

Route 10: Woodcroft/New Hope Commons

Route 10 connects downtown with various regional shopping destinations in southwest Durham. The route alternates between two different patterns during the day, with one pattern terminating at the Woodcroft Shopping Center and the other at the New Hope Commons Shopping Center. Trips that terminate at Woodcroft Shopping Center serve the James Street deviation on inbound trips, and trips that terminate at New Hope Commons serve the James Street deviation on outbound trips. During the evening and on Sundays, all trips serve both shopping centers and James Street on inbound and outbound trips.

The primary problems identified by the operators for route 10 are overcrowding, traffic congestion, and insufficient schedule running time. Traffic congestion occurs on the loop road surrounding New Hope Commons. Overcrowding also occurs in this same area. Operators noted that additional running time is needed between noon and 6 PM on weekdays in the New Hope Commons area due to traffic congestion.

Ridership

Route 10 had an annual ridership of 515,466 in FY 2011 and carried an average of 32.57 passengers per revenue hour and 2.11 passengers per revenue mile on weekdays. Saturday and Sunday productivity measures were 24.49 and 20.39 passengers per revenue hour, respectively.

The route ranked 3rd in weekday ridership, 9th in weekday passengers per revenue hour, and 10th in weekday passengers per revenue mile in FY 2011. Although the route has high ridership compared to other routes in the DATA system, it requires a large amount of service, measured in revenue hours and miles, to transport those riders to and from the suburban shopping areas in the peripheral areas of Durham.

Average daily ridership is shown for route 10 by time of day in Table 73. The midday period carries the greatest number of passengers on all days of the week, though ridership is steady throughout most of the day. In general, the route exhibits stronger demand for service during the PM peak and evening periods than during the AM peak period. Saturday ridership is 25% less than weekday ridership, and Sunday ridership is 65% less than weekday ridership.

Table 73: Route 10 Average Daily Ridership

	Weekday	Saturday	Sunday	Holiday
Early AM	28	11	-	-
AM Peak	263	130	79	85
Midday	712	511	289	330
PM Peak	374	307	159	169
Evening	264	276	47	52
Total	1,641	1,234	574	636

Trip Generators

Figures 79 and 80 show stops with 25 or more average daily boardings or alightings for outbound and inbound trips. The major trip generators for both inbound and outbound trips are New Hope Commons Shopping Center, Shannon Plaza/Goodwill, and Parkway Plaza. Other important trip generators are Henderson Towers (a DHA community) and the Lakewood Shopping Center and YMCA on Chapel Hill Rd.



Figure 79: Route 10 – Top Boarding and Alighting Stops – Outbound

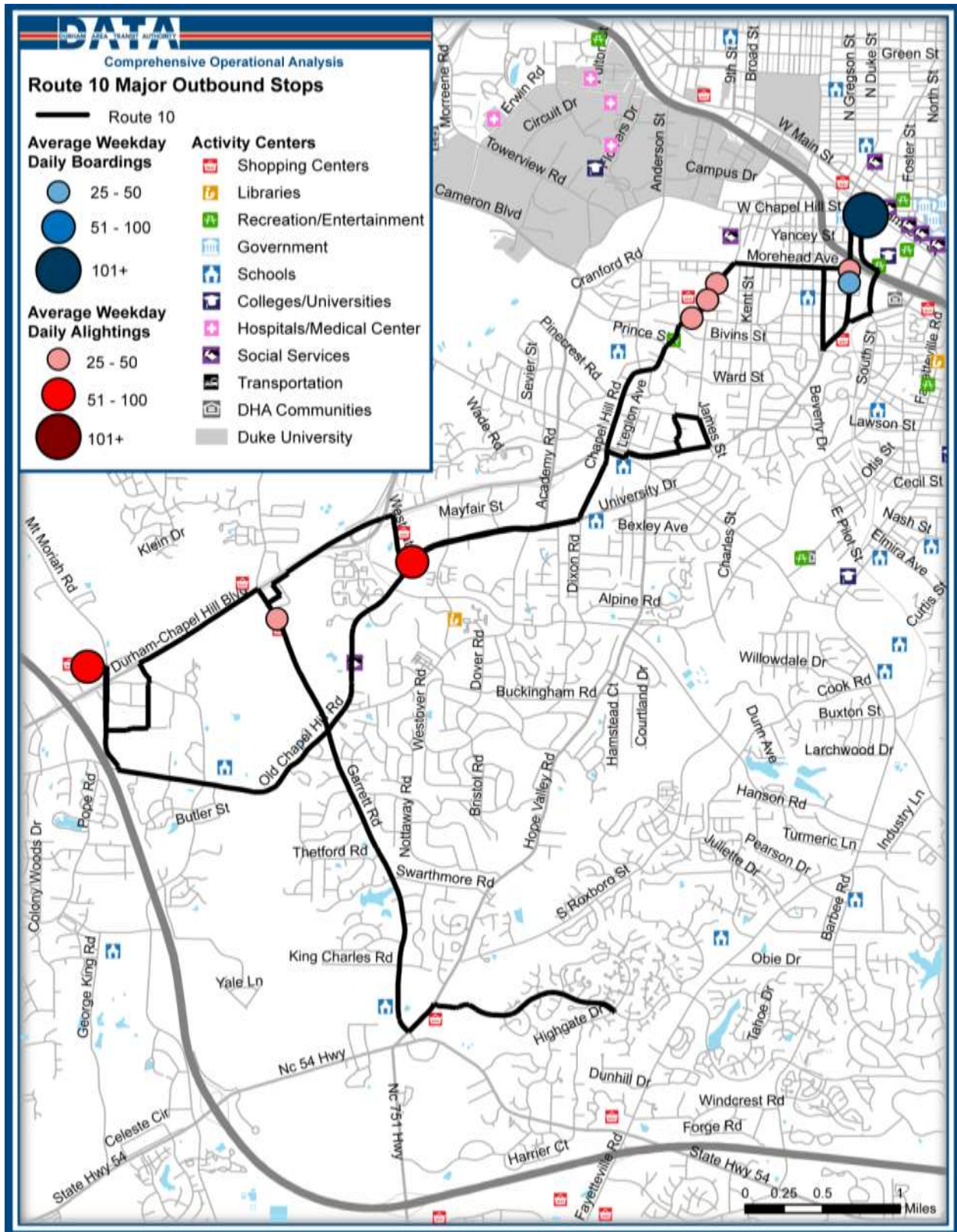
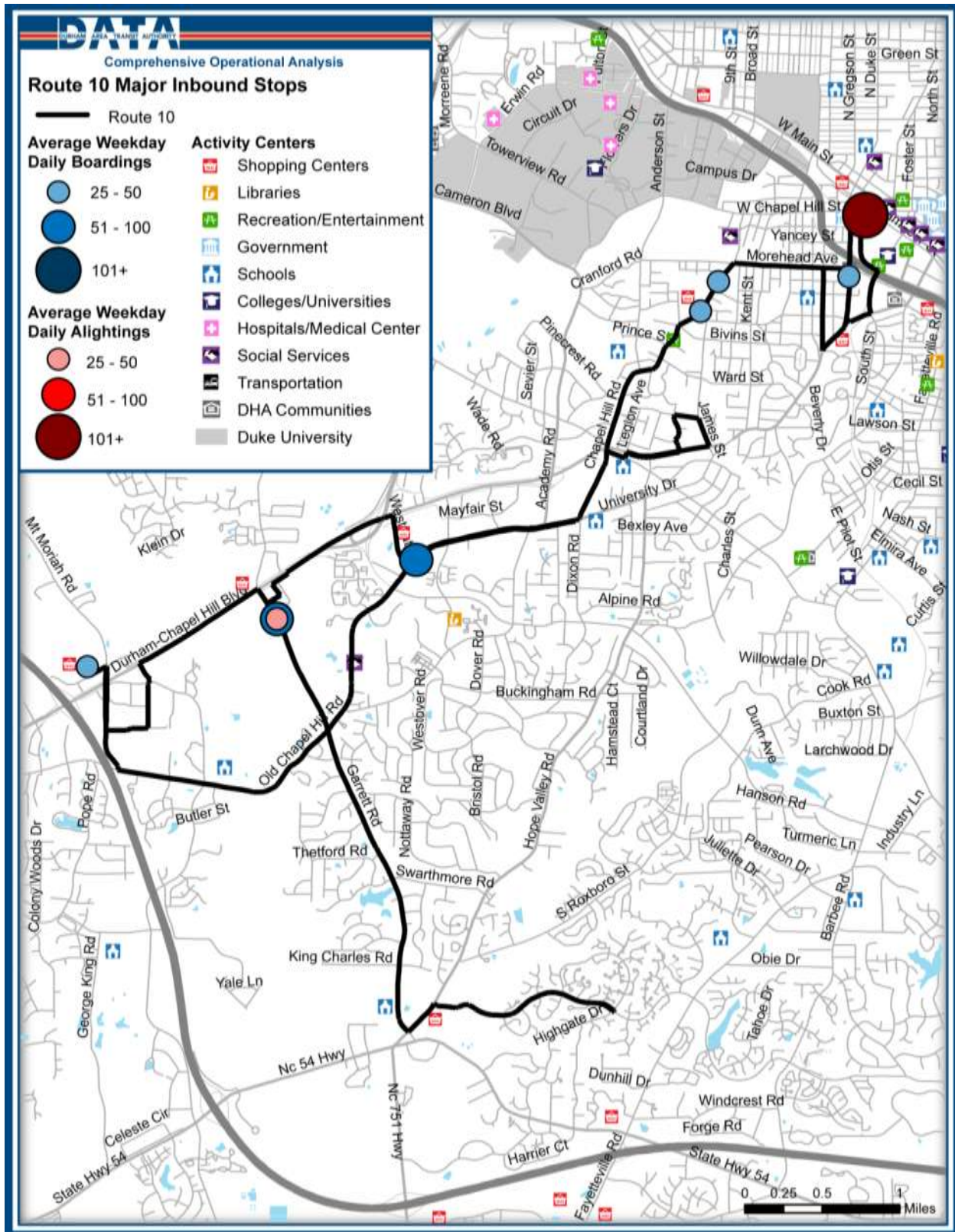




Figure 80: Route 10 – Top Boarding and Alighting Stops – Inbound



Segment Analysis

Figure 81 shows weekday average boarding per outbound trip by segment. Table 74 shows weekday average boardings per outbound trip by segment and time of day. The first segment of the outbound trip, between Durham Station and Chapel Hill Road, has the highest number of boardings per trip. During the PM peak period, there is an average of 22 boardings per trip on this segment. On the remainder of the outbound segments, there are fewer than five boardings per trip for all time periods.

