

Wave



PROPOSED NETWORK REDESIGN REPORT

August 2020



Proposed Network Redesign Report as pre





Wave Transit Delivers Greater Value to the Community

Wave Transit Saves \$1.2 Million Annual Savings Compared to Current Budget

Wave Sets Path for Long-term Financial Sustainability

Reduced Wait Times Through Increased Frequency and Flexible On-Demand Service in the Community

Bus Frequency To Increase

Wave Transit Generates \$1M of New Revenue Through Partnerships



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Introduction

The Cape Fear Public Transportation Authority is at a crossroads. In 2019, the Authority (Wave Transit) announced it was facing a deficit of at least \$745,000 for the upcoming year – and further analysis discovered the budget gap to be at least \$1.2 million. In an effort to begin addressing the budget deficit, the Wave Board of Directors voted to reduce hours of operation across the system beginning in January 2020.

In February 2020, New Hanover County and the City of Wilmington announced that they will work collaboratively towards a new interlocal agreement, effective July 1, 2021.

With consistently declining ridership since FY11-12, technology and customer preferences are changing the mobility landscape – presenting an opportunity for new models of service to meet the community's needs.

As the Wave Board continues to seek solutions to its funding challenges, New Hanover County and the City of Wilmington engaged TransPro Consulting to conduct a diagnostic assessment for cost saving opportunities and ultimately, design a transportation network that effectively and efficiently meets the needs of the community.



Introduction

The initial Diagnostic phase of work consisted of fact-based discovery and decision-making to support the County/City in identifying ways to realize greater efficiency and effectiveness at Wave Transit. The Diagnostic review identified three areas that could be investigated for cost savings and warrant a deeper analysis:

1. Administrative Cost Saving Opportunities – focusing on aspects of Wave’s administration of the transit agency, including non-service delivery functions of the organization
2. Operational Cost Saving Opportunities – focusing on the service delivery and operational aspects of the organization, including maintenance, fixed route and paratransit service
3. Revenue Opportunities – exploring opportunities to increase non-federal revenue sources and leverage Wave assets

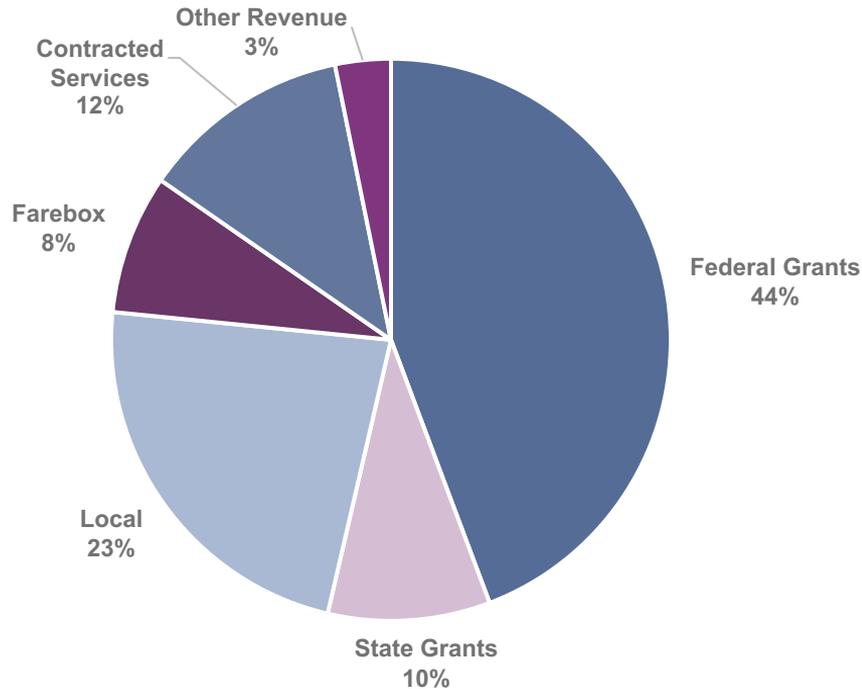
The initial diagnostic identified a combination of savings and revenue opportunities with the potential to save Wave \$1.2 Million in the next fiscal year.

This study focuses on the operational opportunities in the form of a network redesign. The cost savings and revenue estimates identified during the Diagnostic phase have been updated as a result of the recommendations in this report.

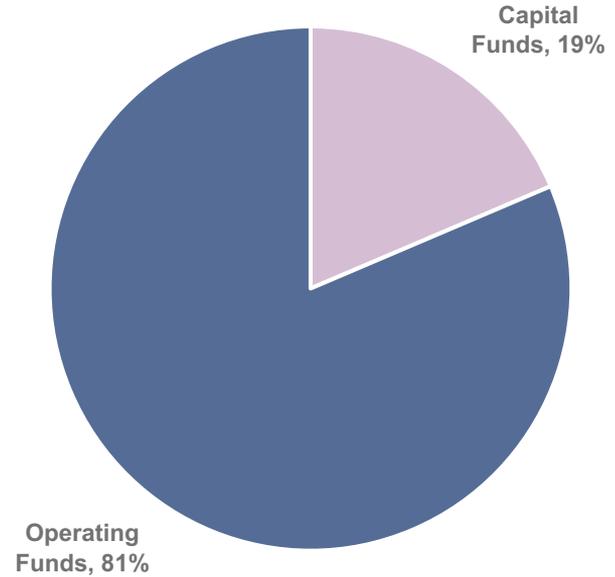


Budget at a Glance

FY 2019 Revenue Sources



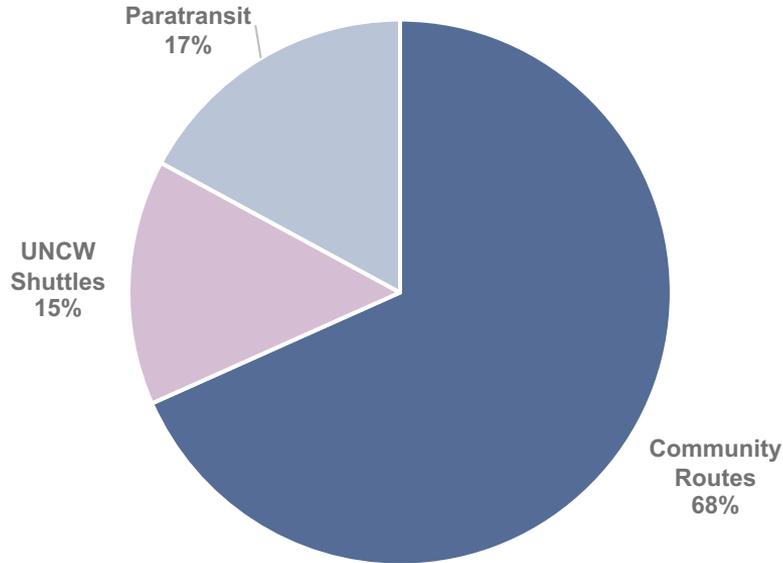
FY 2019 Operating vs. Capital Funds Expended



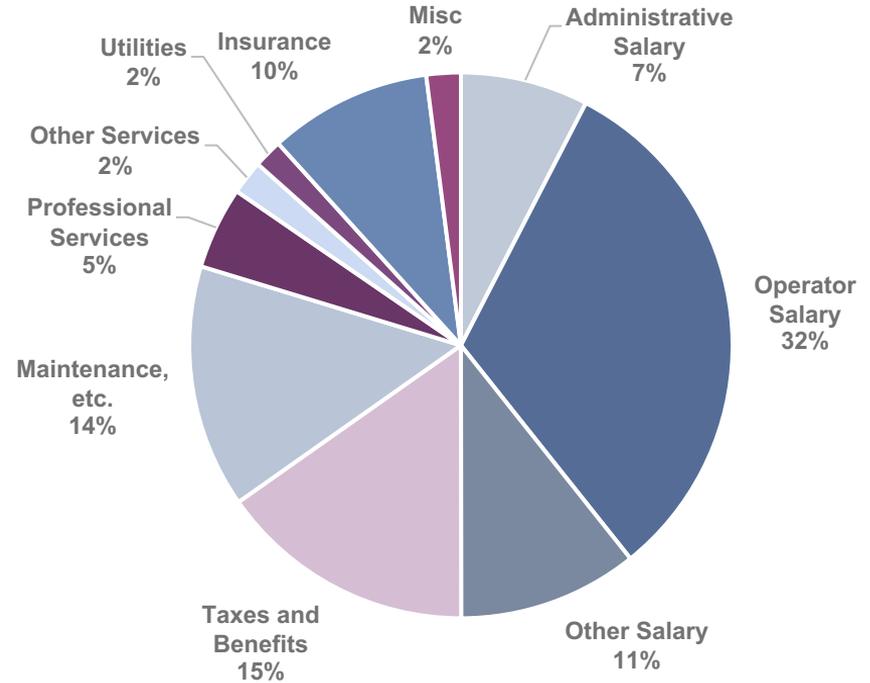


Budget at a Glance

FY 2019 Expense by Service Type



FY 2019 Expense Categories





Administrative Opportunities

The Diagnostic process included a comprehensive assessment of all key functional areas of the organization, seeking to identify gaps and redundancies in the organization.

This analysis recommends the following opportunities for saving in the administrative areas of the organization.

As a subset unit of government, Wave conducts several business functions that align with similar functions conducted by the City of Wilmington, New Hanover County, and the Wilmington Urban Area Metropolitan Planning Organization (MPO). This analysis recommends that Wave exhaust all opportunities to collaborate and share functions to leverage economies of scale across like business units.

Administrative Opportunities

- CFPTA Position Efficiencies – \$130,000
- Management Services Contract Position Efficiencies – \$80,000

Additional Areas for Collaboration with Outside Entities

- Human Resources
- Finance
- Procurement
- Fleet Management
- Parts Inventory Management
- Legal Services
- Custodial Services
- Physical Plant Maintenance

Potential Cost Savings: \$210,000



Operational Opportunities

An initial screening and analysis of current system route performance identified a significant opportunity for savings to the community. The driving force behind this study is to help Wave make business decisions that establish a sustainable future for the Authority. Through difficult decisions, Wave can demonstrate its value to the community as good stewards of limited fiscal resources, ultimately setting Wave on a path for increased investment and service.

Operational Opportunities

- Redesigning a fixed-route network from the ground up that is right-sized for the Wilmington/New Hanover County area
- Integrating modifications to the paratransit operations based on the modifications to the fixed network.
- Determine opportunity for an alternative service profile and defining service standards.

Potential Cost Savings: \$786,000 – \$988,000



Revenue Opportunities

Additional revenue opportunities are critical components for Wave to become financially sustainable. This study recommends that Wave engage the University of North Carolina-Wilmington (UNCW) in renegotiation of its contract to cover a greater share or all of the costs associated with providing the shuttle service. New Hanover County and City of Wilmington taxpayers shoulder an imbalanced burden of the cost of this service that experiences over 95% utilization by UNCW students.

Wave has a strong asset position. These facilities create opportunities for offices space that could be lease to similar or human service agencies creating improved access to essential services for Wave customers. Additionally, The Port City Trolley is currently offered for free, this service could develop a fare to take advantage of the popular shuttle service.

UNCW Contracted Services*	Lease of Office Space	Port City Trolley**
<ul style="list-style-type: none"> The current contract rate does not cover the entire cost to operate the shuttles Current contract expires June 30, 2021 Consider a multi-year approach to realize full revenue potential 	<ul style="list-style-type: none"> Wave has a strong asset position Office space available to lease portions of buildings owned by Wave 	<ul style="list-style-type: none"> Currently fare free Introduce customer fare Coordinate with downtown businesses to support trolley operations to continue free fare efforts on the trolley
Existing Network: \$450,000 – \$650,000		Existing Network: \$25,000 – \$30,000
Redesigned Network: \$1,000,000 – \$1,200,000	\$10,000 – \$20,000	Redesigned Network: N/A

Potential Revenue Opportunity: \$1,010,000 – \$1,220,000

*Due to service changes as a part of the recommended network redesign, allocation of fixed costs are redistributed to existing service hours in the network, therefore increasing the higher revenue opportunity (as a result of increased costs) for the UNCW contracted services.

**The Port City Trolley was included as a revenue opportunity during the initial diagnostic phase of work. As a result of the network redesign, the Port City Trolley is not included, therefore the revenue opportunity is not included.



Revenue Impacts

5307 Federal Revenue Impact:

The formula the Federal Transit Administration (FTA) uses to determine annual allocations of formula funds to transit agencies is based on a combination of factors including the regional population, population density, and bus revenue vehicle miles. Current estimates and updated route information will be included in FY21 National Transit Database (NTD) reporting, and the population estimates will be updated as a result of the 2020 census. Therefore, this study considers potential revenue impacts based on the current budget as a result of the recommended changes, but the actual reduction could be a net loss or a net positive for the Authority. The estimated reduction of 5307 formula funding for FY22 is approximately \$136,000. However, the estimated reduction in federal funding may be offset by future population growth.

Other Federal Revenue Impact:

5339: The 5339 grant is dedicated to capital expenditures for Bus and Bus Facilities and does not impact operating funds. Similar to 5307 funding, the FTA uses a formula to determine annual allocations of formula funds. Factors for the 5339 grant include regional population and density, bus revenue vehicle miles, and bus passenger miles. The estimated reduction of 5339 formula funding for FY22 is approximately \$36,000.

5310: This funding is not tied to service, therefore the anticipated impact is minimal.

5303: This funding is not tied to service, therefore the anticipated impact is minimal.

State Revenue Impact:

SMAP: The funding of the SMAP program is discretionary and dependent on funding from the General Assembly. Due to several factors, this study cannot estimate the impacts of this funding source.

- It is unknown what level (if at all) the program will be funded by the General Assembly in the future
- The formula is dependent on other transit agencies' performance
- There is a lag of two fiscal years in the data used in the allocation formula

On June 25, 2020, Wave staff informed the Board that the North Carolina Department of Transportation would not fund the SMAP program in FY 2021. Wave generally budgets about \$600,000/year for the SMAP funds. Staff indicated the funding decision was only for the FY 2021 budget year, but that no decision on funding for future fiscal years had been made.

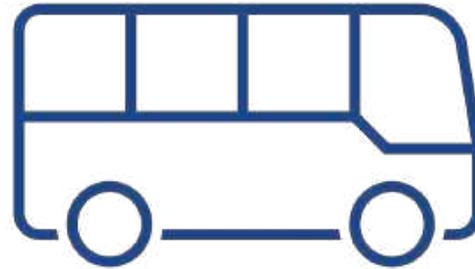
Revenue Impacts

CARES Act Funding:

Special consideration should be given to a unique, one-time allotment of funding created in response to the 2020 COVID-19 global pandemic. These funds provide an opportunity for Wave to close some financial gaps, but cannot be relied upon for the long term sustainability of the Authority. These recommendations are largely silent on the expansion and long-term operation of service with CARES Act funding because they are one-time funds.

Farebox Revenue

In FY 2019, Wave Transit collected \$1,247,424 in passenger fares from fixed route, paratransit and UNCW shuttles. Due to COVID-19, transit ridership has declined in systems across the country. According to most recent ridership, Wave Transit has experienced a 35% average decrease in weekly ridership compared to pre-pandemic levels. On March 25, Wave instituted a rear-door boarding policy to keep bus operators safe, eliminating fare collection on fixed route services and significantly impacting farebox revenue. CARES Act funding could be used to offset the loss of revenue due to ridership declines and rear-door boarding policies as part of the COVID-19 response.





Cost Savings/Revenue Opportunity: \$1,870,000 – \$2,282,000

Administrative Opportunities

- CFPTA Position Efficiencies
- Management Services Contract Position Efficiencies

\$210,000

Operational Opportunities

- Develop a right-sized fixed route network
- Integrate paratransit modifications
- Identify the opportunity and determine service standards for an alternative service profile
- Potential 5307 Federal revenue decrease (~\$136,000)

\$650,000 – \$852,000

Revenue Opportunities

- UNCW contracted services
\$1,000,000 – \$1,200,000
- Lease of office space
\$10,000 – \$20,000
- Port City Trolley

\$1,010,000 – \$1,220,000

Pathway to Service Excellence



Taxpayer Value:

- \$1 million of ineffective service on the road today
- Opportunity to reduce taxpayer subsidy



Community Value:

- Multi-modal network provides the entire community with the freedom of choice for better, faster service to a broader group of people



Customer Value:

- 18% of current customers gain faster connections



Current Service: All Fixed Routes

Annual Customers

1,199,245

Fleet Size

21 35-foot buses; 2 trolleys; 16 shuttles

FY 2019 Service Hours

81,560

FY 2019 Actual Expenses

\$7.2m

FY 2019 Cost Recovery

24%

FY 2019 Trips per Service Hour

14.70

FY 2019 Average Subsidy per Trip

\$4.57



Current Service: Community Routes

Annual Customers

862,712

Fleet Size

21 35-foot buses; 2 trolleys

FY 2019 Service Hours

67,253

FY 2019 Actual Expenses

\$5.9m

FY 2019 Cost Recovery

18%

FY 2019 Trips per Service Hour

12.83

FY 2019 Average Subsidy per Trip

\$5.70



Current Service: UNCW Shuttles

Annual Customers

336,533

Fleet Size

16 shuttles

FY 2019 Service Hours

14,307

FY 2019 Actual Expenses

\$1.3m

FY 2019 Cost Recovery

56%

FY 2019 Trips per Service Hour

23.52

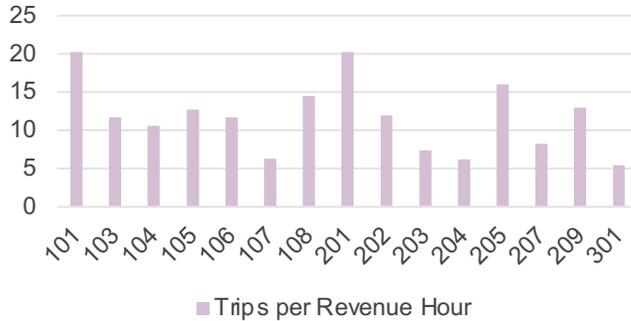
FY 2019 Average Subsidy per Trip

\$1.68



PRODUCTIVITY DATA: COMMUNITY ROUTES

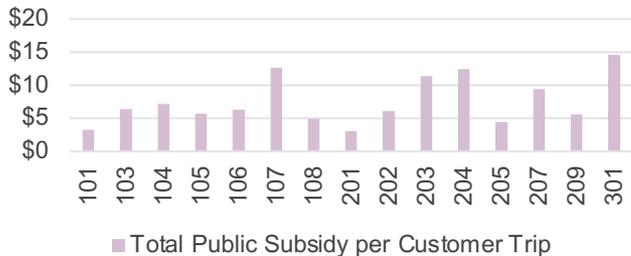
Community Routes: Trips per Revenue Hour



