Better Bus Project

Making transit better together

Gateway East Bus Priority Lanes Pilot Evaluation

Quarter 1 Analysis

August 1 – October 31, 2024

Presentation to Brookline Transportation Board

January 15, 2025

Outline

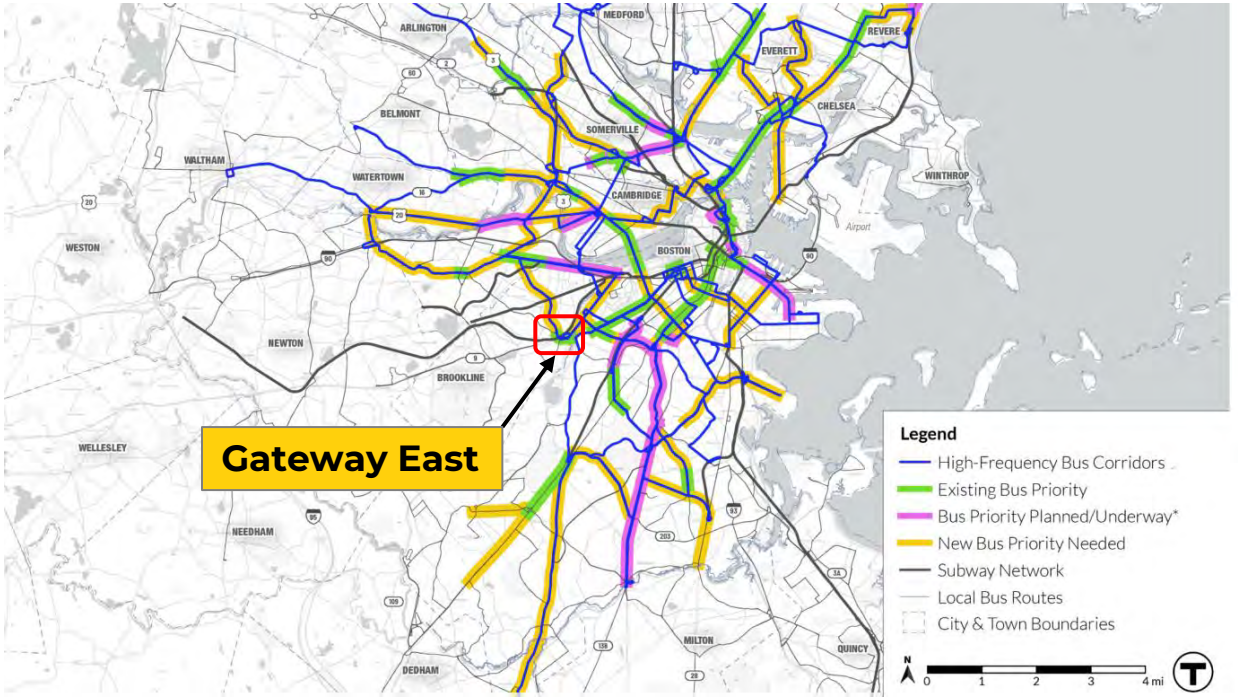
- MBTA Bus Priority Overview
- Project Background
- Project Status & Pilot Analysis Schedule
- Quarter 1 Findings
- Summary & Next Steps

MBTA Bus Priority

Gateway East, after
Photo Credit: Toole Design

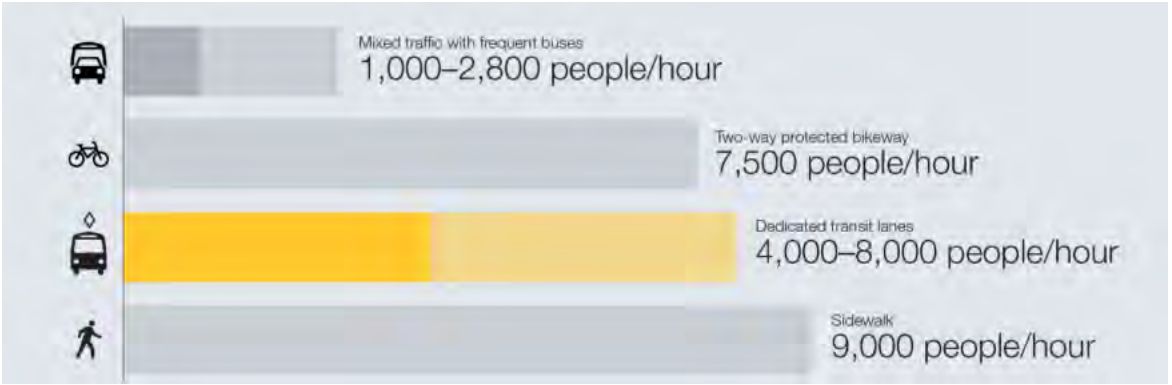
MBTA's Bus Priority Vision Plan

- **Targets existing delay** and service along 26 corridors
- Improves service to **220,000 daily bus riders**
- Covers 10-15% of the bus network; **impacts 80% of all bus riders**
- 5-7+ years of implementation



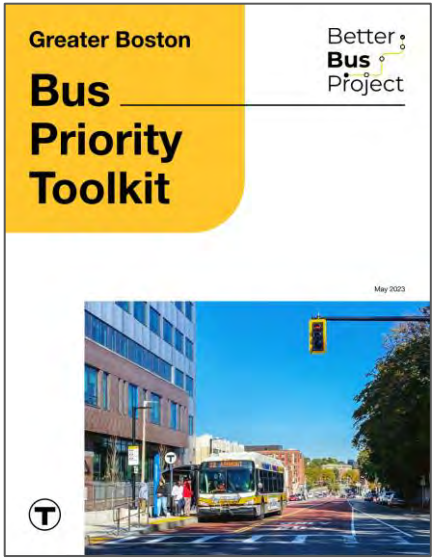
Transit Priority Moves More People

How many people can the space of one travel lane serve?



Person-Throughput Capacity (Graphic from MBTA Bus Priority Toolkit)

By repurposing space for transit, bus lanes can **increase the number of people that can travel along the corridor**, supporting future growth and mode shift to transit.



Project Goals: Why Are Bus Lanes Needed?

- **Fastest, most affordable way** to improve transit service for riders in a short time frame
- **Improving access** to Longwood Medical Area, grocery stores, and other essential services throughout the pandemic and recovery
- **Improving transit equity** by supporting the commuting needs of essential workers, low-income people, and people of color
- **Moving more people more efficiently**

Gateway East, before the bus lanes

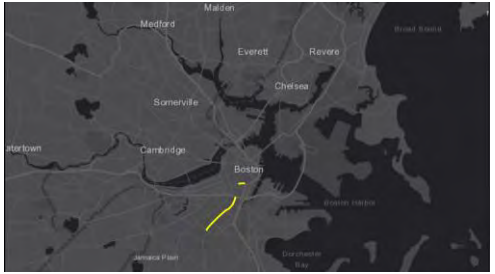
MBTA's Bus Priority Projects

Advance the Bus Priority Vision Plan to reduce bus rider delay through projects such as

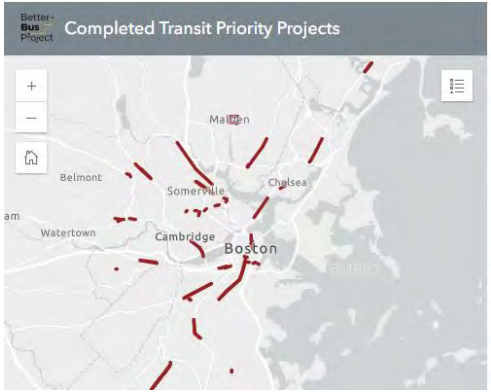
- Bus lanes
- Queue jumps
- Transit signal priority (TSP)

Growth of Bus Priority Projects in Greater Boston

- 40+ miles of bus lanes have been installed
- TSP has been activated at 85+ locations
- Collaboration is ongoing between MBTA and 12+ partner municipalities



*Bus lanes completed as of **2015***



*Bus lanes completed as of **2024***

Project Motivation: Critical Transit Connection

- **Crossroads for three busiest bus routes** servicing Brookline: 60, 65, and 66 - highest bus ridership in all of Brookline
- Route 66 is **the 2nd busiest line in the entire MBTA bus system**
- Critical connections to and from the **Longwood Medical Area**, the Green Line (D and E branches), and other transit services
- Gateway East is the **busiest section of roadway** in Brookline for MBTA buses

MBTA Bus Map

Project Motivation: Bus Ridership & Equity

Typical ridership on the Route 66 bus

- 55% are from households without vehicles
- 40% are from households with incomes of less than $43,500
- 40% are people of color
- 67% are women

Benefits nearly **15,000 daily riders** on Routes 60, 65, 66 – half of which travel through the Gateway East Corridor

During peak hours, the average 66 bus passing through the corridor has 35-45 riders - this means **multiple riders standing**

Route Number	Total Weekday	Through Riders
66*	**11,293**	5,086
65	**2,396**	1,833
60	**873**	343
Total	**14,562**	7,262

*__Second-highest ridership__ in entire MBTA bus system

Project Background

Gateway East, after
Photo Credit: Toole Design

Project Background

The **Gateway East Bus Lane Pilot** is a collaborative effort between MBTA, MassDOT, and The Town of Brookline to **build on the 2021 corridor reconstruction.**

One of principles the Brookline Transportation Board set for the Priority Bus Lane Pilot:

- **"To prioritize safe, space-efficient, and energy efficient movement of people and goods over the movement and parking of private vehicles when designing and improving our public ways** with particular focus on **high traffic routes connectivity and directness** consistent with Brookline Town meetings almost unanimously approval of Warrant Article 31 (WA31), titled as a "**resolution to respond to climate change by prioritizing health, access, and equity of Brookline's public ways**."

Gateway East, before

Pilot Performance Indicators

- User Feedback Surveys
- MBTA Bus Travel Time
- MBTA Bus Travel Time Variability
- Volume and Speed tracked on Boylston St, Secondary Roads, and Residential Side Streets
- Vehicle Travel Times and Control Delay
- Queue Length Analysis

Gateway East, after
Photo Credit: Toole Design

Project Timeline

2020: Collaborative planning effort began.

2021: Brookline Transportation Board authorized Gateway East Bus Priority Lane Pilot project, funded by the MBTA.

2024: Dedicated bus lanes were implemented on Washington St between Station St and the Town Line in both directions.

2024-2025: The pilot is expected to run for one year between August 2024 and July 2025 (note: bus lane installation occurred 6/24/2024 to 9/26/2024).

Quarterly evaluations of the pilot's impacts on bus travel times and car traffic are being conducted by Arcadis and Toole Design Group.

Gateway East, before

Gateway East, after

Gateway East, after
Photo Credit: Toole Design

Project Status

Project Status & Operations

- **Construction – Markings & Signs Completed late September**
    - Installation period extended well into the Q1 analysis period, ending 9/26/24 due to delays with signage installation
- **Traffic Signals – New Signaling System Not Currently Activated**
    - Due to technical difficulties with the vendor, the Adaptive Signal System with Transit Signal Priority is only in partial operation.

Quarter 1 should be viewed as an adjustment period due to the conditions listed above.

Project Status & Operations

- **Enforcement**
  - Start of enforcement postponed due to delays with signage installation
  - Provided time for drivers to adjust
  - BPD is working on an enforcement program. MBTA provided educational flyer that explains regulations & how to turn across bus lanes
- **Other Factors Affecting Local Travel Patterns**
  - The **Pierce School closure** may explain reduced traffic on Cypress St and increased traffic on Walnut St, as the school was relocated to the old Lincoln School between Boylston St and Walnut St

Gateway East, after
Photo Credit: Toole Design

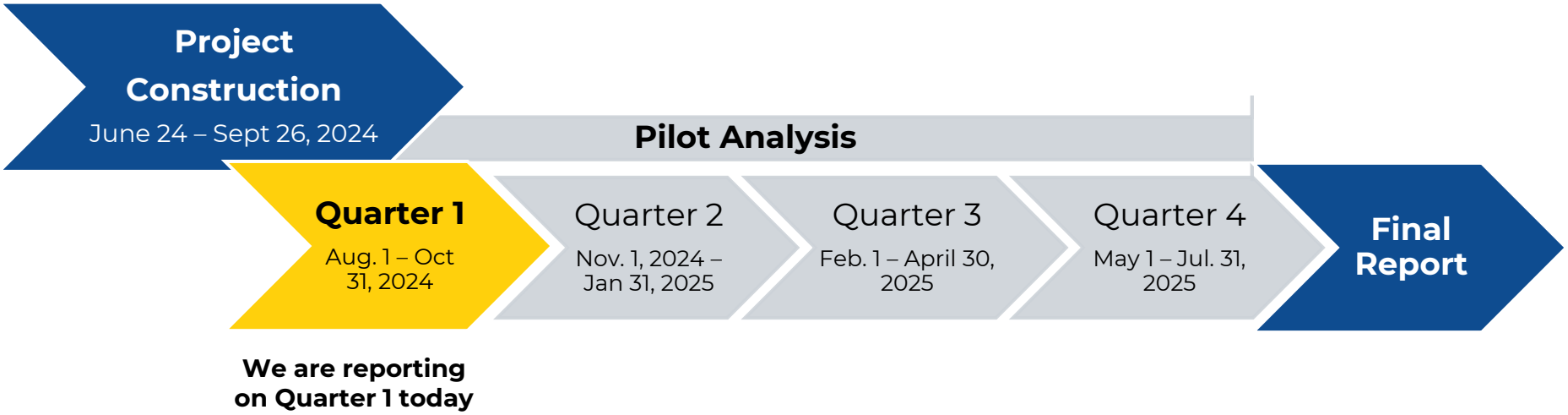
Quarter 1 should be viewed as an adjustment period due to the conditions listed above.

Public Feedback - Gateway East Bus Lane Pilot Survey

- The survey was launched in mid-November and promoted through various channels, including:
  - DPW and Town social media
  - The Town Administrators' Newsletter
  - The Longwood Collective Newsletter
  - Eye-catching yard signs along the corridor
- As of December 4th , we've received 214 responses – Thank you for your feedback!
- The survey remains open for the duration of the pilot and we'd love to hear from you! Haven't taken the survey? Go to: https://www.surveymonkey.com/r/CN3S9WZ
- Survey responses can be found in the appendix.