Figure 81: Route 10 Weekday Average Boardings per Trip – Outbound

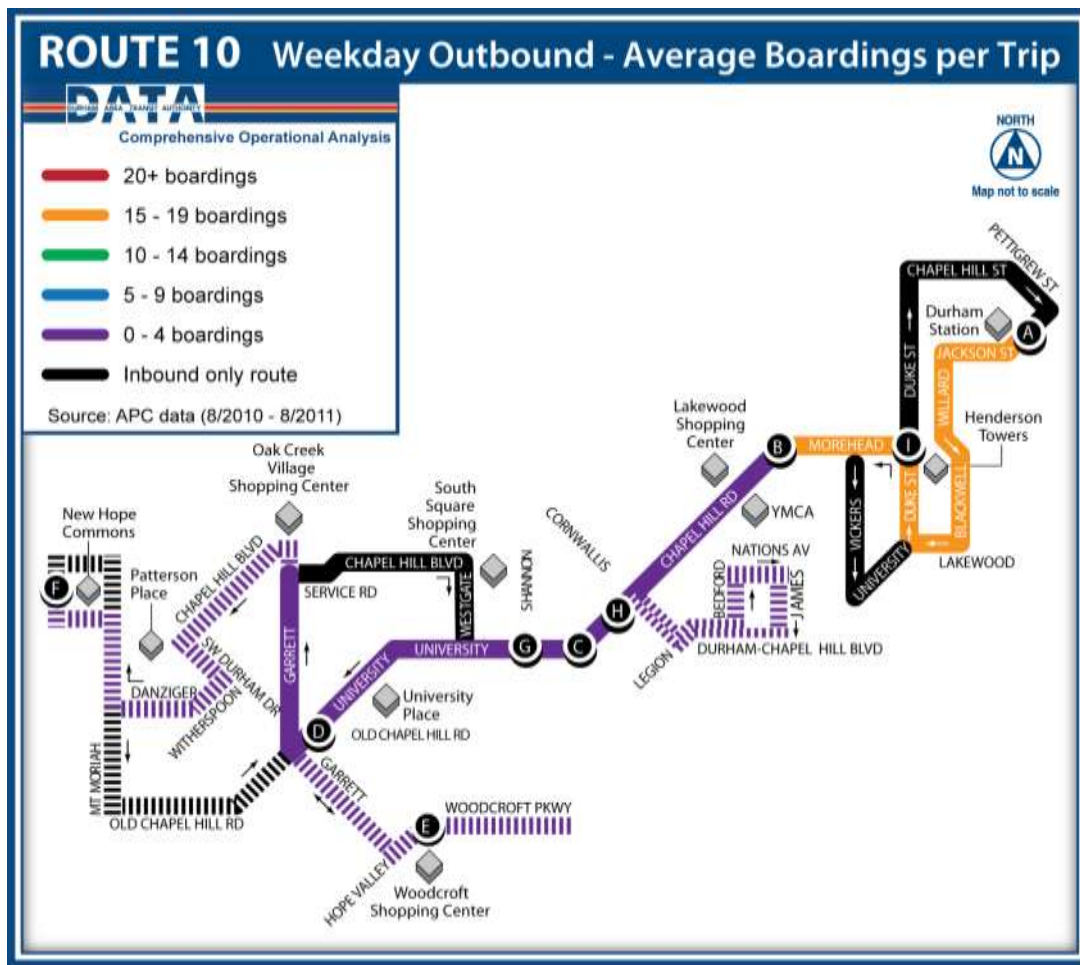


Table 74: Route 10 Weekday Average Boardings per Trip – Outbound

	Early AM	AM Peak	Midday	PM Peak	Evening
Durham Station to Morehead & Chapel Hill Rd.	-	12	18	22	17
Morehead & Chapel Hill to Chapel Hill & University	-	2	4	4	2
Morehead & Chapel Hill Rd. to James St.	-	-	-	-	1
James St. to Chapel Hill Rd. & University	-	-	-	-	0
Chapel Hill & University to Old Chapel Hill & Garrett	-	1	2	4	1
Old Chapel Hill & Garret to New Hope Commons	-	2	2	3	-
Old Chapel Hill & Garret to Woodcroft	-	1	3	2	1
Woodcroft to New Hope Commons	-	-	-	-	1

Figure 82 shows weekday average boarding per inbound trip by segment. Table 75 shows weekday average boardings per inbound trip by segment and time of day. The first segment of the inbound trip originating at New Hope Commons has the highest number of boardings per trip. During the PM peak period, there is an average of 16 boardings per trip on this segment. Boardings per trip are also high during the midday period for trips originating at Woodcroft Shopping Center.

Figure 82: Route 10 Weekday Average Boardings per Trip – Inbound

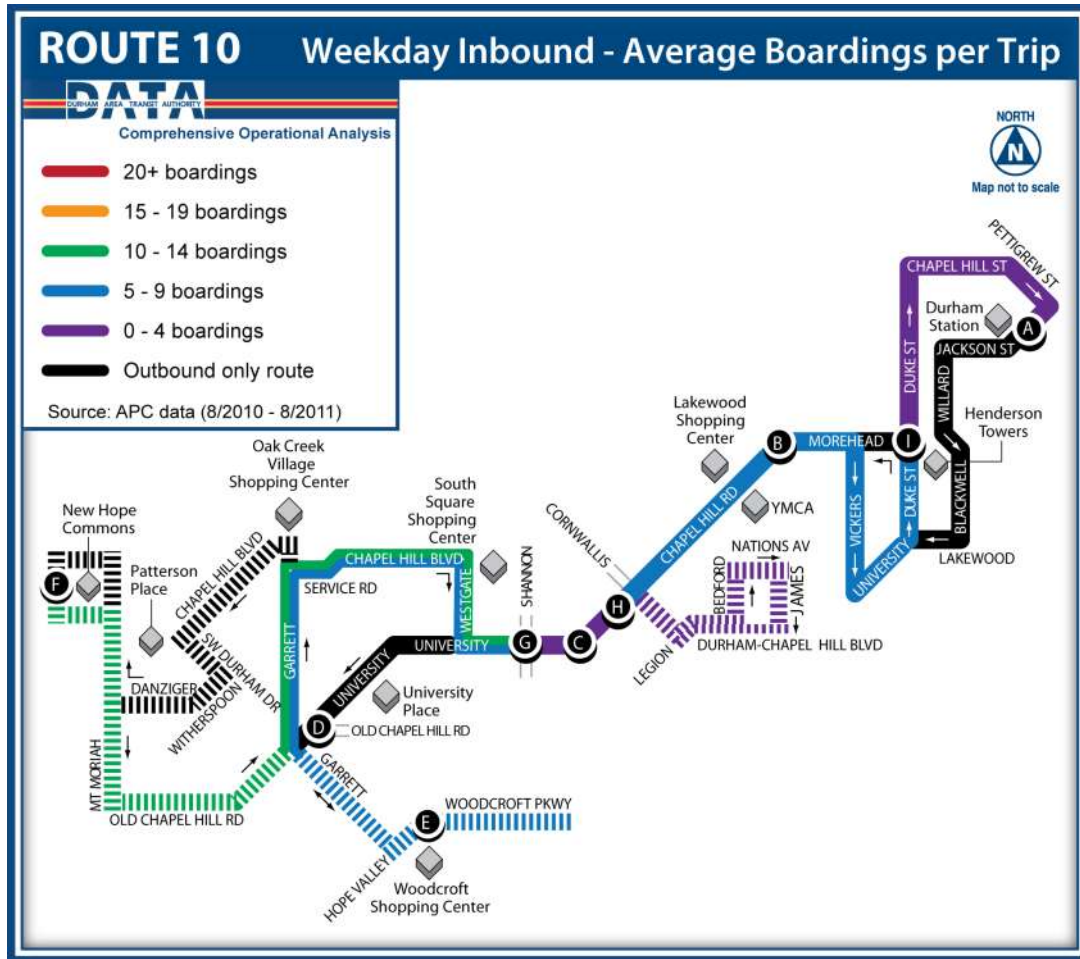


Table 75: Route 10 Weekday Average Boardings per Trip – Inbound

	Early AM	AM Peak	Midday	PM Peak	Evening
New Hope Commons to University Dr. & Shannon	3	7	9	16	7
Woodcroft Shopping Center to University Dr. & Shannon	4	7	12	5	-
University Dr. & Shannon to Chapel Hill Rd. & Cornwallis	2	5	3	3	-
University Dr. & Shannon to James St.	-	-	-	-	2
James St. to Chapel Hill Rd. & Cornwallis	-	-	-	-	0
Chapel Hill Rd. & Cornwallis to Duke St. & Morehead	7	10	8	8	2
Duke St. & Morehead Ave. to Durham Station	0	1	2	1	0

Figures 83 and 84 show weekday average maximum passenger loads by segment for outbound and inbound trips. The segments closest to downtown Durham have the highest average maximum passenger loads for both outbound and inbound trips. For the outbound trip, the average maximum load is 17 passengers between Durham Station and Chapel Hill Road. This segment is the most likely to experience overcrowding, particularly during the PM peak period. For the inbound trip, the average maximum load is 15 passengers from Corwallis Road to Durham Station.

