



# State of the System Analysis

WAVE SHORT RANGE TRANSIT PLAN  
OCTOBER 2023





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# 1 Introduction

## About Reimagine Wave Transit

Reimagine Wave Transit is the short-range transit plan for Wave. The agency is conducting a comprehensive assessment of its existing transit service and establishing a vision of what its services should look like in the coming years. The purpose of Reimagine Wave Transit is to evolve Wave Transit to make its service more efficient, effective, and convenient. The study includes four phases:

1. A **Market Analysis**, which provides an assessment of the existing and potential market for transit in the Wilmington region.
2. This document, the **State of the System Analysis**, which offers a comprehensive review of the existing Wave network, an assessment of each route, and offers recommendations for restructuring Wave's services to better serve the region.
3. **Service Alternatives**, which presents different fiscally constrained approaches for evolving the Wave network to better serve the residents and visitors of the Wilmington region. The service alternatives provide three paths forward for Wave based on different funding levels: existing funding, reduced funding, and expanded funding.
4. The **Final Plan**, which summarizes and compiles the three earlier phases. Implementation of the SRTP's recommendations is expected to begin in FY 2024.

During each phase of the SRTP, Wave staff and the project team will engage with Wave bus operators, residents, existing customers, and stakeholders to ensure that the Final Plan reflects the community's vision for transit in the Wilmington area.

## State of the System Analysis Overview

In short, the State of the System Analysis is an assessment of the service being provided by Wave Transit and how well the existing system meets both customer needs and the underlying demand for transit service. This document provides an overview of all existing Wave services, an analysis of overall network performance, analyses of ridership across the network, and potential opportunities to improve service. Findings from this analysis will inform service alternatives designed to result in positive impacts on service efficiency and reliability.

This document is accompanied by route profiles, which are analyses of the existing routes and microtransit zones. Route profiles describe the existing productivity, ridership, and performance of each fixed-route and microtransit zone; they also provide route-level recommendations for each service provided. This document summarizes many of the network implications of the recommendations included in the route profiles.

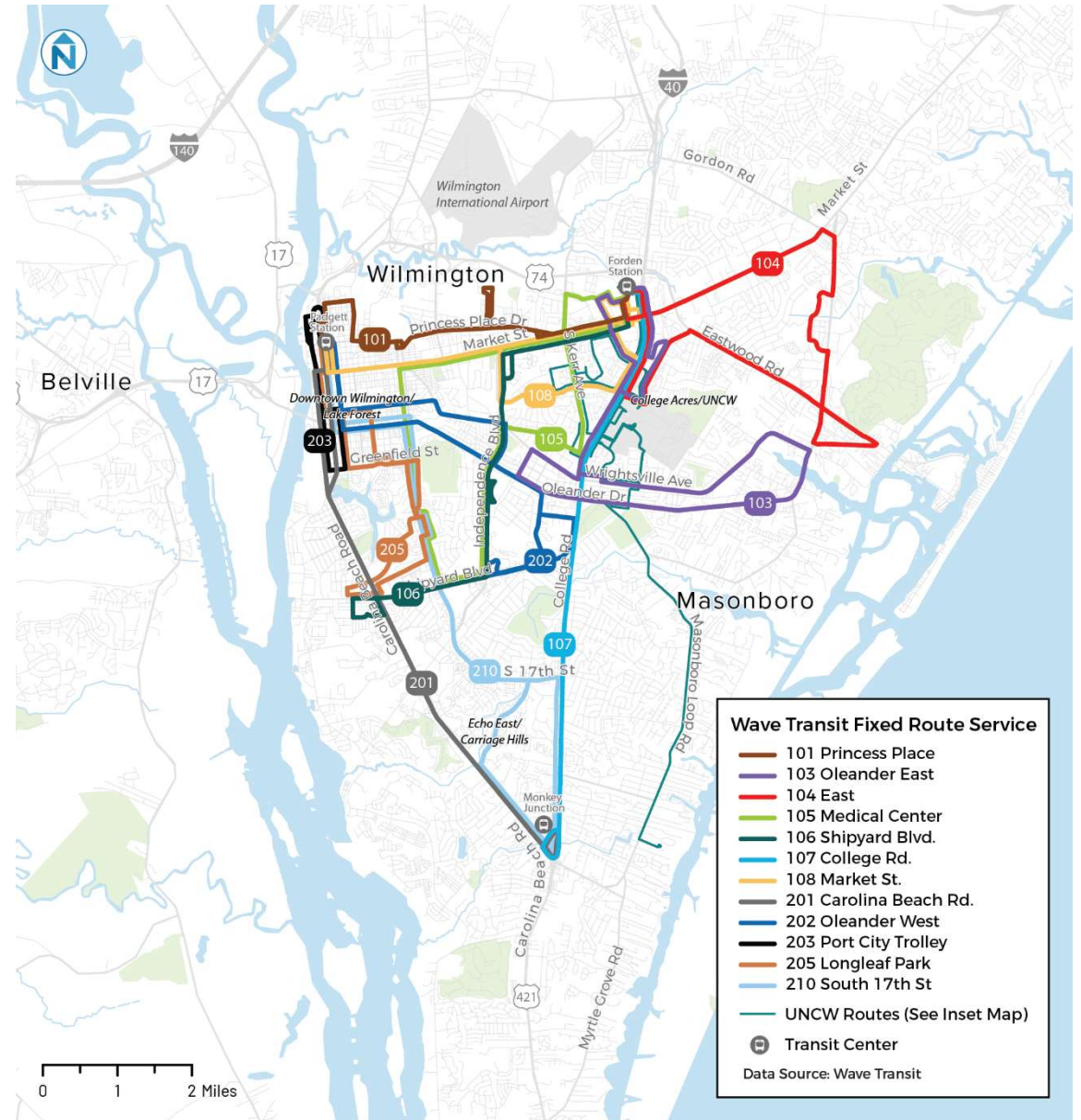
## Overview of Wave's Existing Services

Wave Transit operates a fixed route transit network that consists of twelve routes that operate on weekdays, Saturdays, and Sundays. In addition to the fixed route network, the authority operates Seahawk Shuttle (University of North Carolina-Wilmington, or UNCW) campus routes, RideMICRO (microtransit), and Dial-a-Ride Transportation (ADA paratransit services, or DART).

## Fixed Route Bus

Wave currently operates twelve bus routes in its urban and suburban areas of Wilmington. These routes follow fixed alignments, and service in the urban area is provided seven days a week. Routes in the 100's operate out of Forden Station, and routes in the 200's operate out of Padgett Station. Wave's twelve fixed routes are:

- Route 101 Princess Place
- Route 103 Oleander East
- Route 104 East
- Route 105 Medical Center
- Route 106 Shipyard Blvd
- Route 107 College Rd
- Route 108 Market St
- Route 201 Carolina Beach Rd
- Route 202 Oleander West
- Route 203 Port City Trolley
- Route 205 Longleaf Park
- Route 210 South 17th St



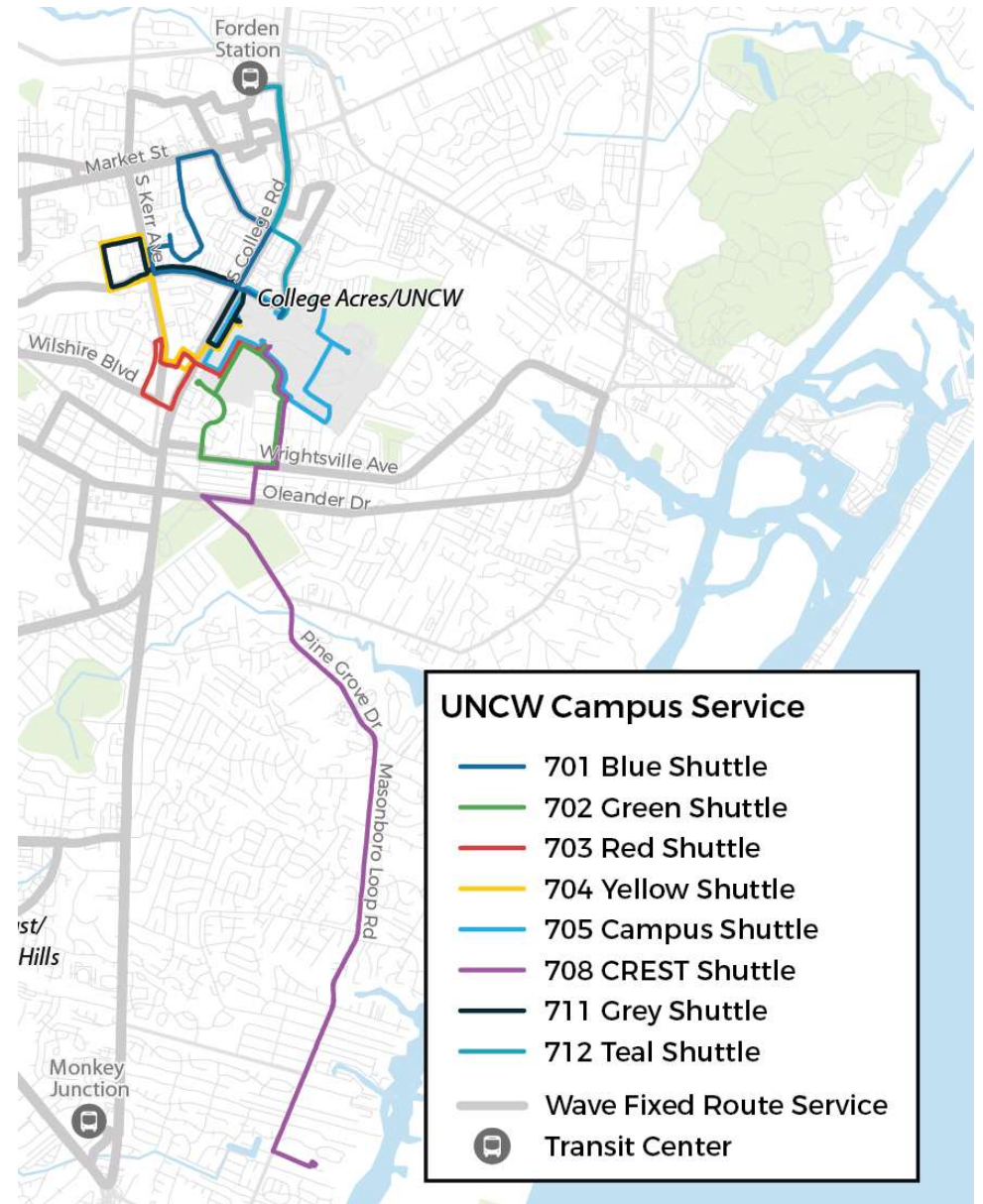


## Seahawk Shuttles

As of October 2023, Wave operates eight UNCW shuttle services, oriented to serving the on and off-campus travel needs of UNCW students, faculty, staff, and visitors. These shuttles operate on weekdays and do not operate on Saturdays and Sundays. Shuttles only operate when school is in session. During the summer, the CREST shuttle is available to students by appointment only.

All UNCW shuttles are open to the public. Riders with UNCW One Cards—including university students, faculty, and staff—can ride all UNCW shuttles and Wave routes for free. Wave’s eight Seahawk Shuttles are:

- Route 701 Blue
- Route 702 Green
- Route 703 Red
- Route 704 Yellow
- Route 705 Campus Shuttle Loop
- CREST Shuttle
- Route 711 Grey
- Route 712 Teal

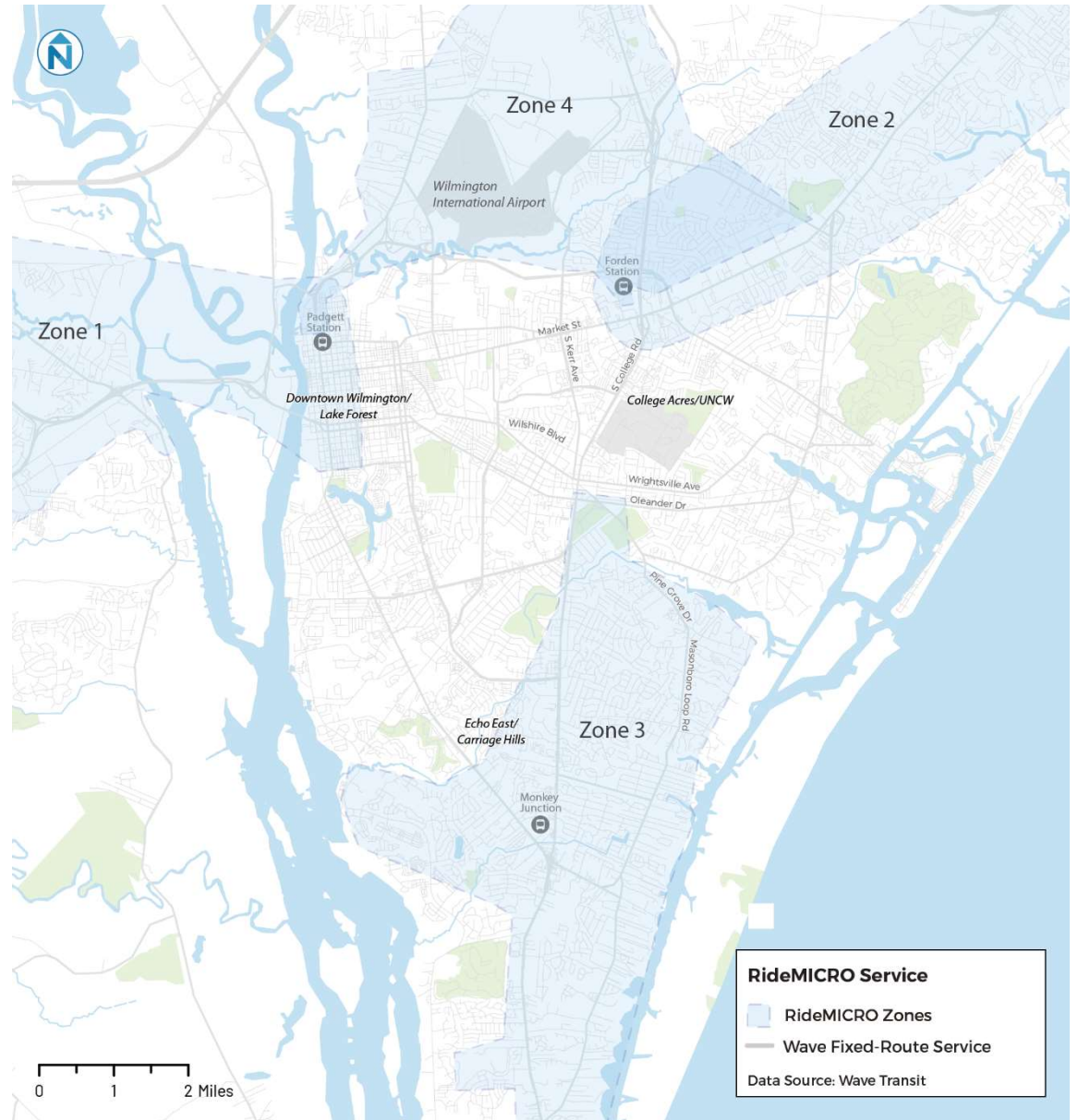


## RideMICRO

RideMICRO is an on-demand point-to-point microtransit service available to anyone requesting a ride within four designated RideMICRO zones. Zones 1 and 2 are designated as regional zones serving Northern Brunswick County and Pender County. Zones 3 and 4 are designated as local zones, serving Southern New Hanover County/Pleasure Island and Northern New Hanover County. There are over 3,000 virtual stops, where riders can designate their pickup and drop off location. Virtual stops are safe and accessible meeting points where riders can be picked up or dropped off by RideMICRO vans.

