


Biking Behavior During July 2024 Red Line Diversion

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massDOT
Massachusetts Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

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Alewife-Kendall Red Line Diversion July 12-28, 2024

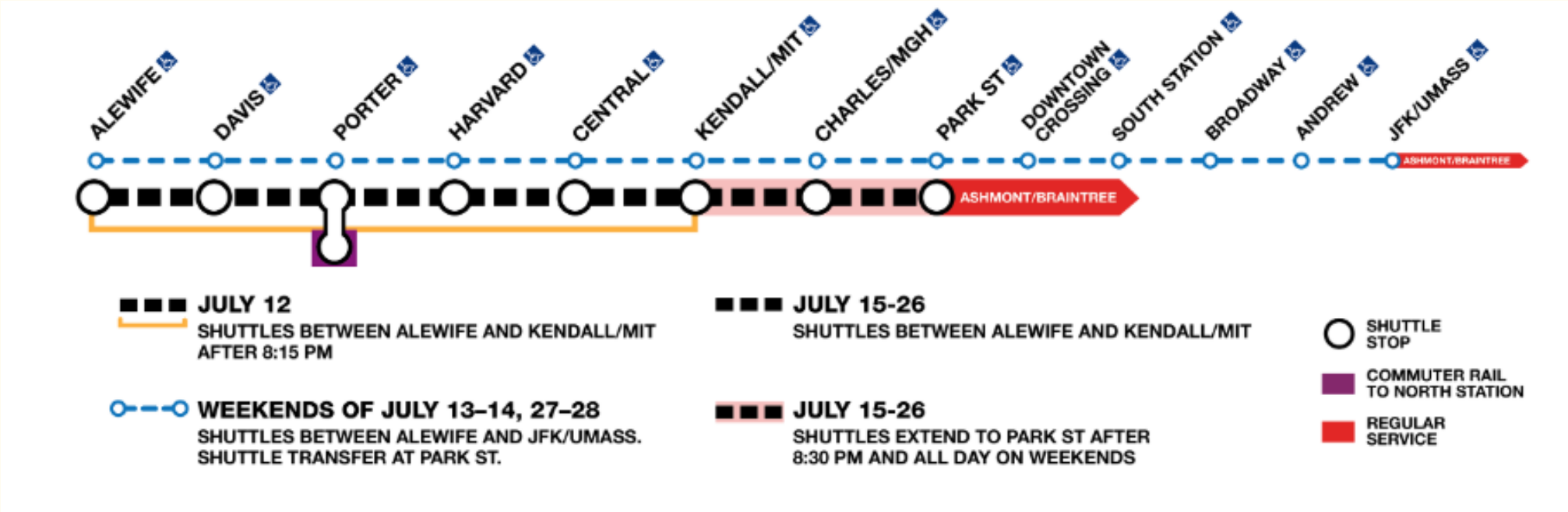


Image courtesy of MBTA.com

How does biking behavior change during an MBTA diversion?

Typical Red Line Ridership

Southbound Red Line ridership one week before diversion:

- 32% alight at stations north of the Charles River
- 68% alight at Charles/MGH, Park, Downtown
  - Park St has second largest southbound Red Line alightings on avg day (9,155), 30% of which are from Harvard to Park St

Can we estimate if these riders diverted to shuttles or bikes?

Method: Overview

Explore if biking increased in the area surrounding the diversion, and into downtown.

- Use GIS to determine catchment area of typical riders in diversion area
- Use new (to OPMI) data sources:
  - Permanent Bike Counters (MassDOT and City of Cambridge)
  - Temporary Bike Counters (MassDOT)
  - Bluebikes
- Estimate change in ridership
- Estimate shuttle usage with CTPS counts

Method: Bike Counter Analysis

Counters document how many bikes pass the counter per hour in each direction.

Placement:

- Permanent counters: on bridges across the Charles river (6)
- Temporary counters: placed in the study area for additional data pre-and during diversion (3)
- Stand-alone counter near Kendall square (1)

