

Local Bus Service Planning and Recommendations

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Introduction

The following route profiles outline ridership patterns for each CARTA route, as well as each route's strengths, weaknesses, and opportunities. This information will be used to further identify key transit corridors in the Charleston region and to develop local service recommendations to complement high-capacity service plans.

The ridership information presented in these profiles is based on weekday Automated Passenger Counter (APC) data for the time period of October 1 through November 15, 2017¹. All values presented in the analyses are averaged over the study period. For example, trip-level ridership is the average ridership for all samples of that trip during the study period.

The maximum passenger loads per trip represent the highest number of passengers on the bus at any time on a trip. In some cases, maximum loads exceed total boardings for a trip. This can occur when passengers board a vehicle in one direction, but stay on past the end of the line and into the next trip in the opposite direction.

The following was used as a brainstorming exercise, and that many of the opportunities noted in the document were modified or eliminating based on discussions with BCDCOG staff.

¹ It is important to note that the APC data used for this analysis was still in the testing phases, so trips and routes may be missing data.



Route XP1: North/South Express (North Charleston/James Island)

Route XP1 is an express service operating between the Walmart Park-and-Ride in James Island and the North Charleston Park-and-Ride on Rivers Avenue, via downtown Charleston. The route operates weekdays, during peak periods only.

Ridership by Stop

Figure 1: Route XP1 Inbound/Southbound Daily Ridership by Stop





B Route XP1 Outbound Boardings and Alightings by Stop OF CA Wid Mart Purk Grid a Regional Transit

Figure 2: Route XP1 Outbound/Northbound Daily Ridership by Stop



Ridership by Trip

Figure 3: Route XP1 Inbound/Southbound Ridership by Trip



Figure 4: Route XP1 Outbound/Northbound Ridership by Trip







- Route XP1 has strong peak directional ridership, with most trips averaging between 20 and 40 passengers.
- To accommodate high ridership, some XP1 trips include two vehicles departing simultaneously.
- Route XP1 serves both the primary and reverse-commute markets.
- The route has relatively high service frequency during peak periods.
- Route XP1 provides a one-seat ride for passengers traveling between James Island and North Charleston.

Weaknesses

- Route XP1 has no mid-day service.
- Low ridership after 5:30 pm (less than 12 passengers per trip in either direction).
- Simultaneous departures increase capacity, but do not increase service frequency on the route.

Opportunities

- **Space peak-period trips to increase frequency**. Some Route XP1 trips are scheduled to depart simultaneously in order to accommodate high ridership demand. Staggering these departures by 10 or 15 minutes would make the route more convenient for many riders by offering more departures times and thus more travel flexibility.
- **Split route into two routes in downtown Charleston**. Route XP1 provides a one seat ride between James Island and North Charleston, but ridership data suggests an almost complete turnover of riders in downtown Charleston. Splitting the route in two would allow for more schedule customization for each market. It could also allow for the James Island service, which has lower ridership, to transition from a highway-running express service to a high-capacity service along Folly Road. A high-capacity service in this corridor could allow Route 31 to be restructured as a feeder service connecting passengers to the high-capacity service, rather than directly to downtown Charleston.
- **Provide at least one mid-day trip in each direction**. The first northbound trip in the afternoon is among the highest-ridership trips for Route XP1. This suggests a pent-up demand for earlier afternoon service.



Route XP2: East West Express (Mt. Pleasant/West Ashley)

Route XP2 is an express service operating between the Citadel Mall park-and-ride in Charleston and the Wal-Mart park-and-ride in Mt. Pleasant, via downtown Charleston. The route operates weekdays, during peak periods only.

Ridership by Stop

Figure 5: Route XP2 Inbound/Westbound Daily Ridership by Stop





Figure 6: Route XP2 Outbound/Eastbound Daily Ridership by Stop



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Ridership by Trip

Figure 7: Route XP2 Inbound/Westbound Ridership by Trip



Figure 8: Route XP2 Outbound/Eastbound Ridership by Trip



■Boardings -Max. Passenger Load



- Route XP2 has a simple and direct alignment.
- By continuing through downtown, Route XP2 provides one-seat service to key destinations throughout downtown for riders coming from the east and the west.
- Route XP2 ridership is well-balanced in both directions during both peak periods.

Weaknesses

- Route XP2 has no mid-day service.
- Trips after 5:30 pm carry fewer than 10 passengers each.

Opportunities

- **Provide at least one mid-day trip in each direction**. The first full-route trips on Route XP2 in the afternoon are among the highest-ridership trips in both directions. This suggests a pent-up demand for earlier afternoon service.
- Eliminate last trip in each direction. Route XP2 ridership is extremely low on the last trip in each direction. Eliminating this last trip, or shifting it to a local route in the same corridor (Route 30 and/or 40) could help improve over-all service productivity on Route XP2.
- **Consolidate with Routes 30 and 40**. Route XP2 has relatively high ridership on some trips, but has the potential to generate much higher ridership with a full day schedule, higher service frequency, and additional stops along the US 17 corridor between West Ashley and Mt. Pleasant. By providing a one-seat ride to key destinations throughout the peninsula, the route would also provide a more convenient user experience and improved productivity compared to Routes 30 and 40. Given that Route XP2 operates on an arterial roadway (rather than a limited-access freeway), some additional stops will not have a significant impact on operating speeds.



Route XP3: Dorchester Road/Downtown

Route XP3 is an express service operating between the Dorchester Village Shopping Center park-and-ride and downtown Charleston. Select trips also serve the Boeing plant at Charleston International Airport. The route operates weekdays, during peak periods only.

Ridership by Stop

Figure 9: Route XP3 Inbound Daily Ridership by Stop





Figure 10: Route XP3 Outbound Daily Ridership by Stop





Ridership by Trip Figure 11: Route XP3 Inbound Ridership by Trip



Figure 12: Route XP3 Outbound Ridership by Trip

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■Boardings -Max. Passenger Load



- Route XP3 serves a number of key regional destinations along the Dorchester Road corridor, including two park-and-rides, Joint Base Charleston, and Boeing.
- The route also provides extensive coverage in downtown Charleston including Meeting Street and MUSC (it should be noted that boardings along Meeting Street are reported on inbound trips, even though many of these passengers are actually heading outbound, thus skewing the ridership by trip data shown in Figure 8).
- Route XP3 offers relatively frequent service at some points in the peak periods.

Weaknesses

- Route XP3 has some long service gaps during peak periods, such as a 50-minute gap between the 6:15 am and 7:05 am inbound trips.
- The route has very limited service to the Boeing/airport area, limiting job-access opportunities for residents along the Dorchester Road corridor, and resulting in very low ridership at the airport and Boeing.

Opportunities

- Consolidate with Route XP4 to improve service to airport area from both downtown and Dorchester Road corridor. Route XP3 has relatively strong ridership during peak periods, but provides very limited service to the airport area. Route XP4 serves the airport area on every trip, but has very low ridership overall. A consolidated route could begin at the Dorchester Road Park and Ride, travel south along the XP3 alignment, serving the airport and Boeing on every trip, and then continue to downtown via I-26 (without directly serving the Tanger Outlets). Transfers to the Tanger Outlets could be made available at the airport by restructuring Route 11. By serving both the airport area/Boeing and the park-and-rides along the Dorchester Road corridor, ridership on the consolidated route will likely exceed the cumulative ridership of Route XP3 and XP4.
- Modify alignment through airport to more efficiently serve Boeing and airport. Providing service to the airport area on every trip could improve ridership from the Dorchester Road corridor, but also has the potential to alienate some riders who value fast service to downtown Charleston. Rather than turning right from International Boulevard to Fuel Farm Road to serve Dreamliner Drive and Boeing, buses could continue one block north along International Boulevard to the parking lot access road and then turn right toward Dreamliner Drive. The parking lot access road intersects a pedestrian walkway leading to the airport terminal, and could serve as a stop location both for airport workers and travelers.