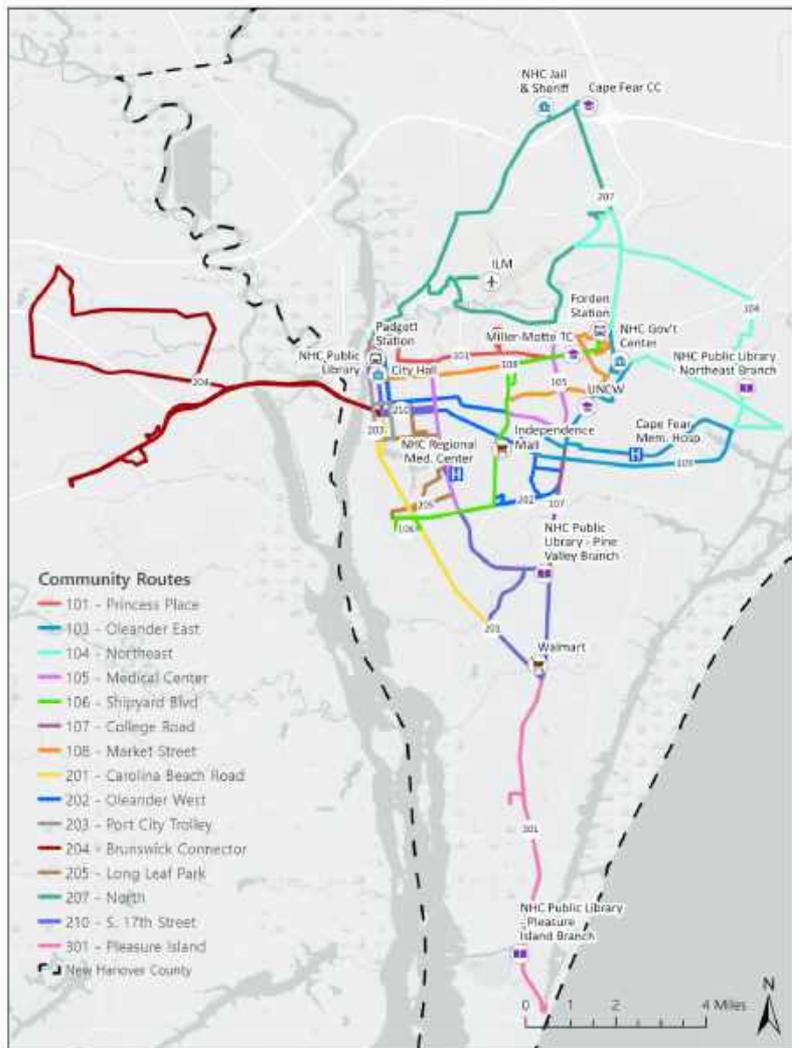
Community Routes: Trips per Revenue Mile



Community Routes: Total Public Subsidy per Customer Trip



- Wave Transit’s Community Routes served 862,712 passengers in FY 2019, a 6% increase from FY 2018.
- The Community Routes operated 67,253 service hours and 1,002,641 service miles in FY 2019.
- Both service hours and miles decreased by 3% since FY 2018.
- In FY 2019, cost per service hour was \$88.74.

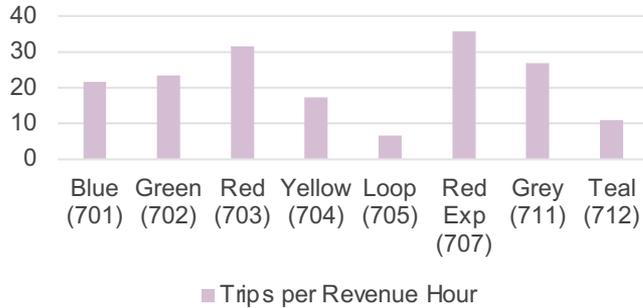


Community Routes

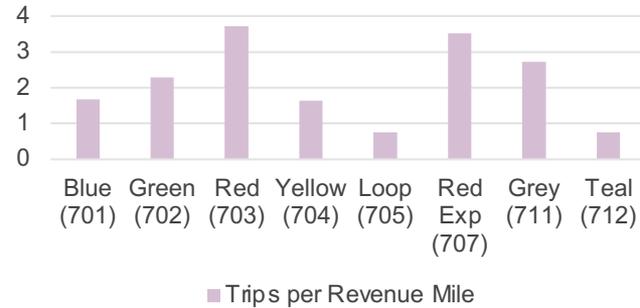


**PRODUCTIVITY DATA:
UNCW SHUTTLES**

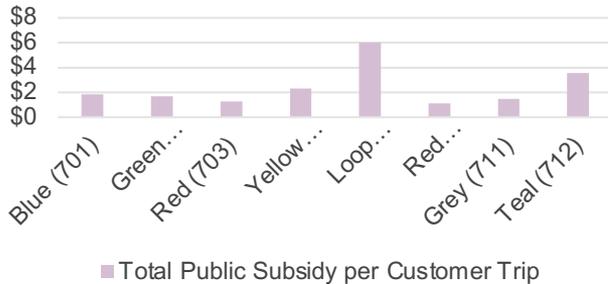
UNCW Shuttles: Trips per Revenue Hour



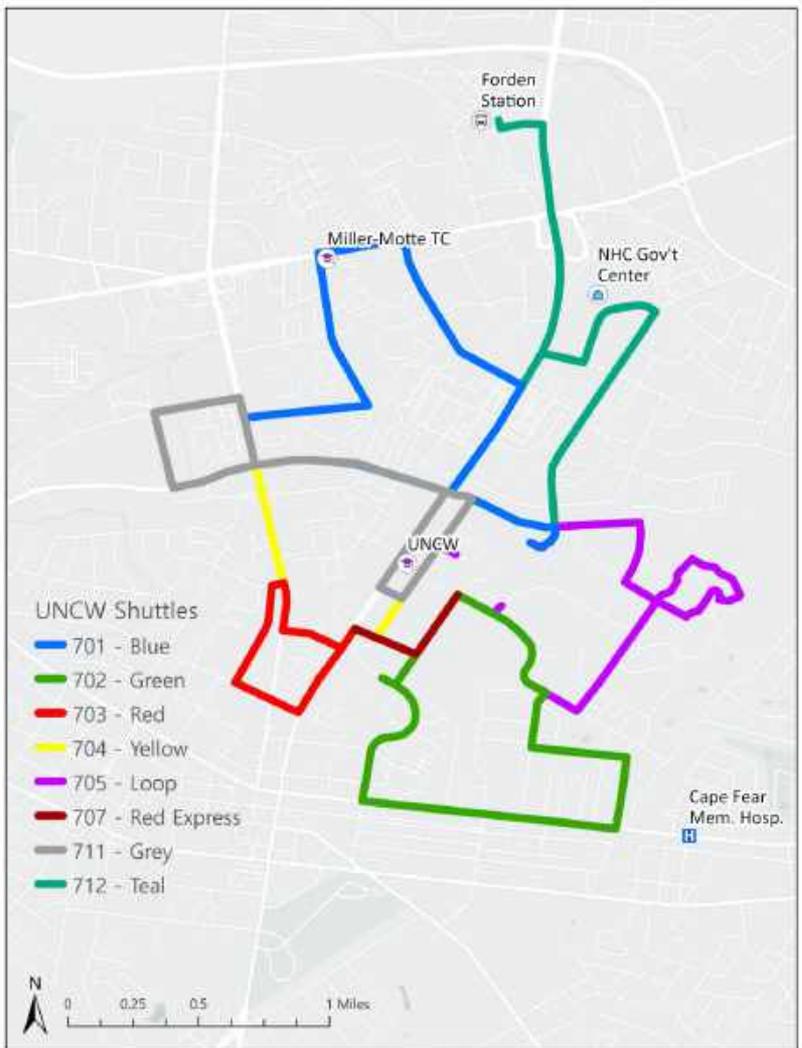
UNCW Shuttles: Trips per Revenue Mile



UNCW Shuttles: Total Public Subsidy per Customer Trip



- UNCW shuttles served 336,533 passengers in FY 2019 compared to 379,243 in FY 2018, a 11% decline.
- Wave Transit operated 14,307 service hours and 151,983 service miles in FY 2019.
- Service hours and miles declined by 13% and 12%, respectively, since FY 2018.



UNCW Shuttles



When making transportation investment decisions, it is important to understand the demographics to define the market and opportunity.

Wave is currently providing service in the context of a Community that is experiencing population growth, but with low densities. Portions of the current system result in transit routes that are long and infrequent, producing lower ridership for the investment. This offers the community a tremendous opportunity to improve quality of service, access to mobility, and value to taxpayers.

DEMOGRAPHICS

Key Drivers for Fixed-Route Transit Service



Population Density



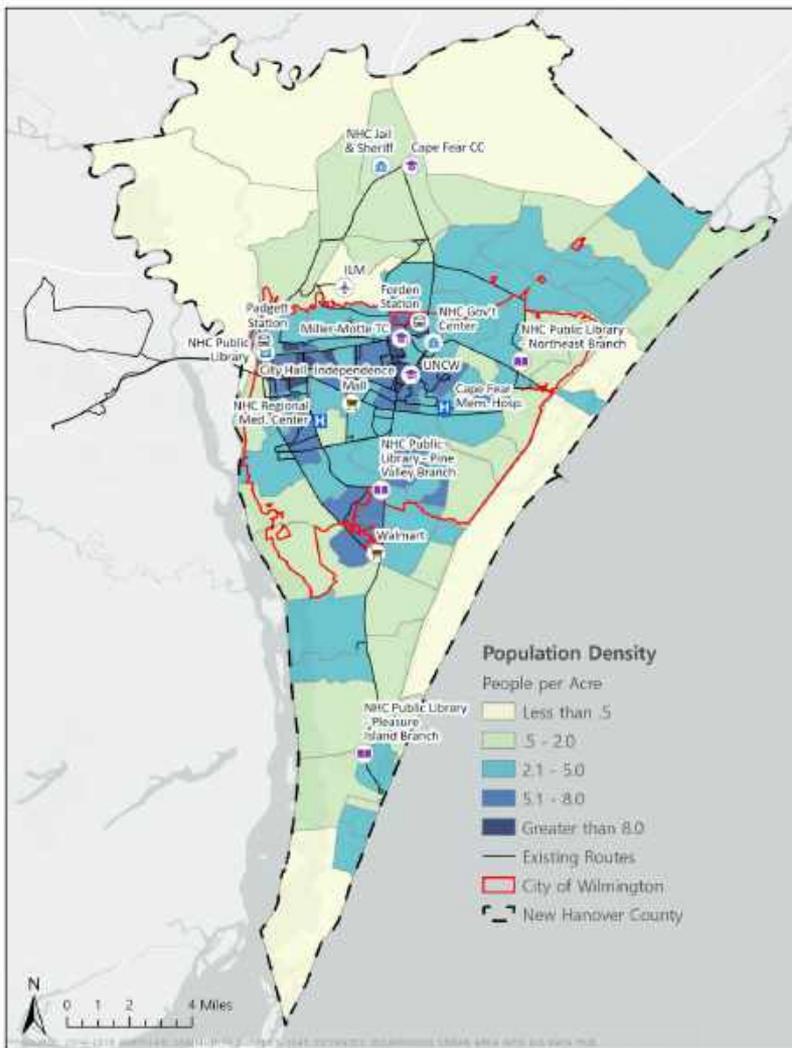
Concentrations of Likely Transit Users

(Including people living in poverty, minority and disadvantaged communities, households with zero or one car, employment density, the aging, and people with disabilities)



