McMAHON ASSOCIATES
45 Bromfield Street, 6th Floor
Boston, MA 02108
p 617-556-0020 | f 617-556-0025

PRINCIPALS
Joseph W. McMahon, P.E.
Joseph J. DeSantis, P.E., PTOE
John S. DePalma
William T. Steffens
Casey A. Moore, P.E.
Gary R. McNaughton, P.E., PTOE

ASSOCIATES
John J. Mitchell, P.E.
Christopher J. Williams, P.E.
R. Trent Ebersole, P.E.
Matthew M. Kozsuch, P.E.
Maureen Chlebek, P.E., PTOE
Dean A. Carr, P.E.

MEMORANDUM

TO: **City of Cambridge, MassDOT**

FROM: **McMahon Associates**

SUBJECT: **Kendall Square Mobility Task Force:**
Route 85 Bus Stop Optimization and Transit Priority Plan

DATE: **Wednesday, September 28, 2016**

This memorandum has been prepared to develop a bus stop optimization plan and identify potential locations for bus priority measures along MBTA Bus Route 85.

Route Overview

The route operates between Kendall Square in Cambridge, and Spring Hill in Somerville, via Hampshire Street and Union Square. The service currently (Fall 2016) operates on weekdays only from 5:45 AM until 7:45 PM, at a 30-minute frequency during the peak period. Based on Fall 2015 Automatic Passenger Count (APC) data, it has an average daily ridership of 377 inbound and 260 outbound. The route is just over two miles long, and about 60% of it overlaps with MBTA's crosstown route CT2, that operates between Sullivan Station and Ruggles Station, via Kendall Square and the Longwood Medical-Academic Area. Seven other bus routes, including routes 64 (during peak periods only), 68, 69, 86, 87, 91and EZRide shuttle, intersect or overlap with Route 85. Bus stop locations have been field verified and the average stop spacing is about 850', but varies between 320' mid-route and 2,520' around Kendall Square. An overview of the existing Route 85 is provided in Figure 1 attached.

Bus Stop Optimization Plan Development

A bus stop optimization plan was developed for Route 85 in consideration of several factors, per the MBTA's Bus Stop Design Guidelines (2016), including but not limited to:

- Existing stop ridership
- Stops shared with other bus routes, particularly CT2
- Connections to parallel and intersecting MBTA and non-MBTA bus routes
- Impacts on consolidating stops with stops on other routes that may overlap/intersect
- Optimal stop spacing along the route (shown in the table below)
- Safety, traffic congestion, intersection operations, bus operations and turn movements
- Topography, sidewalk and crossing conditions at existing and proposed locations
- Neighborhood and origin/destination connectivity

- Proximity of stops to key facilities, such as municipal buildings, schools, senior housing and facilities, and medical facilities
- Connections to existing and future rail facilities and potential roadway circulation changes
- Opportunities to incorporate transit priority measures, particularly queue jump lanes
- Adjacent bicycle facilities
- Stop length and parking impacts

Bus Operating Environment	Average # of Stops per Mile	Average Distance Between Stops
Central Business District (CBD)	4-5	1,000-1,300 feet
Urban outside CBD and Key Bus Routes	4-7	750-1,300 feet
Suburban	4-5	1,000-1,300 feet
Bus Rapid Transit/Limited Stop Service	2-4	1,300-2,600 feet

Source: MBTA Bus Stop Design Guidelines (2016)

Accounting for the factors described above, a proposed bus stop optimization plan for Route 85 was developed and is described on a stop by stop basis in the attached table, and illustrated in Figure 2 attached. In summary the plan includes:

- 3 stop relocations
- 1 new stop
- 6 consolidated stops
- 6 eliminated stops

Figure 3 attached shows the proposed final bus stop locations.

Proposed Optimization Plan Impacts on Other Routes

As noted above, numerous other bus routes overlap and intersect with Route 85. The impacts of the proposed bus stop optimization plan are included in the attached table and summarized below.