Figure 83: Route 10 Weekday Average Max Passenger Load – Outbound

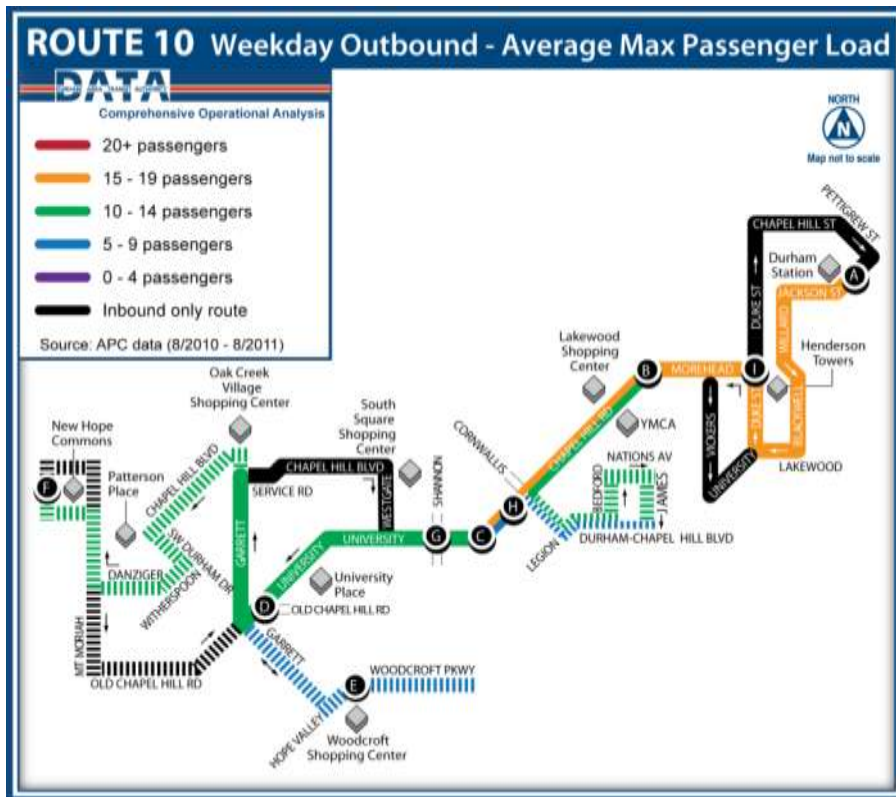
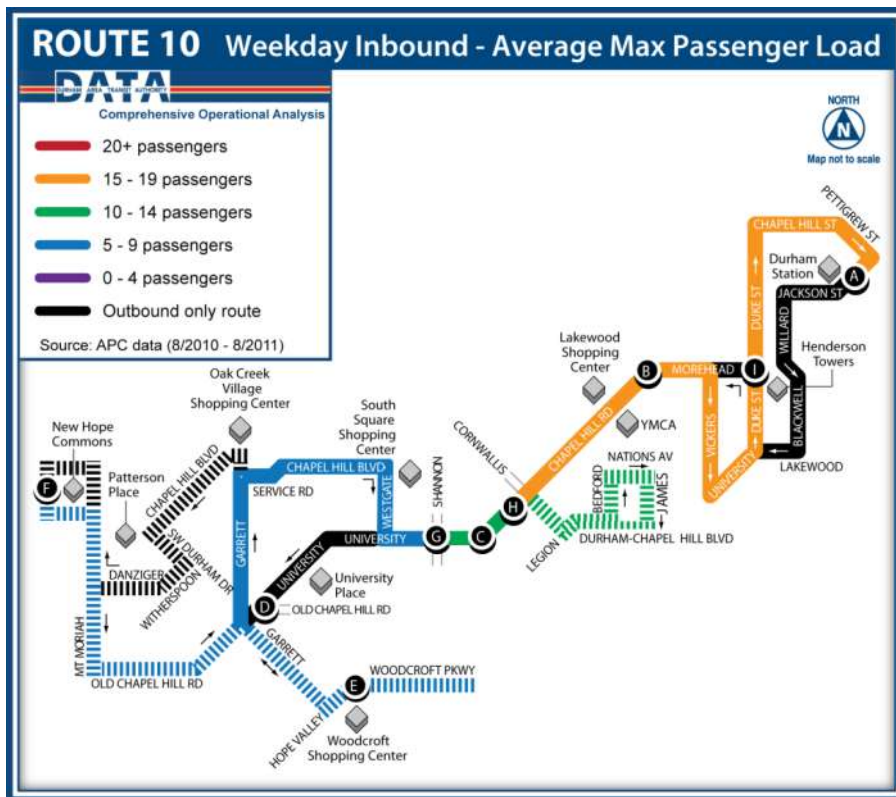


Figure 84: Route 10 Weekday Average Max Passenger Load – Inbound



Run Time and On-time Performance

Weekday on-time performance by time period is shown in Table 76 below. Overall weekday on-time performance for route 10 is 60.5%. The route’s on-time performance is consistent throughout the day, except for the PM peak period, which has a high percentage of late timepoints (46.3%). This is likely attributable to traffic congestion and the long running time of the route. The route also experiences problems running ahead of schedule during the early AM, AM peak, and evening time periods.

Table 76: Route 10 Weekday On-time Performance

	EARLY AM	AM PEAK	MIDDAY	PM PEAK	EVENING	TOTAL
EARLY	25.9%	21.9%	12.6%	8.4%	25.8%	15.7%
ON-TIME	67.2%	64.0%	64.7%	45.3%	59.9%	60.5%
LATE	7.0%	14.0%	22.7%	46.3%	14.3%	23.7%

Tables 77 and 78 show weekday average run times by segment and time of day for outbound and inbound trips. For outbound trips, the longest average run time occurs during the PM peak period for trips destined for Woodcroft Shopping Center. However, average run times for trips destined for Woodcroft Shopping Center show very little variance across the AM peak, midday and PM peak time periods. Outbound trips destined for New Hope Commons, on the other hand, are on average 5.4 minutes longer during the PM peak than during the AM peak. For the inbound trip, the longest average run time occurs during the AM peak period for trips originating from New Hope Commons.

Table 77: Route 10 Weekday Average Run Time – Outbound

	Early AM	AM Peak	Midday	PM Peak	Evening
Durham Station to Morehead & Chapel Hill Rd.	-	9.3	9.6	10.2	9.6
Morehead & Chapel Hill Rd. to Chapel Hill Rd. & University	-	8.1	10.6	11.3	7.2
Morehead & Chapel Hill Rd. to James St.	-	-	-	-	8.9
James St. to Chapel Hill Rd. & University	-	-	-	-	3.5
Chapel Hill Rd. & University to Old Chapel Hill & Garrett	-	8.1	8.4	9.2	7.7
Old Chapel Hill & Garret to New Hope Commons	-	12.2	11.7	12.4	-
Old Chapel Hill & Garret to Woodcroft Shopping Center	-	16.6	14	13.2	9.4
Woodcroft Shopping Center to New Hope Commons	-	-	-	-	18.7

Table 78: Route 10 Weekday Average Run Time – Inbound

	Early AM	AM Peak	Midday	PM Peak	Evening
New Hope Commons to University Dr. & Shannon	17.1	18.1	16.6	18.2	18.6
Woodcroft Shopping Center to University Dr. & Shannon	13.2	17.9	17.3	17.3	-
University Dr. & Shannon to Chapel Hill Rd. & Cornwallis	6.5	10.2	9	7.8	-
University Dr. & Shannon to James St.	-	-	-	-	8.3
James St. to Chapel Hill Rd. & Cornwallis	-	-	-	-	2.3
Chapel Hill Rd. & Cornwallis to Duke St. & Morehead	12.7	12.5	12.1	11.9	10.1
Duke St. & Morehead Ave. to Durham Station	2.3	2.3	2.4	2.2	2.9

Route 11: Duke University/Hillsborough Rd.

Route 11 connects downtown with Duke University’s East Campus, the VA Hospital and Duke Hospitals, and then continues out Hillsborough Rd. to the Bennett Pointe Shopping Center. The route has no variations and fewer one-way segments than other routes in the DATA system.

The primary concerns that operators had with this route were traffic congestion and insufficient scheduled running time, particularly on the inbound trip. As with route 6, route 11 suffers from the same congestion problems at intersections near the VA and Duke Hospitals. Several traffic signals along the route have long cycle times that result in traffic backups, including at the intersections of Lasalle Street and Campus Walk, Erwin Road and Fulton Street, Broad Street and Green Street, and Green Street and Buchannan Blvd. Traffic congestion can also occur on Hillsborough Road.

Operators noted that traffic congestion was greatest near the hospitals on Tuesday and Wednesday mornings. Outbound trips also experience congestion on Hillsborough Road from Kroger to Cole Mill Road. Route 11 was identified as being a route where trips and layovers are often missed.

Ridership

Route 11 had an annual ridership of 283,648 in FY 2011 and carried an average of 28.51 passengers per revenue hour and 1.79 passengers per revenue mile on weekdays. Saturday and Sunday productivity measures were 21.22 and 21.44 passengers per revenue hour, respectively. The route ranked 12th in annual weekday ridership, 11th in weekday passengers per revenue hour, and 12th in weekday passenger per revenue mile.