DEMOGRAPHICS

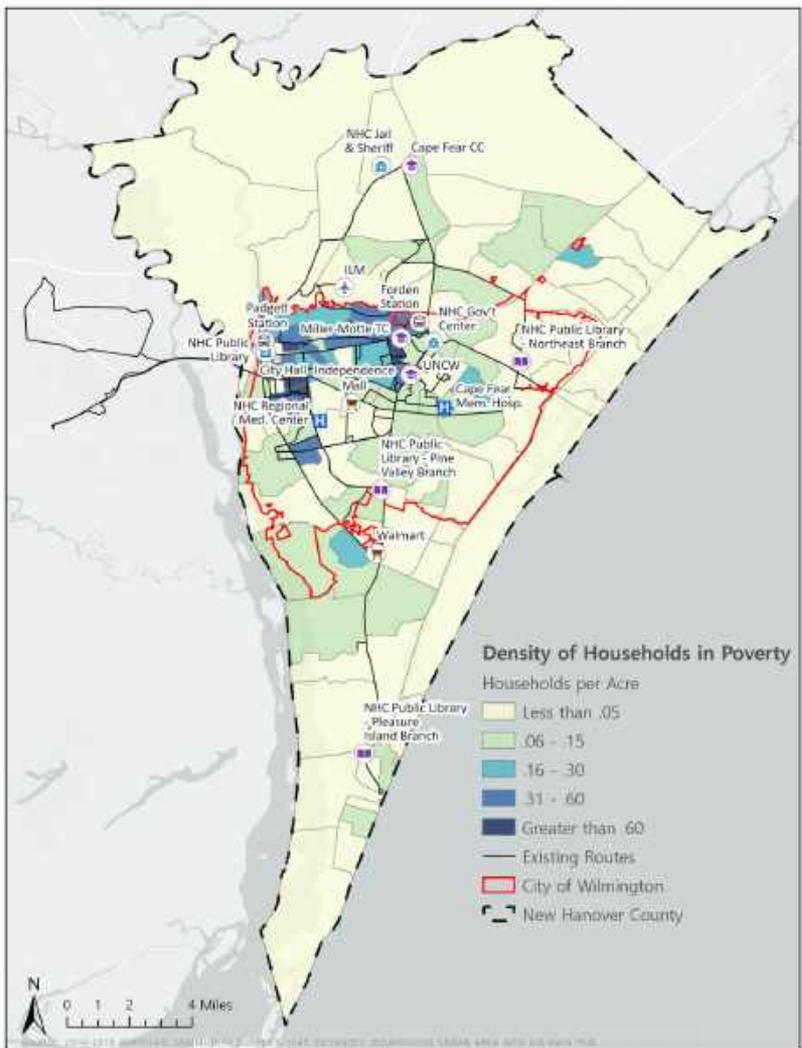
Population Density





DEMOGRAPHICS

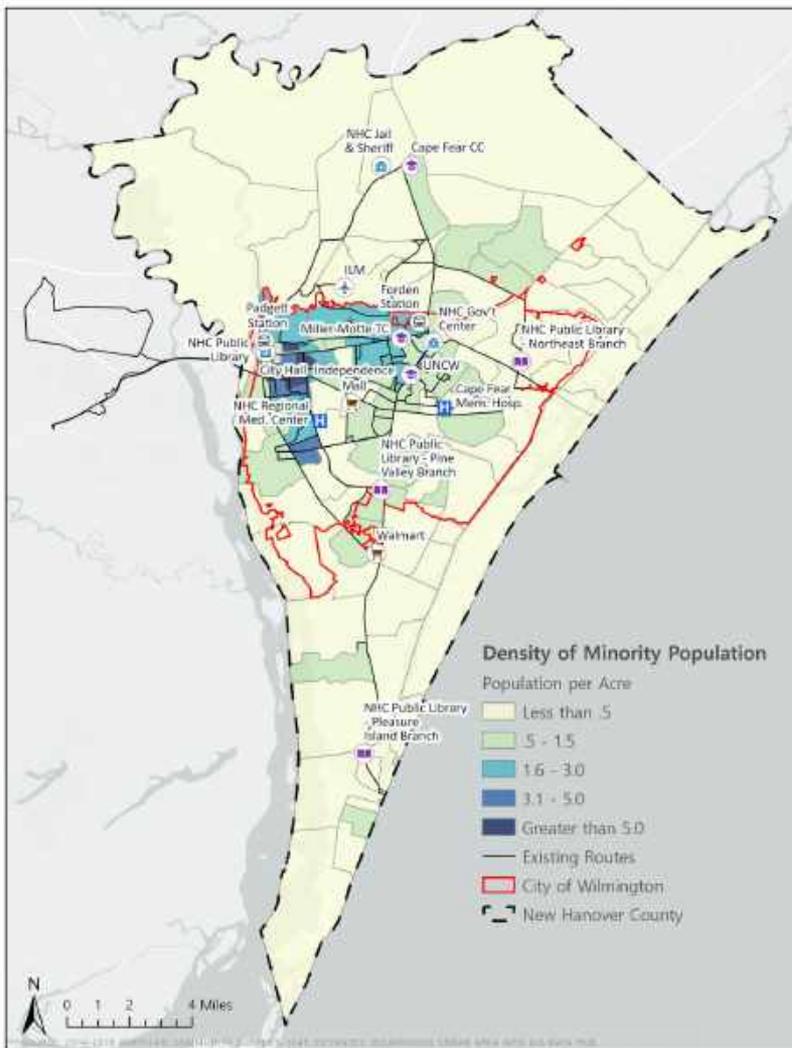
Households in Poverty Density





DEMOGRAPHICS

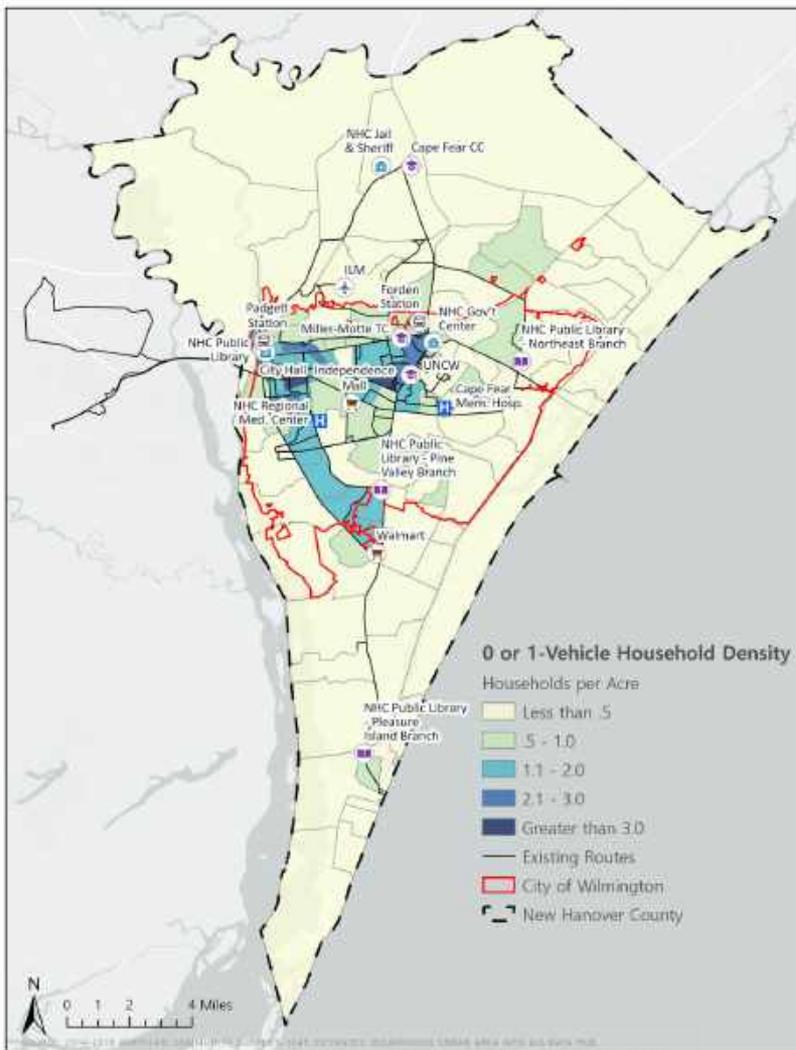
Minority Population Density





DEMOGRAPHICS

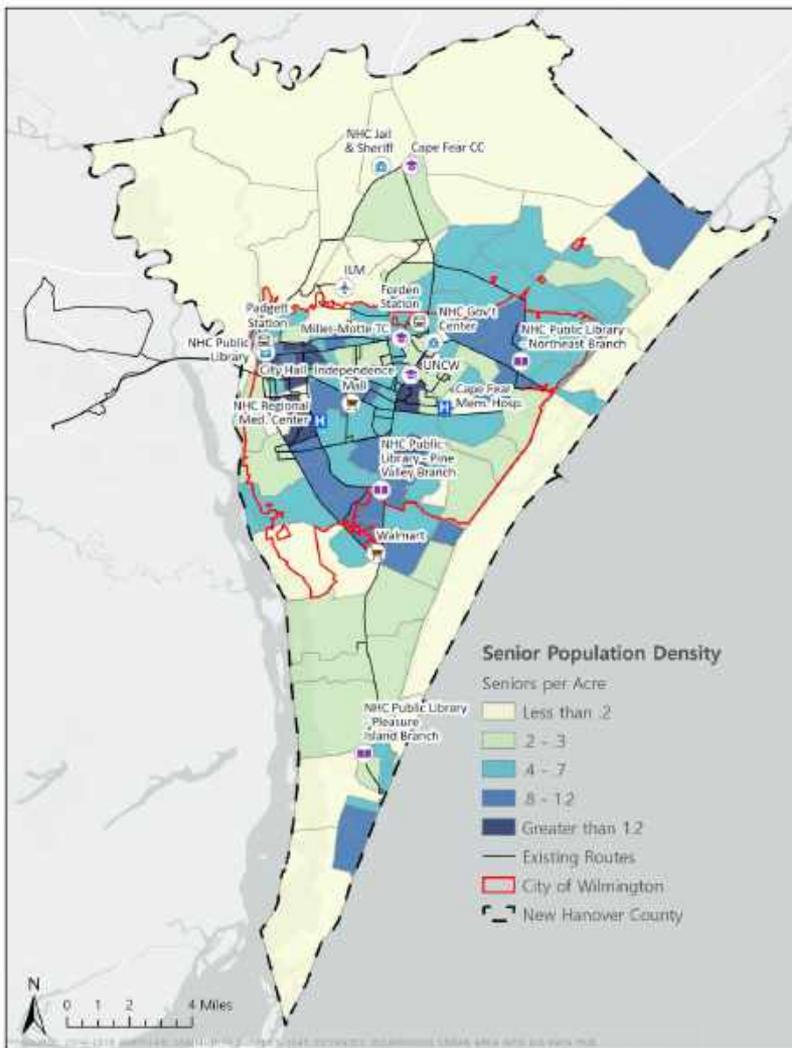
Density of 0- or 1-vehicle Households





DEMOGRAPHICS

Senior Population Density

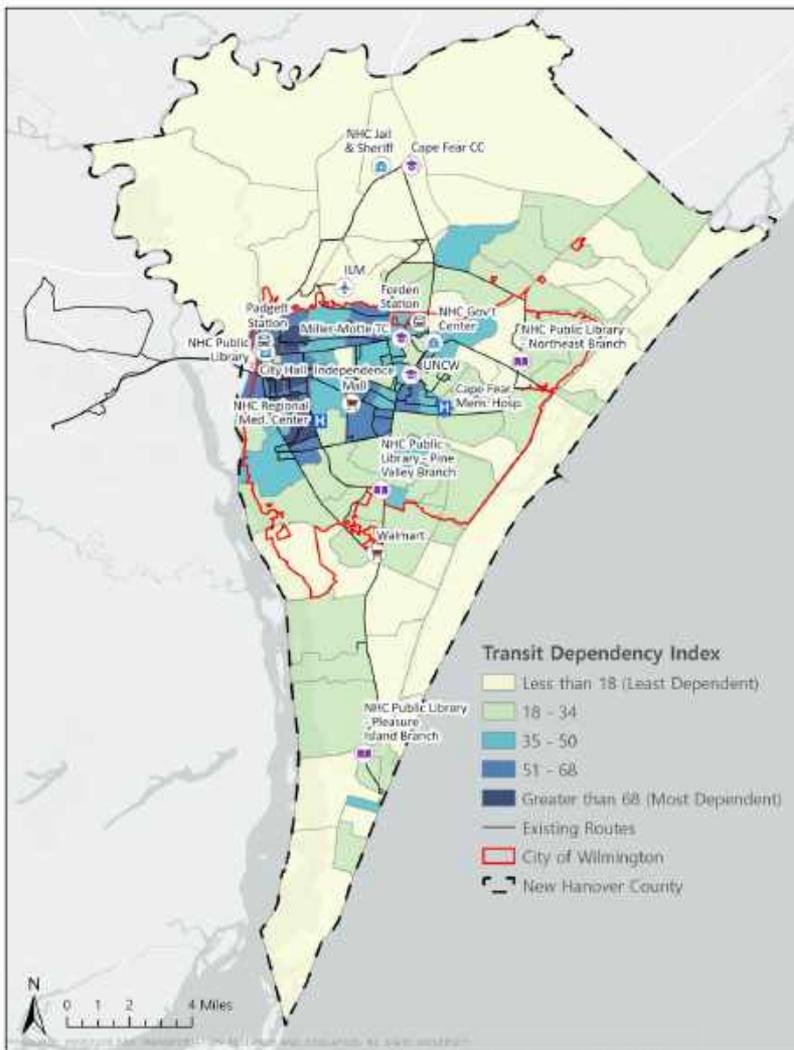




Transit Dependency Index

The Transit Dependency Index from the Institute for Transportation Research and Education at NC State University incorporates population density, senior population, disabled population, youth population, below-poverty population, and no vehicle household into a single variable that measures transit dependency by block group.

In the evaluation for opportunities to provide service in the areas of most need, this index serves as a useful guide in the distribution of transit service, assuring that the community's most dependent maintain access and independence as Wave makes decisions about the allocation of scarce resources.





Opportunities

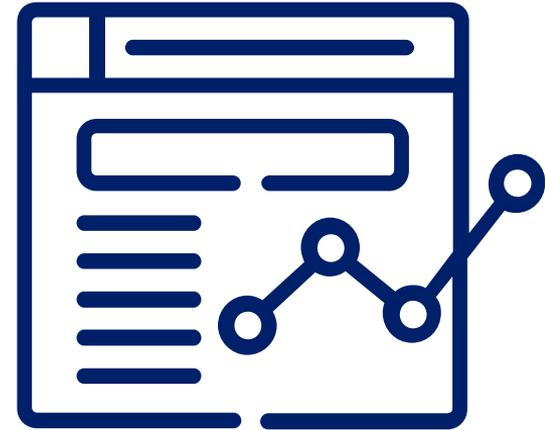
The evaluation of service characteristics and demographic information reveal the following opportunities for creating the right sized network and drives the methodology for the recommendations included in this report:

- There are opportunities to improve taxpayer value through the **reduction of unproductive fixed route service.**
- There are opportunities to **improve the quality and experience of fixed routes service** to communities in the County where it is most needed through modest investments.
- There are opportunities to **improve the quality and experience of mobility services** throughout the County.
- The Authority should **conduct regular trend analysis** for growth and densities and periodic modifications to services to meet changing transportation market demands.

Financial Tool & Model

The consultant developed a spreadsheet-based financial tool in order to estimate costs and revenues for the operation of service recommendations. The consultant met with and received information from the Wave finance team throughout the course of the study to align on costs and revenues of the current Wave system. The costs and revenues of Wave's current system are the foundation of the forecasts produced by the financial tool.

The financial tool was developed to make planning-level decisions and conduct a variety of sensitivity tests to understand the financial impacts of various investment decisions like route length, frequency, and span. The team used this tool in the development of five scenarios which were discussed with Board members and other stakeholders.





Financial Tool & Model

The baseline assumptions in the model come from historical financial information provided to the consultant from Wave Transit Management, and verified where possible.

Key assumptions in the model:

- Fixed costs based on Wave Fiscal Year (FY) 2019 final expenditures without accelerator or cost of living adjustments to year of implementation
- Variable costs based on Wave FY 2019 final expenditures
- Farebox recovery based on current rate per route, not adjusted for ridership growth that is anticipated with greater service availability
- Ridership forecast based on current ridership per hour

To ensure an additional layer of reasonableness in the accuracy of the model, scenarios have been validated against current system characteristics, and where possible, assumptions are preferential towards the most conservative of standards, resulting in higher cost assumptions and lower revenue assumptions.

VARIABLE COSTS

This study considers the following items variable costs in its calculations:

- Operator Salaries
- Fuels
- Fuels - Natural Gas
- Fuels - Electric
- CNG Maintenance
- Fuel Tax Credits
- Lubricants and Oils
- Vehicle Maintenance
 - Parts
 - Consumables
 - Outsourced
 - Electronics
- Towing
- Small Tools
- Shop Supplies
- Cleaning Supplies
- Building Repairs /Maintenance
- Equipment Maintenance
- Tires



Industry Research

The consultant completed a comprehensive scan of similarly-sized transit systems and mobility options around the country. Additionally, discussions with representatives of entities in the mobility field were held to inform this study of industry best practices.

In the rapidly changing environment, there are various applications of different mobility solutions. The portfolio of mobility solutions is evolving; this section highlights some of the current thinking available to the Wilmington community in the application of mobility solutions to create the right sized network.

Technology Enhanced On-Demand and Pre-Scheduled Service

Additional service provider options include both demand response and pre-scheduled service using company-owned sedans and wheelchair accessible vehicles, as well as an ADA-compliant broker service. A key feature of some demand response services are the additional safety measures taken for customer safety by providing FTA-compliant drivers. Areas that these services would be able to supplement are the peak period and service spikes, difficult to schedule trips, overnight/off-hour, rescue trips, service to low trip density regions and feeder trips. Customizations can include ride requests being made the same day with a minimum of 30 minutes advance notice, and up to 30 days in advance. The technology services identified in this study provide the Authority with a suite of technology options to choose from including predetermined geographic territories, eligibility criteria, and real-time vehicle location.

Based on the technology platforms currently used by Wave, investments in technology may be necessary to implement the mobility network. These technology options can be scaled, providing flexibility to the Authority as the transportation market demands change over time. Payment options for these services can be calculated and supported in a variety of ways and is up to the discretion of the transit agency. The customer can pay the transit fare directly to a service provider and the agency can choose to subsidize the rest. Alternatively, the transit agency can collect the transit fare directly and pay the service provider the total via a predetermined billing system. There is also the ability to charge the customer the transit fare via credit card if the customer books via an app or online. A prepaid fare is another option if the agency chooses to connect via a direct Application Programming Interface (API) that allows the call center to book rides directly into a system that auto-tracks the monthly ride allotment and remaining prepaid fares.



Industry Research

Mobility Concepts

Mobility concepts that expand the current portfolio of traditional transit options were developed to provide offerings that link people to destinations and to the core fixed route service. The evaluation of mobility concepts is focused on services that can be deployed in low productivity areas, while providing value to customers and taxpayers. These concepts include demand response, rideshare, and personal mobility solutions and are detailed further in the Recommendations section of this report.

Microtransit

Microtransit is a pool-like service providing high-quality customer transit by being more flexible and responsive to real-time customer demand, similar to a Transportation Network Company (TNC) like UberPool or Lyft Line. This service is a feasible and productive option when fixed route is not productive or areas are underserved. Collaborative planning is vital in this process as it will mitigate as much risk as possible while working together with potential partners and reviewing all the options. This could provide a missing first- and last-mile connection to fixed routes or mobility hubs while also reducing the number of single occupancy vehicles on the road. This service could operate across a broad geography and run as often as needed. The number of trips and the cost per trip would be determined by Wave, as well as the vehicle types that would provide the service based on the customer need. The utilization of an application for trip booking would be an option, as well as leveraging a Call Center where customers could call to book their trip for those who do not have access to a smartphone.

These options give all customers the ability to successfully utilize the service and have the choice and freedom to move around New Hanover County. Utilization of this type of service in other locations have resulted in increased customer satisfaction and positive trends in ridership, productivity, and cost effectiveness. In addition, where agencies have chosen to pay a subsidy, the subsidy per trip has shown a decrease within the first six months as customer usage changes. This demonstrates that a microtransit, demand response service could generate cost savings as adoption and trip volume increase.



Recommendation

The proposed recommendation of this study offers Wave Transit an opportunity to deliver the right service for the greater Wilmington community through a network redesign. All of the financial assumptions for the recommendations in this report are based on fiscal year 2019 actuals as provided to the Consultant by Wave Transit. All projected figures provided are estimates and have not been adjusted for inflation or cost of living.

Utilizing a spreadsheet-based financial model, options have been costed using Wave operational data and industry standards to provide an understanding of the potential financial impacts of the options evaluated and proposed. This process achieved an understanding of the current and estimated future subsidy per trip. The model was used to inform the amount of resources available to stabilize the budget, provide an excellent customer experience, and potentially provide an alternative mobility investment throughout the community.

OPPORTUNITIES

Wave Transit's current, significant investment in service demonstrates the community's commitment to providing mobility throughout the community. The Authority has a flexibility in its approach to transportation investments.

There are opportunities to focus investment on core fixed routes and create substantial value to taxpayers.

There are opportunities to invest in on-demand services that provides access to mobility solutions more quickly and reliably than current service available – specifically in the areas outside Wilmington city limits.



Fixed Route Recommendation

The recommendation suggests that Wave Transit could reduce the overall cost and public subsidy by providing service in the most effective corridors. Reallocating service to the core area and eliminating unproductive service would provide reduce costs by 24%. The Authority has the potential to retain over 88% of existing trips, while adding more trips due to increased frequency. Potential mobility gaps would exist in the more rural areas of the community and could be filled with active transportation modes, ride sharing, and unsubsidized, free market solutions such as transportation network companies like Lyft and Uber. This recommendation provides frequencies at 60-minute intervals, with 30-minute frequencies between Padgett Station and Monkey Junction via US 421 and Padgett Station and Forden Station via Princess Place Drive.

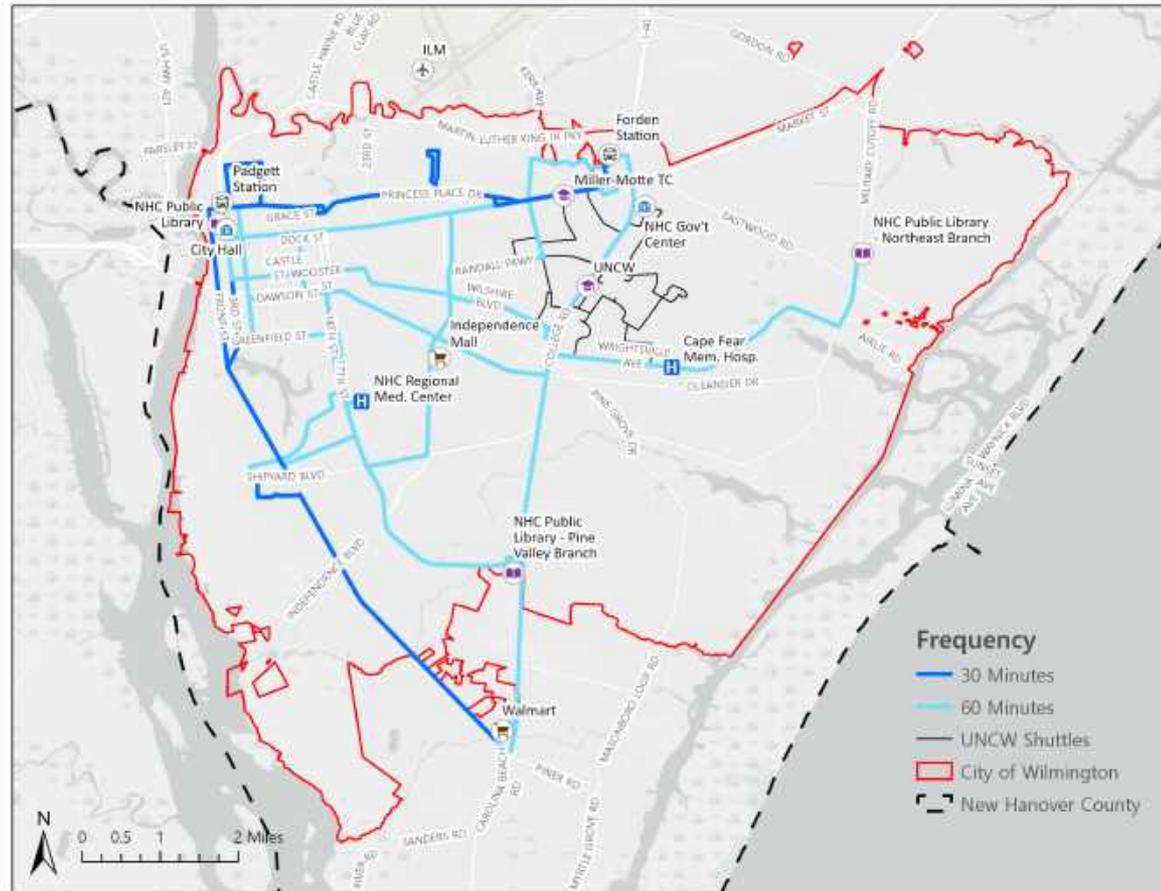
	Current			Recommendation			Community Impact
	Community	UNCW Shuttles	Full System	Community	UNCW Shuttles	Full System	
Total Cost	\$5,970,000	\$1,270,000	\$7,240,000	\$4,520,000	\$1,660,000	\$6,180,000	Reduce cost of the bus system by 24%
Service Hours	67,250	14,300	81,550	41,000	15,000	56,000	39% reduction in service hours
Total Customer Trips	863,000	337,000	1,200,000	816,000	337,000	1,153,000	Retain 88% of customer trips, add 7% of trips due to increased frequency



Fixed Route Recommendation

The recommendation for the fixed route network concentrates service to connect people from where they are to high-density and areas of interest such as shopping centers, libraries, and community services. This concentration allows Wave to provide improved frequency on two routes (Carolina Beach Road and College Road), improving mobility and independence for core transit riders.