Route XP4: NASH Express (N.Charleston/Airport/Visitor Ctr/Tanger Outlets)/Downtown

Route XP4 is an express service operating between Charleston International Airport and the Charleston Visitors' Center in downtown Charleston. Outbound trips also serve the North Charleston Visitors' Center and the Tanger Outlets. The route operates seven days a week.

Ridership by Stop

Figure 13: Route XP4 Inbound Daily Ridership by Stop



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Figure 14: Route XP4 Outbound Daily Ridership by Stop





Ridership by Trip Figure 15: Route XP4 Inbound Ridership by Trip



Figure 16: Route XP4 Outbound Ridership by Trip



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- Route XP4 provides express service between downtown Charleston and the Charleston International Airport.
- The route has easy-to-remember clockface frequency.
- Route XP4 operates seven days a week.

Weaknesses

- Route XP4 has very low ridership, with all trips carrying fewer than 10 passengers.
- The route serves the Tanger Outlets in the outbound direction only, forcing riders to ride out-of-direction to the airport before returning from the outlets to downtown.
- Route XP4 operates seven days a week.

Opportunities

- Consolidate with Route XP3 to improve service to airport area from both downtown and Dorchester Road corridor. Route XP3 has relatively strong ridership during peak periods, but provides very limited service to the airport area. Route XP4 serves the airport area on every trip, but has very low ridership overall. A consolidated route could begin at the Dorchester Road Park and Ride, travel south along the XP3 alignment, serving the airport and Boeing on every trip, and then continue to downtown via I-26 (without directly serving the Tanger Outlets). Transfers to the Tanger Outlets could be made available at the airport by restructuring Route 11. By serving both the airport area/Boeing and the park-and-rides along the Dorchester Road corridor, ridership on the consolidated route will likely exceed the cumulative ridership of Route XP3 and XP4.
- Modify alignment through airport to serve airport terminal and Boeing facility. Route XP4 currently provides direct access to the Charleston International Airport passenger terminal, but does not directly serve the nearby Boeing facility. Despite the direct access to the passenger terminal, ridership on the route is very weak. Adding service to Boeing on every trip may improve the route's over-all ridership and productivity. Rather than circling the terminal area, buses could turn right one block north of Fuel Farm Road onto the parking lot access road and then turn right toward Dreamliner Drive. The parking lot access road intersects a pedestrian walkway leading to the airport terminal, and could serve as a stop location both for airport workers and travelers.



Route 10: Rivers Avenue

Route 10 is a local service operating between Trident Medical Center and the Charleston Visitors' Center in downtown Charleston, primarily via Rivers Avenue. The route also serves SC Works on weekdays only. Route 10 operates seven days a week.

Ridership by Stop

Figure 17: Route XP1 Inbound Daily Ridership by Stop





Figure 18: Route XP2 Outbound Daily Ridership by Stop





Ridership by Trip Figure 19: Route 10 Inbound Ridership by Trip





Figure 20: Route 10 Outbound Ridership by Trip

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- Route 10 provides frequent and relatively direct service along the Rivers Avenue/Meeting Street corridor.
- Route 10 has the highest ridership in the CARTA system, with strong ridership through the route.
- Route 10 has two strong anchors in downtown Charleston and the Trident Medical Center, and serves multiple key destinations including the North Charleston Superstop, SC Works, Trident Technical College and Walmart Supercenter.

Weaknesses

- Several inbound trips have passenger loads exceeding seating capacity, especially during mid-day periods when frequencies are reduced.
- Route 10 operates in a difficult pedestrian environment, particularly in North Charleston where the roadway includes a wide median and few crosswalks.
- Service to SC Works and Trident Technical College requires time-consuming deviations due to poor pedestrian connections.

Opportunities

- Increase frequency during mid-day. Route 10 experiences high ridership demand throughout the service day. When service frequency is reduced from 20 to 30 minutes, some trips experience maximum loads exceeding the seating capacity of typical 40-ft transit buses. Maintaining 20-minute frequency throughout the service day may reduce the frequency and intensity of vehicle overcrowding.
- Modify routing to SC Works and Trident Technical College. Route 10 buses serving SC Works currently deviate from Rivers Avenue to Hanahan Road to serve the career center. Similarly, Trident Technical College requires a long deviation to serve the campus, but in the inbound direction only due to the difficultly of crossing Rivers Avenue adjacent to the campus. To provide a more consistent alignment and reduce the need to backtrack on the route, buses traveling outbound on Rivers Avenue can turn right onto Hanahan Road, then continue onto Highland Park Road, left onto Railroad Avenue, and left again onto Mabeline Road to return to Rivers Avenue. Inbound trips would follow the same alignment in reverse in order to serve both SC Works and the technical college with a single consistent routing.
- **Convert Route 10 into a high-capacity transit service**. Route 10 is a high-ridership route that would justify the higher service frequency and enhanced passenger amenities typically associated with high-capacity transit service. Corridor treatments such as better sidewalks and crosswalks could also allow the route to remain on Rivers Avenue and avoid time-consuming deviations.

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Route 11: Dorchester/Airport

Route 11 is a local service operating between the Tanger Outlets and the Charleston Visitors' Center in downtown Charleston, via Charleston International Airport, Dorchester Road, Spruill Avenue, and Morrison Drive. The route operates seven days a week.

Ridership by Stop

Figure 21: Route 11 Inbound Daily Ridership by Stop





Figure 22: Route 11 Outbound Daily Ridership by Stop





Ridership by Trip





Figure 24: Route 11 Outbound Ridership by Trip





- Route 11 has fairly strong ridership throughout the service day.
- The route expands coverage to otherwise unserved corridors such as North Carolina Avenue, Spruill Avenue, Morrison Drive and Bay Street.
- Route 11 operates seven days a week.

Weaknesses

- Route 11 has relatively weak ridership where it overlaps with the more frequent Route 10.
- Route 11 has irregular service frequencies on weekdays.
- The Tanger Outlets are served in the outbound direction only, requiring inbound passengers from the outlet mall to travel out of direction to the airport before continuing their inbound trip.

Opportunities

- Provide bi-directional service between Tanger Outlets and Charleston International Airport. One-way service between Tanger Outlets and the airport forces out-of-direction travel for inbound passengers from the outlet mall. In addition, the lack of service from the airport to Tanger Outlets makes it more difficult for passengers from the Dorchester Road corridor to access the outlet mall. If bi-directional service were available between the outlet mall and the airport, Dorchester Road passengers could transfer at the airport to access the Tanger Outlets. In addition, Boeing and airport employees could conveniently travel to the outlet mall during lunch, after work, etc.
- **Restructure route as a feeder service**. Route 11 ridership is highest in route segments that do not overlap with the more frequent Route 10. Rather than operating as a continuous local route between the airport area and downtown, Route 11 could be split into shorter, more frequent feeder routes serving a potential high-capacity transit service in the Rivers Avenue/Meeting Street corridor. In North Charleston, a feeder route could connect the airport with Tanger Outlets, the North Charleston Superstop and the Charleston Heights neighborhood. In Charleston, a feeder service could link Morrison Drive and Bay Street with transfer opportunities near the Charleston Visitors Center.



Route 12: Upper Dorchester/AFB

Route 12 is a local service operating between the North Charleston park-and-ride on Rivers Avenue and the North Charleston Superstop at Rivers Avenue and Cosgrove Avenue. The route operates seven days a week.

