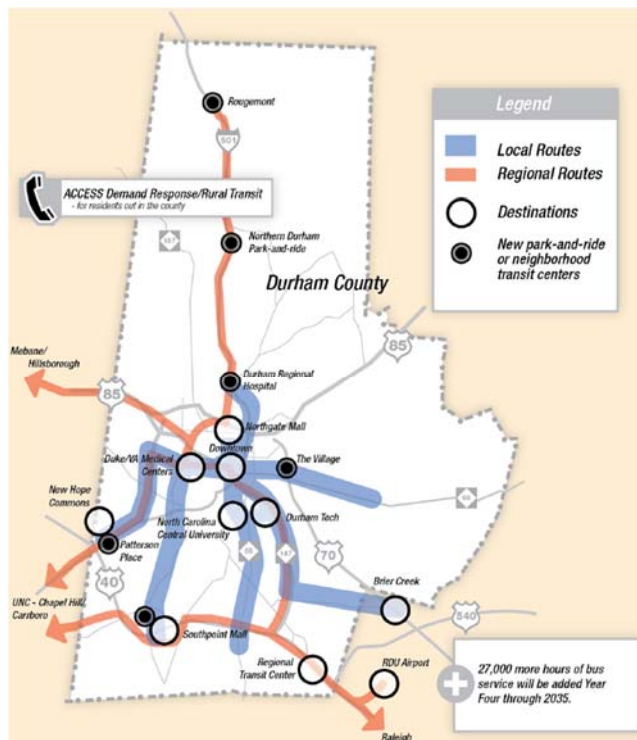
The Durham County BRIP was developed from concerns regarding increasing traffic congestion, income-based inequality in access to transit, and air pollution concerns. The plan was informed by the recommendations of a blue-ribbon group of Triangle leaders called the Special Transit Advisory Commission, as well as the 2009 passage of Congestion Relief and Intermodal Transfer Act (HB 148), which allows for new transportation revenues to be levied through increased sales taxes and vehicle registration fees.

The Durham County BRIP includes three primary elements:

1. New bus service
2. New light rail service
3. New commuter rail service

New bus service envisioned by the Durham County BRIP includes 77,000 additional annual bus hours (a 44% increase) over the 23 year life of the plan, with a focus on connecting residents to jobs and post-secondary/vocational educational centers. The BRIP calls for increases in frequency of buses in high-ridership corridors and expanded weekend service to nearby cities and to the Raleigh-Durham International Airport. It also calls for construction of park-and-rides, neighborhood transit centers, and capital improvements to bus shelters, sidewalks, and transit signal priority.

Figure 2-2 Durham County BRIP Bus Service



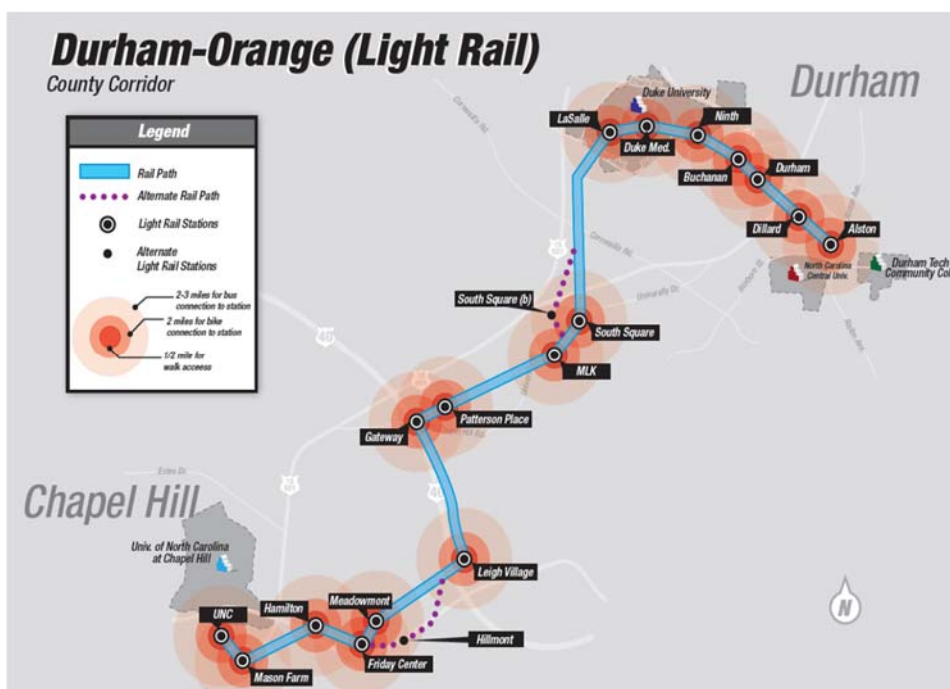
Source: Durham County BRIP (2011)

Durham-Orange Light Rail Service

New light rail transit (LRT) service is planned to connect the University of North Carolina (UNC) hospitals to Alston Avenue in East Durham. This LRT line—which is planned without an estimated service start date—would operate in both Durham and Orange Counties and include 17 stations. The LRT service is planned to connect with local buses, intercity buses, and Amtrak. Ten-minute peak hour headways are planned for the LRT system.

As of April 2019, the Orange County and Durham County Commissioners have voted to officially stop the Durham-Orange LRT project and instead develop a new transit plan. As a major regional transportation project, the Durham-Orange LRT project appears in numerous plans in this chapter. For consistency, the original timelines and status of the project at the time of the plan are still reported.

Figure 2-3 Durham County BRIP Light Rail Service

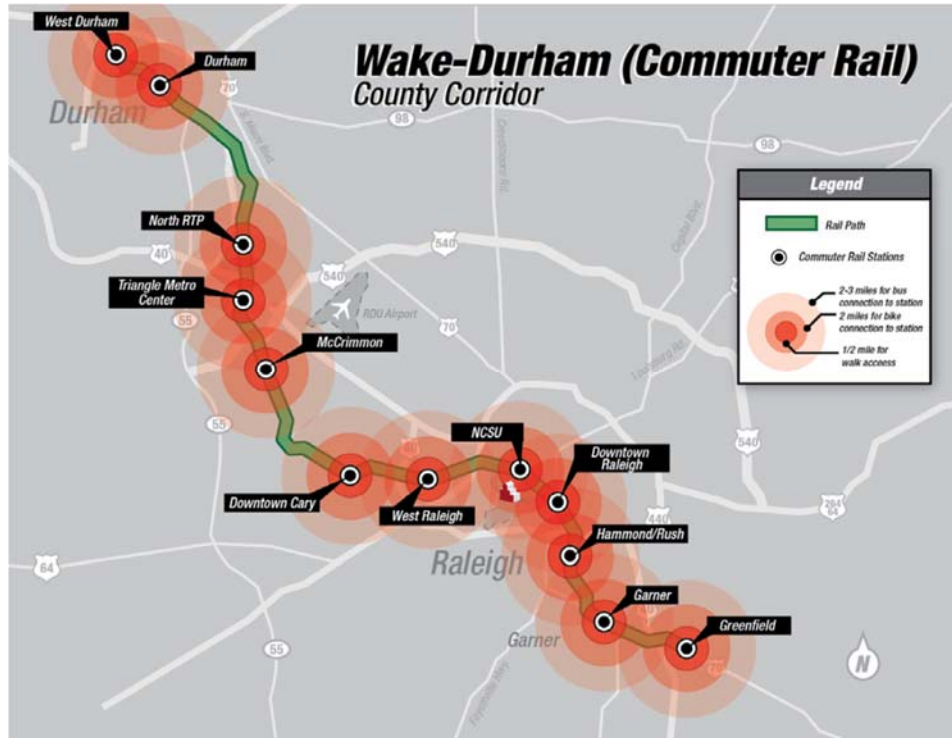


Source: Durham County BRIP (2011)

Wake-Durham Commuter Rail Service

New commuter rail is planned to connect West Durham and Garner, with 12 intermediary stops at major activity centers in the region, including Durham, Research Triangle Park, Morrisville, Cary, and Raleigh. The service is planned as a 12-stop, 37-mile system operating in Durham and Wake Counties, with a potential start date before 2035. Commuter rail trains are planned to run at 20-30 minute headways during peak hours.

Figure 2-4 Durham County BRIP Commuter Rail Service



Source: Durham County BRIP (2011)

Orange County Bus & Rail Investment Plan (2012)

The Orange County BRIP was developed in a similar context to the Durham County BRIP. It cites growing traffic congestion, air quality concerns, and income-based transit access as reasons for the expansion of transit services. The Orange County BRIP is also contextualized by the STAC recommendations and the passage of HB 148.

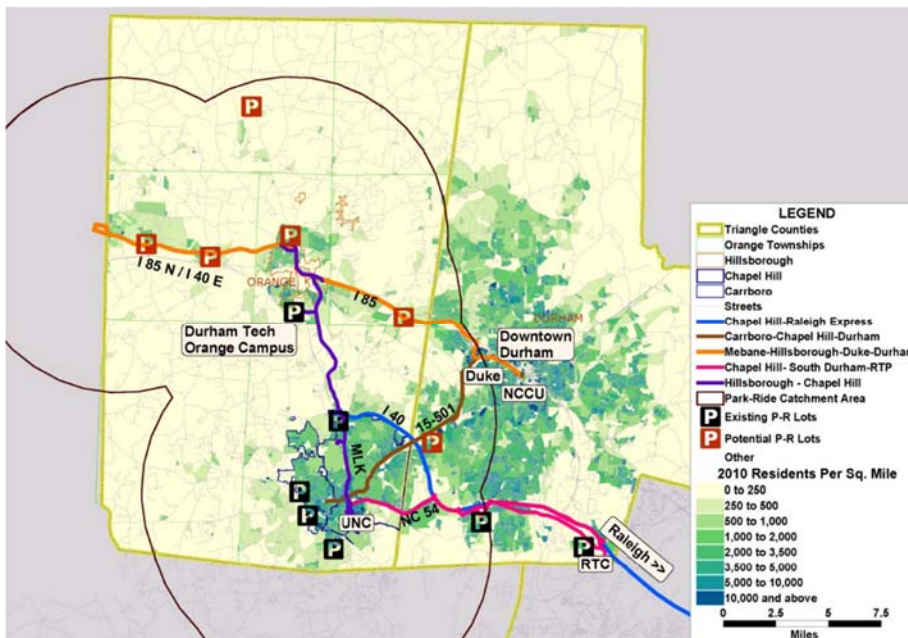
Although the Orange County BRIP plans for much of the same transit service expansion as its Durham County companion, it makes no provision for commuter rail service, as the commuter rail line outlined for Durham County would not serve Orange County.

The Orange County BRIP includes four primary elements:

1. New bus service
2. New Amtrak rail station
3. New light rail service
4. Martin Luther King Jr. Boulevard improvements

New bus service is planned to add 40,950 additional bus hours over the 25-year lifetime of the plan, representing a 20% increase in service hours over existing Chapel Hill Transit (CHT) and Orange Public Transportation (OPT) offerings. This expansion includes local, rural, and regional bus service, including both peak and off-peak service frequency improvements. Capital improvements such as park-and-ride lots, bus shelters, and passenger information infrastructure are also planned.

Figure 2-5 Orange County BRIP Bus Service

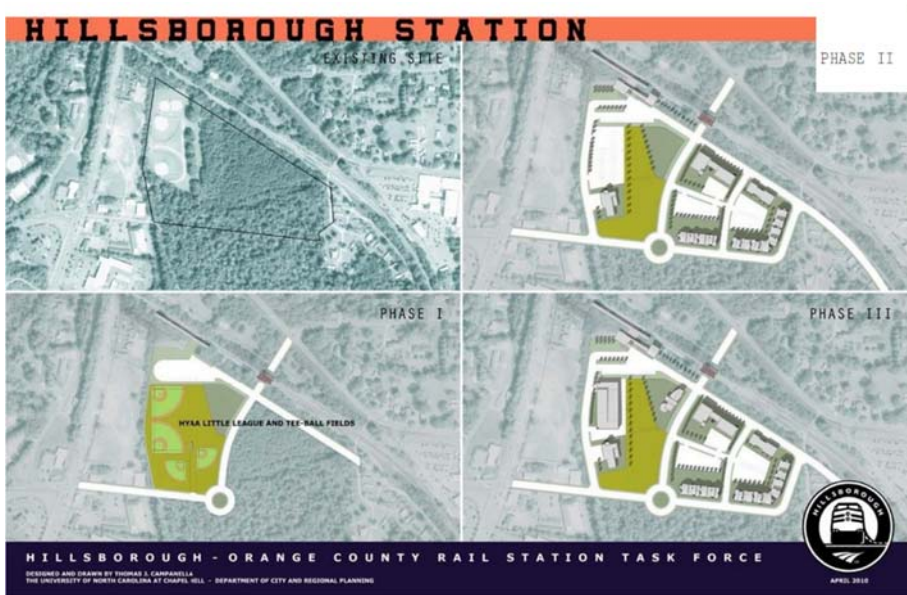


Source: Orange County BRIP (2012)

Hillsborough Amtrak Station

A Hillsborough Amtrak station is outlined in the Orange County BRIP. The plan calls for a 20-acre municipally-owned lot to be developed in 2015 into a rail station, municipal service buildings and offices, a civic events space, and high-density mixed-use development.

Figure 2-6 Orange County BRIP Amtrak Station

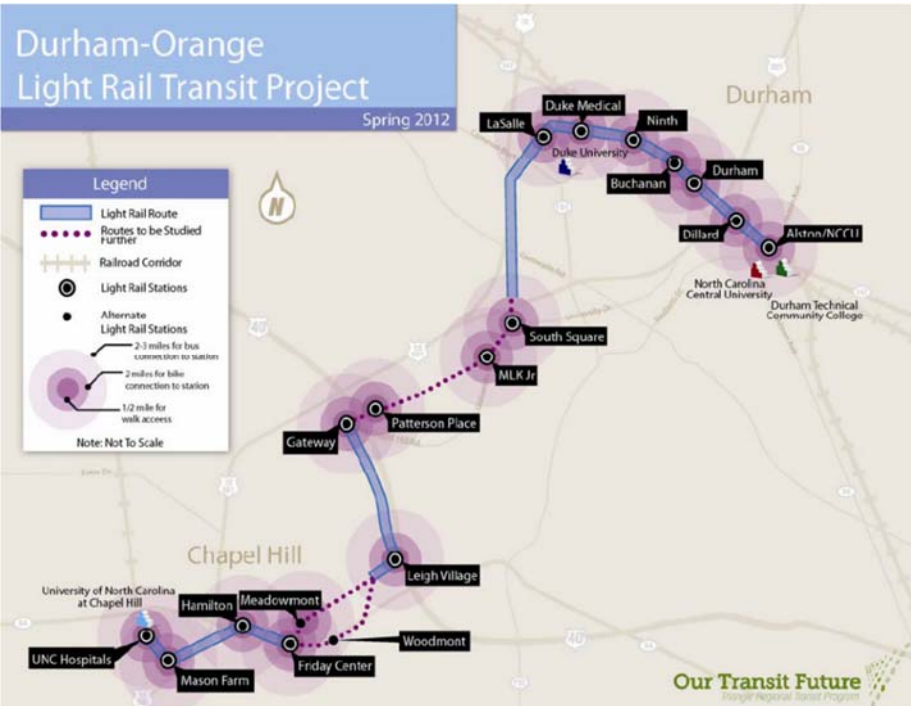


Source: Orange County BRIP (2012)

Durham-Orange Light Rail Service

New light rail service connecting Orange County to Durham County is planned for in the Orange County BRIP, which is well-coordinated with the Durham investment plan. The Orange County light rail plans include slightly more detailed financials than those presented in their Durham County counterpart, and calls for a 2026 opening year.

Figure 2-7 Orange County BRIP Light Rail Service

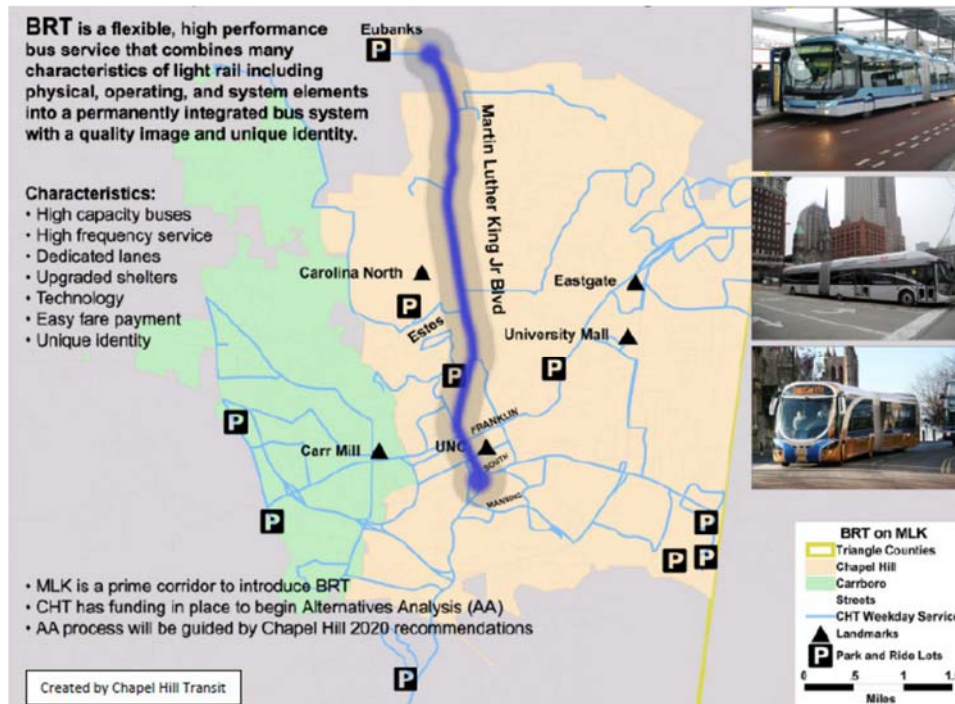


Source: Orange County BRIP (2012)

Martin Luther King Jr. Boulevard Improvements

Major improvements to the Martin Luther King Jr. Boulevard corridor are planned in the Orange County BRIP. The document calls for intermittent exclusive bus lanes and other preferential transit treatments, and plans for capital funding from the state of North Carolina and the federal government. This plan calls for completion of the lanes in 2019.

Figure 2-8 Orange County BRIP Martin Luther King Jr. Boulevard Improvements



Source: Orange County BRIP (2012)

Designing Better Bus Service in Durham (2012)

The 2012 DATA (now GoDurham) Designing Better Bus Service in Durham (DBBS) plan is a three-year plan tasked with finding efficiencies within the existing Durham bus system and expanding services to provide transit where it is most needed.

Plan Goals

Plan development operated under four goals sourced from community members and other stakeholders:

- **Safety:** Routes were reviewed to determine if changes to alignment or stop locations could help bus operators and customers interact in a safer way.
- **Service Quality:** Routes were reviewed and recommendations made in order to provide reliable, convenient, and accessible public transit in Durham County.
- **Fiscal Responsibility:** Recommendations were cognizant of the fiscal constraints of the system and all improvements were within the boundaries of the available funds.

- **Community Benefits:** Route recommendations were developed that supported economic development by serving growing areas, improved access to job centers, and connected citizens and visitors with the assets of the city.

Recommendations Summary

The DBBS process produced four overarching summary recommendations, as well as three funding scenarios that aggregate service improvements into fiscally-constrained implementation packages. The four overarching recommendations—which are tied to plan goals—are presented below:

- **Safety:** Improve customer safety by reducing overcrowding and upgrading bus stop environments.
- **Service Quality:** Improve service reliability by redesigning routes to improve on-time performance from 61% to 90% of all trips.
- **Fiscal Responsibility:** Focus services to meet mobility needs by matching service frequency to demand. This means providing 15-minute service on the busiest route segments and maintaining service on less-traveled route segments at reduced frequency.
- **Community Benefits:** Support economic development by providing more direct service to employment centers and educational institutions, like the Duke/VA medical centers, Southpoint Mall, Durham Tech, and Durham public high schools.

Funding Scenarios

The three funding scenarios each include route improvement packages. Recommendations in funding Scenarios 2 and 3 are borne primarily from the 2011 Durham County BRIP reviewed above, while Scenario 1 is a base scenario. Summaries of funding scenarios and their proposed improvements are evaluated below.

Scenario 1 outlines a basic improvement plan that assumes funding levels consistent with 2012 budgeting. The scenario focuses on improving route reliability and recommends increasing frequency of some routes while shifting services from the least used portions of the system to the most used.

Scenario 2 is a more aggressive implementation package that assumes funding from a \$10 vehicle registration fee. This scenario includes increases in service frequency between downtown and North Carolina Central University (amongst other routes), as well as new and improved commuter services. Scenario 2 also calls for capital improvements to bus stops and park-and-ride lots.

Scenario 3 is predicated upon a ½-cent sales tax increase and is the most aggressive implementation package. It calls for the creation of additional 15-minute headway corridors during peak hours, and service hour expansions to include weekend late-night service and Sunday service. Physical improvements to 170 bus stops, the construction of neighborhood transit centers, and park-and-ride lots are called for in Scenario 3.

Other Aspects of the Plan

The 2012 DBBS plan also includes a detailed accounting of public involvement, existing transit conditions, service measures, and a congruency analysis. Chief findings of these portions of the report are that:

- Community engagement and public involvement in plan formation was robust.
- The DATA system generally performs well when benchmarked against peer systems.
- DATA should improve their ability to compare service provision and performance against peer operators.
- The most attractive sites for future transit ridership are the Duke University/VA Hospital and Research Triangle Park.

Duke and Durham Coordinated Transit Study

The Duke and Durham Coordinated Transit Study (DDCTS) fills in gaps in the 2012 Designing Better Bus Service plan by focusing on enhancing coordination amongst Duke Transit, Triangle Transit, and Durham Area Transit Authority (DATA, now GoDurham). The plan's goals are to improve transit service for Duke University and Duke Medical Center area residents, workers, students, and visitors by:

- Increasing frequency
- Extending coverage and service hours
- Enhancing ease of use (clarity, transfer opportunities, and directness of route)

The DDCTS is quick to stress the importance of complete pedestrian and bicycle networks as an alternative and supporting element of transit service, pointing out that provision of these networks is a cost-effective way to help transit operate more efficiently.

Initially, the plan identifies a number of 'goal' areas for improvement, including overlap of routes within and across transit agencies, overly complex routes and schedules, a lack of system cohesiveness, and duplication of vehicle maintenance and facilities, as well as significant fleet replacement needs and costs. The DDCTS presents a methodology for addressing the areas for improvement and details outreach and analysis that was targeted towards developing recommendations.

The DDCTS also conducts an existing conditions analysis, comparing Duke transportation options to other major universities, reviewing ridership figures, route productivity, and operational overlap amongst the three transit providers.

Plan Recommendations

In developing recommendations, the DDCTS looked to most effectively allocate transit agency service geographies, new residential development, and improved route efficiency to serve Duke University and Duke Medical Center communities. The plan settles on recommending 15 distinct route changes or additions, and also provides cost savings or additions for each. The operational financial analysis projects a net cost savings of \$50,800 per year. All told, two routes are recommended to be eliminated, two new routes developed, a number of routes expanded, modified, or reduced, and two routes combined.

A particularly in-depth analysis is conducted of the fare-free Bull City Connector (BCC) route, which connects Duke University with Downtown Durham. Recommendations for the BCC are made to extend the route and eliminate the route-complicating Durham Station stop.

Durham County Transit Plan (2017)

The 2017 Durham County Transportation Plan (DCTP) serves as an update and more comprehensive articulation of the 2011 BRIP. Although the basic goals of the 2011 Durham County BRIP are not altered in the DCTP, these goals are outlined in greater detail and re-substantiated to reflect the changing political and economic context.

The 2017 DCTP outlines the progress made on the projects planned in the 2011 BRIP. This progress is summarized below.

New bus service has been increased by roughly 41,000 annual hours (approximately 53% of the original 23-year goal of 77,000 annual hours, and 82% of the three-year goal of 50,000 added hours) through the implementation of new routes, increased service frequency, and expanded service hours. Although seven new buses have been purchased, the bus infrastructure (including sidewalks, shelters, and transit signal priority) planned for in the 2011 BRIP has yet to be implemented.

New light rail has undergone its NEPA-required environmental evaluation and has extended its route approximately 0.6 miles to better connect future transit riders with North Carolina Central University. Design and engineering for the project is underway, with the project expected to open two years behind schedule. A capital, operating, and maintenance cost-sharing agreement between Durham and Orange Counties has been established.

The new commuter rail line—called the Wake-Durham Commuter Rail Transit Project—has been delayed due to setbacks in the Wake County planning process and for funding reasons. The 2017 DCTP reiterates Durham County support for the railway and pledges to update project capital costs estimates.

The most significant changes reflected in the 2017 DCTP are those in state and federal funding assumptions made in the 2011 BRIP. Given reductions in available funds for the projects laid out in the 2011 plan, the 2017 DCTP increases planned reliance on local funding sources—namely, a half-cent sales and use tax, a five-percent vehicle rental tax, and a \$10 vehicle registration fee—for all major projects.

In addition to the progress report and updated funding plans, the 2017 DCTP presents a more comprehensive financial plan, which includes the hiring of additional administrative staff, and presents a schedule of needs that remain unfunded. It also outlines the process by which a multilateral stakeholder working group will develop an Annual Work Plan that supports implementation of DCTP projects.

Orange County Transit Plan (2017)

Because it is built to complement the DCTP (reviewed above), the 2017 Orange County Transit Plan (OCTP) is similar in scope and content. The 2017 plan is based upon the 2012 Orange County BRIP (also reviewed above) and similarly outlines progress to date on original BRIP proposals.

Changes in funding assumptions have also been incorporated into the OCTP. The OCTP review of progress on 2012 BRIP projects is summarized below.

New bus service in Orange County has been expanded by approximately 24,000 annual hours (about 59% of the original goal of 40,950 annual hours over the 25-year life of the plan, and 69% of the possible 34,650 hours to add in the first five years), primarily through more frequent

service, longer service spans, and new routes. Seven new buses have been purchased and some bus facilities improvements have been made.

New light rail connecting Orange County to Durham County has moved into the design and engineering phases and is planned to open in 2028, two years behind schedule. The biggest change from the 2012 BRIP that affects Orange County has been the relocation of one Orange County station to Durham County.

The new Amtrak station planned for Hillsborough is identified in the 2017 OCTP as a North Carolina Department of Transportation project that is now scheduled for construction in fiscal years 2019 and 2020.

The Martin Luther King Jr. Boulevard improvement project planned in the 2012 BRIP have been re-titled the 'North-South Bus Rapid Transit (BRT) Project' and has undergone a locally-preferred alternative (LPA) identification process. Chapel Hill Transit is currently in the process of bringing three designs of the BRT project into requisite environmental and public review processes. The Federal Transit Administration has admitted the project into Small Starts Project Development.

In similar fashion to the DCTP, the OCTP presents a more robust financial plan and includes a schedule of unfunded planning and project needs. It also develops an implementation (the same process outlined in the Durham plan) process to translate project proposals into reality.

3 MARKET ANALYSIS

This market analysis presents demographic characteristics associated with the market for transit ridership. The purpose of this analysis is twofold: (1) to identify gaps in transit service in areas with high demand, and conversely (2) to identify overserved areas where transit demand is weak. To do so, it uses a set of nine demographic indicators typically associated with transit ridership.

Several of the indicators provide the basis for a composite Transit Propensity Index (TPI), which in turn highlights the potential for transit use in Durham.

Figure 3-1 lists each indicator included in this analysis, along with (1) whether the data is linked to the place of residence or place of work (2) the unit of measure, (3) the data source, and (4) the geographic level. It also identifies which indicators are used to build the TPI.

Figure 3-1 Market Analysis Indicators

Indicator	By place of	Unit	Source	Geography	TPI
Population	Residence	People per acre	2010 Census	Block group	No
Employment	Work	Jobs per acre	2014 LEHD ¹	Block group	No
Low-wage employment	Work	Jobs paying \$1250/mo or less per acre	2014 LEHD	Block group	No
Low income	Residence	People earning less than 200% of the federal poverty line per acre	2011 – 2015 ACS ²	Block group	Yes
People with disabilities	Residence	People with disabilities per acre	2009 – 2013 ACS	Block group	Yes
Young adults	Residence	Population aged 18-24 inclusive per acre	2010 Census	Block group	No
Seniors	Residence	Population aged 65 and over per acre	2010 Census	Block group	Yes
Rental units	Residence	Rental units per acre	2011 – 2015 ACS	Block group	Yes
Zero-vehicle households	Residence	Households without access to a vehicle per acre	2011 – 2015 ACS	Block group	Yes

¹ Job data was taken from the US Census Bureau's Longitudinal Employer-Household Dynamics database.

² American Community Survey, five-year estimates

KEY FINDINGS

This market analysis assesses nine demographic characteristics that are commonly associated with demand for transit. The analysis helps understand where people who are likely to use transit live and work. These are the key findings from the market analysis:

- **The area around Duke University is a major existing market for transit.** Student housing complexes and destinations on Duke's main campus generate huge demand for transit service. Much of this, however, may be being served by Duke's internal transit system.
- **GoDurham does a good job serving areas with high transit demand.** In addition to Duke University campus, this includes downtown Durham, areas surrounding NCCU, and the north, west, south and east ends of the city. Every area identified as having "high propensity" is served by GoDurham.
- **There are opportunities to improve service to large employment centers.** Research Triangle employment and low-wage jobs located in the south and southeastern portion of Durham are a potential market with a limited level of existing GoDurham service. The majority of low-income populations in Durham are concentrated in the center city and east Durham. There may also be opportunities to connect to other regional transit services provided in these areas.

POPULATION

Population density is a key determinant of transit demand. In Durham, population densities are highest (10 or more people per acre) in the following areas:

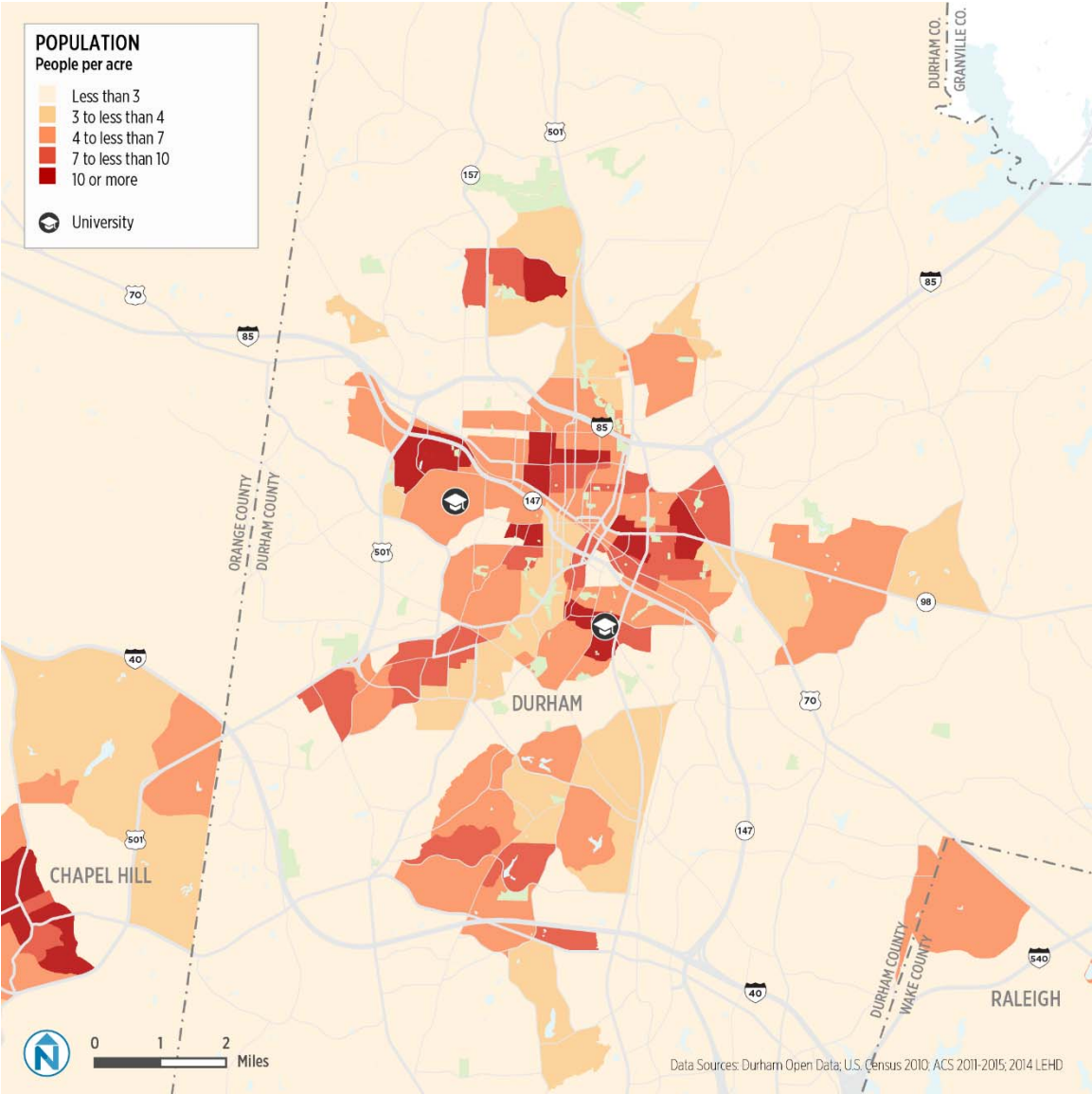
- North of Duke University, along Erwin Road between Highway 501 and Highway 147
- In the neighborhoods between W Chapel Hill Street and Morehead Avenue southeast of Duke University
- Surrounding Duke East Campus in neighborhoods north and south of Markham Road
- Surrounding North Carolina Central University (NCCU) between Roxboro Street and Alston Avenue
- In East Durham neighborhoods along Highway 98 between Roxboro Street and Alston Avenue, and Highway 70 and Spruce Street
- In north Durham, between Highway 157 and Highway 501 and south of Horton Road

Some other areas have moderate densities (7-10 people per acre):

- Neighborhoods in east Durham north of Highway 98 between Highway 70 and N Alston Avenue
- South of Highway 501 along the Highway 501 corridor stretching west toward Chapel Hill
- In south Durham neighborhoods along Woodcroft Parkway

Figure 3-2 presents population density for block groups in Durham.

Figure 3-2 Population Density



EMPLOYMENT

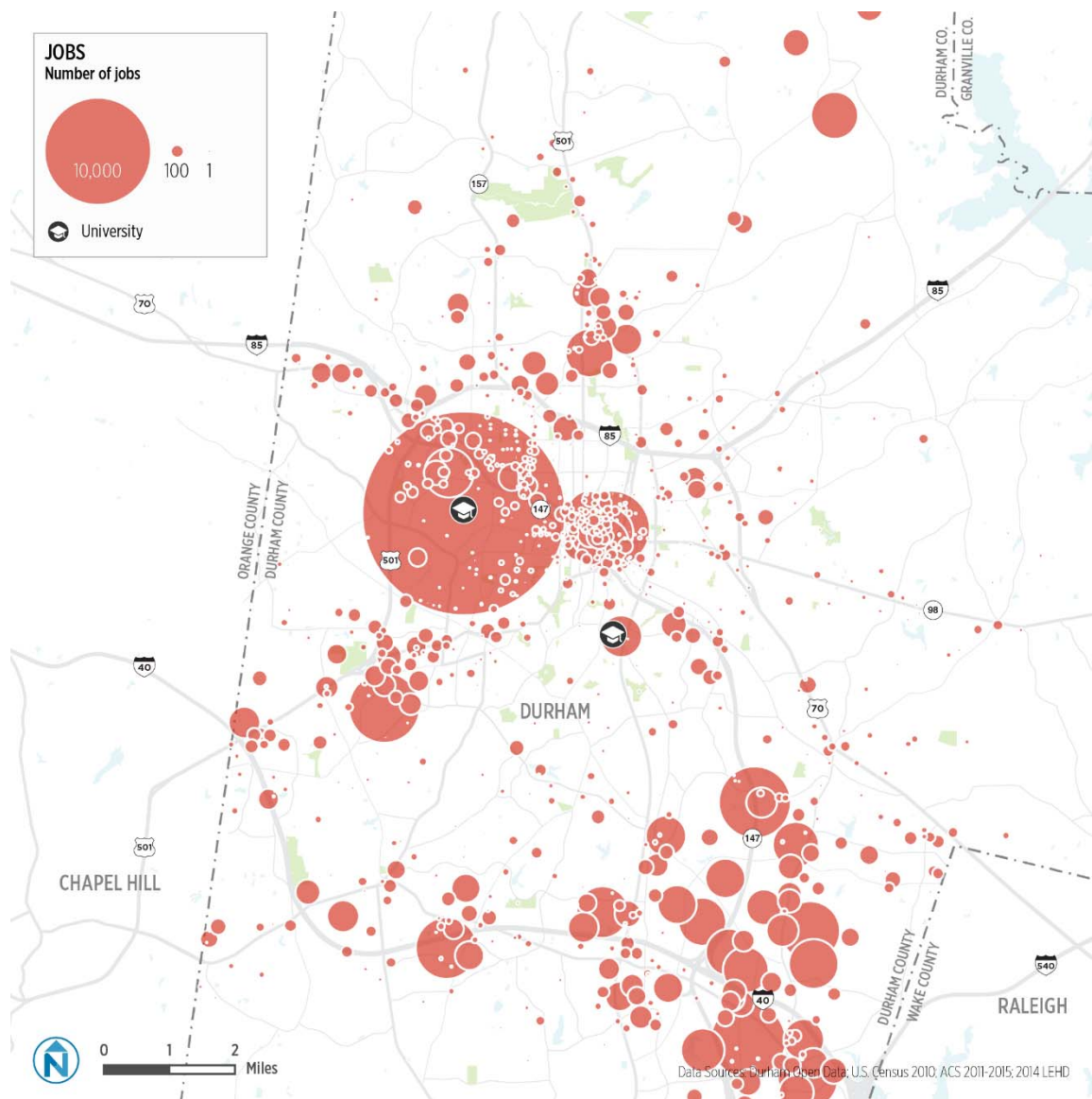
Employment clusters are largely found in the central and south parts of Durham, including:

- Duke University and East Duke campuses
- The downtown core
- South Square shopping area along Highway 501/Durham-Chapel Hill Boulevard
- The Research Triangle Park (RTP) area along Highway 147 and I-40

The employment pattern in the RTP is strongly dispersed, so while there are many large employers, there is no easy way to connect them. Likewise, Duke University shows up as a major employer, but that employment is spread between two campuses.

Figure 3-3 presents job density in Durham according to Longitudinal Employer-Household Dynamics (LEHD) data.

Figure 3-3 Employment Density



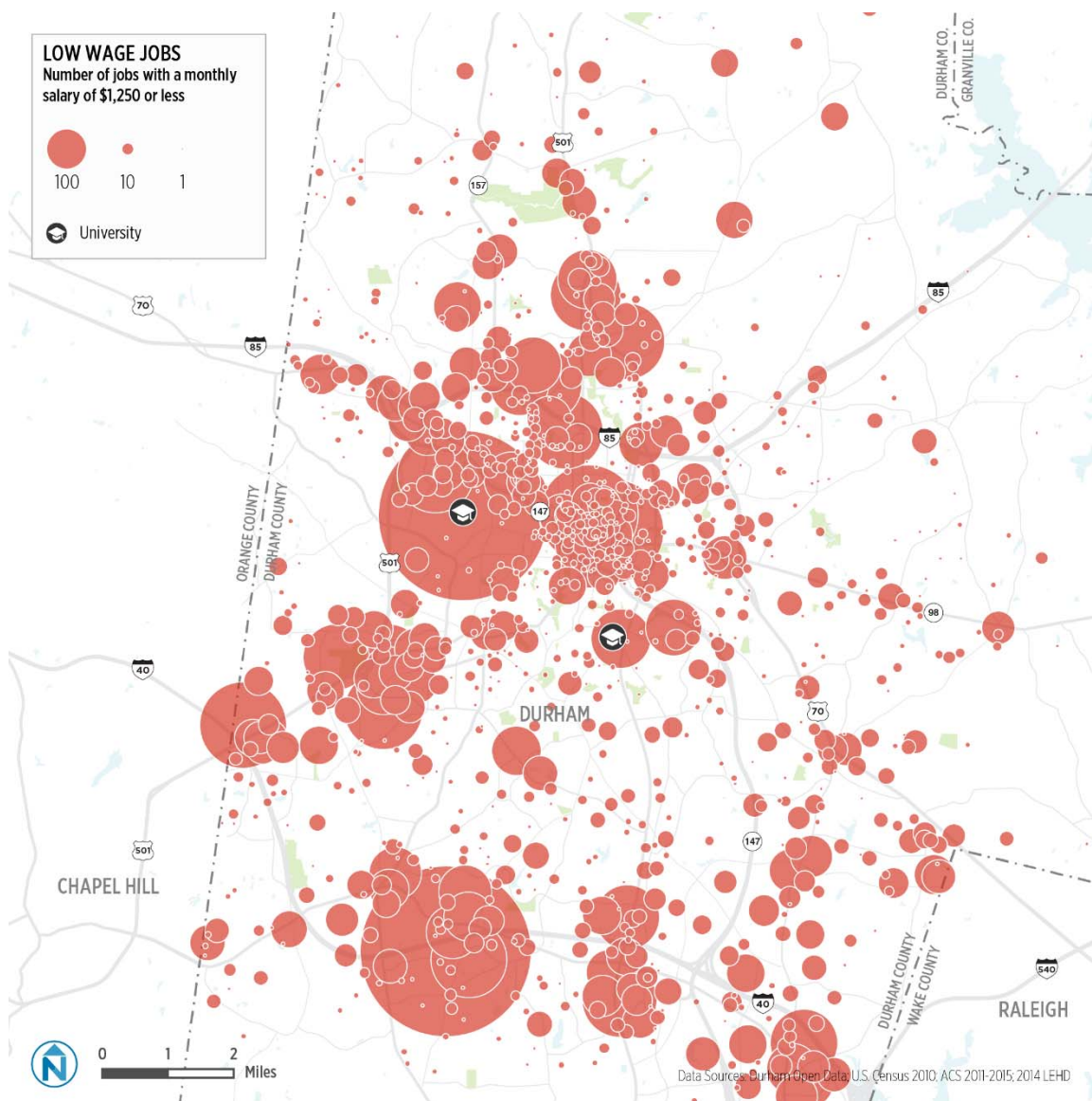
LOW-WAGE EMPLOYMENT

The LEHD survey defines Low Wage Employment as jobs paying \$1,250 per month or less. Low-wage employment in Durham is focused in several zones:

- Duke University and areas to the north of campus
- Southpoint shopping areas along I-40 in south Durham
- Downtown Durham, including the areas north of downtown along Highway 85 and Highway 501
- Along the Highway 501/Durham-Chapel Hill Boulevard corridor south of downtown stretching west toward Chapel Hill

Figure 3-4 presents low wage job density according to LEHD data.

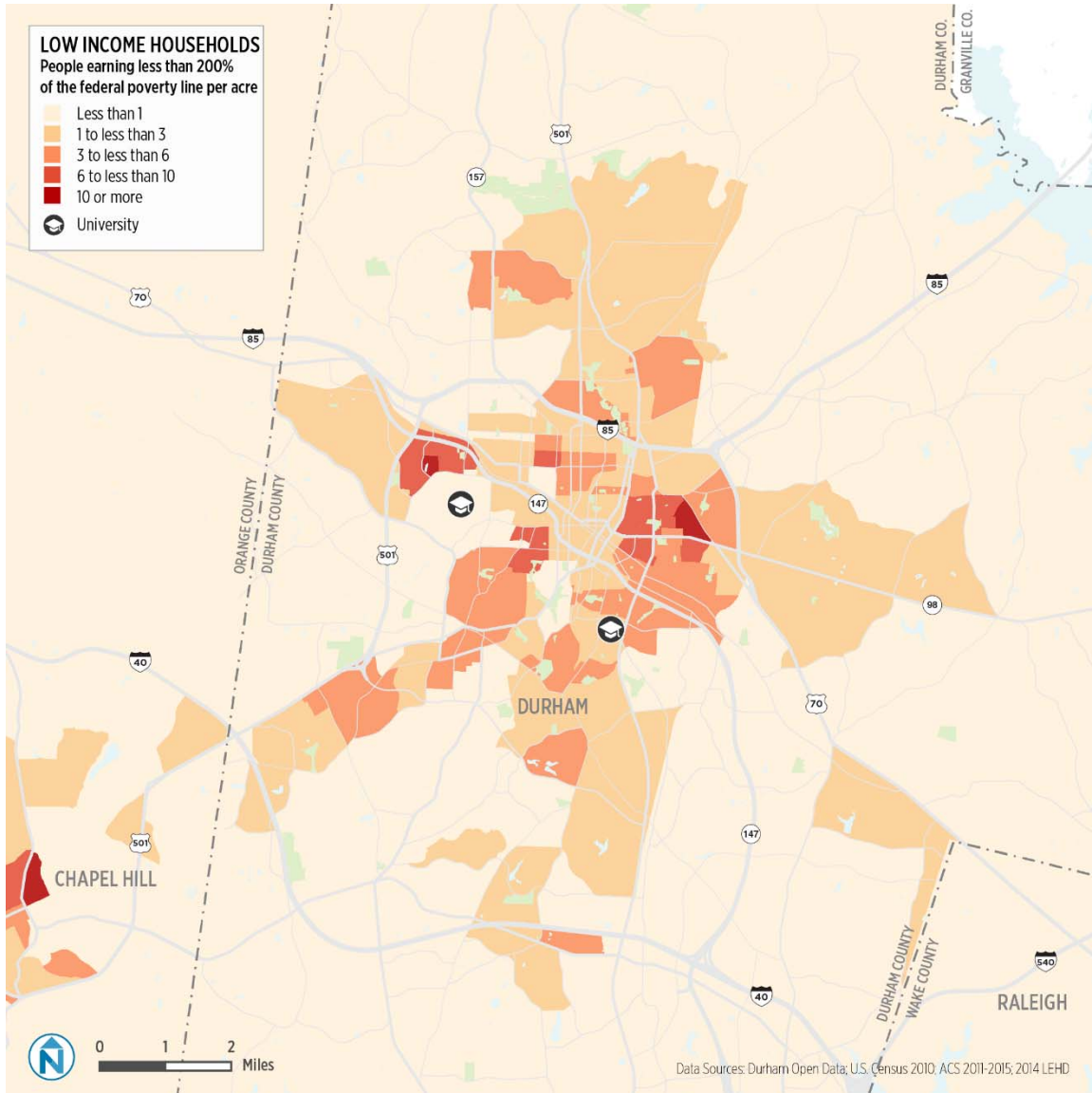
Figure 3-4 Low-Wage Employment Density



LOW-INCOME POPULATIONS

As shown in Figure 3-5, low-income populations are clustered in the neighborhoods immediately north and east of Duke University, and in east Durham neighborhoods along Business 70 between Geer Street, Miami Boulevard, E Main Street, and S Roxboro Street. There appears to be some correlation between low-income areas and student residence locations, particularly surrounding Duke University.

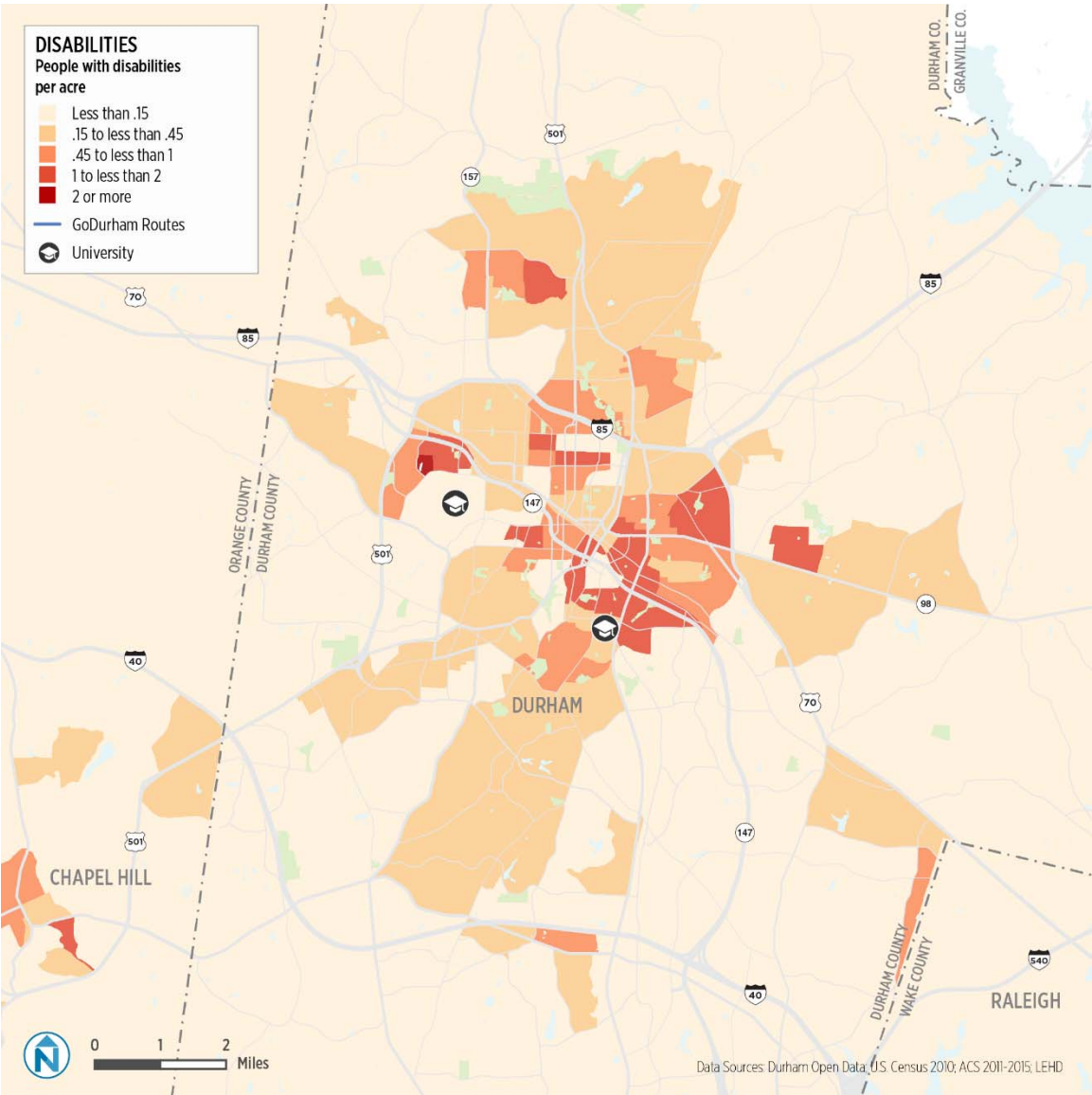
Figure 3-5 Low-Income Population Density



PEOPLE WITH DISABILITIES

People with disabilities living in Durham are clustered in the center of the city. Certain pockets contain more than one person with a disability per acre, including the areas immediately north of Duke, areas north of NCCU, east Durham neighborhoods west of Highway 70, and neighborhoods south of Horton Road in north Durham, between Highway 157 and Highway 501. Figure 3-6 presents the density of people with disabilities in Durham.

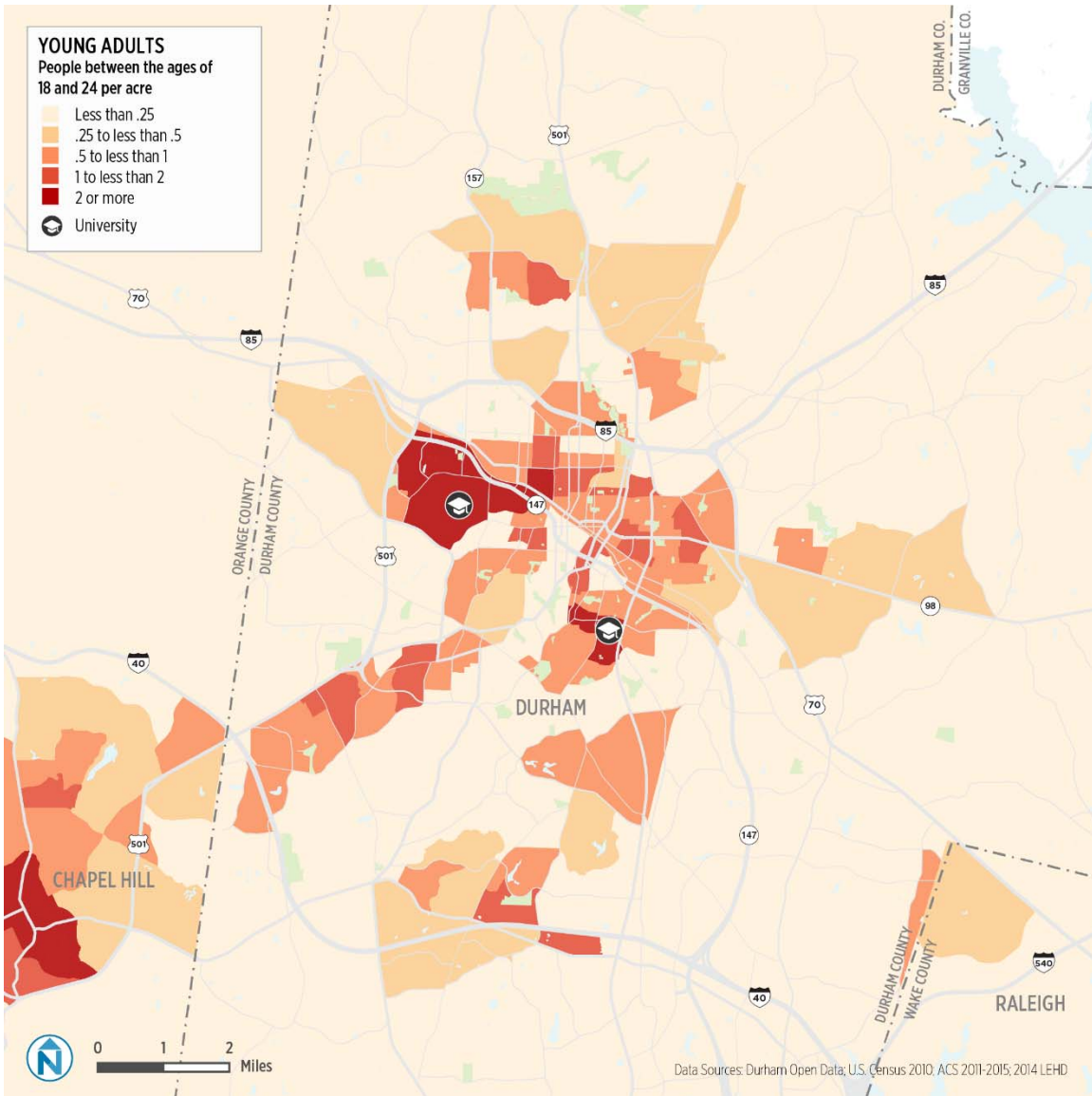
Figure 3-6 Density of People with Disabilities



YOUNG ADULTS

Adults between the ages of 18 and 24 are more likely to take transit than adults over the age of 24. Young adults are concentrated in the neighborhoods immediately surrounding Duke and NCCU, in central and east Durham, as well as those adjacent to the Highway 501/Durham-Chapel Hill Boulevard corridor heading west to Chapel Hill. The density of young adults in the outer parts of the city is very low. Figure 3-7 presents the densities of young adults in Durham at the block group level.

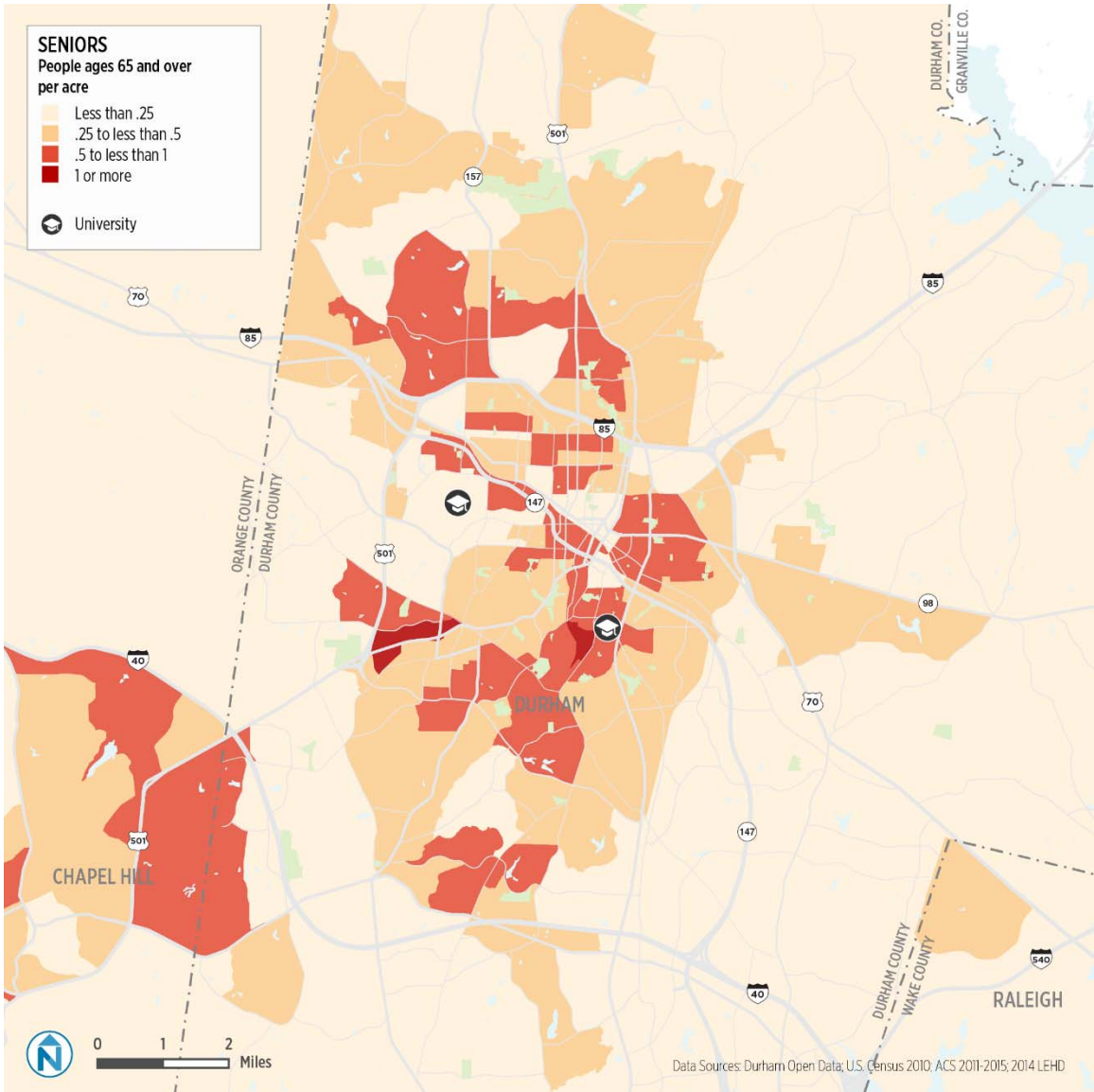
Figure 3-7 Density of Adults Aged 18 to 24



SENIORS

Durham is a very young city, with relatively few seniors (aged 65 and over) residing in the city. Certain areas—most notably the retirement communities at Highway 501/Durham-Chapel Hill Boulevard and I-85 interchange and neighborhood immediately southwest of NCCU—have higher densities of seniors. However, very few neighborhoods have more than one person aged 65 or over per acre. Figure 3-8 shows the density of seniors in Durham at the block level.

Figure 3-8 Density of Adults Aged 65 Years and Over



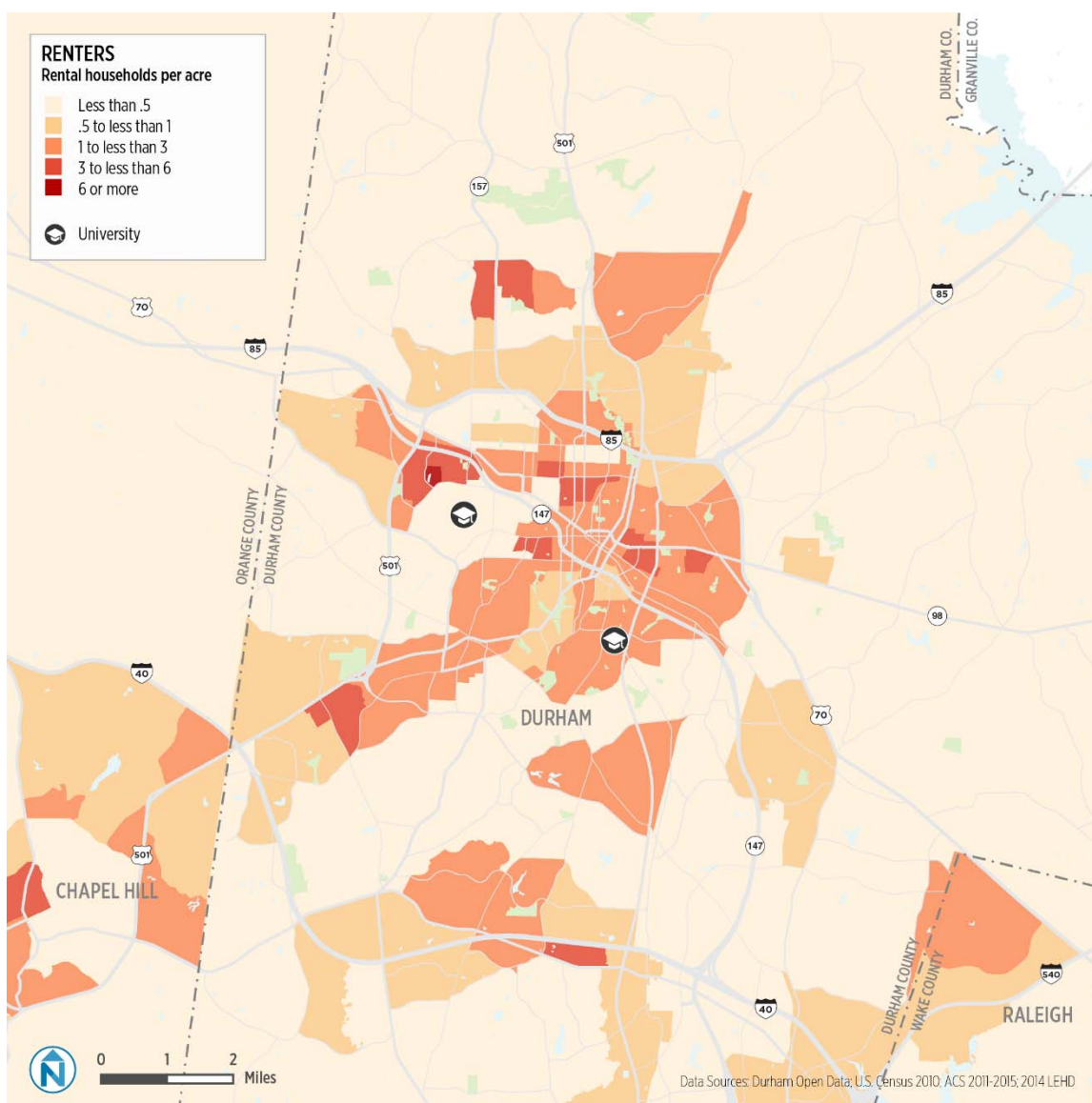
RENTAL UNITS

There is a relationship between transit ridership and rental units. Clusters of rental units are distributed in several different neighborhoods throughout the city and tend to be located along major highways. Areas with a high density of rental units are:

- Immediately north of Duke along Erwin Road
- Downtown Durham along W Markham Avenue
- North Durham in the vicinity of Horton Road
- East Durham along Highway 98
- Southwest Durham along Highway 501/Durham-Chapel Hill Boulevard

Figure 3-9 displays the density of rental units in Durham at the block group level.

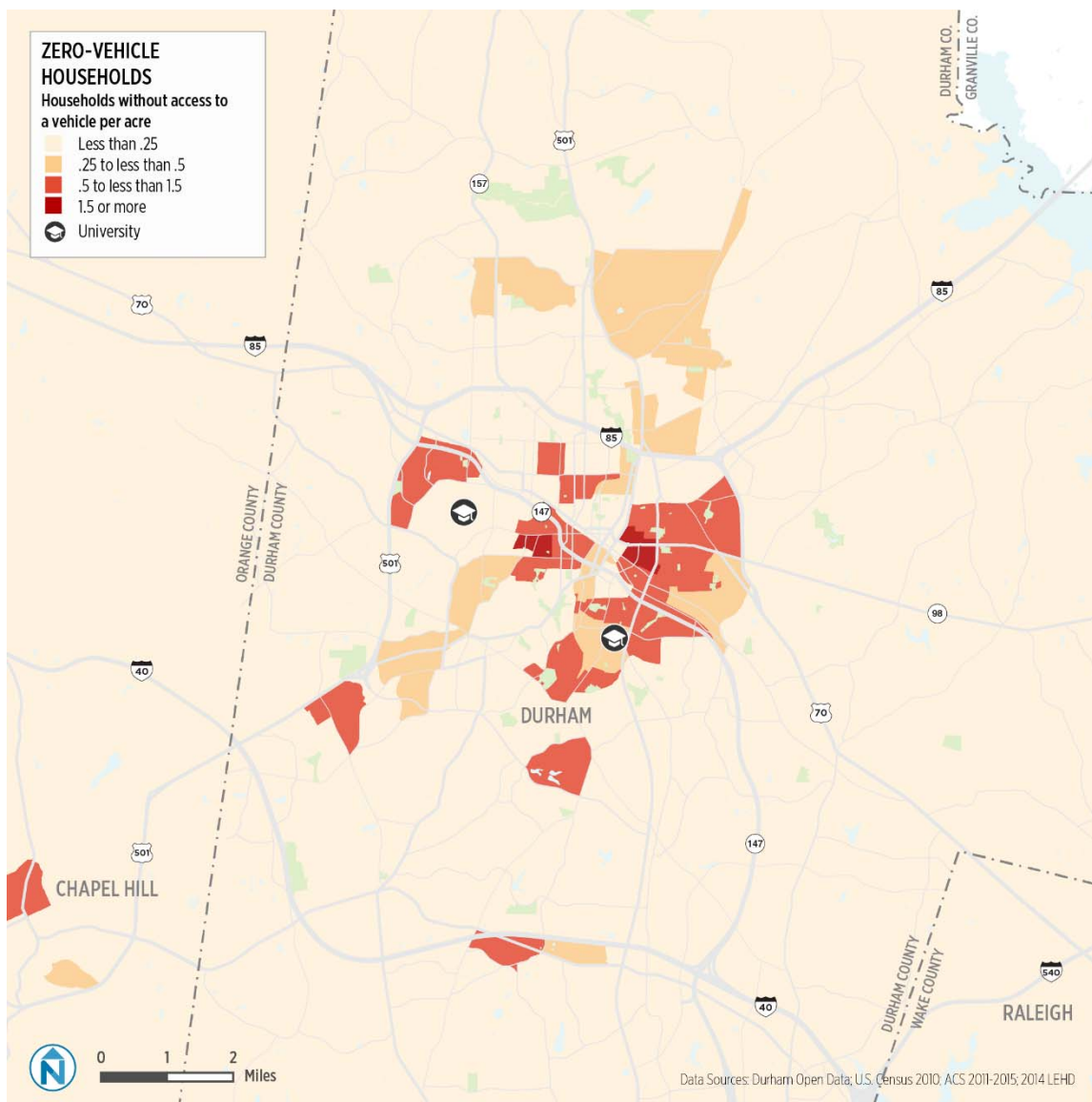
Figure 3-9 Density of Rental Units



ZERO-VEHICLE HOUSEHOLDS

On average, very few households do not have access to a motor vehicle. However, some areas of Durham have more than 0.5 zero-vehicle households per acre. These include a few neighborhoods adjacent to Duke to the north and east, as well as the downtown core and much of the neighborhoods in East Durham between E Geer Street, Highway 70, Cornwallis Road, and Roxboro Street. There are also several neighborhoods in south Durham with at least 0.5 households per acre without access to a vehicle, including around Southpoint. Figure 3-10 presents the density of zero-vehicle households in Durham at the block group level.

Figure 3-10 Density of Households without Access to a Motor Vehicle



TRANSIT PROPENSITY INDEX

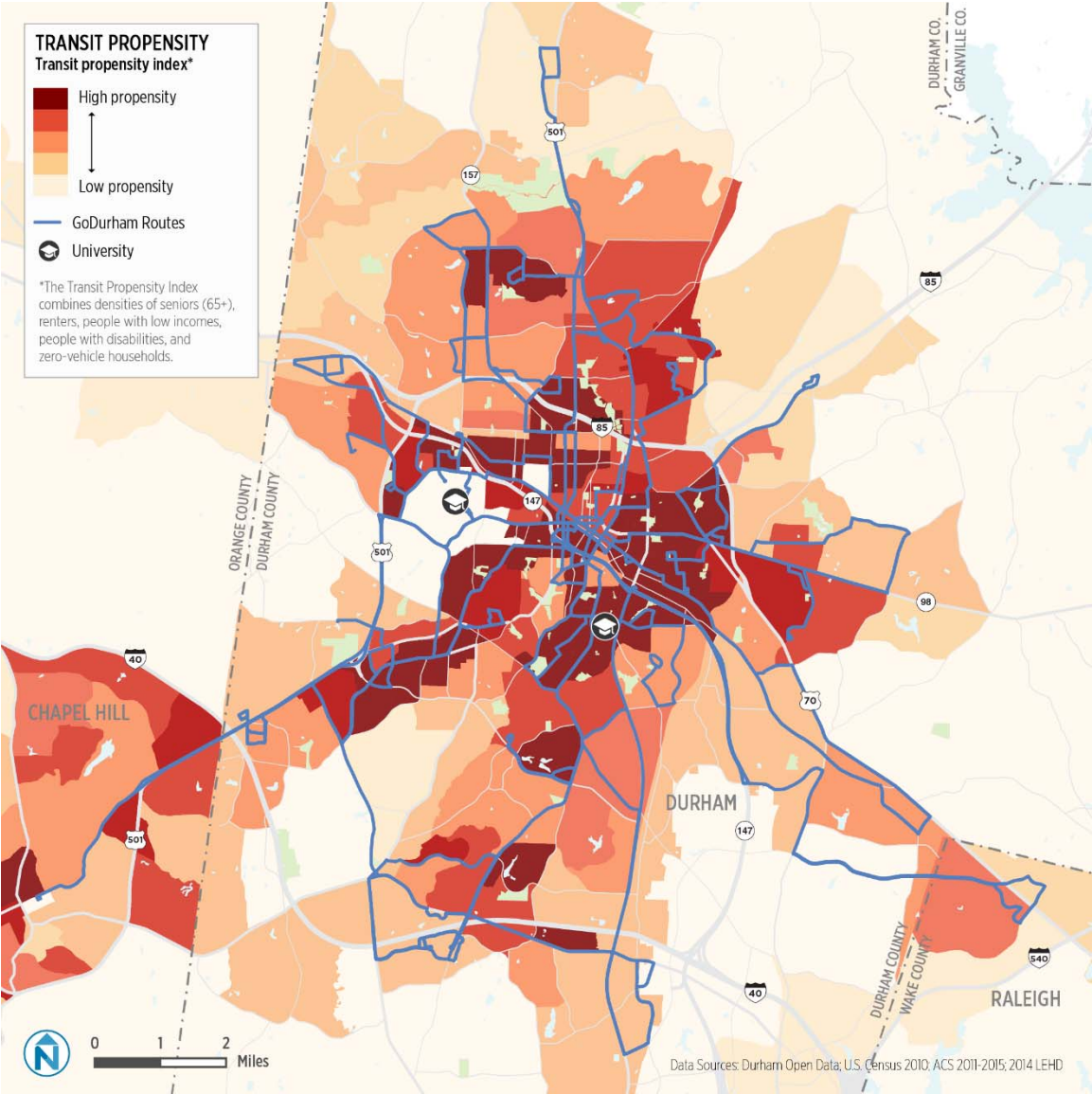
For the purposes of this analysis, propensity to take transit is based on the density of five combined indicators: seniors (ages 65 and up), people with low incomes (less than 200% of the federal poverty line), people with disabilities, rental units, and zero-vehicle households.

Based on the index, the largest demand for transit is clustered into six general areas:

- **Duke University.** This area includes the neighborhoods to the north of Duke University that have a high density of rental units and student housing immediately north of Duke along Erwin Road, and neighborhoods east of the university where there are high concentrations of people with low incomes.
- **Downtown Durham and East Duke.** High demand is located along Markham Avenue both east and west of the center city and neighborhoods surrounding Duke University East Campus.
- **East Durham neighborhoods.** The neighborhoods with highest demand are located in the eastern portion of Durham along the Highway 98 corridor. This includes neighborhoods as far east as Sherron Road.
- **Highway 501/Durham-Chapel Hill Boulevard corridor.** Neighborhoods adjacent to the Highway 501/Durham-Chapel Hill Boulevard corridor heading west to Chapel Hill display high transit propensity characteristics.
- **Southwest Durham and NCCU.** The neighborhoods immediately surrounding NCCU.
- **North Durham.** Neighborhoods in north Durham in the vicinity of Horton Road, as well as neighborhoods east of Highway 501.

Figure 3-11 presents the TPI for block groups in Durham.

Figure 3-11 Transit Propensity Index



4 TREND ANALYSIS

This trend analysis compares current GoDurham performance with past performance. The trends in this section paint a data-driven picture of performance relative to previous years, which in turn helps to shape recommendations for future service improvements.

This section assesses 10 fixed-route performance indicators for the 10-year period from FY 2006 through FY 2015. The ten indicators are:

- Annual passenger trips
- Annual revenue hours
- Annual farebox revenue
- Annual revenue miles
- Passengers per revenue hour
- Farebox recovery ratio
- Passengers per revenue mile
- Operating expense per passenger
- Operating expense per revenue hour
- Total annual operating expenses

KEY FINDINGS

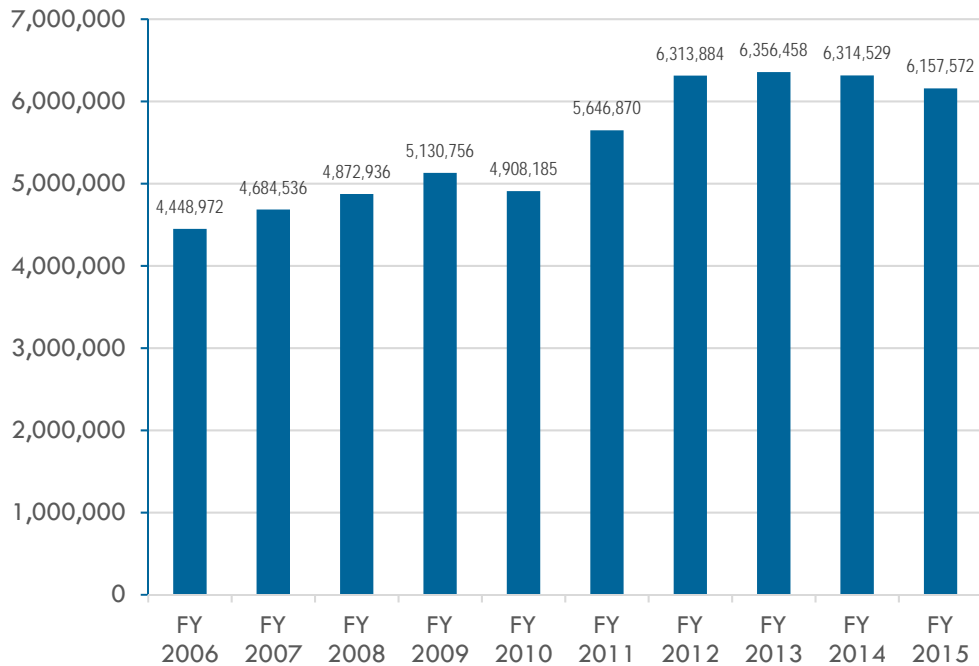
Figure 4-1 through Figure 4-10 present these performance indicators for the years specified. The figures reveal the following key findings:

- Annual passenger trips (Figure 4-1) increased by nearly 20% from FY 2010 to FY 2012, but has been slightly decreasing since after reaching a high in FY 2013.
- The change in ridership corresponds to an increase in annual revenue hours in FY 2011 and FY 2012 (Figure 4-2) as well as an increase in annual revenue miles in FY 2009 (Figure 4-4). In turn, productivity has increased; passengers per revenue hour and passengers per revenue mile (Figure 4-3 and Figure 4-5) have generally been increasing since FY 2010.
- The number of passengers per revenue hour has been steadily increasing since 2010, though it decreased slightly in 2015. This suggests a generally increasing number of new passengers per unit of additional service.
- As ridership increased in FY 2011, farebox revenue increased dramatically (Figure 4-6) while the farebox recovery ratio (Figure 4-7) decreased slightly. This suggests that new passenger revenue generated was related to an increase in service and operating costs. This timeframe also coincides with an increase in revenue hours (Figure 4-2), revenue miles (Figure 4-4), and annual operating expense (Figure 4-10).
- Figure 4-8 shows that GoDurham's operating expense per passenger has decreased by \$0.45 between FY 2010 and FY 2012, which is notable given that ridership, revenue hours, and revenue miles have all increased during the study period. Additionally, operating expense per passenger increased by \$0.21 in FY 2015, concurrently with a decrease in ridership, and increases in revenue hours and revenue miles. GoDurham's

- annual operating expense has been generally increasing over the last decade, contributing to the recent increase in operating expense per passenger.
- Figure 4-9 shows that GoDurham's cost per revenue hour has steadily increased since FY 2011, to a high of \$93.25 in FY 2015.

RIDERSHIP

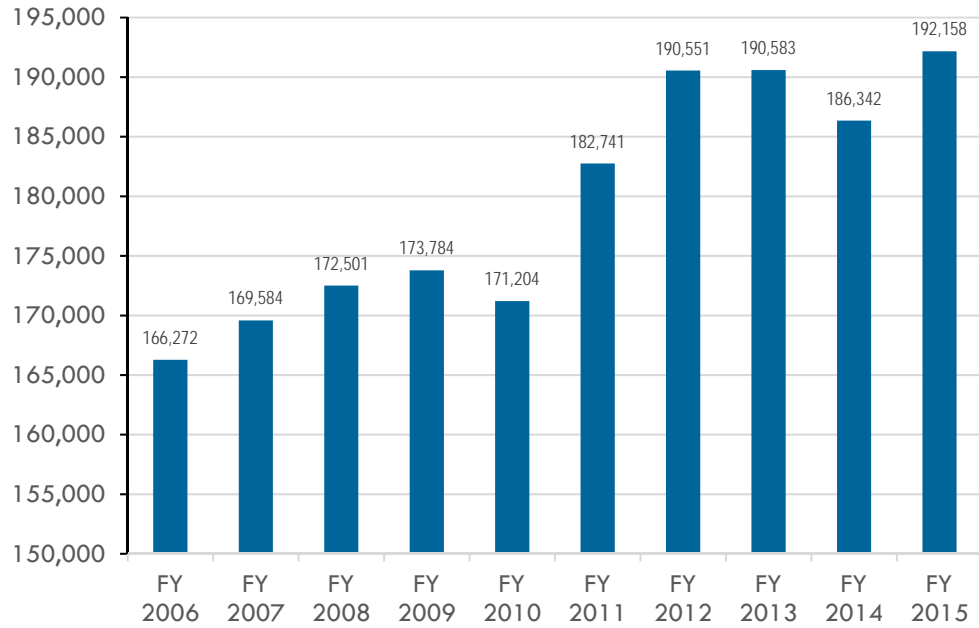
Figure 4-1 Annual Passenger Trips



Source: iNTD Durham Area Transit Authority, FY2006 – FY2015

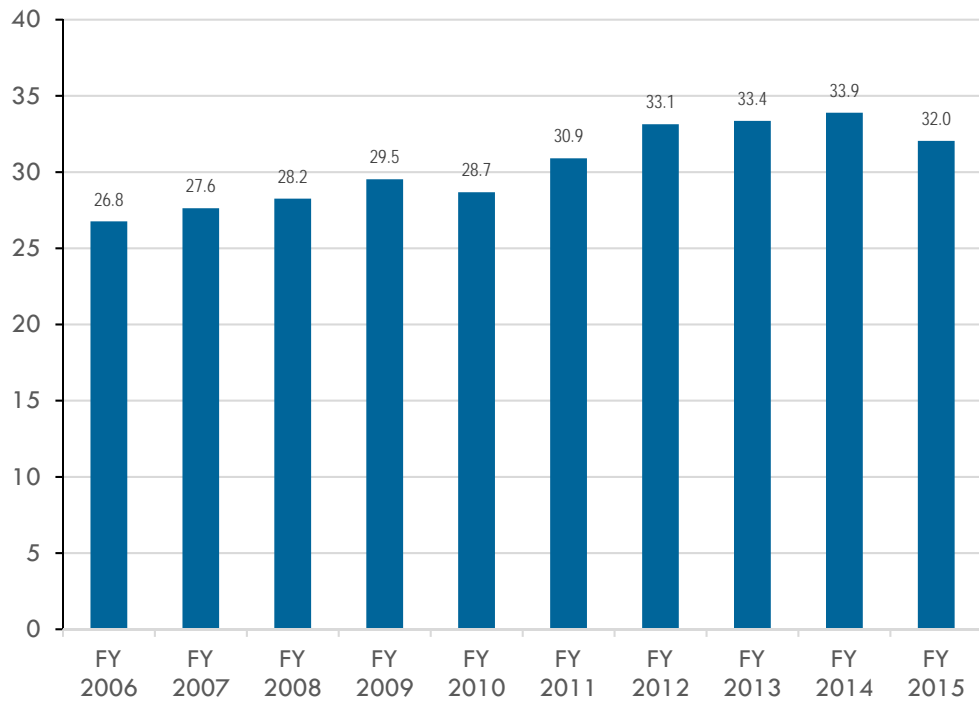
REVENUE HOURS

Figure 4-2 Annual Revenue Hours



Source: iNTD Durham Area Transit Authority, FY2006 – FY2015

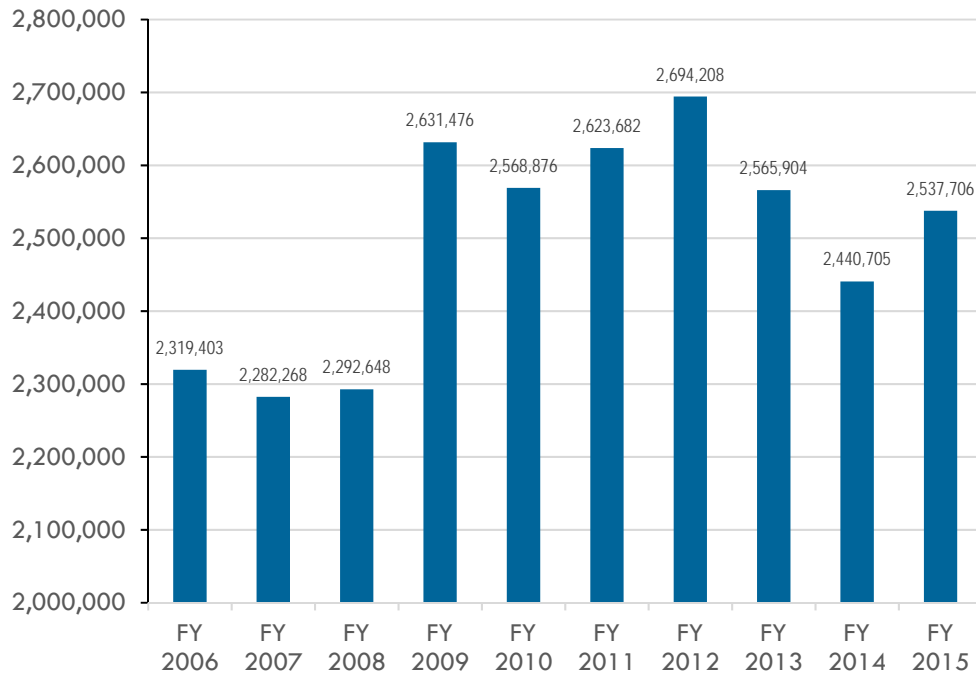
Figure 4-3 Passengers per Revenue Hour



Source: iNTD Durham Area Transit Authority, FY2006 – FY2015

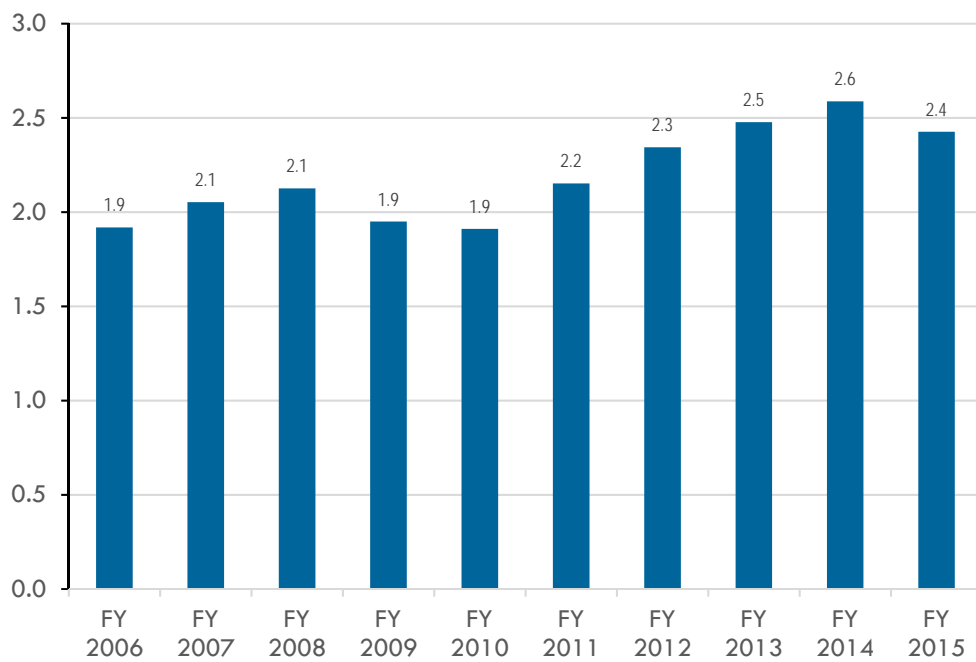
REVENUE MILES

Figure 4-4 Annual Revenue Miles



Source: iNTD Durham Area Transit Authority, FY2006 – FY2015

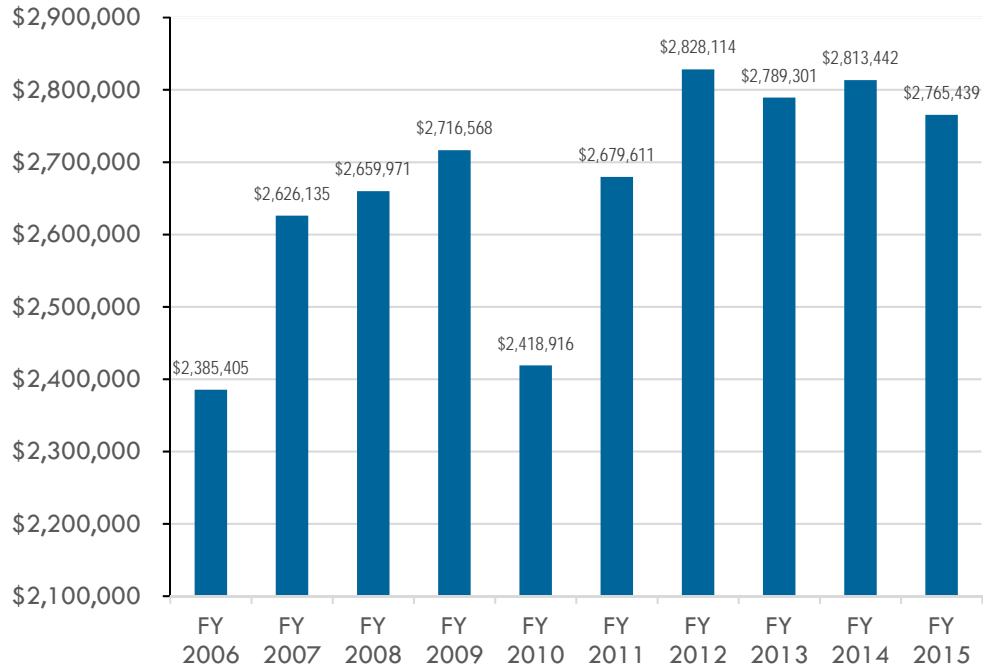
Figure 4-5 Passengers per Revenue Mile



Source: iNTD Durham Area Transit Authority, FY2006 – FY2015

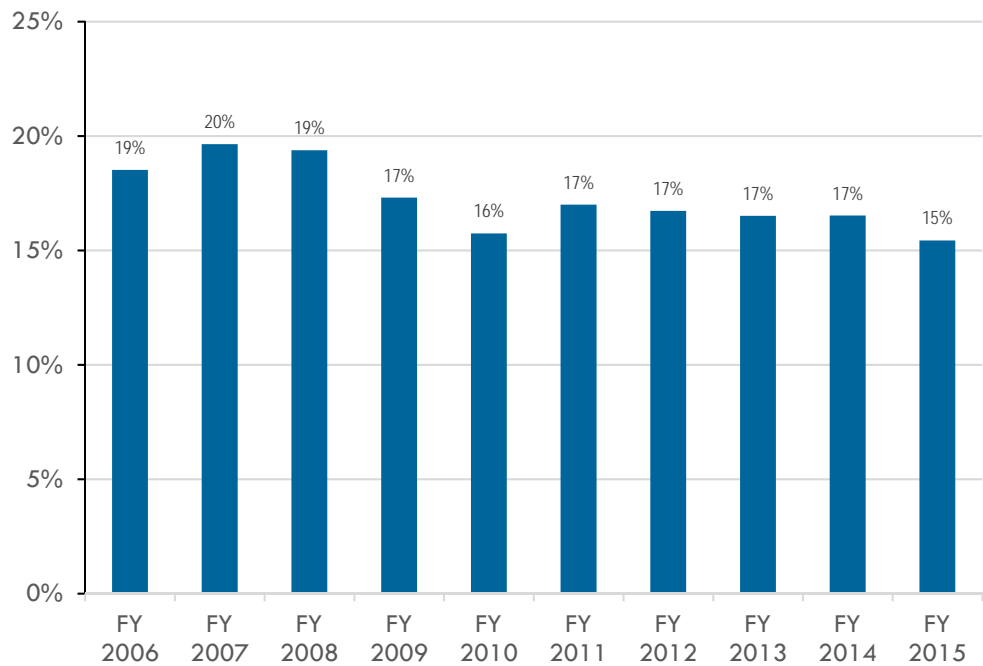
OPERATING EXPENSES AND REVENUE

Figure 4-6 Annual Farebox Revenue



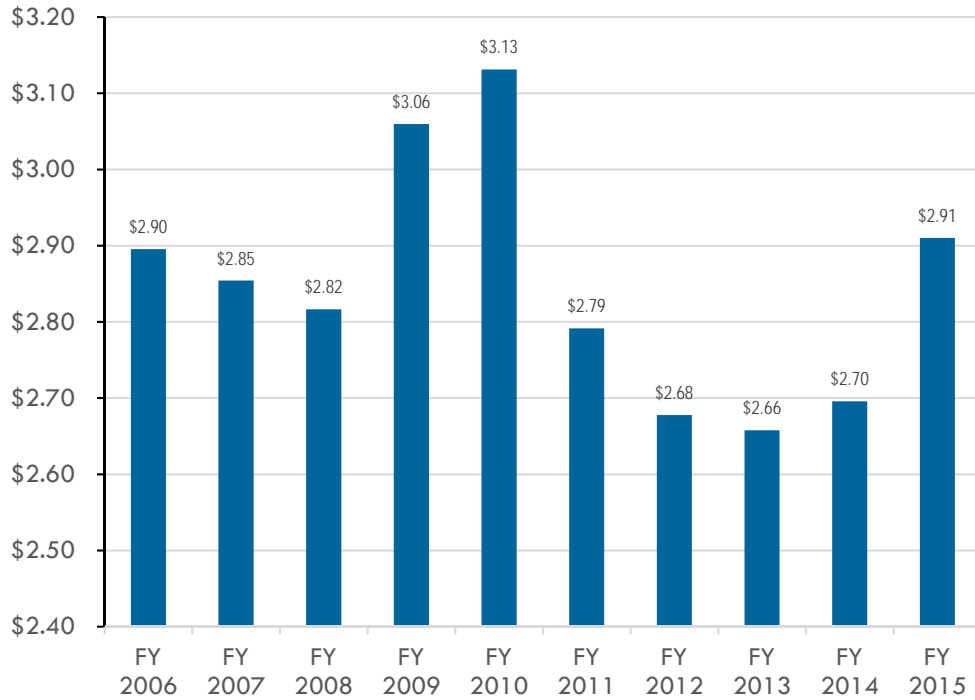
Source: iNTD Durham Area Transit Authority, FY2006 – FY2015

Figure 4-7 Farebox Recovery Ratio



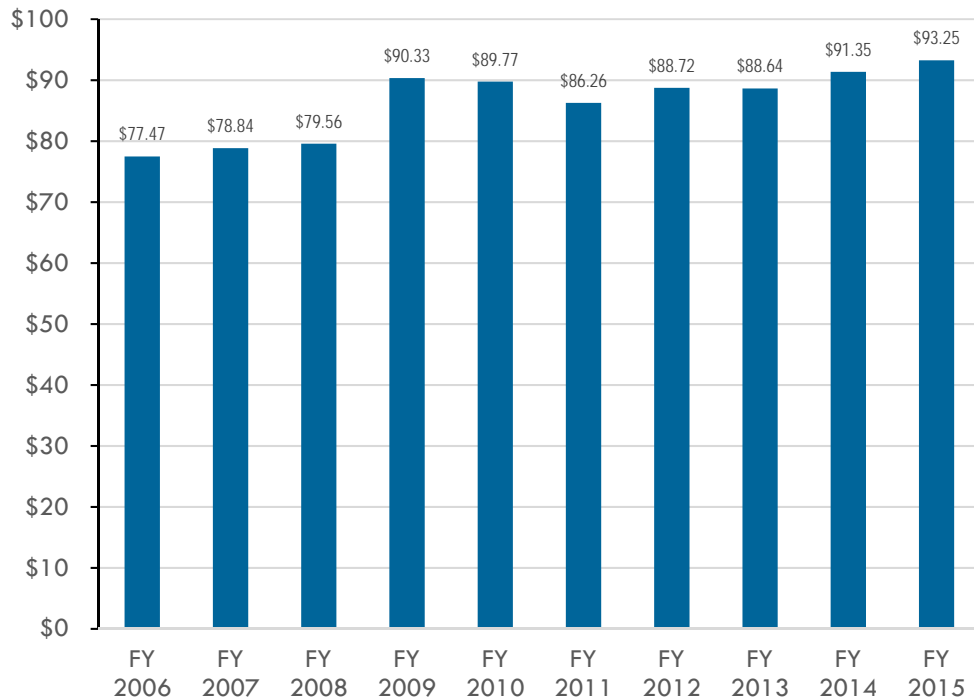
Source: iNTD Durham Area Transit Authority, FY2006 – FY2015

Figure 4-8 Operating Expenses per Passenger



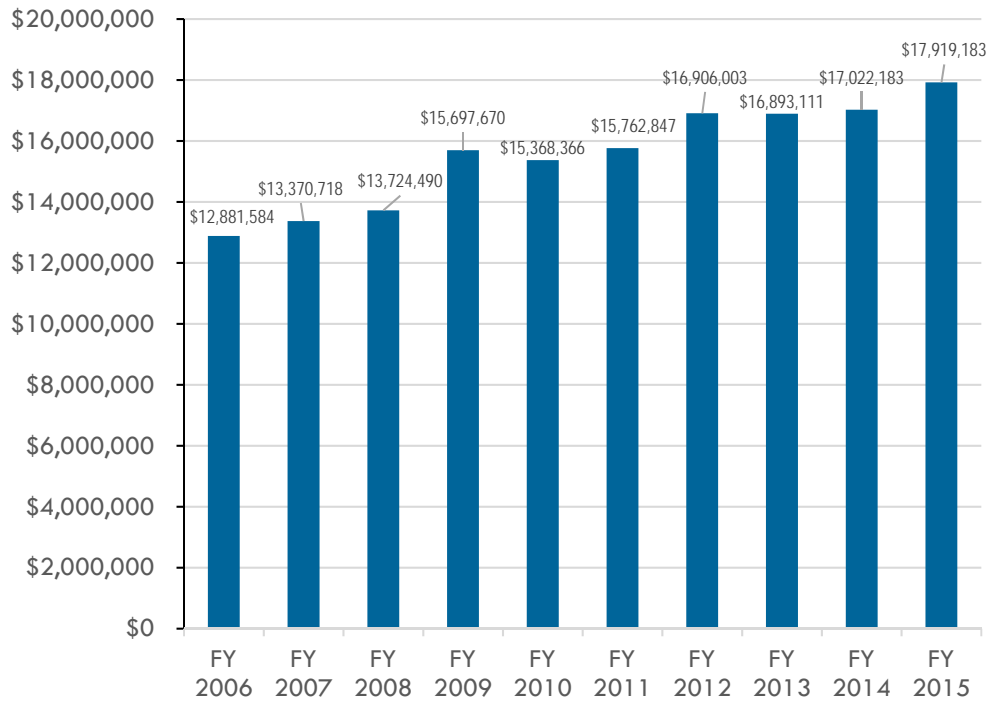
Source: iNTD Durham Area Transit Authority, FY2006 – FY2015

Figure 4-9 Operating Expense per Revenue Hour



Source: iNTD Durham Area Transit Authority, FY2006 – FY2015

Figure 4-10 Total Annual Operating Expenses



Source: iNTD Durham Area Transit Authority, FY2006 – FY2015

5 ROUTE PROFILES

This chapter describes GoDurham's fixed routes, including alignment characteristics, service span, headway, destinations served, ridership, and schedule adherence.