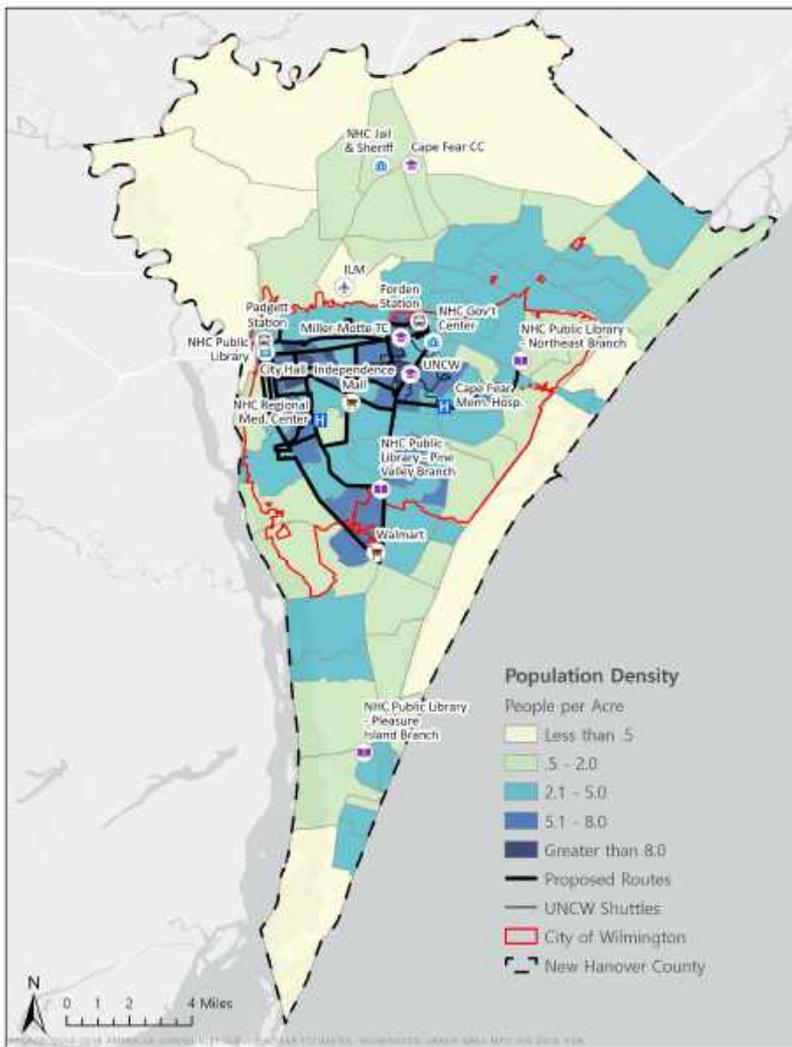
Detailed individual route profiles can be found in Appendix A.





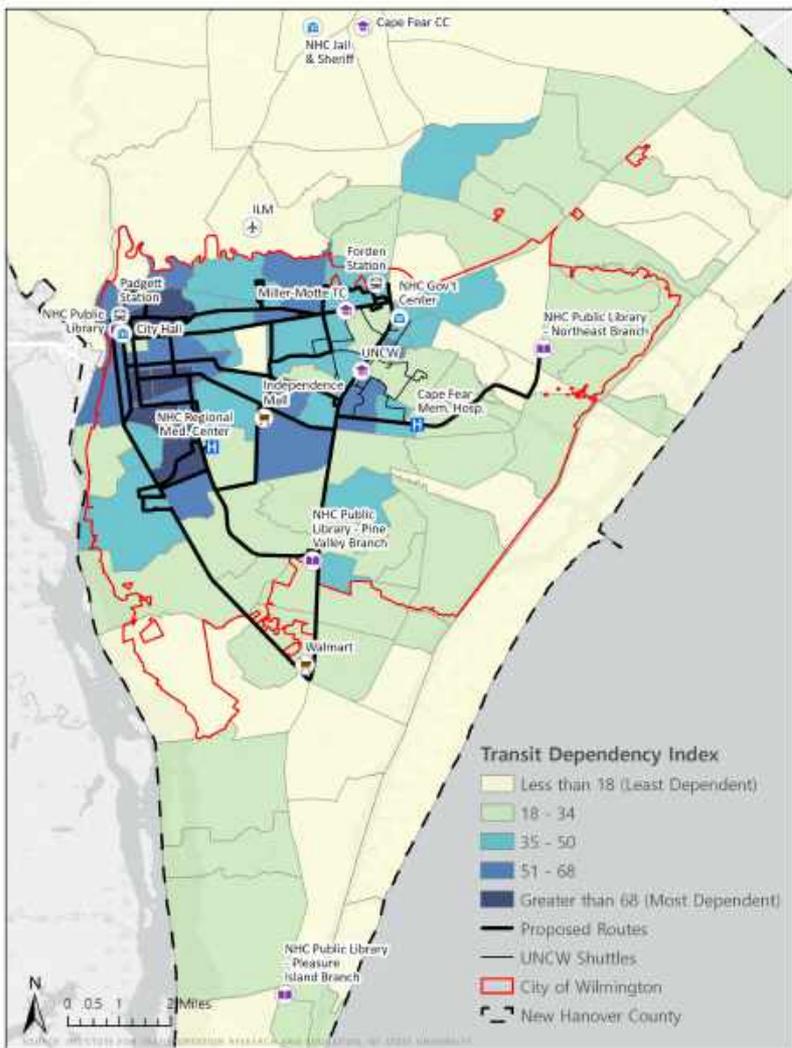
Fixed Route Service Alignment with Population Density

This plan recommends that Wave offer residents an improved fixed route service focused on the core of the existing transit network. This service area represents the majority of trip demand and is concentrated in the City of Wilmington with major corridors along US 421 and Market St. These fixed routes serve the highest concentrations of residential and employment density.





Transit Dependency Index



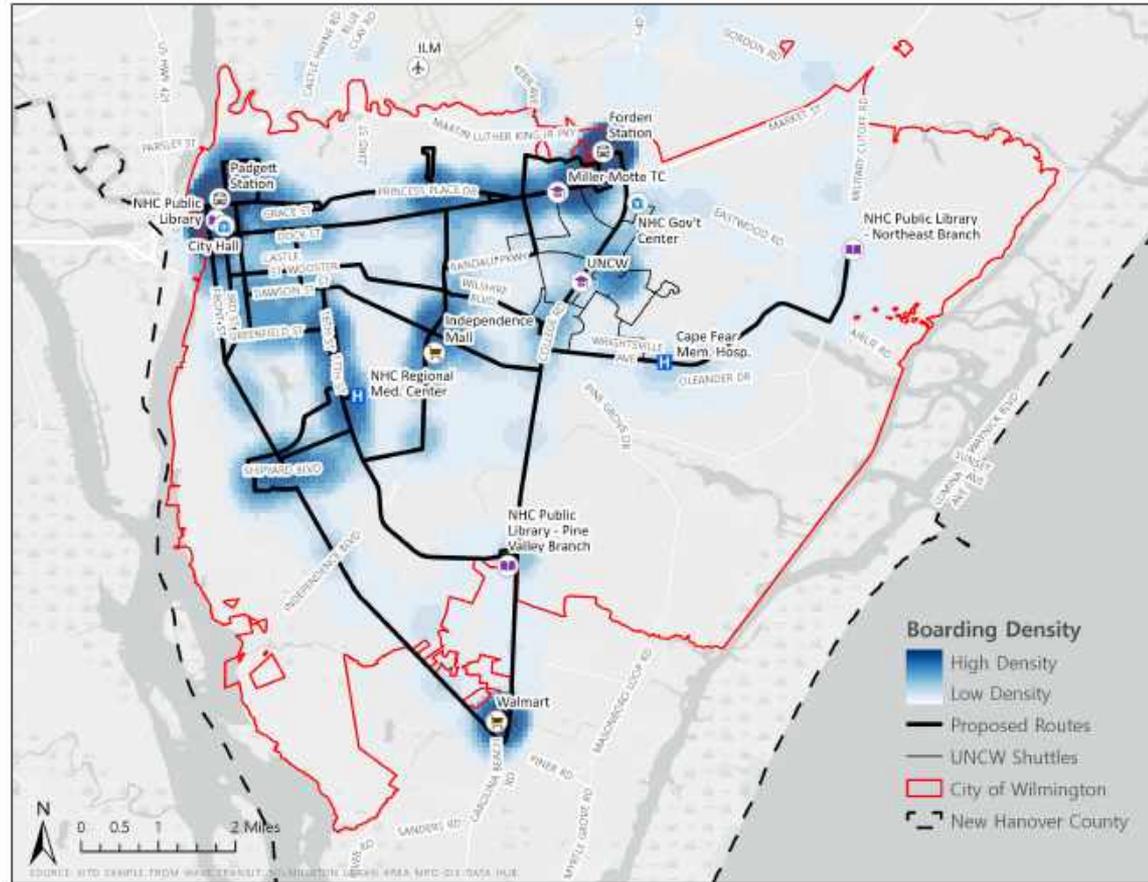


Fixed Route Service Alignment with Existing Ridership

Wave Transit provided stop-level boarding and alighting data, sampled from all routes from July 2019 to January 2020. Using geospatial analysis techniques, TransPro aggregated the data to provide an overall visualization of boarding density.

This map overlays the recommended fixed route system with existing boarding density.

While the proposed route configuration recommends a shift, the impact to current customers' physical access points is unchanged, while doubling the frequency of service on primary corridors.



James reduces his travel time by more than 29%

- 70+ minute travel time
- 1 transfer
- Route 101 → Route 201
- 30-minute wait at Padgett Station

CURRENT

- 50 minute estimated travel time
- 1 transfer
- Princess Place → Carolina Beach Road
- 10-minute wait at Padgett Station thanks to increased frequency on Carolina Beach route

FUTURE

James is using the fixed-route network to travel from a residence on Princess Place Drive to the Walmart shopping center at Monkey Junction.





Olivia reduces her travel time by 83% with zero transfers

- 90-minute travel time
- 1 transfer
- Route 102 → Route 103
- Wrightsville Ave route only travels westbound, potentially requiring an additional transfer on the way home

CURRENT

- 15 minute estimated travel time
- 0 transfers
- Oleander/Wrightsville route
- Travel time home is also 15 minutes

FUTURE

Olivia is using the fixed-route network to travel from a residence on Oleander Drive to NHRMC Orthopedic Hospital.





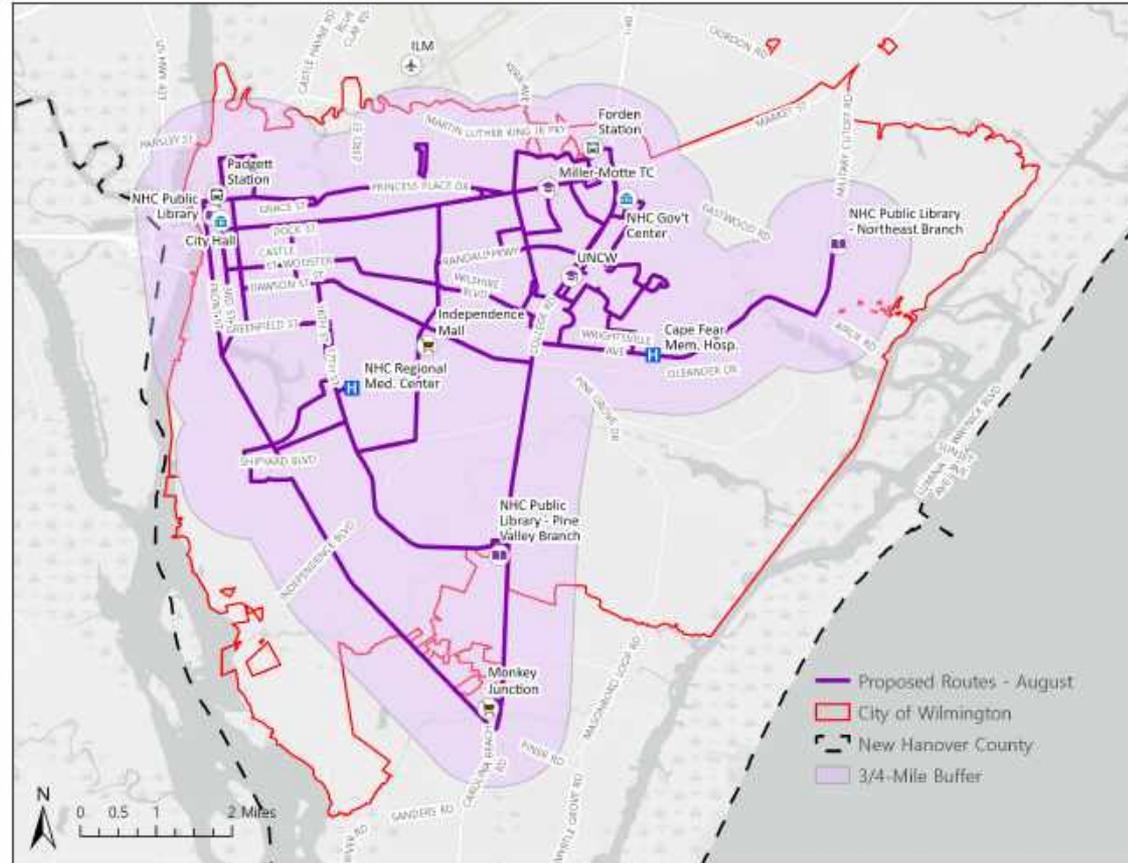
Paratransit Recommendation

The redesigned Wave Transit bus system impacts the ADA paratransit service area, as paratransit services are required within 3/4 mile of a fixed route for ADA customers. This recommendation advises that Wave Transit provide the required paratransit service and develop a communication plan for changes in service to impacted customers with ample time for those ADA paratransit customers to adjust.

	Current Paratransit System	Recommendation	
Total Cost	\$1,496,000	\$1,458,000	Reduce cost of the paratransit system by 3%
Total Customer Trips	60,000	55,700*	Retain 93% of customer trips

*Available address-level data doesn't distinguish between ADA and non-ADA paratransit trips. A more detailed analysis of specific trips should be completed by the Authority to understand the impacts to customers. 43

3/4 Mile ADA Paratransit Coverage



Paratransit Recommendations

This report identifies several opportunities within the paratransit network for improved operational efficiencies and policy changes, independent of the fixed route network redesign. Recommendations based on current network. Productivity gains may be realized as a result of the fixed route network redesign. Potential cost savings were not estimated for these recommendations due to the nature of the opportunities.

Department of Social Services Contract

- Strategy: Seek modifications to the DSS contract to get reimbursed for no shows/cancellations.
- Result: Higher productivity due to fewer untaken trips requested/operated.
- Result: Revenue opportunity to account for the no shows/cancelled trips.

Eligibility Policy

Strengthen the eligibility policy to ensure only the customers that need to use paratransit service are using the service.

- Strategy: Conduct more extensive interviews and assessments of ADA (DART) applicants.
- Result: More trips taken using the fixed route network, reducing the cost of paratransit.

Operational Effectiveness

Increase productivity from 1.74 trips per hour to peer average of 1.87 trips per hour.

- Strategy: Increase subscription rate to 50% of trips.
- Strategy: Reduce the cancellation rates to create more group trips.
- Result: Increase productivity of paratransit trips per hour

Reduce Capital Asset Needs

- Strategy: Increase the number of trips per vehicle from 2,529 to peer average of 3,683.
- Result: Reduce fleet of available vehicles needed.



