

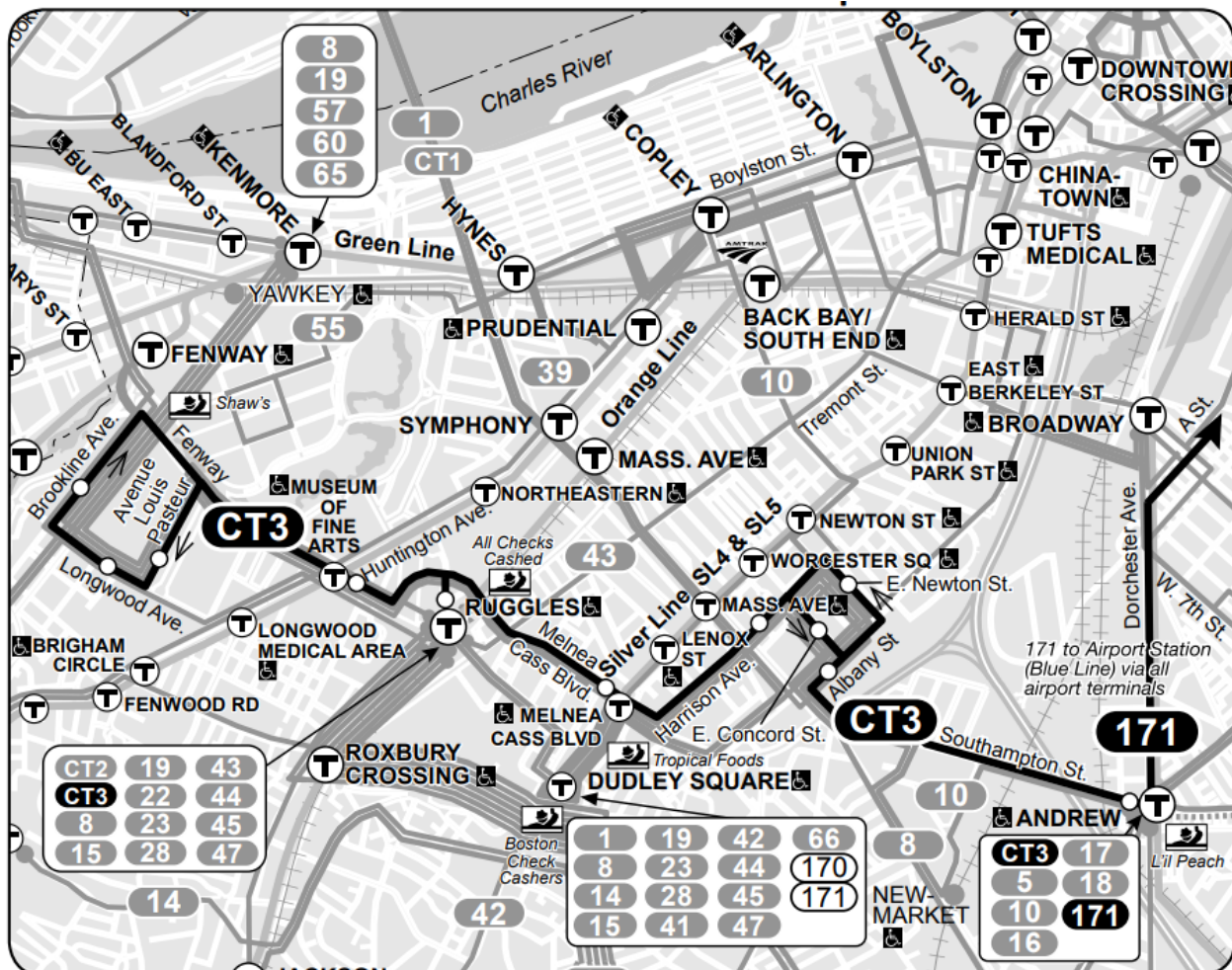
Route CT3

Beth Israel Deaconess or BU Medical Campus-Andrew Station

Route Overview

Route CT3 Beth Israel Deaconess or BU Medical Campus-Andrew Station is a crosstown Local route that operates between the Longwood Medical Area and Andrew Station via Northeastern University, Ruggles Station, and the Boston University (BU) Medical Campus (see Figure 1). Its alignment duplicates parts of many other routes, but most directly Route 47 Central Square, Cambridge - Broadway Station between the Longwood Medical Area and the BU Medical Campus. Its major feature is that it provides true limited stop service, including the most direct connections between the southern end of the Red Line, the BU Medical Campus, and the Longwood Medical Area.