Figure 5-1 shows the existing GoDurham system map, Figure 5-2 presents average daily ridership for each route, Figure 5-3 shows boardings per service hour for each route, and Figure 5-4 shows a system map of boardings by stop.

Ridership maps accompany each route profile. These maps depict boardings and alightings at each stop for each direction based on Automatic Passenger Count (APC) data provided by GoDurham for the month of September 2016.

Appendix A provides more detailed information associated with each route. Specifically, it includes the following charts and tables for reference:

- Weekday load by stop
- Weekday boarding/alighting profile
- Weekday ridership and maximum load by trip
- Tables summarizing boardings, alightings, and maximum load by direction, segment, and time of day

SHORT RANGE TRANSIT PLAN | FINAL REPORT
GoDurham

Figure 5-1 GoDurham System Map

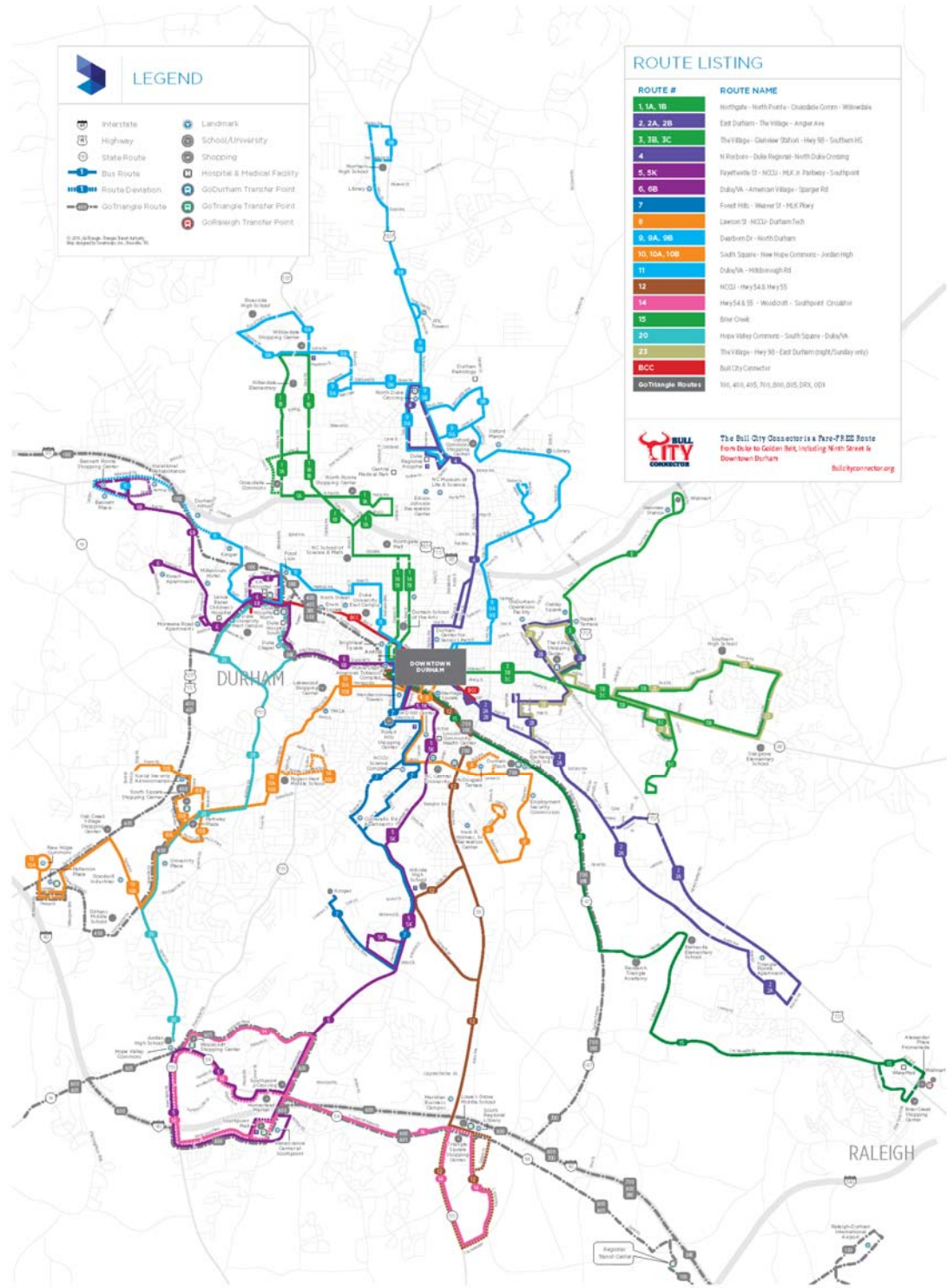
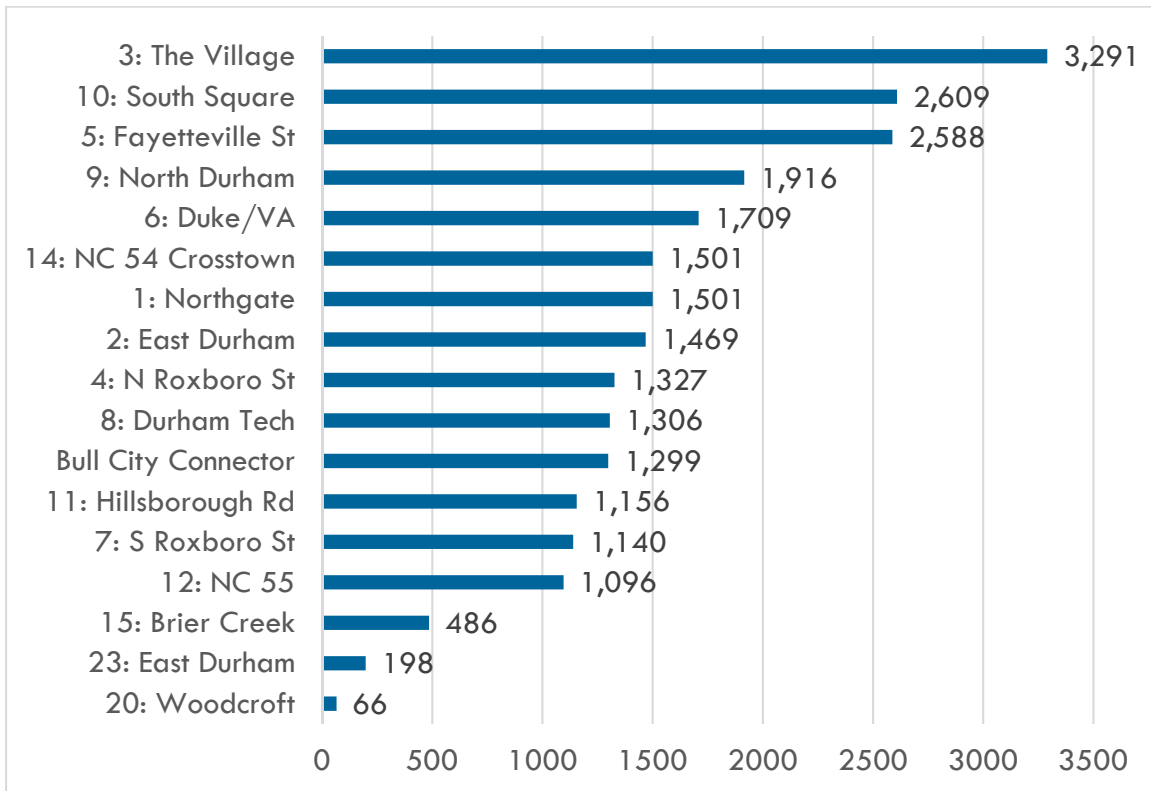
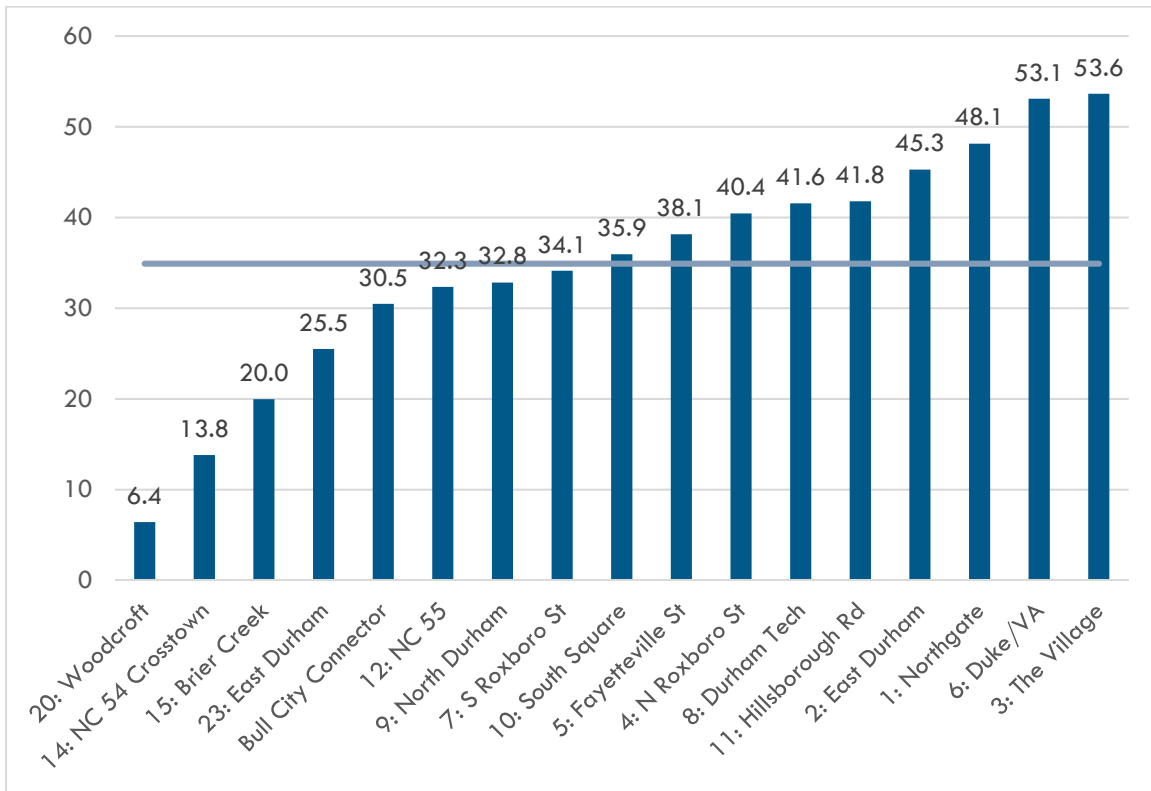


Figure 5-2 Weekday Riders by Route



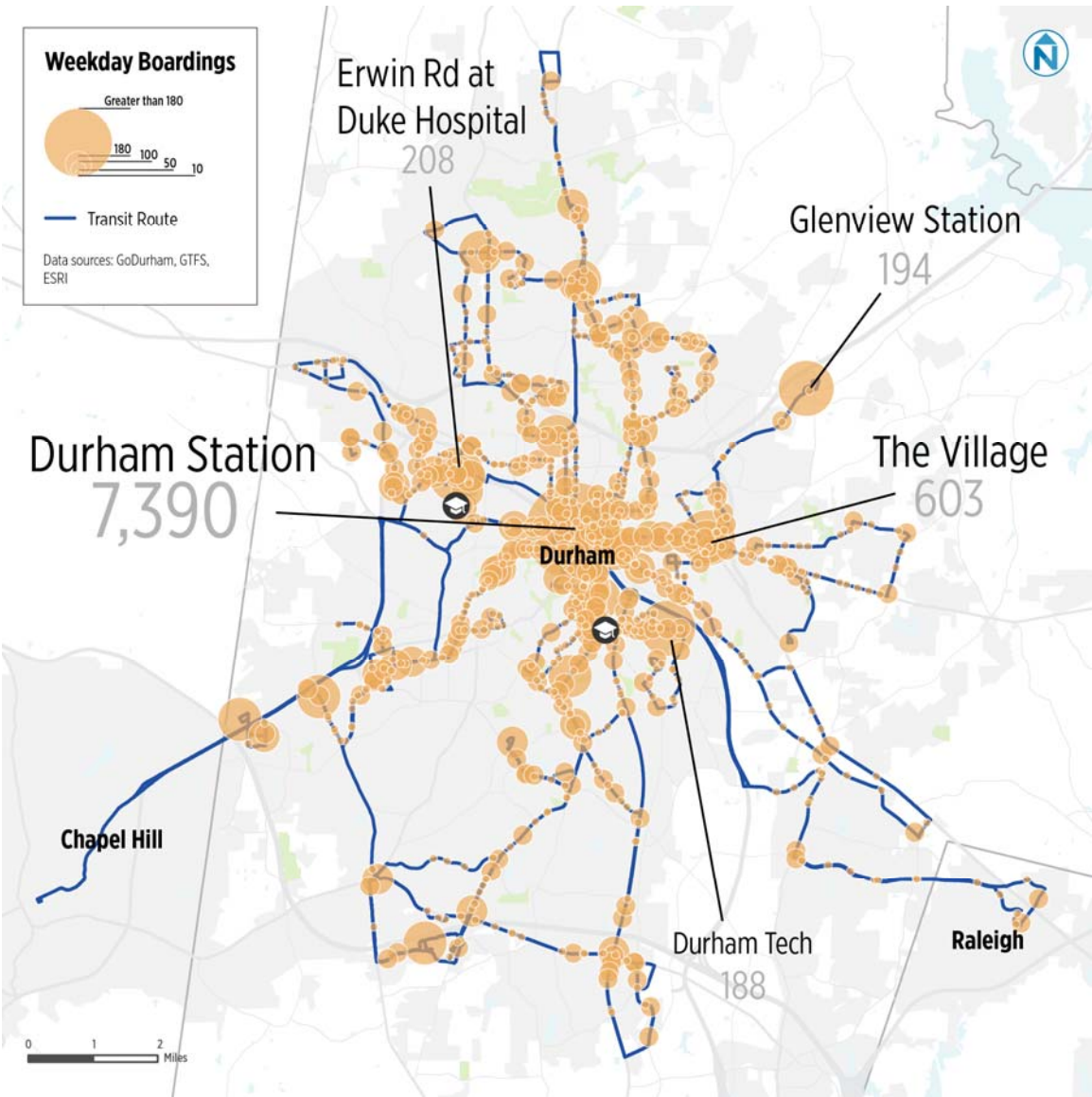
Source: GoDurham System Overview, APC data analysis, September 2016

Figure 5-3 Boardings per Service Hour



Source: GoDurham System Overview, APC data analysis, September 2016

Figure 5-4 GoDurham System Ridership, Average Weekday Boardings by Stop



Source: GoDurham APC data analysis, September 2016

ROUTE 1/1A/1B

Route 1/1A/1B Northgate Mall has three variants (Figure 5-5). All three variants run between Durham Station and Northgate Mall on N Duke Street and N Gregson Street to W Club Boulevard until Broad Street where it splits into the following alignments:

- Route 1A: Brogden Middle School, North Pointe Shopping Center, Croasdaile Commons Shopping Center
- Route 1B: Hillandale Road, Hillandale Elementary School, Willowdale Shopping Center, Guess Road
- Route 1: Same as 1A/1B up to Broad/Guess. Serves North Pointe, Hillandale, and Guess with a series of one-way loops.

Routes 1A and 1B alternate trips on weekdays and Saturdays throughout the day. The route alignment transitions to Route 1's on weekday and Saturday evenings and on Sundays.

Figure 5-5 Route Map, Route 1/1A/1B



Major Destinations

- Northgate Mall (1, 1A, 1B)
- NC School of Science & Math (1, 1A, 1B)
- Durham School of the Arts (1, 1A, 1B)
- Croasdaile Commons (1, 1A)
- North Pointe Shopping Center (1, 1A)
- Hillandale Elementary (1, 1B)
- Brogden Middle School (1)

Ridership

Route 1 has the sixth highest weekday ridership (1,501 weekday riders) and is the third most productive route in the system with 46 passengers per hour. It was part of GoDurham's high frequency service network between Northgate and Durham Station with headways every 15 minutes from October 2013 to 2015. However, due to ridership declines, additional service was removed and service is currently every 30 minutes during the day on the shared segments and every 60 minutes in the evenings and on each branch.

Route 1 is a very productive route. The most productive segment is between Club Boulevard at Dollar Avenue and Durham Station, with 82.6 boardings per service hour. The unique segment of Route 1A is slightly more productive than Route 1B, but both average more than 27 passengers per service hour. The most productive time period is PM peak with 62.6 boardings per service hour, while the least productive time period is early morning before 6:00 AM, with 25.6 boardings per service hour. Stops with the greatest weekday ridership are Durham Station, Northgate Mall, and on Horton Road

Route 1 does not intersect many other routes. It only shares a small portion of Route 9A on Horton Road and transfers are timed to allow for connections

Schedule Adherence

Route 1 is on-time 85% of the time across all timepoints and arrives at Durham Station on-time 96% of the time.

Summary

Route 1 has three different variants that partially overlap each other. It may be confusing for potential patrons to determine exactly how to access Route 1. Route 1 performs well despite its confusing and indirect alignment north of the Northgate Mall.

Route Characteristics		
Weekday & Saturday		
Start Time		5:25 AM
End Time		12:32 AM
Average Daily Boardings		1,501 ¹
Peak Headway (mins) ²		30 – 60
Off-Peak Headway (mins)		30 – 60
Evening Headway (mins)		60
Schedule Adherence	On Time	85% ³
Sunday & Holiday		
Start Time		6:32 AM
End Time		9:32 PM
Headway (mins)		60

¹ Average daily boardings is drawn from GoDurham System Overview and represents 'Weekday Riders'.

² Peak hours defined as 6:00AM-10:00AM and 3:00PM-7:00PM.

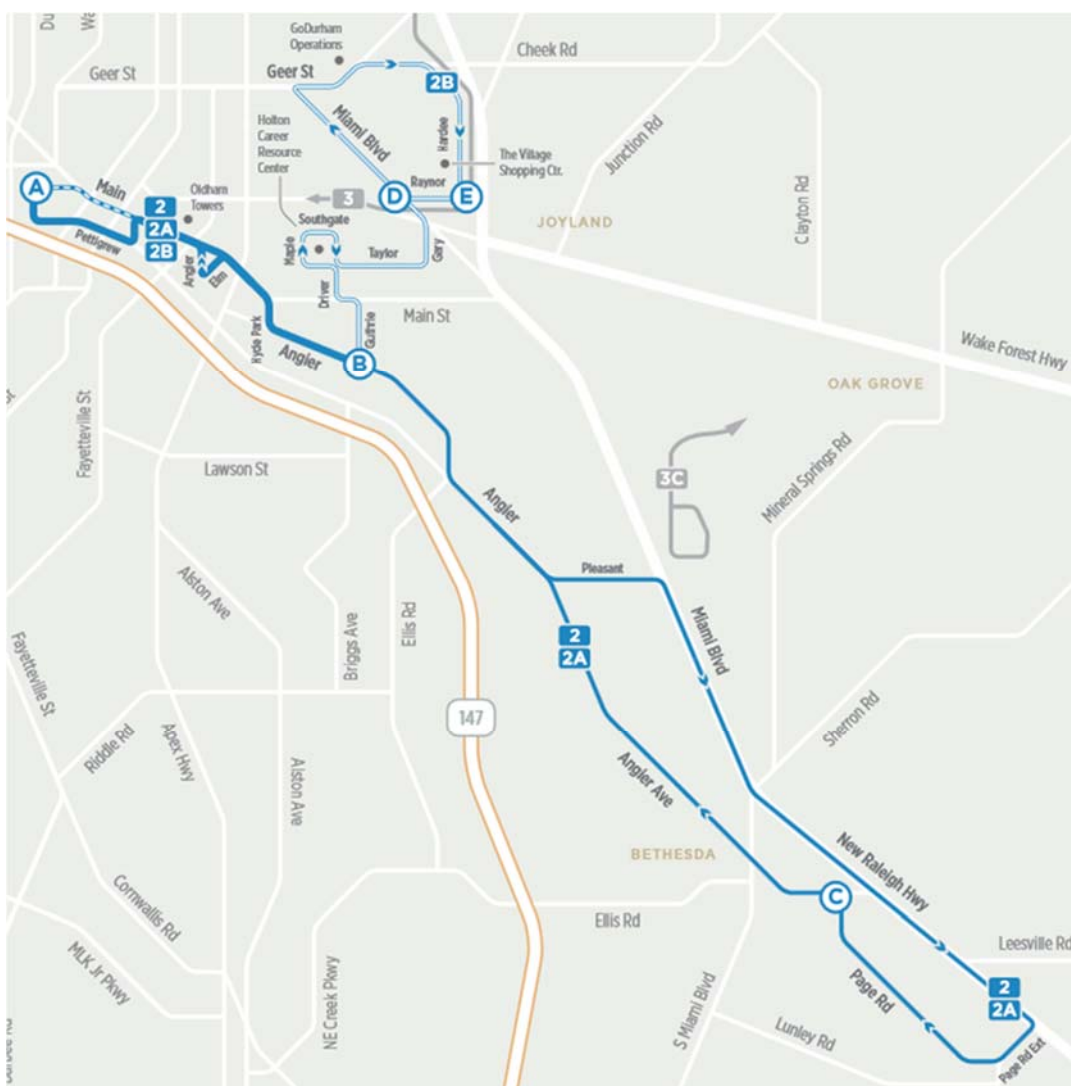
³ On-time performance (OTP) is drawn from GoDurham System Overview and represents OTP across all timepoints.

ROUTE 2/2A/2B

Route 2/2A/2B East Durham operates from Durham Station to the southeast. Route 2 has three different variants, all of which operate from Durham Station to Angier Avenue and Guthrie Avenue (Figure 5-6). Route 2A and 2B alternative trips on weekdays and Saturdays during the daytime, and both serve different destinations in East Durham. Route 2 operates in evenings and Sundays. Specific alignments include:

- Route 2A: Pleasant Drive, US 70, Mission Triangle Pointe Apartments, Angier Avenue
- Route 2B: Holton Career Resource Center, The Village Shopping Center, GoDurham Operations. On Sundays and evenings, Route 23 provides coverage for the unique segments of Route 2B.
- Route 2: Same as 2A, but uses Main Street instead of Pettigrew Street. See Route 23 for service on Route 2B's tail.

Figure 5-6 Route Map, Route 2/2A/2B



Major Destinations

- Oldham Towers (2, 2A, 2B)
- GoDurham Operations (2B)
- Holton Career & Resource Center (2B)
- The Village Shopping Center (2B)
- Mission Triangle Point Apartments (2A)

Ridership

Daily ridership for Route 2/2A/2B (1,469 weekday ridership) is roughly in the middle of the pack relative to other GoDurham routes. Scheduled headways are 30 minutes during the day on the shared segments and 60 minutes during the evenings and on each outlying variant.

Ridership is highest between Durham Station and Angier Avenue at Guthrie Avenue. However, stops serving residential neighborhoods; apartment buildings, such as Mission Triangle Point Apartments; and The Village also have notable ridership.

At 43 passengers per hour, Route 2 is the fourth most productive route in the system. The Durham Station to Angier Avenue at Guthrie Avenue segment is the most productive portion of the route (71.6 boardings per service hour), while each outlying leg carries only about 20 passengers per service hour.

Non-downtown transfers may be made from Route 2B to Route 3 at The Village. Some of Route 2's most productive ridership areas are overlapped by the Bull City Connector, which is free.

Route Characteristics		
Weekday & Saturday		
Start Time		5:30 AM
End Time		12:30 AM
Average Daily Boardings		1,469
Peak Headway (mins)		30 – 60
Off-Peak Headway (mins)		30 – 60
Evening Headway (mins)		60
Schedule Adherence	On Time	88%
Sunday & Holiday		
Start Time		6:30 AM
End Time		9:30 PM
Headway (mins)		60

Schedule Adherence

Route 2 is on-time 88% of the time across all timepoints and arrives at Durham Station on-time 90% of the time.

Summary

Route 2 is a productive route, but it is driven by one segment. Ridership and productivity are particularly high between Durham Station and Angier Avenue at Guthrie Avenue. This segment could support higher levels of service than its existing 30 minute base frequency. The Bull City Connector is sharing some of this market with Route 2.

Neither outlying segment performs well in comparison. Both outlying segments offer indirect routing that inhibit fast travel times. Route 2A and 2's long one-way loop are a detriment to attracting many customers.

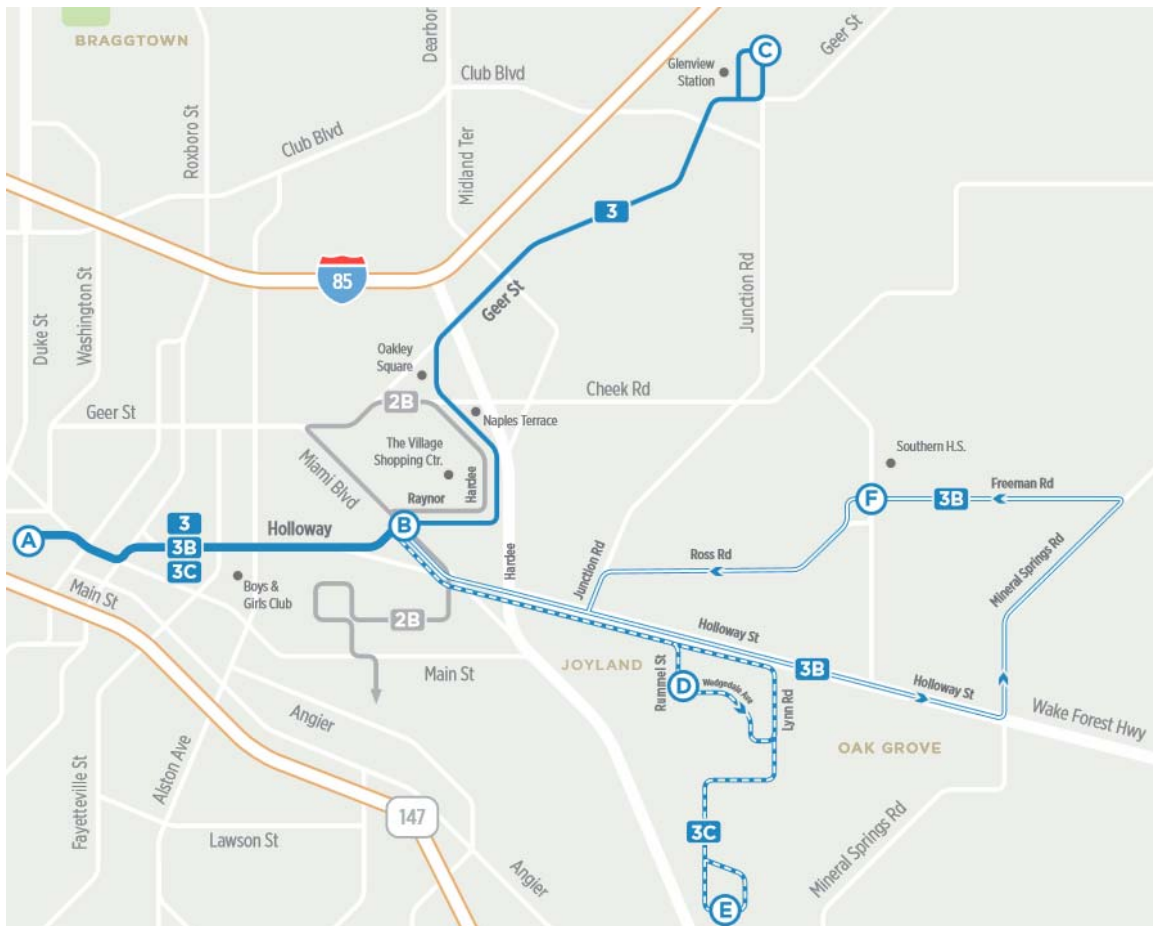
ROUTE 3/3B/3C

Route 3/3B/3C The Village has three variants serving East Durham. All three variants serve Durham Station to Raynor Street at the Village. Routes 3/3B/3C then split into three branches:

- Route 3: Hardee Street, Cheek Road, Glenview Station (Walmart)
- Route 3B: NC 98/Holloway Street, Mineral Springs Road, Freeman Road, Southern High School, Ross Road, Junction Road
- Route 3C: NC 98/Holloway Street, Birchwood, Springwood Park Apartments

Route 3 operates every 30 minutes throughout weekdays and hourly on Sundays and evenings. Routes 3B and 3C operate hourly throughout weekdays and Saturdays and are replaced by Route 23 on evenings on Sundays. When all variants are operating, 15 minute service is provided between Durham Station and The Village.

Figure 5-7 Route Map, Route 3/3B/3C



Major Destinations

- Boys & Girls Club (3, 3B, 3C)
- The Village Shopping Center (3)
- Oakley Square Apartments (3)

- Naples Terrace (3)
- Southern High School (3B)

Ridership

Route 3/3B/3C is the highest ridership (3,291 weekday riders) and most productive (52 passengers per hour) route in the GoDurham system. Headways start every 15 minutes. Since September 2014, GoDurham added an additional “tripper” bus on weeknights and Sunday to relieve crowding.

Ridership is highest between Durham Station and the Village (Raynor Street at the Village), with 70.8 boardings per service hour. The highest ridership stops include Durham Station, Raynor Street at the Village, and Walmart at Glenview Station. Of the three variants radiating from The Village, the Glenview Station is most productive at 48 boardings per service hour. Neither Route 3B or 3C variant is productive at 15.4 and 8.6 passengers per hour.

From PM peak through nighttime trips, there is consistently approximately 60 boardings per service hour, while early morning and AM peak boardings per service hour are 25.3 and 42.2 respectively.

In addition to Route 3, the Village is also served by Route 2B. Route 23 provides coverage service on the segments of Routes 3B and 3C when they are not in service.

Route Characteristics		
Weekday & Saturday		
Start Time		5:13 AM
End Time		12:26 AM
Average Daily Boardings		3,291
Peak Headway (mins)		15
Off-Peak Headway (mins)		15
Evening Headway (mins)		60
Schedule Adherence	On Time	90%
Sunday & Holiday		
Start Time		6:30 AM
End Time		9:26 PM
Headway (mins)		60

Schedule Adherence

Route 3/3B/3C is on-time 90% of the time across all timepoints (ranked first in the system) and arrives at Durham Station on-time 93% of the time (ranked eighth in the system).

Summary

Route 3 is the highest ridership and most productive route in the GoDurham system. The trunk of the route between Durham Station and Raynor Street at the Village is the most productive portion of the route. The relative weak performance of the outlying segments of Routes 3B and 3C are being masked by the fantastic route performance between the Village and Durham Station. Customers on the outlying areas of Routes 3B and 3C also must deal with an evening variant, the Route 23, to access their destinations, which can depress ridership potential.

ROUTE 4

Route 4 N Roxboro Street is a single north/south route that primarily travels along Roxboro Street from Durham Station to North Duke Crossing. This route serves Duke Regional Hospital, the North Carolina Museum of Life & Science, Durham Center for Senior Life, and Durham Convention Center.

Figure 5-8 Route Map, Route 4



Major Destinations

- North Duke Crossing
- Duke Regional Hospital
- Durham Center for Senior Life
- Durham Convention Center
- The Carolina Theatre

Ridership

Route 4 has approximately 1,327 weekday riders. This is about average in terms of ridership. Peak and midday headways are every 30 minutes, while evening headways are every 60 minutes.

Route 4 has an average of 39 passengers per hour, which puts Route 4 as the fifth most productive route in the system. The most productive time periods are PM peak, midday, and early morning (48.7, 45.6, and 40.9 boardings per service hour, respectively. The Horton Road at Roxboro to N Roxboro Road at Duke Regional Hospital is the most productive segment with 50 boardings per service hour. The second most productive segment is Roxboro Road at St. Paul Street to Durham Station.

The Duke Regional Hospital and North Duke Crossing area served by both Route 4 and Route 9.

Route Characteristics		
Weekday & Saturday		
Start Time		5:28 AM
End Time		12:26 AM
Average Daily Boardings		1,327
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	84%
Sunday & Holiday		
Start Time		6:31 AM
End Time		9:26 PM
Headway (mins)		60

Schedule Adherence

Route 4 is on-time 84% of the time across all timepoints and arrives at Durham Station on-time 97% of the time.

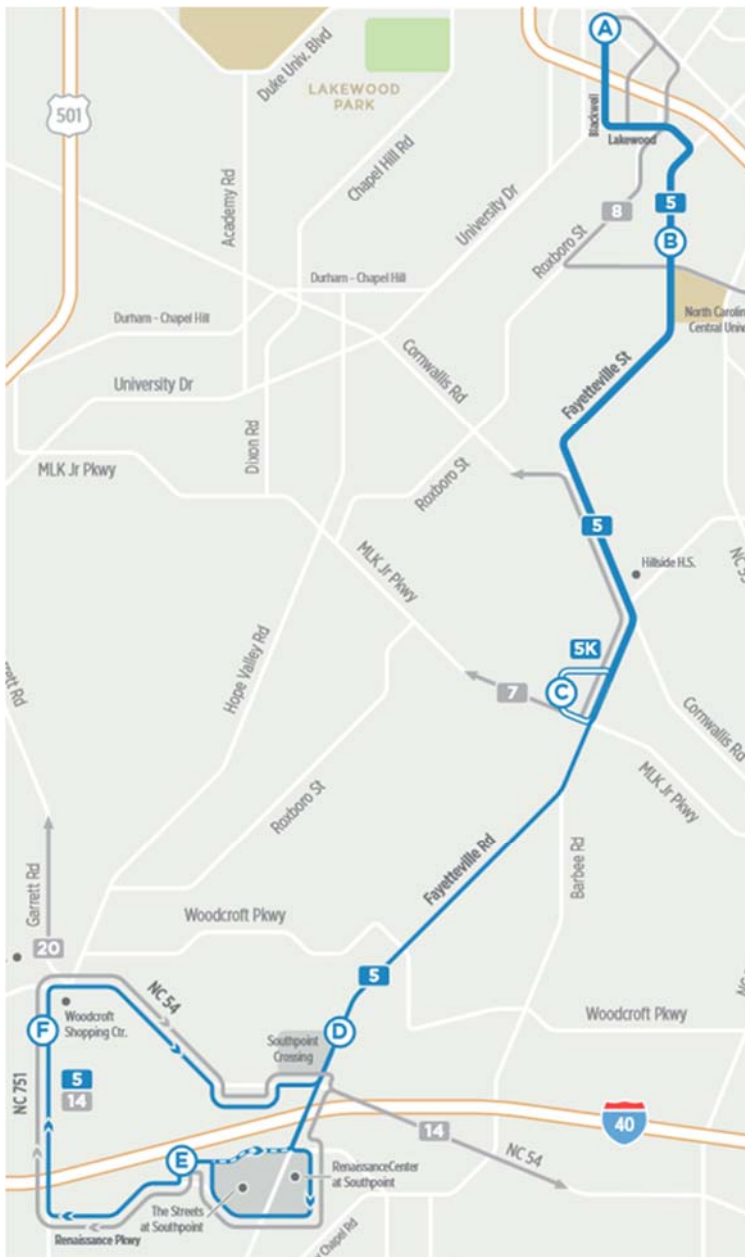
Summary

Route 4 is an easy to understand, direct route with steady ridership along the entire route. There are good destinations on either end, with Duke Regional Hospital and North Duke Crossing the north end and Durham Station on the other. It is a good route.

ROUTE 5/5K

Route 5/5K Fayetteville Street is part of the frequent service network. It has two alignments that operate south of Durham Station along Fayetteville Street. Route 5 extends to the Southpoint area, serving the Streets at Southpoint, Renaissance Center at Southpoint, and Woodcroft Shopping Center. Route 5K also uses the same route along Fayetteville Street; however, the 5K turns around at Stratford Lakes Drive and Martin Luther King Jr. (MLK) Parkway. Between Routes 5 and 5K, 15 minute service is provided between Durham Station and MLK.

Figure 5-9 Route Map, Routes 5/5K



Major Destinations

- North Carolina Central University (5, 5K)
- Hillside High School (5, 5K)
- Jordan High School (5)
- Woodcroft Shopping Center (5)
- The Streets at Southpoint (5)
- Renaissance Center (5)
- Southpoint Crossing Apartments (5)
- Durham Performing Arts Center (5)
- Durham Bulls Athletic Park (5)

Ridership

Route 5 has the third highest ridership (2,588 weekday riders) in the system. It became part of GoDurham's frequent service network in September 2015. Peak headways are scheduled every 15 minutes, while evening headways are scheduled every 60 minutes.

Route Characteristics		
Weekday & Saturday		
Start Time		5:24 AM
End Time		12:33 AM
Average Daily Boardings		2,588
Peak Headway (mins)		15
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	81%
Sunday & Holiday		
Start Time		6:19 AM
End Time		9:33 PM
Headway (mins)		60

While ridership is high, productivity is middle of the pack with approximately 37 passengers per hour. Productivity between Durham Station and Fayetteville Street at Lawson Street is nearly double (68.3 boardings per service hour) the route's average productivity. Productivity is below average on the Streets at Southpoint Cinema to Fayetteville Street at Crooked Creek (18.5 boardings per service hour) and Stratford Lakes Drive at Fayetteville to Fayetteville Street at Lawson Street (23 boardings per service hour) segments. Though there is lower productivity along these segments, stops such as the Streets at Southpoint Cinema and Fayetteville Street at Crooked Creek do have notable ridership. Ridership on the Highgate deviation off of NC54 is low.

Ridership on 5k is notably lower than on Route 5 trips. The average maximum load is usually more than 10 passengers higher on outbound trips and 5 higher on inbound trips. This suggests market demand for an extension may be warranted, given the ridership imbalances.

Transfers are possible to Routes 7 and 8 at Martin Luther King Jr. Parkway and Lawson Street, respectively. At night, Sunday, and holidays, Route 5 continues as Route 14 when it arrives at the Streets at Southpoint Cinema. Route 5 and Route 14 both loop on Renaissance Parkway, NC 751 and NC 54.

Schedule Adherence

Route 5 is on-time 81% of the time across all timepoints and arrives at Durham Station on-time 96% of the time.

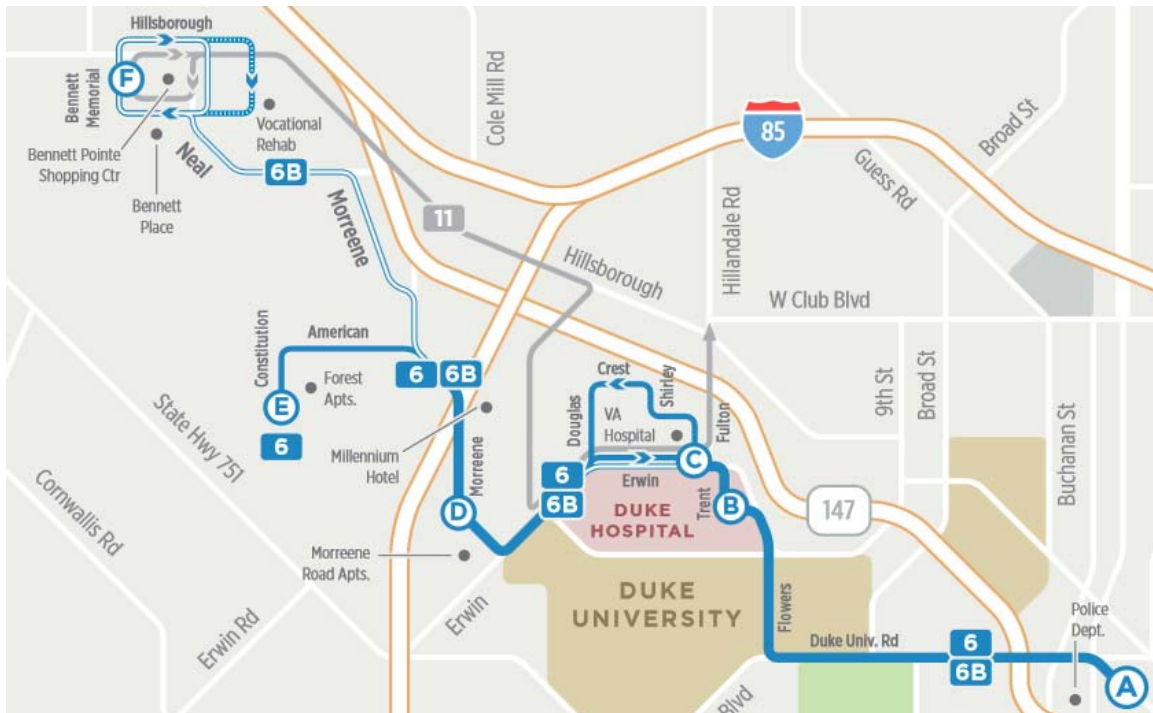
Summary

Route 5/5K is a high ridership route, but has middle-of-the-pack productivity. The 5K short-turns, while likely reducing overloads on Route 5, are comparatively underutilized. The Southpoint area is a huge destination, but long stretches of low ridership areas must be traversed to reach it.

ROUTE 6/6B

Route 6/6B Duke/VA serves Duke University and branches into two different variants. Routes 6 and 6B both travel from Durham Station along Chapel Hill Street and Erwin Road to Morreene Road, serving Durham VA Medical Center, Duke Hospital, and Duke University. Route 6B continues along Morreene Road and loops around Neal Road and Hillsborough Road.

Figure 5-10 Route Map, Routes 6/6B



Major Destinations

- Durham VA Medical Center (6, 6B)
- Duke University/Duke Hospital (6, 6B)
- Durham Police Department (6, 6B)
- Millennium Durham Hotel (6, 6B)
- Morreene Road Apartments (6, 6B)
- The Forest Apartments (6)
- Bennett Pointe Shopping Center (6B)
- Bennett Place State Historic Site (6B)
- Vocational Rehabilitation Services (6B)

Ridership

Route 6 has 1,709 weekday riders (5th highest ridership in the system). Peak headways are scheduled every 30 - 60 minutes while evening headways are scheduled every 60 minutes. The shared segments of Routs 6 and 6B operates a combined 30 minute service.

Route 6 is GoDurham's second most productive route (49 passengers per hour). Between Erwin Road at Duke Hospital and Durham Station, Route 6's productivity is double (108.5 boardings per service hour) the route's average productivity. The least productive segment of the route is Route 6B's deviation from Sparger Road at Food Lion to Constitution Drive at Forest Apartments which has a productivity of 7 boardings per service hour. Ridership is very low on the Hillsborough Road loop.

Route 11 and Route 6 both serve the VA Medical Center, Duke Hospital, and Duke University, and the residents and businesses along Hillsborough Road.

Route Characteristics		
Weekday & Saturday		
Start Time		5:29 AM
End Time		12:29 AM
Average Daily Boardings		1,709
Peak Headway (mins)		30 – 60
Off-Peak Headway (mins)		30 – 60
Evening Headway (mins)		60
Schedule Adherence	On Time	81%
Sunday & Holiday		
Start Time		6:29 AM
End Time		9:29 PM
Headway (mins)		60

Schedule Adherence

Route 6 is on-time 81% of the time across all timepoints and arrives at Durham Station on-time 86% of the time. It is ranked second to last in on-time performance. On-time performance in the afternoon is affected by traffic, and Route 6 is putting pressure on other routes due to missed transfers.

Summary

Route 6/6B is the system's second most productive route. It is particularly productive between Erwin Road at Duke Hospital and Durham Station, and could support more frequent service in this segment. However, Routes 6 and 6B are regularly late during peak commuting hours due to traffic congestion around the Duke and VA Medical Centers and the length of the route.

Route 7 S Roxboro Street serves S Roxboro Street, Fayetteville Road, and Martin Luther King Jr. Parkway. It serves Forest Hills Shopping Center, North Carolina Central University (west edge), Cornwallis Road Apartments, Hillside High School, and Kroger Supermarket. It has a unique service design that includes a mid-route one-way alignments.

Major Destinations

- Durham Bulls Athletic Park
- NCCU (west edge)
- Forest Hills Shopping Center
- Hillside High School
- Pearson STEAM Elementary School
- Kroger Supermarket

Ridership

Route 7 is a lower ridership route with approximately 1,140 weekday riders. Peak and off-peak headways are scheduled every 30 minutes and evening headways are every 60 minutes.

Route 7 is also a lower productivity route (34 passengers per hour). University Drive at Forest Hills to Durham Station has the greatest productivity along the route (71 boardings per service hour) while the remaining route has productivity in the 20 passenger per service hour range. Ridership on the one-way segments is concentrated adjacent to the housing near Cornwallis Road. Ridership on the remainder of Roxboro Road and Otis is low. PM peak is the most productivity time of day with 42.4 boardings per service hour.

Route 7 has transfer opportunities to both Routes 5 and 8 outside of Durham Station

Schedule Adherence

Route 7 is on-time 86% of the time across all timepoints and arrives at Durham Station on-time 93% of the time.

Summary

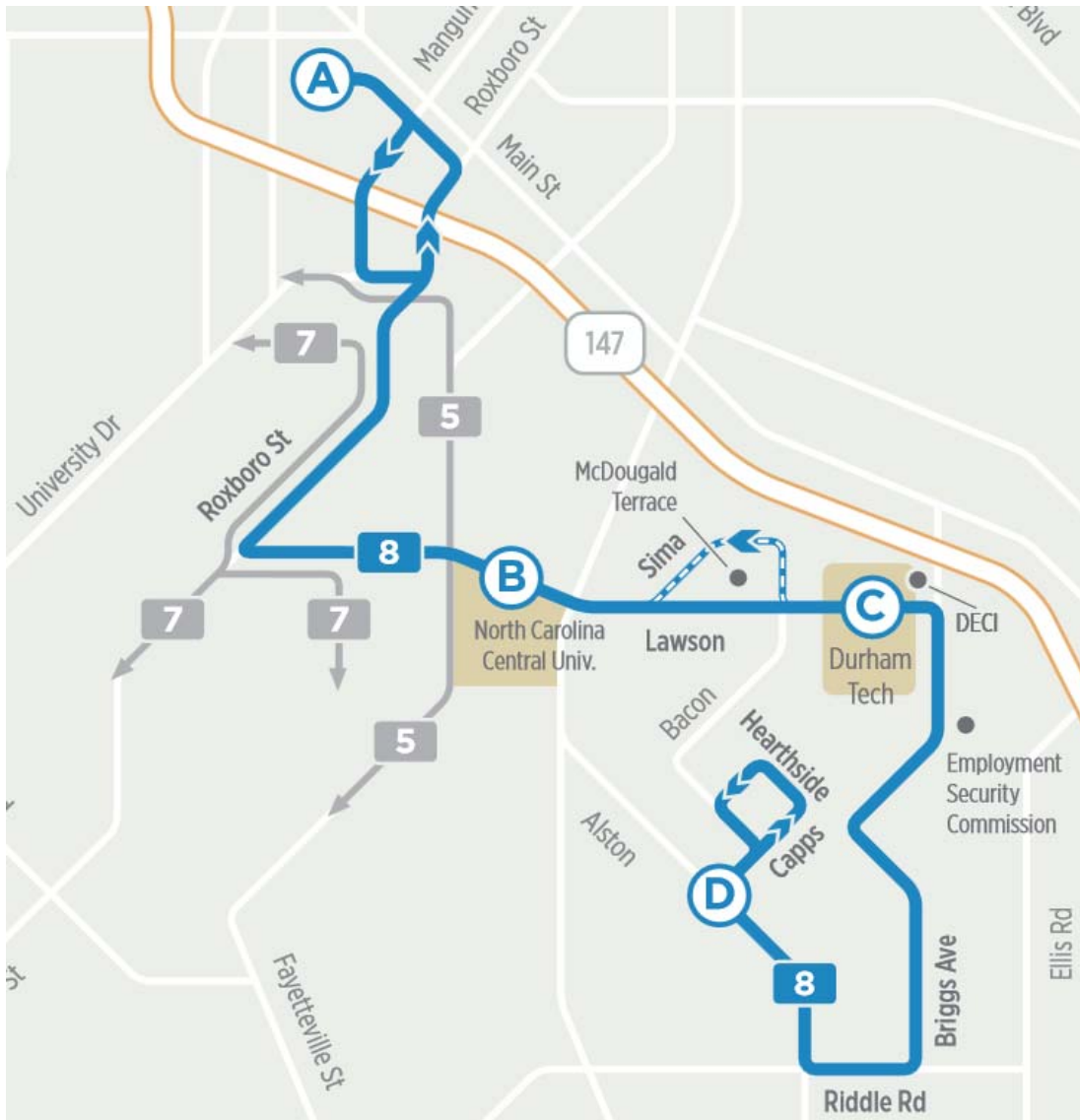
Route 7 is one of the system's lower ridership and lower productivity routes. Much of Route 7's alignment is duplicated by Routes 5 and 8, both of which have higher productivity.

Route Characteristics		
Weekday & Saturday		
Start Time		5:26 AM
End Time		12:26 AM
Average Daily Boardings		1,140
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	86%
Sunday & Holiday		
Start Time		6:26 AM
End Time		9:26 PM
Headway (mins)		60

ROUTE 8

Route 8 Durham Tech serves Lawson Street, North Carolina Central University, and Durham Technical Community College.

Figure 5-12 Route Map, Route 8



Major Destinations

- Durham Technical Community College
- North Carolina Central University
- McDougald Terrace
- Durham Exchange Club Industries
- Employment Security Commission

Ridership

Route 8 serves approximately 1,306 weekday riders. Peak and off-peak headways are scheduled every 30 minutes, and evening headways are scheduled every 60 minutes.

This route's productivity is 38 passengers per hour, and its most productive segment is between Lawson Street at Durham Tech and Lawson Street at Merrick Street (66.3 boardings per service hour). The segment between Durham Tech and Capps Street only has 14 passengers per service hour.

Route 8 is the only service to Durham Tech. However, it does share a portion of Roxboro Street with Route 7 and Route 5 run perpendicular to Route 8 around North Carolina Central University.

Schedule Adherence

Route 8 is on-time 87% of the time across all timepoints and arrives at Durham Station on-time 99% of the time (ranked first in the system).

Summary

Route 8 is middle of the pack in terms of ridership and productivity. It is the only route to serve Durham Tech. The segment between Durham Tech and Capps Street carries few riders. Ridership on that segment is inhibited by out of direction travel.

Route Characteristics		
Weekday		
Start Time		5:29 AM
End Time		12:25 AM
Average Daily Boardings		1,306
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	87%
Saturday		
Start Time		5:29 AM
End Time		12:25 AM
Headway (mins)		60
Sunday & Holiday		
Start Time		6:30 AM
End Time		9:25 PM
Headway (mins)		60

ROUTE 9/9A/9B

Route 9/9A/9B has three variants that serve North Durham. All three variants operate between Durham Station and Meriwether Drive at Pickwick Trail using Club Boulevard. The two primary routes are Route 9A and 9B:

- Route 9A serves Carver Living Center, Duke Regional Hospital, Horton Road, Strawberry Hill Apartments, Foxfire Apartments, Riverside High School, and Willowdale Shopping Center
- Route 9B serves Ben Franklin Boulevard, Roxboro Road, JFK Towers, and Northern High School
- Route 9 overlaps with both 9A and 9B deviations, however it runs to Foxfire Apartments (like 9A), turns around and serves Roxboro Road to JFK Towers (like 9B). Route 9 only runs at night.

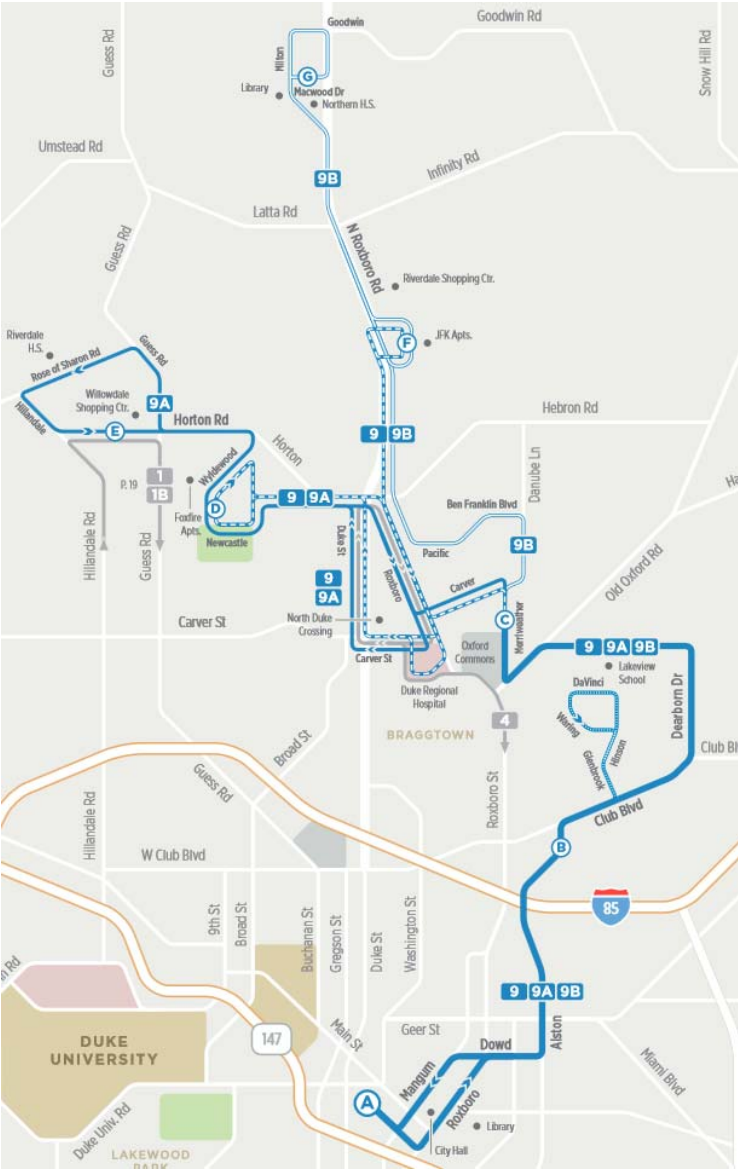
A final school tripper variant also exists to serve Northern High School during school times only.

The frequency on Routes 9A and 9B combine to provide 30 minute service on the shared segments and 60 minute service on the unique branches.

Major Destinations

- Lakeview Secondary School (9, 9A, 9B)
- Preiss-Steele Apartments (9, 9A, 9B)
- City Hall (9, 9A, 9B)
- JFK Apartments (9, 9B)
- North Duke Crossing (9, 9A)
- Duke Regional Hospital (9, 9A)
- Foxfire Apartments (9, 9A)
- Willowdale Shopping Center (9A)
- Riverside High School (9A)
- North Regional Library (9B)
- Northern High School (9B)
- Riverview Shopping Center (9B)

Figure 5-13 Route Map, Route 9/9A/9B



Ridership

Route 9/9A/9B is the fourth highest ridership route with 1,916 weekday riders. Headways are scheduled every 30 to 60 minutes.

While ridership is high, Route 9's productivity is one of the system's lowest. On average, Route 9 serves 29 passengers per hour. The most productive segment of the Route is between Foushee Street at Avondale Drive and Durham Station, with 56.4 boardings per service hour. The second most productive segment, which is served by Route 9A, is between Horton Road at Guess Road and New Castle Road at Wyldeewood Road with 32.5 boardings per hour. All other segments perform below the route's average. Neither variant operates significantly better than the other.

Route 9 connects to Route 1 and Route 4 in North Durham. The Route 1 to 9A connection is timed to allow for transfers.

Route Characteristics		
Weekday & Saturday		
Start Time		5:17 AM
End Time		12:31 AM
Average Daily Boardings		1,916
Peak Headway (mins)		30
Off-Peak Headway (mins)		60
Evening Headway (mins)		60
Schedule Adherence	On Time	85%
Sunday & Holiday		
Start Time		6:27 AM
End Time		9:31 PM
Headway (mins)		60

Schedule Adherence

Route 9 is on-time 85% of the time across all timepoints and arrives at Durham Station on-time 96% of the time.

Summary

Route 9 is a high ridership, but lower low productivity route serving North Durham. Route 9 operates an indirect alignment to reach North Durham, potentially forcing many of the outlying patrons into longer than necessary trips. Overall, with three regular variants and a school tripper, Route 9's alignments are confusing.

Route 10/10A/10B South Square has three different variants. It is part of GoDurham's high frequency service network between South Square and Durham Station. All three routes travel from Durham Station along Morehead Avenue and Chapel Hill Road to University Drive near the South Square. Route 10B loops around Shannon Road, Martin Luther King Jr. Parkway, and Pickett Road, serving the Social Security Administration, DCo Southwest Library, and Emerald Pond Apartments. Routes 10A and 10 continue past South Square Shopping Center and operate the same route. Destinations include New Hope Commons, Patterson Place, Oak Creek Village Shopping Center, and Goodwill. In addition, a bus an hour serves the James Street deviation.

[illegible]

- South Square Shopping Center (10, 10A, 10B)
- Rogers-Herr Middle School (10, 10A, 10B)
- Lakewood YMCA (10, 10A, 10B)
- Lakewood Shopping Center (10, 10A, 10B)
- J.J. Henderson Housing Center (10, 10A, 10B)
- New Hope Commons (10, 10A)
- Patterson Place (10, 10A)
- Oak Creek Village Shopping Center (10, 10A)
- University Place (10, 10A)
- Social Security Administration (10B)

Ridership

Route 10 has the second highest ridership in the system, with 2,609 weekday riders. Ridership is well-distributed along the route. The most notable stops include Durham Station, Lakewood Shopping Center, Oak Creek Apartments, and New Hope Commons. Route 10 is part of the high frequency service network. Headways are 15 minutes during the day and 60 minutes in the evenings.

While ridership is high, the route's average productivity is ranked 10th (34 passengers per hour). Boardings per service hour are nearly double the route's average between Chapel Hill Road at Palmer Street to Durham Station (61.4 boardings per service hour). The second most productive segment of the routes are after the split, where 10 and 10A operate between New Hope Commons and McFarland Drive at Witherspoon. This short segment has 31.8 boardings per service hour. Ridership on Pickett Road is low.

Transfers are possible to Route 20 and to GoTriangle Route 400, which operates from Durham Station to Patterson Place via Duke University.

Route Characteristics		
Weekday & Saturday		
Start Time		5:16 AM
End Time		12:23 AM
Average Daily Boardings		2,609
Peak Headway (mins)		15 – 60
Off-Peak Headway (mins)		15 – 37
Evening Headway (mins)		60
Schedule Adherence	On Time	87%
Sunday & Holiday		
Start Time		6:13 AM
End Time		9:23 PM
Headway (mins)		60

Schedule Adherence

Route 10 is on-time 87% of the time across all timepoints and arrives at Durham Station on-time 97% of the time.

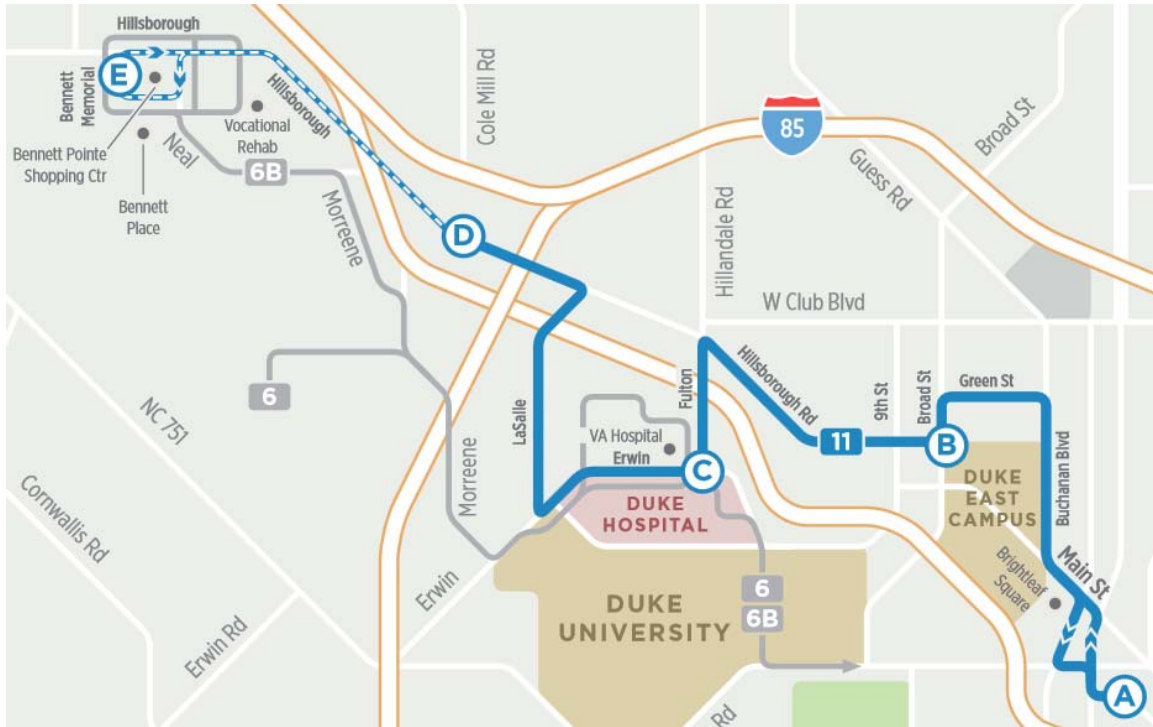
Summary

Route 10 is a high ridership route that serves many shopping centers and residential areas. The deviation to Pickett Road does not carry as many riders as Route 10A. The James Street deviation, while providing coverage, does not generate much ridership and adds several minutes of travel time to most other riders.

ROUTE 11

Route 11 Hillsborough Road connects West Durham with Duke University, and connects many of the same destinations as Route 6. Route 11 primarily operates west of Durham Station along Hillsborough Road. It serves Durham VA Medical Center, Duke Hospital, and Duke University. At night, Route 11 continues west along Hillsborough Road to serve the Bennett Pointe Shopping Center, which is served during the day by Route 6B.

Figure 5-15 Route Map, Route 11



Major Destinations

- Durham VA Medical Center
- Duke University/Duke Hospital
- Bennett Pointe Shopping Center
- Bennett Place Historic Site
- Vocational Rehabilitation Services
- Brightleaf Square

Ridership

Route 11 has 1,156 weekday riders. Ridership is well-distributed between Durham Station and Hillsborough Road at Cole Mill Road. Ridership is low during the evening runs from Hillsborough Road at Cole Mill Road to Sparger Road at Food Lion. Daytime headways are scheduled every 30 minutes, while evening headways are every 60 minutes.

Overall productivity, 37 passengers per hour, is middle of the pack. The most productive portion of the route is between Duke East Campus (Broad Street at Markham Street) to Durham Station, with 45.3 boardings per service hour.

Route 11's schedule is coordinated with Route 6, so that the Hillsborough Road extension is only served when Route 6 is not operating.

Schedule Adherence

Route 11 is on-time 84% of the time across all timepoints and arrives at Durham Station on-time 78% of the time. Route 11 is ranked last in on-time arrivals to Durham Station.

Summary

Route 11 is a lower ridership route with middle of the pack productivity. Route 11's on-time performance in Durham Station arrivals negatively affects its ridership potential. Potential patrons cannot rely on it to make connections. Congestion around Duke's campus, particularly in the afternoon, is a primary culprit for poor on-time performance.

Route Characteristics		
Weekday		
Start Time		5:27 AM
End Time		12:26 AM
Average Daily Boardings		1,156
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	84%
Saturday		
Start Time		5:27 AM
End Time		12:26 AM
Headway (mins)		54 – 62
Sunday & Holiday		
Start Time		6:26 AM
End Time		9:26 PM
Headway (mins)		60

ROUTE 12/12B

Route 12/12B NC 55 operates south of Durham Station along NC 55 until NC 54. At NC 54, Route 12 loops around Alston Avenue, serving Triangle Square Shopping Center, South Regional Library, and Lowe's Grove Middle School. Route 12 and 12B have the same route except on weekdays during the daytime, Route 12 continues as westbound Route 14 when it arrives at NC 54 and Alston Avenue.

When data for Route 12 was collected, the route was on a construction detour. Alston Avenue was under construction, so service was curtailed on Alston and the alignment was modified. The alignment that was analyzed serves Riddle and Cornwallis Roads on all trips, every day.

Major Destinations

- North Carolina Central University (12, 12B)
- Hillside High School (12, 12B)
- Meridian Business Campus (12, 12B)
- Lowe's Grove Middle School (12, 12B)
- Triangle Village Shopping Center (12, 12B)
- South Regional Library (12B)

Figure 5-16 Route Map, Routes 12/12B



Ridership

Route 12 has 1,096 weekday riders. The highest ridership stops are Durham Station, North Carolina Central University, and NC 55 at NC 54 (where Route 12 overlaps with Route 14 and GoTriangle Routes 800 and 805). Headways are approximately every 30 minutes and 60 minutes at night.

Route 12 has approximately 33 passengers per hour. The segment between North Carolina Central University and Durham Station is the most productive segment with 48.7 boardings per service hour and AM peak is the most productive time of day (41.1 boardings per service hour).

Route 12 is interlined with Route 14 during weekdays.

Schedule Adherence

Route 12 is on-time 82% of the time across all timepoints and arrives at Durham Station on-time 95% of the time.

Route Characteristics		
Weekday & Saturday		
Start Time		5:28 AM
End Time		12:28 AM
Average Daily Boardings		1,096
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	82%
Sunday & Holiday		
Start Time		6:24 AM
End Time		9:28 PM
Headway (mins)		60 – 64

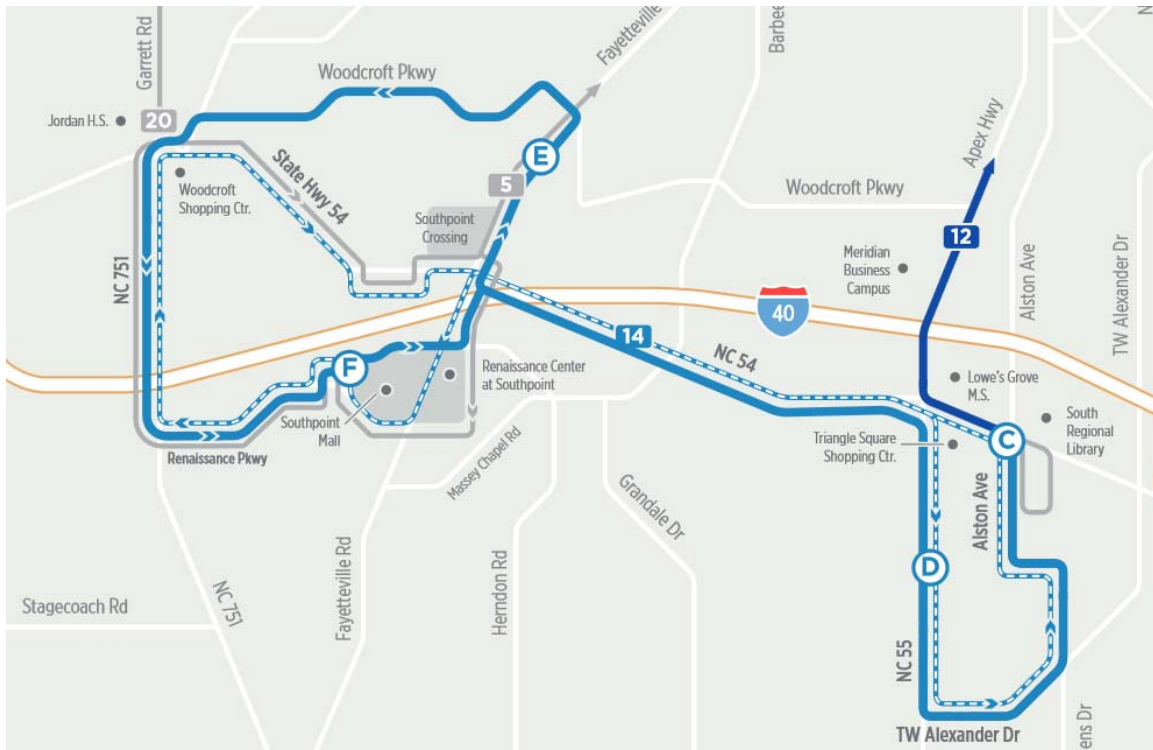
Summary

Route 12 is a lower ridership and lower productivity route; however, it does provide an important connection from the NC55 and NC54 area to Durham Station, while serving North Carolina Central University and residential areas south of the city center. It should be noted that the ridership and route performance results are likely different from when Route 12 is in regular operation, without a construction detour.

ROUTE 14

Route 14 NC 54 Crosstown does not originate at Durham Station. Instead, it serves as a crosstown connection via NC 54 connecting Routes 12, 5, and 20. Major destinations include Fall Pointe at the Park Apartments, Southpoint Mall, Woodcroft Shopping Center, and Renaissance Center at Southpoint.

Figure 5-17 Route Map, Route 14



Major Destinations

- Fall Pointe at the Park Apartments
- Jordan High School
- Woodcroft Shopping Center
- Southpoint Mall
- Renaissance Center at Southpoint
- Triangle Village Shopping Center
- South Regional Library
- Lowe's Grove Middle School

Ridership

Route 14 has the highest ridership of the four routes that do not originate at Durham Station, with 1,501 weekday riders. Normal operating hours are every 60 minutes seven days a week.

Route 14 serves approximately 18 passengers per hour. The most productive segment of the route is between NC 55 at Sedwick Drive and NC 54 at S Alston Ave where Routes 14 is interlined with Route 12. PM peak is the most productive time of day while night runs are the least productive (19.2 as compared to 8 boardings per hour, respectively).

Route 14 is interlined with Route 12, as Route 12 would not be able to reach the Fall Pointe Apartments in a one-hour round trip. During evenings and on Sundays, Route 14 is interlined with Route 5.

Schedule Adherence

No on-time performance is available for Route 14.

Summary

Route 14 is a crosstown route that provides hourly connections along the NC 54 corridor, connecting the Alston Avenue area with Southpoint. The route is indirect, and includes a large terminal loop on the west end. It also has a different evening alignment than daytime alignment on Mondays-Saturdays, which may potentially confuse potential patrons.

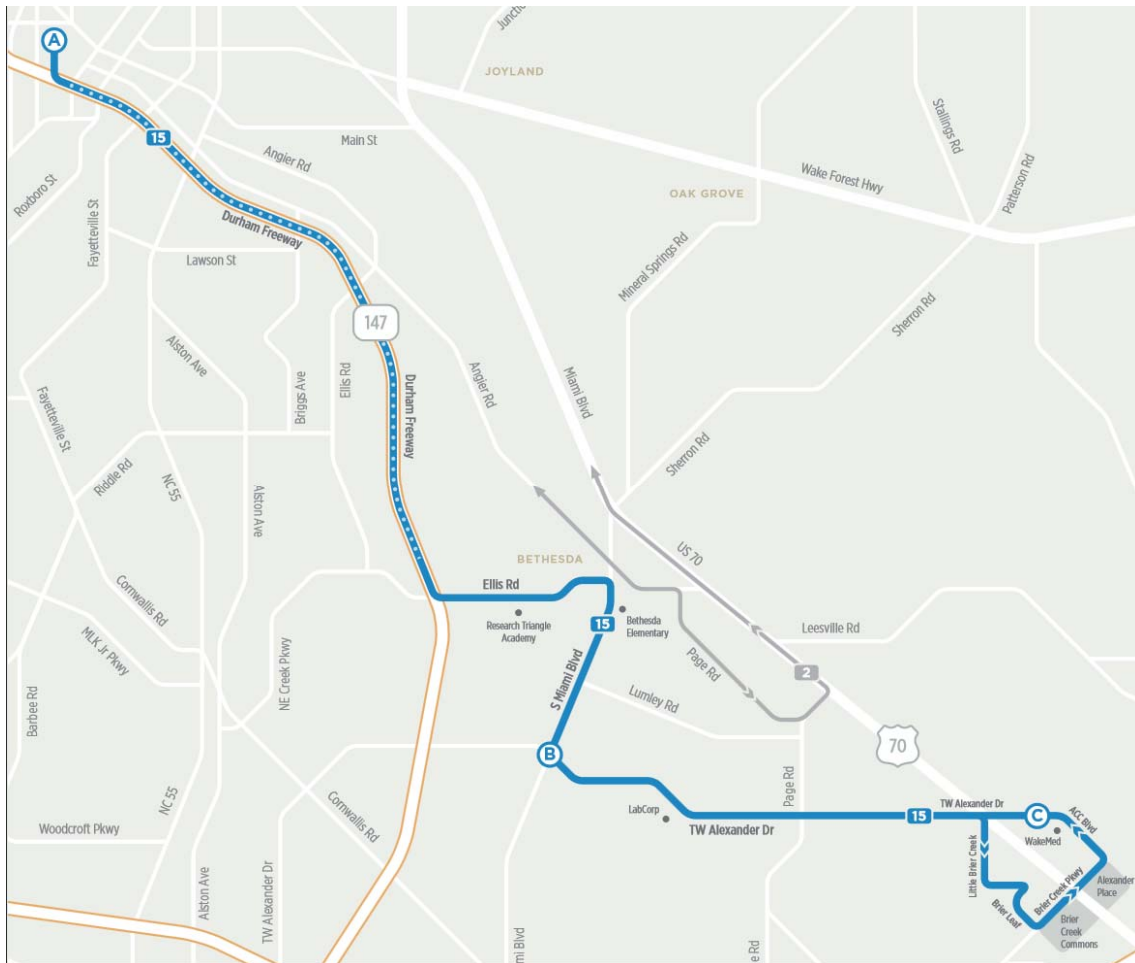
Route Characteristics		
Weekday & Saturday		
Start Time		5:07 AM
End Time		12:00 AM
Average Daily Boardings		1,501
Peak Headway (mins)		60
Off-Peak Headway (mins)		60
Evening Headway (mins)		60
Schedule Adherence	On Time	N/A ⁴
Sunday & Holiday		
Start Time		6:00 AM
End Time		10:00 PM
Headway (mins)		60

⁴ OTP not available for this route.

ROUTE 15

Route 15 Brier Creek operates between Durham Station to Alexander Place Shopping Center (Walmart) in Raleigh via Durham Freeway and TW Alexander Drive. Major destinations along the route include Research Triangle Academy, LabCorp, Brier Creek Shopping Center, and WakeMed Brier Creek.

Figure 5-18 Route Map, Route 15



Major Destinations

- Research Triangle Academy
- Bethesda Elementary
- LabCorp
- WakeMed Brier Creek Healthplex
- Brier Creek Commons
- Alexander Place Shopping Center

Ridership

Route 15 has the lowest ridership of the GoDurham routes that originate from Durham Station, with 486 weekday riders. However, after it received additional investment to expand service in September 2015, Route 15 has roughly tripled its ridership. Headways are scheduled hourly all day.

Route 15 serves 23 passengers per hour. Its two segments, from TW Alexander Drive at WakeMed to TW Alexander Drive at Miami Boulevard and TW Alexander Drive at Miami Boulevard to Durham Station, have similar levels of productivity (approximately 17 and 22 boardings per service hour, respectively). The highest ridership stops include Durham Station, TW Alexander Drive at Miami Boulevard, and stops near Alexander Place and Brier Creek Commons.

For the most part, Route 15 has a unique service alignment; however, Route 2 loops around and stops near Bethesda Elementary.

Route Characteristics		
Weekday & Saturday		
Start Time	5:26 AM	
End Time	12:26 AM	
Average Daily Boardings	486	
Peak Headway (mins)	60	
Off-Peak Headway (mins)	60	
Evening Headway (mins)	60	
Schedule Adherence	On Time	79%
Sunday & Holiday		
Start Time	6:26 AM	
End Time	9:26 PM	
Headway (mins)	60	

Schedule Adherence

Route 15 is on-time 79% of the time across all timepoints and arrives at Durham Station on-time 92% of the time. Route 15 encounters peak-hour traffic congestion along NC 147 for several miles and crosses US 70 twice in Brier Creek.

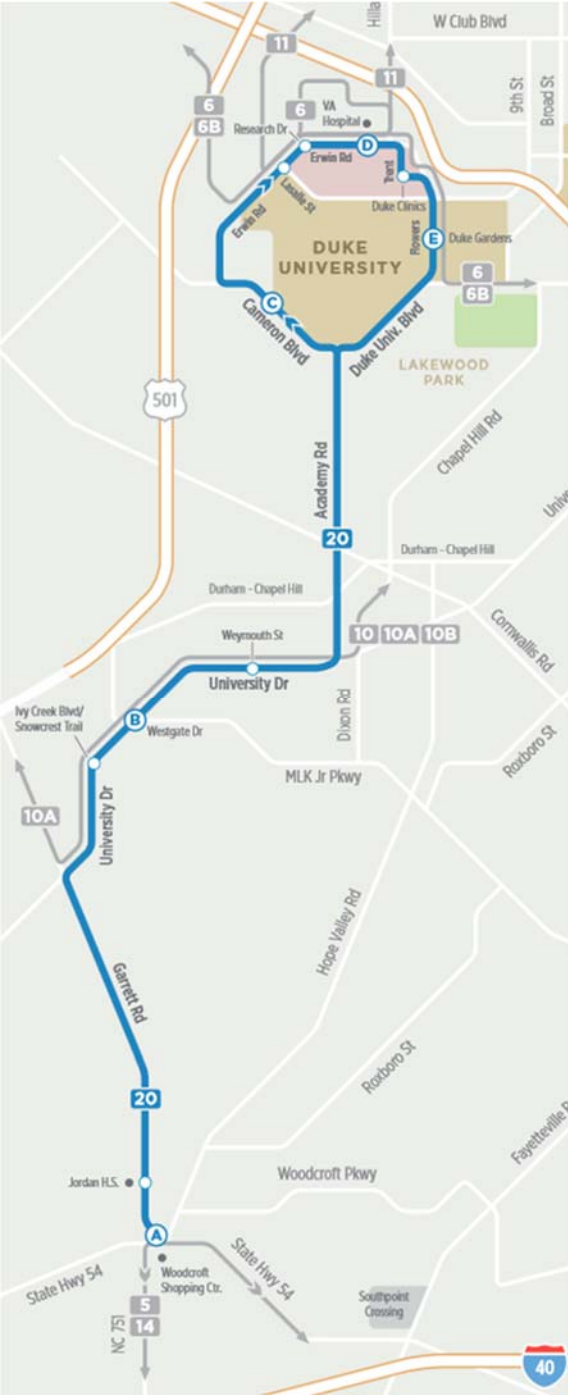
Summary

Route 15 is the lowest ridership route of the routes that originate from Durham Station; however, it provides coverage to a unique area of the city. The multiple mile-long segment on NC147 inhibits ridership – no one is being picked up or dropped off on the freeway. Recent ridership growth indicates some market potential.

ROUTE 20

Route 20 Woodcroft – South Square – Duke/VA is a new commuter-style, limited-stop service that connects South Durham and the Duke/VA area. This route serves Hope Valley Commons park & ride, Jordan High School, South Square, Duke West Campus, Duke Hospital North and South, and VA Hospital. This route does not originate from Durham Station.

Figure 5-19 Route Map, Route 20



Major Destinations

- Durham VA Medical Center
- Duke University/Duke Hospital
- Jordan High School
- Westgate Shopping Center
- Woodcroft Shopping Center

Ridership

Route 20 was launched in August 2016, less than one month before ridership numbers were collected. It operates during weekday peak only. Ridership was 66 weekday riders. Ridership was well distributed across the stops. It is anticipated that ridership will increase as the service matures.

Route 20 intersects with many routes. It connects with Routes 6 and 11 around Duke University and the Duke and VA Medical Centers. It also shares stops along University Drive with Route 10. Finally, Route 20 shares stops with Routes 5 and 14 near Hope Valley Commons.

Route Characteristics		
Weekday		
Start Time		6:20 AM
End Time		7:10 PM
Average Daily Boardings		66
Peak Headway (mins)		30
Off-Peak Headway (mins)		No service
Evening Headway (mins)		No service
Schedule Adherence	On Time	N/A

Schedule Adherence

No on-time performance is available for Route 20.

Summary

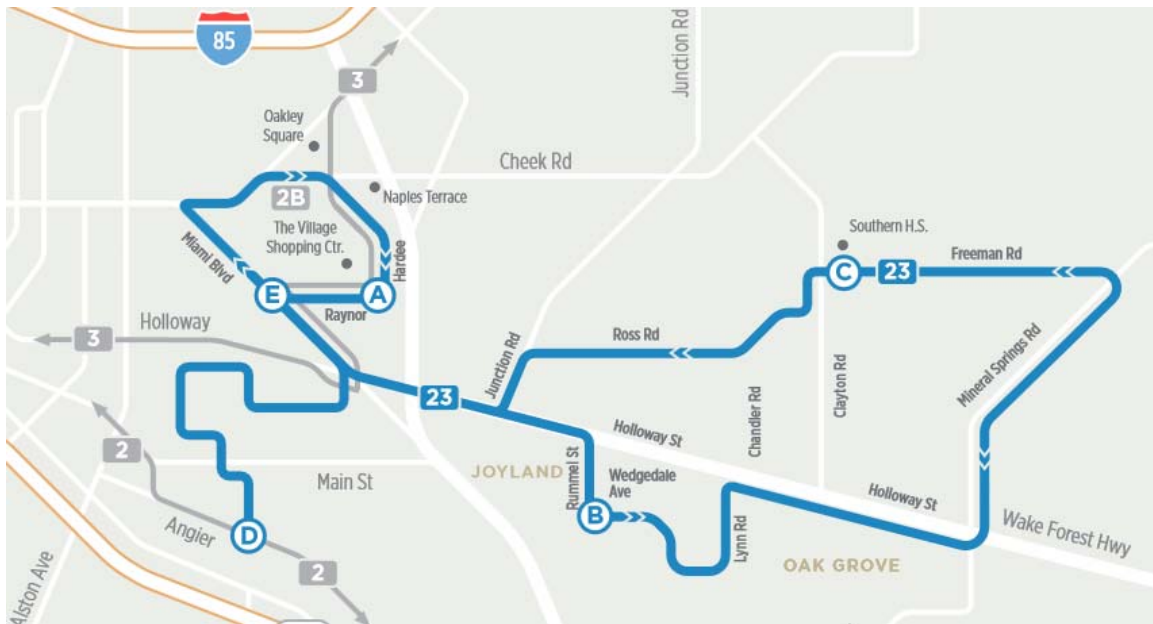
Route 20 is a new commuter-style, limited-stop route. It provides important north-south connections to major destinations from South Durham to the VA/Duke area. Initial ridership is low, but a peak to Duke in the morning and from Duke in the afternoon is apparent, which is the intended target market.

ROUTE 23

Route 23 East Durham and NC 98 is a loop that provides night and Sunday service from the Village. It covers areas that are covered by Routes 2 and 3 during weekdays and Saturdays. Route 23 has a timed transfer to Route 3 in both directions at The Village.

The NC 98 loop leaves the Village and uses Highway 98 to serve residential areas in Joyland and Oak Grove, Mineral Springs Road, Southern High School, and Ross Road. The East Durham loops from the Village to Angier Avenue and Guthrie Avenue.

Figure 5-20 Route Map, Route 23



Major Destinations

- Oakley Square Apartments
- The Village Shopping Center
- Naples Terrace
- Southern High School
- Oak Grove Elementary School

Ridership

Route 23 is a low ridership route (198 weekday riders) that operates Monday-Saturday nights and Sunday. It is scheduled every 60 minutes. Route 23 coordinates its service with Route 3 around the Village and Route 2 along Angier Avenue at Guthrie.

Productivity is 36 passengers per hour. Route 23's productivity is triple the average from the Village to Rummel Street at Highway 98.

Schedule Adherence

No on-time performance is available for Route 23.

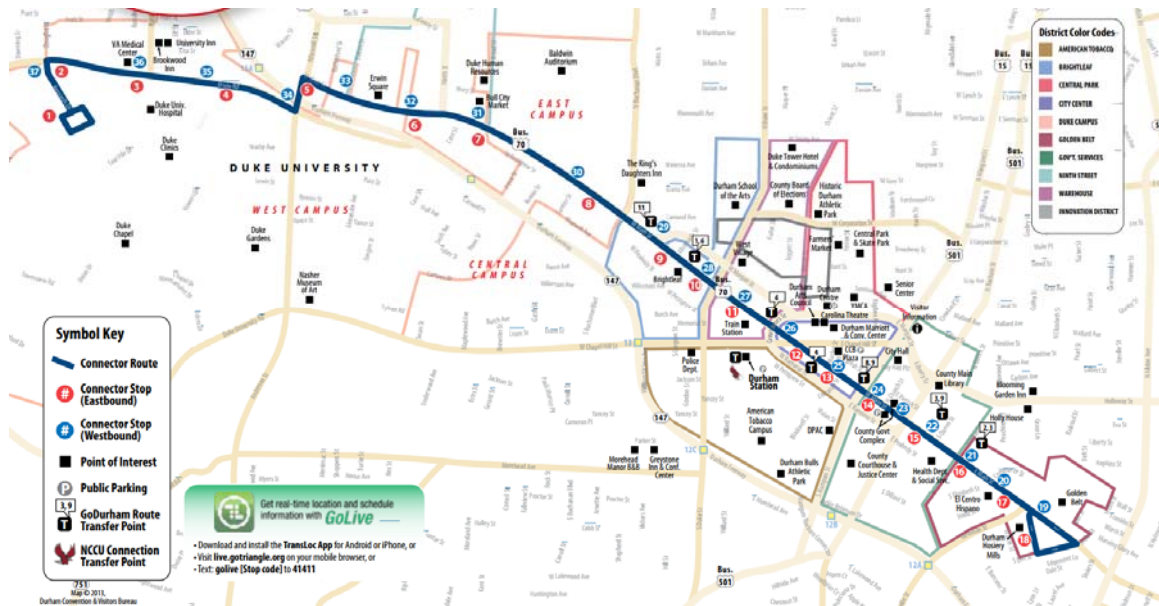
Summary

Route 23 has good productivity considering it is a nighttime loop that requires a transfer to complete a trip. The high productivity calls into question whether Route 23's service area should operate as a separate loop or as a standalone route.

Route Characteristics		
Weekday & Saturday		
Start Time		7:13 PM
End Time		12:40 AM
Average Daily Boardings		198
Peak Headway (mins)		No service
Off-Peak Headway (mins)		No service
Evening Headway (mins)		60
Schedule Adherence	On Time	N/A
Sunday & Holiday		
Start Time		6:18 AM
End Time		9:40 PM
Headway (mins)		60

The Bull City Connector is a fare-free service that operates from Duke University to Golden Belt via Erwin Road and Main Street. Major destinations include the VA/Duke Medical Centers, Ninth Street District, Brightleaf Square, American Tobacco District, City Center District, and Golden Belt District. The Bull City Connector is operated in financial partnership with Duke University.

Figure 5-21 **Route Map, Bull City Connector**



Major Destinations

- Durham VA Medical Center
- Duke University/Duke Hospital
- Ninth Street District
- Brightleaf Square
- American Tobacco District
- City Center District
- Golden Belt District

Ridership

The Bull City Connector has 1,299 weekday riders. It provides fare-free service, operating weekdays every 17 minutes from 6:30 AM-9 PM. Ridership is well-distributed throughout its route.

The Bull City Connector serves approximately 24 passengers per hour. Mornings are the most productive time period of the day, with 40.1 boardings per service hour. Nights are the least productive time of day, with 8 boardings per service hour.

The Bull City Connector crosses many routes; however, like Route 6 and 11, it serves both downtown Durham and the Duke/VA Medical Centers area.

Schedule Adherence

No on-time performance is available for the Bull City Connector.

Summary

The Bull City Connector has recently been changed so that it no longer serves Durham Station. This resulted in a 25-30% loss in ridership. In addition, due to degrading running times, the frequency of the Bull City Connector is now 17 minutes, which casual passengers may no longer consider “walk up” frequency, but one that requires a schedule. It should be noted that there is no published schedule for the Bull City Connector. The Bull City Connector overlaps Route 2 in some high ridership areas. The two routes are competing for the same ridership. One other unique characteristic of the Bull City Connector is the large dropoff in evening ridership. Most other GoDurham routes have very good evening productivity – the Bull City Connector does not.

Route Characteristics		
Weekday		
Start Time		6:30 AM
End Time		9:00 PM
Average Daily Boardings		1,299
Peak Headway (mins)		17
Off-Peak Headway (mins)		17
Evening Headway (mins)		17
Schedule Adherence	On Time	N/A
Saturday		
Start Time		10:00 AM
End Time		9:00 PM
Headway (mins)		17
Sunday		
Start Time		No service
End Time		No service
Headway (mins)		N/A

6 PREFERRED ALTERNATIVE

Short-term recommendations for GoDurham were developed using public input, market conditions, and existing ridership patterns. Initially, two scenarios were developed that represent different principles of route planning and areas of emphasis (see Appendix D for additional information about the two scenarios). Following a public outreach and comment period, a fiscally constrained Preferred Alternative was developed to address operational issues, future growth, industry standard best practices for route design, and meet established project goals.

BEST PRACTICES FOR ROUTE DESIGN

While it is unlikely that a single service type will meet the competing mobility needs of all transit users in Durham, there are certain best practices that can be applied to nearly all transit services to improve the overall passenger experience.

- **Service should be simple:** First and foremost, service should be designed so that it is easy to use and intuitive to understand. This applies not only to the routing and scheduling of service, but also to the information presented to customers at the stop and on passenger information materials.
- **Routes should operate along a direct path:** The fewer directional changes a route makes, the easier it is to understand. Conversely, circuitous alignments are disorienting and difficult to remember. Routes should not deviate from the most direct alignment unless there is a compelling reason, such as to provide service to a major ridership generator. In such cases, the benefits of operating the route off of the main route must be weighed against the inconvenience caused to passengers already on board.
- **Route deviations should be minimized:** As described above, service should be as direct as possible. Consistent with this idea, the use of route deviations—traveling off the most direct route—should be minimized. However, there are instances when deviating service from the most direct route is appropriate—for example, to provide service to major shopping centers, employment sites, schools, and medical centers. In these cases, the benefits of the deviation must be weighed against the inconvenience caused to passengers already on board. Route deviations should be implemented only if:
 - The deviation will result in an increase in overall route productivity.
 - The number of new passengers that will be served is equal to or greater than 25% of the number of passengers who would be inconvenienced by the additional travel time on any particular deviated trip.

In most cases, route deviations should be provided on an all-day basis. Exceptions are during times when the sites that the route deviations service have no activity—for example, route deviations to major employment centers with shift workers may not need to serve those locations between shift changes.

- **Major routes should operate along arterials:** Key corridor and mainline routes should operate on major roadways and avoid deviations to provide local circulation. Riders and potential transit users typically have a general knowledge of an area's arterial road system and use that knowledge for geographic points of reference. The operation of bus service along arterials makes transit service faster and easier for riders to understand and use.
- **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. In cases where such operation is not possible due to one-way streets or turn restrictions, routes should be designed so that the opposite directions parallel each other as closely as possible.
- **Service design should maximize service:** The distance and travel time of a route determine how efficiently a bus can operate. Service should be designed to maximize the time a vehicle is in service and minimize the amount of time it is out-of-service. Since the length of the route and the time it takes to make each trip impacts how long of a layover is required at each end and how many buses are needed to provide the service, it is often more efficient to extend a route to pick up a few more passengers and limit the amount of layover time.

These best practices offer a foundation for the improvement of transit service throughout Durham.

GODURHAM PREFERRED ALTERNATIVE SUMMARY

GoDurham's SRTP seeks to guide the improvement of service over the next several years to better serve existing and potential riders, new developments, and essential services in the community. Three rounds of public outreach were conducted as part of the SRTP process. After hearing from residents through public meetings, conversations about the system, and online surveys, the service planning team developed a Preferred Alternative to best meet the needs of the community. The Preferred Alternative is fiscally constrained and designed for implementation within existing resources.

