



Route Profiles

DECEMBER 2023



CAPE FEAR PUBLIC TRANSPORTATION AUTHORITY



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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. The **State of the System Analysis**, which offers a comprehensive review of the existing Wave network. The State of the System Analysis accompanies this document, the **Route Profiles**, which provide 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.

Route Profiles Overview

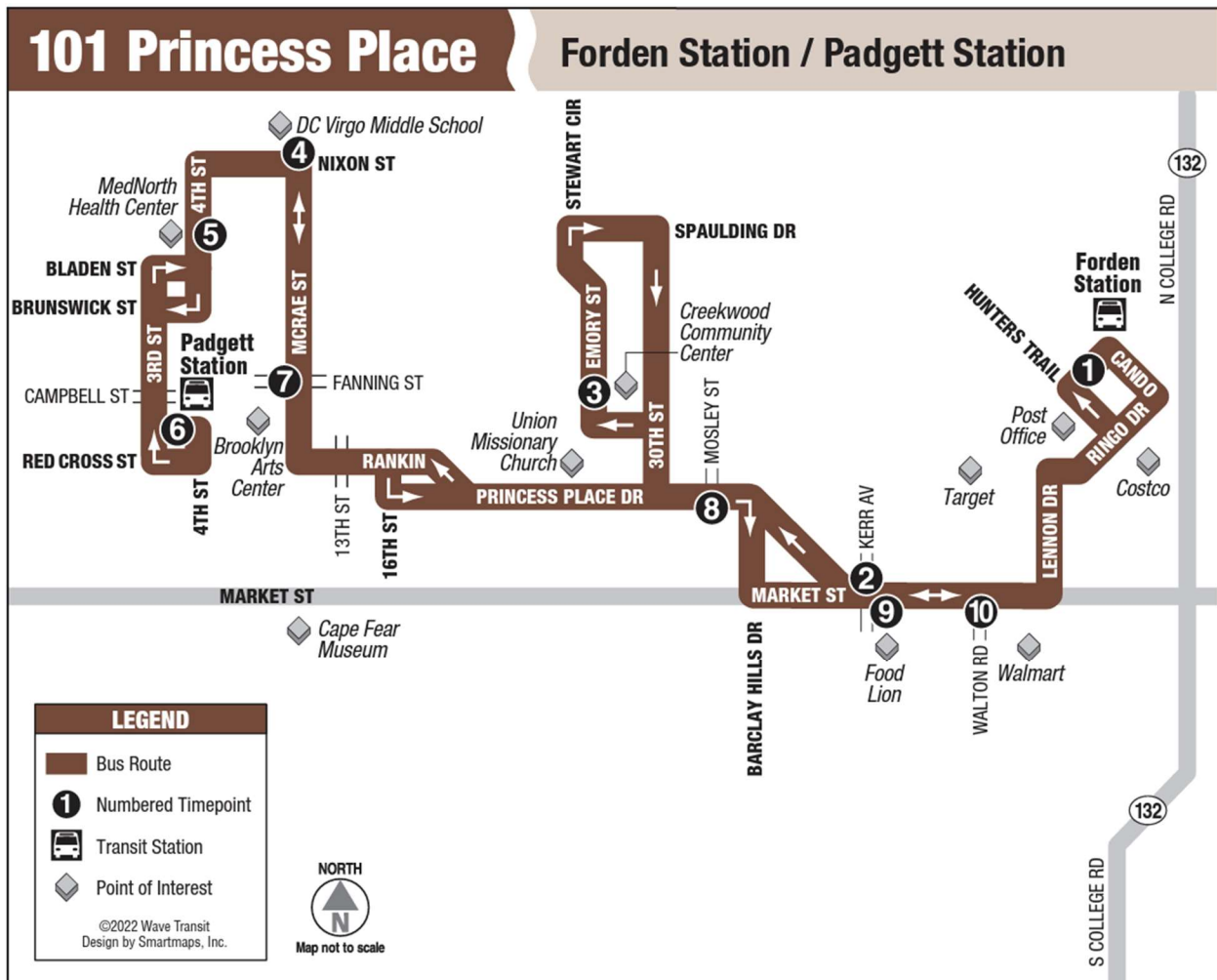
Route profiles are analyses of the existing routes and microtransit zones. Route profiles describe the existing productivity, ridership, and performance of each fixed- route and microtransit zone; they also provide route-level recommendations for each service provided. The State of the System document,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

ROUTE 101 PRINCESS PLACE

Service Overview

Route 101 is a fixed-route service that operates seven days a week between Padgett Station and Forden Station via Princess Place and Market Street. It plays an important role by connecting some of Wilmington’s highest transit need neighborhoods to Wave’s two major transit centers and shopping and employment destinations in Downtown Wilmington and along Market Street. The major opportunity for Route 101 Princess Place is to make the route easier to understand by operating the route along the same streets in both directions.

Figure 1 | Route 101 Route Map



Route Alignment

Route 101 Princess Place operates between Padgett Station and Forden Station via Princess Place and Market Street. The route mostly operates on the same streets in both directions of service, which makes the route easy to understand. However, there are some places where only one-way service is provided. Wave Transit can explore opportunities to operate service bi-directionally in the following areas: on Bladen Street and Brunswick Street between 3rd Street

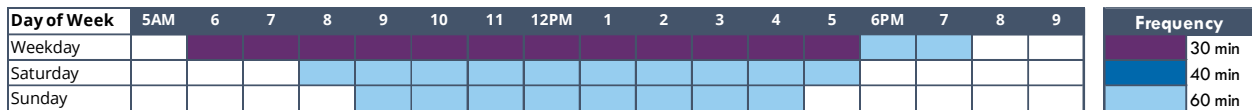
and 4th Street; and in the westbound direction only along Emery Street, Spaulding Drive, and 30th Street to serve the Creekwood community.

The Port City Trolley Route provides similar service to Route 101 north of Padgett Station. Also, Route 106 Shipyard Boulevard, Route 105 Medical Center’s westbound service, and Route 108 Market Street’s westbound service provides duplicative service to Route 101 between Barclay Hills Drive and Forden Station. There may exist opportunities to streamline and coordinate service to provide shorter effective headways north of Padgett Station and along Market Street.

Service Span and Frequency

Route 101 Princess Place operates 7 days a week. Like most routes in Wave’s network, Route 101 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. On weekdays during peak hours (6AM to 6PM), the route runs at 30-minute headways. Otherwise, it operates at 60-minute headways.

Figure 2 | Route 101 Princess Place Service Span and Frequency



Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 101 Princess Place has above average ridership with 284 boardings per average weekday. Compared to weekday ridership, Saturday ridership is 44% and Sunday ridership is 27%. Its productivity is also relatively high, with 10.9 riders per hour on weekdays, 12.4 riders per hour on Saturdays, and 9.5 riders per hour on Sundays.

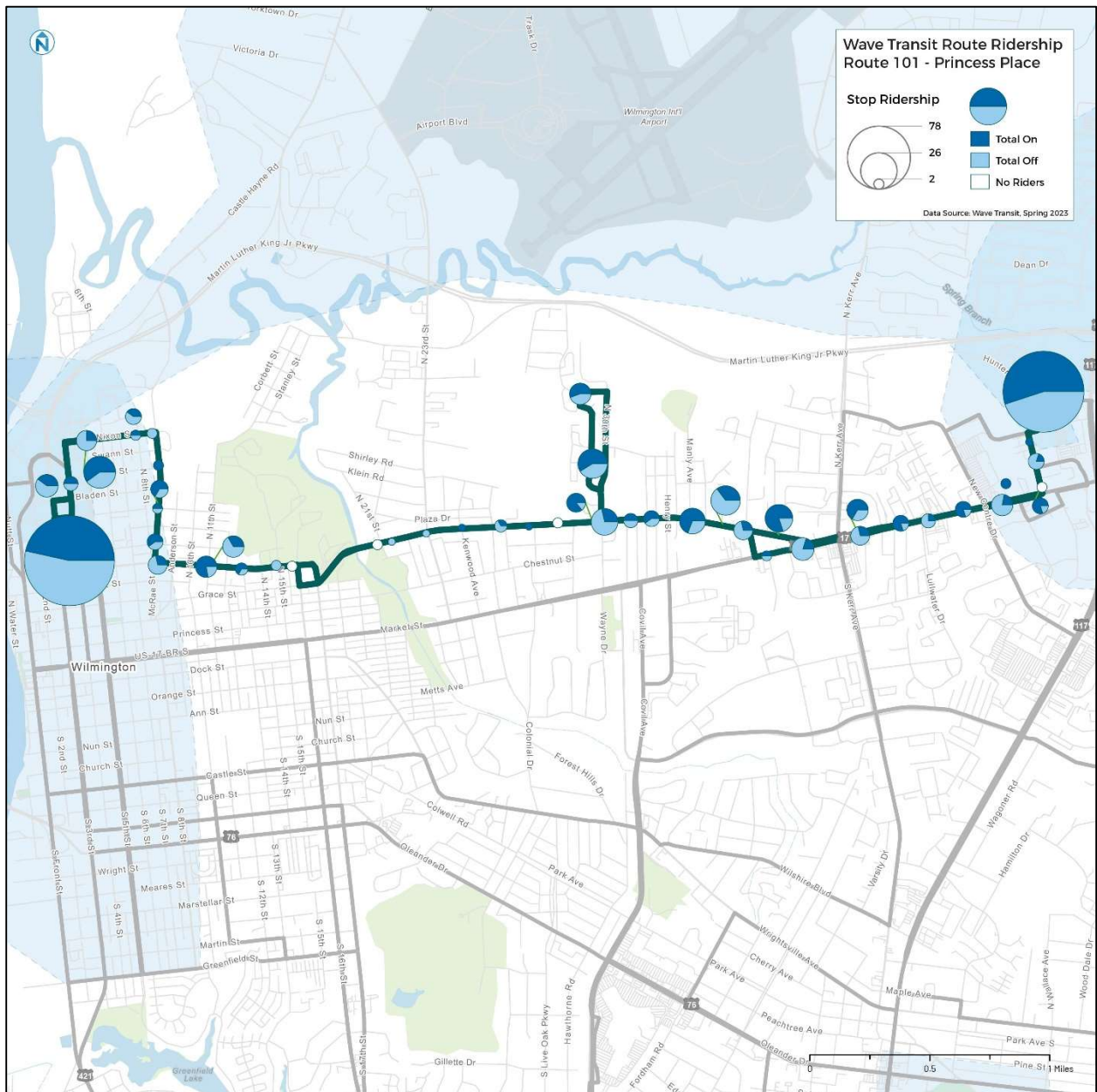
The most productive ridership segments are west of N 11th St (with 47 boardings), and east of N 30th St (89 boardings), with little to no boardings in between. The highest ridership stops include:

- Padgett and Forden Stations, with 74 and 71 boardings, respectively.
- Nixon St / 5th St, with 12 boardings, located near Robert R. Taylor Senior Homes.
- Princess Place Dr / Birchwood Dr, with 12 boardings, located near Eastbrook Apartments.
- Emory St / Clayton Pl, with 10 boardings, located at Creekwood South Housing Complex / Community Center.
- Princess Place Dr EB / Manly Ave, with 9 boardings, located near several churches and education centers.

Figure 3 | Route 101 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	284 (2/12)	124 (3/12)	76 (3/11)
<i>Riders Served per Hour</i>	10.9 (2/12)	12.4 (3/12)	9.5 (3/11)
<i>Vehicle Revenue Hours</i>	26	10	8

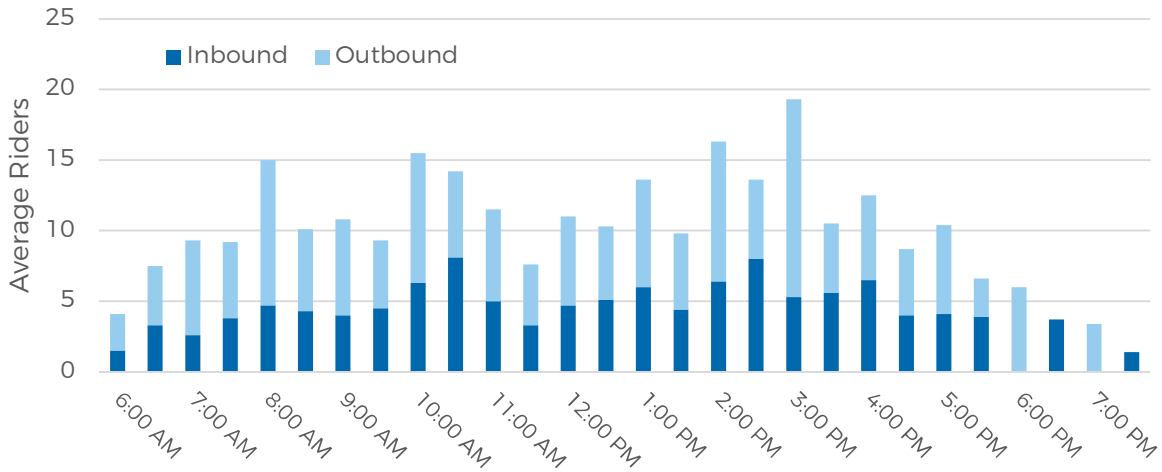
Figure 4 | Route 101 Princess Place Weekday Ridership by Stop



Ridership by Trip

Route 101’s ridership by trip peaks in the morning at 8AM and 10AM with 15 riders, and in the afternoon at 3PM with almost 20 riders. Otherwise, most trips have about 10 riders across the day. In the early morning and evening, there are less than 5 riders per trip. Generally, the service span is a good match for the ridership pattern. Westbound trips have higher ridership than eastbound trips. Ridership at the top of the hour (10AM, 12PM, etc.) is usually higher than ridership at half hours (10:30AM, 12:30PM, etc.).

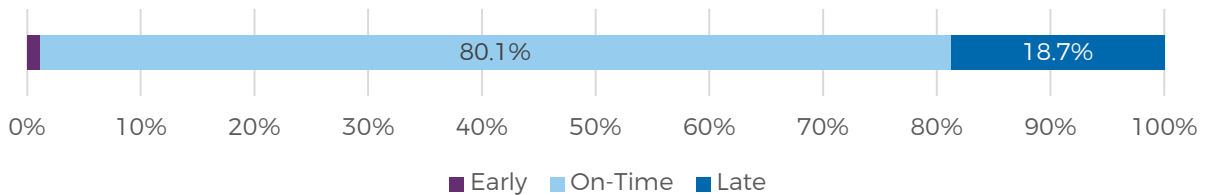
Route 101 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 101 Princess Place meets the minimum standard, with an OTP of 90%. The timepoint with the lowest on-time performance is Padgett Station, where 19% of buses arrive late. This may be due to westbound travel times being longer due to the deviation in Creekwood. However, the route has ample recovery time to allow it to recover before leaving the station.



Stop Spacing

0.28

Average Stop Spacing (Miles) Overall, bus stops are spaced about 0.28 miles apart on average. In other words, there are about 3.6 stops per mile. Stops are well-spaced along the route in both directions.

Transfer Opportunities

There are no significant transfer opportunities outside of those at Padgett and Forden Stations.

Opportunities to Strengthen Route 101 Princess Place

Opportunities to strengthen Route 101 Princess Place are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Provide bidirectional service wherever possible:** Route 101 provides service in one-direction only north of Padgett Station; in the Creekwood neighborhood; and on Barclay Center Drive and Princess Place Road at Market Street. The lack of bidirectionality in these locations makes the route difficult to understand and forces some riders to make a longer walk in only one direction. Route 101 should operate along the same streets in both directions wherever possible.
- **Coordinate Headways and Route Alignments of all Wave services north of Padgett Station:** Route 101 and the Port City Trolley provide similar service north of Padgett Station. Operating these routes along the same streets and coordinating departure times to provide more frequent effective headways north of Padgett Station will improve the quality of service in and north of Downtown Wilmington.
- **Coordinate Headways and Route Alignments of all Wave services on Market Street west of College Road:** Route 101, Route 106, Route 105 westbound, and Route 108 eastbound provide very similar service on Market Street east of Barclay Hills Drive. Operating these routes along the same streets and coordinating departure times to provide more frequent effective headways to and from Forden Station will improve the quality of service along Market Street.

Figure 5 | A redesigned Route 101 could be improved by operating in both directions on Market Street and on the same streets north of Padgett Station. Seahawk shuttles could be reconfigured to provide local service to destinations near Forden Station and along New Center Drive and Randall Parkway.

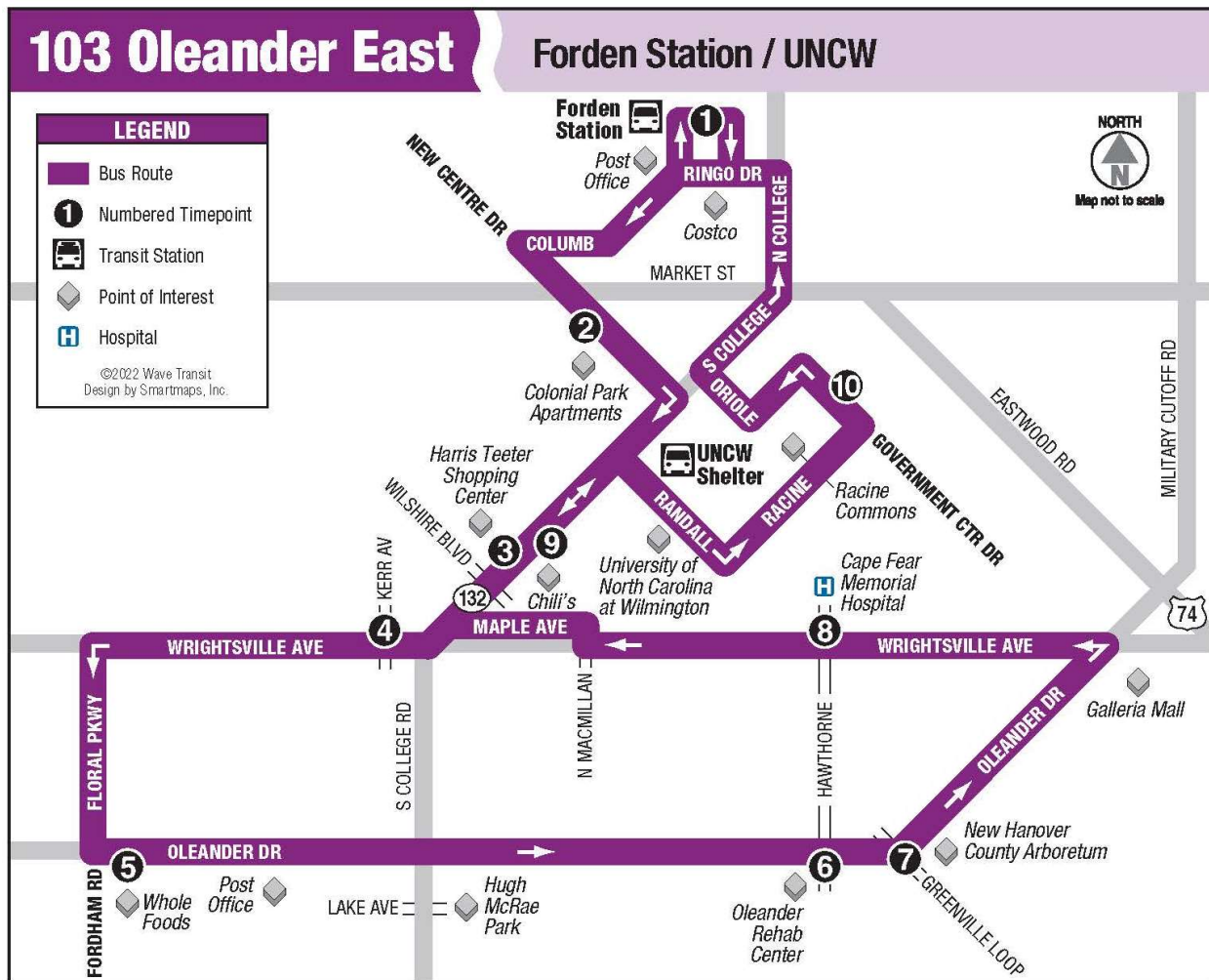


ROUTE 103 OLEANDER EAST

Service Overview

Route 103 Oleander East is a fixed-route service that operates seven days a week out of Forden Station via College Road and Oleander Drive. It connects neighborhoods along Oleander Drive and riders at UNCW to Forden Station and shopping and employment destinations along College Road and Oleander Drive. The major opportunities for Route 103 Oleander East are to redesign it to provide bi-directional service, reduce duplication with other routes, and improve coordination with Seahawk Shuttle service.

Figure 6 | Route 103 Route Map



Route Alignment

Route 103 Oleander East operates out of Forden Station via College Road, Oleander Drive, and Wrightsville Avenue. Except for bi-directional service on a portion of College Road, which duplicates service with Route 107, the route is a one-directional loop. A segment of the route duplicates the connection to UNCW Campus, alongside Route 104 and the Teal Shuttle. The segment on New Centre Drive duplicates service alongside Route 108.

Service Span and Frequency

Route 103 Oleander East operates seven days a week. Like most routes in Wave’s network, Route 103 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. It operates at 60-minute headways during all times.

Figure 7 | Route 103 Oleander East Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency	
Weekday		60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min
Saturday				60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min					60 min
Sunday					60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min					60 min

Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 103 Oleander East has below average ridership with 95 boardings per average weekday – accounting for 5% of daily systemwide ridership. Compared to weekday ridership, Saturday ridership is 71% and Sunday ridership is 39%. Its productivity is also relatively low, with 6.8 riders per hour on weekdays, 6.7 riders per hour on Saturdays, and 4.6 riders on Sundays.

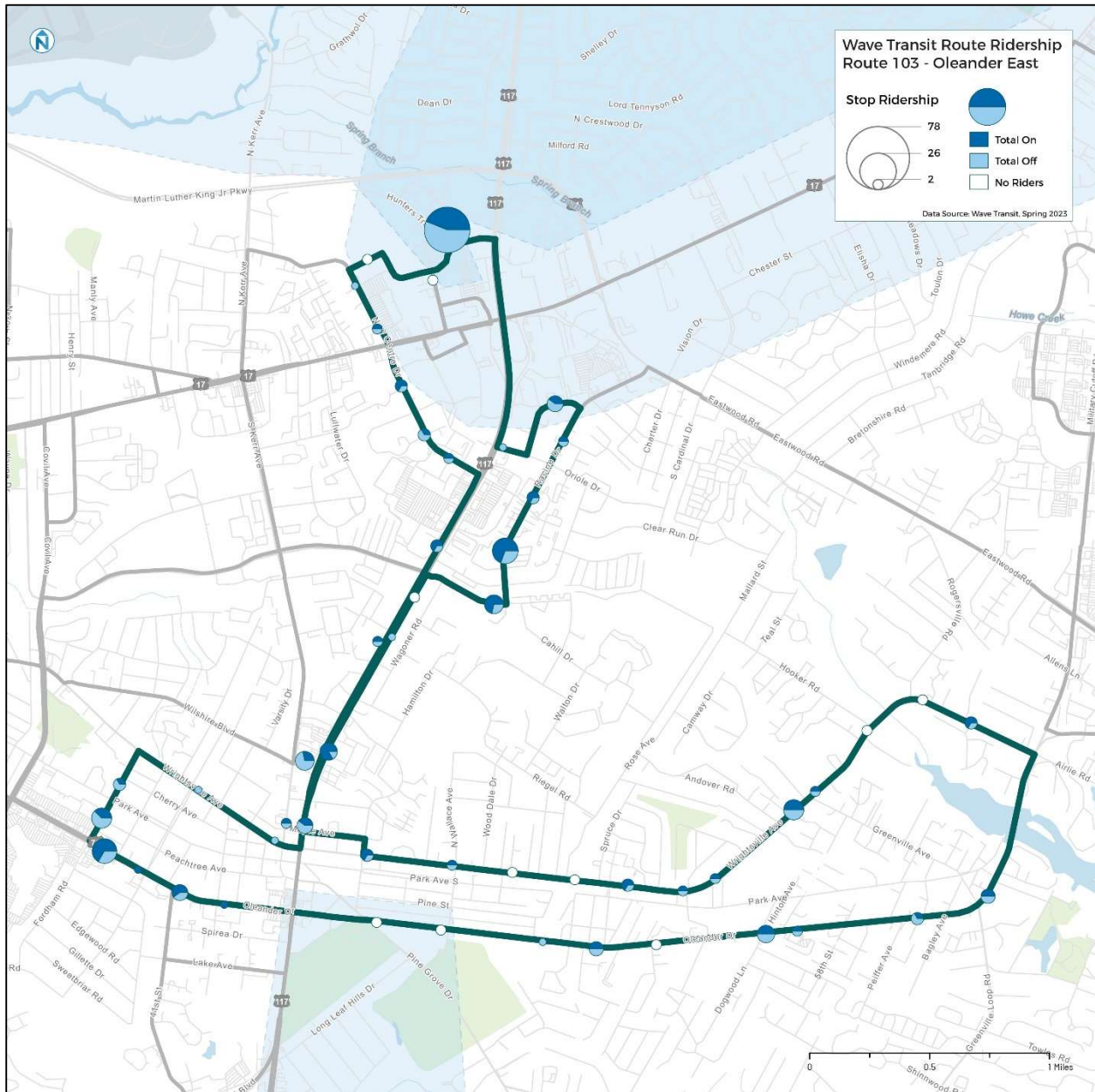
The most productive ridership segments are in the area around Independence Mall at Floral Pkwy / Oleander Dr (17 boardings), UNCW (21 boardings), and around Maple Ave / College Rd (12 boardings). The segment of the loop east of College Rd has a total of 21 boardings, spread thinly throughout Oleander Dr and Wrightsville Rd. The highest ridership stops include:

- Forden Station, with 18 boardings.
- Two stops on Racine Dr at UNCW, with a total of 9 boardings.
- Oleander Dr / Fordham Rd, with 8 boardings, is located at Independence Mall.
- College Rd / Wilshire Blvd, with 5 boardings, is located near Harris Teeter.

Figure 8 | Route 103 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	95 (9/12)	67 (9/12)	37 (8/11)
<i>Riders Served per Hour</i>	6.8 (9/12)	6.7 (8/12)	4.6 (8/11)
<i>Vehicle Revenue Hours</i>	14	10	8

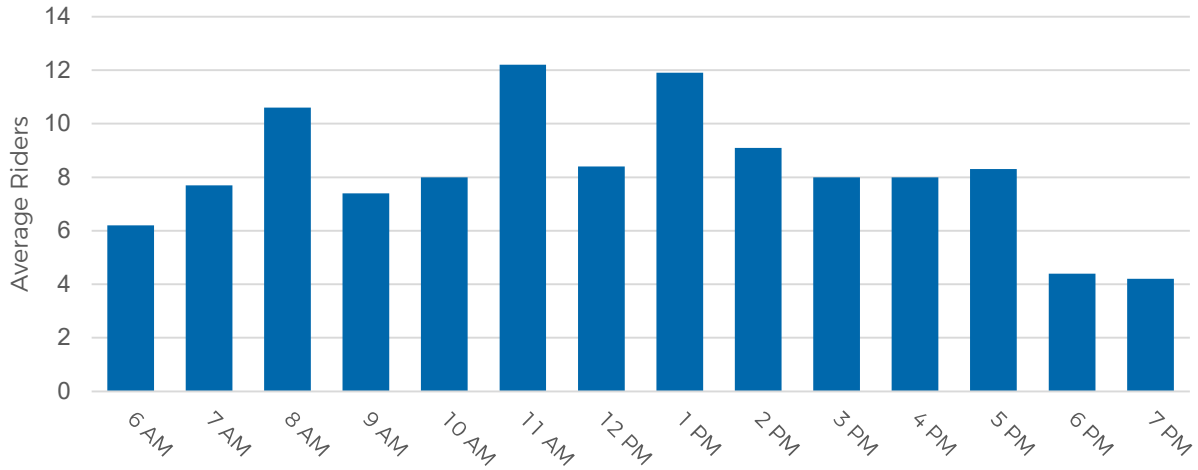
Figure 9 | Route 103 Oleander East Weekday Ridership by Stop



Ridership by Trip

Route 102's ridership is highest around midday and low in the early morning and evening. Around midday, some trips have about 12 riders. Trips across the day generally have about 8 riders. Generally, the service span is a good match for the ridership pattern.

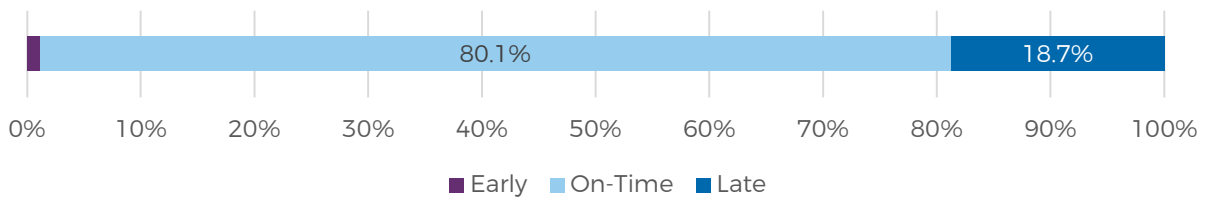
Route 103 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 103 Oleander East does not meet the minimum standard, with an OTP of 82%. Buses arrive late at timepoints 18% of the time and arrive early 0.7% of the time. Buses are particularly late in the first half of the route, until they reach Oleander Dr / Fordham Rd.



Stop Spacing

0.33

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.33 miles apart on average. In other words, there are about 3 stops per mile. There may exist an opportunity for additional stops along College Road to reduce walking distances for some riders.

Transfer Opportunities

Transfer to Route 202 is available on Oleander Dr between Floral Pkwy and S 41st St. Transfer to Seahawk Shuttles is available at University Dr and Bear Hall.

Opportunities to Strengthen Route 103 Oleander East

Opportunities to strengthen Route 103 Oleander East are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Provide bi-directional service wherever possible:** Route 103 provides bi-directional service only on College Rd. The lack of bidirectionality makes the route difficult to understand and forces some riders to make a longer trip in only one direction. Route 103 should operate along the same streets in both directions wherever possible.
- **Eliminate duplicative service on New Centre Drive, College Road, and UNCW campus:** Route 103 duplicates service also provided by Route 104, Route 107, Route 108, and Seahawk Shuttles like the 712 Teal Shuttle and the 701 Blue Shuttle. Instead, Route 103 should be reorganized to focus on unique markets like College Road, Shipyard Boulevard, and/or Oleander Drive.
- **Reconfigure service together with Route 107 College Road to improve effective frequencies north of Oleander Drive.** College Road could support more frequent service north of Oleander Drive. To better match service frequencies to demand, Route 103 could be redesigned to operate between the Medical Center and Forden Station via Shipyard Boulevard, South 41st Street, and Oleander Drive. This service design would provide 30-minute headways together with Route 107 north of Oleander Drive and improve access to the Medical Center, Oleander Drive, and UNCW—three of the region’s strongest job centers.
- **Streamline service between UNCW and Forden Station.** Route 103 provides circuitous service between UNCW and Forden Station and duplicates Route 108, Route 104, the 712 Teal Shuttle and the 701 Blue Shuttle. Route 103 could be redesigned to provide faster service between UNCW and Forden Station, and the other nearby routes (especially 712 Teal and 701) could be redesigned as local circulators that connect UNCW and Forden Station to the region’s major retail, shopping, and civic destinations.

Figure 10 | A redesigned Route 103 could operate between the Medical Center and Forden Station via South 41st St, College Road, and UNCW to provide better effective headways along College Road together with Route 107. Seahawk Shuttle routes could be reconfigured to better serve local trips in the vicinity of Forden Station and UNCW.

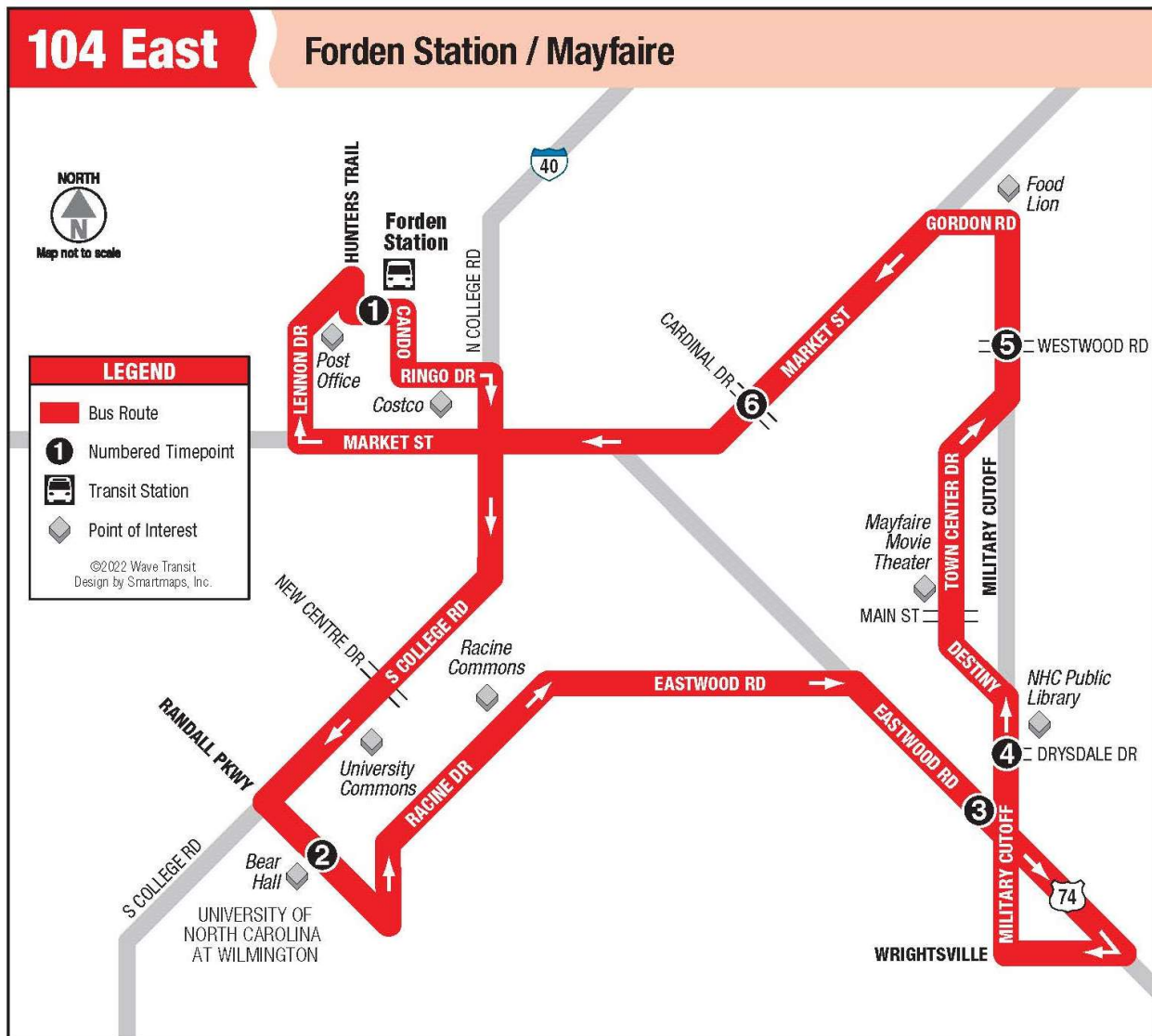


ROUTE 104 EAST

Service Overview

Route 104 East is a fixed-route service that operates seven days a week out of Forden Station via Eastwood Road, Military Cutoff Road, and Market Street. It provides coverage service by connecting Forden Station to lower density commercial and residential areas along Market Street and Military Cutoff; it also provides circulator-like service to major destinations in and near UNCW. The major opportunities for Route 104 East are to provide bi-directional service, discontinue service to areas with very low or no ridership, eliminate duplicative service, or replace the route with RideMICRO Zone 2.

Figure 11 | Route 104 Route Map



Route Alignment

Route 104 East operates out of Forden Station via Eastwood Road, Military Cutoff Road, and Market Street. The route is a one-directional loop, of which a segment duplicates service to UNCW Campus alongside Route 103 and the Teal Shuttle.

Service Span and Frequency

Route 104 East operates seven days a week. Like most routes in Wave’s network, Route 104 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. It operates at 60-minute headways during all times.

Figure 12 | Route 104 East Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		30 min
Saturday																		40 min
Sunday																		60 min

Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 104 East has below average ridership with 70 boardings per average weekday – 4% of daily systemwide ridership. Compared to weekday ridership, Saturday ridership is 59% and Sunday ridership is 53%. Its productivity is also relatively low, with 5 riders per hour on weekdays, 4.1 riders per hour on Saturdays, and 4.6 riders on Sundays.

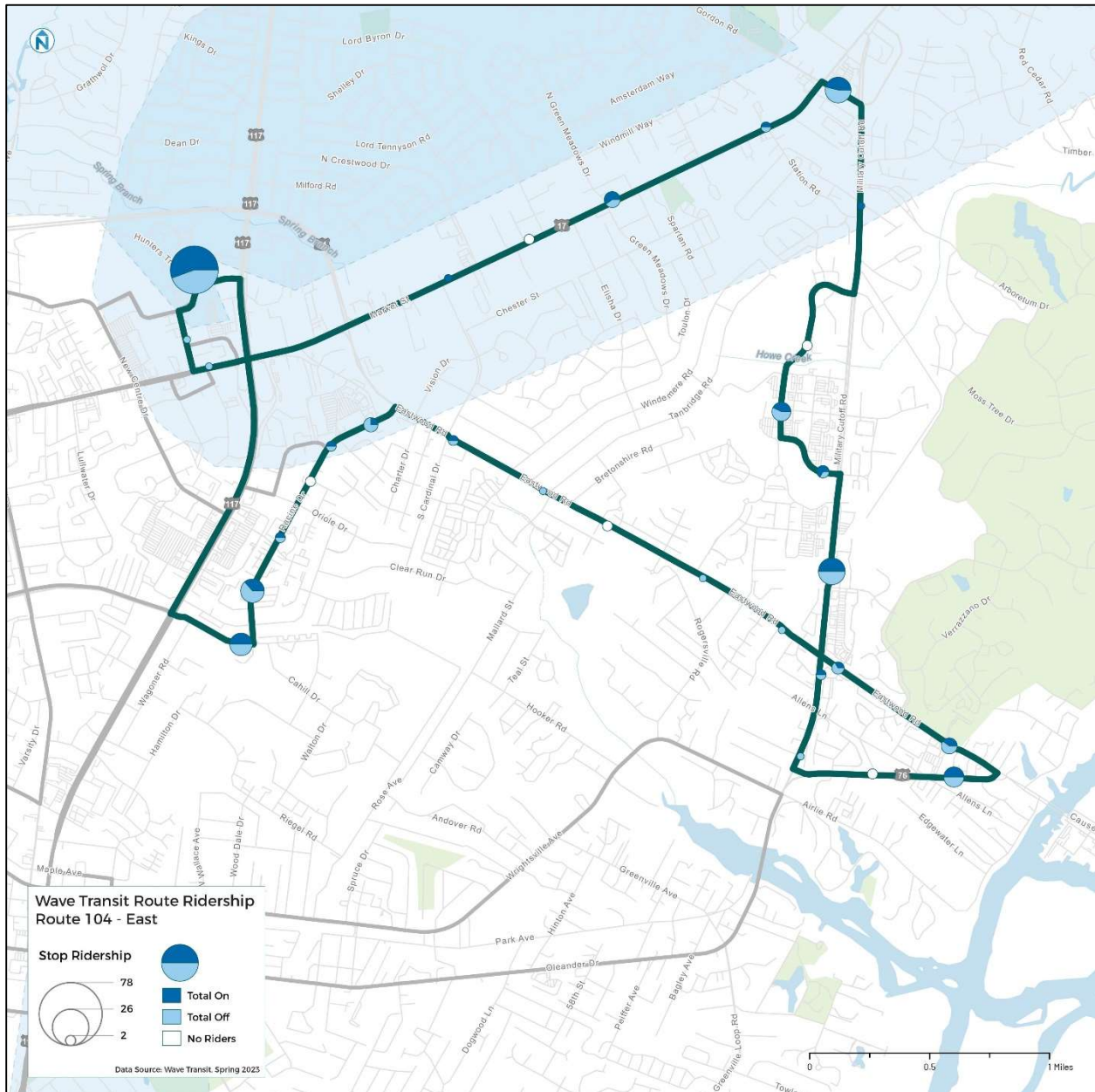
The highest ridership segments include UNCW (9 boardings), and along Military Cutoff Rd (21 boardings). The highest ridership stops include:

- Forden Station, with 25 boardings.
- Racine Drive, at UNCW, with 10 boardings.
- Military Cutoff Rd / Drysdale Dr, with 7 boardings, located near New Hanover County Library.
- Gordon Rd / Military Cutoff Rd, with 6 boardings, located near Big Lots and Food Lion.