Table 79 shows average daily ridership by time period for route 11. While ridership is still highest during the midday period, midday ridership represents a smaller percentage of the total daily ridership for route 11 than for most other DATA routes. This suggests that route 11 carries a higher percentage of work trips than other routes. Saturday ridership is 25% less than weekday ridership, and Sunday ridership is 69% less. It is notable that evening ridership is slightly higher on Saturdays than on weekdays.

Table 79: Route 11 Average Daily Ridership

	Weekday	Saturday	Sunday	Holiday
Early AM	17	6	-	-
AM Peak	135	66	44	41
Midday	384	274	144	121
PM Peak	227	175	67	83
Evening	150	158	24	28
Total	912	679	279	272

Trip Generators

Figures 85 and 86 show stops with 25 or more average daily boardings or alighting for outbound and inbound trips. The major trip generators for both outbound and inbound trips are the Dollar General at Broad Street and Markham Avenue, the VA and Duke hospitals, and the University Shopping Center. For the inbound trip, there are also a number of boardings at Lasalle Street and Campus Walk Avenue, where there are a number of nearby apartment complexes.

Figure 85: Route 11 – Top Boarding and Alighting Stops – Outbound

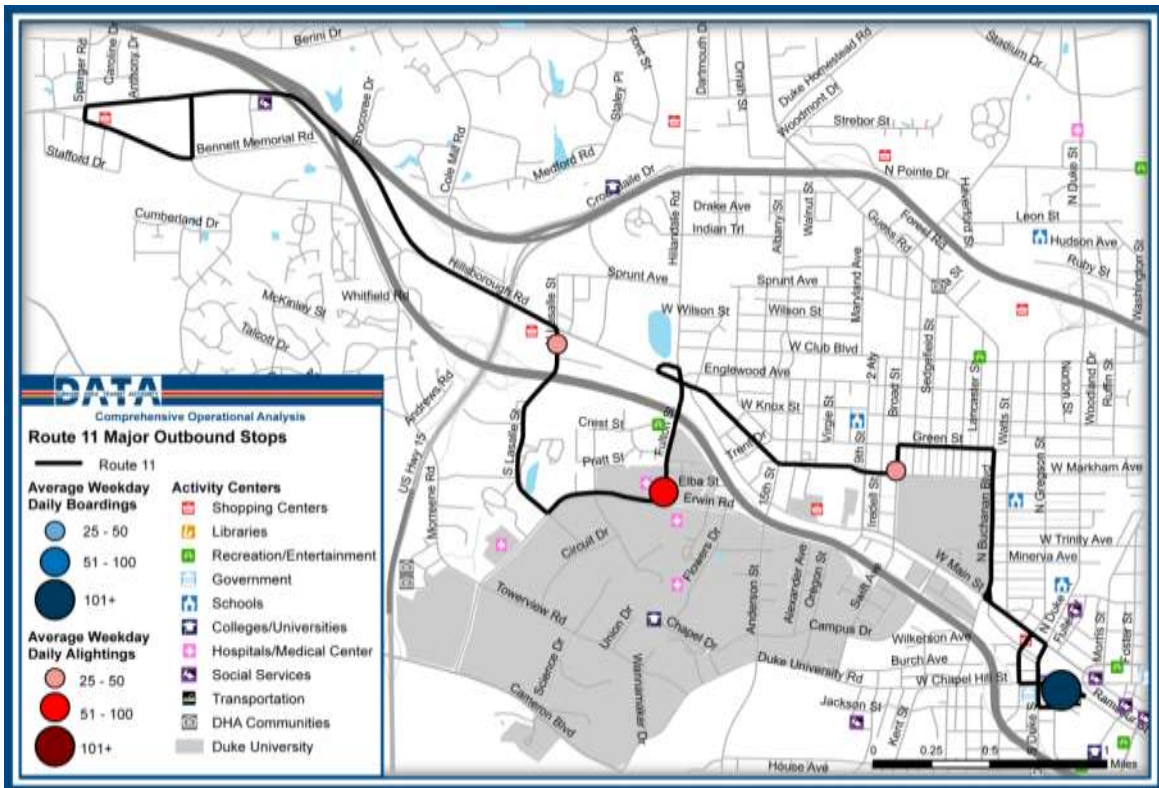
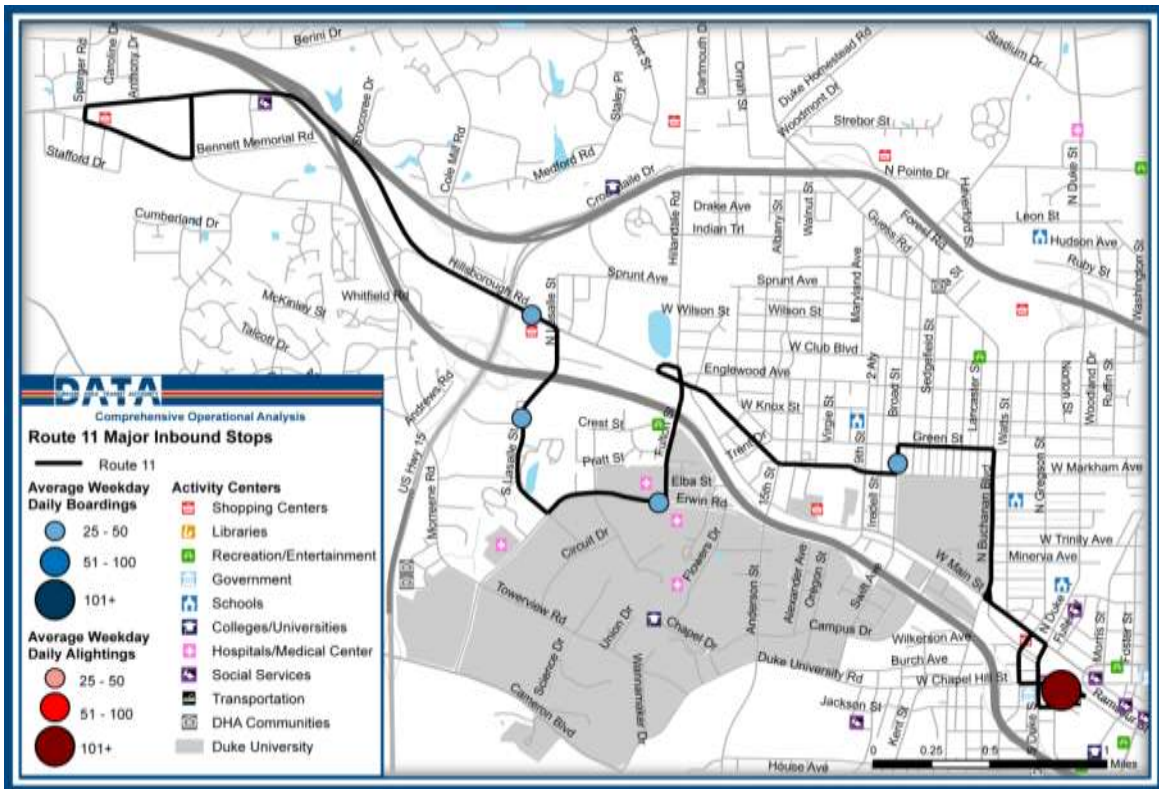


Figure 86: Route 11 – Top Boarding and Alighting Stops – Inbound



Segment Analysis

Figure 87 shows weekday average boardings per outbound trip by segment. Table 80 shows weekday average boarding per outbound trip by segment and time of day. The first segment of the outbound trip has an average of 12 boardings per trip during AM peak, midday and PM peak periods. The second segment, from the VA Hospital to Bennett Point Shopping Center, has far fewer boardings per trip.