Key themes include the following:

- Addressing on-time performance
- Simplifying routes
- Improving frequency of service
- Providing more direct service to popular destinations
- Expanding the number of routes with 15 minute all-day service
- On-demand service to better serve low density areas with mobility needs

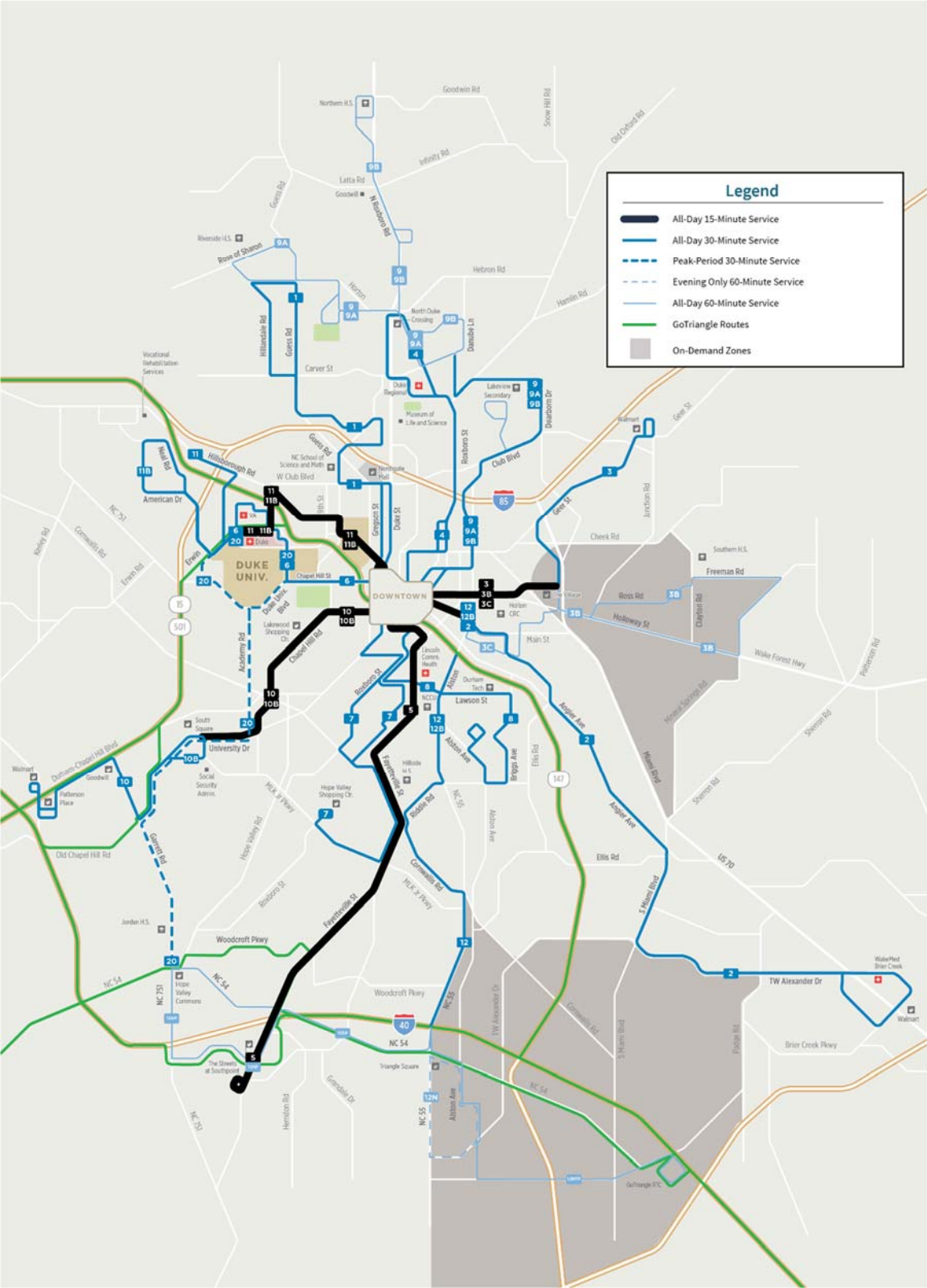
Benefits of the Preferred Alternative include the following:

- 9.3 more miles of very frequent service (every 15 minutes or more all day)
- 12,700 more residents and jobs within a quarter mile of very frequent service
- 16,000 more residents and jobs within a quarter mile of service that operates every 30 minutes or better

Figure 6-1 through Figure 6-3 provide a system map and summary of service proposed as part of the Preferred Alternative.

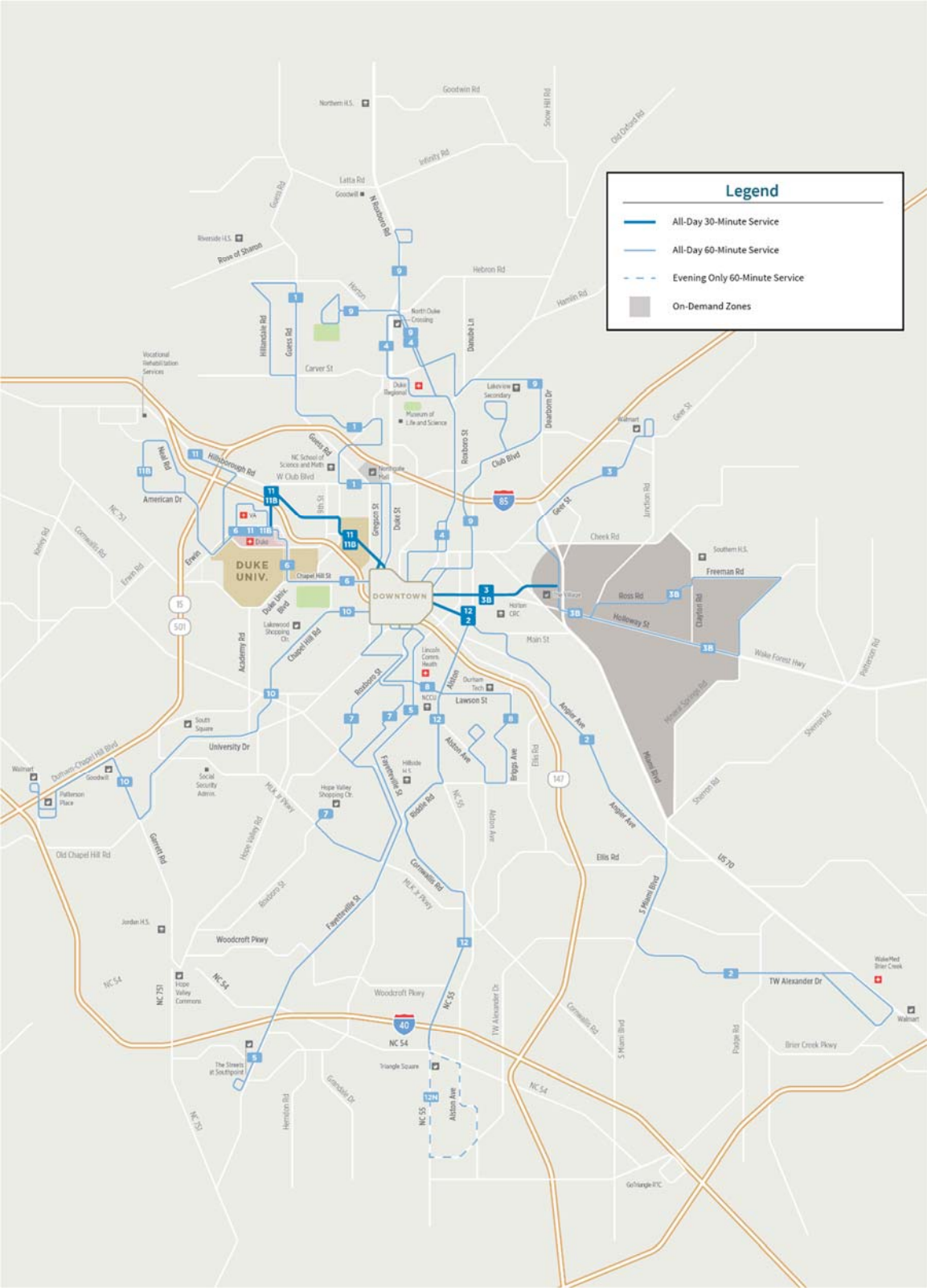
SHORT RANGE TRANSIT PLAN | FINAL REPORT
GoDurham

Figure 6-1 GoDurham Preferred Alternative



SHORT RANGE TRANSIT PLAN | FINAL REPORT
GoDurham

Figure 6-2 GoDurham Preferred Alternative: Nights and Sundays



SHORT RANGE TRANSIT PLAN | FINAL REPORT
GoDurham

Figure 6-3 Preferred Alternative Service Summary

Route	Service Summary	Frequency: Proposed Weekday	Frequency: Proposed Night/Sunday	Service Span: Preferred Alternative
1	Durham Station to Northgate Mall, Costco, and Hillandale Road.	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
2	Durham Station to East Durham, Bethesda, and Briar Creek via Angier Ave, S Miami Blvd, and TW Alexander Dr. Night and Sunday service do not serve Briar Creek.	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
3	15 minute service between Durham Station and Wellons Village. Branch to Walmart operates every 30 minutes. Service to Southern High and Taylor St/Driver St is hourly. Night and Sunday service operates every 30 minutes between Durham Station and Wellons Village. Branches to Walmart and Southern High are hourly.	15/30/60	30/60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
4	Durham Station to North Duke Crossing via Roxboro St and N Roxboro Rd.	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
5	Route 5 connects Durham Station and the Streets at Southpoint via Fayetteville Road. Route 5 would no longer enter the Streets at Southpoint, instead the route would terminate just south of the shopping center.	15	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
6	Durham Station to Duke University Hospital, Durham VA Medical Center via Chapel Hill St, Erwin Rd, and Crest St.	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
7	No change from today. Durham Station to MLK Jr Parkway and S Roxboro Street.	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
8	No change from today. Durham Station to American Tobacco Campus, Lincoln Community Health Center, NCCU, Durham Technical Community College, and Unity Village	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
9	Durham Station to North Duke Crossing via Club Blvd, Dearborn Dr, and Carver St. Branches to Riverside High School and Northern High School operate hourly; 30 minute service between Durham Station and Carver St.	30/60	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
10	Durham Station to Lakewood, South Square, Walmart, and Patterson Place. No service to James St or north of University Dr. 15 minute service between Durham Station and South Square; 30 minute service between South Square and Walmart.	15/30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
11	Durham Station to Duke East Campus, Duke University Hospital, Durham VA Medical Center, American Village, and Hillsborough. 15 minute service between Durham Station and Duke University Hospital, 30 minute service for branches between Duke University Hospital, Hillsborough, and American Village.	15/30	30/60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)
12	Durham Station to East Durham, NCCU, Triangle Village Shopping Center, with branches to the Streets at Southpoint and RTP. 30 minute service to Triangle Village, 60 minute service for branches to RTP and the Streets at Southpoint. Hourly night and Sunday service between Falls Pointe Apartments and downtown Durham only.	30/60	60	5:30 AM - 12:30 AM 6:30 AM - 9:30 PM (Sun)
20	Hope Valley Commons to South Square and Duke University Hospital via Garrett Rd, University Dr, Academy Rd, and Duke University Blvd.	30	-	6:30 AM - 10:00 AM; 3:00 PM - 7:00 PM (Mon-Fri)

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ROUTE DESCRIPTIONS

Route 1

- Route 1 currently operates with three variants (Route 1, Route 1A, and Route 1B). This arrangement is complicated and requires passengers to know three separate schedules.
- Address on-time performance and simplify this route by doing the following:
 - During the base schedule, increase Route 1's cycle time to 75 minutes (interline with revised Route 6)
 - Change routing to serve North Pointe Drive and Lednum bi-directionally all-day weekdays, which provides service to every 30 minutes to this high ridership area.
 - Remove service from the Hillandale Road stops in front of Croasdaile Commons. This will affect approximately 15 passengers, who would need to walk from the stops at Carver/Hillandale. Ridership increases induced by bi-directional all-day and evening service the Brogden area will more than offset these ridership losses.
- On Sundays/evenings, interline Routes 6 and 1 so that even if Route 1 is tight, there is recovery with Route 6.
- During the base schedule, Route 1 would leave Durham Station on the hour and half hour and arrive at Durham Station 15 and 45 minutes past the hour.

Route 2

- Route 2 would be simplified to operate one consistent alignment seven days a week.
- Route 2 would be extended to Briar Creek and operate on Angier Avenue, Miami Boulevard, and TW Alexander Drive—no longer operating on Page Road or US 70. The Route 2 extension would replace Route 15 and double the number of trips to Briar Creek.
- Between Durham Station and Alston Avenue, Route 2 would operate on Main Street in both directions. It would use the stops currently used by the Bull City Connector.
- Route 2B service would be mostly replaced by an extension of Route 3, which would connect Angier Avenue, Driver Street, and Taylor Street to The Village. Service would no longer be available on N. Miami Boulevard and Geer Street.
- During the base schedule, Route 2 would leave and arrive at Durham Station 15 and 45 minutes past the hour. During evenings and Sundays, it would arrive on the hour.

Route 3

- Route 3 is one of the highest ridership routes in Durham. It has three different branches, with Route 3 having very high ridership and Routes 3B and 3C having much lower ridership.
- In Scenario 1, Routes 3 and 3B would remain the unchanged. Service would continue to be every 15 minutes between The Village and Durham Station.
- Route 3C would be restructured to serve The Village and continue to the intersection of Angier Avenue and Alston Avenue via Taylor and Driver Streets. This change would create more direct trips between East Durham, NCCU, and Research Triangle Park (RTP) with a transfer to a restructured Route 12 at Alston Avenue. Approximately 10 riders in

the Springwood Apartments would no longer be served by Route 3C. These riders would have the opportunity to utilize the East Durham On-Demand service.

- Evening and Sunday service would be provided on both Routes 3 and 3B. Route 3 would depart/arrive Durham Station on the hour while Route 3B would depart/arrive on the half hour. Route 3B service would replace Route 23 on evenings and Sundays.

Route 4

- Route 4 is currently the most direct route between North Duke Crossing, Duke Regional Memorial Hospital, and Durham Station.
- No changes are recommended for Route 4.

Route 5

- Route 5 currently includes Route 5k, which extends to MLK. Ridership is lower on Route 5k trips than Route 5.
- In order to improve ridership on Route 5 and to better serve the regional retail center at Southpoint, Route 5 should be modified to serve the Southpoint area on all trips. Route 5k would no longer exist. Southpoint would have service every 15 minutes, which would double service levels for approximately 240 existing riders.
- Route 5 would serve The Streets at Southpoint and the Renaissance Center via stops on Fayetteville Road. It would turn around using Kentington Dr., Ronaldo Dr., and Renaissance Pkwy.
- Route 5 would no longer serve NC 751 and NC 54. A restructured Route 12 would continue to serve this loop. Approximately 100 existing Route 5 riders on this loop would need to transition or transfer to Route 12.

Route 6

- Route 6 has severe on-time performance issues, particularly during afternoon peak times.
- Route 6 would be simplified by having one consistent alignment connecting Duke, the Crest Street neighborhood and Durham Station. The route simplification would address the on-time performance issues. Route 6 would operate every 30 minutes on weekdays and Saturdays and hourly on Sundays and evenings.
- A restructured Route 11 would provide service to American Village. However, service would no longer be provided to Bennett Place.
- Route 6 would be interlined with Route 1 at Durham Station. During the base schedule, Route 6 would leave Durham Station on the hour and half hour and arrive at Durham Station 15 and 45 minutes past the hour. During evenings and Sundays, Route 6 would depart/arrive Durham Station on the hour.

Route 7

- No changes are recommended for Route 7.

Route 8

- No changes are recommended for Route 8.

Route 9

- Route 9 currently operates with three variants (Route 9, Route 9A, and Route 9B), which is complicated and hard for passengers to understand.
- In order to improve speed and reliability, Route 9 and 9A would no longer directly serve Duke Regional Hospital, Crutchfield Street, or N. Duke Street south of Horton Road. Route 4 would continue to directly serve the Duke Regional Hospital northbound stop.
- No other changes to routing or schedule are recommended.

Route 10

- Route 10 is one of GoDurham's highest ridership routes. It includes two different variants.
- In order to operate a consistent 15-minute all-day schedule between Durham Station and South Square, service to James Street would be eliminated. This will cause roughly 50 existing customers to have up to half mile longer walks, but will improve service for more than 250 passengers who are inconvenienced by the longer travel times and inconsistent schedules.
- Route 10B would be shortened to serve the Social Security office, but no longer serve Pickett Road. The Pickett Road segment had low ridership and exposed the route to 15-501 congestion.
- The 6:15 a.m. 10B trip carries 6 outbound passengers and 8 inbound passengers. Due to low ridership, this trip should be deleted.

Route 11

- Route 11 has severe on-time performance issues, particularly during the afternoon peak.
- In order to improve on-time performance, Route 11 would be shortened to no longer serve Buchanan Boulevard and Green Street. Instead, Route 11 would operate to Broad Street via Main Street, serving the existing stops served by the Bull City Connector.
- Route 11 would have two different variants. One variant (Route 11) would continue on LaSalle Street to the existing terminus at Cole Mill Road. The second variant (Route 11B) would continue on the existing Route 6 alignment to American Village. Route 11B would not deviate into the apartments off Morreene Road.
- On weekdays and Saturdays, Route 11's frequency would be upgraded to operate every 15 minutes between LaSalle Street and Durham Station. The extensions to Cole Mill Road and American Village would operate as alternating trips every 30 minutes.
- Route 11 would operate every 30 minutes evenings and on Sundays, with service on the Cole Mill Road and American Village variants operating every 60 minutes.
- Between 2 p.m. and 6 p.m. on weekdays and Saturdays, Route 11 will operate at a 75 minute cycle time, giving operators the ability to stay on time during periods of congestion.
- Currently, Route 11 provides additional night and weekend-only service on an extension west of Cole Mill Road. Route 11 should no longer extend west of Cole Mill Road. This change will also assist in keeping Route 11 on-time during Sunday and evening service.

Route 12

- Currently, Route 12 uses NC 147 to connect Alston Avenue and Durham Station. In order to attract more riders and to provide a better connection from eastern Durham to both RTP and Southpoint—as well as providing a better connection to NCCU—Route 12 should utilize E. Main Street to travel between Durham Station and Alston Avenue. The alignment would be identical to Route 2. Route 12 would be scheduled to arrive and leave Durham Station on the hour and half hour giving E. Main Street service every 15 minutes between Durham Station and Alston Avenue. On Sundays/evenings, Route 12 would be scheduled to arrive and depart Durham Station half past the hour.
- Route 12 currently has two different variants, one of which serves NC 55 and another serving Riddle Road and Cornwallis Road. All Route 12 trips would serve Riddle Road and Cornwallis Road to provide better access to Hillside High School and Route 5.
- Every second Route 12 trip today continues as Route 14, which serves Southpoint. Route 12 should continue to have two different variants. Route 12RTP would continue to the RTP Regional Transit Center via Alston Avenue and Hopson Road. This extension would allow East Durham residents direct service to Research Triangle Park. The other variant, Route 12SP, would continue to Southpoint via NC 54, Fayetteville Road, Renaissance Parkway, NC 751, and NC 54. The Route 12SP extension will replace Route 14. Service to either RTP or Southpoint on Route 12RTP or 12SP would operate hourly, with service between NC 55/NC54 operating every 30 minutes on weekdays and Saturdays.
- On Sundays and evenings, a truncated version of Route 12 (Route 12N) will operate between Falls Pointe Apartments and downtown Durham with hourly service. The Sunday and evening alignment will not serve either Southpoint or RTP.

Route 14

- Currently Route 14 operates hourly service between Triangle Square, Southpoint Mall, and Woodcroft shopping center. Route 14 would be replaced by an extended Route 12 and GoTriangle's on-demand service in RTP. Route 12 would continue to serve the Fayetteville Street, NC 54, NC 751, and Renaissance Parkway loop.
- Woodcroft Parkway would no longer be served by Route 14. This will affect 8 current boardings.

Route 15

- Route 15 would be consolidated with an extension of Route 2. All current stops, with the exception of those on Ellis Road, would continue to have service.
- An extended Route 2 would have 30 minute service on Miami Boulevard and TW Alexander Drive, improving service levels for approximately 150 existing riders. About 8 existing riders on Ellis Road would be negatively affected.

Route 20

- No changes are recommended for Route 20.

Route 23

- Route 23 would be consolidated into a restructured Route 3B.

- Approximately 10 existing Route 23 passengers would need to walk further to access either Route 2 or Route 3.

Bull City Connector (BCC)

- Due to low ridership, the BCC route would be deleted and its resources reallocated to upgrade local service in the same corridor. The BCC resources are also used to address chronic on-time performance issues for Routes 6 and 11.
- East Main Street will be served by 15-minute service all day between Durham Station and Alston Avenue on Routes 2 and 12 and service between Durham Station and Duke/VA Hospital would be every 15-minutes all day on Route 11.
- Anyone traveling on the E. Main Street segment, or to/from Duke will have access to more connections at Durham Station, and more frequent service.

On-Demand Zone

- Develop pilot project to supplement Route 3B service in East Durham with a partnership with private operators, such as taxi cabs, Uber, or Lyft.
- The intent of the on-demand pilot zone is to provide first/last mile services in areas that have a high need, but are difficult to serve with fixed-route bus service due to a limited roadway network and overall lower residential/employment densities.
- Any trip beginning and ending in the service zone will be subsidized by GoDurham. No subsidy should be given for trips going outside the service zone. Transfers to regular service may be made at The Village.

ROUTE MAPS

A series of Preferred Alternative route maps are provided in Figure 6-4 through Figure 6-12. Eliminated routes and routes with no change from existing service (Routes 4, 7, 8, and 20) are not included.

Figure 6-4 Preferred Alternative: Route 1

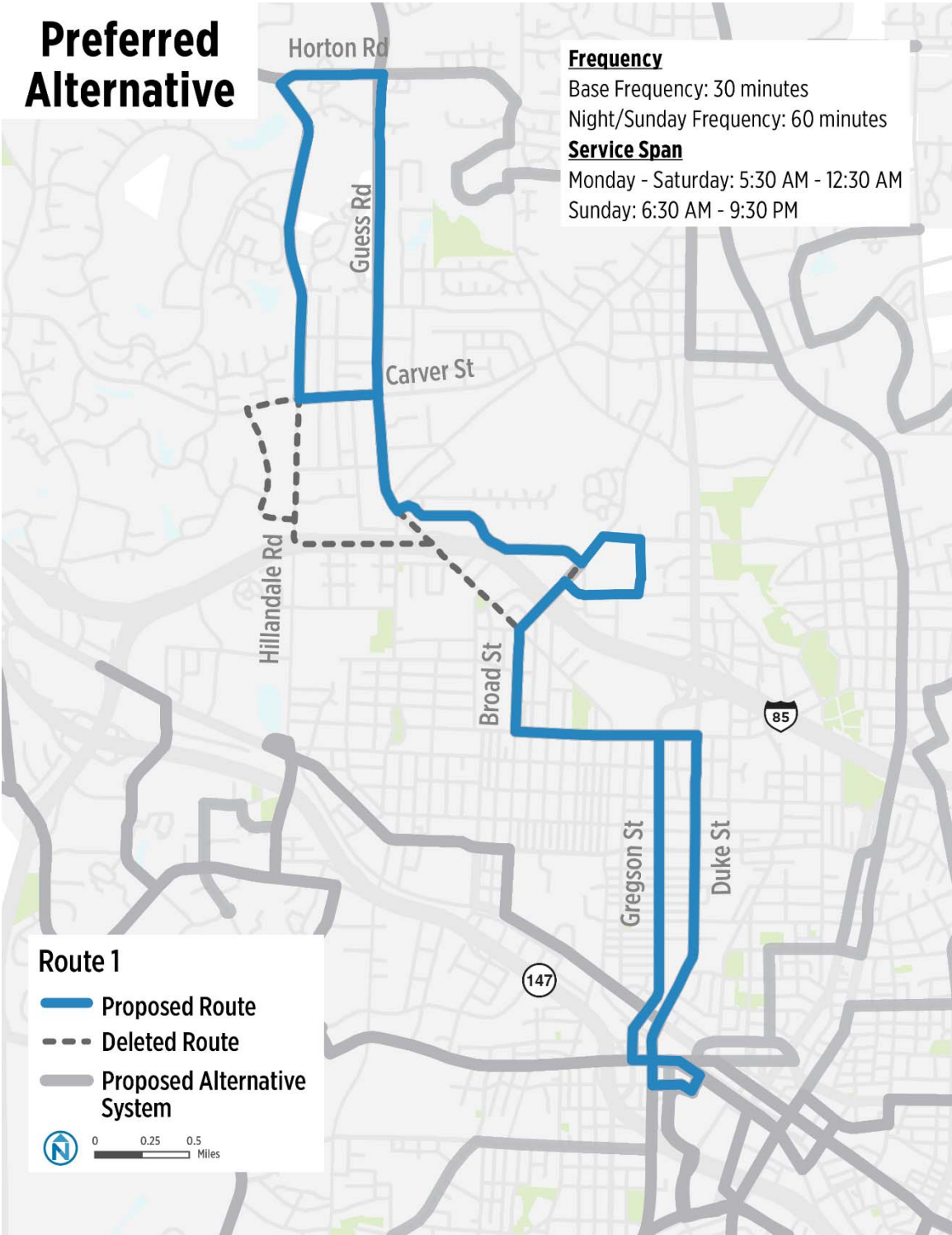


Figure 6-5 Preferred Alternative: Route 2

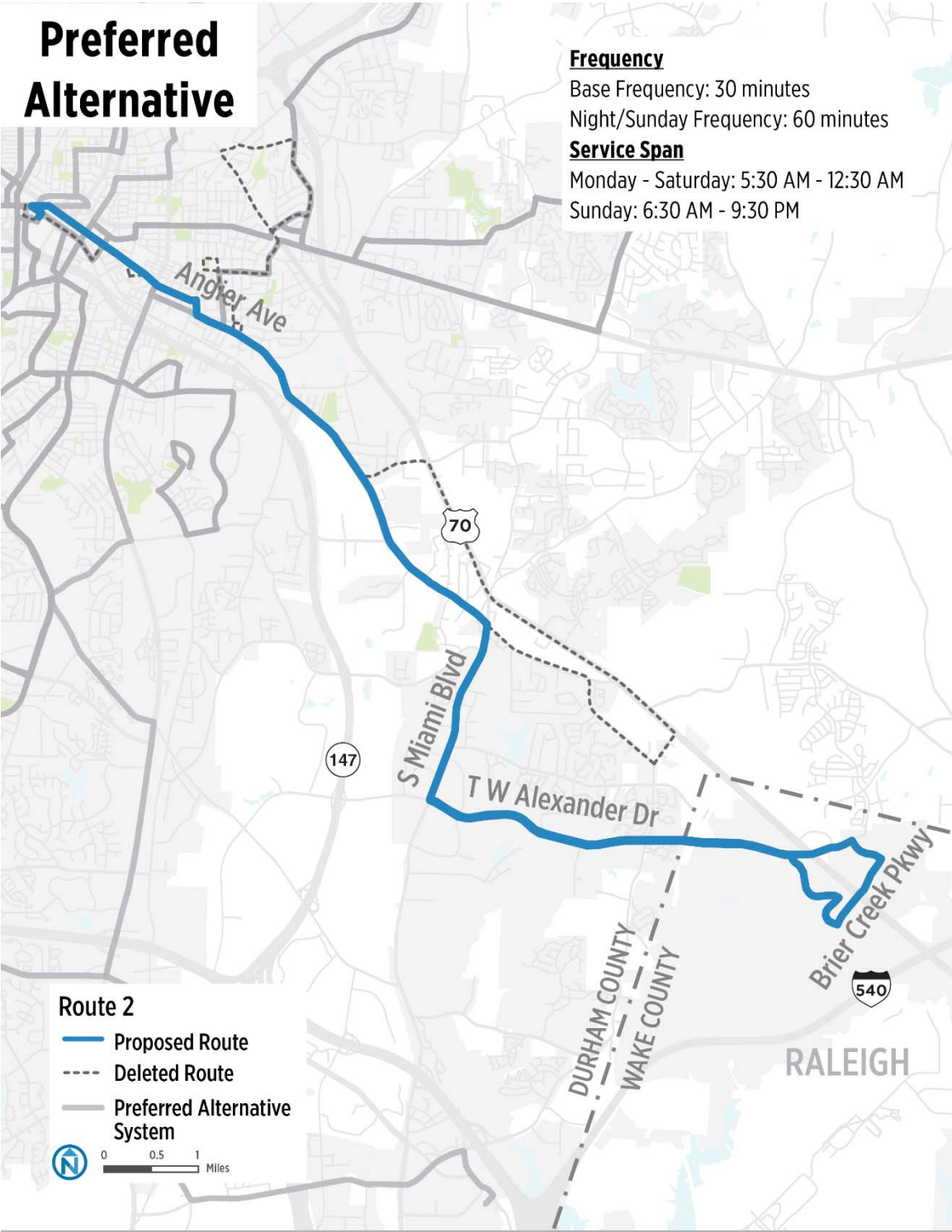


Figure 6-6 Preferred Alternative: Route 3

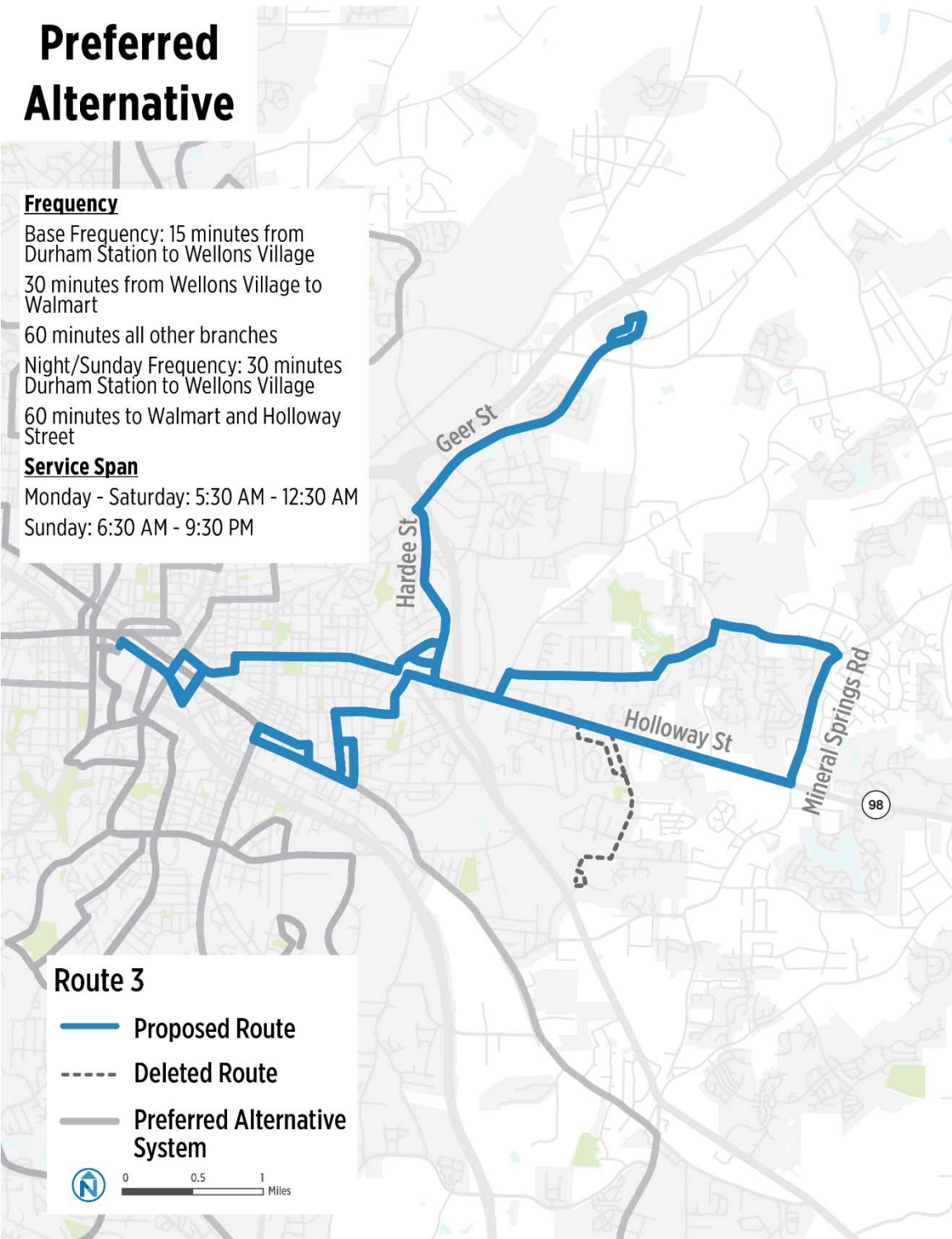


Figure 6-7 Preferred Alternative: Route 5

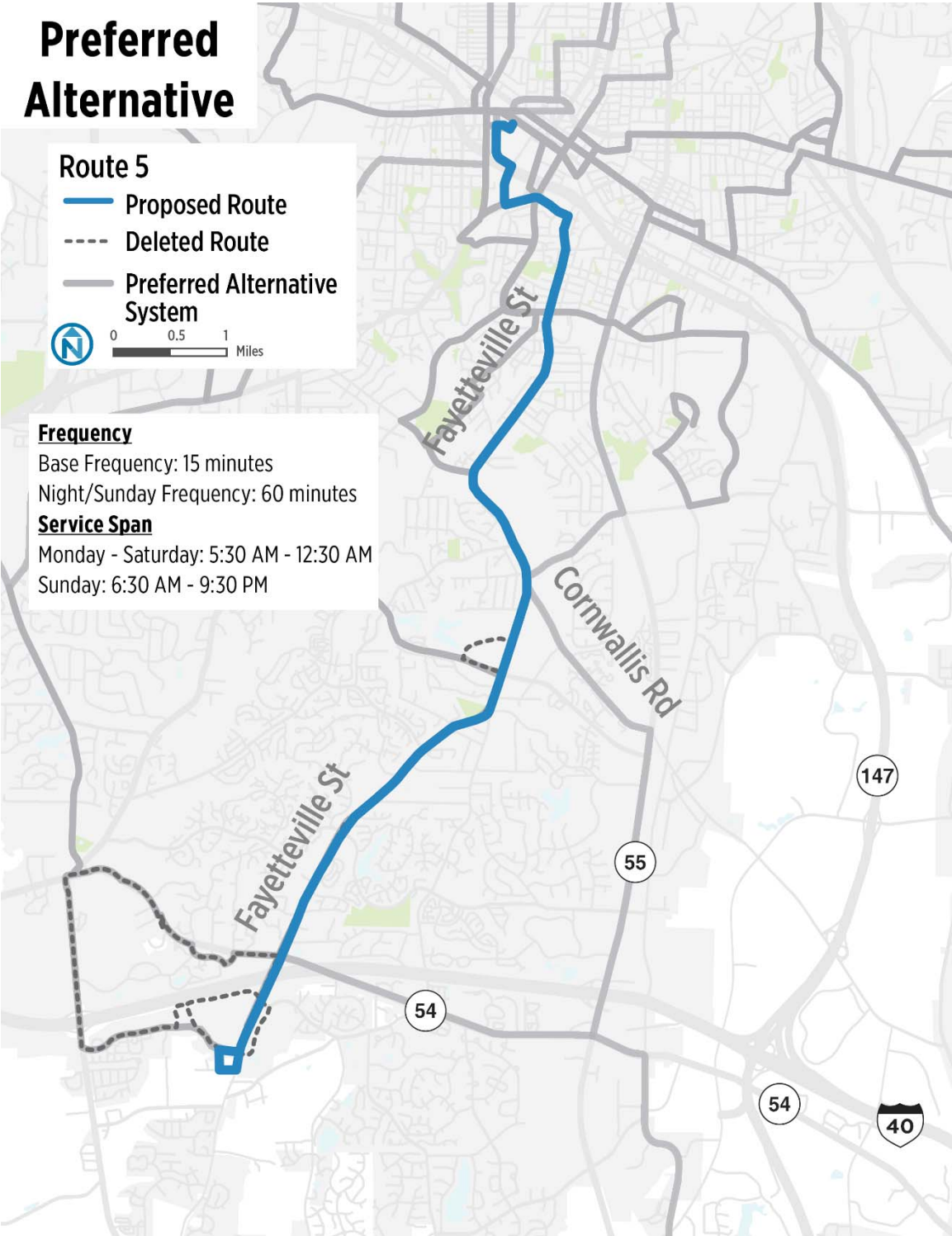


Figure 6-8 Preferred Alternative: Route 6

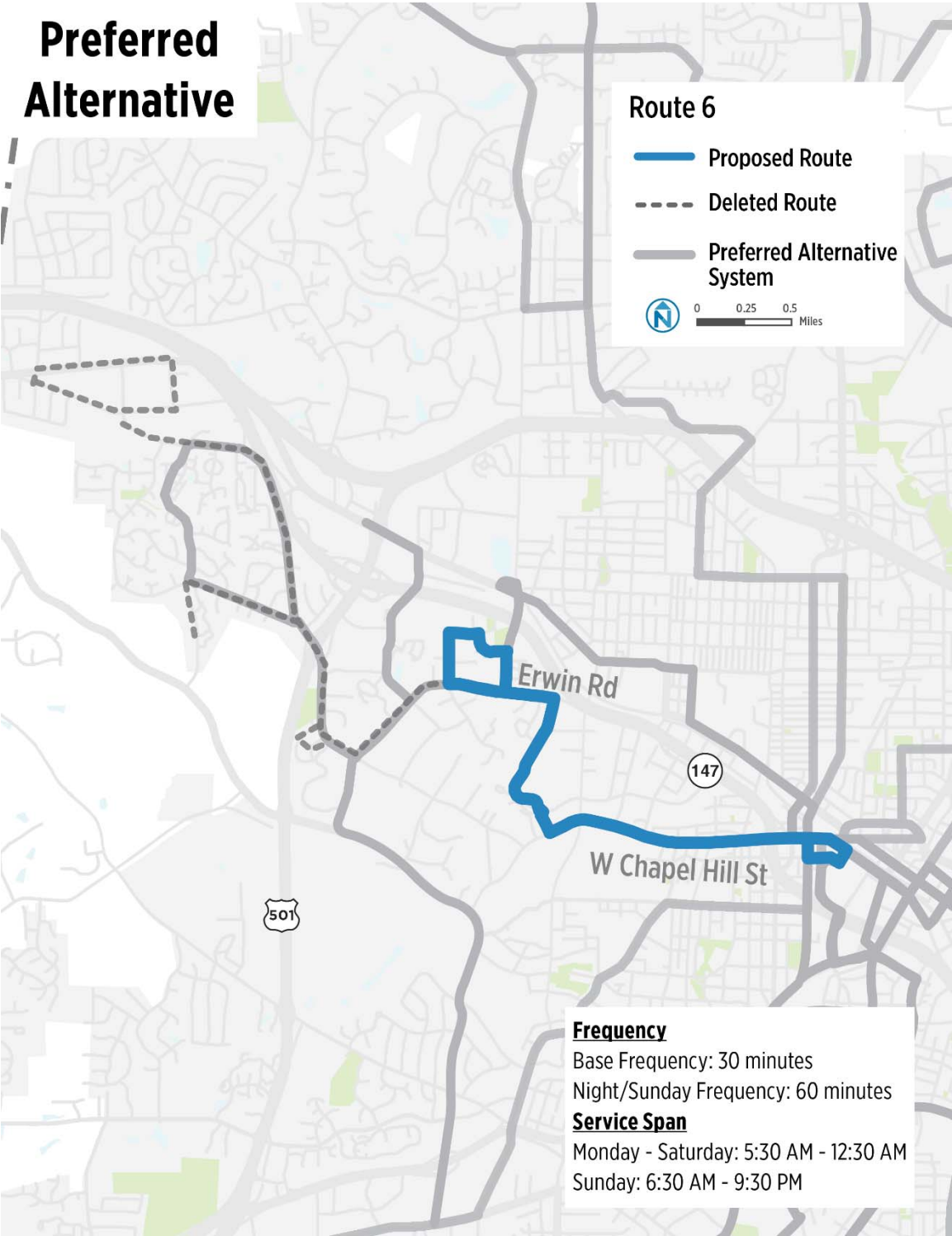


Figure 6-9 Preferred Alternative: Route 9

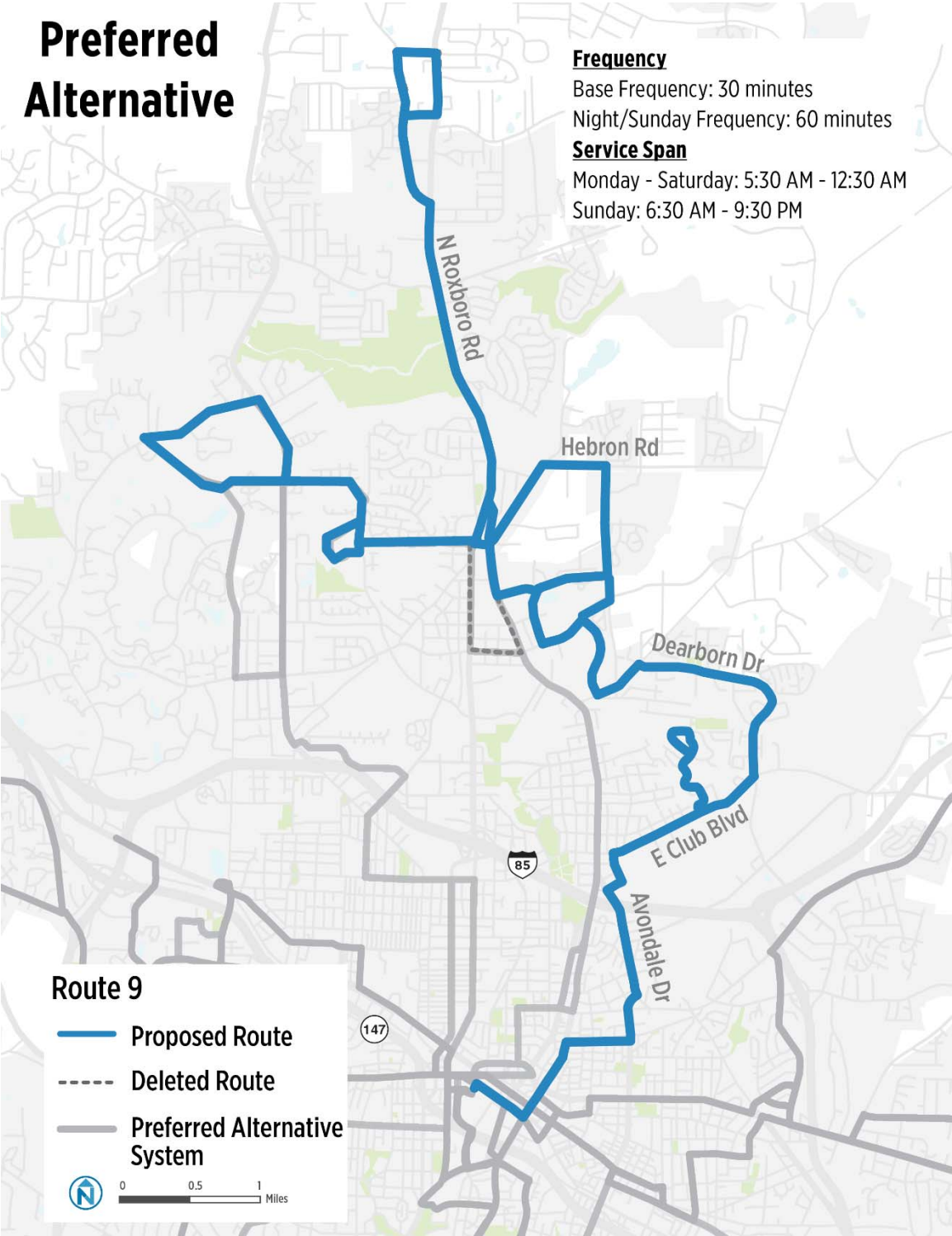


Figure 6-10 Preferred Alternative: Route 10

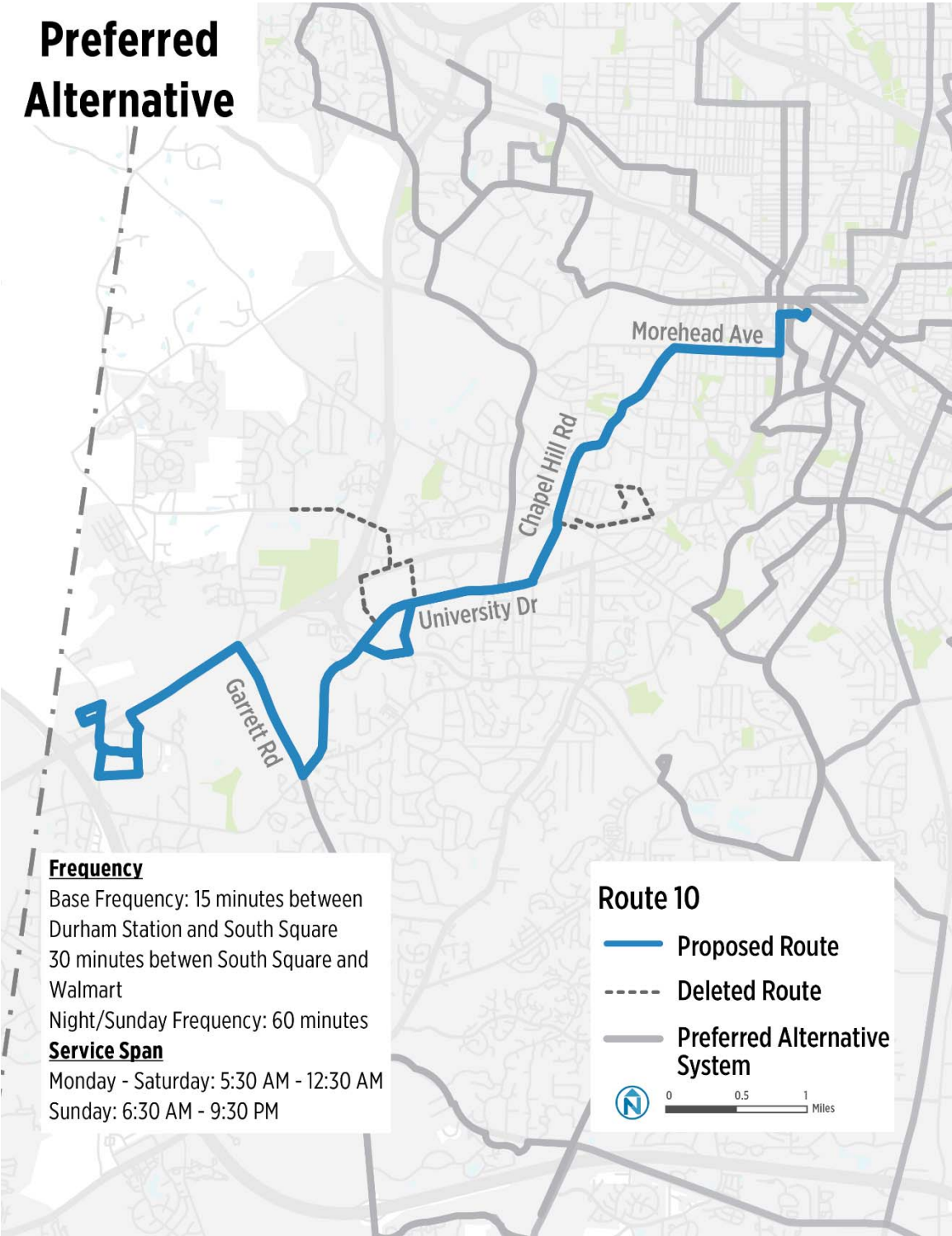


Figure 6-11 Preferred Alternative: Route 11

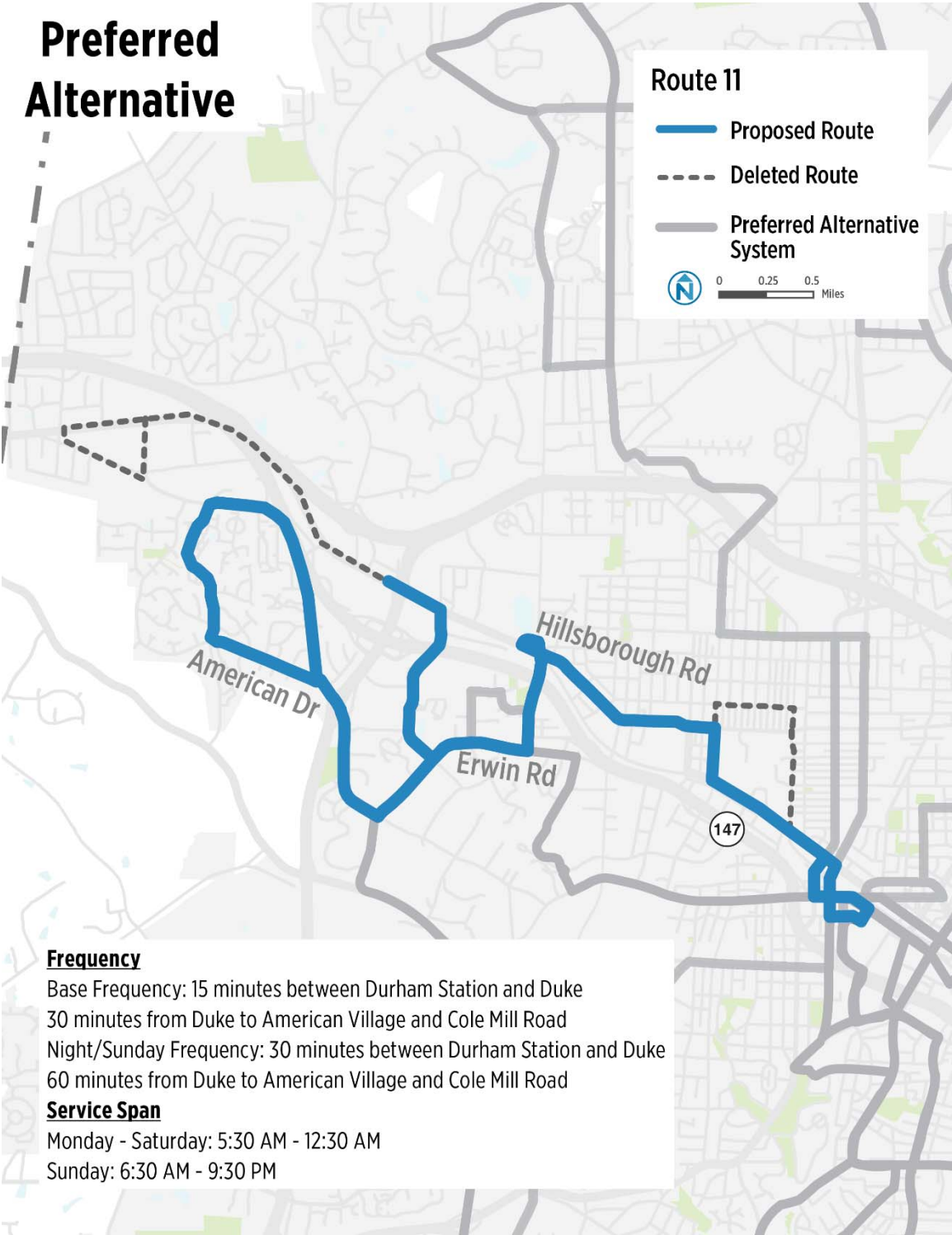
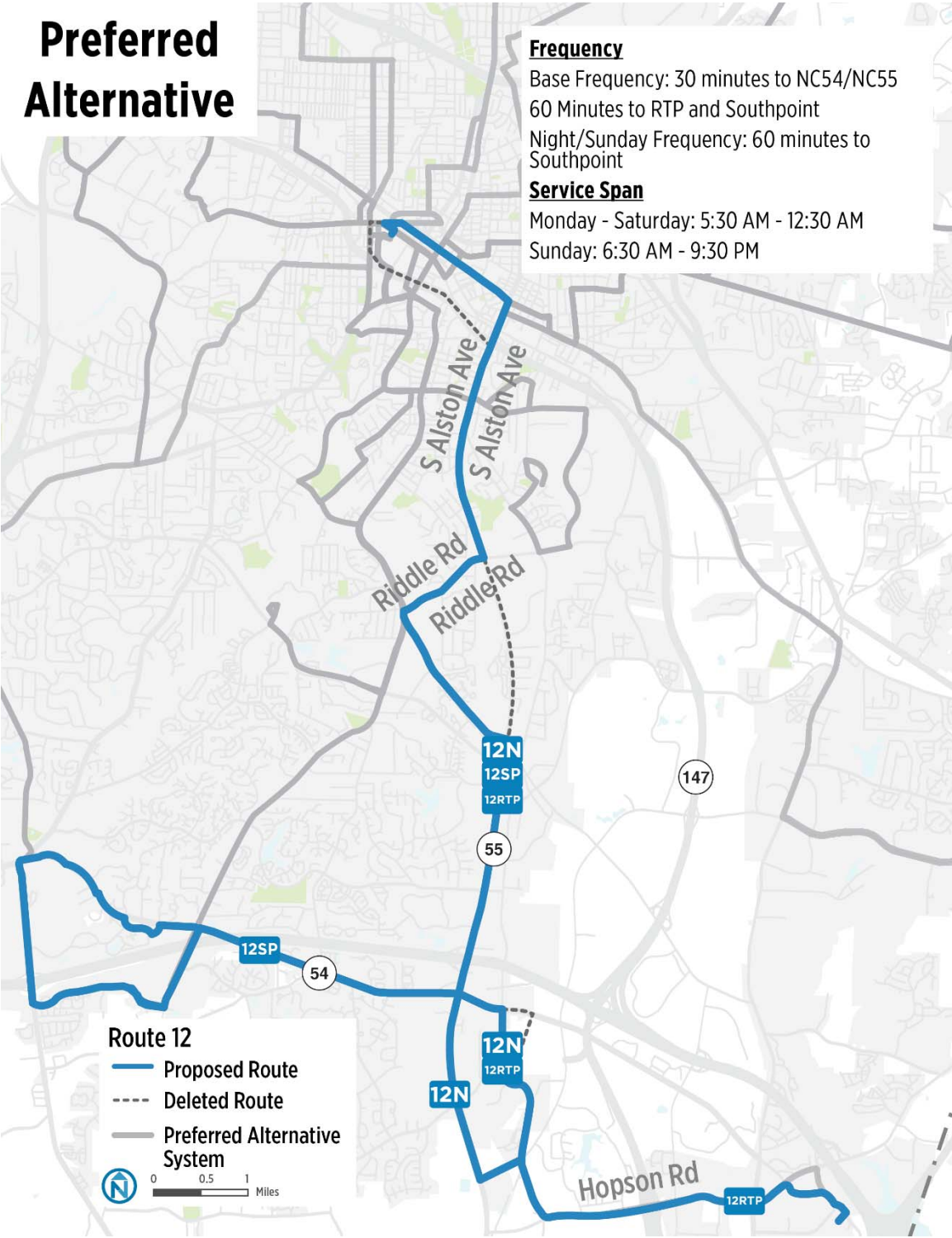


Figure 6-12 Preferred Alternative: Route 12



7 SERVICE EXPANSION CONCEPTS

As part of the SRTP, a cost-neutral restructuring plan was developed to address chronic on-time performance, incorporate more high-frequency service, and improve connections. The technical analysis and public outreach conducted during the SRTP revealed that there were significantly more demands on transit than could be accommodated within the existing budget. This document summarizes expansion concepts that would reflect community needs and desires, as well as leading to improved system utilization. Additional resources would be required for the expansion concepts.

SUMMARY OF EXPANSION CONCEPTS

The highlights of the cost-unconstrained service expansion concepts include:

- **Extended High Frequency Service Network:** New destinations with service every 15 minutes would include Patterson Place, Streets at Southpoint, Duke/VA Hospital, E. Main Street (to Alston Ave) and North Duke Crossing
- **Simplified Service:** Fewer route variations and deviations
- **More frequent weekday & Saturday service:** All routes operate every 30 minutes or better
- **Extended Evening Service:** 30-minute service would end at 10 p.m. instead of 7 p.m.
- **Expanded Sunday Service:** Most routes would operate the same frequency on Sundays as on weekdays and Saturdays
- **More Direct Service to Major Destinations:**
 - Connecting South Durham and North Durham to Duke/VA Hospital
 - Connecting East Durham/The Village to NCCU
 - Connecting more neighborhoods in South Durham to South Square
 - Connecting East Durham neighborhoods to RTP
 - Service to the Museum of Life and Science
- **On-Demand Zones:**
 - On-Demand Zones incentivize the use of on-demand services, which can be agency-operated or partnerships with private providers such as Uber, Lyft, or taxis. Trips within or between zones are subsidized.
 - Potential zones include low-density areas throughout the edges of the service area
 - This service can also provide service after regular bus service stops operating, including between midnight and 4:30 a.m.

- **Supporting Capital Facilities**

- Enhanced bus facilities at the Village, North Duke Crossing, and by MLK/Fayetteville Road to make connecting buses easier
- New park-and-rides to improve service access
- Bus stop enhancements
- Sidewalk access improvements

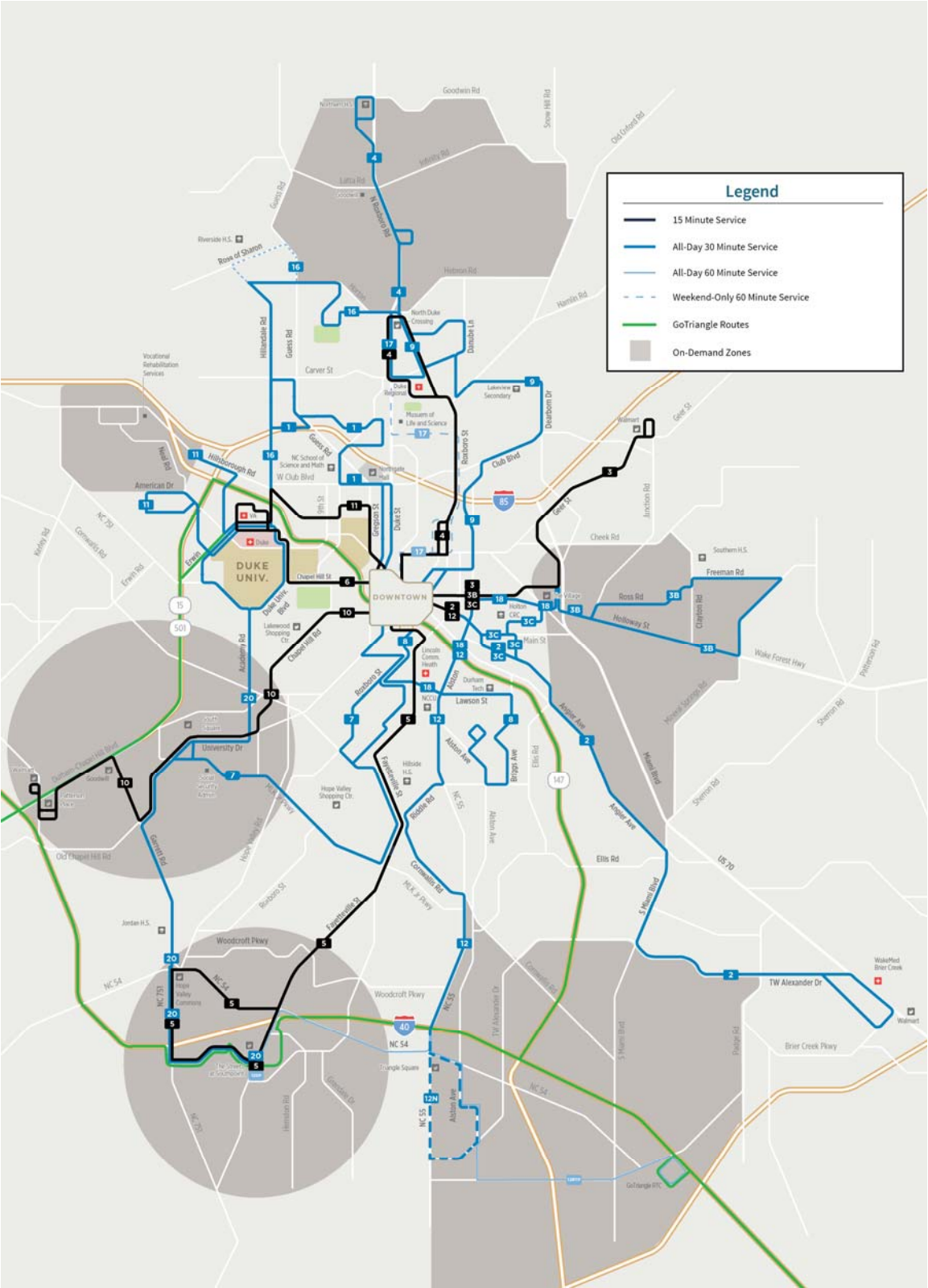
Benefits of the GoDurham expansion concepts include the following:

- 29.4 more miles of very frequent service (every 15 minute or more all day)
- 91,000 more residents and jobs within a quarter mile of very frequent service
- 146,000 more residents and jobs within a quarter mile of service that operates every 30 minutes or better

A map of the proposed expansion concepts is shown in Figure 7-1, and proposed span and frequency are available in Figure 7-2.

SHORT RANGE TRANSIT PLAN | FINAL REPORT
GoDurham

Figure 7-1 GoDurham Service Expansion Concepts



SHORT RANGE TRANSIT PLAN | FINAL REPORT
GoDurham

Figure 7-2 Expansion Concepts Proposed Span and Frequency

Route	Frequency: Preferred Alternative Proposed Weekday	Frequency: Preferred Alternative Proposed Night/Sunday	Service Span: Preferred Alternative	Frequency: Expansion Concepts Proposed Weekday	Frequency: Expansion Concepts Proposed Night/Sunday	Service Span: Expansion Concepts
1	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
2	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
3	15/30/60	30/60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15/30	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
4	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15/30	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
5	15	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
6	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
7	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
8	30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
9	30/60	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
10	15/30	60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
11	15/30	30/60	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 9:30 PM (Sun)	15/30	15/30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
12	30/60	60	5:30 AM - 12:30 AM 6:30 AM - 9:30 PM (Sun)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
16	-	-	-	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
17	-	-	-	60	60	8:00 AM - 6:00 PM (Sat) 8:00 AM - 6:00 PM (Sun)
18	-	-	-	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)
20	30	-	6:30 AM - 10:00 AM; 3:00 PM - 7:00 PM (Mon-Fri)	30	30	5:30 AM - 12:30 AM (Mon-Sat) 6:30 AM - 12:00 AM (Sun)

EXPANSION CONCEPTS ROUTE-LEVEL RECOMMENDATIONS

A description of route-level improvements identified as part of expansion concepts recommendations are provided in this section. While it is assumed that the Preferred Alternative described in Chapter 6 forms the backbone of the expansion concepts, changes from existing service are also described below for reference.

Route 1

- Route 1 currently operates with three variants (Route 1, Route 1A, and Route 1B). This arrangement is complicated and requires passengers to know three separate schedules.
- Address on-time performance and simplify this route by doing the following:
 - Shorten Route 1 to allow this route to consistently operate every 30 minutes with only one variant.
 - Route 1 would only extend as far north as W. Carver Street.
 - A new Route 16 (North Duke Street to Duke) would serve Hillandale Road north of W. Carver Street.

Route 2

- Route 2 would be simplified to operate one consistent alignment seven days a week.
- Route 2 would be extended to Briar Creek and operate on Angier Avenue, Miami Boulevard, and TW Alexander Drive—no longer operating on Page Road or US 70. The Route 2 extension would replace Route 15 and double the number of trips to Briar Creek.
- Between Durham Station and Alston Avenue, Route 2 would operate on Main Street in both directions. It would use the stops currently used by the Bull City Connector.
- Route 2's schedule would be coordinated with Route 12, which would also operate on Main Street between Durham Station and Alston Avenue. The coordinated Route 2 and Route 12 schedule would offer a bus every 15 minutes between Durham Station and Alston Avenue.
- Route 2B service would be mostly replaced by an extension of Route 3, which would connect Angier Avenue, Driver Street, and Taylor Street to The Village. Service would no longer be available on N. Miami Boulevard and Geer Street.

Route 3

- Route 3 is one of the highest ridership routes in Durham. It has three different branches, with Route 3 having very high ridership and Routes 3B and 3C having much lower ridership.
- Ridership on Route 3 is high, as is ridership to the Walmart at the route terminus. Route 3's frequency would be improved to every 15 minutes between Durham Station and Walmart seven days a week.
- What is currently Route 3B and 3C would be restructured to act as feeder service to Route 3. Both Routes 3B and 3C would operate every 30 minutes, but would not go to downtown Durham.

Route 4

- Route 4 is currently the most direct route between North Duke Crossing, Duke Regional Memorial Hospital, and Durham Station.
- Route 4's frequency between North Duke Crossing and Downtown Durham should be upgraded to every 15 minutes, seven days a week.
- Because Route 4 is the most direct connection to the remainder of the system, Route 4 would be extended to Northern High School and replace Route 9 north of North Duke Crossing. The extension from North Duke Crossing to Northern High School would operate every 30 minutes.

Route 5

- Route 5 currently includes Route 5k, which extends to MLK. Ridership is lower on Route 5k trips than Route 5.
- To improve ridership on Route 5 and to better serve the regional retail center at Southpoint, Route 5 should be modified to serve the Southpoint area on all trips. Route 5k would no longer exist. Southpoint would have service every 15 minutes, which would double service levels for approximately 240 existing riders.
- Route 5 would operate every 15 minutes seven days a week.

Route 6

- Route 6 has severe on-time performance issues, particularly during afternoon peak times.
- Route 6 would be simplified by having one consistent alignment connecting Duke, the Crest Street neighborhood and Durham Station. The route simplification would address the on-time performance issues.
- Route 6 would operate every 15 minutes seven days a week.
- A restructured Route 11 would provide service to American Village. However, service would no longer be provided to Bennett Place.

Route 7

- Route 7's current terminus is at the Hope Valley Commons Shopping Center.
- In order to improve connectivity between South Durham and employment opportunities, Route 7 should be extended to South Square via MLK Jr. Parkway.

Route 8

- No routing changes are recommended for Route 8. Evening and Sunday frequency would improve, as with all other routes.

Route 9

- Route 9 currently operates with three variants (Route 9, Route 9A, and Route 9B), which is complicated and hard for passengers to understand.
- To improve speed and reliability, all variants of Route 9 would be consolidated into one consistent alignment that ends near North Duke Crossing. Route 9 no longer directly

serve Duke Regional Hospital and it would no longer extend further north than Pacific Avenue.

- Route 4 would continue to directly serve the Duke Regional Hospital northbound stop, and Route 4 would also be extended to serve all existing Route 9 stops on the segment to Northern High School.
- A new Route 16 would serve Horton Road, Chalk Level Road, Wyldewood Road, and Riverside High School.

Route 10

- Route 10 is one of GoDurham's highest ridership routes. It includes two different variants.
- Route 10 should be consolidated into one consistent alignment that connects Durham Station and New Hope Commons with service every 15 minutes, seven days a week.
- The existing deviation to James Street would be eliminated. This will cause roughly 50 existing customers to have up to half mile longer walks, but will improve service for more than 250 passengers who are inconvenienced by the longer travel times and inconsistent schedules.
- The extended Route 7 would serve the Social Security office. Tower Drive and Picket Road both had low ridership and would be served by a new on-demand zone.

Route 11

- Route 11 has severe on-time performance issues, particularly during the afternoon peak.
- In order to improve on-time performance, Route 11 would be shortened to no longer serve Buchanan Boulevard and Green Street. Instead, Route 11 would operate to Broad Street via Main Street, serving the existing stops served by the Bull City Connector.
- Route 11's frequency would be upgraded to operate every 15 minutes between LaSalle Street and Durham Station, seven days a week. Half of Route 11's trips would continue on LaSalle Street to the existing terminus at Cole Mill Road. The remaining half of the trips would continue on the existing Route 6 alignment to American Village. Route 11 would not deviate into the apartments off Morreene Road.
- Currently, Route 11 provides additional night and weekend-only service on an extension west of Cole Mill Road. Route 11 should no longer extend west of Cole Mill Road. An on-demand zone will assist passengers in this area.

Route 12

- Currently, Route 12 uses NC 147 to connect Alston Avenue and Durham Station. To attract more riders, provide a better connection from eastern Durham to both RTP and Southpoint, and provide a better connection to NCCU, Route 12 should utilize E. Main Street to travel between Durham Station and Alston Avenue. The alignment would be identical to Route 2.
- Route 12 would be scheduled to arrive and leave Durham Station 15 minutes before or after Route 2, giving E. Main Street service every 15 minutes between Durham Station and Alston Avenue.

- Route 12 has two different variants, one of which serves NC 55 and the other serves Riddle Road and Cornwallis Road. All Route 12 trips would serve Riddle Road and Cornwallis Road.
- Route 12 should continue to have two different variants. Half the trips would continue to the RTP Regional Transit Center via Alston Avenue and Hopson Road, while the remaining trips would continue to Southpoint via NC 54, Fayetteville Road, and Renaissance Parkway. This Route 12 extension will replace Route 14.
- Route 12's Regional Transit Center extension would allow East Durham residents direct service to Research Triangle Park.
- On Sundays and on evenings, Route 12 should operate a truncated alignment that extends to the Falls Pointe apartments.

Route 14

- Currently, Route 14 operates hourly service between Triangle Square, Southpoint Mall, and Woodcroft shopping center. Route 14 would be replaced by an extended Route 12 and GoTriangle's on-demand service in the Research Triangle Park. Route 12 would continue to serve the Fayetteville Street, NC 54, NC 751, and Renaissance Parkway.
- Woodcroft Parkway would no longer be served by Route 14. Instead, this area would be served by an on-demand zone.

Route 15

- Route 15 would be consolidated with an extension of Route 2. All current stops, with the exception of those on Ellis Road, would continue to have service.
- An extended Route 2 would have 30 minute service on Miami Boulevard and TW Alexander Drive, improving service levels for approximately 150 existing riders.

Route 16

- One of the findings of the travel demand analysis and public outreach was that more direct service was warranted/desired to connect residents to job opportunities. A more direct trip to the Duke University area from North Durham was an identified opportunity. A new Route 16 would connect North Duke Crossing with direct service to Duke via Hillandale Road.
- Route 16 would provide a direct, all-day connection between North Durham and Duke, with 30-minute, seven day a week service.
- Route 16 would replace portions of the existing Route 9 and Route 1.

Route 17

- During the outreach process, service to the Museum of Life and Science was repeatedly mentioned. A new Route 17, which would operate weekends only, is recommended.
- Route 17's alignment would mostly follow Route 4's alignment between downtown Durham and Roxboro Road. Route 17 would then serve Murray Avenue and the Museum before continuing further north to Carver Street.
- Route 17 would operate hourly on Saturdays and Sundays when the museum is open.

Route 18

- Both the outreach process and an examination of travel patterns showed demand for better connections between East Durham and NCCU. A new Route 18 is recommended to serve this market by connecting The Village with NCCU.
- Route 18's alignment would start at the Village, continue on Holloway Street, Alston Avenue, Larson Street, and end near Fayetteville Street.
- Route 18 would operate every 30 minutes seven days a week.

Route 20

- Route 20 is currently designed to provide job access to Duke University. A few passengers use the service in the reverse direction to Jordan High School.
- Route 20 should be extended to Southpoint to provide a destination on both route ends. The extension should use NC 751 and Renaissance Parkway to provide a direct connection.
- Route 20 currently only operates during weekday peak times. Route 20 should be upgraded to operate seven days a week.

Route 23

- Route 23 would be consolidated into a restructured Route 3B.

Bull City Connector (BCC)

- Due to low ridership, the BCC route would be deleted and its resources reallocated to upgrade local service in the same corridor. The BCC resources are also used to address chronic on-time performance issues for Routes 6 and 11.
- East Main Street will be served by 15-minute service all day between Durham Station and Alston Avenue on Routes 2 and 12 and service between Durham Station and Duke/VA Hospital would be every 15-minutes all day on Route 11. Route 6 would also operate every 15 minutes between Duke and Durham Station.
- Anyone traveling on the E. Main Street segment, or to/from Duke will have access to more connections at Durham Station, and more frequent service.

On-Demand Zones

Much of the residential growth in Durham is happening at the city's fringes, where roadway, sidewalk, and other transit supportive infrastructure may not be available. Suburban development is also much more difficult to serve with traditional transit that utilizes 40-foot buses. There is a need to serve these growing fringe areas, especially as lower-income housing is being pushed further way from the urban core. On-Demand Zones are a way for GoDurham to provide service to these lower-density areas.

On-Demand Zones are defined areas where a smaller vehicle would provide service "on demand", usually through a phone-based app. This could be through a partnership with Uber or Lyft, but it could also be through agency operated vehicles. Regardless of who operates the service, provisions must be made for potential passengers that do not have a smart phone or a bank account, as well as for disabled passengers.

The intent of the on-demand pilot zone is to provide first/last mile services in areas that have a high need, but are difficult to serve with fixed-route bus service due to a limited roadway network and overall lower residential/employment densities.

Any trip beginning and ending in the service zone will be subsidized by GoDurham. No subsidy should be given for trips going outside the service zone.

Five different geographic areas have been identified for initial implementation, including:

- East Durham
- South Square area
- Southpoint area
- North Durham
- West Durham

In addition, on-demand service can also operate after regular bus service stops, including between midnight and 4:30 a.m.