Figure 13 | Route 104 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	70 (12/12)	41 (12/12)	37 (9/11)
<i>Riders Served per Hour</i>	5 (12/12)	4.1 (12/12)	4.6 (9/11)
<i>Vehicle Revenue Hours</i>	14	10	8

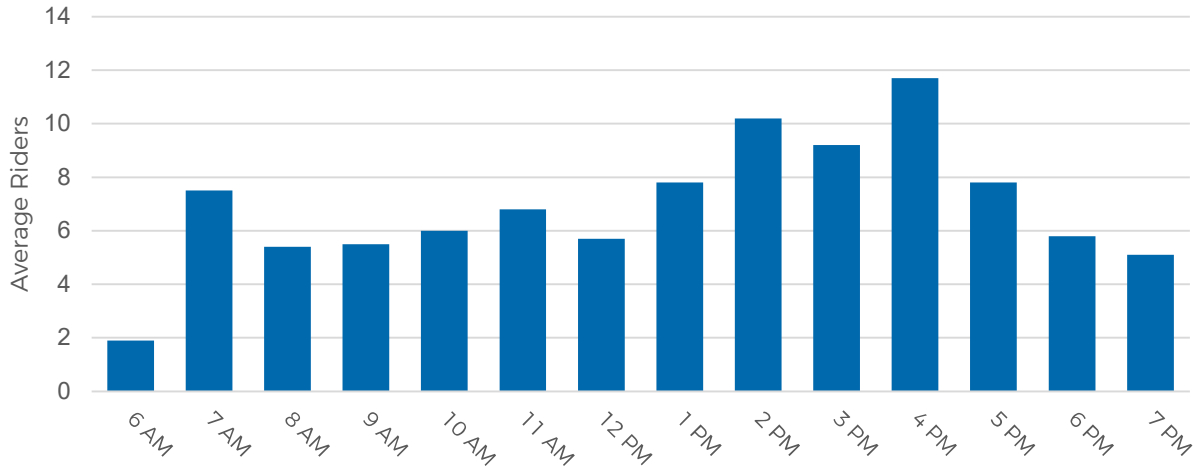
Figure 14 | Route 104 East Weekday Ridership by Stop



Ridership by Trip

Route 104's ridership by trip peaks during the AM and PM peak. Ridership peaks in the morning at 7AM with 8 riders, and in the afternoon at 4PM with 12 riders. Otherwise, most trips have about 6 riders across the day. In the early morning there are two riders per trip. Generally, the service span is a good match for the ridership pattern.

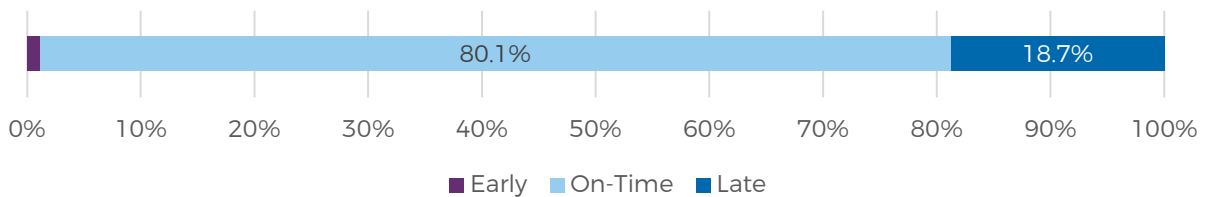
Route 104 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 104 East barely fails to meet the minimum standard, with an 87.9% OTP. Buses arrive late at timepoints 11% of the time and arrive early 1.4% of the time. 33% of buses arrived late when returning to Forden Station.



Stop Spacing

0.47

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.47 miles apart on average. In other words, there are about 2.1 stops per mile. Stop density is low compared to the other routes in the system. There may exist opportunities to add stops along Market Street and Military Cutoff Road to reduce walk distances for some riders.

Transfer Opportunities

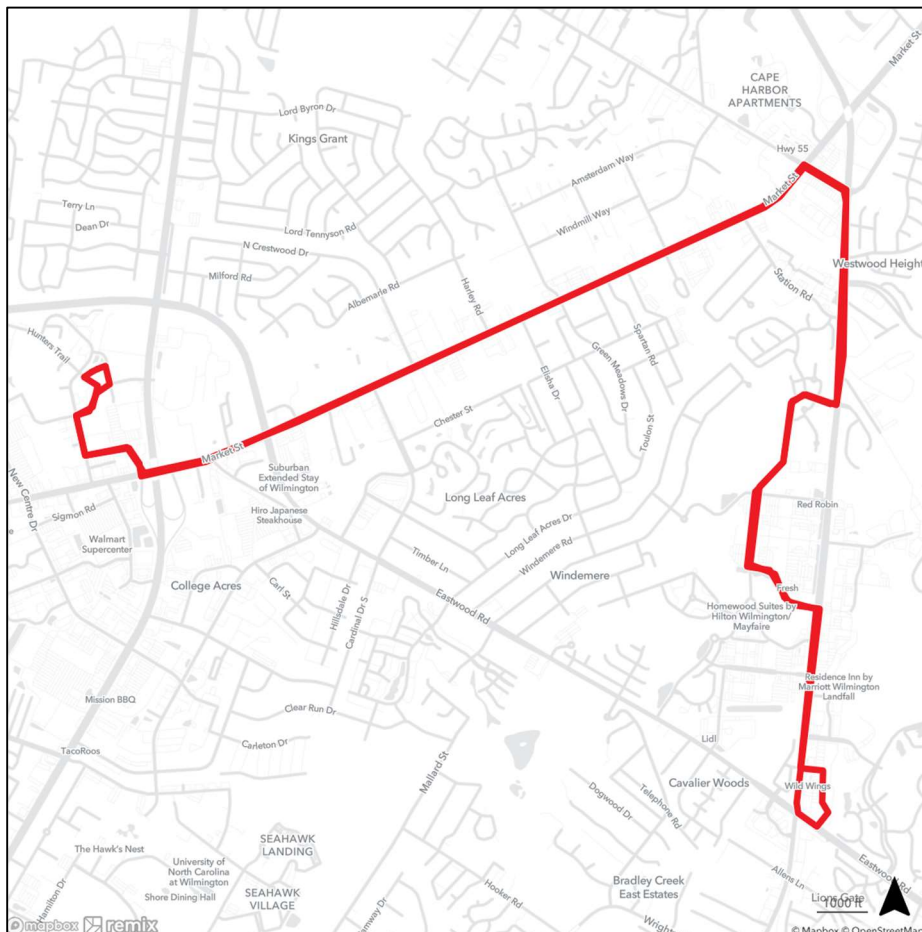
Transfer to Seahawk Shuttles is available at Bear Hall.

Opportunities to Strengthen Route 104 East

Opportunities to strengthen Route 104 East are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Provide bi-directional service wherever possible:** The lack of bidirectionality makes the route difficult to understand and forces some riders to make a longer walk in only one direction. Route 104 should operate along the same streets in both directions wherever possible.
- **Eliminate service in areas with duplicative service or low productivity (UNCW campus and Eastwood Road):** Route 104 duplicates service between Forden Station and the UNCW campus, a connection also provided by Route 103 and the Seahawk Shuttles. Ridership on Eastwood Road is very low; most stops have zero boardings.
- **Eliminate entirely and replace with RideMICRO Zone 2:** Route 104 had the lowest ridership performance by most metrics, on weekdays and Saturdays.

Figure 15 | A redesigned Route 104 could operate between the Forden Station and the intersection of Eastwood Road and Military Cutoff Road via Market Street in both directions. This service design would better serve riders along these important retail and commercial corridors. Service could be integrated with a redesigned/extended Oleander Drive route to enable a transfer to another hourly route at the intersection of Military Cutoff Road and Eastwood Road. Seahawk Shuttle routes could be reconfigured to better serve local trips in the vicinity of Forden Station and UNCW.

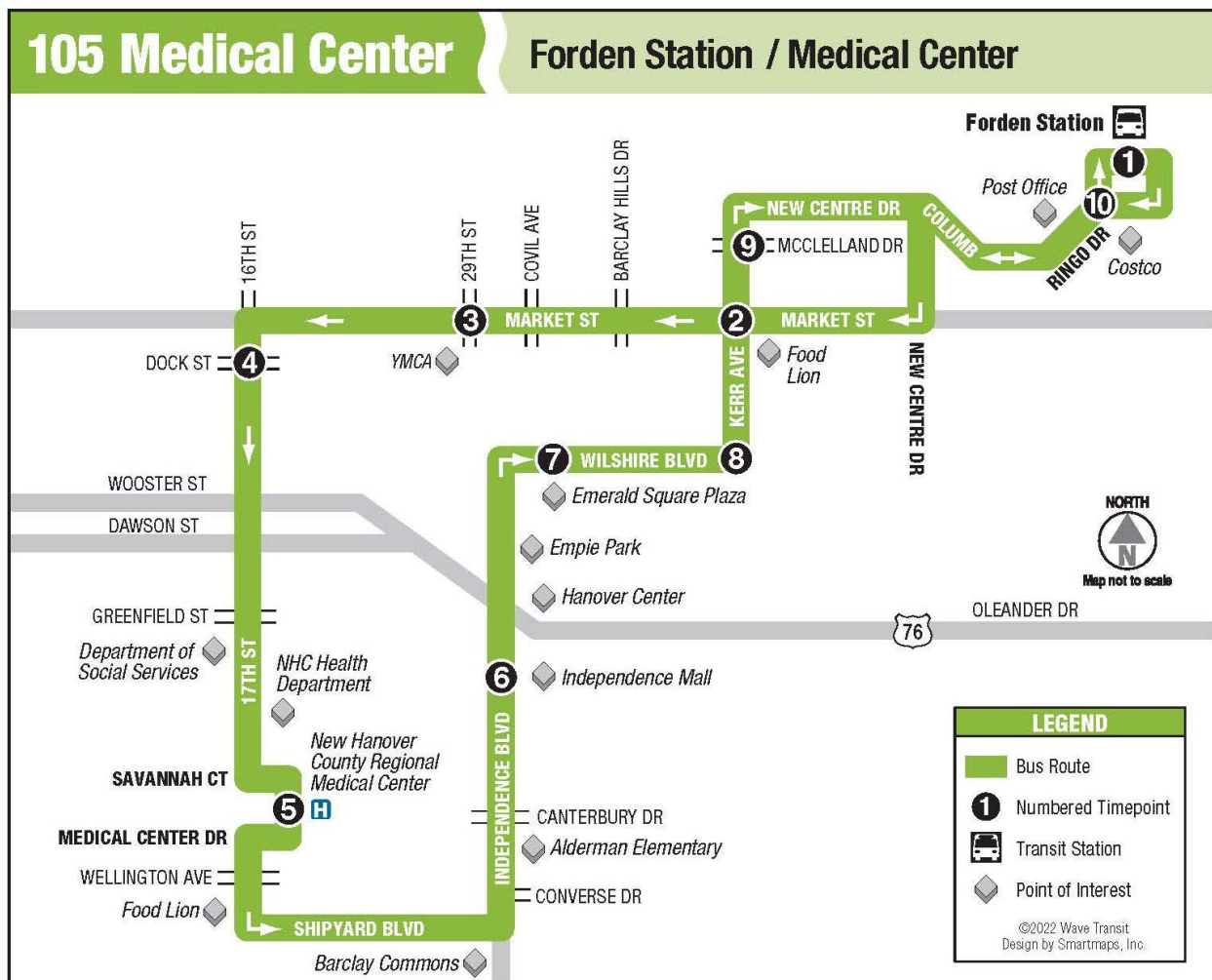


ROUTE 105 MEDICAL CENTER

Service Overview

Route 105 Medical Center is a fixed-route service that operates seven days a week out of Forden Station via Market Street, 17th Street, and Independence Boulevard. It plays an important role by connecting a major transportation center to key locations including the Medical Center, independence mall, and shopping, retail, and housing destinations along Kerr Avenue and Wilshire Blvd. The major opportunities for Route 105 Medical Center are to provide bi-directional service, coordinate headways to improve effective frequencies between major destinations, and improve service span and frequencies.

Figure 16 | Route 105 Route Map



Route Alignment

Route 105 Medical Center operates out of Forden Station via Market Street, 17th Street, Independence Boulevard, and South Kerr Avenue. The route is a one-directional loop, and duplicates service along the following roads:

- Market Street, with Route 108.

- South 17th Street, with Route 210.
- Independence Boulevard, with Route 106.

Service Span and Frequency

Route 105 Medical Center operates seven days a week. Like most routes in Wave’s network, Route 105 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. It operates at 60-minute headways during all times.

Figure 17 | Route 105 Medical Center Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		30 min
Saturday																		40 min
Sunday																		60 min

Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 105 Medical Center has average ridership with 135 boardings per average weekday – 7% of daily systemwide ridership. Compared to weekday ridership, Saturday ridership is 70% and Sunday ridership is 44%. Its productivity is also relatively high, with 9.6 riders per hour on weekdays, 9.5 riders per hour on Saturdays, and 7.4 riders on Sundays.

High ridership segments include S 17th St south of Greenfield St (31 boardings), and Market St east of Wayne Dr (22 boardings). High ridership stops include:

- Forden Station, with 24 boardings.
- 16th St / Greenfield St, with 10 boardings, located near the Social Security, Social Services, and Housing Authority government buildings.
- Independence Blvd / Park Ave, with 8 boardings, located near Stein Mart.
- New Hanover Regional Medical Center, with 6 boardings.

Figure 18 | Route 105 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	135 (5/12)	95 (5/12)	59 (5/11)
<i>Riders Served per Hour</i>	9.6 (4/12)	9.5 (5/12)	7.4 (5/11)
<i>Vehicle Revenue Hours</i>	14	10	8

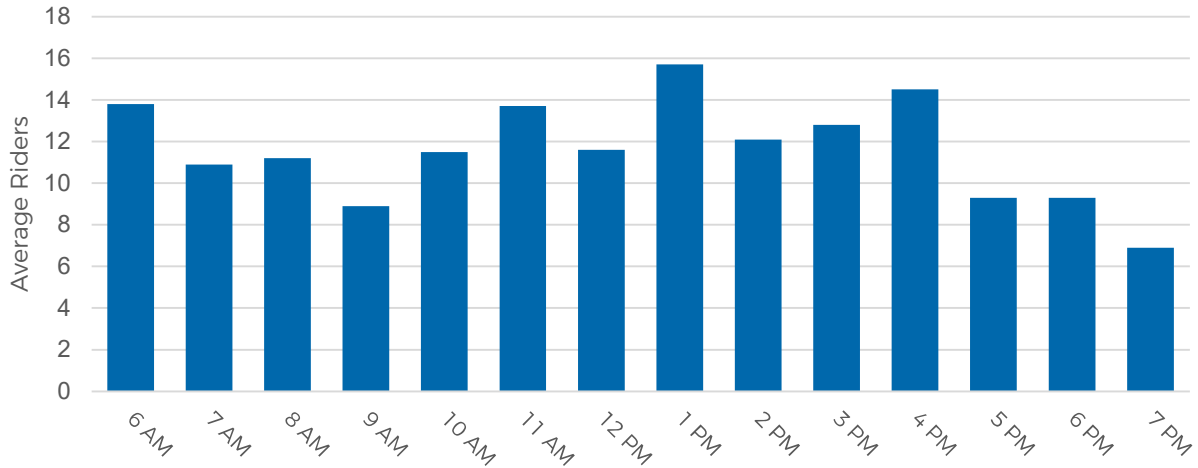
Figure 19 | Route 105 Medical Center Weekday Ridership by Stop



Ridership by Trip

Route 105's ridership by trip broadly fluctuates throughout the day. Ridership averages around 12 riders per trip until 5PM, where ridership falls to about 8 riders per trip until the end of the service span. Route 105 would likely benefit from increased service span in the morning at 5AM, since ridership at 6AM is high.

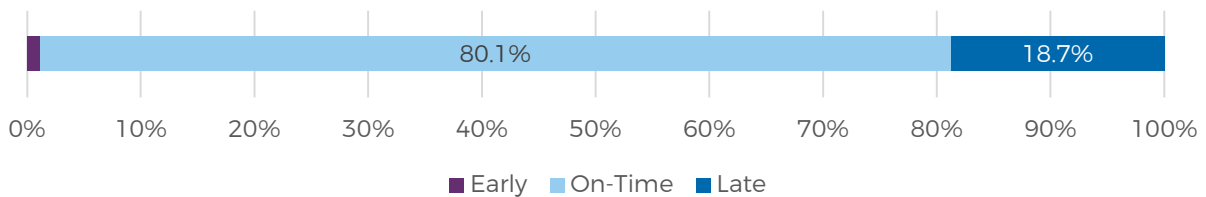
Route 105 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 105 Medical Center does not meet the minimum standard, with an OTP of 84%. Buses arrive at timepoints late 15% of the time, and early 0.5% of the time. Buses arrived late most often at timepoints around Independence Mall and at the end of line at Forden Station.



Stop Spacing

0.29

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.29 miles apart on average. In other words, there are about 3.5 stops per mile. Stops along Route 202’s alignment are well-spaced; however, there may exist an opportunity to add stops along Independence Boulevard to reduce walking distances for some riders.

Transfer Opportunities

Transfer to Route 202 is available at Independence Blvd and Shipyard Blvd or Oleander Dr, and on S 16th St between Castle St and Dawson St. Transfer to Routes 205 and 210 are available along S 17th St. Transfer to Route 206 is available beginning on Shipyard Blvd. However, wait times for transfers at these locations may be long because services are uncoordinated.

Opportunities to Strengthen Route 105 Medical Center

Opportunities to strengthen Route 105 Medical Center are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Provide bi-directional service wherever possible:** The lack of any bidirectionality makes the route difficult to understand and forces some riders to make a longer walk in only one direction. Route 105 should operate along the same streets in both directions wherever possible.
- **Coordinate Headways and Route Alignments of all Wave services on Market Street west of College Road:** Route 101, Route 106, Route 105 westbound, and Route 108 eastbound provide very similar service on Market Street east of Barclay Hills Drive. Operating these routes along the same streets and coordinating departure times to provide more frequent effective headways to and from Forden Station will improve the quality of service along Market Street.
- **End route at Medical Center:** Routes should be anchored at high ridership locations whenever possible, and the Medical Center acts as a strong ridership destination.
- **Make weekday service more frequent:** On weekdays, Route 105 could support 30-minute headways from 8AM to 8PM. On Saturdays, Route 105 could also support 30-minute headways across the entire service span.
- **Begin service earlier :** Route 105 would likely benefit from increased service span in the morning at 5AM, since ridership at 6AM is high.

Figure 20 | A redesigned Route 105 could operate between Forden Station and the Medical Center via Wrightsville Avenue, Randall Parkway, and Kerr Avenue in both directions. This service design would better serve riders along these important residential and commercial corridors. Service along Independence Boulevard and Market Street is already provided by other routes and service along Wilshire Boulevard could be within walking distance of redesigned Route 202 and Seahawk Shuttle service.

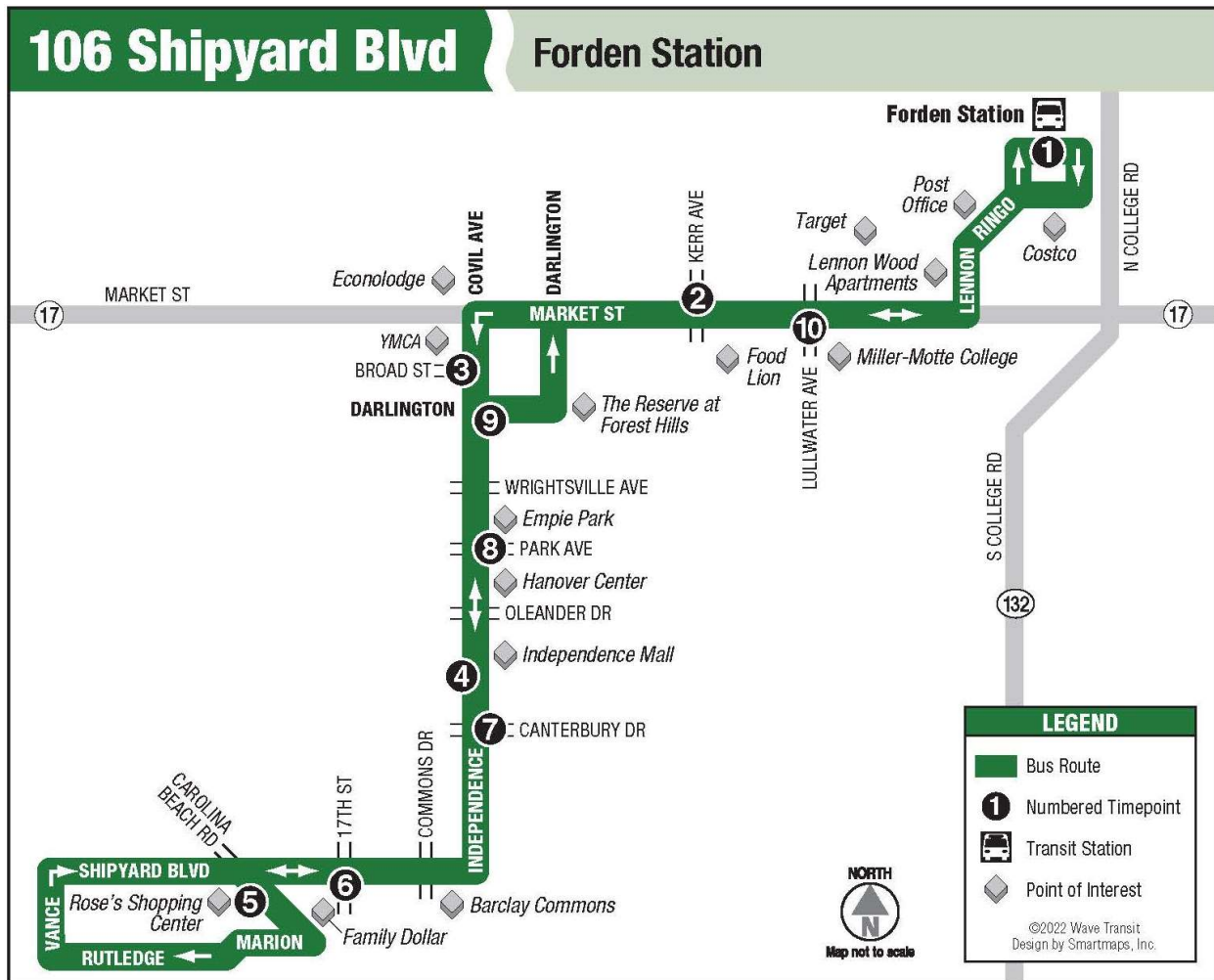


ROUTE 106 SHIPYARD BOULEVARD

Service Overview

Route 106 Shipyard Boulevard is a fixed-route service that operates seven days a week out of Forden Station via Market Street, Independence Drive, and Shipyard Boulevard. It plays an important role by connecting a major transportation center with major retail and commercial destinations on Shipyard Boulevard, Independence Blvd, and Market Street. The major opportunities for Route 106 Shipyard Boulevard are to coordinate headways to improve frequency on Market Street, end the route at Medical Center, and increase overall frequency.

Figure 21 | Route 106 Route Map



Route Alignment

Route 106 Shipyard Boulevard operates out of Forden Station via Market Street, Independence Drive, and Shipyard Boulevard. The route is mostly bi-directional, but duplicates service on Independence Boulevard with Route 105.

Service Span and Frequency

Route 106 Shipyard Boulevard operates seven days a week. Like most routes in Wave’s network, Route 106 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. It operates at 60-minute headways during all times.

Figure 22 | Route 106 Shipyard Boulevard Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday		60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min
Saturday				60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min				60 min
Sunday					60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min				60 min

Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 106 Shipyard Boulevard has below average ridership with 95 boardings per average weekday – 5% of daily systemwide ridership. Compared to weekday ridership, Saturday ridership is 68% and Sunday ridership is 42%. Its productivity is also relatively low, with 6.8 riders per hour on weekdays, 6.5 riders per hour on Saturdays, and 5 riders on Sundays.

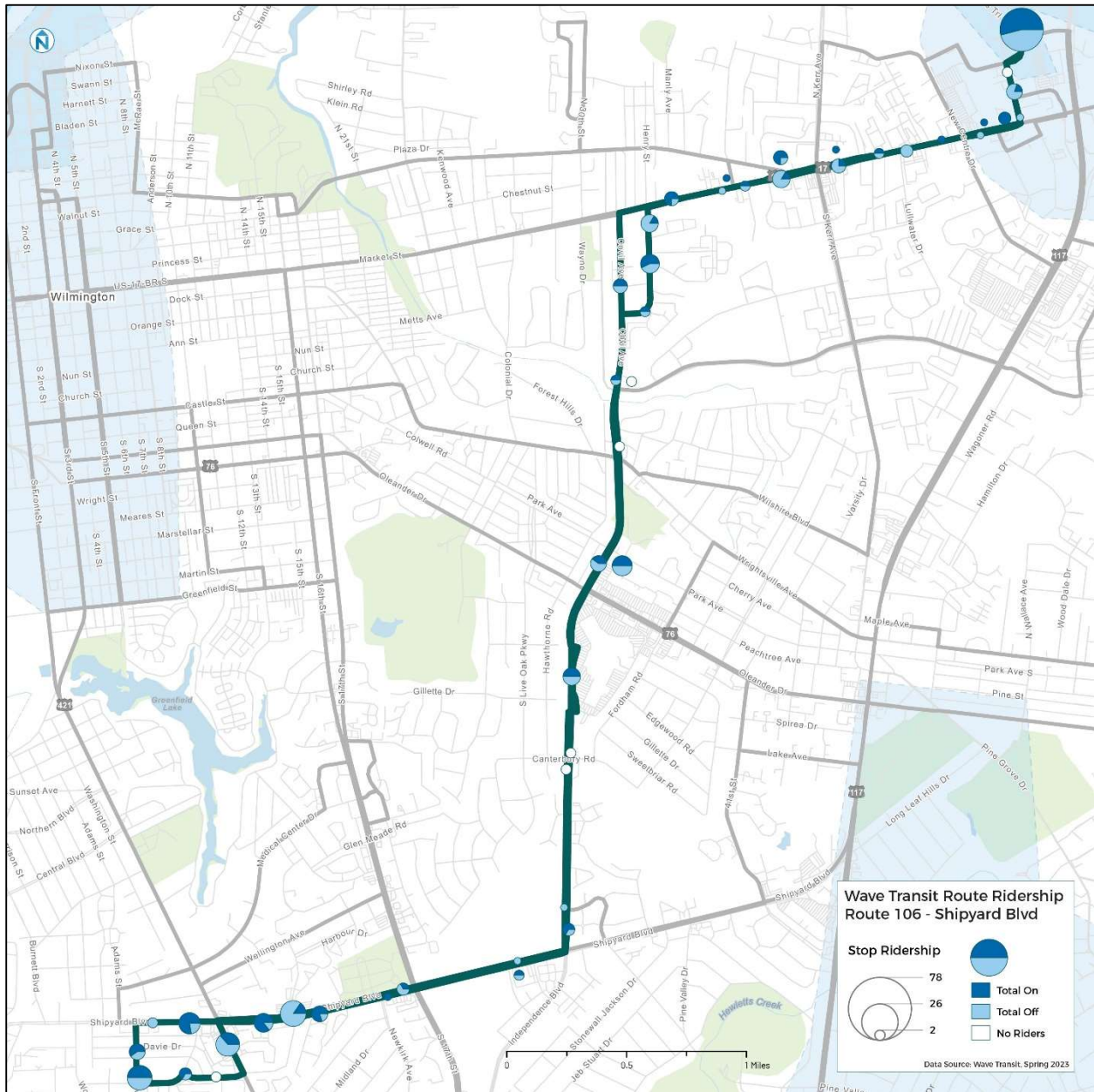
The highest ridership segment is west of S 17th Street, with 36 boardings, and Market St, with 18 boardings. The highest ridership stops include:

- Forden Station, with 20 boardings.
- Two stops near Carolina Beach Rd / Shipyard Blvd, with total 13 boardings, located near restaurants and shopping centers.
- Rutledge Dr / Worth Dr, with 6 boardings.

Figure 23 | Route 106 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	95 (9/12)	65 (10/12)	40 (6/11)
<i>Riders Served per Hour</i>	6.8 (9/12)	6.5 (10/12)	5 (6/11)
<i>Vehicle Revenue Hours</i>	14	10	8

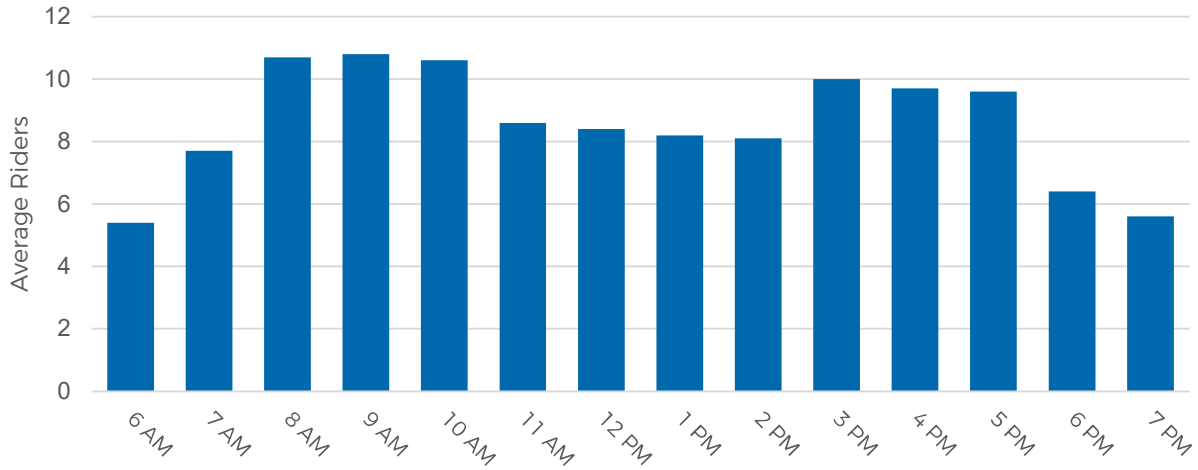
Figure 24 | Route 106 Shipyard Boulevard Weekday Ridership by Stop



Ridership by Trip

Route 106's ridership by trip has two identifiable peaks – from 8AM to 11AM, and from 3PM to 5PM, trips average 10 riders. Around midday, most trips average 8 riders. In the early morning and evening, trips average 6 riders. The service span is a good match for the ridership pattern.

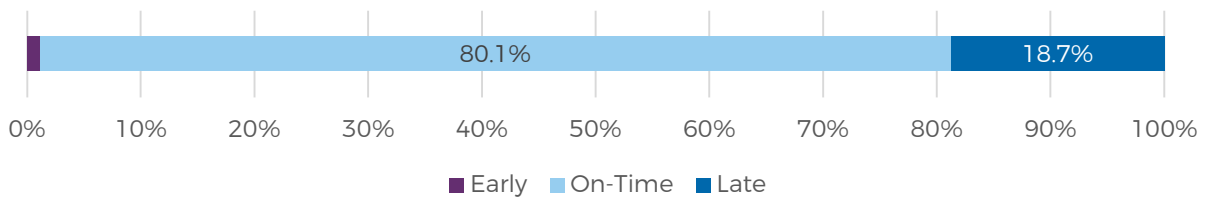
Route 106 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 106 Shipyard Boulevard exceeds the minimum standard, with an OTP of 90%. Buses often arrive early at the penultimate timepoint at Market St / Lullwater Dr, but 24% of buses arrive late when returning to Forden Station.



Stop Spacing

0.34

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.34 miles apart on average. In other words, there are about 3 stops per mile. Stop density is moderate compared to the other routes in the system. There may exist an opportunity to add stops along Independence Boulevard to reduce walking distances for some riders.

Transfer Opportunities

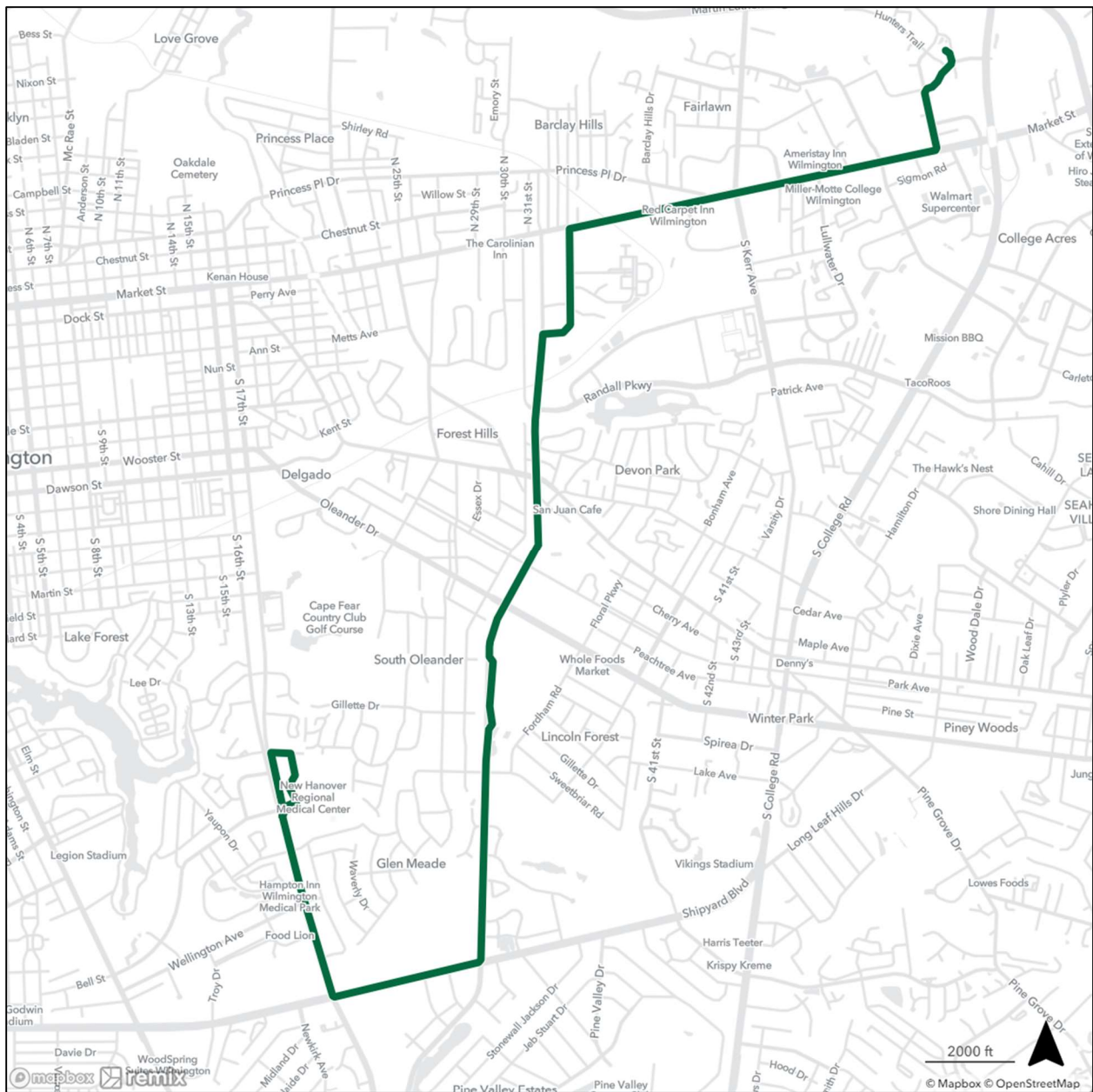
Transfer to 205 and 201 are available at Carolina Beach Rd / Shipyard Blvd. Transfer to Route 105 is available along Shipyard Blvd and Independence Blvd. Transfer to Route 202 is available on Independence Blvd at Oleander Dr or Shipyard Blvd. However, wait times for transfers at these locations may be long because services are uncoordinated.

Opportunities to Strengthen Route 106 Shipyard Boulevard

Opportunities to strengthen Route 106 Shipyard Boulevard are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Coordinate headways and route alignments of all Wave services on Market Street west of College Road:** Route 101, Route 106, Route 105 westbound, and Route 108 eastbound provide very similar service on Market Street east of Barclay Hills Drive. Operating these routes along the same streets and coordinating departure times to provide more frequent effective headways to and from Forden Station will improve the quality of service along Market Street.
- **End route at Medical Center:** Routes should be anchored at high ridership locations whenever possible, and the Medical Center acts as a strong ridership destination.
- **Add bus stops along Independence Boulevard:** Southbound, there are only 4 stops between Market Street and Oleander Drive, a 2-mile-long corridor. Infill stops could be added along this corridor to reduce walking distances for some riders.
- **Operate service every 30 minutes on weekdays:** There is sufficient underlying demand for Route 106 to support 30-minute service all day on weekdays.
- **Operate bidirectional service on Darlington Ave:** If operationally feasible, Route 106 should operate in both directions on Darlington Ave to reduce walking distances for riders and make service easier to understand.

Figure 25 | A redesigned Route 106 could provide more bidirectional service on Darlington Avenue and terminate at the Medical Center. Service between the Medical Center and Carolina Beach Road could be provided by other routes.