Microtransit service began as a pilot funded by NCDOT (North Carolina Department of Transportation) between October 2021 through December 2021 with a phased approach. Services in Zones 1 and 2 were implemented in October 2021, followed by the implementation of Zones 3 and 4 in December 2022. Following the pilot, RideMICRO service formally launched in January 2022 to provide flexible transportation service across Brunswick, Pender, and New Hanover counties.

Riders can book an on-demand ride via the RideMICRO app, by using an online form via the Wave Transit website, or by calling the toll-free number (available on weekdays only) and speaking with a RideMICRO dispatcher. If a ride is booked by phone or online form, a call center representative will confirm the reservation between the hours of 7AM to 10AM & 12PM to 7:30PM. Reservations must be made no less than one hour prior to a trip and can be made up to one week in advance of a trip.





## Dial-A-Ride Transportation

Dial-A-Ride Transportation (DART) is an accessible transportation service available to riders with disabilities who are unable to use the fixed-route bus service. DART is available throughout the Wave Transit service area within 3/4 -mile of all Wave bus routes and operates during the same service hours as Wave routes.

## Other connecting services

### *Commuter services*

In addition to the transit provided by Wave, there are regional and intercity carpool services available to commuters residing in surrounding counties looking to commute to/from Wilmington during the weekday. “Share the Ride NC” is a platform provided by NCDOT (North Carolina Department of Transportation) that allows commuters to find carpool partners and assist with organizing vanpools with large employers. Go Coast, the region’s MPO, also coordinates carpool and vanpool services.

### *Regional connections*

Regional and intercity transportation in Wilmington is provided by Amtrak Thruway bus service and Greyhound bus service. Amtrak Thruway bus connects to rail service in Wilson, NC via Jacksonville, Kinston, and Goldsboro. Both services are available at Wave’s Forden Station.



## 2 Existing Service Analysis

The following sections describe important components of Wave Transit's services which all contribute to the attractiveness of service. **Characteristics like service frequencies, service span, and network design determine how competitive transit is compared to other transportation options.** This section also describes findings from an analysis of key metrics like ridership, productivity, and on-time performance; studying these measures can help Wave identify opportunities to refine service to be more cost-effective and reliable.

### Service Frequency & Wait Times

Service frequency and wait times—which are measures of how often a bus comes to a given stop or how long a rider must wait for their next trip—is one of the most important factors in making transit convenient and competitive. More frequent transit service gives riders more flexibility to travel in a way that fits their jobs and other activities. Very frequent service, coming every 15 minutes or less, makes buses competitive with personal vehicles due to improved reliability and convenience. Service every 30 minutes is generally considered to be the least frequent service acceptable for customers making most trips. Routes operating every 60 minutes are often too inconvenient for most potential customers, and primarily attract people who rely on transit for mobility. Most Wave fixed-route services operate every 30 or 60 minutes.

#### *The Relationship between Frequency and Ridership*

**The increased convenience of more frequent services is the primary reason why more frequent service draws increased**

**ridership.** Frequent service means that customers are less restricted in their travel. Of course, frequent service is only appropriate in markets where there is the underlying demand for transit to support it. Less frequent service and fixed-route service alternatives are appropriate in lower demand areas. Frequency has three primary benefits:

1. **Reduces waiting times:** The frequency of a route represents the longest amount of time a customer would have to wait.
2. **Makes transfers to other routes easy:** Routes that intersect frequently create easy connections and expand the reach of the overall network.
3. **Improves service reliability:** In the event of a service disruption or breakdown, another bus will arrive sooner.

The following section describes the service frequencies and wait times currently offered by Wave's fixed-route, UNCW, and microtransit services, and provides recommendations for better adjusting service frequencies to meet the underlying demand for transit identified in the Market Analysis.

### Fixed Route Frequencies

Wave's fixed routes operate every 30, 40, or 60 minutes. The following maps illustrate how service frequency changes throughout the week.

#### *Weekday Fixed-Route Service*

Wave Transit refers to the service window of 6 AM to 6 PM on weekdays as the "peak". During the peak, Wave operates 30-minute service on 4 of its 12 fixed-routes.



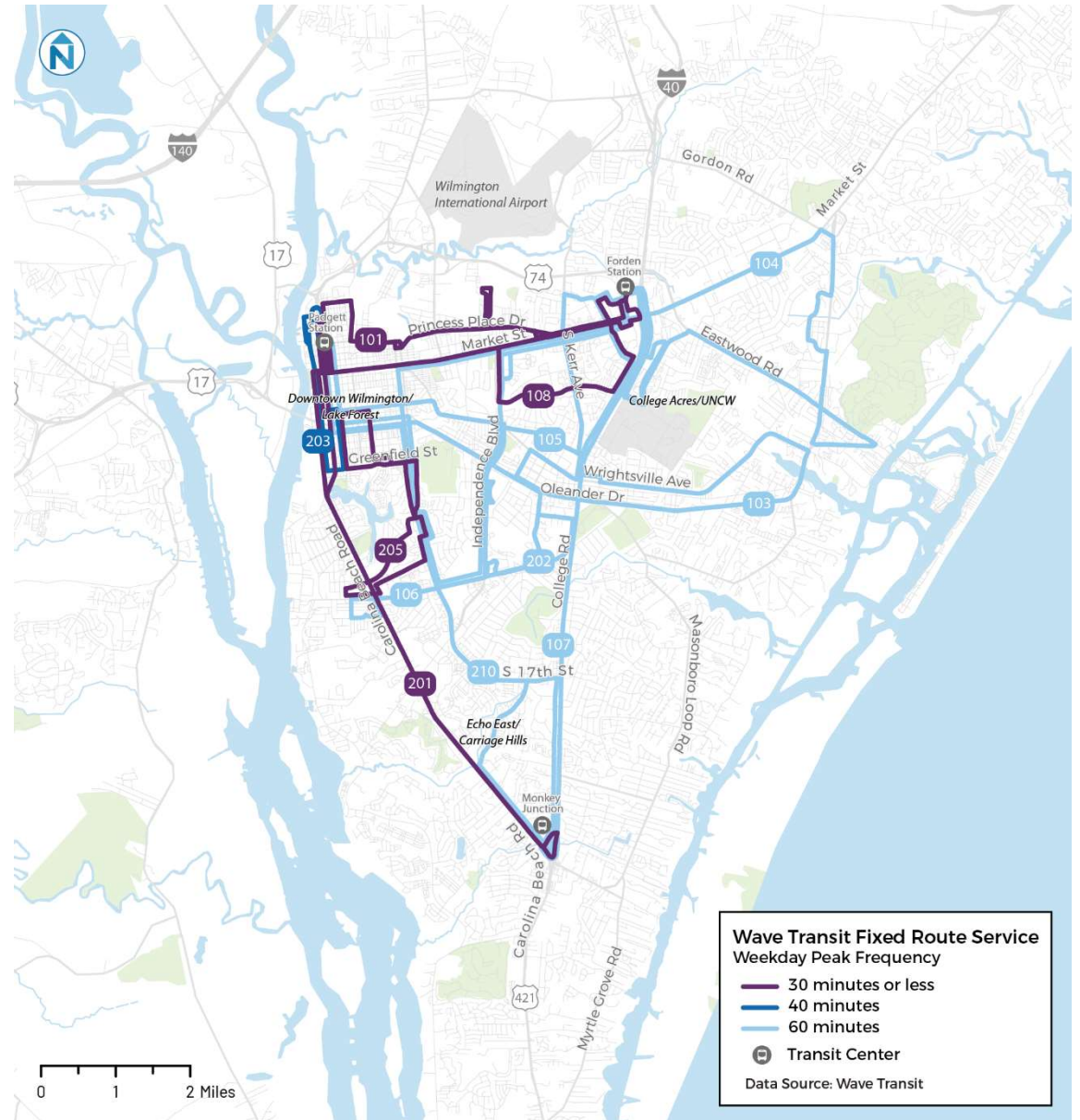
The 4 routes that provide 30-minute service during weekday peaks are:

- Route 101 Princess Place
- Route 108 Market St
- Route 201 Carolina Beach Rd
- Route 205 Longleaf Park

The Port City Trolley (Route 203) operates every 40 minutes. The remaining eight routes operate every 60 minutes all day. After 6 PM, all fixed routes except for the Port City Trolley operate every 60 minutes. The Trolley continues to operate every 40 minutes.

Figure 1 | Fixed-Route Peak (Weekdays 6 AM – 6PM) and Off-Peak (All Other Times) Service Frequencies (in minutes)

Route Name	Peak	Off-Peak
101 Princess Place	30	60
103 Oleander East	60	60
104 East	60	60
105 Medical Center	60	60
106 Shipyard Blvd	60	60
107 College Road	60	60
108 Market Street	30	60
201 Carolina Beach Road	30	60
202 Oleander West	60	60
203 Port City Trolley	40	40
205 Long Leaf Park	60	60
210 South 17th St	30	60



Although none of Wave’s routes operate frequently, the more frequent routes are generally well-matched to the underlying market; more frequent services operate where there is the demand to support them. As described in the Market Analysis, areas with high demand that could justify even higher frequencies include Market Street west of College Road and neighborhoods between Downtown Wilmington and the Medical District.

*Weekend Fixed-Route Service*

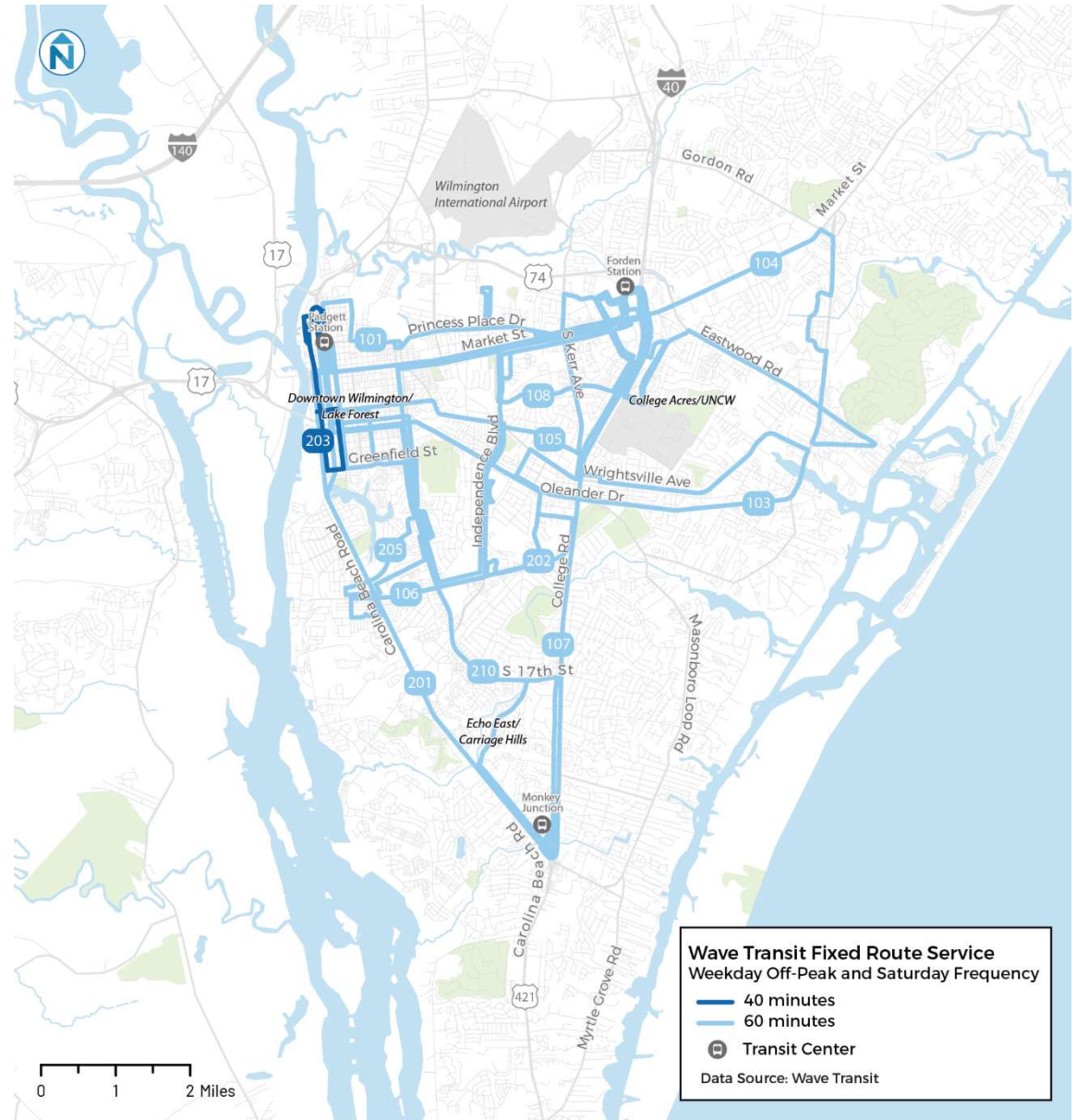
On Saturdays, all fixed routes except the Trolley operate every 60 minutes. The trolley operates every 40 minutes. As discussed later in this document, the demand for service on Saturdays remains strong on Wave’s highest ridership routes, including Routes 101, 108, 201, and 210. There may exist enough demand along these routes to operate them more frequently on Saturdays during midday periods.

On Sundays, all Wave routes operate every 60 minutes. Route 203 does not operate on Sundays.

**Seahawk Shuttles Frequencies**

When UNCW routes are in operation, they operate relatively frequently. Route 704 Yellow operates every 10 minutes. Two routes operate every 15 minutes:

- Route 702 Green
- Route 712 Teal





Three Seahawk Shuttle routes operate every 20 minutes:

- Route 701 Blue
- Route 703 Red
- Route 711 Grey

One route, Route 705 Loop (the on-campus circulator), operates every 30 minutes. The CREST Shuttle operates every 60 minutes.

The frequent nature of most UNCW services means that Wave provides very convenient service to UNCW campus users. Wave and UNCW can continue to coordinate to fine-tune the Seahawk Shuttle service; there may exist opportunities to make service more productive and easier to understand through interlining and/or consolidating similar services.

### RideMICRO Wait Times

Currently there are no wait time standards for RideMICRO. In Spring 2023, the average wait time for booked trips was approximately 15 minutes. Riders have some difficulty booking trips during some periods, however; RideMICRO riders report that during peak periods in Zone 4, trip requests can be denied due to demand exceeding the capacity of the single vehicle dedicated to the zone. To improve RideMICRO service and reliability, Wave can consider adding an additional vehicle to its higher-ridership zones and shrinking the zone boundaries to only the most common pickup and dropoff points.