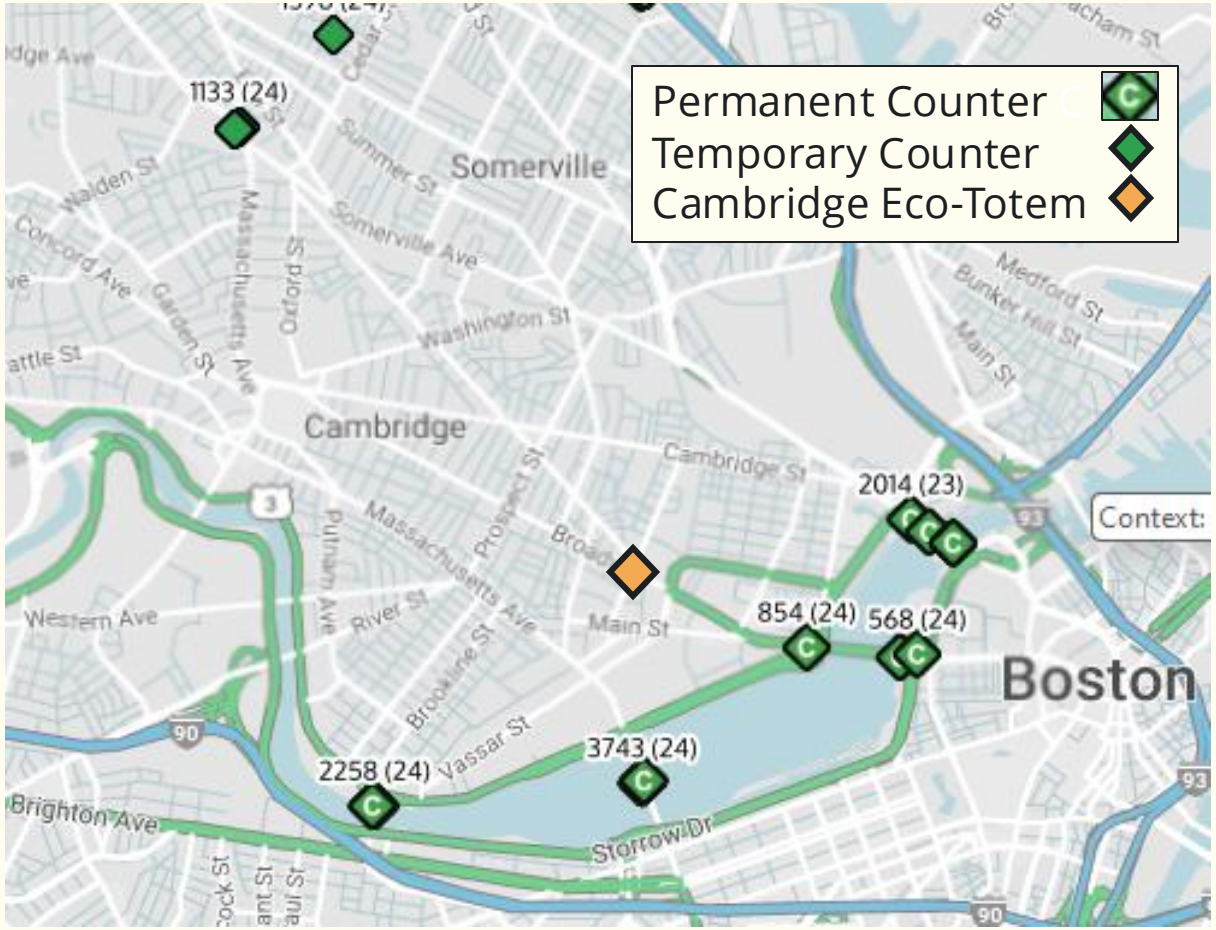
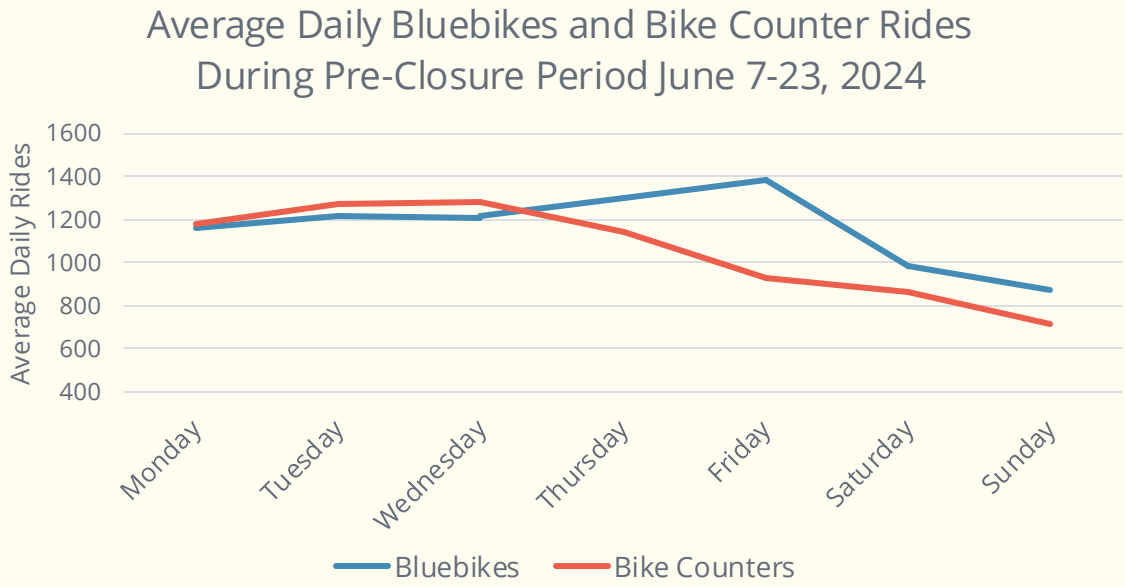


Image and counter data courtesy of MassDOT MS2 database.

Method: Bike Counter Analysis

- Bluebikes trip data showed similar trend and statistical significance to the bike counters and were therefore used for the remainder of the analysis for their increased data detail
  - Provides stop and end location, bike type, trip length, and membership status
  - Allowed for 2023 comparison