Appendix A

Ridership Maps

Figure 1 GoDurham System Ridership, Average Weekday Boardings by Stop

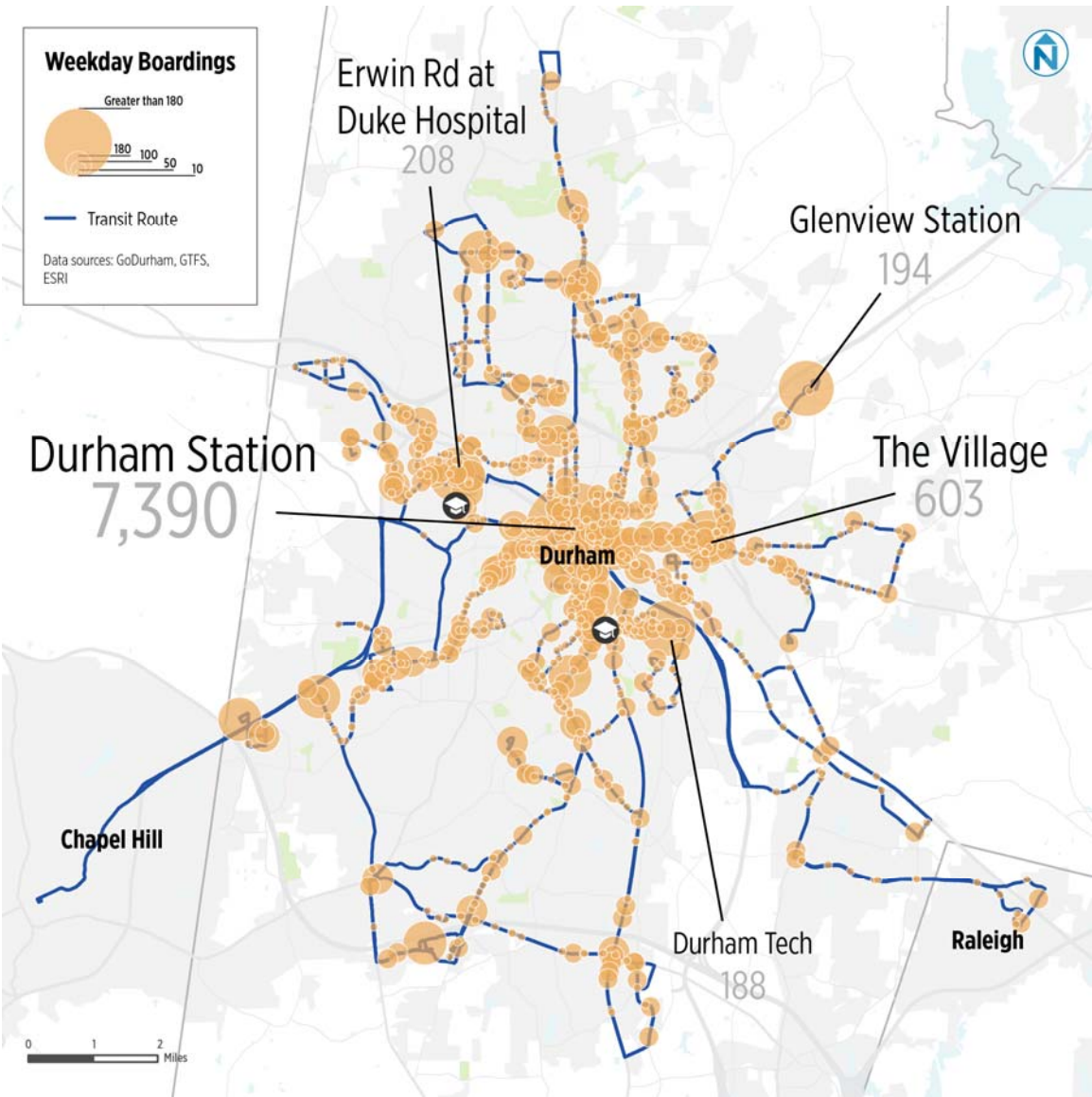


Figure 2 Average Daily Weekday Ridership, Route 1/1A/1B (Combined), Inbound

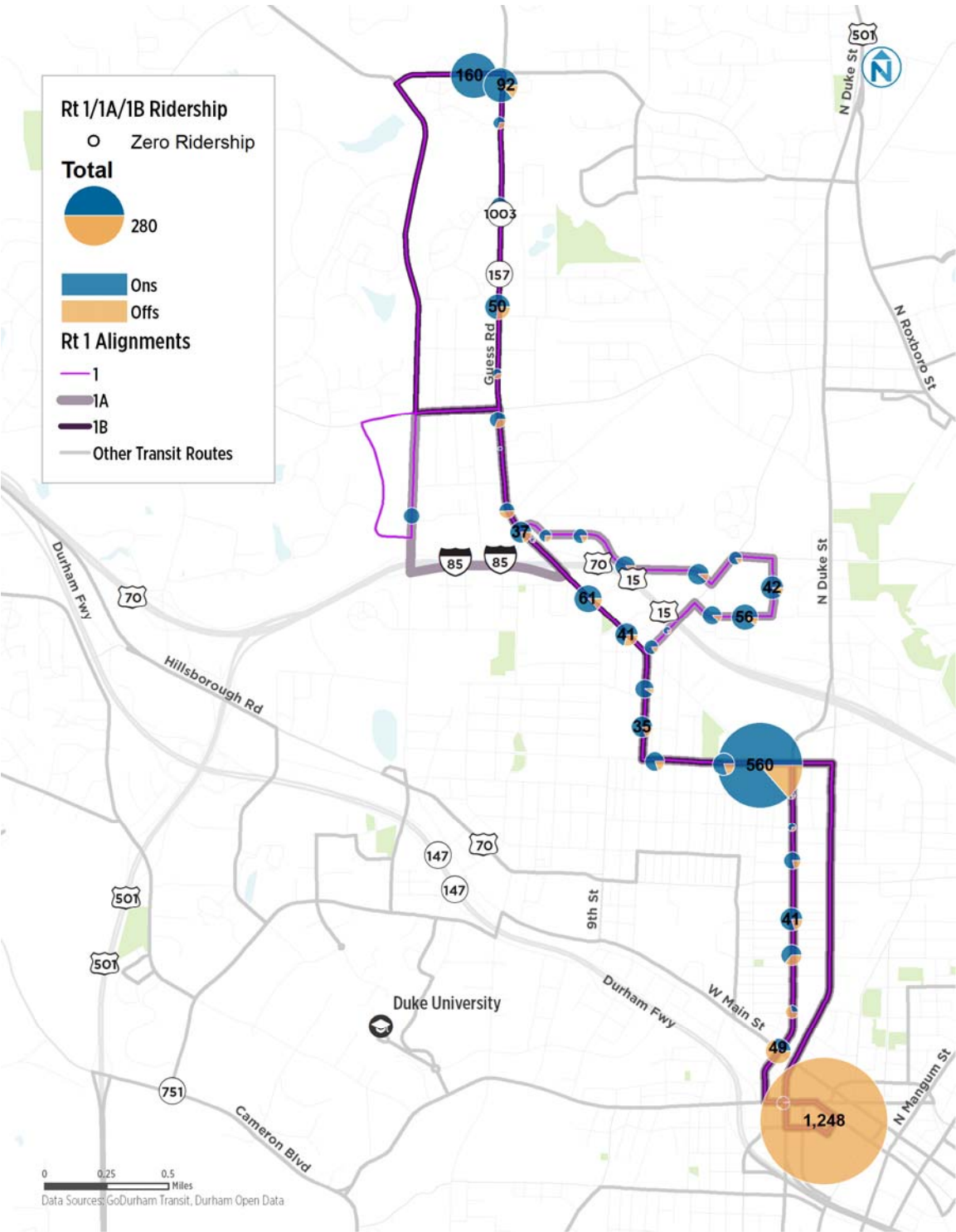


Figure 3 Average Daily Weekday Ridership, Route 1/1A/1B (Combined), Outbound

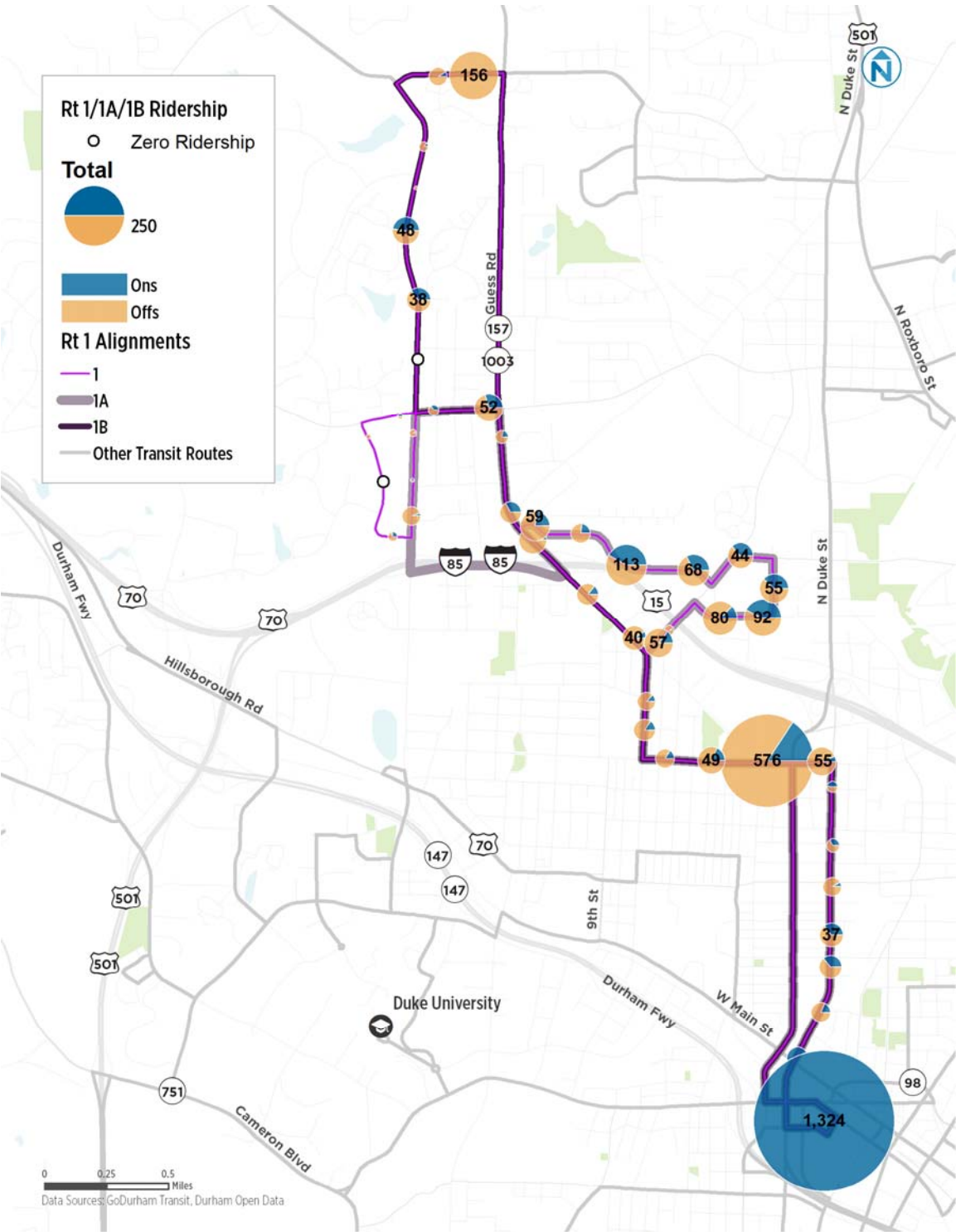


Figure 4 Average Daily Weekday Ridership, Route 2/2A/2B (Combined), Inbound

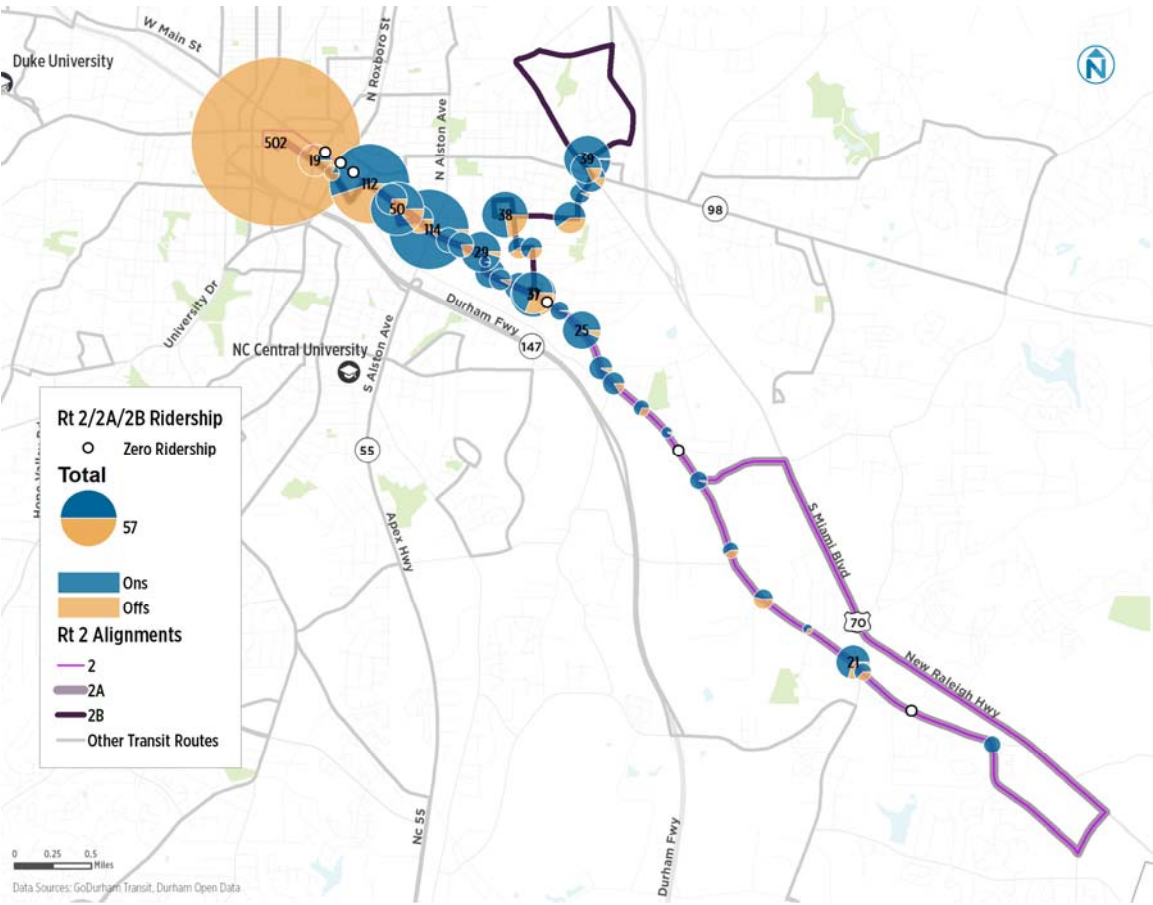


Figure 5 Average Daily Weekday Ridership, Route 2/2A/2B (Combined), Outbound

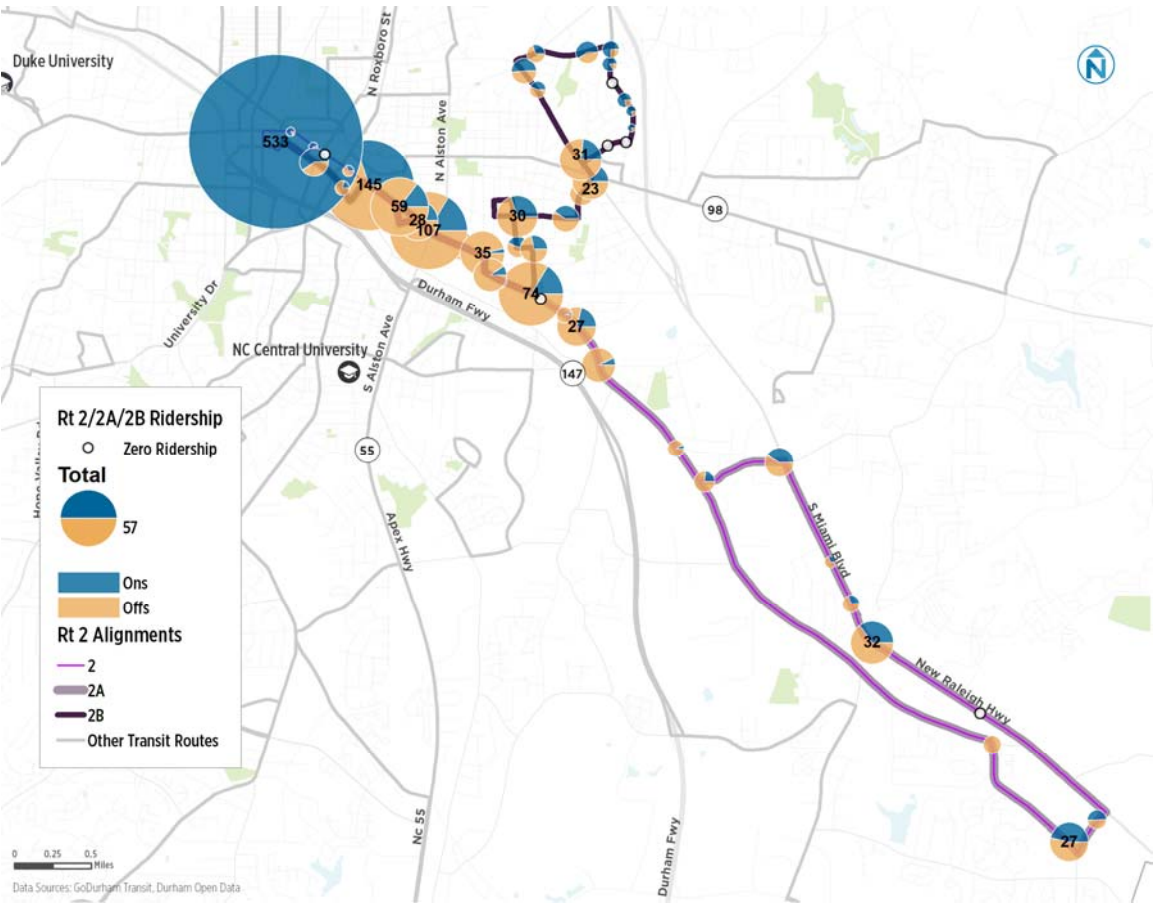


Figure 6 Average Daily Weekday Ridership, Route 3/3B/3C (Combined), Inbound

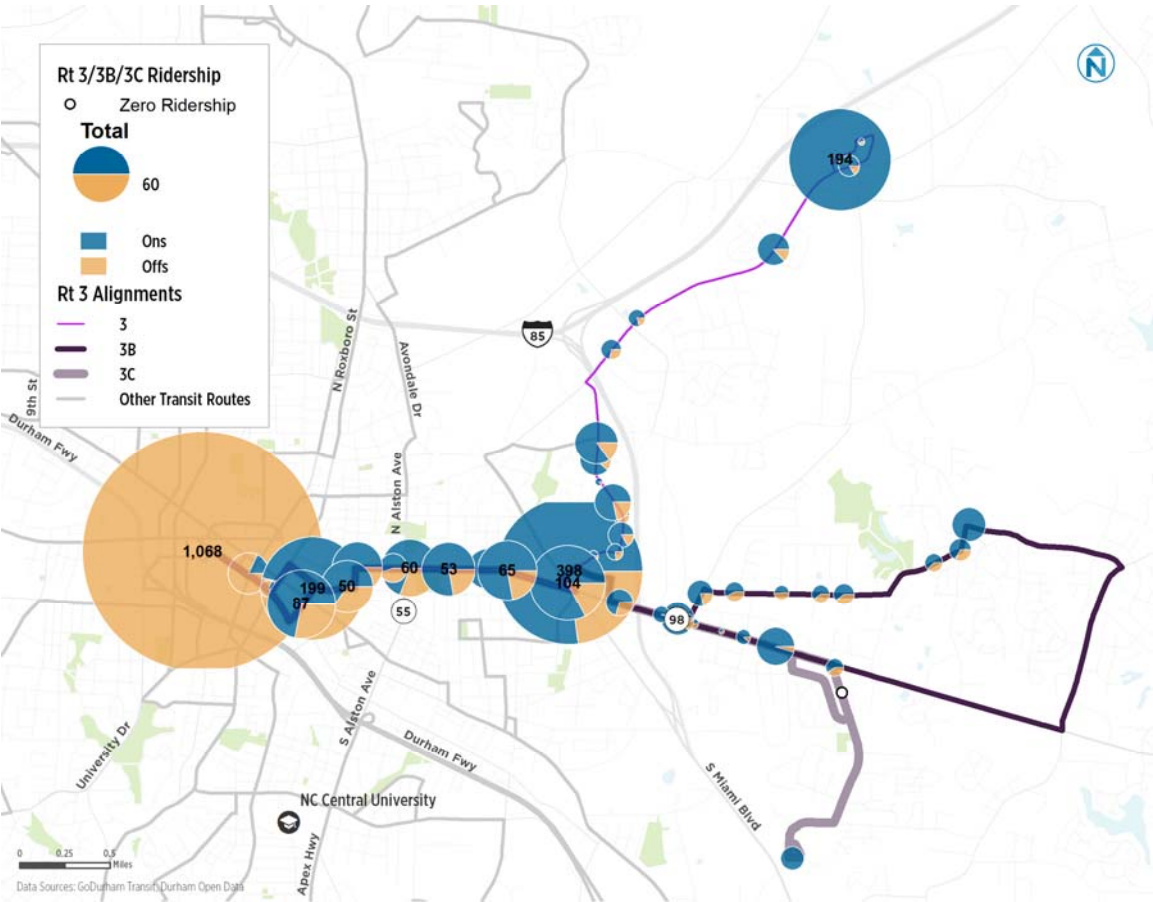


Figure 7 Average Daily Weekday Ridership, Route 3/3B/3C (Combined), Outbound

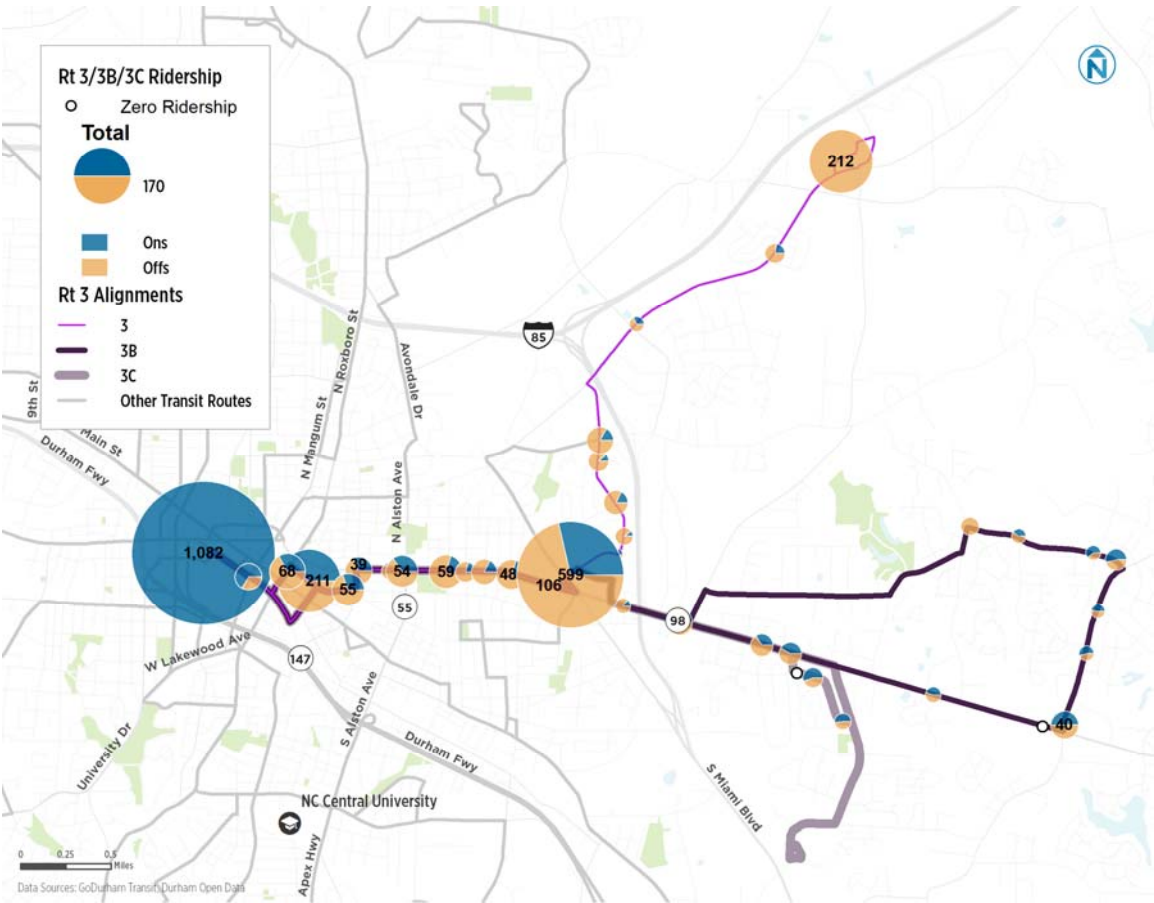


Figure 8 Average Daily Weekday Ridership, Route 4, Inbound



Figure 9 Average Daily Weekday Ridership, Route 4, Outbound



Figure 10 Average Daily Weekday Ridership, Route 5/5K (Combined), Inbound

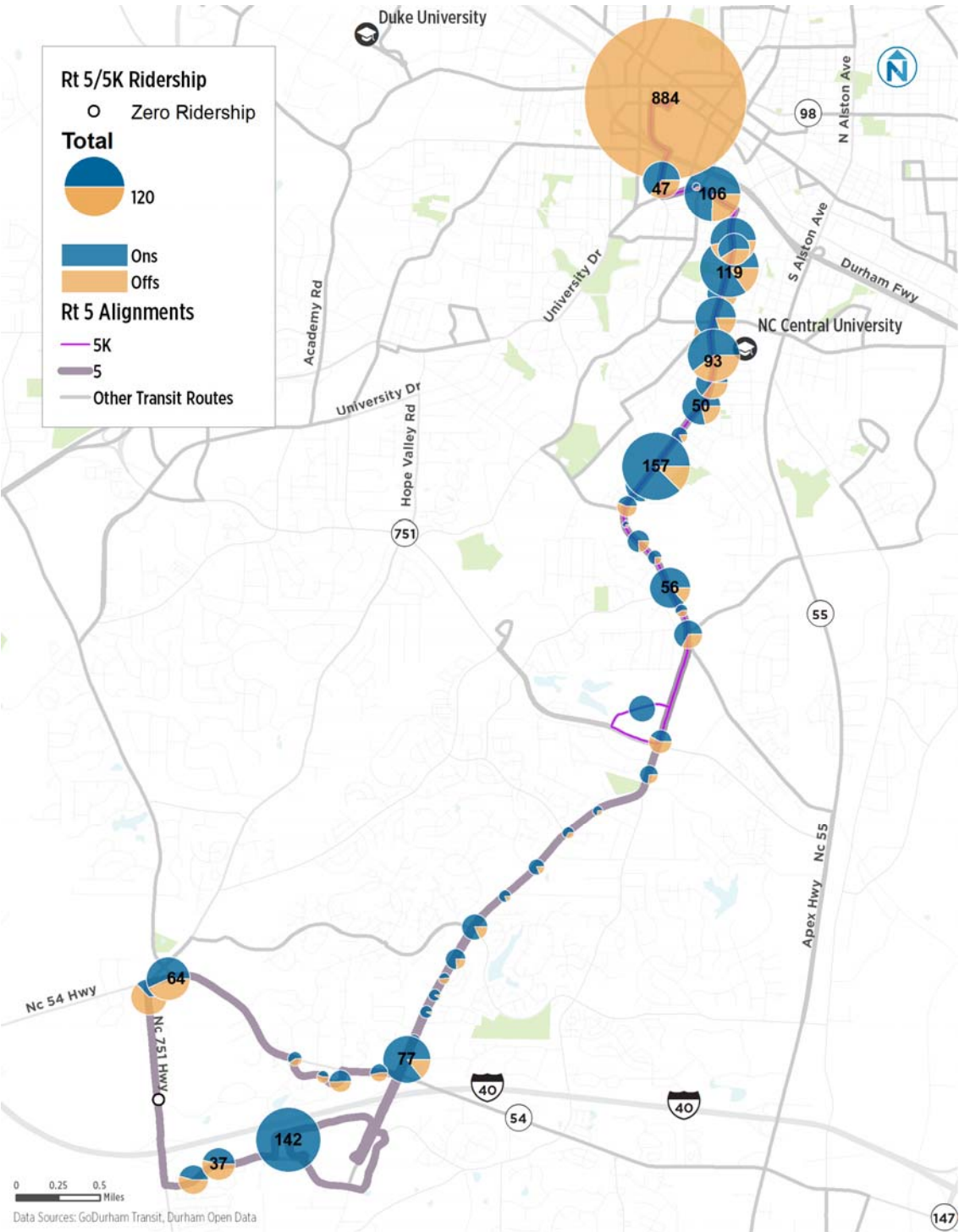


Figure 11 Average Daily Weekday Ridership, Route 5/5K (Combined), Outbound

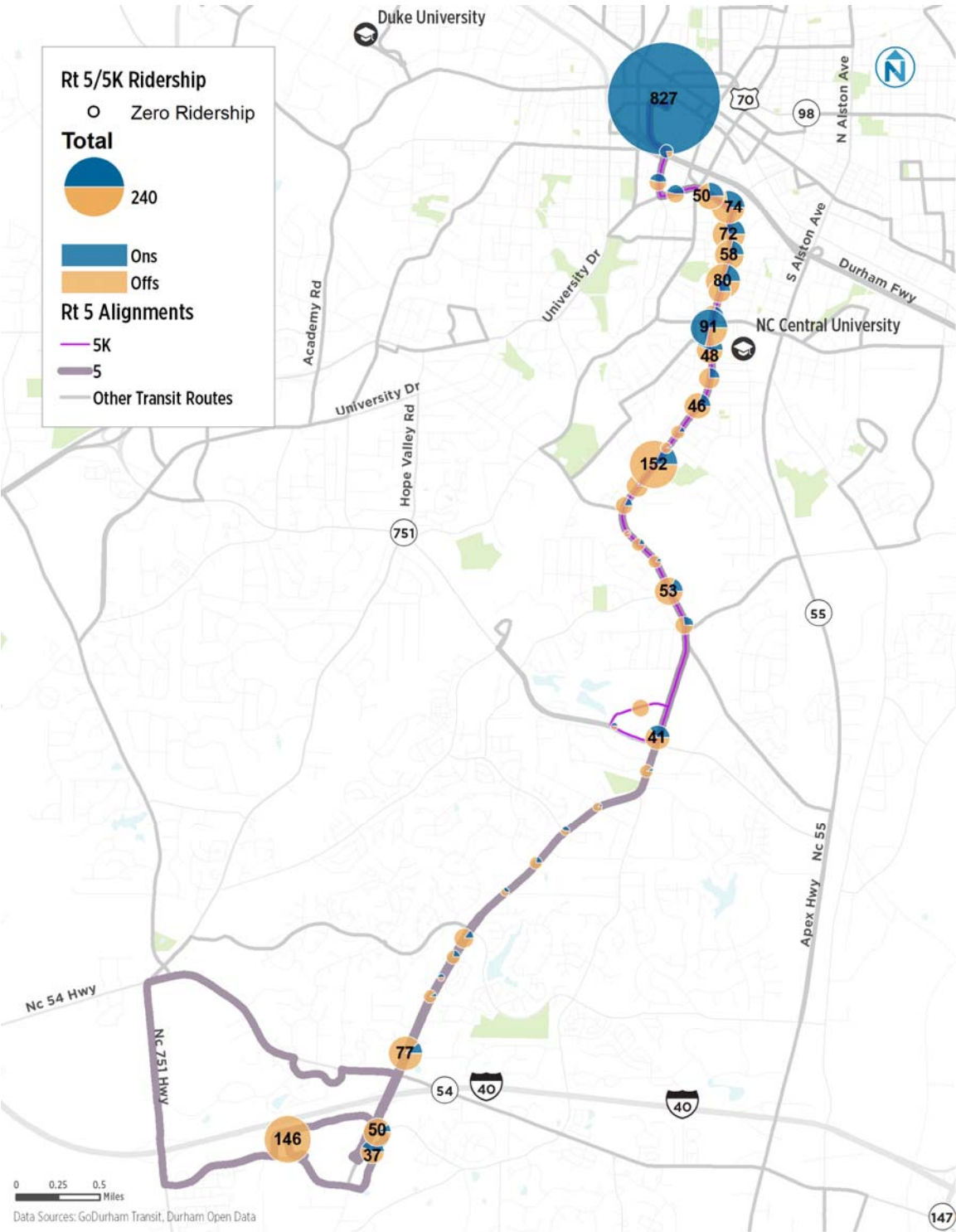


Figure 12 Average Daily Weekday Ridership, Route 6/6B (Combined), Inbound

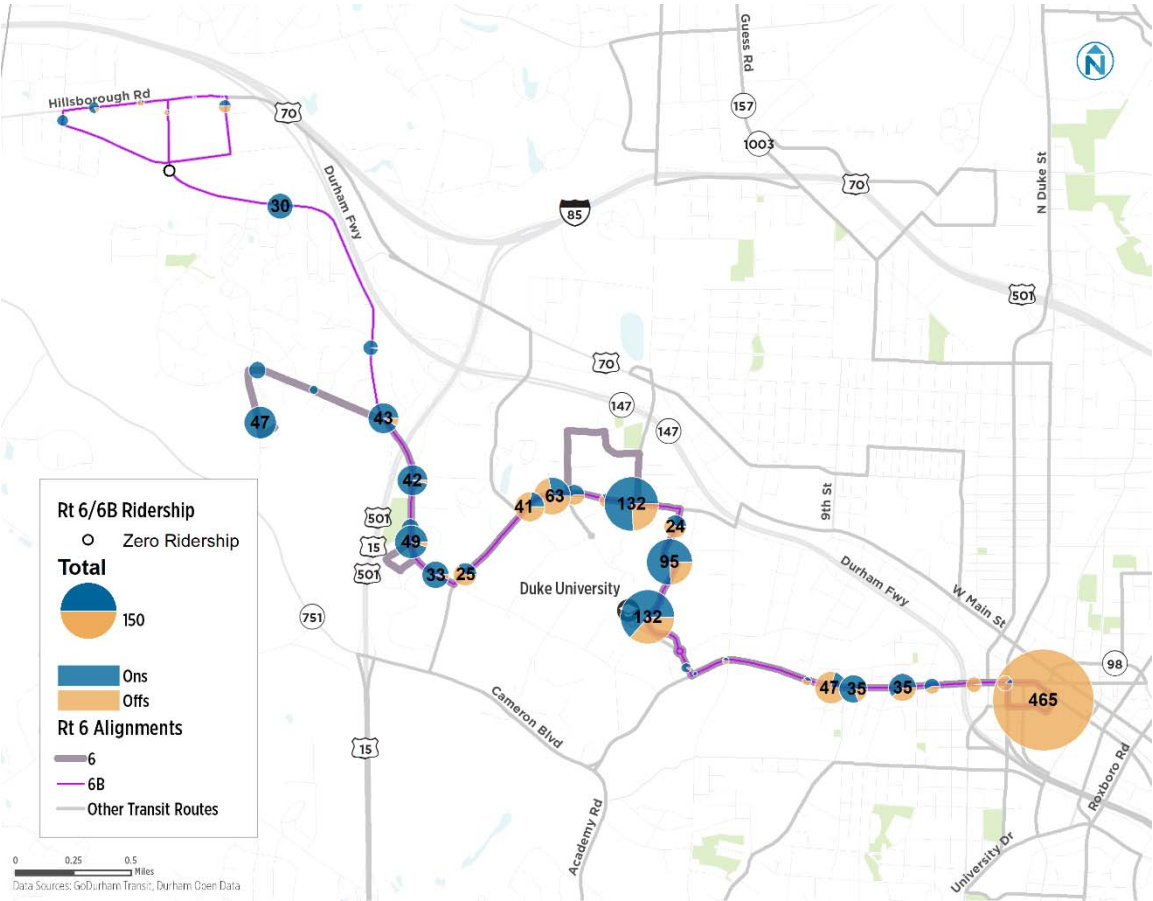


Figure 13 Average Daily Weekday Ridership, Route 6/6B (Combined), Outbound

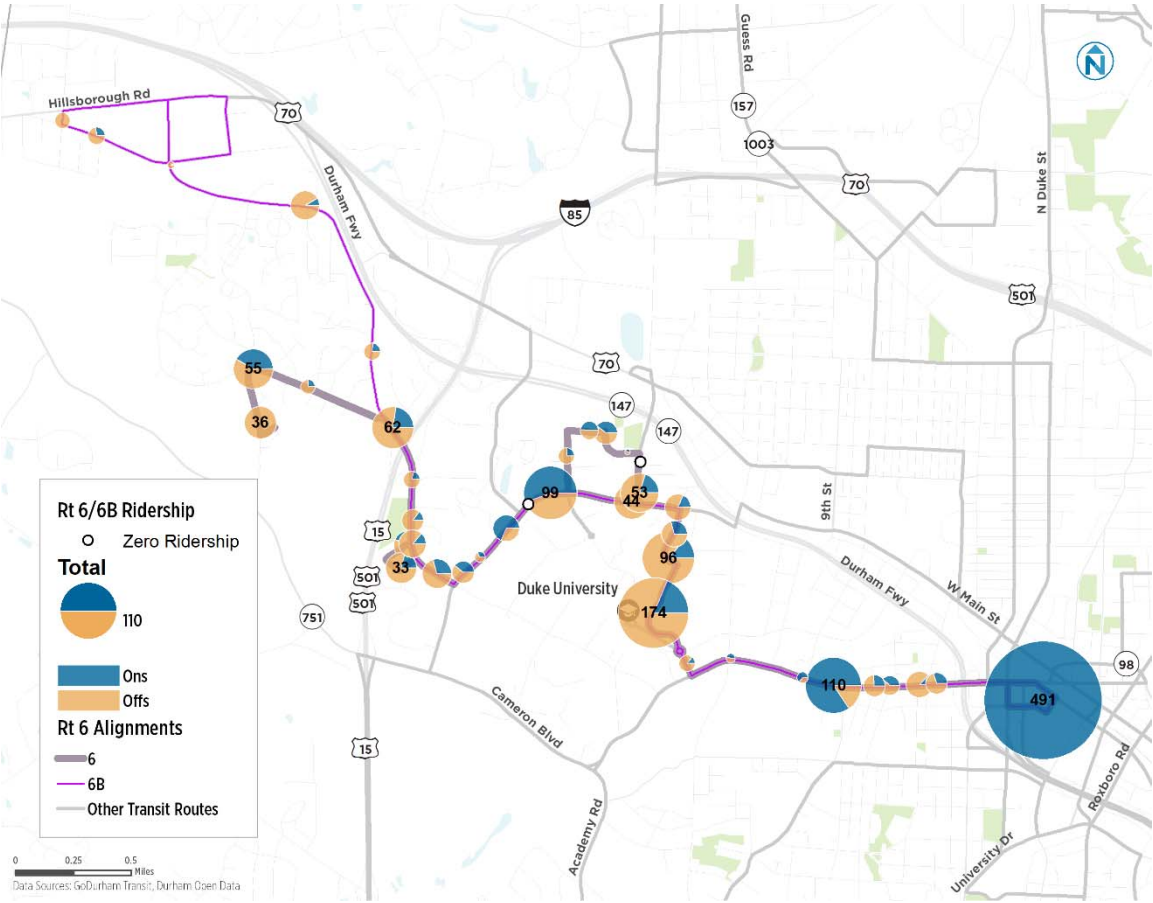


Figure 14 Average Daily Weekday Ridership, Route 7, Inbound

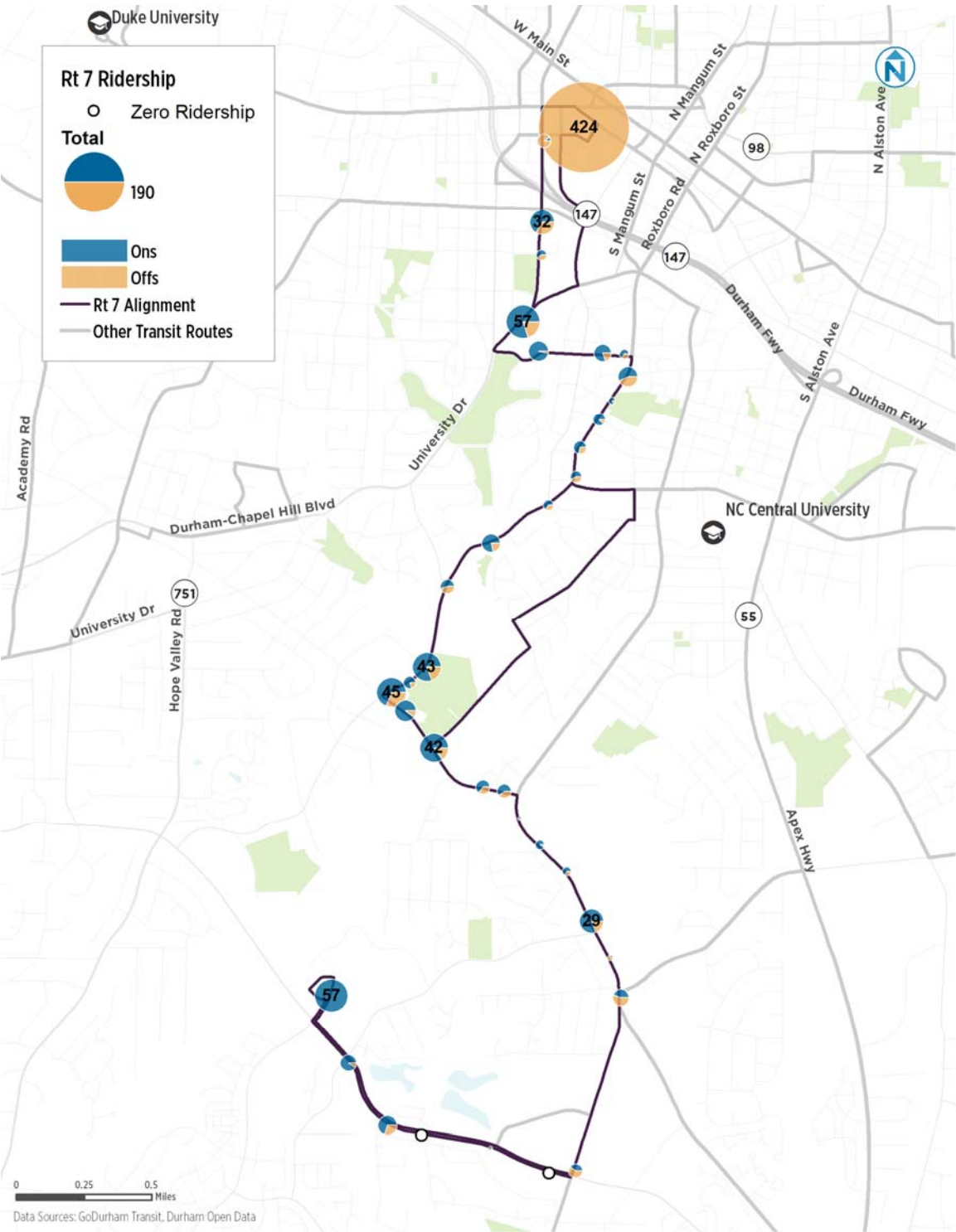


Figure 15 Average Daily Weekday Ridership, Route 7, Outbound

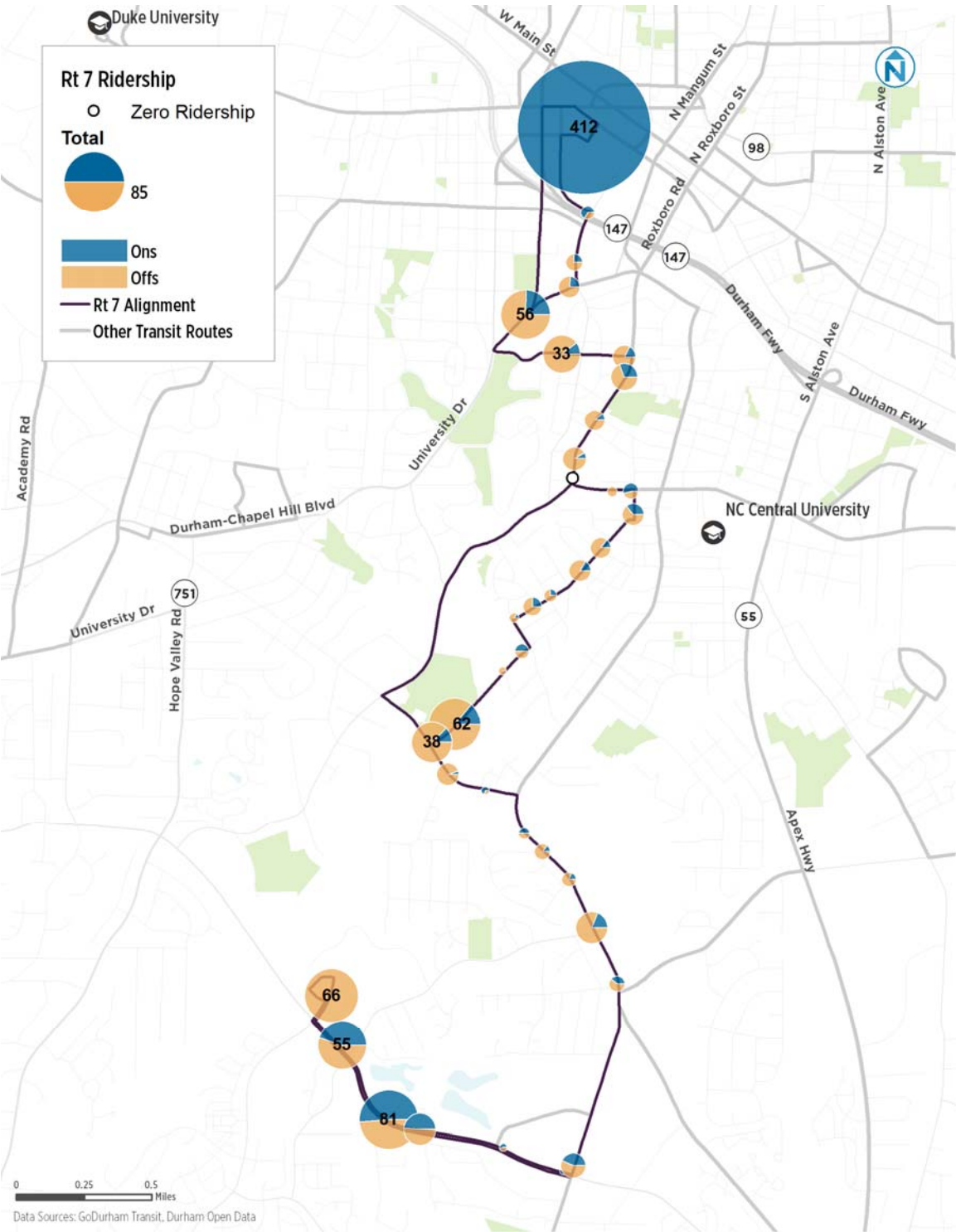


Figure 16 Average Daily Weekday Ridership, Route 8, Inbound

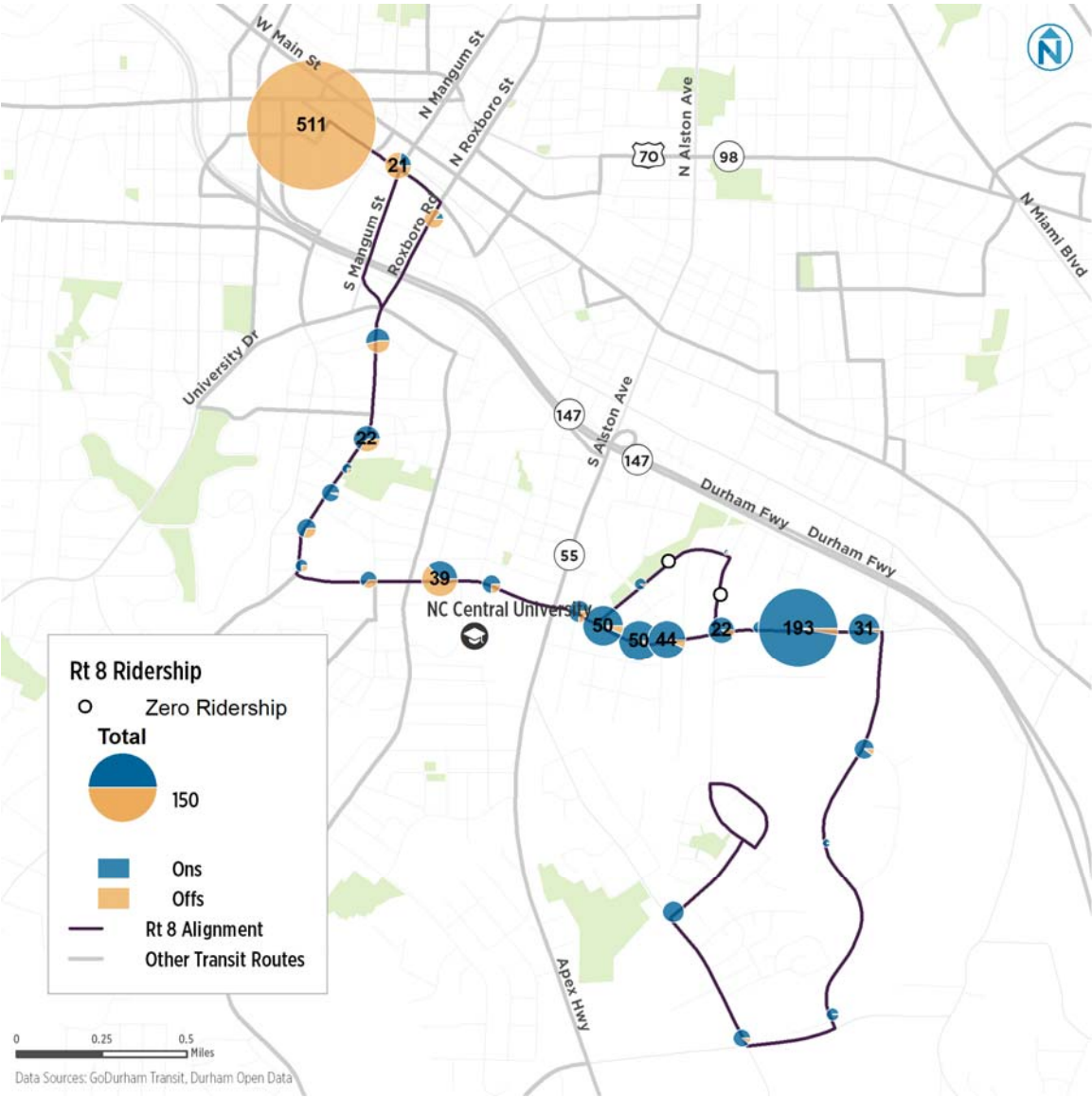


Figure 17 Average Daily Weekday Ridership, Route 8, Outbound

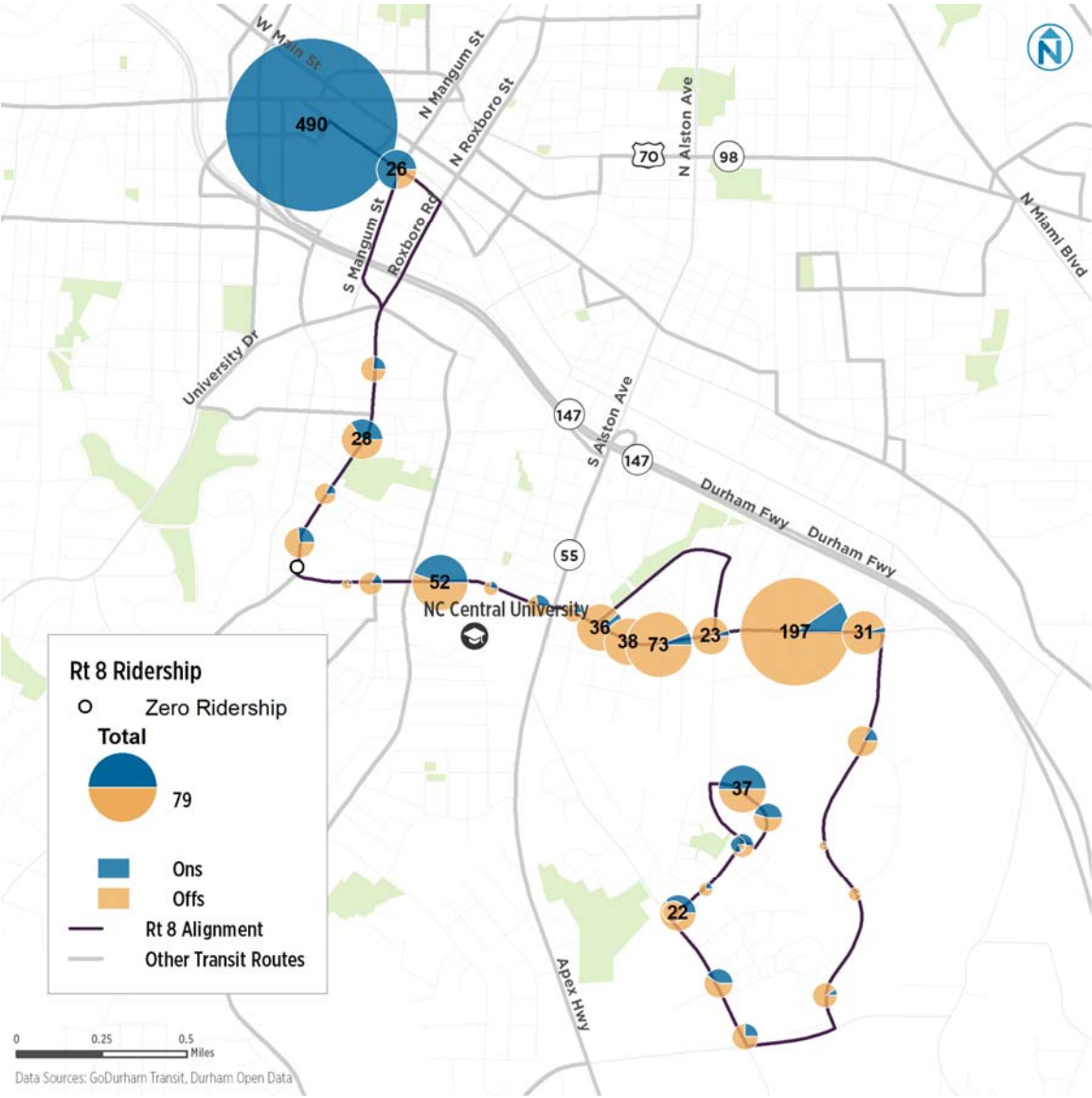


Figure 18 Average Daily Weekday Ridership, Route 9/9A/9B (Combined), Inbound

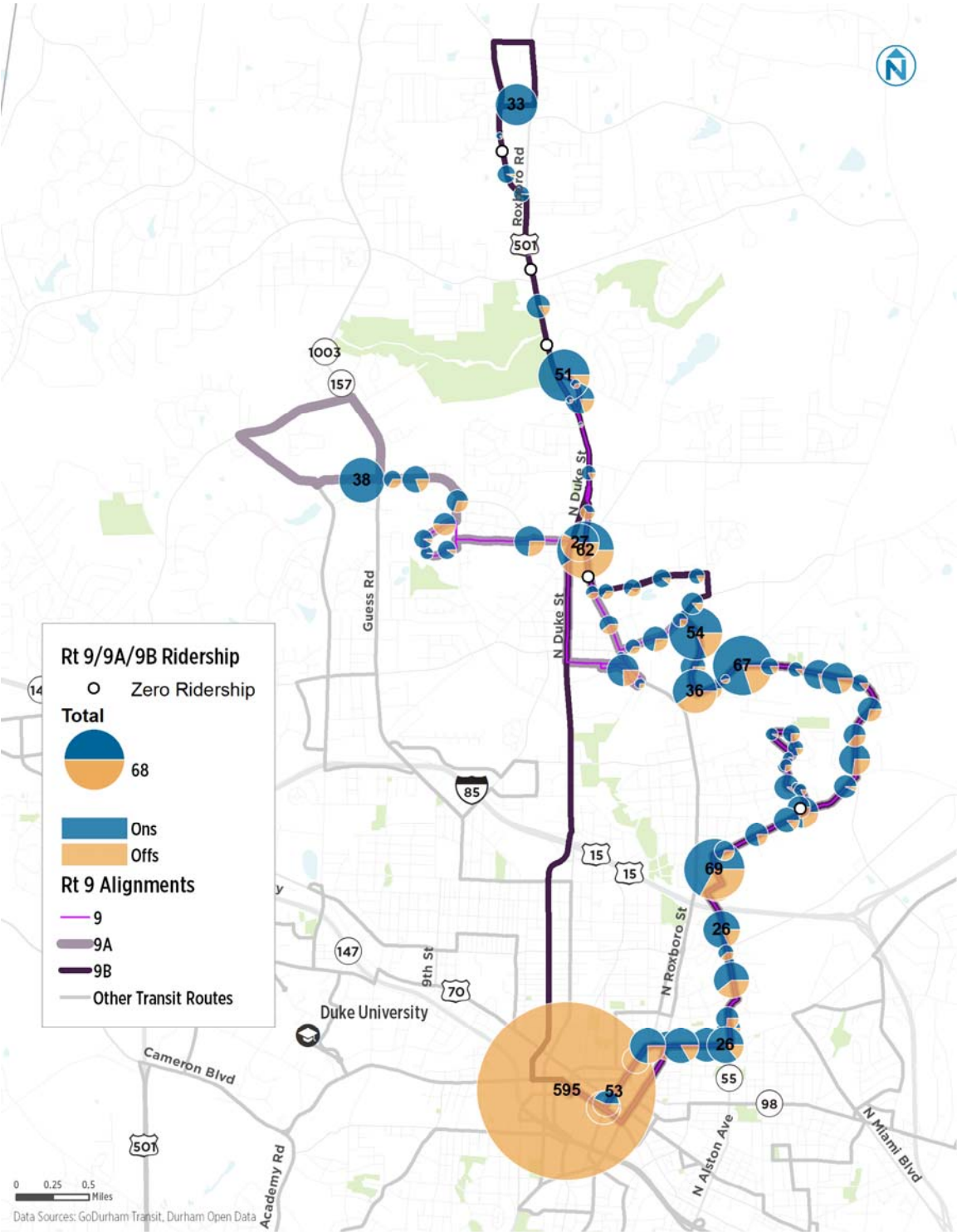


Figure 19 **Average Daily Weekday Ridership, Route 9/9A/9B (Combined), Outbound**

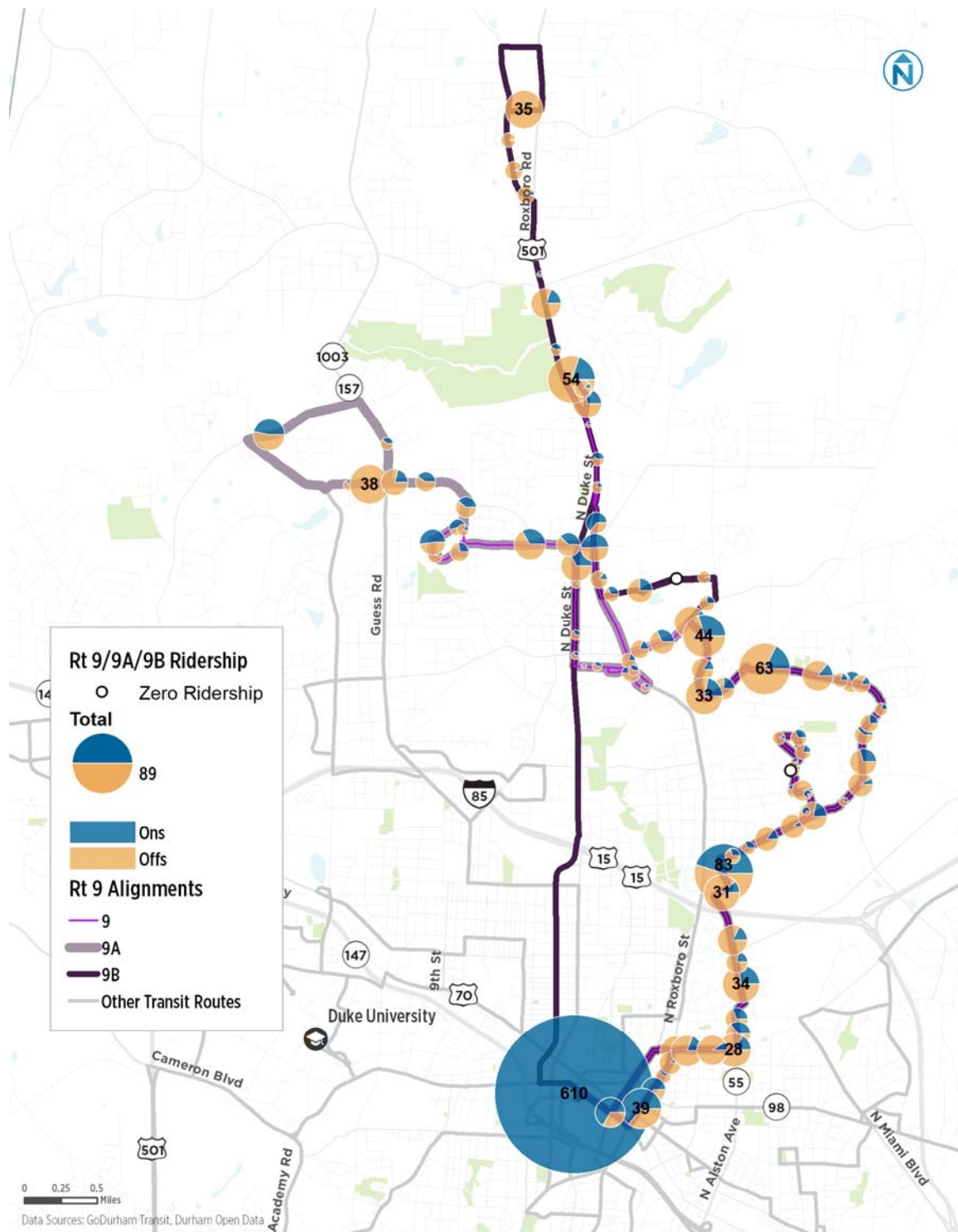


Figure 20 Average Daily Weekday Ridership, Route 10/10A/10B (Combined), Inbound

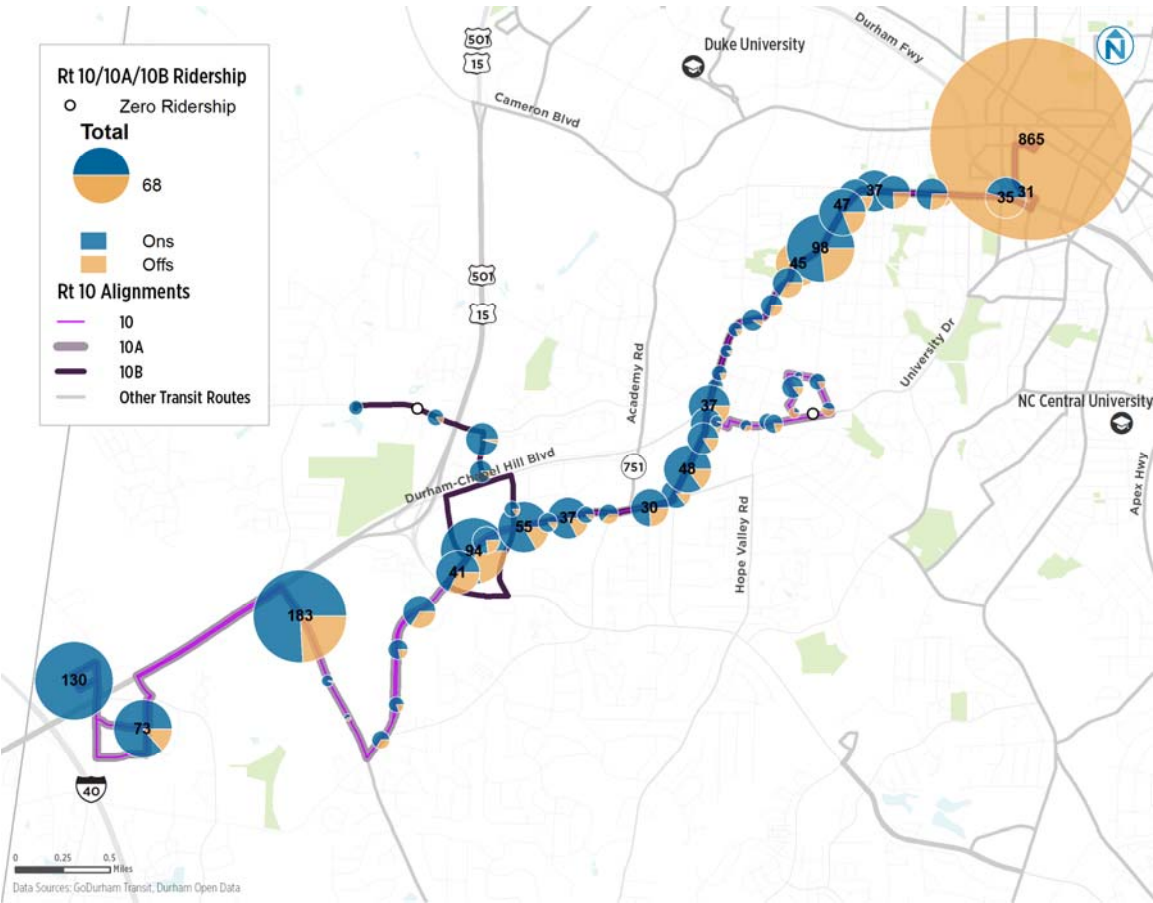


Figure 21 Average Daily Weekday Ridership, Route 10/10A/10B (Combined), Outbound

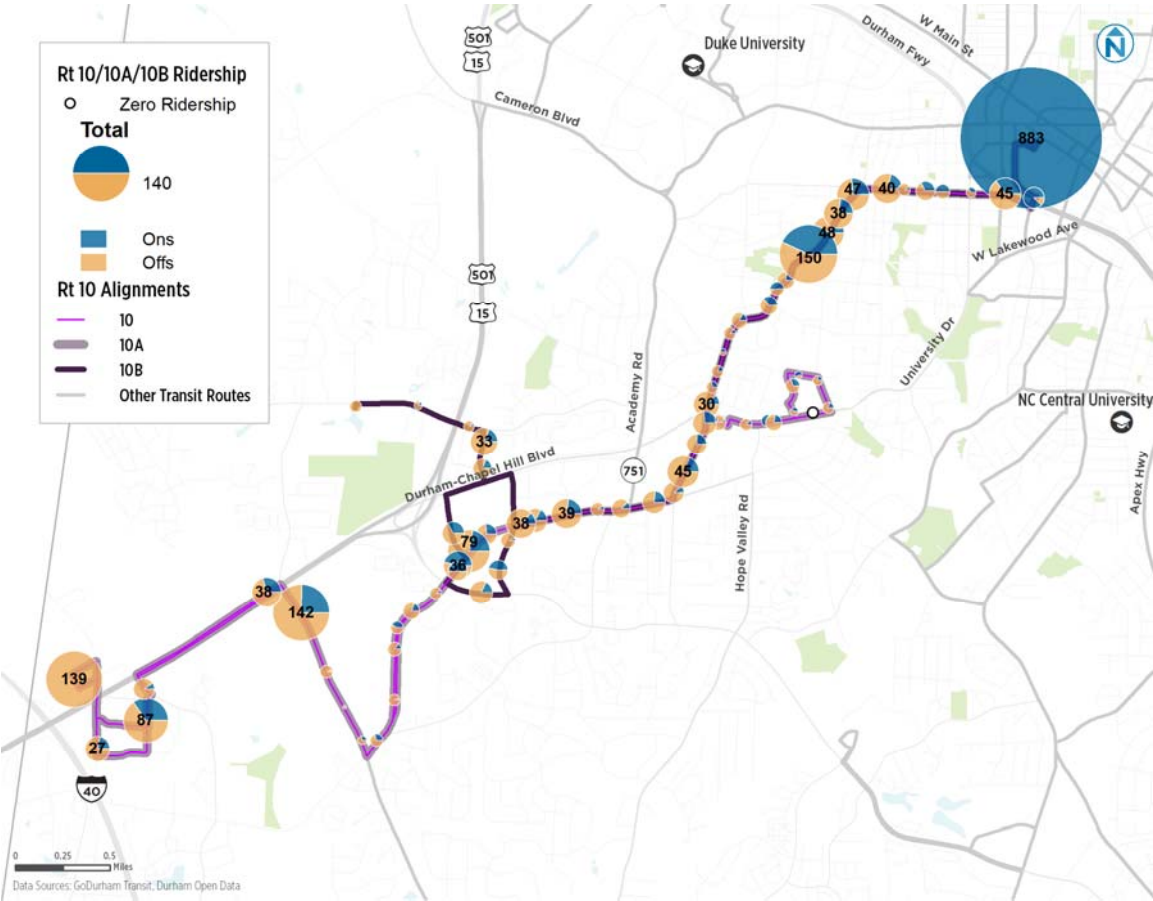


Figure 22 Average Daily Weekday Ridership, Route 11, Inbound

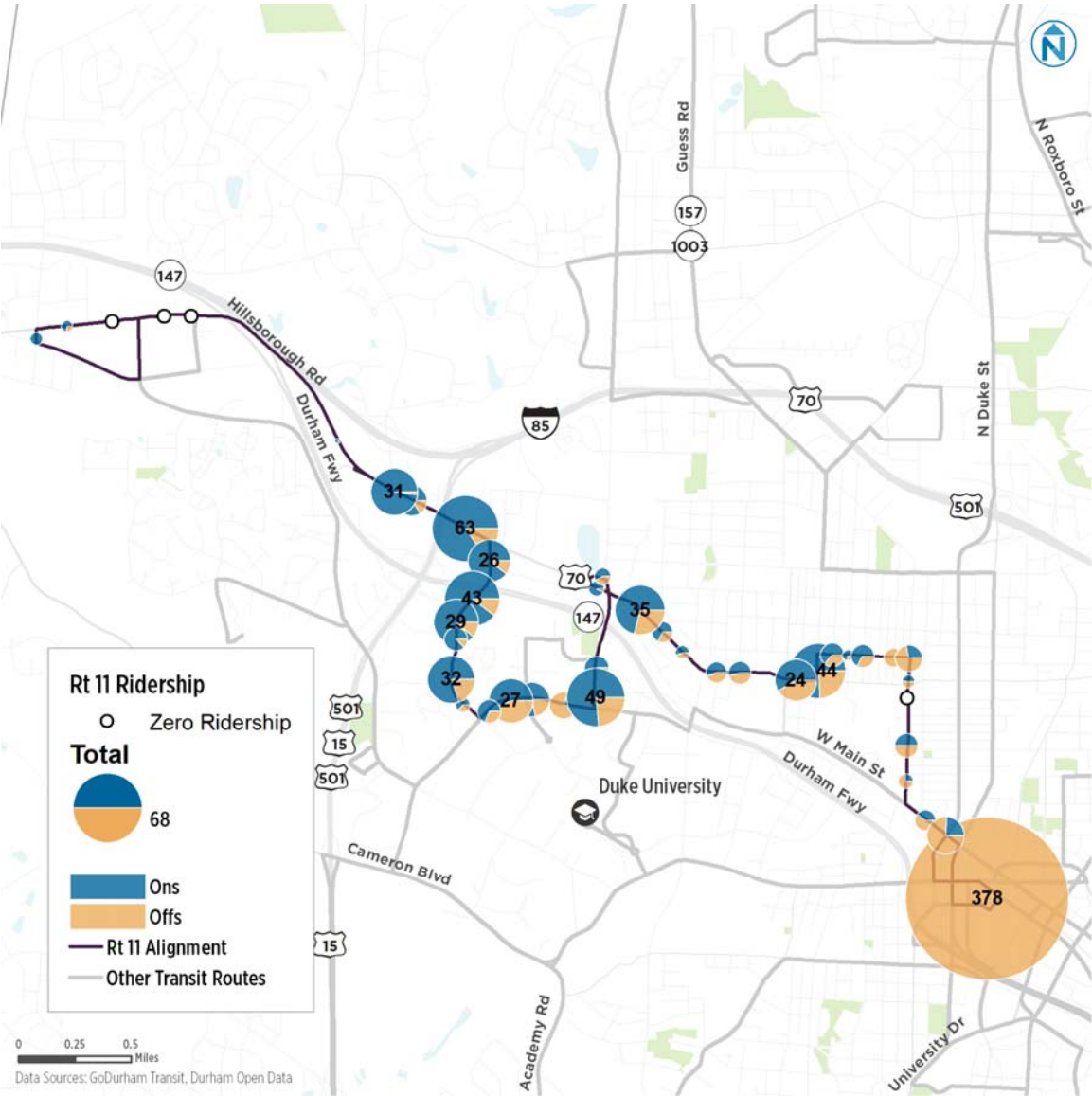


Figure 23 Average Daily Weekday Ridership, Route 11, Outbound

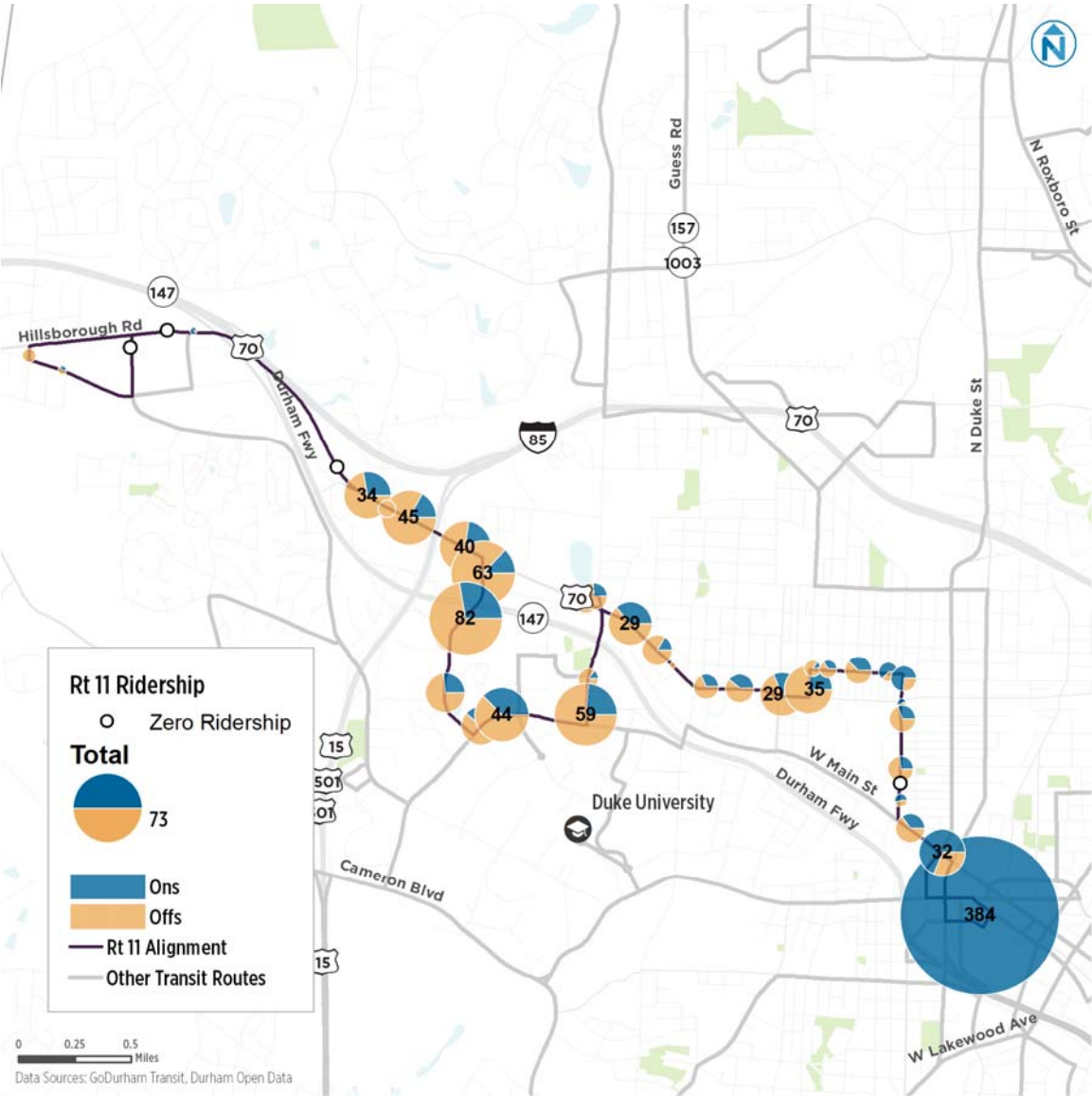


Figure 24 Average Daily Weekday Ridership, Route 12/12B (Combined), Inbound

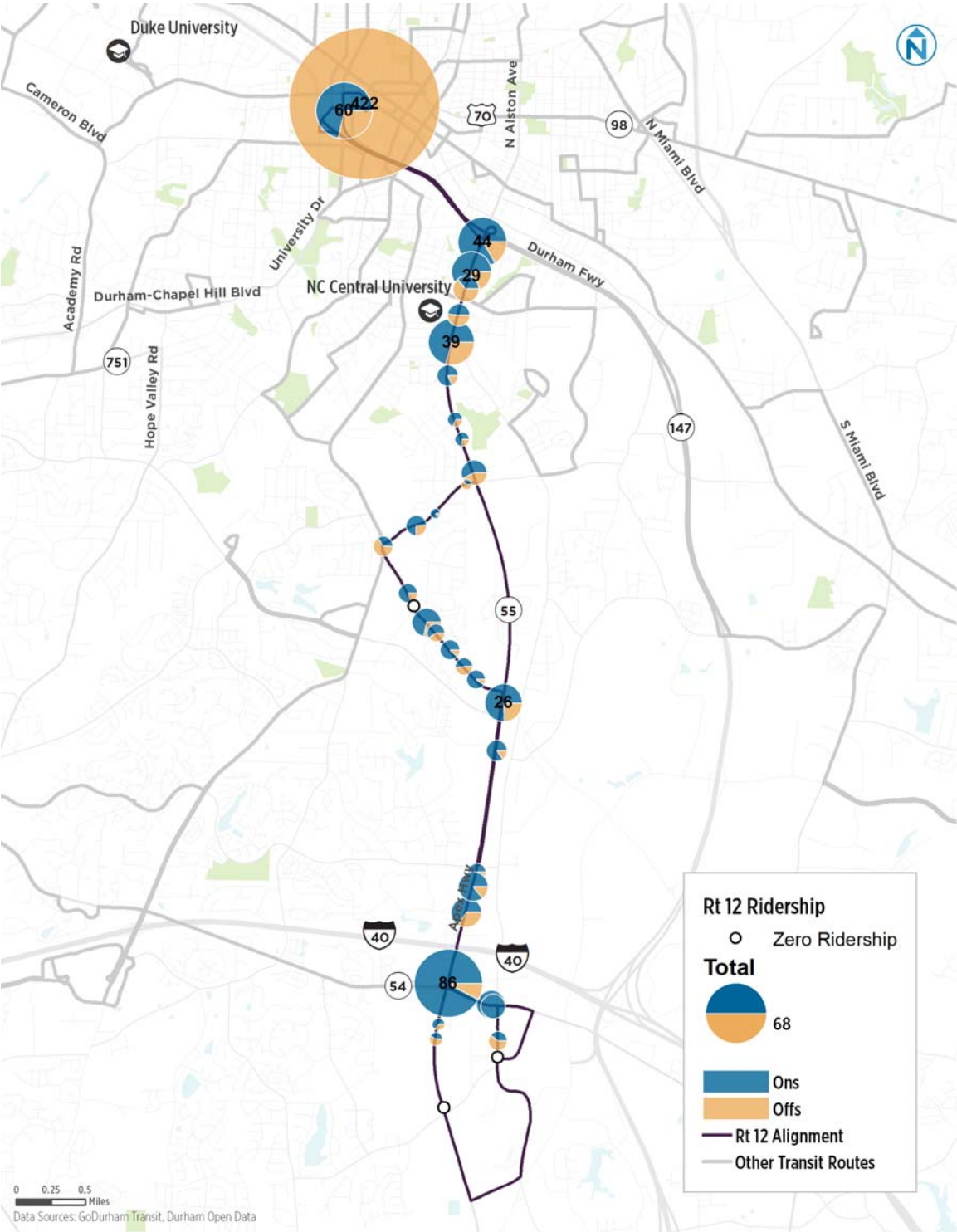


Figure 25 Average Daily Weekday Ridership, Route 12/12B (Combined), Outbound

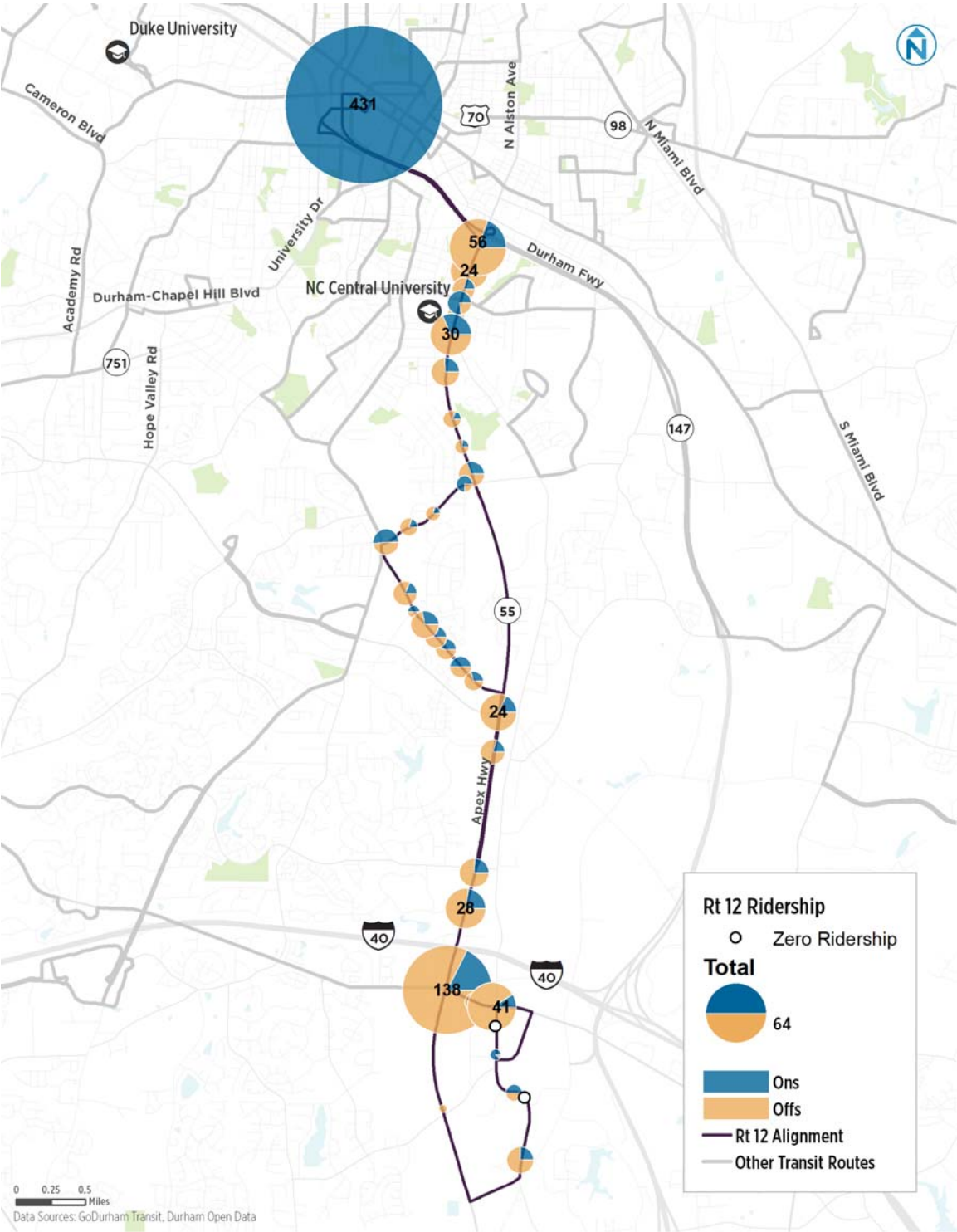


Figure 26 Average Daily Weekday Ridership, Route 14, Inbound

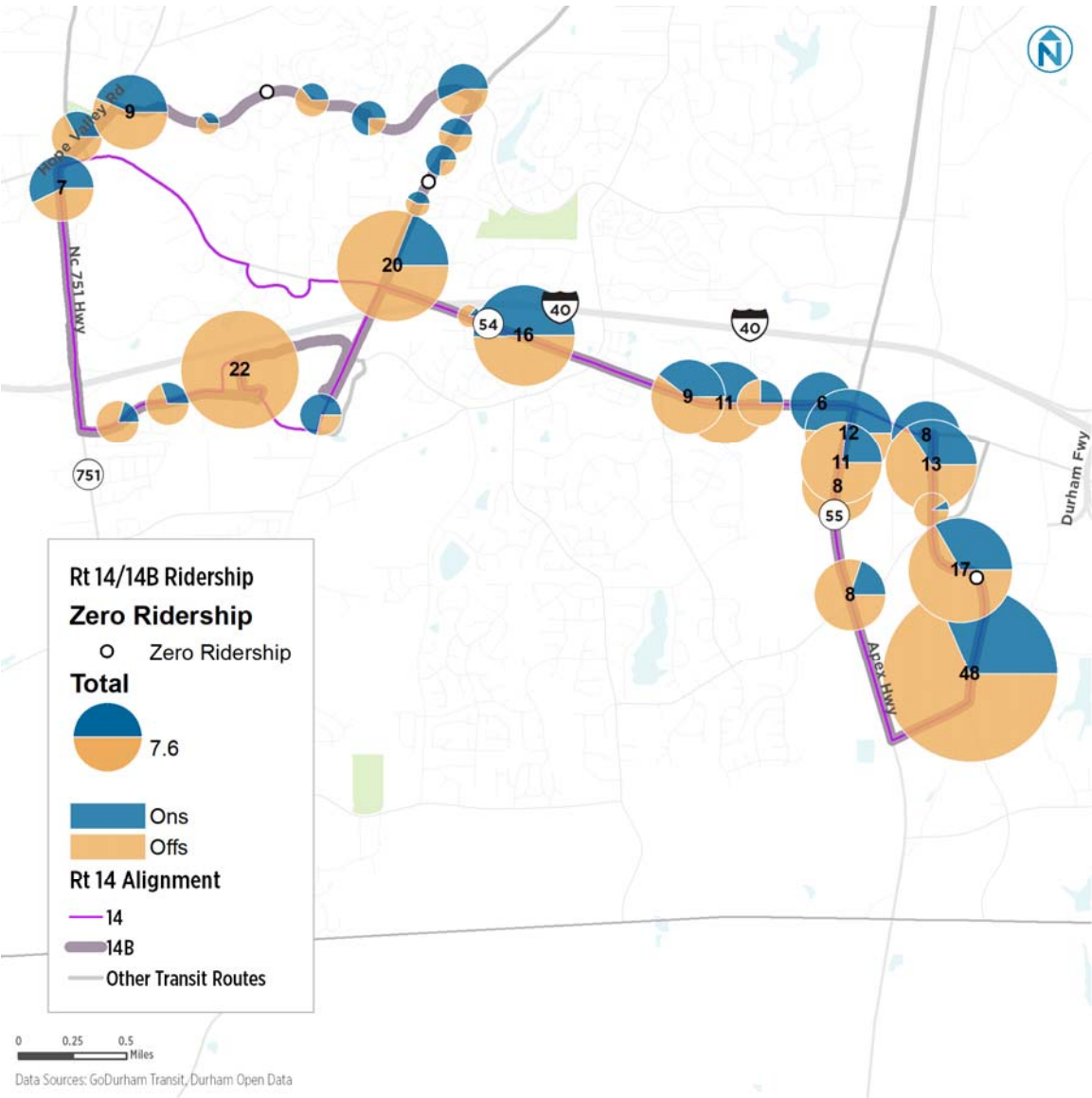


Figure 27 Average Daily Weekday Ridership, Route 14, Outbound

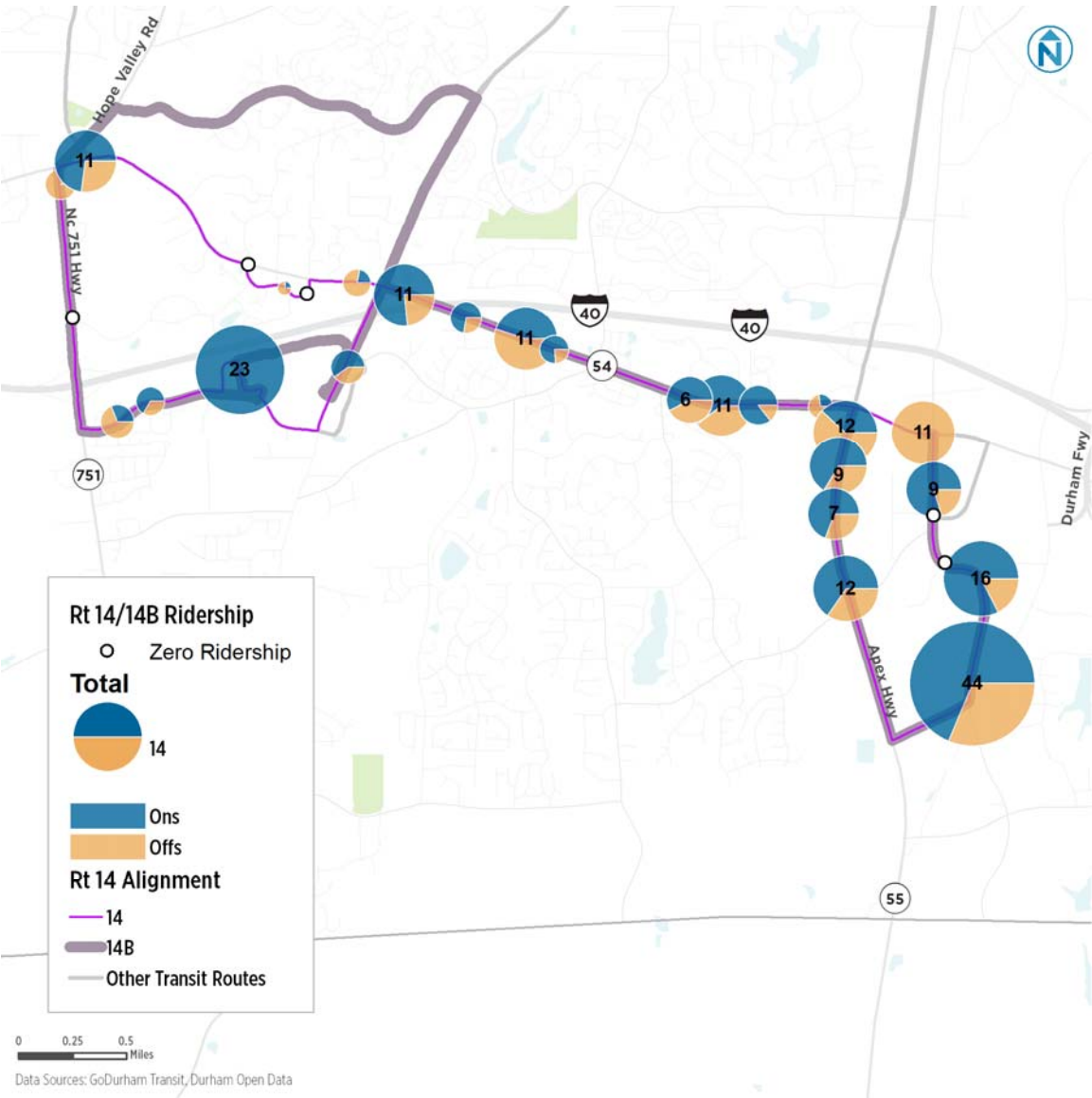


Figure 28 Average Daily Weekday Ridership, Route 15, Inbound

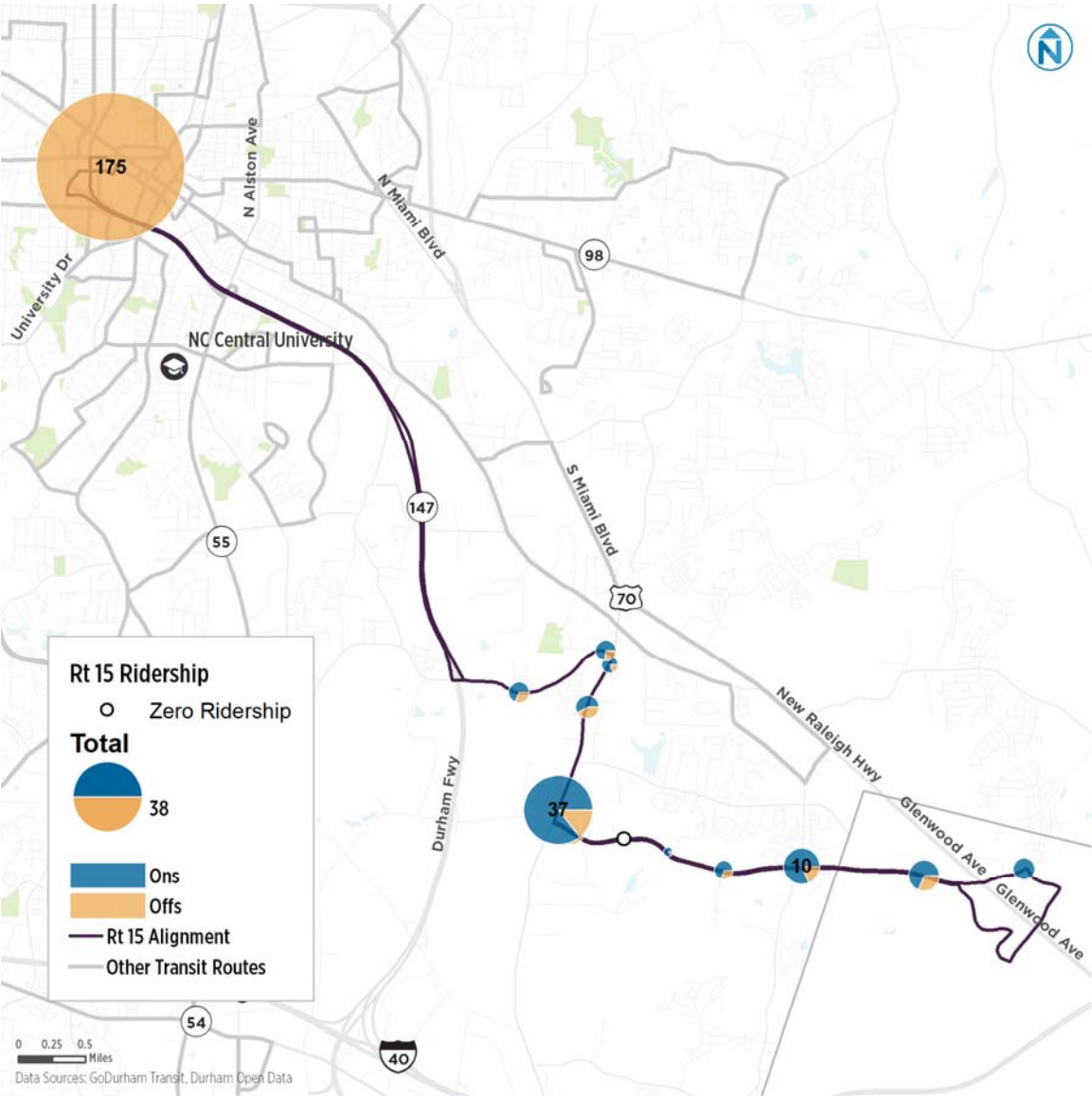


Figure 29 Average Daily Weekday Ridership, Route 15, Outbound

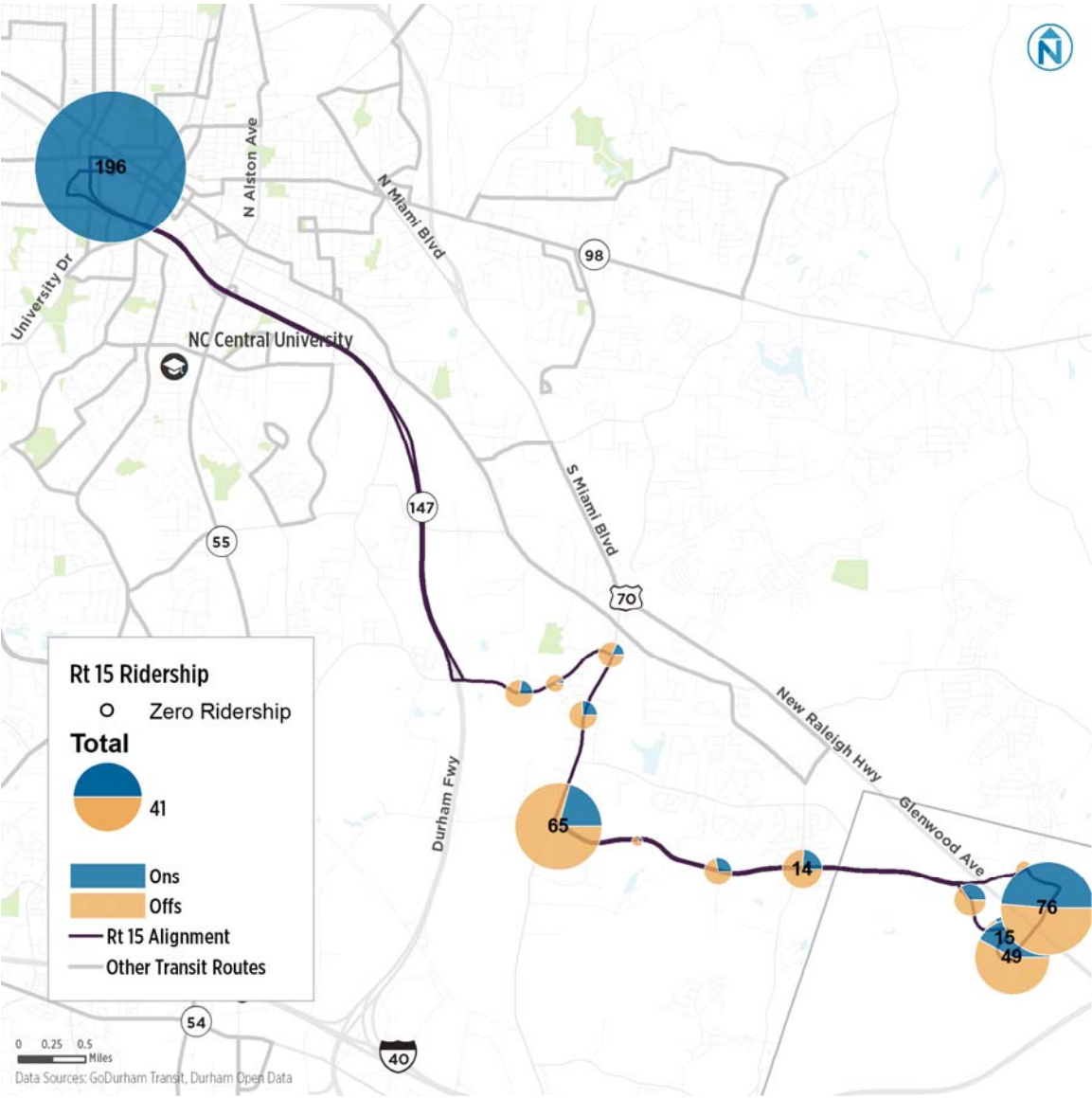


Figure 30 Average Daily Weekday Ridership, Route 20, Inbound

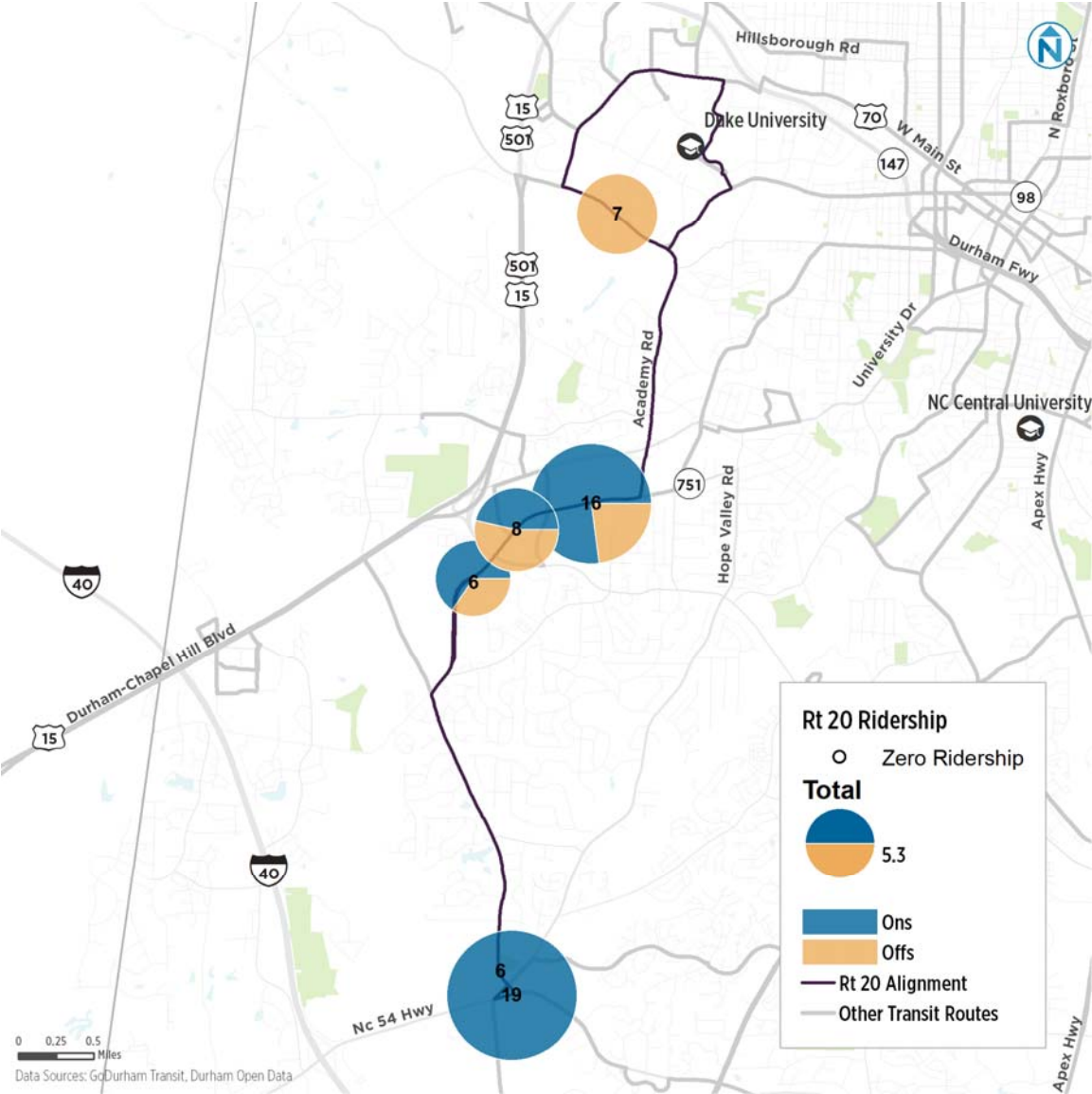


Figure 31 Average Daily Weekday Ridership, Route 20, Outbound

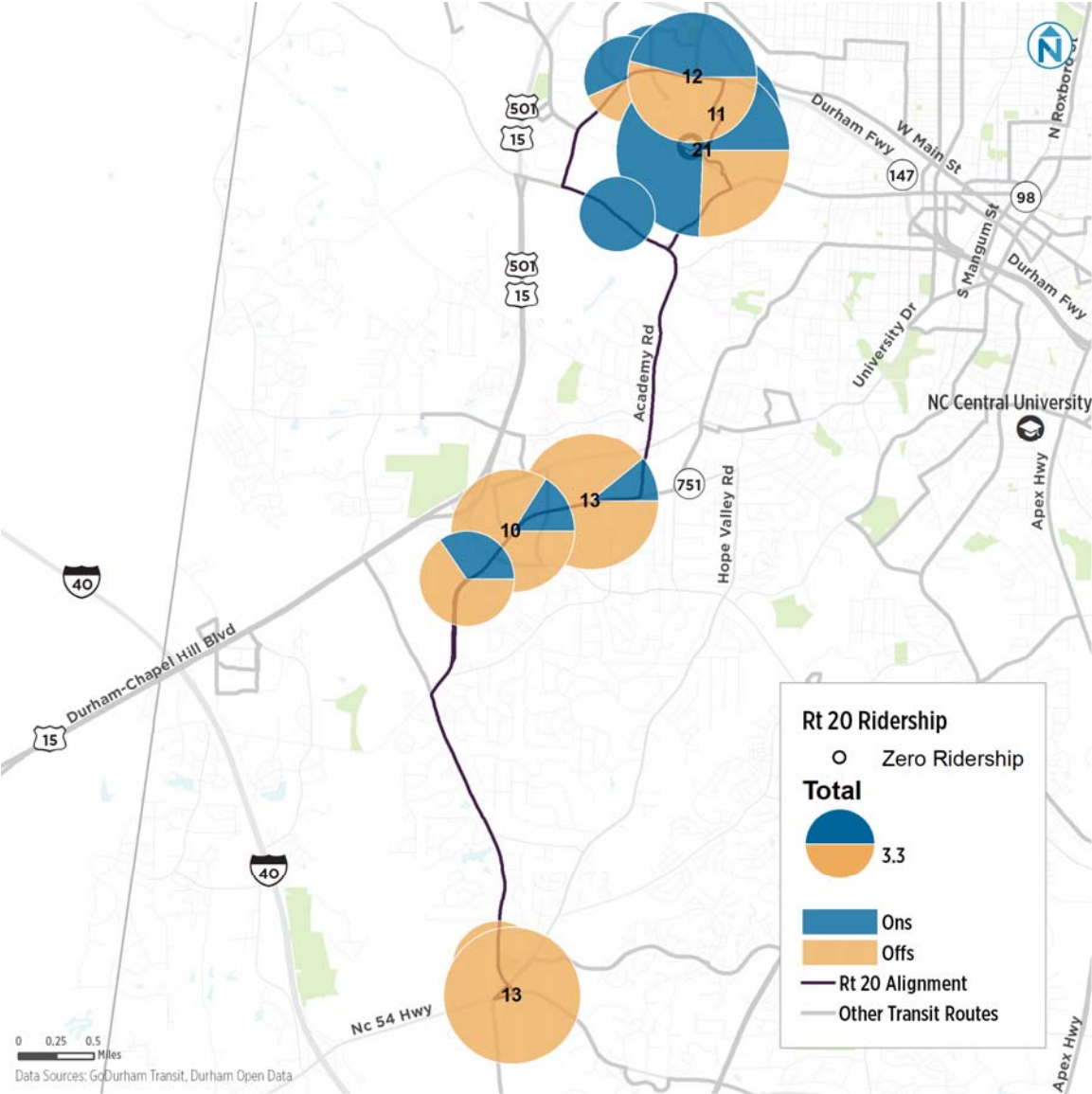


Figure 32 Average Daily Weekday Ridership, Route 23, Loop

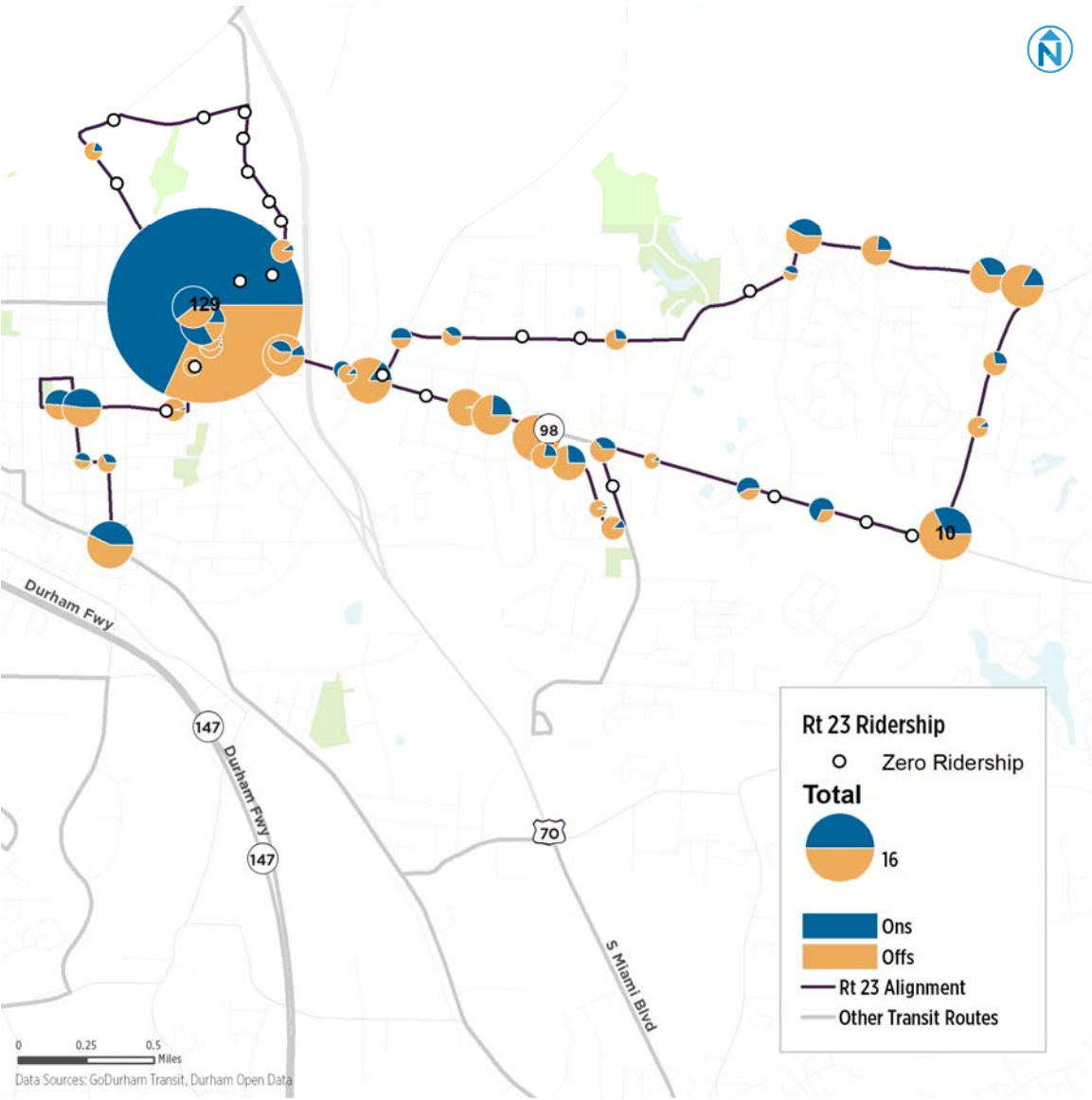
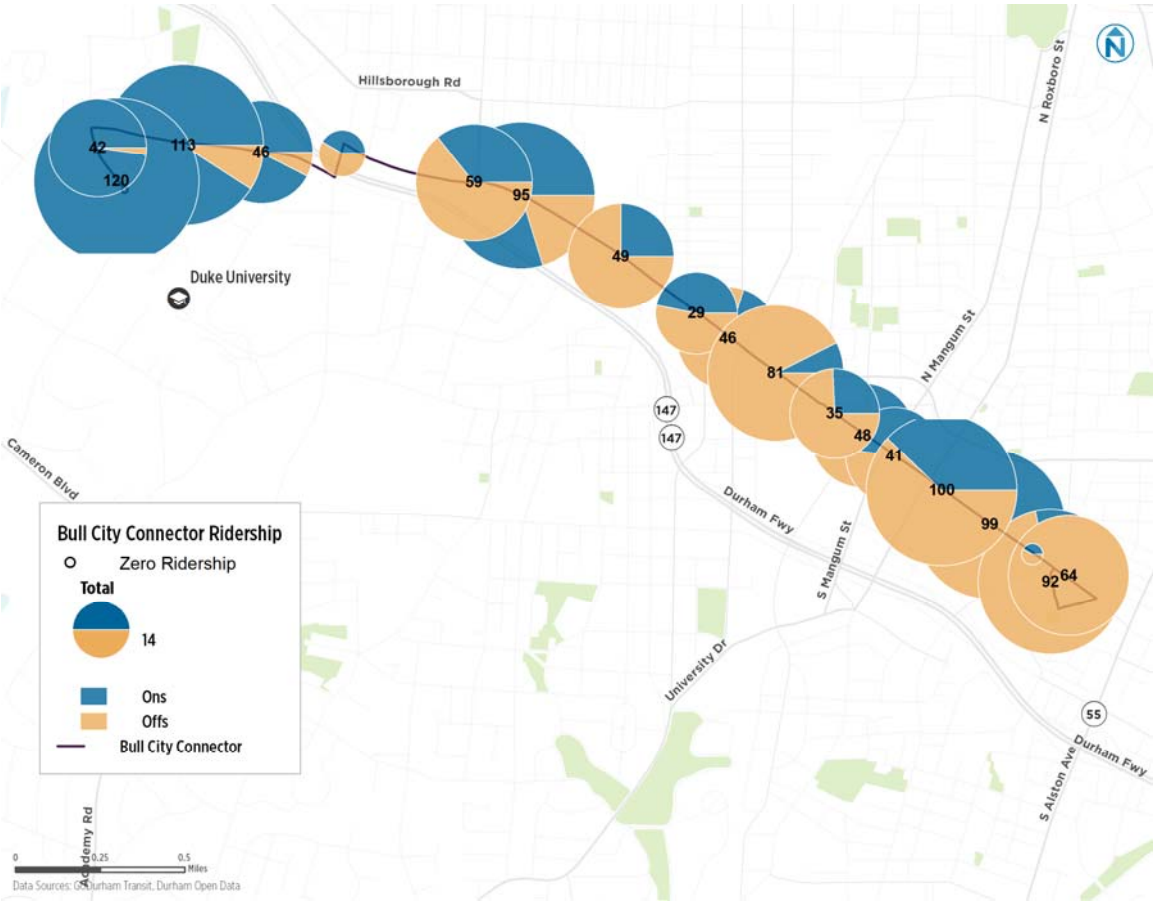



Figure 33 Average Daily Weekday Ridership, Bull City Connector, Inbound



Figure 34 Average Daily Weekday Ridership, Bull City Connector, Outbound

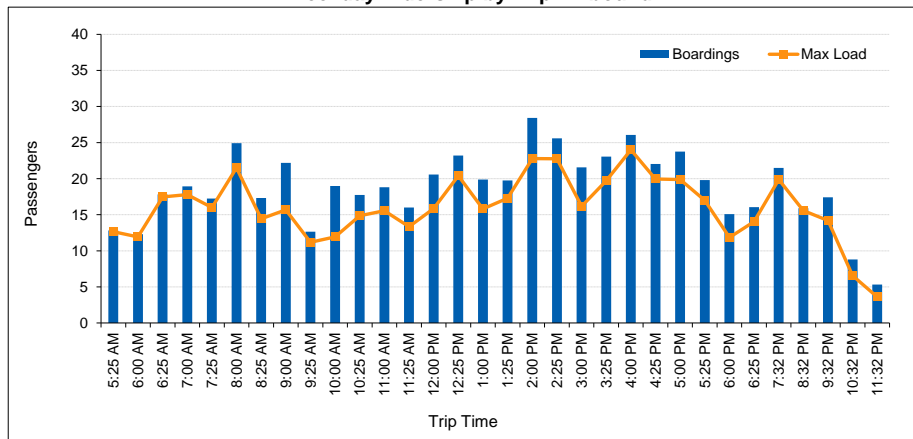


Appendix B Route Profiles

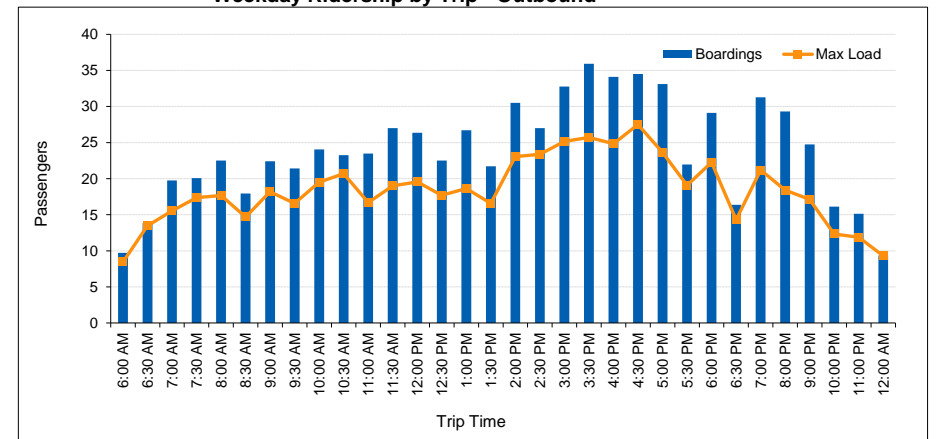
Route 1/1A/1B Weekday		Route Productivity Summary			
		Activity		Service Hours	Productivity
		Boardings	Alightings	Service Hours	Boardings per Service Hour
					
Total		1,366	1,377	28.4	48.1
Inbound		602	683	14.3	42.0
Outbound		764	694	14.0	54.4
By Segment					
1	HORTON RD AT GUESS RD to GUESS RD AT LAMAR ST	162	133	5.8	27.9
2	GUESS RD AT LAMAR ST to HILLANDALE RD AT CROASDAILE	98	72	2.9	34.2
3	HILLANDALE RD AT CROASDAILE to NORTH POINTE DR AT KROGER	63	88	3.4	18.3
4	NORTH POINTE DR AT KROGER to CLUB BLVD AT DOLLAR AVE	205	390	6.1	33.6
5	CLUB BLVD AT DOLLAR AVE to DURHAM STATION &	837	695	10.1	82.6
By Time Period					
Early AM		13	12	0.5	25.6
AM		212	217	5.3	40.4
Midday		540	541	10.5	51.4
PM		329	332	5.3	62.6
Eve		175	178	3.6	48.7
Night		97	98	3.3	30