Ridership by Stop

Figure 25: Route 12 Inbound Daily Ridership by Stop





Figure 26: Route 12 Outbound Daily Ridership by Stop



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Ridership by Trip Figure 27: Route 12 Inbound Ridership by Trip



Figure 28: Route 12 Outbound Ridership by Trip





- Route 12 provides cross-town service linking two key corridors (Rivers Avenue and Dorchester Road).
- The North Charleston Park-and-Ride serves as a gateway to employment destinations in the Dorchester Road corridor.
- Route 12 has fairly strong ridership throughout the service day.
- Route 12 operates seven days a week.

Weaknesses

- Route 12 has an irregular, non-clockface frequency.
- The route's end-of-line loop only serves residents of several multi-family housing complexes near Greenridge Road and Antler Drive in the southbound direction, and limits their access to connection opportunities at the North Charleston Park-and-Ride.

Opportunities

- Operate along Greenridge Road in both directions. Route 12 passes by a large concentration of multi-family housing near Greenbridge Road and Antler Drive. However, this area is only served in the southbound direction. This one-way service creates a missed opportunity to attract riders who cannot use Route 12 to access the North Charleston Park-and-Ride. Providing outbound service on Greenridge and Antler Drive would link these residents to the XP1 route at the park-and-ride, as well as the Otranto Road Library and the T-mobile call center in the former K-mart space.
- **Convert Route 12 into a local feeder route**. Route 12 serves an important role as a cross-town connector between two key corridors, and if both (or just Dorchester Road) corridors feature high-capacity transit in the future, Route 12 could be converted into a local feeder operating between the two corridors. A shorter route could allow for more regular and more frequent service than the current Route 12 schedule.
- **Extend route to Trident Health System.** Extending the route to Trident Health could provide a stronger anchor and allow for new coverage to relatively high-density residential areas, including several apartment complexes and mobile home parks, along Otranto Road and Deerwood Drive.



Route 13: Montague/Remount/Spruill Road

Route 13 is a local service operating between the North Charleston Superstop at Rivers Avenue and Cosgrove Avenue, and the Tanger Outlets, primarily via Montague Avenue, Rivers Avenue, Remount Road, Rhett Avenue, and Spruill Avenue. The route operates seven days a week.

Ridership by Stop

Figure 29: Route 13 Inbound Daily Ridership by Stop




Figure 30: Route 13 Outbound Daily Ridership by Stop



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Ridership by Trip Figure 31: Route 13 Inbound Ridership by Trip



Figure 32: Route 13 Outbound Ridership by Trip





- Route 13 has two strong anchors in Walmart and the North Charleston Superstop, and also serves other retail and grocery destinations including the Tanger Outlets and Price Wise.
- The route has easy-to-remember clockface frequency.
- Numerous connection opportunities are available at North Charleston Superstop.
- Route 13 operates seven days a week.

Weaknesses

- Route 13 forces out-of-direction travel for many passengers traveling to Walmart or the Tanger Outlets, as Remount Road is considerably north of these destinations.
- Most Route 13 trips carry fewer than 15 passengers.
- Route 13 misses potential ridership along Old Murray Court, where there are two large apartment complexes.

Opportunities

- **Split Route 13 into two routes**. Splitting Route 13 into two routes (one north and one south of Montague Avenue) would reduce out-of-direction travel for many riders. The northern route could follow the same alignment as the current route to Remount Road but then turn north on Old Murray Court, west on Yeamans Hall Road, and south on Rhett Avenue to complete an end-of-line loop. This would add service to two large apartment complexes on Old Murray Court and a large mobile home park on Rhett Avenue. The southern route could follow a similar alignment to Route 104 to Montague Avenue and then turn south on Spruill Avenue and follow the current Route 13 alignment to the North Charleston Superstop (or the future location on McMillan Avenue).
- Extend Service to Boeing/Charleston International Airport. One or both of the split routes described above could be extended from Walmart and Tanger Outlets to Boeing and the airport. If both routes are extended and their schedules staggered, they could serve as a frequent shuttle between the airport area, the Tanger Outlets/Walmart area, and potential high capacity transit service operating on Rivers Avenue.



Route 20: King Street

Route 20 is a local service operating between the Joseph Floyd Manor at Mt. Pleasant and King Street, and the US Post Office at Broad Street and Meeting Street, primarily via King Street, and Meeting Street. The route operates seven days a week.

Ridership by Stop

Figure 33: Route 20 Inbound Daily Ridership by Stop





Figure 34: Route 20 Outbound Ridership by Stop





Ridership by Trip

Figure 35: Route 20 Inbound Ridership by Trip



Figure 36: Route 20 Outbound Ridership by Trip





- Route 20 has a very simple and direct alignment.
- Route 20 operates in a very transit-supportive environment with high density, good pedestrian infrastructure, and a strong mix of origins (multi-family housing) and destinations (grocery, retail, services, employment, etc.).
- Route 20 operates 7 days a week.

Weaknesses

- Route 20 has irregular, non-clockface frequencies of 25 to 40 minutes.
- The route operates least-frequently during peak commuting hours.
- All trips after 6:00 pm carry fewer than 10 passengers.

Opportunities

- **Combine with Route 102 to create a Peninsula Circulator**. Route 20 overlaps with a potential high-capacity transit alignment on King Street, north of Columbus. But, if the high-capacity service operates with limited stops, Route 20 could serve as a local feeder even in the same corridor. Combining Route 20 with a truncated Route 102, ending at Mt. Pleasant Street, could create a bi-directional circulator serving much of the Peninsula and potentially connecting with several high-capacity transit services. The two routes can be joined by extending Route 20 service along Broad Street to Rutledge Avenue, and lining up with the existing Route 102 alignment by crossing northbound buses from Rutledge to Ashley Avenue via Bennett Street.
- Increase service frequency during peak periods. If Route 20 serves as a first/last mile connector to and from high-capacity transit, it will need to have frequent service during peak commuting periods (if not all day) to make transfers as convenient as possible.
- Operate with clockface service frequency. To simplify service, it must either run frequent enough to make schedules unnecessary or operate on an easy-to-remember clockface schedule such as hourly service, 30-minute service, 20-minute service, etc. Clockface schedules result in service arriving at the same number of minutes past every hour, rather than jumping around the clock from hour to hour. Any route that operates less often than every 15-minutes should operate on a clockface schedule if possible.



Route 30: Savannah Highway

Route 30 is a local service operating between the Citadel Mall park-and-ride and the Charleston Visitors' Center in downtown Charleston, primarily via Savannah Highway and Spring/Cannon Street. The route operates seven days a week.

Ridership by Stop

Figure 37: Route 30 Inbound Daily Ridership by Stop





Figure 38: Route 30 Outbound Daily Ridership by Stop





Ridership by Trip

Figure 39: Route 30 Inbound Ridership by Trip



Figure 40: Route 30 Outbound Ridership by Trip





- Route 30 has two strong anchors in Citadel Mall and downtown Charleston, and also serves a number of shopping centers and MUSC.
- The route has easy-to-remember clockface frequency.
- Numerous connection opportunities are available at Citadel Mall and in downtown Charleston.

Weaknesses

- Route 30 has relatively low ridership, with most trips carrying fewer than 15 passengers.
- Route 30 has very little multi-family housing directly along its alignment, and thus relies heavily on other routes for feeder traffic.
- Most connections at Citadel Mall are not well-timed, resulting in relatively long transfer wait times.
- Savanah Highway includes a number of car dealership, which are not typically strong transit ridership generators.

Opportunities

- Operate high-capacity transit service between downtown and Citadel Mall. Route 30 is currently a relatively low-ridership route, but higher service frequency would significantly improve the quality of connections with other routes that currently feed the route. High-capacity transit service in the corridor may also spur more transit-supportive development along Savanah Highway, including more mixed-use and multi-family housing developments.
- Improve access to MUSC. Route 30 service on Spring and Cannon Streets provides relatively close access to MUSC, but could be improved by routing the service directly through the heart of the medical district via Courtenay Drive and continuing to downtown via Calhoun Street. This alignment would make service more attractive to prospective riders with destinations in the medical district.