The changes to the stops shared with CT2 are limited to the following:

- Relocating the Webster Avenue at Cambridge Street inbound stop onto Cambridge Street at Columbia Street
- Relocating the Hampshire Street at Cardinal Medeiros Avenue stop from the nearside to the farside of the intersection

These minor relocations to the other side of the intersection have a minimal impact on the CT2 stop spacing. Since the focus of this study was to optimize stops on Route 85 accounting for impacts to Route CT2, the spacing along CT2 itself was not optimized. However, of the four CT2 stop pairs overlapping with Route 85 the existing stop spacing was noted to be slightly above the MBTA guidelines of 2,600 feet. The existing stop spacing ranges from 2,760' to 3,270', as shown in the following table. Modifying and reducing the distance between the CT2 stops would impact the route

running time and the effectiveness of this limited stop route, therefore no further changes, beyond the optimization of the stop locations, shared with Route 85, would be recommended.

Direction	STOP ID	Stop Name	Stop Location	Existing Stop Spacing
INBOUND	2612	SOMERVILLE AVE @ STONE AVE	Midblock	2,780
	2514	WEBSTER AVE @ CAMBRIDGE ST	Nearside	3,270
	2518	HAMPSHIRE ST @ PORTLAND ST	Farside	2,930
	2231	MAIN ST @ KENDALL STATION	Midblock	-
OUTBOUND	2231	MAIN ST @ KENDALL STATION	Midblock	2,520
	2521	HAMPSHIRE ST @ CARDINAL MEDEIROS AVE	Nearside	2,875
	2525	COLUMBIA ST @ CAMBRIDGE ST	Nearside	2,759
	2612	SOMERVILLE AVE @ STONE AVE	Midblock	

The following routes and stops are also impacted by the proposed plan for Route 85:

- Route 87 on Somerville Avenue, at Bow Street and Union Square stops
- Route 91 on Webster Avenue
- Route 69 on Cambridge Street
- Routes 64 (during peak periods only) and 68 and EZRide on Broadway

Transit Priority Measures

After riding multiple trips during the AM and PM peak periods on a typical weekday (on Tuesday morning on September 13, and Wednesday evening on September 14), we observed firsthand congestion points and challenging turn movements experienced by bus operators and riders. Based on these observations, local knowledge and experience, and the proposed optimization plan, we have identified five individual intersections for potential bus queue jump lanes (QJL), either exclusively for buses or shared with right turn lanes.

Inbound

1. Shared QJL on Somerville Avenue southbound approaching Washington Street, in conjunction with a relocated farside stop on Webster Street, reducing capacity for through movements
2. Shared QJL on Hampshire Street southbound approaching Portland Street, with the removal of metered parking spaces
3. Shared QJL on Broadway approaching Galileo Galilei Way, in conjunction with a relocated farside stop
4. Bus lane on Broadway eastbound from Galileo Galilei Way to Ames Street, or a shared QJL approaching Ames Street

Outbound

1. Shared QJL on Broadway westbound approaching Galileo Galilei Way, in conjunction with a new nearside MBTA stop (an EZRide stop currently exists in this location)

2. Shared QJL on Hampshire Street northbound approaching Cardinal Medeiros Avenue, in conjunction with a relocated farside stop
3. Exclusive bus QJL on Hampshire Street approaching Windsor Street
4. Exclusive bus QJL on Webster Avenue approaching Prospect Street

Almost all the signalized intersections along the route could be considered for Transit Signal Priority (TSP), however, intersections likely to provide the most benefit include:

1. Hampshire Street, Portland Street and Cardinal Medeiros Avenue
2. Broadway and Galileo Galilei Way
3. Broadway and Ames Street
4. Columbia Street and Cambridge Street
5. Webster Avenue and Prospect Street
6. Prospect Street and Somerville Avenue
7. Summer Street and Central Street

Figure 3 attached shows the locations of intersections proposed for transit priority measures, including QJLs and TSP.