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
586	DUKE ST AT MAIN ST	O
502	GREGSON ST AT TRINITY AVE	I
586	DUKE ST AT MAIN ST	O
13	GREGSON ST AT TRINITY AVE	I
97	GREGSON ST AT TRINITY AVE	I
229	DUKE ST AT MAIN ST	O
146	DUKE ST AT MAIN ST	O
76	DUKE ST AT TRINITY AVE	O
51	DUKE ST AT CORPORATION ST	O

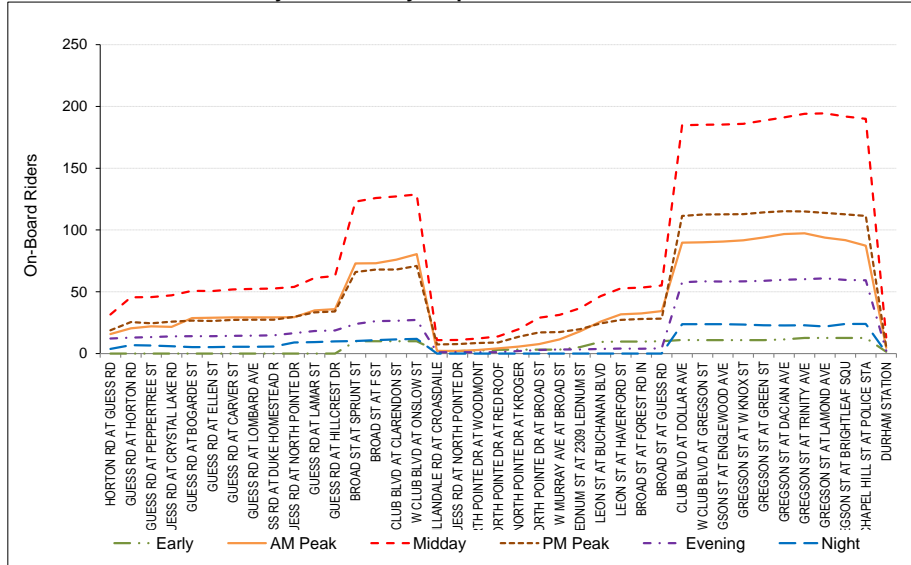
Weekday Ridership by Trip - Inbound



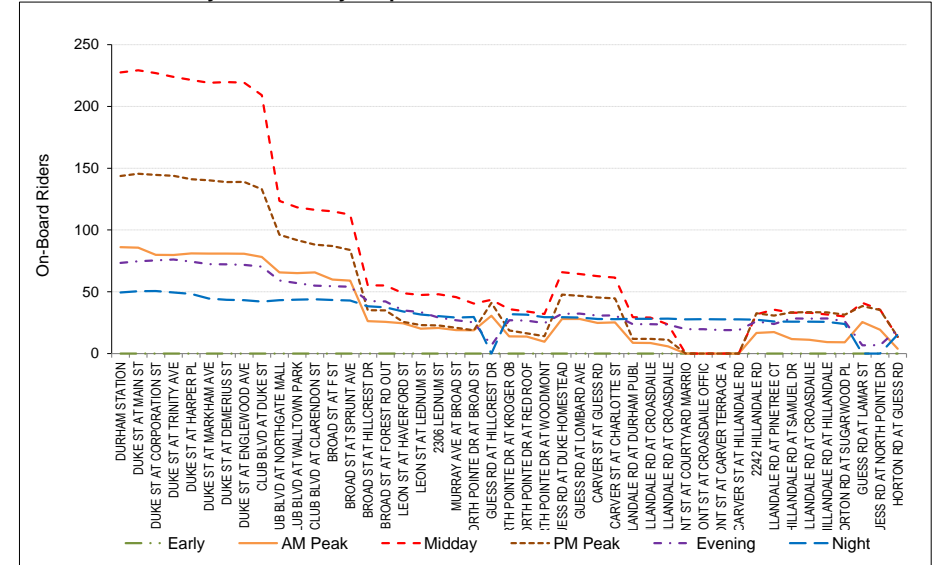
Weekday Ridership by Trip - Outbound



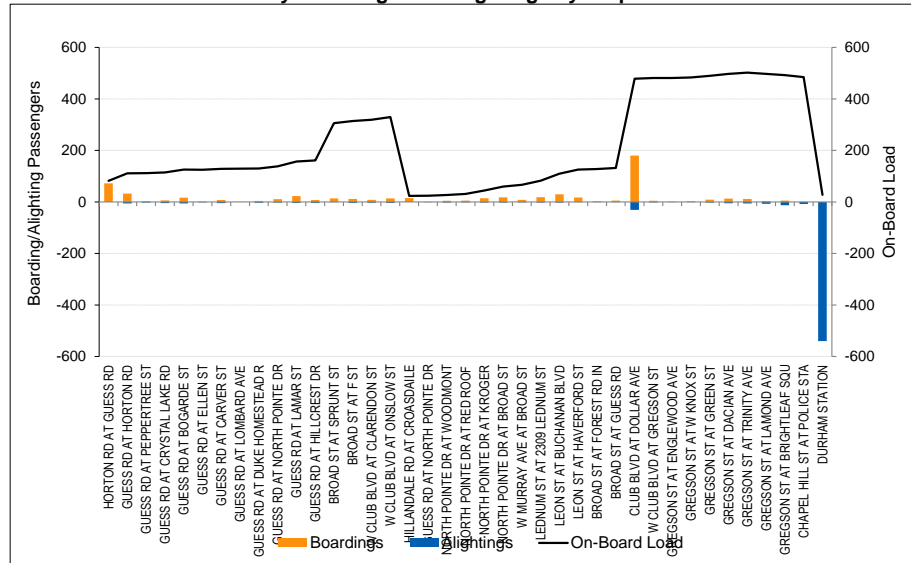
Weekday On-Board by Stop and Time Period - Inbound



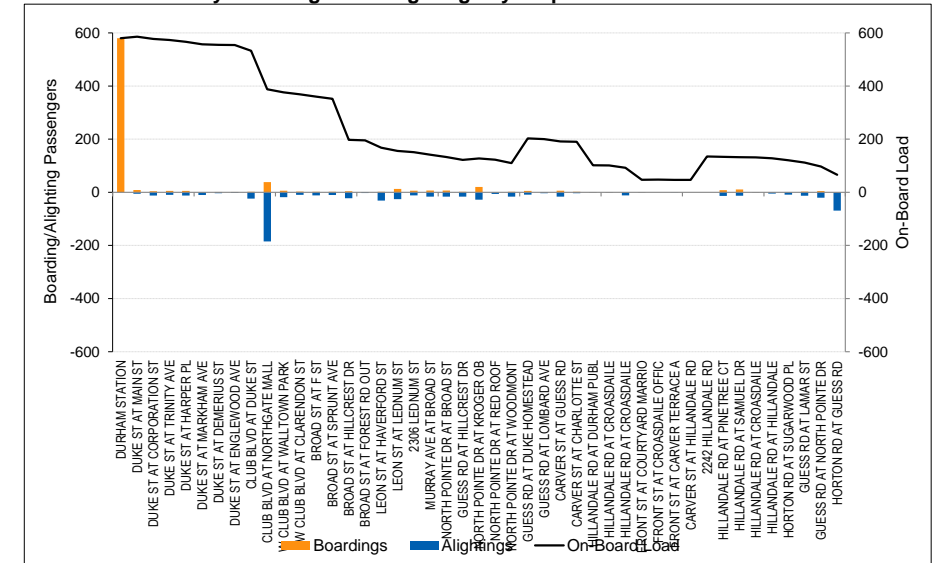
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



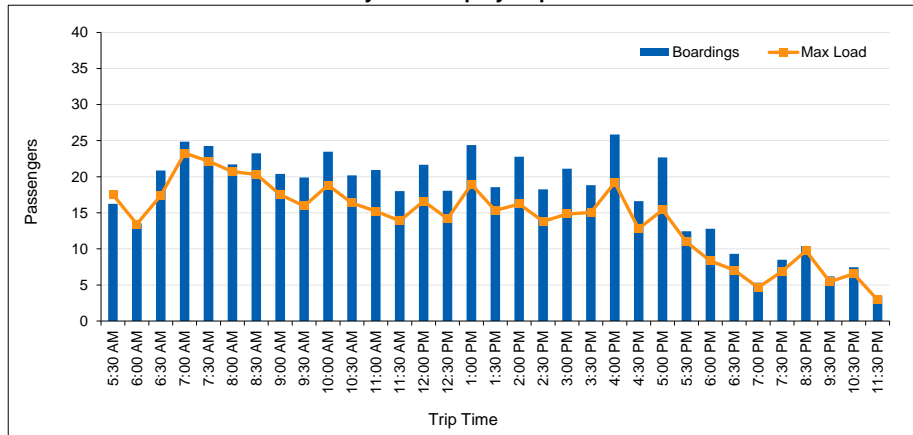
Weekday Boardings and Alightings by Stop - Outbound



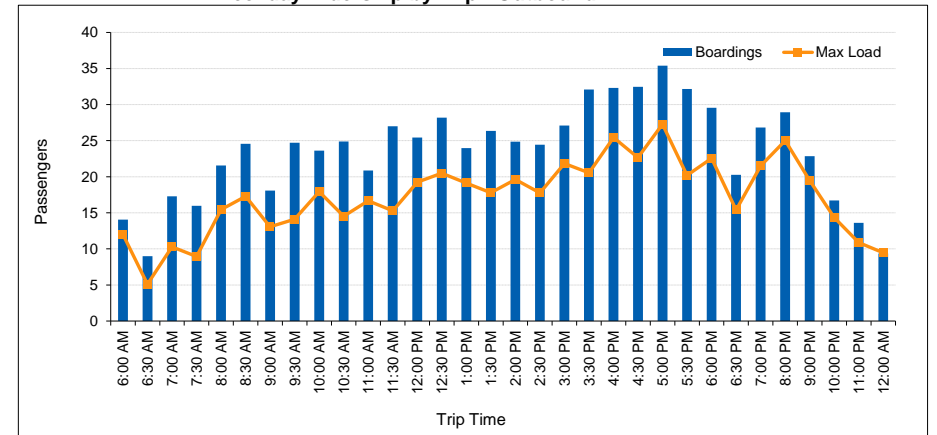
Route 2/2A/2B Weekday		Route Productivity Summary		
		Activity	Service Hours	Productivity
		Boardings	Alightings	Service Hours
				Boardings per Service Hour
Total		1,327	1,346	29.3
Inbound		572	679	13.5
Outbound		755	667	15.8
By Segment				
1	RAYNOR ST AT THE VILLAGE to PAGE RD AT ANGIER AVE	122	44	6.3
2	PAGE RD AT ANGIER AVE to ANGIER AVE AT GUTHRIE AVE	212	297	9.2
3	ANGIER AVE AT GUTHRIE AVE to DURHAM STATION	993	1,005	13.9
By Time Period				
Early AM		16	17	0.4
AM		231	218	5.5
Midday		539	548	10.9
PM		309	320	5.5
Eve		152	157	3.8
Night		80	87	3.3

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
535	DURHAM STATION	O
453	E MAIN ST AT OLDHAM TOWERS	I
535	DURHAM STATION	O
18	E MAIN ST AT OLDHAM TOWERS	I
117	E MAIN ST AT ELIZABETH ST	I
205	PETTIGREW ST AT MANGUM ST	O
137	PETTIGREW ST AT MANGUM ST	O
82	DURHAM STATION	O
54	E MAIN ST AT MANGUM ST OUTBO	O

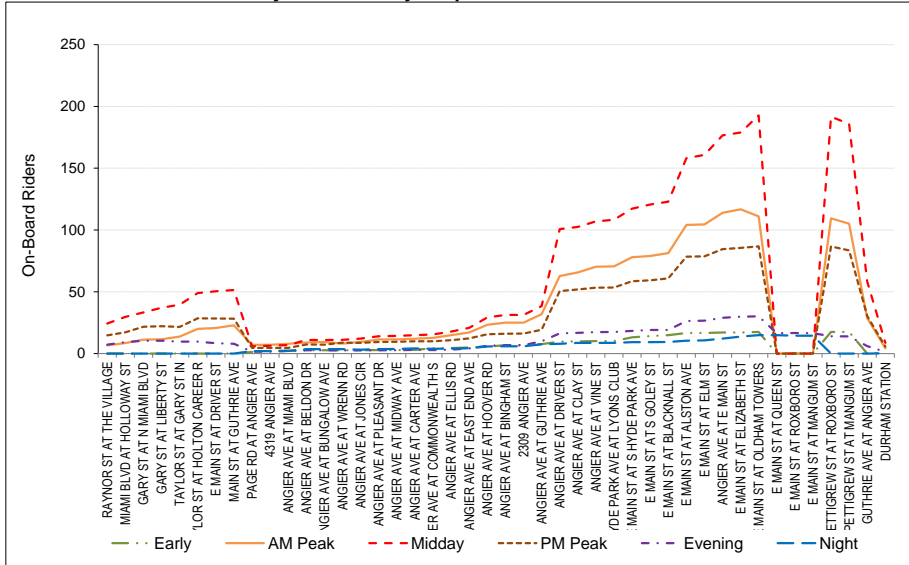
Weekday Ridership by Trip - Inbound



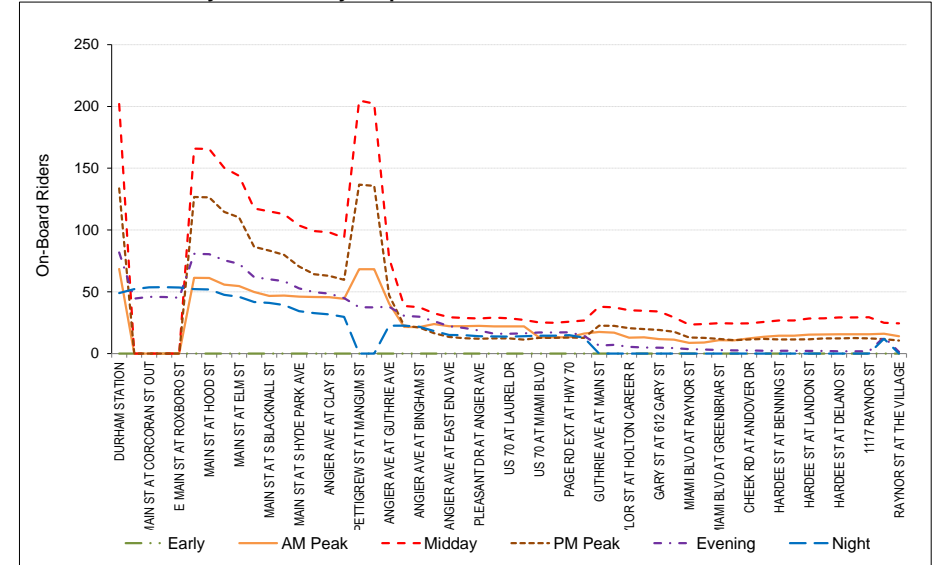
Weekday Ridership by Trip - Outbound



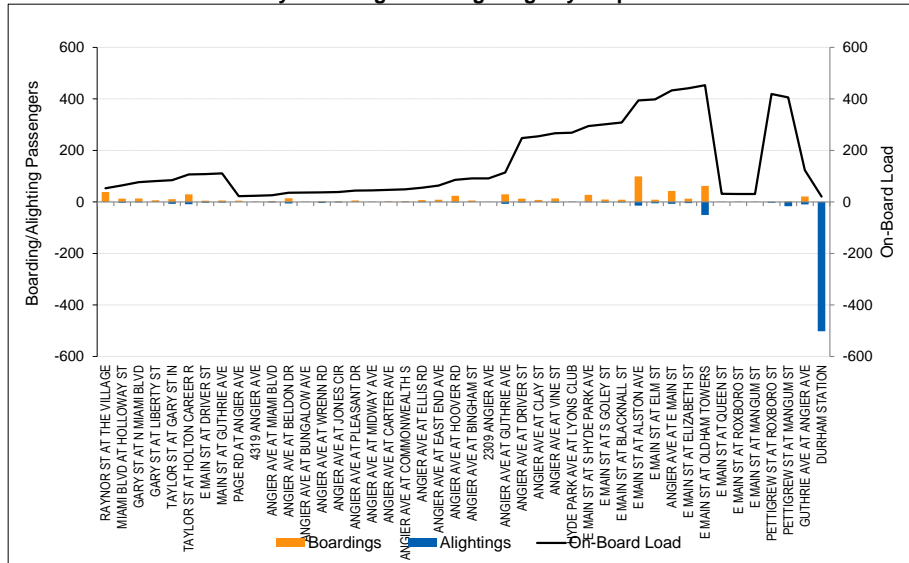
Weekday On-Board by Stop and Time Period - Inbound



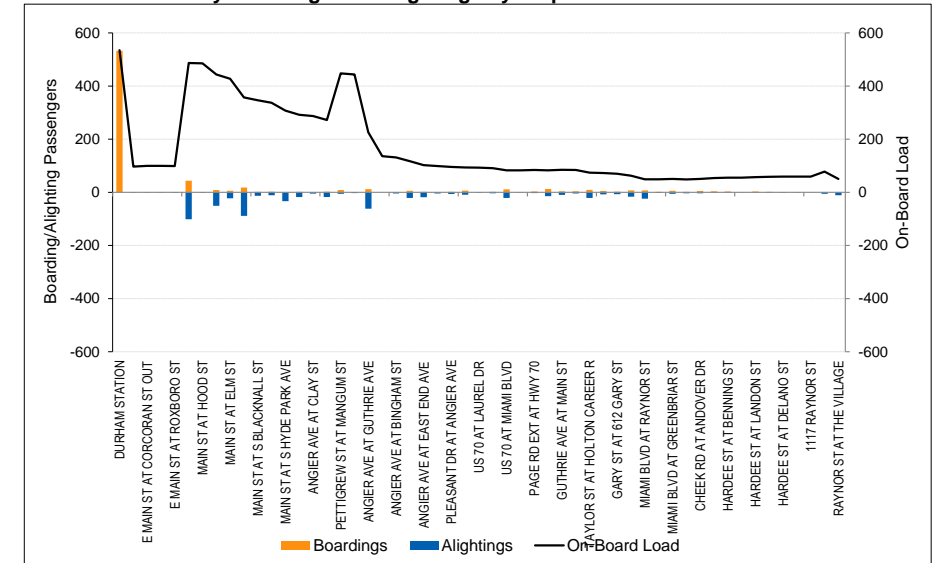
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



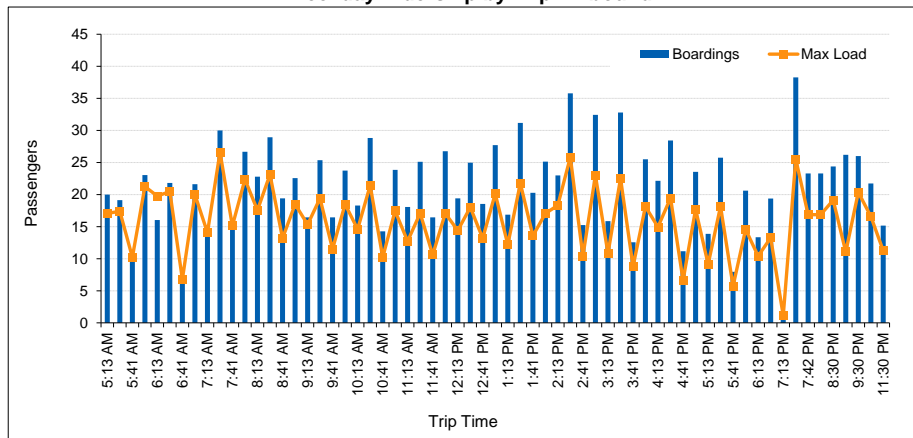
Weekday Boardings and Alightings by Stop - Outbound



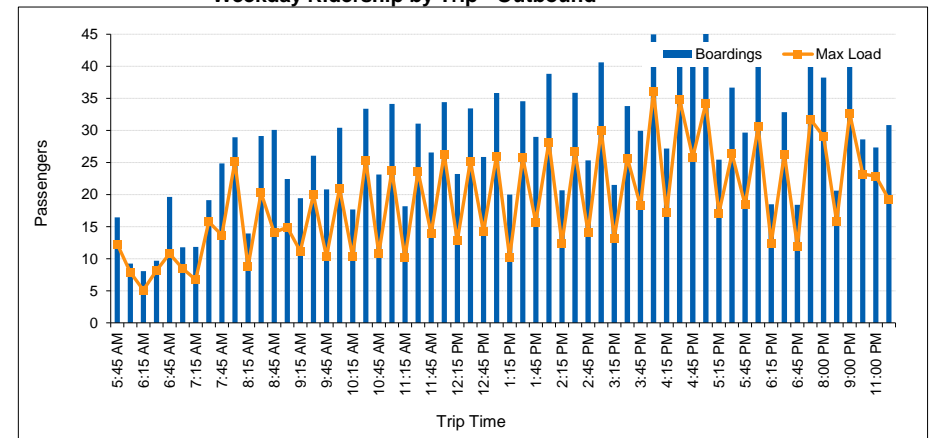
Route 3/3B/3C Weekday		Route Productivity Summary			
		Activity		Service Hours	Productivity
		Boardings	Alightings	Service Hours	Boardings per Service Hour
Total		2,960	3,051	55.2	53.6
Inbound		1,322	1,524	28.7	46.0
Outbound		1,638	1,527	26.5	61.9
By Segment					
1	FREEMAN ST AT CLAYTON RD to IVEY WOOD LN AT SPRINGWOOD	89	50	5.8	15.4
2	IVEY WOOD LN AT SPRINGWOOD P to WALMART AT GLENVIEW ST	45	218	5.2	8.6
3	WALMART AT GLENVIEW STATION to RAYNOR ST AT THE VILLAGE	639	771	13.3	48.0
4	RAYNOR ST AT THE VILLAGE to DURHAM STATION	2,188	2,012	30.9	70.8
By Time Period					
Early AM		66	56	1.9	35.3
AM		464	457	11.0	42.2
Midday		1,195	1,235	22.0	54.3
PM		671	699	11.0	61.0
Eve		384	409	6.3	60.7
Night		180	194	3.0	60

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
1,104	PETTIGREW ST AT MANGUM ST	O
977	S DILLARD ST AT DURHAM PUBLI	I
1,104	PETTIGREW ST AT MANGUM ST	O
44	S DILLARD ST AT DURHAM PUBLI	I
215	S DILLARD ST AT DURHAM PUBLI	I
425	PETTIGREW ST AT MANGUM ST	O
294	PETTIGREW ST AT MANGUM ST	O
154	PETTIGREW ST AT MANGUM ST	O
97	ROXBORO ST AT LIBERTY ST	O

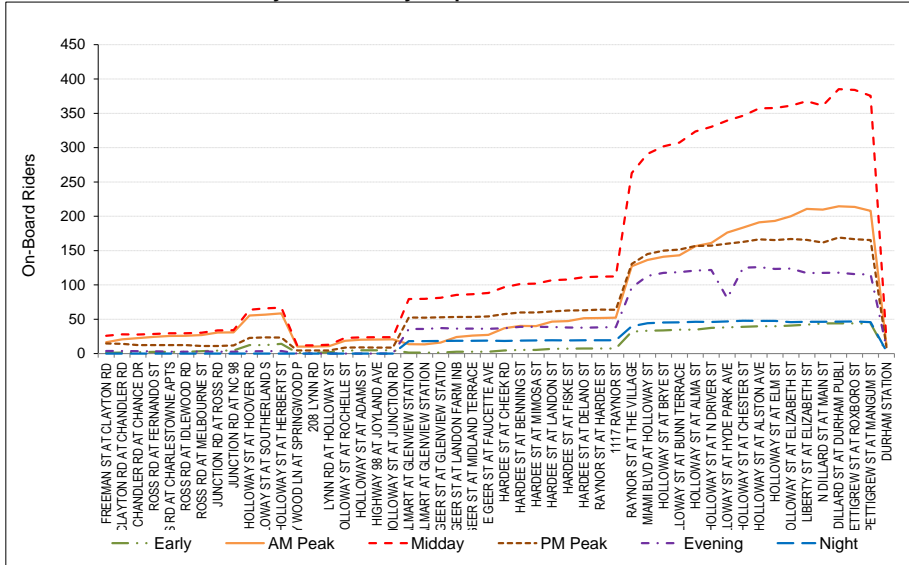
Weekday Ridership by Trip - Inbound



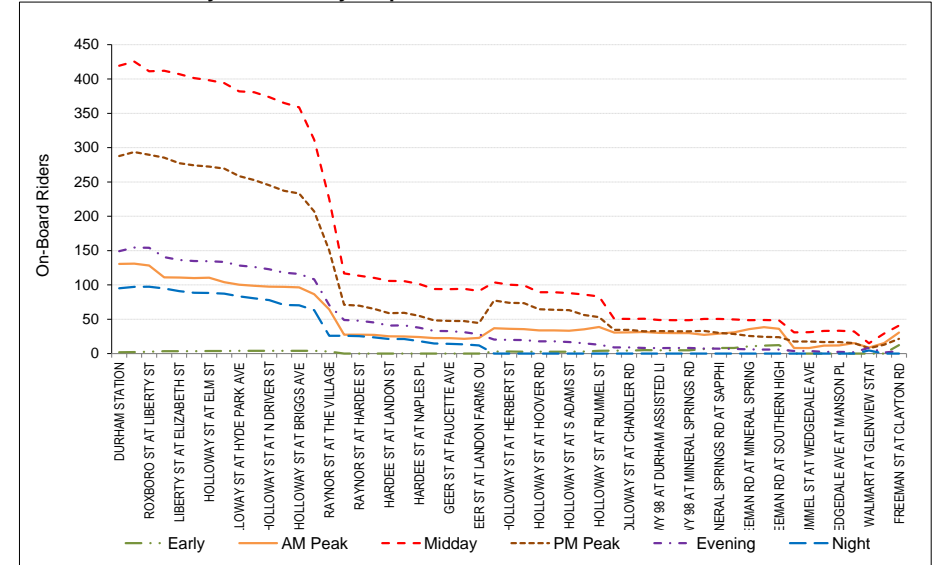
Weekday Ridership by Trip - Outbound



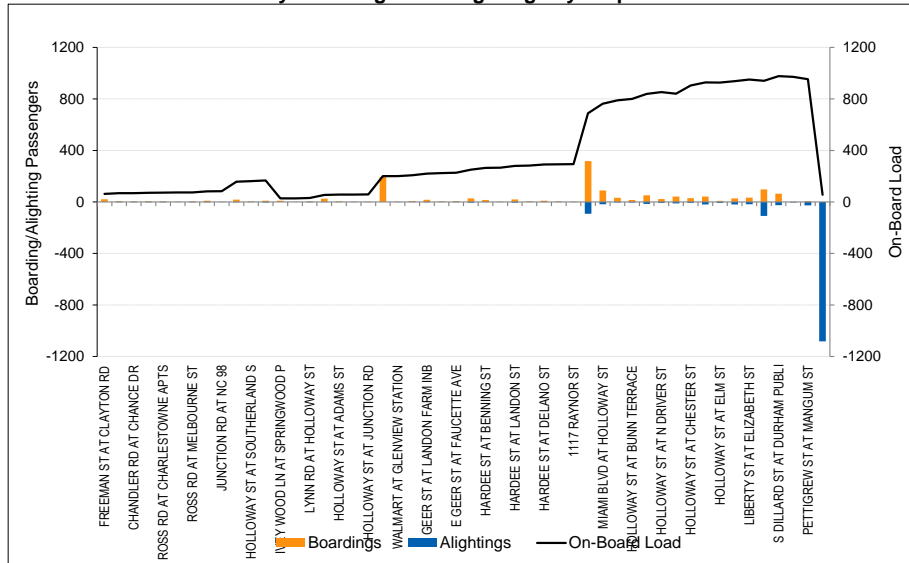
Weekday On-Board by Stop and Time Period - Inbound



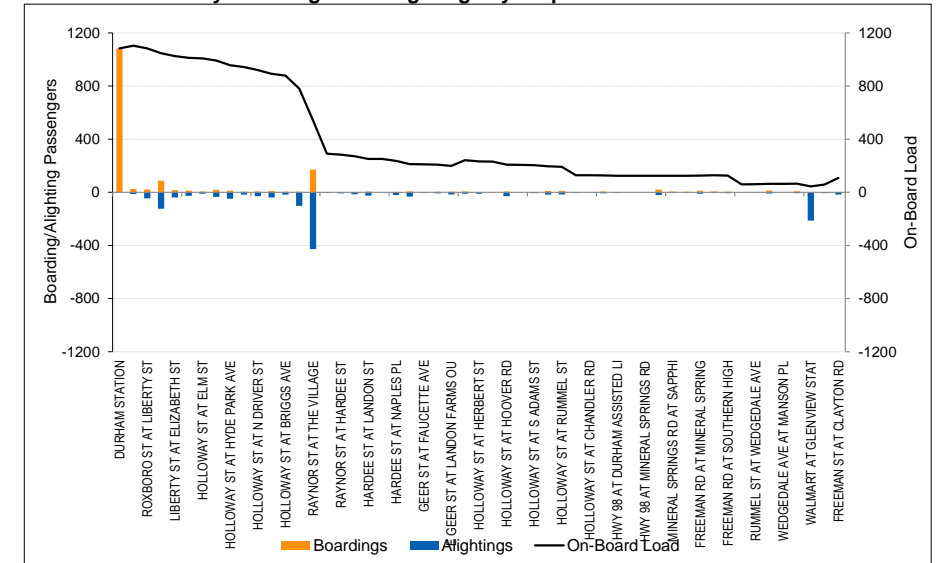
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



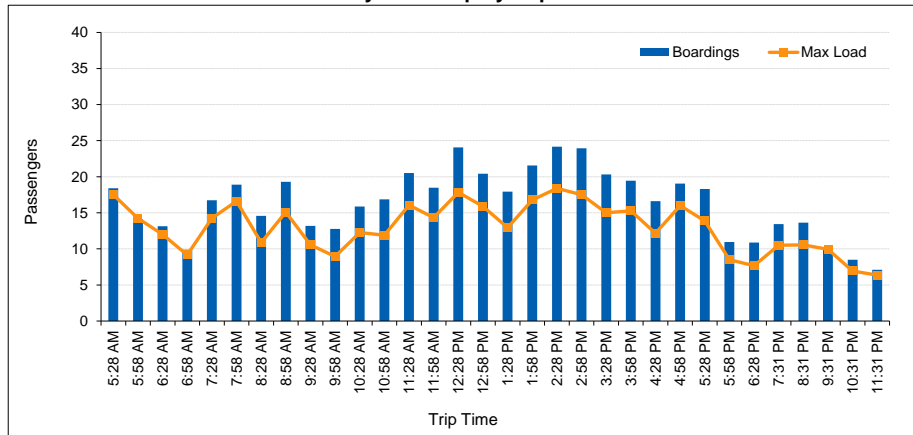
Weekday Boardings and Alightings by Stop - Outbound



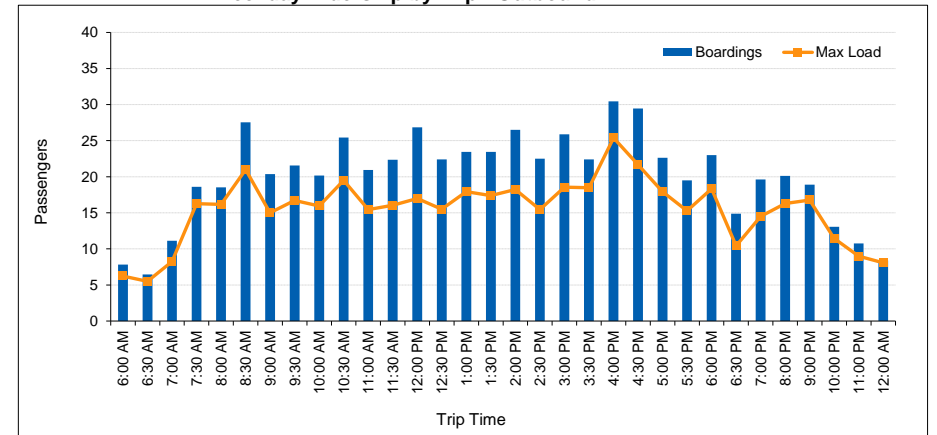
Route 4 Weekday		Route Productivity Summary		
		Activity	Service Hours	Productivity
		Boardings	Alightings	Service Hours
				Boardings per Service Hour
Total		1,168	1,246	28.9
Inbound		523	648	14.2
Outbound		645	598	14.7
By Segment				
1	HORTON RD AT ROXBORO RD to N ROXBORO RD AT DUKE REGIO	266	266	5.3
2	N ROXBORO RD AT DUKE REGIONA to ROXBORO RD AT ST PAUL S	223	257	7.7
3	ROXBORO RD AT ST PAUL ST to DURHAM STATION	679	723	15.8
By Time Period				
Early AM		18	20	0.5
AM		177	192	5.5
Midday		501	534	11.0
PM		268	279	5.5
Eve		127	141	3.5
Night		77	79	2.9

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
491	E CHAPEL HILL ST AT MAIN ST	O
411	RIGSBEE AVE AT SEMINARY ST	I
491	E CHAPEL HILL ST AT MAIN ST	O
18	RIGSBEE AVE AT W CORPORATION	I
76	RIGSBEE AVE AT W CORPORATION	I
199	E CHAPEL HILL ST AT MAIN ST	O
117	E CHAPEL HILL ST AT MAIN ST	O
60	E CHAPEL HILL ST AT MAIN ST	O
45	RIGSBEE AVE AT SEMINARY ST	O

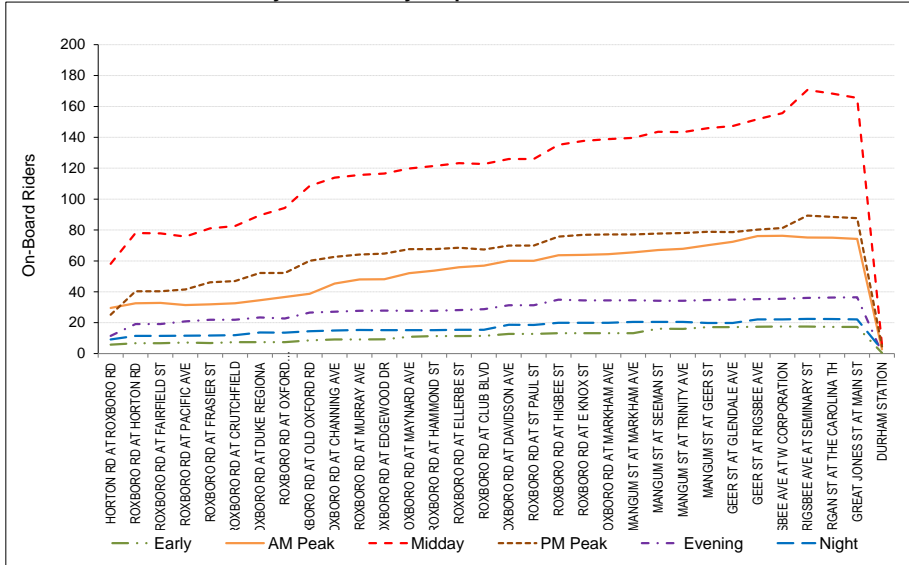
Weekday Ridership by Trip - Inbound



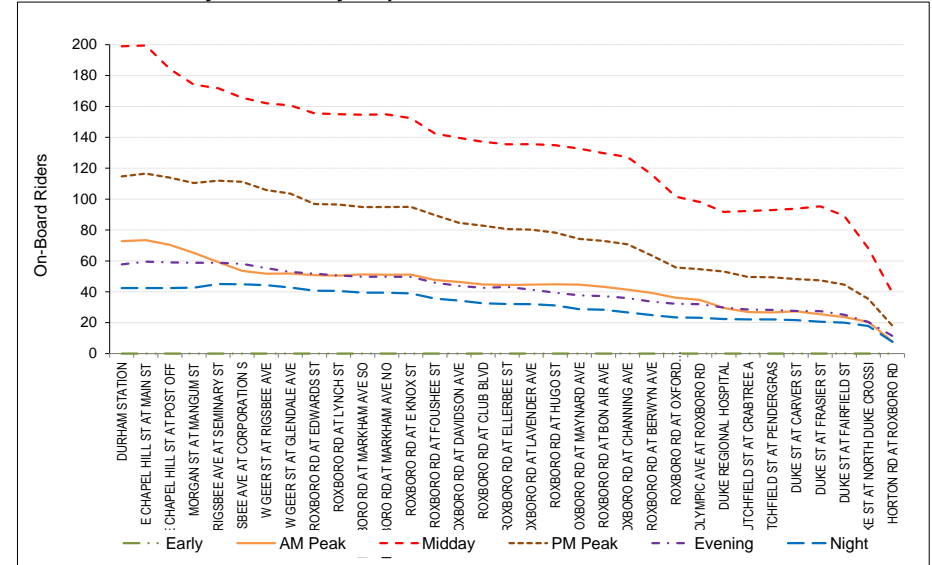
Weekday Ridership by Trip - Outbound



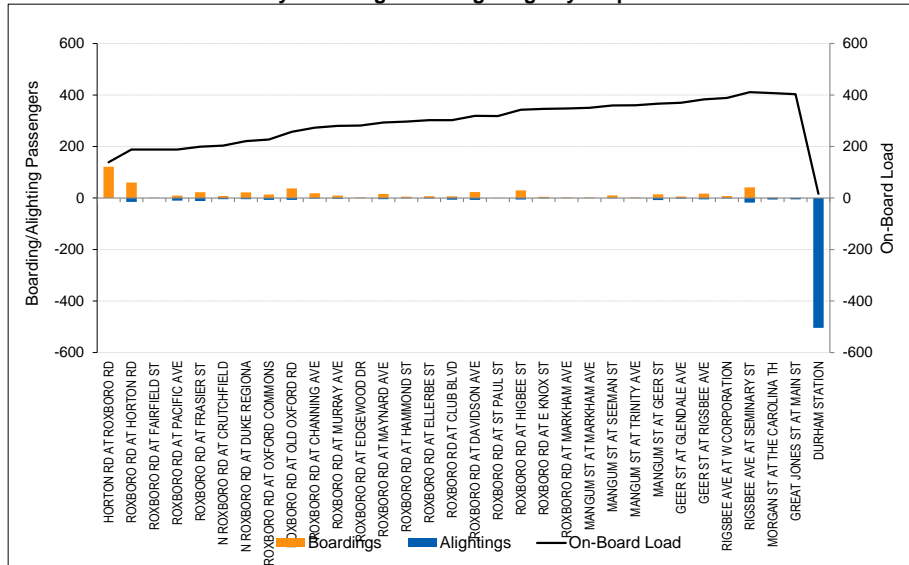
Weekday On-Board by Stop and Time Period - Inbound



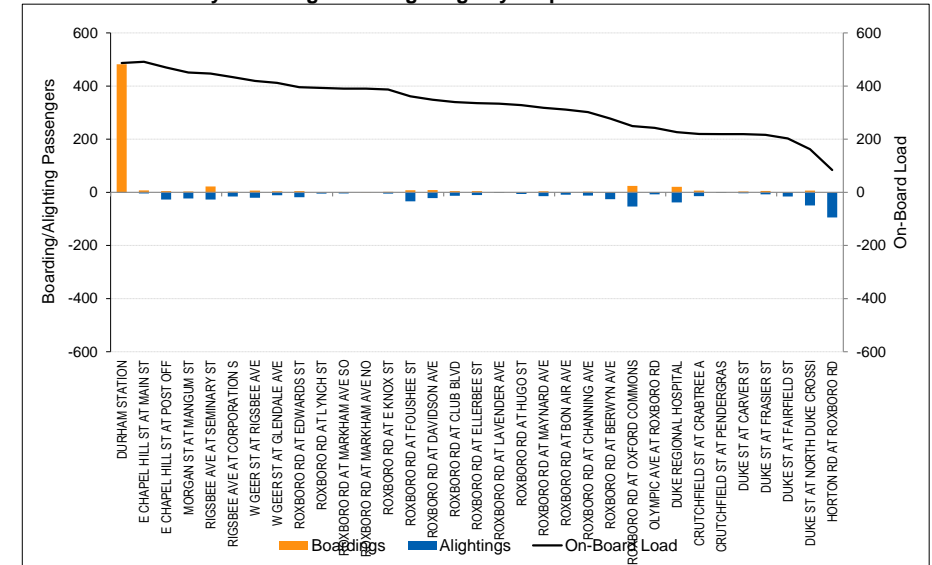
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



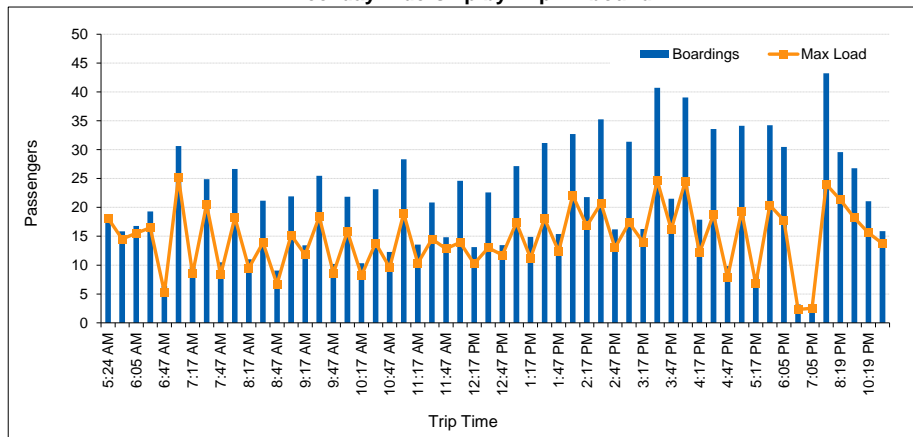
Weekday Boardings and Alightings by Stop - Outbound



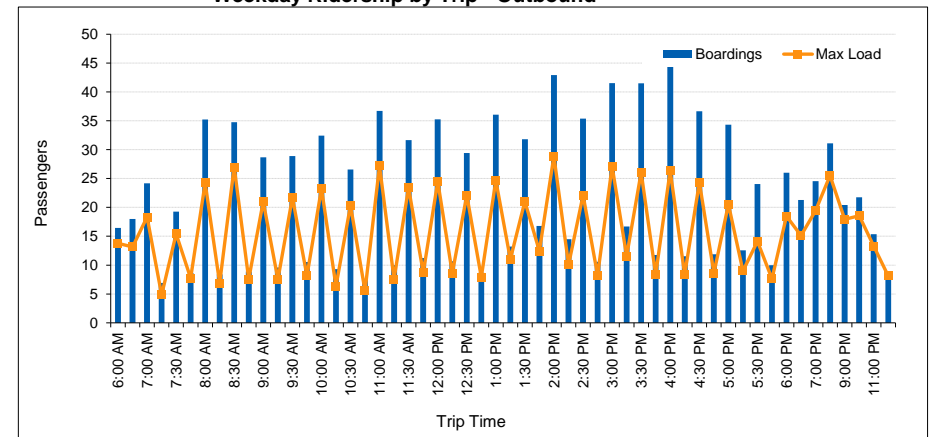
Route 5/5K Weekday		Route Productivity Summary		
		Activity	Service Hours	Productivity
		Boardings	Alightings	Boardings per Service Hour
Total		2,340	2,452	61.4
Inbound		1,165	1,329	34.1
Outbound		1,176	1,122	27.3
By Segment				
1	STREETS AT SOUTHPOINT CINEMA to FAYETTEVILLE RD AT CROOKED C	276	392	15.0
2	FAYETTEVILLE RD AT CROOKED C to STRATFORD LAKES DR AT FAYETT	554	207	18.0
3	STRATFORD LAKES DR AT FAYETT to FAYETTEVILLE ST AT LAWSON ST	219	485	9.5
4	FAYETTEVILLE ST AT LAWSON ST to DURHAM STATION	1,291	1,368	68.3
By Time Period				
Early AM		18	19	0.5
AM		361	358	12.0
Midday		999	1,043	26.4
PM		585	622	12.8
Eve		246	262	5.6
Night		130	147	4.0

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
837	BLACKWELL ST AT FOREST HILLS	O
800	BLACKWELL ST AT FOREST HILLS	I
837	BLACKWELL ST AT FOREST HILLS	O
18	LAKEWOOD AVE AT HERITAGE SQU	I
148	BLACKWELL ST AT FOREST HILLS	I
377	WILLARD ST AT BLACKWELL ST O	O
190	WILLARD ST AT BLACKWELL ST O	O
83	BLACKWELL ST AT FOREST HILLS	I
58	LAKEWOOD AVE AT SENIOR APTS	O

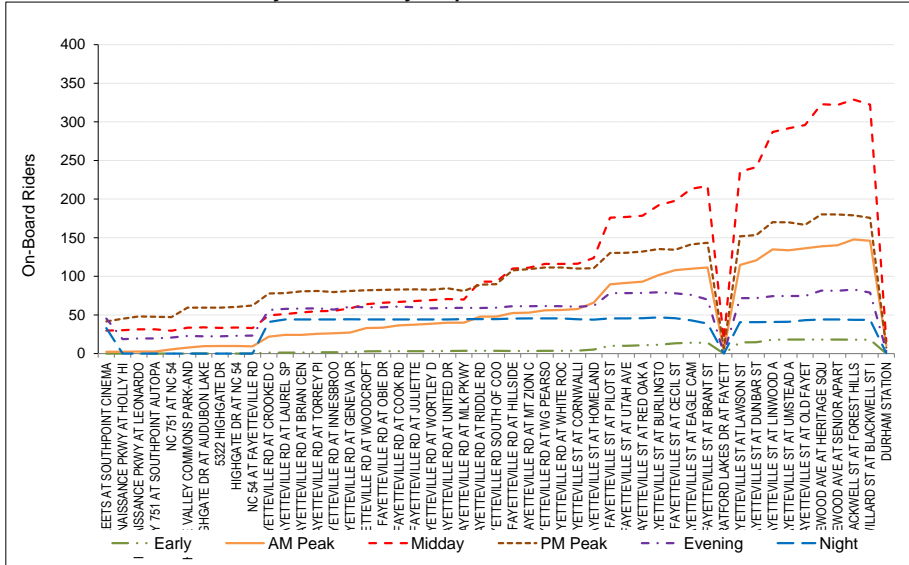
Weekday Ridership by Trip - Inbound



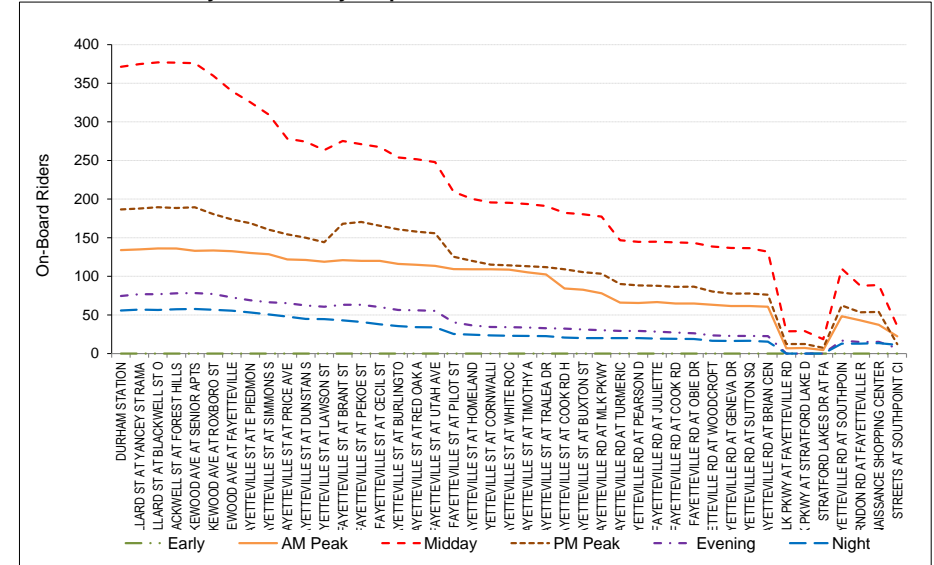
Weekday Ridership by Trip - Outbound



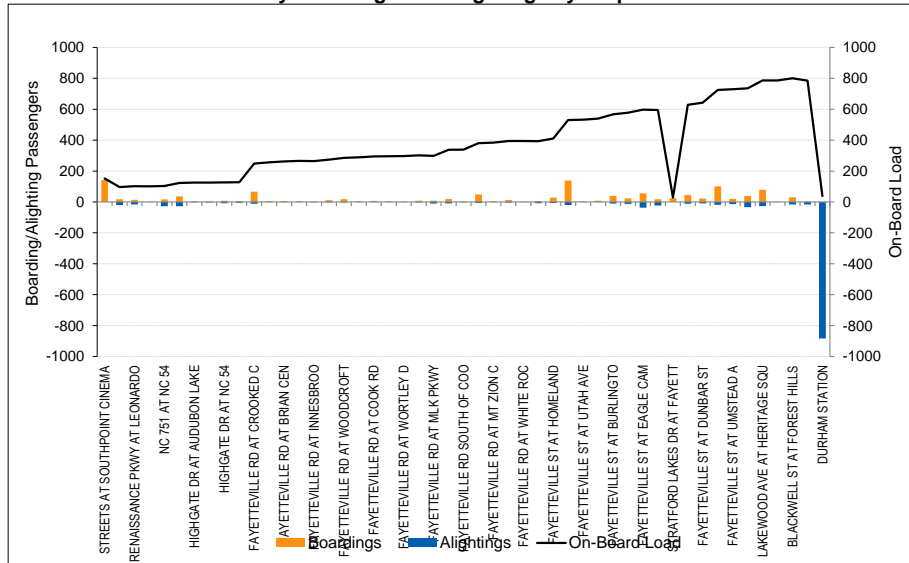
Weekday On-Board by Stop and Time Period - Inbound



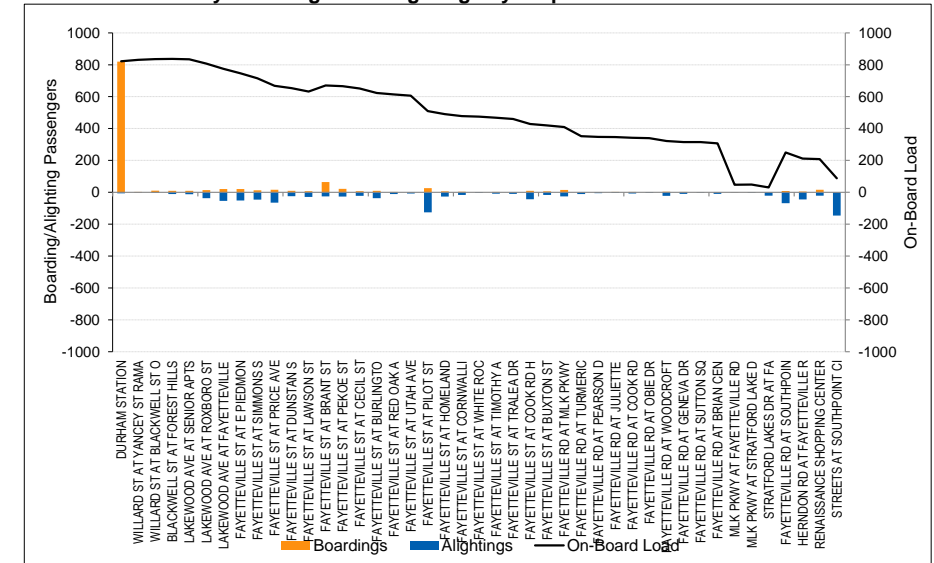
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



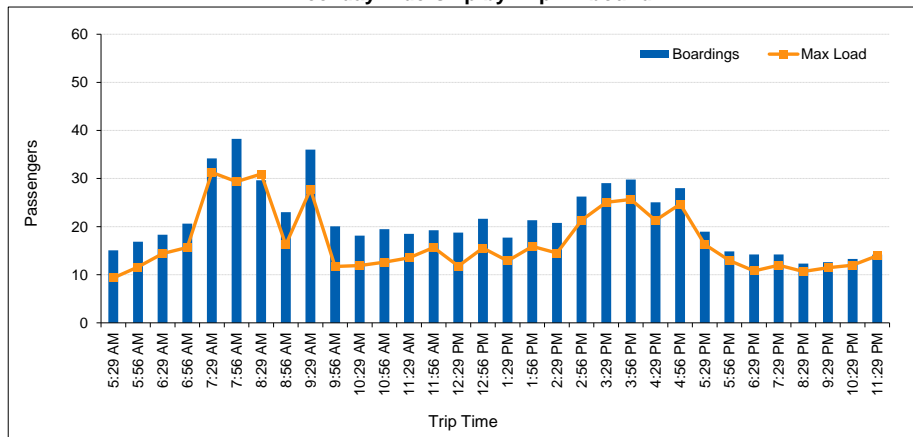
Weekday Boardings and Alightings by Stop - Outbound



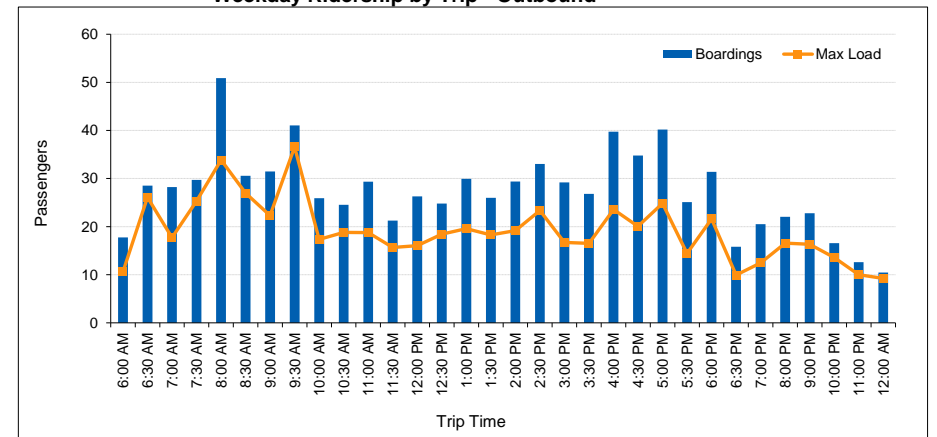
Route 6/6B Weekday		Route Productivity Summary		
		Activity	Service Hours	Productivity
		Boardings	Alightings	Boardings per Service Hour
				
Total		1,557	1,584	29.3
Inbound		680	787	14.5
Outbound		877	798	14.8
By Segment				
1	SPARGER RD AT FOOD LION to CONSTITUTION DR AT FOREST AP	147	55	3.7
2	CONSTITUTION DR AT FOREST AP to MORREENE RD AT GLASSON	76	67	10.8
3	MORREENE RD AT GLASSON ST to ERWIN RD AT DUKE HOSPITAL	137	145	3.9
4	ERWIN RD AT DUKE HOSPITAL to DURHAM STATION	1,198	1,318	11.0
By Time Period				
Early AM		15	15	0.4
AM		344	356	5.5
Midday		598	604	11.0
PM		353	350	5.5
Eve		145	156	3.7
Night		103	103	3.2

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
548	DUKE UNIVERSITY RD AT SWIFT	O
422	CHAPEL HILL ST AT ARNETTE AV	I
548	DUKE UNIVERSITY RD AT SWIFT	O
9	MORREENE RD AT ERWIN RD	I
140	DUKE UNIVERSITY RD AT SWIFT	O
241	DUKE UNIVERSITY RD AT SWIFT	O
134	DUKE UNIVERSITY RD AT ANDERS	I
57	ERWIN RD AT MORREENE RD	O
49	CHAPEL HILL ST AT ARNETTE AV	O

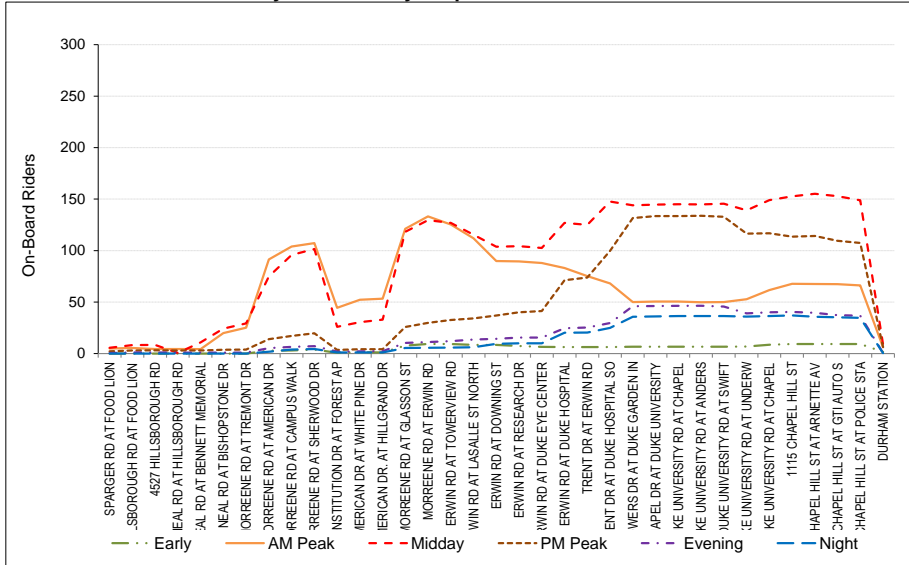
Weekday Ridership by Trip - Inbound



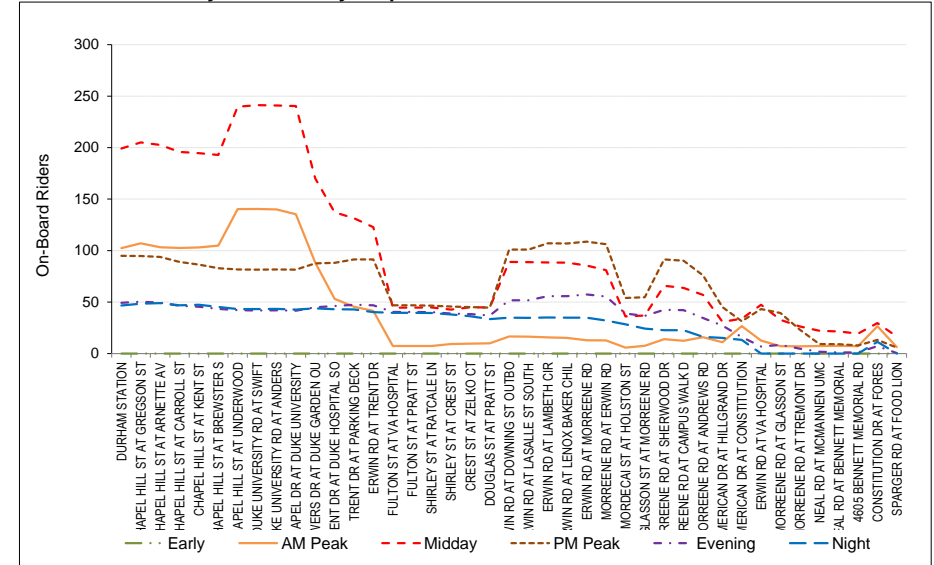
Weekday Ridership by Trip - Outbound



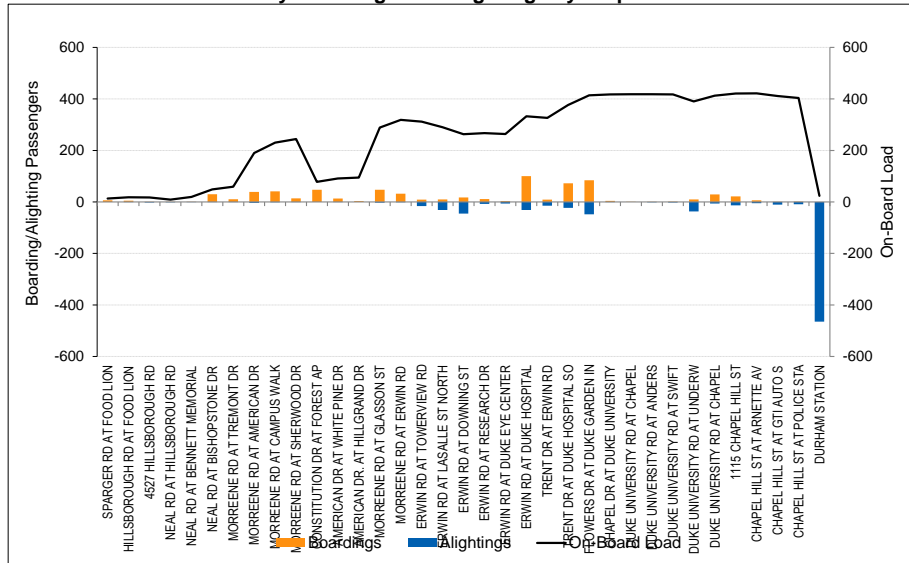
Weekday On-Board by Stop and Time Period - Inbound



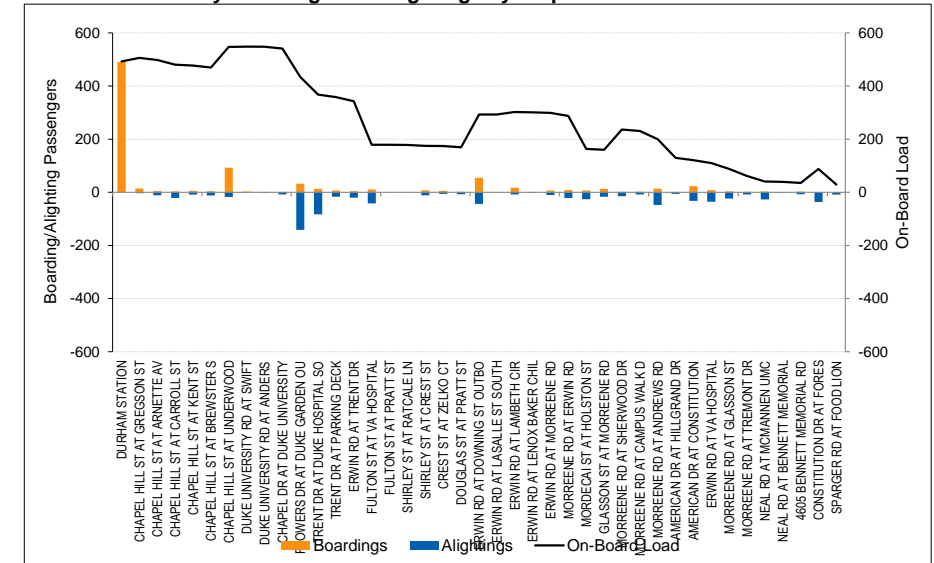
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



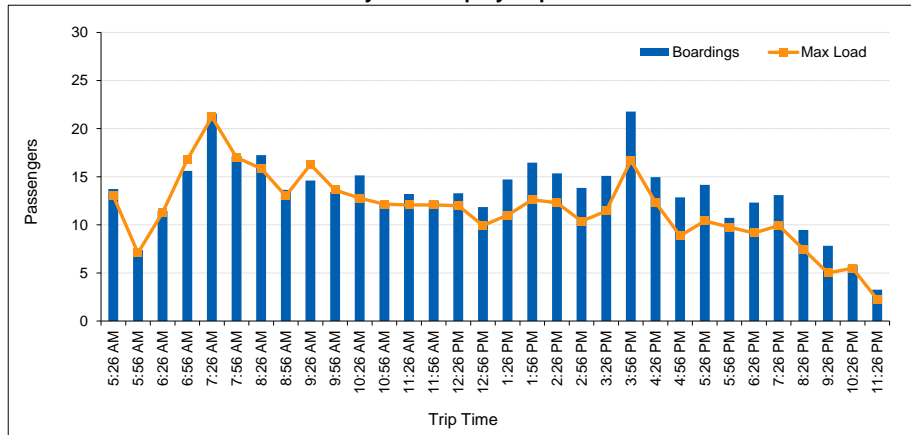
Weekday Boardings and Alightings by Stop - Outbound



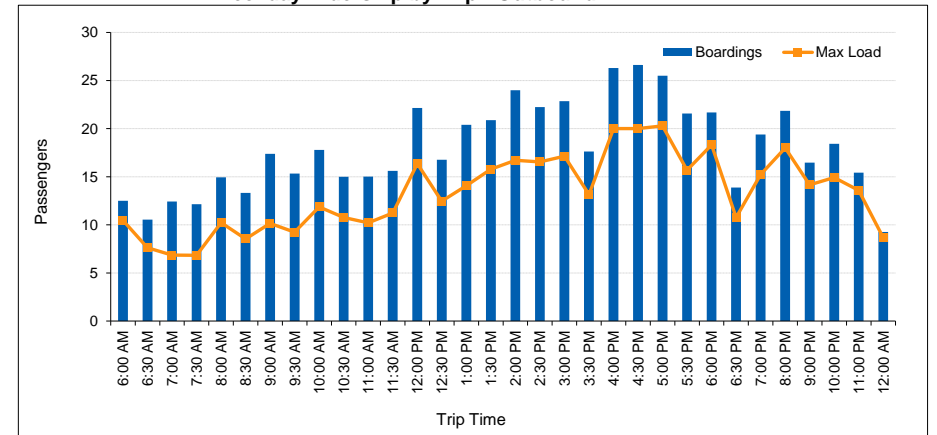
Route 7 Weekday		Route Productivity Summary		
		Activity	Service Hours	Productivity
		Boardings	Alightings	Service Hours
				Boardings per Service Hour
Total		1,001	1,022	29.3
Inbound		426	560	15.5
Outbound		575	462	13.9
By Segment				
1 S ROXBORO ST AT KROGER to FAYETTEVILLE RD AT HILLSIDE		187	202	9.1
2 FAYETTEVILLE RD AT HILLSIDE to UNIVERSITY DR AT FOREST HILL		322	346	13.3
3 UNIVERSITY DR AT FOREST HILL to DURHAM STATION		492	473	6.9
By Time Period				
Early AM		14	16	0.5
AM		166	167	5.5
Midday		389	391	11.0
PM		233	243	5.5
Eve		122	127	3.7
Night		76	77	3.2

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
419	WILLARD ST AT BLACKWELL ST O	O
368	DUKE ST AT HENDERSON TOWERS	I
419	WILLARD ST AT BLACKWELL ST O	O
13	DUKE ST AT HENDERSON TOWERS	I
88	DUKE ST AT HENDERSON TOWERS	I
155	WILLARD ST AT YANCEY ST RAMA	O
106	WILLARD ST AT BLACKWELL ST O	O
62	WILLARD ST AT BLACKWELL ST O	O
51	WILLARD ST AT BLACKWELL ST O	O

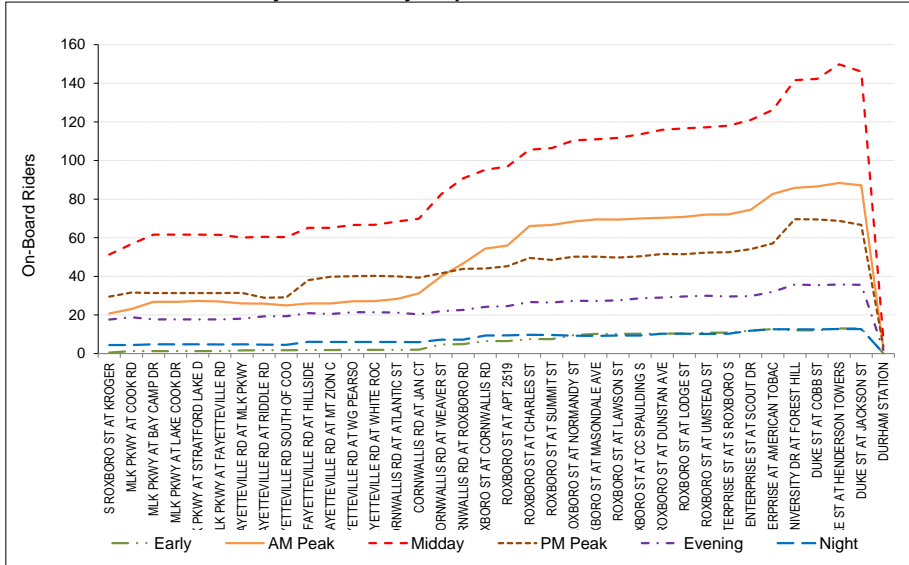
Weekday Ridership by Trip - Inbound



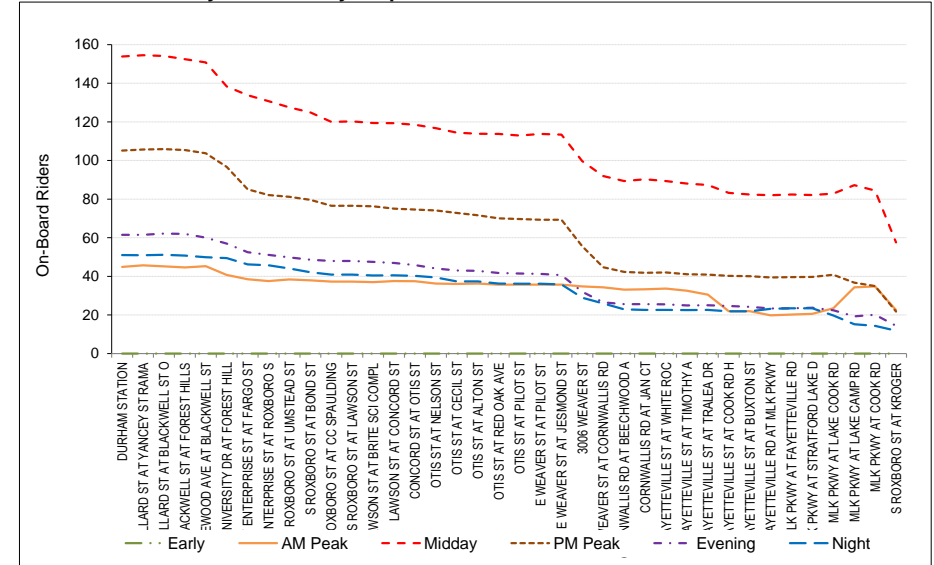
Weekday Ridership by Trip - Outbound



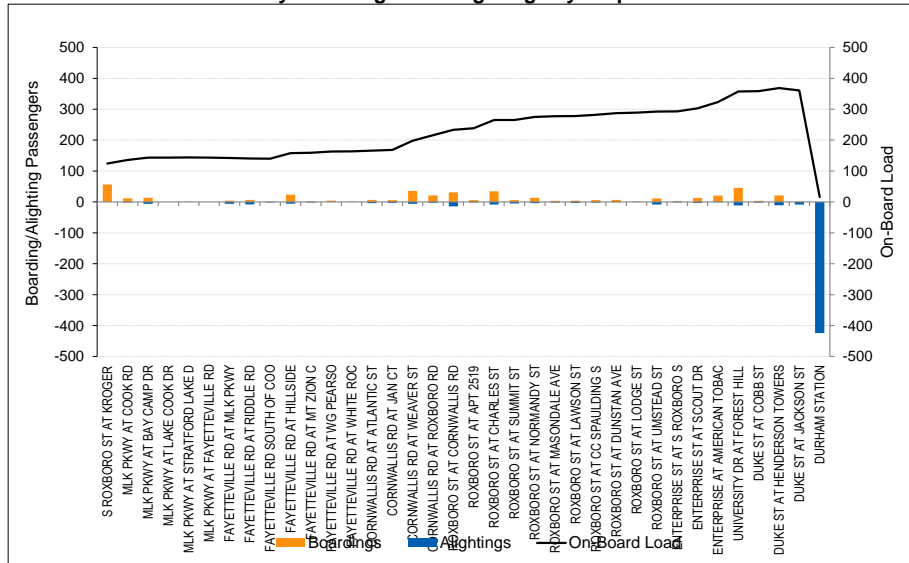
Weekday On-Board by Stop and Time Period - Inbound



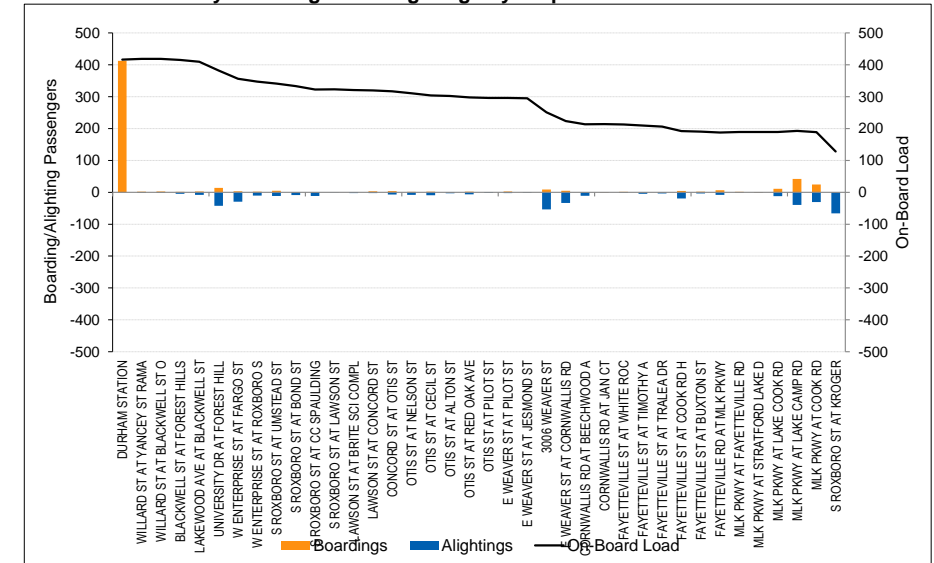
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



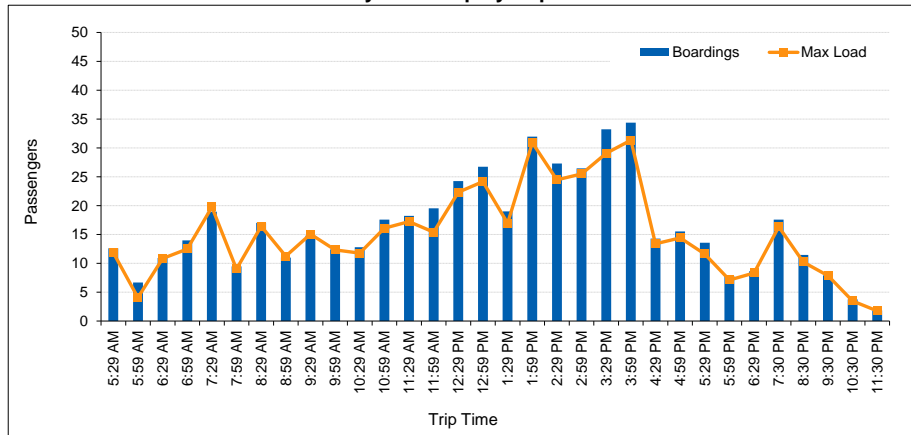
Weekday Boardings and Alightings by Stop - Outbound



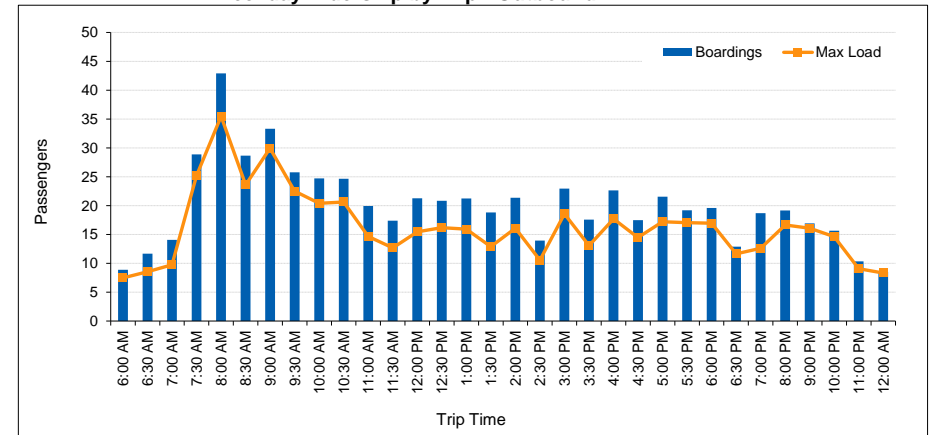
Route 8 Weekday		Route Productivity Summary		
		Activity	Service Hours	Productivity
		Boardings	Alightings	Service Hours
				Boardings per Service Hour
Total		1,163	1,202	28.0
Inbound		522	617	13.8
Outbound		641	585	14.2
By Segment				
1	CAPPS ST AT S ALSTON AVE to LAWSON ST AT DURHAM TECH IB	144	312	10.0
2	LAWSON ST AT DURHAM TECH IB to LAWSON ST AT MERRICK ST	417	241	6.3
3	LAWSON ST AT MERRICK ST to DURHAM STATION	602	649	11.7
By Time Period				
Early AM		13	13	0.4
AM		212	224	5.3
Midday		499	509	10.6
PM		259	260	5.3
Eve		116	128	3.4
Night		65	68	2.9

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
511	PETTIGREW ST AT MANGUM ST	O
468	ROXBORO ST AT CHESTNUT ST	I
511	PETTIGREW ST AT MANGUM ST	O
12	ROXBORO ST AT DILLARD ST	I
109	S ROXBORO ST AT BOND ST	O
211	LAWSON ST AT NCCU SOCCER FIE	I
124	ROXBORO ST AT UMSTEAD ST	I
58	PETTIGREW ST AT MANGUM ST	O
48	PETTIGREW ST AT MANGUM ST	O

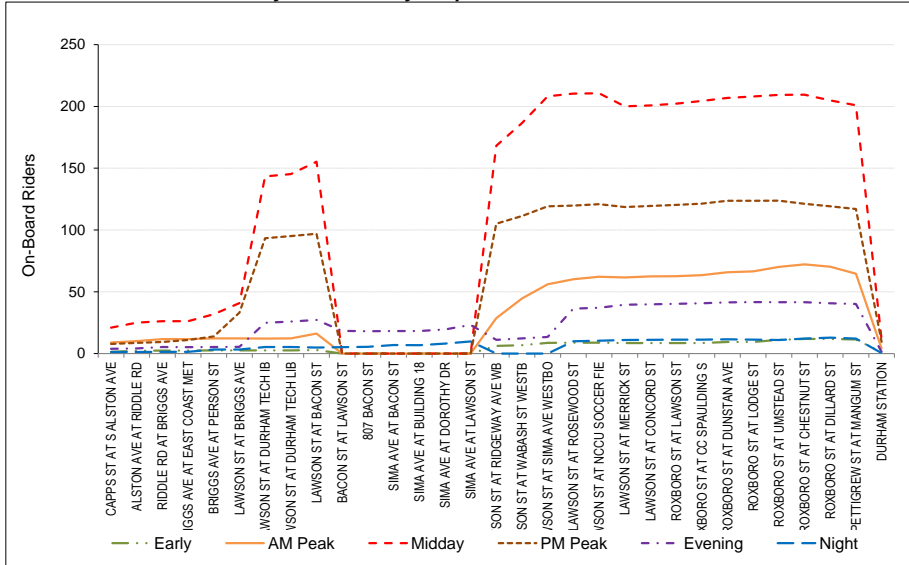
Weekday Ridership by Trip - Inbound



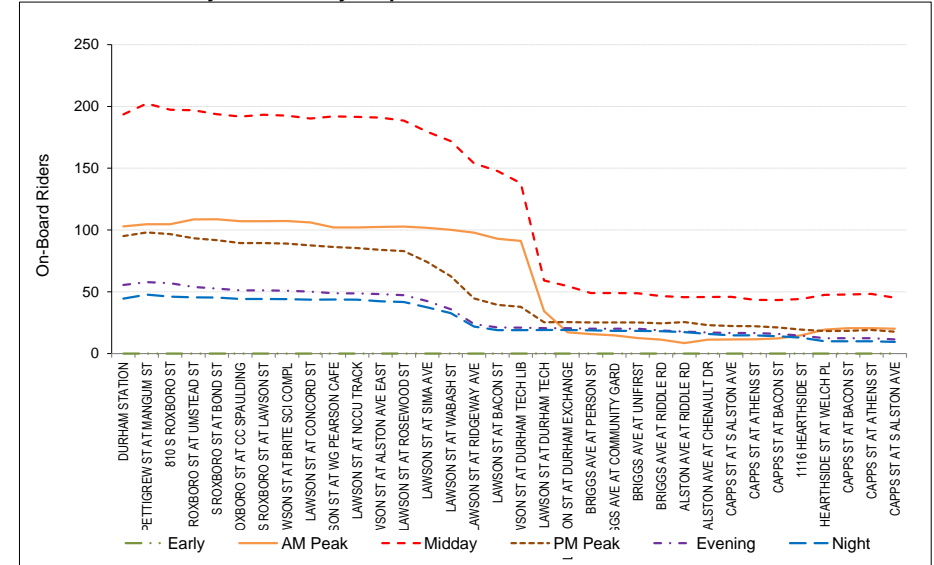
Weekday Ridership by Trip - Outbound



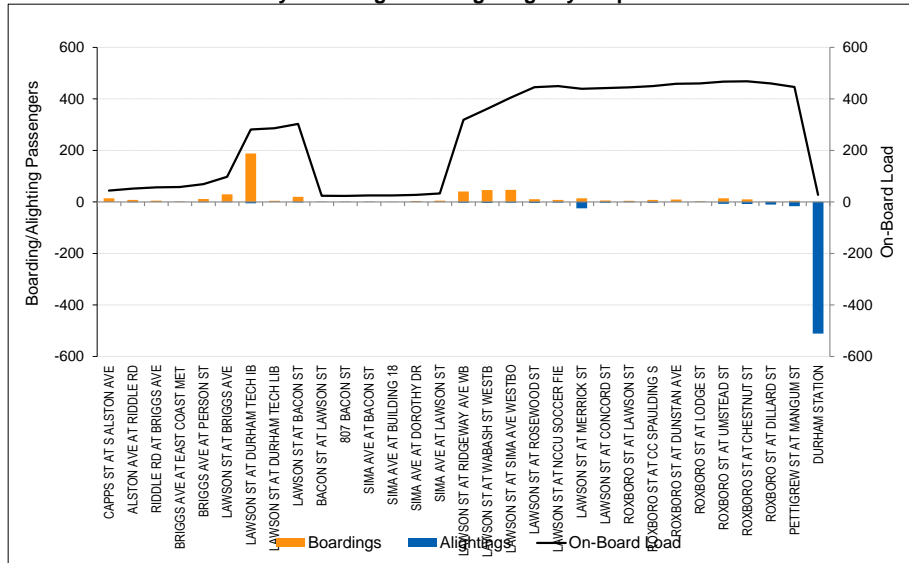
Weekday On-Board by Stop and Time Period - Inbound



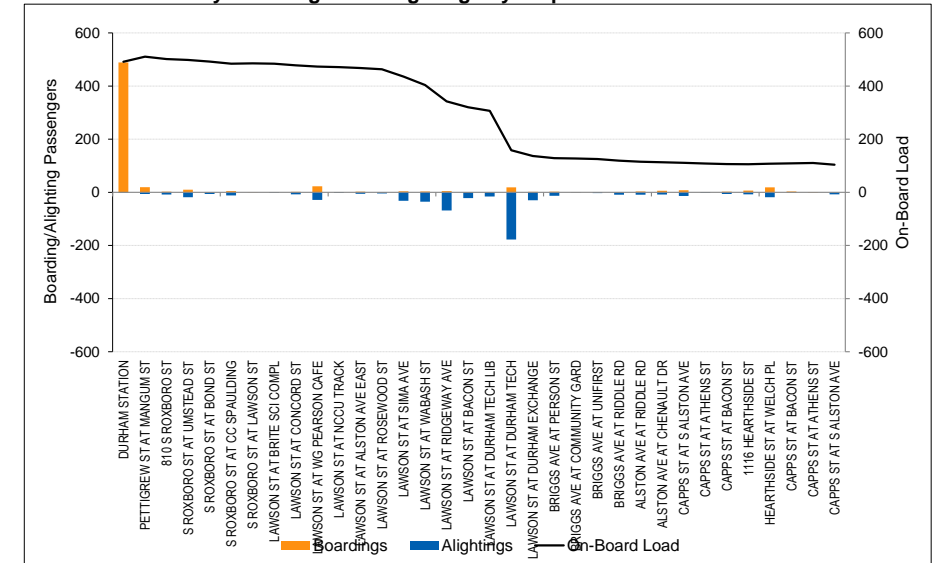
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



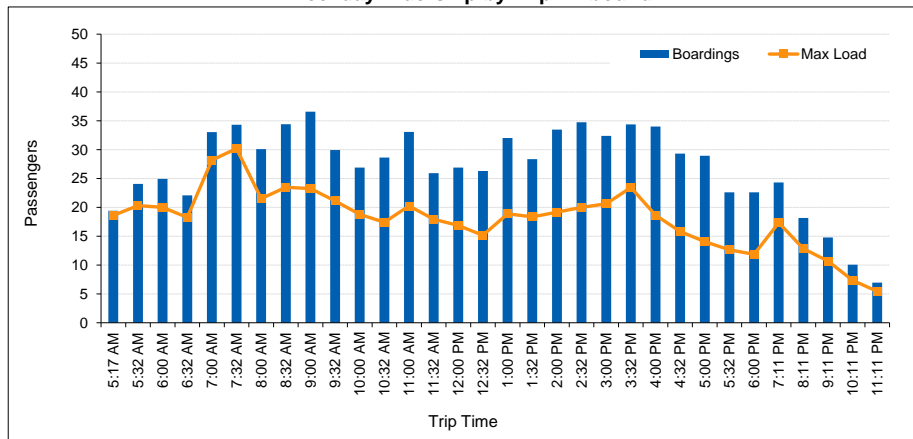
Weekday Boardings and Alightings by Stop - Outbound



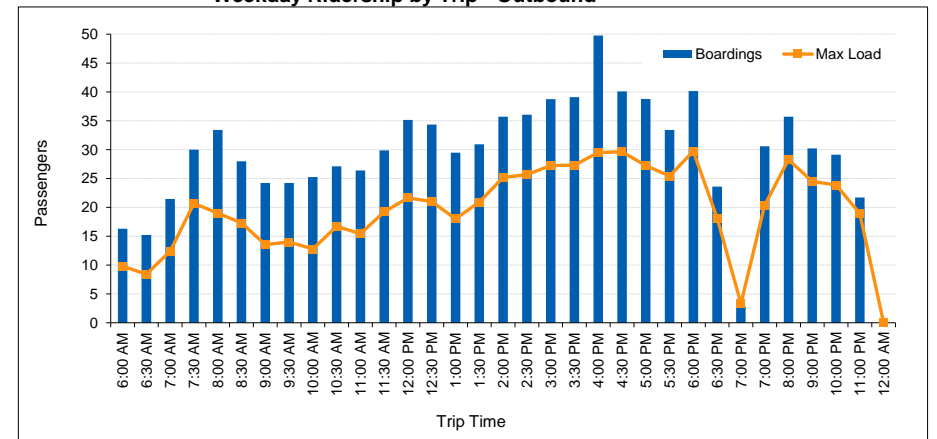
Route 9/9A/9B Weekday		Route Productivity Summary			
		Activity		Service Hours	Productivity
		Boardings	Alightings	Service Hours	Boardings per Service Hour
					
	Total	1,820	1,859	55.4	32.8
	Inbound	863	926	27.7	31.2
	Outbound	957	934	27.7	34.5
	By Segment				
1	TOM WILKINSON RD AT NORTHERN to SEVEN OAKS RD AT RIVER	86	123	4.1	20.9
2	SEVEN OAKS RD AT RIVERVIEW S to HORTON RD AT GUESS RD	158	95	7.4	21.3
3	HORTON RD AT GUESS RD to NEW CASTLE RD AT WYLDEWOOD F	106	70	3.3	32.5
4	NEW CASTLE RD AT WYLDEWOOD R to MERIWETHER DR AT PICK	129	224	7.6	17.0
5	MERIWETHER DR AT PICKWICK TR to FOUSHEE ST AT AVONDALE	445	436	17.2	25.9
6	FOUSHEE ST AT AVONDALE DR & to DURHAM STATION	896	912	15.9	56.4
	By Time Period				
	Early AM	43	47	1.5	28.7
	AM	323	322	10.7	30.2
	Midday	721	733	21.4	33.7
	PM	421	438	10.7	39.4
	Eve	198	202	6.2	32.1
	Night	113	117	5.0	23

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
637	ROXBORO ST AT HOLLOWAY ST	O
573	DOWD ST AT MANGUM ST	I
637	ROXBORO ST AT HOLLOWAY ST	O
38	MANGUM ST AT RAMSEUR ST	I
141	DOWD ST AT MANGUM ST	I
226	DOWD ST AT MANGUM ST	I
166	ROXBORO ST AT HOLLOWAY ST	O
96	ROXBORO ST AT HOLLOWAY ST	O
67	ROXBORO ST AT HOLLOWAY ST	O

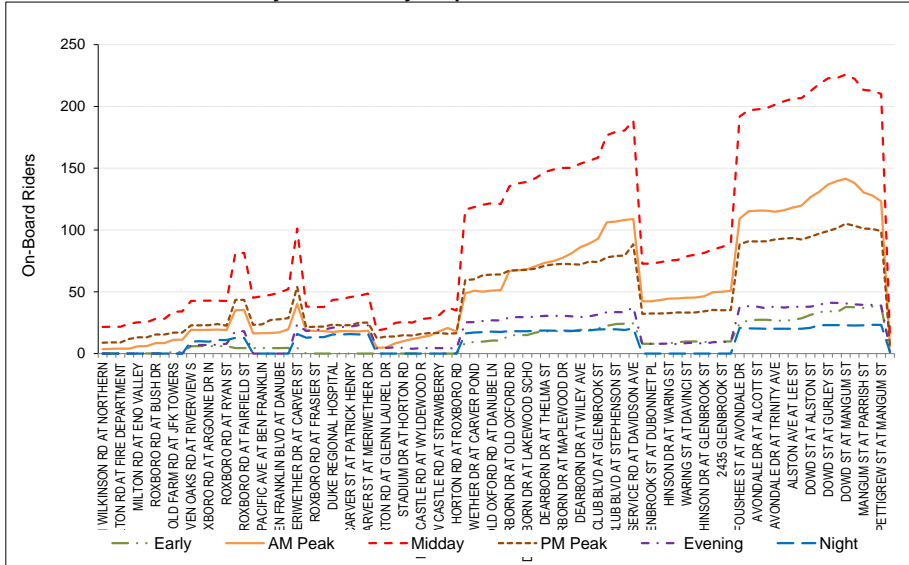
Weekday Ridership by Trip - Inbound



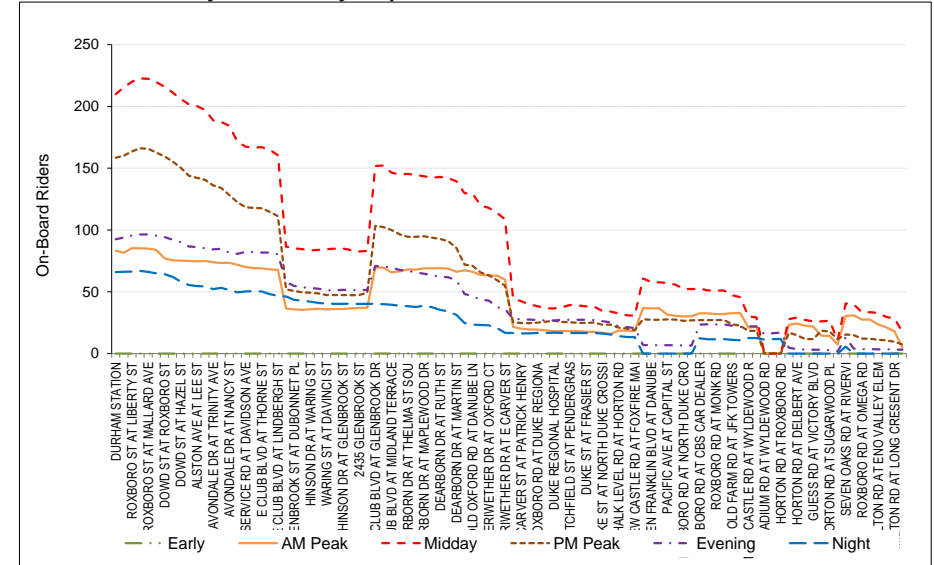
Weekday Ridership by Trip - Outbound



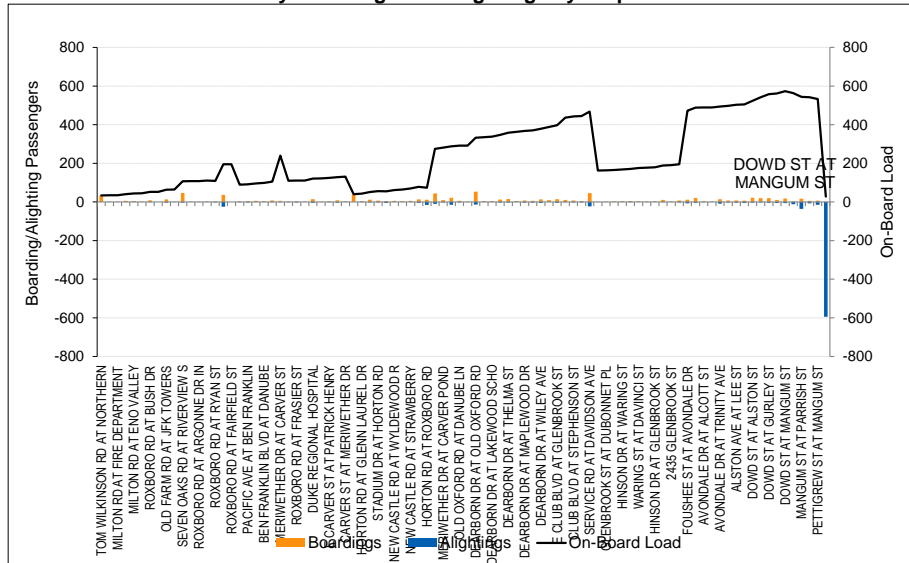
Weekday On-Board by Stop and Time Period - Inbound



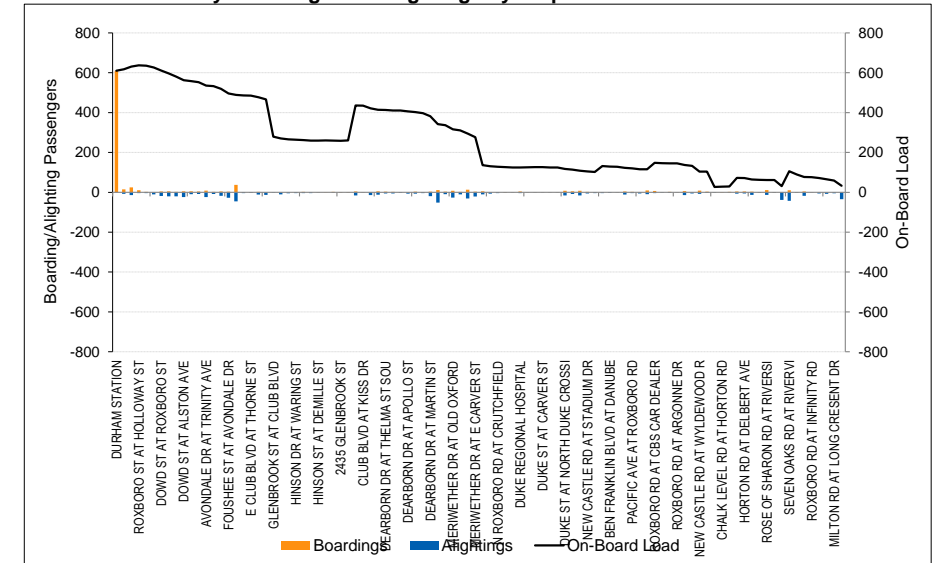
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