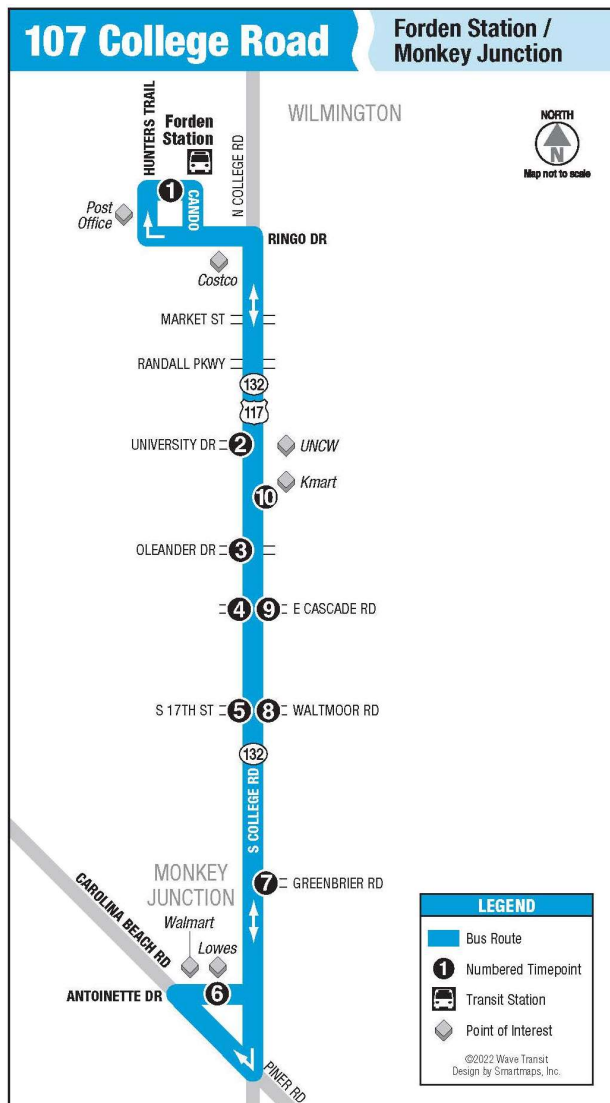


ROUTE 107 COLLEGE ROAD

Service Overview

Route 107 College Road is a fixed-route service that operates seven days a week between Forden Station and Monkey Junction via College Road. It plays an important role by serving a critical transit corridor and connecting two transportation hubs. The major opportunities for Route 107 College Road are to more directly serve higher ridership locations that would be difficult to reach via existing pedestrian infrastructure, and to coordinate headways with other routes to improve frequency along College Road.

Figure 26 | Route 107 Route Map



Route Alignment

Route 107 College Road operates between Forden Station and Monkey Junction via College Road. Route 107 is a bi-directional route that duplicates service along College Road with Route 103.

Service Span and Frequency

Route 107 College Road operates seven days a week. Like most routes in Wave’s network, Route 107 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. It operates at 60-minute headways during all times.

Figure 27 | Route 107 College Road Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency	
Weekday		60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min
Saturday				60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min				60 min	60 min
Sunday					60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min				60 min	60 min

Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 107 College Road has below average ridership with 95 boardings per average weekday – 5% of daily systemwide ridership. Compared to weekday ridership, Saturday ridership is 72% and Sunday ridership is 38%. Its productivity is also relatively low, with 6.8 riders per hour on weekdays, 6.8 riders per hour on Saturdays, and 4.5 riders on Sundays.

The highest ridership segment is located on College Rd between Oleander Dr and New Centre Dr, with 23 boardings, with very few boardings to the south. High ridership stops include:

- Forden Station and Monkey Junction, with 32 and 30 boardings, respectively.
- College Rd / Randall Pkwy, with 5 boardings, located at a shopping plaza.
- College Rd / Wilshire Blvd, with 5 boardings, located near Harris Teeter among other shopping locations.

Figure 28 | Route 107 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	95 (9/12)	68 (8/12)	36 (10/11)
<i>Riders Served per Hour</i>	6.8 (9/12)	6.8 (7/12)	4.5 (10/11)
<i>Vehicle Revenue Hours</i>	14	10	8

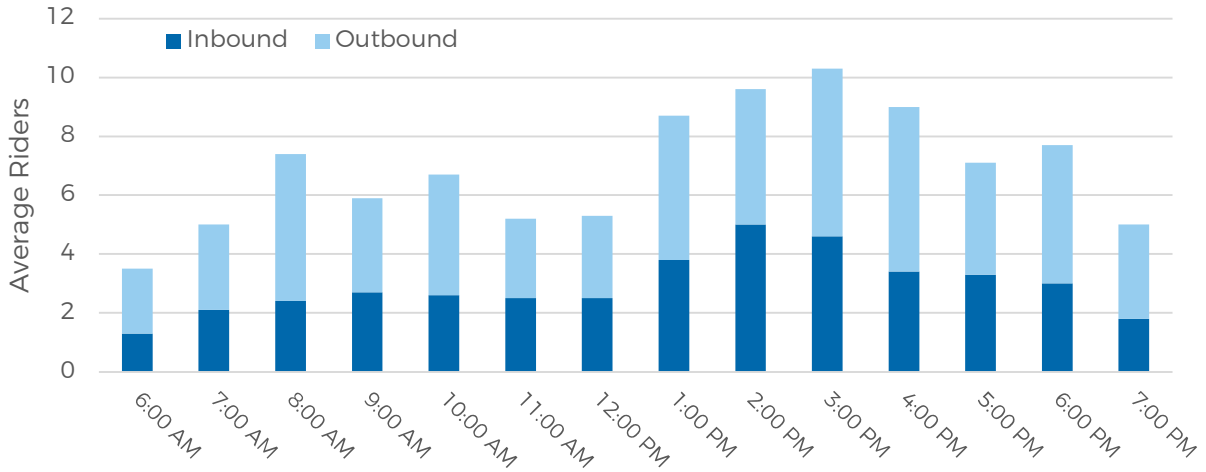
Figure 29 | Route 107 College Road Weekday Ridership by Stop



Ridership by Trip

Route 101's ridership by trip peaks at 8AM and in the afternoon from 1PM to 4PM where trips average 5 riders. Otherwise, most trips have about 3-4 riders across the day. Southbound trips have somewhat higher ridership than northbound bound trips. The service span fits ridership patterns.

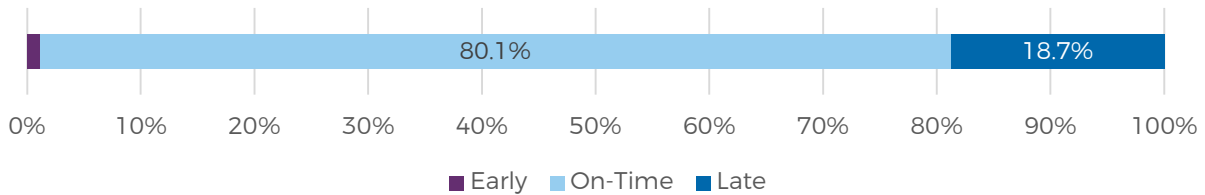
Route 107 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 107 College Road fails to meet minimum standards, with an OTP of 79%. Buses arrive late at timepoints 20% of the time and arrive early 0.9% of the time. Buses arrived late at least 33% of the time at three of the five southbound timepoints, and 26% of the time at the end of line at Forden Station.



Stop Spacing

0.52

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.52 miles apart on average. In other words, there are about 1.9 stops per mile. Stop density is the lowest in the system. There may exist an opportunity for additional stops along College Road to reduce walking distances for some riders.

Transfer Opportunities

Transfer is available to Route 103 on College Rd between Oleander Dr and Wrightsville Ave, but it requires walking up to a quarter mile. However, wait times for transfers at these locations may be long because services are uncoordinated.

Opportunities to Strengthen Route 107 College Road

Opportunities to strengthen Route 107 College Road are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Add infill stops along College Road:** Route 107 has an average of 0.52 miles between stops, the longest average spacing of all routes in the network. Developing stop spacing standards and adding stops can improve ridership, particularly since the pedestrian infrastructure on College Road discourages walking. Key stop locations include UNCW campus, Shipyard Boulevard, and Oleander Drive.
- **Enter UNCW campus to provide safer access to UNCW Campus:** Currently, southbound riders must cross College Road to enter campus. Rerouting the alignment to serve Wagner Road improves pedestrian safety and may allow the Teal Shuttle to better operate as a local circulator.
- **More directly serve Long Leaf Mall:** Currently, walking access the southbound alignment is unable to stop at the New Hanover County Senior Resource Center, and the northbound stop forces pedestrians to cross College Road without a signalized intersection and crosswalk. Rerouting the alignment to serve Shipyard Boulevard improves pedestrian safety.
- **Reconfigure service together with Route 103 Oleander East to improve effective frequencies north of Oleander Drive.** College Road could support more frequent service north of Oleander Drive. To better match service frequencies to demand, Route 103 could be redesigned to operate between the Medical Center and Forden Station via Shipyard Boulevard, South 41st Street, and Oleander Drive. This service design would provide 30-minute headways together with Route 107 north of Oleander Drive and improve access along the higher demand College Road corridor.

Figure 30 | A redesigned Route 103 could be slightly realigned to provide front door service to major destinations that are difficult to access via transit: Long Leaf Mall and UNCW. These changes will improve access to transit and allow duplicative Seahawk Shuttle routes to be redesigned to operate more usefully as local circulators.



ROUTE 108 MARKET STREET

Service Overview

Route 108 Market Street is a fixed-route service that operates seven days a week between Forden Station and Padgett Station via Market Street and Randall Parkway. It plays an important role by serving the major residential and retail corridor of College Road and connecting two key transit hubs. The major opportunities for Route 108 Market Street are to provide bi-directional service on Market Street, reduce circuitousness south of Forden Station, and coordinate headways to improve effective frequency along the corridor.

Figure 31 | Route 108 Route Map



Route Alignment

Route 108 Market Street operates between Forden Station and Padgett Station via Market Street and Randall Parkway. Route 108 operates bi-directional, unique, and easy to understand service west of Covil Avenue. Service on Market Street east of Covil Avenue is duplicated with Route 105 east of South 17th Street. Service on New Centre Drive is duplicated by Route 103. Route 108 operates circuitously to serve major retail destinations south of Forden Station.

Service Span and Frequency

Route 108 Market Street operates seven days a week. Like most routes in Wave’s network, Route 108 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. On weekdays during peak hours (6AM to 6PM), the route runs at 30-minute headways. Otherwise, it operates at 60-minute headways.

Figure 32 | Route 108 Market Street Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday		30 min	30 min	30 min	30 min	30 min	30 min	30 min	30 min	30 min	30 min	30 min	30 min	60 min	60 min	60 min	60 min	
Saturday				40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min				
Sunday					60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min	60 min					

Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 108 Market Street has above average ridership with 301 boardings per average weekday – 16% of daily systemwide ridership. Compared to weekday ridership, Saturday ridership is 48% and Sunday ridership is 27%. Its productivity is also relatively high, with 11.6 riders per hour on weekdays, 14.5 riders per hour on Saturdays, and 10.3 riders on Sundays.

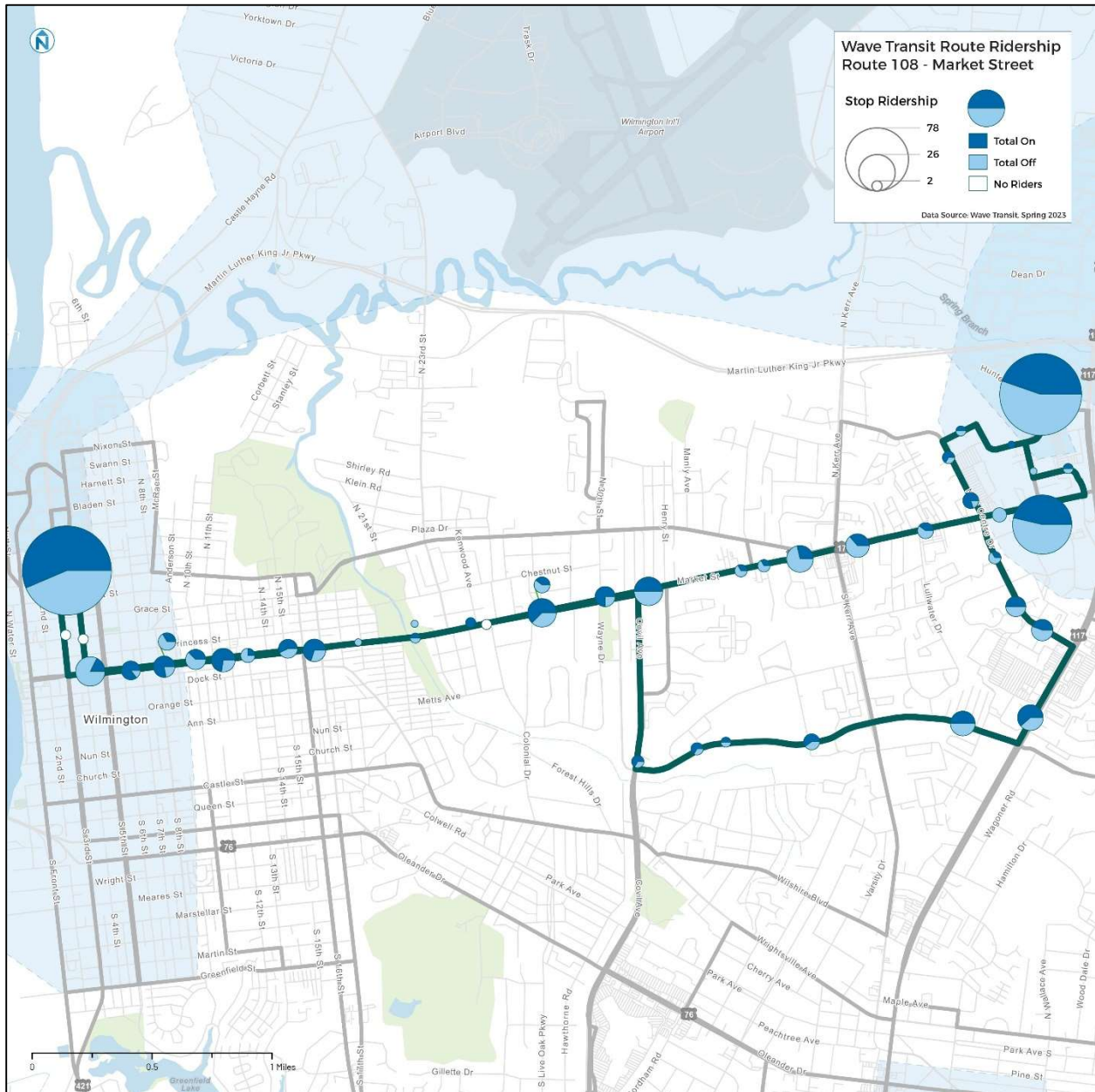
The highest ridership segments include Market St west of 17th St (41 boardings), and between Darlington Ave and Colonial Dr (25 boardings). The highest ridership stops include:

- Padgett and Forden Stations, with 88 and 59 boardings, respectively.
- Sigmon Rd at Walmart, with 32 boardings.
- Market St / Colonial Dr, with 10 boardings, located near several hotels and churches.
- Two stops at Randall Pkwy / College Rd, with a total of 14 boardings.

Figure 33 | Route 108 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	301 (1/12)	145 (1/12)	82 (1/11)
<i>Riders Served per Hour</i>	11.6 (1/12)	14.5 (1/12)	10.3 (1/11)
<i>Vehicle Revenue Hours</i>	26	10	8

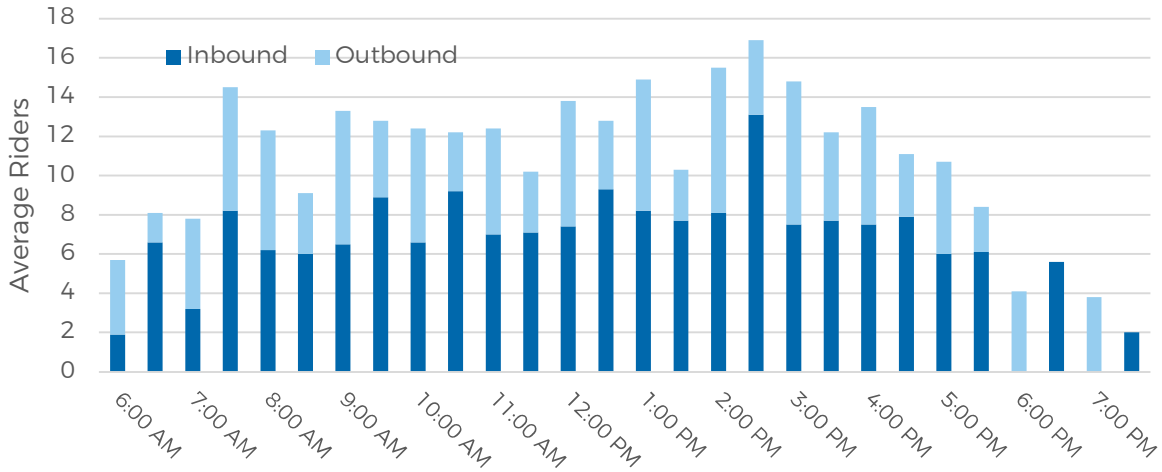
Figure 34 | Route 108 Market Street Weekday Ridership by Stop



Ridership by Trip

Route 108's ridership by trip peaks in the morning at 7:30AM with 14 riders and at 2:30PM with 16 riders. Otherwise, most trips have about 12 riders across the day. In the early morning and evening, there are less than 5 riders per trip. Generally, the service span is a good match for the ridership pattern. Eastbound trips have higher ridership than westbound trips. Ridership at the top of the hour (10AM, 12PM, etc.) is generally higher than ridership at half hours (10:30AM, 12:30PM, etc.).

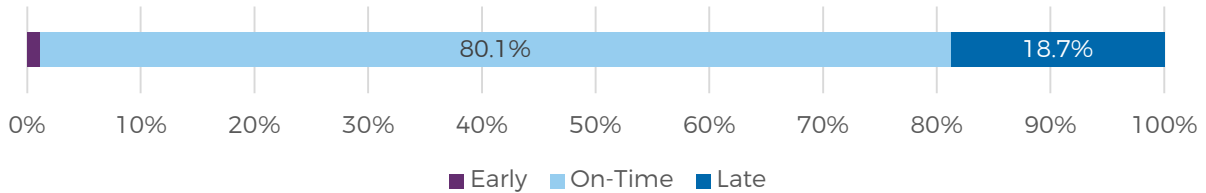
Route 108 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 108 Market Street exceeds the minimum standard, with an OTP of 90%. Buses arrive early and recover at Padgett Station, but are often late when returning to Forden Station.



Stop Spacing

0.31

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.31 miles apart on average. In other words, there are about 3.3 stops per mile. Stop density is moderate compared to the other routes in the system.

Transfer Opportunities

There are no major opportunities to transfer between routes outside of the transit centers.

Opportunities to Strengthen Route 108 Market Street

Opportunities to strengthen Route 108 Market Street are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Provide bi-directional service wherever possible:** The lack of bidirectionality east of Covil Avenue makes the route difficult to understand and forces some riders to make a longer walk in only one direction. Route 108 should operate along the same streets in both directions wherever possible.
- **Coordinate headways and route alignments of all Wave services on Market Street west of College Road:** Route 101, Route 106, Route 105 westbound, and Route 108 eastbound provide very similar service on Market Street east of Barclay Hills Drive. Operating these routes along the same streets and coordinating departure times to provide more frequent effective headways to and from Forden Station will improve the quality of service along Market Street.
- **Streamline route south of Forden Station:** Route 108 could operate more directly between Market Street and Forden Station to improve travel times and make the route easier to understand. Other routes such as an existing Seahawk Shuttle route could be redesigned to provide local circulator service in this area.

Figure 35 | A redesigned Route 108 could be redesigned to provide bi-directional service along Market Street and more direct service to and from Forden Station. These changes will improve access to transit and allow duplicative Seahawk Shuttle routes like Route 701 Blue and Route 712 Teal to be redesigned to operate more usefully as local circulators.

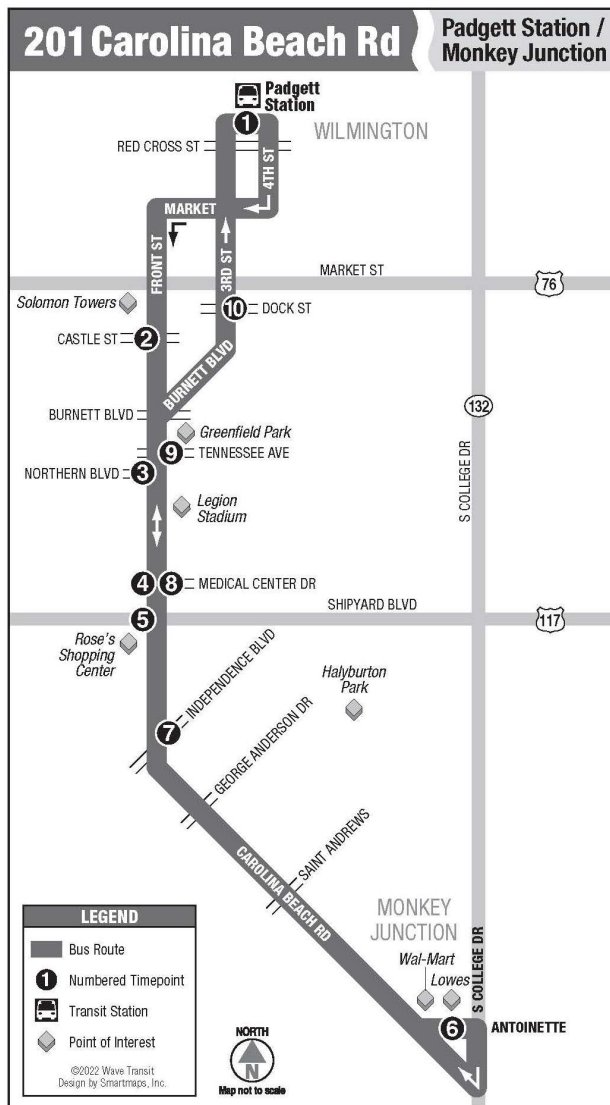


ROUTE 201 CAROLINA BEACH ROAD

Service Overview

Route 201 Carolina Beach Road is a fixed-route service that operates seven days a week between Padgett Station and Monkey Junction via Front Street and Carolina Beach Road. It plays an important role by serving a major transit corridor and connecting two key transit hubs. The major opportunity for Route 201 Carolina Beach Road is to provide bi-directional service north of Burnett Boulevard.

Figure 36 | Route 201 Route Map



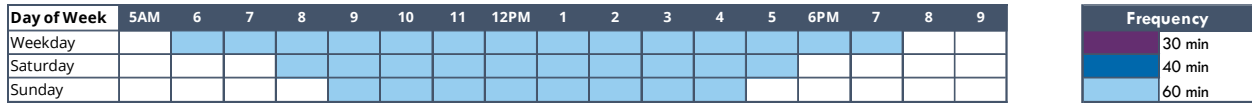
Route Alignment

Route 201 Carolina Beach Road operates between Padgett Station and Monkey Junction via Carolina Beach Road. North of Burnett Boulevard, Route 201 operates southbound via Front Street and northbound via 3rd Street.

Service Span and Frequency

Route 201 Carolina Beach Road operates seven days a week. Like most routes in Wave’s network, Route 201 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays.

Figure 37 | Route 201 Carolina Beach Road Service Span and Frequency



Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 201 Carolina Beach Road has above average ridership with 236 boardings per average weekday – 12% of daily systemwide ridership. Compared to weekday ridership, Saturday ridership is 47% and Sunday ridership is 25%. Its productivity is also relatively average, with 9.1 riders per hour on weekdays, 11.1 riders per hour on Saturdays, and 7.5 riders on Sundays.

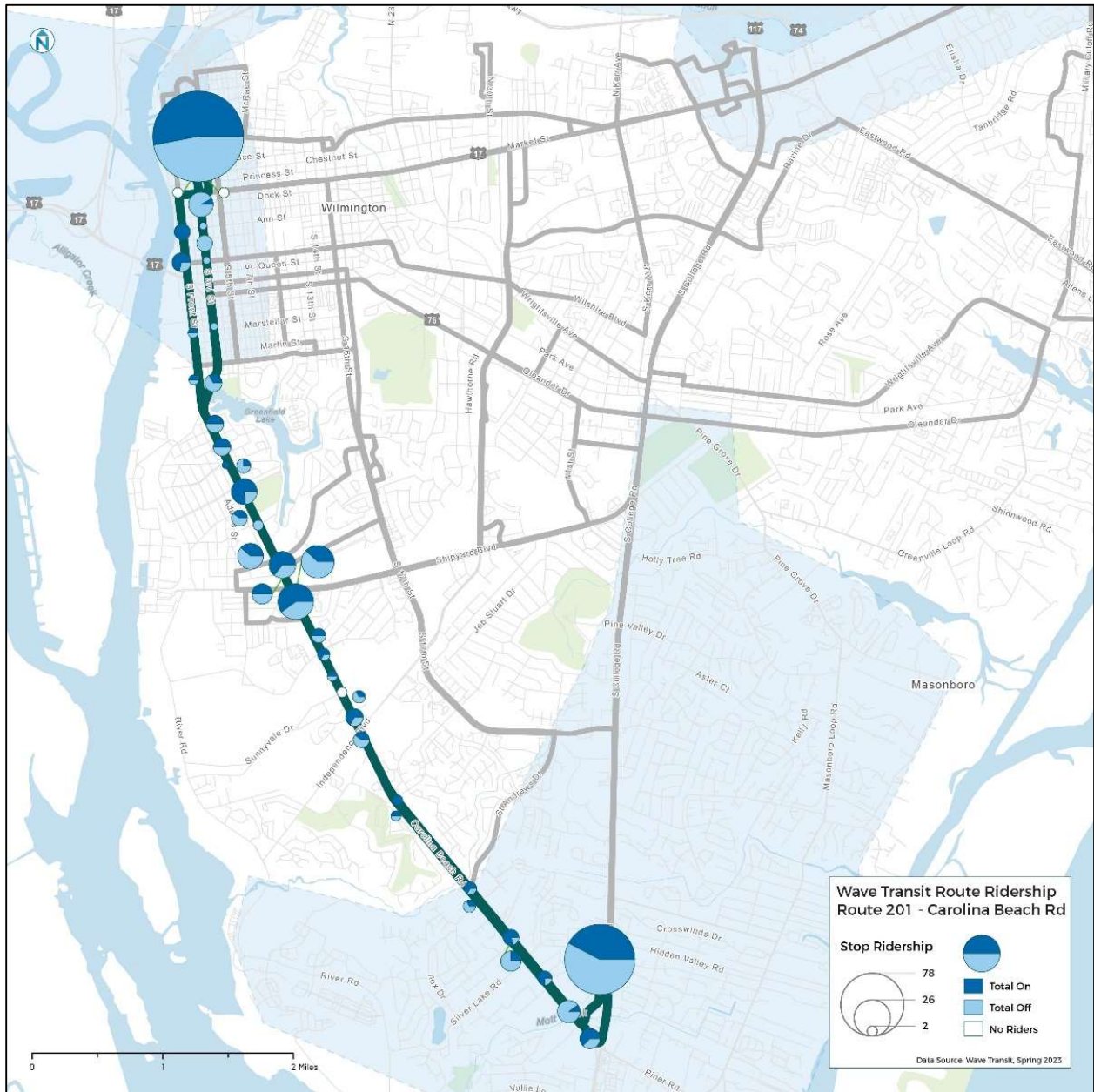
The highest ridership segments are on Carolina Beach Rd between Medical Center Dr and Holbrook Ave (with 41 boardings), and between South Carolina Ave and Southern Blvd (20 boardings). The highest ridership stops include:

- Padgett Station and Monkey Junction, with 86 and 41 boardings, respectively.
- Three stops at Carolina Beach Rd / Shipyard Blvd, with 32 total boardings, located near shopping centers, medical facilities, and restaurants.
- Carolina Beach Rd / Central Blvd, with 10 boardings, located near Legion Stadium.

Figure 38 | Route 201 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	236 (4/12)	111 (4/12)	60 (4/11)
<i>Riders Served per Hour</i>	9.1 (5/12)	11.1 (4/12)	7.5 (4/11)
<i>Vehicle Revenue Hours</i>	26	10	8

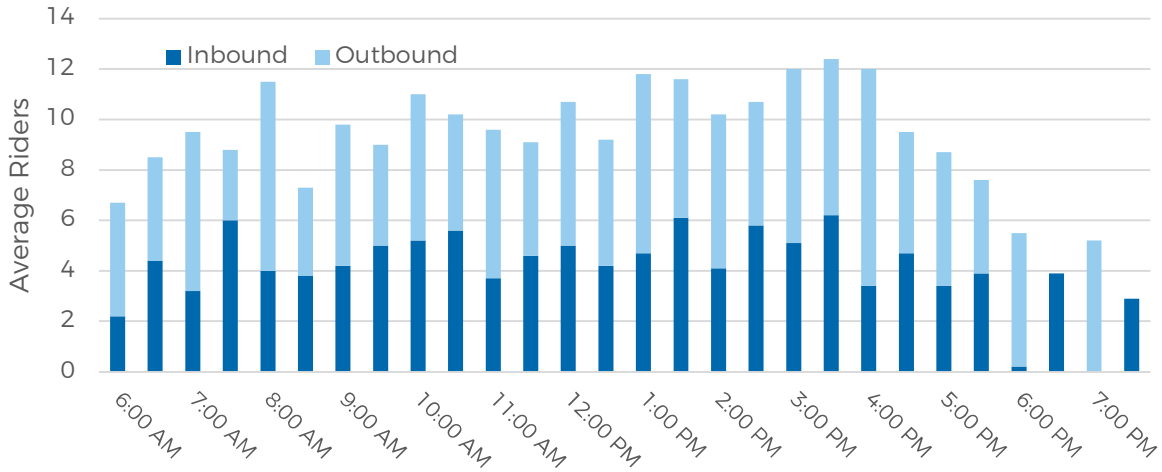
Figure 39 | Route 201 Carolina Beach Road Weekday Ridership by Stop



Ridership by Trip

In the Spring of 2023, Route 201 ran at 30-minute frequencies during peak hours. Ridership by trip is relatively level throughout the day. Ridership averages 9 per trip in the morning and 11 per trip in the afternoon. Trips in the early morning and evening see 6 riders or fewer. Generally, the service span is a good match for the ridership pattern. Southbound trips are somewhat more common in the morning, and northbound trips in the afternoon. Ridership at the top of the hour (10AM, 12PM, etc.) is usually higher than ridership at half hours (10:30AM, 12:30PM, etc.).

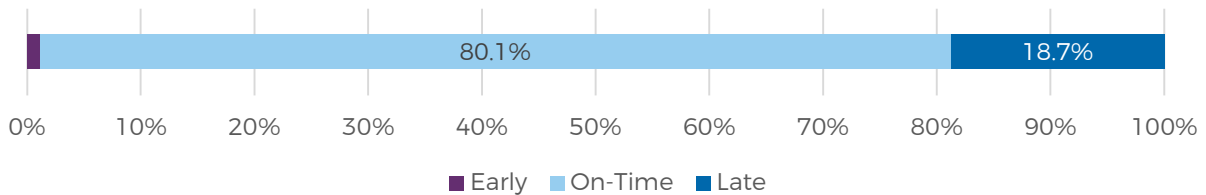
Route 201 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 201 Carolina Beach Road fails to meet the minimum standard, with an OTP of 87%. Buses arrive late at timepoints 12% of the time and arrive early 1.7% of the time. 35% of buses arrived late at Monkey Junction, and 50% of buses arrived late at Padgett Station.



Stop Spacing

0.40

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.40 miles apart on average. In other words, there are about 2.5 stops per mile. Stop density is low compared to the other routes in the system. There may exist opportunities for infill stops on Carolina Beach Road south of Independence Boulevard to reduce walking distances for some riders.

Transfer Opportunities

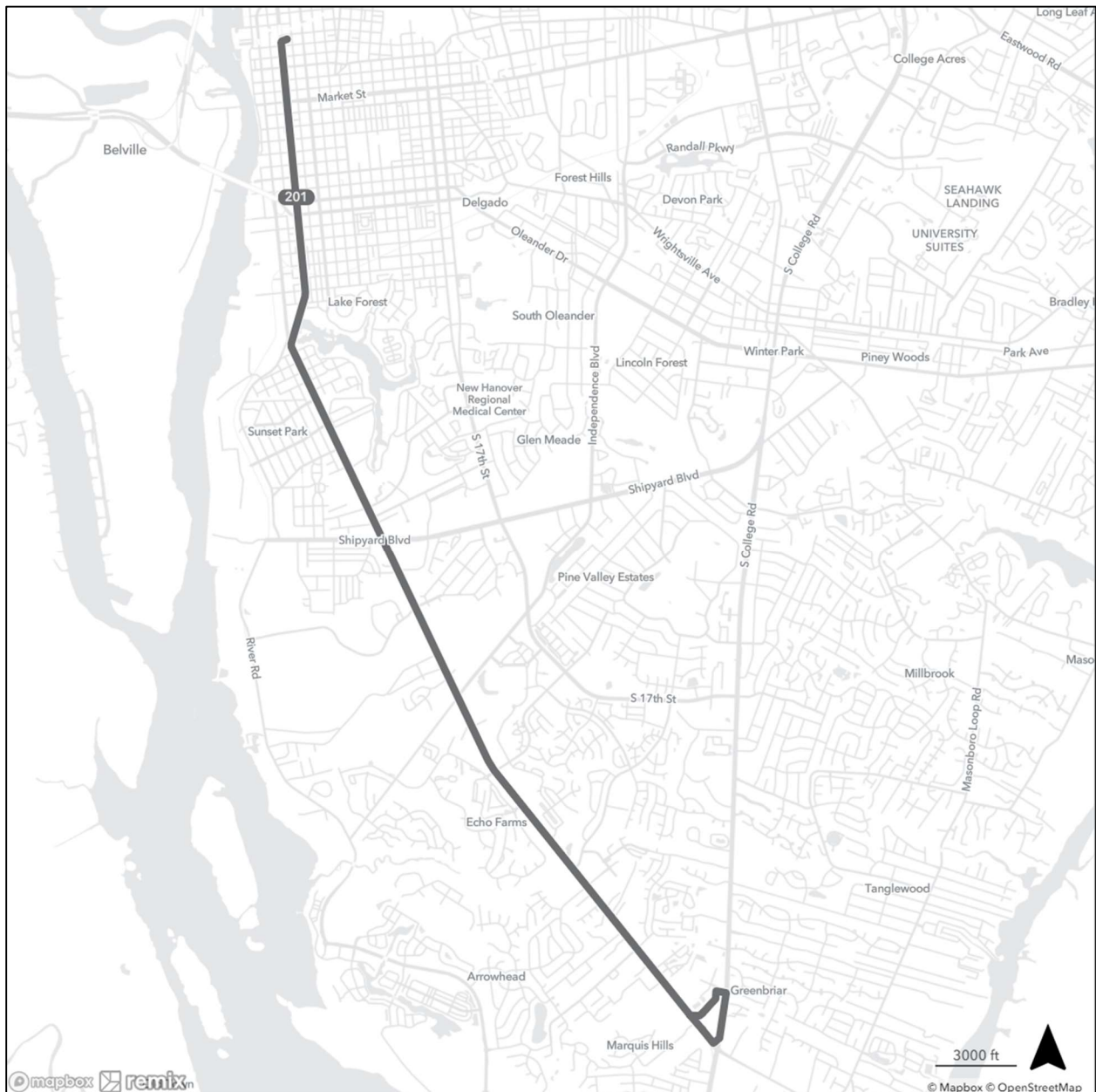
Transfer to 106 and 105 is available at Carolina Beach Rd / Shipyard Blvd. However, wait times for transfers at this location may be long because services are uncoordinated.

Opportunities to Strengthen Route 201 Carolina Beach Road

Opportunities to strengthen Route 201 Carolina Beach Road are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Provide bi-directional service wherever possible:** The lack of bidirectionality in downtown Wilmington makes the route difficult to understand and forces some riders to make a longer walk in only one direction. Route 201 could operate along 3rd Street in both directions. 3rd St has higher transit demand and capacity and creates a frequent transit corridor when combined with other routes.

Figure 40 | A redesigned Route 201 could operate bi-directional service along the entirety of its alignment. 3rd Street is a well-designed corridor for bi-directional service and features quality pedestrian facilities.

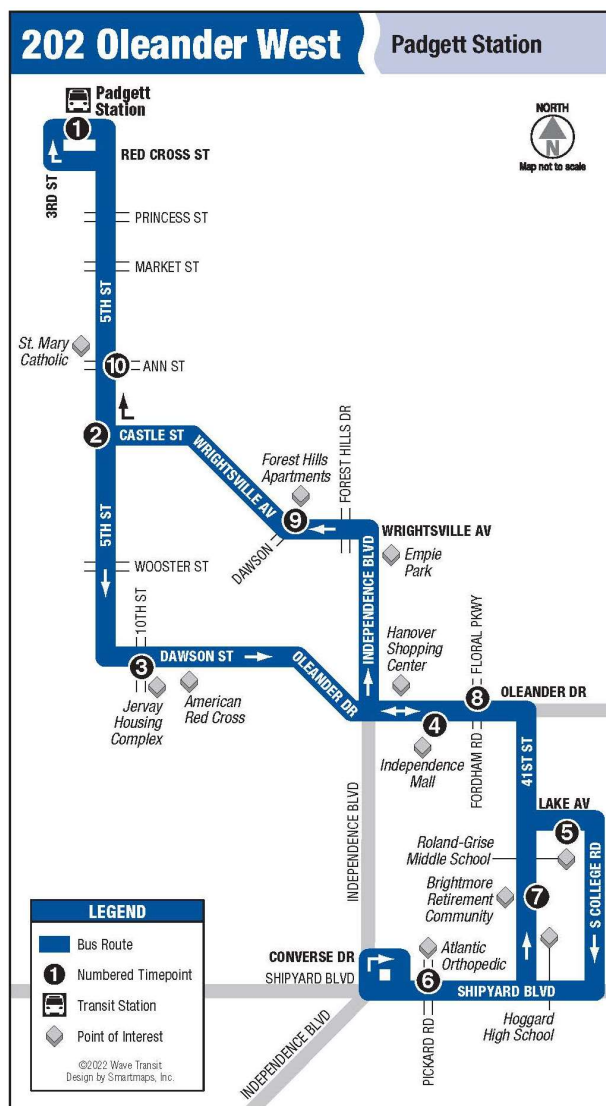


ROUTE 202 OLEANDER WEST

Service Overview

Route 202 Oleander West is a fixed-route service that operates seven days a week out of Padgett Station to Shipyard Boulevard and Independence Boulevard via Wrightsville Avenue and Oleander Drive. It plays an important role by connecting a major transit center to neighborhoods in downtown Wilmington and commercial destinations along Oleander Drive and Shipyard Boulevard. The major opportunities for Route 202 Oleander West are to provide bi-directional service, eliminate duplicative service, realign via higher ridership corridors, and redesign service with other routes to provide more direct service along Oleander Drive and Shipyard Boulevard.

Figure 41 | Route 202 Route Map



Route Alignment

Route 202 Oleander West operates out of Padgett Station via 5th Street, Oleander Drive, and Castle Street. The route is largely bi-directional, except for between Castle Street and Independence Boulevard, and between Lake Avenue and Shipyard Boulevard.

Service Span and Frequency

Route 202 Oleander West operates seven days a week. Like most routes in Wave’s network, Route 202 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. It operates at 60-minute headways during all times.

Figure 42 | Route 202 Oleander West Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		30 min
Saturday																		40 min
Sunday																		60 min

Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 202 Oleander West has average ridership with 120 boardings per average weekday – 16% of daily systemwide ridership. Compared to weekday ridership, Saturday ridership is 49% and Sunday ridership is 32%. Its productivity is also relatively average, with 8.6 riders per hour on weekdays, 5.9 riders per hour on Saturdays, and 4.8 riders on Sundays.