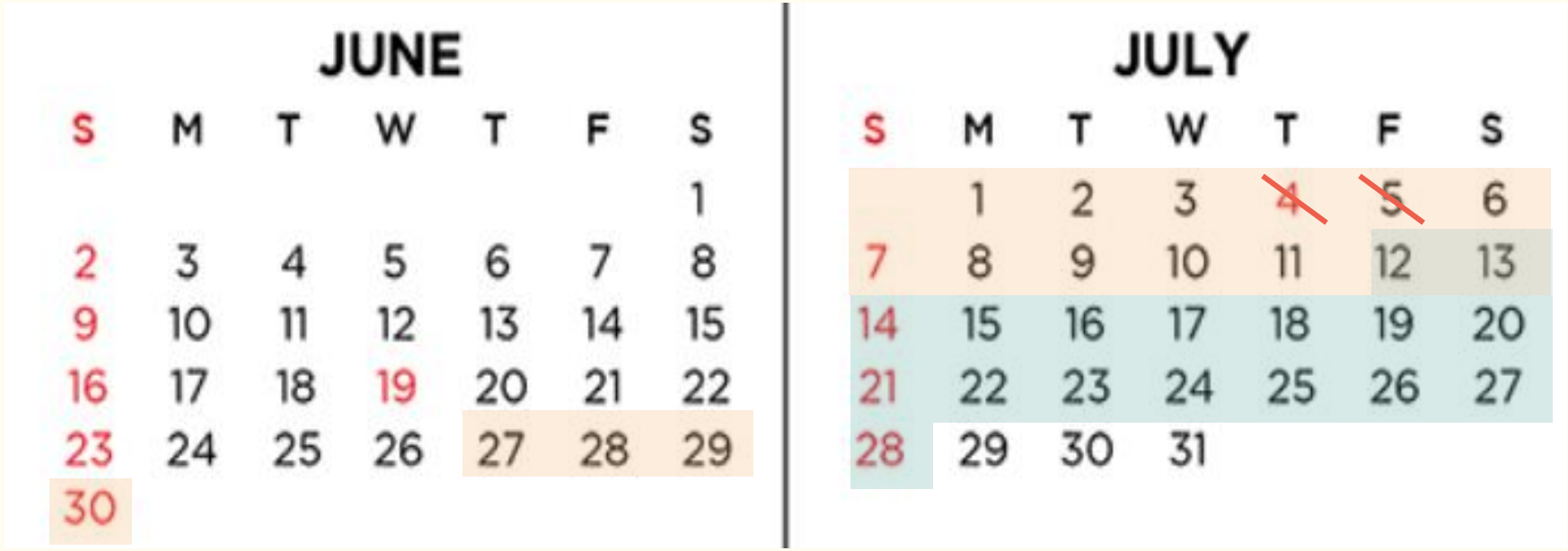


Method

Define comparison period.

Diversion Period:
July 12-28, 2024

Comparison Period:
June 27-July 11,
excluding July 4 and 5



JUNE

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

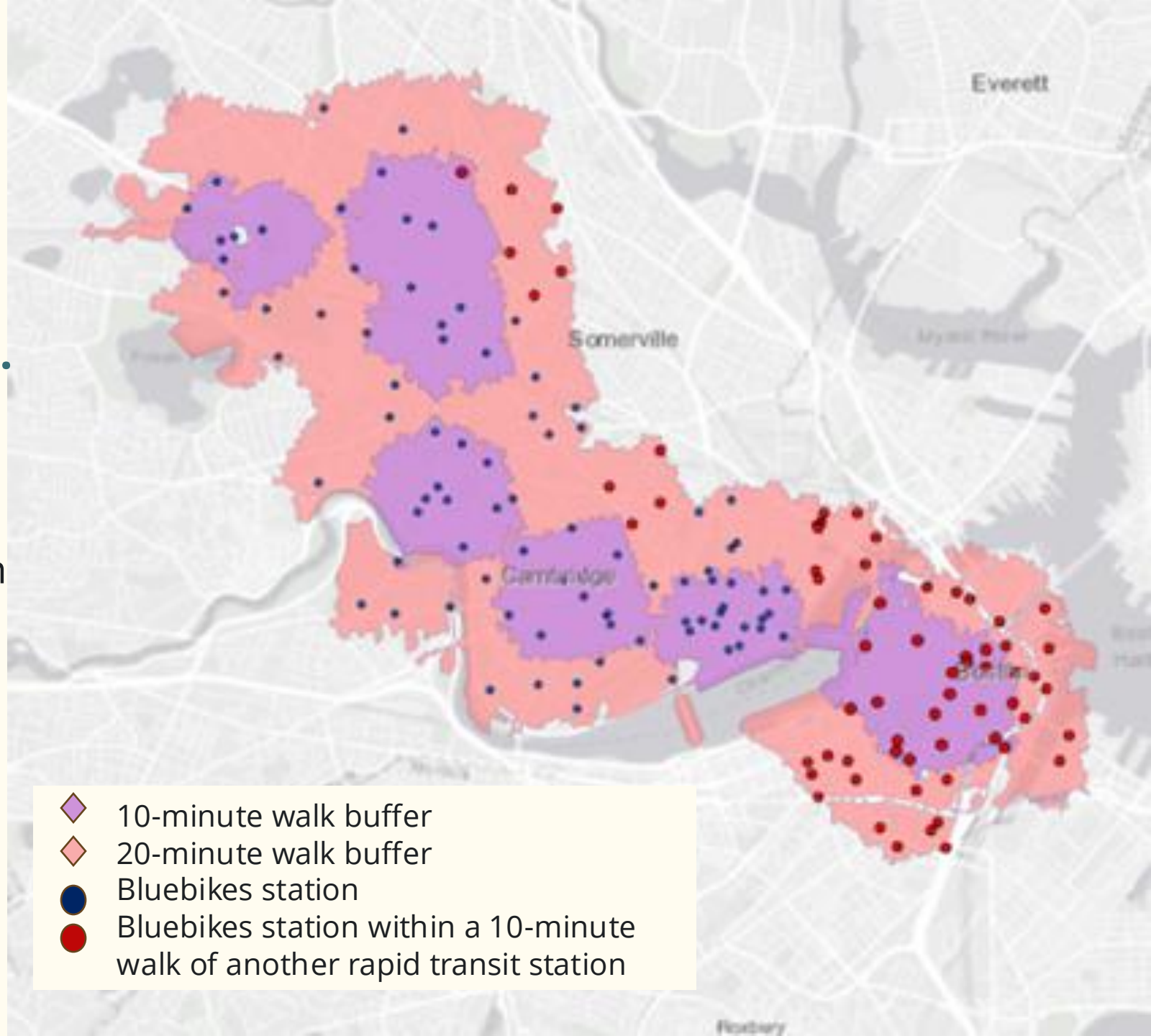
JULY

S	M	T	W	T	F	S
	1	2	3	~~4~~	~~5~~	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Method: Bluebikes

Define comparison groups.