Paratransit Peer Analysis

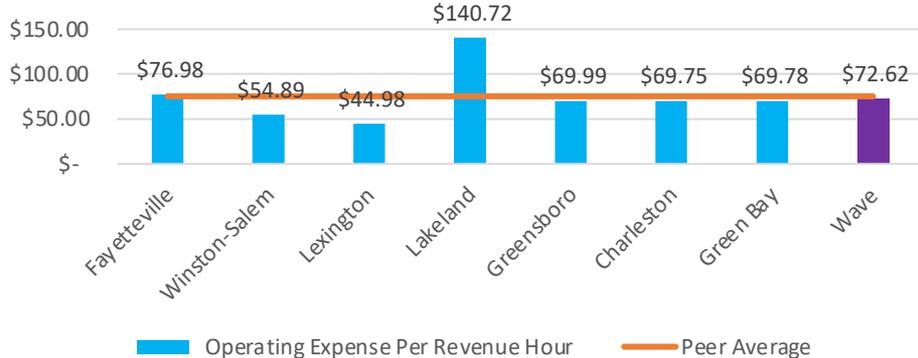
- Identified peer agencies using industry best practice methodology (TCRP Report 141)
- Considers similarities across 5 service characteristics and 9 urban area characteristics, such as total vehicle miles operated, service area type, population growth rate, percent poverty, etc.
- Peer comparison charts are based on latest available data in the National Transit Database (2018)



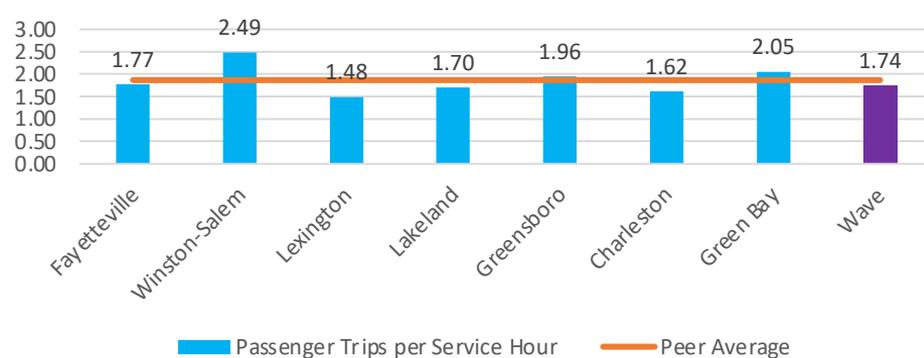


Paratransit Peer Analysis

Cost per Hour



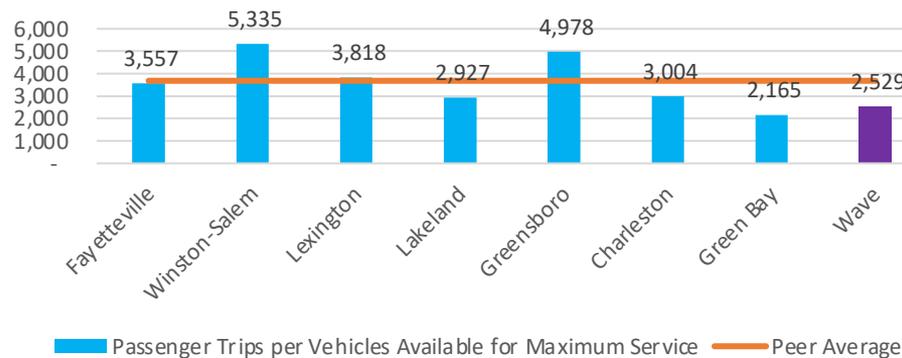
Trips per Hour



Cost per Trip



Trips per Vehicle





Wave Transit Reduces Total Costs by 20%

	Current			Recommendation			Community & Paratransit Impact
	Community & Paratransit	UNCW Shuttles	Full System	Community & Paratransit	UNCW Shuttles	Full System	
Total Cost	\$7,466,000	\$1,270,000	\$8,736,000	\$5,978,000	\$1,660,000	\$7,638,000	Reduce cost of the transit system by 20%
Total Customer Trips**	863,000	337,000	1,200,000	816,000	337,000	1,153,000	Retain 88% of customer trips, add 7% of trips due to increased frequency



Service Span and Frequency

Route	Weekday Service Hours	Weekday Frequency	Weekend Service Hours	Weekend Frequency
Princess Place – Peak Princess Place – Off-Peak	6:00AM - 6:00PM 6:00PM – 8:00PM	30 Minutes 60 Minutes	9:00AM - 6:00PM	60 Minutes
Carolina Beach – Peak Carolina Beach – Off-Peak	6:00AM - 6:00PM 6:00PM – 8:00PM	30 Minutes 60 Minutes	9:00AM - 6:00PM	60 Minutes
17th Street	6:00AM - 8:00PM	60 Minutes	9:00AM - 6:00PM	60 Minutes
College Road	6:00AM - 8:00PM	60 Minutes	9:00AM - 6:00PM	60 Minutes
Shipyards/Independence	6:00AM - 8:00PM	60 Minutes	9:00AM - 6:00PM	60 Minutes
Market Street	6:00AM - 8:00PM	60 Minutes	9:00AM - 6:00PM	60 Minutes
Wilshire/Wrightsville	6:00AM - 8:00PM	60 Minutes	9:00AM - 6:00PM	60 Minutes
Oleander/Wrightsville	6:00AM - 8:00PM	60 Minutes	9:00AM - 6:00PM	60 Minutes

Customer Impact



	Community	UNCW Shuttles	Full System	Cost Trips/Hour	Trips/Hour	Cost/Trip
Current Customer Trips	863,000	337,000	1,200,000	\$88.77	12.83	\$6.92
Estimated Existing Customer Trips	764,000	337,000	1,101,000	\$81.20	13.72	\$5.92
Estimated Customer Trips in Recommendation	816,000*	337,000	1,153,000	\$81.20	14.66	\$5.54



Fleet Impacts

As a result of the redesigned network, the number of vehicles needed for peak service compared to the current system is reduced. In the short term, this increases Wave Transit's spare ratio and can help keep service reliable. As vehicles reach the end of their useful life, Wave Transit will save a substantial amount in local match, the portion of funding that must be provided from local sources to match the federal grants most commonly used to fund capital expenses like buses.

	Current System	Recommendation
Buses	15	11
Shuttles (UNCW)	9	9
Trolleys	1	1
Total Fixed Route Vehicles	25	21
Future Capital Cost Avoidance	-	\$1.9m
Future Local Match Cost Avoidance	-	\$385k



Title VI Impacts

In accordance with Title VI of the Civil Rights Act of 1964 and FTA Circular 4702.1B, Wave Transit is not required to conduct an equity analysis due to major service changes. While the agency is located in a UZA of 200,000 or more in population, it does not have a fixed route fleet greater than 50 vehicles in peak service.

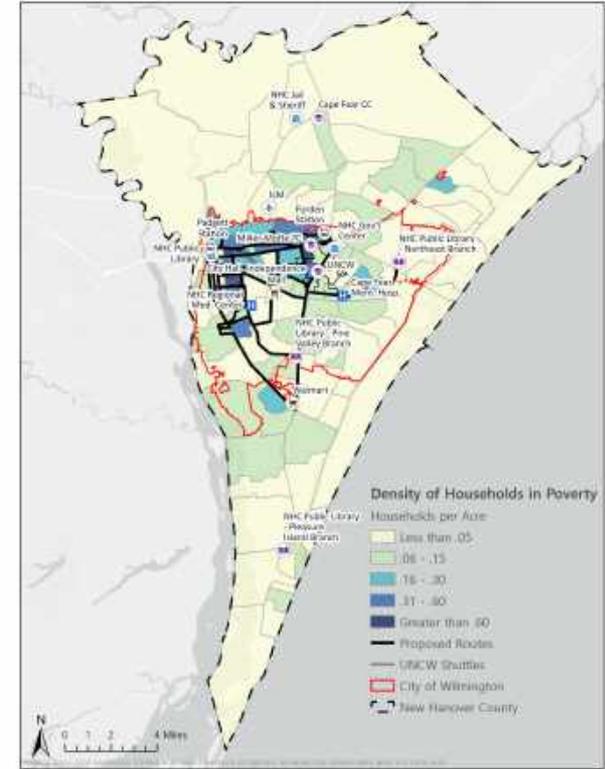
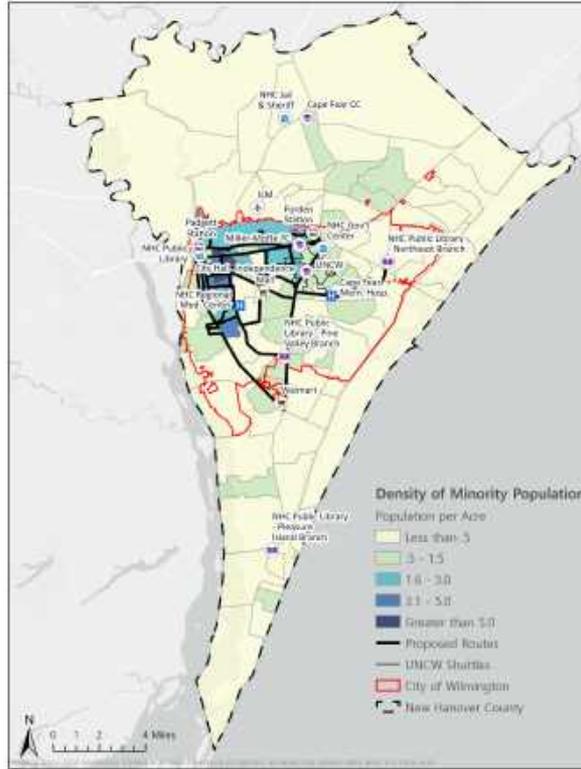
The Consultant used network analysis to accurately measure the existing and future service areas of the fixed route network. Network analysis determines access to locations based on the underlying street network. In this case, ½ mile buffers were created from existing and future Wave stops using the street network, simulating a pedestrian walking 10 minutes from their homes, workplaces, etc. to the bus stop. These walksheds were then matched to census blocks and block groups. This provides a more accurate picture of Wave's service area, especially in locations without grid street networks.

The proposed changes represent a 32% decrease in system-wide service as measured by revenue hours (81,560 to 55,670). The proposed changes do not appear to disproportionately impact vulnerable populations in the community. While 79% of the total current service population is expected to be served by the recommended fixed route network, 88% of the minority population and 94% of households in poverty will continue to be served.

Title VI Impacts



	Percent of Existing Service Population Served by Proposed Fixed Routes
Total Population	79%
Minority Population	88%
Households Below Poverty Line	94%





Investment Standards

As communities change through natural demographic shifts, job growth, investment, and land use patterns, Wave Transit will find that changes to existing routes or new fixed route investments may be needed to serve the community. The primary drivers for traditional fixed route transit ridership are a combination of characteristics that include residential population density, employment density, people that are 65 or older, people with disabilities, minority and disadvantaged populations, and single or zero car households.

This study recommends that the Authority adopt a set of investment standards to guide objective investment in transportation infrastructure. A contributor to the current state of low productivity service for Wave Transit is the distribution of routes throughout the County, attempting to create greater access with little frequency. This combination of infrequent service and low population density creates low productivity transit service – few riders for the money spent.

Additionally, the Authority needs to be on sound financial footing before expansion investments are made. The following investment standards should only be pursued after the Authority has demonstrated multiple, consecutive years of balanced budgets or years with revenues in excess of expenses.

This study recommends that before new fixed route service is offered, that the Authority conduct a rolling assessment of the 5-year American Community Survey (ACS) data to understand local demographic shifts. Additional considerations are provided on the next page.

Before investing in additional fixed route service, Wave should look for clustering of growth and density trends for these core characteristics:

- Population density
- Employment density
- Percent of households with no vehicle
- Percent of households below poverty level
- Percent minority
- Percent 65+ population
- Percent people with disabilities

Furthermore, it is recommended that these markets be screened for their ridership potential based on the available data through demand response, mobility, and origin and destination travel data available through the MPO and other partner organizations. The process of service opportunity assessment should ideally be conducted on an annual basis.



Investment Standards Checklist

Criteria (see Appendix C for specific targets)	Importance
Population/ Employment Density Threshold Reached or Anticipated	High
Higher concentrations of populations in following groups: households with no vehicle available, households below poverty, elderly, and people with disabilities	High
Origins and Destinations Along or Connected by Corridor	Medium
Mix of Uses	Medium
Transit-Supportive Land Use Plans	Medium
Congestion Level	Medium
Presence of Sidewalks	Medium
Presence of Bicycle Lanes	Low

While there is no one-size-fits-all formula for assessing transit feasibility, various academic and practical studies have provided helpful criteria and guidelines that can be consulted before conducting a more comprehensive, site-specific study. The checklist below provides a tool that Wave Transit can use going forward.

The full table with specific thresholds defined can be found in Appendix C.



Performance Management

With this study comes a recommendation for the Authority to develop a Mobility Scorecard to help accurately monitor and report on the performance of each service platform within the Wave Transit mobility network. By design, such a scorecard will provide the Wave Board of Directors, Wave leadership, customers, mobility providers, stakeholders, and those interested within the community a simple way to know how well the service is performing collectively – as well as how each separate mobility service within the system is performing.

The transportation industry is brimming with data and digital systems to gather data. The key to effectively leveraging these systems lies in selecting the right data points to monitor. Performance outcomes that reflect the quality of service delivery are essential. For example, national best practices in performance monitoring indicate that on-time performance is one of the most important aspects of service performance to customers. Therefore, an effective scorecard should monitor and report on that metric. Where multiple services or third-party providers are involved, a performance scorecard also serves as an ideal tool to drive higher levels of performance, accountability, and vendor management.

Ideally, a performance scorecard is a quarterly monitoring tool, the results of which are reported to the Board as well as the community. Additionally, the scorecard itself is easy for readers to comprehend. A 100-point system – like most everyone is accustomed to using in school and college – serves as the basis for simplified reporting. Metrics carefully selected to be included in the scorecard should be prioritized based upon criteria defined by customers and management.

The most effective performance scorecard programs include a side-by-side comparison of:

1. Operational performance metrics identified as priorities by customers, and
2. Customer perceptions of the same areas of service

This format enables management to clearly see where service strengths and challenges can be found in the network. For example, looking at the on-time performance metric, a transportation provider might score outstanding performance values (88% or higher). If, at the same time, customer perceptions show that on-time performance is lacking, something must be done to close the gap. In this instance, the transportation provider might want to explore a communications initiative to educate customers about the reality of their service.



Performance Management

As part of Wave’s system redesign, initiated in 2020, draft Success Outcomes and a draft Performance Scorecard has been developed to define outcomes and measures of mobility to help the authority manage the performance of the system redesign, the effectiveness of Wave as a mobility provider, and enhance the culture of ownership among Wave staff in improving regional mobility. The components of the Mobility Scorecard wrap around Wave’s essential priorities as it strives to establish a position of long-term financial sustainability.

During the process of redesigning the system, the Board of Directors, Wave staff, and community stakeholders consistently identified four priorities that the Authority must address.

Mobility priorities for Wave:

1. Financial Sustainability – for Wave to continue providing functional mobility services to the community, it must resolve chronic deficit budgets.
2. Serve highest need, transit-dependent customers
3. Improve convenience – to improve customer experience, enhance independent mobility, and attract “choice” riders
4. Regional access – improve regional access through partnerships and additional funding

Fundamentally, a mobility scorecard wraps its focus solely on the factors of mobility and access. Given the chronic annual financial conditions of Wave, the continuous adoption of deficit budgets, the lack of a dedicated revenue source, and the inaction of former Board and staff leadership to make necessary and difficult business decisions, the recommended mobility scorecard includes a financial sustainability metric. The Wave administration staff should be evaluated on their performance against these objective criteria.



Performance Management

Wave Transit’s success depends on the ability for the Authority to become financially stable, provide excellent service, and deliver value to customers and the community. Across the nation, many transit agencies are using clearly defined success outcomes to establish clear definitions of success by which they are measured. This study recommends the Wave Transit Board complete a success outcomes exercise in which clearly defined outcomes are identified, which the management team works to accomplish and is held accountable for. To the right are example success outcomes for the Board’s consideration.

This study provides a draft mobility scorecard on the following pages for the Authority to use as it seeks to provide increased convenience and mobility to its customers.

Success Outcomes	Metric	Information System	Success Definition
MOBILITY OUTCOMES	Mobility Score	Mobility Scorecard	Improve mobility Improve access Ridership
CUSTOMER EXPERIENCE	Net Promoter Score	Customer Survey	Improve over baseline
COMMUNITY VALUE	Community Value Score	Perception Survey	Improve over baseline
TAXPAYER VALUE	Operating Performance	Financial and Operations Data	Increase efficiency



Performance Management

In developing a mobility scorecard, value is placed on the issues of mobility and access, defined as follows:

1. **Access: Can a person in the Wilmington/New Hanover County region get to where they want to go?**
 - *Do they have access to a mobility option?*
 - *Can an individual get to a vehicle / can a vehicle get to them?*
 - *Do the region's most vulnerable populations have access to a mobility option?*
 - *Can the region's most vulnerable populations afford to ride it?*
 - *Does the mobility option access desired destinations?*

2. **Mobility: How well can a person in the Wilmington/New Hanover County region get to where they want to go?**
 - *What is the quality of their travel experience?*
 - *How much time does it take to connect to the opportunity?*
 - *How cost effective is the mobility option to the consumer?*
 - *How cost effective is the mobility option to the community?*
 - *How safe is the mobility option?*
 - *How reliable is the mobility option in connecting people to opportunities?*

3. **Will people use the portfolio of mobility options to connect to opportunities?**
 - *What is a customer's level of satisfaction with their mobility experience?*
 - *How easy was it to use the mobility option?*
 - *Was the connection competitive with the driving alternative?*
 - *Was it the same speed or faster?*
 - *Did it save the customer money?*
 - *Did the mobility option offer the customer an experience aligned with their personal preference for connecting to opportunities?*



Performance Management

Priority	Metric		Goal	Weight	Tactic
Financial Sustainability (40)	Balanced budget		Pass/Fail	25	Board adoption of a balanced budget, staff adherence to balanced budget
	Increase % of revenues from non-federal sources		5% increase above 2020	10	
	Complete fiscal year without bridge loans or emergency grants		Pass/Fail	5	
Mobility (30)	Percent of community that agrees Wave helps make seamless connections between mobility options	Perception	10% increase above baseline	12	Establish baseline via customer/community sentiment survey
	Percent mobility option is available within a shorter or the same amount of time as during traditional peak period	Actual	% increase above baseline	6	
	Percent change in mobility for targeted populations*	Actual	Increases above baseline	6	Establish baseline via customer/community survey
	Percent change in wait times for all mobility options	Actual	Decreases below baseline	6	Establish baseline via customer survey

Priority	Metric		Goal	Weight	Tactic
Access (30)	Percent of community that agree they can access a mobility option when desired	Perception	10% increase above baseline	6	Establish baseline via community sentiment survey
	Percent of population with access to jobs via a mobility option within an hour or better	Actual	% increase above baseline	2	Develop geospatial tool
		Perception	10% increase above baseline	2	Establish baseline via customer/community sentiment survey
	Percent of population with access to healthcare resources via a mobility option within an hour or better	Actual	10% increase above baseline	2	Develop geospatial tool
		Perception	10% increase above baseline	2	Establish baseline via customer/community sentiment survey
	Percent of population with access to educational resources via a mobility option within an hour or better	Actual	10% increase above baseline	2	Develop geospatial tool
		Perception	10% increase above baseline	2	Establish baseline via customer/community sentiment survey
	Percent of population with access to social services via a mobility option within an hour or better	Actual	10% increase above baseline	2	Develop geospatial tool
		Perception	10% increase above baseline	2	Establish baseline via customer/community sentiment survey
	Percent of population with access to frequent mobility option within ½ mile of housing	Actual	28%***	2	Develop geospatial tool
		Perception	10% increase above baseline	2	Establish baseline via customer/community sentiment survey
	Percent of customers agree that trips are affordable	Perception	10% increase above baseline	2	Establish baseline via customer/community sentiment survey
Percent of trip denials for demand response service		10% decrease below current rate	2		



Recommended Implementation Plan

The following is an actionable strategy for Wave Transit to successfully implement the proposed transportation network redesign. The recommended implementation plan provides structure and order to a potentially complicated process that includes consistent and clear communication, commitment to change management resources, and procurement procedures that support partnership, innovation, and competition.

Wave should thoughtfully consider its approach to managing a change of this significance. A variety of options for implementation exist, including Wave Transit's management of proposed changes, some other management and oversight by an external department or party of the City or County, or the potential engagement of an external program manager.

Additionally, elements of the redesigned transportation network that are presented in this report as options (such as the mobility service) may be undertaken at the discretion of Wave Transit, including concurrently with the fixed route changes.

This study recommends using a What, How, Who, When structure to successfully implement this mobility network. The implementation schedule identifies the major activities, durations, and owners responsible for driving the plan. Next steps should include the development of a detailed schedule that demonstrates linked and dependent activities. The schedule allows for concurrent activities and serves as a guide to driving successful implementation.