Gateway East, after
Photo Credit: Toole Design

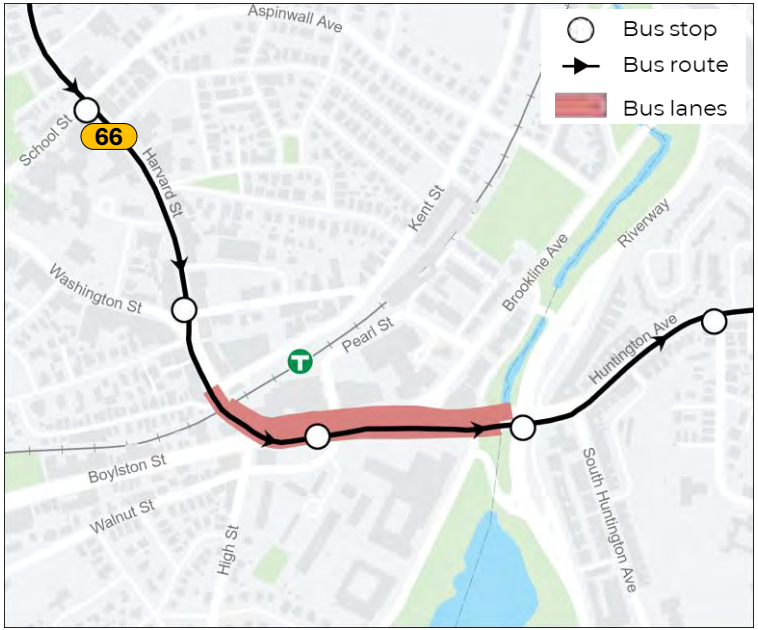
Pilot Analysis Schedule



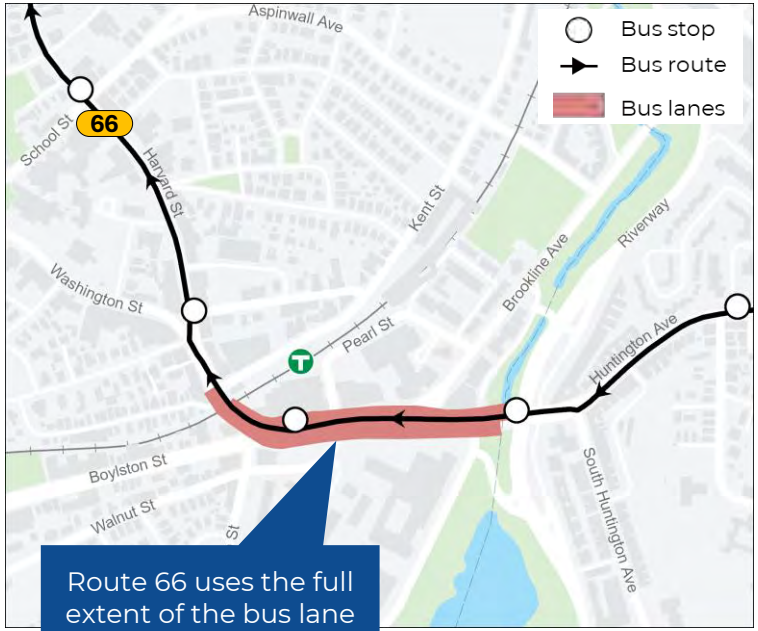
Quarter 1 Findings

Bus Routing Through the Project Area

66 Inbound

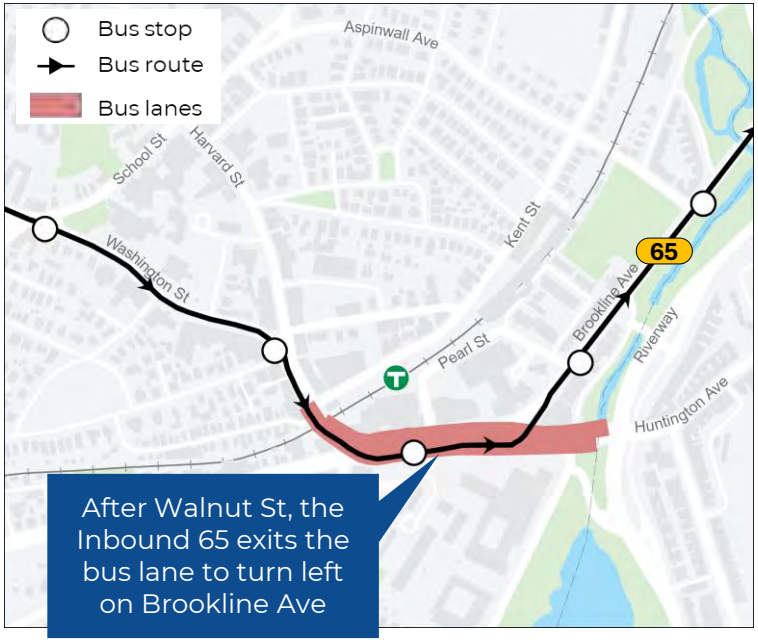


66 Outbound

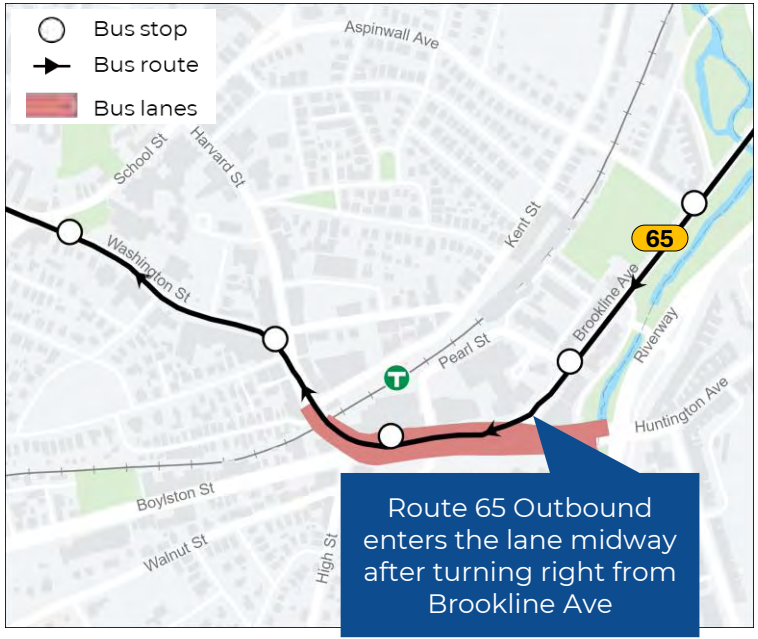


Bus Routing Through the Project Area

65 Inbound

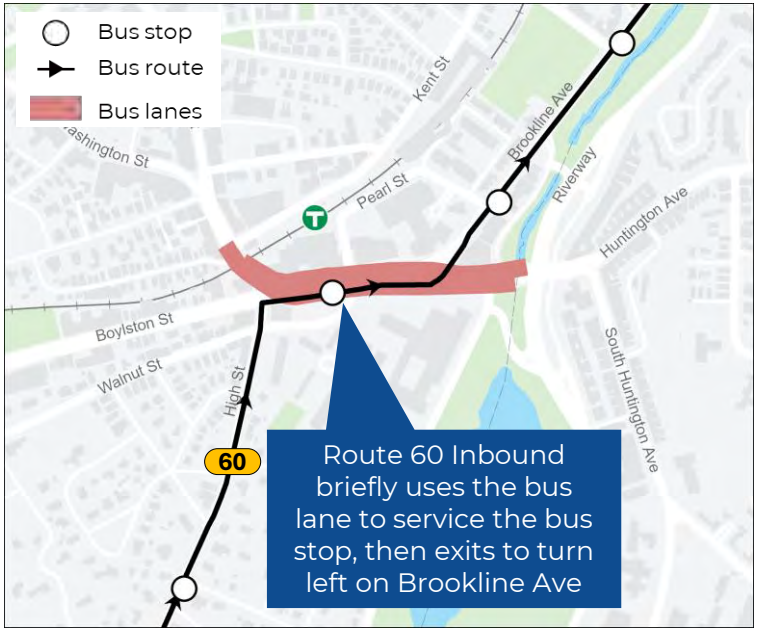


65 Outbound

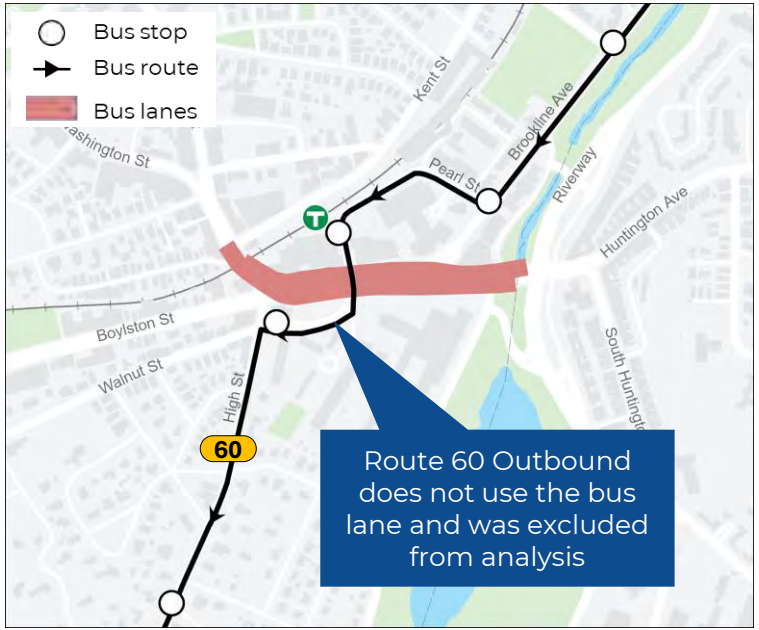


Bus Routing Through the Project Area

60 Inbound



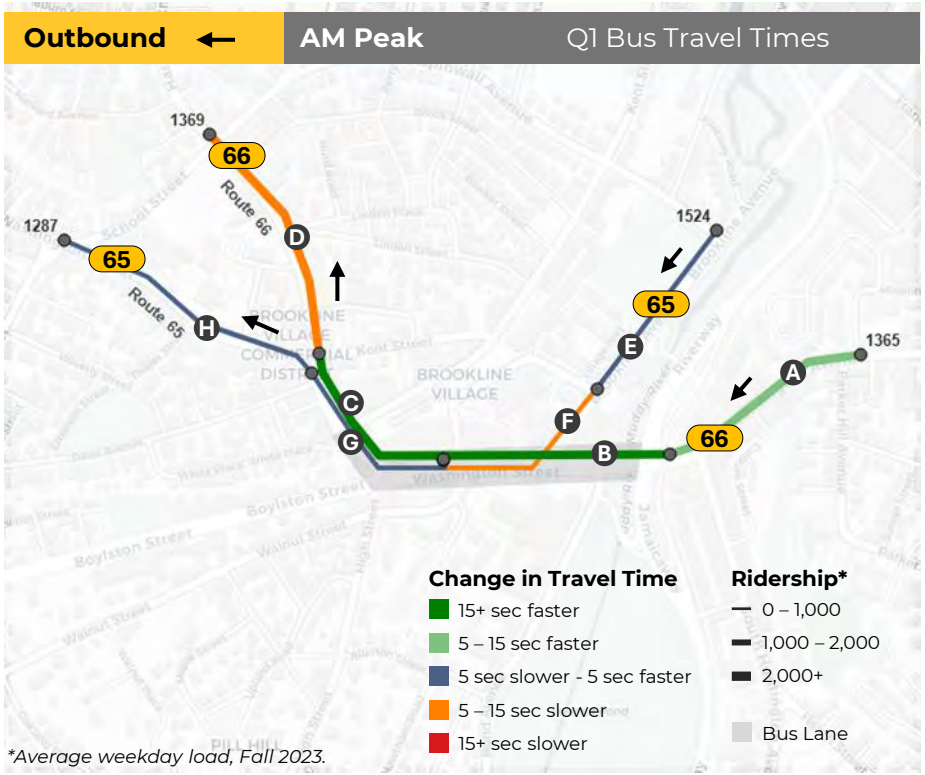
60 Outbound



Bus Travel Times

Gateway East, after
Photo Credit: Toole Design

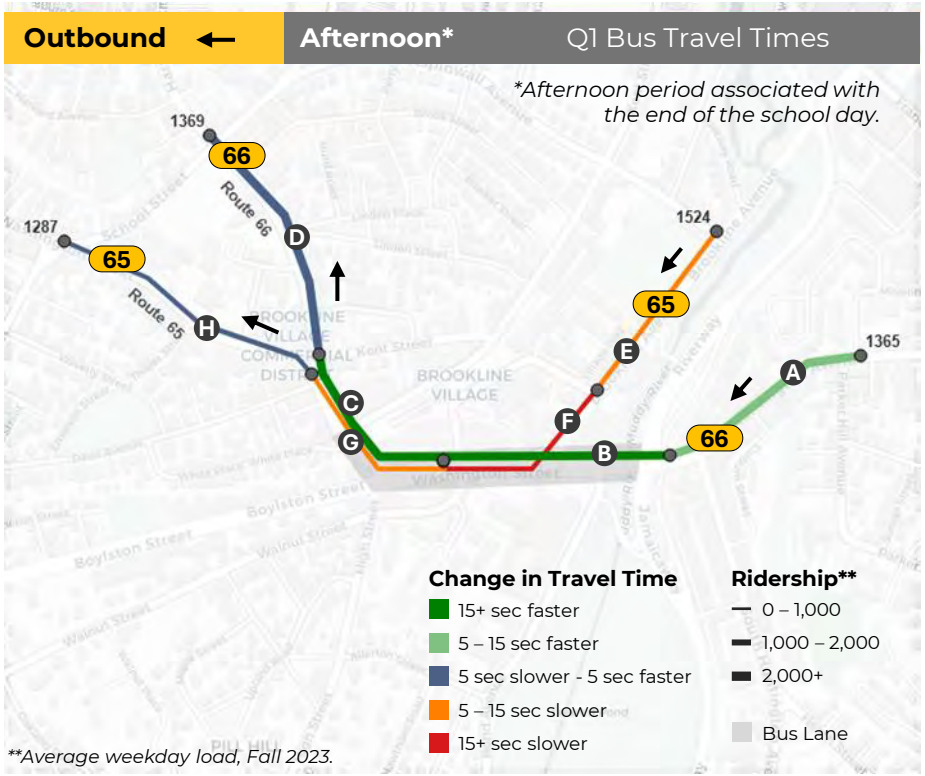
Has travel time improved for bus riders?



Median Stop-to-Stop Bus Travel Time

Segment	Baseline (min)	Q1 (min)	Change (sec)
Route 66			
Full corridor	8:23	7:46	-37
A	2:05	1:59	-6
B	2:15	1:55	-20
C	2:04	1:34	-30
D	1:54	2:05	+11
Route 65			
Full corridor	5:33	5:44	+11
E	1:07	1:12	+5
F	1:37	1:45	+8
G	1:32	1:34	+2
H	1:03	1:04	+1

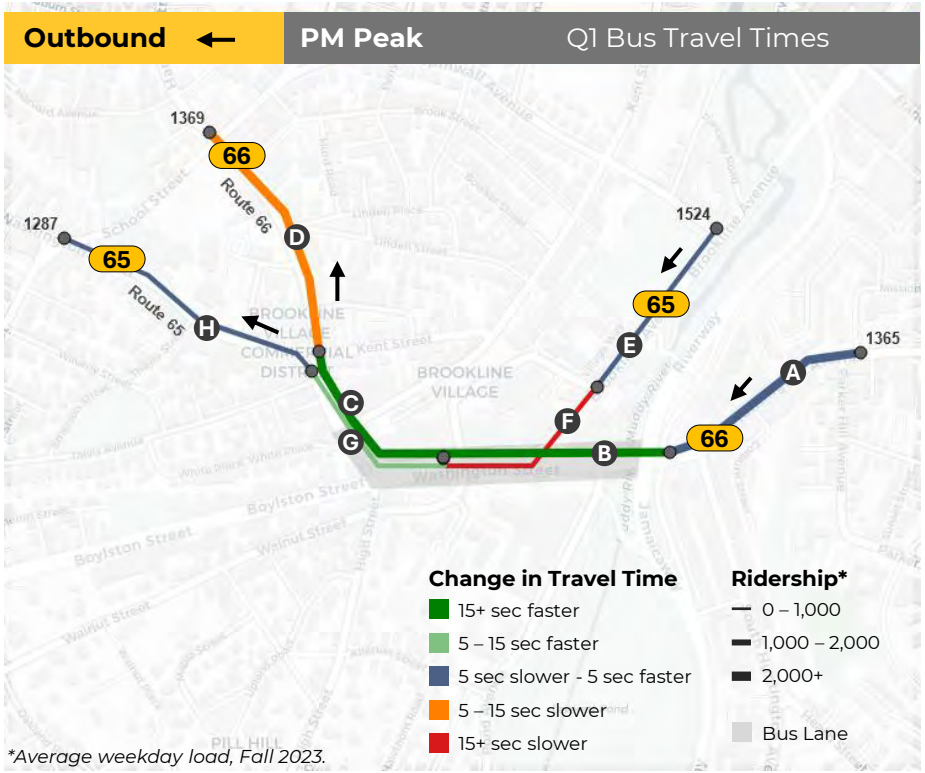
Has travel time improved for bus riders?



Median Stop-to-Stop Bus Travel Time

Segment	Baseline (min)	Q1 (min)	Change (sec)
Route 66			
Full corridor	8:25	7:25	-60
A	2:06	1:58	-8
B	2:20	1:55	-25
C	1:48	1:30	-18
D	1:59	2:00	+1
Route 65			
Full corridor	6:02	6:34	+33
E	1:15	1:24	+9
F	1:36	1:56	+20
G	1:43	1:54	+11
H	1:03	1:05	+2

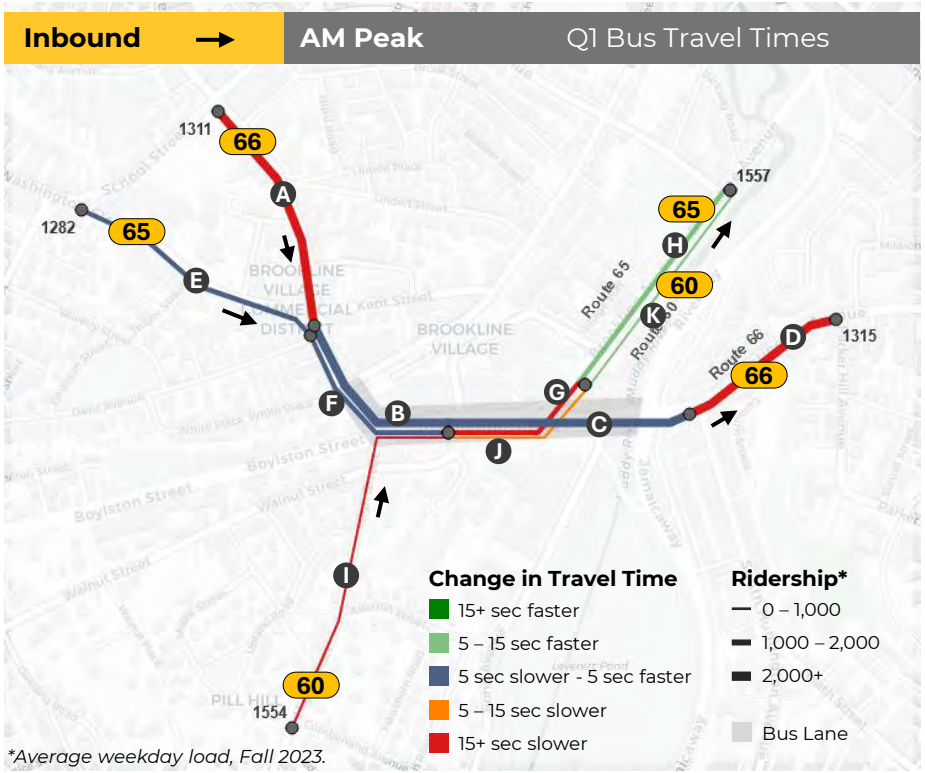
Has travel time improved for bus riders?



Median Stop-to-Stop Bus Travel Time

Segment	Baseline (min)	Q1 (min)	Change (sec)
Route 66			
Full corridor	8:39	8:10	-29
A	2:03	2:05	+2
B	2:39	1:59	-40
C	1:49	1:28	-21
D	2:04	2:11	+7
Route 65			
Full corridor	6:34	6:41	+7
E	1:18	1:21	+3
F	1:49	2:14	+25
G	1:56	1:48	-8
H	1:08	1:06	-2

Has travel time improved for bus riders?

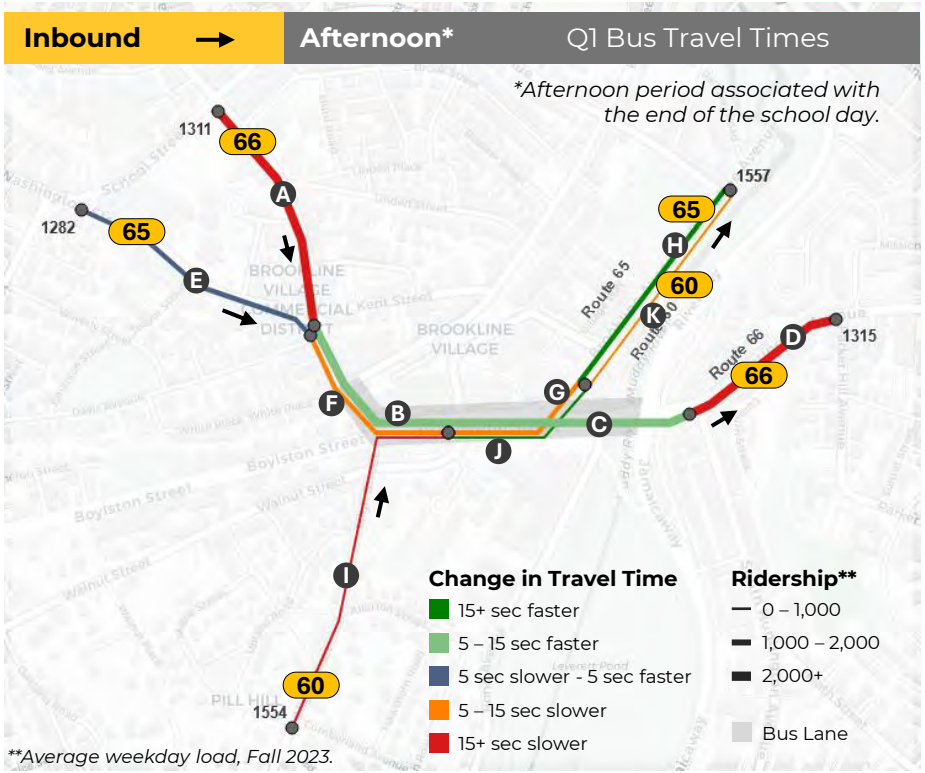


*Average weekday load, Fall 2023.

Median Stop-to-Stop Bus Travel Time

Segment	Baseline (min)	Q1 (min)	Change (sec)
Route 66			
Full corridor	8:05	9:03	+58
A	1:14	1:48	+34
B	2:34	2:32	-2
C	1:39	1:40	+1
D	2:22	2:38	+16
Route 65			
Full corridor	7:05	7:06	+1
E	1:15	1:18	+3
F	2:26	2:26	0
G	1:38	2:08	+30
H	1:06	0:54	-12
Route 60			
Full corridor	6:25	7:20	+55
I	3:10	4:02	+52
J	1:50	1:58	+8
K	1:12	1:01	-11

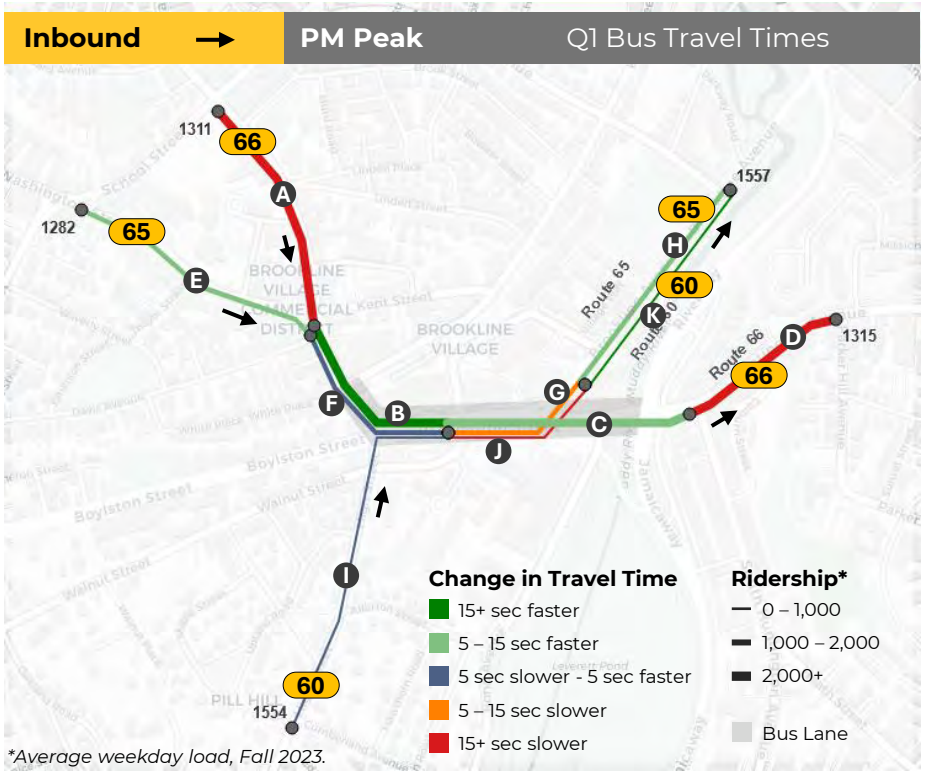
Has travel time improved for bus riders?