The highest ridership segment is on Oleander Dr between 41st St and Independence Blvd, with 33 boardings. The highest ridership stops include:

- Padgett Station, with 26 boardings.
- Two stops near Independence mall, with 18 total boardings.
- 41st St / Shipyard Blvd, with 6 boardings, near John T Hoggard High School.

There is low ridership on Oleander Drive between Independence Boulevard and 17th Street.

Figure 43 | Route 202 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	120 (6/12)	59 (11/12)	38 (7/11)
<i>Riders Served per Hour</i>	8.6 (6/12)	5.9 (11/12)	4.8 (7/11)
<i>Vehicle Revenue Hours</i>	14	10	8

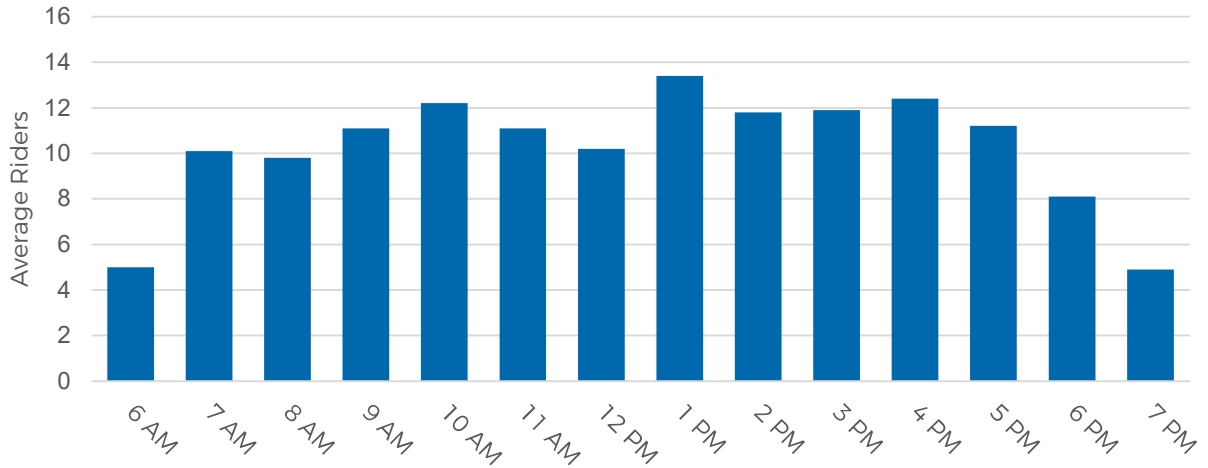
Figure 44 | Route 202 Oleander West Weekday Ridership by Stop



Ridership by Trip

Route 202's ridership by trip is relatively level throughout the day, averaging 11 riders per trip. The first and last trip of the day average 5 riders. The service span is a good match for the ridership pattern.

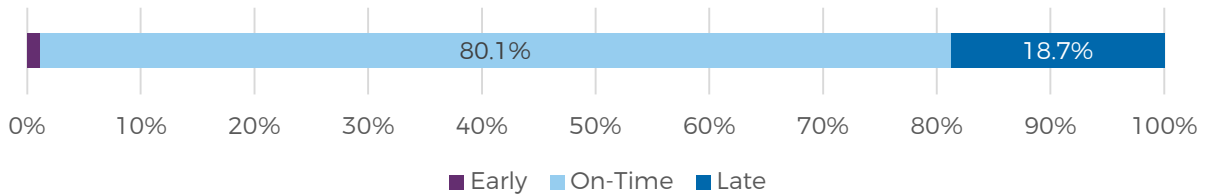
Route 202 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 202 Oleander West exceeds the target standard, with an OTP of 94%. On-time performance is lowest when returning to Padgett Station, where 21% of buses arrived late.



Stop Spacing

0.28

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.28 miles apart on average. In other words, there are about 3.6 stops per mile. Stops are well-placed along Route 202’s alignment.

Transfer Opportunities

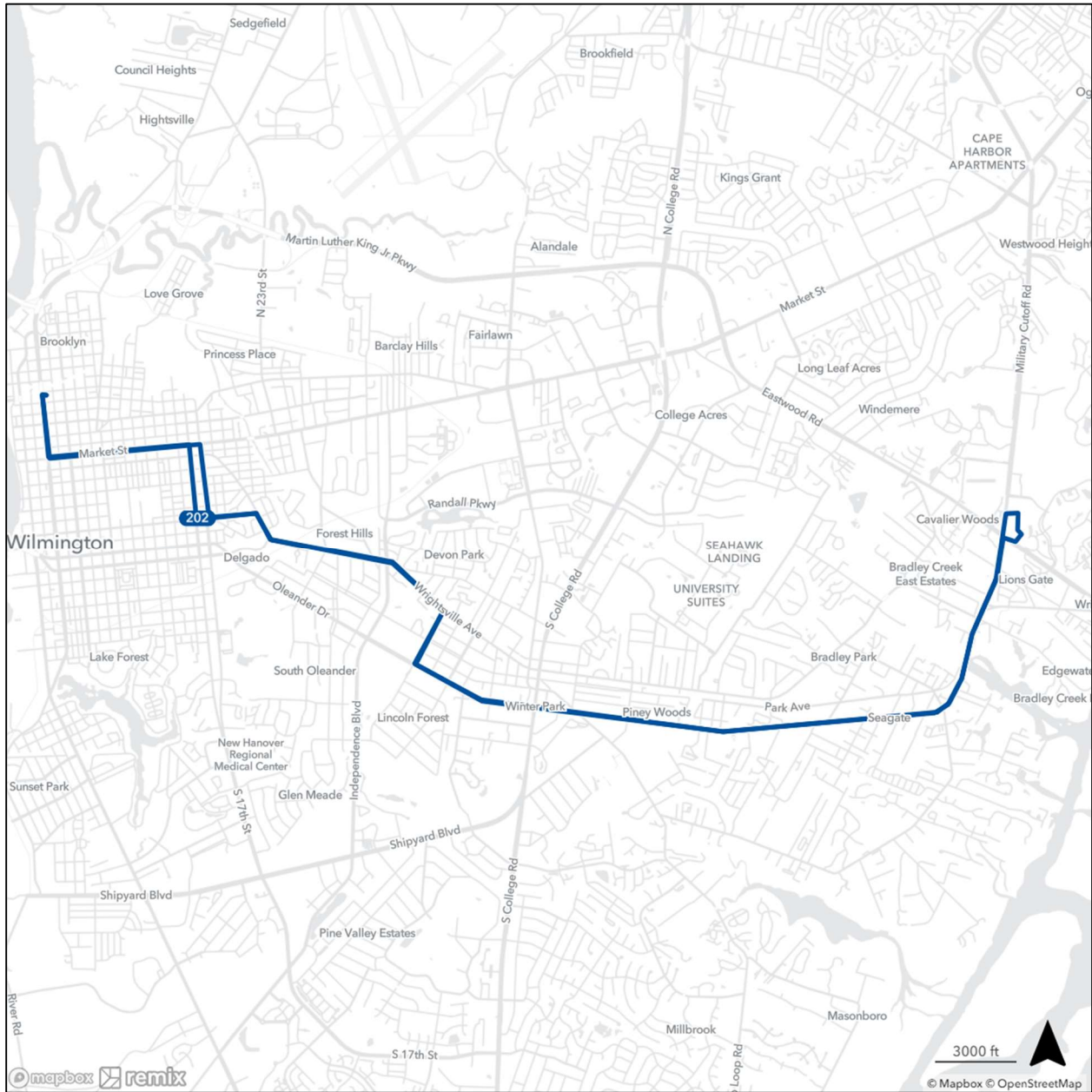
Transfers to Routes 105 and 106 are available on Independence Blvd at Oleander Dr and Shipyard Blvd. Transfer to Route 108 is available on Oleander Dr between Floral Pkwy and S 41st St. However, wait times for transfers at these locations may be long because services are uncoordinated.

Opportunities to Strengthen Route 202 Oleander West

Opportunities to strengthen Route 202 Oleander West are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Provide bi-directional service wherever possible:** Route 202 provides bi-directional service only in downtown Wilmington and a short stretch of Oleander Drive. The lack of bidirectionality makes the route difficult to understand and forces some riders to make a longer walk in only one direction. Route 202 should operate along the same streets in both directions wherever possible. Bi-directional service could be provided on Wrightsville Avenue between Independence Boulevard and 16th Street (where ridership and underlying demand are much higher than on Oleander Drive), and 41st Street between Lake Avenue and Shipyard Boulevard.
- **Operate via Market Street between Padgett Station and 16th Street:** Route 202 duplicates service provided by Route 205 and Route 210 between Padgett Station and 16th Street. To provide unique service, Route 202 could be realigned to operate between Padgett Station and Wrightsville Avenue via Market Street and 16th/17th Streets.
- **Combine Route 202 and Route 103 to provide a more direct Oleander Drive route:** Riders find it easier to understand when a single route serves a single corridor. Further, the combination would improve east-west connectivity across the city. Route 202 could provide connections to Route 104 East near the intersection of Eastwood Road and Military Cutoff Road. A different route could provide service along Shipyard Boulevard and 41st Street between College Road and 17th Street.

Figure 45 | A redesigned Route 202 could provide more bidirectional service between Padgett Station and Eastwood Rd & Military Cutoff Road via Wrightsville Avenue, Floral Parkway, and Oleander Drive.

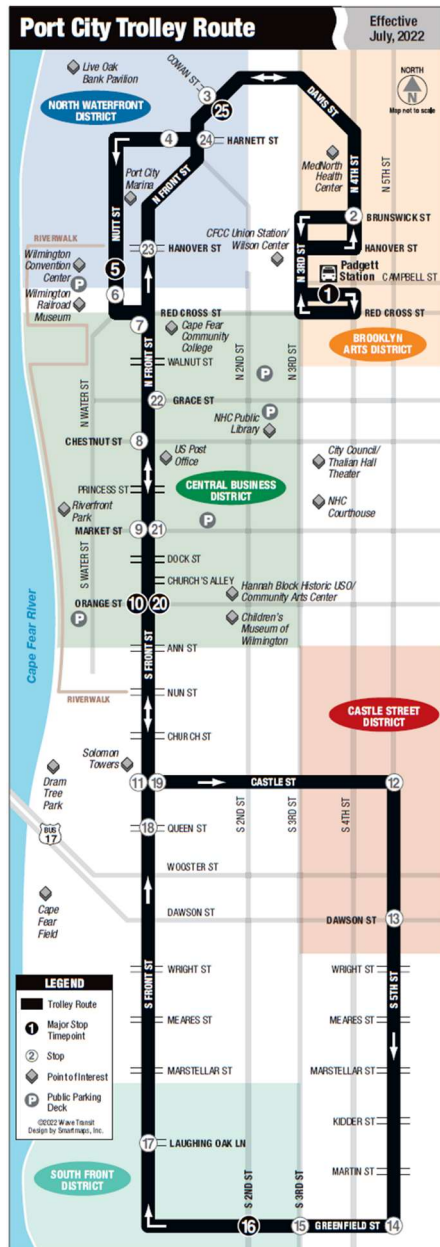


ROUTE 203 PORT CITY TROLLEY

Service Overview

Route 203 Port City Trolley is a fixed-route service that operates on weekdays and Saturdays out of Padgett Station via South Front Street. It provides circulation through the major commercial and residential districts in downtown Wilmington. The major opportunities for Route 203 Port City Trolley include eliminating duplicative service, operating the route bi-directionally, discontinuing service to low ridership stops, realigning the route to serve unique markets, and improving frequencies to operate the route every 30 minutes.

Figure 46 | Route 203 Route Map



Route Alignment

Route 203 Port City Trolley operates out of Padgett Station and travels in an indirect alignment to and from Greenfield Street via Nutt Street, Front Street, 5th Street, and Castle Street. Route 203 duplicates many other Wave routes, including Route 201, Route 205, and Route 210.

Service Span and Frequency

Route 203 Port City Trolley operates on weekdays and Saturdays. Unlike most routes in Wave’s network, Route 203 operates from 7AM to 7PM on Mondays through Thursdays, and 7AM to 8PM on Fridays and Saturdays. It operates at 40-minute headways during all times.

Figure 47 | Route 203 Port City Trolley Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency	
Mon to Thu			40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min				30 min
Fri and Sat			40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min			40 min
Sunday																			60 min

Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 203 Port City Trolley has average ridership with 96 boardings per average weekday – 5% of daily systemwide ridership. Compared to weekday ridership, Saturday ridership is 91%. Its productivity is also relatively average, with 8 riders per hour on weekdays, and 6.7 riders per hour on Saturdays.

The highest ridership segment is on Front St between Grace St and Castle St, with 31 boardings. The highest ridership stops include:

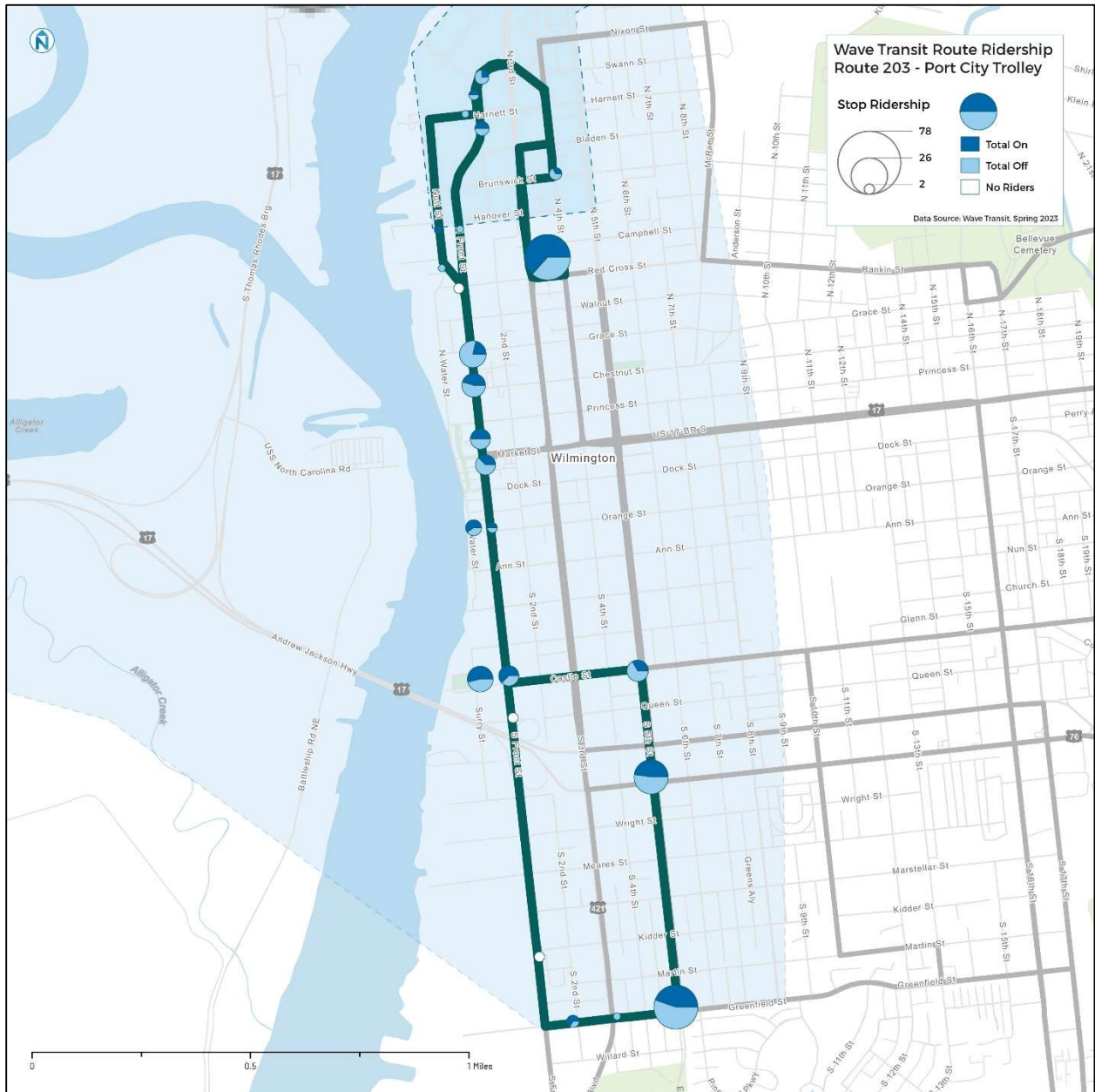
- Padgett Station, with 26 boardings.
- 5th St / Greenfield St, with 17 boardings, with several nearby churches and service/logistics centers.
- 5th St / Dawson St, with 10 boardings, located near Dollar General and Urgent Care.

The Trolley has low ridership between Padgett Station and Grace Street; it also has low ridership on Front Street south of Castle Street.

Figure 48 | Route 203 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	96 (8/12)	87 (7/12)	n/a
<i>Riders Served per Hour</i>	8 (8/12)	6.7 (9/12)	n/a
<i>Vehicle Revenue Hours</i>	12	13	n/a

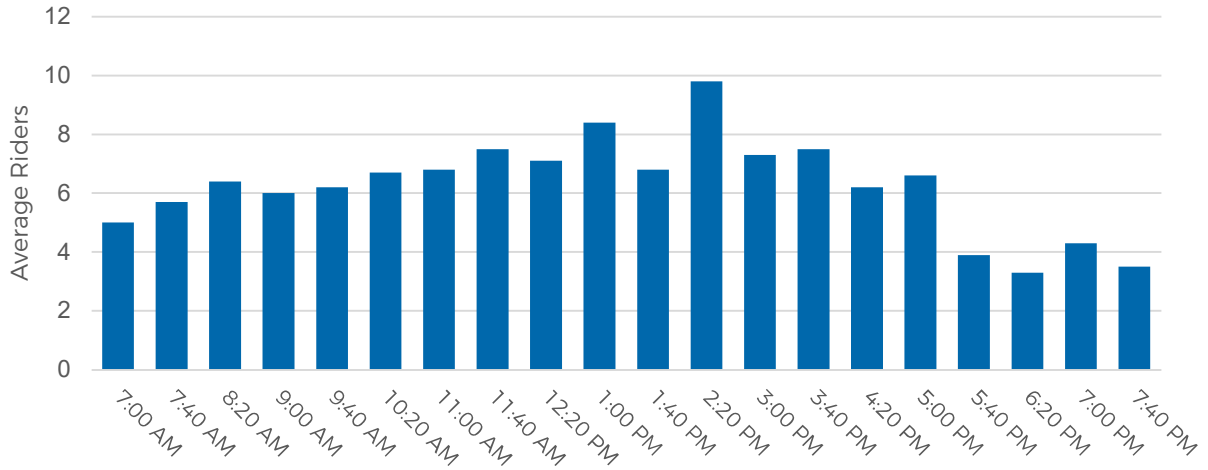
Figure 49 | Route 203 Port City Trolley Weekday Ridership by Stop



Ridership by Trip

Route 202's ridership by trip slowly rises from 5 riders at 7AM to 10 riders at 2:20PM. Afterward, ridership gradually declines to 4 riders per trip by the end of day. The service span is a good match for the ridership pattern.

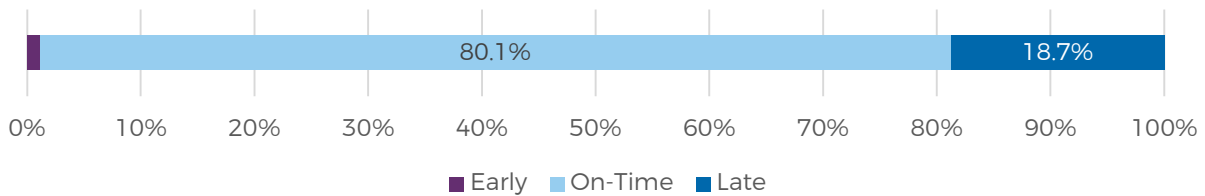
Route 203 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 203 Port City Trolley has the lowest OTP in the system, with 75%. Buses arrive late 21% of the time, and early 3.7% of the time.



Stop Spacing

0.28

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.28 miles apart on average. In other words, there are about 3.6 stops per mile. Stops are well-placed along the Trolley's alignment.

Transfer Opportunities

As a local downtown circulator, Route 203 theoretically provides transfers to other routes that travel through downtown, including Routes 101, 201, 202, 205, and 210.

Opportunities to Strengthen Route 203 Port City Trolley

Opportunities to strengthen Route 203 Port City Trolley are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Eliminate duplicative service and serve a unique transit market** : Currently, Route 203 duplicates service in downtown Wilmington alongside Routes 201, 205, and 210. If other fixed routes are realigned to concentrate on high ridership corridors and locations, Route 203 can act as a “cleanup” route to connect Wilmington’s high tourist activity areas, Padgett Station, and major housing communities on the south side of downtown.
- **Increase frequency to every 30 minutes**: Currently, Route 203 is the only route that does not operate at clockface headways, and it operates too infrequently to serve as a reliable circulator. A redesigned route could support more frequent service, especially on weekdays.
- **Discontinue service to low ridership areas**: Route 203 sees very low ridership north of Grace Street (other than at Padgett Station) and on Front Street south of Castle Street. Route 203 could focus its service on the higher demand corridors of Front Street north of Castle Street and Castle Street itself.

Figure 50 | A redesigned Route 203 could provide more bidirectional service on Front Street and Castle Street, and “clean up” a more streamlined downtown network by operating as a 30-minute circulator between major residential areas and the important commercial and tourism corridors of Castle Street and Front Street.

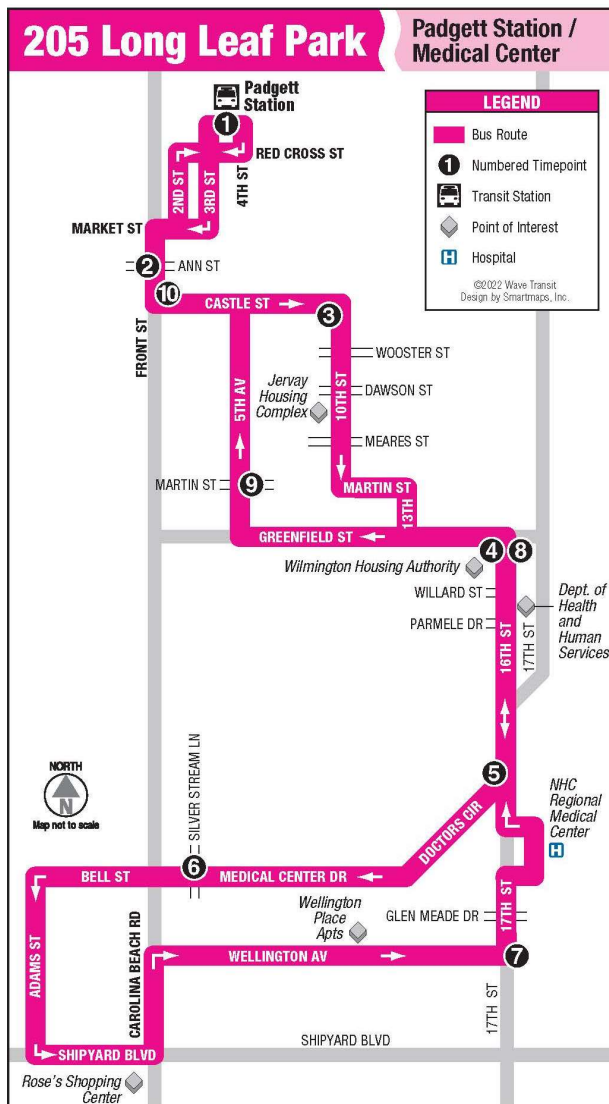


ROUTE 205 LONG LEAF PARK

Service Overview

Route 205 Long Leaf Park is a fixed-route service that operates seven days a week out of Padgett Station via Greenfield Street, South 17th Street and Medical Center Drive. It plays an important role by connecting a major transit center to transit reliant neighborhoods and healthcare facilities on Greenfield Street, 17th Street, and Medical Center Drive. The major opportunities for Route 205 Long Leaf Park are to operate it on the same streets as Route 210 between Padgett Station and 16th/17th Streets to provide frequent service between Padgett Station and the Medical Center.

Figure 51 | Route 205 Route Map



Route Alignment

Route 205 Long Leaf Park operates out of Padgett Station via Greenfield Street, South 17th Street and Medical Center Drive. The route is largely one-directional, except for the stretch on South 17th Street.

Service Span and Frequency

Route 205 Long Leaf Park operates seven days a week. Like most routes in Wave’s network, Route 205 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. On weekdays during peak hours (6AM to 6PM), the route runs at 30-minute headways. Otherwise, it operates at 60-minute headways.

Figure 52 | Route 205 Long Leaf Park Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		30 min
Saturday																		40 min
Sunday																		60 min

Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 205 Long Leaf Park has above average ridership with 265 boardings per average weekday – 14% of daily systemwide ridership. Compared to weekday ridership, Saturday ridership is 51% and Sunday ridership is 29%. Its productivity is also relatively high, with 10.2 riders per hour on weekdays, 13.6 riders per hour on Saturdays, and 9.8 riders on Sundays.

The highest ridership segments include Greenfield St (58 boardings) and the area around Carolina Beach Rd / Wellington Ave (40 boardings). Key ridership stops include:

- Padgett Station, with 89 boardings.
- Three stops on Greenfield St / Martin St, with a total of 34 boardings, located around Food Bank CENC.
- Three stops near Carolina Beach Rd / Wellington Ave, with a total of 31 boardings, located near healthcare facilities, and restaurants.
- New Hanover Regional Medical Center, with 10 boardings.

Figure 53 | Route 205 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	265 (3/12)	136 (2/12)	78 (2/11)
<i>Riders Served per Hour</i>	10.2 (3/12)	13.6 (2/12)	9.8 (2/11)
<i>Vehicle Revenue Hours</i>	26	10	8

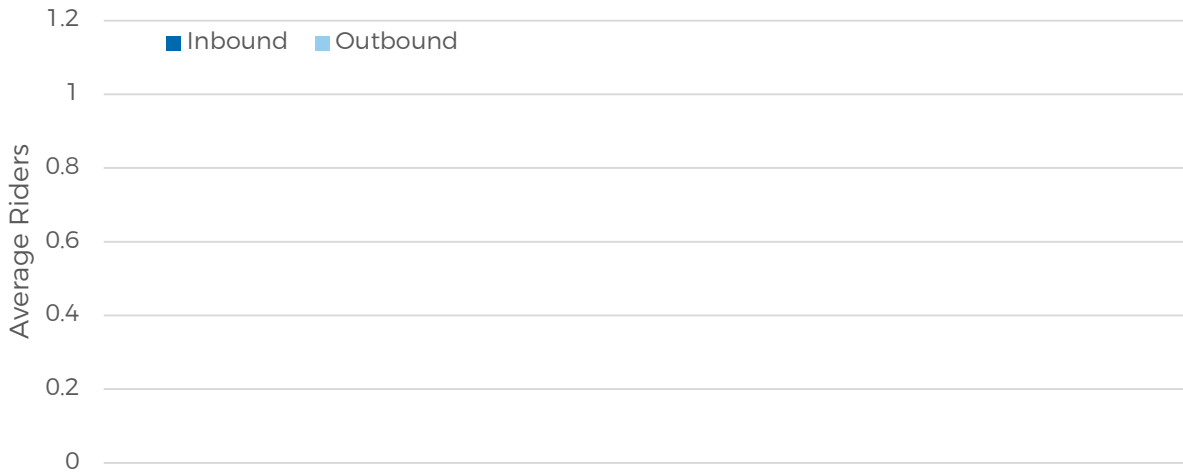
Figure 54 | Route 205 Long Leaf Park Weekday Ridership by Stop



Ridership by Trip

Route 2-5's ridership by trip is relatively consistent throughout the day, except ridership at the top of the hour (10AM, 12PM, etc.) is almost always significantly higher than ridership at half hours (10:30AM, 12:30PM, etc.). This difference in ridership is especially pronounced in the morning. Top of the hour trips average 12 riders, while half hour trips average 8 riders. Riders in the afternoon are slightly more likely to be going southbound. Ridership on the first and last trips of the day, indicating that there may exist demand to operate service one hour earlier and later than today.

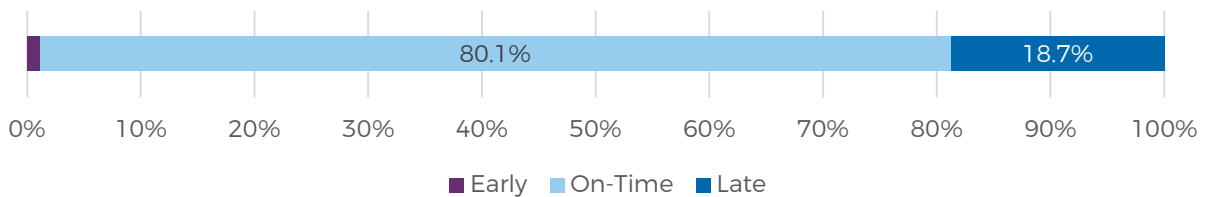
Route 205 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 205 Long Leaf Park fails to meet the minimum standard, with an OTP of 78%. Buses arrive at timepoints late 14% of the time and arrive early 8.3% of the time. On-time performance struggled on Front St and beginning at Medical Center Dr until the end of line.



Stop Spacing

0.23

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.23 miles apart on average. In other words, there are about 4.4 stops per mile. Stops are well-spaced along Route 205's alignment.

Transfer Opportunities

Transfer to Routes 201 and 106 are available at Carolina Beach Rd and Shipyard Blvd. Transfers to Routes 105 and 210 are available on 17th St and Medical Center.

Opportunities to Strengthen Route 205 Long Leaf Park

Opportunities to strengthen Route 205 Long Leaf Park are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Provide bi-directional service wherever possible:** The lack of bidirectionality in downtown Wilmington makes the route difficult to understand and forces some riders to make a longer walk in only one direction. Route 205 could operate along 3rd Street and Greenfield Street in both directions. These corridors have higher transit demand and capacity and, if Route 210 were to use the same streets, this redesign would create a high frequency connection between Padgett Station and the Medical Center.
- **Increase weekend frequency:** Route 205 could support 30-minute frequencies during peak periods seven days a week.
- **Begin operating service earlier and end operating service later:** There exists unmet demand for service beginning earlier in the day and later in the evening. Route 205 could operate one additional trip at 5 AM and one additional trip at 8 PM.
- **Realign via Marion Drive south of Shipyard Boulevard:** In conjunction with a redesigned Route 106 that would terminate at the Medical Center instead of at Carolina Beach Rd/Shipyard Boulevard, Route 205 could operate Route 106's existing terminal loop via the neighborhoods with higher concentrations of transit reliant residents on Marion Drive and Vance Street.
- **Rename Route together with Route 210.** Route 205's existing name can be confusing, because there also exists a city park called Long Leaf Park that is not served by the route. The route's name refers to the Long Leaf Park neighborhood that it does serve. To help make service clearer, and to better advertise a potential new frequent service between Padgett Station and the Medical Center (together with Route 210), Wave can consider renaming this route as branch or service pattern of Route 210:
 - **Route 210A:** Padgett Station to Monkey Junction via Medical Center
 - **Route 210B:** Padgett Station to Shipyard/Rutledge via Medical Center

Figure 55 | A redesigned Route 205 could provide bidirectional service between Padgett Station and the Medical Center. Combined with Route 210 departing 15 minutes before and after each Route 205 trip, this service change would provide frequent service along this important transit corridor. Route 205 could also be slightly redesigned on its southern end to serve an otherwise abandoned portion of Route 106 on Marion Drive.

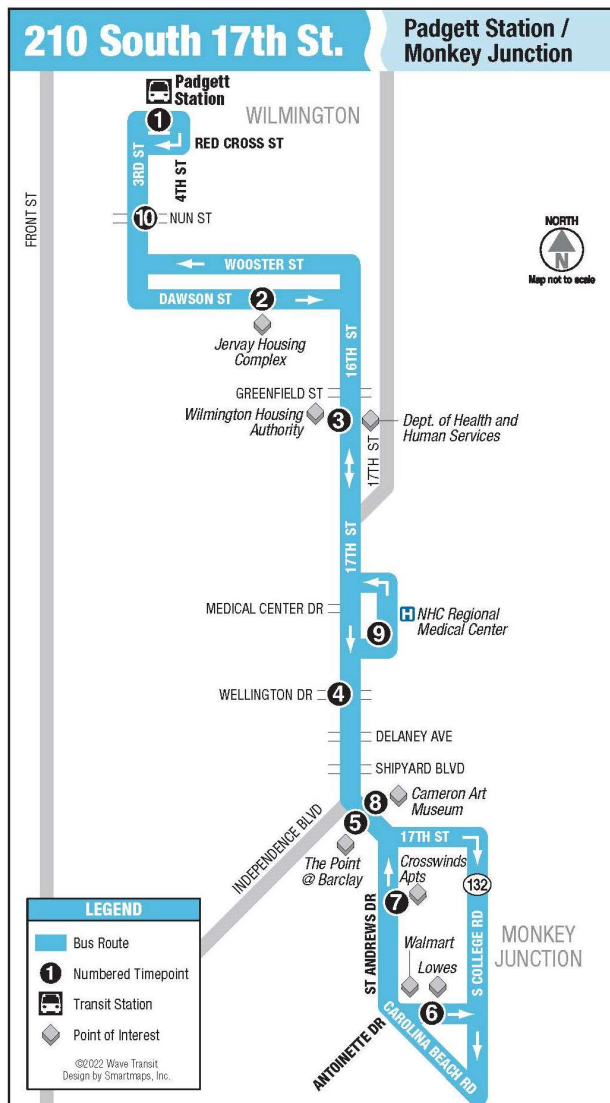


ROUTE 210 SOUTH 17TH STREET

Service Overview

Route 210 South 17th Street is a fixed-route service that operates seven days a week between Padgett Station and Monkey Junction via South 17th Street. It plays an important role by serving a major transit corridor and connecting two key transit hubs to the Medical Center. The major opportunities for Route 210 South 17th Street are to provide bi-directional service near Monkey Junction, coordinate service with Route 205, and increase frequency to every 30 minutes.

Figure 56 | Route 210 Route Map



Route Alignment

Route 210 South 17th Street operates between Padgett Station and Monkey Junction via South 17th Street. The route is largely bi-directional, except for the alignment near Monkey Junction, where the southbound alignment serves College Road alongside Route 107, and the northbound alignment serves Carolina Beach Road alongside Route 201. Service between Padgett Station and the Medical Center is duplicative with Route 205.

Service Span and Frequency

Route 210 South 17th Street operates seven days a week. Like most routes in Wave’s network, Route 210 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. It operates at 60-minute headways during all times.

Figure 57 | Route 210 South 17th Street Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		30 min
Saturday																		40 min
Sunday																		60 min

Ridership and Productivity

Compared to Wave’s 11 other fixed-route services, Route 210 South 17th Street has average ridership with 117 boardings per average weekday – 6% of daily systemwide ridership. Compared to weekday ridership, Saturday ridership is 76% and Sunday ridership is 29%. Its productivity is also relatively average, with 8.4 riders per hour on weekdays, 8.9 riders per hour on Saturdays, and 4.3 riders on Sundays.

Ridership is largely evenly dispersed throughout the route, though most boardings occur on 16th / 17th St (42 boardings). High ridership stops include:

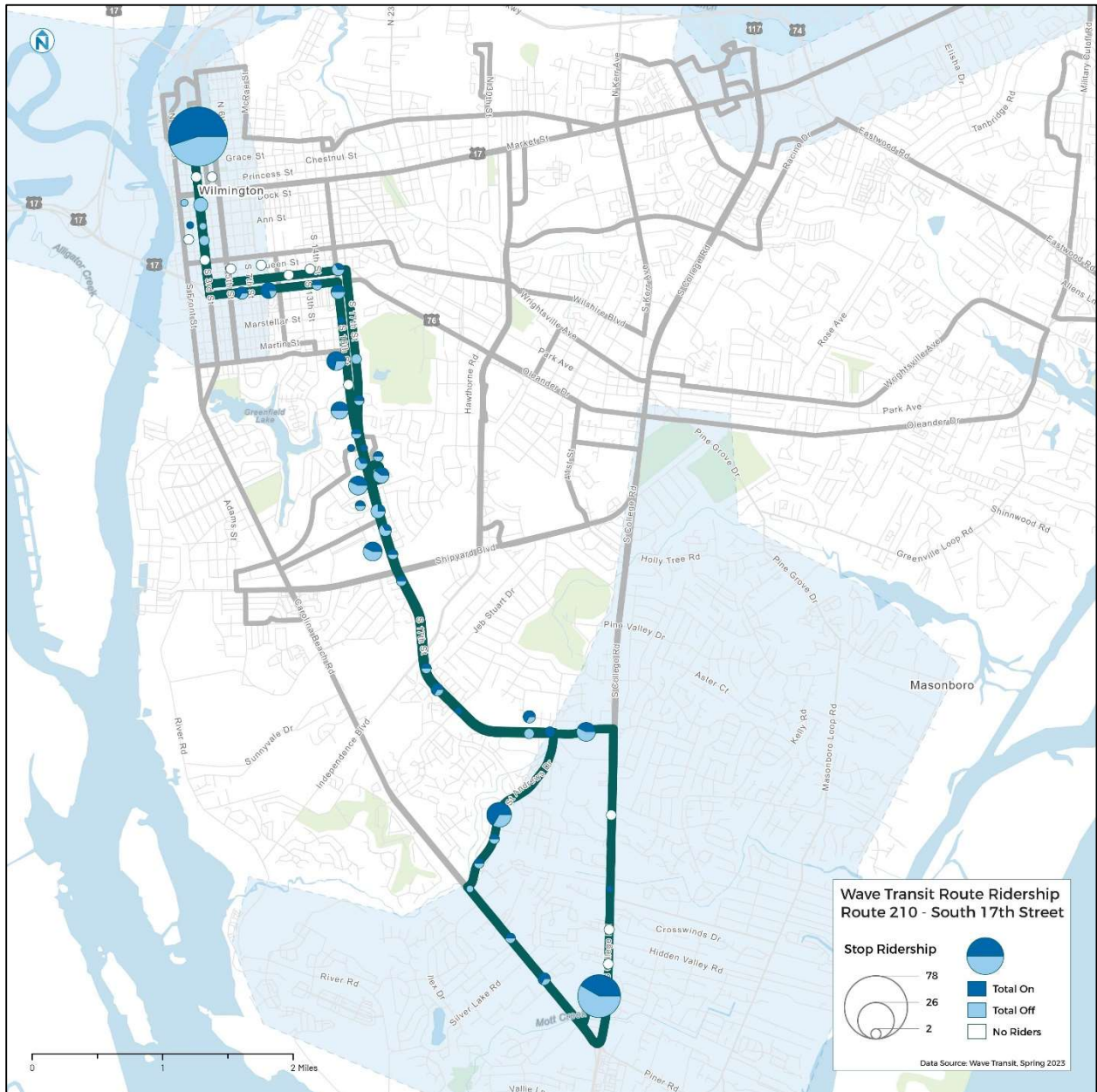
- Padgett Station and Monkey Junction, with 38 and 15 boardings, respectively.
- St Andrews Dr at Crosswinds, with 8 boardings, located near Crosswinds Apartments.
- Greenfield St / 16th St. with 5 boardings, located near Social Services, Social Security and Housing Administration government buildings.