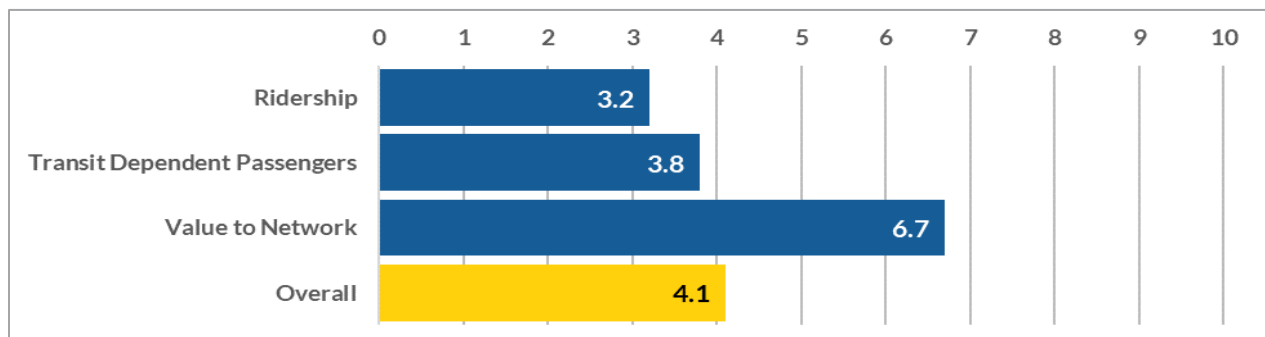
Figure 1 | Service Map



Network Importance

Route CT3 is of moderate importance within the overall system (see Figure 2). On a scale of 0 to 10, the route rates 3.2 in terms of ridership, 3.8 in terms of transit dependent ridership, and 6.7 in terms of its value to the network (which reflects the number of people who are uniquely served, the number of jobs and other important destinations, and the number of transferring passengers). Its overall score, which gives a 70% weight to overall ridership and a 15% weight to both other measures, is 4.1.

Figure 2 | Relative Importance within MBTA Bus Network (on a scale of 0 to 10)



Service Overview

Schedule

Route CT3 operates on weekdays from 6:15 AM to 8:36 PM. It provides fairly frequent service during peak periods and shoulders of the peaks and infrequent service during the midday and evening. Route CT3 operates with a combination of full-length service between the Longwood Medical Area and Andrew Station and short turns between the BU Medical Campus and Andrew Station. Full-length service operates (see Table 1):

- Every 20 minutes from the beginning of service until 9:25 AM inbound and until 8:55 AM outbound.
- With the exception of one trip, every 60 minutes between those times and 1:55 PM inbound and 1:25 PM outbound.
- Every 25 to 30 minutes between those times and 6:10 PM inbound and 4:25 PM outbound from Avenue Louis Pasteur (mostly every 25 minutes), and every one to 20 minutes from BU Medical Campus.
- Every 35 to 50 minutes after those times through the end of service.

Short-turns operate between the BU Medical Campus and Andrew Station between 3:06 PM and 5:53 PM inbound and between 6:05 AM and 8:54 AM outbound. With only a few exceptions, those trips alternate with full-length trips. AM outbound service between Andrew Station and the BU Medical Center operates regularly every 10 minutes. In the PM inbound, service is not as regular, but averages 13 minutes.

Since the completion of this document, the MBTA has made minor adjustments to the Route CT3 schedule.

Table 1 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (RANGE)	FREQUENCY (AVERAGE)	DAILY TRIPS (INBOUND/OUTBOUND)
Full Length Trips				
Monday-Friday	6:15 AM to 8:36 PM			26/27
Early AM	6:15 AM to 6:59 AM	20	20	1/2
AM Peak	7:00 AM to 8:59 AM	20	20	6/6
Midday Base	9:00 AM to 1:29 PM	20 - 60	49	6/5
Midday School	1:30 PM to 3:59 PM	25 - 35	30	5/5
PM Peak	4:00 PM to 6:29 PM	1 - 35	25	6/6
Evening	6:30 PM to 7:29 PM	35 - 55	24	3/2
Late Evening	7:30 PM to 8:36 PM	55 - 50	58	1/1
Night	-	-	-	-
Saturday	-	-	-	-
Sunday	-	-	-	-
BU Medical Center-Andrew Station				
Monday-Friday	6:05 AM to 5:53 PM			9/9
Early AM	6:00 AM to 6:59 AM	20	20	0/3
AM Peak	7:00 AM to 8:54 AM	20	20	0/6
Midday Base	-	-	-	-
Midday School	1:30 PM to 3:59 PM	20	20	3/0
PM Peak	4:00 PM to 5:53 PM	1 - 20	25	6/0
Evening	-	-	-	-
Night	-	-	-	-
Saturday	-	-	-	-
Sunday	-	-	-	-

Note: Span of service reflects the time the first bus begins service until the time the last bus finishes service.

Route CT3 meets the service span and frequency standards on weekdays. However, it does not meet the standards for weekends, which specify that routes in urban areas should operate seven days a week. The justification for not providing weekend service is that the route is largely a limited service supplement to other routes that do operate on weekends.