Median Stop-to-Stop Bus Travel Time

Segment	Baseline (min)	Q1 (min)	Change (sec)
Route 66			
Full corridor	8:09	8:48	+40
A	1:39	2:11	+32
B	2:59	2:47	-13
C	1:37	1:32	-6
D	1:46	2:17	+31
Route 65			
Full corridor	6:54	6:38	-16
E	1:21	1:25	+4
F	2:19	2:26	+8
G	1:36	1:47	+11
H	0:60	0:43	-17
Route 60			
Full corridor	5:41	5:50	+9
I	2:24	2:40	+16
J	2:14	1:52	-22
K	0:50	0:56	+6

Has travel time improved for bus riders?



Median Stop-to-Stop Bus Travel Time

Segment	Baseline (min)	Q1 (min)	Change (sec)
Route 66			
Full corridor	8:42	9:06	+24
A	1:41	2:16	+35
B	3:15	2:55	-20
C	1:51	1:41	-10
D	1:47	2:16	+29
Route 65			
Full corridor	7:08	6:35	-33
E	1:25	1:18	-7
F	2:17	2:17	0
G	1:42	1:48	+6
H	1:02	0:51	-11
Route 60			
Full corridor	6:02	6:05	+3
I	2:43	2:47	+4
J	1:28	2:12	+44
K	1:27	0:53	-34

Key Findings – Q1 Bus Service

Travel Time

- The **segments with bus lanes are seeing the most improvement**, compared to study area segments where buses travel in mixed traffic.
- Results on the Route 66 are promising so far (in bus lane segments)
    - Route 66 is a good lens to view the project through: it has 77% of the ridership, and is the only bus route that travels the full project corridor in both directions.
- The 65 and 60 routes have more mixed results, but their use of the project corridor is more limited. Further insights expected as monitoring continues.

Travel Time Variability

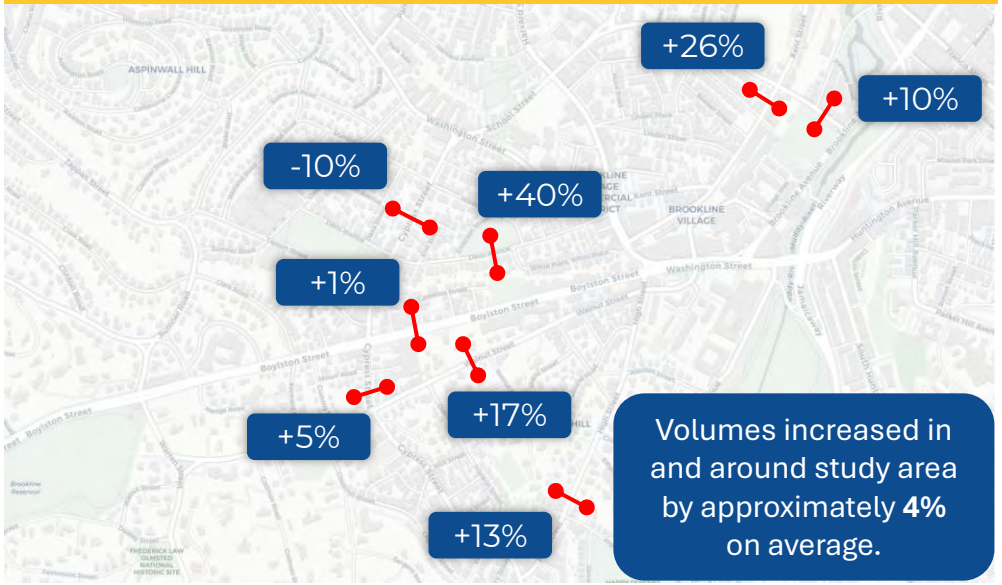
- The **improvements are notable** for such a short corridor.

Vehicle Volumes & Speeds

Gateway East, after
Photo Credit: Toole Design

Has the project impacted traffic on secondary streets and residential side streets?

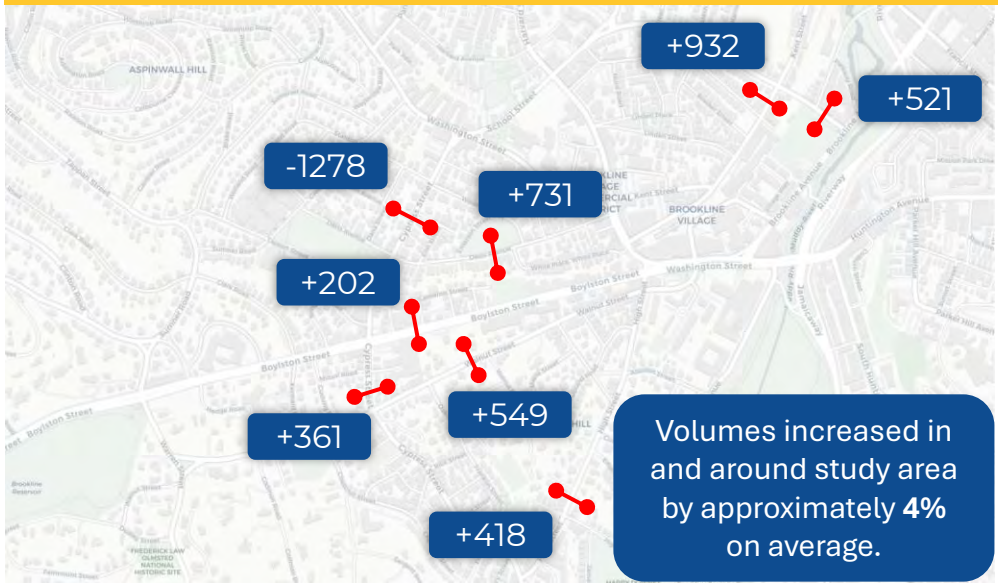
Q1 Average Daily Traffic (ADT) Volume Change – Percentage



- Traffic on Route 9 **remained relatively constant** with **moderate increase** of traffic on side streets
- Some fluctuation with speeds, but in general **most observed speeds decreased**
- Could be options for **traffic calming** in the future if trends don't correct
- Nearby traffic patterns: **Pierce School** closed for construction and relocated to Old Lincoln School on Boylston St/Walnut St

Has the project impacted traffic on secondary streets and residential side streets?

Q1 Average Daily Traffic (ADT) Volume Change - Volumes



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- Nearby traffic patterns: **Pierce School** closed for construction and relocated to Old Lincoln School on Boylston St/Walnut St

Has the project impacted speed on side streets?

Northbound/Eastbound

Location	NB/EB **50th** Percentile Speeds (MPH)			NB/EB **85th** Percentile speeds (MPH)		
	Baseline Sept 2023	**Q1 Speeds Oct 2024**	**Change**	Baseline Sept 2023	**Q1 Speeds Oct 2024**	**Change**
Aspinwall Ave, between Brookline Ave & Kent St	20.2	**17.4**	**-13.9%**	24.7	**23.0**	**-7.1%**
Kent St, between Aspinwall Ave & Brook St	18.0	**17.3**	**-4.0%**	24.1	**23.7**	**-2.0%**
Davis Ave, between Cypress St & Washington St	22.7	**20.7**	**-8.7%**	27.7	**24.8**	**-10.4%**
Cypress St, between Davis Ave & Gorham Ave	21.4	**20.4**	**-4.4%**	26.4	**24.7**	**-6.5%**
Cypress St, between Boylston St & Walnut St	19.5	**19.8**	**+1.6%**	24.1	**24.2**	**+0.3%**
Boylston St (Rt 9), between Cypress St & High St	28.8	**28.1**	**-2.6%**	34.6	**35.8**	**+3.4%**
Walnut St, between Cypress St & High St	23.5	**21.4**	**-8.9%**	28.4	**25.1**	**-11.7%**
High St, between Cumberland Ave & Edgehill Rd	22.6	**26.1**	**+15.2%**	27.4	**29.9**	**+9.0%**

Speed % Change Key:

<-10%	-10% to -5%	-5% to -1%	-1% to +1%	0% to +5%	+5% to +10%	>+10%

Some fluctuation with speeds, but in general most observed speeds have decreased

Has the project impacted speed on side streets?

Southbound/Westbound

Location	SB/WB **50th** Percentile Speeds(MPH)			SB/WB **85th** Percentile speeds (MPH)		
	Baseline Sept 2023	**Q1 Speeds Oct 2024**	**Change**	Baseline Sept 2023	**Q1 Speeds Oct 2024**	**Change**
Aspinwall Ave, between Brookline Ave & Kent St	20.5	**20.0**	**-2.4%**	24.9	**24.1**	**-3.2%**
Kent St, between Aspinwall Ave & Brook St	21.8	**21.7**	**-0.3%**	26.1	**25.4**	**-3.0%**
Davis Ave, between Cypress St & Washington St	21.3	**18.3**	**-14.1%**	26.1	**23.2**	**-11.0%**
Cypress St, between Davis Ave & Gorham Ave	19.3	**19.7**	**+1.9%**	24.8	**25.2**	**+1.9%**
Cypress St, between Boylston St & Walnut St	18.1	**17.7**	**-2.3%**	23.7	**23.5**	**-0.7%**
Boylston St (Rt 9), between Cypress St & High St	29.2	**27.5**	**-5.6%**	35.8	**34.4**	**-3.9%**
Walnut St, between Cypress St & High St	22.6	**20.9**	**-7.5%**	27.3	**24.7**	**-9.4%**
High St, between Cumberland Ave & Edgehill Rd	23.6	**24.7**	**+4.5%**	28.4	**28.9**	**+1.9%**

Speed % Change Key:

<-10%	-10% to -5%	-5% to -1%	-1% to +1%	0% to +5%	+5% to +10%	>+10 %

Some fluctuation with speeds, but in general most observed speeds have decreased

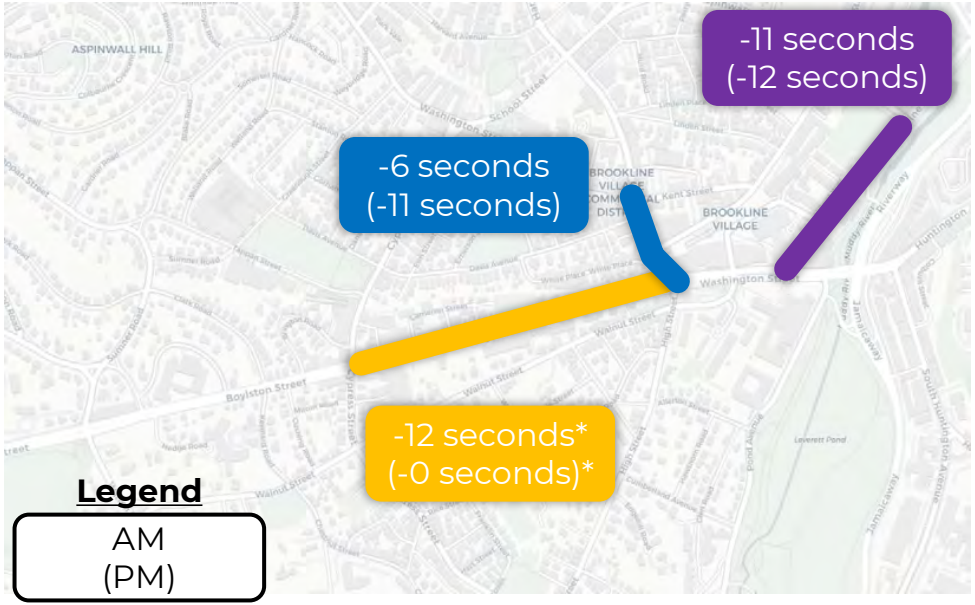
Vehicle Travel Times & Control Delay

Gateway East, after
Photo Credit: Toole Design

Has the project created impacts to general purpose traffic?

1. Boylston St eastbound between Cypress St and High St (**orange**)
2. Washington St southbound between Boylston St and Harvard St (**blue**)
3. Brookline Ave northbound between Aspinwall Ave and Washington St (**purple**)

Has the project created impacts to general purpose traffic?



- Intersection delay either remains constant or decreases slightly
- *Data may be affected by INRIX platform limitations, but does not indicate significant increases in vehicle delay

Corridor Travel Time

Boylston Street & Brookline Avenue between Sumner Street and Aspinwall Avenue

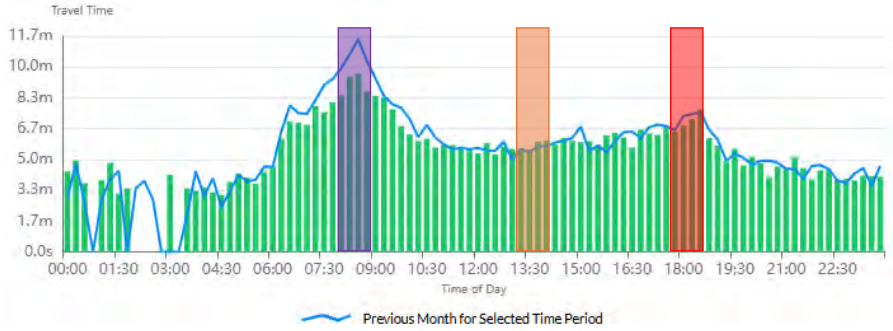
Approximately 1.2 miles

Includes all three intersections in project area

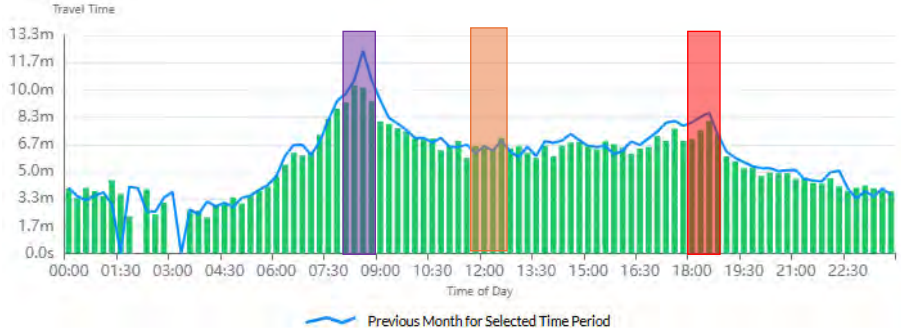
Q1 Travel Time - Boylston Street and Brookline Avenue inbound between Sumner Street and Aspinwall Avenue

Average Travel Time over Time of Day

Baseline



Quarter 1



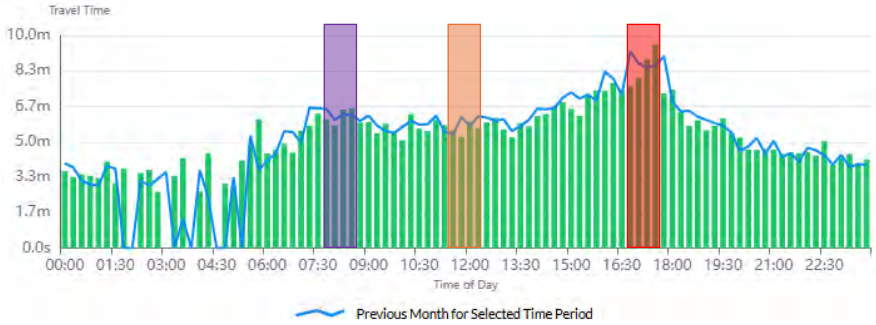
Period	Baseline Travel Time	Quarter 1 Travel Time
AM Peak Hour	9.0 minutes	9.7 minutes
MD Peak Hour	5.7 minutes	6.6 minutes
PM Peak Hour	7.0 minutes	7.5 minutes

Approximately 30-60 second increase in travel time for vehicles travelling through all project area intersections

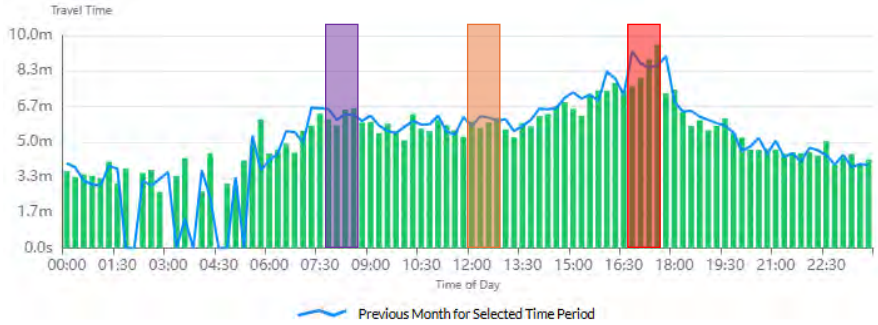
Q1 Travel Time - Boylston Street and Brookline Avenue outbound between Sumner Street and Aspinwall Avenue

Average Travel Time over Time of Day

Baseline



Quarter 1



Period	Baseline Travel Time	Quarter 1 Travel Time
AM Peak Hour	6.2 minutes	6.0 minutes
MD Peak Hour	5.5 minutes	5.9 minutes
PM Peak Hour	8.5 minutes	8.8 minutes

Approximately 10-30 second increase in travel time for vehicles travelling through all project area intersections

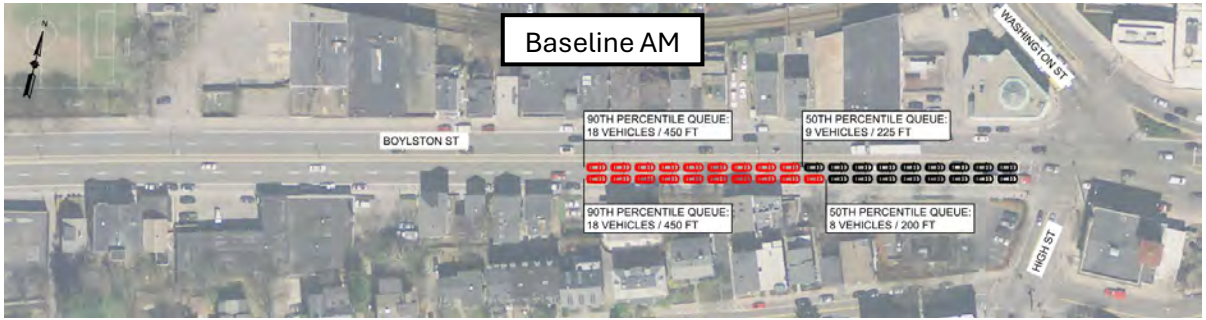
Queuing Data

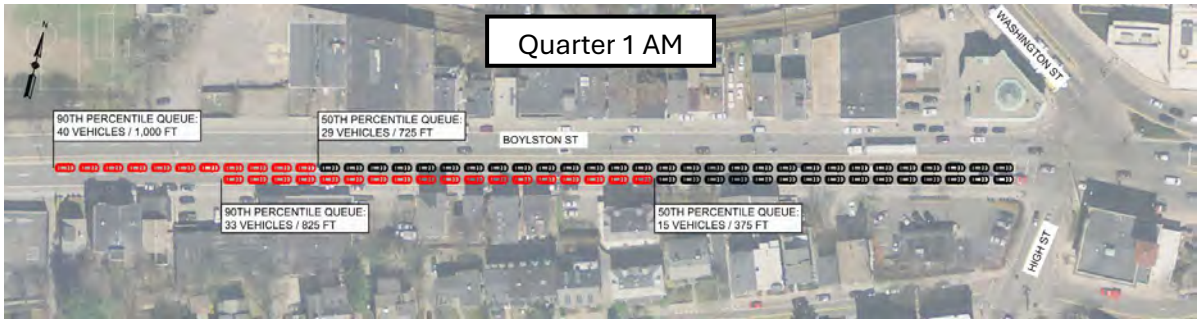
Gateway East, after
Photo Credit: Toole Design

Has the project created impacts to queuing at three major approaches?

- Vehicle queues generally increased, with greatest increase observed on Route 9.
- Minimal increased delay and constant vehicle volumes indicates that while queues may be longer, the bus lanes have not reduced the ability for vehicles to travel through the project area.