## Service Span

Service span—the hours during which a bus route operates—is a second factor that strongly influences the convenience of a transit system. **Service that runs for longer hours during the day is more convenient, allowing people to access jobs and locations that might open earlier or later.** Span and frequency, when considered together, provide a clear depiction of when customers have access to transit and when that transit is operating most frequently.

### Fixed Route Service Spans

Wave’s fixed-route services are characterized by very consistent service spans that make it easy to understand when services are operating. When routes start and end at the same time, they are all available for riders to transfer to and from. In general, Wave’s weekday service spans are generally well-matched to the most common travel times, however there may exist some opportunities to begin individual routes earlier in the day or end service later in the day to better meet individual markets. This section describes how service spans differ by routes and by day of the week.

#### *Weekday Fixed-Route Service Spans*

On weekdays, almost all Wave routes operate between 6AM and 8PM. Between March and November, Route 203 Port City Trolley operates between 7AM and 7PM on Mondays through Thursdays, and between 7AM and 8PM on Fridays. During the winter (December through February), the Trolley operates between 8AM and 5PM on Mondays through Saturdays.

Wave’s weekday service spans are generally well-matched to the most common travel times, however extending service until 9 PM on the region’s bigger commercial corridors could better serve evening demand for transit, especially for workers in service jobs.

Figure 2 | Weekday Fixed-Route Service Spans and Frequencies





### Saturday Fixed-Route Service Spans

On Saturdays, most routes operate between 8AM and 6PM. Route 203 operates between 7AM and 8PM during the peak season (March through November). Due to strong Saturday demand on Route 101, Route 108, Route 201, and 205, there may be an opportunity to operate service later in the evening on these routes, especially during the peak season of March through November.

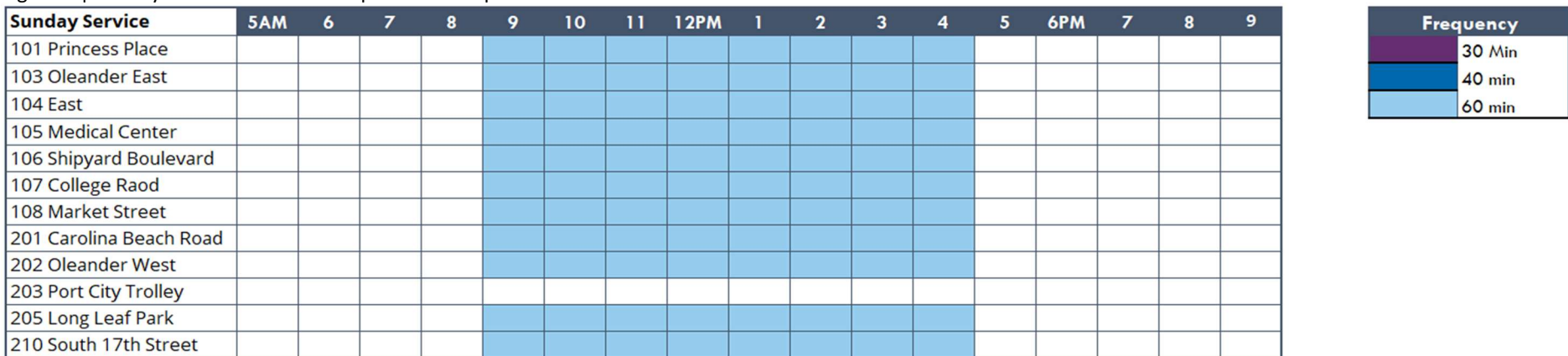
Figure 3 | Saturday Fixed-Route Service Spans and Frequencies



### Sunday Fixed-Route Service Spans

On Sundays, most Wave routes operate between 9AM and 5PM. Route 203 is the only route in the system that does not operate on Sundays.

Figure 4 | Sunday Fixed-Route Service Spans and Frequencies



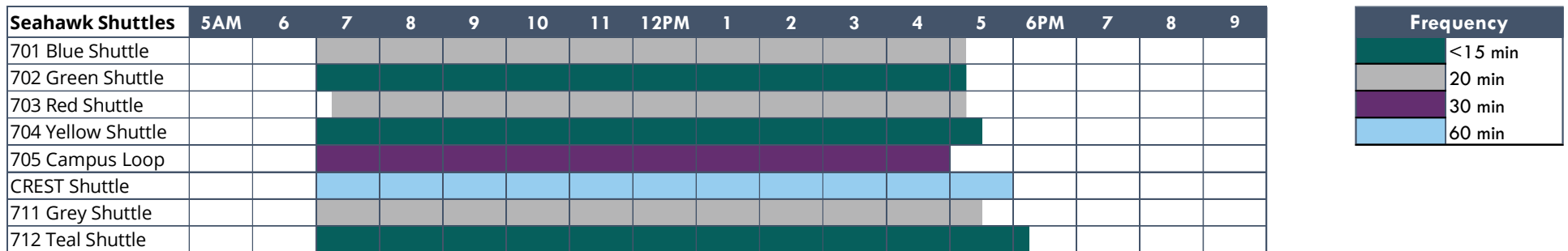
## Seahawk Shuttles Service Spans

During the school year, UNCW campus shuttles operate on weekdays only. All routes begin operating between 7:00 AM and 7:20 AM. The end times for UNCW routes vary:

- Five routes end service between 5:30 PM and 5:50 PM: Route 701 Blue, Route 702 Green, Route 703 Red, Route 704 Yellow, and Route 711 Grey
- Route 712 Teal operates until 6:30 PM
- The CREST Shuttle operates until 7 PM

The Seahawk Shuttle service spans are designed with campus users' needs in mind; as a result, the service span provided on the UNCW shuttles is appropriate. From 5 PM to 10 PM, UNCW provides late night on-demand service within a one-mile radius of campus. UNCW campus shuttles do not operate during summer sessions, and when classes are not in session, Between May 10 to August 5, CREST Shuttle operates by appointment Monday through Thursday between 8AM and 4PM, and on Fridays between 8AM and 11:30AM.

Figure 5 | Seahawk Shuttle Service Spans and Frequencies



## RideMICRO

RideMICRO service spans vary widely. All four zones operate on weekdays, and Zone 3 and Zone 4 also provide service on Saturdays and Sundays.



Figure 6 | RideMICRO Service Spans

RideMICRO	Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9
Zones 1 & 2	Weekday																	
	Weekday																	
Zones 3 & 4	Saturday																	
	Sunday																	

The inconsistent and in some cases part-time service spans of RideMICRO service limit the usefulness of RideMICRO service and can make the service confusing to understand. There may exist opportunities to consolidate low-productivity RideMICRO zones to improve the service span of the most important zones.

*Weekday RideMICRO Service Spans*

RideMICRO Zone 1 and Zone 2 operate two separate service spans on weekdays. In these zones, service operates in the morning from 6:30 AM to 10 AM. No service is provided from 10 AM to 12 PM. Service begins again at 12 PM and is available until 7 PM

Zone 3 and Zone 4 operate on weekdays from 6AM to 8PM.

*Weekend RideMICRO Service Spans*

Zone 3 and Zone 4 operate on Saturdays from 8AM to 6PM and on Sundays from 9AM to 5PM.



## Network Design

The most successful transit networks provide fast, direct, and well-coordinated service between places with a relatively high density of people and jobs. In the Wilmington area, Wave’s network appropriately reflects the hub-and-spoke nature of the road network, with most routes operating to and from Padgett Station (in Downtown Wilmington), Forden Station, and to a lesser extent Monkey Junction. As described in the Reimagine Wave Transit Market Analysis, Wave provides excellent coverage to the vast majority of transit supportive areas within its service area. Its network of fixed-route bus routes, UNCW oriented “Seahawk Shuttle” services, microtransit, and paratransit provide a sizeable network that reaches most areas with at least some demand for transit. This section describes the strengths and weaknesses of Wave’s existing approach to providing transit service.

Wave’s existing coverage-focused approach to providing service is accomplished by both the distribution of its routes and the specific design of some route alignments. In terms of route distribution, some Wave routes and microtransit zones provide very similar services to one another, especially in the most-walkable areas of the region such as Downtown and its adjacent residential neighborhoods. As a result, some Wave services compete with each other for riders, which can degrade ridership. And the design of many routes allows each individual route to cover a lot of ground by operating large one-way loops, indirect alignments, and some mid-route deviations that take the bus away from its primary corridor. These circuitous route alignments increase trip times and can make Wave service less convenient.

Wave’s fixed-route services operate according to a generally well-coordinated and easy-to-understand schedule. Every route (except the Port City Trolley) departs from its origin at either the top or the

bottom of the hour. This “pulse” of service once or twice an hour limits the wait time for passengers transferring between routes.

## Strengths and Weaknesses of Wave’s Existing Network

### Strengths

**Well-Coordinated Transfers** - Wave routes operate a “pulse” at Padgett Station, Forden Station, and Monkey Junction, meaning that buses there arrive and depart at the same time. This pulse improves the rider experience by allowing all routes to meet at a central point within the network. This pulse reduces transfer and wait times for riders and allows for Wave’s network to be intuitive and easy to navigate.

**Consistent and Clockface Headways** - Both routes and shuttles operate consistent and easy-to-remember headways throughout the day. Most Wave routes operate every 30 or 60 minutes and UNCW shuttles operate every 15 or 20 minutes. Consistent headways during service make it easier for riders to remember when a bus comes during service hours; they reduce the need to consult a schedule to find a route’s next departure time.

Figure 7 | Clockface headways (like on Route 101, which departs Forden Station and Padgett Station at the top and bottom of every hour) on all Wave routes make service simple to understand.

<b>101 Schedule</b>		<b>MONDAY-FRIDAY: Peak service (every 30 minutes) 6:00am – 6:00pm; Off Peak service (hourly) 6:00pm – 8:00pm</b>					
		<b>SATURDAY: Off Peak service (hourly) 8:00am – 6:00pm</b>			<b>SUNDAY: Off Peak service (hourly) 9:00am – 5:00pm</b>		
<small>*Monday-Friday, first trips depart both Forden Station and Padgett Station at 6:00am. Saturday and Sunday, first trip departs Forden Station. Time points indicate the minutes after each hour that a bus will depart from that location during operating hours. All bus routes return to their starting point (bus stop #1) after leaving bus stop #10.</small>							
BUS STOP	PEAK TIMES	OFF PEAK	BUS STOP	PEAK TIMES	OFF PEAK		
1 Forden Station*	:00 :30	:00	6 Padgett Station*	:30 :00	:30		
2 Market St / Kerr Ave	:06 :36	:06	7 McRae St / Fanning St	:36 :06	:36		
3 Emory St at Creekwood Comm. Ctr	:11 :41	:11	8 Princess Place Dr at Mary C Mosley	:45 :15	:45		
4 Nixon St at DC Virgo Middle School	:24 :54	:24	9 Market St / Kerr Ave (Food Lion)	:50 :20	:50		
5 4th St at MedNorth Health Center	:26 :56	:26	10 Market St at Walton Rd	:52 :22	:52		



**Direct Service to Some Major Destinations** – Wave routes and UNCW shuttles play a critical role in connecting residents and visitors—many of whom do not have access to a personal vehicle—to jobs, appointments, and other important destinations. Wave provides front-door service to a variety of key destinations that would otherwise be a dangerous walk for many riders, including the New Hanover Regional Medical Center, UNCW’s main campus, and Mayfaire Town Center. These destinations draw enough riders consistently that Wave does riders a service and makes their routes more convenient by providing close to front door access to these sites.

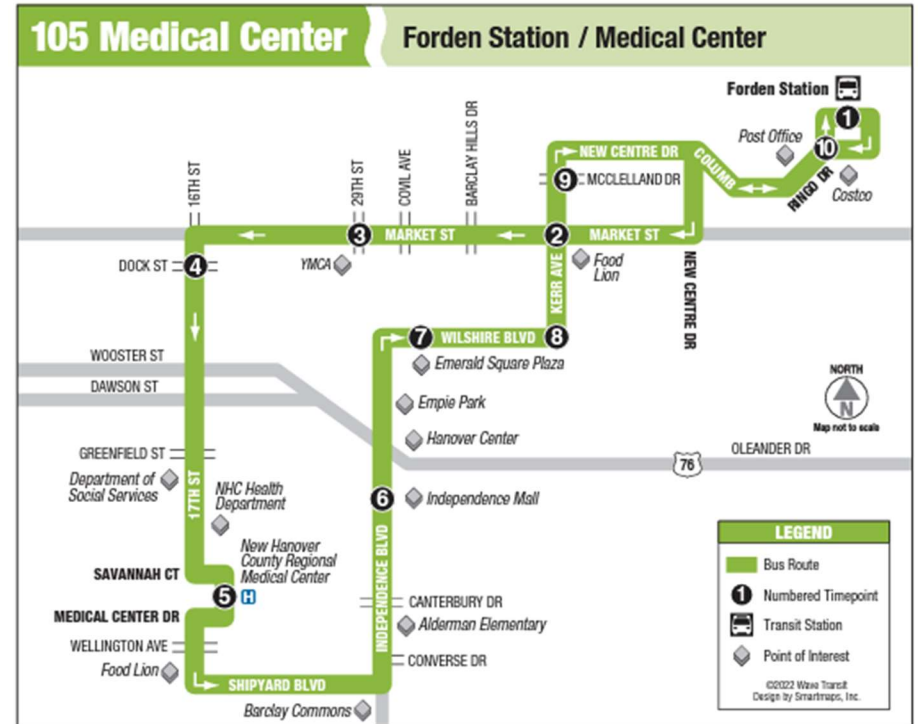
*Weaknesses*

**Route Indirectness** – Several Wave routes and UNCW shuttles operate as circulators and provide service in only one direction. For example, Route 105 Medical Center operates a long one-way loop between Forden Station and the Medical Center. In some cases, the one-way portions of loop routes like Route 105 are more than a mile apart from each other, meaning this route design typically increases travel times for all riders, especially those wanting to travel in the opposite direction of the loop. While one-way service may increase the number of destinations a single route can serve, streamlining individual routes to make service easier to understand and more convenient (e.g., making them bidirectional, shortening loops, and reducing deviations) would improve rider experience and create more efficient service. In general, routes should serve a defined market and only one or two travel corridors.

There are major opportunities to streamline all fixed routes except for Route 107, which is an example of a direct and bi-directional route. Some services, like Routes 201 and 205, are generally linear and direct, but they still unnecessarily operate on two different parallel corridors in Downtown Wilmington. For Route 201 operates on South

Front Street on outbound trips, and on 3<sup>rd</sup> Street on inbound trips, despite both streets being bidirectional.

Figure 8 | Indirect and looping routes like Route 105 maximize the number of destinations that a single route can serve but significantly increases travel times and can make service difficult to understand.



**Major Destinations are Inconsistently Served** – The dangerous pedestrian environment near many major destinations – especially big-box retailers near the intersection of College Road and Market Street—means that Wave routes must necessarily turn from their primary travel corridor to provide front door access to popular destinations. However, in cases where routes travel near a major destination, routes provide inconsistent front door service or service in

only one direction to major destinations, which can make service difficult to understand and which may force riders to make dangerous trips to their destination regardless. For example, in the eastbound direction Route 108 Market Street deviates from its primary corridor to serve a dedicated Walmart bus stop that places riders much closer to the Walmart than they would be if the bus remained on Market Street. In the westbound direction, however, Route 108 does not deviate from Market Street and any riders traveling to Walmart must walk a longer and more dangerous distance to the big-box retailer from westbound Route 108's stop at New Centre Drive at Red Roof Inn.