Potential Implementation Program Components

Governance

- Board Composition
- Roles & Responsibilities
- Performance Management
- Interlocal Agreement
- Funding

Strategy and Operations

- Program Management
- Internal Communication
- Budget Development and Compliance
- Schedule Management and Reporting

Communications

- Brand Management
- Public Engagement
- Stakeholder Engagement
- Marketing Tactics
- Social Media Tactics
- Public Relations
- Media Management

Fixed Route Implementation

- Scheduling
- Staffing
- Route Redeployment

Mobility Services Option

- Success Definition
- Specification Development
- Request for Information (RFI) Development
- Fare Structure Development
- Technology Needs Assessment
- Specification Revision

Procurement

- Invitation for Bid (IFB) / RFP Development for Management Services Contract
- Optional Add-on or separate procurement for Mobility Services
- Proposal Review and Evaluation
- Contract Negotiation
- Performance Measurement / Contract Compliance



Recommended Implementation Plan: Governance

New Hanover County and the City of Wilmington dissolved the Wave Transit Board in February 2020 and created an Interim Board to oversee the development of a balanced budget and the redesign of the transit network. A permanent Board, as well as other key fundamental changes to the governance of Wave Transit, will be necessary for the long-term success of Wave Transit.

Board Composition

A key part of the governance model will be alignment around the size and composition of the permanent board to ensure ideal representation and ability to provide oversight and strategic direction. Additionally, it will be important to identify those individuals who will serve for the first term on the new Board.

Roles & Responsibilities

As the new Board is assembled, there is an opportunity for addressing roles and responsibilities to ensure that the Board is engaged in the most effective manner in oversight and policy direction. It is also recommended that the new Board receive Board Governance Training that emphasizes the roles and responsibilities and how to effectively govern performance.

Performance Management

The Board should provide direction on the overall outcomes for success of Wave Transit, likely covering key strategic areas such as Fiscal Sustainability, Customer Satisfaction, Community Value, and Employee Engagement. By aligning with staff on key performance metrics that measure what matters and focus on results, the Board will have a mechanism for evaluating Wave Transit's performance in a consistent manner. As part of this process, performance metrics should be prioritized such that it is clear what to focus the most resources and attention on.

Interlocal Agreement

As part of the new governance structure, modifications to the interlocal agreement will be necessary. This agreement will incorporate stronger performance metrics and mechanisms to hold Wave Transit accountable for its performance in key areas. This will also provide clarity to each party to the agreement of their respective roles.

Funding

As a result of the new Board composition, there may be a need to evaluate the existing funding contributions and levels. There may also be discussion of funding levels tied to service and/or performance objectives.



Recommended Implementation Plan: Strategy and Operations

Implementing a comprehensive transportation network redesign is a major endeavor that requires strong program management and oversight to ensure that all of the elements are coordinated and executed according to the schedule and budget.

Program Management

While program management can be handled by existing staff, the engagement of an implementation program manager is an option that could provide Wave Transit a temporary partner, solely focused on the successful transition to the redesigned network, while allowing the agency to remain focused on core service delivery. A program manager is a professional project management entity staffed and resourced with professionals skilled in project management, change management, subject matter expertise and procurement specialists. A program manager integrates with the existing organization and represents an owner's interest in the implementation of significant ventures, like the mobility network redesign. Regardless of whether the role is staffed in-house or contracted, the functions remain the same.

Internal Communication

The successful implementation of this program requires strong communication internally to ensure key parties are apprised of progress in various areas and can become ambassadors for the change in their interactions with customers and community stakeholders. This could include a cadence of regular status meetings, employee town halls, all-staff emails, and other means.

Budget Development and Compliance

The development and management of a budget specifically around the network redesign is critical to Wave Transit's success and continued progress towards financial sustainability.

Schedule Management and Reporting

With many moving parts and a target implementation of July 1, 2021, it is important to develop a schedule that includes key milestones and dependencies, as well as the discipline to follow the schedule or make reasonable adjustments.



Recommended Implementation Plan: Communications

Should the Authority pursue any of the recommendations of this study, the successful implementation of this program requires strong communication programming; it is essential to a community's introduction of any change elements.

For Wave Transit, it will be extremely important to implement a multi-faceted communications strategy that will integrate well-executed tactics across numerous communications and marketing platforms to:

- Inform existing customers about new service options
- Raise awareness about new transportation options to potential customers
- Infuse enthusiasm and confidence in the Authority's transportation solutions and value to the community
- Spark excitement across the community for the Authority's innovative transportation solutions (if implemented)
- Increase ridership

Elements of a Communications Plan

Brand Management – Bright and colorful imagery and an upbeat tagline could be developed and integrated into all marketing, public relations and social media touch points.

Public Engagement – Input and involvement from the public is absolutely essential to foster buy-in and excitement around all that will be new in Wave Transit's transportation network. Citizen advocates will generate word-of-mouth interest, enthusiasm, and support.

Stakeholder Engagement – Business leaders, elected officials, mobility advocates, and other niche groups will all be enticed to support the program and stand behind the Authority in promoting the new mobility network.

Marketing Tactics – A well-developed strategy of the marketing steps and tools to raise awareness and gain support. Marketing elements include advertising across multiple platforms such as print ads, outdoor advertising, apparel, and vehicle ads.

Social Media Tactics – A well-developed strategy to promote the brand across social Media.

Public Relations – Development and consistency of message management.

Media Management – Media event planning and staging, sound bite development and strong, consistent talking points for anyone involved in promoting the brand and elements of the new mobility network.



Recommended Implementation Plan: Fixed Route

In order to turn the planned fixed route redesign into reality, there are a series of more detailed next steps that need to occur.

Scheduling

This is the process that determines how the parameters of the redesigned network will be combined with work rules to inform timetables (the specific times that the bus will reach each stop) and how trips will be combined into a daily schedule.

Staffing

Based on the schedule and work rules, new assignments will be prepared to ensure proper levels of staffing for each route. These pieces of work will need to be bid according to union rules.

Staff at all levels will also need to be trained on the new network, both for their own familiarity and to be able to answer customer questions.

Route Redeployment

There are a number of logistics to manage the redeployment of the new network, including final preparation of staff, updating schedule information on signs, website, and apps, moving/removing/adding bus stop signage, and monitoring the performance of the network when it launches. It is important to coordinate the route redeployment with activities undertaken as part of the Communications Plan to ensure that customers and stakeholders are prepared and informed about the changes and where to find more information.



Recommended Implementation Plan: Mobility Services Option

One of the options discussed in this plan is the concept of a more flexible, on-demand service that could be deployed in areas of the County not served by fixed route. If this option is pursued, the following steps are recommended to prepare for a competitive procurement of technology and/or services (discussed on the following page).

Success Definition

A measurable definition of the overall outcomes desired from the mobility solution.

Specification Development

Guidelines for what is desired, within which there is flexibility for the market to tell Wave Transit how they would achieve the defined goals. These would be integrated into a Request for Information (RFI).

Request for Information (RFI) Development

Provides an opportunity to invite the industry to demonstrate the solutions they feel would be a best fit for delivering the desired outcomes and existing conditions of the Authority.

Fare Structure Development

If Wave Transit pursues a mobility option, it will be necessary to determine the cost that would be paid by the customer, as well as the transfer policy between the mobility service and the fixed route network. It is recommended that transfers to the fixed route be encouraged. This would require consideration of the overall cost of journeys in any assessment of potential fare structure.

Technology Needs Assessment

Through the RFI process, Wave Transit may learn that certain technologies may be helpful or necessary for optimal integration of a new mobility option. This may necessitate a review of existing technology and gaps that may exist.

Specification Revision

Based on the information provided through the RFI process, update specifications in preparation for an Invitation for Bid (IFB)/Request for Proposals (RFP). Although more specific than the RFI, an effective RFP for these services should not be overly prescriptive as to how the services will be delivered, but rather it should provide relevant information and solicit proposals that provide innovative solutions that deliver the desired outcomes.



Recommended Implementation Plan: Procurement

At a minimum, Wave Transit will need to re-bid its Management Services contract, which is currently operating under an extension due to COVID-19. The extension provides Wave Transit with an opportunity to provide a longer procurement and transition timeline, which could encourage increased competition.

Depending on the desired path and funding availability for additional mobility services, Wave Transit could opt to:

- A) Procure Management Services and Mobility Services as one RFP package
- B) Procure Management Services and Mobility Services as separate RFP packages
- C) Procure Management Services only

Invitation for Bid (IFB) / RFP Development

Although Wave Transit has a Management Services RFP that it has used in the past, the revised timeline and network redesign offer an opportunity to introduce revisions. Whether for fixed route or an alternative mobility solution, the RFP should be written in a manner that allows flexibility for the industry to demonstrate the solutions they feel would be a best fit for delivering the desired outcomes for the City of Wilmington and New Hanover County.

Proposal Review and Evaluation

Proposals will be reviewed by evaluation criteria that aligns with the desired outcomes.

Contract Negotiation

In addition to the standard contract and price negotiation, it is strongly recommended to include specific, objective performance criteria as part of the negotiated contract as a way to provide accountability for delivering results. These should be aligned with Wave Transit's overall desired outcomes and performance goals.

Performance Measurement / Contract Compliance

Once the contract is awarded and service begins, Wave Transit will provide contract oversight, with particular emphasis on the identified performance metrics. Wave Transit may wish to use a similar Scorecard template to manage contractor performance as it uses to manage overall agency performance. Additionally, Wave Transit should ensure that it has a process in place for addressing and tracking any performance issues in a timely manner.

Closing



Wave Transit is at a crossroads. This study recommends making changes that will provide a long-term sustainable future, both financially and operationally. Through courageous decision-making around administrative efficiencies, operational improvements, and revenue generation, Wave Transit can chart a course to be successful for many years to come.

ADMINISTRATIVE OPPORTUNITIES

CFPTA Position Efficiencies

Management Services Contract Position Efficiencies

\$210,000

OPERATIONAL OPPORTUNITIES

Develop a right-sized fixed route network

Integrate paratransit modifications

Alternative service profile (optional)

\$786,000 – \$988,000

Potential reduction of federal revenue:
\$136,000



REVENUE OPPORTUNITIES

UNCW contracted services

\$1,000,000 – \$1,200,000

Lease of office space

\$10,000 – \$20,000

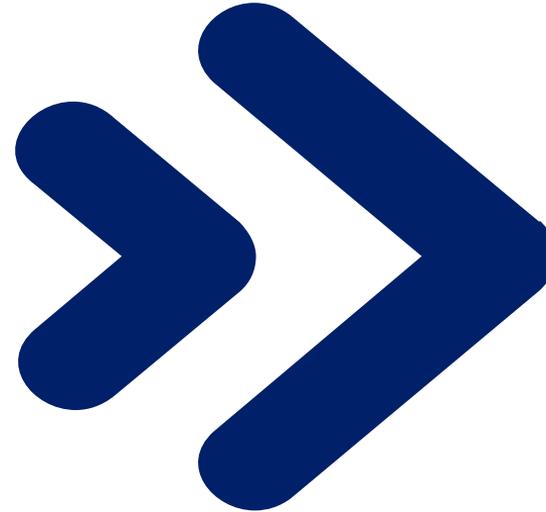
\$1,010,000 – \$1,220,000

**Cost Savings/Revenue Opportunity:
\$1,870,000 – \$2,282,000**



Recommended Next Steps

- Approve redesigned network
- Direct staff to follow the implementation plan for the redesigned network
- Seat new Board of Directors under new governance structure
- Begin drafting performance standards for mobility network (if option is selected)
- Begin drafting RFI/RFP documents for management services and mobility network (if option is selected)
- Negotiate updated contract with UNCW
- Continue to seek additional partnerships for improved administrative and operational efficiencies





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Appendix A: Route Profiles

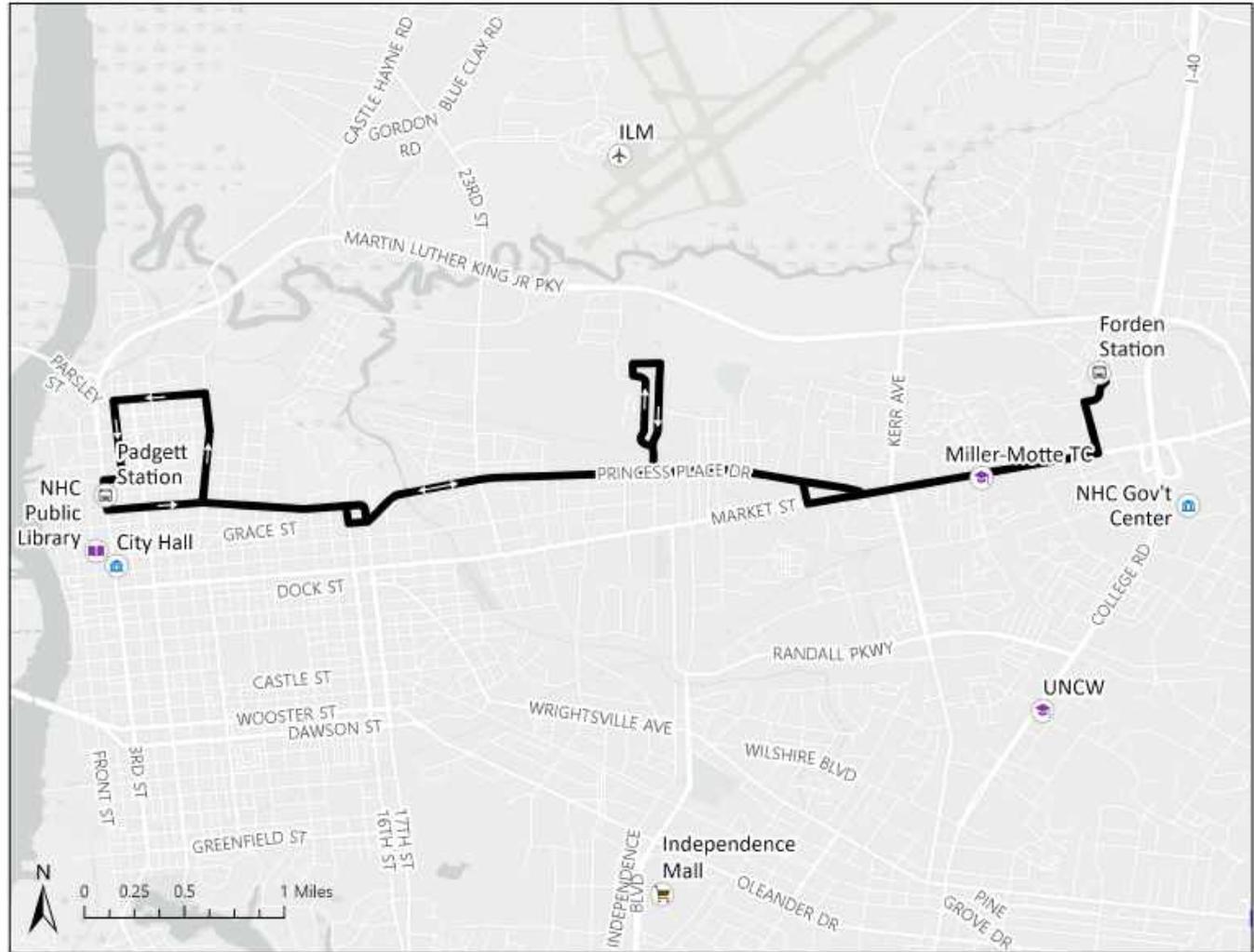


Princess Place

This route provides connection between Forden Station and Padgett Station along Princess Place Drive.

It mostly follows existing Route 101, including a connection to Creekwood Apartments north of Princess Place. The only deviation is a one-way loop north of Padgett Station along McRae, Nixon and 4th Streets.

Princess Place route has 30-minute headways from 6am-6pm on weekdays, with 60-minute headways from 6pm-8pm.

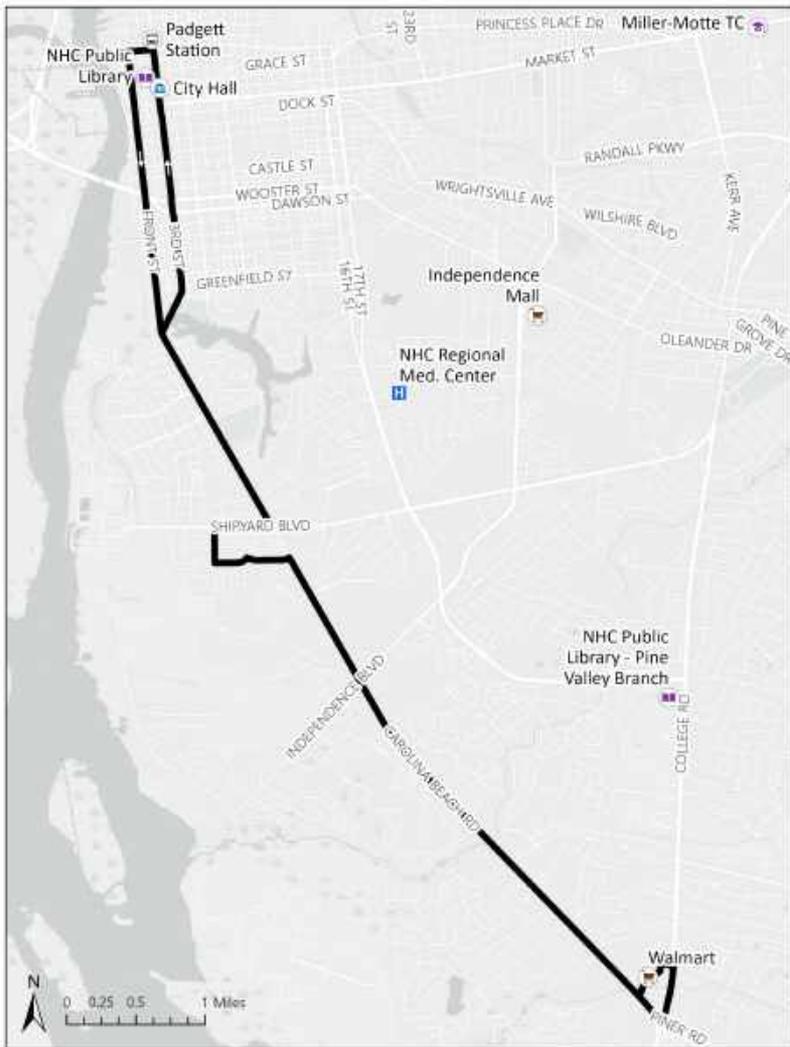




Carolina Beach

This route provides connection between Padgett Station and Monkey Junction along Front Street in Downtown Wilmington and Carolina Beach Road. It travels north on 3rd Street for inbound trips and south on Front Street for outbound trips. It also travels briefly on Shipyard Boulevard to Vance Street and Rutledge, similar to existing Route 106.

Currently, Route 201 has 60-minute headways. Our recommendation for this route includes increased weekday frequency to 30 minutes from 6am-6pm and 60-minute headways from 6pm-8pm.