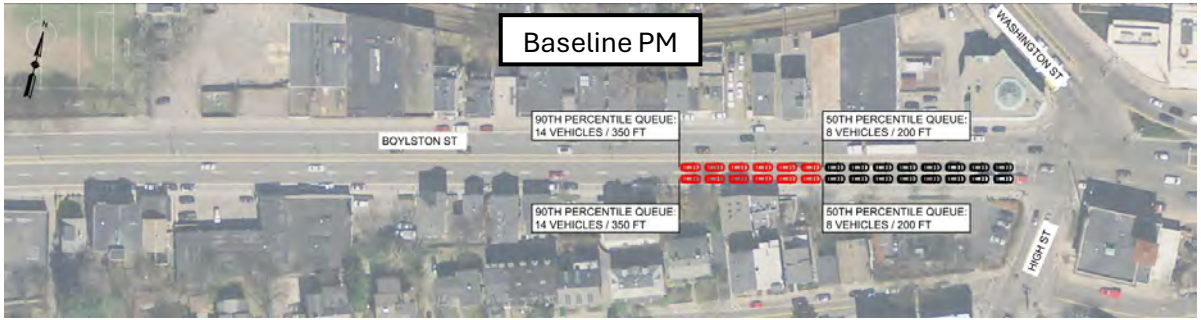
Boylston Street (Rt 9), approaching Washington Street, AM

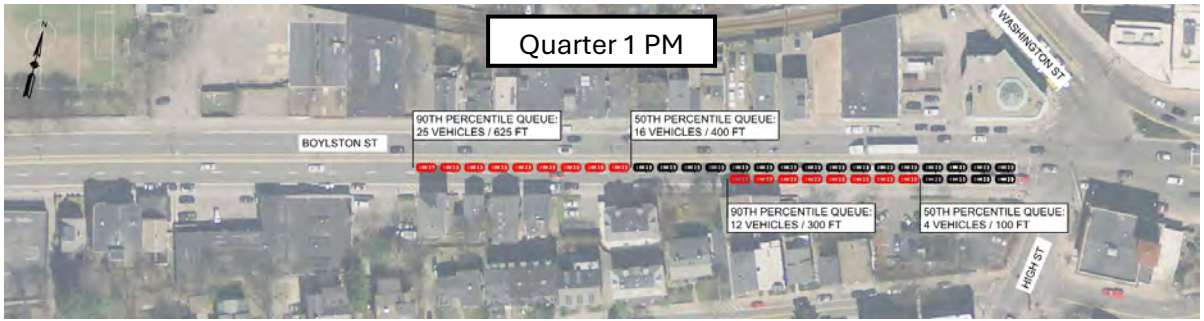




- Significant increase in AM vehicle queues

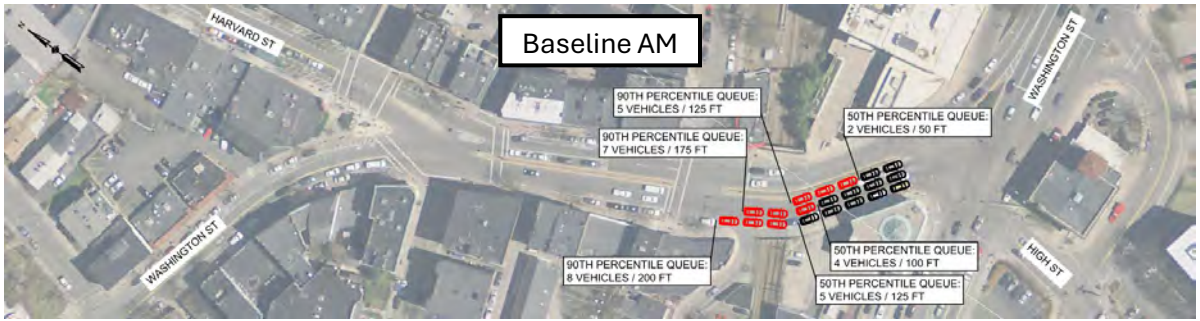
Boylston Street (Rt 9), approaching Washington Street, PM

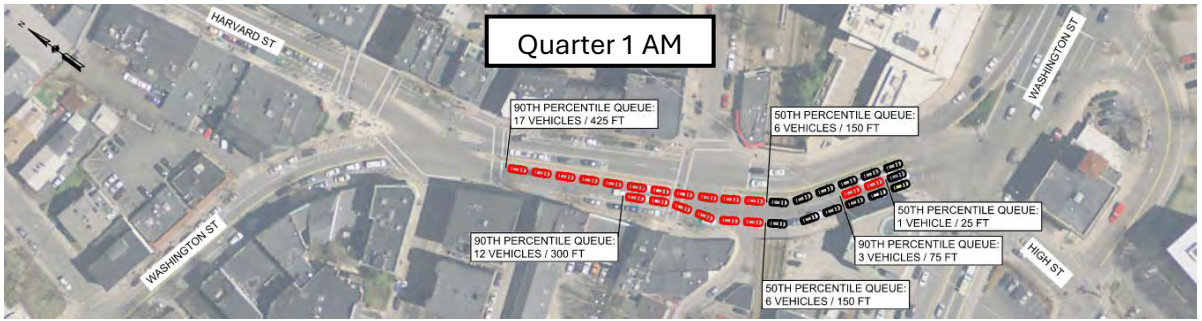




- Slight increase in PM vehicle queues

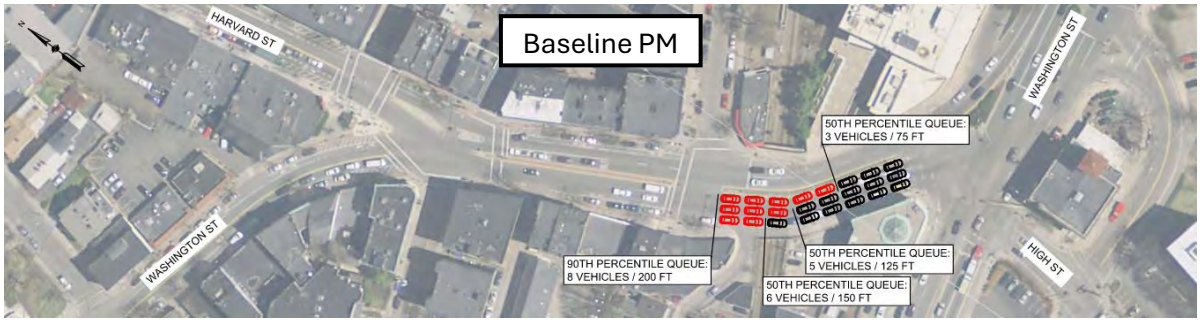
Washington Street, approaching Boylston Street (Rt 9), AM

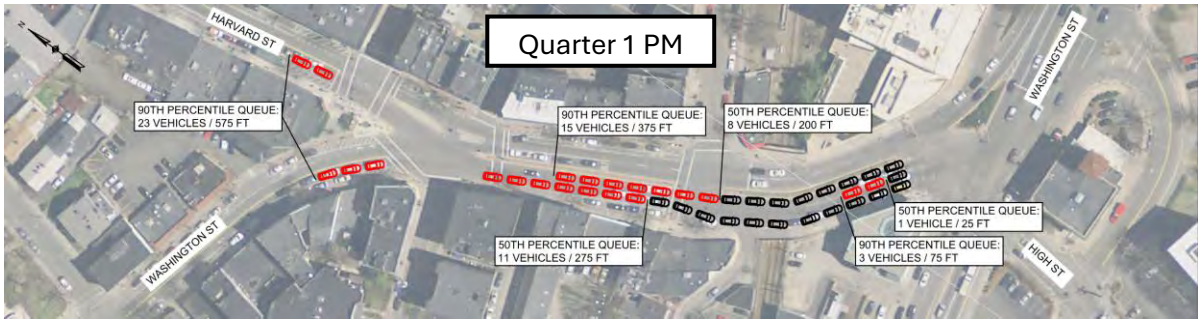




- Increase in AM vehicle queues

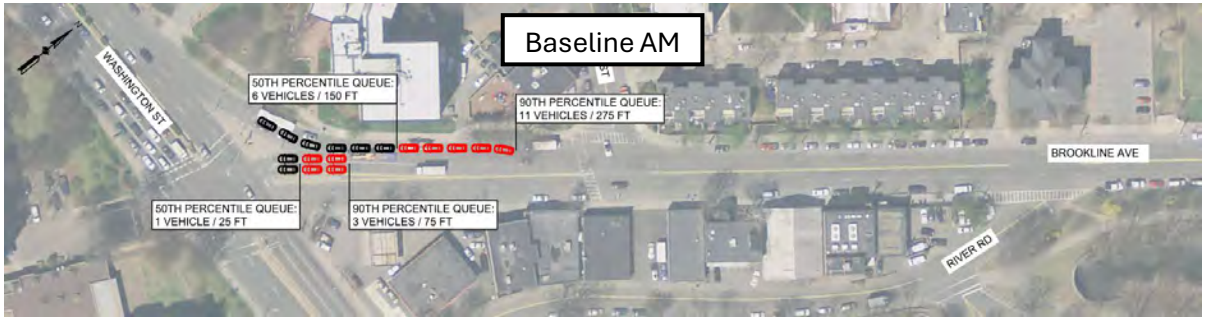
Washington Street, approaching Boylston Street (Rt 9), PM





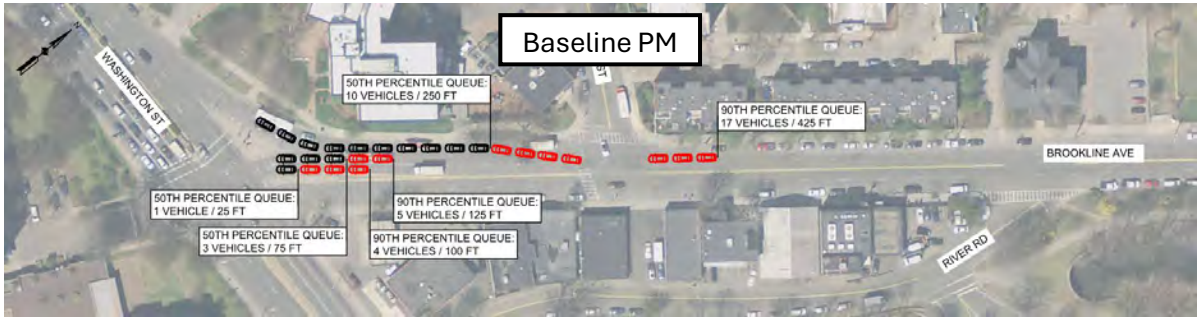
- Increase in PM vehicle queues

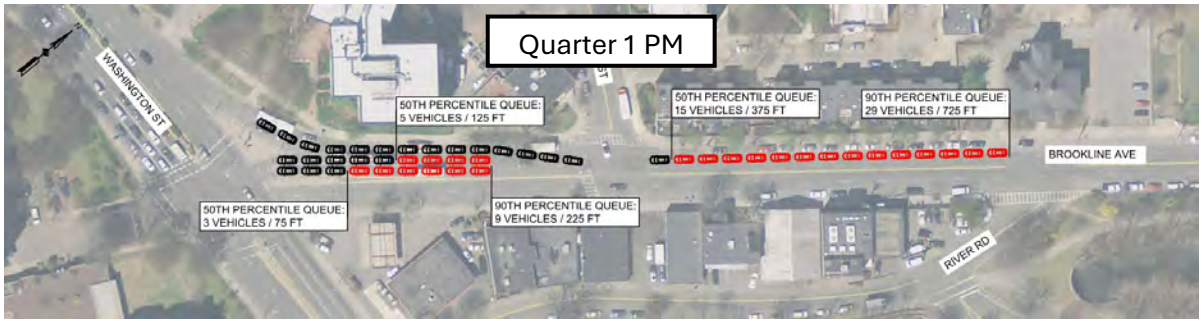
Brookline Avenue, approaching Washington Street (Rt 9), AM



- Slight decrease in AM vehicle queues

Brookline Avenue, approaching Washington Street (Rt 9), PM





- Increase in PM vehicle queues

Summary & Next Steps

Gateway East, after
Photo Credit: Toole Design

Quarter 1 Summary

- **Bus Travel Times & Variability** improvements observed on the 66 in the bus lanes.
- **Vehicle Volumes** on Rt 9 were relatively constant with moderate increase of volumes on side streets. Most observed **speeds have decreased.**
- **Vehicle Travel Times:** intersection delay remains constant
- **Vehicle Queue Lengths** have generally increased particularly on Rt 9. However, queue lengths remain below the predictions outlined in the Bus Lane Traffic Impact Study.
- **User Feedback Surveys** will remain open throughout the pilot.

*Q1 should be viewed as an adjustment period due to factors such as delay with **bus lane implementation and enforcement** likely contributing to results.*

Next Steps

- **Continue monitoring** & reporting quarterly throughout pilot duration
  - **Next report - Winter 2025: Quarter 2 (Nov. 1, 2024 – Jan. 31, 2025)**
  - Spring 2025: Quarter 3 (Feb. 1, 2025 – April 30, 2025)
  - Summer 2025: Quarter 4 (May 1, 2025 – July 31, 2025)
  - Summer/Fall 2025: Final Report
- MBTA continue coordination with **adaptive signal system** vendor
- Brookline continue coordination with BPD on **education & enforcement**

Appendix

Data Collection Schedule

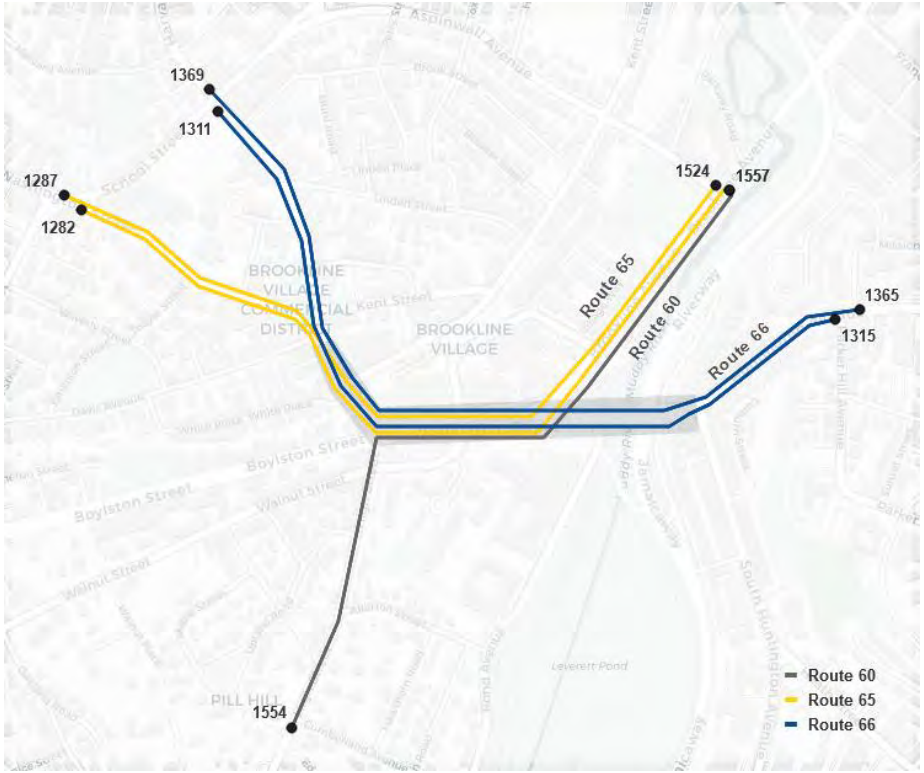
Period	Period Dates*	Traffic Count Dates	INRIX Dates	Queuing Dates
Baseline	Aug 1 – Oct 31, 2023	Sep 26-28, 2023	Jun 2024**	May 18, 2021***
Quarter 1	**Aug 1 – Oct 31, 2024**	**Oct 8-10, 2024**	**Oct 2024**	**Dec 3 2024**
Quarter 2	Nov 1, 2024 – Jan 31, 2025	Jan 2025	Jan 2025	
Quarter 3	Feb 1 – Apr 30, 2025	Apr 2025	Apr 2025	
Quarter 4	May 1 – Jul 30, 2025	Jul 2025	Jul 2025	

**APC data for travel time analysis collected over entire period.*
***INRIX Blackout from 6/2023 – 2/2024*
****Baseline queue data may be affected by decreased traffic in wake of COVID-19 pandemic*

Appendix A

Bus Service Complete Results

Analysis Area



Route 60 inbound between High St at Cumberland Ave (1554) and Brookline Ave opposite Aspinwall Ave (1557)

Route 65 inbound between Washington St at Cypress St (1282) and Brookline Ave at Aspinwall Ave (1557)

Route 65 outbound between Brookline Ave at Aspinwall Ave (1524) and Washington St at School St (1287)

Route 66 inbound between Harvard St at School St (1311) and Huntington Ave at Parker Hill Ave (1315)

Route 66 outbound between Huntington Ave opposite Parker Hill Ave (1365) and Harvard St at Aspinwall Ave (1369)

Data

- All analysis was completed using stop arrival and departure times in **automatic passenger counter (APC)** data.
- Data was collected for **weekdays** from August 1 through October 31, 2025.
- MBTA-defined **time periods**:
  - AM Peak: 7:00 AM to 9:00 AM
  - Afternoon: 2:00 PM to 4:00 PM*
  - PM Peak: 4:00 PM to 7:00 PM

*Associated with the end of the school day.

Metrics

Travel Time	Variability (MBTA Metric)	Travel Time Quality of Service (TTQOS)	Travel Time Variability Quality of Service (TTVQOS)
Median travel time of a vehicle over a segment at a given time.	**Relative difference** between the median and 90th percentile of travel times.	Letter grade (A to E) for **how much delay** vehicles experience on average over a segment at a given time.	Letter grade (A to E) for **how consistent** vehicle travel time is over a segment at a given time.