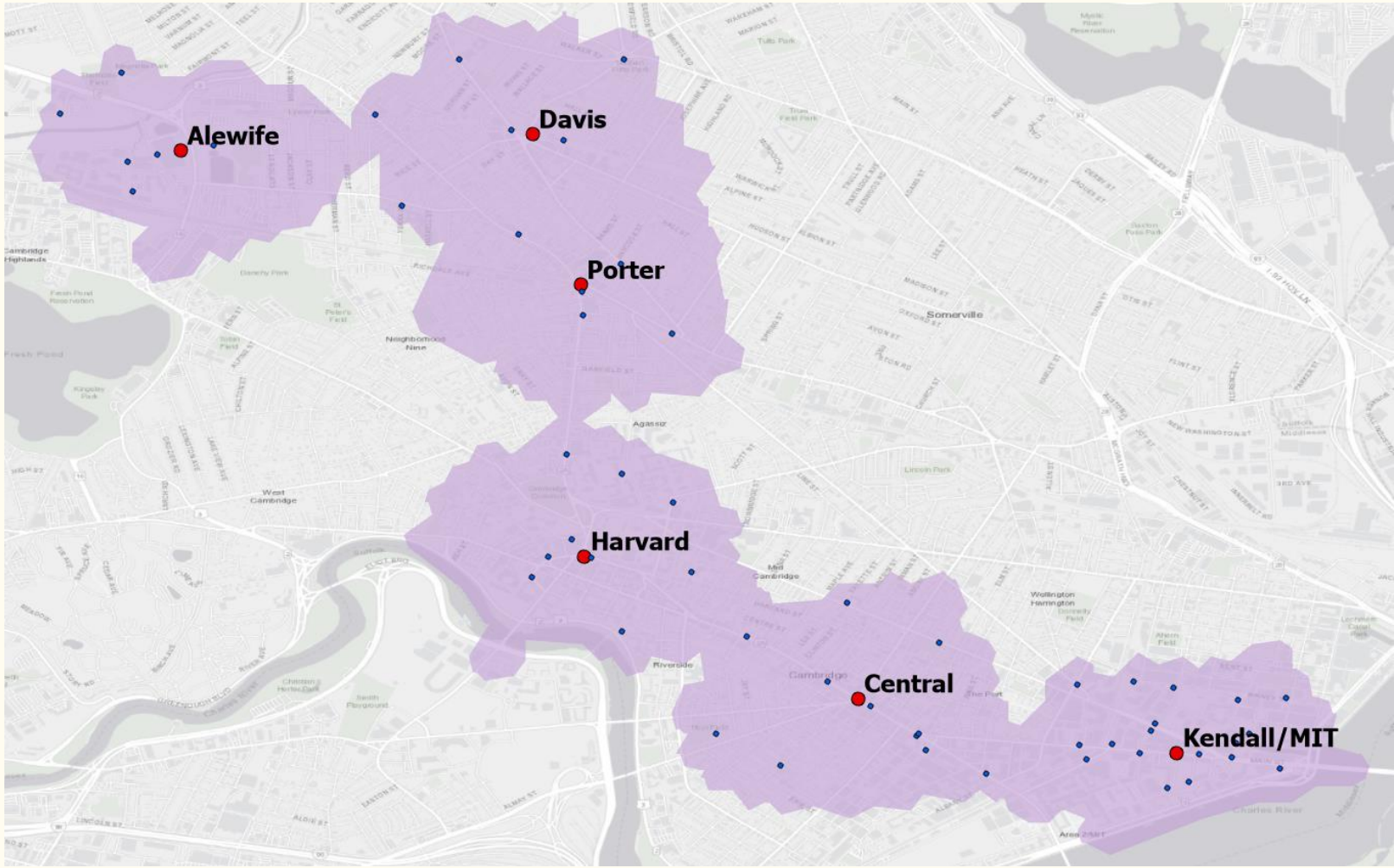
- Initially considered all Bluebikes stations within 10 and 20 min walk buffer of a Red Line station entrance from Alewife – Park