Figure 9 | Many Wave routes, like Route 108 east of Covil Avenue, provide inconsistent service to major destinations that makes service difficult to understand.



To make service easier to understand, Wave could serve major destinations more consistently with all nearby routes or leave front-door access to major destinations to dedicated circulators or microtransit services. Opportunities to streamline and simplify service are abundant in the retail area near Market Street and College Road, in the Dry Pond neighborhood, and at New Hanover Regional Medical Center (where southbound Route 210 and southbound Route 205 come very close but do not directly serve the hospital, while all other trips do).

**Service Duplication** – For travel between some major destinations, Wave provides multiple lower-frequency route options that depart at the same time instead of one higher frequency route that would better serve high-demand markets. These areas include:

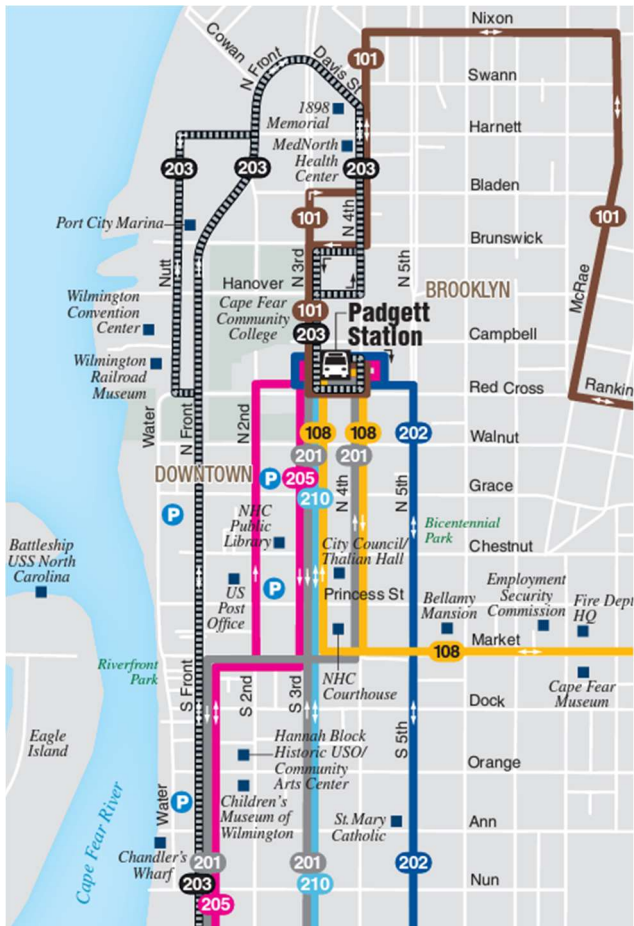
- South of Padgett Station, where Route 201 Carolina Beach Road, Route 202 Oleander West, Route 203 Port City Trolley, Route 205 Long Leaf Park, and Route 210 Market Street provide very similar north-south service but on parallel corridors.
- Downtown Wilmington, where RideMICRO Zone 1 also provides on-demand service in an area very well served by buses.
- Along Route 101 Princess Place, a 30-minute route where RideMICRO Zone 4 service is also provided.
- Several retail corridors, including Market Street between Covil Avenue and Fornden Station; Independence Boulevard; and Oleander Drive.
- Randall Parkway among some Seahawk Shuttle routes such as Route 704 Yellow and Route 711 Grey.

The duplicative nature of these routes indicates that there exists an opportunity to consolidate similar routes and reinvest those resources into providing more frequent service where there is the market



demand to support it. Without increasing operating costs, Wave could feasibly consolidate Route 205 and Route 210 and provide service every 15 minutes between Padgett Station and South 17<sup>th</sup> Street.

Figure 10 | There is a major opportunity to streamline and consolidate similar services, especially in the walkable and higher-demand neighborhoods in and near downtown Wilmington.



## Ridership

Analyzing ridership and ridership trends is one way to understand how well a transit service works. **Ridership can help indicate where services are working well, where service is needed, and where service could be improved.**

### Systemwide Ridership Trends

Wave's ridership was relatively high during FY19 and FY20 (pre-pandemic) carrying approximately 600,000 to 700,000 riders annually. Transit ridership varies by month with peak ridership occurring in the spring and summer. Fluctuations in ridership reflect tourism peaks during warmer months and the UNCW schedule (Figure 12). Ridership declined drastically beginning in March 2020 during the COVID-19 pandemic. This decline reflects public health concerns and the closure of many major employers and key destinations at the time. Ridership began to recover in October 2021 as businesses and institutions began re-opening.

Wave Transit Ridership has continued to improve since FY21, however, ridership has yet to return to pre-pandemic levels. There were 411,000 trips in FY21 and over 453,000 trips in FY23 (Figure 11). As of April 2023, ridership was about 70% of pre-pandemic levels, and rising slowly. Attaining pre-pandemic ridership levels could be a worthwhile aspiration for Wave Transit.

Figure 11 | Systemwide Annual Ridership Trends (FY19 – FY23)

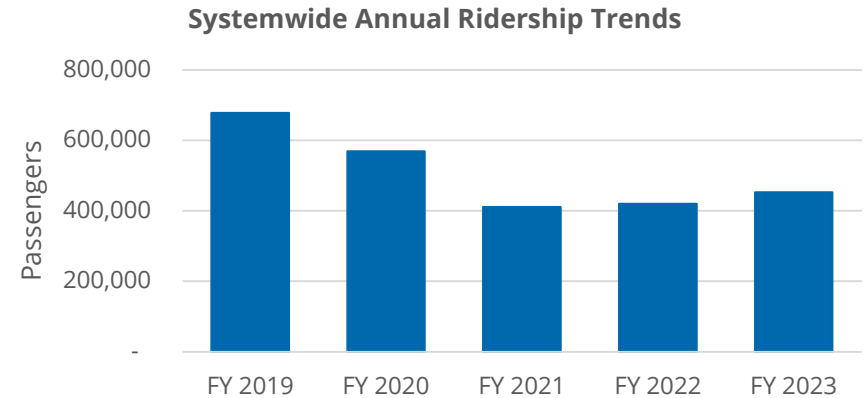
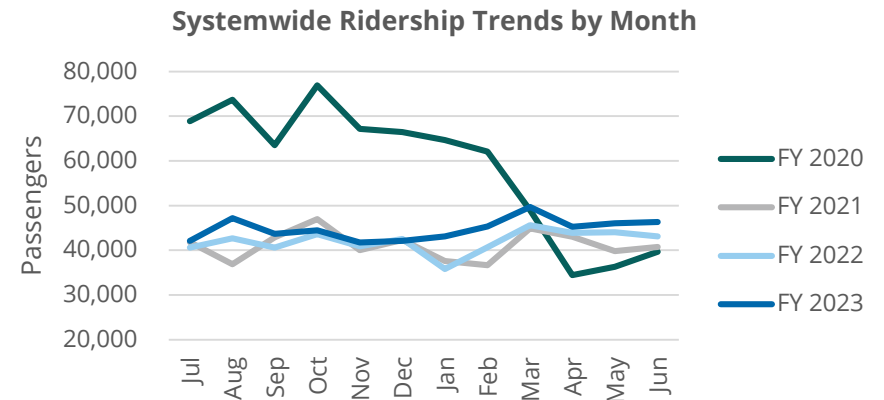


Figure 12 | Systemwide Ridership Trends by Month (FY20 – FY23)





## Ridership by Route

### Fixed-Routes Ridership

Figure 13 shows the average weekday, Saturday, and Sunday ridership for each fixed route (March-May 2023).

#### Weekdays

On weekdays, the highest ridership routes included Route 108 Market Street (301 boardings per weekday, Route 101 Princess Place (284 boardings), Route 205 Long Leaf Park (265 boardings), and Route 201 Carolina Beach Rd (236 boardings). These four routes averaged 272 boardings and made up 57% of Wave’s total system ridership. Routes 108, 101, and 205 run two buses during peak hour service, while Route 201 runs hourly. The other eight Wave routes, all of which operate hourly, averaged 103 weekday boardings, ranging from 135 boardings (Route 105 Medical Center) to 70 boardings (Route 104 East).

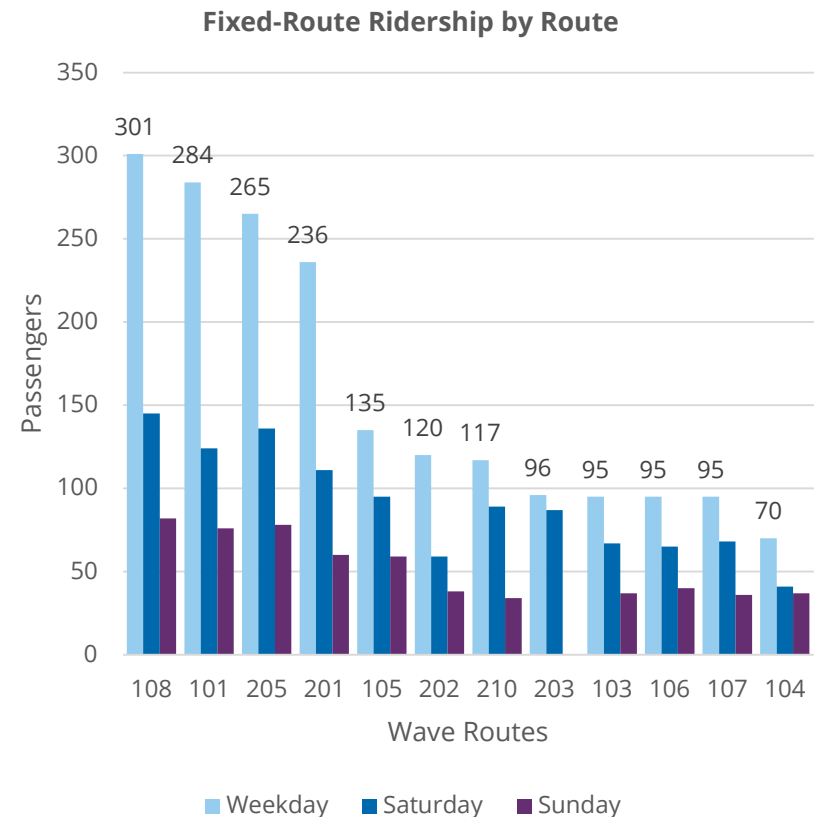
#### Saturdays

On Saturdays, routes with the highest ridership included Route 108 (145 boardings per Saturday), Route 205 (136 boardings), Route 101 (124 boardings), and Route 201 (111 boardings). These four routes averaged 129 boardings and made up 47% of total system ridership; Saturday ridership on these routes is often higher than weekday ridership on hourly routes. The remaining eight routes averaged 71 boardings, ranging from 95 boardings (from Route 105) to 41 boardings (from Route 104). The relatively high Saturday ridership on Route 101, Route 108, Route 201, and Route 205 illustrate the strong weekend demand for service that exists in some areas of Wave’s service; there may exist an opportunity to provide more frequent service or service for longer hours on Saturdays for these routes.

#### Sundays

On Sundays, routes with the highest ridership included Route 108 (82 boardings per Sunday), Route 205 (78 boardings), Route 101 (76 boardings), and Route 201 (60 boardings). These four routes averaged 74 boardings and were 51% of total system ridership. The remaining seven routes averaged 40 boardings, ranging from 59 boardings (from Route 105) to 34 boardings (from Route 210).

Figure 13 | Average Daily Fixed-Route Ridership by Route (Spring 2023)

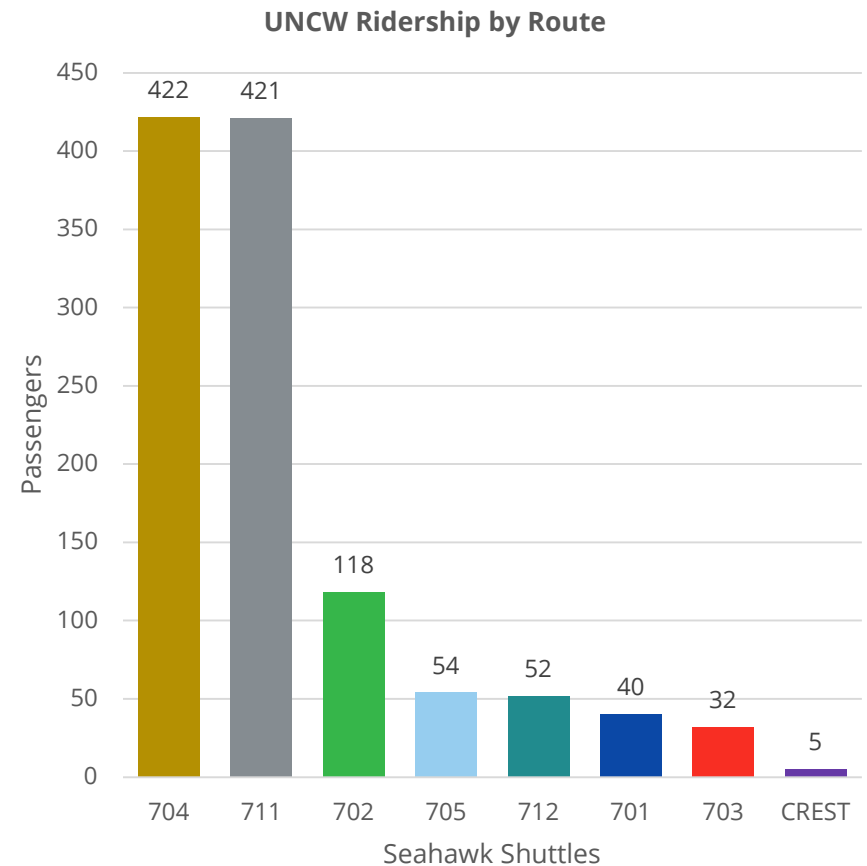


### Seahawk Shuttles Ridership

Among the UNCW routes, there were 1,104 boardings on weekdays, Route 704 Yellow Shuttle (422 boardings) and Route 711 Grey Shuttle (421 boardings) had the highest ridership out of all Wave services, including UNCW and fixed-route service (Figure 14). These two routes made up 76% of total ridership on UNCW routes. The remaining six routes average 52 boardings, ranging from 118 boardings (from Route 702 Green Shuttle) to 5 boardings (from the CREST Shuttle).

UNCW's highest ridership routes are not necessarily the most frequent, indicating that there may exist an opportunity to better match service frequencies to demand. Route 711 Grey Shuttle has about 8x the ridership of Route 712 Teal Shuttle, although Route 712 Teal operates more frequently (every 15 minutes). Wave and UNCW can continue to coordinate to fine-tune the Seahawk Shuttle service, ensuring that these routes serve unique travel markets and operate relatively directly while still being cost-effective. Ridership on the CREST Shuttle is so low that the resources used to operate it could be better allocated elsewhere in the Seahawk Shuttle network. There may also be an opportunity to better market UNCW service and integrate it into Wave's fixed-route service to reduce service duplication with similar fixed routes like Route 103 Oleander East and Route 104 East.