Metrics

$$\text{TTQOS} = \frac{\text{average travel time } (\textit{observed})}{\text{reference travel time*}}$$

$$\text{TTVQOS} = \frac{\text{standard deviation travel time } (\textit{observed})}{\text{average travel time } (\textit{observed})}$$

TTQOS and TTVQOS Letter Grade Descriptions

Grade	Metric Upper Threshold		Representative Bus Service
	TTQOS	TTVQOS	
A	1.4	1.4	Fully grade-separated
B	1.8	2.7	Reserved right-of-way, subject to traffic signal control
C	2.4	3.8	Mixed traffic, little to no traffic congestion
D	3.0	5.1	Mixed traffic, modest traffic congestion
E	4.0	8.0	Mixed traffic, moderate traffic congestion
F	N/A	N/A	*Perceived as too slow to be a good travel choice*

**Based on segment length.*

Bus Service - Baseline Complete Results

Travel Times, Dwell, and QOS Ratios | Time Period: AM Peak

Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	1554	1555	190.0	492.9	13.0	23.0	91%	1.59	5.5	F	8.1	F
		1555	1556	110.0	173.3	9.0	20.0	56%	0.58	3.7	E	4.4	D
		1556	1557	72.0	130.2	11.0	19.4	47%	0.81	2.2	C	5.3	E
		1554	**1557**	**385.0**	**752.6**	**11.0**	**19.4**	**47%**	**0.95**	**3.9**	**E**	**6.1**	**E**
65	inbound	1282	1283	75.0	122.6	12.0	26.0	71%	0.63	2.1	C	3.3	C
		1283	1555	146.0	242.0	13.0	25.0	84%	0.66	4.7	F	4.8	D
		1555	1556	98.0	206.6	9.0	16.0	51%	1.11	3.9	E	5.7	E
		1556	1557	66.0	140.0	9.0	14.0	24%	1.12	2.1	C	4.5	D
		1282	**1557**	**425.0**	**572.2**	**9.0**	**14.0**	**24%**	**0.35**	**3.1**	**E**	**3.7**	**C**
65	outbound	1524	1525	67.0	102.0	8.0	14.0	54%	0.52	2.0	C	2.9	C
		1525	1526	97.0	160.0	9.0	17.0	65%	0.65	3.0	E	4.1	D
		1526	1286	92.0	153.0	9.0	13.0	57%	0.66	3.2	E	3.5	C
		1286	1287	63.0	98.4	8.0	14.0	24%	0.56	1.9	C	2.7	B
		1524	**1287**	**333.0**	**445.2**	**8.0**	**14.0**	**24%**	**0.34**	**2.5**	**D**	**2.9**	**C**
66	inbound	1311	1313	74.0	125.0	14.0	31.0	88%	0.69	2.2	C	3.6	C
		1313	1555	154.0	242.6	15.0	34.0	87%	0.58	5.0	F	4.9	D
		1555	1314	99.0	150.2	14.0	28.0	93%	0.52	3.1	E	3.8	C
		1314	1315	142.0	222.0	18.0	52.3	94%	0.56	4.3	F	3.8	D
		1311	**1315**	**485.0**	**667.8**	**18.0**	**52.3**	**94%**	**0.38**	**3.6**	**E**	**3.7**	**C**
66	outbound	1365	1366	125.0	195.0	14.0	34.0	88%	0.56	3.6	E	3.7	C
		1366	1526	135.0	211.0	13.0	23.0	94%	0.56	4.0	E	3.9	D
		1526	1367	124.0	186.0	12.0	20.0	83%	0.50	3.7	E	3.9	D
		1367	1369	114.0	203.1	11.0	19.5	79%	0.78	3.3	E	4.5	D
		1365	**1369**	**502.5**	**695.0**	**11.0**	**19.5**	**79%**	**0.38**	**3.7**	**E**	**3.8**	**C**

**Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).*

Travel Times, Dwell, and QOS Ratios | Time Period: Afternoon

Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	1554	1555	144.0	249.0	11.0	19.0	86%	0.73	3.4	E	5.0	D
		1555	1556	134.0	185.0	10.0	16.0	64%	0.38	4.1	F	4.5	D
		1556	1557	50.0	128.0	9.0	14.0	5%	1.56	1.8	C	4.6	D
		1554	**1557**	**341.0**	**435.5**	**9.0**	**14.0**	**5%**	**0.28**	**3.1**	**E**	**3.4**	**C**
65	inbound	1282	1283	81.0	145.3	12.0	33.0	64%	0.79	2.4	C	3.5	C
		1283	1555	138.5	216.6	12.0	20.6	78%	0.56	4.3	F	4.1	D
		1555	1556	96.0	203.3	10.0	16.9	53%	1.12	3.6	E	5.1	D
		1556	1557	59.5	134.3	7.0	13.6	12%	1.26	1.9	C	4.7	D
		1282	**1557**	**414.0**	**559.6**	**7.0**	**13.6**	**12%**	**0.35**	**3.0**	**D**	**3.3**	**C**
65	outbound	1524	1525	75.0	112.2	10.0	23.8	64%	0.50	2.3	C	2.9	C
		1525	1526	96.0	171.2	12.0	24.0	81%	0.78	3.2	E	4.0	D
		1526	1286	103.0	171.2	11.0	20.0	68%	0.66	3.6	E	3.8	C
		1286	1287	63.0	96.0	9.0	18.7	55%	0.52	2.0	C	10.8	F
		1524	**1287**	**361.5**	**483.1**	**9.0**	**18.7**	**55%**	**0.34**	**2.7**	**D**	**4.4**	**D**
66	inbound	1311	1313	99.0	159.0	13.0	39.5	86%	0.61	2.8	D	3.7	C
		1313	1555	179.0	268.0	18.0	42.9	83%	0.50	5.6	F	4.0	D
		1555	1314	97.0	144.7	13.0	26.0	83%	0.49	2.9	D	3.1	C
		1314	1315	106.0	164.7	14.0	36.0	83%	0.55	3.2	E	3.4	C
		1311	**1315**	**488.5**	**655.7**	**14.0**	**36.0**	**83%**	**0.34**	**3.6**	**E**	**3.0**	**C**
66	outbound	1365	1366	126.0	177.5	15.0	38.0	80%	0.41	3.4	E	5.5	E
		1366	1526	140.0	186.0	14.0	37.0	90%	0.33	4.0	E	3.1	C
		1526	1367	107.5	173.5	15.0	36.9	81%	0.61	3.5	E	5.5	E
		1367	1369	119.0	188.0	14.0	27.1	73%	0.58	3.1	E	9.0	F
		1365	**1369**	**505.0**	**629.0**	**14.0**	**27.1**	**73%**	**0.25**	**3.5**	**E**	**4.6**	**D**

**Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).*

Travel Times, Dwell, and QOS Ratios | Time Period: PM Peak

Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	1554	1555	163.0	295.0	13.0	23.0	91%	0.81	4.0	E	5.7	E
		1555	1556	88.0	176.0	9.0	15.7	37%	1.00	3.5	E	4.5	D
		1556	1557	87.0	146.2	9.0	16.1	10%	0.68	2.3	C	4.4	D
		1554	**1557**	**362.0**	**497.6**	**9.0**	**16.1**	**10%**	**0.37**	**3.3**	**E**	**3.6**	**C**
65	inbound	1282	1283	85.0	145.0	10.0	21.5	48%	0.71	2.4	D	3.8	C
		1283	1555	137.0	232.1	11.0	23.0	67%	0.69	4.5	F	4.2	D
		1555	1556	102.0	210.1	9.0	18.0	48%	1.06	3.8	E	5.1	D
		1556	1557	61.5	137.1	8.0	13.9	10%	1.23	2.0	C	4.9	D
		1282	**1557**	**427.5**	**572.1**	**8.0**	**13.9**	**10%**	**0.34**	**3.1**	**E**	**3.4**	**C**
65	outbound	1524	1525	78.0	130.8	13.0	30.0	63%	0.68	2.5	D	4.4	D
		1525	1526	109.0	191.0	14.0	31.0	78%	0.75	3.6	E	4.3	D
		1526	1286	116.0	178.8	12.0	27.0	65%	0.54	3.8	E	3.7	C
		1286	1287	68.0	106.8	12.0	27.0	63%	0.57	2.0	C	2.8	C
		1524	**1287**	**394.0**	**529.0**	**12.0**	**27.0**	**63%**	**0.34**	**3.0**	**D**	**3.5**	**C**
66	inbound	1311	1313	101.0	171.0	14.0	51.0	83%	0.69	2.9	D	4.4	D
		1313	1555	195.0	289.0	20.0	53.0	90%	0.48	6.0	F	3.9	D
		1555	1314	110.5	171.0	14.0	30.0	90%	0.55	3.3	E	3.4	C
		1314	1315	107.0	165.1	13.0	27.0	81%	0.54	3.2	E	5.0	D
		1311	**1315**	**522.0**	**696.0**	**13.0**	**27.0**	**81%**	**0.33**	**3.8**	**E**	**3.6**	**C**
66	outbound	1365	1366	123.0	204.0	18.0	45.0	80%	0.66	3.5	E	6.7	E
		1366	1526	159.0	235.0	17.0	41.0	86%	0.48	4.5	F	11.7	F
		1526	1367	109.0	166.0	15.0	39.0	76%	0.52	3.4	E	9.3	F
		1367	1369	124.0	189.0	14.0	30.0	78%	0.52	3.3	E	7.3	E
		1365	**1369**	**519.0**	**702.0**	**14.0**	**30.0**	**78%**	**0.35**	**3.7**	**E**	**6.9**	**E**

**Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).*

Bus Service – Q1 Complete Results

Travel Times, Dwell, and QOS Ratios | Time Period: AM Peak

Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	1554	1555	242.0	509.0	13.0	22.0	95%	1.10	6.1	F	7.1	E
		1555	1556	118.0	169.0	11.0	18.5	37%	0.43	4.0	E	3.4	C
		1556	1557	61.0	110.0	10.0	26.8	32%	0.80	1.8	C	3.9	D
		1554	**1557**	**440.0**	**715.0**	**10.0**	**26.8**	**32%**	**0.62**	**4.1**	**F**	**5.3**	**E**
65	inbound	1282	1283	78.0	134.0	12.0	24.0	76%	0.72	2.2	C	3.4	C
		1283	1555	146.0	235.1	14.0	24.0	91%	0.61	4.7	F	4.3	D
		1555	1556	128.0	209.0	10.0	14.5	61%	0.63	4.4	F	3.9	D
		1556	1557	54.0	107.7	9.0	14.0	26%	0.99	1.7	B	4.4	D
		1282	**1557**	**426.0**	**577.7**	**9.0**	**14.0**	**26%**	**0.36**	**3.1**	**E**	**3.3**	**C**
65	outbound	1524	1525	72.0	103.0	9.0	16.9	47%	0.43	2.1	C	2.7	B
		1525	1526	105.0	168.0	11.5	20.0	79%	0.60	3.2	E	3.9	D
		1526	1286	94.0	163.6	9.0	15.0	52%	0.74	3.3	E	3.7	C
		1286	1287	64.0	100.0	8.0	16.0	17%	0.56	1.9	C	2.8	C
		1524	**1287**	**344.0**	**449.4**	**8.0**	**16.0**	**17%**	**0.31**	**2.6**	**D**	**2.8**	**C**
66	inbound	1311	1313	108.0	167.0	15.0	34.0	92%	0.55	3.0	D	3.6	C
		1313	1555	152.0	242.9	15.0	32.7	93%	0.60	4.8	F	4.4	D
		1555	1314	99.5	153.9	15.5	31.0	95%	0.55	3.2	E	10.1	F
		1314	1315	158.0	248.8	18.0	54.5	91%	0.57	4.6	F	8.6	F
		1311	**1315**	**543.0**	**711.9**	**18.0**	**54.5**	**91%**	**0.31**	**3.9**	**E**	**3.3**	**C**
66	outbound	1365	1366	119.0	190.8	16.0	33.4	92%	0.60	3.4	E	3.1	C
		1366	1526	115.0	186.6	13.0	25.0	94%	0.62	3.5	E	3.8	C
		1526	1367	94.0	137.4	11.0	19.3	93%	0.46	3.0	D	3.2	C
		1367	1369	125.0	253.4	10.0	16.2	86%	1.03	3.8	E	5.6	E
		1365	**1369**	**466.0**	**642.8**	**10.0**	**16.2**	**86%**	**0.38**	**3.4**	**E**	**3.4**	**C**

**Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).*

Travel Times, Dwell, and QOS Ratios | Time Period: Afternoon

Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	1554	1555	160.0	262.2	14.0	23.0	96%	0.64	3.7	E	4.3	D
		1555	1556	112.0	180.2	9.0	14.0	37%	0.61	4.0	F	3.5	C
		1556	1557	56.0	101.6	9.0	12.0	6%	0.81	1.7	B	3.6	C
		1554	**1557**	**350.0**	**480.8**	**9.0**	**12.0**	**6%**	**0.37**	**3.1**	**E**	**3.1**	**C**
65	inbound	1282	1283	85.0	144.2	11.0	31.6	72%	0.70	2.5	D	4.0	D
		1283	1555	146.0	232.3	12.0	20.0	87%	0.59	4.6	F	4.6	D
		1555	1556	106.5	178.0	9.0	15.0	61%	0.67	3.7	E	3.4	C
		1556	1557	43.0	85.0	11.0	21.4	6%	0.98	1.3	A	3.3	C
		1282	**1557**	**398.0**	**543.0**	**11.0**	**21.4**	**6%**	**0.36**	**2.9**	**D**	**3.5**	**C**
65	outbound	1524	1525	84.0	120.3	11.0	26.3	70%	0.43	2.5	D	3.2	C
		1525	1526	116.0	188.3	13.0	26.0	86%	0.62	3.7	E	3.8	C
		1526	1286	114.0	182.0	11.0	23.0	73%	0.60	3.8	E	5.2	E
		1286	1287	64.5	108.0	10.0	27.7	44%	0.67	2.0	C	4.1	D
		1524	**1287**	**394.0**	**519.1**	**10.0**	**27.7**	**44%**	**0.32**	**3.0**	**D**	**3.3**	**C**
66	inbound	1311	1313	130.5	199.2	16.0	40.0	86%	0.53	3.6	E	4.5	D
		1313	1555	166.5	263.2	20.0	45.0	86%	0.58	5.3	F	4.1	D
		1555	1314	91.5	136.0	13.0	28.0	88%	0.49	2.7	D	3.1	C
		1314	1315	136.5	200.0	13.0	37.1	82%	0.47	4.0	E	3.4	C
		1311	**1315**	**528.0**	**709.0**	**13.0**	**37.1**	**82%**	**0.34**	**3.9**	**E**	**3.2**	**C**
66	outbound	1365	1366	118.0	153.0	16.0	37.0	84%	0.30	3.1	E	3.0	C
		1366	1526	115.0	172.2	16.0	52.1	93%	0.50	3.4	E	3.9	D
		1526	1367	90.0	136.0	12.0	27.6	86%	0.51	3.4	E	15.4	F
		1367	1369	120.0	218.2	12.0	21.4	61%	0.82	3.5	E	4.7	D
		1365	**1369**	**445.0**	**609.4**	**12.0**	**21.4**	**61%**	**0.37**	**3.3**	**E**	**6.2**	**E**

**Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).*

Travel Times, Dwell, and QOS Ratios | Time Period: PM Peak

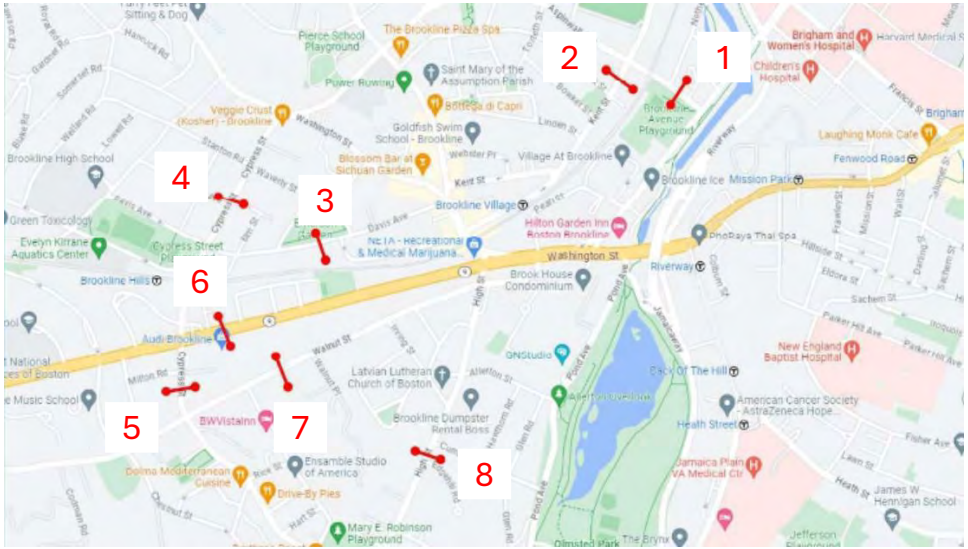
Route	Direction	Segment Start	Segment End	Travel Time Percentile (seconds)		Downstream Stop Dwell Percentile* (seconds)			Var (MBTA)	TTQOS Ratio		TTVQOS Ratio	
				50th	90th	50th	90th	Stopped %					
60	inbound	1554	1555	167.0	274.0	14.0	22.0	96%	0.64	3.9	E	4.4	D
		1555	1556	132.0	186.0	9.0	16.3	43%	0.41	4.4	F	3.4	C
		1556	1557	53.0	106.0	8.0	11.0	19%	1.00	1.7	B	3.7	C
		1554	**1557**	**365.0**	**504.0**	**8.0**	**11.0**	**19%**	**0.38**	**3.3**	**E**	**3.2**	**C**
65	inbound	1282	1283	78.0	132.2	10.0	24.0	53%	0.69	2.3	C	4.4	D
		1283	1555	137.0	229.2	11.0	20.0	77%	0.67	4.5	F	4.3	D
		1555	1556	108.0	181.2	8.0	15.0	37%	0.68	3.8	E	3.8	C
		1556	1557	51.0	99.0	8.0	12.2	10%	0.94	1.6	B	3.6	C
		1282	**1557**	**395.0**	**535.0**	**8.0**	**12.2**	**10%**	**0.35**	**2.9**	**D**	**3.4**	**C**
65	outbound	1524	1525	81.0	139.0	13.0	29.0	70%	0.72	2.7	D	4.7	D
		1525	1526	134.0	212.0	14.0	28.2	84%	0.58	4.1	F	4.1	D
		1526	1286	108.0	176.7	11.0	21.0	67%	0.64	3.6	E	3.9	D
		1286	1287	66.0	101.7	10.5	21.0	50%	0.54	1.9	C	2.7	B
		1524	**1287**	**401.0**	**555.4**	**10.5**	**21.0**	**50%**	**0.39**	**3.1**	**E**	**3.5**	**C**
66	inbound	1311	1313	136.0	186.9	15.0	51.6	90%	0.37	3.6	E	3.8	C
		1313	1555	175.0	271.9	21.0	52.0	91%	0.55	5.5	F	4.1	D
		1555	1314	101.0	148.9	15.0	30.0	93%	0.47	3.2	E	10.5	F
		1314	1315	135.5	179.9	13.0	30.0	86%	0.33	3.9	E	3.1	C
		1311	**1315**	**545.5**	**703.8**	**13.0**	**30.0**	**86%**	**0.29**	**4.0**	**E**	**4.1**	**D**
66	outbound	1365	1366	125.0	190.6	19.0	42.0	87%	0.52	3.5	E	3.8	C
		1366	1526	119.0	188.0	16.0	30.0	91%	0.58	3.6	E	3.6	C
		1526	1367	88.0	151.4	14.0	36.0	79%	0.72	3.0	D	4.0	D
		1367	1369	131.0	214.6	14.0	29.0	72%	0.64	3.7	E	4.2	D
		1365	**1369**	**490.0**	**639.4**	**14.0**	**29.0**	**72%**	**0.30**	**3.5**	**E**	**3.5**	**C**

**Calculated for buses that stop (excludes stops with no boardings, alightings, or dwell).*

Appendix B

Highway Volumes

Data Collection Locations



1. Aspinwall Ave, between Brookline Ave & Kent St
2. Kent St, between Aspinwall Ave & Brook St
3. Davis Ave, between Cypress St & Washington St
4. Cypress St, between Tappan St & Davis Ave
5. Cypress St, between Boylston St & Walnut St
6. Boylston St (Route 9), between Cypress St & High St
7. Walnut St, between Cypress St & High St
8. High St, between Cumberland Ave & Edgehill Rd

Baseline Volumes – Sept 2023

Location	ADT	Peak AM	Peak PM
Aspinwall Ave, between Brookline Ave & Kent St	5,484	465	501
Kent St, between Aspinwall Ave & Brook St	3,605	364	292
Davis Ave, between Cypress St & Washington St	1,840	264	177
Cypress St, between Davis Ave & Gorham Ave	12,553	1113	932
Cypress St, between Boylston St & Walnut St	7,730	879	585
Boylston St (Rt 9), between Cypress St & High St	22,520	1777	1765
Walnut St, between Cypress St & High St	3,193	472	435
High St, between Cumberland Ave & Edgehill Rd	3,224	321	310
Total Volumes	**60,149**	**5,655**	**4,997**

Q1 Volumes – Oct 2024

Location	ADT	Change	Peak AM	Change	Peak PM	Change
Aspinwall Ave, between Brookline Ave & Kent St	6,005	**+9.5%**	635	**+36.6%**	546	**+9.0%**
Kent St, between Aspinwall Ave & Brook St	4,537	**+25.9%**	533	**+46.4%**	392	**+34.2%**
Davis Ave, between Cypress St & Washington St	2,571	**+39.7%**	359	**+36.0%**	228	**+28.8%**
Cypress St, between Davis Ave & Gorham Ave	11,275	**-10.2%**	964	**-13.4%**	805	**-13.6%**
Cypress St, between Boylston St & Walnut St	8,091	**+4.7%**	895	**+1.8%**	646	**+10.4%**
Boylston St (Rt 9), between Cypress St & High St	22,722	**+0.9%**	1,826	**+2.8%**	1,825	**+3.4%**
Walnut St, between Cypress St & High St	3,742	**+17.2%**	505	**+7.0%**	482	**+10.8%**
High St, between Cumberland Ave & Edgehill Rd	3,642	**+13.0%**	352	**+9.7%**	335	**+8.1%**
Total Volumes / Average % Change	62585	**+4.0%**	6069	**+7.3%**	5259	**+5.2%**

Baseline Speeds (mph) -Sept 2023

Location	NB/EB 50th Percentile	NB/EB 85th Percentile	SB/WB 50th Percentile	SB/WB 85th Percentile
Aspinwall Ave, between Brookline Ave & Kent St	20.2	24.7	20.5	24.9
Kent St, between Aspinwall Ave & Brook St	18.0	24.1	21.8	26.1
Davis Ave, between Cypress St & Washington St	22.7	27.7	21.3	26.1
Cypress St, between Davis Ave & Gorham Ave	21.4	26.4	19.3	24.8
Cypress St, between Boylston St & Walnut St	19.5	24.1	18.1	23.7
Boylston St (Rt 9), between Cypress St & High St	28.8	34.6	29.2	35.8
Walnut St, between Cypress St & High St	23.5	28.4	22.6	27.3
High St, between Cumberland Ave & Edgehill Rd	22.6	27.4	23.6	28.4

Appendix C

Highway Travel Times and Control Delays

Study Locations

Intersections

1. Washington St at Station St
2. Boylston St (Route 9) at High St and Washington St
3. Washington St (Route 9) at Pearl St and Walnut St
4. Washington St (Route 9) at Brookline Ave

Corridors

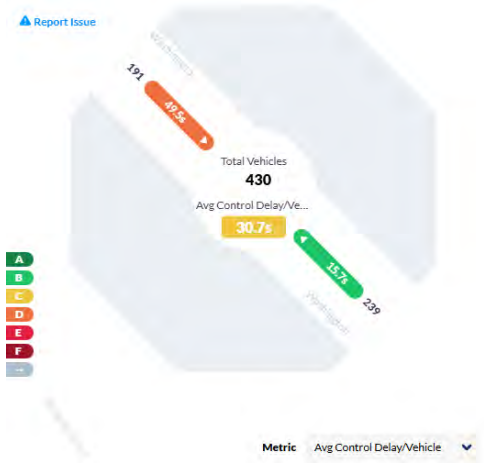
1. Boylston St eastbound between Cypress St and High St
2. Washington St southbound between Boylston St and Harvard St
3. Brookline Ave northbound between Aspinwall Ave and Washington St.