TSP implementation needs to consider the lack of existing preemption infrastructure in Cambridge (for emergency vehicles) and the general preference in Cambridge for pre-timed signals (i.e. the lack of vehicle detection is highly likely). It is generally assumed that these are not barriers for the Somerville intersections. Aside from broader TSP strategies, consideration of bus-only detection, such as video-detection (although video recording is also discouraged in Cambridge), will need further exploration, especially for shared QJL/right turn lanes and single lane approaches. Shared QJL/right turn lanes adjacent to bike facilities will also require further study to avoid conflicts between modes. In addition, further traffic analysis is recommended to refine TSP and QJL recommendations, in particular where bus movements occur on multiple intersection approaches.

Additional Observations

In review of the Route 85, and in consideration of other route analyses being undertaken as part of the Kendall Square Mobility Task Force project, two observations that may warrant future consideration and analysis include:

- Realigning Route 85 and CT2 to operate on Columbia Street in both directions, rather than inbound on Windsor Street and outbound on Columbia Street. Observations indicate that the current roadway configuration could accommodate buses in both directions.
- With the removal of the Hampshire Street at Clark Street and Webster Avenue stops, and the proximity of Hampshire Street at Portland Street and Cardinal Medeiros stops to Broadway, Routes 85 and CT2 could potentially be re-routed to Broadway, in particular if Route 68 was removed in favor of adding Route 70 or other service.