Figure 14 | UNCW Campus Shuttles Ridership by Route (Spring 2023)





## Ridership by Stop

Ridership by stop varies from very low to very high among Wave's stops served by fixed-route service.

### Wave Fixed-Routes

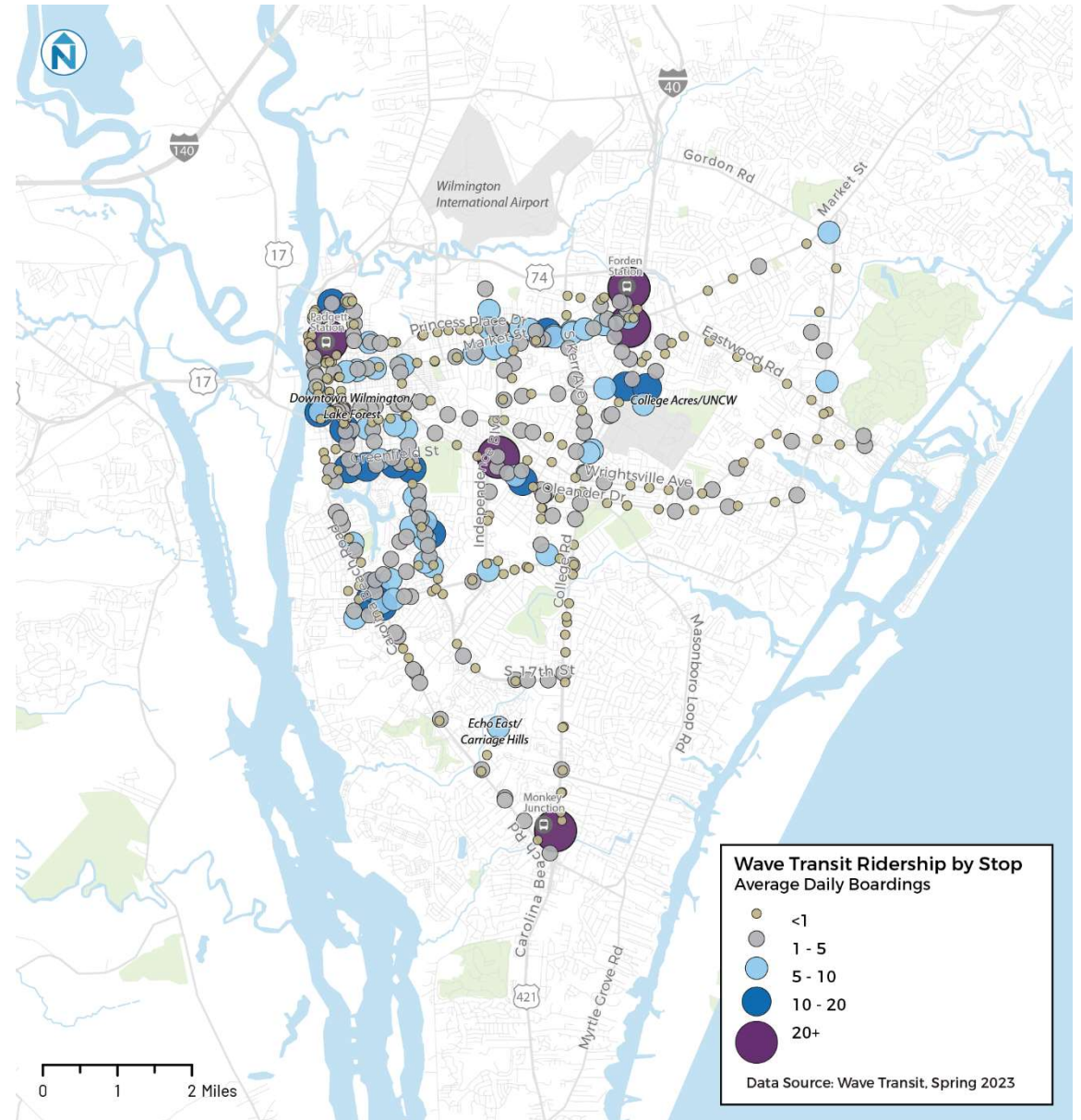
As of Spring 2023, five stops comprise 43% of boardings in the Wave network: These stops include:

- Padgett Station (427 boardings)
- Forden Station (249 boardings)
- Monkey Junction (86 boardings)
- Sigmon Road Walmart (32 boardings)
- Independence Boulevard at Park (22 boardings)

These stops all serve as key destinations in Wilmington and are high-transfer areas. There are also corridors and neighborhoods with consistently high ridership. Wave can consider improving service frequency in these stronger markets:

- Market Street east of Covil Ave
- South 16<sup>th</sup>/17<sup>th</sup> Street
- Carolina Beach Road near Medical Center Drive, Wellington Avenue, and Shipyard Boulevard
- Dry Pond

Ridership is very low along portions of some routes, including Eastwood Road and Wrightsville Avenue west of Greenville Avenue. Wave can consider discontinuing service in these areas or shifting service to microtransit.



### Seahawk Shuttles

In the UNCW network, three stops comprise 62% of the ridership in the school network:

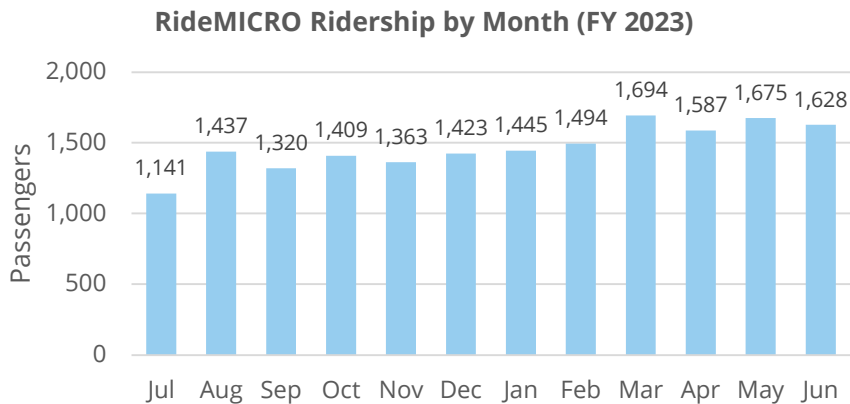
- Alderman Lot Shuttle Stop (395 boardings)
- Aspire 349 (231 boardings)
- UNCW Teal Terminal (103 boardings).

The largest ridership draw to the Seahawk Shuttles is toward the the Aspire 349 the apartment complexes popular with UNCW students between Emerson St and Randall Pkwy near Kerr Ave. Ridership is low along portions of Market Street, New Centre Dr, and at the Center for Marine Science. Wave can consider discontinuing UNCW service in these areas since these corridors are well served by fixed routes.

### RideMICRO

In FY 2023, RideMICRO averaged 1,400 passengers per month across all zones with its greatest ridership occurring in March 2023 (Figure 15).

Figure 15 | RideMICRO Total Ridership by Month (FY 2023)

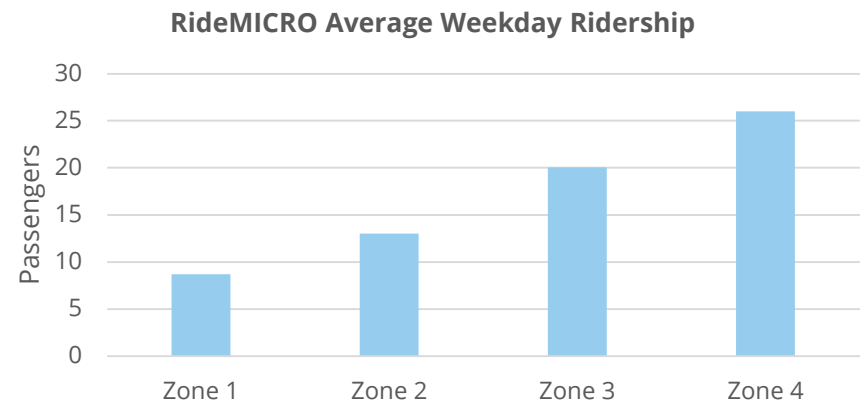


FY 2023 was the first complete year of RideMICRO service since being implemented in Fall 2021. Since July 2022, RideMICRO service has continued to increase steadily as more Wave riders have become familiar with the new service. Ridership has increased from approximately 1,200 to serving over 1,600 passengers per month.

### Ridership by Zone

Ridership on all RideMICRO zone services is lower than any fixed-route services. As of Spring 2023, on weekdays, Zone 4 had the highest ridership out of all RideMICRO zones with 26 average daily boardings. Followed by Zone 3 (20 average daily boardings), Zone 2 (13 average daily boardings), and Zone 1 (9 average daily boardings) (Figure 16). Wave should continue to monitor the ridership of its zones and consider discontinuing any very low ridership service and reinvesting its resources into more productive and popular zones.

Figure 16 | RideMICRO Average Weekday Ridership

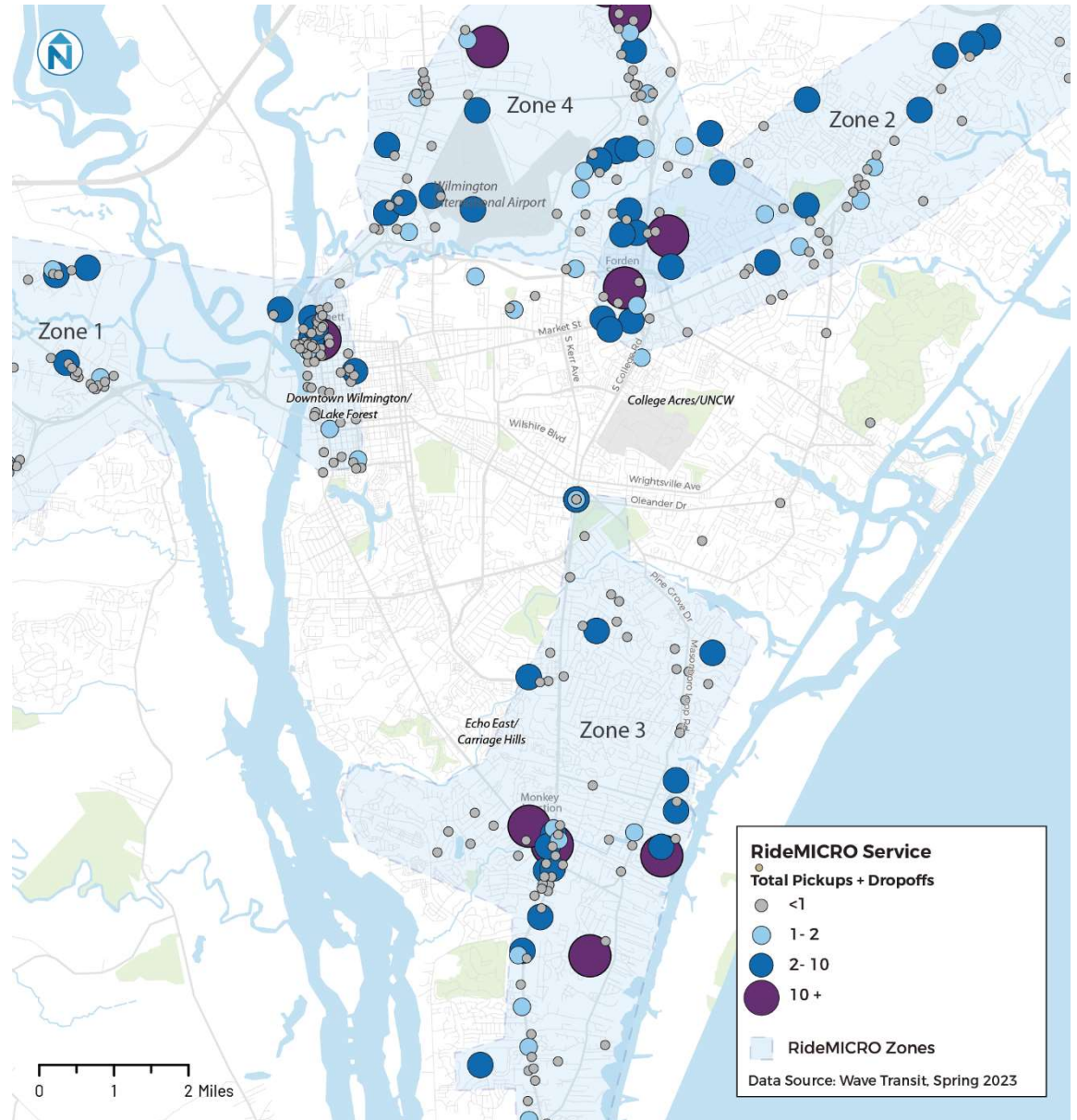


### Ridership by Stop

In Spring 2023, the greatest number of RideMICRO pickups and drop-offs occurred in areas where there are higher concentrations of key trip generators such as grocery stores (e.g., Walmart), medical facilities, and academic institutions. These areas included Downtown Wilmington (Zone 1), Cape Fear Community College (Zone 4), Carolina Beach (Zone 3), and shopping locations at Monkey Junction (Zone 3) and south of Forden Station (Zone 2). Across the four zones, rides were evenly distributed geographically, but Zones 3 and 4 experienced the greatest number of rides over the three-month period. Ridership is low in some areas like Zone 3 north of Monkey Junction and Zone 2 south of Market Street.

It is important to note that RideMICRO service currently duplicates some areas that are also well-served by fixed-route services, including in Downtown Wilmington, along Market Street east of Forden Station, and near and north of Monkey Junction. Duplicating fixed-route service with microtransit can undermine the ridership of bus service, which is a much more cost-effective service type.

While Wave continues to fine-tune RideMICRO service, the agency can consider discontinuing service where ridership is very low and where more attractive fixed-route service is already offered. These changes can ensure that Wave is delivering service in the most cost-effective manner, since the limited capacity of RideMICRO vehicles means the zones will always have relatively low ridership and the cost-per-passenger of RideMICRO service is significantly higher than fixed route trips (see Service Productivity chapter for more information on cost effectiveness).





## Service Quality

Several factors influence the way riders typically view the quality of transit service. Metrics like on-time performance, passengers per revenue hour, and cost per passenger help evaluate how well transit service is meeting the needs of passengers in a comfortable, reliable, and cost-effective way.