Figure 87: Route 11 Weekday Average Boardings per Trip – Outbound

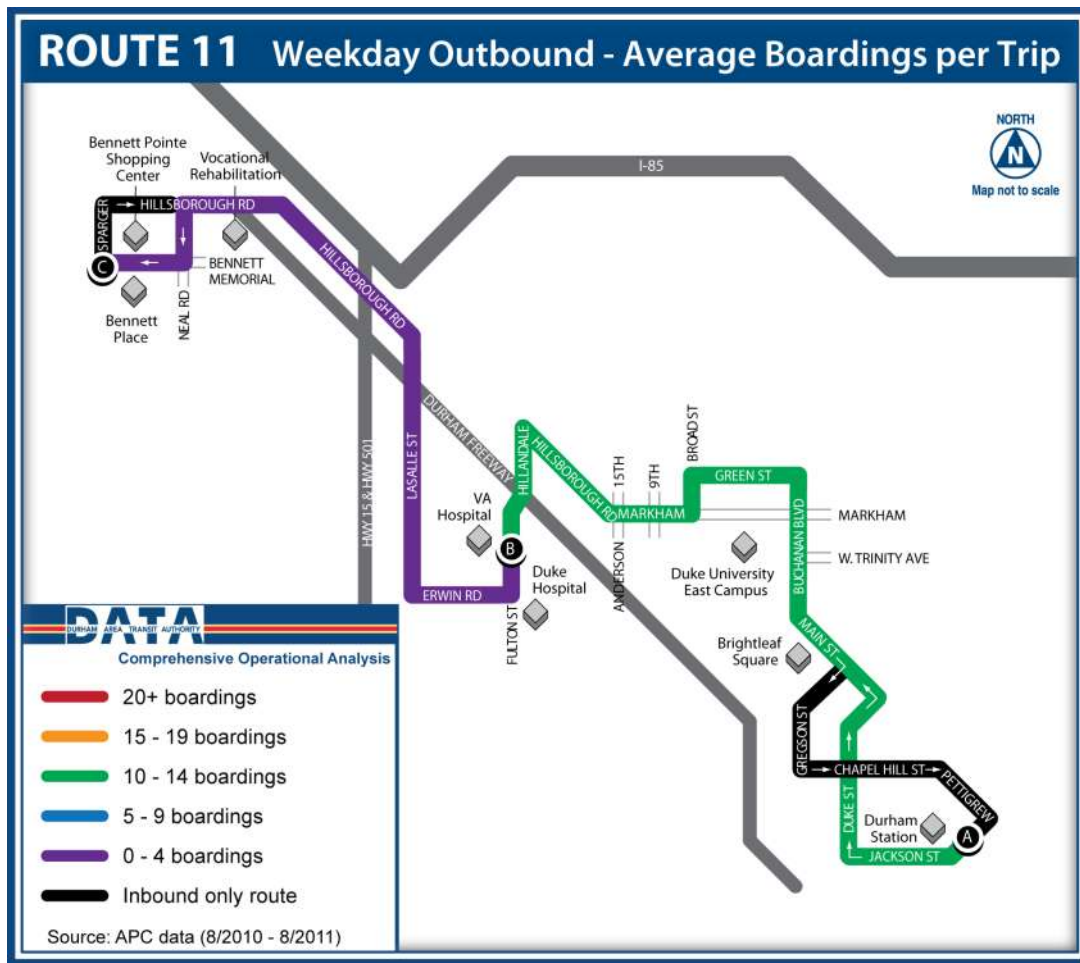


Table 80: Route 11 Weekday Average Boardings per Trip – Outbound

	Early AM	AM Peak	Midday	PM Peak	Evening
Durham Station to Fulton & VA Hospital		12	12	12	7
Fulton & VA Hospital to Bennett Memorial Rd.		1	2	3	1

Figure 88 shows weekday average boardings per inbound trip by segment. Table 81 shows weekday average boardings per inbound trip by segment and time of day. Boardings are less concentrated for the inbound trip than for the outbound trip and do not vary greatly throughout the day. Inbound boardings are highest between Bennett Memorial Rd. and Duke Hospital during the PM peak period.

Figure 88: Route 11 Weekday Average Boardings per Trip – Inbound

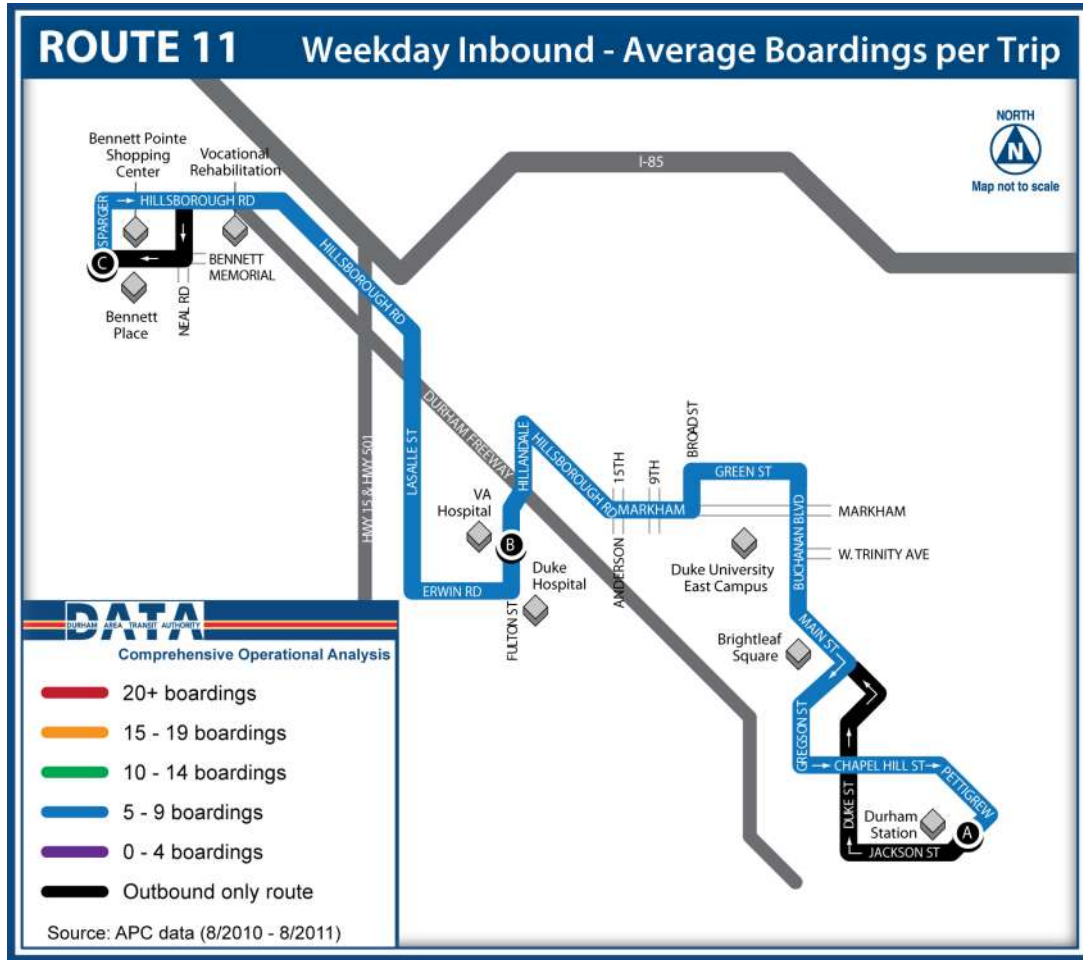


Table 81: Route 11 Weekday Average Boardings per Trip – Inbound

	Early AM	AM Peak	Midday	PM Peak	Evening
Bennett Memorial Rd. to Erwin Rd. & Duke Hospital	4	6	6	8	4
Erwin Rd. & Duke Hospital to Durham Station	2	2	6	6	3

Figures 89 and 90 show weekday average maximum passenger loads for outbound and inbound trips. Average maximum loads are highest on the outbound trip between Durham Station and the VA Hospital. Overcrowding is most likely to occur on this segment during the PM peak period or whenever a trip is missed.

Figure 89: Route 11 Weekday Average Max Passenger Load – Outbound

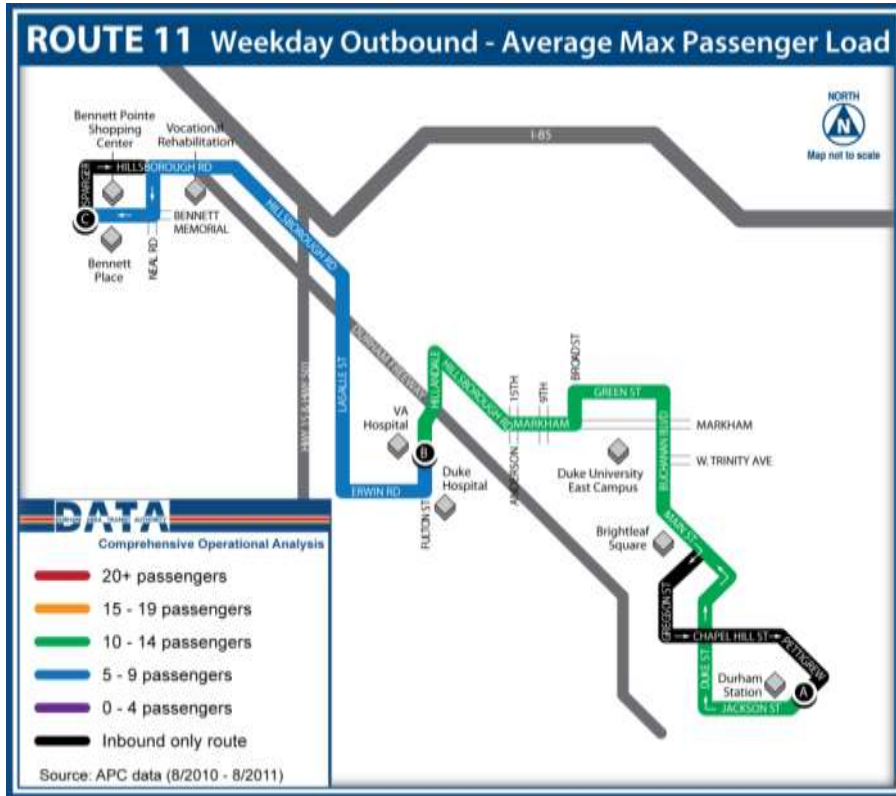
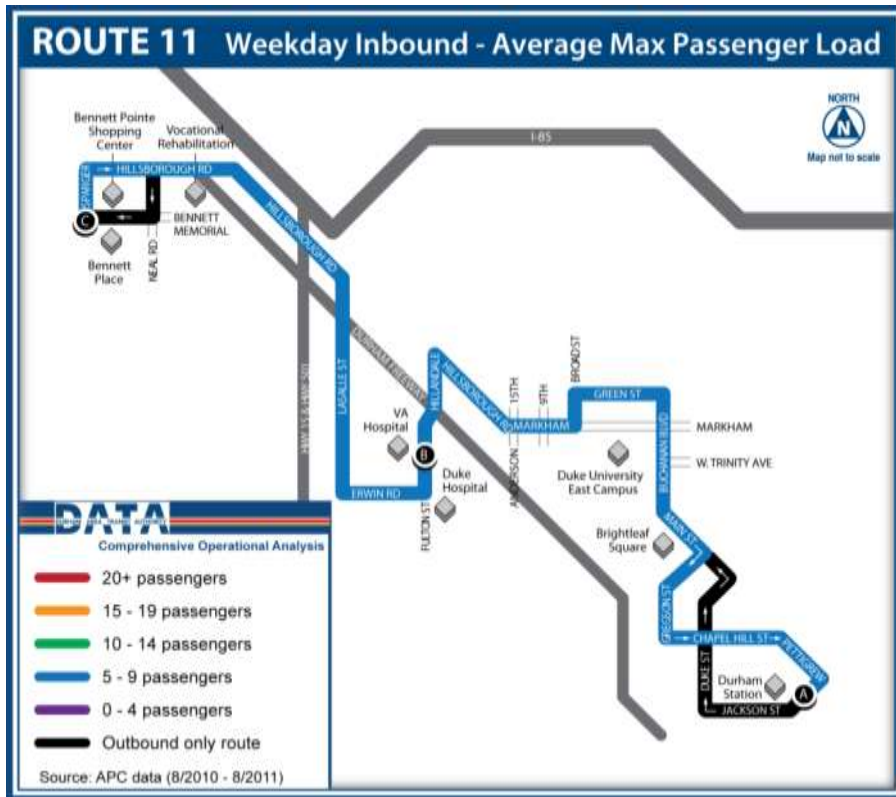


Figure 90: Route 11 Weekday Average Max Passenger Load – Inbound



Run Time and On-time Performance

Weekday on-time performance by time period is shown in Table 24 below. Overall weekday on-time performance for Route 11 is 57.3%. The route's on-time performance is consistent throughout the day, except for the PM peak period, which has a very high percentage of late timepoints (57.3%). The route also experiences problems running ahead of schedule during the early AM and evening time periods.