Intersections

1. Washington St at Station St
2. Boylston St (Route 9) at High St and Washington St
3. Washington St (Route 9) at Pearl St and Walnut St
4. Washington St (Route 9) at Brookline Ave

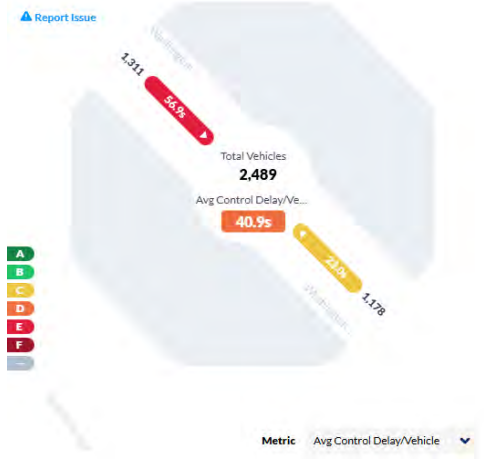
#1 Washington St at Station St – Baseline

Delay AM (6am-9am)



Delay PM (4pm-7pm)

Delay Avg. Daily



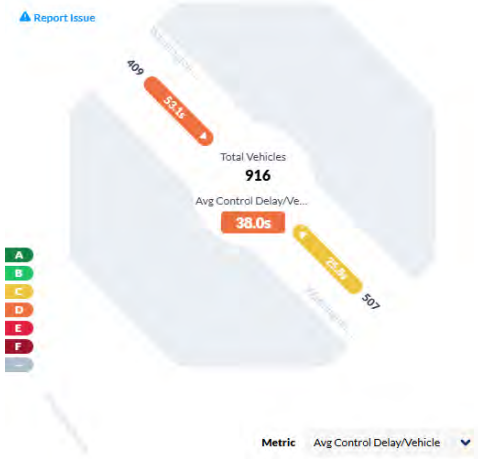
- Average intersection delay of about 40 seconds
- Average intersection delay varies from ~30-60 seconds during peak periods
- Most significant delay is Washington St southbound, in the PM peak (about 1.2 minutes)

All data is from June 2024 weekdays.

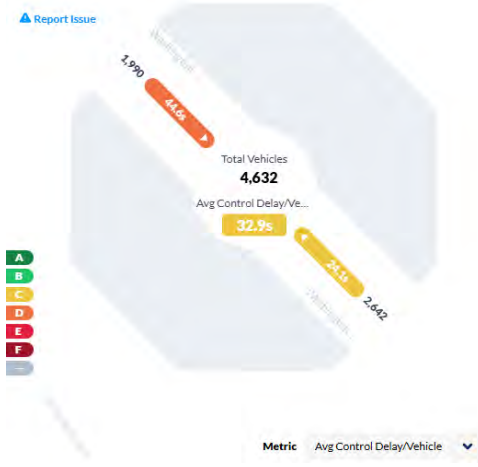
#1 Washington St at Station St – Quarter 1

Delay AM (6am-9am)

Delay PM (4pm-7pm)



Delay Avg. Daily



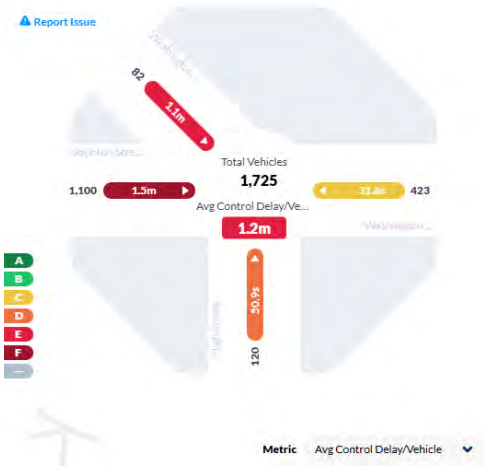
- **<u>4-17 second decrease in total intersection delay</u>**
- Delay reduced for Washington St southbound in PM peak.

All data is from October 2024 weekdays.

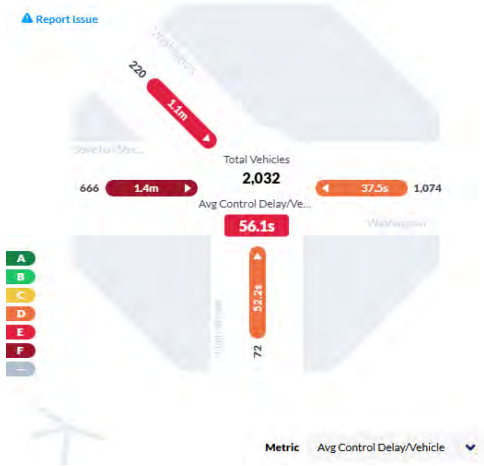
**Note increase in volumes related to INRIX data sample. <u>Not indicative of actual volume change</u>.*

#2 Boylston St (Route 9) at High St and Washington St – Baseline

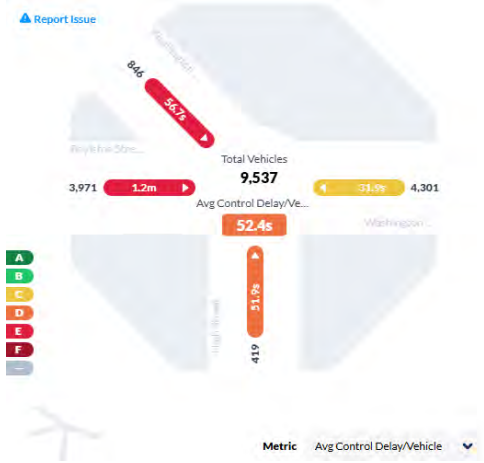
Delay AM (6am-9am)



Delay PM (4pm-7pm)



Delay Avg. Daily

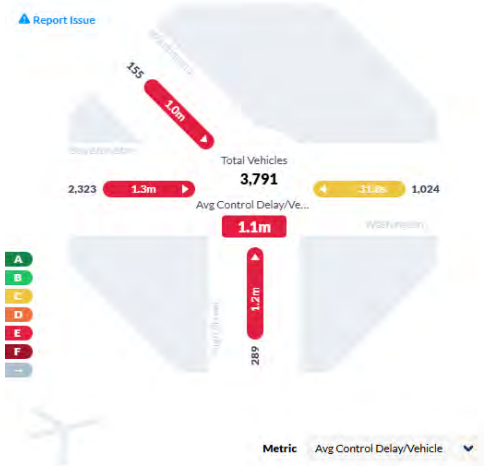


All data is from June 2024 weekdays.

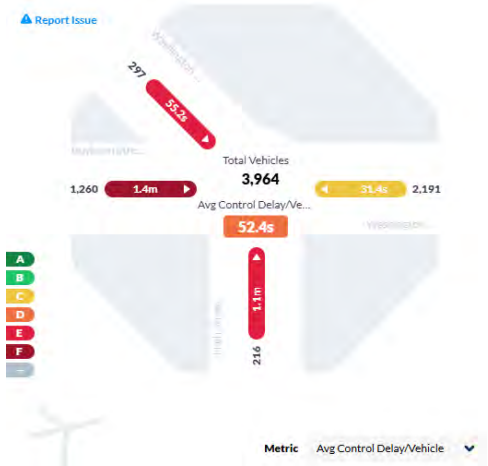
- Average intersection delay of about 1 minute throughout day
- Highest delay on Boylston St (Route 9), approximately 1.5 minutes during peak periods

#2 Boylston St (Route 9) at High St and Washington St – Quarter 1

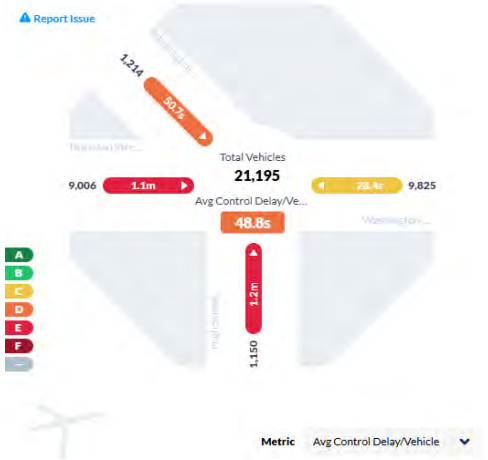
Delay AM (6am-9am)



Delay PM (4pm-7pm)



Delay Avg. Daily



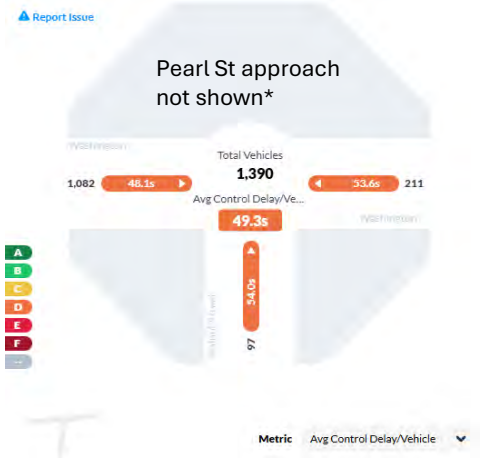
- **<u>Inrix shows slight decrease in total intersection delay</u>**
- Long queue lengths extend past the 500' approach distance Inrix uses to collect data, so actual intersection delay is likely higher

All data is from October 2024 weekdays.

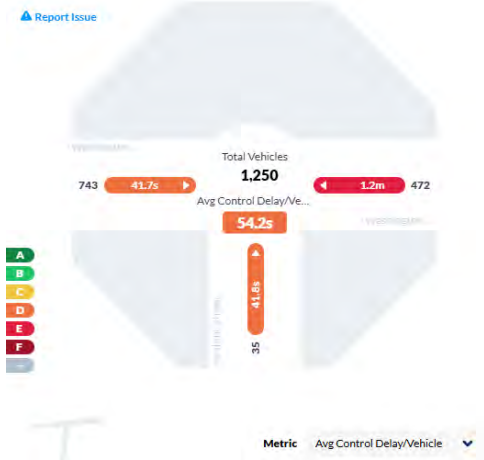
**Note increase in volumes related to INRIX data sample. <u>Not indicative of actual volume change</u>.*

#3 Washington St (Route 9) at Pearl St and Walnut St – Baseline

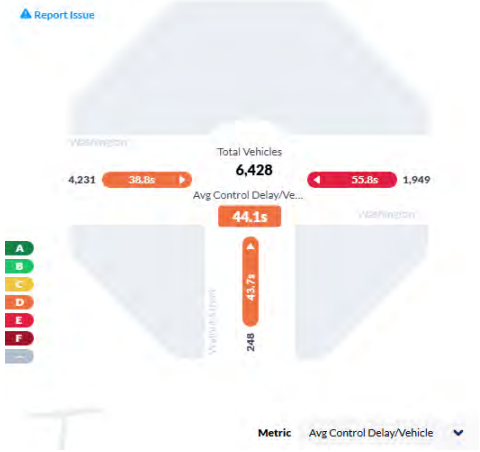
Delay AM (6am-9am)



Delay PM (4pm-7pm)



Delay Avg. Daily



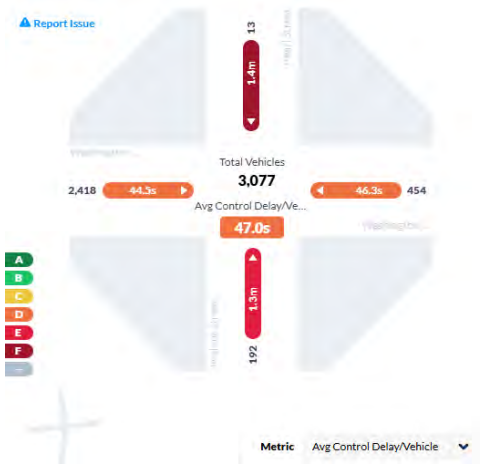
- Average intersection delay of 45-55 seconds throughout day
- Washington St (Route 9) through movements typically see highest delay

All data is from June 2024 weekdays.

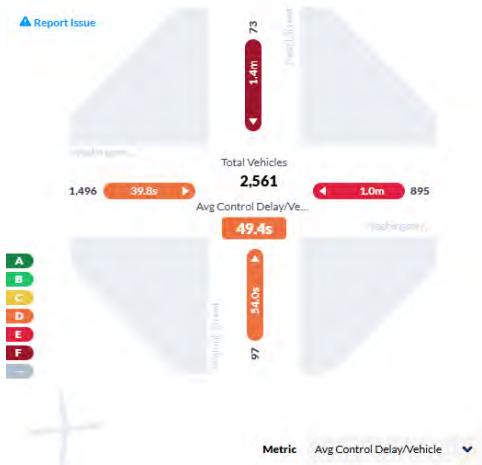
**Intersection diagram is missing the Pearl St approach because no volumes were recorded by INRIX at this approach during June 2024*

#3 Washington St (Route 9) at Pearl St and Walnut St – Quarter 1

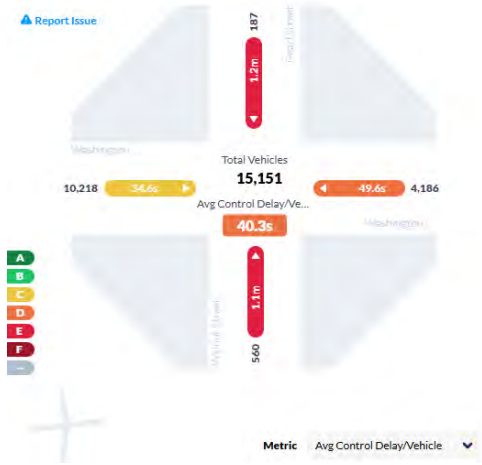
Delay AM (6am-9am)



Delay PM (4pm-7pm)



Delay Avg. Daily



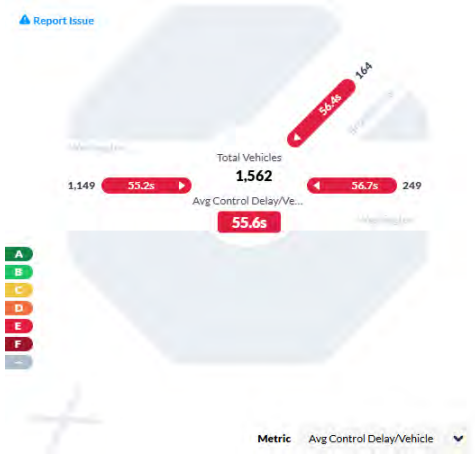
- **<u>~4 second decrease in average intersection delay</u>**
- Washington St (Route 9) movements see slight decreases in delay

All data is from October 2024 weekdays.

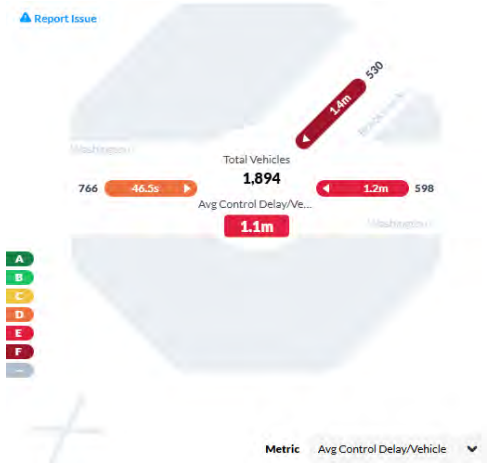
**Note increase in volumes related to INRIX data sample. <u>Not indicative of actual volume change</u>.*

#4 Washington St (Route 9) at Brookline Ave - Baseline

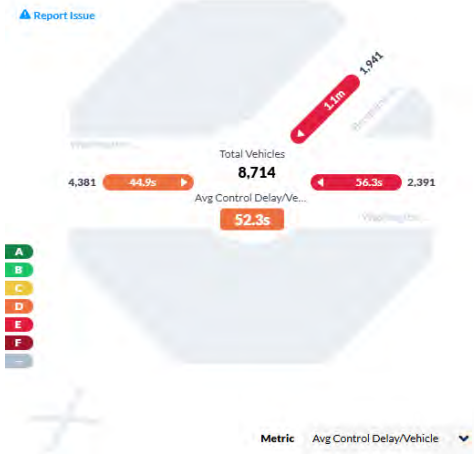
Delay AM (6am-9am)



Delay PM (4pm-7pm)



Delay Avg. Daily

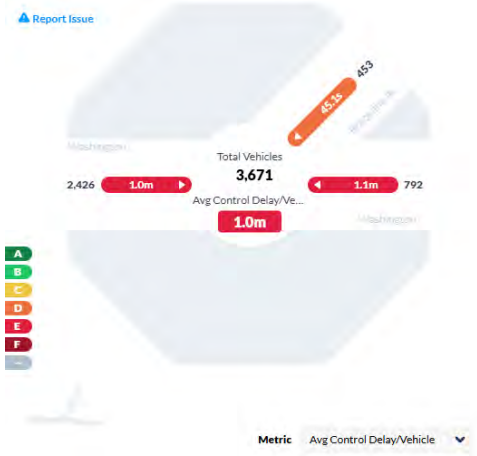


- Average intersection delay of ~50-70 seconds throughout day
- Highest delays are approaching project area
- Generally lesser delays leaving project area

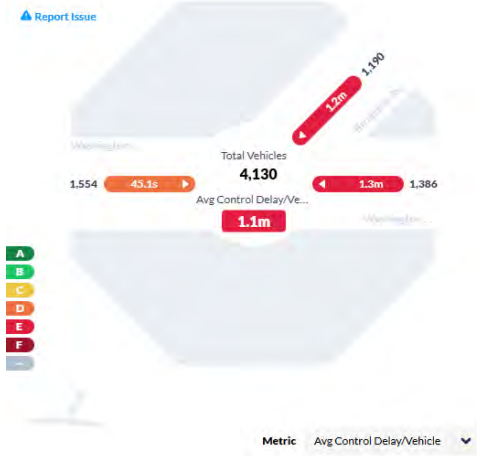
All data is from June 2024 weekdays.