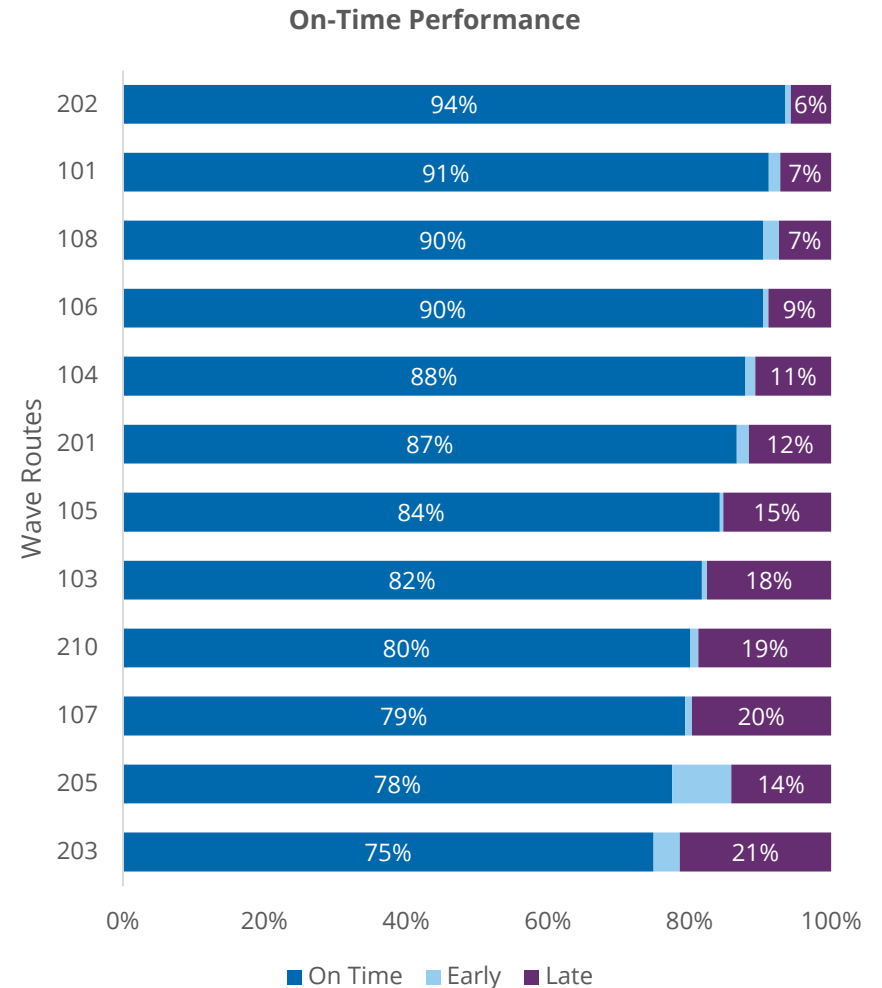
### On-time Performance

On-time performance reflects service quality, specifically the reliability and service design of Wave’s routes. In the context of transit service, on-time performance is measured by the time a bus arrives or leaves at timepoints as published in their schedules. Wave Transit’s Title VI Program describes the criteria and standards for on-time performance. A bus is considered early if it arrives at a timepoint more than one minute in advance of the scheduled time. A bus is considered late if it arrives more than five minutes after the scheduled time. The minimum standard for on-time performance is 88%, and the target standard is 93%.

Wave generally has good on-time performance, despite service on average not meeting the agency’s minimum standard. In Spring 2023, 2% of all trips arrived early, 13% of trips arrived late, and 85% of trips arrived on time. According to Figure 17, Route 202 had the strongest on-time performance, with 94% of trips being on-time. Route 203 had the highest rate of late trips, likely because it exclusively serves the congested downtown area and is very circuitous. Route 205 was most likely to be early and has the second lowest on-time performance. The high variability in early and late arrivals for Route 205 is dependent on the fluctuating rate of ridership of seniors and disabled individuals that need to board and alight near the medical facilities along the route, particularly on Medical Center Dr. On-time performance at the Medical Center / Silver Stream timepoint is around 50%. Streamlining routes and

working with partners to improve pedestrian facilities at bus stops can help Wave to improve the on-time performance of its worst performing routes.

Figure 17 | Fixed Route On-time Performance (Spring 2023)



## Passengers per Revenue Hour

Productivity metrics help Wave understand how many people can benefit from their service compared to how much service costs to operate. Wave keeps track of productivity at the route and system level in order to maximize high-quality service using their available resources.

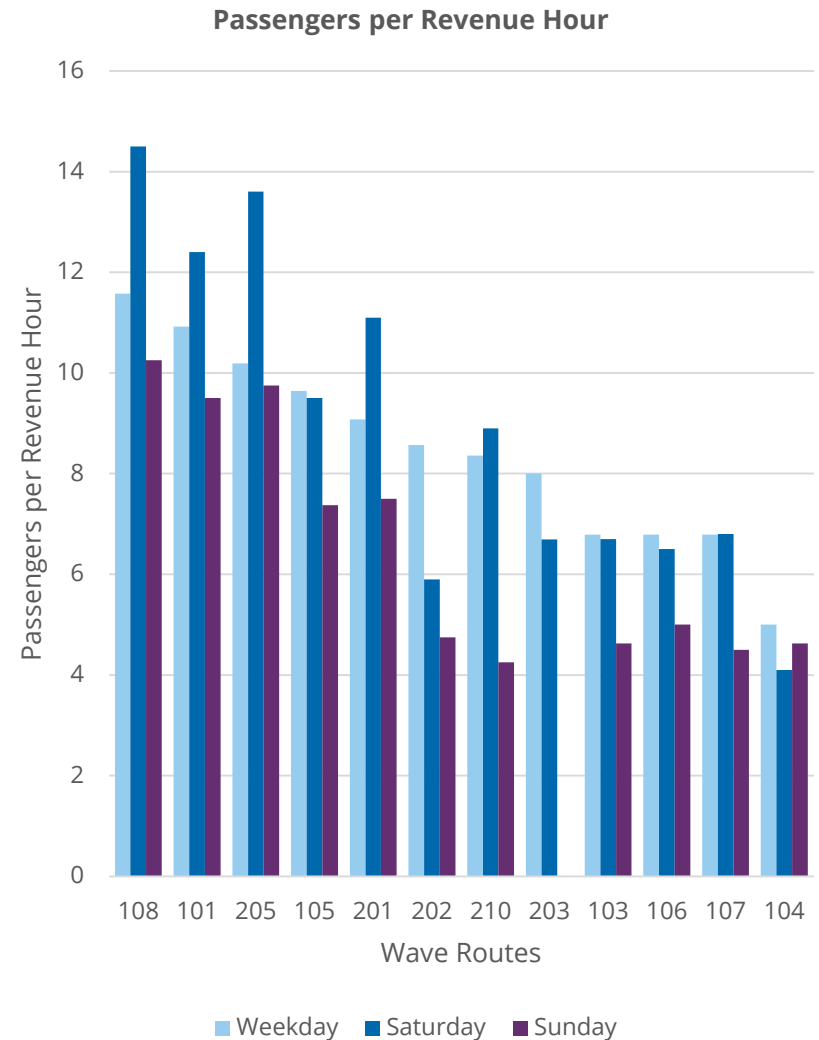
### *Fixed-Route Productivity*

On weekdays, Wave routes averaged 8.5 passengers per revenue hour. Route 108 had the highest ridership per hour across weekdays (11.6 passengers per hour), Saturdays (14.5), and Sundays (10.3). Route 104 had the lowest passengers per hour across weekdays (5.0) and Saturdays (4.1). Route 210 had the lowest passengers per hour on Sundays (4.3). Low productivity can be caused by a few factors, including infrequent service, circuitous service, and low underlying demand.

Saturdays, the twelve Wave routes average 8.9 passengers per hour, and on Sundays, eleven Wave routes average 6.6 passengers per hour (Figure 18). Generally, routes on weekdays and Saturdays have similar levels of ridership productivity, and Sundays see the lowest productivity across all routes, except Route 104.

Three of the four highest ridership routes (Route 108, 101, 205, and 201) have significantly higher ridership productivity on Saturdays compared to weekdays. This is because in the Spring of 2023 these routes ran at 30-minute headways during peak hours on weekdays, which results in lower productivity (but higher ridership). Riders on these routes could be well served by more frequent service during some periods on Saturdays, to match the stronger underlying demand indicated by these figures.

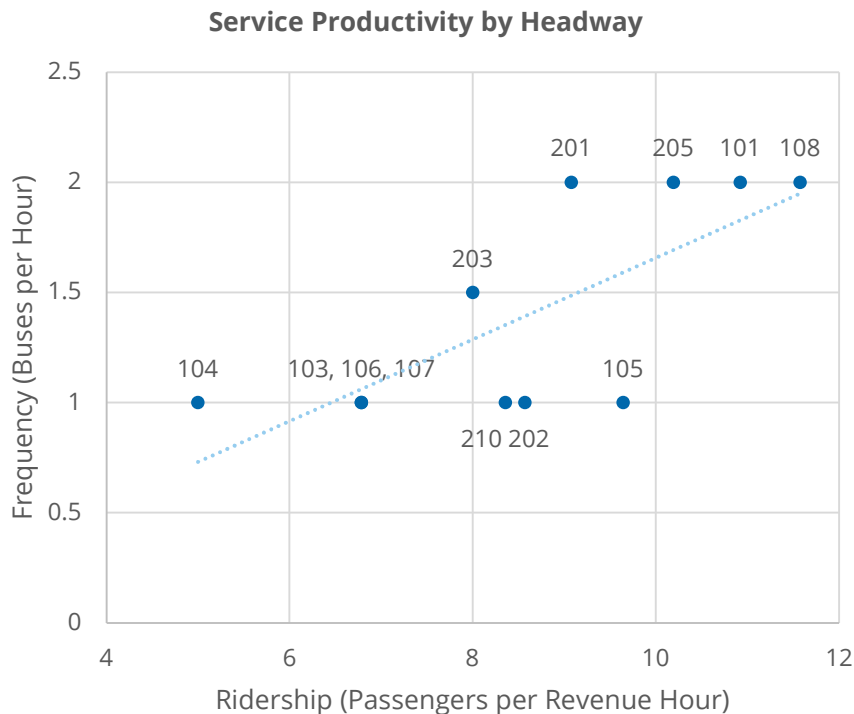
Figure 18 | Fixed-Route Passengers per Revenue Hour (Spring 2023)



### Frequency and Service Productivity

Figure 19 compares routes' productivity (passengers per hour) to their headway during Spring 2023. On weekdays, routes with higher average daily headways tend to have higher ridership productivity. Routes 108, 101, 205, and 201 have 30-minute headways from 6AM to 6PM on weekdays and average 10.44 boardings per hour. Other routes (not including Route 203) have 60-minute headways all day and have a lower average of 7.42 passengers per hour. While ridership is dependent on many factors, longer wait times can often be the cause of low productivity.

Figure 19 | Fixed-Route Service Productivity by Headway

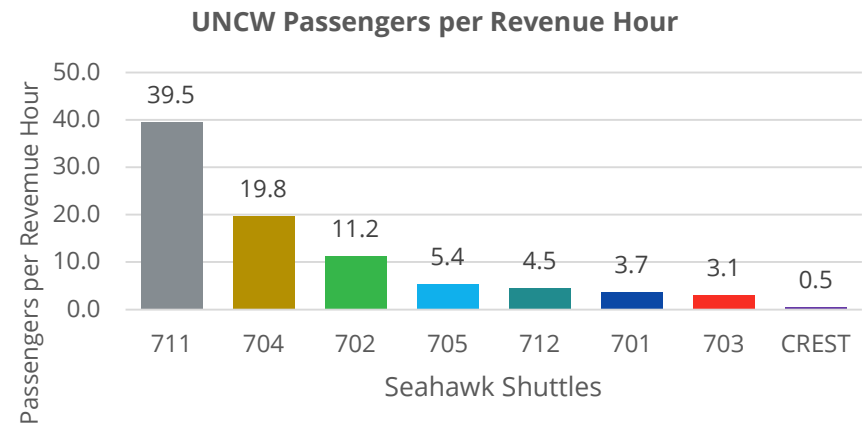


### Seahawk Shuttles Productivity

The strong and hyperlocal nature of the UNCW travel market, in conjunction with the limited service spans offered by Seahawk Shuttle routes, makes UNCW routes on average more productive than many Wave routes. On weekdays, UNCW shuttles averaged 11.8 passengers per hour (Figure 20). Route 704 Yellow and Route 711 Grey were the most productive shuttles in Spring 2023, with 19 or more boardings per revenue hour. These shuttles serve areas with high transit demand including off-campus student housing (e.g., Redpoint housing complex) and have more frequent service (every 30 minutes). The two shuttles have the same total ridership, but Route 711 has higher productivity because a lower frequency (fewer service hours) creates a higher ridership to service hour ratio.

The least productive route was the CREST Shuttle, which connects UNCW to the Center for Marine Science. This is likely due to infrequent service (60 minutes). Additionally, the shuttle operates within a low-transit demand area and is the longest UNCW route.

Figure 20 | UNCW Passengers per Revenue Hour (Spring 2023)



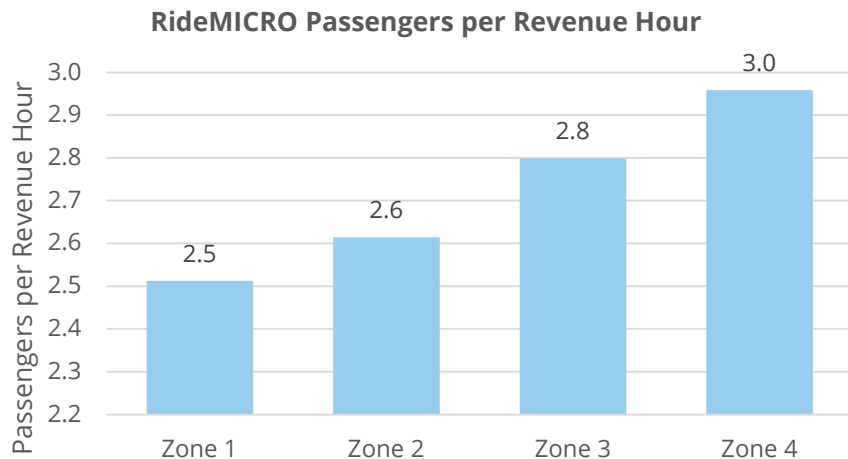


### RideMICRO Productivity

In Spring 2023, RideMICRO zones averaged 2.7 passengers per revenue hour, which is lower than any fixed-route or UNCW service except the CREST Shuttle. On weekdays, Zone 4 was the most productive zone as it is the only transit service available that serves Cape Fear Community College (CFCC), College Road north of Forden Station, Gordon Road, and the airport which have higher transit demand. On weekends, Zone 3 was the most productive zone, likely due to leisure travel such as riders taking weekend trips to Carolina Beach during the warmer months.

It is likely that Zones 3 and 4 were most productive on weekdays because these zones replaced fixed route service in areas which historically had ridership. The two zones are able to capture pre-existing ridership and serve key destinations such as CFCC and Wilmington beaches. Zones 1 and 2 were the least productive zones. These two zones operate in new service areas, so riders may not yet be familiar with RideMICRO service.

Figure 21 | RideMICRO Passengers per Revenue Hour



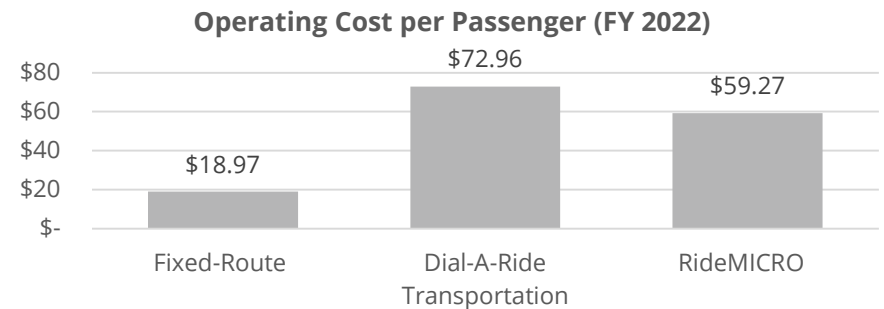
### Cost per Passenger

Operating cost per passenger is a basic measure of cost effectiveness (Figure 22). During FY2022, the cost per passenger of Wave's fixed-route service was the lowest (\$18.00) when compared to all modes. Fixed-route service accounts for most of Wave's ridership and service is meeting the demand and need of transit riders in Wilmington.