Table 82: Route 11 Weekday On-time Performance

	EARLY AM	AM PEAK	MIDDAY	PM PEAK	EVENING	TOTAL
EARLY	23.1%	16.5%	9.5%	4.5%	20.0%	11.5%
ON-TIME	67.3%	68.3%	59.0%	38.1%	62.2%	57.3%
LATE	9.6%	15.1%	31.5%	57.3%	17.8%	31.3%

Tables 83 and 84 show weekday average run times by segment and time of day for outbound and inbound trips. Considering the total average run times for outbound and inbound trips, it is evident why this route would struggle to remain on-time. Average run times are longest in the PM peak period for both outbound and inbound trips, when the total average run time exceeds the 60 minute cycle time of this route. Average run times during the AM peak and midday time periods also far exceed the scheduled running times for this route.

Table 83: Route 11 Weekday Average Run Time – Outbound

	Early AM	AM Peak	Midday	PM Peak	Evening
Durham Station to Fulton & VA Hospital	-	14.7	15	16.7	14.2
Fulton & VA Hospital to Bennett Memorial Rd.	-	12.4	12.3	12.9	10.9
Total	-	27.1	27.3	29.6	25.1

Table 84: Route 11 Weekday Average Run Time – Inbound

	Early AM	AM Peak	Midday	PM Peak	Evening
Bennett Memorial Rd. to Erwin Rd. & Duke Hospital	12.7	13.4	13.3	15.2	13.3
Erwin Rd. & Duke Hospital to Durham Station	12.3	15	15.6	16.5	14.4
Total	25	28.4	28.9	31.7	27.7

Route 12: Highway 55/Highway 54

Route 12 connects downtown with destinations in south Durham via the Durham Freeway and NC-55. Destinations include NCCU, Hillside High School, Meridian Business Campus, and Triangle Square Shopping Center to the south of I-40. Beginning with the August 2011 service period, route 12B (which previously served Lowes Give Middle School) was incorporated with route 12. Ridership data for FY 2011 are provided for both routes below.

Operators identified the major problems with this route as being overcrowding near the South Regional Library, traffic congestion at the intersection of Lawson Street and Alston Avenue, and insufficient schedule running time.

Ridership

Route 12 had an annual ridership of 193,860 in FY 2011 and carried an average of 32.03 passengers per revenue hour on weekdays. Saturday and Sunday productivity measures were 24.58 and 19.53 passengers per revenue hour, respectively. The route ranked 14th in weekday annual ridership, 10th in weekday passengers per revenue hour, and 14th in weekday passengers per revenue mile. The difference in the route’s passenger per revenue hour and revenue mile rankings is due to the long distance of the route (more revenue miles) and the higher than average operating speeds on the Durham Freeway and Highway 55 segments of the route (fewer revenue hours). Route 12B had an annual ridership of 5,702 in FY 2011 and carried an average of 4.01 passengers per revenue hour on weekdays. Route 12B was not operated on weekends.

Tables 85 and 86 show average daily ridership by time of day for routes 12 and 12B. Table 85 indicates that route 12 weekday ridership is fairly constant throughout the day, with the greatest number of passengers carried during the midday period. Evening ridership is higher than the PM peak period ridership on weekdays and Saturdays, and average Saturday ridership is only 23% less than the average weekday ridership. Table 86 shows that route 12B ridership was very low, with most passengers utilizing the route during the AM and PM peak periods.

Table 85: Route 12 Average Daily Ridership

	Weekday	Saturday	Sunday	Holiday
Early AM	12	9	-	-
AM Peak	100	62	42	45
Midday	209	161	112	116
PM Peak	135	100	73	69
Evening	152	134	27	26
Total	609	467	254	255

Table 86: Route 12B Average Daily Ridership

	Weekday	Saturday	Sunday	Holiday
Early AM	-	-	-	-
AM Peak	6	-	-	-
Midday	1	-	-	-
PM Peak	14	-	-	-
Evening	1	-	-	-
Total	22	-	-	-

APC, on-time performance and run time data were not available for Routes 12 and 12B.

Route 13: Durham Tech/The Village

Route 13 is operated on the southeast side of Durham, providing additional access to NCCU, McDougald Terrace, Durham Technical Community College, and The Village Shopping Center, and supplementing Route 16 service along Holloway St. Route 13 functions as a crosstown route that does not serve the downtown area, but rather connects routes that run into downtown at various points along its alignment. It is one of only two DATA routes that do not serve Durham Station. The route facilitates transfers to DATA routes 2, 3, 5, 8, 12, 16 and 16B at various points along the route.

Ridership

Route 13 had an annual ridership of 97,918 in FY 2011 and carried an average of 16.31 passengers per revenue hour on weekdays. Saturday and Sunday productivity measures were 12.64 and 8.68 passengers per revenue hour, respectively. The route ranked 15th in weekday annual ridership, 16th in weekday passengers per revenue hour, and 15th in weekday passengers per revenue mile.

Table 87 shows average daily ridership by time of day for route 13. The midday period exhibits the highest ridership, while the PM peak and evening time periods carry roughly the same number of passengers. The AM peak period is not well utilized on weekends or holidays. Saturday ridership is 23% less than the average weekday ridership, and Sunday ridership is 64% less than the average weekday ridership. Route 13 is the second worst performing Sunday route for all performance measures.

Table 87: Route 13 Average Daily Ridership

	Weekday	Saturday	Sunday	Holiday
Early AM	3	3	-	-
AM Peak	43	21	11	10
Midday	129	112	64	70
PM Peak	68	53	28	27
Evening	65	51	10	9
Total	310	240	113	116

Trip Generators

Figures 91 and 92 show stops with 25 or more average daily boardings or alightings for outbound and inbound trips. The major trip generators for route 13 include The Village Shopping Center, Durham Tech and Rochelle Manor Apartments, however, The Village Shopping Center is the only stop with more than 25 average daily boardings or alightings on the route.