Service Patterns

Route CT3 operates with three service patterns (see Table 2). Two operate between the Longwood Medical Area and Andrew Station and differ in terms of how they serve the terminal loop in the Longwood Medical Area, and the third provides short-turn service

between the BU Medical Area and Andrew Station. Short-turn trips were added to the Route CT3 schedule as part of a mitigation package for Fairmount Line construction delays. These patterns operate as follows:

Inbound

- From the beginning of service until 1:55 PM, full-length service starts at the Beth Israel Deaconess Medical Center on Longwood Avenue and operates to Andrew Station via the Fenway without serving the Longwood loop (Pattern CT3.0).
- From 2:25 PM on, full-length service operates from Avenue Louis Pasteur to Andrew Station (Pattern CT3.1). This pattern serves the loop in the peak direction.
- From 3:06 PM to 5:46 PM, most full-length trips alternate with short-turns from the BU Medical Campus to Andrew Station (Pattern CT3.2). The only exceptions are between 3:40 PM and 4:05 PM and between 5:29 PM and 5:48 PM, when there are two short-turns between full-length trips.

Outbound

- Until 1:25 PM, full-length trips operate from Andrew Station to the Longwood Medical Area. In the Longwood Medical Area, it operates three-quarters around the Avenue Louis Pasteur/Longwood Avenue/Brookline Avenue loop, terminating at Beth Israel Deaconess Medical Center on Longwood Avenue (Pattern CT3.0). This pattern serves the loop in peak direction (which is outbound in the AM peak).
- Until 8:05 AM, full-length trips alternate with short-turns between Andrew Station and the BU Medical Campus (Pattern CT3.2)
- From 1:25 PM on, all service operates from Andrew Station to Avenue Louis Pasteur, which is the first stop on the Avenue Louis Pasteur/Longwood Avenue/Brookline Avenue loop (Pattern CT3.1).

Table 2 | Service Patterns

PATTERN	ORIGIN	DESTINATION	UNIQUE FEATURE	TRIPS PER WKD	TRIPS PER SAT	TRIPS PER SUN
INBOUND				36	-	-
CT3.0	Beth Israel	Andrew Station	AM service that operates to beginning of Longwood loop	14	-	-
CT3.1	Avenue Louis Pasteur	Andrew Station	PM inbound service that serves Longwood loop	13	-	-
CT3.2	BU Medical Campus	Andrew Station	Short turn	19	-	-
OUTBOUND				36	-	-
CT3.0	Andrew Station	Beth Israel	PM service that operates to beginning of Longwood loop	14	-	-

PATTERN	ORIGIN	DESTINATION	UNIQUE FEATURE	TRIPS PER WKD	TRIPS PER SAT	TRIPS PER SUN
CT3.1	Andrew Station	Avenue Louis Pasteur	AM inbound service that serves Longwood loop	13	-	-
CT3.2	Andrew Station	BU Medical Campus	Short turn	9	-	-

Ridership

Route CT3 serves approximately 1,280 riders per weekday.

Ridership by Stop

Ridership is concentrated at four primary locations: the Longwood Medical Area, BU Medical Campus, Ruggles Station, and Andrew Station. On inbound trips (see Figure 3):

- 110 passengers board at the three stops along the Longwood Medical Area loop along Avenue Louis Pasteur, Longwood Avenue, and Brookline Avenue.
- 20 passengers board and 100 alight at Ruggles Street at Huntington Avenue.
- 30 passengers alight at Ruggles Station at the stop on the upper busway and 70 passengers board at the stop on the lower busway.
- 210 passengers board and 40 alight at the two stops serving BU Medical Campus.
- 130 passengers board and 40 alight at Massachusetts Avenue at Albany Street.
- 370 passengers, or 67% of all inbound passengers, alight at Andrew Station.

Outbound patterns are largely the reverse of inbound patterns.

Ridership by Trip

Route CT3's ridership is commute oriented, with high ridership from Andrew Station in the early morning and AM peak and back in the PM peak. On inbound trips (see Figure 4):

- Ridership before 2:25 PM is very low, at around 10 passengers per trip.
- From 2:30 PM to 6:00 PM, full-length trips carry 20 to 40 passengers, with maximum loads of 30 or less. Short-turn trips between the BU Medical Campus and Andrew Station carry 20 or fewer passengers, with maximum loads of 20 or less.
- Ridership after 6:00 PM is 10 passengers per trip or less.

On outbound trips (See Figure 5):

- The short-turn trip at 6:05 AM carries only six passengers, and the first full-length trip at 6:15 AM carries 25 passengers.

- Between 6:15 AM and 8:00 AM, full-length trips carry 40 to 50 passengers, with maximum loads of around 30 passengers. The short-turn trips carry 21 or fewer passengers with maximum loads generally between 10 and 20 passengers.
- Trips after 8:00 AM generally carry around 20 passengers through 4:50 PM.
- Most trips after 4:50 PM carry fewer than 10 passengers.