Route 210 has low ridership along College Road. And between St. Andrews Drive and Shipyard Boulevard.

Figure 58 | Route 210 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	117 (7/12)	89 (6/12)	34 (11/11)
<i>Riders Served per Hour</i>	8.4 (7/12)	8.9 (6/12)	4.3 (11/11)
<i>Vehicle Revenue Hours</i>	14	10	8

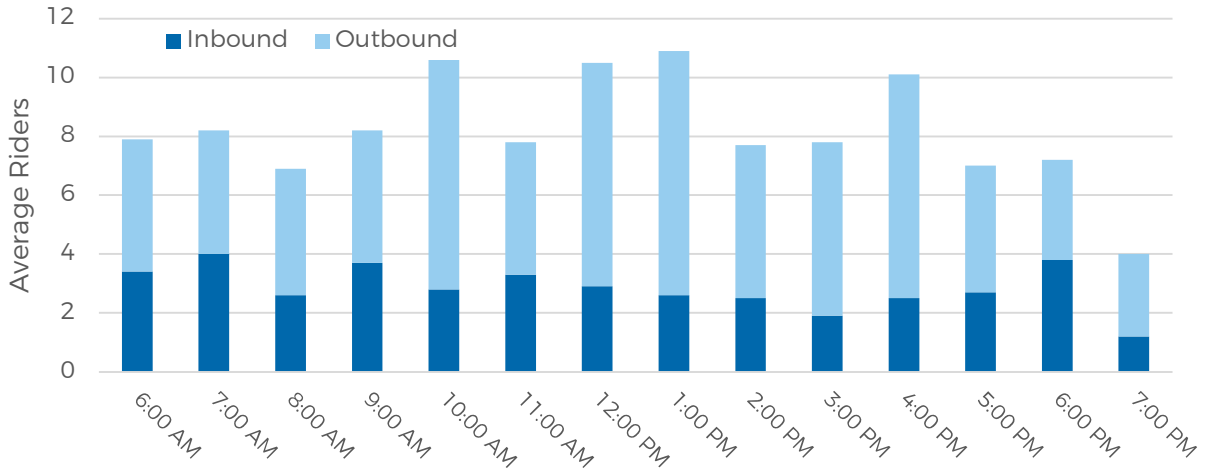
Figure 59 | Route 210 South 17th Street Weekday Ridership by Stop



Ridership by Trip

Ridership by trip on Route 210 is relatively even throughout the day, averaging 8 riders per trip. Southbound ridership is higher than northbound ridership, particularly in the late morning / early afternoon. Ridership on the first trip of the day is relatively high, indicating that there may exist demand for service to begin earlier in the day.

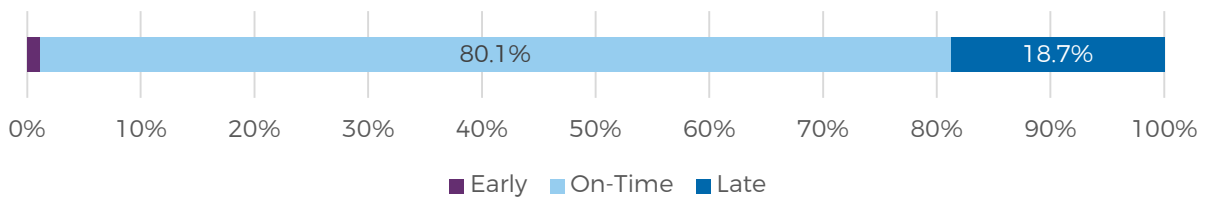
Route 210 Ridership by Trip



On-Time Performance

Wave Transit defines an on-time bus as arriving at a timepoint less than one minute early and fewer than five minutes late to a timepoint. Wave Transit adopted an on-time performance standard between a minimum standard of 88% and a target of 93%.

Route 210 South 17th Street fails to meet the minimum standard, with an 80% OTP. Buses arrive late at timepoints 19% of the time and arrive early 1.1% of the time. On-time performance struggled at the beginning, with 31% of buses arriving late, and on the northbound half of the route, where about 20% of buses arrived late.



Stop Spacing

0.35

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.35 miles apart on average. In other words, there are about 2.8 stops per mile. Stop density is low compared to the other routes in the system. There may exist an opportunity to add infill stops along South 17th Street south of Shipyard Boulevard to reduce walking distances for some riders.

Transfer Opportunities

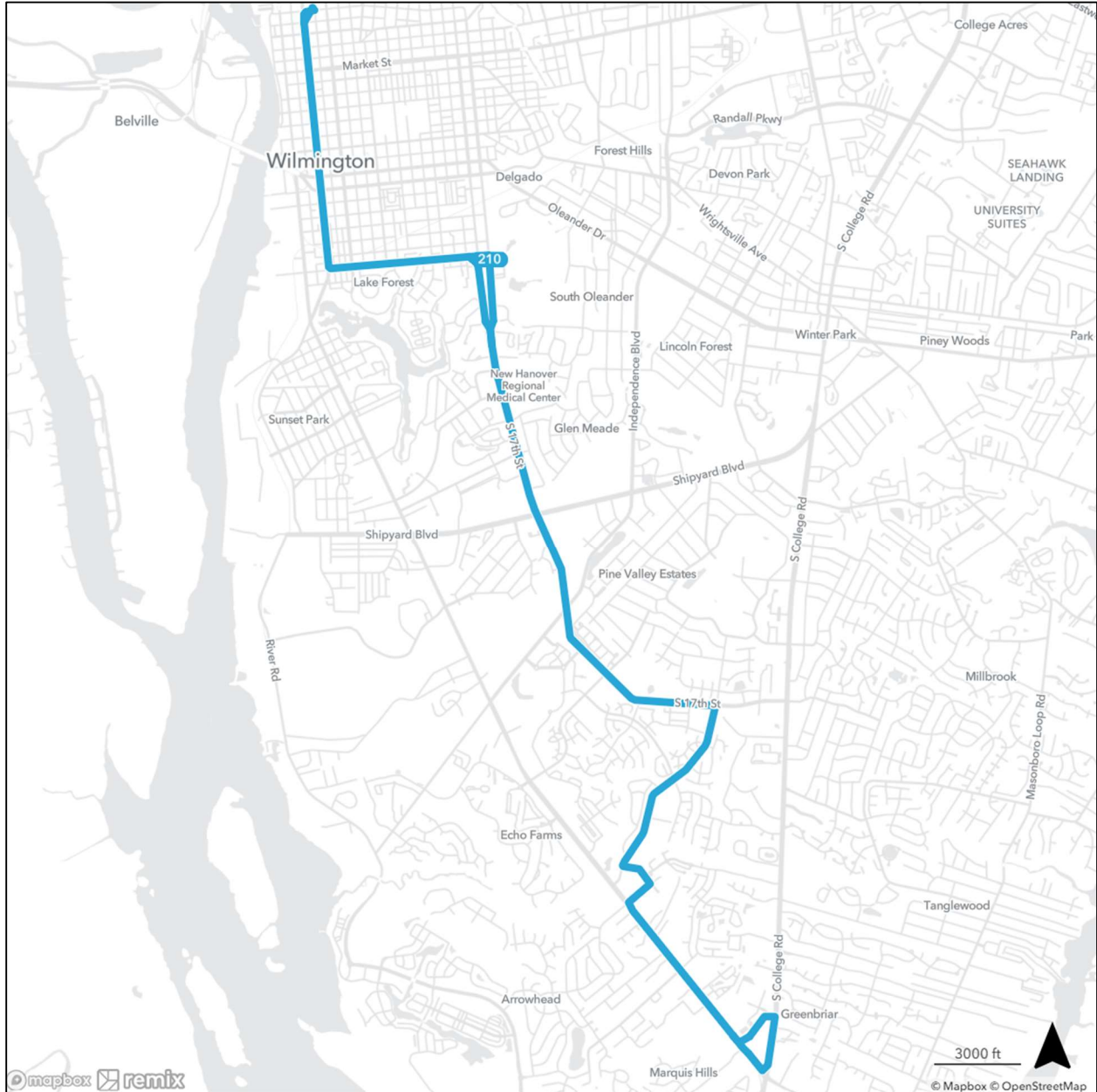
Transfer to Routes 105 and 205 are available at the Medical Center. However, wait times for transfers at this location may be long because services are uncoordinated.

Opportunities to Strengthen Route 210 South 17th Street

Opportunities to strengthen Route 210 South 17th Street are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Provide bi-directional service wherever possible:** The lack of bidirectionality in downtown Wilmington makes the route difficult to understand and forces some riders to make a longer walk in only one direction. Route 210 could operate along 3rd Street and Greenfield Street in both directions. These corridors have higher transit demand and capacity and, if Route 205 were to use the same street, this redesign would create a high frequency connection between Padgett Station and the Medical Center. Route 210 could also operate via St Andrews Drive in both directions to provide bidirectional service and avoid service duplication with Route 107 on College Road.
- **Increase weekend frequency:** Route 210 could support 30-minute frequencies during peak periods seven days a week.
- **Begin operating service at 5 AM:** There exists unmet demand for service beginning earlier in the day. Route 210 could operate one additional trip at 5 AM.
- **Rename Route together with Route 205.** Route 205's existing name can be confusing, because there also exists a city park called Long Leaf Park that is not served by the route. The route's name refers to the Long Leaf Park neighborhood that it does serve. To help make service clearer, and to better advertise a potential new frequent service between Padgett Station and the Medical Center (together with Route 210), Wave can consider renaming Route 205 and Route 210 as branches of each other:
 - **Route 210A:** Padgett Station to Monkey Junction via Medical Center
 - **Route 210B:** Padgett Station to Shipyard/Rutledge via Medical Center

Figure 60 | A redesigned Route 210 could provide bidirectional service between Padgett Station and the Medical Center. Combined with Route 205 departing 15 minutes before and after each Route 205 trip, this service change would provide frequent service along this important transit corridor. The route could also be redesigned to provide bidirectional service between S 17th Street and Monkey Junction via St Andrews Drive.

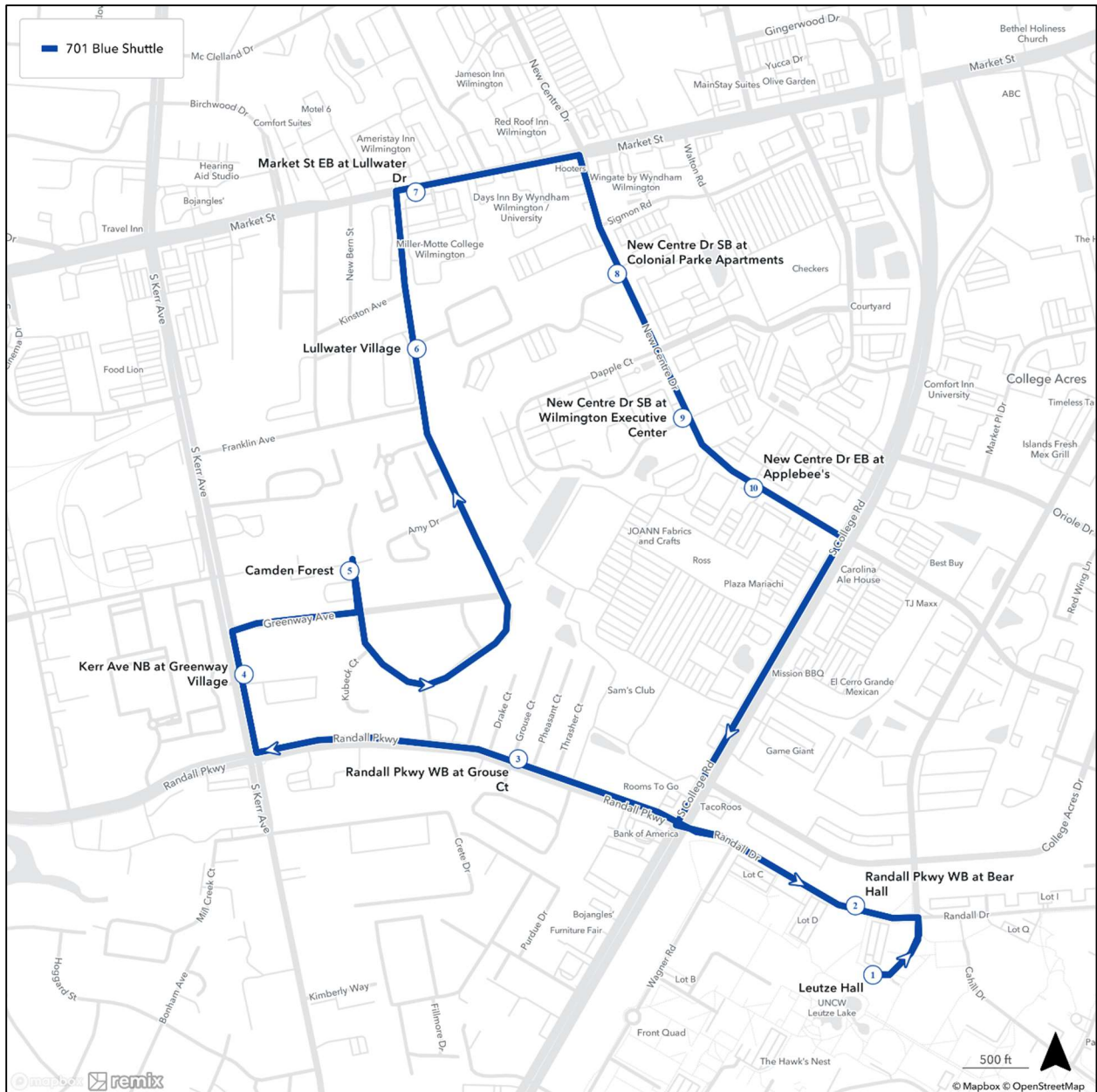


ROUTE 701 BLUE SHUTTLE

Service Overview

Route 701 Blue is a Seahawk Shuttle service that operates on weekdays only between Leutze Hall and Lullwater Drive. It plays an important role by serving residential and commercial areas northwest of UNCW campus. The major opportunities for Route 701 Blue are to combine the route with Route 712 Teal to provide a more useful local circulator service that also connects directly to Forden Station.

Figure 61 | Route 701 Route Map



Route Alignment

Route 701 Blue operates a one-way loop out of Leutze Hall, and serves Randall Pkwy, Kerr Ave, Lullwater Dr, Market St, and New Center Dr. The Randall Pkwy segment is duplicative with the Grey Shuttle.

Service Span and Frequency

Route 701 Blue operates on weekdays only during the school year. Route 701 operates from 7AM to 5:15PM on weekdays. It operates at 20-minute headways during all times.

Figure 62 | Route 701 Blue Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		20 min

Ridership and Productivity

Compared to other Seahawk Shuttles, Route 701 Blue has low levels of ridership with 40 boardings per average weekday. Its productivity is also relatively low, with 3.7 riders per hour on weekdays. Route 701’s productivity is relatively low considering the relatively high frequency provided by the route.

The highest ridership stops include:

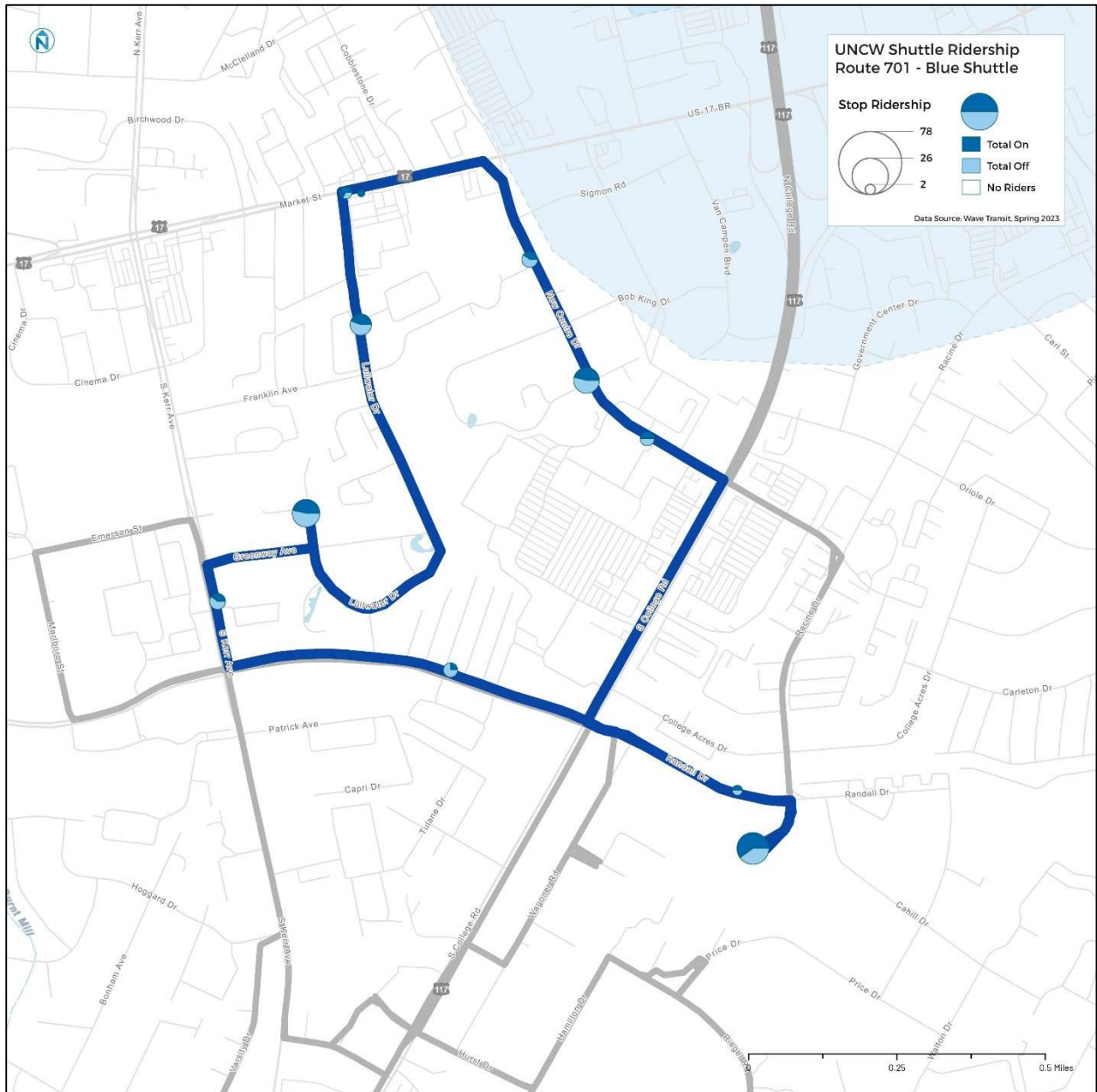
- Leutze Hall (12 boardings)
- Camden Forest (7 boardings)
- Wilmington Executive Center (6 boardings)
- Lullwater Village (4 boardings)

There is low or no ridership on Market Street.

Figure 63 | Route 701 Ridership and Productivity Service Statistics

Service Statistic	Weekdays
<i>Ridership</i>	40 (6/8)
<i>Riders Served per Hour</i>	3.7 (6/8)
<i>Vehicle Revenue Hours</i>	10.67

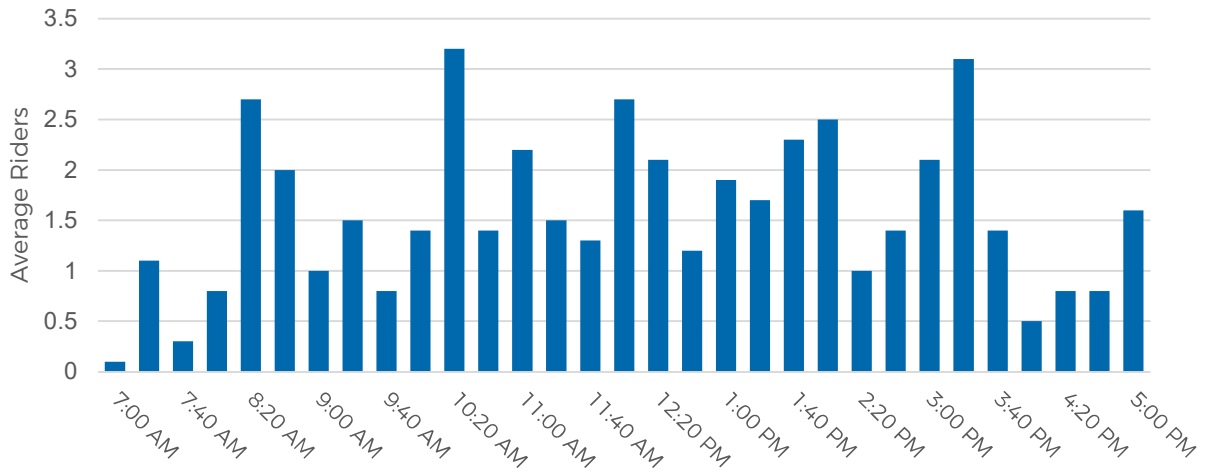
Figure 64 | Route 701 Blue Weekday Ridership by Stop



Ridership by Trip

Ridership by trip for the Blue Shuttle is generally low in the early morning and late afternoon, averaging 1 rider per trip. Across the day, trips range from 1-3 riders per trip. Generally, the service window is appropriate for the level of demand.

701 Blue Shuttle Ridership by Trip



Stop Spacing

0.45

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.45 miles apart on average. In other words, there are about 2.2 stops per mile. There may exist an opportunity to add infill stops on Randall Parkway and New Centre Drive to reduce walking distances for some riders.

Transfer Opportunities

Transfer is available at Leutze Hall to the 705 Campus Loop and the Route 712 Teal Shuttle.

Opportunities to Strengthen Route 701 Blue

Opportunities to strengthen Route 701 Blue are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- Provide bi-directional service and eliminate duplicative service wherever possible:** Despite its higher frequency, Route 701 Blue has very low ridership. The lack of bidirectionality makes the route difficult to understand and forces some riders to make a longer walk in only one direction. It also duplicates Grey Shuttle service. Route 701 Blue Shuttle could be redesigned to operate as a UNCW-Forden Station local circulator service that can safely connect campus users and Wave riders to nearby shopping and retail destinations (without also duplicating other nearby service).
- Serve Walmart and Forden Station:** Shuttle routes should be anchored at desirable destinations that provide high ridership.
- Combine with Route 712 Teal:** Wave provides multiple but uncoordinated routes between UNCW and Forden Station, including Route 103 Oleander East, Route 104 East, Route 107 College Road, and Route 712 Teal. These routes operate slightly differently between these two major destinations. Instead of serving multiple places with different routes, UNCW and public fixed-route service should be coordinated so that service is not

duplicative and therefore easier to understand. One way this could be accomplished is by operating all College Road fixed-route service (including Route 107 College Rd and a redesigned Route 103 that would operate between Forden Station and the Medical Center via College Road) via the Alderman Lot Shuttle Stop to increase effective frequency between UNCW and Forden Station to every 30 minutes. This new half-hourly connection could enable Route 712 Teal, whose sole purpose is to provide an express connection between Forden Station and UNCW to be combined with Route 701 Blue to provide a more useful local circulator for UNCW students and Wave riders to connect to both campus and nearby shopping and retail destinations like Walmart, Costco, Target, and the County Government Center.

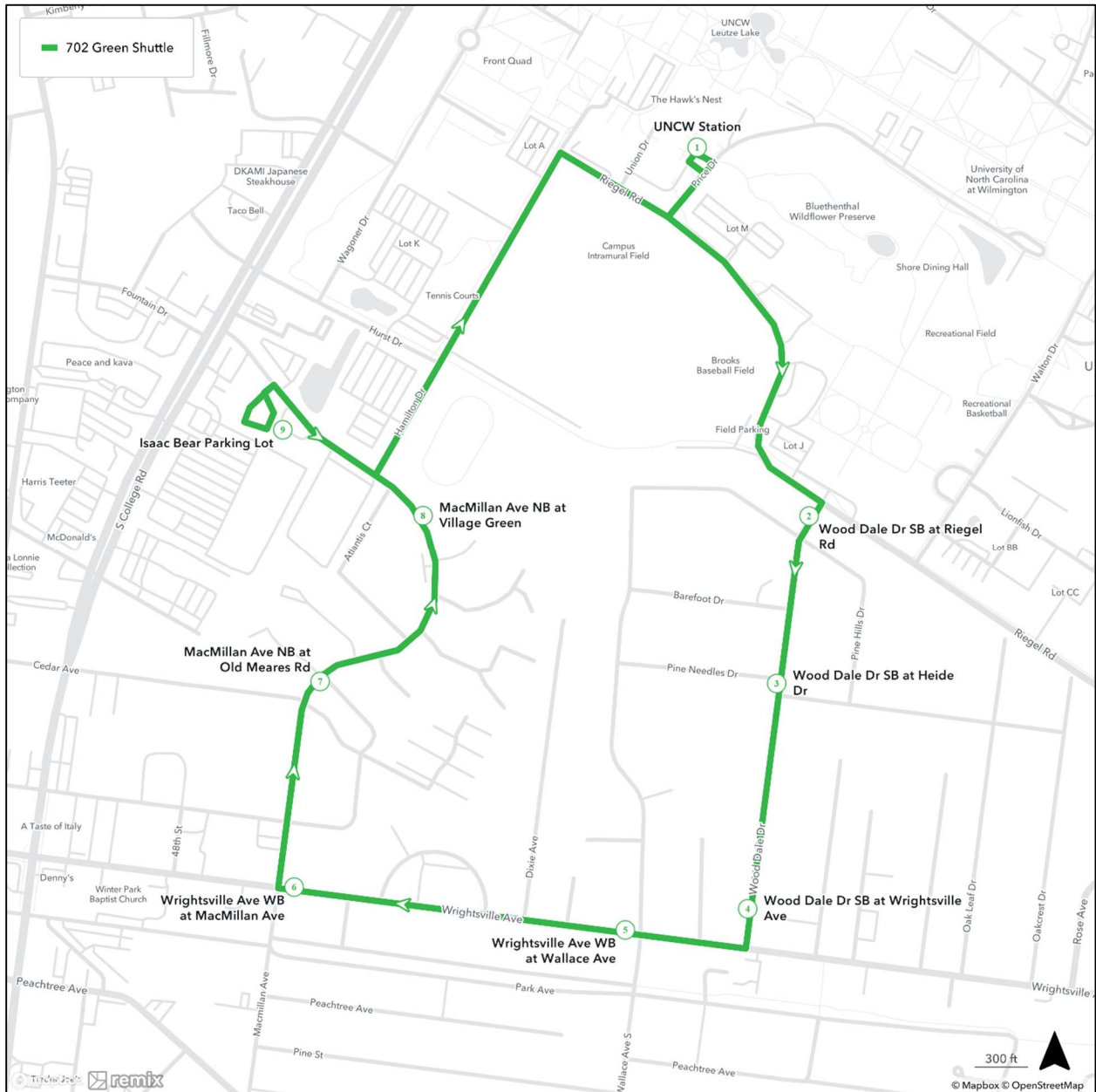
- **Serve Greenway Ave and Lullwater Drive residential destinations with infill stations and a realignment of the Grey Route Shuttle** : Route 711 Grey could pick up otherwise abandoned portions of a redesigned Route 701 Blue by operating via Lullwater Drive on inbound trips to UNCW.
- **Operate Year-Round**: A redesigned Route 701 that provides both local circulator service to shopping destinations and a connection between Forden Station and UNCW could support year-round service.

ROUTE 702 GREEN SHUTTLE

Service Overview

Route 702 Green is a Seahawk Shuttle service that operates on weekdays only between UNCW Station and Wrightsville Avenue. It plays an important role by serving residential and commercial areas southwest of UNCW campus. No major change is suggested for this route.

Figure 66 | Route 702 Route Map



Route Alignment

Route 702 Green operates out of UNCW Station to serve Macmillan Ave, Wrightsville Ave, Wood Dale Dr, and Isaac Bear Parking Lot in a one-way loop.

Service Span and Frequency

Route 702 Green operates on weekdays only. Like most routes in UNCW’s network, Route 702 operates from 7AM to 5:15PM on weekdays. It operates at 15-minute headways during all times.

Figure 67 | Route 702 Green Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		15 min

Ridership and Productivity

Compared to other Seahawk Shuttles, Route 702 Green has high levels of ridership with 118 boardings per average weekday. Its productivity is also relatively high, with 11.2 riders per hour on weekdays.

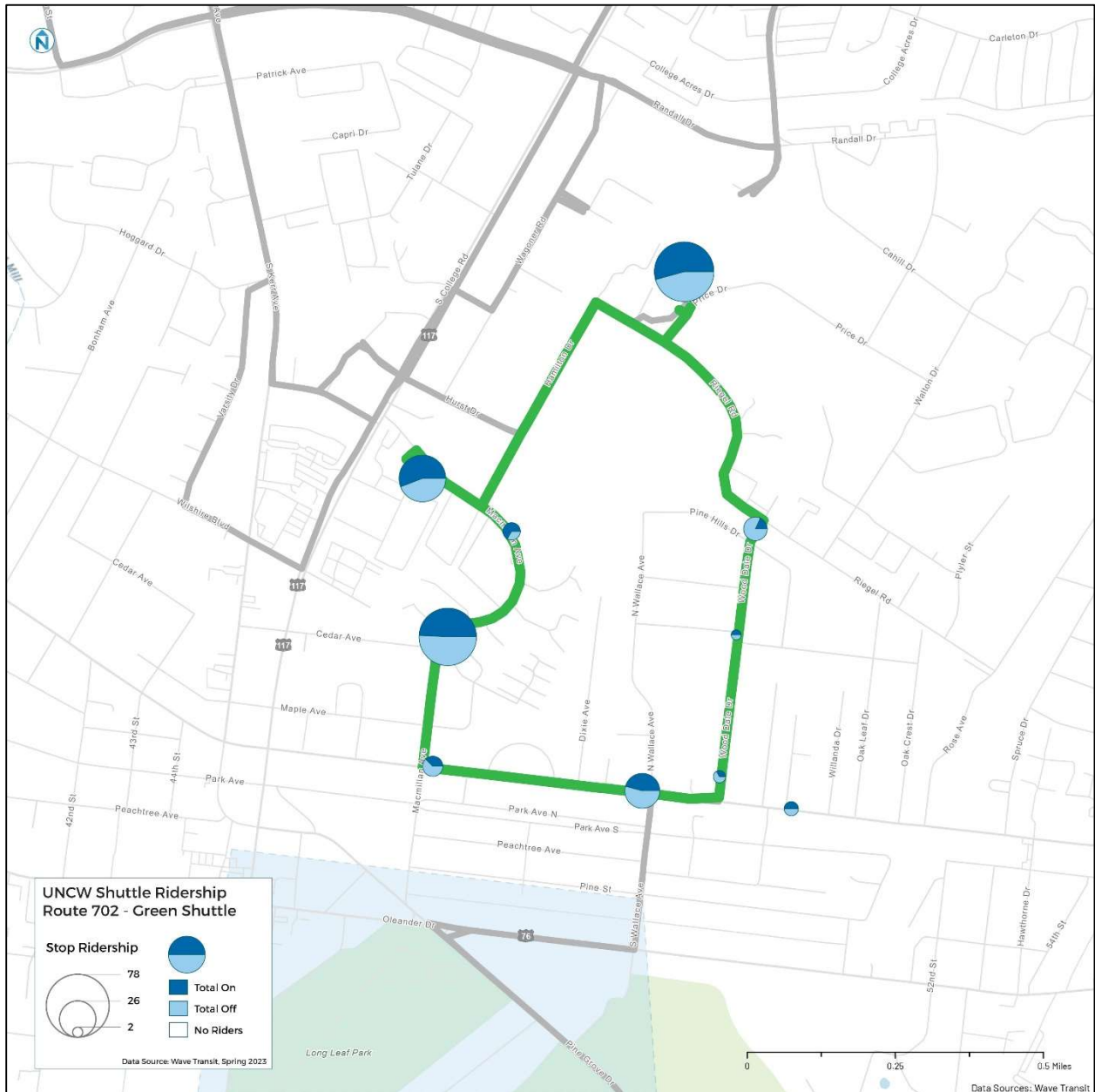
The highest ridership stops include:

- UNCW Station (38 boardings)
- MacMillan Ave / Old Meares Rd (32 boardings)
- Isaac Bear Parking Lot (24 boardings)
- Wrightsville Ave / Wallace Ave (11 boardings)

Figure 68 | Route 702 Ridership and Productivity Service Statistics

Service Statistic	Weekdays
<i>Ridership</i>	118 (3/8)
<i>Riders Served per Hour</i>	11.2 (3/8)
<i>Vehicle Revenue Hours</i>	10.5

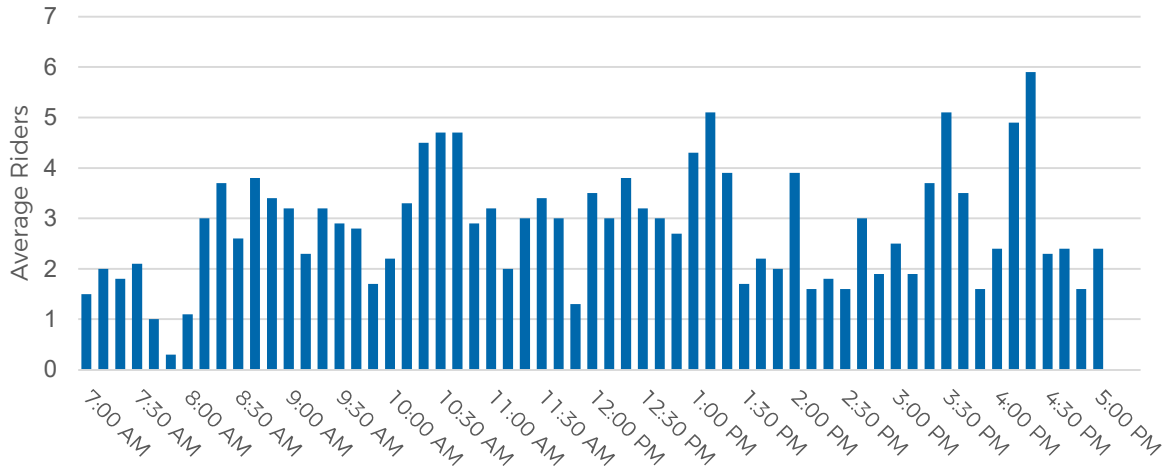
Figure 69 | Route 702 Green Weekday Ridership by Stop



Ridership by Trip

Ridership by trip for the Green Shuttle is generally low in the early morning and late afternoon, averaging 1-2 riders per trip. Across the day, trips range from 2-6 riders per trip. Route 702 could begin service later in the day (8 AM) when demand is higher.

702 Green Shuttle Ridership by Trip



Stop Spacing

0.34

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.34 miles apart on average. In other words, there are about 2.9 stops per mile.

Transfer Opportunities

Transfer is available at Teal Terminal to Campus Loop, Red Shuttle, and the CREST Shuttle.

Opportunities to Strengthen Route 702 Green

Opportunities to strengthen Route 702 Green are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

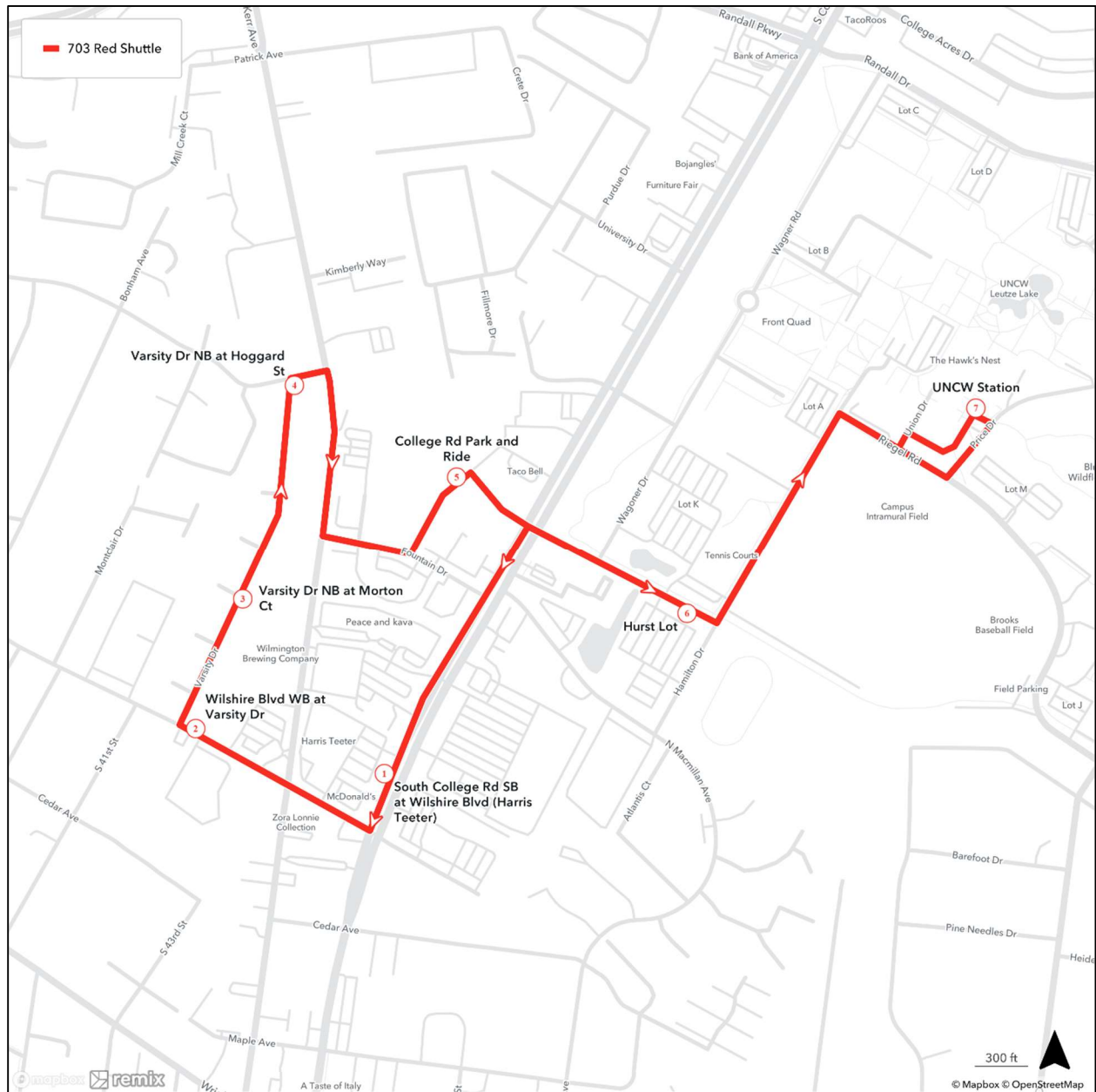
- **Begin operating service later in the day.** Ridership is very low on Route 701 until 8 AM. Route 702 could begin operating at 8 AM with very little impact on riders.

ROUTE 703 RED SHUTTLE

Service Overview

Route 703 Red is a Seahawk Shuttle service that operates on weekdays only between UNCW Station and Varsity Drive. It plays an important role by serving College Road Park and Ride and residential and commercial areas west of UNCW campus. The major opportunity for Route 703 Red is to consolidate the route with 704 Yellow Shuttle to provide more frequent service.