#4 Washington St (Route 9) at Brookline Ave – Quarter 1

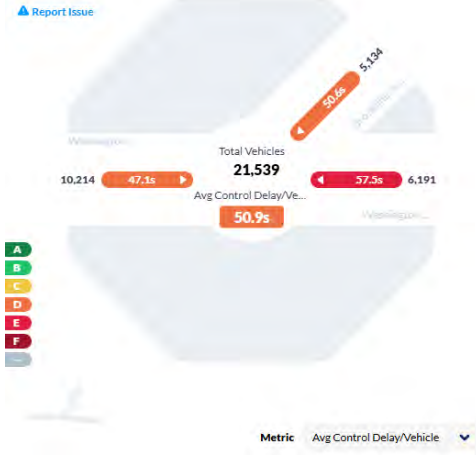
Delay AM (6am-9am)



Delay PM (4pm-7pm)



Delay Avg. Daily

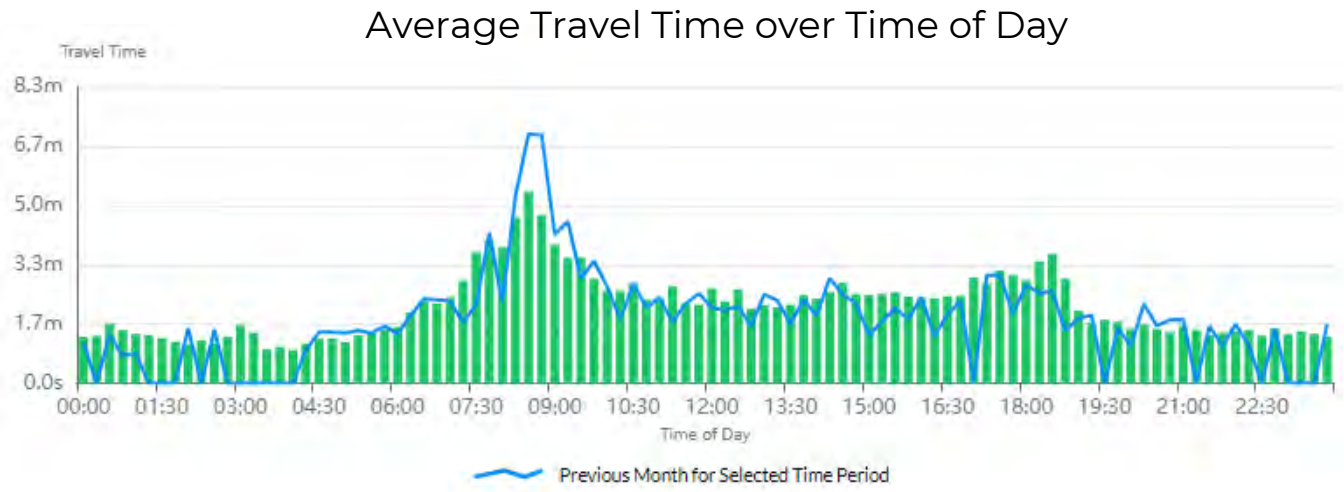


- **<u>Generally, no change in total intersection delay</u>**
- Delay is more evenly distributed between vehicles entering and vehicles leaving the project area

All data is from October 2024 weekdays.

**Note increase in volumes related to INRIX data sample. <u>Not indicative of actual volume change</u>.*

Q1 Travel Time - Boylston St eastbound from Cypress St to High St

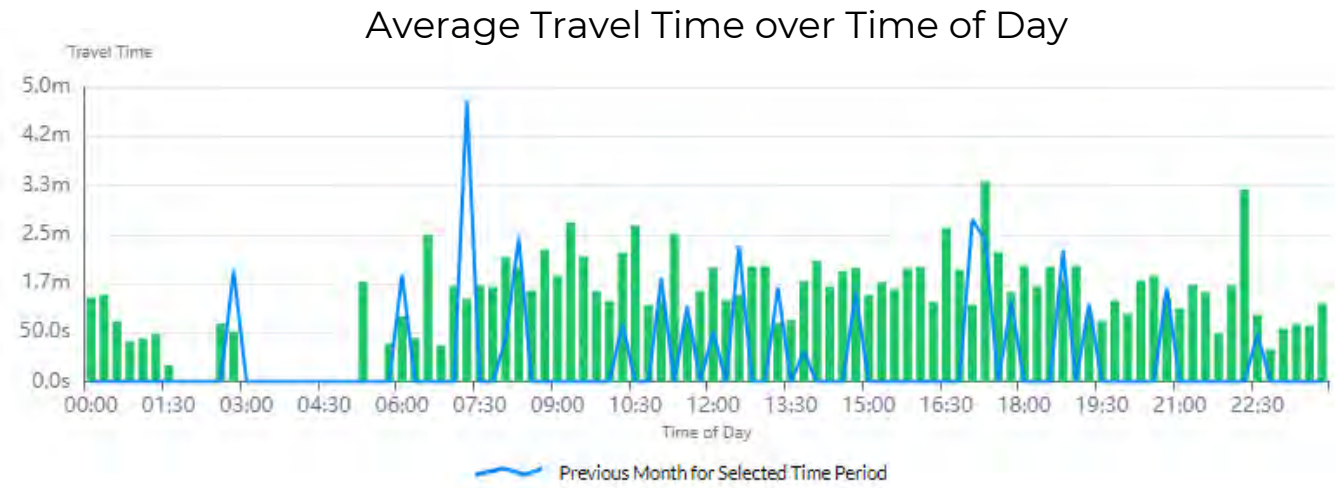


All data is from October 2024 weekdays.

Period	Travel Time	Time of Day
AM Peak Hour	4.7 minutes	8:15am-9:15am
MD Peak Hour	2.6 minutes	2:00pm-3:00pm
PM Peak Hour	3.2 minutes	4:45pm-5:45pm

**Baseline data not available from INRIX.*

Q1 Travel Time - Washington St southbound from Harvard St to Boylston St



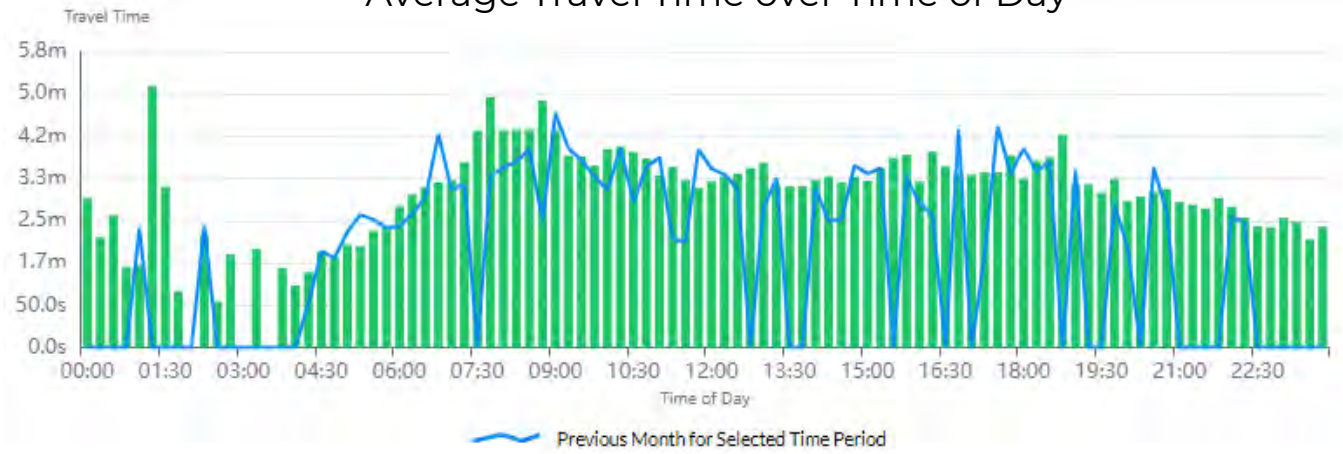
All data is from October 2024 weekdays.

Period	Travel Time	Time of Day
AM Peak Hour	2.2 minutes	8:45am-9:45am
MD Peak Hour	1.9 minutes	2:00pm-3:00pm
PM Peak Hour	2.3 minutes	4:30pm-5:30pm

**Baseline data not available from INRIX.*

Q1 Travel Time - Brookline Ave northbound from Washington St to Aspinwall Ave

Average Travel Time over Time of Day*



All data is from October 2024 weekdays.

Period	Travel Time**	Time of Day
AM Peak Hour	4.5 minutes	7:45am-8:45am
MD Peak Hour	3.5 minutes	12:15pm-1:15pm
PM Peak Hour	3.8 minutes	6:00pm-7:00pm

**Baseline data not available from INRIX.*
***Note this includes delay at the Washington St & Brookline intersection approach.*

Appendix D

Queueing Data

Queue Length of Boylston St EB, west of Washington St

		Left Lane		Right Lane		Total		
		Baseline	Q1	Baseline	Q1	Baseline	Q1	Change
	10th %ile	2	16	1	5	3	20	+677%
AM	50th %ile	9	29	8	15	17	44	**+159%**
	90th %ile	18	40	18	33	36	73	**+102%**
	Longest	25	55	25	43	50	98	+96%
	10th %ile	1	8	1	1	2	9	+329%
PM	50th %ile	8	16	8	4	16	20	**+25%**
	90th %ile	14	25	14	12	28	37	**+33%**
	Longest	21	31	22	18	43	49	+14%

Queue Length of Washington St SB, north of Boylston St

		Left Lane		Center Lane		Right Lane		Total		
		Baseline	Q1	Baseline	Q1	Baseline	Q1	Baseline	Q1	Change
AM	10th %ile	0	2	2	0	2	3	4	5	+28%
	50th %ile	2	6	4	1	5	6	11	13	**+18%**
	90th %ile	5	17	7	3	8	12	20	32	**+59%**
	Longest	8	20	13	5	9	17	30	42	+40%
PM	10th %ile	1	3	1	0	4	4	6	7	+17%
	50th %ile	3	8	5	1	6	11	14	19	**+36%**
	90th %ile	8	15	8	3	8	23	24	41	**+73%**
	Longest	28	25	10	4	11	35	49	64	+31%

Bus only lane

Queue Length of Brookline Ave SB, north of Boylston St

		Left Lane		Center Lane		Right Lane		Total		
		Baseline	Q1	Baseline	Q1	Baseline	Q1	Baseline	Q1	Change
AM	10th %ile	0	0	0	0	1	0	1	0	-100%
	50th %ile	1	1	1	1	6	3	8	5	**-38%**
	90th %ile	3	2	3	3	11	8	17	13	**-24%**
	Longest	4	5	4	4	16	11	24	20	-17%
PM	10th %ile	0	1	1	1	4	5	5	7	+43%
	50th %ile	1	3	3	5	10	15	14	23	**+64%**
	90th %ile	4	9	5	9	17	29	26	47	**+81%**
	Longest	6	13	8	12	21	32	35	57	+63%

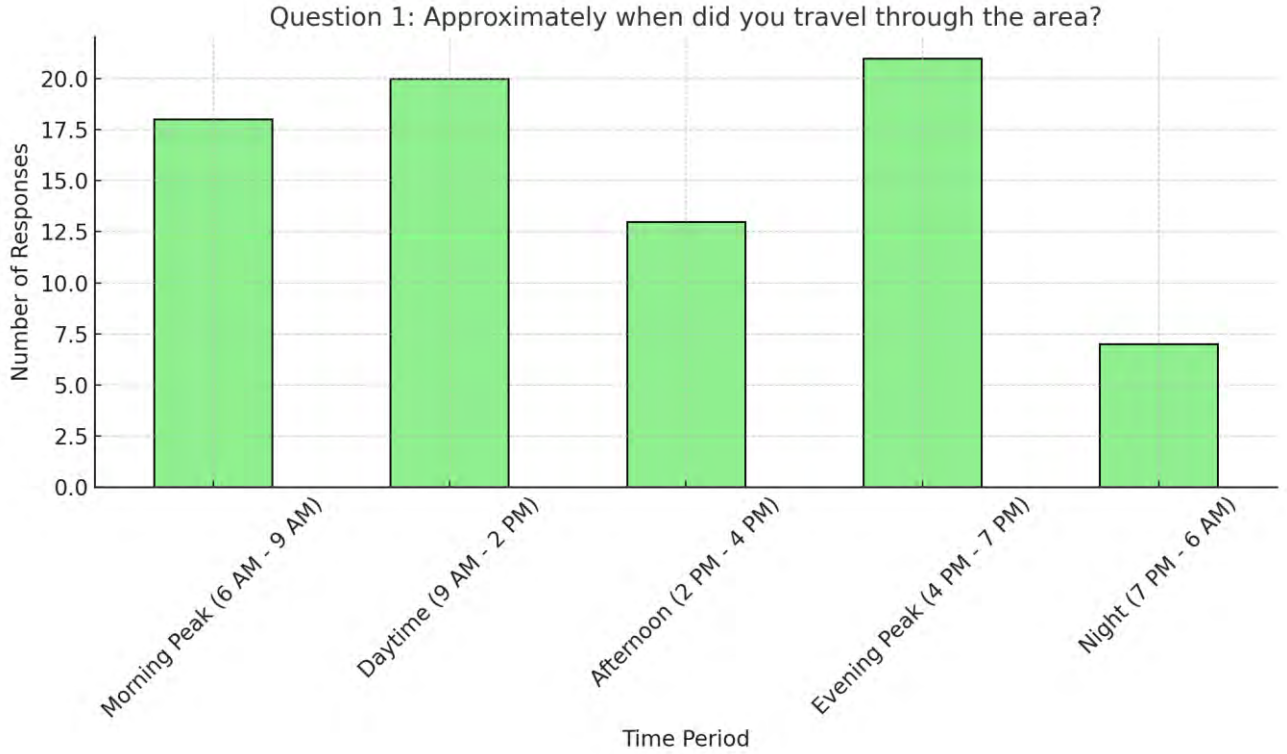
Appendix E

Survey Results as of December 4, 2024

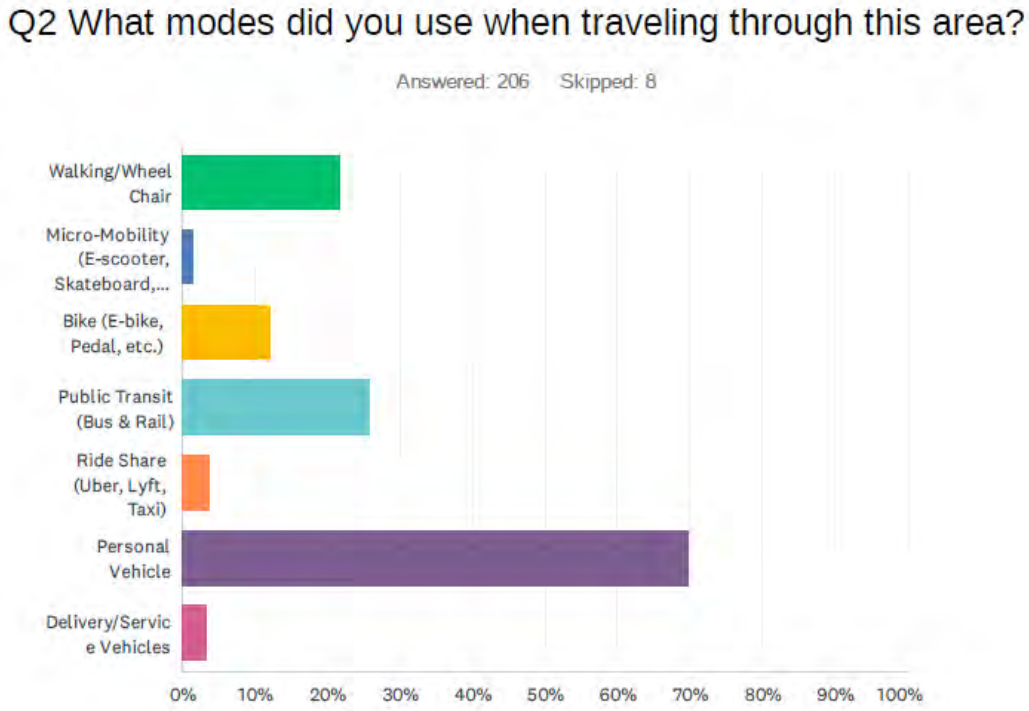
Gateway East Bus Lanes Pilot Survey

- The survey was launched in mid-November and promoted through various channels, including:
  - DPW and Town social media
  - The Town Administrators' newsletter
  - The Longwood Collective Newsletter
  - Eye-catching yard signs along the corridor
- As of December 4th , we've received 214 responses – Thank you for your feedback!
- All Survey responses can be viewed at: https://www.surveymonkey.com/results/SM-YCTVFqgIJbu6v8ccgAYb0Q_3D_3D/
- The survey remains open for the duration of the pilot and we'd love to hear from you! Haven't taken the survey? Go to: https://www.surveymonkey.com/r/CN3S9WZ

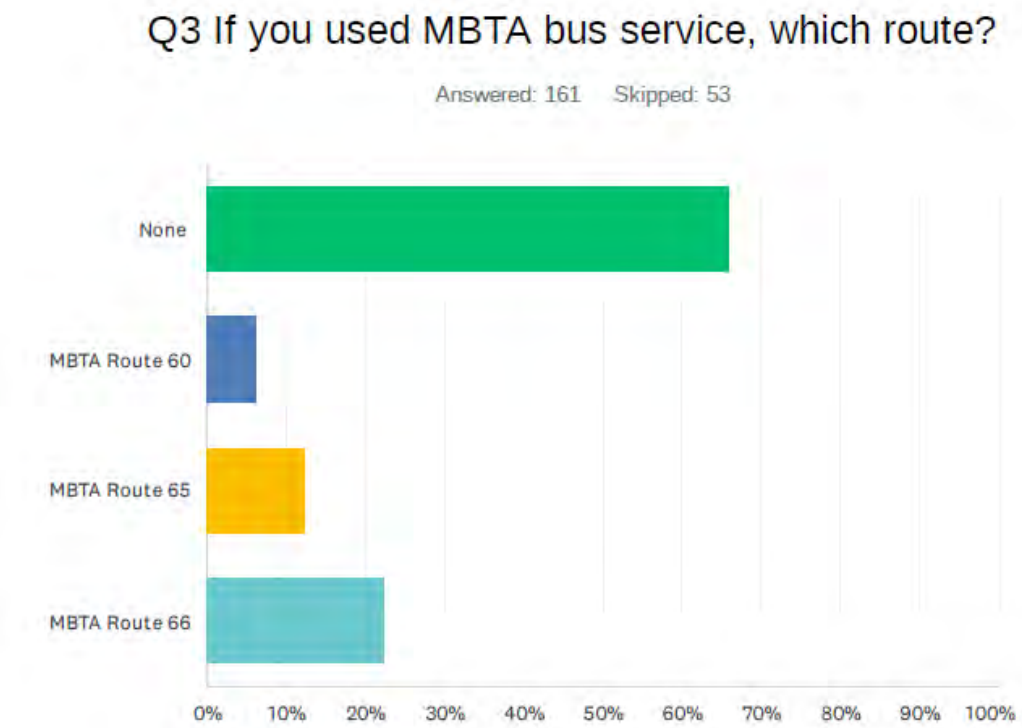
Gateway East Bus Lanes Pilot Survey: Question 1