Figure 3 | Weekday Inbound Ridership by Stop Map

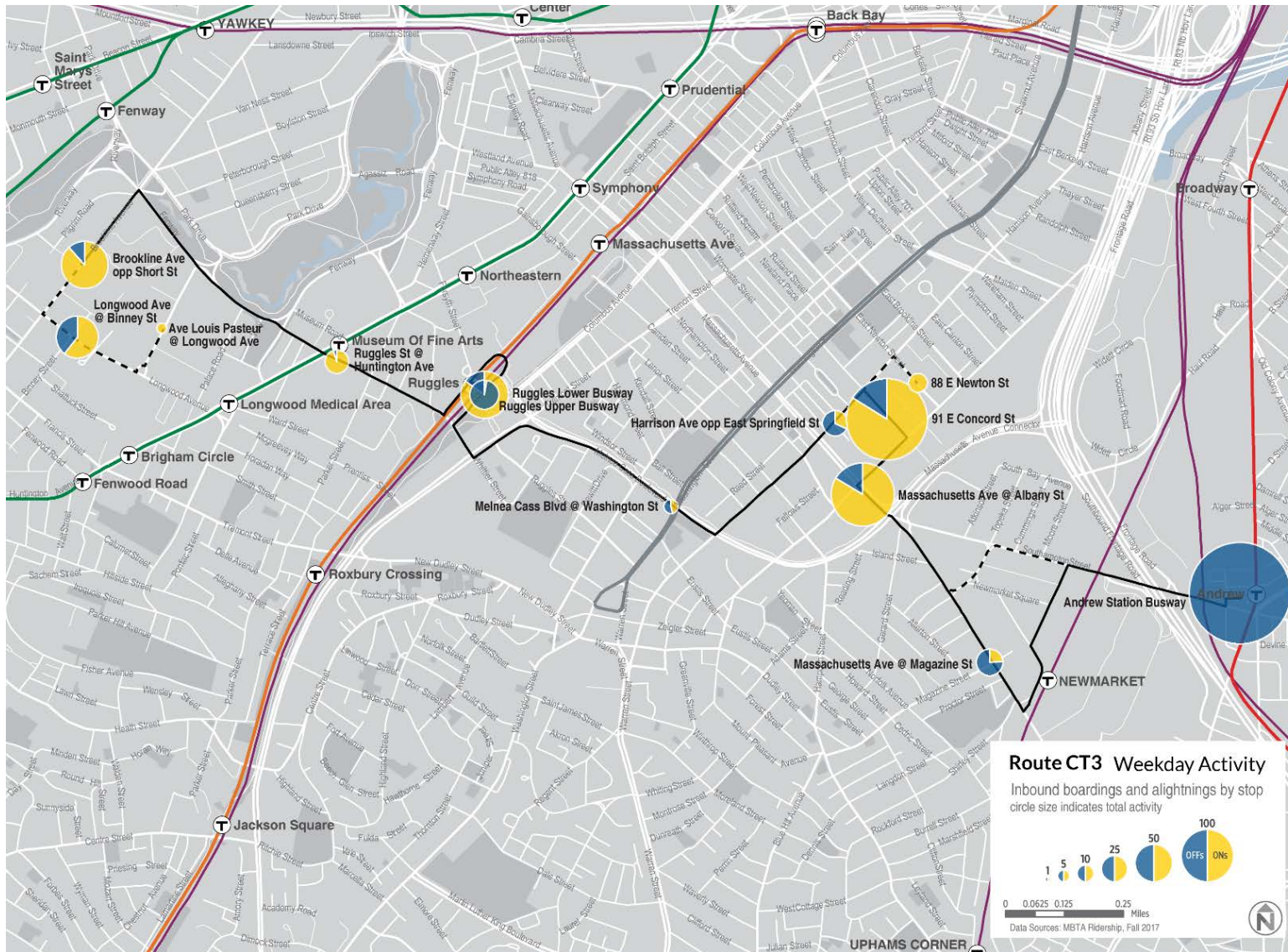


Figure 4 | Weekday Ridership by Trip: Inbound

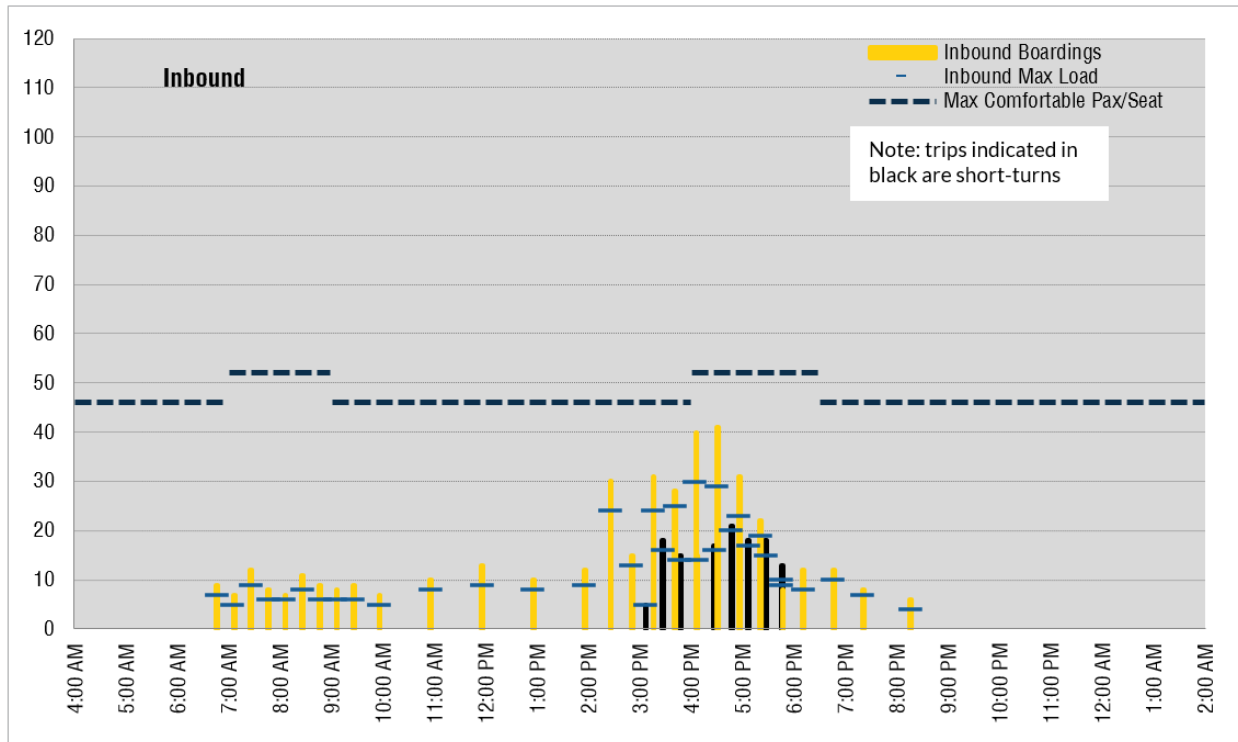
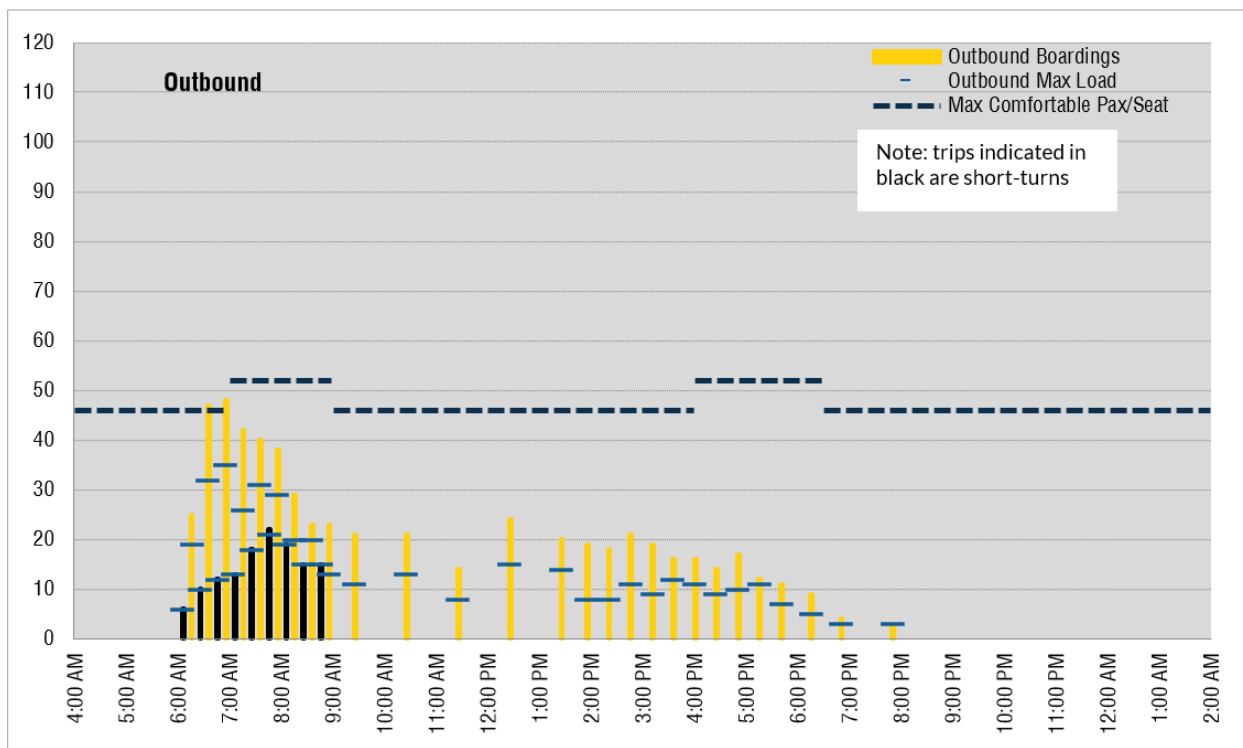


Figure 5 | Weekday Ridership by Trip: Outbound



Passenger Comfort

The MBTA desires that passengers travel in relatively comfortable conditions. At the same time, the MBTA's definition of comfort reflects the very high volume environment in which the MBTA operates, and that some passengers may have to stand for a portion of their trip. More specifically, at least 92% of passengers' travel times should be in comfortable conditions, and ideally, at least 96% of travel times should be in comfortable conditions. Comfortable conditions are considered to be 140% or less of seated capacity during high volume periods and 125% or less during other periods.