Route 85 Proposed Bus Stop Plan
Prepared by McMahon Associates
Draft 9/26/16

	Stop Shared With Other Routes	Routes Intersecting	Stop Seq	STOP ID	Stop Name	Stop Location	Distance To Next Stop (ft.)	Route 85 On (FA15)	Route 85 Off (FA15)	% of Route Ridership	All Routes On (FA15)	All Routes Off (FA15)	Total Ridership	Stop Pairs Opposite	Proposed Distance to Next Stop (ft.)	Reallocated Ridership On	Reallocated Ridership Off	Proposed Recommendation	Notes
INBOUND			1	2519	AVON ST @ CENTRAL ST	Farside	1,290	144	0	19%	144	0	144	N/A	1,290	144	0	Retain stop.	Summer St has no DYCL, narrow ROW, diffcult for layover so better on side streets, although likely more demand at Summer/Central intersection. Assume Senior Housing accesses back door to this stop (500').
			2	2520	AVON ST @ SCHOOL ST	Nearside	325	27	0	4%	27	0	27	N/A	840	42	0	Retain stop. Improve bus stop sign locations & length = -2 permit parking spaces. Serves Cummings School & residential.	
			3	2507	SUMMER ST @ SCHOOL ST	Farside	920	55	0	7%	55	0	55	Y	1,260	66	1	Consolidate with opp Vinal at farside of Church = -2 parking spaces to improve spacing, access to side streets & crosswalk.	
			4	2508	SUMMER ST OPP VINAL AVE	Midblock	320	24	1	3%	24	1	25	Y	-	-	-	Consolidate with School as above.	
	87		5	2574	51 BOW ST	Farside	1,220	10	1	1%	10	1	11	N/A	940	49	50	Consolidate with Somerville @ Union at farside of Kilby to improve spacing, very low ridership @ Bow, moving Bow closer to Market Basket and challenges accessing/egressing from Union Sq stop due to traffic congestion. Rt 87 stop on Somerville opp Bow will also relocate to Kilby (moving 175' east, distance from previous stop at School changes from 610' to 785', and distance to next stop changes from 770' (to Union Sq) to 1,190' (Washington @ Union Sq).	
	87		6	2510	SOMERVILLE AVE @ UNION SQUARE	Midblock	420	28	4	4%	76	110	185	Y	-	-	-	Consolidate with Bow as above. Stop would be eliminated from Rt 87, but the next stop on Somervile Ave. in Union Square is 400' away (and 540' from the proposed relocated stop at Kilby.	
	91	86	7	2511	WEBSTER AVE @ WASHINGTON ST	Midblock	380	18	1	2%	62	26	88	N/A	1,040	95	45	Retain, but shift stop to farside of Washington - flip school pickup/drop off area with bus stop for easier stop access and improved connections to crossings and other bus routes. Consider shared QJL/right turn lane on Somerville approaching Washington (removing one thru lane, currently shared with right turns; leaving left only and left-thru lane).	
	91		8	2512	25 WEBSTER AVE @ NEWTON ST	Nearside	1,020	15	2	2%	25	31	56	N/A	1,490	9	2	Consolidate with Norfolk at farside of Prospect to improve spacing, low ridership and neighborhood connectivity. Stop would be opposite proposed GLX Sta. Construction in area (inc. adjacent to proposed stop, appears to be residential building under construction), therefore parking impacts to be determined. This stop would be eliminated from Rt 91. Distance from previous stop on Webster @ Washington is 380' and next stop at Newton @ Clark is 310'.	
			9	2513	WEBSTER AVE @ NORFOLK ST	Nearside	690	7	1	1%	7	1	8	Y	-	-	-	Consolidate with Newton as above.	
	CT2		10	2514	WEBSTER AVE @ CAMBRIDGE ST	Nearside	1,160	19	3	3%	124	53	177	Y	1,830	220	177	Relocate onto Cambridge St farside of Columbia (verify access after left turn, otherwise shift stop east and more midblock, to improve safety (existing stop in driveway & multiple curb cuts to auto stores on Webster) and operations for access to left turn lane onto Cambridge St. Stop also served by CT2. Rt 69 IB stop farside of Windsor will also relocate to Columbia (moving 300' west, distance from previous stop at Norfolk changes from 840' to 540', and distance to next stop at Berkshire changes from 820' to 1,140').	
			11	2515	WINDSOR ST @ LINCOLN ST	Nearside	830	7	1	1%	7	1	9	N	-	-	-	Eliminate stop to improve spacing and low ridership and limited neighborhood connectivity.	
			12	2516	WINDSOR ST @ HAMPSHIRE ST	Nearside	700	8	7	2%	8	7	15	Y	1,190	13	11	Relocate to Hampshire farside of Windsor to improve bus operations and turning movements from Windsor onto Hampshire and thereby safety. Currently the bus needs to pullout from a nearside of Windsor stop to make a left turn onto Hampshire, merging mid intersection with other left turning vehicles. Also no crossing of Hampshire required for student trips to/from Cambridgeport School.	
			13	2517	HAMPSHIRE ST @ CLARK ST	Farside	580	3	6	1%	3	6	9	Y	-	-	-	Eliminate stop to improve spacing and low ridership (along with stop pair).	
	CT2		14	2518	HAMPSHIRE ST @ PORTLAND ST	Farside	690	11	60	9%	87	115	202	Y	965	89	118	Retain stop due to good sidewalk conditions, connections to Tech Square, and access to Kendall area with queuing on Hampshire. Consider a shared QJL/right turn lane on Hampshire (replacing metered parking) approaching Portland and TSP.	
	64 (peak), 68	EZRide	15	2228	BROADWAY @ GALILEO GALILEI WAY	Nearside	2,240	1	29	4%	1	33	34	N	2,015	1	33	Relocate stop to farside of Galileo to consolidate with EZRide stop on farside. Provides a more centralized stop with crosswalk behind the stop and away from active driveway at Draper. No parking impact, but will obstruct curbside bike lane, therefore, redesign to mitigate this conflict should be evaluated. Improve sidewalk to create landing area and ideally solid surface in clear zone. Verify access after left turn for EZRide buses. Stop move also affects Route 64 (peaks only) and 68 improving spacing from 460' to ~800'. Consider a shared QJL/right turn lane on Broadway approaching Galilelo (currently left, thru, right lane), and TSP. Also consider TSP and shared QJL/right turn lane or bus lane approaching Ames and continuing around Kendall Square, back to Ames.	
	CT2, 64, (peak), 68, EZRide		16	2231	MAIN ST @ KENDALL STATION	Midblock		0	261	35%	153	566	720			153	566	Retain stop due to high ridership and direct connection to Red Line.	
					TOTAL			**377**	**377**				**1,764**						