Figure 70 | Route 703 Route Map



Route Alignment

Route 703 Red operates out of UNCW Station, serving College Rd, Wilshire Blvd, Varsity Dr, and College Rd Park and Ride in a one-way loop. Notably, the route provides direct service to campus for park-and-ride users but riders from campus must ride the route for about 10 minutes to return to the park-and-ride.

Service Span and Frequency

Route 703 Red operates on weekdays only. Like most routes in UNCW’s network, Route 703 operates from 7:15AM to 5:15PM on weekdays. It operates at 20-minute headways during all times.

Figure 71 | Route 703 Red Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		20 min

Ridership and Productivity

Compared to other Seahawk Shuttles, Route 703 Red has low ridership with 32 boardings per average weekday. Its productivity is also relatively low, with 3.1 riders per hour on weekdays.

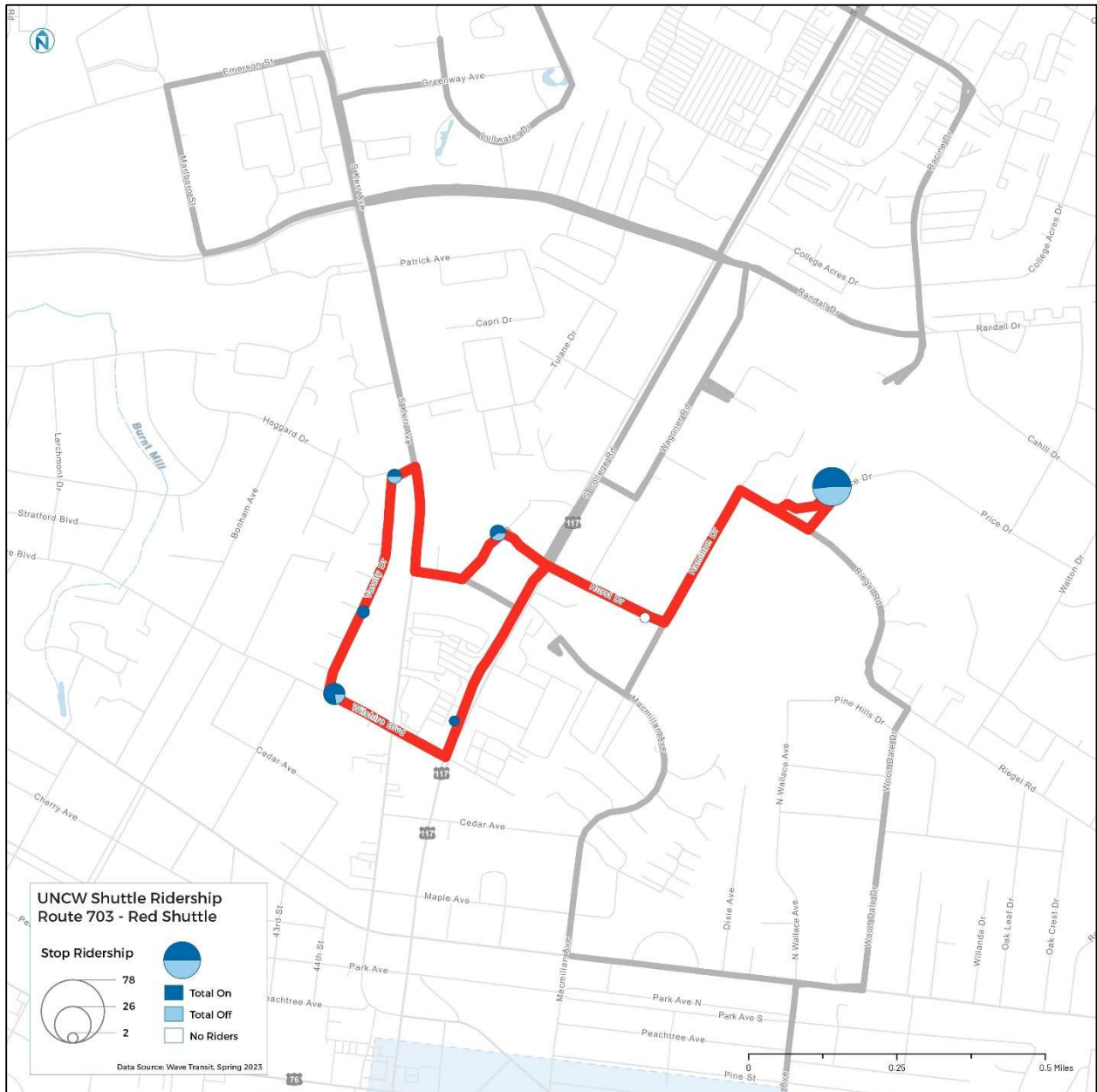
The only stops with significant ridership are:

- UNCW Station (15 boardings)
- Wilshire Blvd / Varsity Dr (7 boardings)

Figure 72 | Route 703 Ridership and Productivity Service Statistics

Service Statistic	Weekdays
<i>Ridership</i>	32 (7/8)
<i>Riders Served per Hour</i>	3.1 (7/8)
<i>Vehicle Revenue Hours</i>	10.33

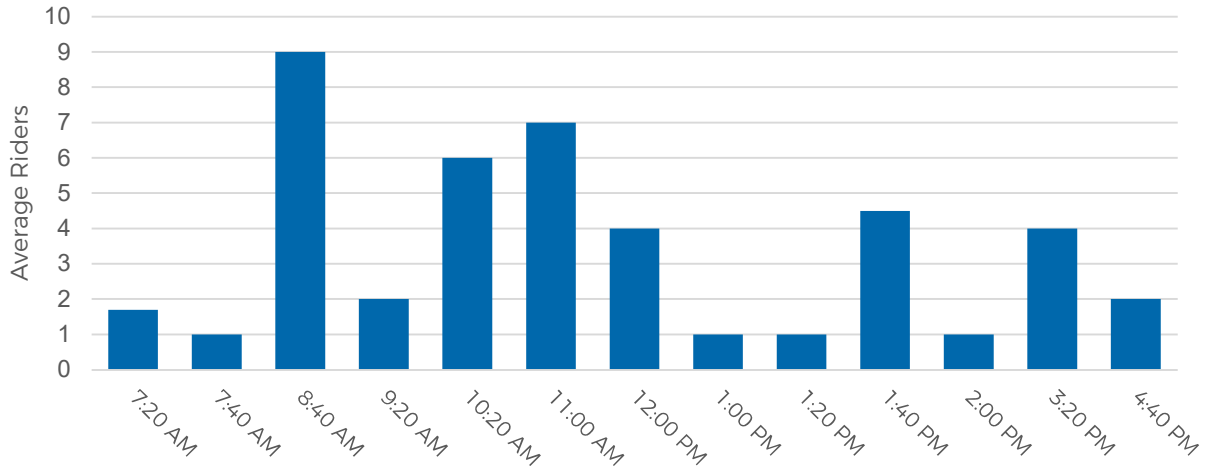
Figure 73 | Route 703 Red Weekday Ridership by Stop



Ridership by Trip

Ridership by trip for the Red Shuttle fluctuates wildly across the day. The 8:40 trip has 9 passengers. Ridership in the late morning (10AM - 12AM) and mid-afternoon (1:40PM and 3:20PM) averages 5 riders per trip. Otherwise trips average 1-2 passengers. Generally, the service window is appropriate for the level of demand.

703 Red Shuttle Ridership by Trip



Stop Spacing

0.41

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.41 miles apart on average. In other words, there are about 2.4 stops per mile.

Transfer Opportunities

Transfer is available at UNCW Station to Campus Loop, Green Shuttle, and the CREST Shuttle.

Opportunities to Strengthen Route 703 Red

Opportunities to strengthen Route 703 Red are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- Consolidate with Route 704 Yellow Shuttle:** Other than the three stops on Varsity Drive, Route 703 Red Shuttle duplicates other Wave-provided services like Route 704 Yellow Shuttle and Route 107 College Road. The duplicative nature of this route may explain the route’s low ridership, despite its higher frequency service. Route 703 could be combined with a slightly redesigned Route 704 Yellow Shuttle (which would serve the park-and-ride in both directions) to provide even more frequent service.

Figure 74 | A redesigned Red/Yellow Shuttle could consolidate service between the residential complexes on Varsity Drive, the Park and Ride, and Teal Terminal with a new frequent route.

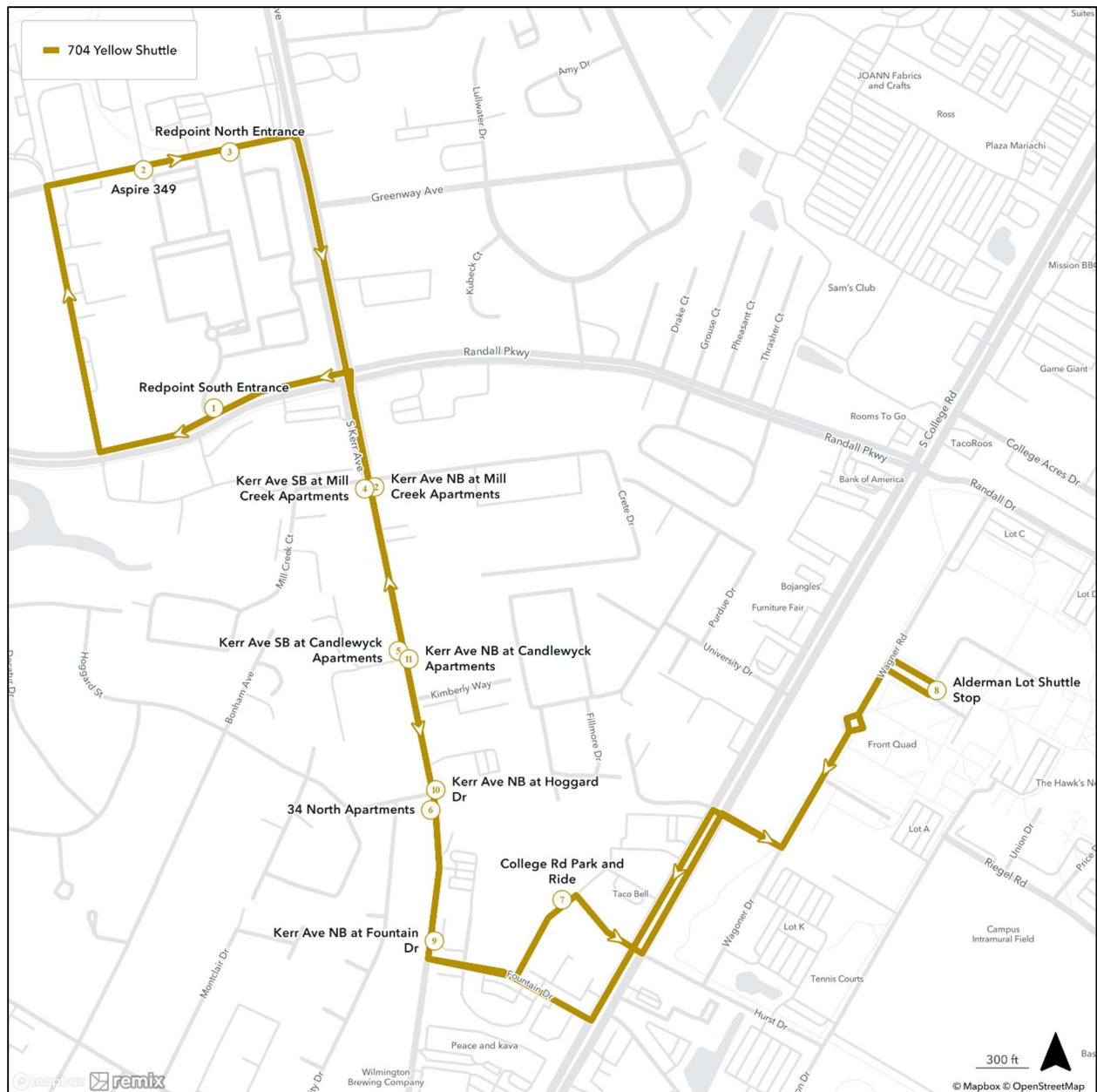


ROUTE 704 YELLOW SHUTTLE

Service Overview

Route 704 Yellow is a Seahawk Shuttle service that operates on weekdays only between Alderman Lot Shuttle Stop and Carolina Cove Apartments via the College Rd Park and Ride. It plays an important role by serving College Road Park and Ride and residential and commercial areas west of UNCW campus. If operationally feasible, Route 704 Yellow should serve the Park and Ride in both directions.

Figure 75 | Route 704 Route Map



Route Alignment

Route 704 Yellow operates out of Alderman Lot Shuttle Stop, serving Kerr Ave, and the Carolina Cove Apartments / Redpoint, and College Rd Park and Ride. Service to Carolina Cove Apartments / Redpoint is also provided by the Grey Shuttle.

Service Span and Frequency

Route 704 Yellow operates on weekdays only. Like most routes in UNCW's network, Route 704 operates from 7AM to 5:15PM on weekdays. It operates at 10-minute headways during all times.

Figure 76 | Route 704 Yellow Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		10 min

Ridership and Productivity

Compared to other Seahawk Shuttles, Route 704 Yellow has high levels of ridership with 422 boardings per average weekday. Its productivity is also relatively high, with 19.8 riders per hour on weekdays.

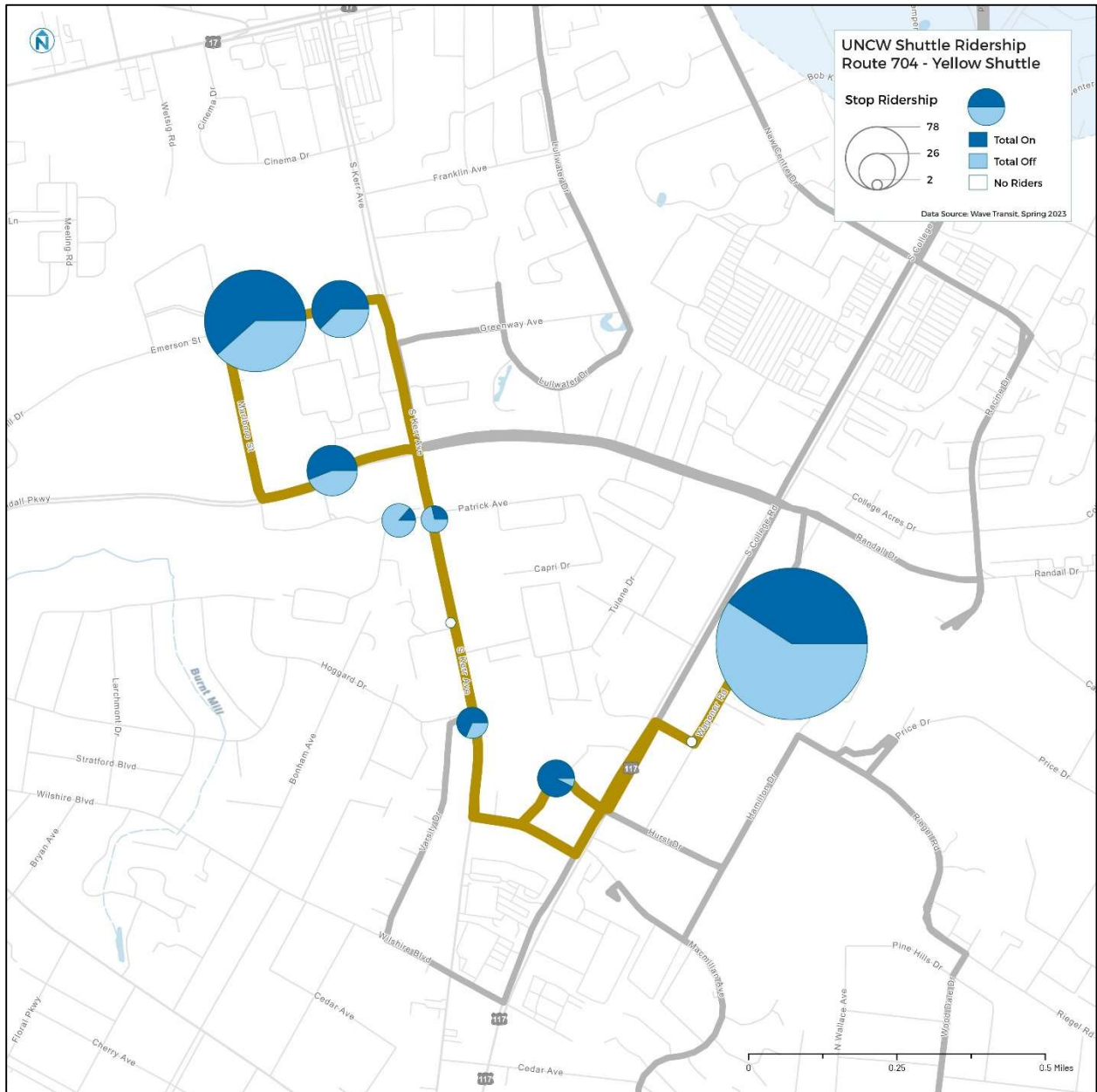
The highest ridership stops include:

- Alderman Lot Shuttle Stop (184 boardings)
- Three stops at Redpoint (193 total boardings)
- College Rd Park and Ride (25 boardings)
- 34 North Apartments (13 boardings)

Figure 77 | Route 704 Ridership and Productivity Service Statistics

Service Statistic	Weekdays
<i>Ridership</i>	422 (1/8)
<i>Riders Served per Hour</i>	19.8 (2/8)
<i>Vehicle Revenue Hours</i>	21.34

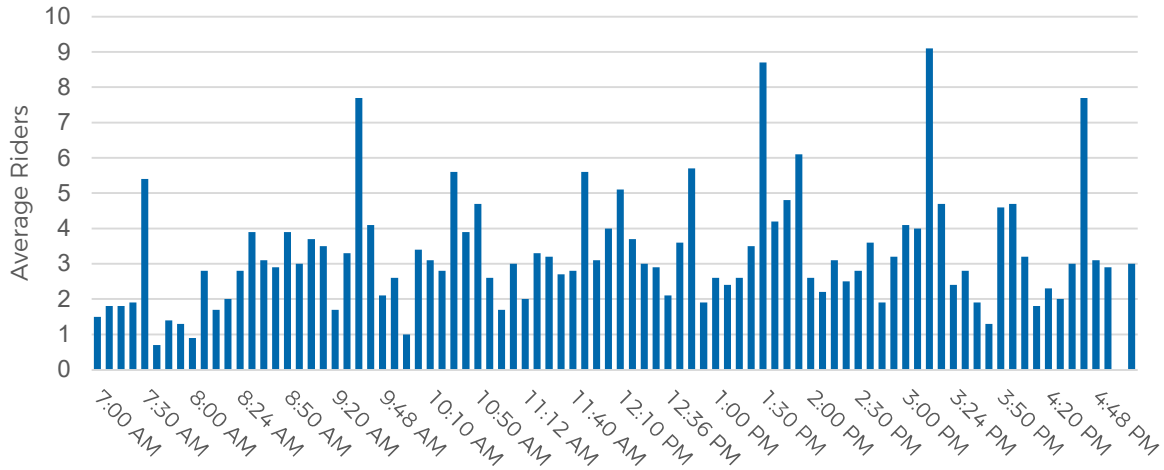
Figure 78 | Route 704 Yellow Weekday Ridership by Stop



Ridership by Trip

Ridership by trip for the Yellow Shuttle fluctuates wildly across the day. Most trips average 2-5 passengers, but a handful of trips see up to 8 or 9 passengers. Generally, the service window is appropriate for the level of demand.

704 Yellow Shuttle Ridership by Trip



Stop Spacing

0.39

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.39 miles apart on average. In other words, there are about 2.6 stops per mile.

Transfer Opportunities

Transfer is available at Alderman Lot Shuttle Stop to Campus Loop and Grey Shuttle.

Opportunities to Strengthen Route 704 Yellow

Opportunities to strengthen Route 704 Yellow are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- Consolidate with Route 703 Red Shuttle:** Other than the three stops on Varsity Drive, Route 703 Red Shuttle duplicates other Wave-provided services like Route 704 Yellow Shuttle and Route 107 College Road. The duplicative nature of this route may explain the Red Shuttle's low ridership, despite its higher frequency service. Route 703 could be combined with a slightly redesigned Route 704 Yellow Shuttle (which would serve the park-and-ride in both directions) to provide even more frequent service.

Figure 79 | A redesigned Red/Yellow Shuttle could consolidate service between the residential complexes on Varsity Drive, the Park and Ride, and Teal Terminal with a new frequent route.

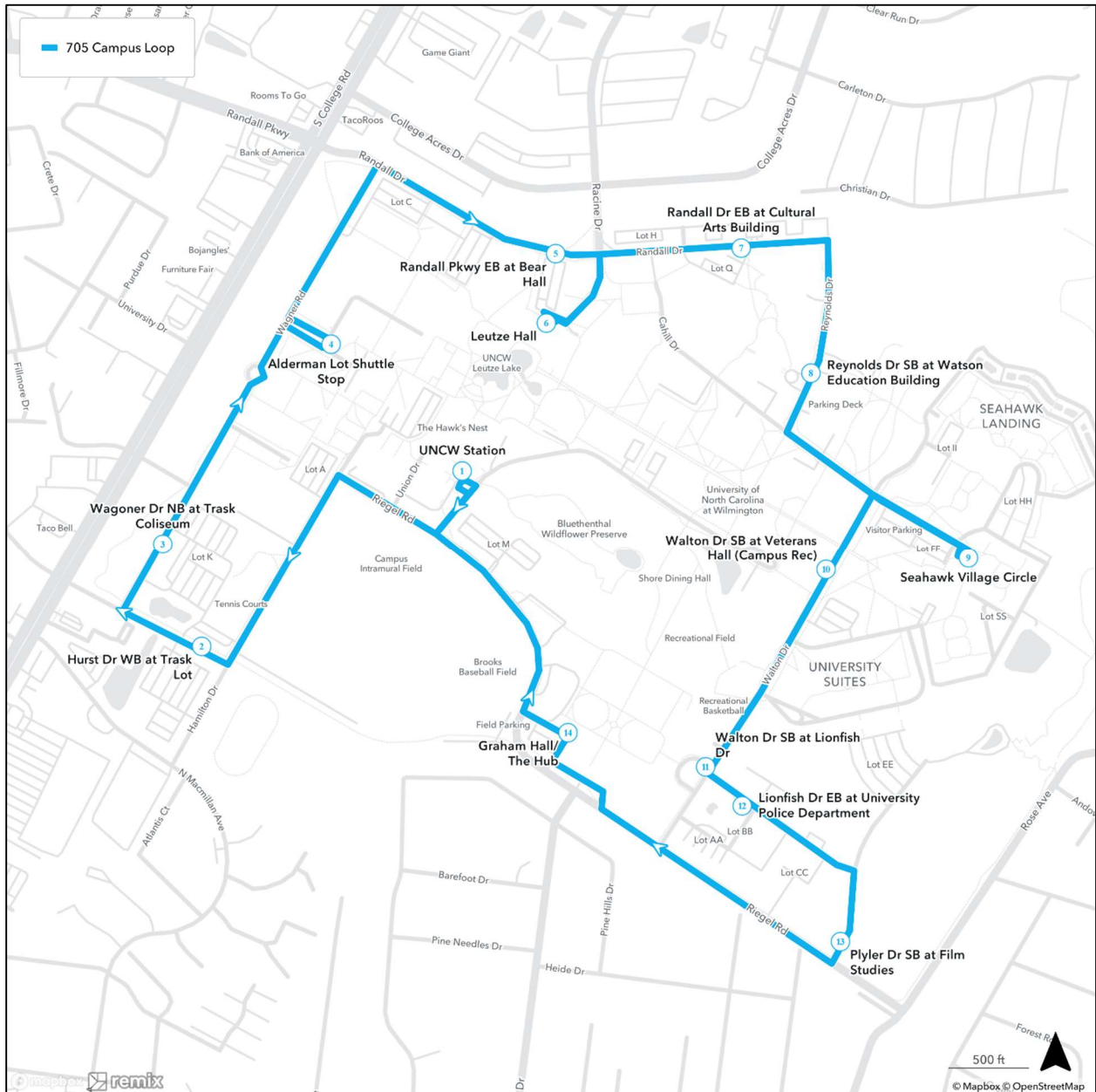


ROUTE 705 CAMPUS LOOP

Service Overview

Route 705 Campus Loop is a Seahawk Shuttle service that operates on weekdays only around UNCW campus. It plays an important role by providing service to major campus buildings and key shuttle stops. No change is suggested for the Campus Loop Shuttle.

Figure 80 | Route 705 Route Map



Route Alignment

Route 705 Campus Loop operates around UNCW campus, serving Wagner Rd, Riegel Rd, Walton Dr, and Randall Dr.

Service Span and Frequency

Route 705 Campus Loop operates on weekdays only. Like most routes in UNCW's network, operates from 7AM to 5PM on weekdays. It operates at 30-minute headways during all times.

Figure 81 | Route 705 Campus Loop Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		30 min

Ridership and Productivity

Compared to other Seahawk Shuttles, Route 705 Campus Loop has average ridership with 54 boardings per average weekday. Its productivity is also relatively average, with 2.7 riders per hour on weekdays.

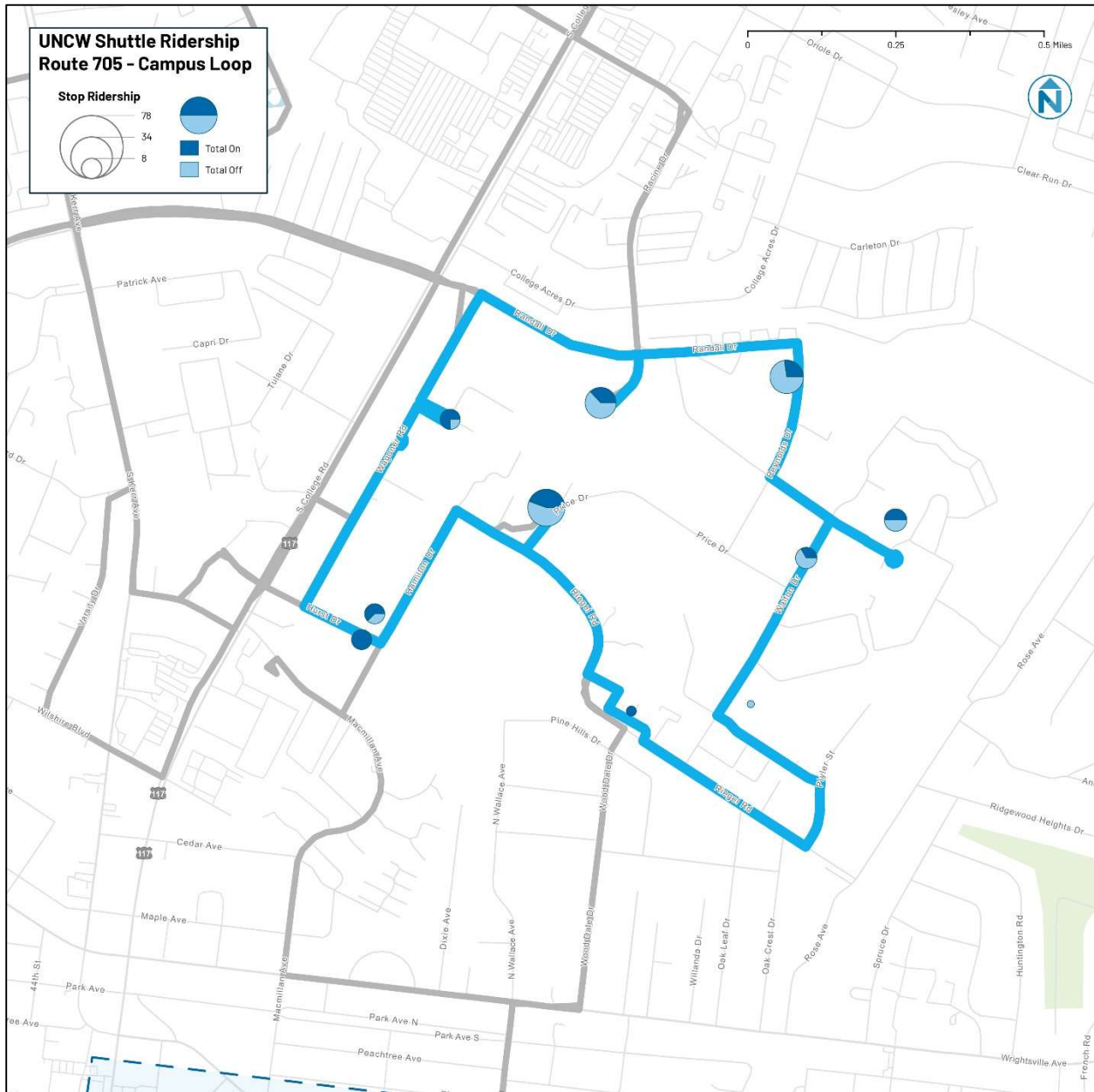
The most productive ridership segments are on the western side of the campus. There is low ridership around east campus. The highest ridership stops include:

- UNCW Station, with 12 boardings.
- Trask Coliseum, with 8 boardings.
- Leutze Hall, with 7 boardings.

Figure 82 | Route 705 Ridership and Productivity Service Statistics

Service Statistic	Weekdays
<i>Ridership</i>	54 (4/8)
<i>Riders Served per Hour</i>	2.7 (4/8)
<i>Vehicle Revenue Hours</i>	10

Figure 83 | Route 705 Campus Loop Weekday Ridership by Stop



Ridership by Trip

Data not available.

Stop Spacing

0.31

Overall, bus stops are spaced about 0.31 miles apart on average. In other words, there are about 3.2 stops per mile.

Average Stop
Spacing (Miles)

Transfer Opportunities

Transfer is available at Leutze Hall to Blue and Teal Shuttles, Alderman Lot Shuttle Stop to Yellow and Grey Shuttles, and UNCW Station to Red, Green, and CREST Shuttles. Transfer is available at Bear Hall to Routes 103 and 104.

Opportunities to Strengthen Route 705 Campus Loop

No major changes to Route 702 are suggested.

ROUTE 708 CREST SHUTTLE

Service Overview

Route 708 CREST is a Seahawk Shuttle service that operates on weekdays only between UNCW Station and the Center for Marine Science. The major opportunity for Route 708 CREST is to discontinue the service and reinvest it into other higher ridership services.

Figure 84 | Route 708 Route Map



Route Alignment

Route 708 CREST operates directly between UNCW Station and the Center for Marine Science with one stop in each direction at Masonboro Loop Rd and Andrews Reach.

Service Span and Frequency

Route 708 CREST operates on weekdays only. Like most routes in UNCW's network, Route 708 operates from 7:15AM to 6:15PM on weekdays. It operates at 60-minute headways during all times.

Figure 85 | Route 708 CREST Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		60 min

Ridership and Productivity

Compared to other Seahawk Shuttles, Route 708 CREST has the lowest level of ridership with 5 boardings per average weekday. Its productivity is also the lowest in the system, with 0.5 riders per hour on weekdays.

Figure 86 | Route 708 Ridership and Productivity Service Statistics

Service Statistic	Weekdays
<i>Ridership</i>	5 (8/8)
<i>Riders Served per Hour</i>	0.4 (8/8)
<i>Vehicle Revenue Hours</i>	11

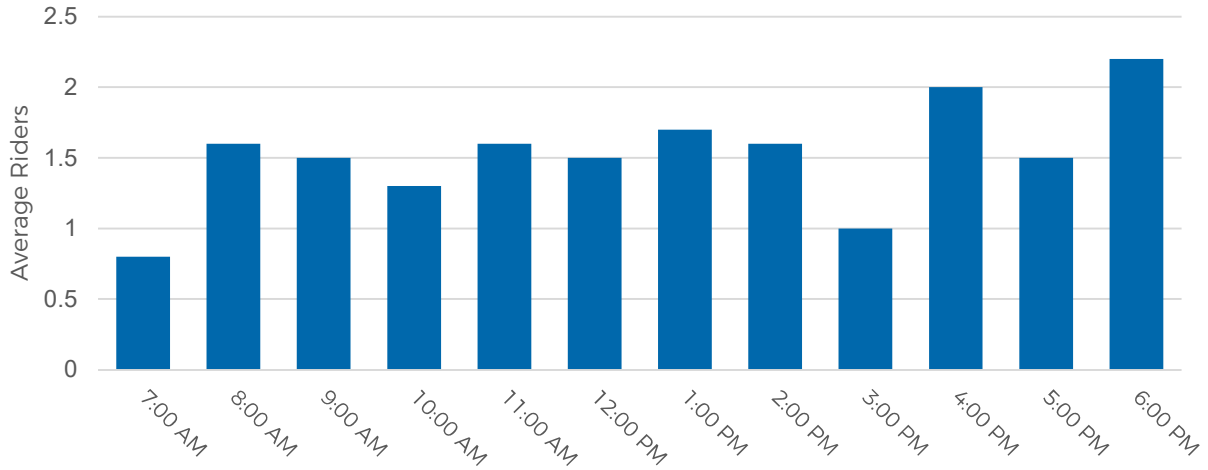
Figure 87 | Route 708 CREST Weekday Ridership by Stop



Ridership by Trip

Ridership by trip for the CREST Shuttle averages 1.5 riders. Generally, the service window is appropriate for the level of demand.

708 CREST Shuttle Ridership by Trip



Stop Spacing

2.6

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 2.6 miles apart on average. In other words, there are about 0.4 stops per mile, reflecting the “express” nature of this route.

Transfer Opportunities

Transfer is available at UNCW Station to Campus Loop, Green Shuttle, and the Red Shuttle.

Opportunities to Strengthen Route 708 CREST

Opportunities to strengthen Route 708 CREST are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

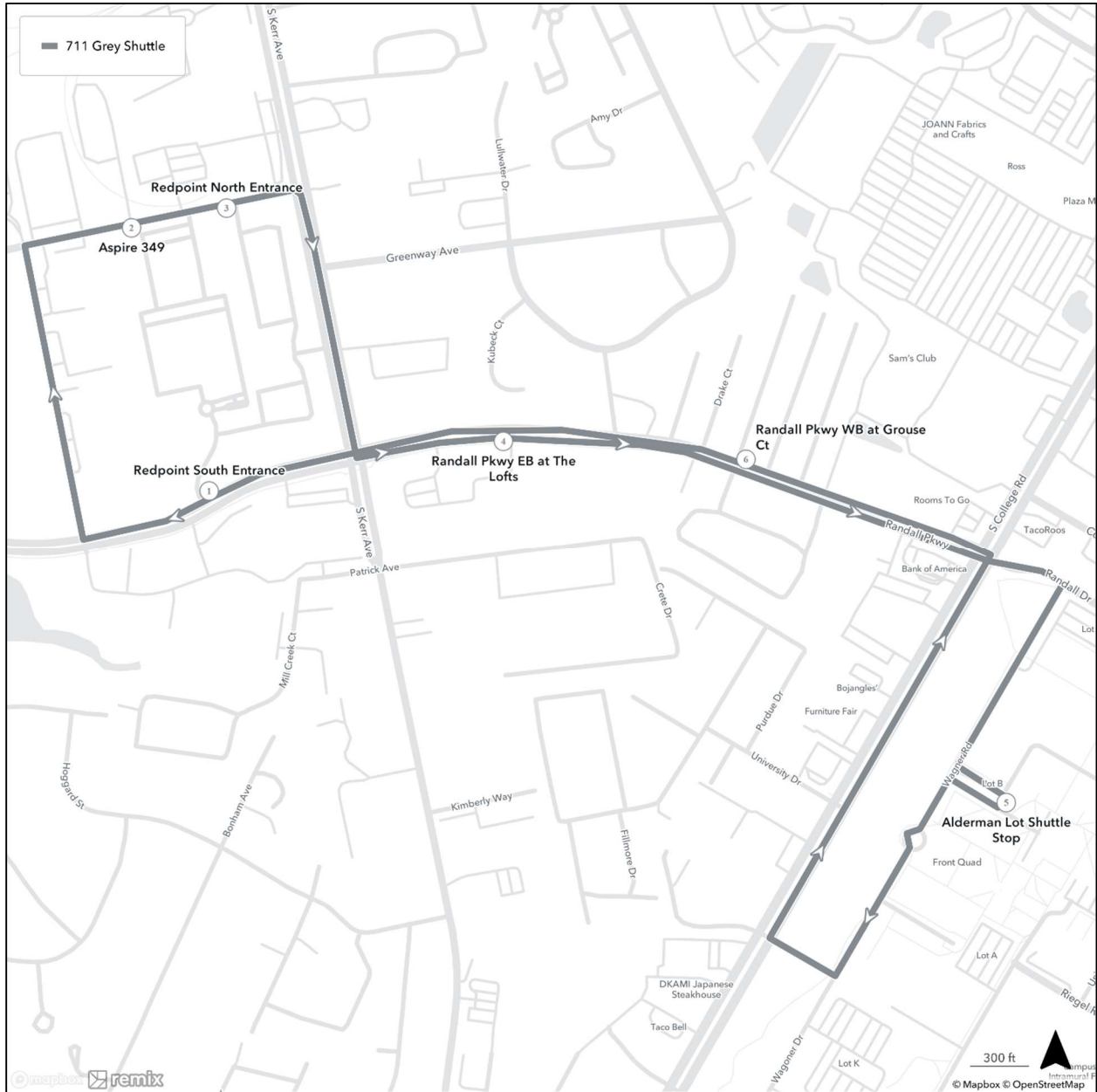
- **Discontinue service**, due to low ridership. Service to the Center for Marine Science is available via RideMICRO Zone 3. In addition, the CREST Shuttle is very unproductive, and the resources used to operate it could be reinvested into other more productive services.

ROUTE 711 GREY SHUTTLE

Service Overview

Route 711 Grey is a Seahawk Shuttle service that operates on weekdays only between Alderman Lot Shuttle Stop and Carolina Cove Apartments. It plays an important role by serving residential and commercial areas west of UNCW campus. The major opportunity for Route 711 Grey is to realign the route slightly to serve more unique destinations.

Figure 88 | Route 711 Route Map



Route Alignment

Route 711 Grey operates between Alderman Lot Shuttle Stop and Carolina Cove Apartments. Service to Carolina Cove Apartments / Redpoint is also provided by the Yellow Shuttle.

Service Span and Frequency

Route 711 Grey operates on weekdays only. Like most routes in UNCW’s network, Route 711 operates from 7AM to 5:30PM on weekdays. It operates at 20-minute headways during all times.

Figure 89 | Route 711 Grey Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		20 min

Ridership and Productivity

Compared to other Seahawk Shuttles, Route 711 Grey has high levels of ridership with 421 boardings per average weekday. Its productivity is also relatively high, with 39.5 riders per hour on weekdays.