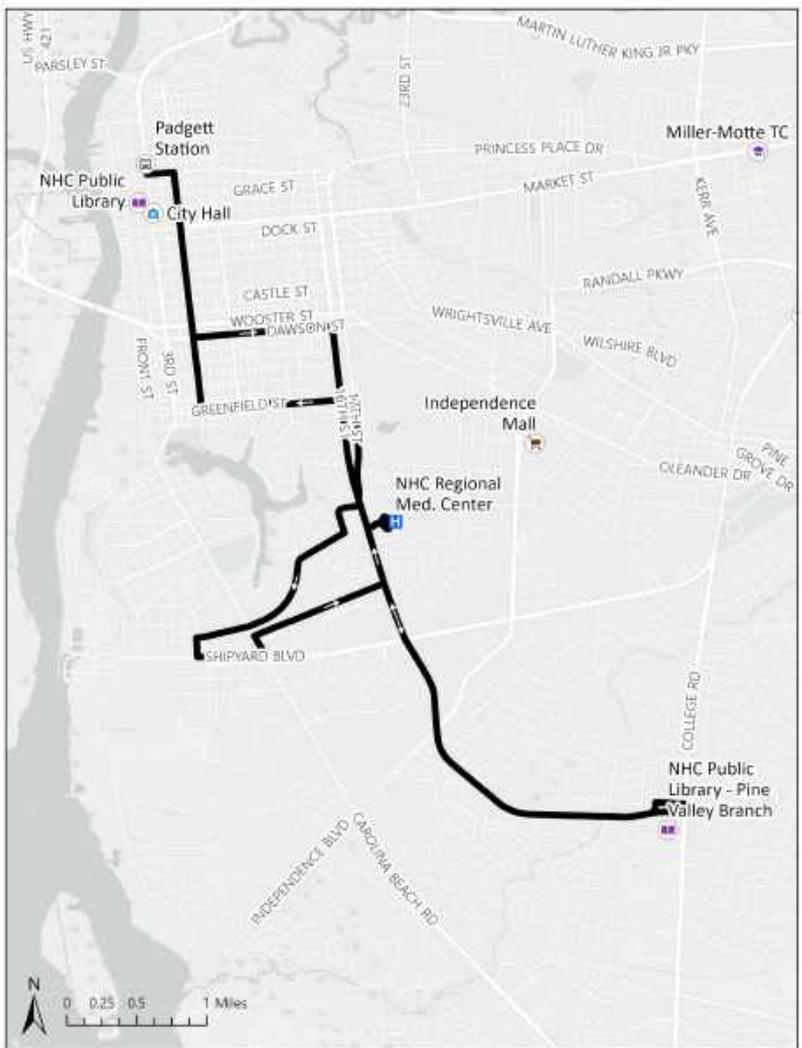


17th Street

This route provides connection between Padgett Station, the New Hanover County Regional Medical Center, and the Pine Valley Branch of the public library.

The outbound route travels south on 5th Street, east on Dawson Street and south on 16th Street. Similar to existing Route 205, it travels west on Medical Center Drive past Carolina Beach Road before traveling east on Wellington Avenue. It continues south until reaching the library branch at College Road. The inbound route travels directly to the NHC Regional Medical Center before heading north on 17th Street, west on Greenfield Street and north on 5th Street back to Padgett Station.

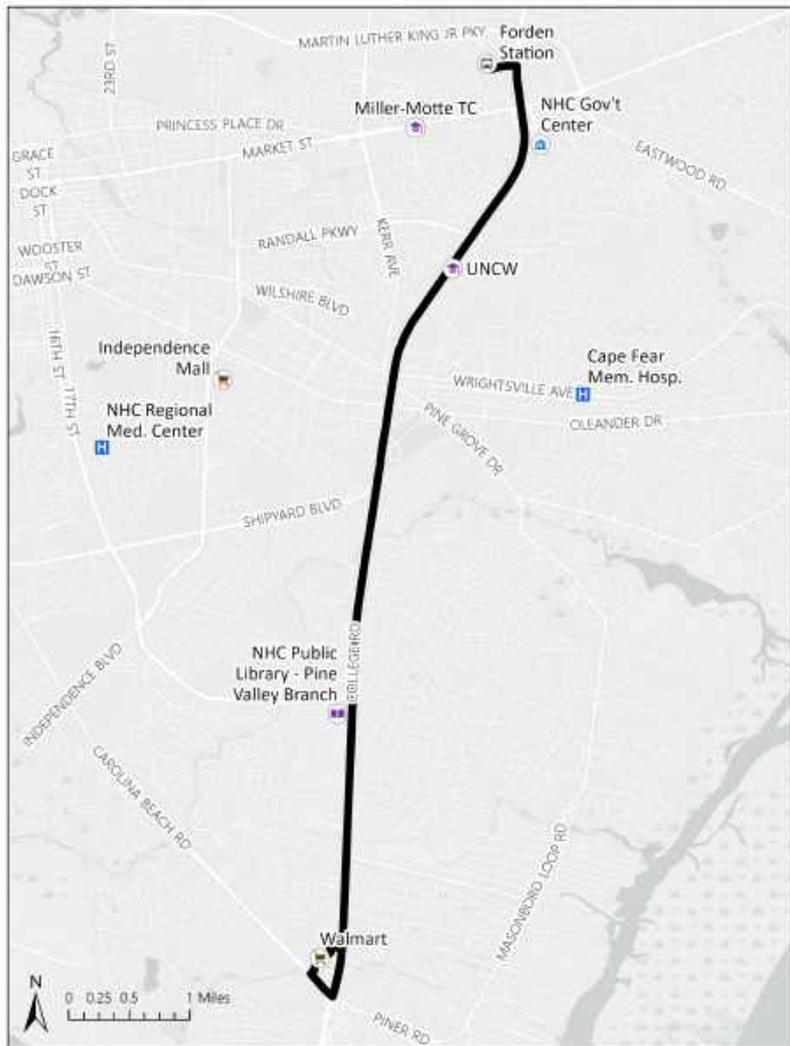
It follows similar alignments to Routes 210 and 205.





College Road

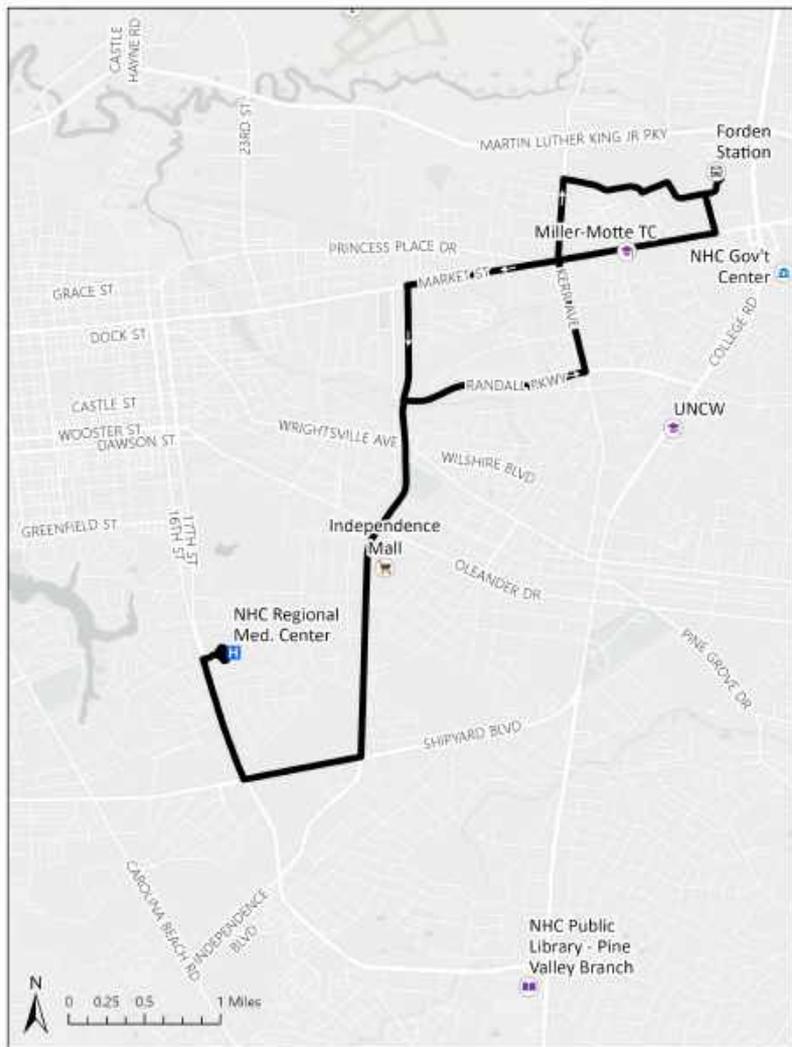
This route provides connection between Forden Station and Monkey Junction. It follows the same alignment as existing Route 107 along College Road. Currently, Route 107 makes 10 runs per day, as it is used for Route 301 to travel to Pleasure Island every 3 hours. The future route is includes 14 runs per day.



Shipyard/Independence

This route connects Forden Station to the NHC Regional Medical Center.

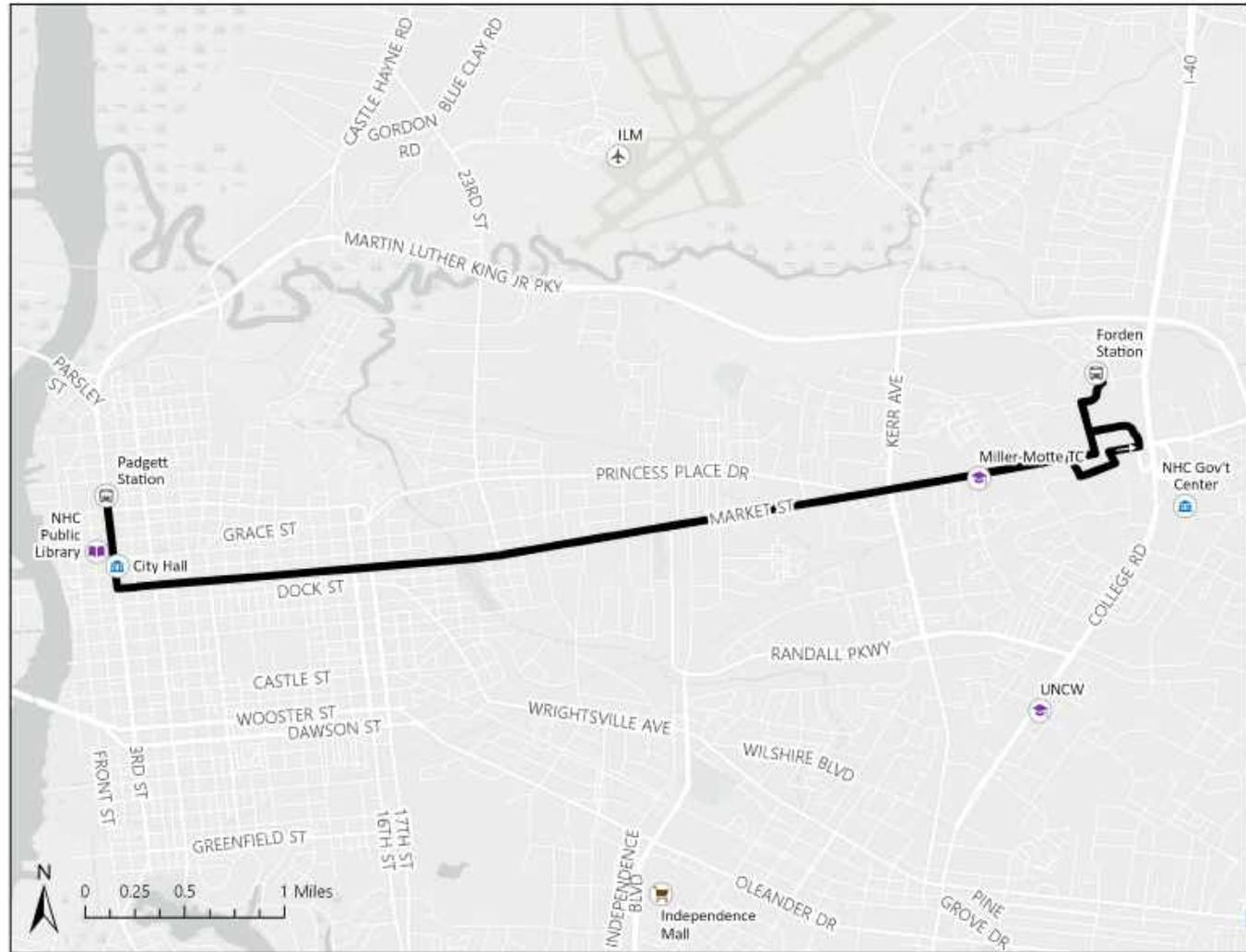
The future route follows a similar alignment to existing Routes 105, 106 and 108. Outbound trips head west on Market Street, south on Independence Boulevard past Independence Mall, west on Shipyard Boulevard and north on 17th Street directly to the hospital. Inbound routes also travel on 17th Street before turning east on Randall Parkway, north on Kerr Avenue and east on New Centre Drive, similar to existing Routes 108 and 105.



Market Street

This route connects Padgett Station to Forden Station along Market Street.

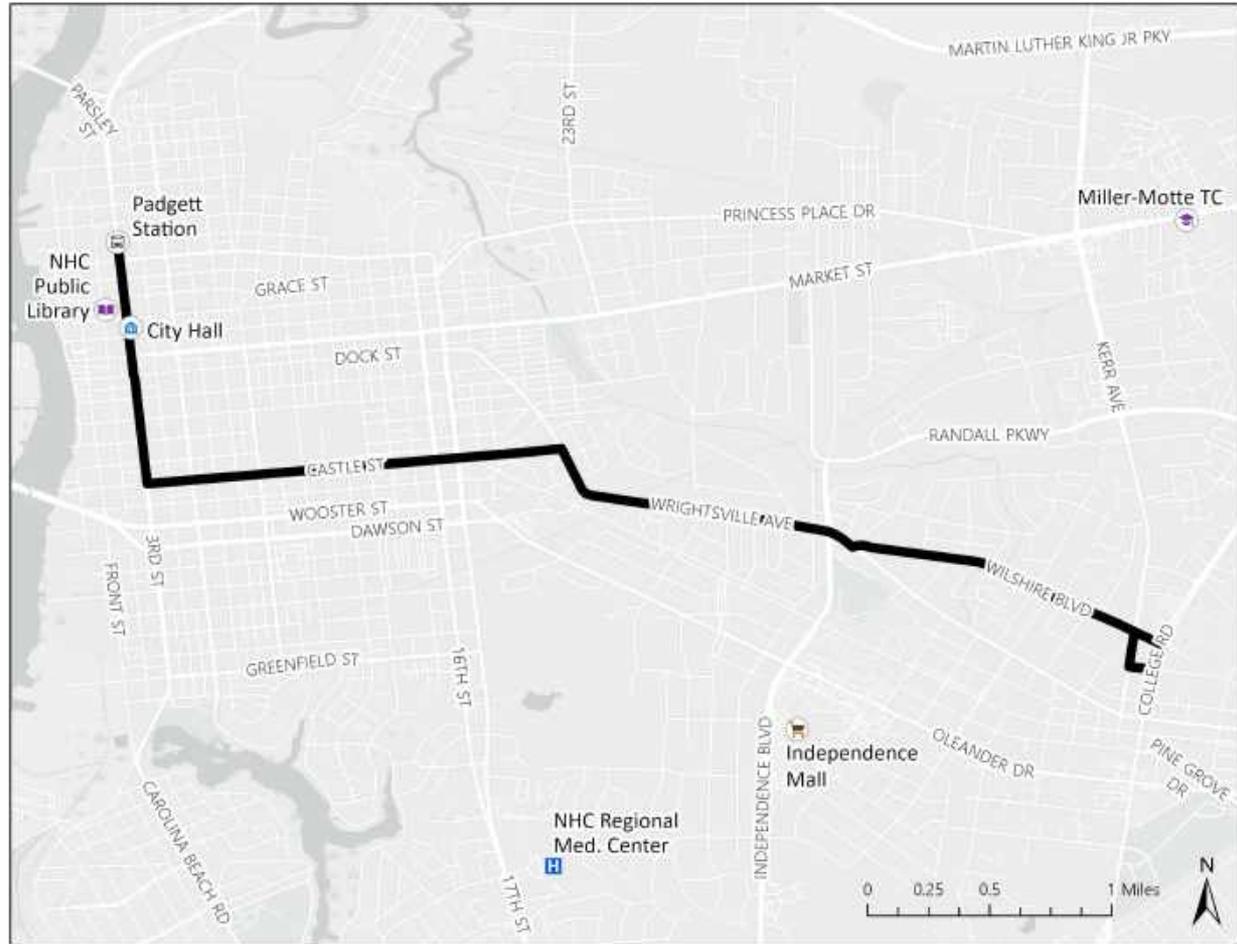
Market Street is currently served by Route 108, which is eastbound only between Covil Avenue and New Centre Drive. The new route does not deviate to Randall Parkway, instead providing two-way service along the entire stretch between Padgett and Forden. Like Route 108, it provides access to the Wal-Mart south of Forden Station on inbound trips.



Wilshire/Wrightsville

This route travels from Padgett Station to the intersection of College Road and Wilshire Boulevard. The inbound route travels south on 3rd Street, and east on Castle Street before proceeding southeast on Wrightsville Avenue. Just past Independence Boulevard, the route deviates north slightly to Wilshire Boulevard before turning around at College Road.