DART is the most expensive service to operate on a per passenger basis (\$72.96 per passenger). Paratransit costs per passenger are expected to exceed other modes. Paratransit service is provided based on eligibility and will fluctuate based on the number of eligible riders in the service area.

RideMICRO cost per passenger is relatively high; its costs on a per passenger basis are roughly double the cost of fixed-route service. While RideMICRO service is relatively inexpensive to operate (at about \$70 per hour, compared to \$110 for fixed route), RideMICRO ridership and productivity are very low due to the on-demand nature of the service and the limited demand in some areas of the RideMICRO zones. To make RideMICRO service more cost-effective, Wave can consider adjusting the boundaries of the service zones to discontinue service to low- and no-demand regions and where fixed-route service is already provided.

Figure 22 | Operating Cost per Passenger by Mode



## Paratransit Assessment

### Dial-A-Ride Transportation

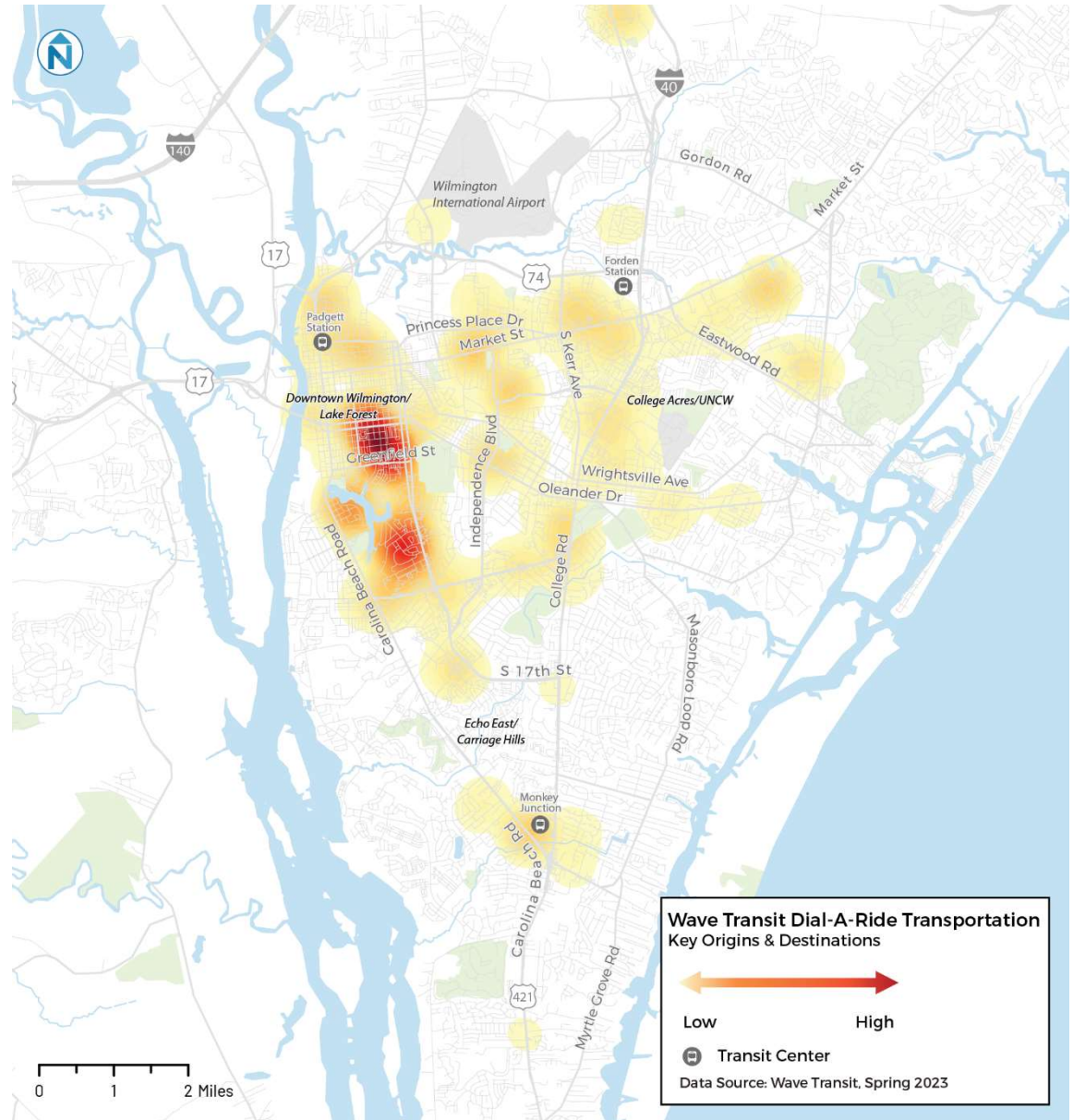
Wave Transit's Dial-A-Ride transportation (DART) is a paratransit service provided in accordance with the federal American with Disabilities Act (ADA) for riders unable to ride fixed-route service because of a disability. Fares are \$4.00 per person each way.

Riders with a qualifying disability can request a ride on DART by scheduling a trip at least 24 hours and up to 14 days in advance. The service is available for travel within  $\frac{3}{4}$  of a mile of one of Wave's fixed-route transit service during the same hours of operation of fixed route service: weekdays from 6AM to 8PM, Saturdays from 8AM to 6PM, and Sundays from 9AM to 5PM.

#### Major DART Origins and Destinations

In Spring 2023, important DART origin and destinations were primarily concentrated in Downtown Wilmington and south of Downtown along Carolina Beach Road and South 17<sup>th</sup> Street. Most trips were taken for medical, shopping, and/or educational purposes. Outside of private residences, the top five DART origins and destinations included:

- Coastal Enterprises of Wilmington - Disability Services & Support Organization
- Elderhaus at the Lake - Adult Day Care Center
- DaVita Sedc Wilmington Dialysis Center
- RHA Health Services - Wilmington IDD Vocational Center
- DaVita Cape Fear Dialysis Center



### DART Ridership

Since the pandemic began, DART ridership has rebounded and surpassed pre-pandemic levels, illustrating the vital role that DART and Wave play in meeting residents' transportation needs. From FY 2018 to FY 2020, annual ridership on DART hovered around 20,000. In FY 2021, annual ridership fell about 33% to approximately 14,000 rides. In FY 2022 and FY 2023, ridership surpassed pre-pandemic levels, increasing to nearly 26,500 trips in FY 2023. However, total ridership across all eight service providers in the Wilmington region has not rebounded to pre-pandemic levels, which averaged an annual 60,000 rides. Thus, DART's share of overall Dial-A-Ride ridership has increased from 31% to 50%, making it the most-used service provider.

From FY 2019 through FY 2020, ridership across all service providers hovered around 1.6 rides per hour. During the pandemic, ridership fell to 1.2 rides per hour, but rebounded to about 1.25 by 2023.

Figure 23 | Dial-A-Ride Annual Ridership Trends

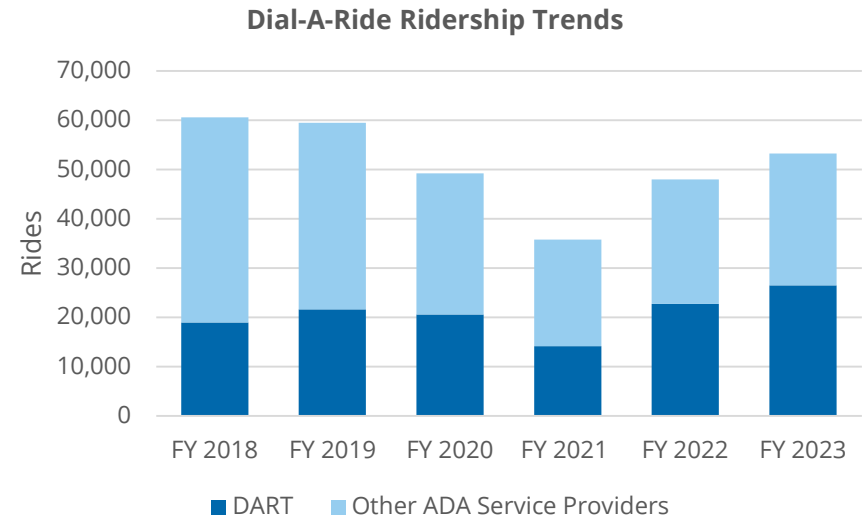
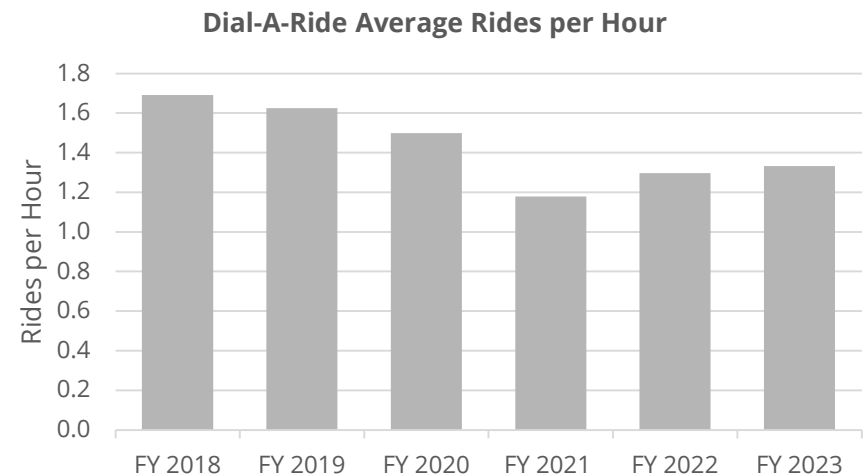


Figure 24 | Dial-A-Ride Productivity





## 3 Transit Facilities and Customer Information

### Transit Facilities

High-quality transit facilities are important for ensuring a safe and attractive experience for riders. **Transit facilities can make riding transit more comfortable for riders waiting for the bus by providing amenities such as covered areas, seating, and passenger information.**

#### Wave Transit Centers

Transit centers provide riders with a comfortable space to wait for the bus or to connect with other regional and inter-city services. Wave operates two official transit centers: Padgett Station in Downtown Wilmington and Forden Station near the intersection of College Road and Market Street at 505 Cando Street. Both transit centers have very high-quality amenities including indoor air conditioning, covered boarding areas, bathrooms, staffed information desks, access to maps, and information, and seating.

Wave's transit centers can accommodate multiple buses at once and have ample space for layovers and operator breaks. There exists additional capacity for connecting services like RideMICRO vehicles and Greyhound and Amtrak Thruway buses.

Monkey Junction is a third major transfer location, although it is not an official transit center. Monkey Junction is composed of two dedicated pull-outs with shelters where riders can wait for and transfer between routes. Unlike Padgett Station and Forden Station,

Monkey Junction lacks indoor facilities and staff and occasionally exceeds bus capacity during peak pulse times.

Forden Station houses most of Wave's administrative offices. Wave's maintenance facilities are located at the Wave Transit Operations Center at 1480 Castle Hayne Rd. It is served by RideMICRO service.

#### *Teal Terminal*

Teal Terminal is UNCW's main stop for Seahawk shuttles. This terminal is located at the Fisher University Union, The Teal Terminal provides riders with real-time information for shuttle locations and additional university and student organization announcements.

#### Park and Ride

Park and Ride locations are parking areas that are available and reserved for Wave Transit riders. The Park and Rides available to Wave rider are privately owned and maintained, these lots are not owned by Wave Transit. Parking is available to riders that would like to park their vehicles and connect to regional or local transit services. Park and Rides are convenient for riders that live outside of the Wave Transit network and are looking to decrease vehicle miles and/or their carbon footprint. Park and Rides can also be used as carpool and vanpool meeting locations. There are four Park and Ride locations that connect with Wave's transit network:

- Food Lion on Mt. Misery Road near US 74/76
- Lowes Foods near Brunswick Forest at Brunswick Village Blvd
- Leland Town Hall
- College Road Park and Ride - Hoggard (served by several UNCW shuttles)

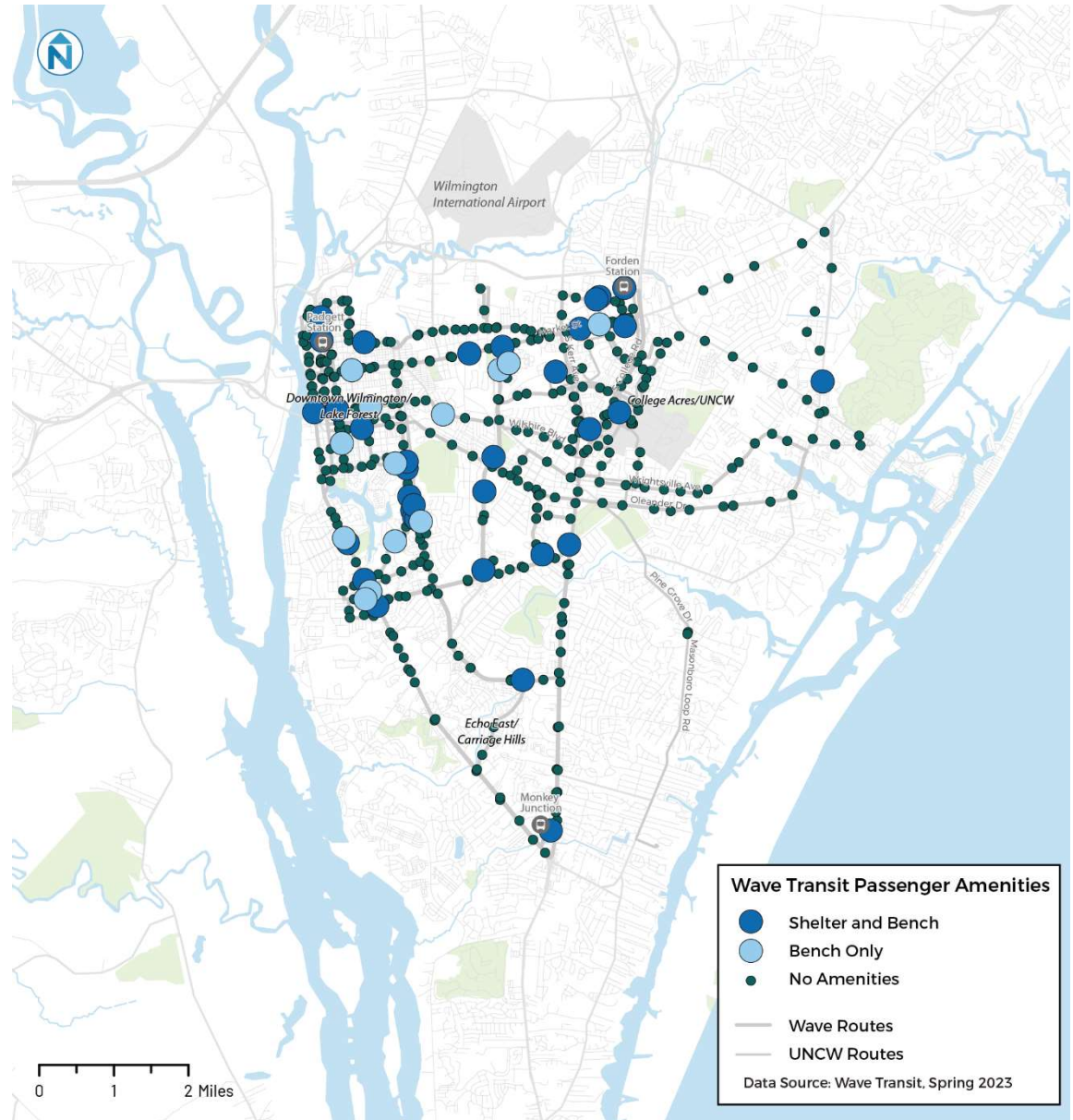
## Bus Stops and Amenities

Across the fixed-route and UNCW networks, 11% of all bus stops have some type of amenity beyond a bus stop sign. Amenities are best utilized when they serve stops with high ridership or stops that serve a greater number of seniors or persons with disabilities. Most Wave amenities are concentrated at stops serving key destinations or at stops located near medical/healthcare facilities including MedNorth, Shipyard Medical Center, and Horizons Health Primary Care.