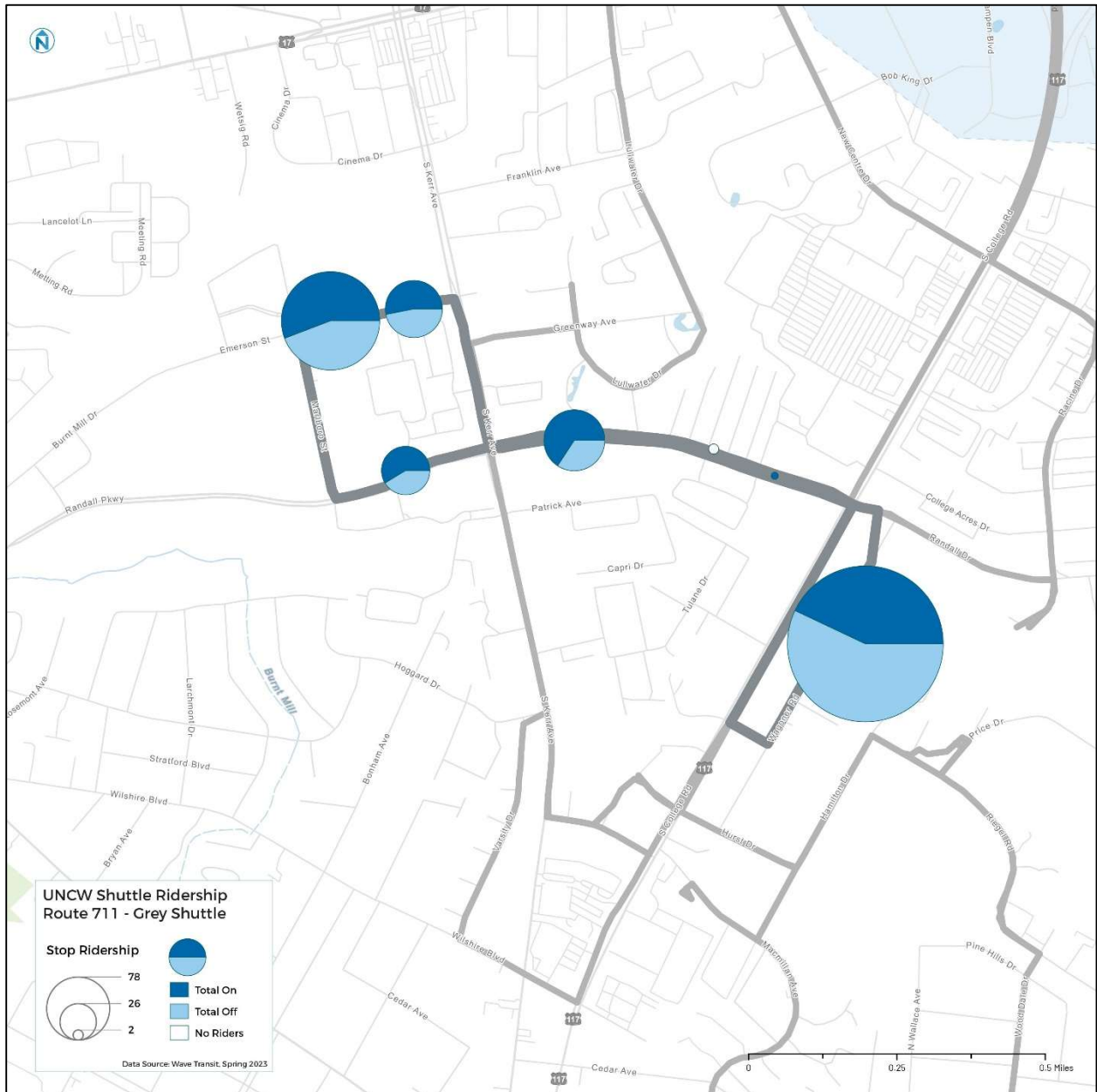
The highest ridership stops include:

- Alderman Lot Shuttle Stop (205 boardings)
- Three stops at Redpoint (167 total boardings)
- Randall Pkwy at the Lofts (48 boardings)

Figure 90 | Route 711 Ridership and Productivity Service Statistics

Service Statistic	Weekdays
<i>Ridership</i>	421 (2/8)
<i>Riders Served per Hour</i>	13.2 (1/8)
<i>Vehicle Revenue Hours</i>	10.67

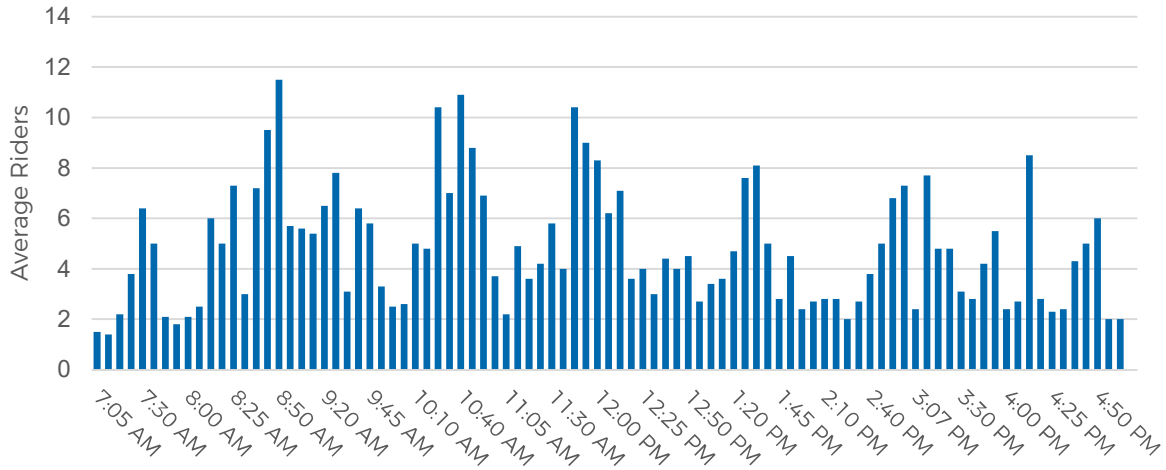
Figure 91 | Route 711 Grey Weekday Ridership by Stop



Ridership by Trip

Ridership by trip for the Grey Shuttle fluctuates wildly across the day. Peaks occur around 9AM, 10:40AM, 11:30AM, 1:20PM, and 3PM, where trips average 8-11 riders. Otherwise, most trips average 2-4 riders. Generally, the service window is appropriate for the level of demand.

711 Grey Shuttle Ridership by Trip



Stop Spacing

0.58

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 0.58 miles apart on average. In other words, there are about 1.7 stops per mile. Stop density is low compared to the other routes in the system.

Transfer Opportunities

Transfer is available at Alderman Lot Shuttle Stop to Campus Loop and Yellow Shuttle.

Opportunities to Strengthen Route 711 Grey

Opportunities to strengthen Route 711 Grey are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Add infill stops:** Additional bus stops could be added at Marlboro/Emerson (to serve the Progress Apartments) and Greenway Village (to serve the Camden Forest Apartments) in order to improve access to this route.
- **Realign via Franklin Avenue:** Route 711 Grey could operate inbound via Franklyn Ave/Lullwater Drive to better serve apartments currently served by Route 701 Blue.
- **Operate to/from Leutze Hall:** Most Route 711 Grey riders are riding to classes located primarily along Chancellors Walk on the eastern side of campus. Operating to/from Leutze Hall would drop riders closer to this major destination and also improve connections to the Route 701 Blue and Route 712 Teal.
- **Increase frequency:** Route 711 Grey could support very frequent (10 minutes or better) service during the entirety of its service span.

Figure 92 | A redesigned Route 711 Grey would operate less duplicative alignment and serve more student residential areas by operating via Franklin Ave and Lullwater Drive. This alignment would be especially useful if Route 701 Blue and Route 712 Teal were consolidated.

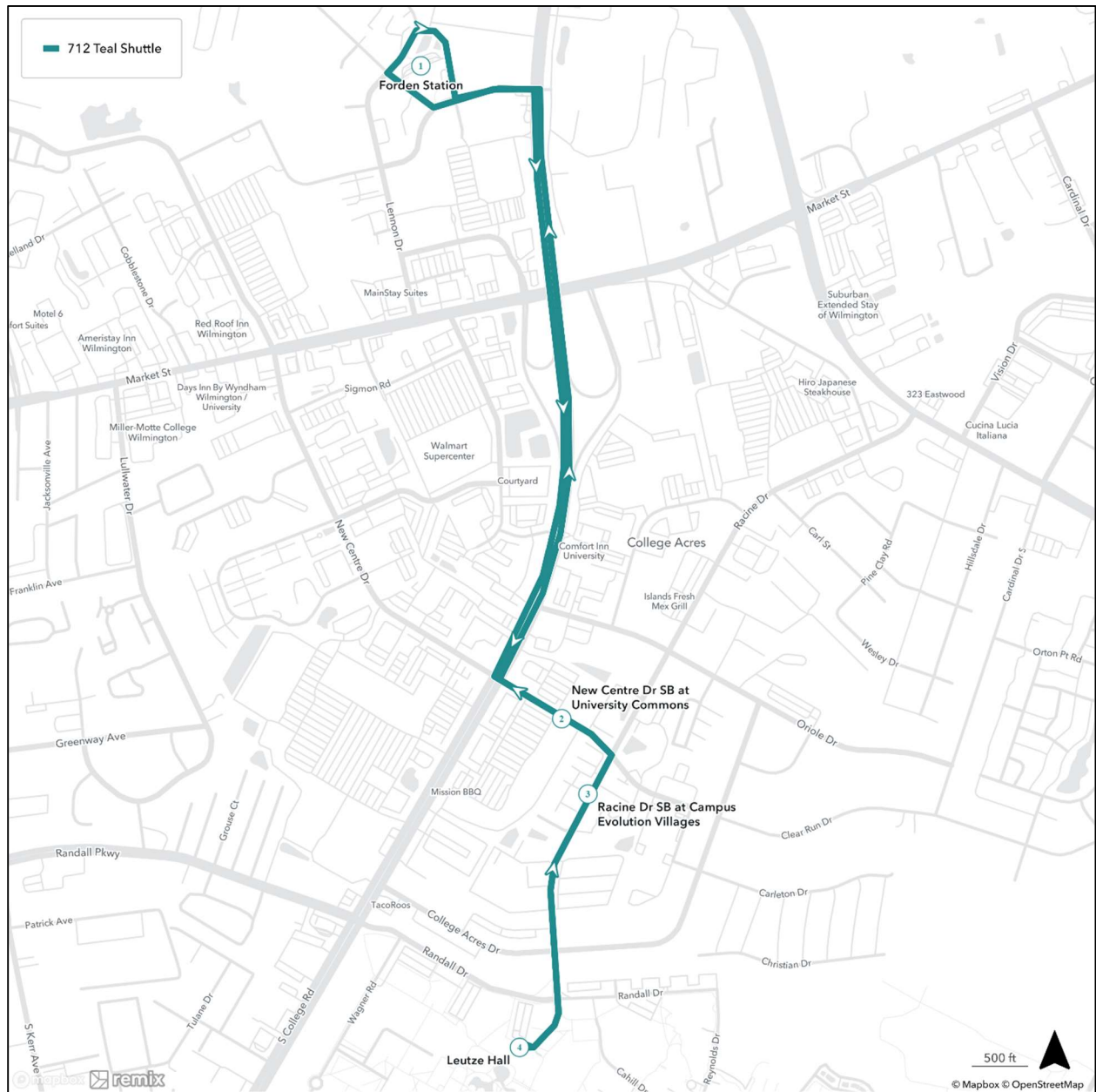


ROUTE 712 TEAL SHUTTLE

Service Overview

Route 712 Teal is a Seahawk Shuttle service that operates on weekdays only between Leutze Hall and Forden Station. The major opportunity for Route 712 Teal is to consolidate it with Route 701 Blue, operate it via major retail, civic, and commercial destinations south of Forden Station, and operate it year-round and on weekends.

Figure 93 | Route 712 Route Map



Route Alignment

Route 712 Teal operates directly between Leutze Hall and Forden Station via two stops to serve residential and retail destinations east of College Road. Service is duplicated by Routes 103 and 104 at Bear Hall, and by Route 107 at University Drive / College Road.

Service Span and Frequency

Route 712 Teal operates on weekdays only. Like most routes in UNCW's network, Route 712 operates from 7AM to 6:15PM on weekdays. It operates at 15-minute headways during all times.

Figure 94 | Route 712 Teal Service Span and Frequency

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9	Frequency
Weekday																		15 min

Ridership and Productivity

Compared to other Seahawk Shuttles, Route 712 Teal has low ridership with 52 boardings per average weekday. Its productivity is also relatively high, with 11.5 riders per hour on weekdays. Route 712 Teal has low ridership, especially considering the frequency of the service.

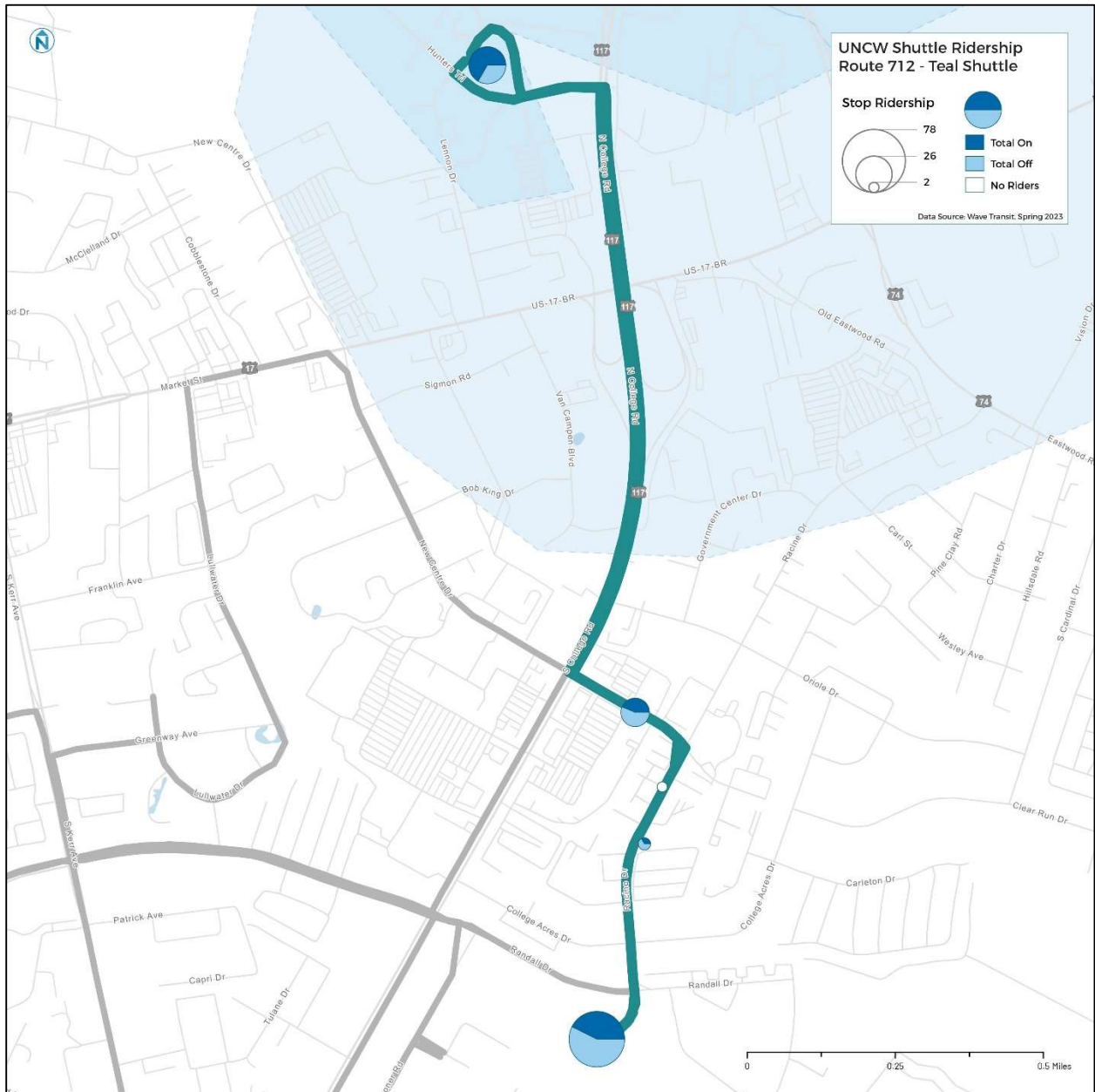
The highest ridership stops include:

- Leutze Hall (26 boardings)
- Forden Station (18 boardings)
- University Commons (7 boardings)

Figure 95 | Route 712 Ridership and Productivity Service Statistics

Service Statistic	Weekdays
<i>Ridership</i>	52 (5/8)
<i>Riders Served per Hour</i>	1.1 (6/8)
<i>Vehicle Revenue Hours</i>	11.5

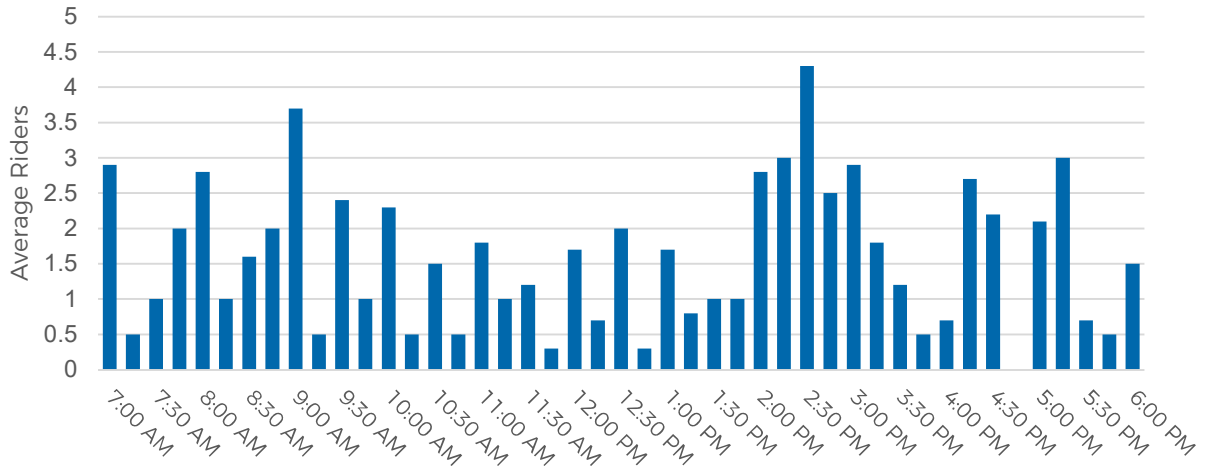
Figure 96 | Route 712 Teal Weekday Ridership by Stop



Ridership by Trip

Ridership by trip for the Teal Shuttle fluctuates throughout the hour and the day. Trips at :15 and :45 generally have lower ridership than trips at the top of the hour and half hour. Ridership is consistently high from 2PM to 3PM, where trips average 3 riders. Overall, trips range from 1-3 riders across the day. Generally, the service window is appropriate for the level of demand.

712 Teal Shuttle Ridership by Trip



Stop Spacing

1.1

Average Stop Spacing (Miles)

Overall, bus stops are spaced about 1.1 miles apart on average. In other words, there is about 1.0 stop per mile. Stop density is low compared to the other routes in the system. There may exist opportunities for infill stations along Racine Drive to reduce walking distances for many riders.

Transfer Opportunities

Transfer is available at Leutze Hall to the Campus Loop and the Blue Shuttle. Transfer is available at Forden Station to many Wave routes.

Opportunities to Strengthen Route 712 Teal

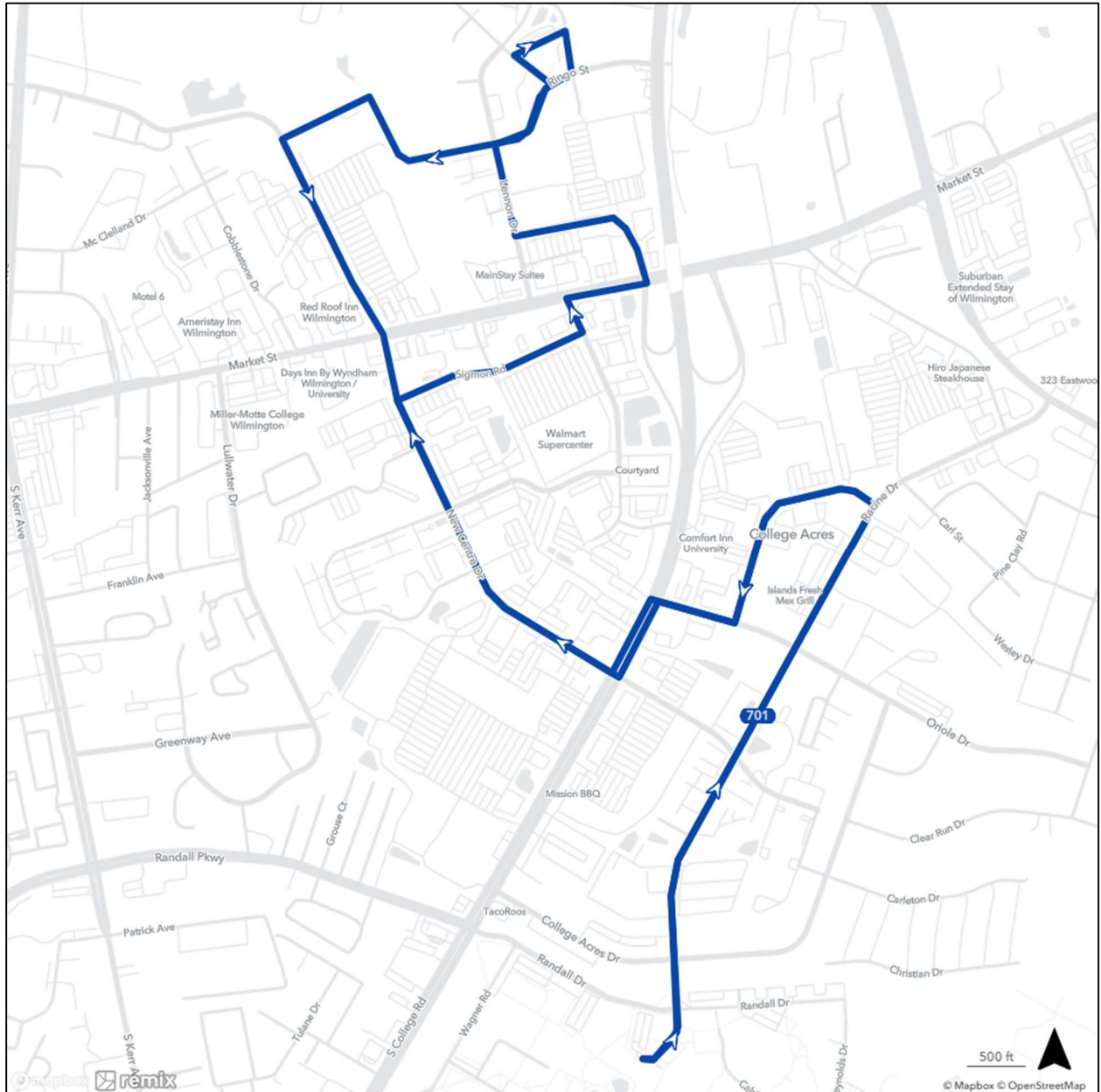
Opportunities to strengthen Route 712 Teal are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- Combine with Route 701 Blue:** Wave provides multiple but uncoordinated routes between UNCW and Forden Station, including Route 103 Oleander East, Route 104 East, Route 107 College Road, and Route 712 Teal. These routes operate slightly differently between these two major destinations. Instead of serving multiple places with different routes, UNCW and public fixed-route service should be coordinated so that service is not duplicative and therefore easier to understand. One way this could be accomplished is by operating all College Road fixed-route service (including Route 107 College Rd and a redesigned Route 103 that would operate between Forden Station and the Medical Center via College Road) via the Alderman Lot Shuttle Stop to increase effective frequency between UNCW and Forden Station to every 30 minutes. This new half-hourly connection could enable Route 712 Teal, whose sole purpose is to provide an express connection between Forden Station and UNCW to be combined with Route 701 Blue to provide a more useful local circulator for UNCW students and Wave riders to connect to

both campus and nearby shopping and retail destinations like Walmart, Costco, Target, and the County Government Center.

- **Operate Year-Round:** A redesigned Route 701 that provides both local circulator service to shopping destinations and a connection between Forden Station and UNCW could support year-round service.

Figure 97 | Potential redesigned Route 701 Blue service

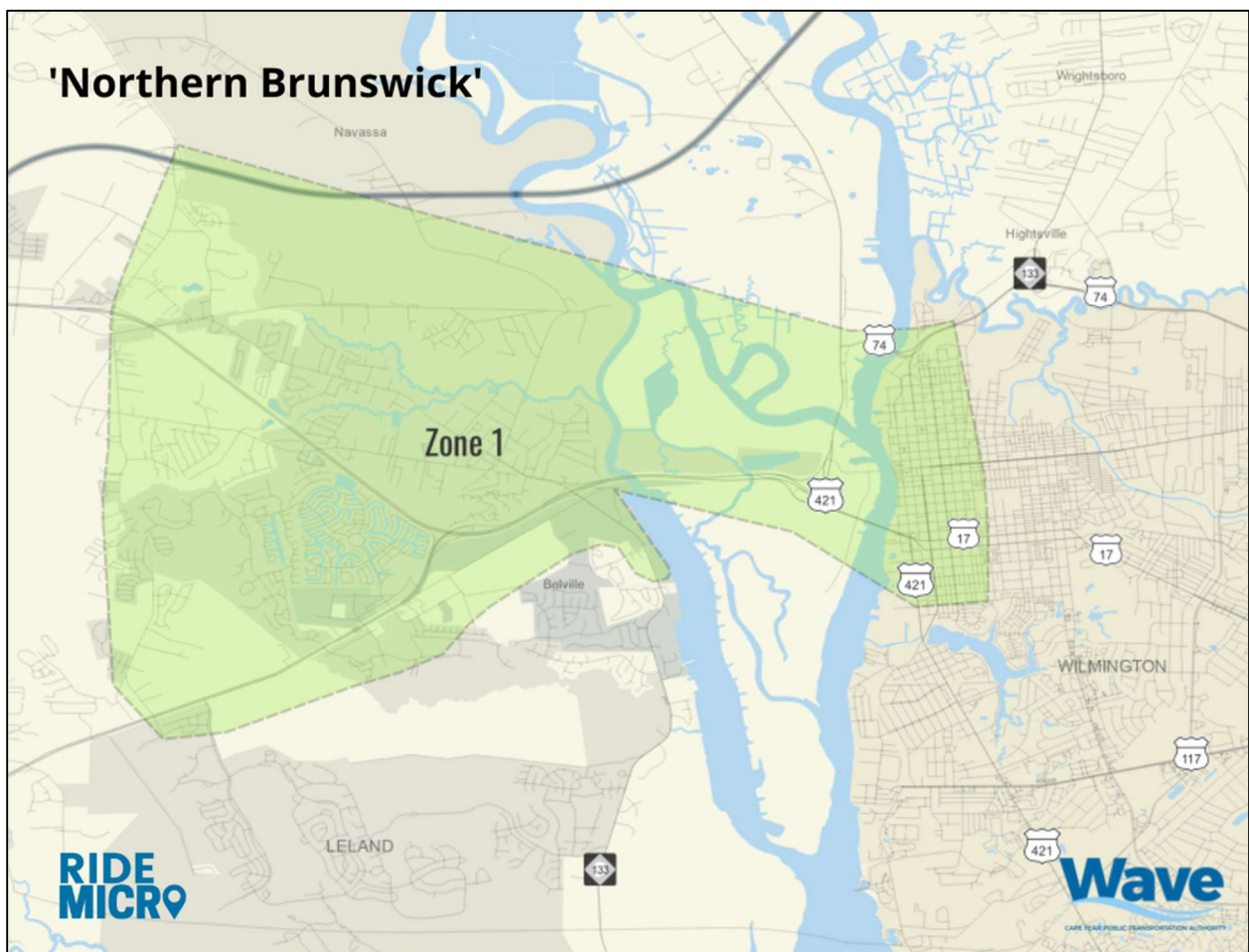


RIDEMICRO ZONE 1 NORTHERN BRUNSWICK

Service Overview

RideMICRO Zone 1 Northern Brunswick is a RideMICRO microtransit service that operates on weekdays in northern Brunswick County with connections available to Padgett Station and downtown Wilmington. It connects low demand residential areas and major destinations along Ocean Highway and Andrew Jackson Highway to Wave fixed-route service and major destinations in Downtown Wilmington. The major opportunities for RideMICRO Zone 1 are to create a single service window, prioritize zone boundaries at high ridership areas, reduce duplication with Wave fixed-route service, or eliminate the zone and pool resources in other zones.

Figure 98 | RideMICRO Zone 1 Route Map



Service Boundary

RideMICRO Zone 1 operates in Northern New Hanover County with connections available to Padgett Station and routes in downtown Wilmington. It covers roughly 21.6 square miles and provides on-demand pick up and drop off service to many communities including downtown Wilmington, Leland, Navassa, Belville, Magnolia Greens, Lanvale, and Brunswick Forest. Zone 1's

eastern boundary follows 8th Street / 9th Street between Greenfield Street and Bess Street. This service in downtown Wilmington duplicates many Wave fixed routes. The southern border follows Greenfield Street in downtown Wilmington but acts as a half-mile buffer stretching south of Ocean Highway until Lanvale Road. Zone 1’s western boundary is a quarter-mile buffer stretching west of Lanvale Road and Mt. Misery Road until Industrial Boulevard. The northern border is a half-mile buffer stretching north of Old Mill Road and is bounded by Bess Street in Wilmington.

Service Span and Wait Times

RideMICRO Zone 1 operates on weekdays, from 6:30AM to 10AM, and from 12PM to 7PM. 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 1, trip requests can be denied due to demand exceeding the capacity of the single vehicle dedicated to the zone.

Figure 99 | RideMICRO Zone 1 Service Span

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9
Weekday																	

Ridership and Productivity

Compared to Wave’s 3 other RideMICRO routes, RideMICRO Zone 1 has the lowest ridership with 9 boardings per average weekday. Its productivity is also the lowest, with 2.5 passengers per revenue hour.

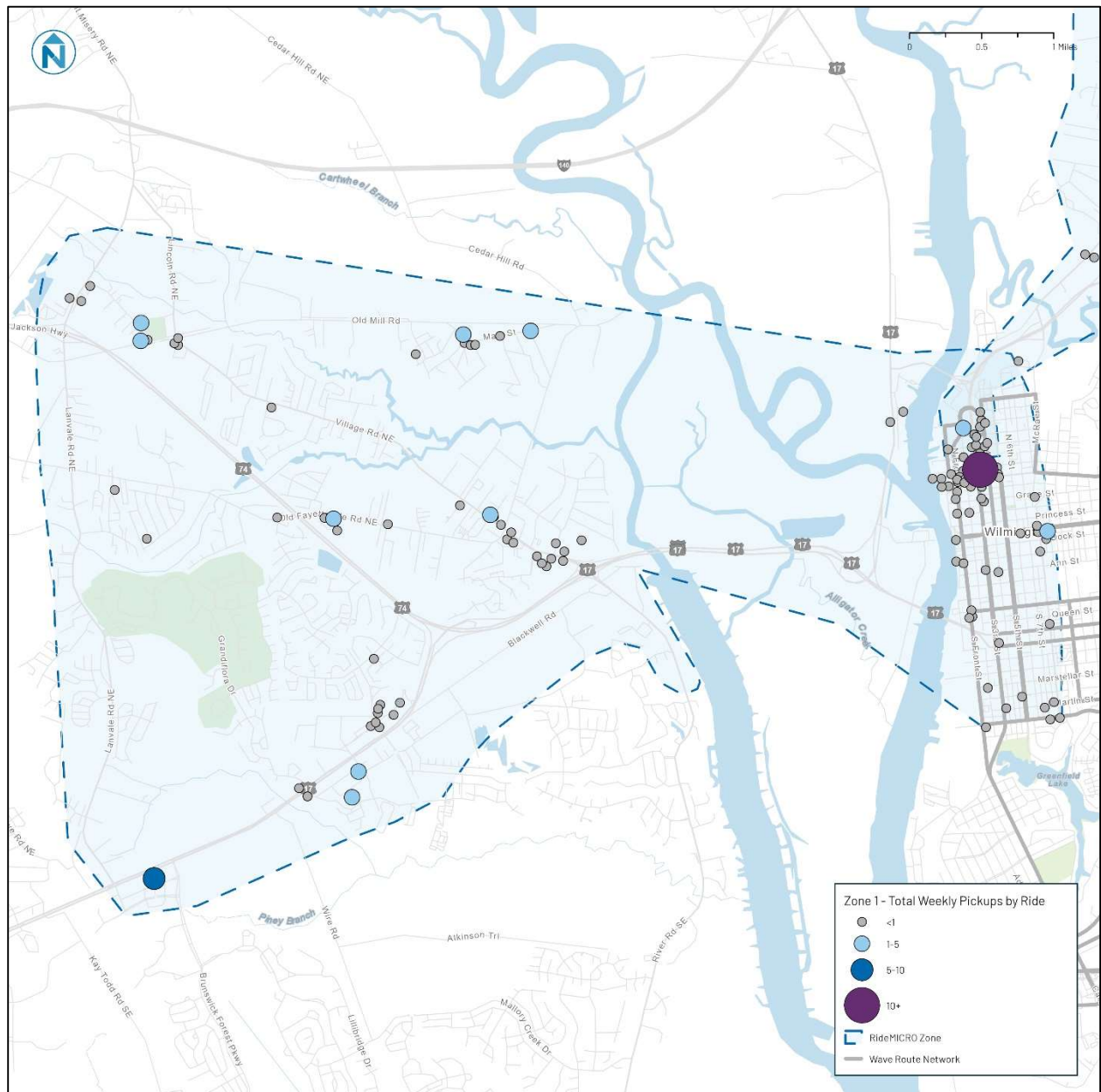
The most common pickup locations for Spring 2023 on weekdays are:

- Padgett Station, with 65 pickups
- The Villages at Brunswick Forest shopping center, with 108 pickups
- Walmart in Leland, with 39 pickups
- The area around the intersection of Village Road, Leland School Road, and Lincoln Road, with about 80 pickups
- Old Fayetteville Road near north Brunswick High School, with about 45 boardings
- The area along Village Road at the intersection with Old Fayetteville Road, with about 50 pickups
- Navassa, along Main Street, with about 30 pickups.

Figure 100 | RideMICRO Zone 1 Ridership and Productivity Service Statistics

Service Statistic	Weekdays
<i>Ridership</i>	9 (4/4)
<i>Riders Served per Hour</i>	0.8 (4/4)
<i>Vehicle Revenue Hours</i>	10.5

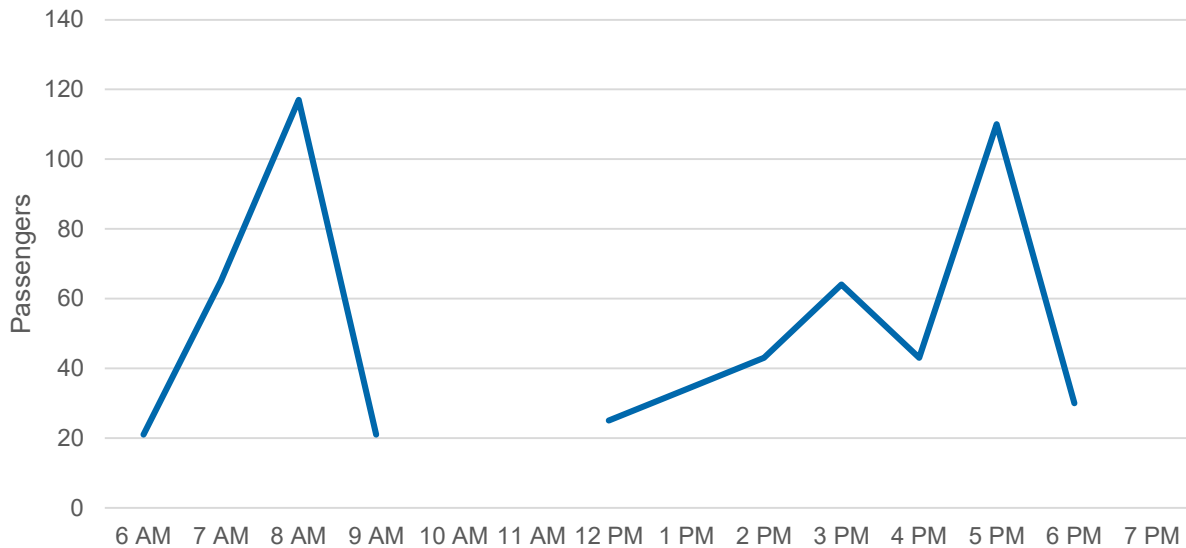
Figure 101 | RideMICRO Zone 1 Weekday Ridership by Stop



Ridership by Time of Day

RideMICRO Zone 1’s ridership activity in both service windows gradually rises throughout, and peaks towards the latter half of the window. They peak at roughly equal levels at 8AM, and at 5PM, and fall toward the end of the service window. It is unclear whether low midday ridership is due to the large gap in service during midday or due to low demand.

Figure 102 | RideMICRO Zone 1 Pickups by Time of Day (Spring 2023)



On-Time Performance

Anecdotally, many riders and RideMICRO vehicle operators report that during peak times, same-day reservations for trips cannot be provided due to vehicle availability. In addition, best practice for microtransit service involves operating a zone with at least 2 vehicles to provide sufficient redundancy and allow operators to take breaks. These factors indicate that Wave should consider increasing the number of vehicles operating in Zone 1 to at least 2.

Transfer Opportunities

Riders can transfer to and from Zone 1 service at Padgett Station, and to any route in downtown Wilmington.

Opportunities to Strengthen RideMICRO Zone 1

Opportunities to strengthen RideMICRO Zone 1 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Create a single service window.** Having a single service window makes it easier for passengers to plan trips.
- **Reduce zone size to highest demand areas** . To provide service more cost-effectively, Wave can consider eliminating service west of Andrew Jackson Highway and Ocean Highway, where ridership is low.