Route 31: Folly Road

Route 31 is a local service operating between the Charleston Visitors' Center in downtown Charleston and Battery Island Drive in south Charleston, primarily via Folly Road and Spring/Cannon Street. The route also serves Maybank Highway, Riverland Drive, and Central Park Road on outbound trips only. Route 31 operates seven days a week.

Ridership by Stop

42

Figure 41: Route 31 Inbound Daily Ridership by Stop





Figure 42: Route 31 Outbound Daily Ridership by Stop





Ridership by Trip Figure 43: Route 31 Inbound Ridership by Trip



Figure 44: Route 31 Outbound Ridership by Trip





- Route 31 provides local circulation on James Island and connects the community to Charleston.
- Service is available seven days a week.

Weaknesses

- Route 31 has long headways of 105 minutes between trips, limiting its appeal for many commuters.
- Route 31 has a circuitous alignment with many stops served in one direction only and generating little or no ridership.
- Route 31 has very poor on-time performance, with almost 50% of stops served late, on average.

Opportunities

• **Restructure route as a feeder service**. Route 31 has a circuitous alignment as it tries to provide broad coverage on James Island, and connecting service between James Island and downtown Charleston. The circuitous alignment results in low ridership at stops served in one direction only. To improve service, Route 31 could be restructured to serve as a feeder service for more direct service along Folly Road. Given the land-use and density of James Island, an innovative (app-dispatched) demand response service may be the most appropriate feeder model for the area.

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Route 32: North Bridge

Route 32 is a local service operating between the North Charleston Superstop at Rivers Avenue and Cosgrove Avenue, and the Citadel Mall park-and-ride, primarily via Cosgrove Avenue and Sam Rittenburg Boulevard. On Sundays, the route extends northwest along the regular Route 301 alignment to serve Roper St. Francis Hospital and Wal-Mart on Ashley Circle. Route 31 operates seven days a week.

Ridership by Stop

Figure 45: Route 32 Inbound Daily Ridership by Stop





Figure 46: Route 32 Outbound Daily Ridership by Stop





Ridership by Trip Figure 47: Route 32 Inbound Ridership by Trip



Figure 48: Route 32 Outbound Ridership by Trip





- Route 32 has two strong anchors in Citadel Mall and the North Charleston Superstop, and also serves a number of retail and grocery stores, including Harris Teeter, Save-A-Lot, Publix, and BI-LO.
- The route has easy-to-remember clockface frequency.
- Route 32 provides an important cross-town link, connecting North Charleston and West Ashley.
- Numerous connection opportunities are available at Citadel Mall and the North Charleston Superstop.

Weaknesses

- Relatively low-frequency service, especially give the key cross-town link.
- Most trips carry fewer than 20 passengers.

Opportunities

• Increase peak-period frequency. Route 32 provides a key cross-town link by connecting West Ashley and North Charleston. Increasing peak-period service to every 30-minutes may make the route more appealing to commuters and also improve transfer connectivity with other routes.

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Route 33: St. Andrews/Ashley River Road

Route 33 is a local service operating between the Charleston Visitors' Center in downtown Charleston and BI-LO on Bees Ferry Road, primarily via Calhoun Street, St. Andrews Boulevard, and Ashley River Road. The route also serves Citadel Mall. Route 33 operates seven days a week.

Ridership by Stop

Figure 49: Route 33 Inbound Daily Ridership by Stop





Figure 50: Route 33 Outbound Daily Ridership by Stop





Ridership by Trip Figure 51: Route 33 Inbound Ridership by Trip



Figure 52: Route 33 Outbound Ridership by Trip





- Route 33 serves several strong anchors and has a good mix of origins (multi-family housing) and destinations (retail, employment, medical, etc.).
- The route has strong ridership, especially in peak periods.
- The route has easy-to-remember clockface frequency on weekdays.
- Route 33 operates seven days a week.

Weaknesses

• Some peak period trips are at or near capacity.

Opportunities

- Extend route to Walmart on Bee's Ferry Road. While Route 33 has a good mix of transit-supportive origins and destinations, it terminates two miles short of a Walmart Supercenter. Walmarts tend to be very strong ridership generators and would make for a stronger anchor for Route 33 than the current terminus at BI-LO. Extending Route 33 to the Walmart, which is served by Route 301, would also create new connection opportunities for riders.
- Increase peak-period frequency. Some Route 33 trips are at or near capacity during peak periods. Increasing peak-period service from hourly to every 30 minutes would match the elevated demand for service.
- Restructure route as a feeder service. Route 33 could be restructured to serve as a feeder service for potential high-capacity transit service in the US 17 corridor. Potential alignments for the feeder route could be a bi-directional loop combining Route 301 and the portion of Route 33 north of Citadel Mall. This loop would close the coverage gap on Bees Ferry Road and would likely be more reliable, in terms of on-time performance, than the current Route 33 service into downtown. The St. Andrews and Ashley River Road segment of the route could operate as a feeder as well, between a potential transit station at or near Citadel Mall and another one near Savanah Highway and Wesley Drive.



Route 40: Mt. Pleasant

Route 40 is a local service operating between the Charleston Visitors' Center in downtown Charleston and Mt. Pleasant Towne Center, primarily via Meeting Street, Johnnie Dodds Boulevard, and US-17. On weekday evenings, the last trip of the day extends further northeast along the regular Route XP2 alignment to serve the Wal-Mart park-and-ride in Mt. Pleasant. Route 40 operates seven days a week.

Ridership by Stop

Figure 53: Route 40 Inbound Daily Ridership by Stop





Figure 54: Route 40 Outbound Daily Ridership by Stop





Ridership by Trip

Figure 55: Route 40 Inbound Ridership by Trip



Figure 56: Route 40 Outbound Ridership by Trip



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- Route 40 provides local access along the US 17 corridor by serving Johnnie Dodds Boulevard frontage roads.
- The route has easy-to-remember clockface frequency.
- Route 40 has a fairly robust span of service, operating into the 9:00 pm hour on weekdays at 11:00 pm hour on Saturdays.
- Route 40 operates seven days a week.

Weaknesses

• Route 40 stops in the inbound and outbound direction are located far from each, along frontage roads on opposite sides of US 17.

Opportunities

- Restructure route as a feeder service. Route 40 operates along opposite frontage roads of US 17 in the inbound and outbound direction. This service approach makes it inconvenient for passengers to get to and from bus stops that may be on the opposite side of US 17 from their destination. To improve service, Route 40 could be restructured to serve as a feeder service for a potential high-capacity transit service in the US 17 corridor. Rather than providing service directly to downtown Charleston, Route 40 could operate between retail and multi-family housing destinations on either side of US 17, and provide connection opportunities to the high-capacity service when crossing over US 17 at cross-streets.
- Expand coverage and/or peak frequency. If Route 40 transitions to a feeder route focused on service in Mt. Pleasant, the resources saved by not operating all the way to downtown Charleston could be reinvested in more coverage in Mt. Pleasant, where there are several large apartment complexes with strong ridership potential that are not well-served today. Similarly, service frequency could be improved (at least during peak periods) to attract more riders and allow for more convenient connections to a potential high-capacity service in the US 17 corridor.



Route 41: Coleman Boulevard

Route 41 is a local service operating between the Charleston Visitors' Center in downtown Charleston and the Wando Crossing Shopping Center in Mt. Pleasant, primarily via Wando Way and Coleman Boulevard. The route operates on Weekdays and Saturdays only.