Method: Bluebikes

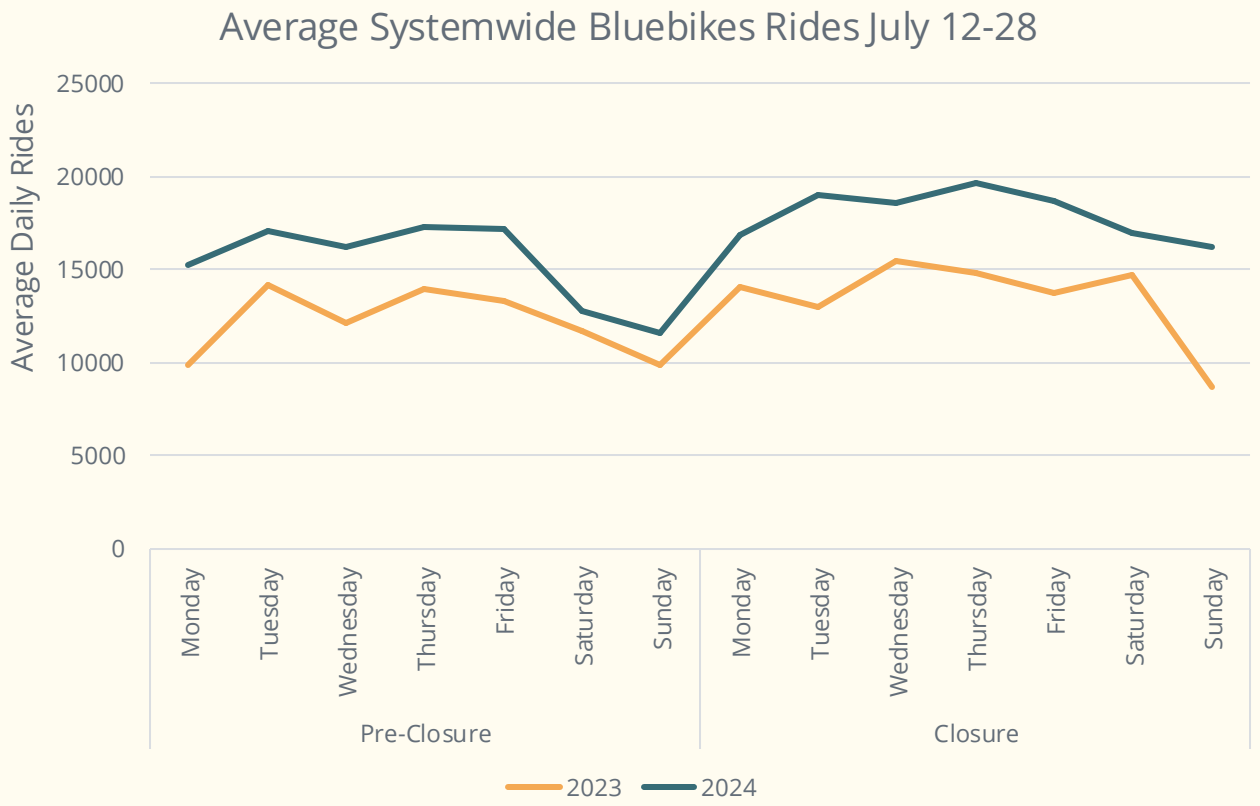
Define comparison groups.

- Systemwide
  - All rides at all docks within Bluebikes system
- Red Line Study Area
  - Best estimate for Red Line replacement trips



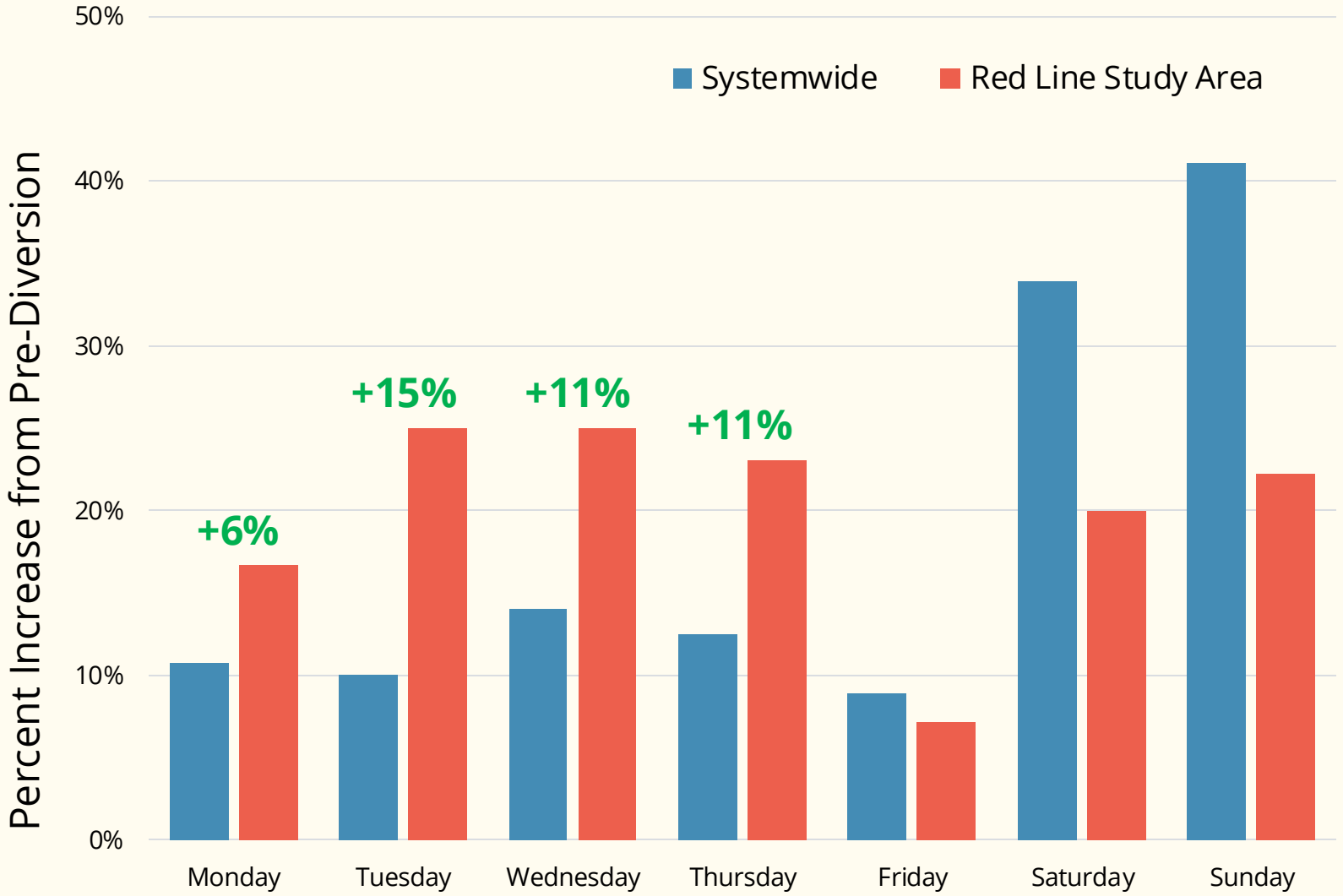
Findings: Bluebikes

- Average Bluebikes rides increased across all bikes in the system (*p<.001)* during the diversion period, particularly on weekends



Average Daily Increase

Average weekday increase in the study area was 24%, nearly double the 12% average of systemwide increase.