Route 85 Proposed Bus Stop Plan
Prepared by McMahon Associates
Draft 9/26/16

	Stop Shared With Other Routes	Routes Intersecting	Stop Seq	STOP ID	Stop Name	Stop Location	Distance To Next Stop (ft.)	Route 85 On (FA15)	Route 85 Off (FA15)	% of Route Ridership	All Routes On (FA15)	All Routes Off (FA15)	Total Ridership	Stop Pairs Opposite	Proposed Distance to Next Stop (ft.)	Reallocated Ridership On	Reallocated Ridership Off	Proposed Recommendation	Notes
OUTBOUND	CT2, 64, (peak), 68, EZRide		1	2231	MAIN ST @ KENDALL STATION	Midblock	2,520	185	0	35%	478	195	673		1,475	445	194	Retain stop due to high ridership and direct connection to Red Line.	Evaluate signal phasing at Main and Ames. Bus cannot make right turn when pedestrians are crossing, which causes delay.
	64, (peak), 68, EZRide			NEW	BROADWAY @ GALILEO GALILEI WAY	Nearside									1,095	33	1	Create new MBTA stop (stop would be shared with an existing EZRide stop) to improve spacing and to create pair for proposed relocated inbound stop. Consider shared QJL/right turn lane and TSP, if stop was set back sufficiently.	
	CT2		2	2521	HAMPSHIRE ST @ CARDINAL MEDEIROS AVE	Nearside	355	48	8	11%	106	65	171	Y	1,250	106	65	Retain stop due to relatively high ridership and to maintain stop pair with Hampshire @ Portland and connection with CT2 and Hubway station, but relocate stop farside for crosswalk behind the stop. Also, provides an opportunity for shared QJL/right turn lane and TSP. 3 2-hour metered parking spaces would need to be removed.	If retained nearside, stop needs to be lengthened = - 2 loading spaces.
			3	2522	HAMPSHIRE ST @ WEBSTER AVE	Farside	865	1	1	0.5%	1	1	3	Y	-	-	-	Eliminate stop due to low ridership and to improve spacing (along with low ridership at stop pair)	
			4	2523	HAMPSHIRE ST @ WINDSOR ST	Nearside	575	6	9	3%	6	9	15	Y	1,570	9	12	Relocate stop to farside of Windsor (after the driveways) to improve operation and safety with a crosswalk behind the stop, and opportunity for an exclusive QJL (no right turns here). Remove 2-3 parking spaces in front of The Big Hand Art Studio. The bus was observed not pulling into the stop due to it already being stopped in traffic.	Crosswalk behind the stop does not meet ADA and should be realigned.
			5	2524	HAMPSHIRE ST @ COLUMBIA ST	Nearside	1,080	3	3	1%	3	3	6	N	-	-	-	Eliminate stop due to difficult turn movements, low ridership, and to improve spacing. Currently the bus has difficulty turning right onto Columbia when there are cars/bikes exiting Columbia southbound. Turning from the travel lane, versus curbside, would enable buses to make right turns. Distance to the proposed relocated previous stop at Windsor is 320'.	
	CT2		6	2525	COLUMBIA ST @ CAMBRIDGE ST	Nearside	1208	5	13	3%	35	100	135	N	1,530	35	100	Retain stop with the addition of a front sign to identify its location nearside of Cambridge. TSP could potentially be explored if stop was set back sufficiently.	
			7	2527	WEBSTER AVE @ COLUMBIA ST (OPP TREMONT)*	Farside	326	0	1	0.3%	0	1	2	Y	-	-	-	Eliminate stop to improve spacing, low ridership, and proximity to next stop (300').	Although the distance to the next stop at Webster @ Prospect will be 1,400' from Columbia @ Cambridge, an additional stop does not appear to be necessary, and the Prospect stop is a better location.
			8	2528	WEBSTER AVE @ PROSPECT ST	Nearside	1,225	3	9	2%	3	9	13	N	1,225	3	10	Retain stop to maintain stop pair with the proposed relocated inbound stop farside of Prospect for neighborhood connectivity, and access to the proposed GLX Sta. Improve bus stop with better signage (current signage is low). Other sidewalk and streetscape improvements are expected with the new GLX Sta. TSP and exclusive QJL could potentially be explored if stop was set back sufficiently.	
	CT2, 86, 87, 91		9	2612	SOMERVILLE AVE @ STONE AVE	Midblock	510	3	23	5%	449	357	805	N/A	510	449	357	Retain stop due to connections with other routes, stop amenities, and neighborhood connections. Consider TSP at Prospect/Somerville Ave [note buses operate on all approaches]. Should the GLX Union Square Station proceed in the future a re-evaluation of stops in this area maybe warranted. The Prospect @ Somerville stop (not currently utilized by Rt 85) will likely be shifted closer to the station, farside of Bennett Court, due to severe grades associated with the bridge. Unlike the existing location stop that is so close to Somerville Ave that it can not be served by Rt85, it could serve a stop closer to the station. However, the previous stop on Webster @ Prospect would then be below the MBTA's spacing guidelines.	If Webster becomes a two-way street (as potential mitigation for McGrath Boulevard), rerouting the 85 outbound on Webster instead of Prospect should be considered to avoid Union Square congestion. The next stop after Webster @ Prospect would be Bow @ Warren, eliminating Somerville Ave @ Stone Ave. Although this stop has route connectons, it is not utilized that heavily by 85 users and is only 510' from Bow @ Warren.
	87		10	26131	BOW ST @ WARREN AVE	Nearside	780	4	17	4%	84	58	142	Y	780	84	58	Retain stop due to relatively high ridership and central location in Union Square. Options for moving the stop further north on Somerville Ave would require removing angled, metered parking spaces.	This would be the stop after Webster @ Prospect, if Webster became two-way (as potential mitigation for McGrath Blvd) and Somerville @ Stone would no longer be on route.
			11	2614	SUMMER ST @ WESLEY PARK	Midblock	960	1	20	4%	1	20	20	Y	960	20	1	Retain stop due to uphill walk on Summer and ridership mostly offs, which generates minimal delay. No parking on Summer reduces conflicts with bus stop.	
			12	2533	SUMMER ST @ SCHOOL ST	Nearside	815	0	36	7%	0	36	37	Y	815	0	36	Retain stop due to uphill walk on Summer and ridership mostly offs, which generates minimal delay. No parking on Summer reduces conflicts with bus stop.	
			13	2532	117 SUMMER ST	Midblock	460	0	11	2%	0	11	11	N/A	870	0	11	Retain stop to maintain service at the Somerville Home, a residential facility for ages 50+. A crosswalk is located behind the stop.	
			14	2534	SUMMER ST OPP CARTER TERR**	Nearside	410							N/A	-	-	-	Eliminate stop to improve spacing, poor stop location between residential driveways and absence of a crosswalk. Stop is also short. Removing stop may improve bus operations through signalized intersection at Central Street. Consider TSP at Summer/Central.	
			15	2519	AVON ST @ CENTRAL ST	Farside		0	111	21%	0	111	111			-	113	Retain stop.	
					TOTAL			**260**	**262**				**2143**						