Ridership by Stop

Figure 57: Route 41 Inbound Daily Ridership by Stop





Figure 58: Route 41 Outbound Daily Ridership by Stop



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Ridership by Trip Figure 59: Route 41 Inbound Ridership by Trip



Figure 60: Route 41 Outbound Ridership by Trip



12:00 AM 12:30 AM 1:00 AM



- Route 41 provides local coverage in Mt. Pleasant, including service to retail and multifamily housing developments along the Coleman Boulevard and Chuck Dawley corridors.
- Route 41 provides weekday and Saturday service.

Weaknesses

- Route 41 provides 90-minute service frequency, which limits the convenience and appeal of the route.
- Most Route 41 trips in both directions carry fewer than 10 passengers.

Opportunities

• Restructure route as a feeder service and increase frequency. Route 41 has limited service frequency, which results in very low ridership. To attract more riders, Route 41 must operate more frequently than every 90 minutes. If the route is restructured as a feeder route connecting to potential high-capacity transit in the US 17 corridor, it could provide more circulation in Mt. Pleasant. The resources saved by not operating to downtown Charleston could also be reinvested into providing hourly service (at least) on the route.

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Route 42: Wando Circulator

Route 42 is a local service operating between Mt. Pleasant Town Center and Wando High School, primarily via Hungry Neck Boulevard/Sweetgrass Basket Parkway and US-17. The route also serves Mt. Pleasant Hospital. Route 42 operates seven days a week.

Ridership by Stop

Figure 61: Route 42 Inbound Daily Ridership by Stop





Figure 62: Route 42 Outbound Daily Ridership by Stop





Ridership by Trip Figure 63: Route 42 Inbound Ridership by Trip



Figure 64: Route 42 Outbound Ridership by Trip





- Route 42 provides local coverage in Mt. Pleasant, including service to retail, medical, and educational destinations in the US 17 corridor.
- Route 42 has an easy-to-remember clockface frequency.
- Route 42 provides connection opportunities to Route 40 and Route XP2 at the Walmart-Mt. Pleasant Park-and-Ride and other points along the route.
- Route 42 operates seven days a week.

Weaknesses

- Route 42 has very low ridership, with most trips carrying 10 or fewer passengers
- The route operates in a difficult-to-serve environment with low density, and challenging pedestrian conditions.
- Key destinations along Route 42, including Walmart and Mt. Pleasant Hospital, are provided direct service in one direction only.

Opportunities

• Replace fixed-route service with innovative demand response service. Route 42 operates along a corridor that includes a very wide arterial with few signalized crosswalks, and relatively high-speed traffic (regardless of the posted speed limit). While there are several key destinations along the corridor, including a high school, hospital, and retail centers, pedestrian access is difficult due to large set-backs and direct service in often provided in one direction only. Given the land-use and density of the area, an innovative (app-dispatched) demand response service may be the most appropriate service model for the area. The demand response service could cover a larger service area than the current Route 42 and help connect area residents to nearby destinations, as well as other transit services.



Route 102: North Neck/Rutledge

Route 102 is a local service operating between the Medical University of South Carolina and the North Charleston Superstop at Rivers Avenue and Cosgrove Avenue, primarily via Ashley Avenue, Rutledge Avenue, King Street, Azalea Drive, and Cosgrove Avenue. The route also serves the Citadel, and on inbound trips only, serves Baker Hospital Boulevard. Route 102 operates on weekdays and Saturdays only.

Ridership by Stop

Figure 65: Route 102 Inbound Daily Ridership by Stop




Figure 66: Route 102 Outbound Daily Ridership by Stop





Ridership by Trip Figure 67: Route 102 Inbound Ridership by Trip



Figure 68: Route 102 Outbound Ridership by Trip





Strengths

- Route 102 has easy-to-remember clockface frequency.
- The route operates on Weekdays and Saturdays.
- Route 102 has a fairly robust span of service, operating past 8:30 pm hour on weekdays and Saturdays.

Weaknesses

- Route 102 has very low ridership north of Mt. Pleasant Street, with the exception of the North Charleston Superstop.
- Baker Hospital is served in the southbound direction only, limiting the utility and appeal of the stop.
- Nearly all trips carry ten or fewer passengers.

Opportunities

- **Truncate route at Mt. Pleasant Street**. Ridership on Route 102 is very low north of Mt. Pleasant Street. Ending Route 102 at Mt. Pleasant Street would reduce unproductive service and still allow passengers to access North Charleston via a convenient transfer (Route 11 or a potential future high-capacity transit service).
- **Combine with Route 20 to create a Peninsula Circulator**. Combining Route 20 with a truncated Route 102, ending at Mt. Pleasant Street, could create a bi-directional circulator serving much of the Peninsula and potentially connecting with several high-capacity transit services. The two routes can be joined by extending Route 20 service along Broad Street to Rutledge Avenue, and following an alignment similar to the current Route 102 alignment between Calhoun Street and Mt. Pleasant Street.
- Serve the Charleston Housing Authority properties along Line Street and Allway Street. Route 102 ridership is generally weak along Rutledge and Avenue and Ashley Avenue, north of Spring Street. Shifting Route 102 service Hagood Avenue, between Spring Street and Congress Street would substantially improve transit service for residents of the Charleston Housing Authority properties along Line Street and Allway Street, by providing bi-directional service to grocery, retail, and employment destinations.
- Increase service frequency during peak periods. If Route 102 serves as a first/last mile connector to and from high-capacity transit, it will need to have frequent service during peak commuting periods (if not all day) to make transfers as convenient as possible.



Route 103: Leeds Avenue

Route 103 is a local service operating between the North Charleston Superstop at Rivers Avenue and Cosgrove Avenue, and the intersection of Paramount Drive and Dorchester Road, near I-526. The route also serves the Lonnie Hamilton Charleston County Office Building and primarily runs along Dorchester Road, Leeds Avenue, and Faber Place Drive. Route 103 operates on weekdays only.

Ridership by Stop

Figure 69: Route 103 Inbound Daily Ridership by Stop





Figure 70: Route 103 Outbound Daily Ridership by Stop





Ridership by Trip Figure 71: Route 103 Inbound Ridership by Trip



Figure 72: Route 103 Outbound Ridership by Trip

72





Strengths

- Route 103 has easy-to-remember clockface frequency.
- Route 103 serves a number of key regional destinations including the Charleston County Office Building, Charleston County Detention Center, Charleston Department of Motor Vehicles, the Cummins Plant and Leeds Park, and several trade schools.
- Route 103 offers multiple transfer opportunities at the North Charleston Superstop and along Dorchester Road.

Weaknesses

- Most Route 103 trips carry fewer than ten passengers.
- Route 103 has a fairly circuitous alignment.

Opportunities

- Streamline service along Dorchester Road. Route 103 provides connections to several key regional destinations that are concentrated along Leeds Avenue and Faber Place Drive. Service north of Dorchester Drive serves primarily single-family homes, and does not generate substantial ridership. Shifting service to Dorcheser Road, between Constitution Avenue and Leeds Avenue, would streamline the route and reduce travel time for passengers transferring at the North Charleston Superstop or along Dorchester Road.
- Extend route northeast after serving the Superstop. Extending Route 103 past the North Charleston Superstop to serve Hobson Road and Noisette Boulevard could allow Route 104 service to shift to Spruill Avenue, and for Route 13 to focus on service north of I-526 only.
- Increase service frequency during peak periods. If Route 103 serves as a first/last mile connector to and from potential high-capacity transit service along Dorchester Road, it will need to have more frequent service during peak commuting periods (if not all day) to make transfers as convenient as possible.