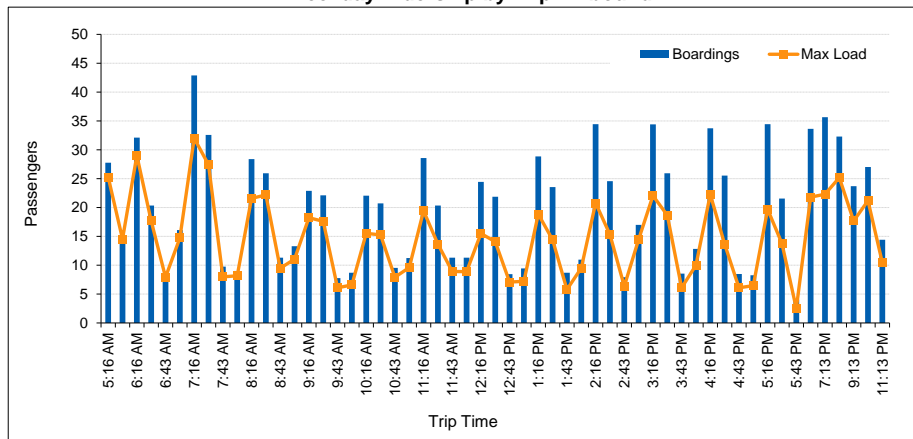
Weekday Boardings and Alightings by Stop - Outbound



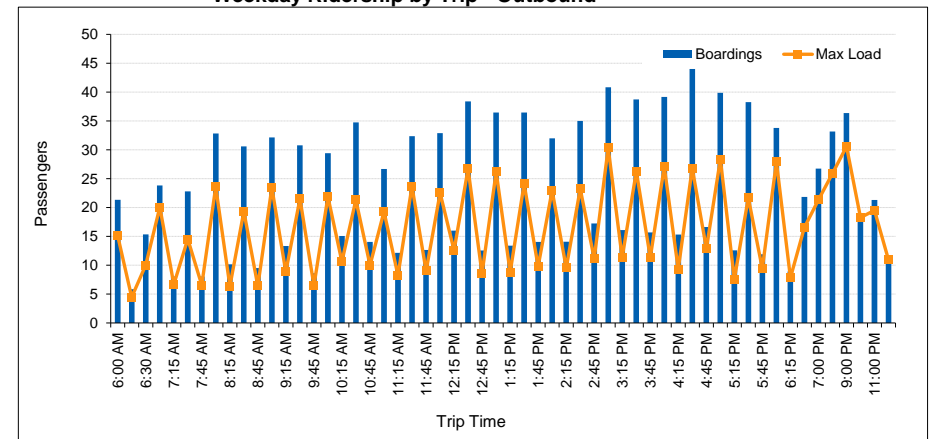
Route 10/10A/10B Weekday		Route Productivity Summary		
		Activity	Service Hours	Productivity
		Boardings	Alightings	Boardings per Service Hour
Total		2,383	2,436	66.3
Inbound		1,093	1,209	33.7
Outbound		1,290	1,227	38.2
By Segment				
1	EMERALD POND LN AT PICKETT R to NEW HOPE COMMONS	354	261	13.4
2	NEW HOPE COMMONS to MCFARLAND DR AT WITHERSPOON	166	79	5.2
3	MCFARLAND DR AT WITHERSPOON to UNIVERSITY DR AT WESTG	356	360	14.2
4	UNIVERSITY DR AT WESTGATE DR to CHAPEL HILL RD AT PALMER	315	563	14.1
5	CHAPEL HILL RD AT PALMER ST to DURHAM STATION &	1,191	1,173	19.4
By Time Period				
Early AM		28	28	0.7
AM		413	401	13.1
Midday		975	1,001	28.0
PM		567	592	14.0
Eve		248	259	6.0
Night		152	155	4.5

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
908	WILLARD ST AT BLACKWELL ST O	O
791	MOREHEAD AVE AT ARNETTE AVE	I
908	WILLARD ST AT BLACKWELL ST O	O
25	MOREHEAD AVE AT CARROLL ST I	I
189	MOREHEAD AVE AT DUKE ST	I
388	WILLARD ST AT BLACKWELL ST O	O
221	WILLARD ST AT BLACKWELL ST O	O
97	WILLARD ST AT YANCEY ST RAMA	O
79	WILLARD ST AT BLACKWELL ST O	O

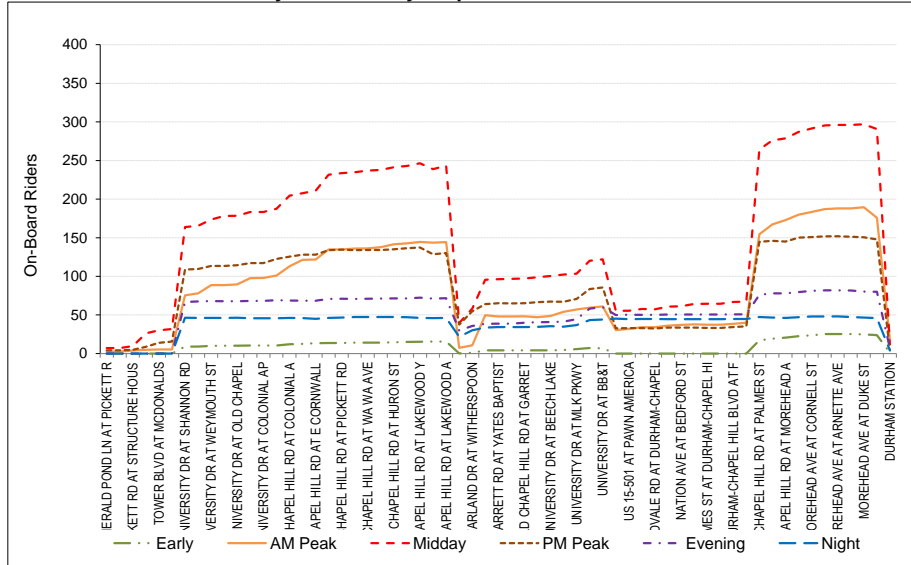
Weekday Ridership by Trip - Inbound



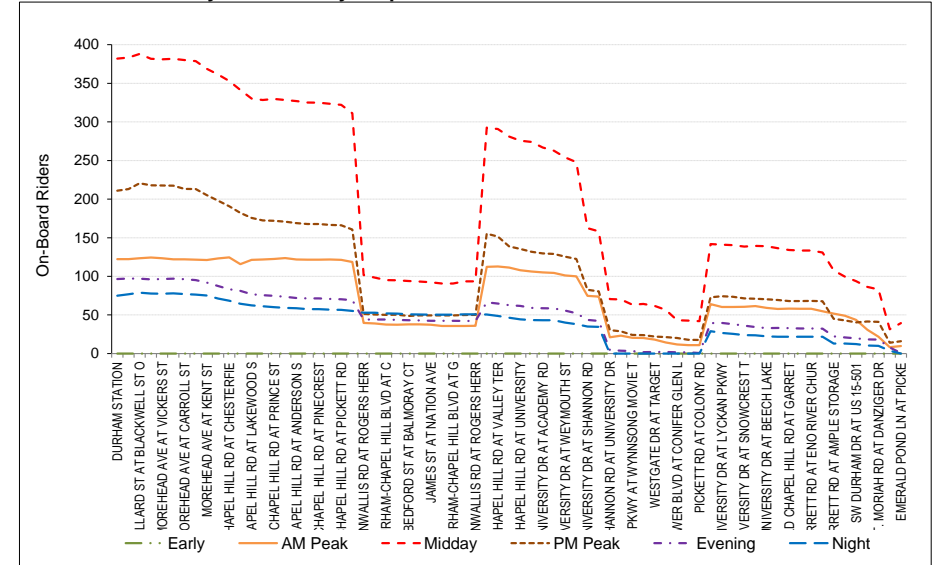
Weekday Ridership by Trip - Outbound



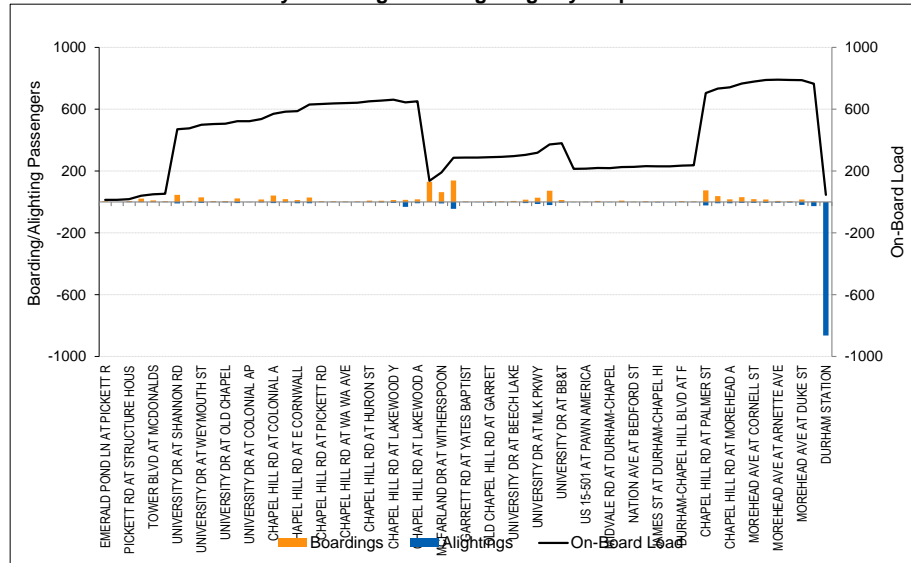
Weekday On-Board by Stop and Time Period - Inbound



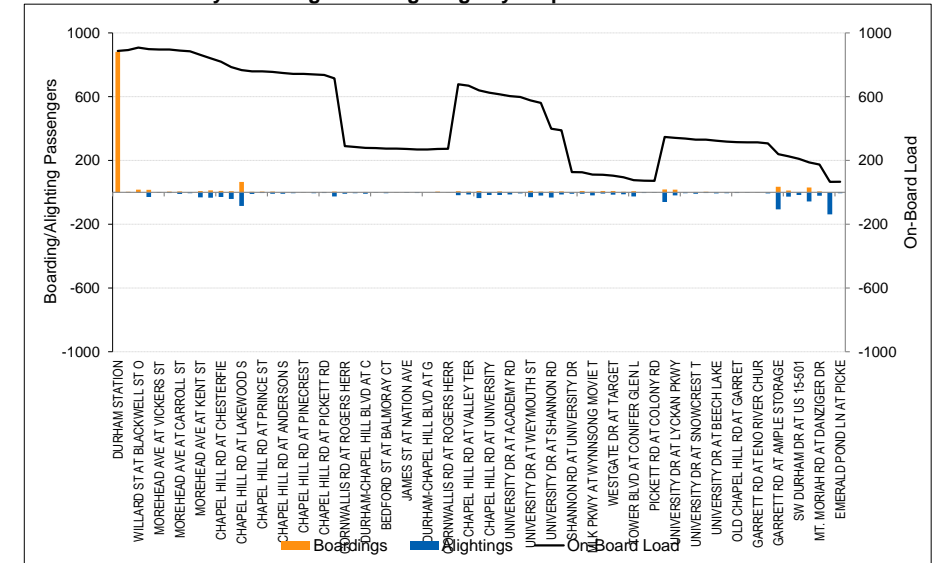
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



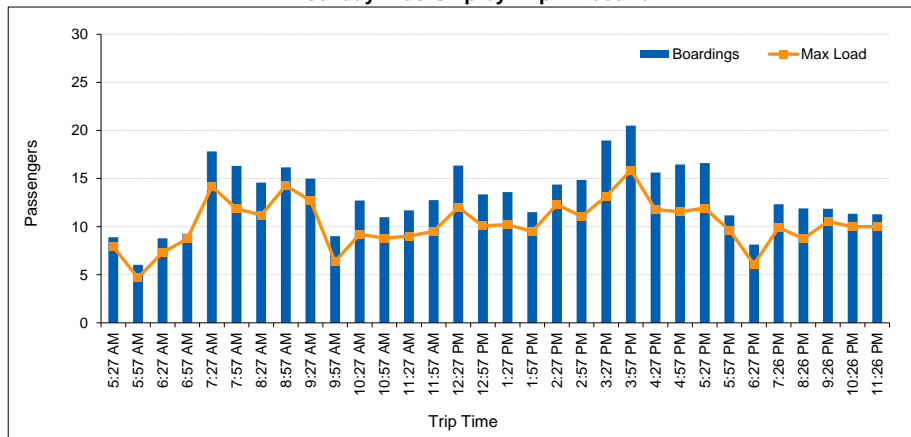
Weekday Boardings and Alightings by Stop - Outbound



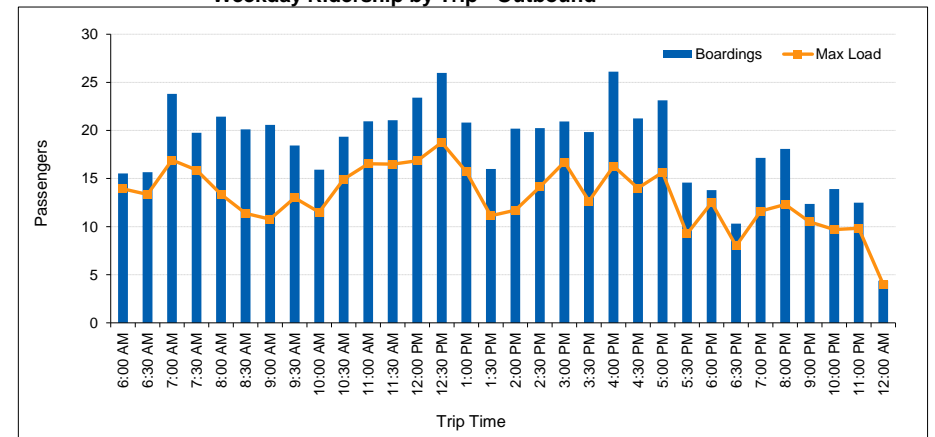
Route 11 Weekday		Route Productivity Summary			
		Activity		Service Hours	Productivity
		Boardings	Alightings	Service Hours	Boardings per Service Hour
Total		1,008	1,042	24.1	41.8
Inbound		420	537	15.0	28.0
Outbound		588	506	9.1	64.6
By Segment					
1	SPARGER RD AT FOOD LION to HILLSBOROUGH RD AT COLE MILL	15	33	0.8	17.4
2	HILLSBOROUGH RD AT COLE MILL to FULTON ST AT VA HOSPITAL	351	366	5.4	64.7
3	FULTON ST AT VA HOSPITAL to BROAD ST AT MARKHAM ST	144	157	6.9	21.0
4	BROAD ST AT MARKHAM ST to DURHAM STATION	499	486	11.0	45.3
By Time Period					
Early AM		9	10	0.5	19.1
AM		189	193	4.3	44.0
Midday		400	416	8.6	46.6
PM		229	240	4.3	53.2
Eve		103	104	3.3	31.5
Night		78	79	3.2	24

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
398	MAIN ST AT GREGSON ST	O
318	GREEN ST AT BERKELEY ST	I
398	MAIN ST AT GREGSON ST	O
8	HILLSBOROUGH RD AT HILLANDAL	I
81	DURHAM STATION	O
168	GREEN ST AT BERKELEY ST	O
83	DURHAM STATION	O
42	HILLSBOROUGH RD AT HILLANDAL	O
33	GREEN ST AT LANCASTER ST	O

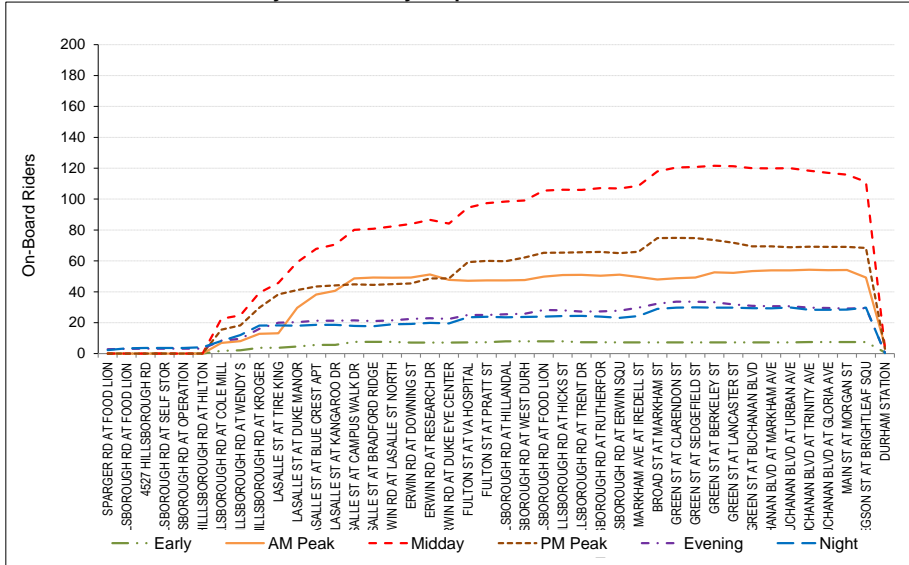
Weekday Ridership by Trip - Inbound



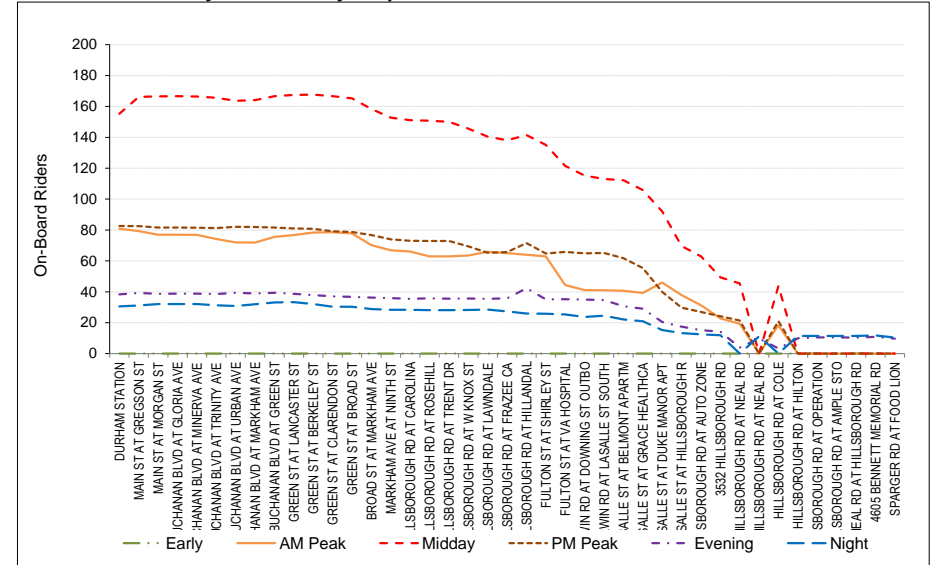
Weekday Ridership by Trip - Outbound



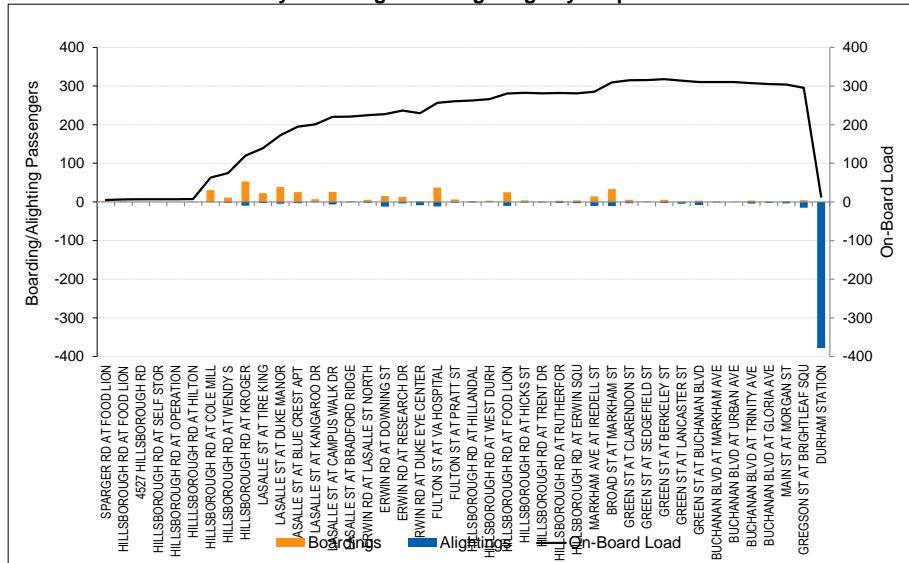
Weekday On-Board by Stop and Time Period - Inbound



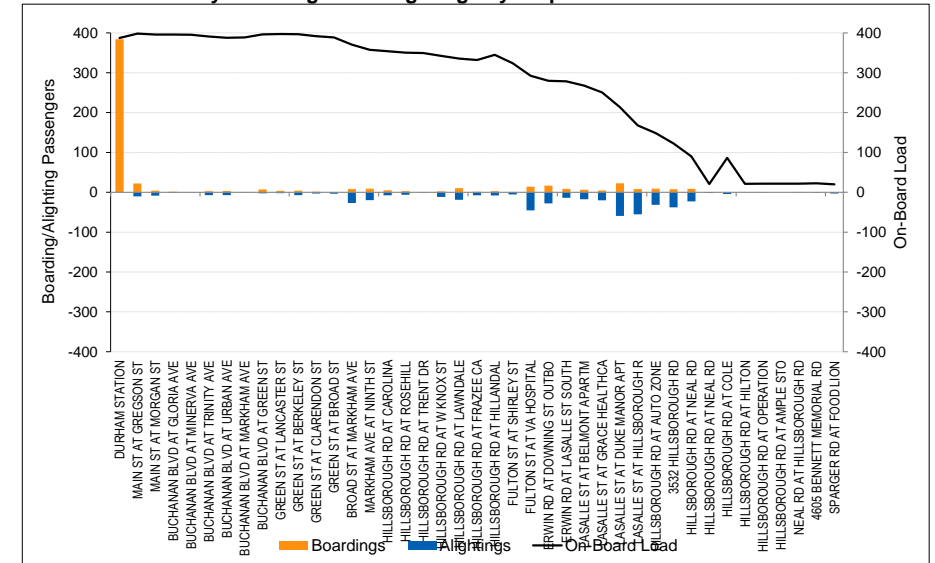
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



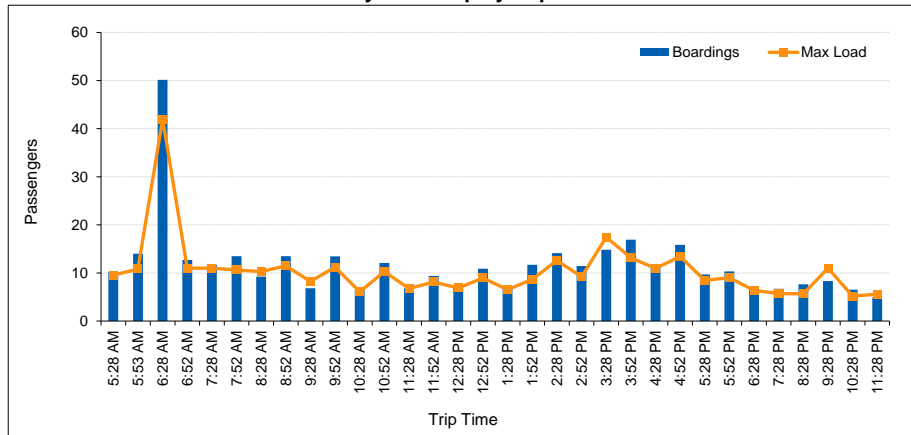
Weekday Boardings and Alightings by Stop - Outbound



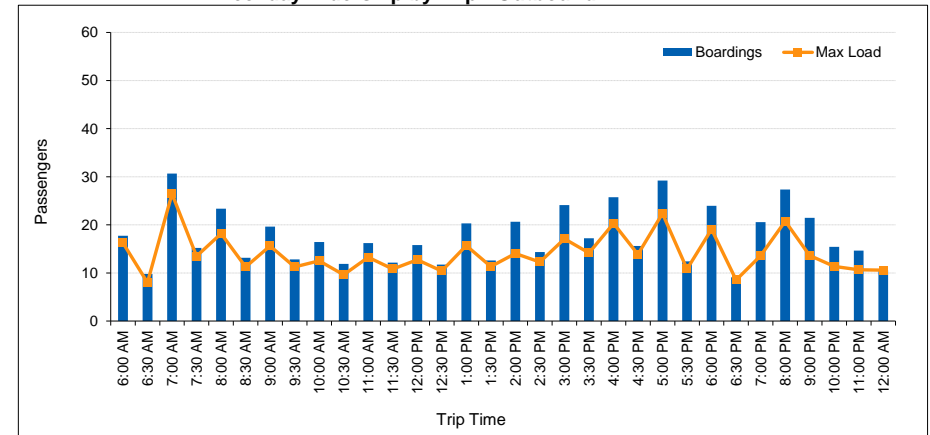
Route 12/12B Weekday		Route Productivity Summary		
		Activity	Service Hours	Productivity
		Boardings	Alightings	Service Hours
				Boardings per Service Hour
Total		934	941	28.9
Inbound		372	539	15.7
Outbound		562	401	13.2
By Segment				
1	NC 55 AT SEDWICK DR to NC 54 AT S ALSTON AVE WESTBO	32	58	1.5
2	NC 54 AT S ALSTON AVE WESTBO to NC 55 AT ALSTON AVE NCCU	304	329	15.1
3	NC 55 AT ALSTON AVE NCCU to DURHAM STATION	597	553	12.3
By Time Period				
Early AM		10	17	0.5
AM		221	191	5.4
Midday		304	313	10.8
PM		204	214	5.4
Eve		112	119	3.6
Night		82	87	3.2

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
434	DURHAM STATION	O
291	ALSTON AVE AT DURHAM FREEWAY	I
434	DURHAM STATION	O
10	ALSTON AVE AT DURHAM FREEWAY	I
87	NC 55 AT MARTIN LUTHER KING	O
148	DURHAM STATION	O
99	DURHAM STATION	O
62	DURHAM STATION	O
45	DURHAM STATION	O

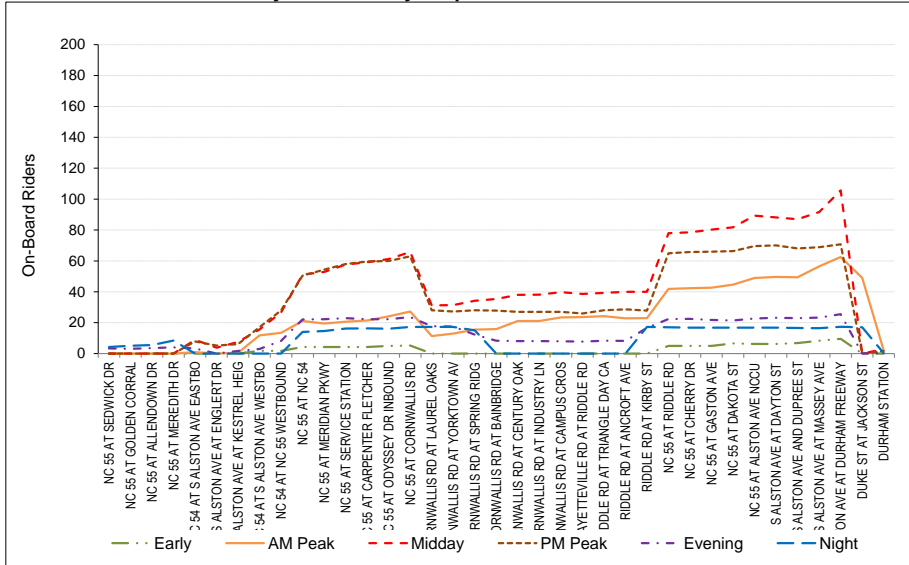
Weekday Ridership by Trip - Inbound



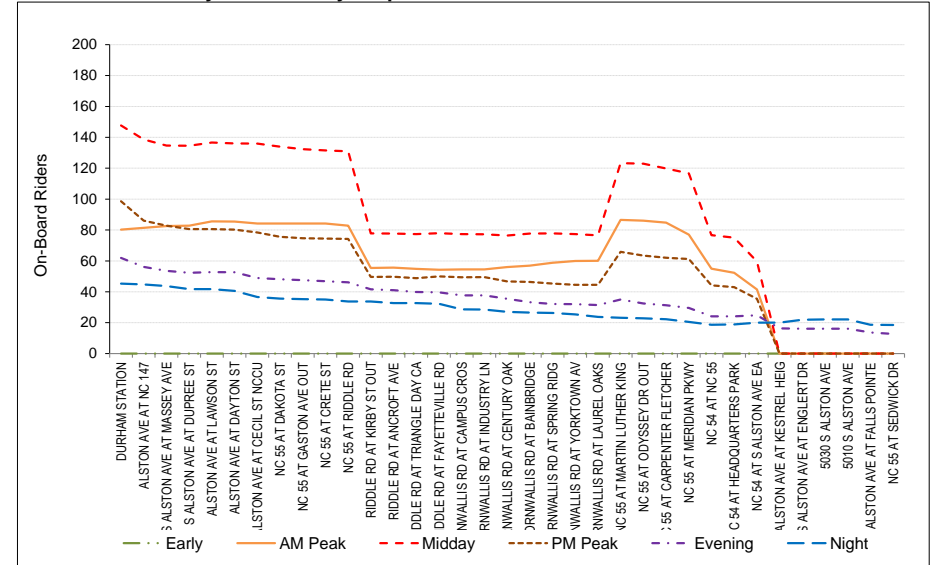
Weekday Ridership by Trip - Outbound



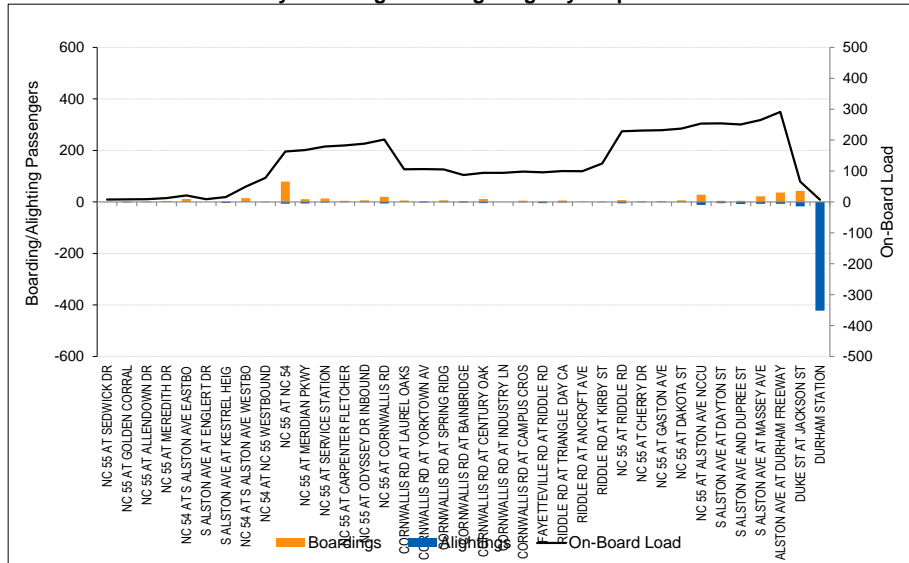
Weekday On-Board by Stop and Time Period - Inbound



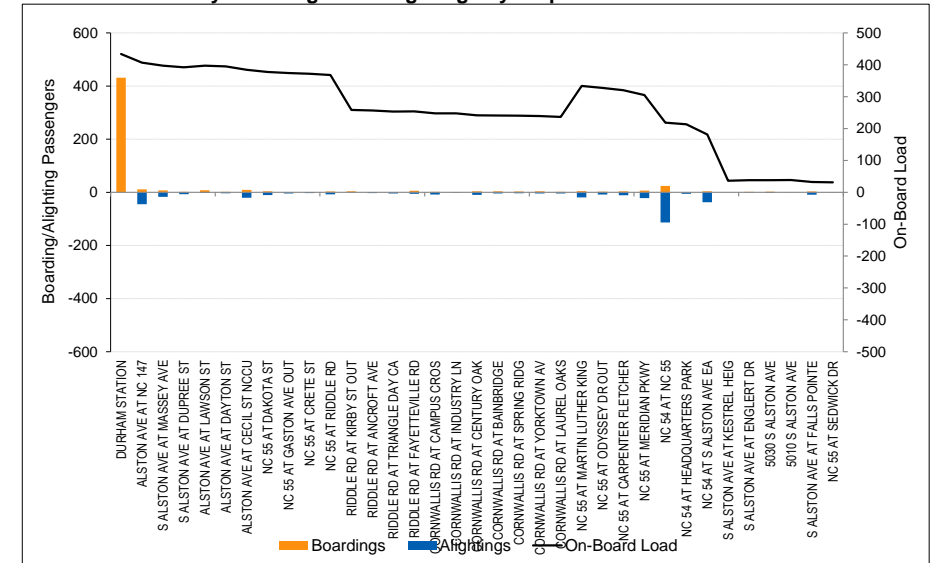
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



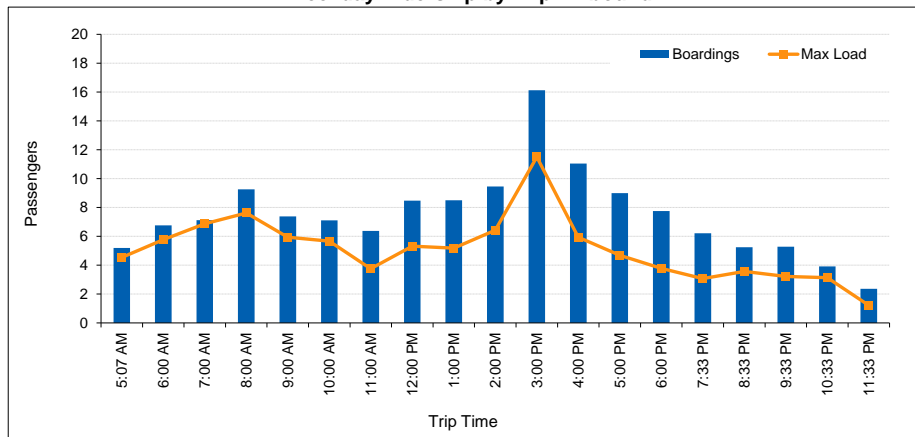
Weekday Boardings and Alightings by Stop - Outbound



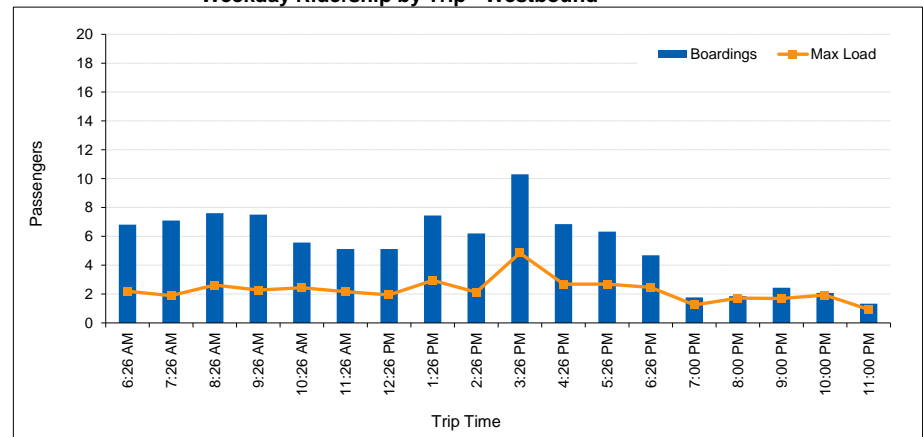
Route 14 Weekday		Route Productivity Summary			
		Activity		Service Hours	Productivity
		Boardings	Alightings	Service Hours	Boardings per Service Hour
	Total	239	250	17.3	13.8
	Eastbound	143	77	8.7	16.5
	Westbound	96	172	8.6	11.2
	By Segment				
1	STREETS AT SOUTHPOINT CINEMA to NC 55 AT SEDWICK DR EB	118	129	13.0	9.1
2	NC 55 AT SEDWICK DR EB to NC 54 AT S ALSTON AVE WE	120	121	4.3	28.1
	By Time Period				
	Early AM	5	1	0.4	14.9
	AM	45	54	3.1	14.4
	Midday	84	83	6.2	13.6
	PM	60	60	3.1	19.2
	Eve	28	31	2.4	11.3
	Night	17	20	2.1	8

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
89	S ALSTON AVE AT KESTREL HEIG	E
89	S ALSTON AVE AT KESTREL HEIG	E
29	NC 54 AT PINE GLENN TRAIL	W
5	5010 S ALSTON AVE	E
20	5030 S ALSTON AVE	E
32	S ALSTON AVE AT KESTREL HEIG	E
22	S ALSTON AVE AT KESTREL HEIG	E
10	NC 54 AT WAFFLE HOUSE	E
7	HOPE VALLEY COMMONS PARK-AND	E

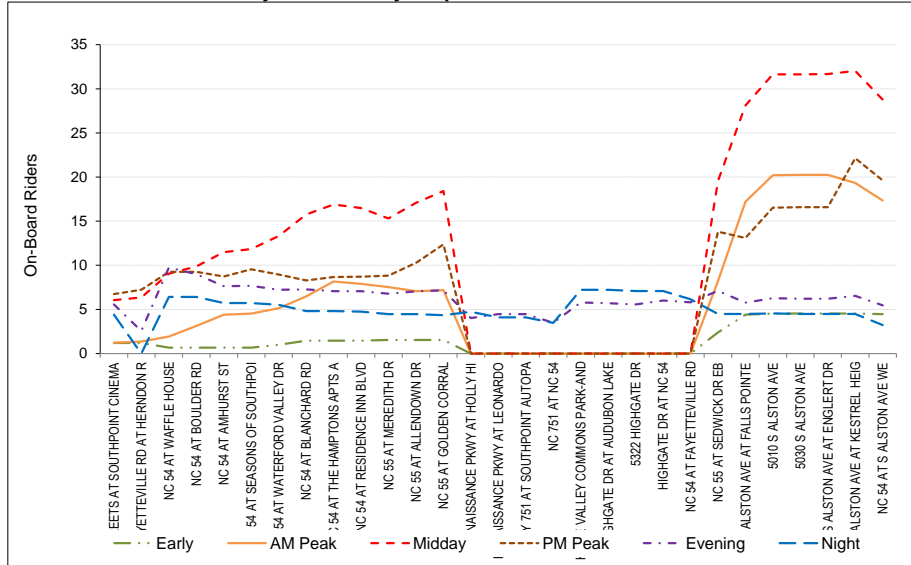
Weekday Ridership by Trip - Inbound



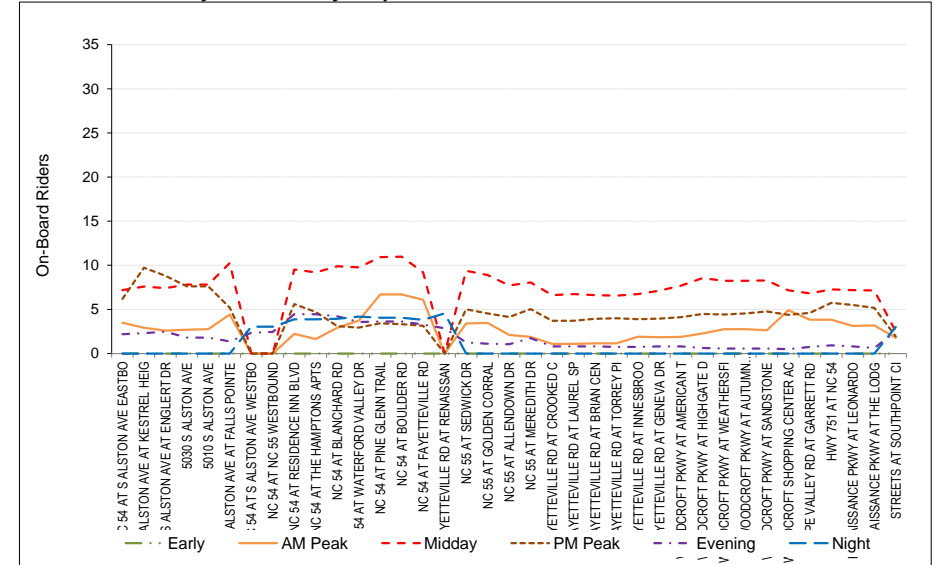
Weekday Ridership by Trip - Westbound



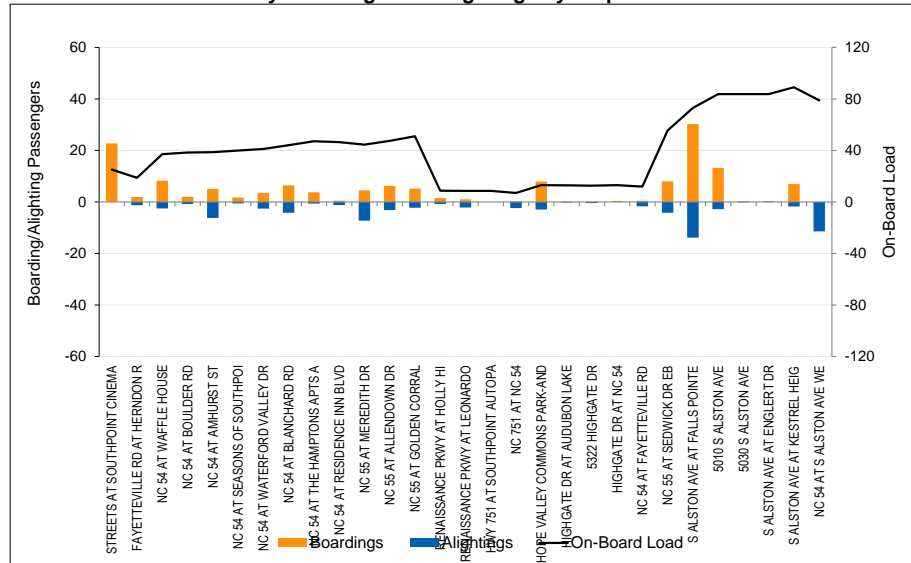
Weekday On-Board by Stop and Time Period - Eastbound



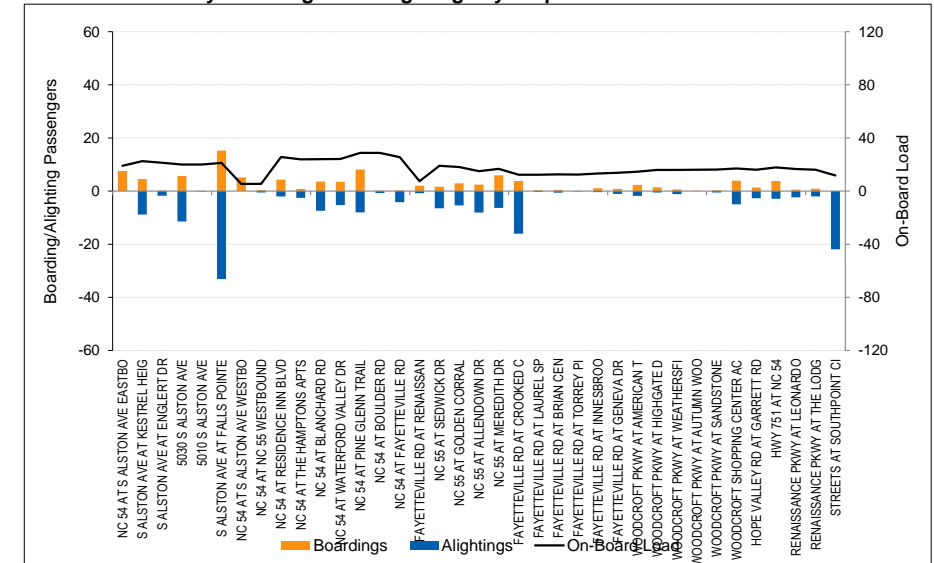
Weekday On-Board by Stop and Time Period - Westbound




Weekday Boardings and Alightings by Stop - Eastbound



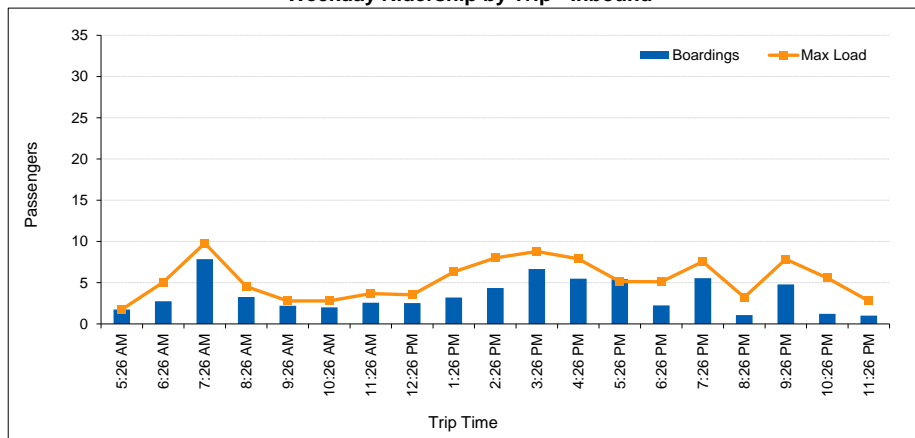
Weekday Boardings and Alightings by Stop - Westbound



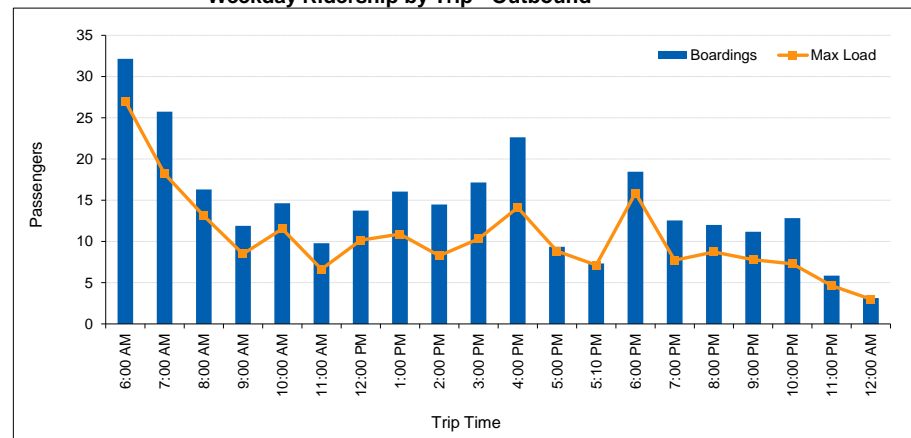
Route 15 Weekday		Route Productivity Summary			
		Activity		Service Hours	Productivity
		Boardings	Alightings	Service Hours	Boardings per Service Hour
					
	Total	353	368	17.7	20.0
	Inbound	66	191	9.2	7.2
	Outbound	287	176	8.5	33.8
By Segment					
1	TW ALEXANDER DR AT WAKEMED A to MIAMI BLVD AT TW ALEXAN	113	165	6.6	17.1
2	MIAMI BLVD AT TW ALEXANDER D to DURHAM STATION	240	203	11.1	21.7
By Time Period					
	Early AM	2	4	0.5	3.6
	AM	88	90	2.8	32.0
	Midday	97	101	5.5	17.7
	PM	74	78	3.0	24.5
	Eve	52	55	2.8	18.9
	Night	40	39	3.2	13

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
195	DURHAM STATION	O
101	ELLIS RD AT RESEARCH TRIANGL	I
195	DURHAM STATION	O
2	MIAMI BLVD AT TW ALEXANDER D	I
58	DURHAM STATION	O
56	DURHAM STATION	O
33	DURHAM STATION	O
32	ELLIS RD AT RESEARCH TRIANGL	O
21	BRIER CREEK PKWY AT SKYLAND	O

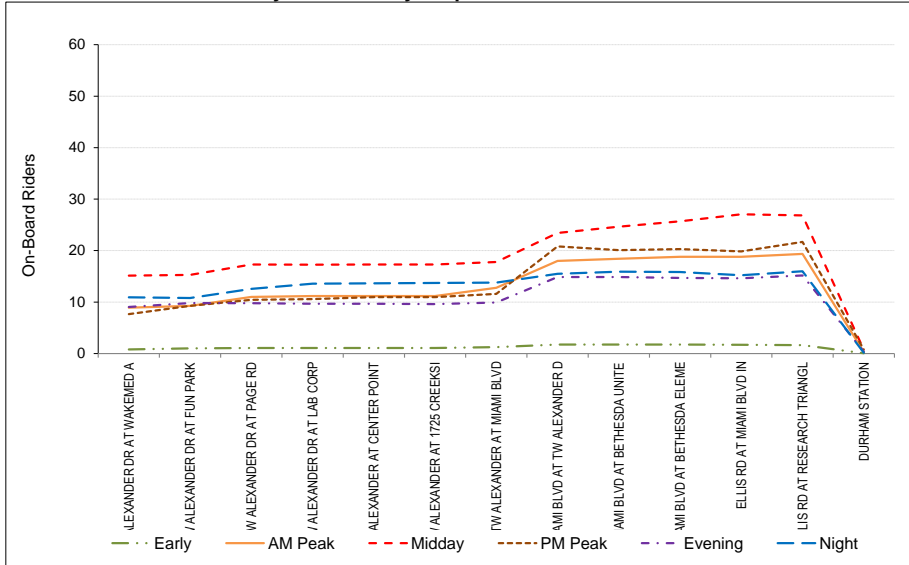
Weekday Ridership by Trip - Inbound



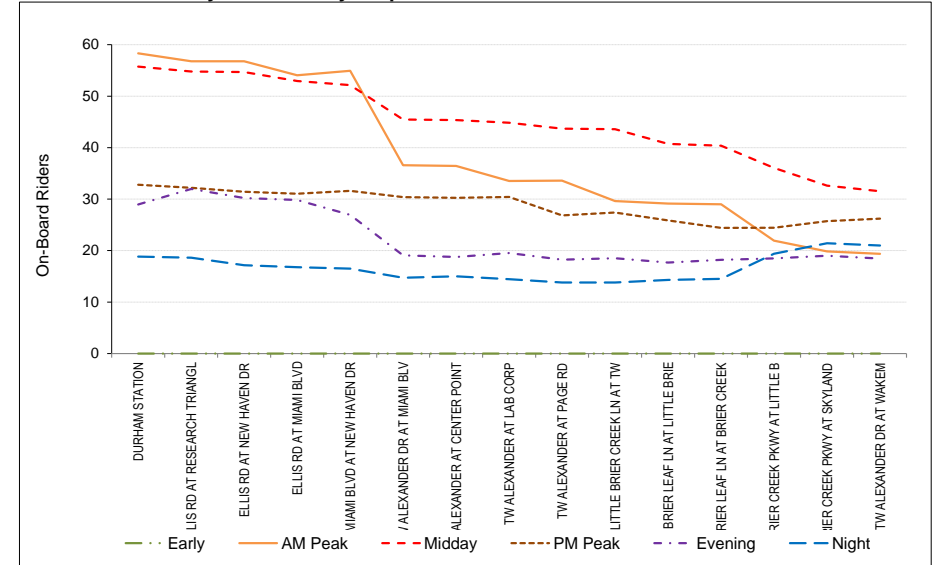
Weekday Ridership by Trip - Outbound



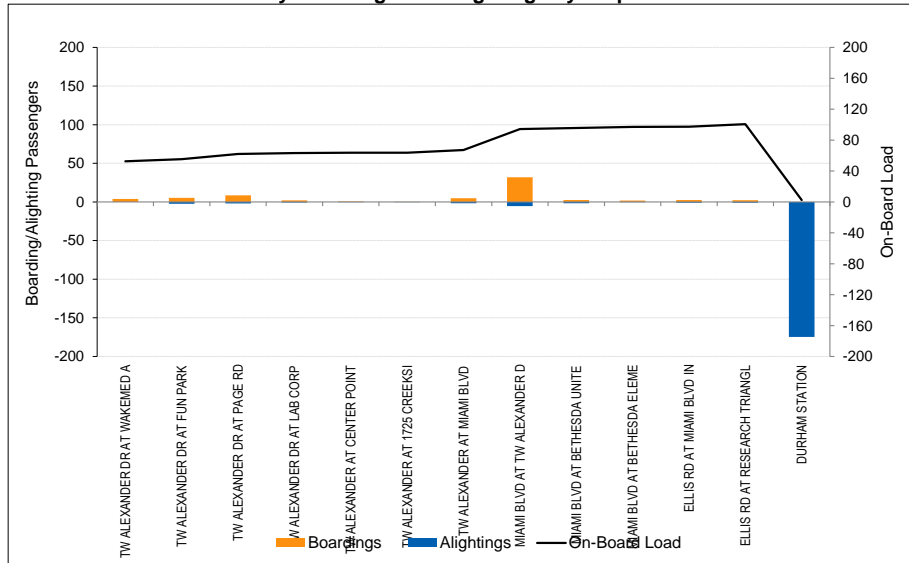
Weekday On-Board by Stop and Time Period - Inbound



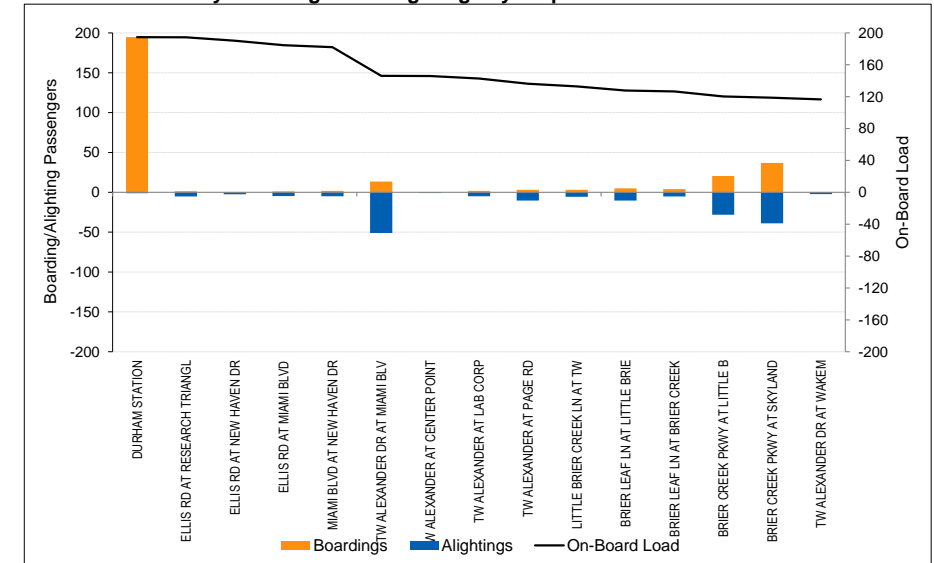
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



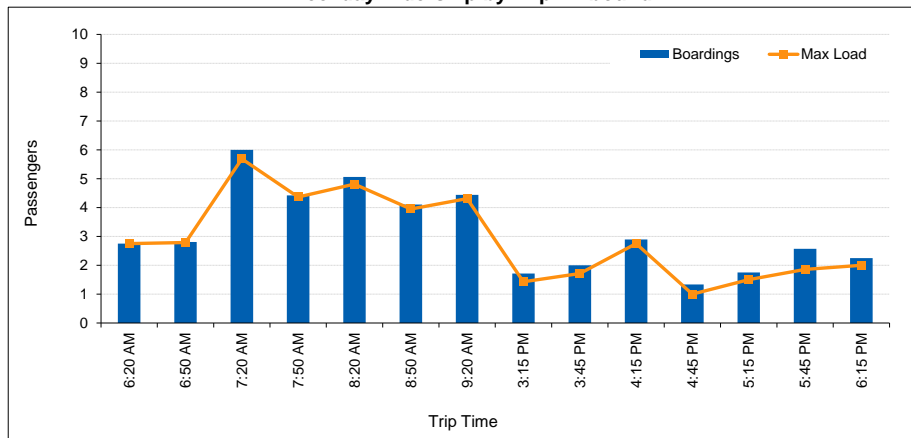
Weekday Boardings and Alightings by Stop - Outbound



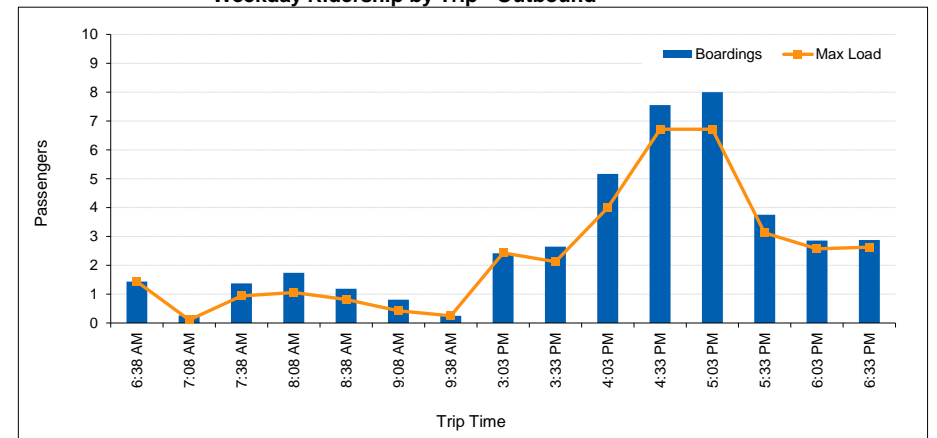
Route 20 Weekday		Route Productivity Summary			
		Activity		Service Hours	Productivity
		Boardings	Alightings	Service Hours	Boardings per Service Hour
					
Total		86	83	13.5	6.4
Inbound		44	18	4.2	10.5
Outbound		42	65	9.3	4.6
By Segment					
1	HOPE VALLEY COMMONS PARK-AND to UNIVERSITY DR AT WESTGATE DR	32	34	5.8	5.5
2	UNIVERSITY DR AT WESTGATE DR to CAMERON BLVD AT SCIENCE PARK	54	49	7.6	7.1
By Time Period					
AM		31	29	4.9	6.4
Midday		5	6	1.5	3.6
PM		42	40	5.5	7.6
Eve		8	8	1.5	5.2

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
36	UNIVERSITY DR AT WEYMOUTH ST	I
36	UNIVERSITY DR AT WEYMOUTH ST	I
31	FLOWERS DR AT DUKE GARDEN IN	O
24	UNIVERSITY DR AT WEYMOUTH ST	I
4	UNIVERSITY DR AT WEYMOUTH ST	I
25	FLOWERS DR AT DUKE GARDEN IN	O
5	FLOWERS DR AT DUKE GARDEN IN	O

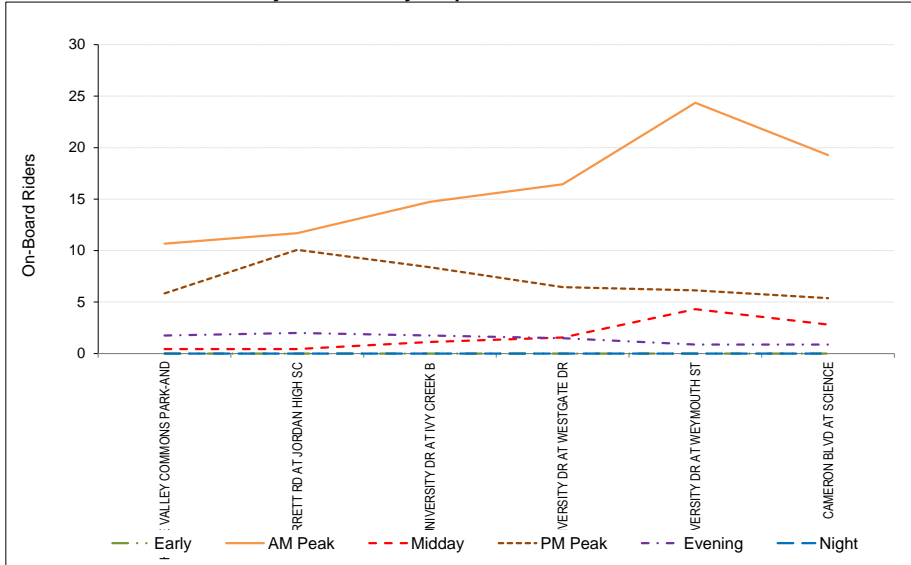
Weekday Ridership by Trip - Inbound



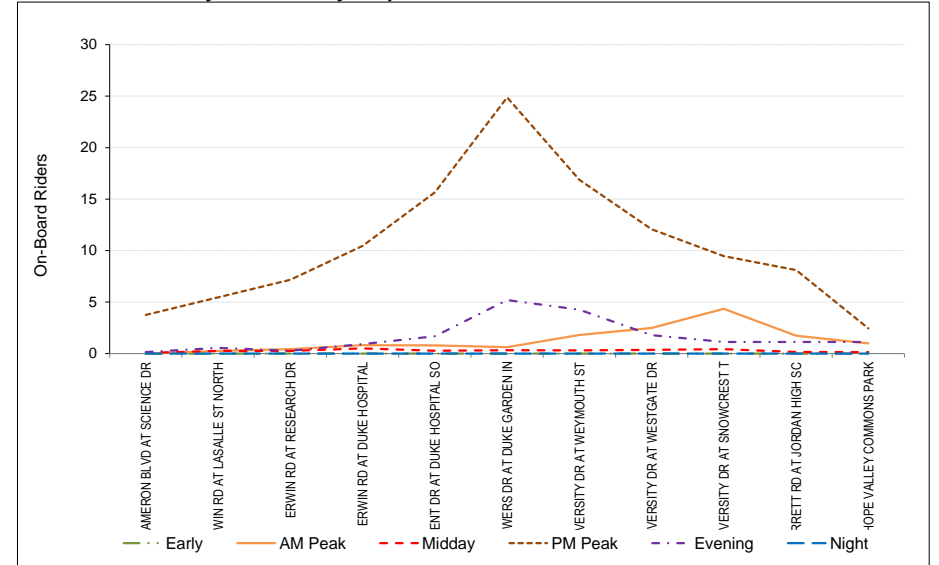
Weekday Ridership by Trip - Outbound



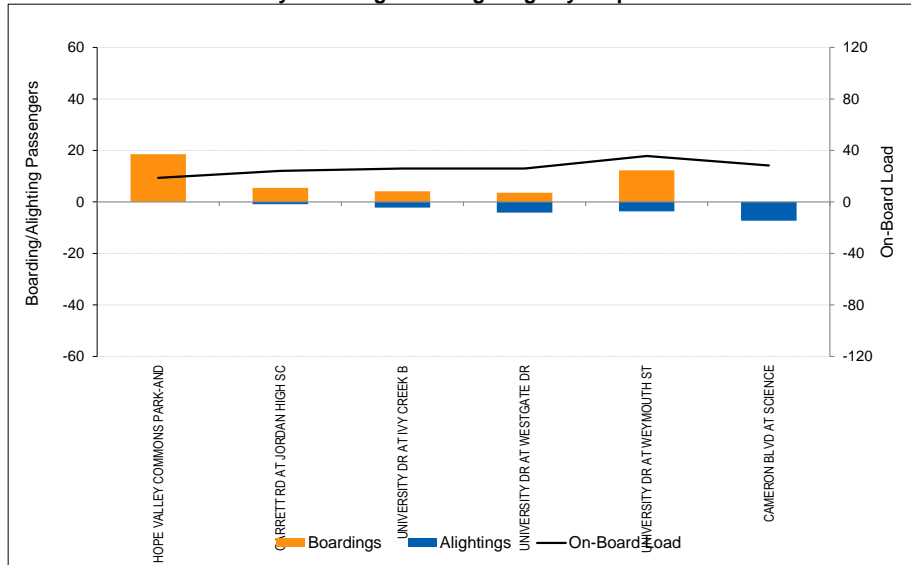
Weekday On-Board by Stop and Time Period - Inbound



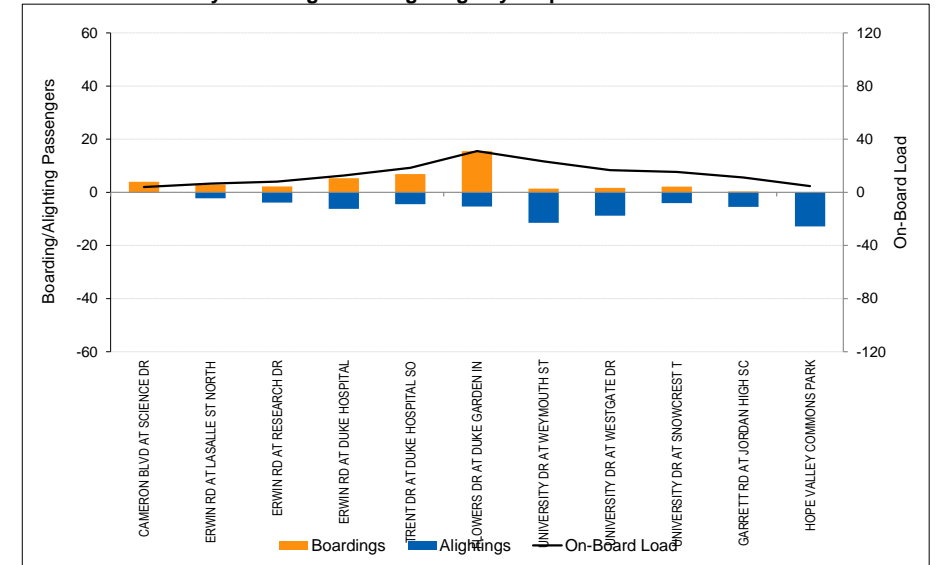
Weekday On-Board by Stop and Time Period - Outbound




Weekday Boardings and Alightings by Stop - Inbound



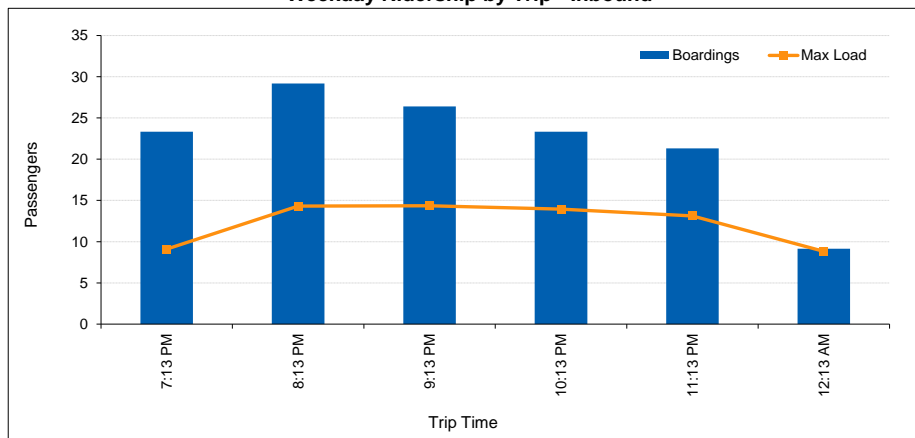
Weekday Boardings and Alightings by Stop - Outbound



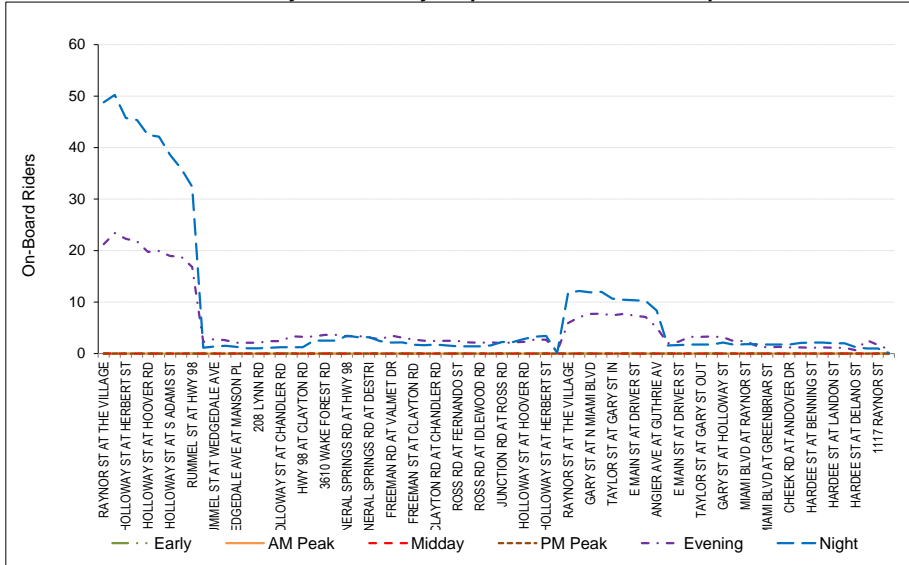
Route 23 Weekday		Route Productivity Summary			
		Activity		Service Hours	Productivity
		Boardings	Alightings	Service Hours	Boardings per Service Hour
					
	Total	133	130	5.2	25.5
	Loop	133	130	5.2	25.5
	By Segment				
1	RAYNOR ST AT THE VILLAGE to RUMMEL ST AT HWY 98	77	22	0.5	154.2
2	RUMMEL ST AT HWY 98 to FREEMAN ST AT CLAYTON RD	14	37	1.0	14.5
3	FREEMAN ST AT CLAYTON RD to RAYNOR ST AT THE VILLAGE	7	8	1.2	5.6
4	RAYNOR ST AT THE VILLAGE to ANGIER AVE AT GUTHRIE AV	23	35	1.3	18.1
5	ANGIER AVE AT GUTHRIE AV to MIAMI BLVD AT RAYNOR ST &	7	8	0.6	12.1
6	MIAMI BLVD AT RAYNOR ST & to RAYNOR ST AT THE VILLAGE	5	19	0.7	7.0
	By Time Period				
	Eve	53	52	1.9	27.6
	Night	80	79	3.3	24

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
74	MIAMI BLVD AT HOLLOWAY ST	L
74	MIAMI BLVD AT HOLLOWAY ST	L
23	MIAMI BLVD AT HOLLOWAY ST	L
50	MIAMI BLVD AT HOLLOWAY ST	L

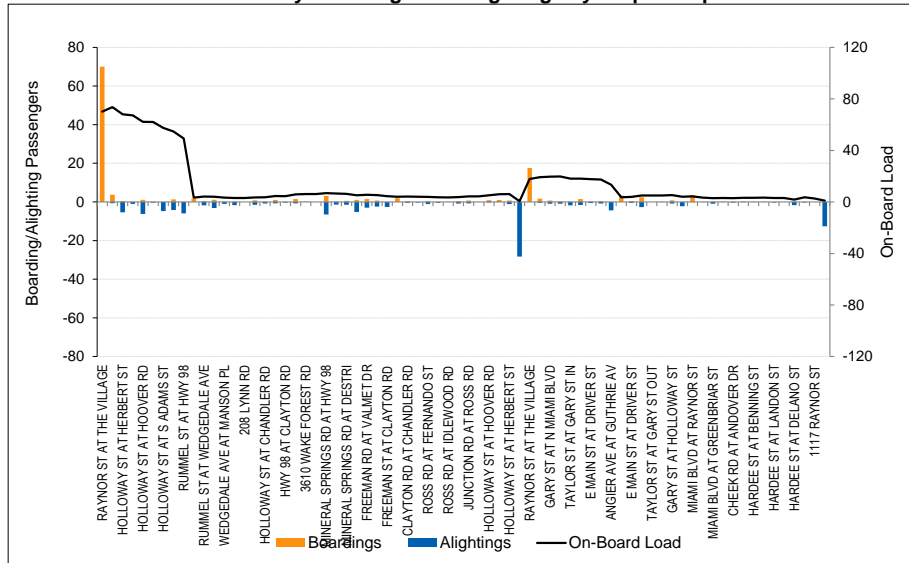
Weekday Ridership by Trip - Inbound




Weekday On-Board by Stop and Time Period - Loop



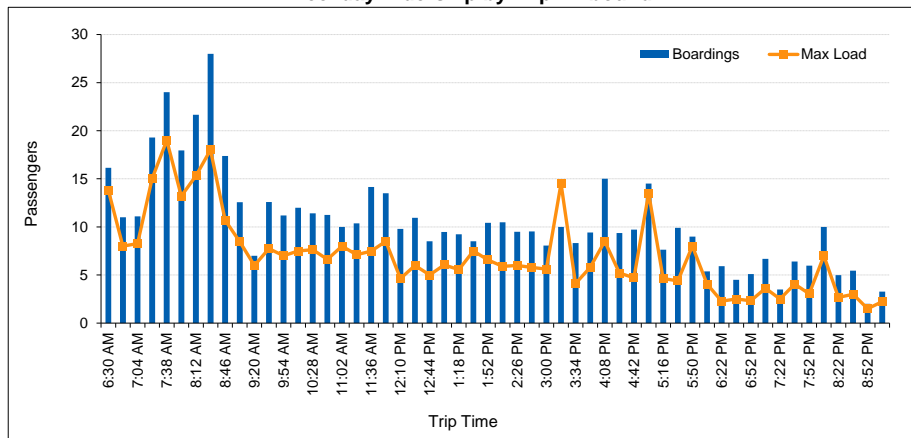
Weekday Boardings and Alightings by Stop - Loop



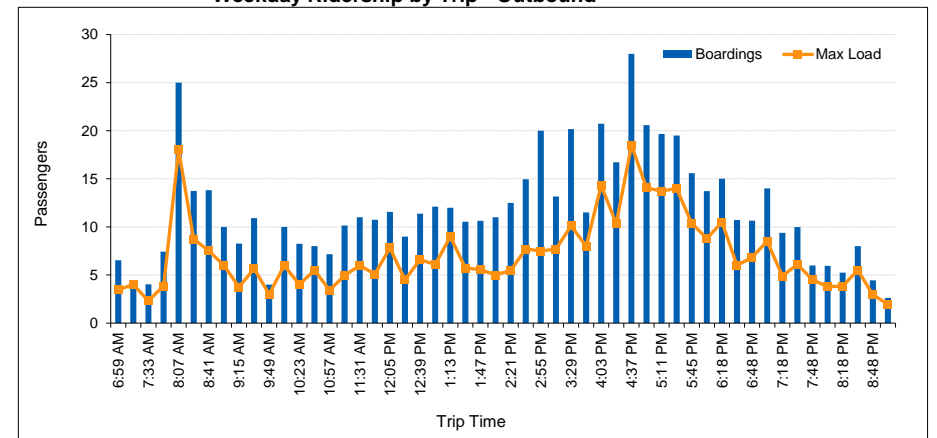
Route BCC Weekday		Route Productivity Summary		
		Activity	Service Hours	Productivity
		Boardings	Alightings	Boardings per Service Hour
Total		1,179	1,174	38.7
Inbound		569	615	20.3
Outbound		610	559	18.4
By Segment				
1 MAIN ST AT GOLDEN BELT to MAIN ST AT IREDELL ST		653	666	21.5
2 MAIN ST AT IREDELL ST to RESEARCH DR AT CIRCUIT D		526	508	17.2
By Time Period				
AM		241	231	6.0
Midday		436	446	15.8
PM		308	301	7.9
Eve		186	187	8.0
Night		8	8	1.0

Route Operations Summary		
On-Board Load		
Max Passengers On Board	Max Load Location	Direction
341	MAIN ST AT SWIFT AVE	O
318	MAIN ST AT CAMPUS DR	I
341	MAIN ST AT SWIFT AVE	O
104	MAIN ST AT CAMPUS DR	I
128	E MAIN ST AT MANGUM ST	I
121	MAIN ST AT SWIFT AVE	O
65	MAIN ST AT SWIFT AVE	O
3	MAIN ST AT WEST VILLAGE	I

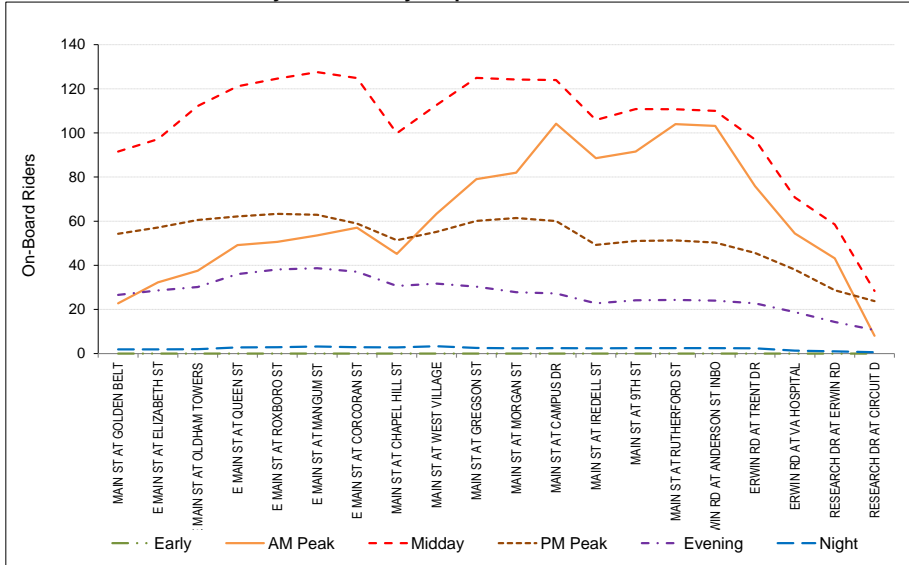
Weekday Ridership by Trip - Inbound



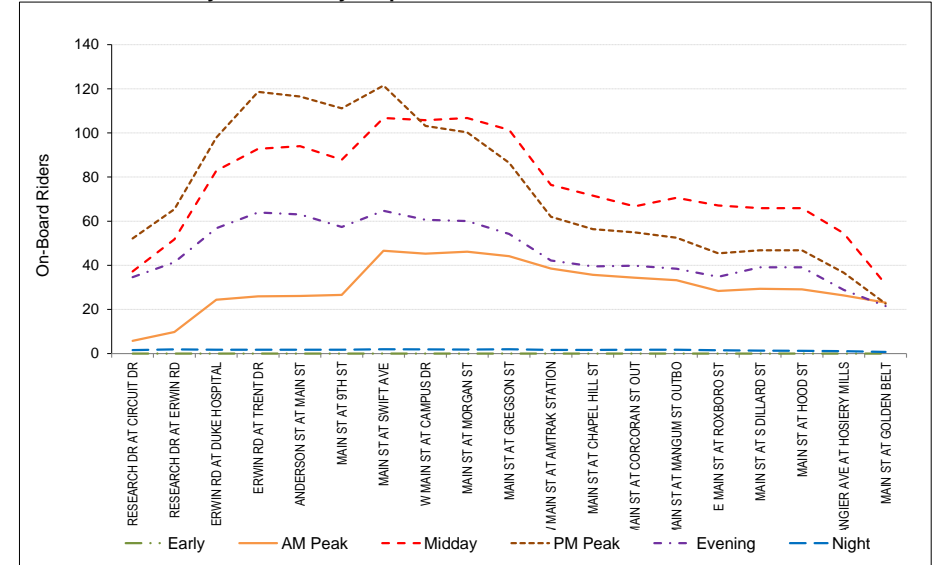
Weekday Ridership by Trip - Outbound



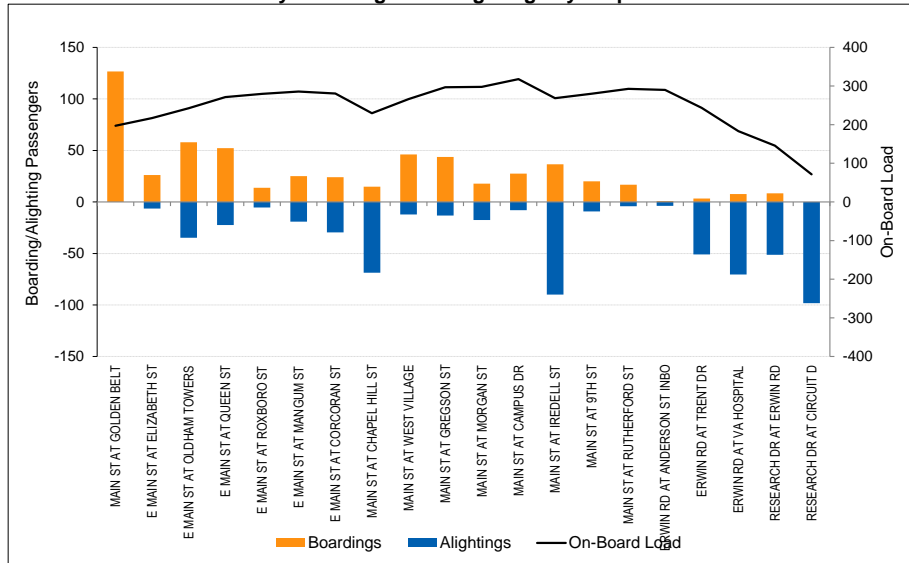
Weekday On-Board by Stop and Time Period - Inbound



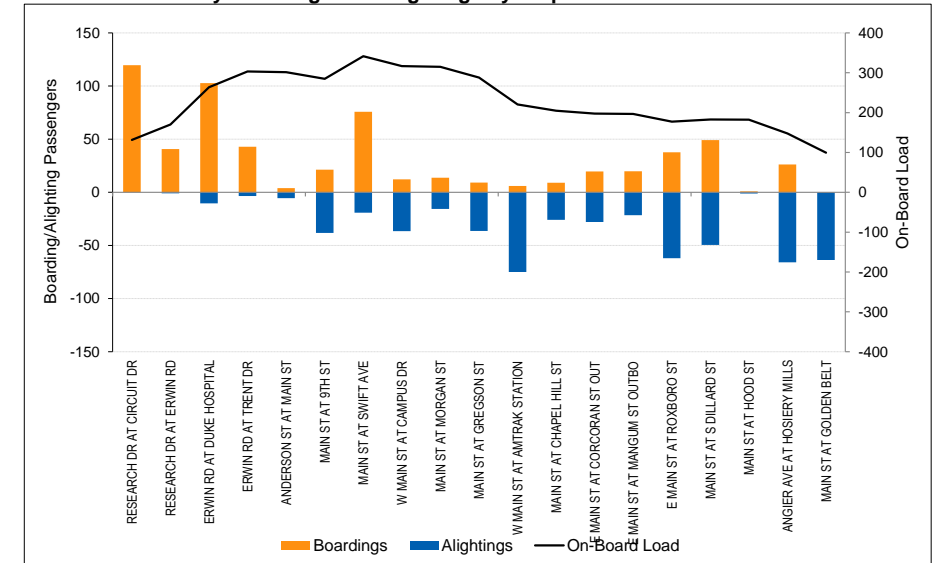
Weekday On-Board by Stop and Time Period - Outbound



Weekday Boardings and Alightings by Stop - Inbound



Weekday Boardings and Alightings by Stop - Outbound



Appendix C

Phase I Public Outreach Survey Results

This Appendix provides an overview of the key themes and takeaways from public comments on the GoDurham Short Range Transit Plan survey. The GoDurham online survey was open for public comment from September 22, 2017 to October 20, 2017. Nearly 950 responses were gathered. The verbatim open-ended comments from the survey are attached to this memo as an appendix. These comments include responses related to ridership behavior, desired improvements and service changes, home and work locations, and general open-ended comments.

Key Findings

- The highest priority improvements for non-transit users are more direct service, service closer to their homes, and more park-and-ride availability
- The highest priority improvements for current transit users are improved daytime frequency (Monday-Saturday), later evening service, and improved nighttime frequency (Sunday).
- The primary reasons respondents do not regularly take transit is because the routes aren't convenient or they take too long.
- The college aged and retired populations are more likely to take transit out of necessity, while the professional and young professional populations take transit for financial reasons or for personal preferences.
- GoDurham users ride transit primarily out of personal preference or necessity and highest priorities are increasing service frequency. GoTriangle users are more likely to take transit for financial reasons and prioritize faster travel times and more direct service.

Short Range Transportation Plan Survey

Survey respondents were asked a variety of questions regarding their current transportation behaviors, preferences for transit, desired improvements, and general demographic information. These responses will be used to identify how Durham area residents choose to travel, what their preferences are for improving transit service, and to inform proposed service improvement strategies for the agency.

Survey Results

Overall Results

Overall, 949 people responded to the GoDurham Survey. These respondents were asked to identify which transit routes they use most often, shown in Figure 1. The three most commonly selected routes were GoTriangle's Route 400 (26%), Route 800 (21%), and DRX (18%). GoDurham's most commonly used routes were Route 10 (16%) and Route 5 (15%) providing service from Durham Station west to University Place and New Hope Commons and south to Southpoint Crossing and the Streets at Southpoint, respectively.

The top three reasons cited by respondents for using transit, shown in Figure 2, were to save money (46%), improve the environment/air quality (44%), and to avoid traffic congestion (40%). Additionally, 36% of respondents took transit because they either were not able to drive (15%) or could not afford a car (21%).

Figure 1 Transit routes used by survey respondents

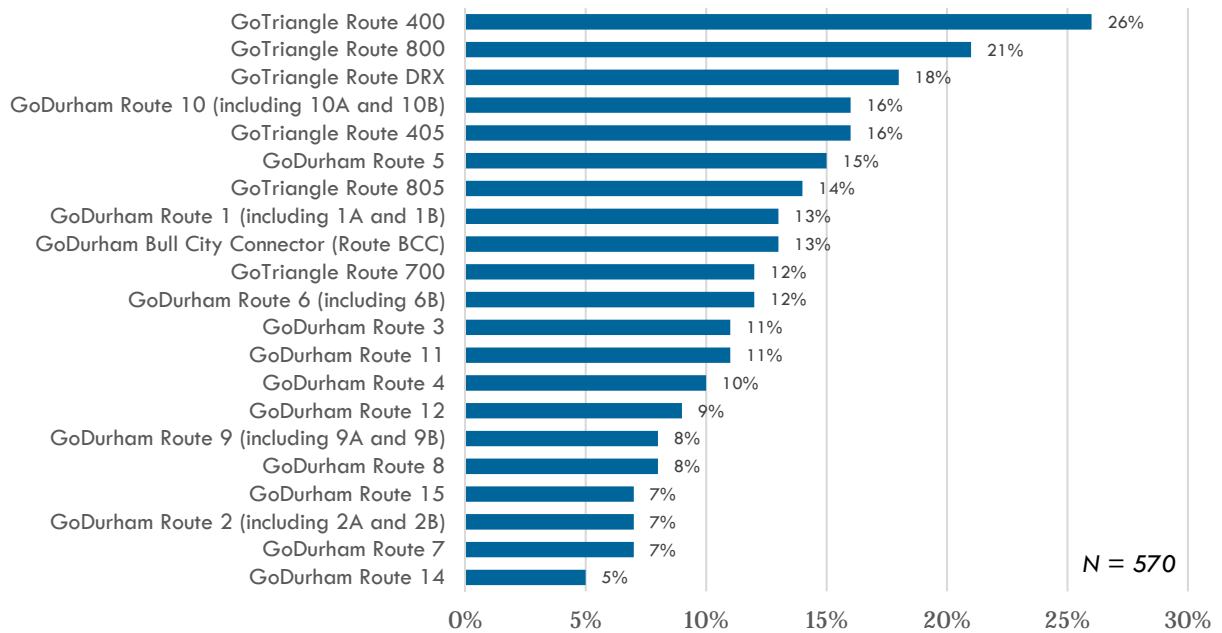
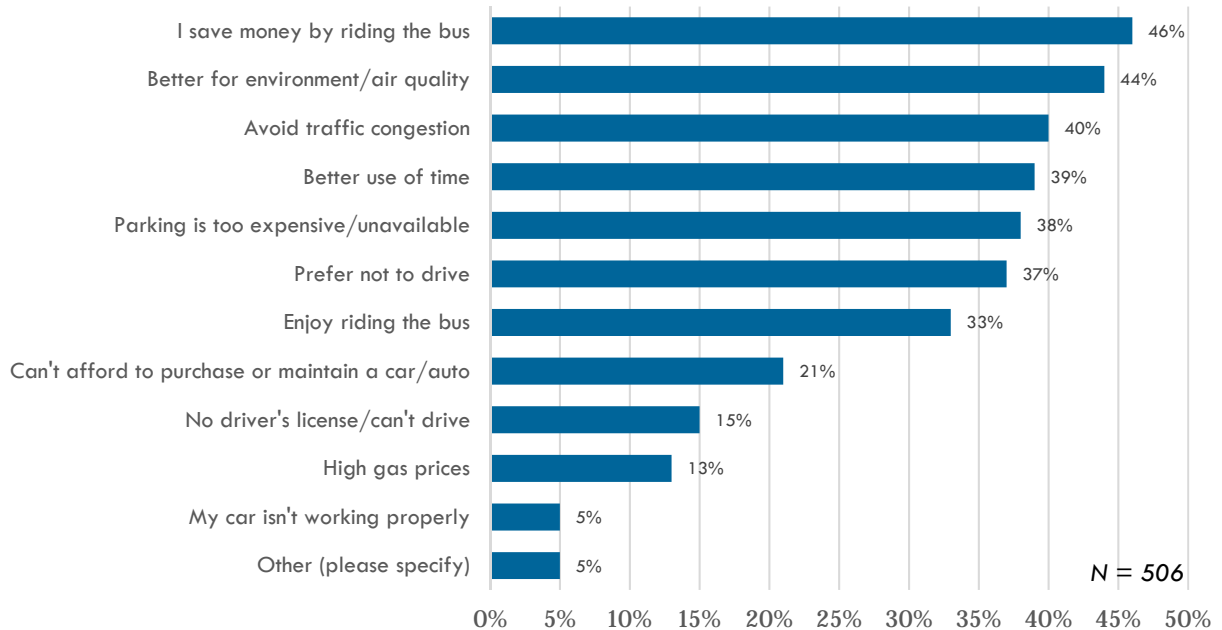


Figure 2 Reasons survey respondents ride transit



Survey respondents were asked to identify the reasons they do not use transit, shown in Figure 3, and what improvements would cause them to use transit more often, shown in Figure 4. The top reasons respondents don't take transit is because it is inconvenient (28%), takes too long (28%), the schedules don't match their needs (23%), or they prefer using their own vehicle (23%). The most commonly selected improvement that would make respondents more likely to take transit

was more frequent service during the day Monday-Saturday (46%), followed by later evening service (29%), and more frequent service at night and/or Sundays (29%). This suggests improving service frequency and span may be an effective improvement strategy for increasing ridership.

Figure 3 Reasons survey respondents do not ride transit

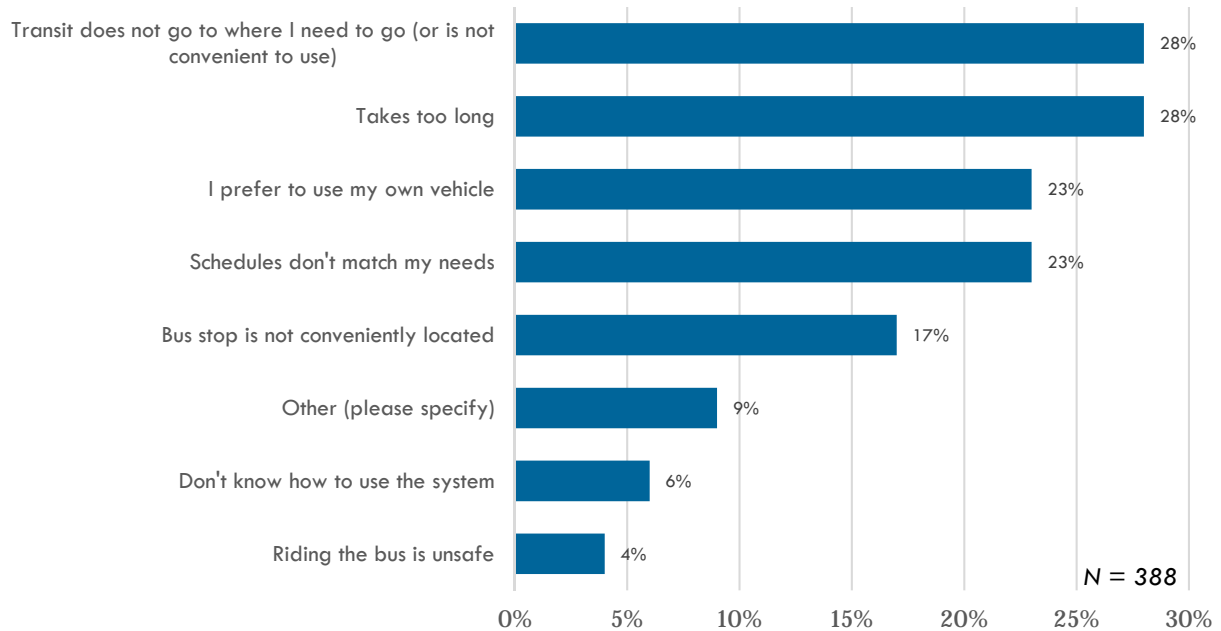
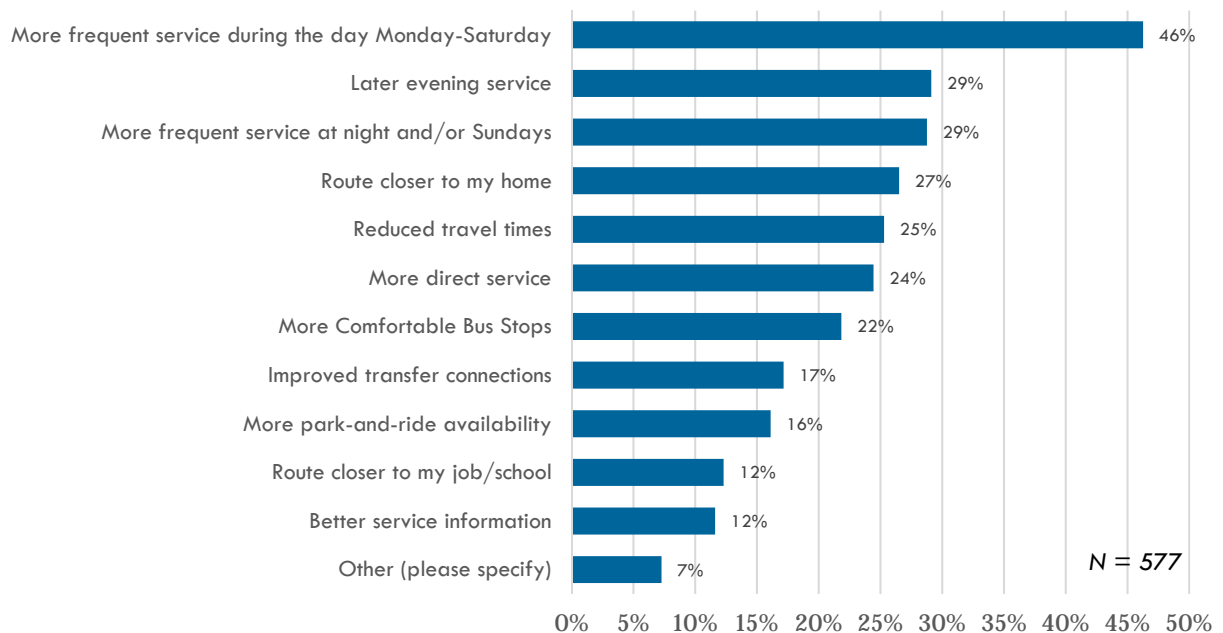


Figure 4 Improvements that would cause survey respondents to use transit more often



Age Analysis

This analysis divides survey respondents into four distinct age groups, college age (18-24), young professional (25-34), professional (35-64), and retired/approaching retirement (65 or older). Figure 5 shows the reasons that survey respondents of each age group ride transit and Figure 6 shows the improvements that would make survey respondents in each age group more likely to ride transit. More frequent service during the day Monday-Saturday was the most commonly selected improvement for all four age groups.

The college age population are more likely to ride transit out of necessity, because they can't afford a car, can't drive, or don't have a license. Aside from more frequent daytime service Monday-Saturday, the college age population's most commonly selected improvements were more frequent night or Sunday service and routes closer to my job/school. These improvements are indicative of college students with later, irregular commute patterns.