Approximately 8% of all Wave stops have shelters, and approximately 3% of stops only have a bench. Over half of the top 20 ridership stops across the networks have either a shelter or a bench. Over a quarter of the 44 stops that receive at least 10 boardings per weekday have at least a bench. The following list describes areas of the network that have a high concentration of bus stops with amenities:

- There are 10 stops spread throughout downtown Wilmington, bounded by Greenfield St and S 17<sup>th</sup> St.
- There are 8 stops with amenities on S 17<sup>th</sup> St between New Hanover Regional Medical Center and Greenfield St.
- There are 4 stops with amenities on Carolina Beach Rd between Medical Center Dr and Shipyard Blvd.
- There are 5 stops around Market St between N Kerr Ave and N College Rd.

There exists ample opportunity to improve the amenities available at Wave's stops, and Wave may consider developing bus stop design guidelines that can guide the agency in investing in its highest need stops first.



## Pedestrian Access and Connectivity

Effective transit service relies on an interconnected and comfortable pedestrian network that helps people reach their destinations and access transit.

There are several corridors in the service network that have distant, difficult, or non-existent street crossings, and many stops have no sidewalk. The lack of connectivity to destinations or transfers can be a disincentive for riders. As a result, routes traveling on corridors with limited pedestrian access and connectivity may need to deviate or serve destinations directly to allow for safe access. For instance, facilities such as the New Hanover Regional Medical Center and the Walmart near Market Street are set back from nearby transit corridors and there are limited safe and direct pedestrian connections to their entrances. The siting of these destinations forces riders to make uncomfortable street crossings or walk through heavily trafficked parking lots, often in areas lacking sidewalks, crosswalks, curb cuts, or traffic lights. Important transit corridors that lack safe pedestrian infrastructure include College Road, Market St east of Covil Avenue, Carolina Beach Road, 16th/17th Street, Shipyard Boulevard, and Oleander Drive.

To better serve areas with poor pedestrian infrastructure, Wave can consider implementing a new local fixed-route or microtransit circulator between Forden Station and the major destinations within the big-box retail and strip mall agglomeration north of UNCW near the intersection of College Road and Market Street. This new service could allow nearby fixed route services to be streamlined. Access would also be improved significantly by partnering with municipalities and property owners to improve pedestrian facilities near key destinations.

## Bus Stop Spacing

Bus stops are the main access points to transit services and should be conveniently located, in addition to being accessible and safe. However, bus stops are also the major reason that transit service is slower than automobile trips depending on the number of times the bus needs to stop. Since most riders want service that balances convenience and reduced travel times, the number and location of stops is a key component of determining that balance.

The average bus stop spacing for Wave Transit routes is about 1/3-mile. Routes 205, 203, 202, 101, 105, and 108 have an average stop spacing of less than 1/3-mile. Routes 103 and 106 have an average stop spacing of around 1/3-mile. Routes 210, 201, 104, and 107 have the furthest stop spacing, ranging from 1/3 to 1/2-mile (Figure 25 | Bus Stop Spacing on Fixed-Route Service).

Notably, the three routes that serve Monkey Junction have some of the furthest stop spacing due to low stop density south of Shipyard Blvd. Route 107, which has the furthest stop spacing in the network, exclusively serves College Rd: a low stop-density corridor that has little to no sidewalk infrastructure. Stops that are spaced outside of walking distance from each other do not decrease accessibility – it is reasonable to expect someone to walk 1/4-mile (about a 5-minute walk) to their destination from a bus stop. However, when stops are spaced further apart and pedestrian access may become limited due to the lack of safe street crossings or sidewalks, taking transit becomes less attractive.

The average stop spacing of UNCW Shuttles (excluding the CREST Shuttle) is approximately 0.57 miles. Routes 712 Teal and the CREST Shuttle have the furthest stop spacing (Figure 26). They operate as point to point shuttles toward Forden Station and UNCW Center for Marine Science, respectively. The remaining shuttles have closer stop spacing because they are circulator routes and are meant to provide frequent service and decrease walk times to bus stops.



Figure 25 | Bus Stop Spacing on Fixed-Route Service

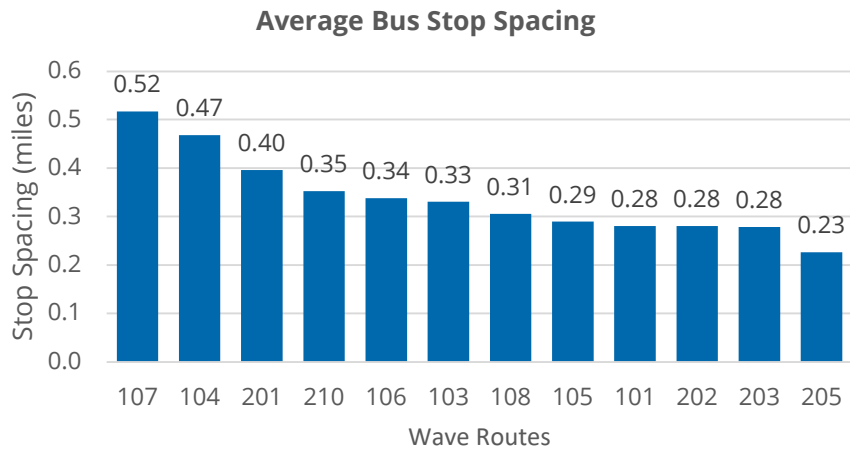
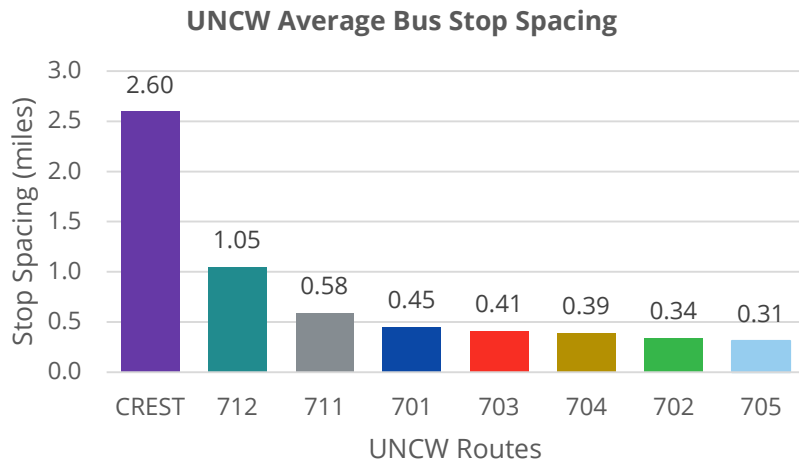


Figure 26 | UNCW Bus Stop Spacing by Route



## Fares, Technology, and Passenger Information

Easy to understand and access fare payment and passenger information limits obstacles to accessing transit service and can ensure that investments in service have the greatest possible reach.

### Fares

The one-way standard fare to ride Wave is \$2.00 per trip. Wave Transit offers discounts for bulk purchases, such as 24-hour, seven-day, and monthly passes. Full-price monthly passes cost \$31. All RideMICRO trips are \$2 (not included in the cost of a monthly pass) and a one-way ride Dial-A-Ride trip is \$4.00 (Figure 27).

Reduced fares on the fixed-route service are available to older adults 65 years or older, people with disabilities, those with a Medicare card, and local students. UNCW students, faculty, and staff and children four years of age and younger ride fare free. Transfers between buses are also free. Free transfers are only valid for 75 minutes. Transfers cannot be used to/from RideMICRO service.

Passes are available for purchase on Wave buses, and RideMICRO and DART vans with cash. Passes are also available for purchase at Padgett Station and Forden Station with cash, credit/debit, or Apple Pay. Additionally, RideMICRO passengers can purchase passes using the RideMICRO App with debit/credit card.

### Passenger Information

In order to effectively ride transit, current and potential customers need to be able to access information about schedules, fares, bus stops, and alerts. This information is primarily available at Padgett Station and Forden Station, on Wave Transit’s website, and on mobile apps. Padgett Station and Forden Station both have staffed

information kiosks, system maps, and printed schedules, as well as real-time information signs with upcoming bus arrivals at its bays.

Figure 27 | Wave Transit Fare and Pass Information

PASS TYPE	REGULAR FARE	REDUCED-FARE
One Ride Pass	\$2	\$1
10 Ride Pass	\$20	\$10
24-Hour Pass	\$5	\$2.50
7-Day Pass	\$20	\$10
31-Day Pass	\$80	\$40
Transfer Pass	Free	Free
DART One-Way Pass	\$4	NA
DART 10-Day Pass	\$4	NA
RideMICRO One-Way Pass	\$2	NA

The Wave Transit website has the following functionalities:

- Route schedules and interactive route maps
- Fare information
- Trip planner
- Real-time information on bus location and upcoming arrivals
- Alerts and detours
- Information about current Wave Transit initiatives and rider programs

The website also provides information on two mobile apps that riders can download: **Wave Transit App**, which has real-time arrival information, route maps, trip planning, and alerts, and **RideMICRO**,

where riders can purchase RideMICRO passes, book rides, and track RideMICRO vehicles.

However, similar route and real-time schedule information is not available through the popular Transit App, and real-time information is not available through Google Maps. **Compatibility across multiple platforms, especially those that potential riders may already be familiar with, would improve passenger access to information** as well as enable future integration with other mobility services, such as potential bike share services. As the Wilmington area grows and travel demand increases, coordinating and integrating technology and services will be increasingly important. Potential areas of focus for better integrating passenger information include future Mobility-as-a-Service programs, app-based fare payments, and open-loop payment systems.

Currently, Wave updates every bus stop with the typical bus departure time for the routes serving that station. Although this is useful for passengers, it is very labor intensive to update bus stops any time there is a service change. Wave can consider updating its bus stop signs with QR codes and a phone number that riders can call or text to request real-time arrival information.

Additionally, Wave can make service easier to understand by including UNCW service information in their public-facing system map. Because UNCW routes are accessible to the public and serve many popular destinations, Wave can consider updating public information materials to better describe how Seahawk Shuttle and fixed route services are integrated. These passenger information additions will supplement any service changes also intended to integrate fixed-route and UNCW services further.





## 4 Summary

### *Key Takeaways*

Wave Transit operates a regional transit system with many strengths that form a solid foundation for further investment:

- **Wave's fixed-route services operate according to a well-coordinated and easy-to-understand schedule**. The top-of-the-hour, clockface "pulse" of service once or twice an hour limits the wait time for passengers transferring between routes.
- **Wave Transit provides excellent coverage** to the vast majority of transit supportive areas within its service area.
- **Wave generally has good on-time performance.**

As of April 2023, ridership was about 70% of pre-pandemic levels, and rising slowly. Attaining pre-pandemic ridership levels could be a worthwhile aspiration for Wave Transit. **Opportunities to improve service design and build ridership** include streamlining circuitous routes, consolidating duplicative services, serving difficult-to-access major destinations more consistently, and working with partners to improve pedestrian access in a more targeted way:

- **There are major opportunities to make nearly all fixed routes more direct.** Streamlining individual routes to make service easier to understand and more convenient (e.g., making them bidirectional, shortening loops, and reducing deviations to low-ridership areas) would improve rider experience and create more efficient service.
- **The duplicative nature of some routes and RideMICRO zones indicates that there exists an opportunity to consolidate similar services and reinvest those resources into providing more frequent service where there is the market demand to support**

**it.** For example, without increasing operating costs, Wave could feasibly consolidate Route 205 and Route 210 and provide service every 15 minutes between Padgett Station and South 17th Street.

- To make service easier to understand, **Wave could serve major destinations more consistently with all nearby routes or shift front-door access to major destinations to dedicated circulators or microtransit services**. Wave could potentially implement a new local fixed-route or microtransit circulator between Forden Station and the major destinations within the big-box retail and strip mall agglomeration north of UNCW near the intersection of College Road and Market Street.
- **Wave should continue working towards making bus stops more comfortable and accessible to all riders**. Wave may consider developing bus stop design guidelines that can guide the agency and its partners in investing in its highest need stops first.
- **Wave can work to integrate customer information with popular apps including Google Maps and Transit App**. Compatibility across multiple platforms, especially those that potential riders may already be familiar with, would improve passenger access to information.

In addition to unmet demand for more frequent weekday service on the corridors identified in the Market Analysis, **there may exist enough demand along Routes 101, 108, 201, and 210 to operate more frequent service during Saturday middays.**

Wave's service spans are generally well-matched to the most common travel times, however **extending weekday service until 9 PM and Saturday service later into the evening on the region's bigger commercial corridors could better serve evening demand for transit, especially for workers in service jobs.**

### *UNCW Seahawk Shuttles*

**Wave provides very convenient and frequent service to UNCW campus users.** Wave and UNCW can continue to coordinate to fine-tune the service; there may exist opportunities to make service more productive by consolidating similar services, discontinuing service to areas with low or no ridership, and better matching frequency to demand.

- **Wave can make service easier to understand by including UNCW service information in their primary public-facing system map.** There are opportunities to reduce existing service duplication between fixed-route and UNCW routes by better integrating these services and their accompanying customer information.

### *RideMICRO Service*

**RideMICRO service spans are inconsistent, making the service less intuitive for riders.** Wave's current microtransit operations which dedicate only one service vehicle to each microtransit zone result in less useful and reliable service. The gaps in the service spans of Zones 1 and 2 limit their usefulness, and demand for trips in Zone 4 sometimes exceed the ability of the existing service to meet them. There may exist opportunities to refine RideMICRO service boundaries to focus only on areas with consistent demand and/or consolidate low-productivity RideMICRO zones to improve the service span of the more important zones.

**RideMICRO service currently duplicates some trips that are also available by fixed-route service**, including in Downtown Wilmington, along Market Street east of Forden Station, and near and north of Monkey Junction. While Wave continues to fine-tune RideMICRO service, the agency can consider discontinuing service where ridership is very low and where more attractive fixed-route service is already offered.