Spacing guidelines: 750 - 1,300 ft.

Over
Under

Existing Spacing: Avg. IB 852; Avg. OB 864; Minimum 320; Maximum 2,520

low ridership: < 5% total route boardings

Proposed Spacing: Avg. IB 1,286; Avg. OB 1,098; Minimum 510; Maximum 2,015

Summary of Recommendations

Eliminations - 6 stops
Relocations - 3 stops
Consolidated - 6 stops consolidated into 3 stops
New - 1 stop

TSP - 9 approaches
QJLs - 8 approaches

Notes:
*Webster @ Columbia - Stop announcement is "Webster @ Newton" but is located opposite Tremont
**Not listed in APC data, but confirmed stop is active
Columbia St. is two-way; why not route in both directions; seems wide enough?
With removal of Clark/Webster stop, CT2 and 85 could relocate to Broadway (especially if Route 68 is removed). Is there more transit demand on Broadway than Hampshire?
TSP implementation needs to consider the lack of existing preemption infrastructure in Cambridge (for emergency vehicles) and general preference in Cambridge for pre-timed signals (i.e. lack of vehicle detection is highly likely); assuming these are not barriers for the Somerville intersections. Aside from broader TSP strategies, consideration of bus-only detection, such as video-detection (although video recording is also discouraged in Cambridge), will need further exploration, especially for shared QJL/right turn lanes and single lane approaches.
Shared QJL/right turn lanes adjacent to bike facilities will require further study to avoid conflicts between modes.
Further traffic analysis is recommended to refine TSP and QJL recommendations, in particular where bus movements occur on multiple intersection approaches.