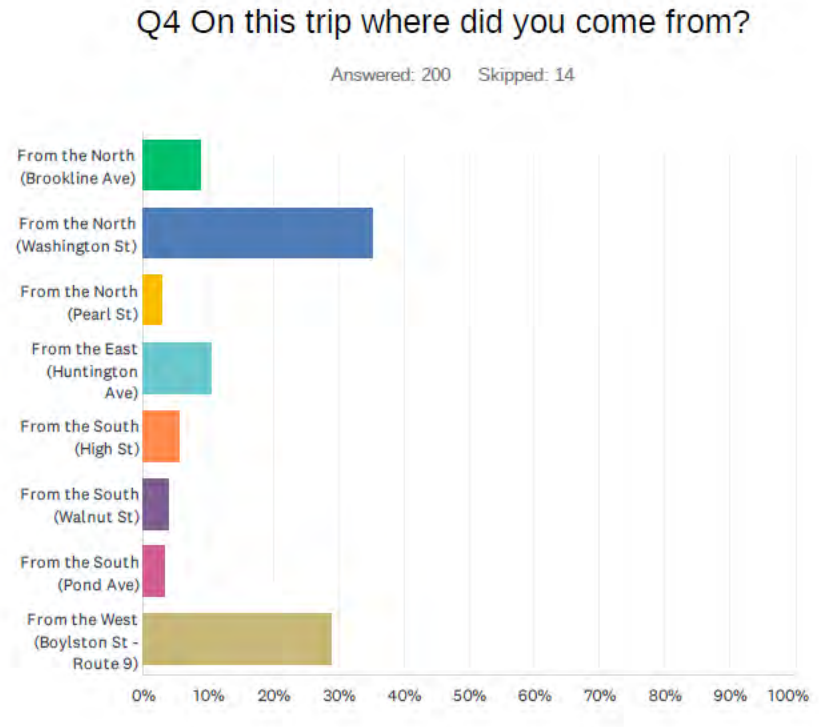
Gateway East Bus Lanes Pilot Survey – Question 2



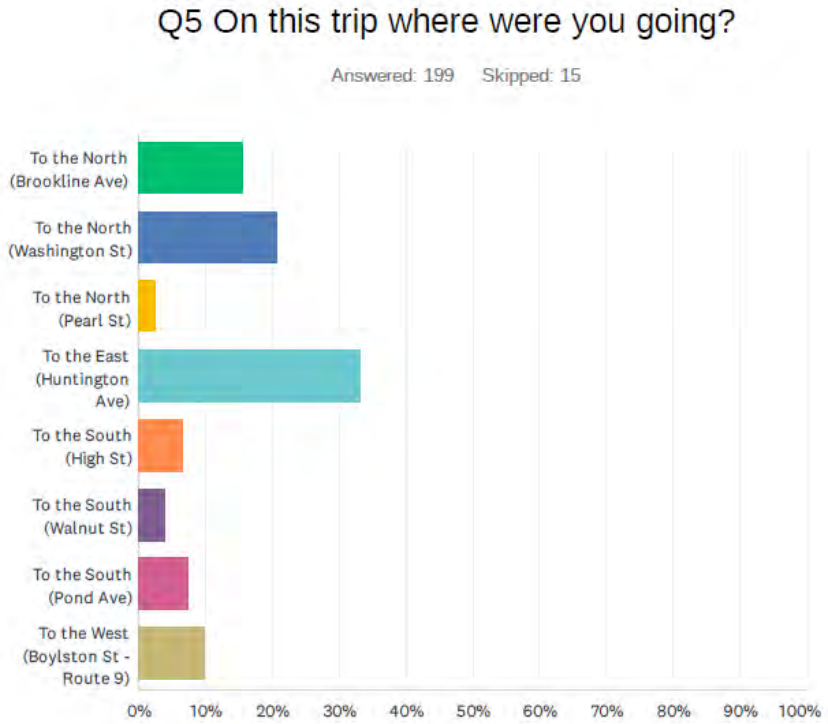
Gateway East Bus Lanes Pilot Survey – Question 3



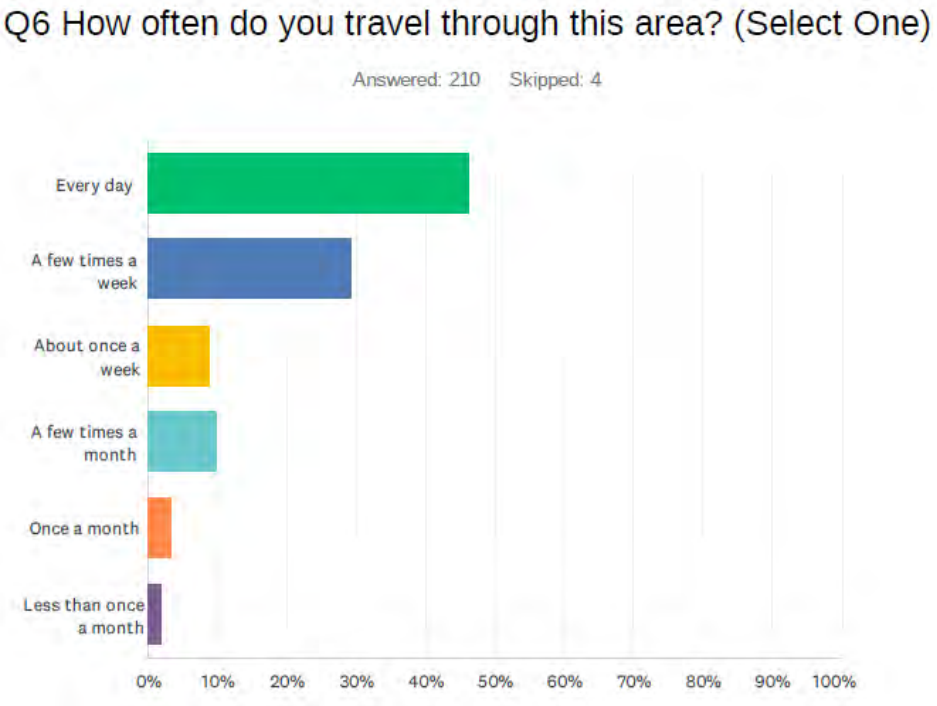
Gateway East Bus Lanes Pilot Survey – Question 4



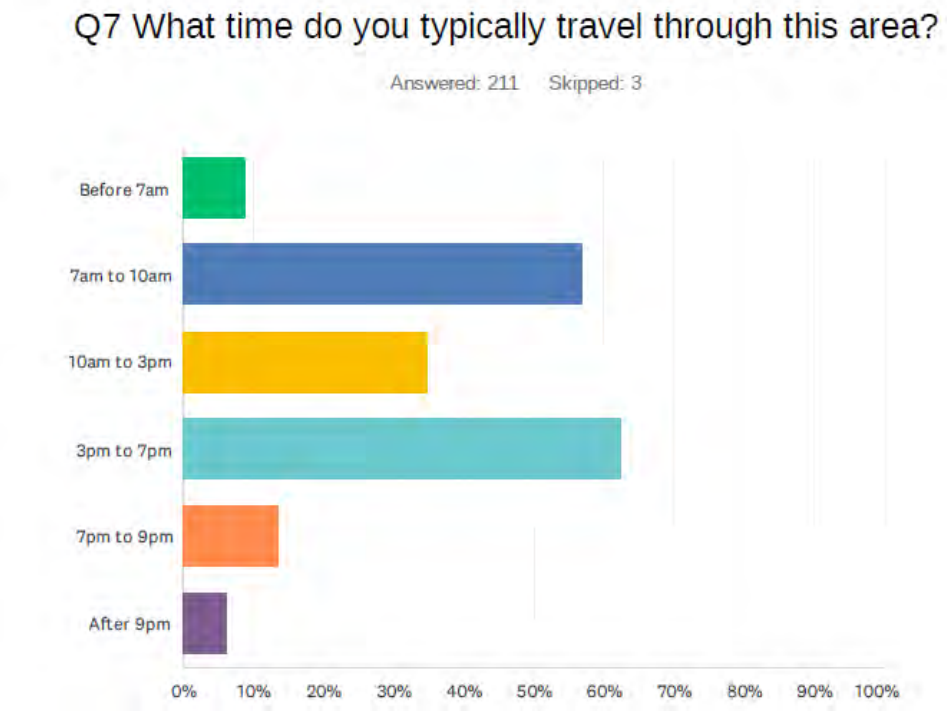
Gateway East Bus Lanes Pilot Survey – Question 5



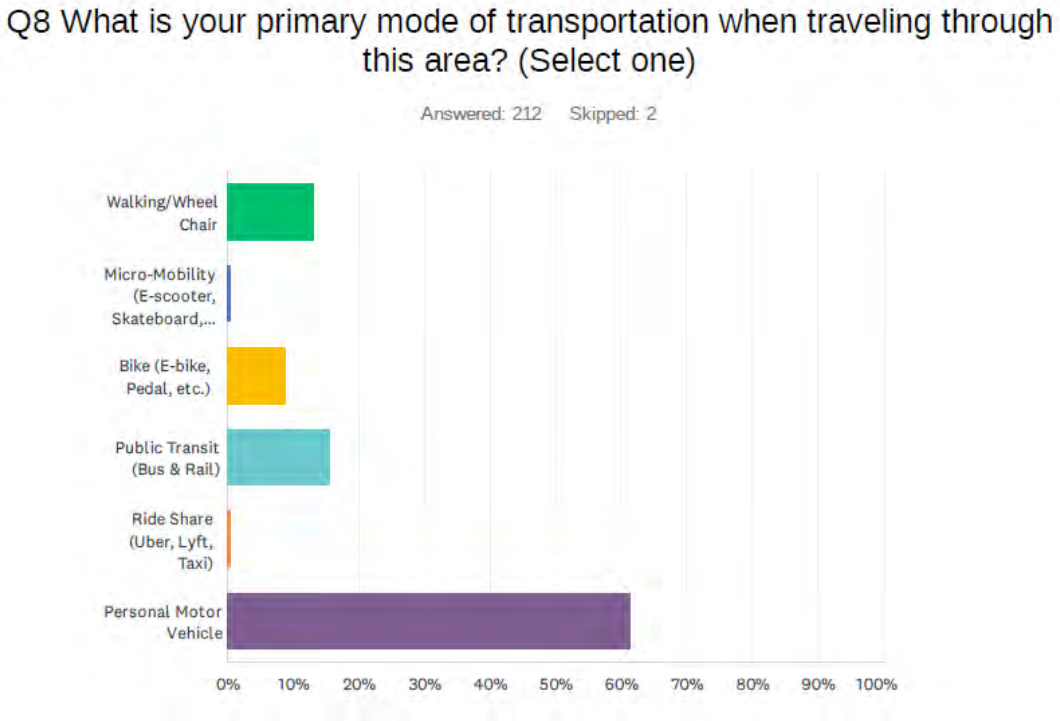
Gateway East Bus Lanes Pilot Survey – Question 6



Gateway East Bus Lanes Pilot Survey – Question 7



Gateway East Bus Lanes Pilot Survey – Question 8



Gateway East Bus Lanes Pilot Survey – Question 9

Q9 The dedicated bus lane has improved safety for:

Answered: 212 Skipped: 2

	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE	TOTAL
those walking through this area	37.86% 78	13.59% 28	24.76% 51	12.62% 26	11.17% 23	206
those biking or using micro-mobility devices through this area	38.92% 79	15.76% 32	20.69% 42	13.79% 28	10.84% 22	203
those taking public transit through this area.	24.75% 50	9.41% 19	26.73% 54	21.29% 43	17.82% 36	202
those driving through this area.	55.02% 115	11.00% 23	15.79% 33	11.48% 24	6.70% 14	209

Gateway East Bus Lanes Pilot Survey – Question 10

Q10 The dedicated bus lane has improved access for:

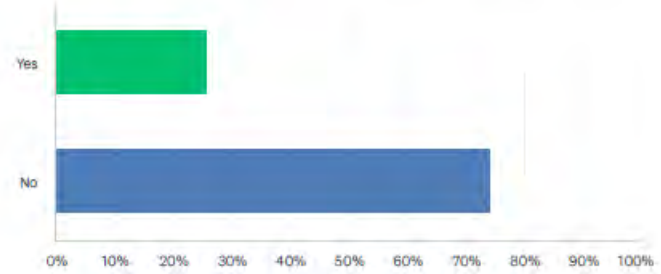
Answered: 211 Skipped: 3

	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE	TOTAL
those walking through this area	37.68% 78	11.59% 24	29.47% 61	11.11% 23	10.14% 21	207
those biking or using micro-mobility devices through this area	34.98% 71	13.30% 27	27.59% 56	12.81% 26	11.33% 23	203
those taking public transit through this area.	23.50% 47	8.50% 17	20.00% 40	24.00% 48	24.00% 48	200
for those driving through this area.	59.90% 124	11.11% 23	20.29% 42	4.83% 10	3.86% 8	207

Gateway East Bus Lanes Pilot Survey – Question 11 & 12

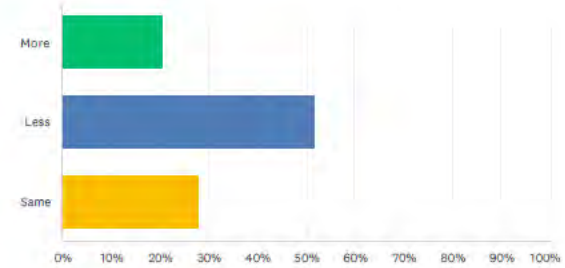
Q11 Do you feel your trip is faster with the bus lanes?

Answered: 205 Skipped: 9



Q12 Do you feel that your trip time is more or less consistent from day to day with the bus lanes?

Answered: 201 Skipped: 13



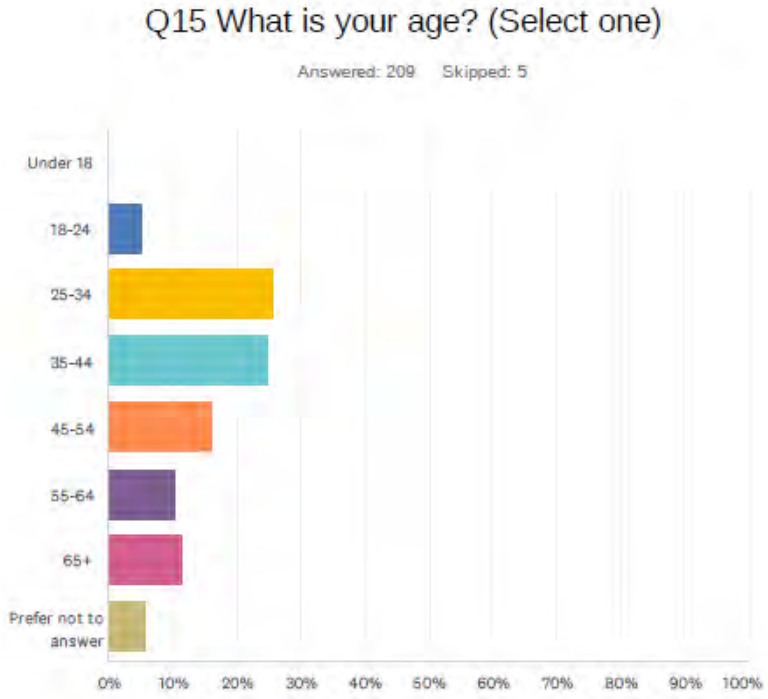
Gateway East Bus Lanes Pilot Survey – Question 13

- Q13 Has the dedicated bus lanes caused you to change how you travel through the area? (Open ended)
  - 175 responses Key Themes from the Open ended Comments:
    - Negative Feedback (~70%):
      - Increased Traffic congestion and delays.
      - Drivers feel confused and forced into last-minute lane changes.
      - Insufficient bus frequency to justify the dedicated lane.
      - Gridlock caused by poorly timed traffic signal and misuse of the lane.
      - Attempts to avoid area.
    - Positive Feedback (~10%):
      - Improved reliability and speed for buses.
      - Some responder are more likely to use buses.
    - Neutral or Unclear Feedback (~20%):
      - Observations without a clear stance (e.g., “no noticeable change”)
      - Mixed sentiments that acknowledge both pros and cons.

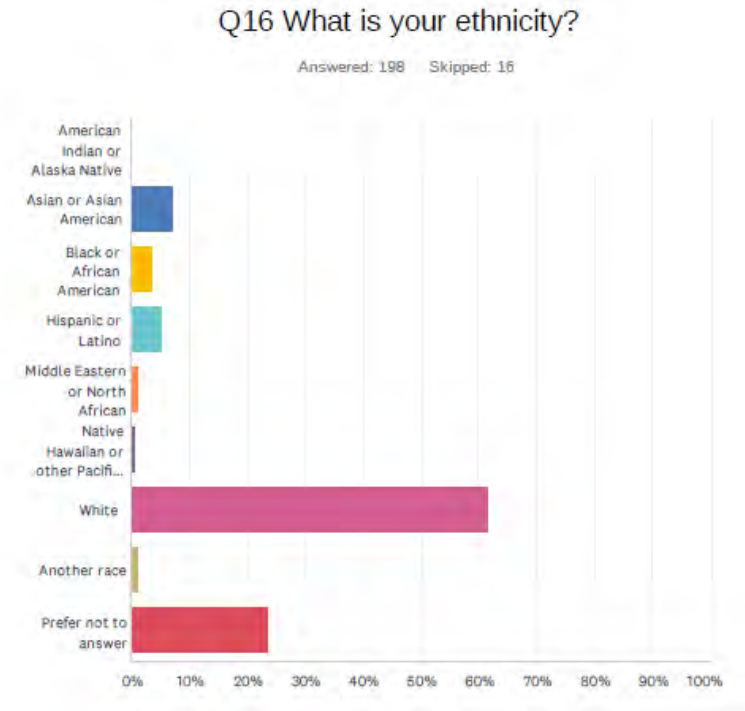
Gateway East Bus Lanes Pilot Survey – Question 14

- Q14 Should the Town and MBTA make changes to the dedicated bus lanes? (Open-ended)
  - 180 responses Key Themes from the Open ended Comments:
    - Negative Feedback (~60%):
      - Request to remove the bus lanes or restrict their hours of operation.
      - Frustration over increased congestion and poor implementation while the bus lane is empty.
      - Concerns about drivers not respecting the bus lanes and safety issues with merging and turning.
    - Positive Feedback (~20%):
      - Suggestions to adjust signal timings and improve enforcement.
      - Recognition of the potential for better transit efficiency if changes are made.
    - Neutral or Unclear Feedback (~20%)
      - Observations without a clear stance (e.g., “no noticeable change”, “lack of enforcement”)
      - Mixed sentiments that acknowledge both pros and cons.

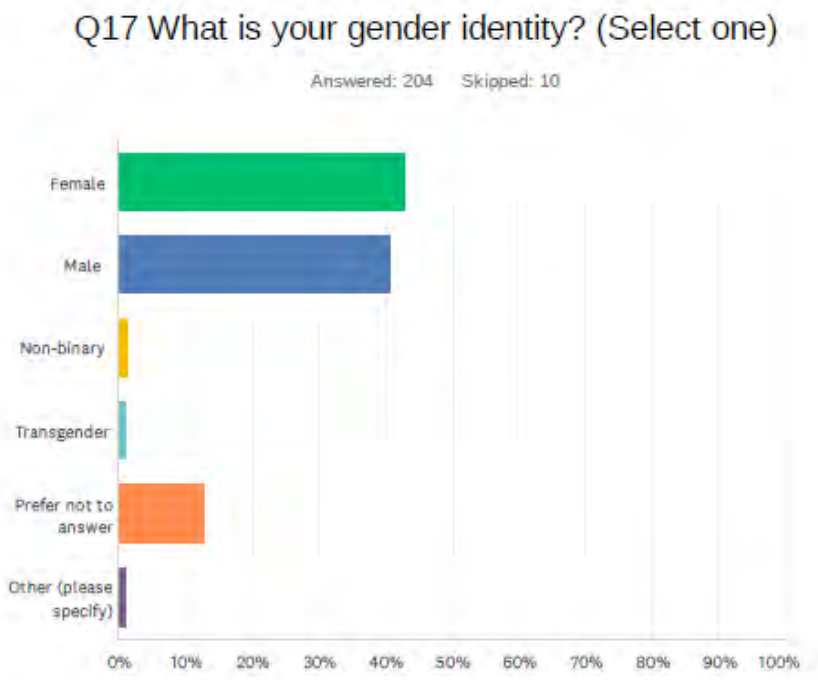
Gateway East Bus Lanes Pilot Survey – Question 15



Gateway East Bus Lanes Pilot Survey – Question 16



Gateway East Bus Lanes Pilot Survey – Question 17



Gateway East Bus Lanes Pilot Survey – Question 18