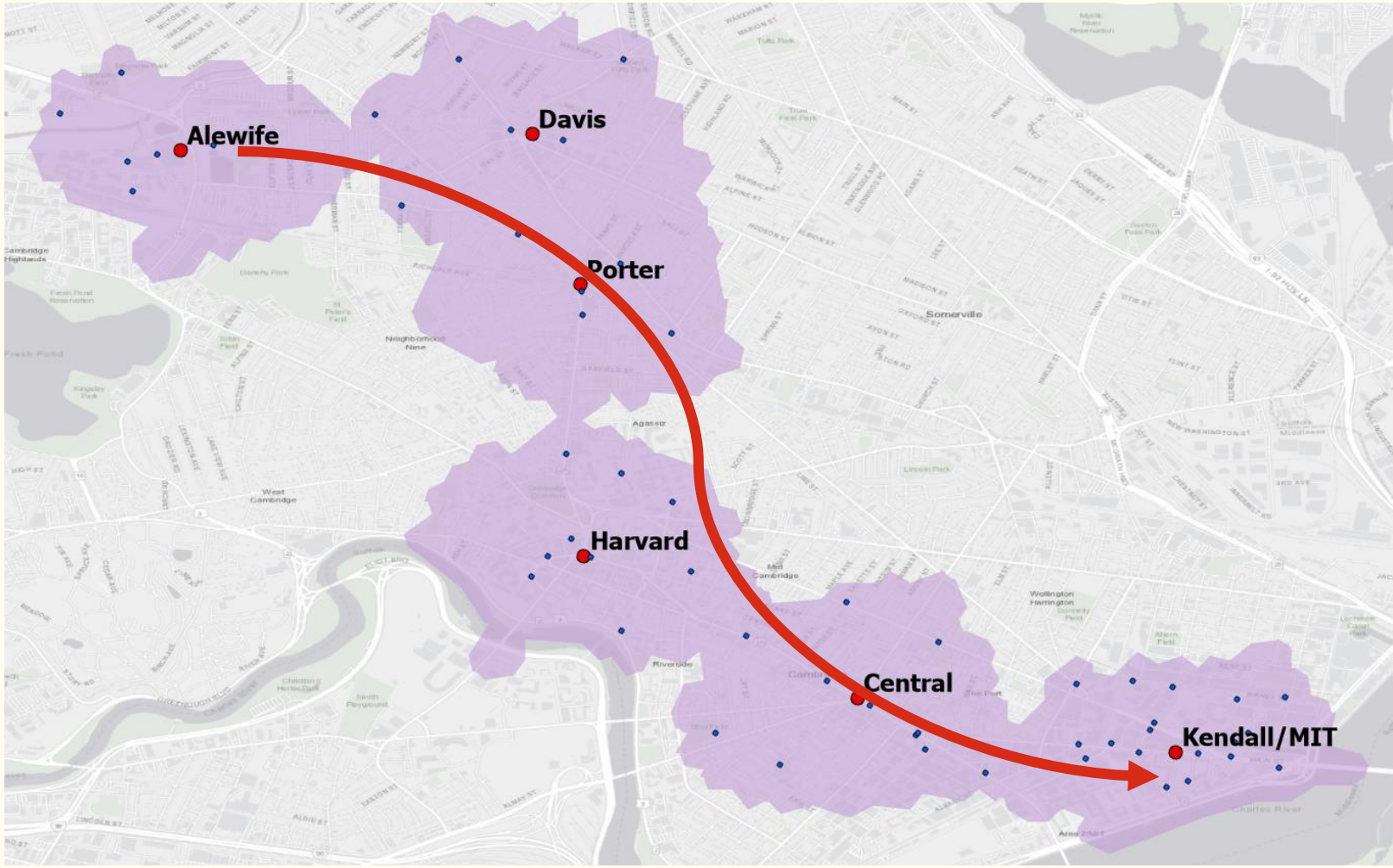
Findings: Bluebikes

Findings: Shuttle Ridership

- Alewife station: 50%
- Kendall Station: 35%
  - Kendall shuttles operated in 3 loops:
    - Harvard Loop: 49%
    - Local Loop: 33%
    - Express: 18%
- Shuttle ridership numbers are comparable to shuttle use during the 2022 Orange Line shutdown

Findings: Mode Share

- On a typical weekday, during peak period travel southbound from Alewife to Kendall:
  - 36% of riders used the shuttle
  - 2% of riders may have switched to biking



Findings Summary

- Bike rides significantly increased across all Bluebikes systemwide, particularly on weekends.
- There was an additional average 12% increase in the study area on weekdays.
- Average shuttle ridership was 40% and met expected levels.

Future Active Travel Project Goals

OPMI Strategic Research

Goals:

- Establish a **hub for active travel research** at the MBTA
- Create a **shared knowledge base** of active travel research and data sources
- Help define **data collection and storage practices** so that people can access high quality bike/ped data

Priority Areas 2025

Collaboration

Consolidate research projects and communicate status updates.

Data Standards

Develop MBTA practices for collecting and reporting on active travel data.

Targeted Research

OPMI internal based projects that prioritize research gaps and co-benefits of active travel.