On Route CT3, 94.7% of passenger minutes are in comfortable conditions, which is above the minimum standard of 92%, but below the target of 96% (see Table 3). All overcrowding occurs due to off-schedule service.

Table 3 | Passenger Time Spent Traveling in Comfortable Conditions

	WEEKDAYS	SATURDAYS	SUNDAYS
Minimum Standard	92%	92%	92%
Target	96%	96%	96%
Actual	94.7%	-	-

Reliability and Speed

Reliability

At 43%, Route CT3's reliability is very poor and among the worst of any MBTA bus route (see Table 4). As described in the next section, this is due to actual running times that exceed schedule times for most of the day. This is compounded by dropped trips, which accounted for 1% of all trips in Fall 2017.

Table 4 | Reliability

SERVICE DAY	ORIGIN/MID-ROUTE ON-TIME PERFORMANCE	DESTINATION ON-TIME PERFORMANCE	OVERALL RELIABILITY	DROPPED TRIPS
Monday-Friday	42%	49%	43%	1%
Saturday	-	-	-	-
Sunday	-	-	-	-

Running Times

Actual running times are longer than scheduled running times for most of the day. On full length trips, trips run up to seven minutes longer than scheduled (see Figure 6 and Figure 7). On short-turn trips, they are up to four minutes longer than scheduled, which is very high considering that these trips are scheduled to take 10 minutes or less (see Figure 8 and Figure 9).