The young professional population rides transit for financial, productivity, or lifestyle reasons. Financially, 61% of young adults said parking is too expensive/unavailable and 57% said they save money by riding the bus. Additionally, 59% ride transit because it is better for the environment and 48% ride transit because it is a better use of time and to avoid traffic congestion. The young professional population placed a higher priority on reducing travel times as an incentive to riding transit, emphasizing a priority on spending time productively.

The professional population had similar responses to the young professionals, with respondents prioritizing saving money, avoiding traffic congestion, and valuing the environment. In terms of improvements, this age group selected improved transit connections more frequently than the other three groups. This suggests that the professional group has similar interest and priorities as the young professional group, but may live in areas requiring a two-seat trip for their commutes.

The most common responses from the retired population were that they prefer not to drive (29%) and save money riding the bus (26%). Fifteen percent of the retired population also said they couldn't drive or did not have a license and 9% said their car was not working properly. This suggests a split between the retired population riding transit out of necessity and out of personal preference. The retired population also listed improved service information and more comfortable bus stops at higher rates than other age groups.

Figure 5 Reasons survey respondents ride transit by age group

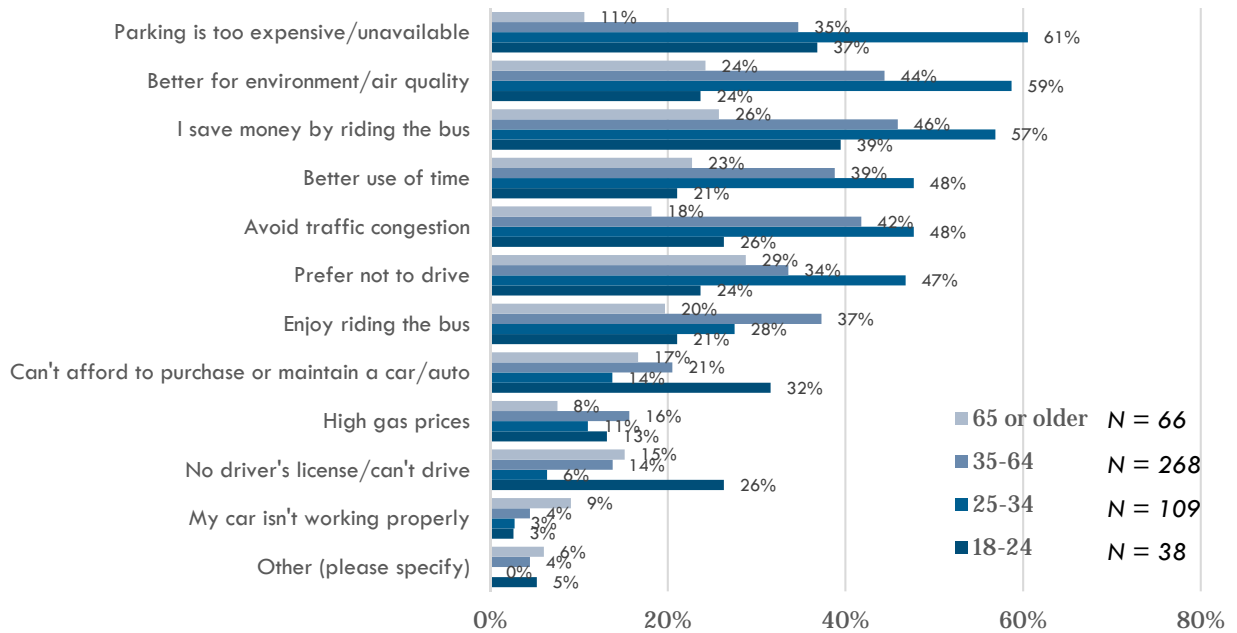
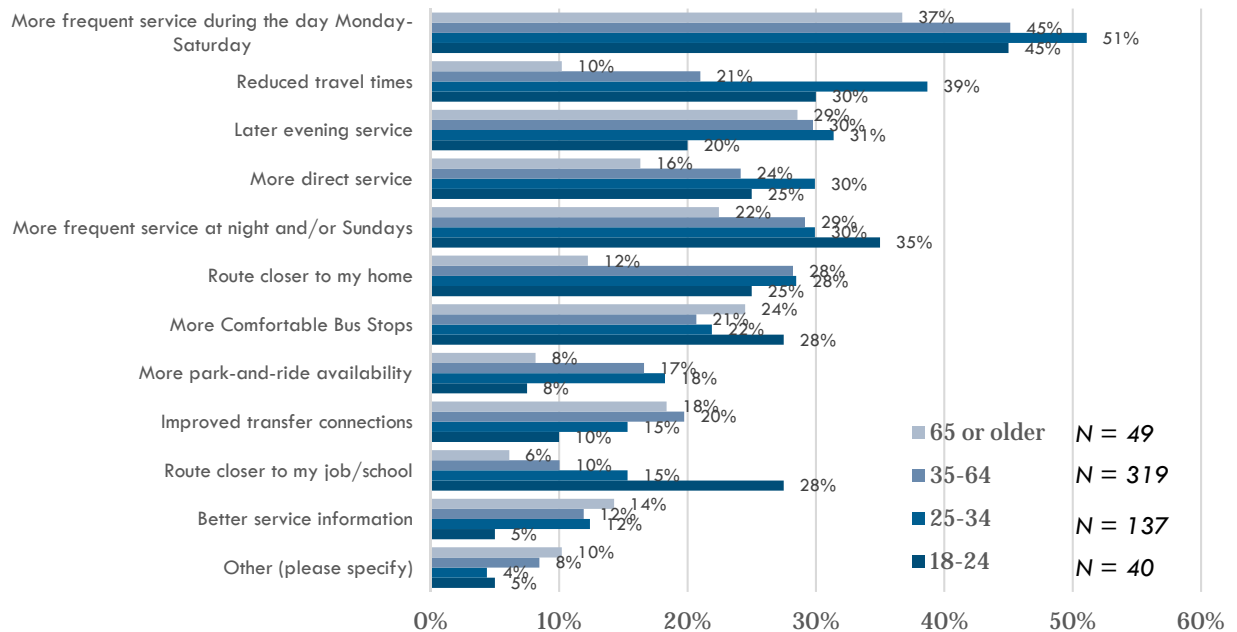


Figure 6 Improvements that would cause survey respondents to take transit more often by age



Transit User Analysis

Survey respondents were analyzed based on whether they identified as a transit user or as someone who never takes transit. These groups' responses for why they don't ride transit (

Transit users' improvement priorities are primarily focused on improving frequency and service span, with 49% calling for more daytime frequency Monday-Saturday, 33% for more nighttime or Sunday frequency, and 33% for later evening service. Non-transit users placed a much higher emphasis on convenience including routes going closer to their home (38%), more direct service (34%), and more park-and-ride availability (38%).

Figure 7) and what improvements would make them more likely to ride transit (Figure 8) were analyzed.

The majority of non-transit users (65%) said they ride transit because they prefer to use their own vehicle. The second most commonly selected response for non-transit users was that the bus takes too long (35%). The top two responses for transit users was that the bus takes too long (21%) and the schedules don't match their needs (21%). This suggests that a significant portion of non-transit users don't take the bus out of personal preference, but that many may take it if travel times were more competitive with their own vehicles.

Transit users' improvement priorities are primarily focused on improving frequency and service span, with 49% calling for more daytime frequency Monday-Saturday, 33% for more nighttime or Sunday frequency, and 33% for later evening service. Non-transit users placed a much higher emphasis on convenience including routes going closer to their home (38%), more direct service (34%), and more park-and-ride availability (38%).

Figure 7 Reasons survey respondents do not ride transit

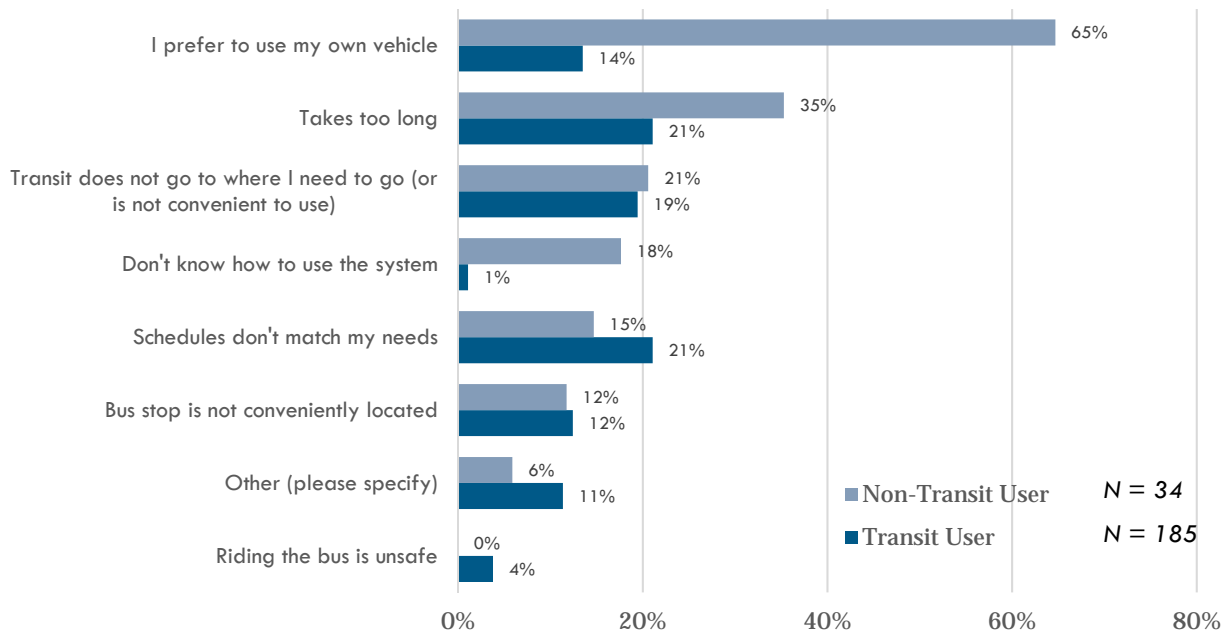
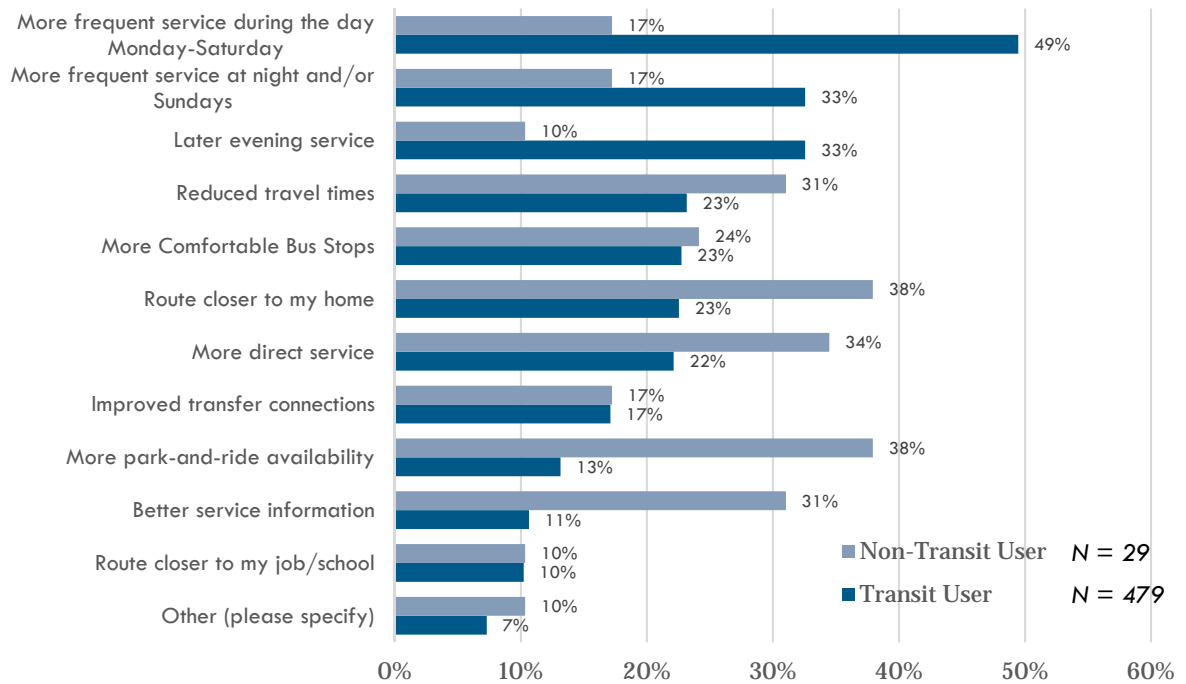
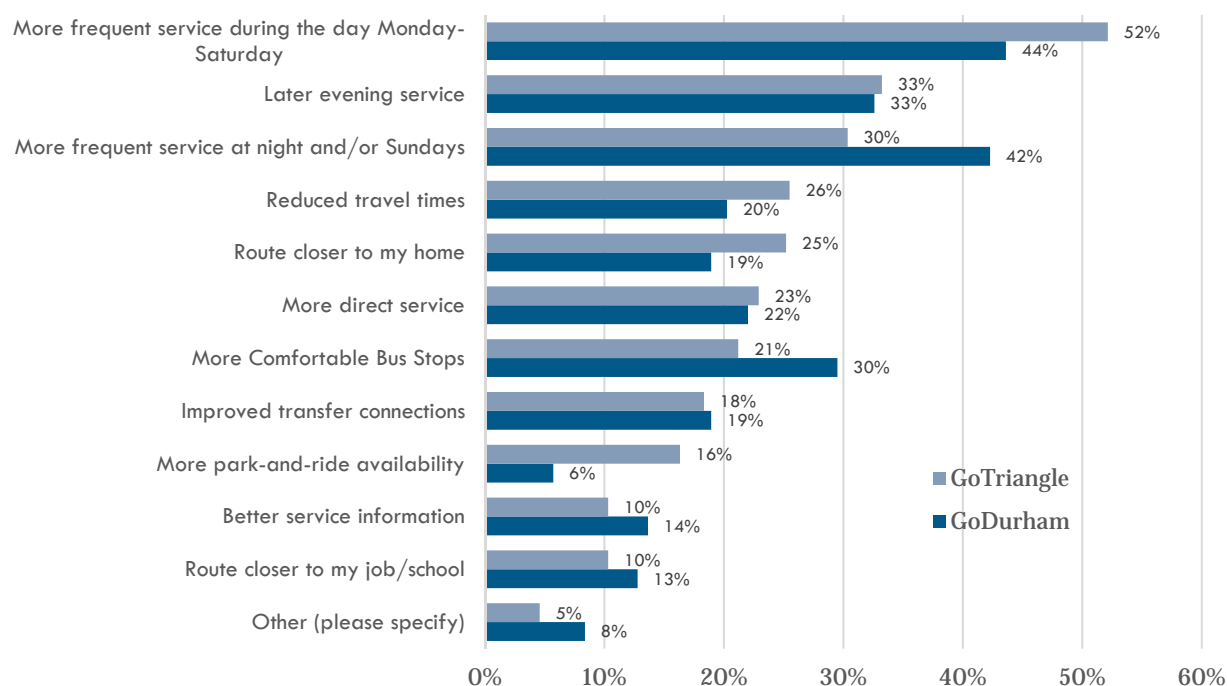


Figure 8 Improvements that would cause survey respondents to take transit more often by transit use



Transit Agency Analysis

An analysis was conducted to identify trends and differences between priorities of GoTriangle riders and GoDurham riders. The results of this analysis are shown in and



The majority of GoTriangle riders take transit for financial and productivity reasons, with 54% riding to save money, 47% riding because parking is too expensive, 46% to avoid traffic congestion, and 45% because it is a better use of time. GoDurham riders are more likely to ride transit out of personal preference or necessity than for other reasons. The most commonly selected responses for GoDurham users was to save money (38%), that they prefer not to drive (31%), enjoy riding the bus (27%), and don't have a driver's license/can't drive (26%).

Both GoDurham and GoTriangle users placed the highest priority on adding more frequent service daytime service Monday-Saturday. However, GoTriangle users placed a higher priority on routing service closer to their homes and reducing travel times, while GoDurham users were more likely to prioritize adding more nighttime and Sunday frequency. These are typical priorities for users on a regional service, like GoTriangle, who want to see faster, more direct service. Additionally, GoDurham users' priorities on increased frequency are typical of local service.

Figure 9 Reasons survey respondents ride transit by transit agency

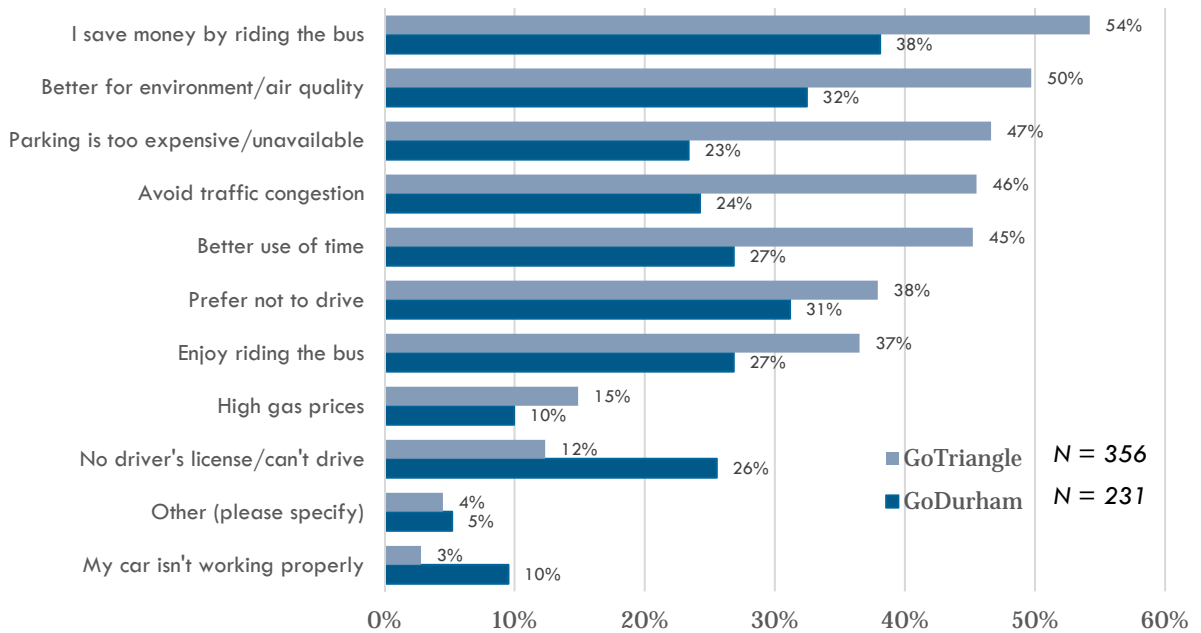
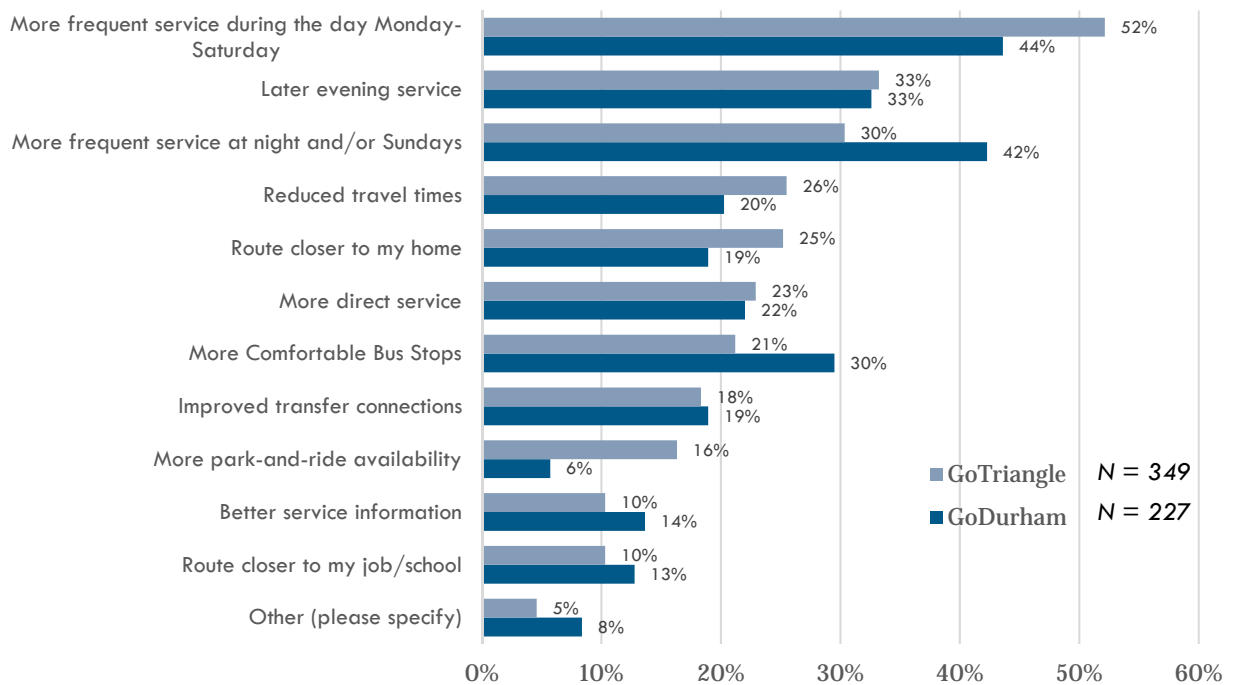


Figure 10 Improvements that would cause survey respondents to take transit more often by transit agency



Who Responded to the Survey?

Age of Respondent

The largest number of respondents to the survey were between the ages of 24 and 34 (23%), followed by 35 to 44 (21%), 55 to 64 (21%), and 45 to 54 (20%), as shown in Figure 11. This suggests that the majority of survey respondents are working age, between 24 and 64, and that there is a relatively even distribution between the four smaller age groups comprising the larger working age population. The college age (18 to 24) and retired (65 or older) populations were much smaller, 6% and 9% respectively, compared to the other major population groups.

Primary Mode of Transportation

More survey respondents selected driving alone as their primary mode of transportation (44%) than taking the bus (29%), however, these were the two most commonly selected modes of transportation. A smaller proportion of respondents selected walking (7%), biking (6%), and carpooling (5%). This suggests that the respondents represent a relatively diverse set of commute experiences to inform potential service improvements.

Transit Agencies Used

The most frequently used transit agency for survey respondents, shown in Figure 13, was GoTriangle (45%), while 18% used GoDurham, 17% used both GoDurham and GoTriangle, and 19% used neither. This suggests that respondents regularly use both local and regional service, and that their decisions and priorities are informed accordingly.

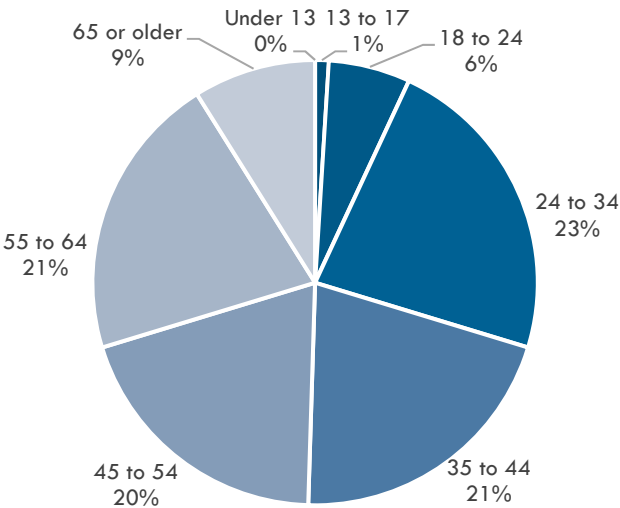
Frequency of Ridership

The majority of survey respondents identified as regular transit users, with 69% of respondents using transit at least three days per week and 50% using transit at least five days per week, shown in Figure 14.

Length of Ridership

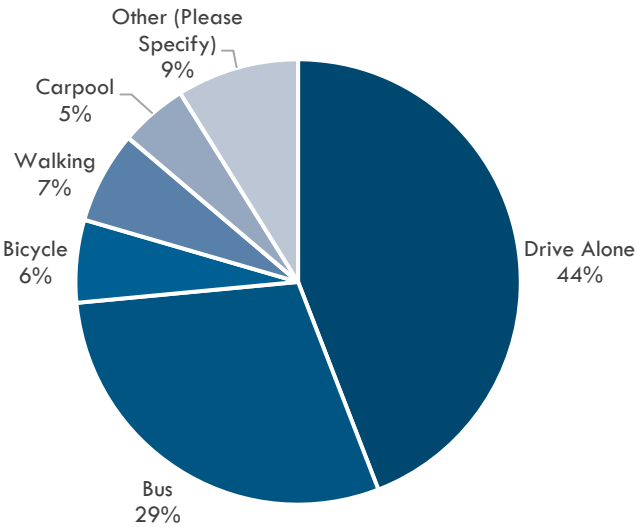
Almost half of survey respondents have been riding transit for more than four years (47%), while 19% have been riding for one to two years, and 16% have been riding for less than one year. This suggests that GoDurham and GoTriangle have been generally successful at both retaining their existing riders and generating new ridership.

Figure 11 Age of survey respondents



N = 742

Figure 12 Primary mode of transportation for survey respondents



N = 732

Figure 13 Transit agencies used by survey respondents

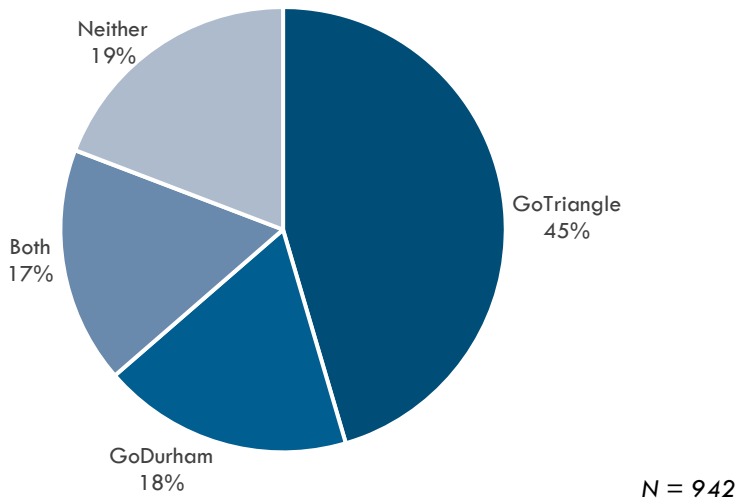


Figure 14 Frequency of transit ridership for survey respondents

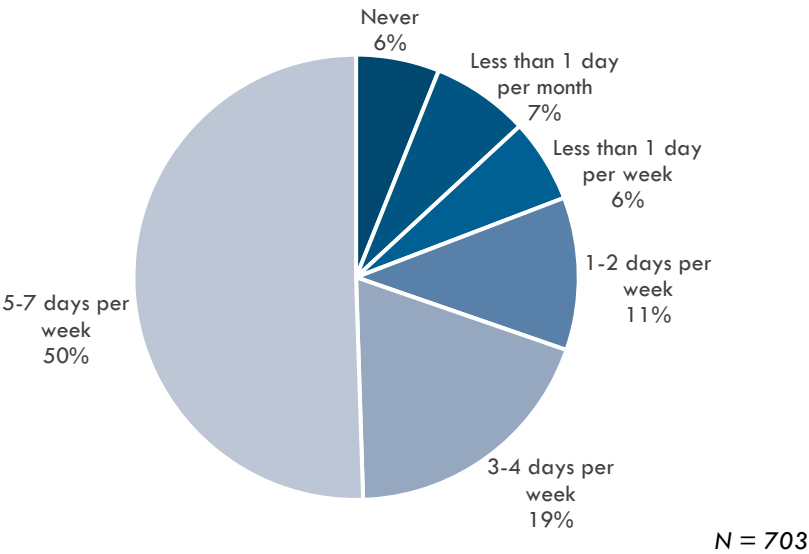
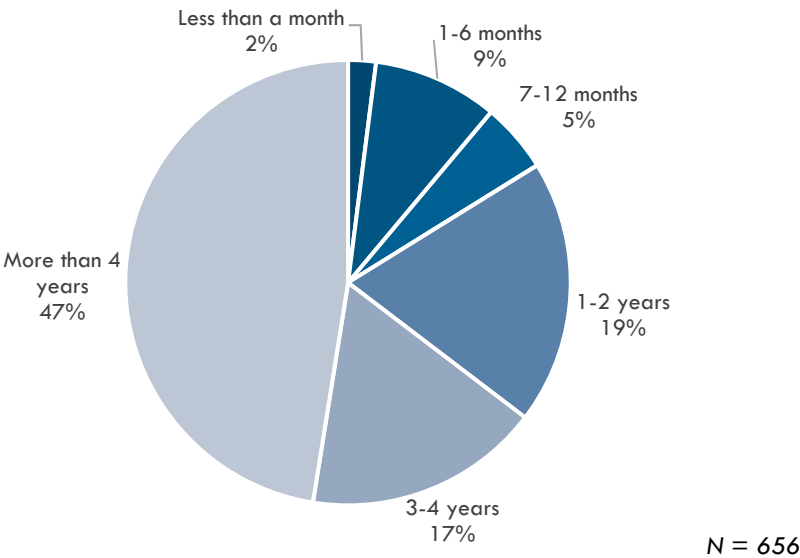


Figure 15 Length of transit ridership for survey respondents



Appendix D Phase II Public Outreach Scenario Themes

GODURHAM SHORT-RANGE TRANSIT PLAN SCENARIOS

GoDurham sought input on a short-range transit plan to guide how GoDurham improves transit service over the next several years to better serve existing and potential riders, new developments, and essential services in our community.

After hearing from Durham residents through public meetings, conversations about the system, and an online survey, the GoDurham service planning team focused on:

- Simplifying routes,
- Improving frequency of service, and
- Providing more direct service to popular destinations.

Two scenarios were developed to help visualize ways to improve the system. Each scenario is a concept that is meant to show what the system could look like. The final recommendation will consider all of these comments and will try to combine the most popular parts of each scenario to guide the growth of the system moving forward.

Convenient and cost-effective transit service requires a delicate balance of where buses travel, how often they arrive and what times of day they operate.

To develop the following service scenarios, we reached out –to stakeholders, residents, riders, and non-riders to hear their input, commendations, and complaints about the current system. We also looked at existing ridership patterns, on-time performance, where people travel and demographic data in order to identify any unmet needs within the system.

The scenarios above are examples of what our transit system could look like. The final recommendations will be based on feedback we receive from you.

Your input will guide how we make improvements as well as how we prioritize expansions that will require additional funding, such as: more frequent bus service, improved night and Sunday service, new on-demand services, and more direct service to major destinations in Durham and the region.

Scenario 1 Themes/Benefits

The highlights of Scenario 1 include the following:

- **Improving on-time performance**
 - Adjusting routes with chronic on-time performance issues
- **Simplifying service**
 - Eliminating confusing variants
 - Providing consistent all-day service
 - Emphasizing bi-directional service
- **Reallocating Bull City Connector resources into better service**
 - Replacing the Bull City Connector with frequent regular bus service between E. Main Street and Duke's Campus, which will improve connections for existing and potential patrons
- **Expanding the number of routes with 15-minute all-day service**
 - Portions of Routes 2 and 6 would operate more frequently
- **Extending direct service to Duke/VA Hospital to North Durham**
 - New all-day service directly connecting North Durham to Duke
- **Improved connectivity to job sites such as RTP and North Raleigh**
 - Some East Durham residents will have a direct ride to both RTP and Briar Creek
- **Reducing service in low ridership areas**
- **On-Demand Zones**
 - On-Demand Zones incentivize the use of on-demand services, which can be agency-operated or partnerships with private providers such as Uber, Lyft, or taxis. Trips within or between zones are subsidized. Two different zones and late night service between 12:30 a.m. and 5 a.m. are recommended.

All of Scenario 1's improvements can be accommodated within the current operating budget.

Benefits of the Scenario 1 include:

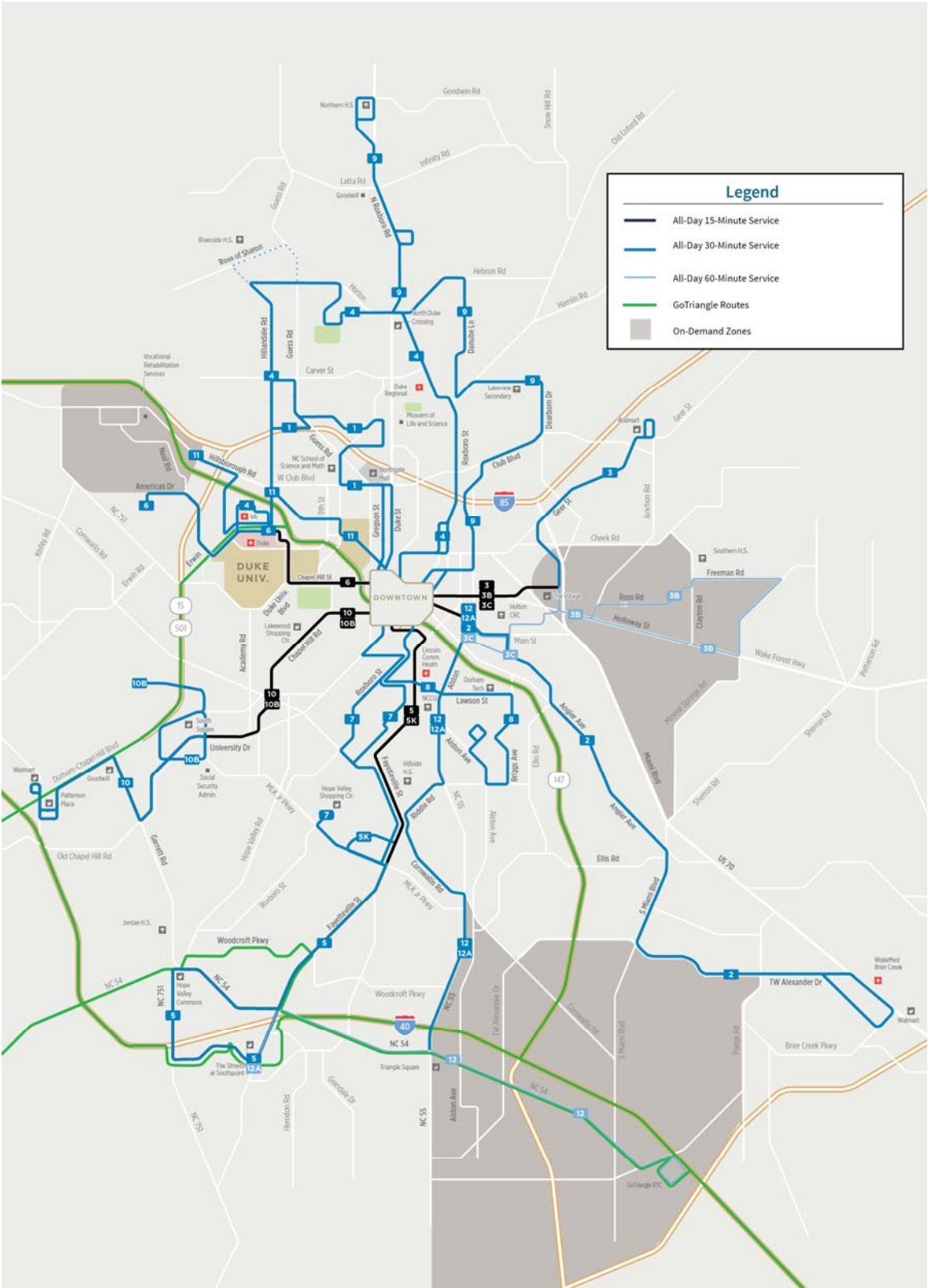
5.1 more miles of very frequent service (every 15 minute or more all day)

47,000 more residents and jobs within a quarter mile of very frequent service

53,000 more residents and jobs within a quarter mile of service that operates every 30 minutes or better

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Draft Scenario 1 Map



SCENARIO 2 THEMES/BENEFITS

Themes for Scenario 2 include the following:

- **Simplifying service**
 - Eliminating confusing variants
 - Providing consistent all-day service
 - Emphasizing bi-directional service
- **Improving the Bull City Connector**
 - Extending the service so it runs from E. Main Street to the Horton Career & Resource Center and The Village Shopping Center
 - Transitioning from a 17-minute frequency to an easier-to-remember 20-minute frequency
- **Emphasizing high ridership areas**
 - Providing 15-minute service on E Holloway, Fayetteville, and Chapel Hill Rd
 - Offering new all-day 15-minute service from Durham Station to Southpoint
- **Expanding the number of routes with 15-minute all-day service**
 - Route 5 service to Southpoint would be improved to every 15-minutes, but Route 5 would no longer travel through parking lots or to NC 751 to provide access
- **Extending direct service to Duke/VA Hospital to North Durham**
 - Offering new all-day service directly connecting North Durham to Duke
- **Direct service to the Museum of Life and Science**
- **Improving on-time performance**
 - Adjusting routes with chronic on-time performance issues
- **Reducing service in low ridership areas**

All of Scenario 2's improvements can be accommodated within the current operating budget.

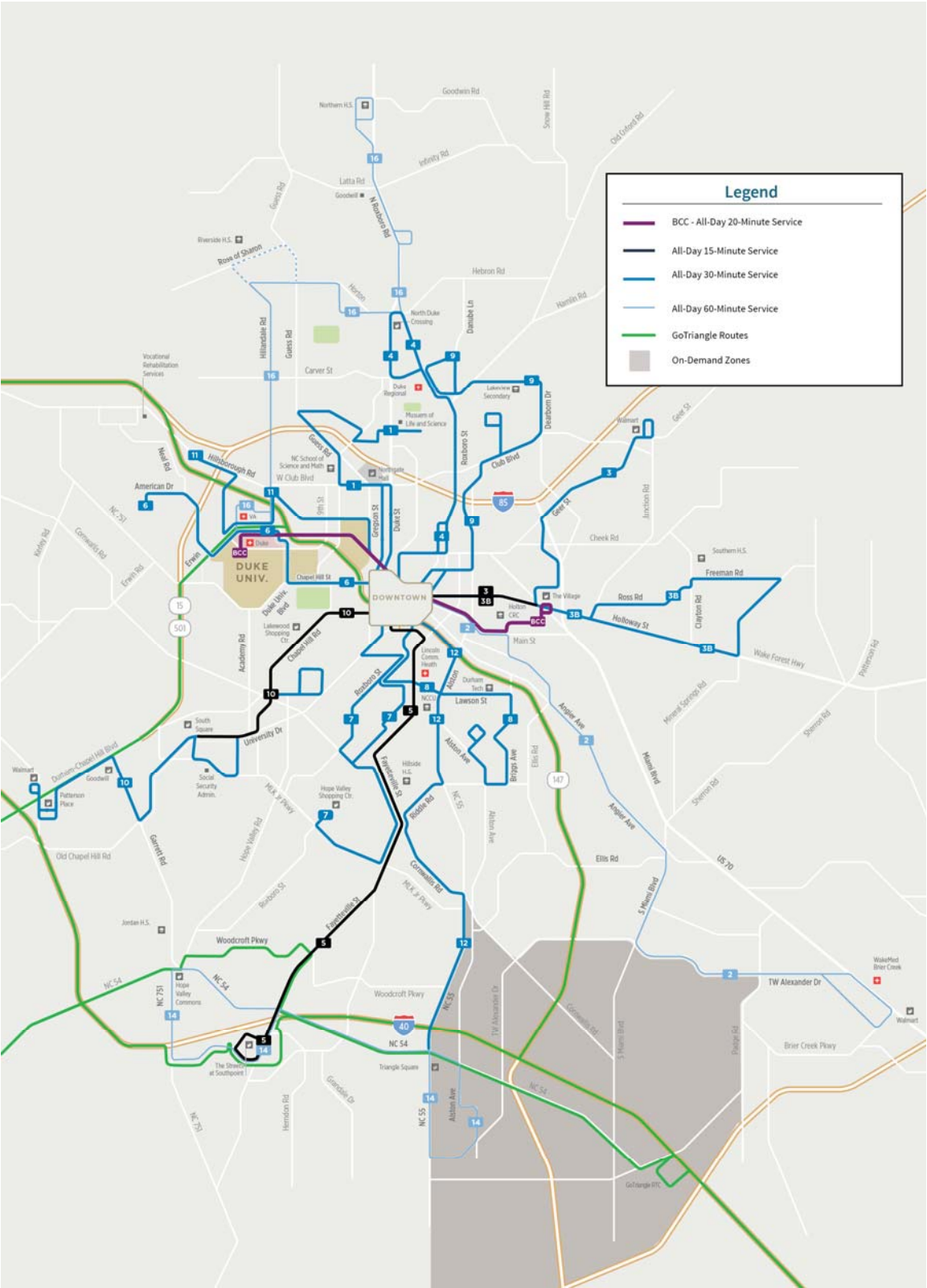
Benefits of the Scenario 1 include:

3.9 more miles of very frequent service (every 15 minute or more all day)

9,000 more residents and jobs within a quarter mile of very frequent service

9,000 more residents and jobs within a quarter mile of service that operates every 30 minutes or better

Draft Scenario 2 Map



Appendix E Preferred Alternative Removed Stops Mitigation

This Appendix provides an overview of the service changes proposed in the GoDurham Preferred Alternative as of February 2018, identifies bus stops that would lose service, and denotes the distance from these stops to the nearest service area.

Key Findings

- Eleven routes and 91 bus stops would be impacted by these service changes.
- The impacted stops have a daily average of 590 boardings and 565 alightings.

Removed Stop Analysis

Route 1/1A/1B

Service for Route 1/1A/1B would be simplified to remove service along Guess Road between Broad Street and N Pointe Drive and on Front Street and Hillandale Road south of W Carver Street. This would remove a total of nine stops from service. Two stops would be removed from Guess Road, both of which are within 2 mile of service on Broad Street. Seven stops would be removed from Hillandale Road and Front Street, six of which are within ½ mile of service; the furthest stop from service is Front Street at Carver Terrace, which would be approximately 0.54 miles from the nearest transit stop.

Overall, impacted bus stops average 21 boardings and 46 alightings per day.

Stop ID	Stop Name	Route	Ons	Offs
5467	FRONT ST AT CROASDAILE OFFICE	1	0	0
5590	HILLANDALE RD AT CROASDAILE OFFICE	1/1A	11	15
5621	FRONT ST AT COURTYARD MARRIOTT	1	1	0
5695	HILLANDALE RD AT CROASDAILE OFFICE	1/1A	1	0
5845	HILLANDALE RD AT DURHAM PUBLIC SCHOOLS	1/1A	1	0
5861	FRONT ST AT CARVER TERRACE APARTMENTS	1	0	0
6114	GUESS RD AT LAMAR ST	1/1B	4	23
6115	GUESS RD AT HILLCREST DR	1/1B	3	8
6541	CARVER ST AT HILLANDALE RD	1	0	0
Total			21	46

Route 2/2A/2B

Service for Route 2/2A/2B would be simplified to remove service from nine stops from service, including the removal of Route 2A and Route 2B. Route 2 would no longer travel in a loop along Miami Boulevard, US 70, Page Road, and Angier Avenue. All removed stops are within 1 mile from proposed service realignments. Passengers currently accessing the service at these stops would have to walk to Angiers Avenue, Miami Boulevard, TW Alexander Drive or Geer Street to access the service.

Overall, impacted bus stops average 84 boardings and 89 alightings per day.

Stop ID	Stop Name	Route	Ons	Offs
5237	PLEASANT DR AT US 70	2/2A/2B	14	12
5724	PAGE RD AT ANGIER AVE	2/2A/2B	9	10
5804	US 70 AT ANGIER AVE	2/2A/2B	3	2
6087	US 70 AT MIAMI BLVD	2/2A	21	11
6217	PAGE RD EXT AT HWY 70	2/2A/2B	7	5
6310	US 70 AT LAUREL DR	2/2A	1	0
6311	4319 ANGIER AVE	2/2A/2B	8	29
6566	PAGE RD AT FOXRIDGE CRESCENT	2/2A/2B	18	18
6685	US 70 AT FAMILY DOLLAR	2/2A	3	2
Total			84	89

Route 3/3B/3C

In the preferred alternative, Route 3C would be removed from service and Route 3B would be altered slightly to provide service on Angier Avenue instead of Main Street. This would remove service from seven bus stops. All seven bus stops removed from service are within ½ mile of the proposed realignment, and five of the seven stops are within ¼ mile of the service. Passengers accessing these stops would need to walk north to Holloway Street to access Route 3B or to N Guthrie Avenue to access Route 3C.

Overall, impacted bus stops average 26 boardings and 30 alightings per day.

Stop ID	Stop Name	Route	Ons	Offs
5061	WEDGEDALE AVE AT LYNN RD	3C	7	7
5134	RUMMEL ST AT HWY 98	3C	1	1
5713	RUMMEL ST AT WALTON ST	3C	10	12
5790	RUMMEL ST AT WEDGEDALE AVE	3C	0	0
6002	208 LYNN RD	3C	0	0
6648	WEDGEDALE AVE AT MANSON PLACE	3C	1	0
6686	IVEY WOOD LN AT SPRINGWOOD PLACE	3C	7	10
Total			26	30

Route 5/5K

Route 5/5K would be simplified to remove the Route 5K loop on MLK Jr Boulevard. Route 5 would maintain its existing alignment except it would not enter the Streets at Southpoint. The Streets at Southpoint bus stop would be the highest ridership bus stop removed from service under the preferred alternative. Both removed stops are within ¼ mile of existing service operating on Fayetteville Street.

Overall, impacted bus stops average 167 boardings and 166 alightings per day.

Stop ID	Stop Name	Route	Ons	Offs
5956	STREETS AT SOUTHPOINT CINEMA	5	146	142
6646	STRATFORD LAKES DR AT FAYETTEVILLE RD	5K	21	24
Total			167	166

Route 6/6B

Route 6/6B would be simplified to remove the Route 6B variant and to stop service at the Duke/VA Hospital. A portion of the Route 6/6B extensions would continue to be served by Route 11; however, nine stops would be removed from service. All nine stops removed from service are within $\frac{3}{4}$ mile of the proposed service realignment, with seven of the nine stops within about $\frac{1}{2}$ mile of the service.

Overall, impacted bus stops average 86 boardings and 67 alightings per day.

Stop ID	Stop Name	Route	Ons	Offs
5398	CONSTITUTION DR AT FORES	6	36	47
6078	MORDECAI ST AT HOLSTON ST	6	26	7
5448	4527 HILLSBOROUGH RD	6B	2	0
5625	SPARGER RD AT FOOD LION	6B	9	6
5809	HILLSBOROUGH RD AT SELF STORAGE	6B	0	0
6060	4605 BENNET MEMORIAL RD	6B	8	3
6557	NEAL RD AT BENNET MEMORIAL RD	6B	0	0
6559	NEAL RD AT HILLSBOROUGH RD	6B	1	0
6662	OPERATIONS DR AT WESTERN PARK	6B	4	4
Total			86	67

Route 10/10A/10B

Service on Route 10/10A/10B would be simplified to remove the loop on Durham-Chapel Hill, James Street, Nation Ave, and Bedford Street and to remove Route B service from Westgate, Tower Boulevard, and Pickett. Route 10B would provide service on a smaller loop between University Drive, Shannon, and MLK Jr. Boulevard. Service would be removed from 20 bus stops. The 10 stops removed from the Route 10/10A loop are all within $\frac{3}{4}$ of a mile from the proposed realignment, while seven of the ten stops removed from the 10B loop are within $\frac{3}{4}$ mile of the proposed realignment. The remaining three stops are within 1.2 miles from the proposed service.

Overall, impacted bus stops average 122 boardings and 101 alightings per day.

Stop ID	Stop Name	Route	Ons	Offs
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5092	TOWER BLVD AT SOCIAL SECURIT	10B	1	22
5183	JAMES ST AT DURHAM-CHAPEL HI	10/10A	7	3
5190	NATION AVE AT BEDFORD ST	10/10A	1	3
5193	MIDVALE RD AT DURHAM-CHAPEL	10/10A	4	2
5361	WESTGATE DR AT TARGET	10B	15	7
5493	TOWER BLVD AT MCDONALDS	10B	13	3
5574	US 15-501 AT PAWN AMERICA	10/10A	6	3
5650	DURHAM-CHAPEL HILL BLVD AT F	10/10A	1	10
5658	DURHAM-CHAPEL HILL BLVD AT G	10/10A	0	0
5659	PICKETT RD AT STRUCTURE HOUS	10B	1	5
5693	BEDFORD ST AT BALMORAY CT	10/10A	8	11
5847	PICKETT RD AT COACHMANS WAY	10B	0	0
5871	TOWER BLVD AT CONIFER GLEN L	10B	26	6
5928	JAMES ST AT NATION AVE	10/10A	5	6
5946	CORNWALLIS RD AT ROGERS HERR	10/10A	10	1
5979	EMERALD POND LN AT PICKE	10B	6	4
5990	DURHAM-CHAPEL HILL BLVD AT C	10/10A	10	8
6050	PICKETT RD AT COLONY RD	10B	2	1
6145	PICKETT RD AT WESTERN BYPASS	10B	5	1
6191	SHANNON RD AT SAMS CLUB	10B	1	5
Total			122	101

Route 11

Route 11 would be adjusted slightly to remove service from Gregson Street and operate on Main Street, replicating some of the service of the Bull City Connector. This alignment would remove seven stops from service. All seven impacted stops are within ½ mile of the proposed service realignment.

Overall, impacted bus stops average 4 boardings and 3 alightings per day.

Stop ID	Stop Name	Route	Ons	Offs
5448	4527 HILLSBOROUGH RD	11	0	0
5625	SPARGER RD AT FOOD LION	11	3	2
5682	HILLSBOROUGH RD AT AMPLE STO	11	0	0
5809	HILLSBOROUGH RD AT SELF STOR	11	0	0
5915	HILLSBOROUGH RD AT OPERATION	11	0	1
6060	4605 BENNETT MEMORIAL RD	11	1	0

6559	NEAL RD AT HILLSBOROUGH RD	11	0	0
Total			4	3

Route 12

The alignment of Route 12 would be adjusted slightly to operate on Main Street instead of NC-147, and to continue operating south on Alston Avenue to reach the GoTriangle RTC. This change would remove service from four bus stops. All four impacted bus stops are within ¼ mile of the proposed service realignment.

Overall, impacted bus stops average 5 boardings and 7 alightings per day.

Stop ID	Stop Name	Route	Ons	Offs
5161	NC 55 AT MEREDITH DR	12	1	4
6278	NC 55 AT SEDWICK DR	12	1	0
6279	NC 55 AT GOLDEN CORRAL	12	2	1
6283	NC 55 AT ALLENDOWN DR	12	1	2
Total			5	7

Route 14

Route 14 would be removed from service and replaced with a revised version of Route 12. This new route would not operate on TW Alexander Drive and NC 55 south of NC 54, removing nine stops from service. All of the stops removed from NC 55 are within ½ mile of the proposed service, while the stops on Woodcroft Parkway are within 1 mile of the service.

Overall, impacted bus stops average 52 boardings and 46 alightings per day.

Stop ID	Stop Name	Route	Ons	Offs
1203	WOODCROFT PKWY AT HIGHGATE D	14	0	1
1778	WOODCROFT PKWY AT WEATHERSFI	14	1	1
5161	NC 55 AT MEREDITH DR	14	6	6
5782	WOODCROFT PKWY AT AUTUMN WOO	14	0	0
5956	STREETS AT SOUTHPOINT CI	14	22	23
6278	NC 55 AT SEDWICK DR	14	6	2
6279	NC 55 AT GOLDEN CORRAL	14	5	3
6283	NC 55 AT ALLENDOWN DR	14	8	2
6583	NC 55 AT SEDWICK DR EB	14	4	8
Total			52	46

Route 15

Route 15 would be removed from service; however, a large portion of the route would be replicated by Route 2. Service would be removed from NC 147 and Ellis Road, resulting in three stops being removed from service. The three stops removed from Ellis Road are all within 1 mile of the proposed service realignment, with two stops within ½ mile.

Overall, impacted bus stops average 5 boardings and 5 alightings per day.

Stop ID	Stop Name	Route	Ons	Offs
6450	ELLIS RD AT NEW HAVEN DR	15	3	0
6452	ELLIS RD AT RESEARCH TRIANGL	15	1	2
6645	ELLIS RD AT MIAMI BLVD IN	15	1	3
Total			5	5

Route 23

Route 23 would be removed from service; however, much of the service would be replicated by Route 3/3A. This would result in 12 stops being removed from service. The Route 23 stops removed from service are also served by the existing alignment of Route 2B and Route 3/3B/3C. All of these stops would be within ½ mile of the proposed service realignment.

Overall, impacted bus stops average 18 boardings and 5 alightings per day.

Stop ID	Stop Name	Route	Ons	Offs
5061	WEDGEDALE AVE AT LYNN RD	23	2	0
5134	RUMMEL ST AT HWY 98	23	6	2
5523	MIAMI BLVD AT GREENBRIAR ST	23	1	0
5713	RUMMEL ST AT WALTON ST	23	3	1
5780	E MAIN ST AT DRIVER ST	23	1	0
5790	RUMMEL ST AT WEDGEDALE AVE	23	2	0
5977	ROBINWOOD RD AT MIAMI BLVD	23	0	0
6002	208 LYNN RD	23	0	0
6288	E GEER ST AT FAY ST	23	0	0
6345	TAYLOR ST AT HOLTON CAREER R	23	2	2
6569	CHEEK RD AT ANDOVER DR	23	0	0
6648	WEDGEDALE AVE AT MANSON PL	23	1	0
Total			18	5

Appendix F Service Guidelines and Performance Measures

INTRODUCTION

Purpose

GoDurham's mission is to provide safe, reliable, convenient and accessible transportation for the citizens and visitors of Durham. GoDurham also strives to make efficient and equitable use of its limited resources. This document details the service guidelines, performance measures and service change process that will direct GoDurham in accomplishing its mission and goals in a rational and transparent manner.

Overview

This document is divided into three sections:

- **Service guidelines** serve as a framework for the provision, design and allocation of routes, schedules and stops. Guidelines are intended to be used with some flexibility.
- **Performance measures** describe the process by which existing services are evaluated in terms of ridership productivity, on-time performance and passenger safety.
- **Service changes** are implemented twice a year, primarily in response to performance evaluations, new development, and rider feedback.

Route Classification

Three route types are identified in this document, each with distinctive service guidelines and performance measures.

Figure 1 | GoDurham Transit Services Types




Service Type	Characteristics
Frequent Route 	Frequent routes are high productivity local services that operate along densely developed primary arterials and offer a high level of frequency. Routes should be simple and direct.
Local Routes 	Local routes also operate along primary arterials, but in areas of less dense development patterns. These routes offer relatively frequent, simple, and direct service.
Coverage Routes 	Coverage routes serve low-density areas and typically focus on extending service coverage. Productivity is usually low. Branch segments may be classified as community routes.
Special Routes	Downtown circulators, shuttles, and peak-hour commuter services are classified as special routes. Guidelines for special routes are typically relaxed due to their unique rider markets and funding sources.

Figure 2 | GoDurham Route Classification

Route	Type
1 Northgate	Local
2 East Durham	Local
3 The Village	Frequent
4 North Roxboro	Local
5 Fayetteville	Frequent
6 Duke & VA Hospitals	Local
7 Forest Hills	Local
8 Lawson Street	Local
9 Dearborn Drive	Local
10 South Square / New Hope Commons	Frequent
11 Duke & VA / Hillsborough Rd	Frequent
12 NCCU / Hwy 54 & 55	Local
14 Hwy 54 & 55 / Southpoint	Coverage
15 TW Alexander / Brier Creek	Coverage
20 Woodcraft / South Square	Coverage
23 The Village / East Durham Link	Special
BCC Bull City Connector	Special

SERVICE GUIDELINES

GoDurham uses service guidelines as a framework for the design and allocation of bus service and bus stops. Service guidelines are divided into five categories:

1. **Service coverage** guides the development of new services.
2. **Route design** focuses on the simple and efficient alignment and structure of service.
3. **Service span** guidelines sets route start and end times.
4. **Service frequencies** guide how often transit service is operated.
5. **Bus stop** guidelines cover stop spacing, stop placement and passenger amenities.

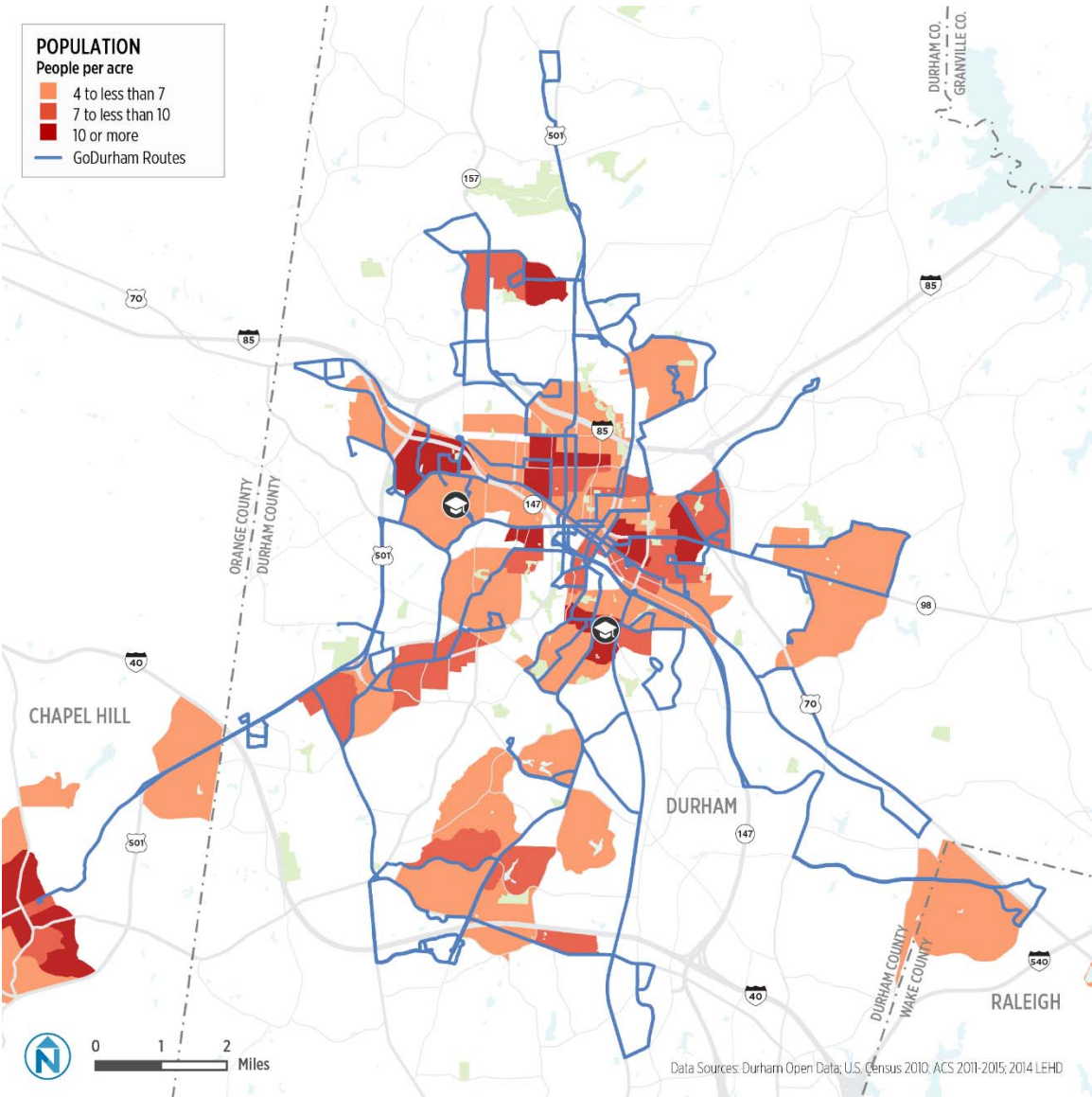
Service Coverage

Coverage and frequency are competing service characteristics that strongly influence the convenience and efficiency of a transit system. As the City of Durham expands to the north and east, it is important to increase service coverage in a responsive yet responsible manner. This involves ensuring that sufficient demand exists for new routes and/or route extensions so that transit services are cost-effective.

Population density is the strongest indicators of potential transit demand. Recent transit analyses in cities similar to Durham reveal that population densities of less than four persons per acre cannot successfully support basic fixed-route transit. Once residential densities exceed ten persons per acre, frequent bus service may be viable. Transit-supportive population densities are depicted on Figure 3.

While population density are a good method to evaluate the service demand, there are other factors to consider, such as vehicle ownership, household income, low-income employment, and low supply and/or high cost of parking. In areas where one or more of these conditions exist, transit service may be effective even if population densities are low.

Figure 3 | Transit Supportive Population Densities



Route Design

Simple

The way transit service is designed influences how easy it is for people to understand available transportation options. Most of the guidelines in this section aim to make service intuitive, logical, and easy to understand.

Direct

Riders prefer faster, more direct transit services. In order to remain competitive with personal vehicles, special attention should be placed on designing routes to operate as directly as possible. Direct routes maximize average speed for the bus and minimize travel time for passengers. Route deviations should be limited to major destinations such as shopping centers, employment sites, medical centers, schools, etc. In these cases, the benefits of deviating service from the main route must be weighed against the inconvenience caused to passengers already on board. Route deviations may also be considered when pedestrian access to a large trip generator is unsafe due to a lack of infrastructure.

In most cases, where route deviations are provided, they should operate for the entire service period. Exceptions are during times when the sites that the route deviations serve have no activity—for example, route deviations to high schools do not need to be in place on weekends.

Efficient

The distance and travel time of a route determine how efficiently a bus can operate. Service should be designed to maximize the time a vehicle is in service, and minimize the amount of time it is out-of-service. Routes should be designed to operate at clockface cycles of 30, 60, 90 or 120 minutes with less than 10-15% layover time. Strategies for addressing routes with excess layover may include extending service to pick up a few more passengers or interlining with other routes to arrive at a combined clockface headway (e.g. $45' + 45' = 90'$).

GoDurham operates several routes that include a core trunk segment with more frequent service and multiple branch segments with less frequent service. This operating practice allows GoDurham to provide a higher level of service along higher ridership corridors closer to the city center and lower levels of service in lower-density outlying areas. In an effort to maximize efficiency and offer consistent headways on the trunk segment of the route, branch segments should be roughly equal in travel time.

Service Span

Span of service refers to the time a route begins and the time it ends. Service span guidelines define when minimum period that different route types should operate. Service can start earlier and/or end later if demand warrants and the route meets minimum productivity expectations described in the following chapter. Because service span is a major factor in determining how much a route will cost to operate, it may not be financially feasible to operate extended service spans on all routes.

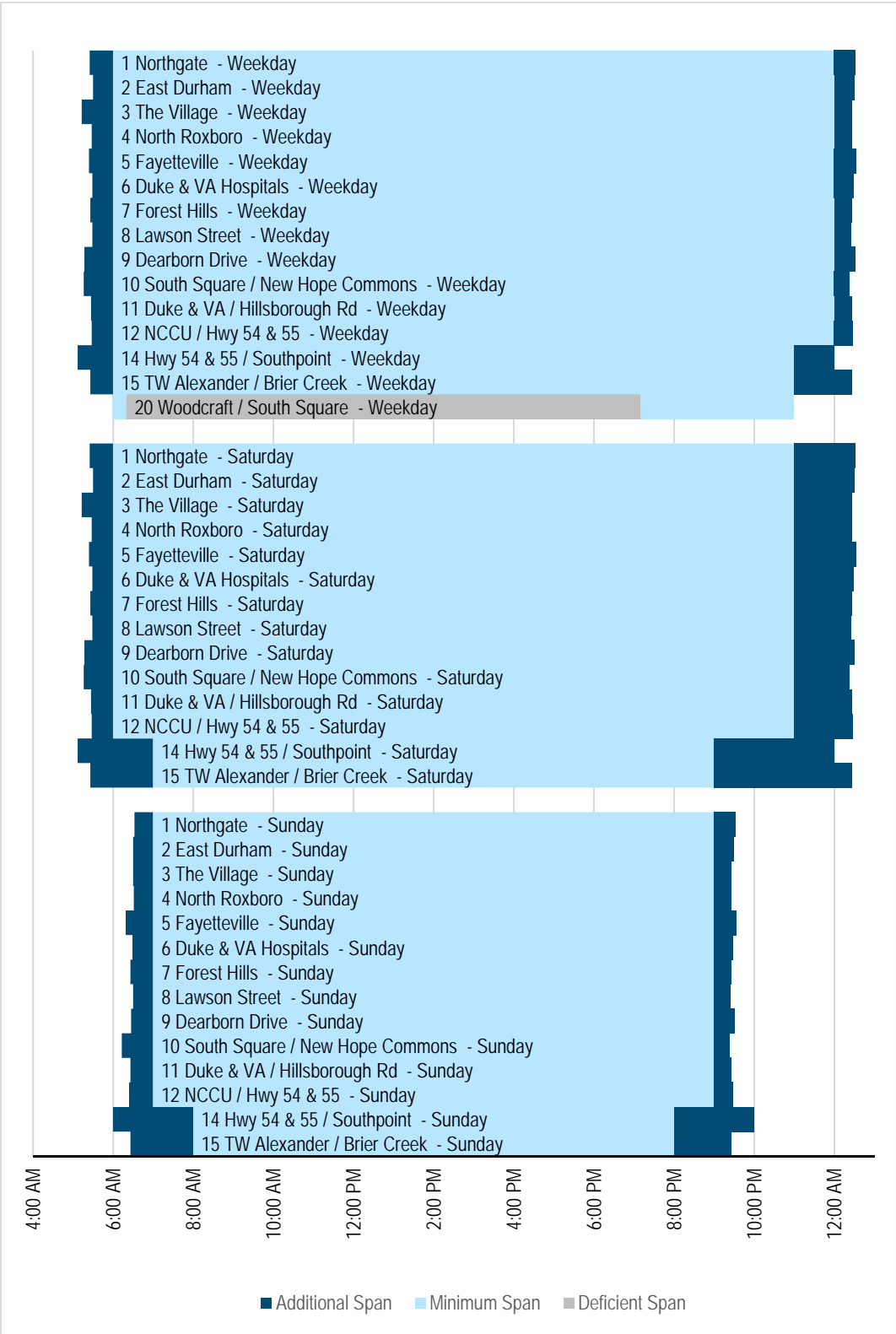
GoDurham currently provides a robust weekday and Saturday service span on all frequent and local routes that begins at 5:30 a.m. and ends at 12:30 a.m., thus ensuring that riders will be able to connect with regional (GoTransit) services. Service spans on Sunday run from 6:30 a.m. to 9:30 p.m. on most routes. Figure 4 details the recommended minimum service spans for each route type by day. Current GoDurham service spans are depicted on Figure 5. Only Route 20 does not meet its recommended minimum service span.

Figure 4 | Minimum Service Span

	Frequent Routes	Local Routes	Coverage Routes	Special Routes
Weekdays				
Begin	6:00 a.m.	6:00 a.m.	6:00 a.m.	No minimum
End	12:00 a.m.	12:00 a.m.	11:00 p.m.	No minimum
Saturdays				
Begin	6:00 a.m.	6:00 a.m.	7:00 a.m.	No minimum
End	11:00 p.m.	11:00 p.m.	9:00 p.m.	No minimum
Sundays				
Begin	7:00 a.m.	7:00 a.m.	8:00 a.m.	No minimum
End	9:00 p.m.	9:00 p.m.	8:00 p.m.	No minimum

Notes: The beginning span refers to the departure of the first trip, and the ending span refers to the departure time of the last trip.

Figure 5 | Current GoDurham Service Spans



Service Frequencies

Service frequency is a critical to establish transit service as an attractive and viable travel mode, and significantly influences transit ridership. Alternatively, frequency has a significant impact on operating costs. Improving a route from a 60-minute frequency to a 30 minute-frequency doubles the route's operating costs. Because operating high-frequency service is so expensive, transit service frequency can vary throughout the day (i.e. peak and off-peak periods) to reflect existing or potential demand. Service frequencies are also set to ensure there are enough vehicles on the route to accommodate passenger volumes while not exceeding recommended loading standards.

Note that when a corridor is served by multiple or branched routes, the overall service frequency along the trunk segment the corridor is effectively more frequent than the branch segments. Service frequencies are listed in terms of “clock face intervals” (e.g. every 15, 20, 30, or 60 minutes) as these intervals are easier for passengers to remember and can help facilitate better transfer connections between routes. Whenever possible, frequencies should be set at regular clock-face intervals. However, there are two key exceptions:

- Where individual trips must be adjusted away from clock face intervals to meet shift times, transfer connections, or other special circumstances;
- Where the desired frequency of service causes round trip recovery time to exceed 20% of the total round trip vehicle time. In such cases, the inefficiency of the schedule outweighs the benefit of a clock face schedule, except when trying to meet a timed transfer at a location like Durham Station.

Maximum service frequency guidelines are presented in Figure 6 As with service spans, recommended service frequencies should be used a guideline.

Figure 6 | Maximum Service Frequency (minutes)

	Frequent Routes	Local Routes	Coverage Routes	Special Routes
Weekdays				
Peak	15	30	60	No maximum
Base	15	30	60	No maximum
Night	30	60	60	No maximum
Saturdays				
Base	30	30	60	No maximum
Night	30	60	60	No maximum
Sundays				
Base	30	60	60	No maximum
Night	30	60	60	No maximum

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Figure 7 | Current GoDurham Service Frequencies (minutes)

	1	2	3	4	5	6	7	8	9	10	11	12	14	15	20
Weekdays															
Peak	30	30	15	30	15	30	30	30	30	15	30	30	60	60	60
Base	30	30	15	30	30	30	30	30	30	15	30	30	60	60	60
Night	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
Saturdays															
Base	30	30	15	30	15	30	30	30	30	15	60	30	60	60	-
Night	60	60	60	60	60	60	60	60	60	60	60	60	60	60	-
Sundays															
Base	60	60	60	60	60	60	60	60	60	60	60	60	60	60	-
Night	60	60	60	60	60	60	60	60	60	60	60	60	60	60	-

15: More frequent than minimum
30/60: Less frequent than minimum

Bus Stops

Bus Stop Spacing

Bus stop spacing guidelines are intended to guide the placement of future stops, while balancing customer convenience with operating efficiency. Customer convenience involves a tradeoff between distance to stops and travel speeds. Closely spaced stops reduce the distance to/from customer origins and destination. However, closely spaced stops also result in slower bus speeds as each additional stop requires the bus operator to decelerate, come to a complete stop, allow time for customers to alight and/or board, accelerate, and merge back into traffic. Since most riders want service that balances convenience and speed, the number and location of stops is a key component of determining that balance.

In general, areas with high population and employment density should have shorter stop spacing than areas with moderate or low densities. Figure 8 provides stop spacing guidelines based on population and employment density characteristics. Actual stop spacing will vary based on built environment characteristics.

Figure 8 | Recommended Bus Stop Spacing

	Frequent Routes	Local Routes	Coverage Routes	Special Routes
Minimum Stop Spacing in Feet				
Moderate to High Density Areas	1,300	1,000	1,000	No Guideline
Low Density Areas	1,300	1,000	1,000	No Guideline
Maximum Number of Stops Per Mile				
Moderate to High Density Areas	4	5	5	No Guideline
Low Density Areas	4	5	5	No Guideline

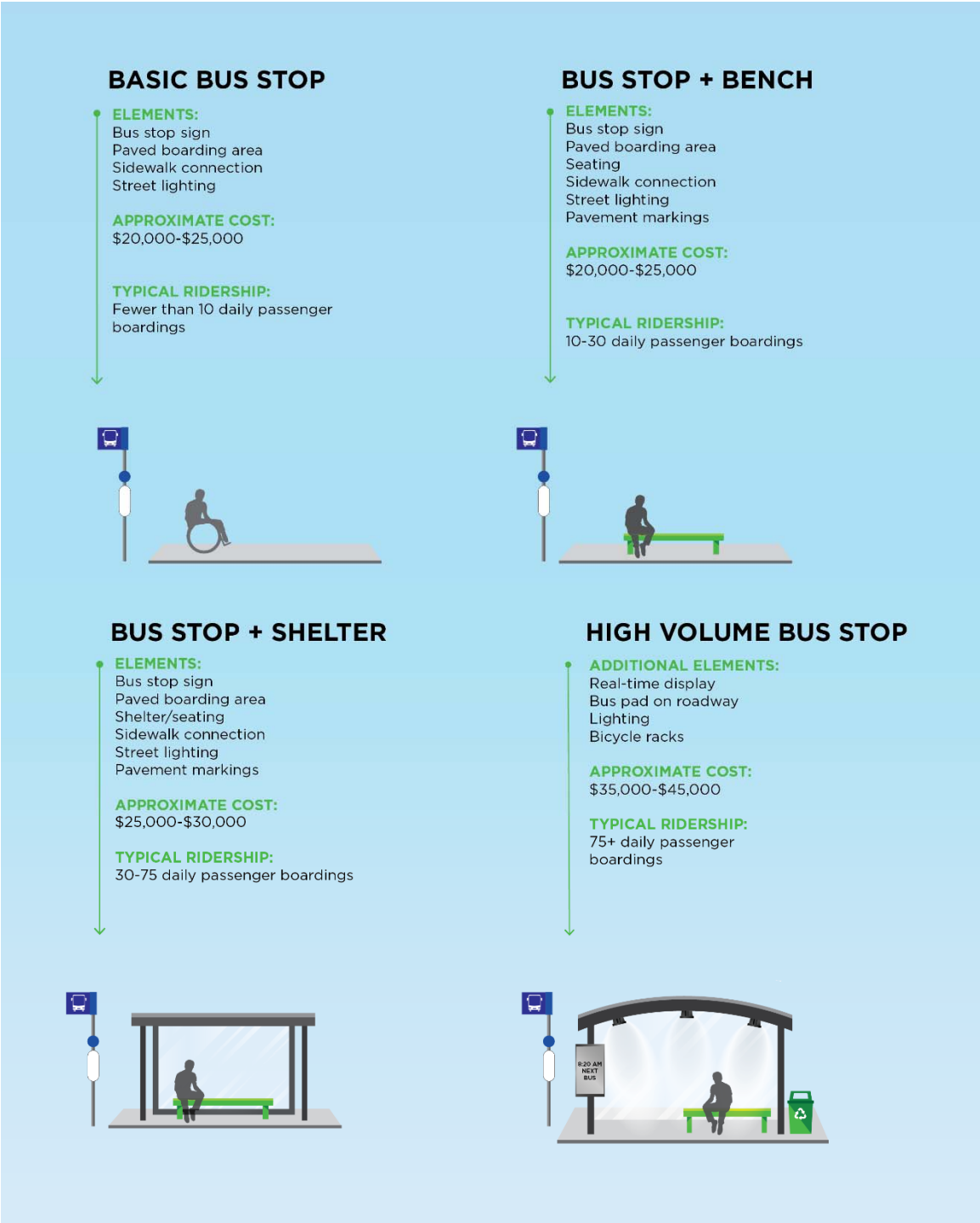
Bus Stop Amenities

In addition to stop spacing, stops should include amenities that are appropriate for the level of passenger activity occurring at each stop. This guideline serves several purposes: it ensures amenities are distributed with equity and ensures that transit providers are efficiently investing capital resources in locations where it is most appropriate. Since passenger amenities enhance multiple routes, these standards are not specific to the type of service, only the total number of boardings, as described.

Where practicable, all new or improved bus stops and passenger waiting areas must conform to the ADA requirements as laid out in the Department of Transportation ADA standards for Transportation Facilities (2006). These standards specify a variety of requirements for platform surface, widths, and connectivity to surrounding sidewalk infrastructure and shelter facilities. As funds are available, existing bus stops and passenger waiting areas should be updated to meet ADA requirements.

Additionally, all stops should include clear signage. Additional amenities such as benches should be provided, as appropriate, depending on the level of passenger activity. Figure 9 provides a description of recommended bus stop amenities based on average daily passenger boardings.

Figure 9 | Bus Stop and Transit Station Types



PERFORMANCE MEASURES

Performance measures describe the methodology by which services are evaluated. Routes should be evaluated monthly to identify trends and inform the service change proposal development. The following three performance measures are recommended for GoDurham:

- On-Time Performance
- Route Productivity
- Passenger Loads

These performance measures will identify high- and low-performing routes and trips, thereby assisting GoDurham in determining when it is appropriate to adjust investments associated with specific route schedules. Accordingly, performance measures are defined for route type, recognizing that expectations for productivity and efficiency will be shaped by the underlying market and operating characteristics.

On-Time Performance

On-time performance measures how closely a transit service adheres to the published schedule. It is an important measure for transit users because it directly impacts service reliability. It is also crucial for timed-transfer systems as buses arriving more than five minutes late at GoDurham Station will likely result in missed connections. On-time performance is measured by comparing scheduled and actual bus departure and arrival times at fixed time points (bus stops identified in published schedules).

To precisely measure on-time performance, a definition of on-time must be established. The most widely accepted fixed route measure of on-time is up to one minute earlier and no more than five minutes later (-1 minute to +5 minutes) than the scheduled arrival time at all time points. The only exception to this measure would include early arrivals on commuter routes to their final destinations. Minimum on-time performance percentages are defined in Figure 10.

Figure 10 | Minimum On-Time Performance

	Frequent Routes	Local Routes	Coverage Routes	Special Routes
Weekday	85%	85%	85%	85%
Saturday	85%	85%	85%	85%
Sunday	85%	85%	85%	85%

Route Productivity

The number of passenger boardings per revenue hour (or revenue trip on commuter routes) measures how well the service is being used. For frequent, local and coverage routes, productivity should be measured by dividing the number of passenger boardings by the number of vehicle revenue hours for each route. For special routes (circulators, shuttles and commuter express) productivity should be measured as passenger boardings per trip.

An ideal productivity range for each route type and day of the week is provided in Figure 11. Routes performing below the ideal range may require corrective action, such as schedule adjustments or route revisions. At the opposite end of the scale, routes performing above the ideal range may indicate the demand for additional service (i.e. headway or span improvement) or capacity (i.e. higher-capacity vehicle).

Figure 11 | Target Route Productivity Range

	Boardings per Revenue Hour			Boardings per Revenue Trip
	Frequent Routes	Local Routes	Coverage Routes	Special Routes
Weekdays	30-50	25-40	15-30	20-35
Saturdays	25-40	20-35	15-25	15-30
Sundays	20-35	15-30	10-20	-

Passenger Loads

Passenger loads refers to the ratio of riders on the bus relative to the number of available seats. Passenger loads vary by route type, time of day and for some routes, direction of travel. High passenger loads impact rider comfort and safety. During peak periods, some riders on high-ridership routes may be expected to stand for a portion of the trip. Overcrowding on buses often indicates the need for improved frequency or increased capacity.

During off-peak periods, most services should be designed to try to provide a seat to all customers. Commuter service should always be designed to provide a seat to all customers due to high travel speeds. Appropriate vehicle assignments are critical in managing passenger loads. Recommended maximum vehicle loads by service type and time of day are detailed in Figure 12.

Figure 12 | Maximum Vehicle Loads

	Frequent Routes	Local Routes	Coverage Routes	Special Routes
Weekdays				
Peak	120%	120%	100%	No maximum
Base	120%	100%	100%	No maximum
Night	120%	100%	100%	No maximum
Saturdays				
Base	100%	100%	100%	No maximum
Night	100%	100%	100%	No maximum
Sundays				
Base	100%	100%	100%	No maximum
Night	100%	100%	100%	No maximum

SERVICE CHANGES

GoDurham conducts two service changes each year to modify routes and adjust schedules based on performance evaluation findings, rider feedback, operator feedback and land use changes. Each service change process also allows GoDurham to implement new services and if necessary, discontinue consistently unproductive route segments or scheduled trips. Route realignment or consolidation should always be explored prior to considering the elimination of an entire route. GoDurham typically schedules implementation of major route and schedule changes in August and minor changes in January.

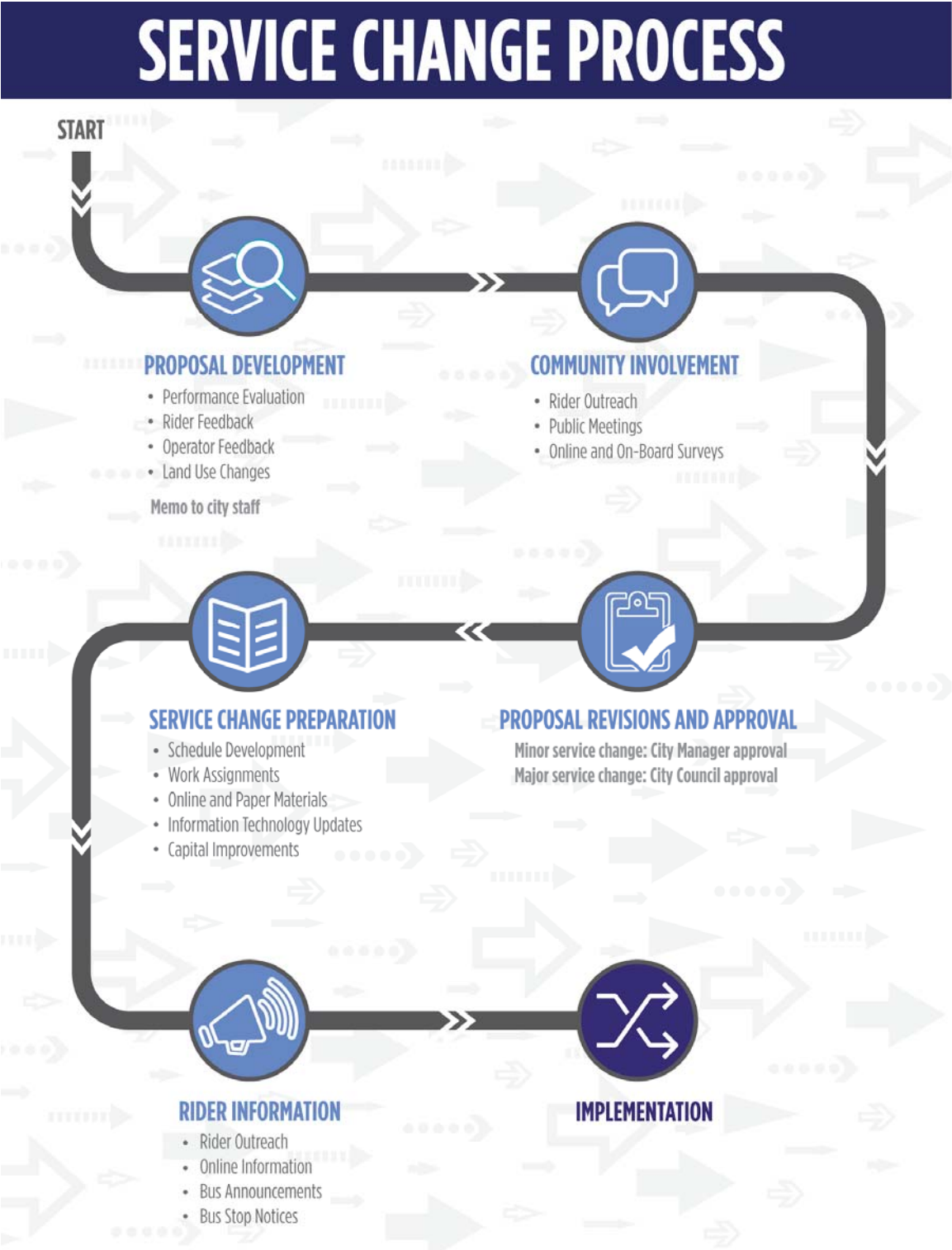
Each service change includes multiple opportunities for public comment, staff revision and board review. Each service change process spans approximately six months from the start of proposal development to the implementation date. GoDurham's service change process with key activities and actions is summarized in Figure 14.

The City of Durham adopted a service change policy in June 2011 that created four service change types based on rider impacts. Each service change type has unique minimum impacts and approval requirements, as detailed in Figure 13.

Figure 13 | Service Change Classifications

Service Change Type	Rider Impact	Requirements	Approval
Operational change <ul style="list-style-type: none"> ▪ Detours ▪ Stop change or closure 	<ul style="list-style-type: none"> ▪ < ¼ mile of existing route ▪ < ¼ mile bus stop impact 	<ul style="list-style-type: none"> ▪ None 	City Department of Transportation
Minor service change <ul style="list-style-type: none"> ▪ Route ▪ Schedule adjustment 	<ul style="list-style-type: none"> ▪ < 150 passenger boardings or ▪ < 25% of a route's boardings ▪ < 25% of a route's miles or ▪ < 25% of a route's revenue hours 	<ul style="list-style-type: none"> ▪ Public comment 	City Department of Transportation
Significant service change <ul style="list-style-type: none"> ▪ Route ▪ Schedule adjustment 	<ul style="list-style-type: none"> ▪ > 150 passenger boardings or ▪ > 25% of a route's boardings ▪ > 25% of a route's miles or ▪ > 25% of a route's revenue hours 	<ul style="list-style-type: none"> ▪ Public comment 	City Manager
Fare change	<ul style="list-style-type: none"> ▪ Any rider impact 	<ul style="list-style-type: none"> ▪ Public hearing ▪ Title VI analysis 	City Council
Major service change <ul style="list-style-type: none"> ▪ Route modification ▪ Schedule adjustment 	<ul style="list-style-type: none"> ▪ > 25% of system boardings or ▪ > 25% of system revenue miles or ▪ > 25% of system revenue hours 	<ul style="list-style-type: none"> ▪ Public hearing ▪ Title VI analysis (see page 4-3) 	City Council

Figure 14 | GoDurham Service Change Process



Title VI Analysis

The Federal transit Administration (FTA) has established requirements and guidelines that transit systems must use when implementing a “major service change and/or fare change”. According to these guidelines, the City of Durham must conduct an analysis to determine whether the proposed changes would create a disparate impact on minority populations or a disproportionate burden on low-income populations.

The most current Census decennial data or Census American Community Survey (ACS) demographic data should be used for this analysis. For reference, the FTA defines the following populations as minorities: American Indian, Asian, African American, Hispanic, and Native Hawaiian. The FTA defines low-income persons as a person whose median household income is at or below the U.S. Department of Health and Human Services (HHS) Poverty Guidelines. FTA Title VI requirements and guidelines were updated on October 1, 2012 and can be reviewed in their entirety in FTA Circular 4702.1B.

Appendix G

GoDurham SRTP Process Presentation



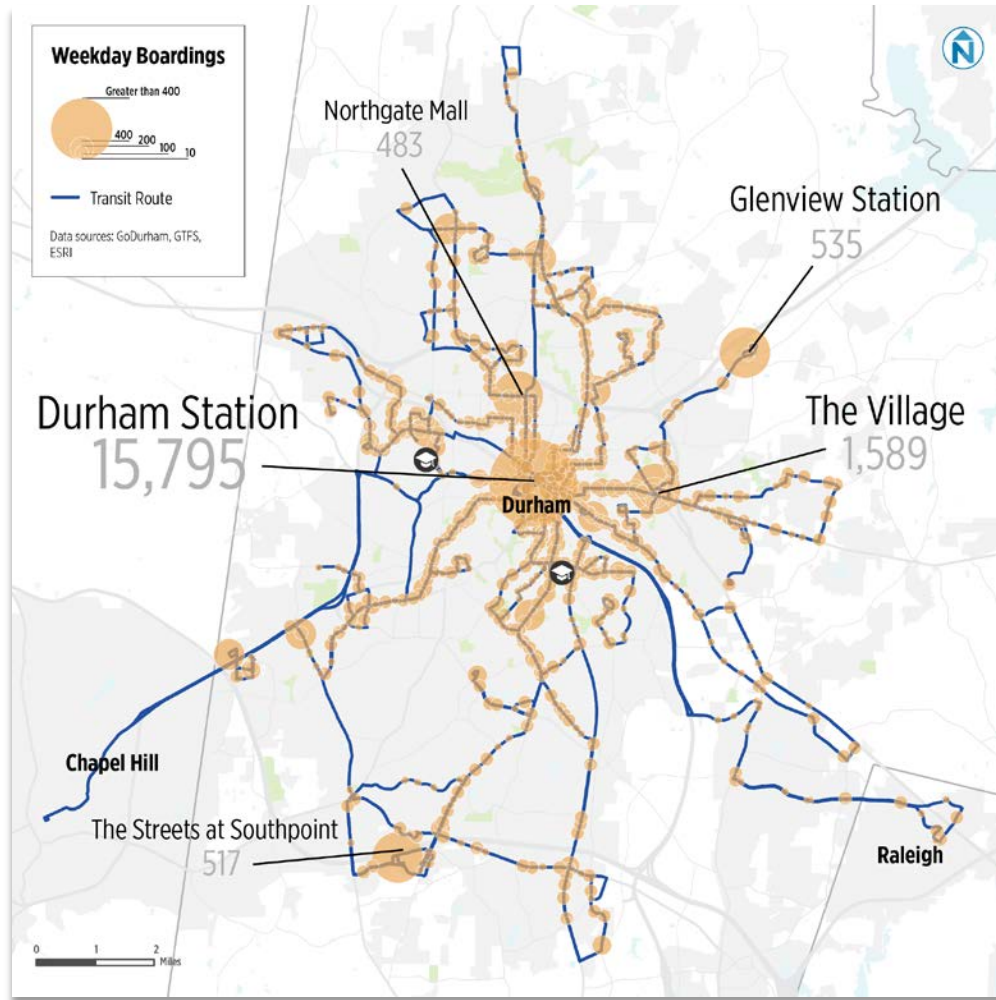
Short Range Transit Plan

Agenda

- What is a Short Range Transit Plan?
- Initial Service Options
- Transit Vision
- Phase II Outreach Results
- Preferred Option
- Additional Needs
- Next Steps

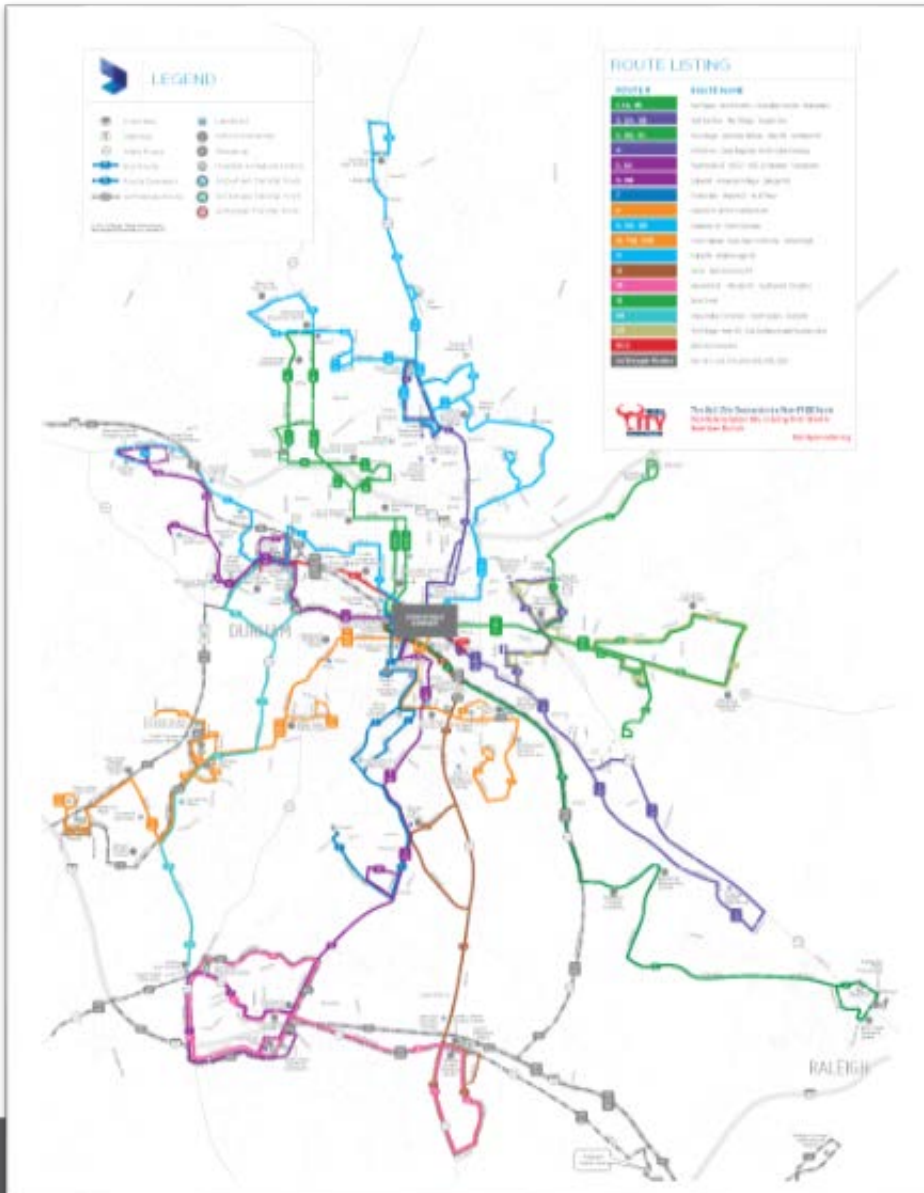


What is a Short Range Transit Plan?



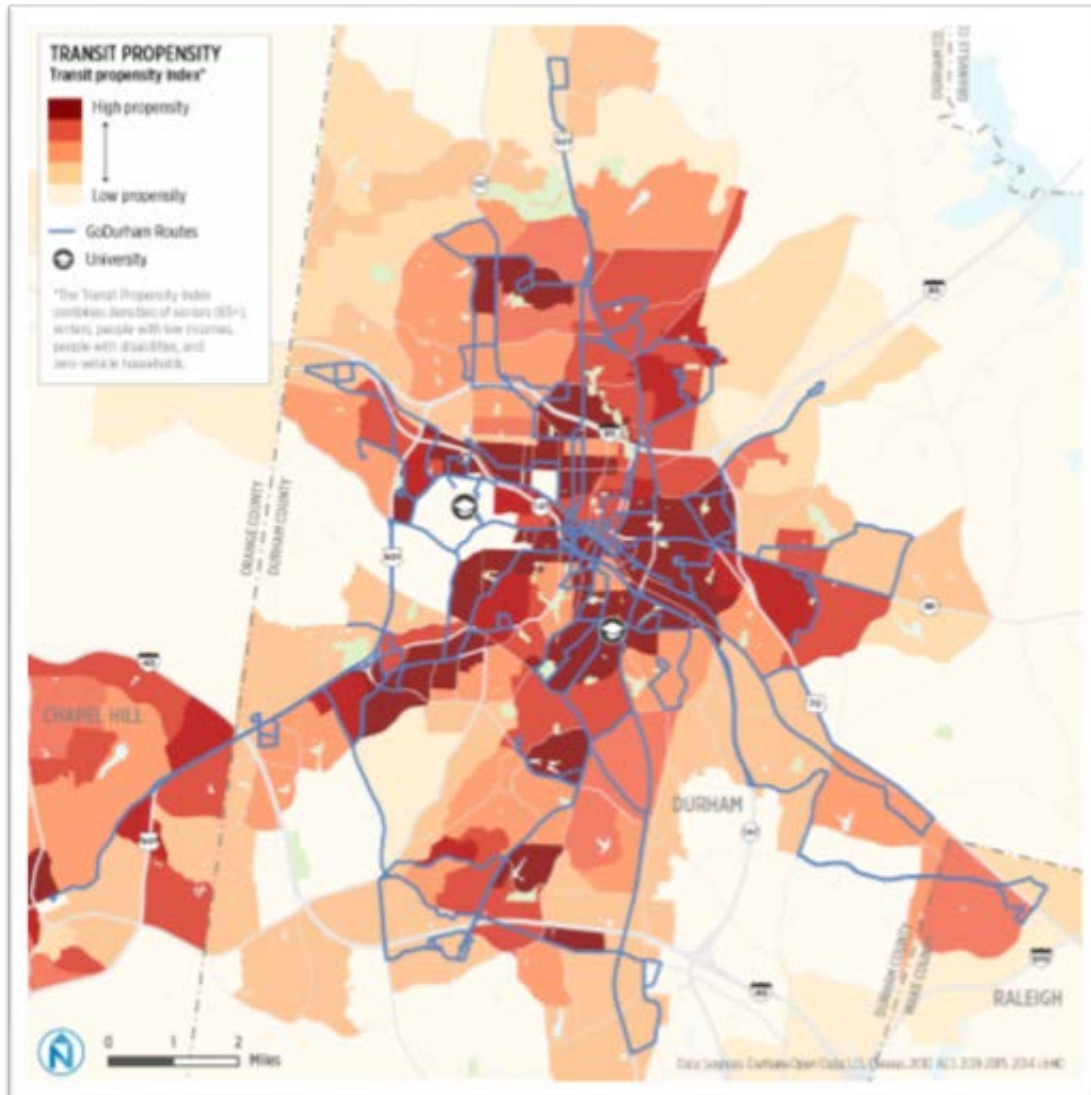
- Assessment of existing service
- Market analysis
- Document unmet needs
- Roadmap to improve service in the next 5 years

GoDurham SRTP Goals



- Address on-time performance
- Simplify route patterns
- Find opportunities for smaller vehicles or innovative on-demand service
- Increase service to areas with high demand
- Reduce service to low ridership areas
- Identify opportunities for more direct service
- Evaluate options for Bull City Connector

What Does the Market Say?