Route 104: Montague Avenue

Route 104 is a local service operating between the North Charleston Superstop at Rivers Avenue and Cosgrove Avenue, and the Tanger Outletts, primarily via McMillan Avenue, Noisette Boulevard, and Montague Avenue. The route also serves the Danny Jones Center and North Charleston City Hall. Route 104 operates on weekdays only.

Ridership by Stop

Figure 73: Route 104 Inbound Daily Ridership by Stop





Figure 74: Route 104 Outbound Daily Ridership by Stop





Ridership by Trip





Figure 76: Route 104 Outbound Ridership by Trip





Strengths

- Route 104 has two strong anchors in Walmart and the North Charleston Superstop
- The route has easy-to-remember clockface frequency.
- Numerous connection opportunities are available at North Charleston Superstop.
- Route 104 operates on weekdays and Saturdays.
- Route 104 has a fairly robust span of service, operating into the 9:00 pm hour on weekdays at 8:00 pm hour on Saturdays.

Weaknesses

- Most Route 104 trips carry fewer than 15 passengers.
- Ridership is very low at all stops along Noisette Boulevard.
- Service to Danny Jones Park requires a significant deviation from the route's most direct path, and generates very little ridership.

Opportunities

- Shift service from Noisette to Spruill Avenue. Route 104 ridership along Noisette Boulevard is very low. Shifting Route 104 service to Spruill Avenue could allow Route 13 to focus on service north of I-526 only. This would make for two simplified, and more logical routes connecting Walmart to neighborhoods north and south of I-526 respectively. Service to Hobson Avenue could be picked up by an extension of Route 103 from the North Charleston Superstop.
- Extend Service to Boeing/Charleston International Airport. One or both of the proposed routes serving Walmart, as described above, could be extended from Walmart and Tanger Outlets to Boeing and the airport. If both routes are extended and their schedules staggered, they could serve as a frequent shuttle between the airport area, the Tanger Outlets/Walmart area, and potential high capacity transit service operating on Rivers Avenue.



Route 203: Medical Shuttle

Route 203 is a circulator service linking parking and medical facilities including MUSC, Ralph H. Johnson VA Medical Center, and Roper Hospital. The route also serves the South Carolina DMV and Employment Security Commission. Route 203 operates on weekdays only and has no mid-day service.

Ridership by Stop

Figure 77: Route 203 Daily Ridership by Stop





Ridership by Trip Figure 78: Route 203 Ridership by Trip



Note: the 3:02pm, 3:22pm, 3:42pm, 4:02pm, and 4:42pm trips are missing from this data

Strengths

- Route 203 has frequent service (up to every five minutes) at peak periods.
- The route is specifically designed to address the parking connectivity needs of the MUSC/VA Medical Center area.

Weaknesses

- Route 203 operates with an irregular service frequency during peak periods. Some trips are spaced every five minutes, while others are spaced every ten.
- Route 203 service is not available during the mid-day.

Opportunities

• **Provide all-day service on Route 203.** The lack of mid-day service on Route 203 forces passengers to find other options such as Route 213 to travel between medical facilities and parking lots along Fishburne Street. This can create confusion, as the routes do not follow identical alignments. All day service on Route 203 could allow for the restructuring of Route 213 into a smaller, more streamlined loop.



Route 204: MUSC/Calhoun Circulator

Route 204 is a circulator service linking key downtown destinations such as the Canterbury House, Harris Teeter, Charleston City Market, Charleston County Library, Charleston Visitors' Center with medical facilities including MUSC and the Ralph H. Johnson VA Medical Center. Route 204 operates on weekdays only.

Ridership by Stop

Figure 79: Route 204 Daily Ridership by Stop





Ridership by Trip Figure 80: Route 204 Ridership by Trip



Note: the 1:40pm trip is missing from this data

Strengths

- Route 204 provides cross-peninsula service, allowing riders to get back and forth between the east and west side of downtown.
- Route 204 provides an important local grocery connection with service to Harris Teeter,

Weaknesses

- Route 204 operates as a one-way loop, forcing out-of-direction travel for most riders.
- Route 204 operates with non-clockface service frequency.
- The route has a limited span of service, beginning service late in the morning and ending in the early afternoon.
- All Route 204 trips carry fewer than 5 passengers.

Opportunities

- Operate bi-directionally via Market Street. The current Route 204 has very limited appeal because it operates as a large one-way loop. Operating the route bidirectionally would reduce travel times for riders by providing direct service to key destinations on either side of the peninsula. From the Charleston Visitors Center, buses could travel to Harris Teeter and Market Street, and then serve MUSC. Buses could then return east along the same (or similar) alignment.
- **Combine with Route 213 to form a bi-directional loop**. Routes 204 and 213 both operate as large one-way loops. Combining the routes' respective service areas into a



bidirectional loop serving MUSC, Spring Street, the Charleston Visitors Center, Harris Teeter, and Market Street would help simplify transit service on the Peninsula. The route would also serve as a feeder to potential high-capacity transit service along Calhoun Street and Meeting Street.

Route 210: Aquarium/College of Charleston DASH Shuttle

Route 210 is a circulator service linking key downtown destinations such as Marion Square and the Charleston Visitors' Center with the College of Charleston and the South Carolina Aquarium. The route operates seven days a week, but the College of Charleston is served on weekdays only. Between September and April, Route 210 runs with expanded service frequency.

Ridership by Stop

Figure 81: Route 210 Daily Ridership by Stop





Ridership by Trip Figure 82: Route 210 Ridership by Trip



Strengths

- Route 210 has two strong anchors in the aquarium and College of Charleston.
- Route 210 has high service frequency (up to every 10 minutes) during the academic year.
- The route has strong ridership, with several trips carrying more than 30 passengers.
- Route 210 has a robust span of service, operating into the 10:00 pm hour on weekdays and 8:00 pm hour on Saturdays.
- Route 210 operates seven days a week.

Weaknesses

 Route 210 serves two strong but unrelated anchors that likely justify different levels of service from one another.

Opportunities

• Unlink aquarium and College of Charleston service. Rather than serving the aquarium, Route 210 could instead serve the College of Charleston and Trident Technical College via the Charleston Visitors Center. These two destinations are more similar to one another in terms of level of service requirements and would likely both justify the service frequency adjustments during summer months.

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Route 211: Meeting/King DASH Shuttle

Route 211 is a circulator service linking key downtown destinations including Marion Square, the Charleston Visitors Center, City Hall, Waterfront Park, and Charleston Market. Route 211 operates seven days a week.

Ridership by Stop

84

Figure 83: Route 211 Inbound Daily Ridership by Stop





Ridership by Trip Figure 84: Route 211 Inbound Ridership by Trip



Strengths

- Route 211 has strong anchors in the Charleston Visitors Center, Waterfront Park, and Charleston Market.
- Route 211 has high service frequency (every 15 minutes for much of the day).
- The route has strong ridership, with several trips carrying more than 50 passengers.
- Route 211 has a robust span of service, operating into the 9:00 pm hour every day.
- Route 211 operates seven days a week.

Weaknesses

• Route 211 would be more convenient for tourists if it also served the South Carolina Aquarium, putting the peninsula's top tourist destinations onto one route.

Opportunities

• Serve the South Carolina Aquarium with Route 211. Rather than serving the aquarium with Route 210, it would be a better fit to serve this top tourist destination with Route 211 which already serves tourist draws like Waterfront Park and Charleston Market. Buses departing the Visitors Center could alternate between Waterfront Park and the South Carolina Aquarium.



Route 213: Meeting/King DASH Shuttle

Route 213 is a circulator service linking key downtown destinations including the Charleston Visitors' Center, Trident Technical College Palmer Campus, Marion Square, College of Charleston, South Carolina DMV, and MUSC. Route 213 operates seven days a week.