Figure 91: Route 13 – Top Boarding and Alighting Stops – Outbound

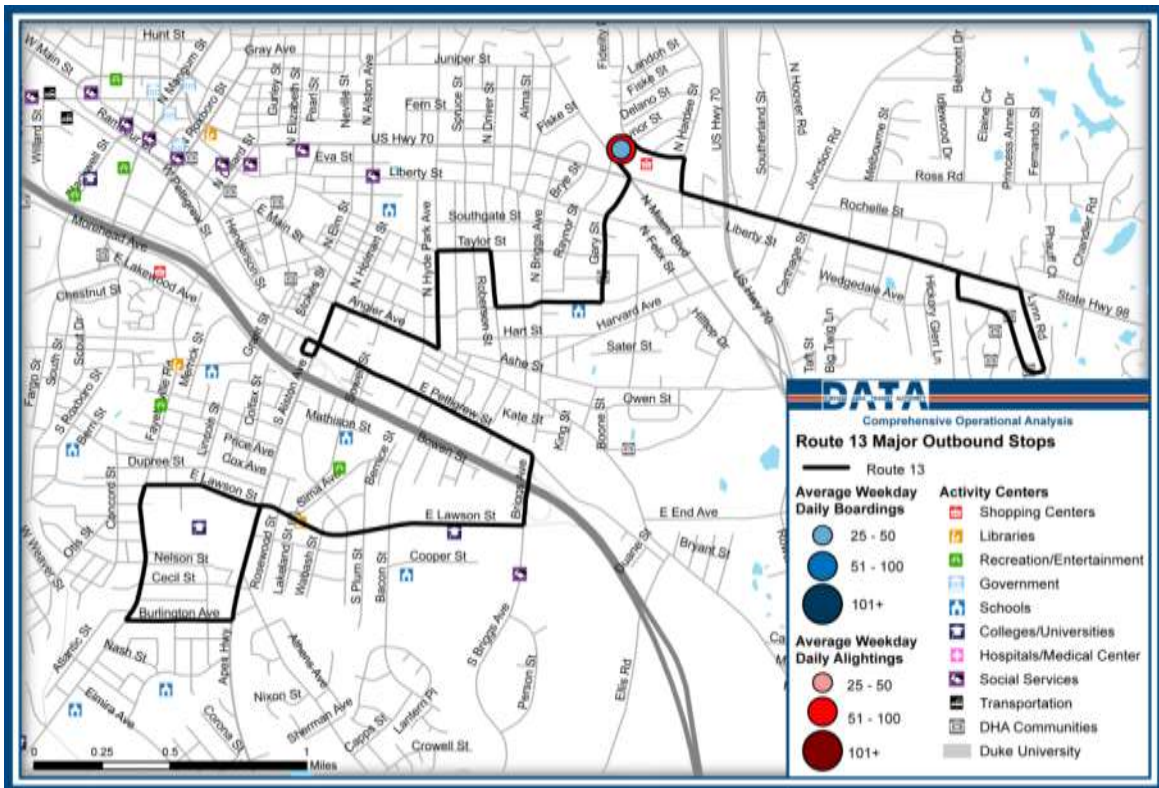
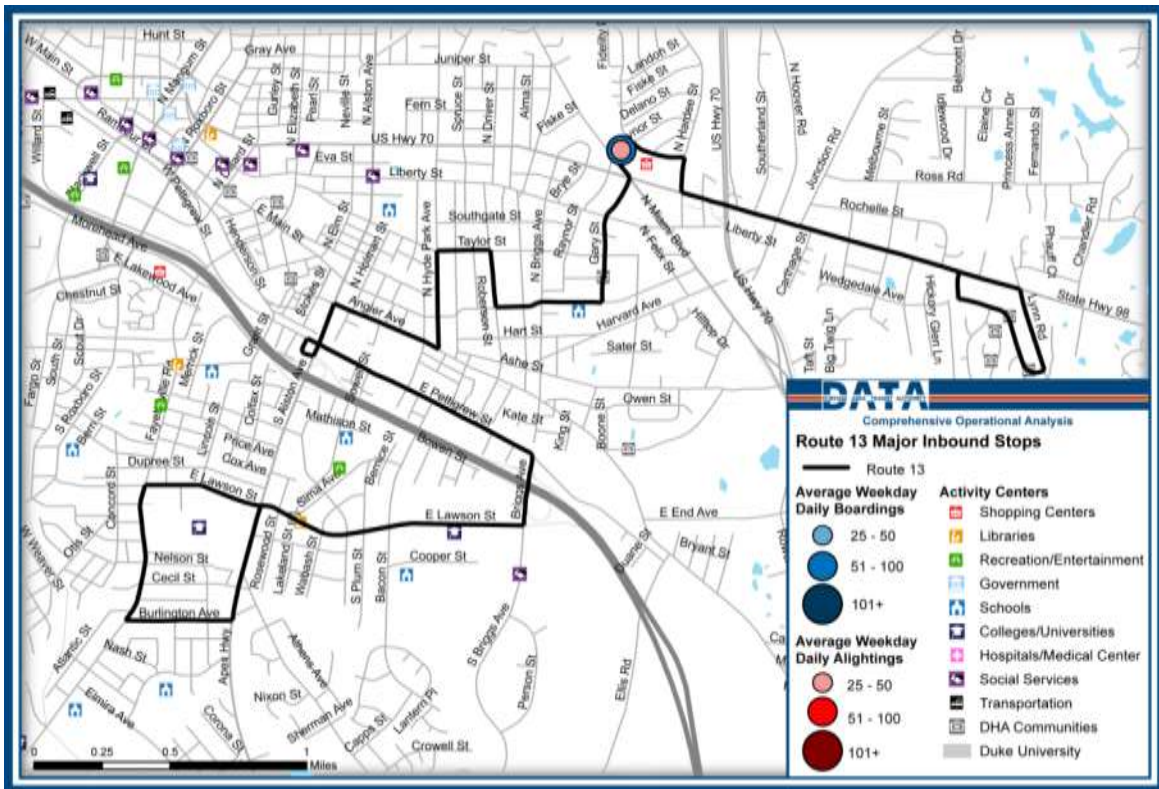


Figure 92: Route 13 – Top Boarding and Alighting Stops – Inbound



Segment Analysis

Figure 93 shows weekday average boardings per outbound trip by segment. (For route 13, “outbound” is considered to be the trip originating from Rummel St. and NC 98). Table 88 shows weekday average boardings per outbound trip by segment and time of day. Boarding activity is low on all segments of the route and fairly constant throughout the day but declines during the evening. The second segment of the trip, between The Village Shopping Center and Briggs Avenue and Lawson Street, has the highest number of boardings per trip during the midday and PM peak time periods.

Figure 93: Route 13 Weekday Average Boardings per Trip – Outbound

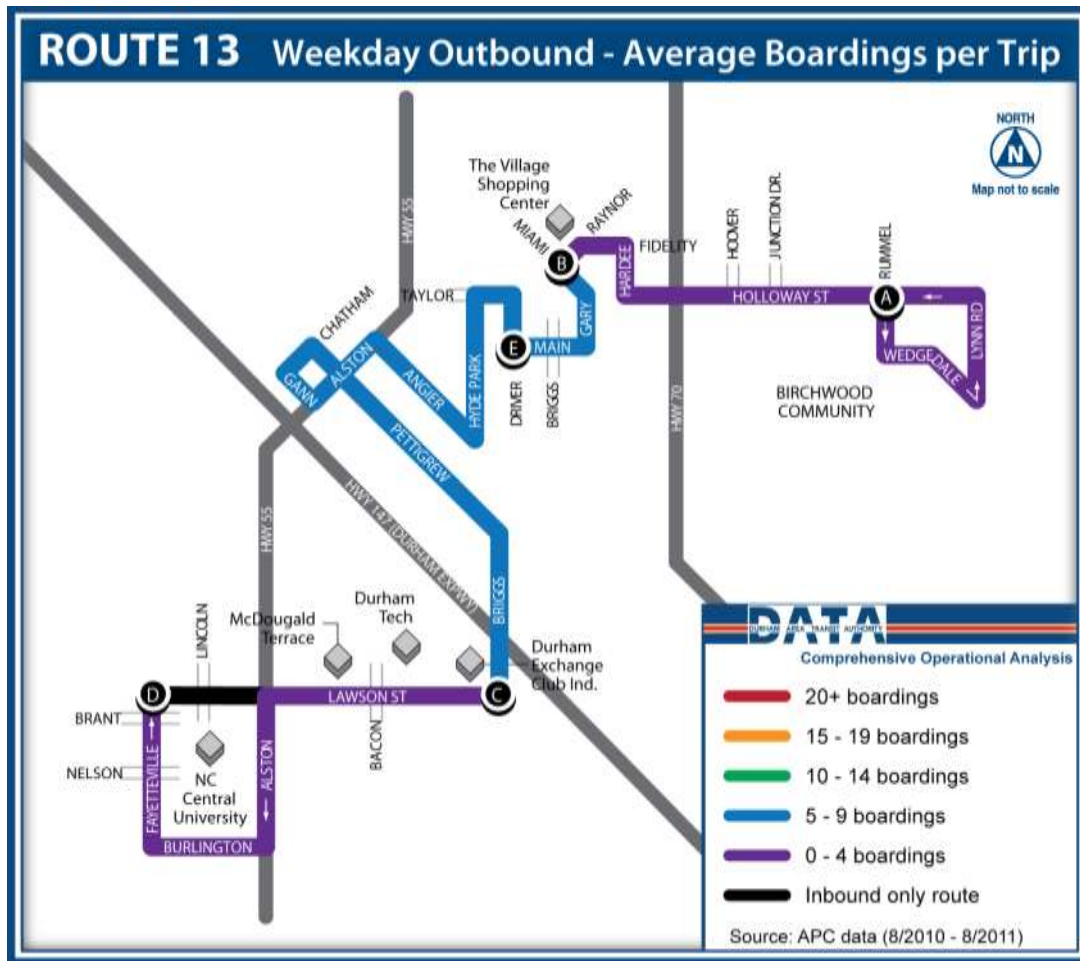


Table 88: Route 13 Weekday Average Boardings per Trip – Outbound

	Early AM	AM Peak	Midday	PM Peak	Evening
Rummel St. & NC-98 to Raynor St. & Miami	-	5	5	3	2
Raynor St. & Miami to Lawson St. & Briggs Ave.	-	3	6	7	4
Lawson St. & Briggs Ave. to Fayetteville & Brant St.	-	2	3	4	1

Figure 94 shows weekday average boardings per inbound trip by segment. (For route 13, “inbound” is considered to be the trip originating from Fayetteville St. and Lawson St.) Table 89 shows weekday average boardings per inbound trip by segment and time of day. The data show that boarding activity is very low on all segments of the route. The PM peak period experiences the highest level of boarding activity, with an average of five boardings per trip on the first and third segments of the inbound trip.