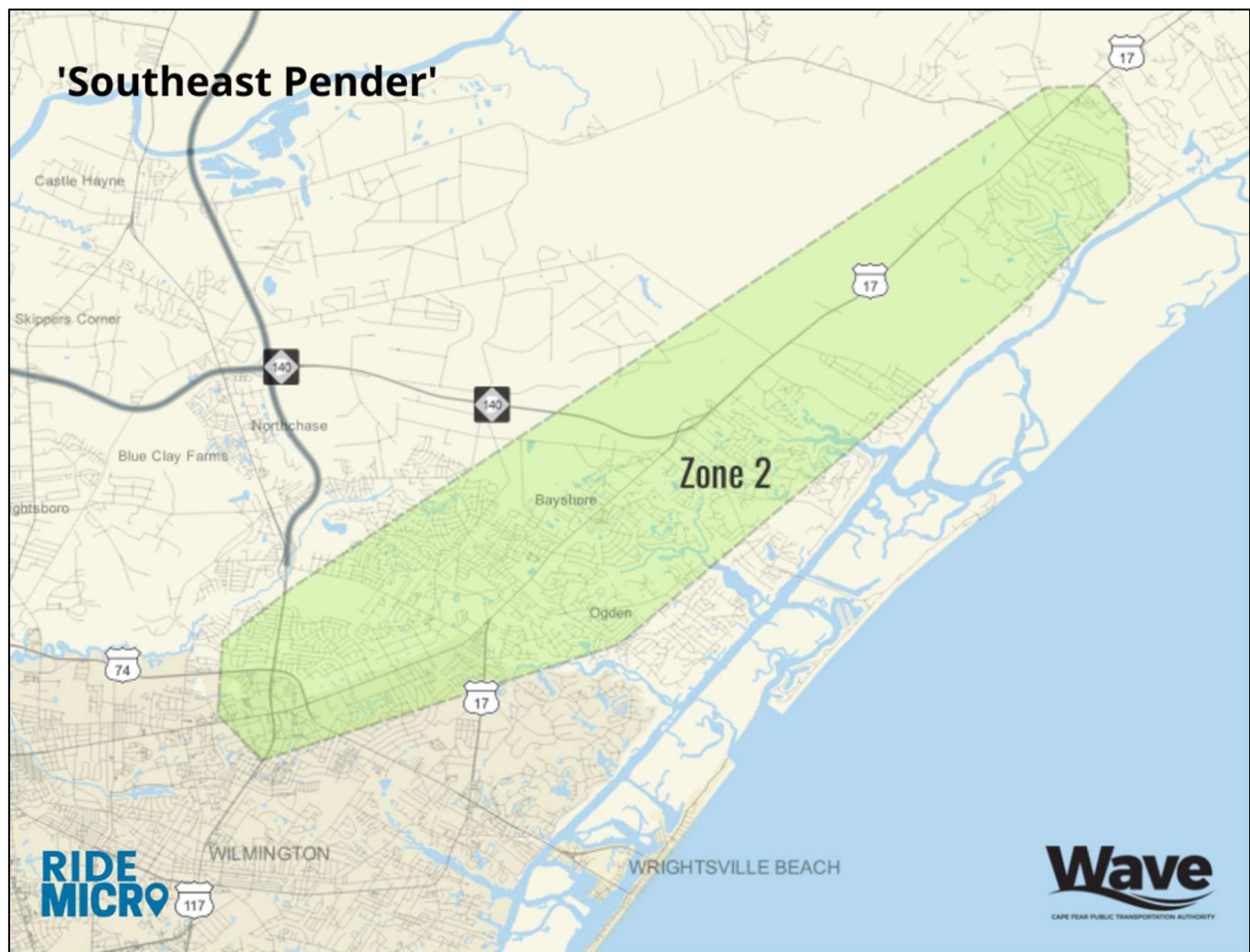
- **Disallow duplication with other Wave services** . Wave provides higher quality service in downtown Wilmington via fixed route. The app should not allow passengers to begin and end a trip within downtown Wilmington alone via RideMICRO.
- **Eliminate the zone.** Zone 1 is the least productive of the four zones by all metrics, and its ridership and productivity are very low. Resources could be better allocated to improve service on other RideMICRO zones within New Hanover County such as Zone 4.

RIDEMICRO ZONE 2 SOUTHEAST PENDER

Service Overview

RideMICRO Zone 2 Southeast Pender is a RideMICRO microtransit service that operates on weekdays in northeast New Hanover County / southeast Pender County with connections available to Forden Station and Route 104. It plays an important role by connecting low demand residential areas along Market Street and Highway 17 to Wave fixed-route service. The major opportunities for RideMICRO Zone 2 are to create a single service window, prioritize zone boundaries at high ridership areas, eliminate duplicative service with Zone 4 and Route 104, or eliminate the zone entirely and pool resources in other zones.

Figure 103 | RideMICRO Zone 2 Route Map



Service Boundary

RideMICRO Zone 2 Southeast Pender operates in northeast New Hanover County / southeast Pender County with connection available to Forden Station and Route 104. It covers roughly 28 square miles and provides on-demand pick up and drop off service to many communities including Kings Grant, Cape Harbor Apartments, Ogden, Bayshore, Scotts Hill, Brown Town, and Hampstead. Zone 2's service boundary can be characterized as a buffer around Market Street

and Highway 17 from Forden Station to Loblolly Trail in Hampstead, a length of approximately 14 miles. The width of the buffer is about 2 miles. Towards the Market Street end, the buffer is slightly larger on the northern side, and towards the Highway 17 end, the buffer is larger on the southern side.

Service Span and Wait Times

RideMICRO Zone 2 operates on weekdays, from 6:30AM to 10AM, and from 12PM to 7PM. 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 2, trip requests can be denied due to demand exceeding the capacity of the single vehicle dedicated to the zone.

Figure 104 | RideMICRO Zone 2 Service Span

Day of Week	5AM	6	7	8	9	10	11	12PM	1	2	3	4	5	6PM	7	8	9
Weekday																	

Ridership and Productivity

Compared to Wave’s 3 other RideMICRO routes, RideMICRO Zone 2 has low ridership with 13 boardings per average weekday. Its productivity is also relatively low with 2.6 riders per hour on weekdays.

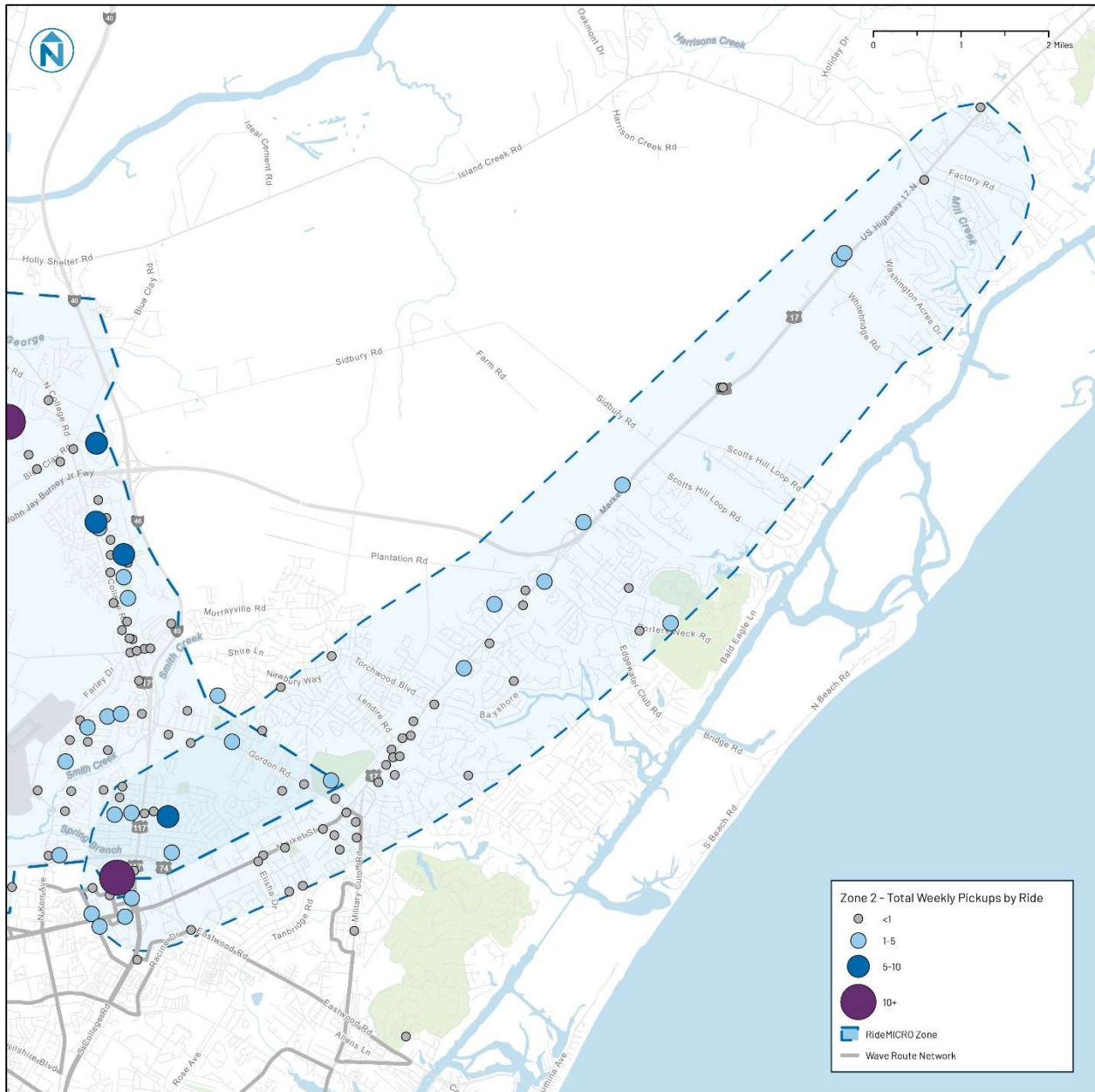
The most common pickup locations for Spring 2023 on weekdays are:

- Forden Station, with 495 pickups
- On Blue Heron Drive, with 58 pickups
- On Highway 17, with about 150 pickups along the corridor
- On Market Street, with about 100 pickups northeast of Gordon Road, the extent of fixed route service.
- Cape Harbor Apartments, with 56 pickups

Figure 105 | RideMICRO Zone 2 Ridership and Productivity Service Statistics

Service Statistic	Weekdays
<i>Ridership</i>	13 (3/4)
<i>Riders Served per Hour</i>	1.2 (3/4)
<i>Vehicle Revenue Hours</i>	10.5

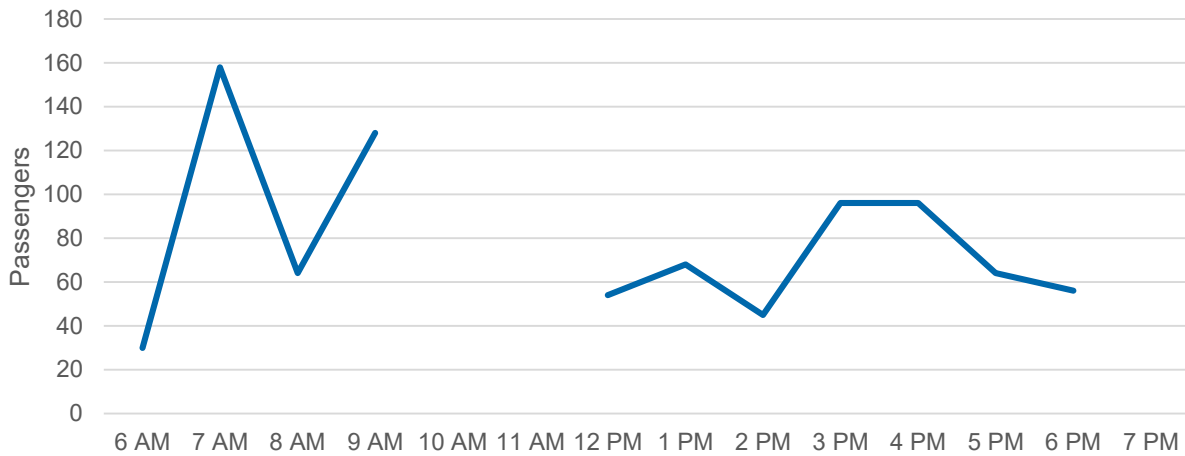
Figure 106 | RideMICRO Zone 2 Weekday Ridership by Stop



Ridership by Time of Day

RideMICRO Zone 2's ridership activity begins low at the start of the day, but peaks at 7AM and 9AM. Ridership in the PM window remains at a moderate level. The high ridership at the end of the AM window suggests unmet demand for RideMICRO service in the late morning.

Figure 107 | RideMICRO Zone 2 Pickups by Time of Day (Spring 2023)



On-Time Performance

Anecdotally, many riders and RideMICRO vehicle operators report that during peak times, same-day reservations for trips cannot be provided due to vehicle availability. In addition, best practice for microtransit service involves operating a zone with at least 2 vehicles to provide sufficient redundancy and allow operators to take breaks. These factors indicate that Wave should consider increasing the number of vehicles operating in Zone 1 to at least 2.

Transfer Opportunities

Riders can transfer to and from Zone 2 service at Forden Station and along Market Street via Route 104.

Opportunities to Strengthen RideMICRO Zone 2

Opportunities to strengthen RideMICRO Zone 2 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Create a single service window** . Having a single service window makes it easier for passengers to plan trips.
- **Reduce zone size to highest demand areas** . To provide service more cost-effectively, Wave can consider eliminating service northeast of Scotts Hill. Most ridership is concentrated southwest of Scotts Hill Loop Road. Shrinking the zone size will also allow the zone to be served more effectively with fewer vehicles.
- **Reduce zone size to avoid duplicating other Wave services**. RideMICRO Zone 4 provides overlapping service with RideMICRO Zone 2. To avoid duplicating other services, especially more productive and cost-effective fixed-route services, Wave can alter Zone 2's zone boundaries to allow pickups and drop-offs only east of College Road.
- **Eliminate the zone**. Zone 1 is the second least productive of the four RideMICRO zones. Resources could be better allocated to higher demand microtransit zones such as Zone 4.

RIDEMICRO ZONE 3 SOUTHERN NEW HANOVER

Service Overview

RideMICRO Zone 3 Southern New Hanover is a RideMICRO microtransit service that operates seven days a week in southern New Hanover County with connections available to Monkey Junction and College Road. It plays an important role by connecting low demand residential areas and Carolina Beach to Wave fixed-route service. The major opportunities for RideMICRO Zone 3 are to redesign the service zone to minimize duplication with fixed-route service, discontinue service to areas with very ridership, and add an additional vehicle to improve service reliability.

Figure 108 | RideMICRO Zone 3 Route Map



Service Boundary

RideMICRO Zone 3 Southern New Hanover operates in southern New Hanover County with connections available to Monkey Junction and College Road. It covers roughly 25.6 square miles and provides on-demand pick up and drop off service to many communities including Winter Park, Milbrook, Silver Lake, Myrtle Grove, Carolina Beach, and Kure Beach. The northern boundary roughly aligns with the following: the river from the east coast north of Masonboro

Sound Road, Pine Grove Drive, Oleander Drive, College Road, St. Andrews Drive, and the river until River Road on the west coast. The western boundary follows the western coast for a mile, then retracts east to act as a quarter mile buffer for Carolina Beach Road until it reaches Kure Beach. The eastern boundary follows the coastline until Masonboro Sound Road.

Service Span and Wait Times

RideMICRO Zone 3 operates seven days a week. Like most services in Wave’s network, RideMICRO Zone 3 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. 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 3, trip requests can be denied due to demand exceeding the capacity of the single vehicle dedicated to the zone.

Figure 109 | RideMICRO Zone 3 Service Span

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

Ridership and Productivity

Compared to Wave’s 3 other RideMICRO routes, RideMICRO Zone 3 has above average ridership with 20 boardings per average weekday. Compared to weekday ridership, Saturday ridership is 80% and Sunday ridership is 54%. Its productivity is also relatively high with 1.4 riders per hour on weekdays, 1.6 riders per hour on Saturdays, and 1.1 riders per hour on Sundays. Weekend ridership is higher compared to Zone 4, likely because CFCC located in Zone 4 is closed on weekends.

The most common pickup locations for Spring 2023 on weekdays are:

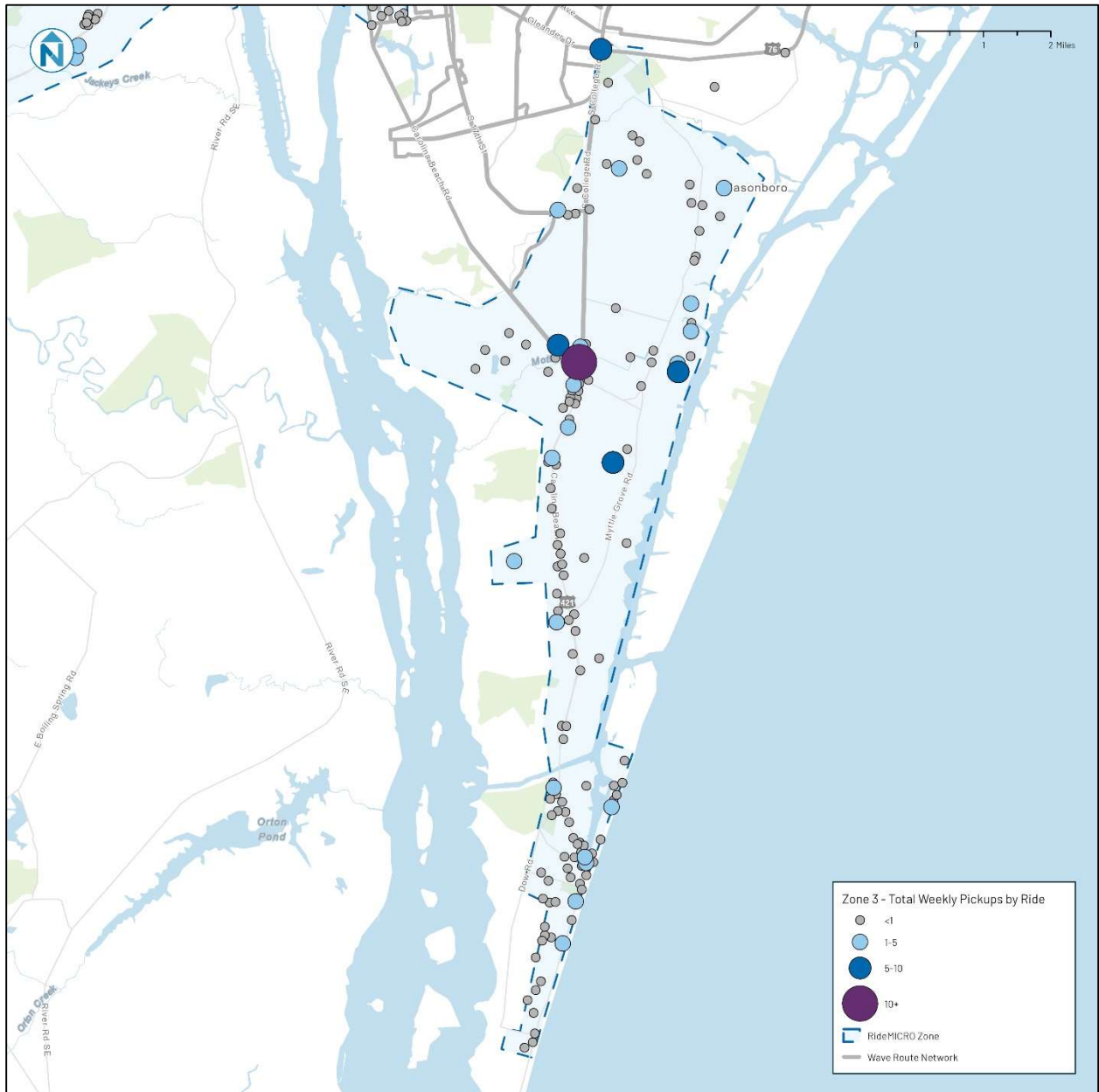
- Monkey Junction, with about 350 boardings around the intersection of Carolina Beach Road and College Road.
- Center for Marine Science, with about 140 pickups
- Carolina Beach Road north of Myrtle Grove Road, with about 146 pickups
- Carolina Beach, with about 225 pickups

There is low or no ridership north of Monkey Junction (except near the intersection of College Road and Oleander Drive), east of Myrtle Grove Road, or in the new residential communities along River Road west of Silver Lake and Monkey Junction.

Figure 110 | RideMICRO Zone 3 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	20 (2/4)	16 (1/2)	9 (1/2)
<i>Riders Served per Hour</i>	1.4 (2/4)	1.6 (1/2)	1.1 (1/2)
<i>Vehicle Revenue Hours</i>	14	10	8

Figure 111 | RideMICRO Zone 3 Weekday Ridership by Stop

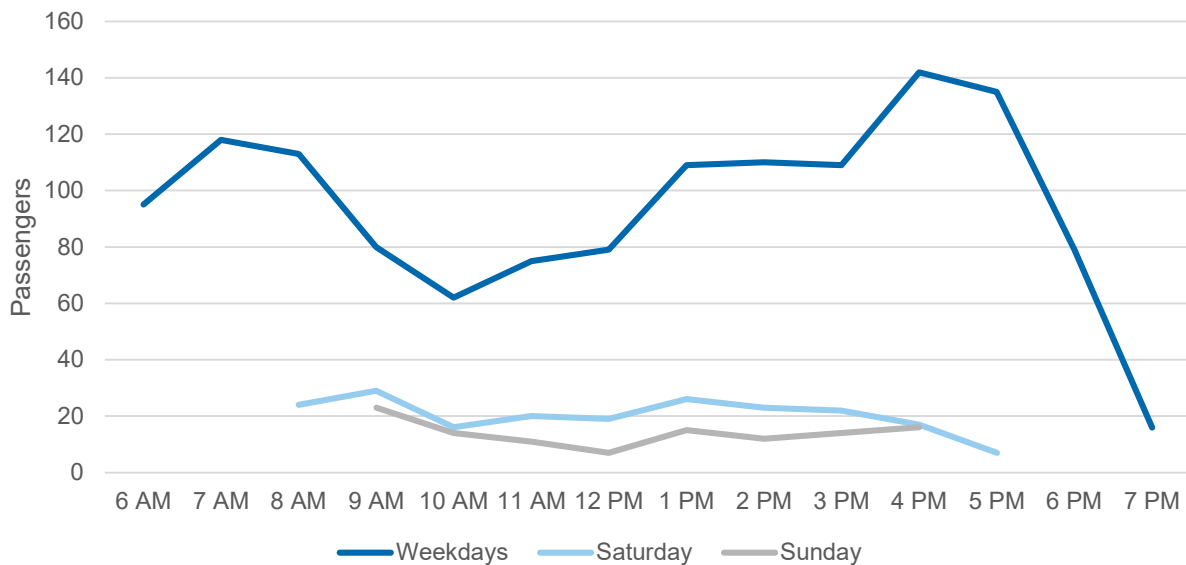


Ridership by Time of Day

RideMICRO Zone 1's ridership activity begins high at the start of service on weekdays and peaks at 7 AM. Ridership declines by about 50% until 10 AM before slowly ramping back up again to 4 PM when ridership increases to about 120% of early morning demand. Ridership then declines to almost none before service ends on weekdays. This ridership pattern suggests that there exists unmet demand for service beginning earlier in the day.

On Saturdays and Sundays, ridership is very low with ~20 total riders per hour for all of Spring 2023.

Figure 112 | RideMICRO Zone 3 Pickups by Time of Day (Spring 2023)



On-Time Performance

Anecdotally, many riders and RideMICRO vehicle operators report that during peak times, same-day reservations for trips cannot be provided due to vehicle availability. In addition, best practice for microtransit service involves operating a zone with at least 2 vehicles to provide sufficient redundancy and allow operators to take breaks. These factors indicate that Wave should consider increasing the number of vehicles operating in Zone 1 to at least 2.

Transfer Opportunities

Riders can transfer to and from Zone 3 service at Monkey Junction and along College Road via Route 107.

Opportunities to Strengthen RideMICRO Zone 3

Opportunities to strengthen RideMICRO Zone 3 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Increase vehicles during weekday service**. On weekdays, the demand for service in this zone is often higher than the capacity of the single vehicle assigned to the zone. Wave can consider increasing the number of vehicles in this zone to improve reliability.

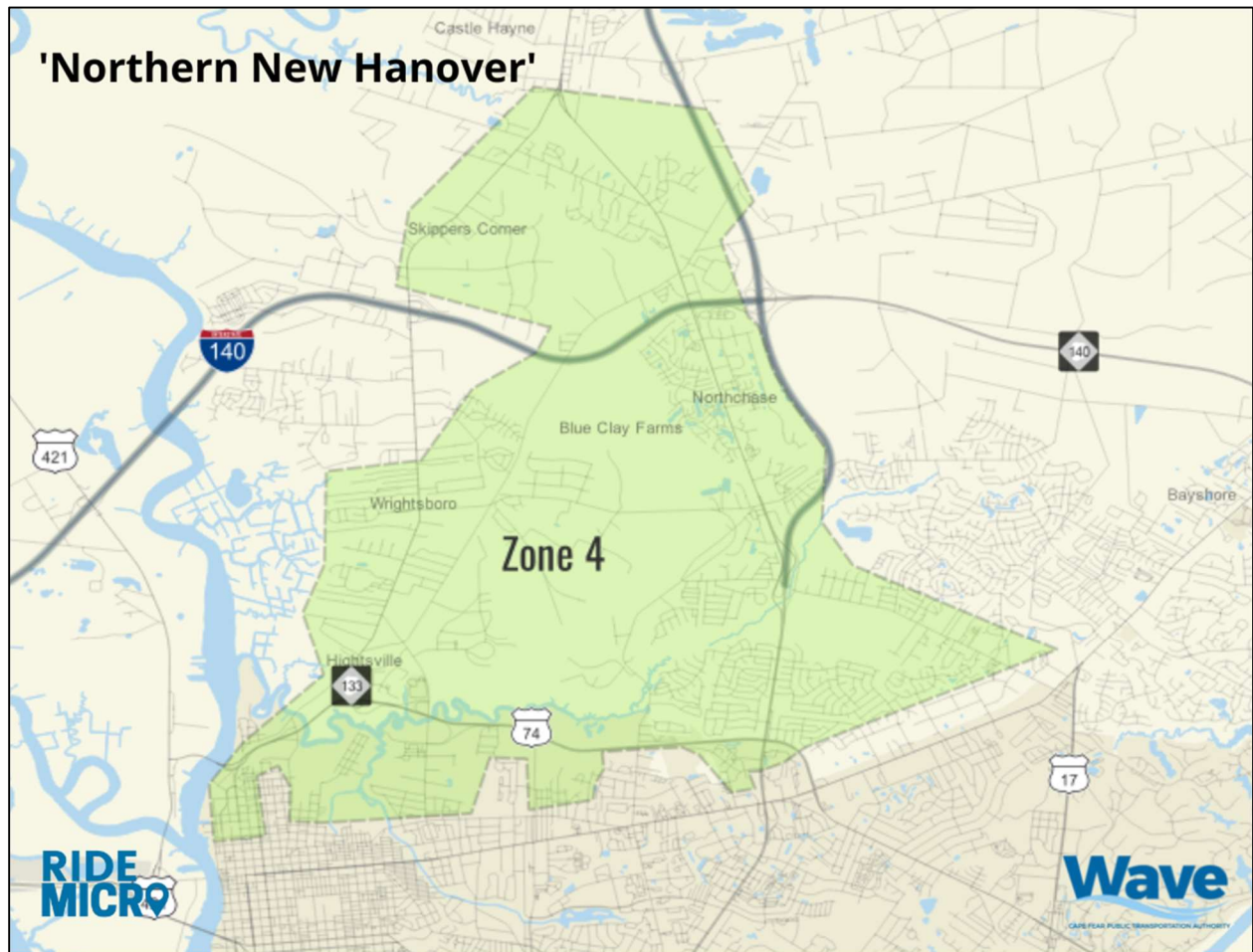
- **Reduce zone size to highest demand areas** . To provide service more cost-effectively, Wave can consider focusing the zone's eastern boundaries to act as a quarter-mile buffer from Carolina Beach Road instead of following the coastline and eliminating service south of Carolina Beach.
- **Reduce zone size to avoid duplicating other Wave services** . Wave provides higher quality service along College Road corridor via route 107. To avoid duplicating other services, especially more productive and cost-effective fixed-route services, Wave can alter Zone 3's zone boundaries to allow pickups and drop-offs only at or south of Monkey Junction.
- **Begin weekday service at 5 AM.** There exists unmet demand for weekday service beginning earlier in the day on weekdays.

RIDEMICRO ZONE 4 NORTHERN NEW HANOVER

Service Overview

RideMICRO Zone 4 Northern New Hanover is a RideMICRO microtransit service that operates seven days a week in Northern New Hanover County with connection available to Padgett Station and Forden Station. It plays an important role by connecting low demand residential areas and major destinations like the airport and the Cape Fear Community College North Campus to Wave fixed-route service. The major opportunities for RideMICRO Zone 4 are to redesign the service zone to minimize duplication with fixed-route service and add an additional vehicle to improve service reliability.

Figure 113 | RideMICRO Zone 4 Route Map



Service Boundary

RideMICRO Zone 4 operates in Northern New Hanover County with connections available to Padgett Station and Forden Station. It covers roughly 18.6 square miles and provides on-demand pick up and drop off service to many communities including Kings Grant, Brookfield, Wrightsboro, Sedgefield, and Hightsville. Zone 4's southern boundary roughly follows the alignment of Route 101 Princess Place to Forden Station; east of Forden Station, the zone

provides service outside of a 0.25-mile radius of Market Street. Along its eastern edge, the zone provides service within a 0.25-mile radius of Gordon Street and west of I-40 to Skippers Corner, North Campus. Zone 4’s western boundary is defined roughly by Castle Hayne Road, I-140, and Blue Clay until Wrightsboro, where the zone’s boundary extends west to provide service to most developed areas south to Padgett Station.

Service Span and Wait Times

RideMICRO Zone 4 operates seven days a week. Like most services in Wave’s network, RideMICRO Zone 4 operates from 6AM to 8PM on weekdays, 8AM to 6PM on Saturdays, and 9AM to 5PM on Sundays. 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.

Figure 114 | RideMICRO Zone 4 Service Span

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

Ridership and Productivity

Compared to Wave’s 3 other RideMICRO routes, RideMICRO Zone 4 has above average ridership with 26 boardings per average weekday. Compared to weekday ridership, Saturday ridership is 30% and Sunday ridership is 19%. Its productivity is also relatively high with 1.9 riders per hour on weekdays, 0.8 riders per hour on Saturdays, and 0.6 riders per hour on Sundays. Weekend ridership is lower compared to Zone 3, likely because CFCC is closed on weekends.

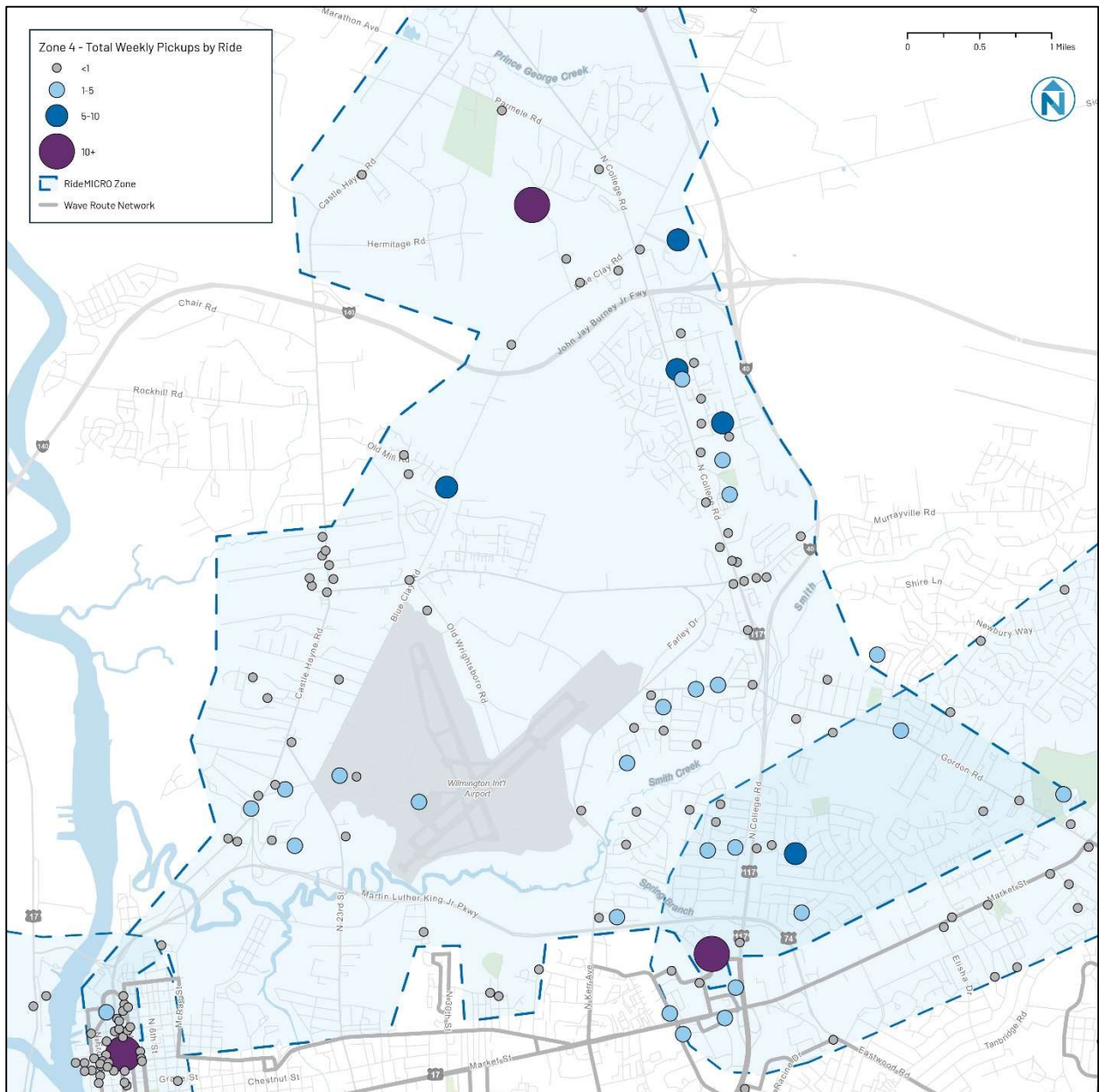
The most common pickup locations for Spring 2023 on weekdays are:

- Forden Station and Padgett Station, with 261 and 418 pickups respectively
- Cape Fear Community College North Campus Library, with 122 pickups
- Cape Fear Community College Main Campus, with around 200 pickups
- New Hanover County Detention Center, with 165 pickups
- Along Gordon Road between Kerr Ave and College Road, with about 100 pickups
- Near the intersection of Blue Clay Road and Old Mill Road, with 130 pickups
- In Wrightsboro center (near the intersection of Castle Hayne Road and Kerr Avenue), with 20 pickups within a few blocks
- The airport, with 53 pickups
- Near the distribution and auto repair shop agglomeration near the intersection of Castle Hayne Road and the I-140 on-ramps, with 60 pickups

Figure 115 | RideMICRO Zone 4 Ridership and Productivity Service Statistics

Service Statistic	Weekdays	Saturdays	Sundays
<i>Ridership</i>	26 (1/4)	8 (2/2)	5 (2/2)
<i>Riders Served per Hour</i>	1.9 (1/4)	0.8 (2/2)	0.6 (2/2)
<i>Vehicle Revenue Hours</i>	14	10	8

Figure 116 | RideMICRO Zone 4 Weekday Ridership by Stop

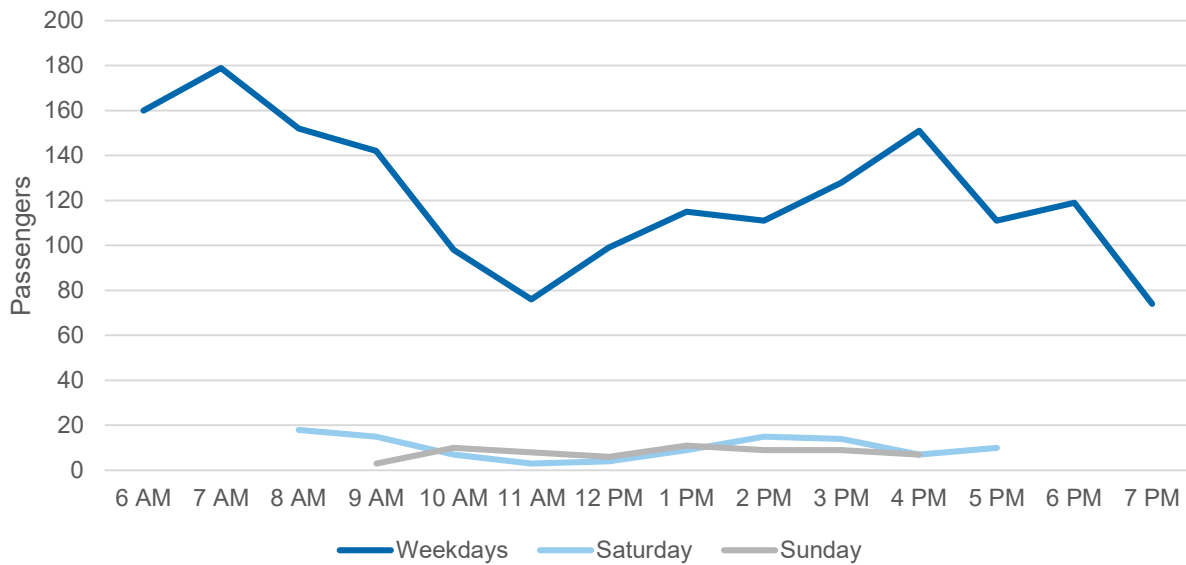


Ridership by Time of Day

RideMICRO Zone 4's ridership activity begins high at the start of service on weekdays and peaks at 7 AM. Ridership declines by about 50% until 11 AM before slowly ramping back up again to 4 PM when ridership increases to about 75% of early morning demand. Ridership then slowly declines to about midday levels of demand before service ends on weekdays. This ridership pattern suggests that there exists unmet demand for service beginning earlier in the day.

On Saturdays and Sundays, ridership is very low with ~10 total riders per hour for all of Spring 2023.

Figure 117 | RideMICRO Zone 4 Pickups by Time of Day (Spring 2023)



On-Time Performance

Anecdotally, many riders and RideMICRO vehicle operators report that during peak times, same-day reservations for trips cannot be provided due to vehicle availability. In addition, best practice for microtransit service involves operating a zone with at least 2 vehicles to provide sufficient redundancy and allow operators to take breaks. These factors indicate that Wave should consider increasing the number of vehicles operating in Zone 4 to at least 2.

Transfer Opportunities

Riders can transfer to and from Zone 4 service at Padgett Station and Forden Station.

Opportunities to Strengthen RideMICRO Zone 4

Opportunities to strengthen RideMICRO Zone 4 are listed below. Some suggestions may be contradictory, as there is usually more than one approach to improving a route.

- **Increase vehicles during weekday service**. On weekdays, the demand for service in this zone is often higher than the capacity of the single vehicle assigned to the zone. Wave can consider increasing the number of vehicles in this zone to improve reliability.

- **Reduce zone size to highest demand areas.** To provide service more cost-effectively, Wave can consider focusing the zone’s boundaries on the Castle Hayne Road, Blue Clay Road, College Road, Gordon Road (east of College Road) and Kerr Avenue (south of Gordon Road) corridors. Ridership is consistently very low east of I-40 and along Kerr Avenue north of Gordon Road.
- **Reduce zone size to avoid duplicating other Wave services** . Wave provides higher quality service along the Princess Place corridor with Route 101 service, which operates every 30 minutes during peak. RideMICRO Zone 2 also provides overlapping service with Zone 4’s eastern half. To avoid duplicating other services, especially more productive and cost-effective fixed-route services, Wave can alter Zone 4’s zone boundaries to allow pickups and drop-offs only north of I-140 and west of I- except for to and from Forden Station and Padgett Station.
- **Begin weekday service at 5 AM.** There exists unmet demand for weekday service beginning earlier in the day on weekdays.
- **Discontinue weekend service** . Zone 4 has consistently very low demand for service on weekend days. Service can be discontinued in this zone on weekends without impacting many riders and may allow resources to be reallocated to more cost-effective services.
- **Replace the eastern half of zone with hourly fixed-route service** . The highest demand locations for RideMICRO service in Zone 4 roughly follow a potential bus corridor. Wave could replace RideMICRO service along the Kerr Avenue, Gordon Road, and College Road corridors with an hourly route to and from Forden Station. This service could be more reliable for existing RideMICRO customers who face trouble learning about the service or booking same-day trips. A potential alignment for replacement fixed-route service is shown below:

Figure 118 | Potential hourly fixed-route service replacement of eastern Zone 4 RideMICRO service