Ridership by Stop

Figure 85: Route 213 Daily Ridership by Stop





Ridership by Trip Figure 86: Route 213 Ridership by Trip



Strengths

- Route 213 has strong anchors in MUSC and Trident Technical College.
- The route has relatively strong ridership, with several trips carrying more than 30 passengers.
- Route 213 has a robust span of service, operating into the 9:00 pm hour on weekdays and Saturdays.
- Route 213 operates seven days a week.

Weaknesses

- Route 213 operates with non-clockface service frequency.
- The route operates as a

Opportunities

• Combine with Route 204 to form a bi-directional loop. Routes 204 and 213 both operate as large one-way loops. Combining the routes' respective service areas into a bidirectional loop serving MUSC, Spring Street, the Charleston Visitors Center, Harris Teeter, and Market Street would help simplify transit service on the Peninsula. The route would also serve as a feeder to potential high-capacity transit service along Calhoun Street and Meeting Street.



Route 301: Glenn McConnell Circulator

Route 301 is a local service operating between Citadel Mall and Walmart on Ashley Circle, primarily via Savannah Highway, Castlewood Boulevard, Henry Tecklenburg Drive, and Glenn McConnel Parkway. The route also serves Roper St. Francis Hospital, Charleston Mental Health Center, and West Ashley High School. Route 301 operates on weekdays and Saturdays only.

Ridership by Stop

Figure 87: Route 301 Inbound Daily Ridership by Stop





Figure 88: Route 301 Outbound Daily Ridership by Stop



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Ridership by Trip





Figure 90: Route 301 Outbound Ridership by Trip





Strengths

- Route 301 serves two strong anchors with Citadel Mall and Walmart Supercenter.
- Route provides connection opportunities at Citadel Mall.
- Several large multi-family housing communities are located along the route.

Weaknesses

- Route 301 is a very low-ridership route with most trips carrying fewer than 10 passengers.
- Most connections at Citadel Mall are not well-timed, resulting in relatively long transfer wait times.
- Difficult pedestrian environment along Glenn McConnell Parkway, makes access to bus stops a challenge.

Opportunities

- Work with City of Charleston to improve pedestrian connections. The Glenn McConnell Parkway corridor along which Route 310 operates includes a high school, a hospital, several large apartment complexes, and a Walmart Supercenter. These are all land-uses that typically generate strong transit ridership. However, the lack of sidewalks along the corridor and the deep setbacks of developments from the corridor limit the route's ridership potential. The addition of pedestrian and transit amenities such as sidewalks and passenger shelters may improve ridership. It could also streamline service by reducing the need to deviate from the primary corridor to make up for poor pedestrian access (e.g. Willian E. Murray Boulevard).
- Shift Service from Savage Road to Ashley Towne Center Drive. Ridership along Savage Road and Castlewood Boulevard is extremely low, despite the high-density housing along Castlewood Boulevard. Shifting service to Ashley Towne Center Drive would improve access to Food Lion and the Abberly at West Ashley Apartment Homes.
- Improve transfer coordination at Citadel Mall. Route 301 does not provide direct service to downtown Charleston, and connections at Citadel Mall to other routes that do are often poorly timed. A potential high-frequency, high-capacity transit service between the mall and downtown Charleston would improve connection opportunities and make feeder routes more appealing. High-frequency service simplifies coordination by ensuring that a transfer opportunity will be available within a short period of time of any other arrival at the transfer location.



Summary of Recommendations by Route

Introduction

While the recommended HCT network will form the core of region's future transit network, it's success will depend on a supporting network of local, express, and seasonal transit services. These supporting services provide critical links, including long-distance, limited-stop, and first/last mile connections, that feed passengers into the HCT corridors and help make the network complete.

Guiding Principles

To develop recommendations for supporting services, the study team considered both the HCT network recommendations, and the performance of the existing transit network. A diagnostic route profile was developed for each existing CARTA route. Each profile examined the route's ridership by stop and by trip; and identified the route's strengths and weaknesses in terms of service performance and design. The following guiding principles were used to assess the design of each route:

- Service Should Operate at Regular Intervals: In general, people can easily remember repeating patterns, but have difficulty remembering irregular sequences.
- Routes Should Operate Along a Direct Path: The fewer directional changes a route makes, the easier it is to understand. Circuitous alignments are disorienting and difficult to remember.
- Routes Should be Symmetrical: Routes should operate along the same alignment in both directions to make it easy for riders to know how to get back to where they came from.
- **Routes Should Serve Well Defined Markets**: The purpose of a route should be clear, and each should include strong anchors and a mix of origins and destinations.
- Service Should be Well Coordinated: At major transfer locations, schedules should be coordinated to the greatest extent possible to minimize connection times for the predominant transfer flows.

Finally, each route profile presented a set of potential service improvement opportunities aimed at addressing the performance and/or design deficiencies identified for the route.

Proposed Route Network

Using the service improvement opportunities developed in the route profiles as a starting point, the study team began to sketch out a proposed supporting service network, focusing first on coverage and then on service characteristics such as frequency and span of service.

The proposed service network was revised and refined several times based on the feedback of BCDCOG staff. The resulting network complements the proposed HCT network by proving connections to and from transit-supportive neighborhoods and key activity centers (as identified in the Travel Market Analysis). The supporting transit network also helps fill gaps within the HCT corridors by providing local service between HCT stops, which are generally spaced more than 1/4 mile apart.

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Some parts of the Charleston region include large, but relatively low-density residential developments. These areas may have a need for mobility services, but lack the density and land-use needed to support traditional fixed-route service. However, new tools such as appbased demand response services can now provide flexible service over a large area, with greater responsiveness than previous generations of demand response services. The proposed supporting services network makes extensive use of app-based demand-response services, both to provide connections to/from HCT corridors, and to provide local circulation in suburban environments.

The proposed supporting services network also includes two seasonal routes serving the beach-front communities of Folly Beach and Isle of Palms. These routes are intended to provide beach access for Charleston area residents and access to mainland retail destinations for seasonal island visitors.

Proposed Service Characteristics.

The development of a proposed supporting services network was followed by the development of service characteristics for each route. This process began by measuring the round-trip miles of each proposed route, and diving by an estimated average speed to produce an estimated round-trip run time. For most routes, the estimated average speed was in the range of 12 to 14 miles per hour, which is a typical range for local transit services operating outside of highly congested urban areas.

To ensure strong on-time performance, a minimum recovery time equal to 10 percent of the run time was added to each route's cycle time. Cycle times that are multiples or products of 60 allow for the development of clock-face schedules. Clock-face schedules are schedules that result in buses serving a particular stop at the same time or times past every hour (e.g. 1:10, 2:10, 3:10, etc., or 1:00, 1:30, 2:00, 2:30, etc.). Clock-face frequencies make it simple for riders to remember schedules, and make it easier to coordinate connections at key hubs.

Clock-face schedules are proposed for all of the recommended routes, and recovery times are projected to fall between 10 and 20 percent of total cycle time for most routes. When recovery time is less than 10 percent of total cycle time, there is a high risk of poor on-time performance because there is insufficient buffering between trips. With insufficient recovery time, one late trip can lead to another, causing a bus to get further and further behind schedule. On the other hand, if there is more than 20 percent recovery time in a schedule, buses are sitting unproductively for long periods of time.

Routes that have excess recovery time are highlighted in the proposed service characteristics table. It is often possible to mitigate excess recovery time by interlining routes. Interlining is the practice of operating a single bus or group of buses on multiple routes. Interlining is often used to optimize cycle times and recovery times. For example, if one route has insufficient recovery time while another has excessive recovery time, interlining the routes can result in a cycle with an optimal mix of running time and recovery time. In order to interline two routes, they must share a common end-of-line and have the same service frequency.