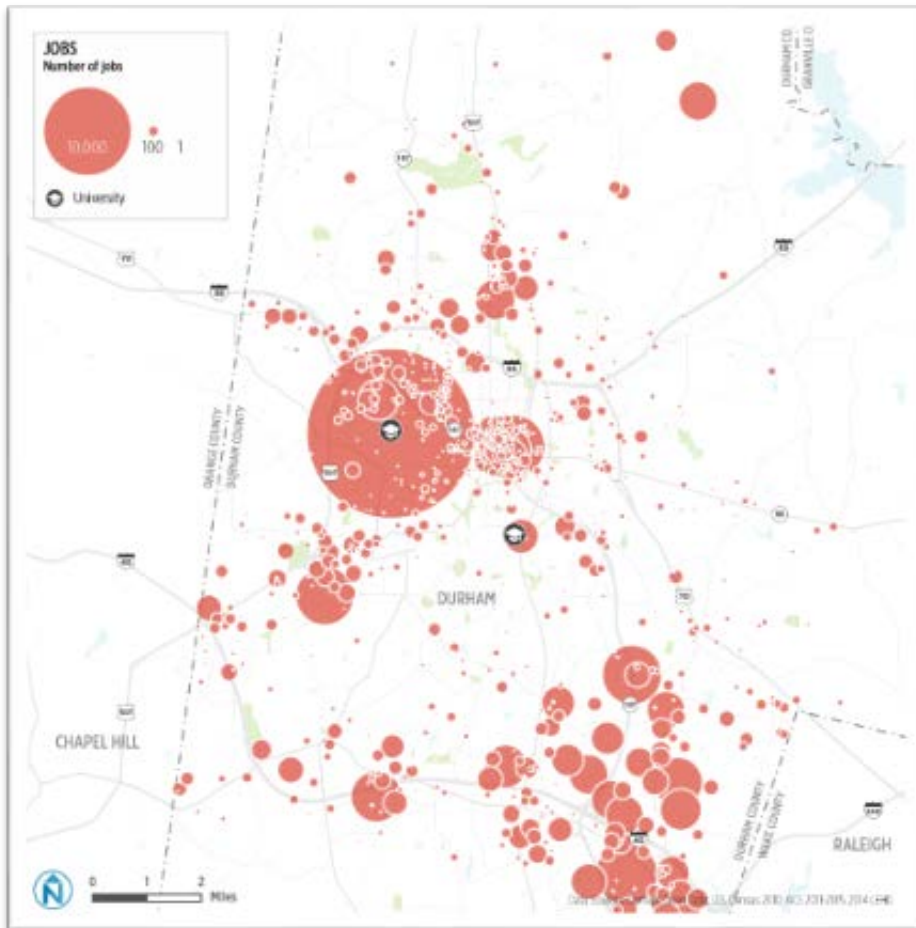


- Population & employment
- Socioeconomic factors
- Work travel patterns for regular and low-income employees

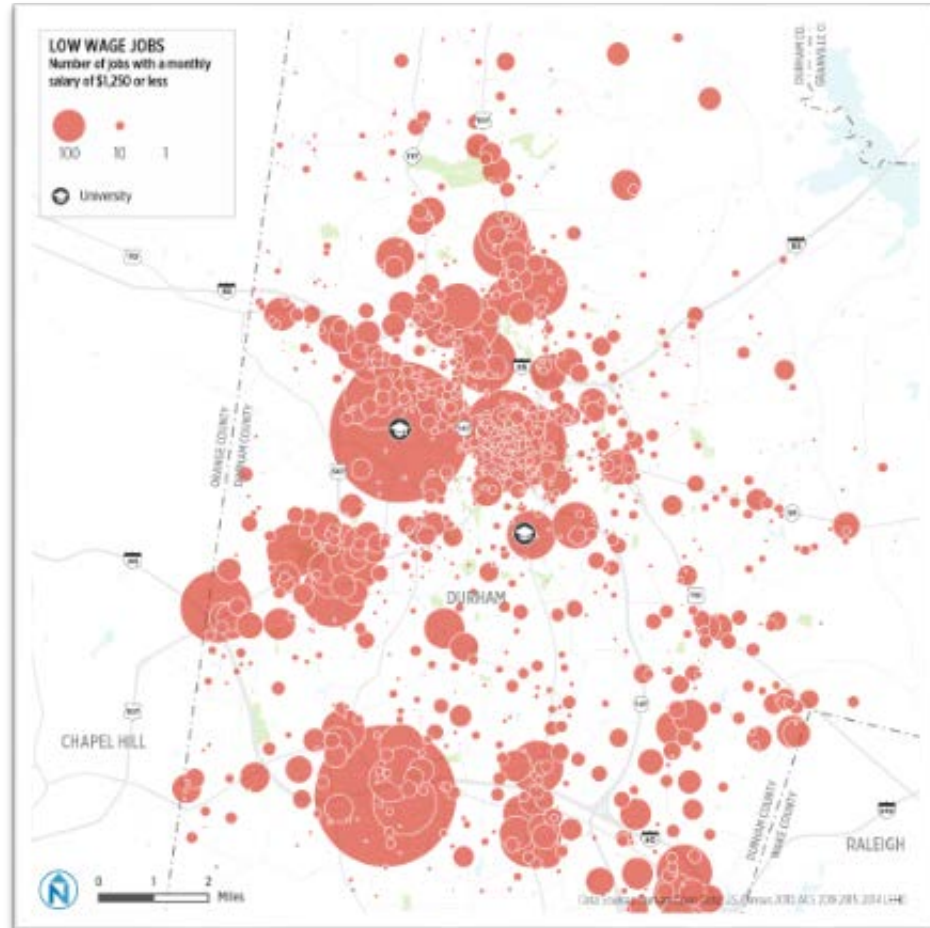
Demand clustered into six areas based on density of five combined indicators

What Does the Market Say?

Employment Concentrations

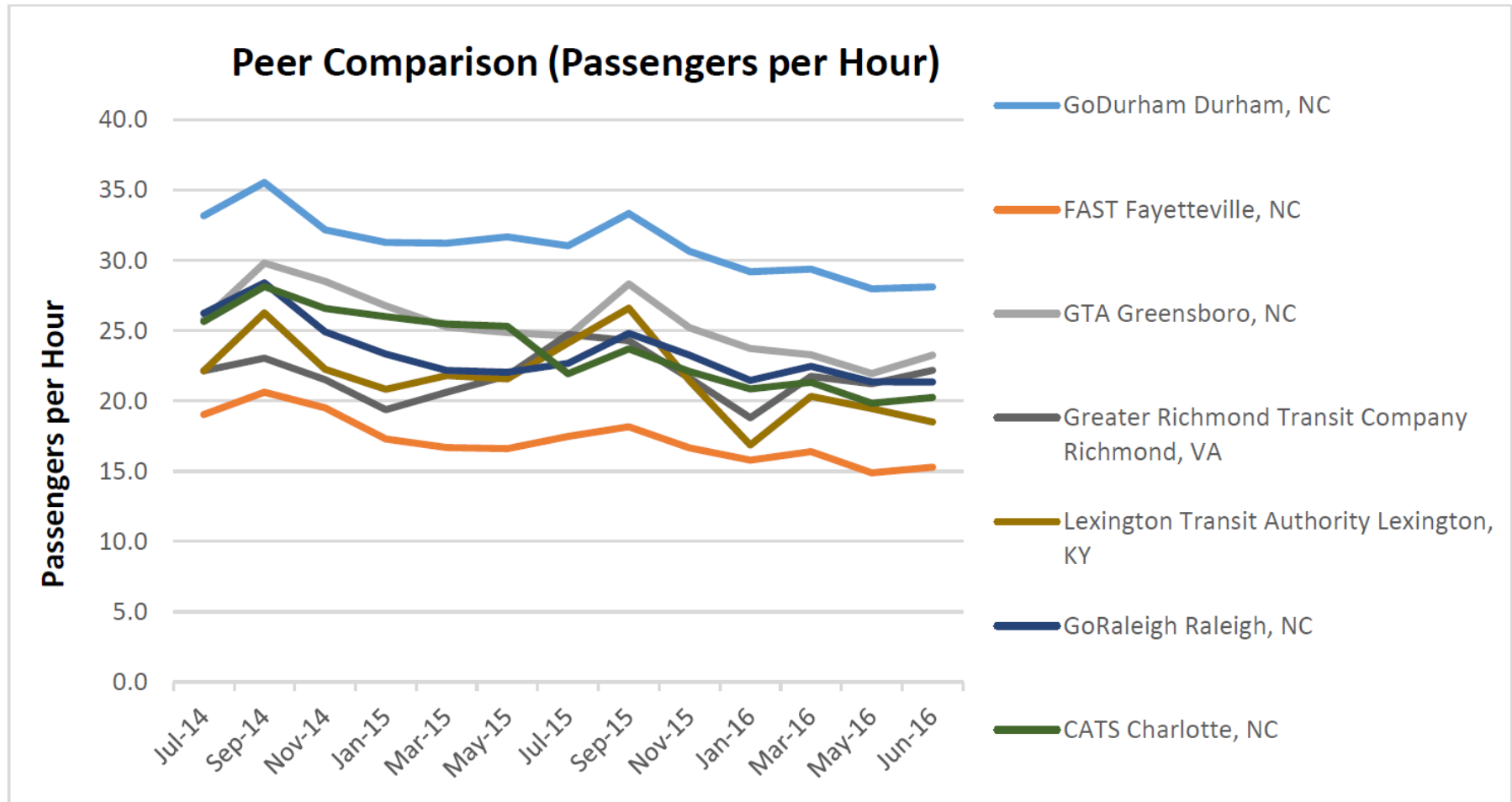


Low Wage Job Concentrations

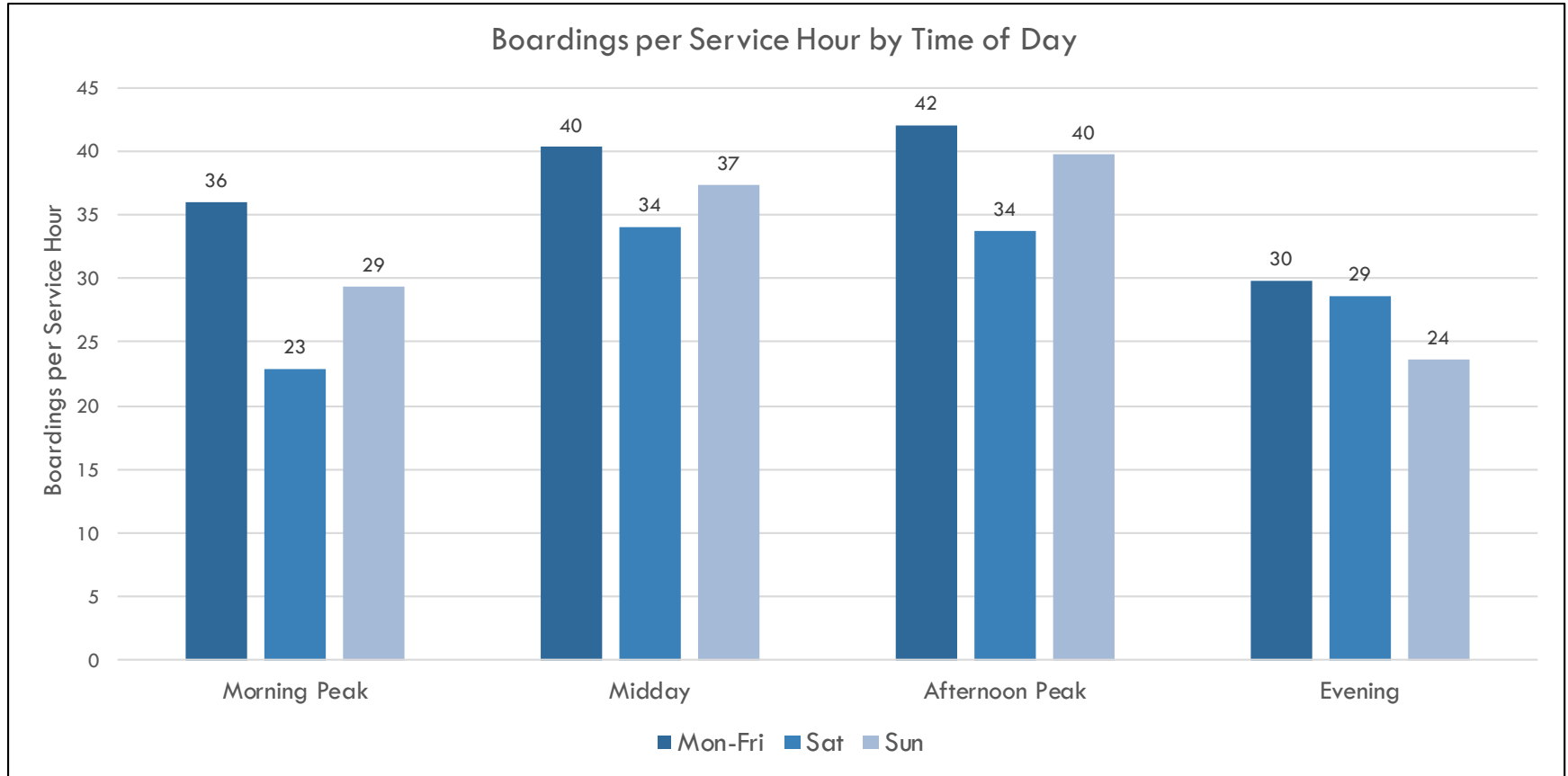


What Do the Numbers Say?

GoDurham is a productive service



GoDurham Ridership is Strong



What Do the People Say?

Phase I

- Information gathering
- Understanding priorities

Phase II

- Gather feedback on two service scenarios
- Use input to create Preferred Option

Phase III

- Gather feedback on Preferred Option

Stakeholders
Passenger Outreach
Community Events

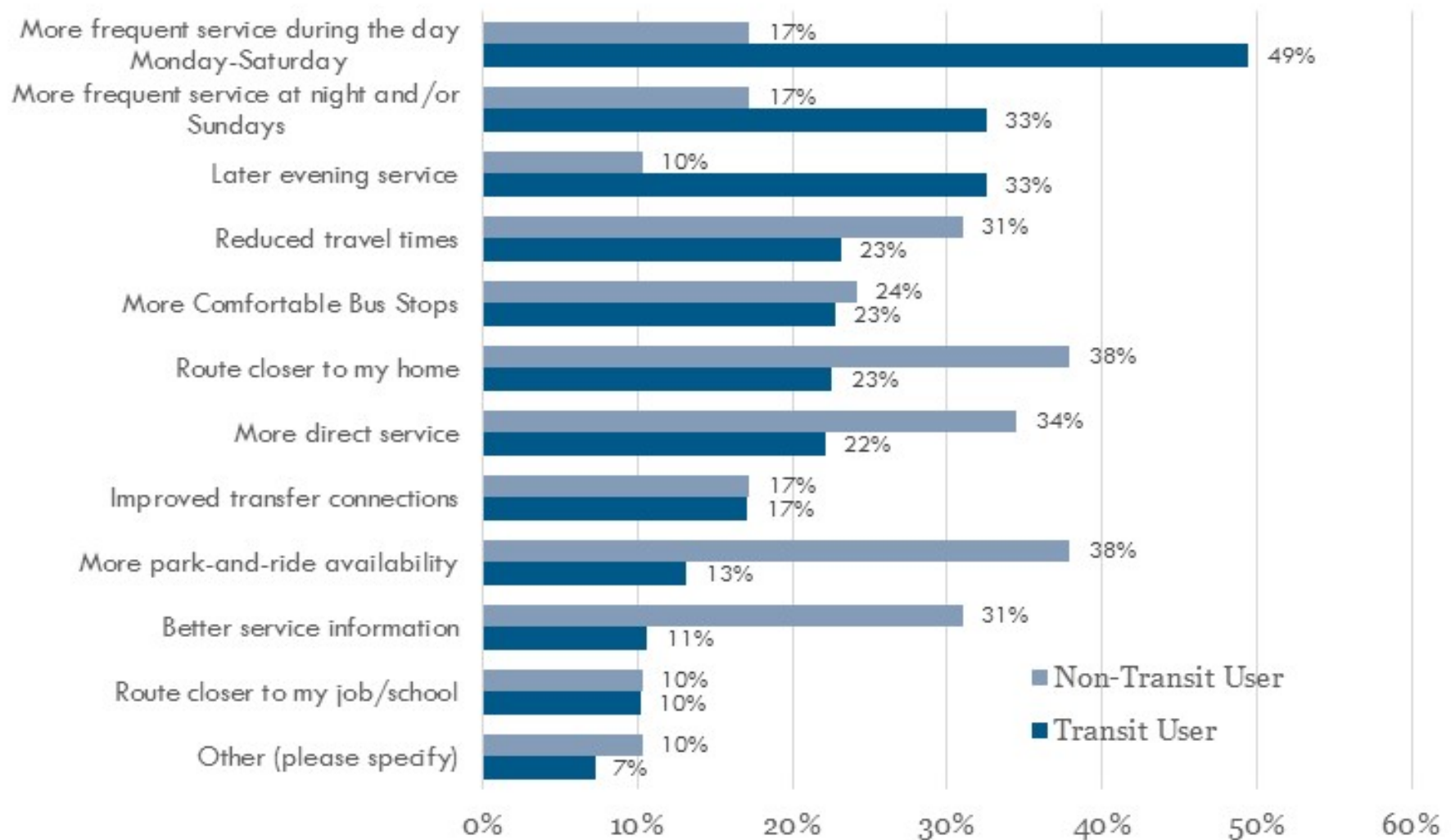


Highest priority



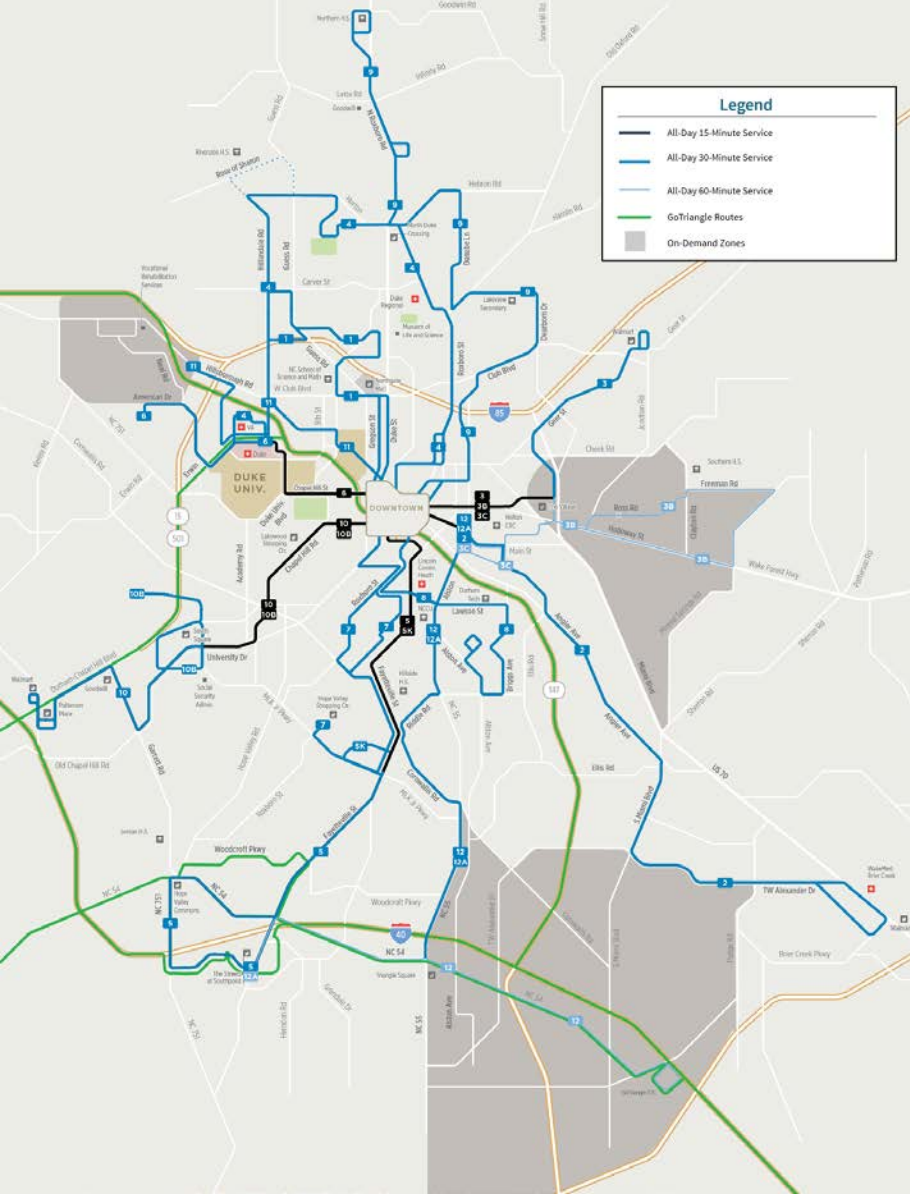
More frequent service

Improvement Priorities for 950 Survey Responses

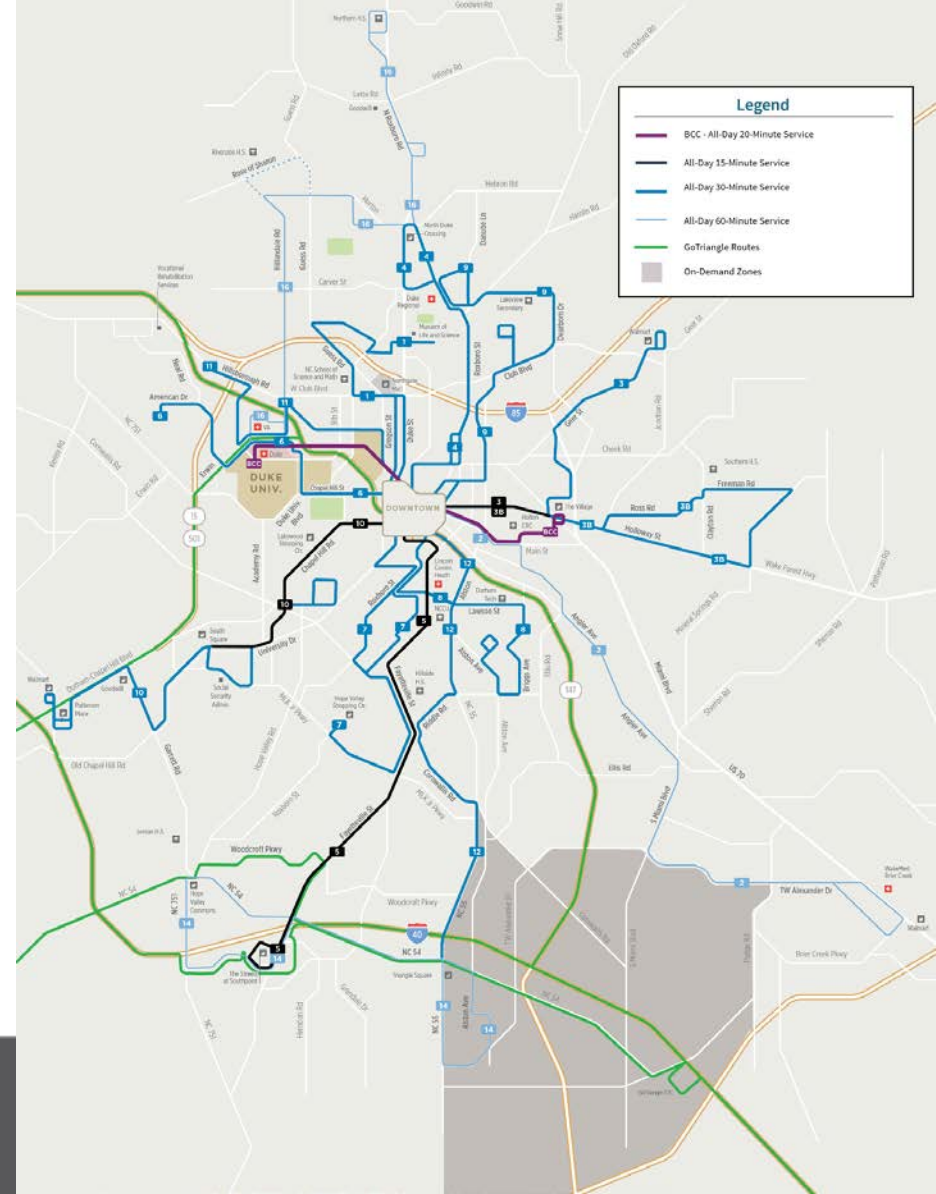


Two Service Options Were Developed

Scenario 1



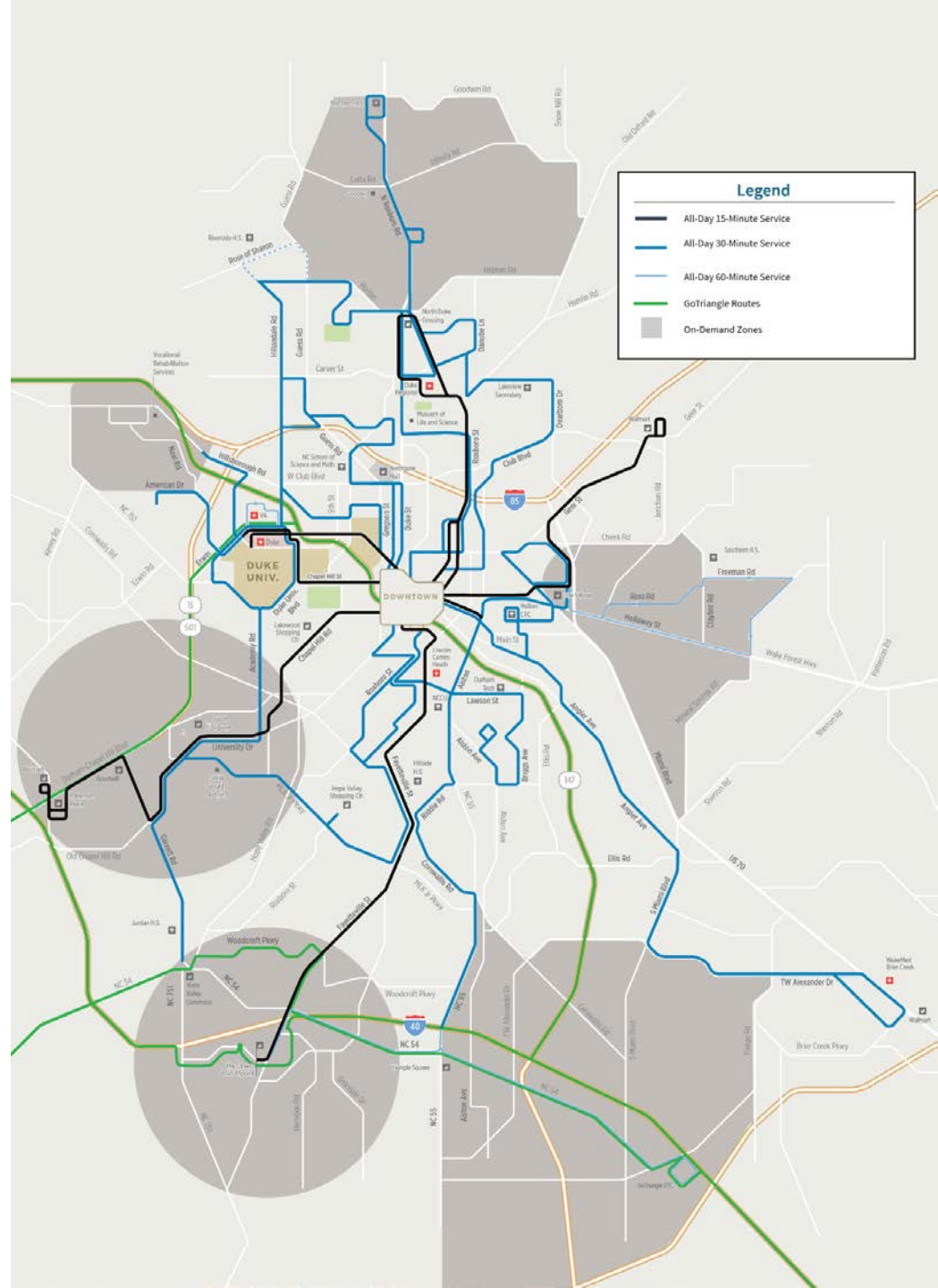
Scenario 2



Transit Vision

- More corridors with service every 15-minutes all day
- Simplified Service
- More frequent weekday & Saturday service
- Later Evening Service
- More frequent and later Sunday Service
- More Direct Service to Major Destinations
- On-Demand Zones
- Supporting Capital Facilities

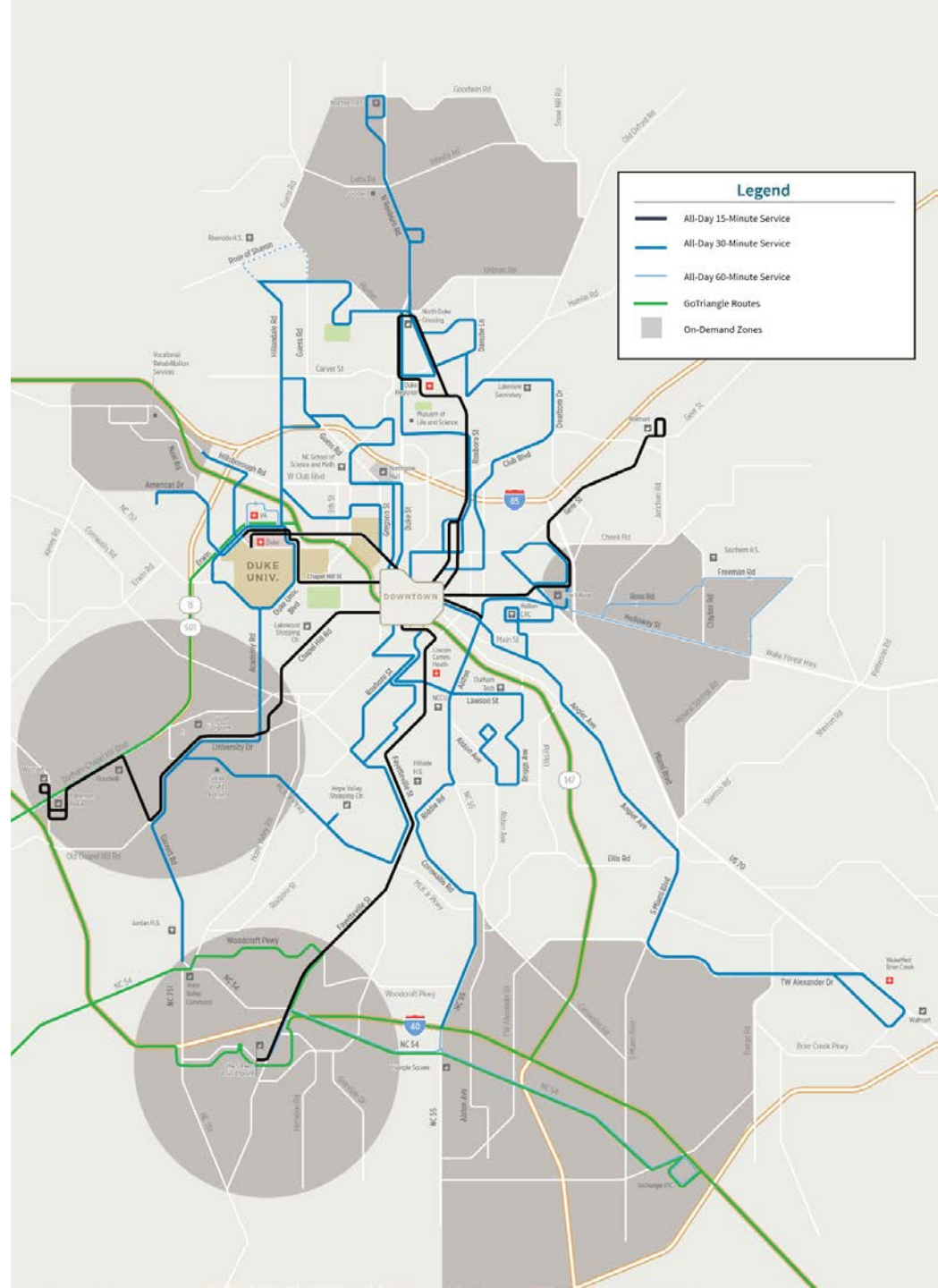
Additional operating resources will be necessary to implement these improvements



Transit Vision

- 29.4 more miles of frequent service (every 15 minute or more all day)
- 91,000 more residents and jobs within a quarter mile of frequent service
- 146,000 more residents and jobs within a quarter mile of service that operates every 30 minutes or better

Additional operating resources will be necessary to implement these improvements



Phase II Outreach: What We Heard

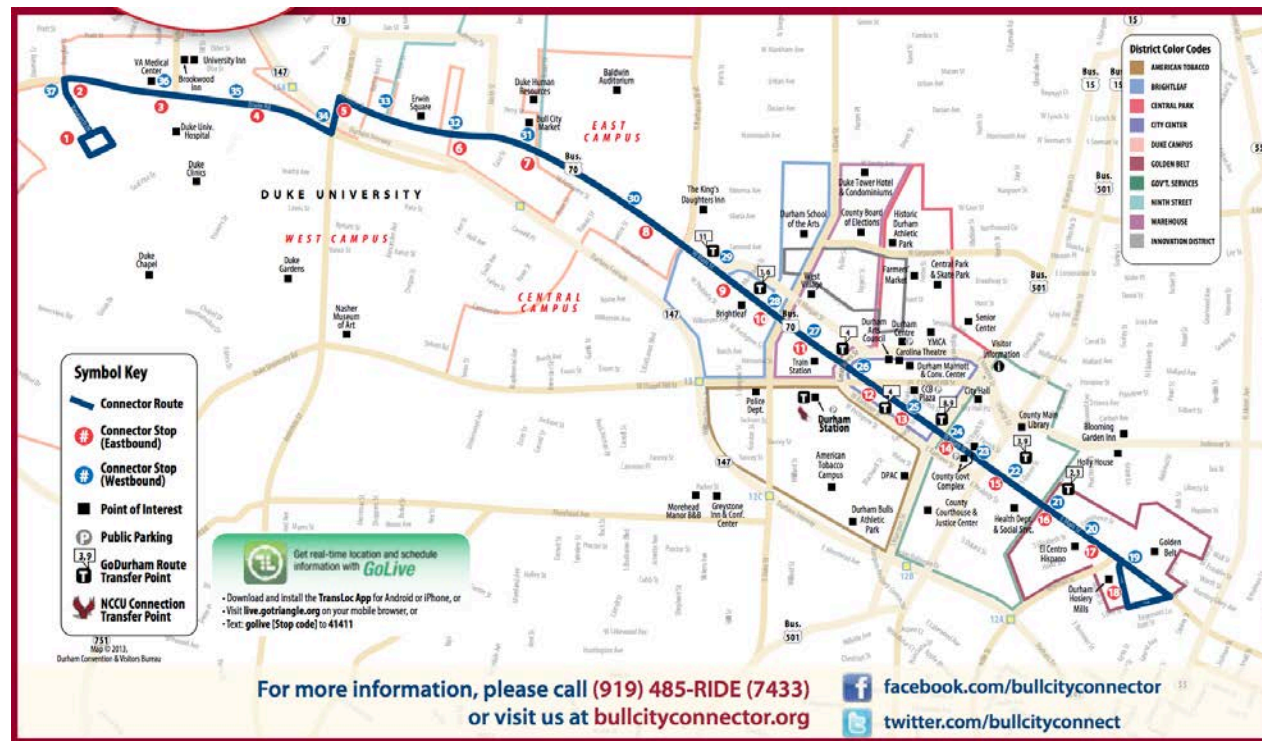
- Many positive responses related to expanded service to RTP and expanded high frequency service network
 - *“LOVE connecting East Durham to RTP and Brier Creek for workers & increased shopping opportunities.”*
 - *“This scenario appears to provide service to more residents more frequently”*
- Some commenters mention they are concerned about the removing Route 20
 - *“I take the #20 bus from my apartment complex to Duke University daily. This is a very convenient route for me and I would not be in favor of eliminating this line.”*
 - *“I take the bus #20 to school at Duke almost every day. Eliminating this route would hurt a lot of students.”*

Phase II Outreach: What We Heard

- Many riders support maintaining the Bull City Connector as a fare free service, but many prefer adding back a connection to Durham Station
 - *“I think it is important to have a free bus service for lower income riders to use to get to the Duke/VA Hospitals.”*
 - *“It definitely needs to go to the Durham Station because that's where all the other buses go.”*
- Some commenters mention they would like to see improved frequencies and an expanded service area
 - *“I feel the more people you reach and the improved frequencies are key. Bus stop improvements are important across the board ... Whether you revamp the BCC or other buses on the routes, improved frequency should be strongly considered as well.”*

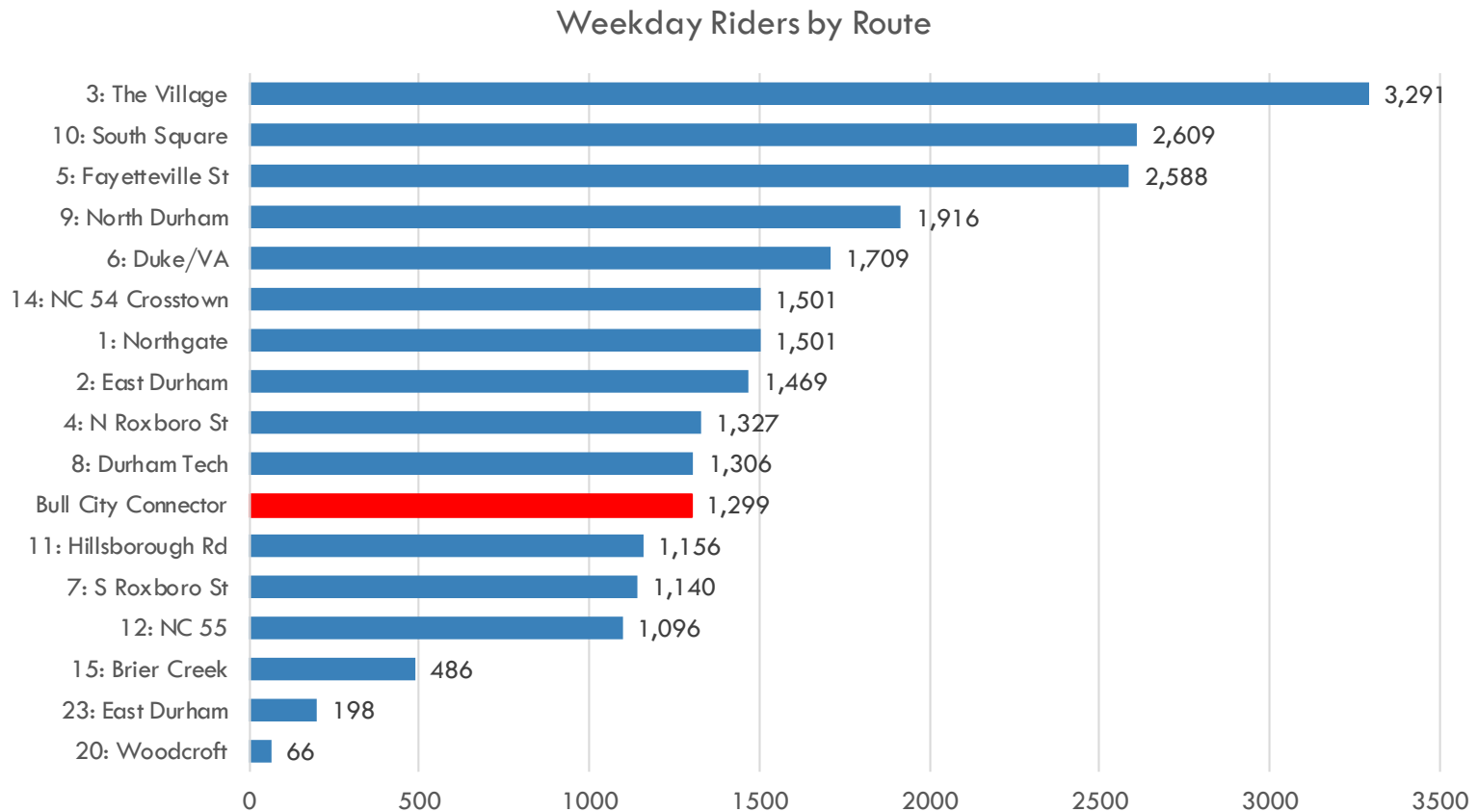
BCC Costs \$1.1 Million to Operate Annually

- Duke contributed \$350,000 annually but is eliminating funding
- Durham contributed remaining \$750,000



BCC Underperforms Compared to Other Service

- Removal of Durham Station stop resulted in 25-30% loss in ridership



BCC Resources Can be Better Utilized

What We Know:

Despite being fare free, the BCC underperforms compared to other routes

What We Heard:

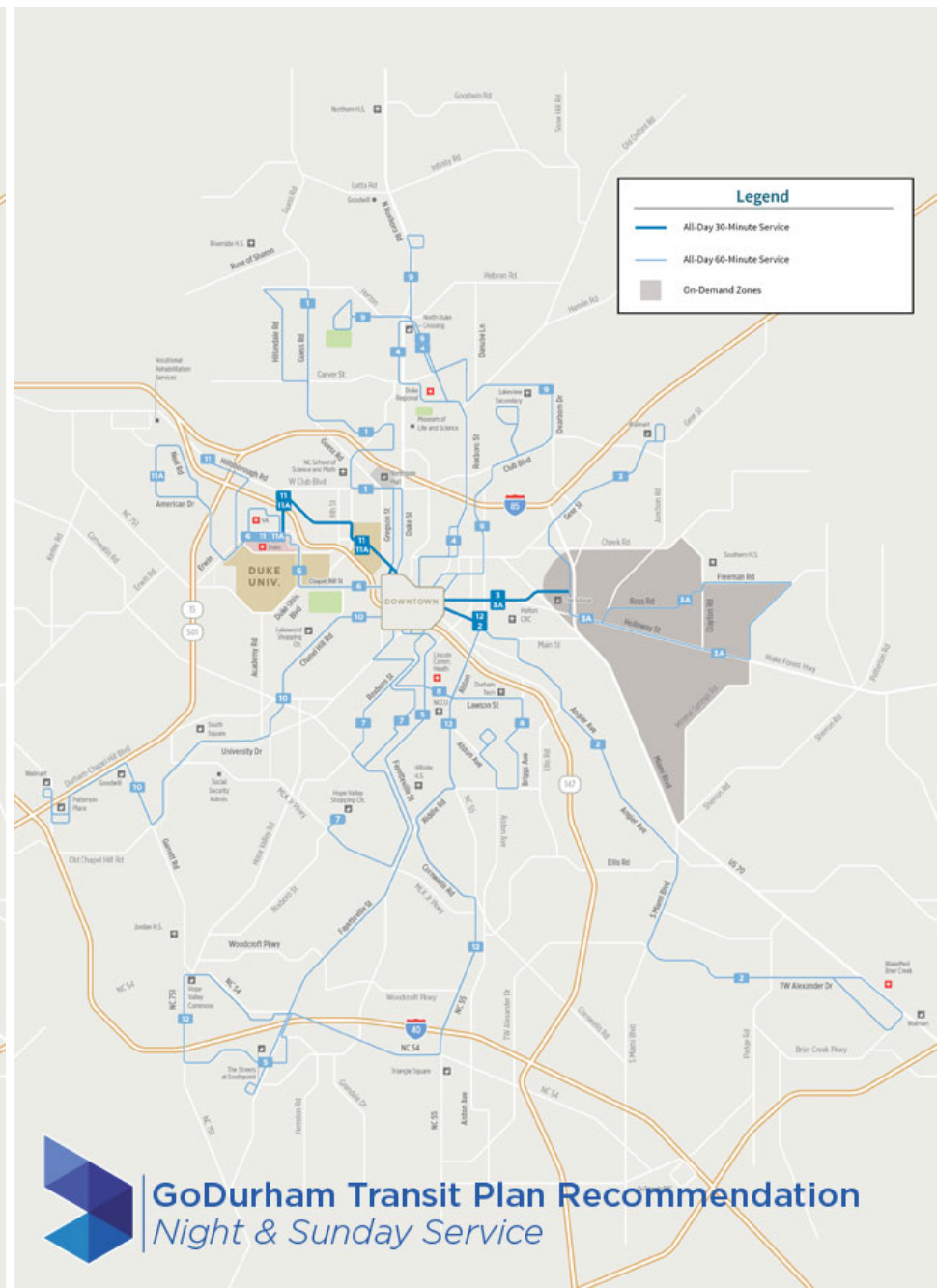
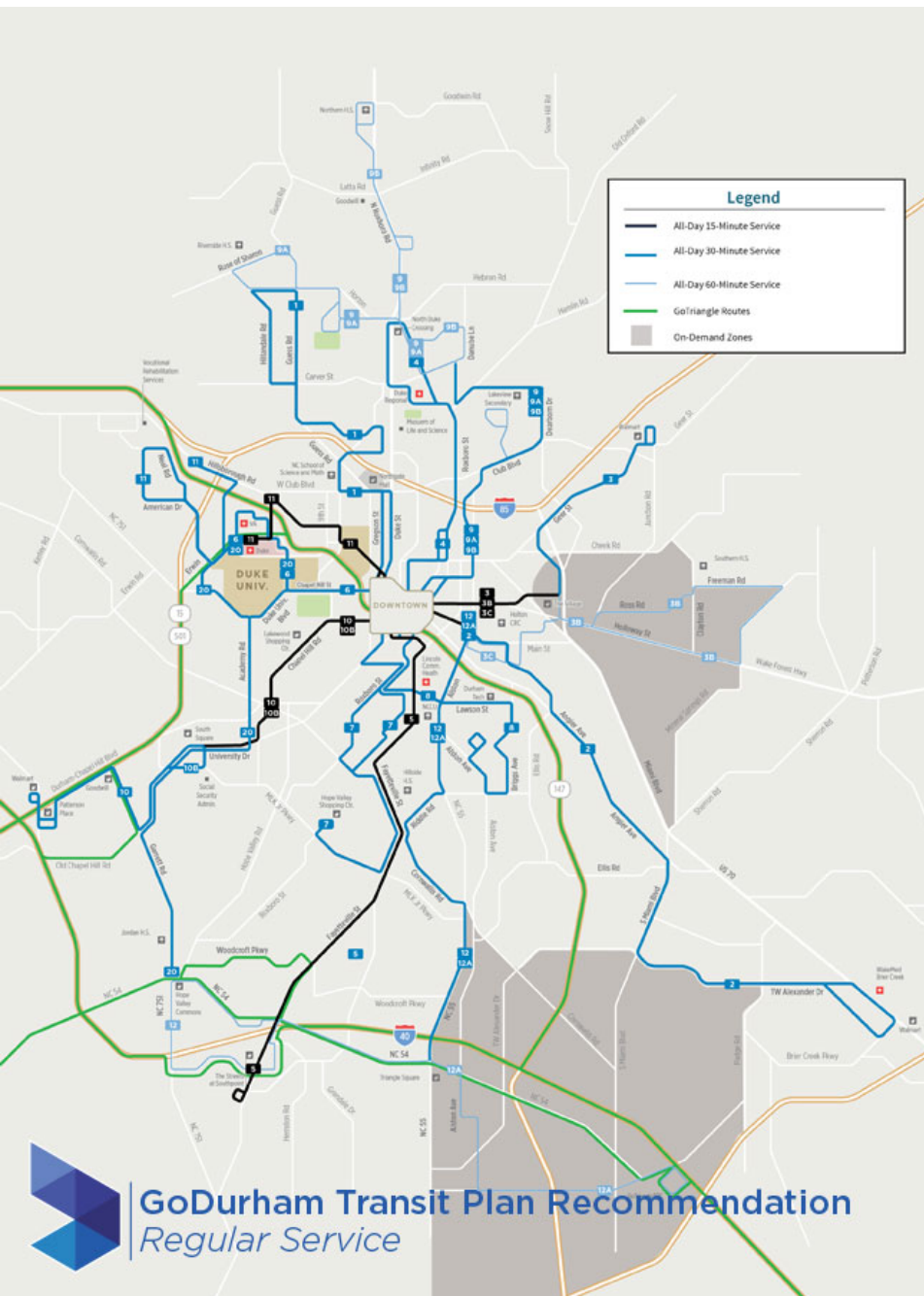
BCC should serve Durham Station and fare free is important

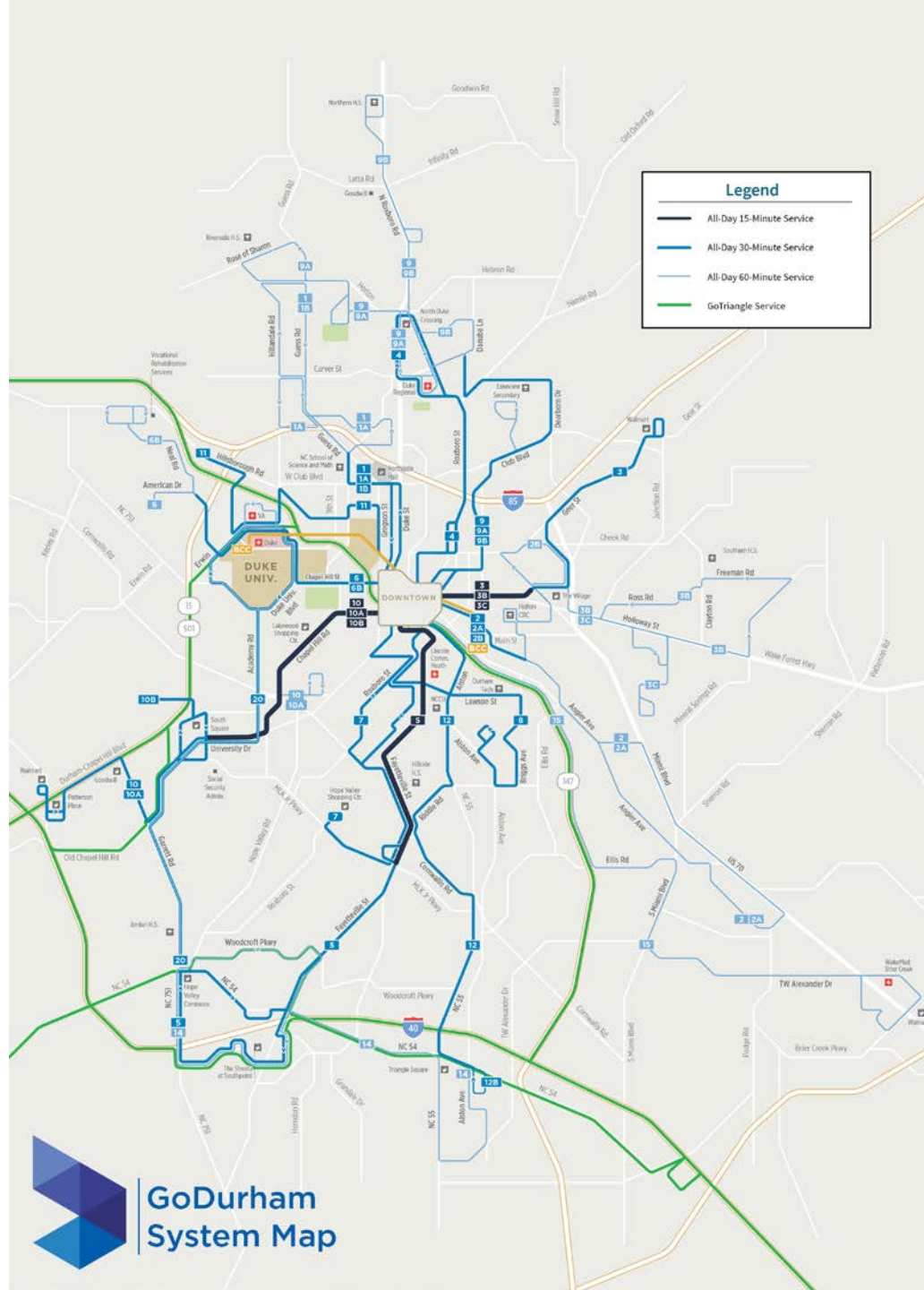
What We're Recommending:

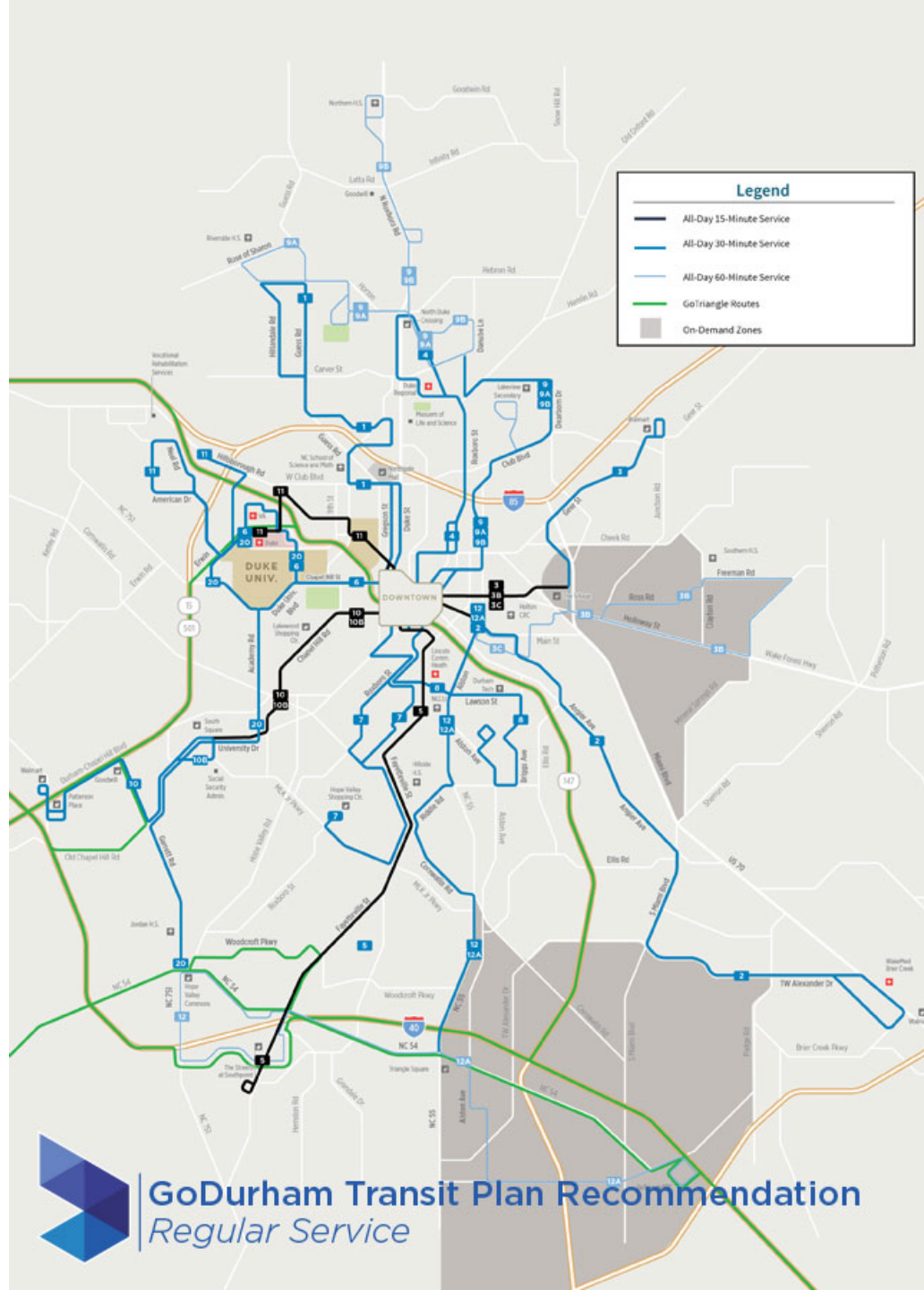
Reallocate BCC's resources to improve service system-wide

What are the Benefits?

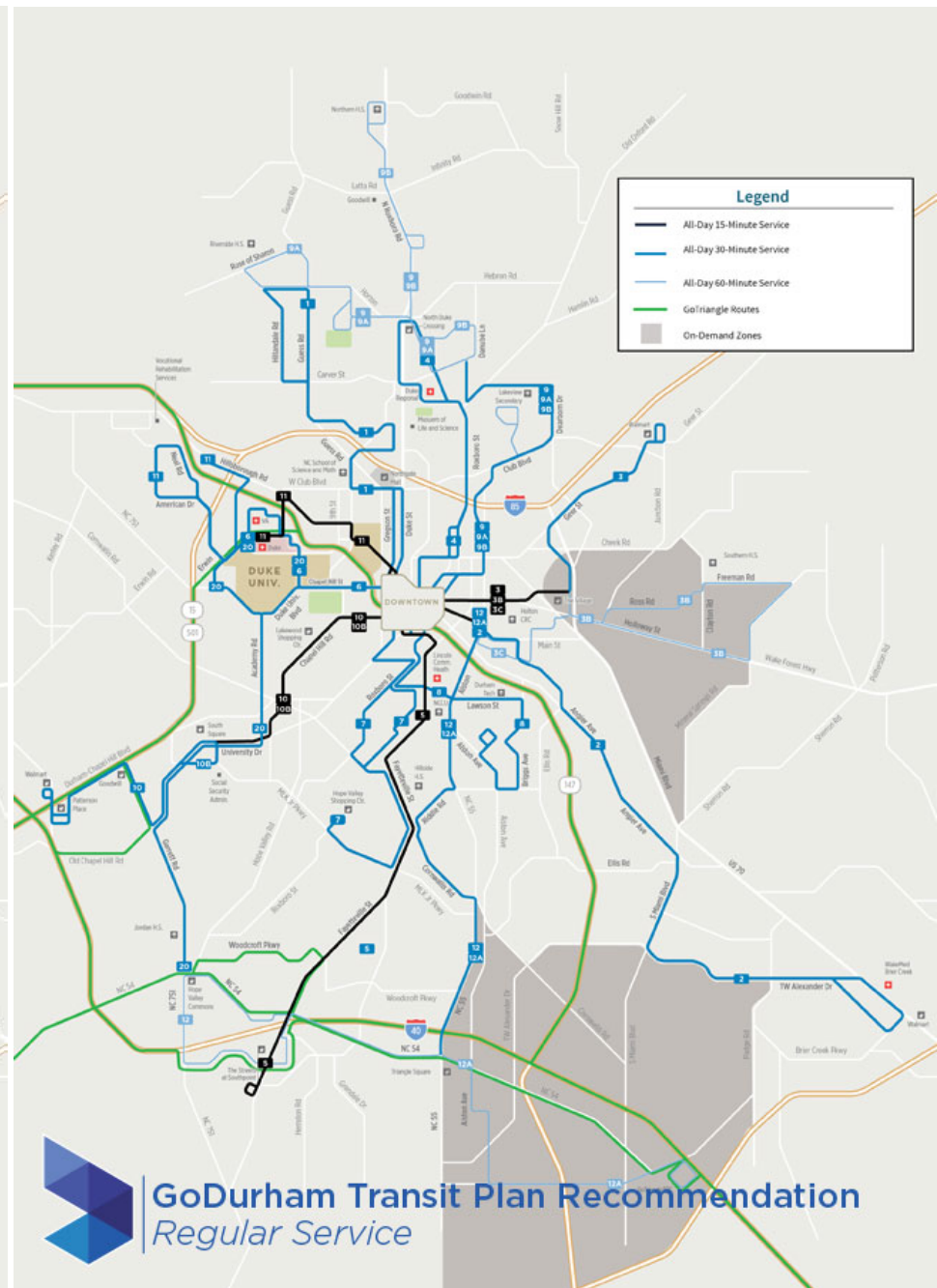
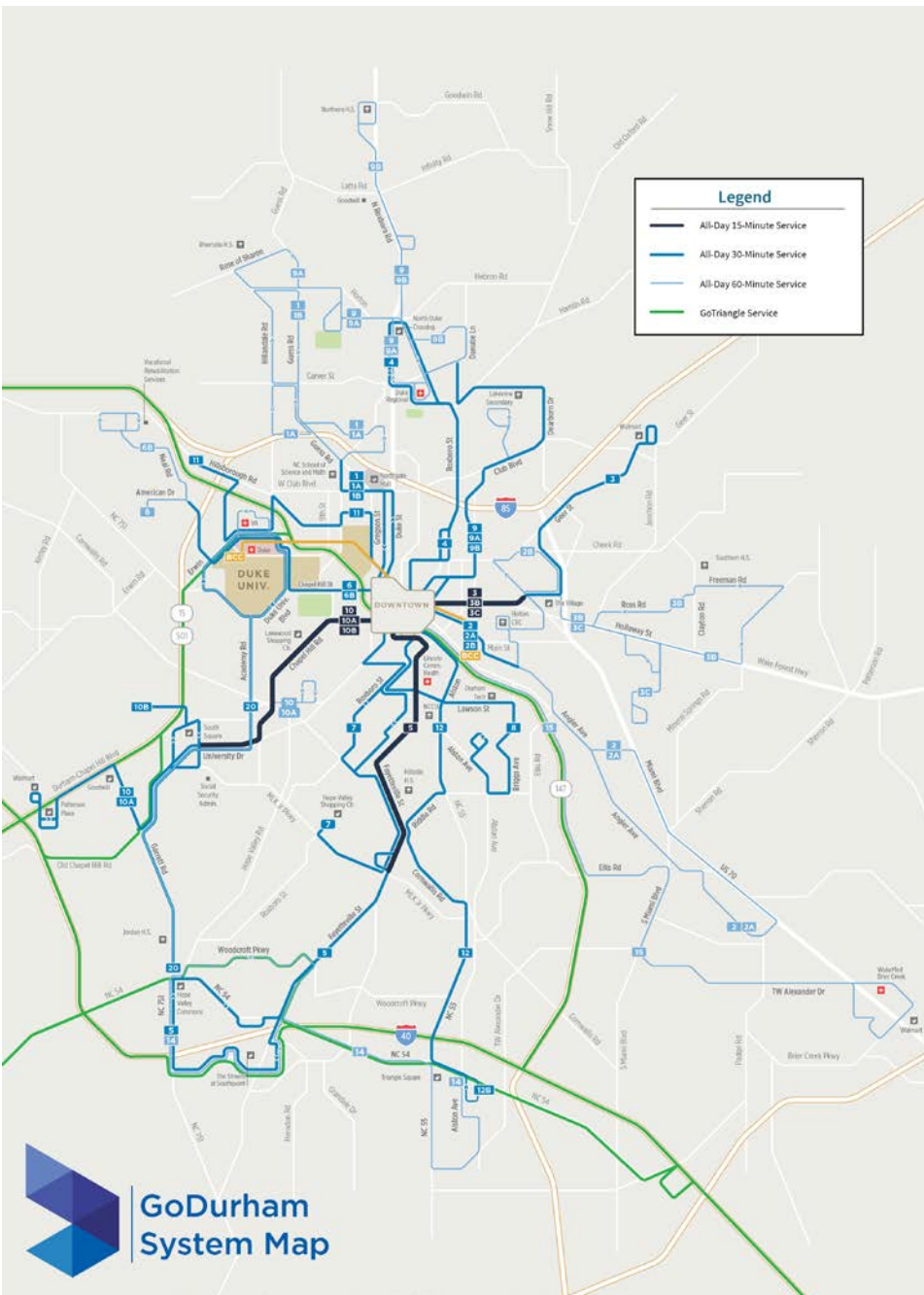
- Address chronic on-time performance issues on Routes 6 and 11
- New 15-minute service on Main Street between Alston Avenue and Duke/VA Hospital (with service to Durham Station)
- Existing BCC riders will have more connections at Durham Station and more frequent service







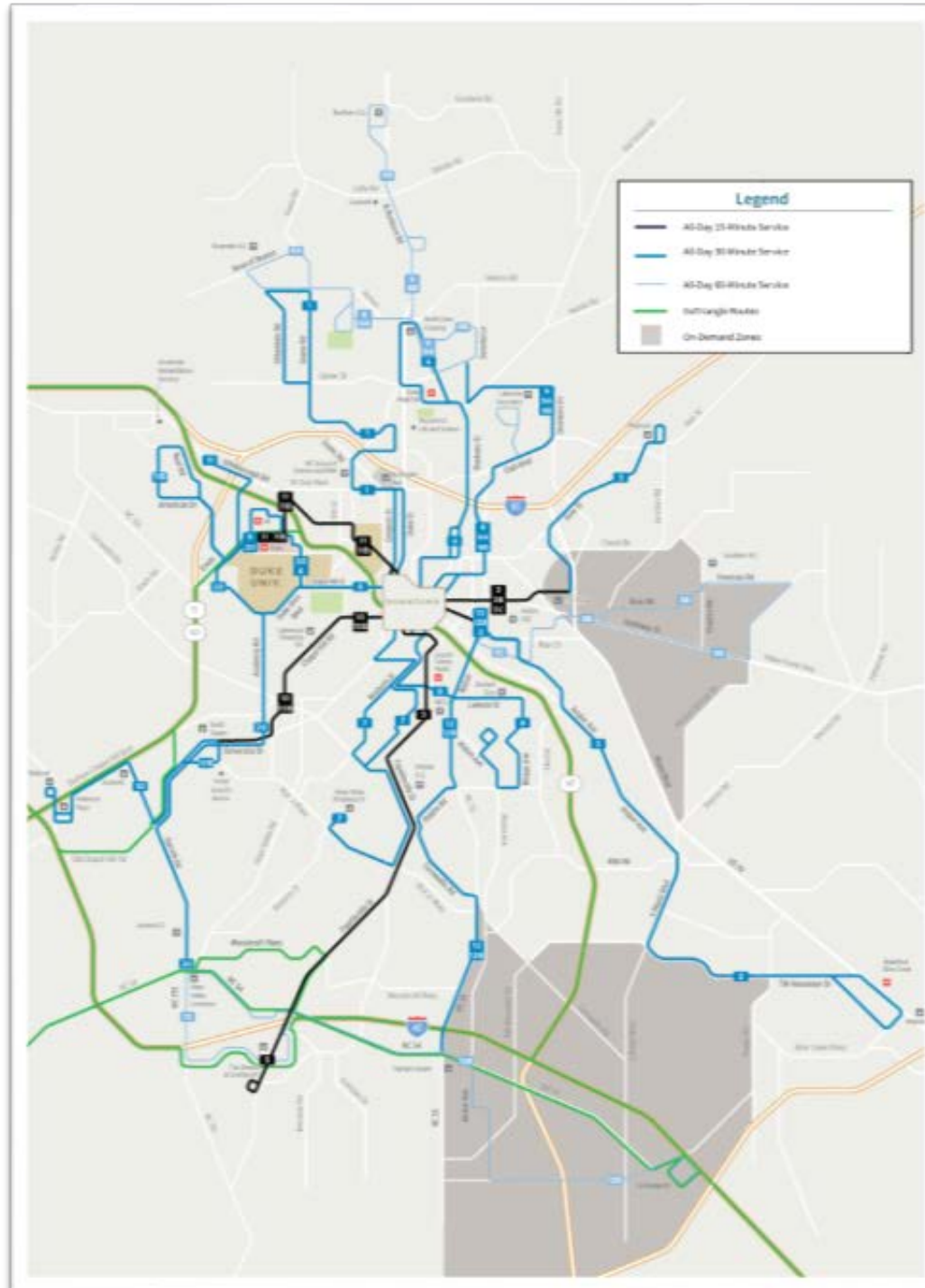
GoDurham Transit Plan Recommendation Regular Service



Preferred Option: Why Change?

- Addressing on-time performance
- Simplifying routes
- Improving frequency of service
- Providing more direct service to popular destinations
- Expanding the number of routes with 15 minute all-day service
- On-demand service to better serve low density areas with mobility needs

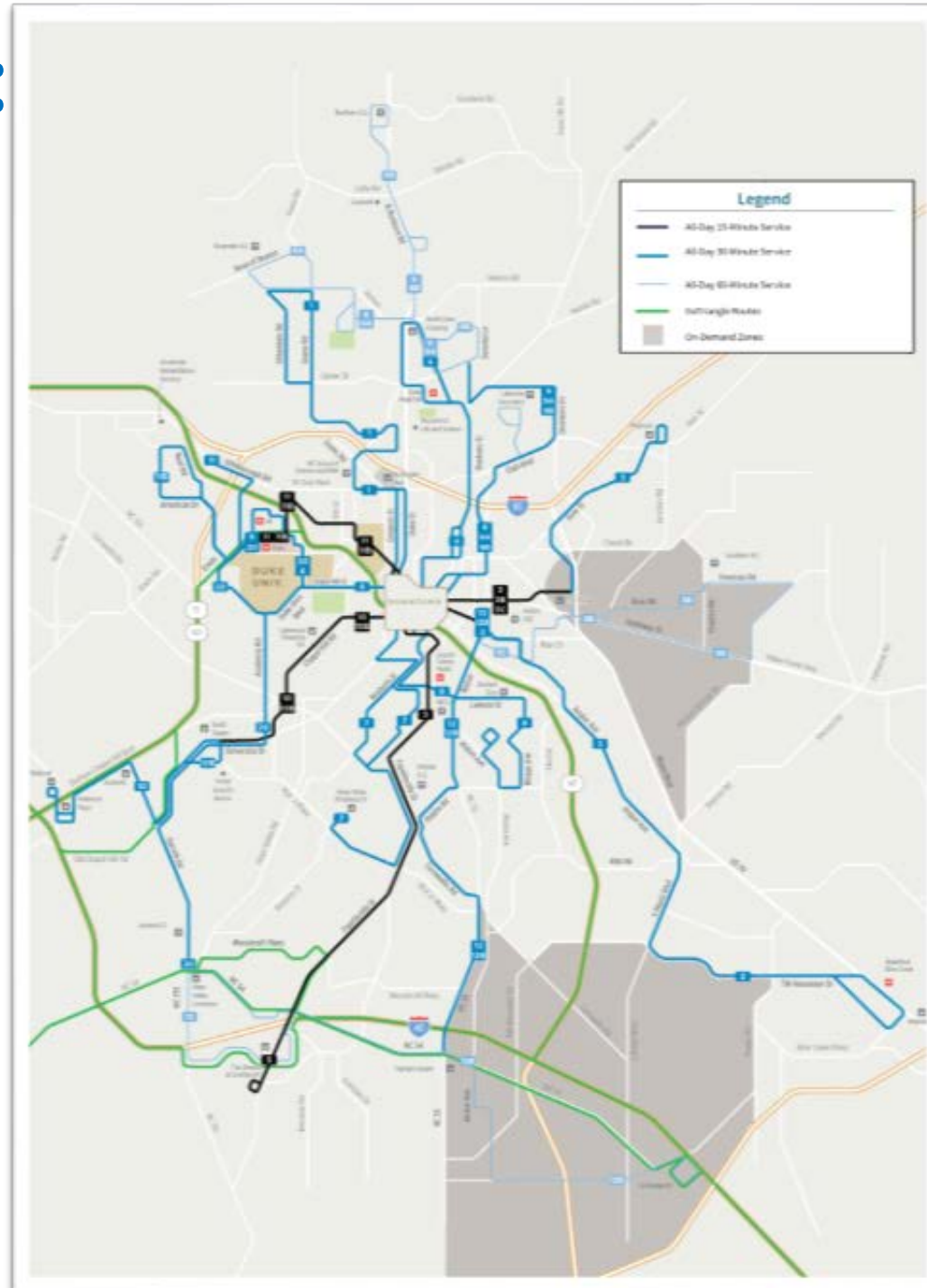
All improvements can be accommodated within the current operating budget



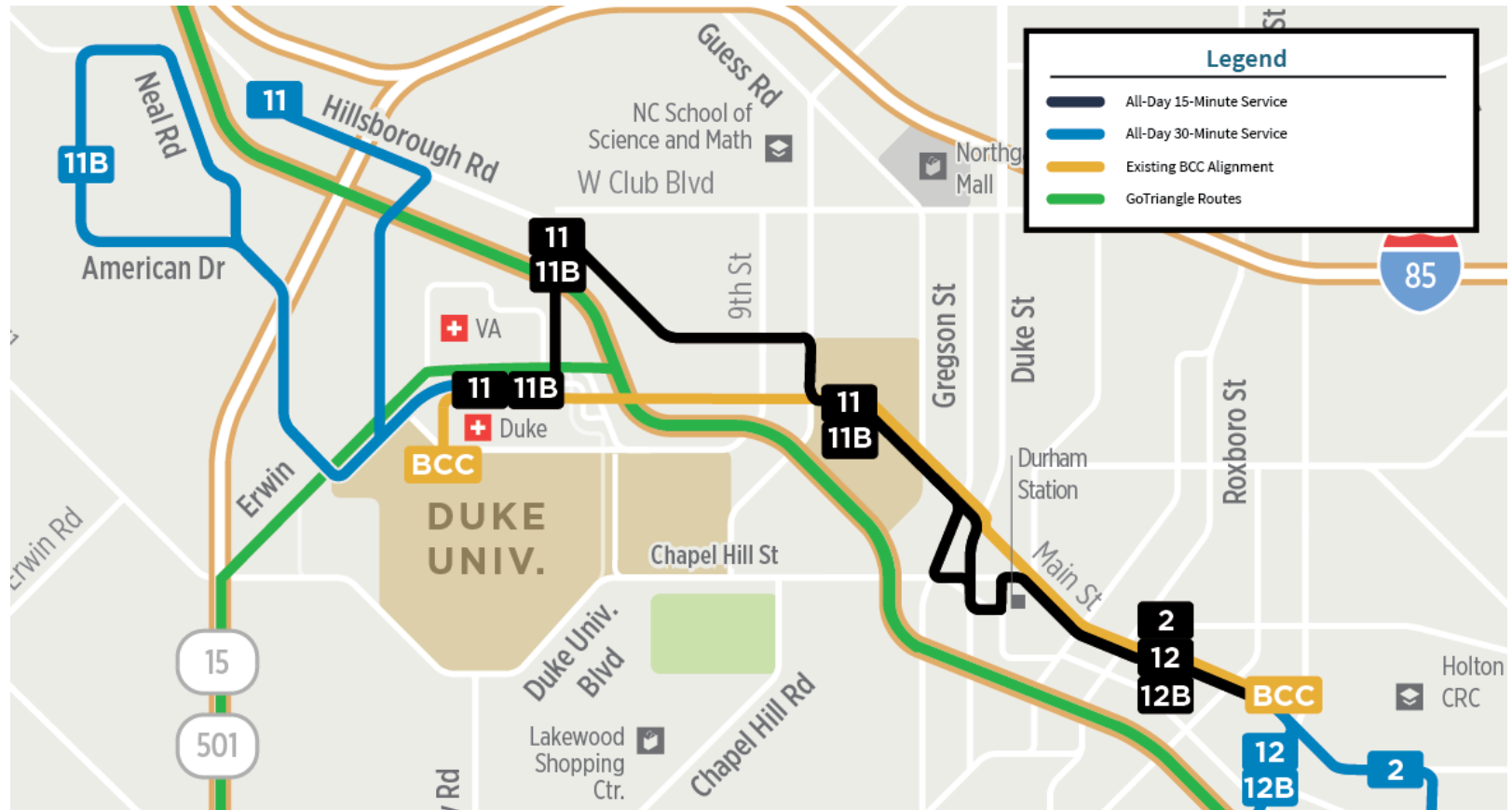
Preferred Option: Why Change?

- 9.3 more miles of very frequent service (every 15 minutes or more all day)
- 12,700 more residents and jobs within a quarter mile of very frequent service
- 16,000 more residents and jobs within a quarter mile of service that operates every 30 minutes or better

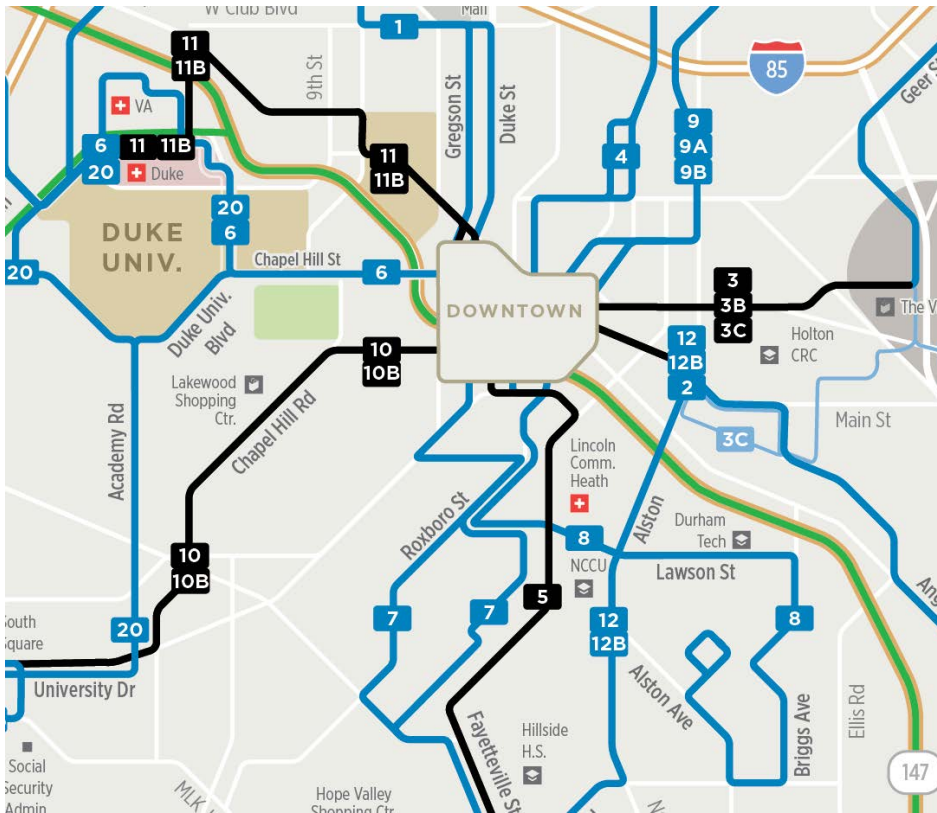
All improvements can be accommodated within the current operating budget



Routes 2, 11, and 12 Would Provide Similar Service at Improved Frequency for Existing BCC Riders



15-Minute Service All Day to Southpoint



Preferred Alternative

Route 5

- Proposed Route
- Deleted Route
- Preferred Alternative System

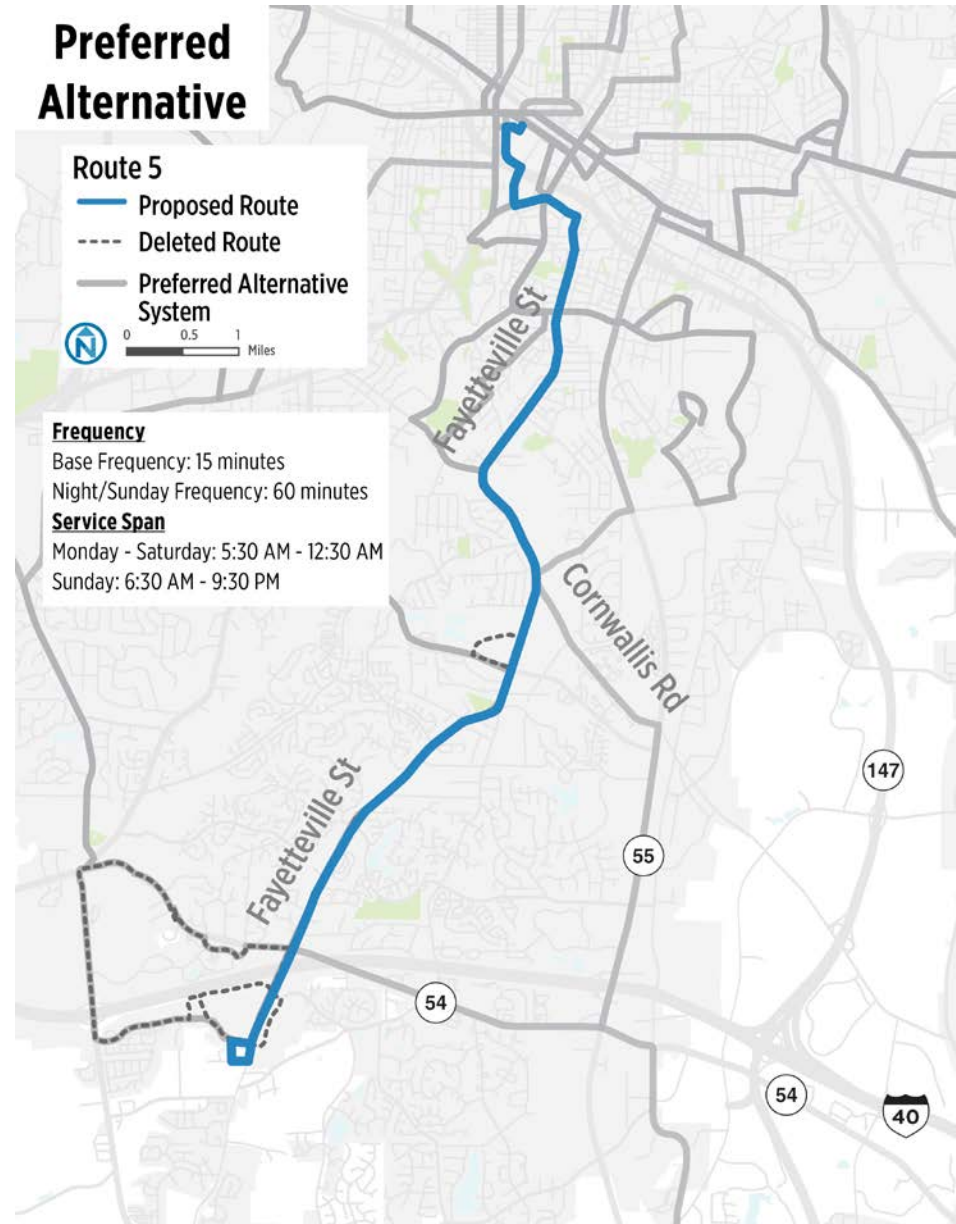


Frequency

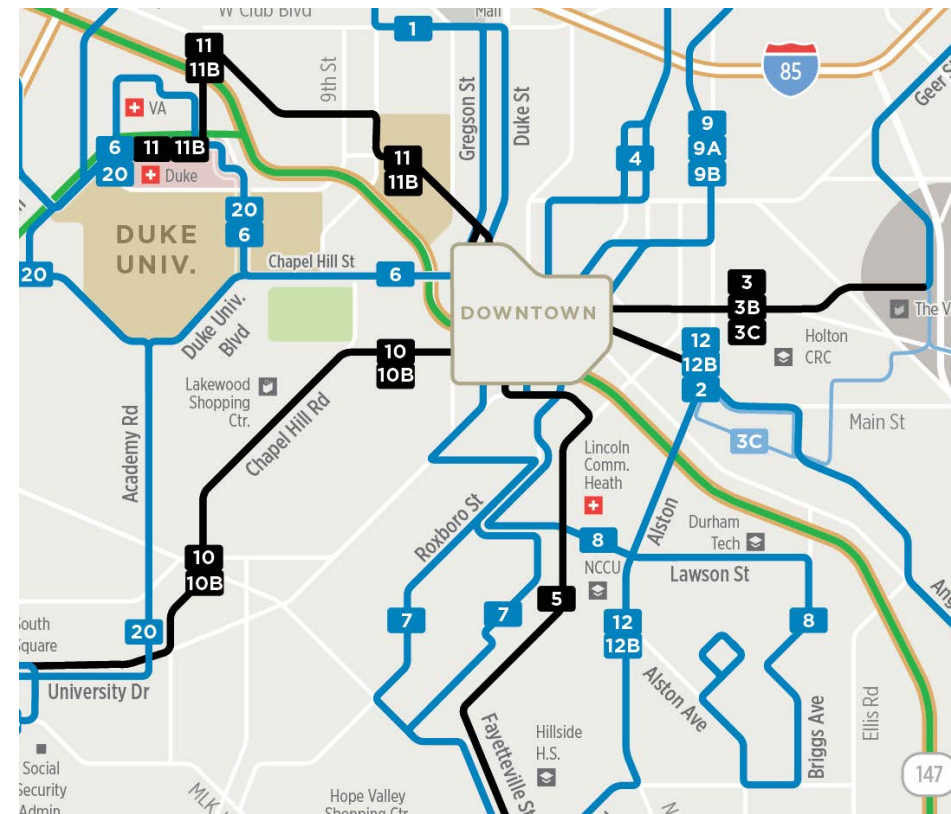
Base Frequency: 15 minutes
Night/Sunday Frequency: 60 minutes

Service Span

Monday - Saturday: 5:30 AM - 12:30 AM
Sunday: 6:30 AM - 9:30 PM



Improved Connectivity in East Durham



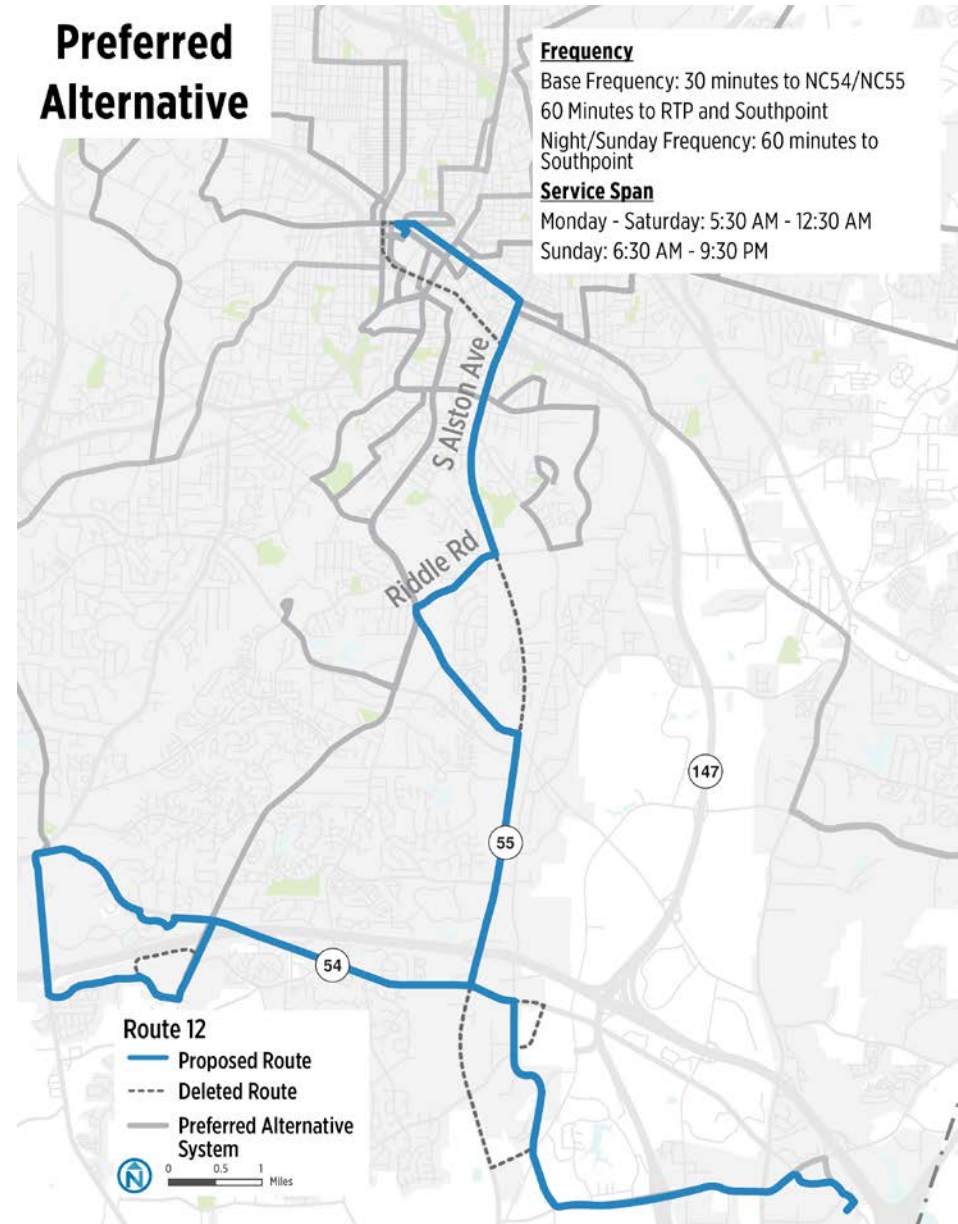
Preferred Alternative

Frequency

Base Frequency: 30 minutes to NC54/NC55
60 Minutes to RTP and Southpoint
Night/Sunday Frequency: 60 minutes to Southpoint

Service Span

Monday - Saturday: 5:30 AM - 12:30 AM
Sunday: 6:30 AM - 9:30 PM



Phase III Outreach: What We're Hearing

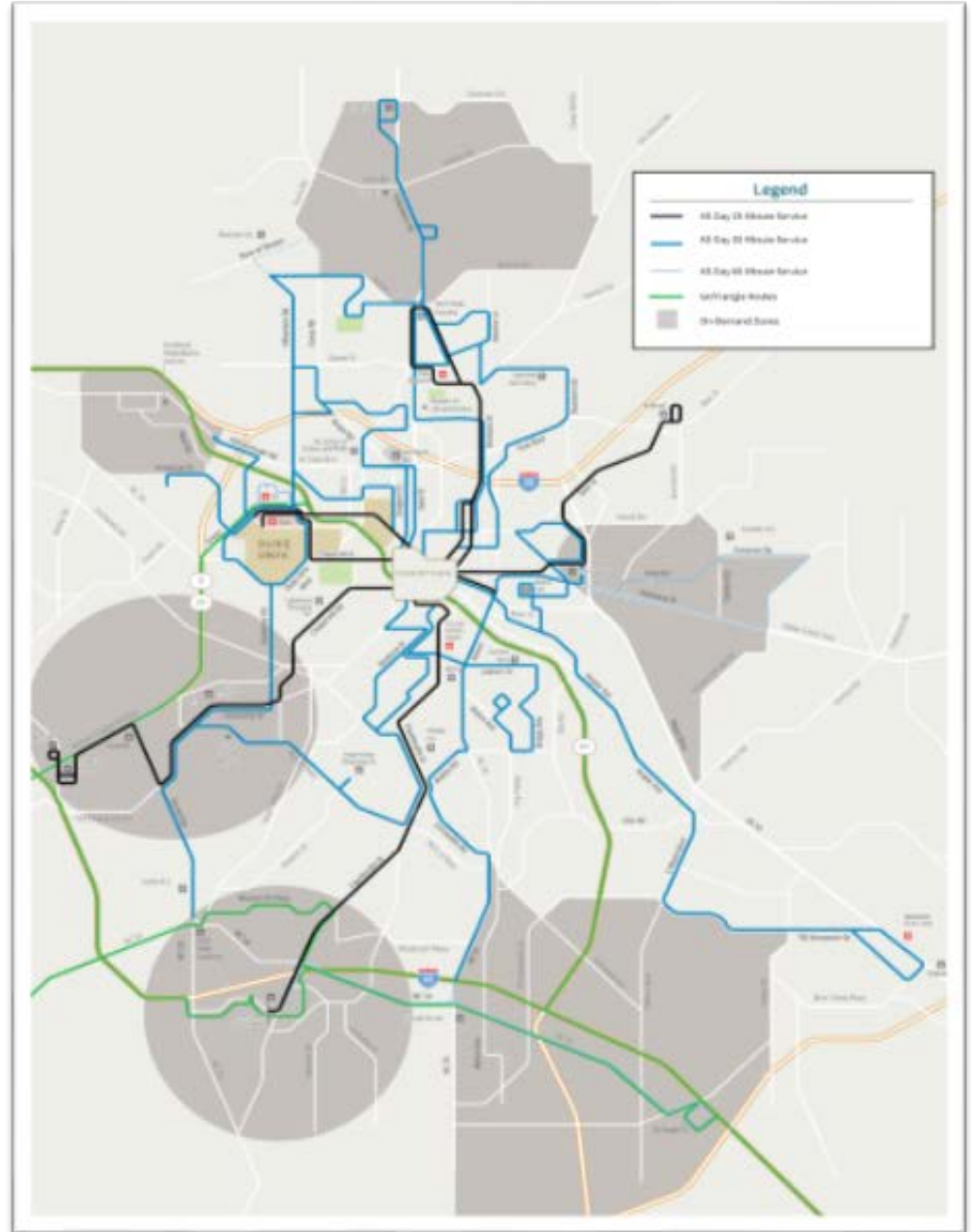
- Happy to see some routing patterns simplified
- Relieved to see Route 20 continuing to operate
- Excited about increased frequency to South Point and along Main St.
- Agree with changes to Route 11 to increase reliability
- Concerned about maintaining access along S Alston Avenue
- Unhappy about losing fare free service



Additional Resources Necessary for Transit Vision

Some service priorities are not possible within current resources available:

- Later evening service
- Crosstown connections
- More frequent weekend service
- Larger expansion of frequent (15 min) network



Near-Term Needs: High Priority

Route 10 to New Hope
Commons Every 15 Minutes

Crosstown Service: North
Durham and Duke

Estimated cost:
\$2.3-\$2.7 million
Addition Vehicles: 3

Improve Sunday and Evening
Service to New Hope
Commons and Southpoint

Late Night
On-Demand Service
(12am – 5am)

Near-Term Needs: Lower Priority

Additional On-Demand
Zones (six total)

Downtown to North Duke
Crossing (Route 4)
Frequency Upgrades

Estimated cost:
\$1.9-\$2.3 million
Addition Vehicles: 2

Saturday Service pilot to
Museum of Life and Science

All-Day service from
NC 54/NC 751 (Route 20)
to Duke

Next Steps

- Gather feedback on Preferred Recommendation
- Review of service standards
- Finalize Preferred Recommendation
- Finalize plan