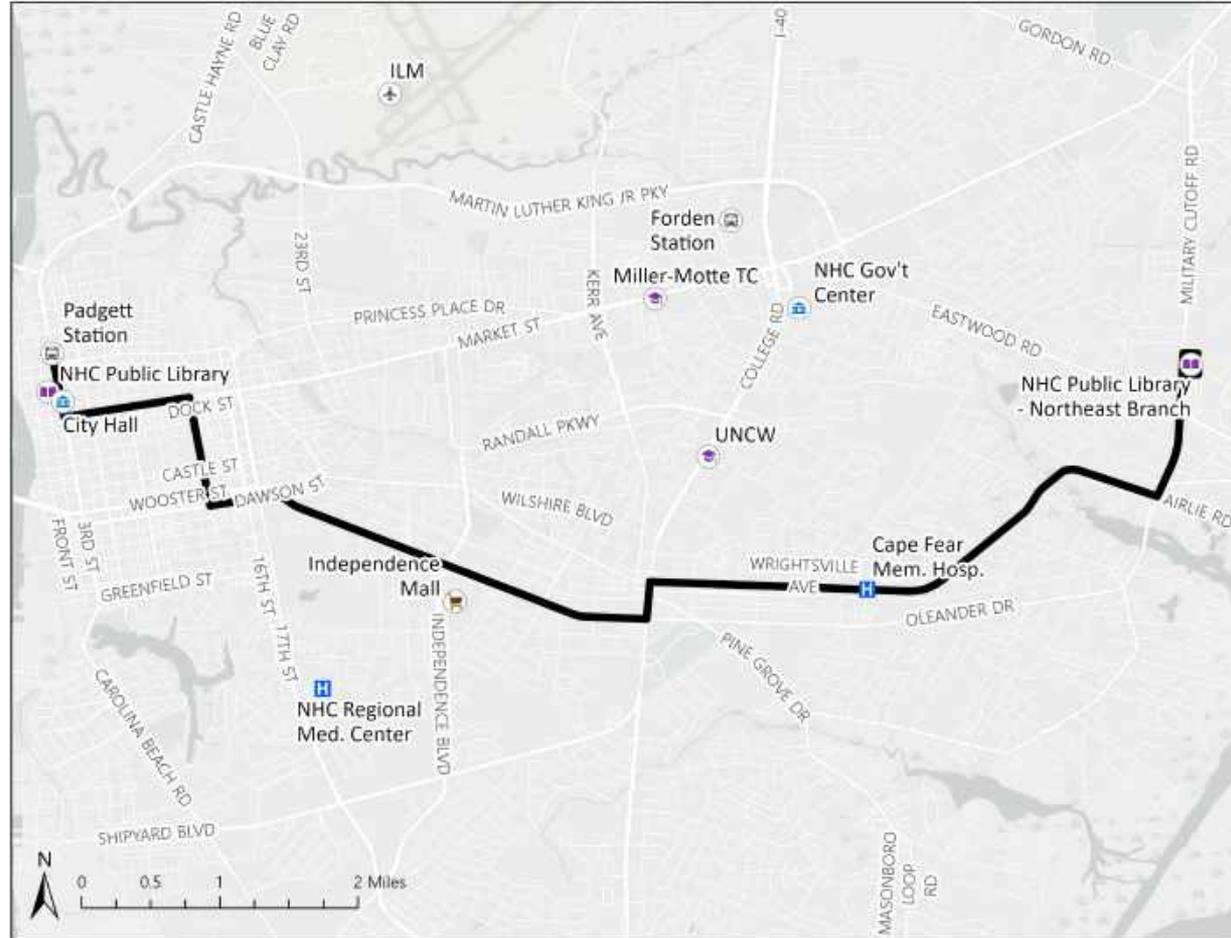
Castle Street and Wrightsville Avenue are currently served by westbound Route 202, and Wilshire Boulevard is served by eastbound Route 105. The future route provides two-way service on each corridor.



Oleander/Wrightsville

This route connects Padgett Station and the New Hanover County Public Library - Northeast Branch on Military Cutoff Road. The outbound route travels south on 3rd Street, east on Market Street and south on 13th Street. It then heads southeast on Oleander Drive, briefly north on College Road before heading east on Wrightsville Avenue. It stops at Cape Fear Memorial Hospital and travels north on Military Cutoff Road to the library.

It covers corridors currently served by Routes 202, 103 and 104, but replaces one-way service with two-way service.





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Appendix B: Additional Service Options

The options contained in Appendix B were considered by this study, however, inclusion of the following service options in the redesigned network rest with the Board of Directors' priorities.



Customers Connect to the Fixed Route Network via Alternative Service Profile

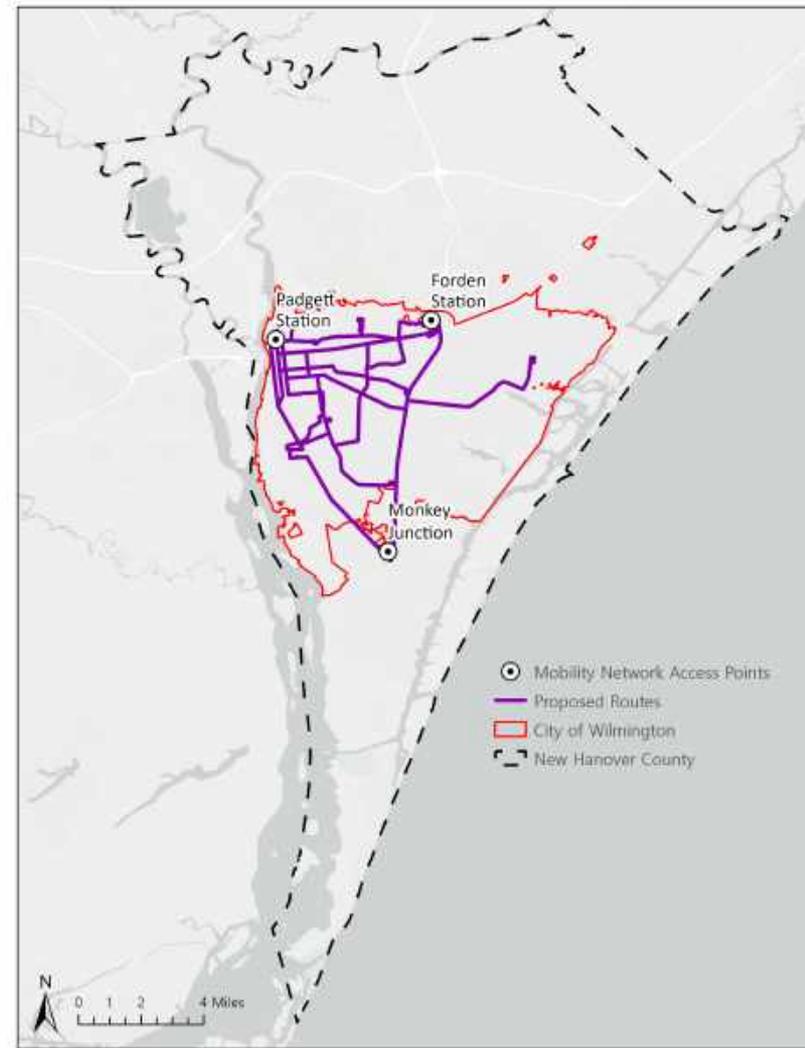
- On-demand service connections to/from Forden Station, Padgett Station, and Monkey Junction
- Board and Staff define the outcomes for successful implementation
- Maintain access to the fixed route network
- Enhance opportunities for choice: shared and connected
- Engage partnerships for service delivery
- Conduct a 12-month pilot program to determine long-term feasibility

	Recommendation
Total Cost	\$202,000
Total Customer Trips	49,000

Alternative Service Profile Connection Points

- **Forden Station**
- **Padgett Station**
- **Monkey Junction**

In an environment where customers are constantly seeking to improve their mobility options and are looking to travel with greater convenience, an alternative service profile provides current customers and potential customers – with origins or destinations further removed from a fixed route – the opportunity to connect to the Wave Transit network to reach their destination. This service provides opportunities for customers outside of the fixed route network to connect quickly and conveniently to the fixed route network at Forden Station, Padgett Station, or Monkey Junction. This service profile gives Wave Transit the opportunity to provide service coverage to a large portion of the County, while limiting its costs while running the most effective service possible. This report recommends Wave Transit partner with private or non-profit providers through a request for proposals (RFP) process to create the best value opportunity for the Authority.





Jason reduces travel time by more than 45%

- 100+ minute travel time
- 1 transfer
- Route 207 → Route 108
- 13 minute walk

CURRENT

- 55 minute estimated travel time
- 1 transfer
- Alternative Service → Padgett Station, up to 30 minute wait, Oleander/Wrightsville route eastbound to Queen Street.

FUTURE

Jason uses an alternative service to travel between the Cape Fear Community College Fire Safety Training Center and a residence on Queen Street.



Port City Seasonal Trolley

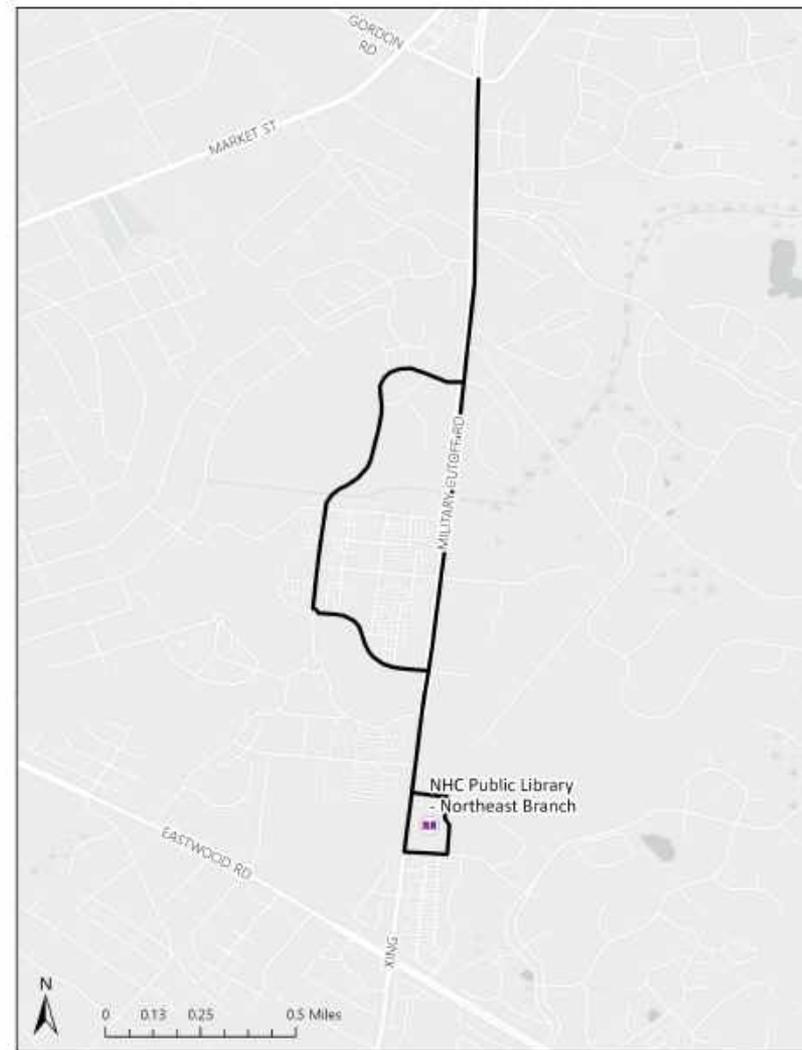
- **40-minute frequency along Front St, Castle St, S 5th St and Greenfield St.**
- **Wednesday – Saturday; June 1-November 30;**
10 hours per day
- **Seasonal service based on existing ridership patterns**

	Recommendation
Total Cost	\$42,500
Total Customer Trips	20,400



Oleander/Wrightsville Route Extension Along Military Cutoff Road

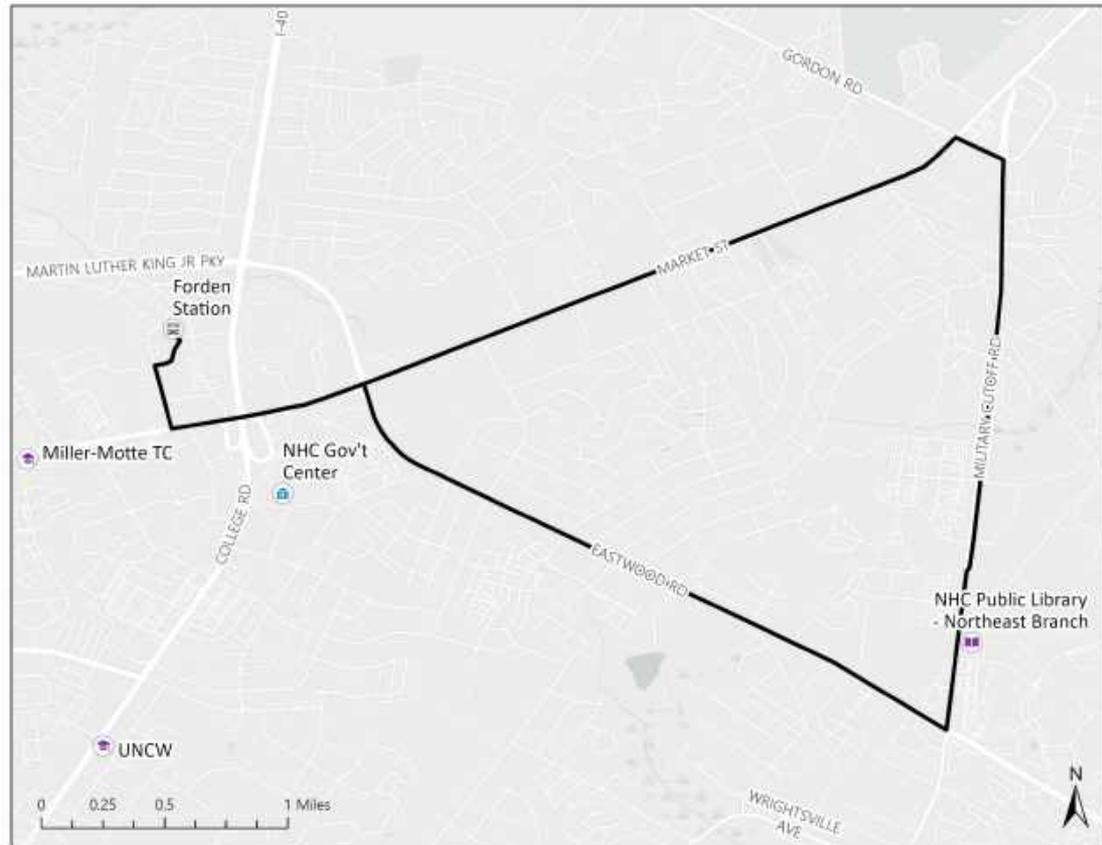
	Recommendation
Total Cost	\$42,000





Route Along Market Street, Military Cutoff Road and Eastwood Road

	Recommendation
Total Cost	\$102,000





Additional Service Option Estimated Costs

	Fixed Route Including Service Option Cost	Additional Service Option Cost	Total Cost Including Fixed Route & Paratransit
Total Fixed Route	\$6,164,609		\$7,622,609
1 Option			
Alternative Service Profile	\$6,366,609	\$202,000	\$7,824,609
Seasonal Trolley	\$6,208,135	\$43,526	\$7,666,135
Mayfaire Extension	\$6,206,661	\$42,052	\$7,664,661
Eastwood/Market	\$6,266,384	\$101,775	\$7,724,384
2 Options			
Alternative Service Profile & Seasonal Trolley	\$6,410,135	\$245,526	\$7,868,135
Alternative Service Profile & Mayfaire Extension	\$6,408,661	\$244,052	\$7,866,661
Alternative Service Profile & Eastwood/Market	\$6,468,384	\$303,775	\$7,926,384
Seasonal Trolley & Mayfaire Extension	\$6,250,187	\$85,578	\$7,708,187
Seasonal Trolley & Eastwood/Market	\$6,309,901	\$145,292	\$7,767,901
Seasonal Trolley & 17th St	\$6,347,256	\$182,647	\$7,805,256
Eastwood/Market & Mayfaire Extension	\$6,308,437	\$143,828	\$7,766,437
3 Options			
Alternative Service Profile, Trolley, Mayfaire Extension	\$6,452,187	\$287,578	\$7,910,187
Alternative Service Profile, Trolley, Eastwood/Market	\$6,511,901	\$347,292	\$7,969,901
Trolley, Mayfaire Extension, Eastwood/Market	\$6,351,962	\$187,353	\$7,809,962
4 Options			
Alternative Service Profile, Trolley, Eastwood/Market, Mayfaire Extension	\$6,553,962	\$389,353	\$8,011,962



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Appendix C: Investment Standards

Criteria	Target Value or Condition	Importance															
Population/ Employment Density Threshold Reached or Anticipated	<p>The following can be considered as a useful guideline:</p> <table border="1" data-bbox="707 274 1184 437"> <thead> <tr> <th>Local Bus</th> <th>Pop/Acre</th> <th>Jobs/Acre</th> </tr> </thead> <tbody> <tr> <td>60-minute frequency</td> <td>8-16</td> <td>4-8</td> </tr> <tr> <td>30-minute frequency</td> <td>16-31</td> <td>8-16</td> </tr> <tr> <td>15-minute frequency</td> <td>31-47</td> <td>16-24</td> </tr> <tr> <td>10-minute frequency</td> <td>47-92</td> <td>24-48</td> </tr> </tbody> </table>	Local Bus	Pop/Acre	Jobs/Acre	60-minute frequency	8-16	4-8	30-minute frequency	16-31	8-16	15-minute frequency	31-47	16-24	10-minute frequency	47-92	24-48	High
Local Bus	Pop/Acre	Jobs/Acre															
60-minute frequency	8-16	4-8															
30-minute frequency	16-31	8-16															
15-minute frequency	31-47	16-24															
10-minute frequency	47-92	24-48															
Higher concentrations of populations in following groups: households with no vehicle available, households below poverty, elderly, and people with disabilities	Areas with higher than average presence of these target populations, which typically have higher need and propensity to use transit.	High															
Origins and Destinations Along or Connected by Corridor	<p>Transit that operates in a straight line is typically more efficient and offers better travel times for customers.</p> <p>Condition A: Longer-distance, express-type service is appropriate if there is a concentration of origins in one part of the County and a concentration of destinations in another part of the County</p> <p>Condition B: Local service is appropriate if there are several pockets of origins and destinations within a more confined area (about 3-15 miles)</p>	Medium															

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Investment Standards (continued)

Criteria	Target	Importance
Mix of Uses	Having a variety of origins and destinations (residential, work, school, health, grocery, dining, retail, etc.) is associated with higher transit usage and efficiency, as there is a greater chance that transit will be useful to more people and usage will be more spread throughout the day.	Medium
Transit-Supportive Land Use Plans	<p>If transit is planned in places expected to become more transit-supportive over time, this presents the most opportunity for transit to become more efficient and productive. Transit-supportive development and policies include things like:</p> <ul style="list-style-type: none"> • Smaller lot sizes • Mixed use • Multi-family housing • Reduced parking minimums, paid parking • Pedestrian and bicycle infrastructure 	Medium
Congestion Level	Areas with higher levels of congestion (if aligned with criteria listed above) are indicative of potential transit markets. Transit would not be expected to reduce congestion, but could be expected to add capacity to these corridors.	Medium
Presence of Sidewalks	<p>Continuous sidewalks between potential bus stops and most origins/destinations within ¼ - ½ mile of the stop</p> <p>*More important on highly-trafficked and/or high-speed streets</p>	Medium
Presence of Bicycle Lanes	<p>Continuous bike lanes between potential bus stops and most origins/destination within ½ - 2 miles of the stop</p> <p>*More important on highly-trafficked and/or high-speed streets</p>	Low



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Appendix D: Recommended Implementation Plan