Collaboration

- Consolidate active travel work happening at MBTA
  - Track and manage a project list and relevant data sources
- Convene regular meetings to update the status of active travel projects
- Act as a conduit between the MBTA, MassDOT, and external research partners

Data Standards

- Develop MBTA practices for collecting and working with active travel data with emphasis on:
  - Accessibility
  - Equity
  - Data Quality
- Coordinate with MassDOT on expanding ongoing data collection practices outside of Boston area
- Establish performance measures to account for active travel data and projects more effectively

Targeted Research

- Perform in-house research that prioritizes closing research gaps established and:
  - Consistently keep in mind the co-benefits of active travel
  - Proactively consider equity and accessibility with every project
- Follow Strategic Research agenda
- Support MBTA research with external partners that incorporates active travel into its design

Questions?

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Appendix

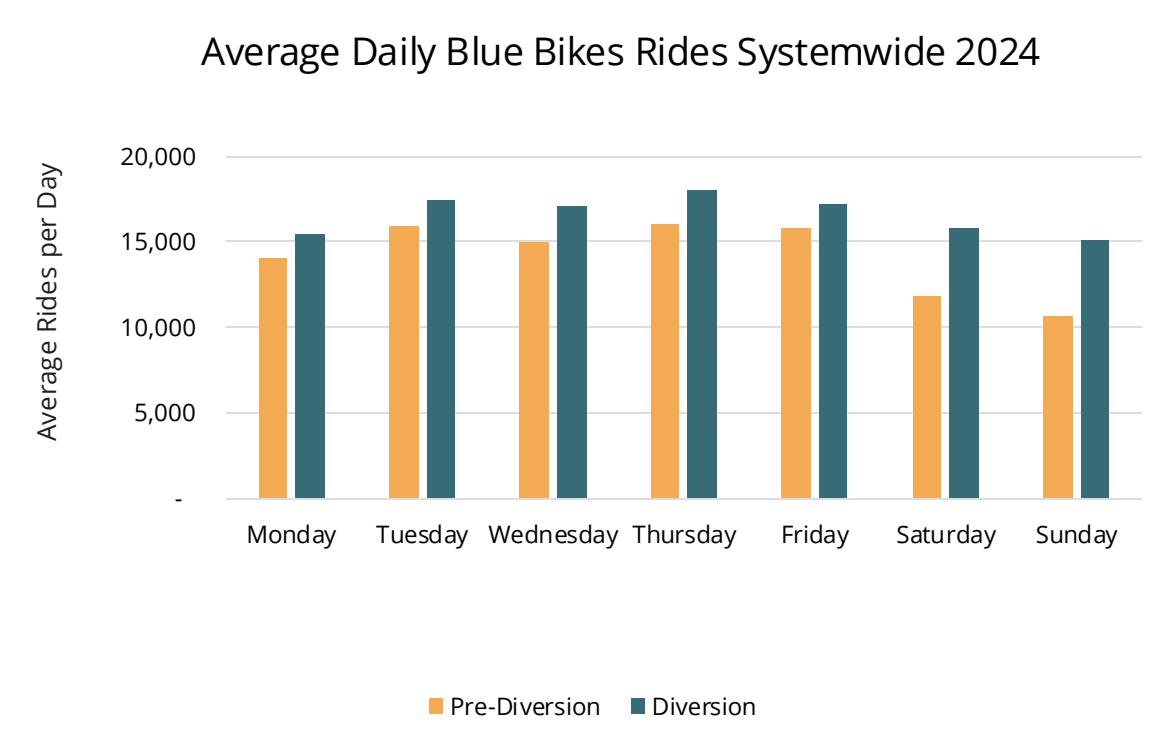
- Data Notes
- Additional Methods
- Additional Visuals