Terminus/Start
Avon St. @ Central St.
144 Inbound
113 Outbound

Summer St. Opp Carter Terr.*

117 Summer St.
0 | 11

Avon St. @School St.
27 | 0

Summer St. @ School St.
0 | 36

Summer St. @ School St.
55 | 0

Summer St. Opp. Vinal Ave.
24 | 1

Summer St. @ Wesley Park
20 | 1

51 Bow St.
10 | 1

Bow St. @ Warren Ave.
84 | 58

Somerville Ave. @ Stone Ave.
449 | 357

Somerville Ave. @ Union Square
76 | 110

Webster Ave. @ Washington St.
62 | 26

25 Webster Ave. @ Newton St.
25 | 31

Webster Ave. @ Prospect St.
3 | 9

Webster Ave. @ Columbia St.
0 | 1

Webster Ave. @ Norfolk St.
7 | 1

Columbia St. @ Cambridge St.
35 | 100

Webster Ave. @ Cambridge St.
124 | 53

Windsor St. @ Lincoln St.
7 | 1

Hampshire St. @ Columbia St.
3 | 3

Windsor St. @ Hampshire St.
8 | 7

Hampshire St. @ Windsor St.
6 | 9

Hampshire St. @ Webster Ave.
1 | 1

Hampshire St. @ Clark St.
3 | 6

Hampshire St. @ Cardinal Medeiros Ave.
106 | 65

Hampshire St. @ Portland St.
87 | 115

Broadway @ Galileo Galilei Way
1 | 33

Terminus/Start
Main St. @ Kendall Station
153 | 566 Inbound
478 | 195 Outbound
631 | 761 Total

410′ 1,290′ 460′ 815′ 325′ 960′ 920′ 320′ 780′ 1,220′ 510′ 420′ 380′ 1,225′ 326′ 1,020′ 1,208′ 690′ 1,160′ 1,080′ 830′ 575′ 865′ 700′ 355′ 580′ 2,520′ 795′ 2,240′

Future GLX Station

Kendall/MIT Station

Somerville
Cambridge

Legend

- Route 85 Stop
- Route 85/CT2 Stop
- Other Route Stop

XXX′ Stop Spacing
On | Off Stop Ridership
EZRide
EZRide Stop
MBTA Red Line
Signalized Intersection

MBTA Bus Routes

- 85
- 64
- 68
- 69
- 86
- 87
- 91
- CT2

*APC ridership data not available, but confirmed as an active stop

Landmarks

- Municipal
- Medical
- K-12 School
- Senior Facility

0 1,000 Feet

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Kendall Square Mobility Task Force
Figure 1
Route 85 Existing Bus Stops
Draft 9/23/16