The service frequency for each route was determined by considering the route's current schedule and service performance. Service frequencies were generally not reduced unless

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justified by poor productivity. However, in several cases proposed service frequencies are higher than justified by current ridership and productivity. These higher frequencies (i.e. 30minute service rather than hourly) are a function of the routes' 90-minute cycle times which do not allow for hourly frequency without interlining. Interlining these routes, when possible, would reduce the total number of vehicles and revenue hours required to operate the proposed network.

	С	E	K	Μ	Ν
7	X	Х	X	X	X
10	Х	Х	Х	Х	Х
11	Х	Х			
12	Х	Х			
13	Х	Х			
14	X				
15	X	X			
20	Х	Х			
30			X	Х	
33	X	Х	X	Х	X
40					X
41					X
103	Х	Х			
203	Х		X	X	X
210	X		X	X	X
213	X		X	X	X
XP1	Х	Х	Х	Х	X
XP2	Х	X	X		X
XP4	X	Х	X	X	X
IOPT					X
FBT				X	
James Island DR				Х	
Daniel Island DR					
Mt. Pleasant DR					X
Goose Creek DR	Х				
West Ashley DR			Х		
Summerville DR		X			

Supporting Service Recommendations



- Route 7
 - Modification of the new Hop Shuttle meant to get hospitality workers from park & ride on Conroy Street to jobs in the Peninsula.
 - Northbound service shifted to Meeting Street to provide bi-directional service and connection opportunities to HCT Corridor C, E, K, M, and N.
- Route 10
 - Picks up coverage from current Route 20 along King Street and current Route 11 on Meeting Street and Spruill Avenue.
 - Complements HCT service with parallel local service in the Peninsula, and overlapping local service in the neck to fill gaps between HCT stations.
- Route 11
 - First/last mile connector between HCT Corridors C and E and Airport, Tanger Outlets, Convention Center area, and Trident One-Stop Career Center.
- Route 12
 - Similar to current Route 12.
 - Complements HCT corridors with local/feeder service along Dorchester Road between Rivers Avenue and Michaux Parkway, and Ashley Phosphate Road between Dorchester Road and Rivers Avenue.
 - Also complements HCT Corridor E with overlapping service between Michaux Parkway and Ashley Phosphate Road to fill gaps between HCT stations.
- Route 13
 - Picks up coverage from highest ridership segments of current Routes 13 and 104 along Montague Avenue, Spruill Avenue, Mall Drive, and Centre Pointe Drive.
 - Provides connection between HCT Corridors C and E and Amtrak Station, North Charleston City Hall, and Tangers Outlets.
- Route 14
 - Picks up coverage from current Routes 10 between Trident One-Stop Career Center and Trident Medical Center.
 - Complements HCT Corridor C with overlapping service along Rivers Avenue between Hanahan Road and Otranto Boulevard to fill gaps between HCT stations
 - Adds new local/feeder service along Fernwood Drive, Salamander Road, Otranto Road, Antler Drive, and Greenridge Road for access to Trident Medical Center, Former K-Mart Park & Ride, and HCT Corridor C.
- Route 15
 - Picks up coverage from current Routes 14 along Remount Road, Rivers Avenue, Mall Road, and Centre Pointe Drive.
 - Provides connection between HCT Corridors C and E and Amtrak Station, North Charleston City Hall, and Tangers Outlets.
- Route 20
 - Peninsula circulator connecting multiple residential areas to Food Lion, Harris Teeter, Citadel, MUSC, and Meeting Street Corridor.
 - Provides connections to HCT Corridors C and E at Meeting Street and Huger Street.



• Route 30

- Local/feeder service connecting multiple residential areas in West Ashley and James Island to Walmart, Citadel Mall, Food Lion, Harris Teeter, Earth Fare, and Publix.
- Complements HCT Corridors K and M with overlapping service along Orleans Road, Savanah Highway, and Folly Road to fill gaps between HCT stations.
- Route 32
 - Similar to current Route 32.
 - Connects HCT Corridors C, E, and K with local/feeder service along Sam Rittenberg Boulevard and Cosgrove Avenue.
- Route 33
 - Local/feeder service connecting multiple residential areas in West Ashley and the Peninsula to Citadel Mall, MUSC area, and Meeting Street Corridor.
 - Provides connections to all HCT corridors.
- Route 40
 - First/last mile connector between HCT Corridor N and multiple retail and multi-family housing destinations along US 17 corridor in Mt. Pleasant, including Six Mile Marketplace, Mt. Pleasant Town Center, and Wando Crossing.
- Route 41
 - Picks up coverage from current Route 41 along Coleman Boulevard and Chuck Dawley Boulevard in Mt. Pleasant.
 - Provides connections to HCT Corridor N at Houston Northcutt Boulevard and Wando Crossing.
- Route 103
 - Picks up coverage from current Route 103 east of Rivers Avenue and current Route 104 west of Rivers Avenue along McMillan Avenue and Hobson Avenue.
 - Provides connections to HCT Corridors C and E at North Charleston Superstop.
- Route 203
 - Similar to current Route 203.
 - Provides connections to HCT Corridors C, K, M and N at Calhoun Street and Courtney Drive.
- Route 210
 - Similar to current Route 210.
 - Provides connections to HCT Corridors C, K, M and N at Calhoun Street and St. Philip Street.
- Route 213
 - Modification of current Route 213 to provide bi-directional service along Calhoun Street and Meeting Street, and expand direct service to MUSC and VA to more lowincome housing residents along America Street.
 - Provides connections to HCT Corridors C, K, M and N along Meeting Street and Calhoun Street.
- Route 301
 - Modification of current Route 301 to operate as a bi-directional circulator/feeder in the Citadel Mall area.



- Provides connections to HCT Corridor K at Magwood Drive and Glenn McConnell Parkway, and at Citadel Mall.
- Route XP1
 - Express route serving Volvo, Nexton Park & Ride, Boeing/Airport, Meeting Street Corridor, and MUSC area during peak periods only.
 - Provides connections to HCT corridors near airport and along Meeting Street and Calhoun Street.
- Route XP2
 - Express route serving the I-526 corridor, linking Mt. Pleasant, Daniel Island, Boeing/Airport, and Citadel Mall areas.
 - Provides connections to HCT corridors at Wando Crossing, near airport, and at Citadel Mall.
- Route XP4
 - Express route serving Boeing/Airport, Meeting Street Corridor, and MUSC area during off-peak periods to supplement Route XP1.
 - Provides connections to HCT corridors near airport and along Meeting Street and Calhoun Street.
- Route IOPT
 - Isle of Palms seasonal trolley.
 - Links Isle of Palms to retail destinations and HCT Corridor N at Mt. Pleasant Town Center
- Route FT
 - Folly Beach seasonal trolley.
 - o Links Folly Beach to retail destinations and HCT Corridor M at Walmart Park & Ride.
- James Island On-Demand
 - App-based demand-response service to supplement limited fixed-route network.
 - Provides connections to HCT Corridor M along Folly Road.
- Daniel Island On-Demand
 - App-based demand-response service to supplement limited fixed-route network.
 - o Provides connections to XP2 service.
- Mt. Pleasant On-Demand
 - App-based demand-response service to supplement limited fixed-route network.
 - Provides connections to HCT Corridor N along US 17.
- Goose Creek On-Demand
 - App-based demand-response service to supplement limited fixed-route network.
 - Provides connections to HCT Corridor C along Rivers Avenue.
- West Ashley On-Demand
 - App-based demand-response service to supplement limited fixed-route network.
 - Provides connections to HCT Corridor K along Glenn McConnell Parkway.
- Summerville On-Demand
 - App-based demand-response service to supplement limited fixed-route network.
 - Provides connections to HCT Corridor E along Dorchester Road, Old Trolley Road, and Main Street in Summerville.