Figure 94: Route 13 Weekday Average Boardings per Trip – Inbound

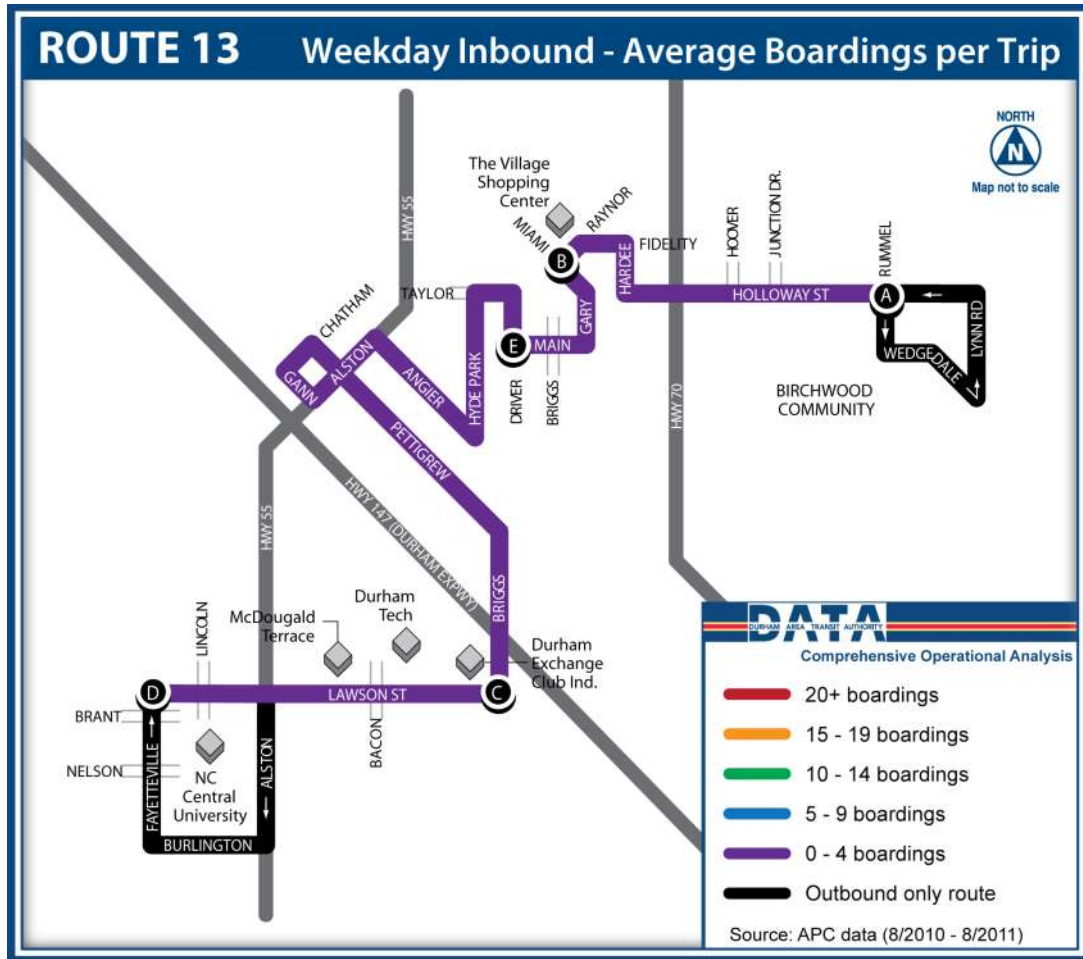


Table 89: Route 13 Weekday Average Boardings per Trip – Inbound

	Early AM	AM Peak	Midday	PM Peak	Evening
Fayetteville St. & Lawson St. to Main St. & Driver St.	1	2	4	5	3
Main St. & Driver St. to Raynor St. & Miami	0	1	1	1	0
Raynor St. & Miami to Rummel St. & NC-98	0	1	4	5	4

Average maximum passenger loads are shown for outbound and inbound trips in Figures 95 and 96. Average passengers loads are low on all segments of the route. The highest loads occur on the outbound trip between The Village Shopping Center and NCCU, but there is no indication of any overcrowding.



Figure 95: Route 13 Weekday Average Max Passenger Load – Outbound

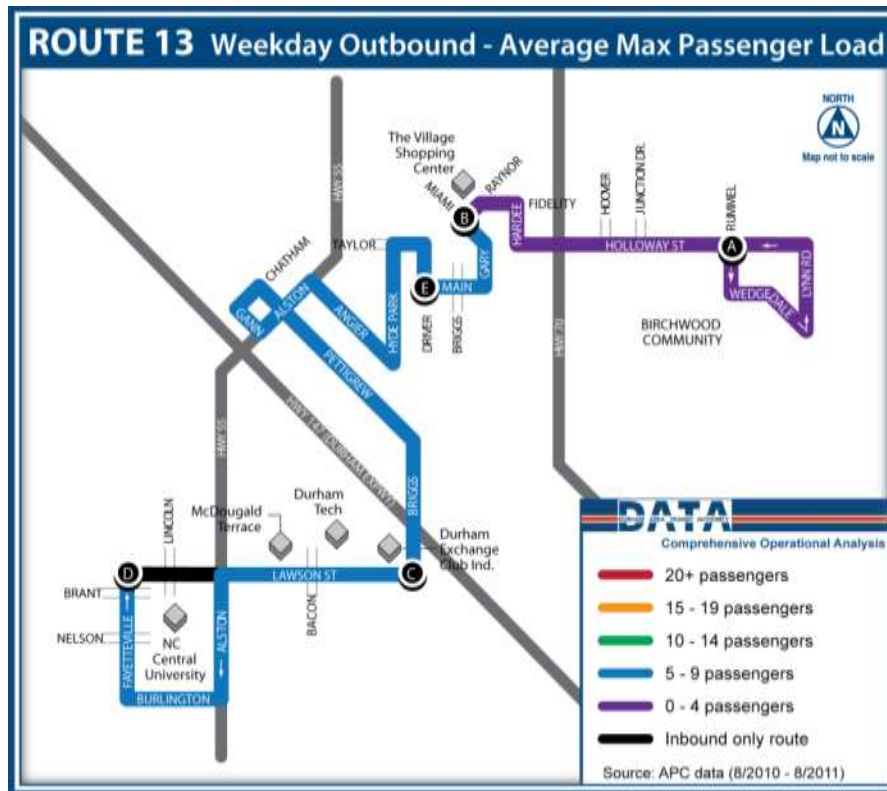
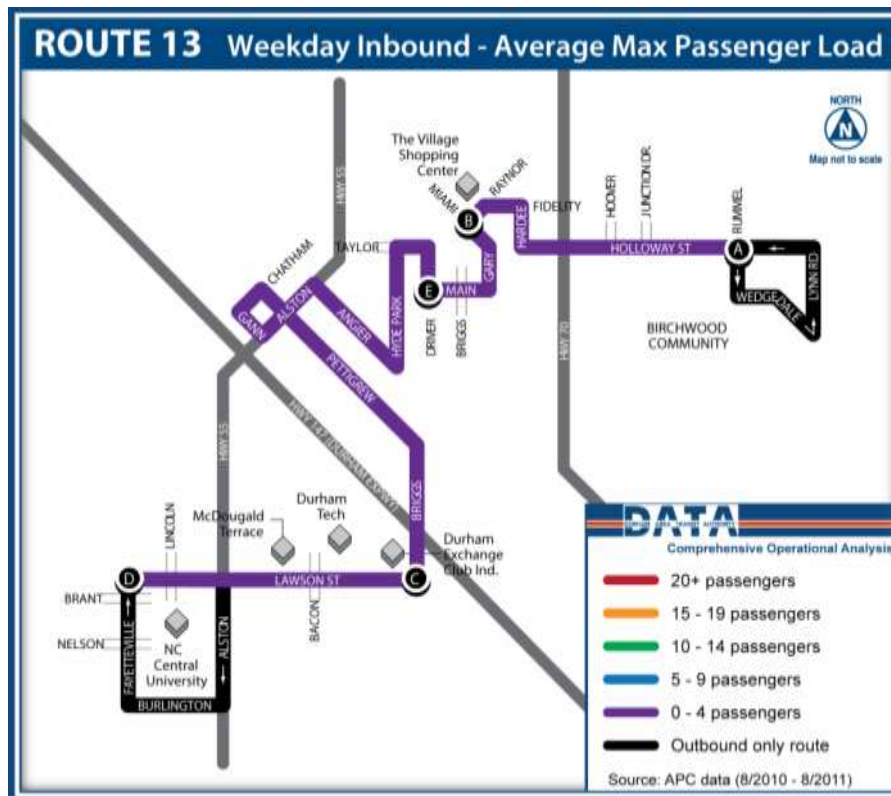


Figure 96: Route 13 Weekday Average Max Passenger Load – Inbound



Run Time and On-time Performance

Weekday on-time performance by time period is shown in Table 90 below. Overall weekday on-time performance for route 13 is 44.5%. The route has significant problems with running late in all time periods, but in particular during the PM peak period, when 82.3% of timepoints are late.

Table 90: Route 13 Weekday On-time Performance

	EARLY AM	AM PEAK	MIDDAY	PM PEAK	EVENING	TOTAL
EARLY	12.5%	4.5%	1.5%	0%	4.2%	2.7%
ON-TIME	64.6%	57.1%	56.3%	17.7%	37.4%	44.5%
LATE	22.9%	38.4%	42.2%	82.3%	58.4%	52.7%

Average weekday run times for outbound and inbound trips are shown by time of day and segment in Tables 91 and 92. For the outbound trip, average run times are longer during the AM and PM peak periods. During the AM peak, the longest average run times occur during the AM and PM peak periods, but there is not much variation in outbound run times throughout the day.

For the inbound trip, the longest run times occur during the early AM and PM peak periods. During the PM peak period, when on-time performance is the worst, the cumulative average run time for outbound and inbound trips is 59 minutes, which allows for only a single minute of layover or recovery time *on average*. The average run times indicate that there is insufficient time in the schedule to operate the route as currently designed on a 60 minute cycle.

Table 91: Route 13 Weekday Average Run Time – Outbound

	Early AM	AM Peak	Midday	PM Peak	Evening
Rummel St. & NC-98 to Raynor St. & Miami	-	9.9	8.9	8.5	8.7
Raynor St. & Miami to Lawson St. & Briggs Ave.	-	15.8	15.3	15.6	14.8
Lawson & Briggs Ave. to Fayetteville & Brant St.	-	7.5	8.5	9.3	8.3
Total	-	33.2	32.7	33.4	31.8

Table 92: Route 13 Weekday Average Run Time – Inbound

	Early AM	AM Peak	Midday	PM Peak	Evening
Fayetteville & Lawson St. to Main St. & Driver St.	15	14.5	14.2	15.4	13.5
Main St. & Driver St. to Raynor St. & Miami	4.7	5.4	4.8	4.9	5.1
Raynor St. & Miami to Rummel St. & NC-98	6.2	5.1	5.2	5.3	5.3
Total	25.9	25	24.2	25.6	23.9