Terminus/Start
Avon St. @ Central St.
144 Inbound
113 Outbound

Summer St. Opp Carter Terr.*

117 Summer St.
0 | 11

Avon St. @School St.
27 | 0

Summer St. @ School St.
0 | 36

Summer St. @ School St.
55 | 0

Summer St. Opp. Vinal Ave.
24 | 1

Summer St. @ Wesley Park
20 | 1

51 Bow St.
10 | 1

Bow St. @ Warren Ave.
84 | 58

Somerville Ave. @ Stone Ave.
449 | 357

Somerville Ave. @ Union Square
76 | 110

Webster Ave. @ Washington St.
62 | 26

Webster Ave. @ Prospect St.
3 | 9

25 Webster Ave. @ Newton St.
25 | 31

Future GLX Station

Webster Ave. @ Columbia St.
0 | 1

Webster Ave. @ Norfolk St.
7 | 1

Columbia St. @ Cambridge St.
35 | 100

Webster Ave. @ Cambridge St.
124 | 53

Windsor St. @ Lincoln St.
7 | 1

Hampshire St. @ Columbia St.
3 | 3

Windsor St. @ Hampshire St.
8 | 7

Hampshire St. @ Windsor St.
6 | 9

Hampshire St. @ Clark St.
3 | 6

Hampshire St. @ Webster Ave.
1 | 1

Hampshire St. @ Cardinal Medeiros Ave.
106 | 65

Hampshire St. @ Portland St.
87 | 115

Broadway @ Galileo Galilei Way
1 | 33

Kendall/MIT Station

Terminus/Start
Main St. @ Kendall Station
153 | 566 Inbound
478 | 195 Outbound
631 | 761 Total

410′ 1,290′ 460′ 815′ 325′ 960′ 920′ 320′ 780′ 1,220′ 510′ 420′ 380′ 1,225′ 326′ 1,020′ 1,208′ 690′ 1,160′ 1,080′ 830′ 575′ 865′ 700′ 355′ 580′ 2,520′ 795′ 2,240′

Somerville
Cambridge

Legend

- Route 85 Stop
- Route 85/CT2 Stop
- Other Route Stop

MBTA Bus Routes
- 85
- 64
- 68
- 69
- 86
- 87
- 91
- CT2
- MBTA Red Line

*APC ridership data not available, but confirmed as an active stop

- Proposed Stop Relocation
- Proposed New/Relocated Stop
- Proposed Stop Elimination
- Proposed Transit Priority Measure
- XXX′ Existing Stop Spacing
- On | Off Existing Stop Ridership
- EZRide
- EZRide Stop
- Signalized Intersection

Landmarks
- Municipal
- Medical
- K-12 School
- Senior Facility

0 1,000 Feet

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Kendall Square Mobility Task Force
Figure 2
Route 85 Proposed Bus Stop Optimization Plan
Draft 9/23/16

Terminus/Start
Avon St. @ Central St.
144 Inbound
113 Outbound

117 Summer St.
0 | 11

1,290′
870′
815′

Avon St. @School St.
42 | 0

Summer St. @ School St.
0 | 36

840′
960′

Summer St. @ Church St.
66 | 1

Summer St. @ Wesley Park
20 | 1

1,260′
780′

Bow St. @ Warren Ave.
84 | 58

Somerville Ave. @ Stone Ave.
449 | 357

510′
940′

Somerville Ave. @ Kilby St.
49 | 50

Webster Ave. @ Washington St.
95 | 45

1040′
1,225′

Webster Ave. @ Prospect St.
3 | 10

Future GLX Station

Webster Ave. @ Prospect St.
9 | 2

1,490′
1,520′

Columbia St. @ Cambridge St.
35 | 100

Webster Ave. @ Cambridge St.
220 | 177

Somerville
Cambridge

1,570′
1,830′

Windsor St. @ Hampshire St.
13 | 11

Hampshire St. @ Windsor St.
9 | 12

1,250′

Hampshire St. @ Cardinal Medeiros Ave.
106 | 65

1,190′

Broadway @ Galileo Galilei Way
33 | 1

1,095′
965′
1,475′
2,015′

Hampshire St. @ Portland St.
89 | 118

Broadway @ Galileo Galilei Way
1 | 33

Kendall/MIT Station

Terminus/Start
Main St. @ Kendall Station
153 | 566 Inbound
445 | 194 Outbound
598 | 760 Total

Legend

- Route 85 Stop
- Route 85/CT2 Stop
- Other Route Stop

MBTA Bus Routes

- 85
- 64
- 68
- 69
- 86
- 87
- 91
- CT2
- MBTA Red Line

*APC ridership data not available, but confirmed as an active stop

- Proposed New/Relocated Stop
- Proposed New/Relocated Stop with CT2
- Proposed Transit Priority Measure
- XXX′ Proposed Stop Spacing
- On | Off Reallocated Stop Ridership
- EZRide
- EZRide Stop
- Signalized Intersection

Landmarks

- Municipal
- Medical
- K-12 School
- Senior Facility

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Kendall Square Mobility Task Force
Figure 3
Route 85 Final Bus Stop Plan
Draft 9/23/16