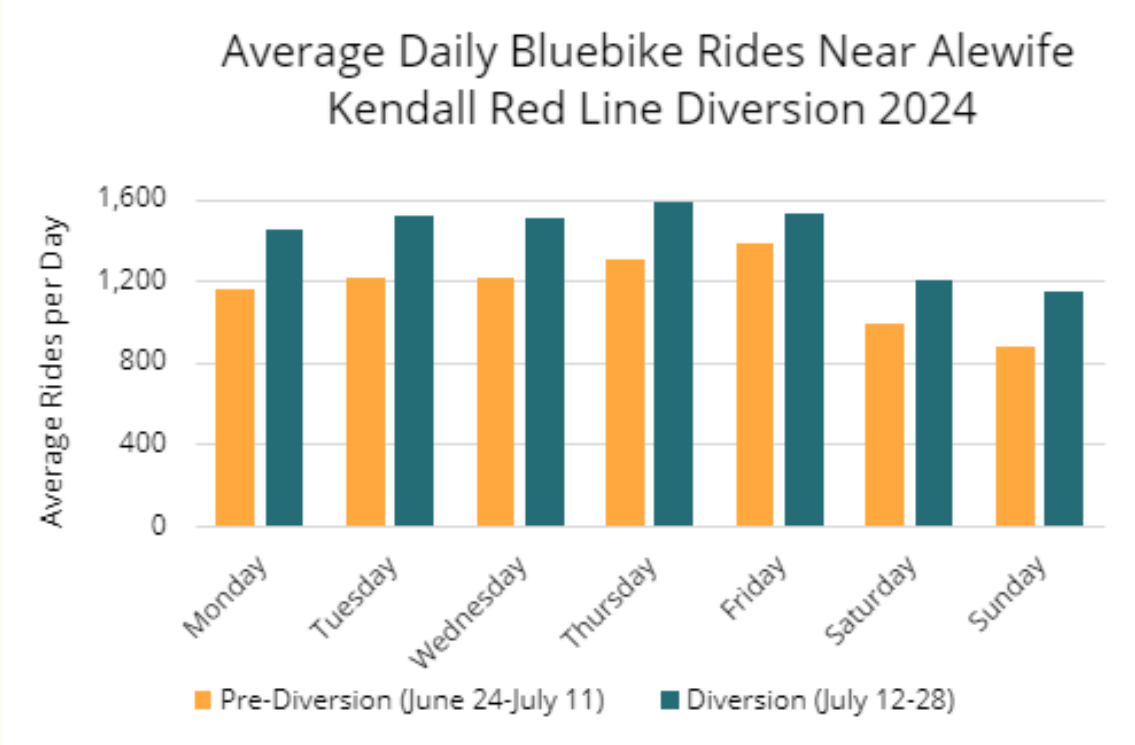
Data Notes

- Assumption that weather did not impact riding
  - Temp and precipitation similar between June & July 2024
- School ended June 20th and should not have impacted the comparison diversion periods
- Kendall shuttle ridership was lower than at Alewife, which indicates more people may have self-diverted in other ways near here and ridership may have shifted to more non-transit riders due to the convenience of the Harvard loop shuttle
- Bluebikes offered 5 free rides as an incentive during the diversion period, which expired when the diversion ended. Did not appear significantly impact results
- Bluebikes data from 2019 and 2021 could not be compared to further explore seasonal trends

Daily trend for Bluebikes system vs Red Line study area

- Average rides increased across all docks on all days, significant at the >.001 level





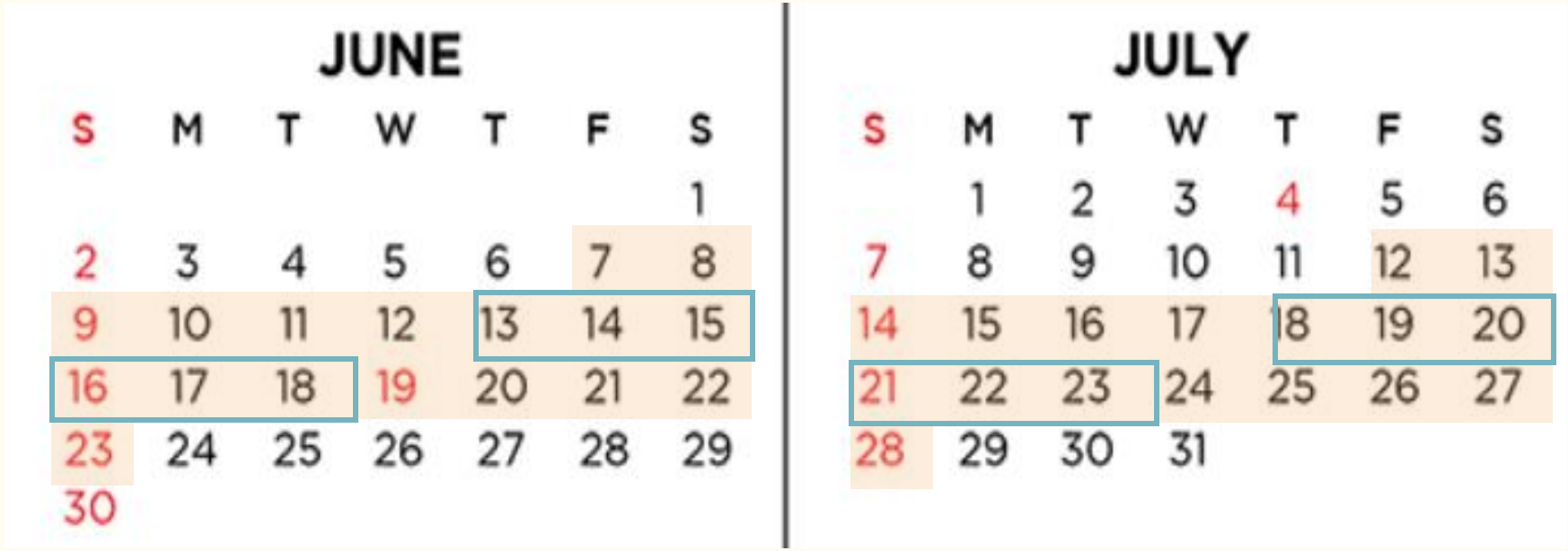
Post-diversion, biking mostly returned to pre-diversion-diversion numbers, but was too variable to identify a significant trend

Method: Initial Comparison Period

Determine comparison period.

Diversion Period:
July 12-28, 2024

Comparison Period:
June 7-23



Blue box indicates full days of temporary counter data.

Method: Shuttle Ridership

To obtain estimated shuttle ridership, CTPS counts of shuttle ons and offs from morning (7-11am) and evening (3-7pm) peal periods during the diversion were compared to average timeframe directly before the diversion.

- One full day of shuttle counts for each station:
  - Alewife: Wednesday July 24th
  - Kendall: Thursday July 18th

Shuttle Ridership

Summary table of average shuttle boardings at Alewife and Kendall compared to typical Red Line boardings on a comparable weekday. Percentages were calculated and then numbers were rounded to the nearest 100.

	Alewife			Kendall	
AM	Typical boardings	2,700	AM	Typical boardings	18,000*
	Shuttle boardings	1,300		Shuttle boardings	2,000
	Riders converted to shuttle	47%		Riders converted to shuttle	40%
PM	Typical boardings	1,400	PM	Typical boardings	18,900*
	Shuttle boardings	700		Shuttle boardings	6,700
	Riders converted to shuttle	53%		Riders converted to shuttle	36%

*Accounts for total typical passengers onboard the train arriving or departing Kendall on an average comparable weekday, which estimates equivalent ridership for this terminal shuttle stop that would be used by all shuttle riders, regardless of their origin or destination.