Figure 6 | Scheduled & Median Travel Time by Trip: Full-Length Trips Inbound

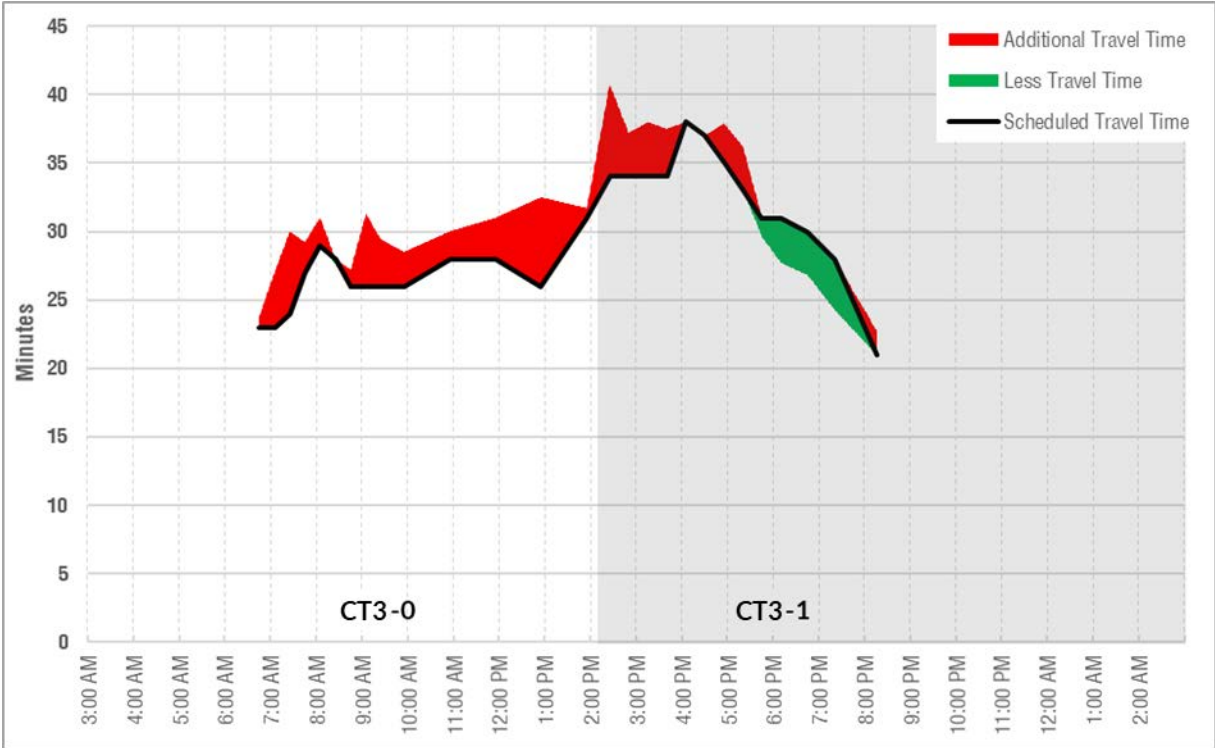


Figure 7 | Scheduled & Median Travel Time by Trip: Full-Length Trips Outbound

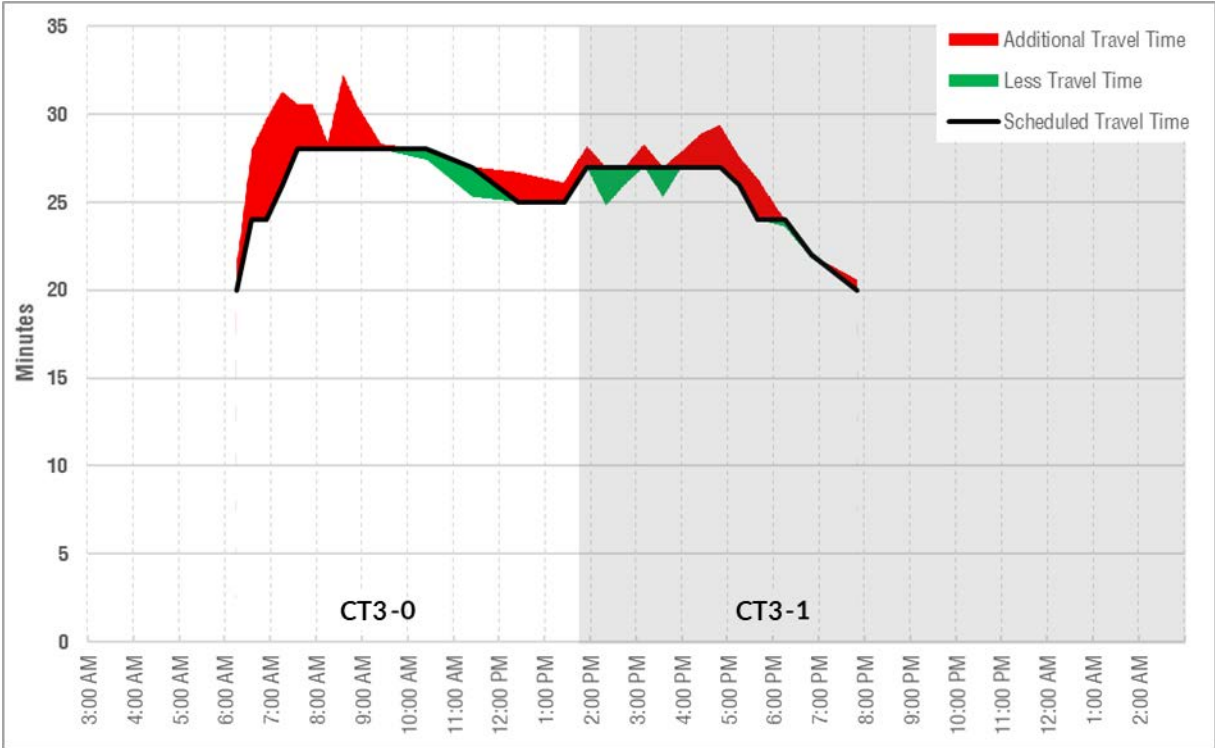


Figure 8 | Scheduled & Median Travel Time by Trip: Short-Turn Trips Inbound

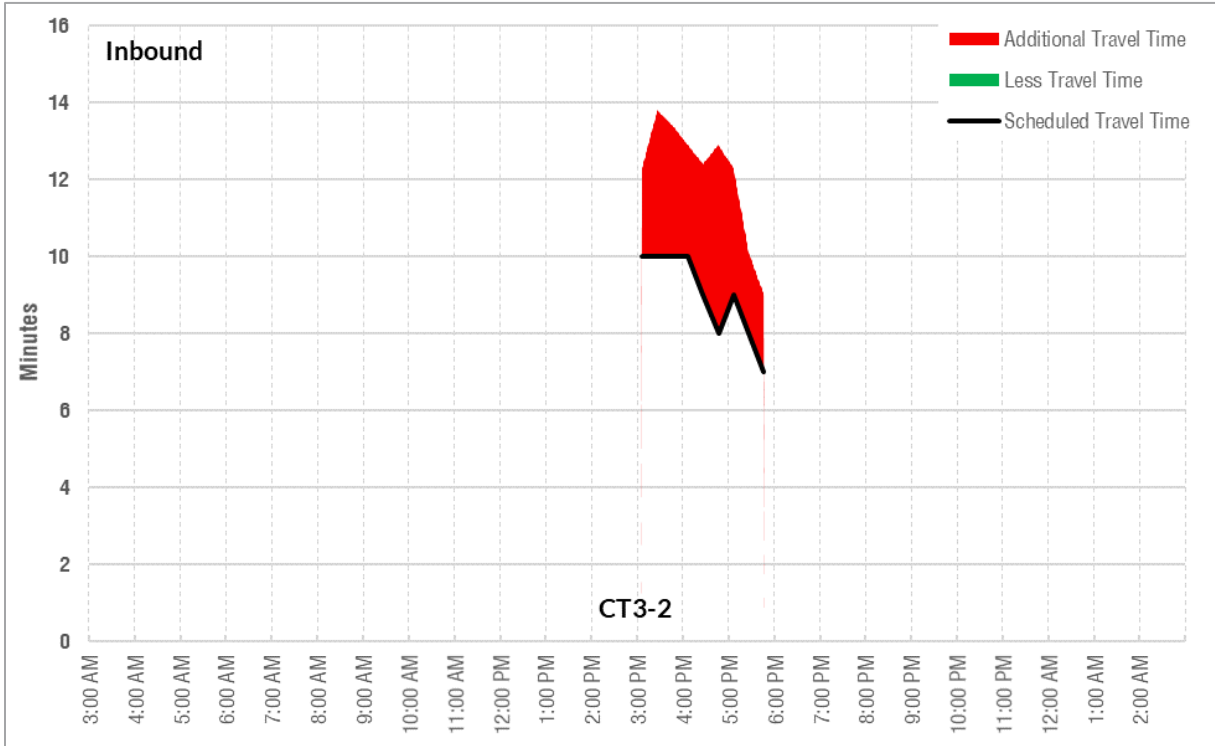
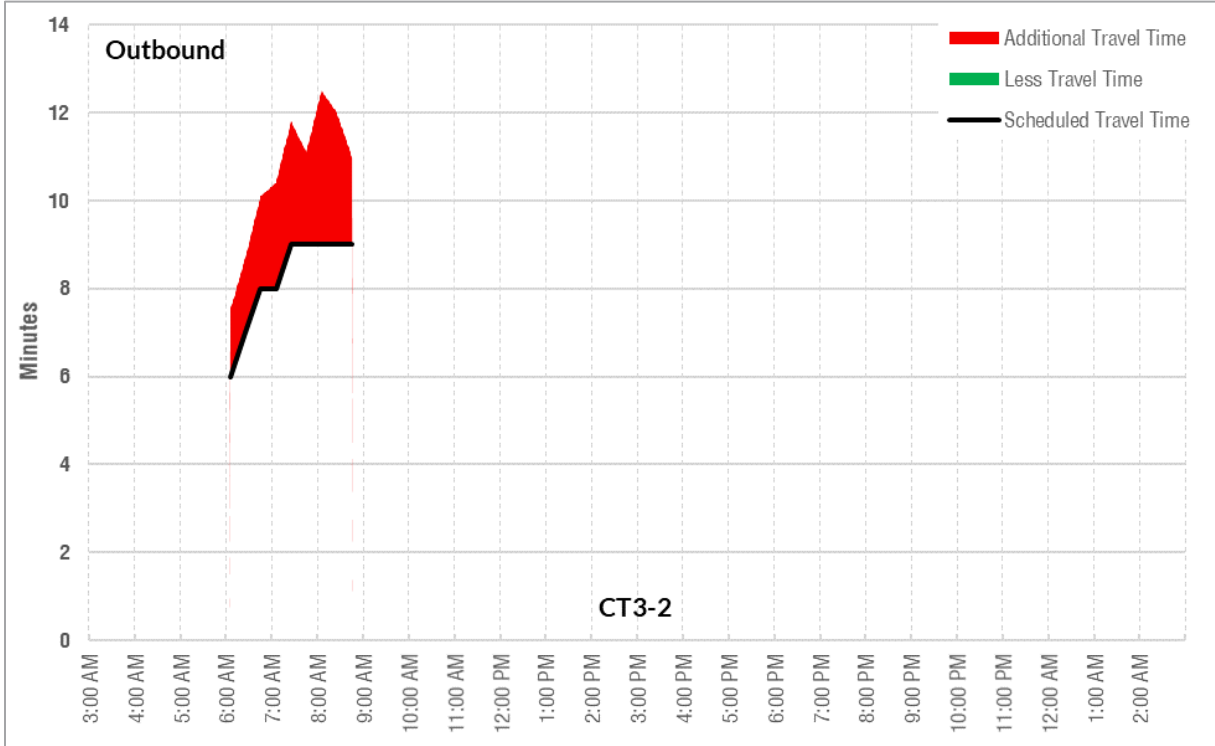


Figure 9 | Scheduled & Median Travel Time by Trip: Short-Turn Trips Outbound



Stop Spacing

Route CT3 has an average of four stops per mile, which is within the MBTA's stop spacing guideline of two to four stops per mile for limited-stop routes.

Summary

Route CT3 is a niche route designed to provide limited-stop service between the southern branch of the Red Line and the BU Medical Campus and the Longwood Medical Area. Its ridership is relatively good on full-length trips during peak periods, but low at other times. Ridership on the peak period short-turns between Andrew Station and the BU Medical Campus is also low. The route's on-time performance is also extremely poor.