Sumner closure

Fall 2023 travel behavior analysis

2024-04-26
Contents

- Background
- Findings
- Appendix
  - Detailed information by mode
  - Methodology notes
Sumner Tunnel closure

• Major highway artery closure
• 05 July – 31 August
• Primary impact on westbound/southbound travel
• Pre-shutdown daily travel through Sumner Tunnel of 40,000 cars

Image credit: Victorgrigas via Wikimedia commons. CC BY-SA 3.0.
Closure expectations

Travelers usually heed carmageddon warnings:

1. Well-publicized closure of a major artery usually causes more local congestion

2. Irregular, worsening car traffic increases the appeal of avoiding trips or shifting modes to something faster or more reliable

3. Expected some reduction in total trips taken and some shift to transit
Summer Sumner monitoring dashboard

**Sumner Tunnel Closure Dashboard**

**Important Re-Opening Note:**
This dashboard will not be updated daily after the re-opening of the Sumner Tunnel on September 1st. Periodic updates may still occur. Data for many of the below services can be found on the MBTA’s Open Data Portal, MBTA Performance Dashboards, and the MassDOT Mobility Dashboard. Please don’t hesitate to reach out to the Office of Performance Management & Innovation (OPMI) at opmi@mbta.com with any questions, concerns, or suggestions for further research.

**Important Data Notes:**
This data is preliminary and subject to change. As we receive additional information, expected counts across modes to change due to corrections.

Traffic data shown only includes traffic on the major harbor crossings: Sumner/Callahan, Ted Williams Tunnel YW/BEB, and Tobin Bridge SB/NB.

Farisgate entries to all stations serving the Blue Line includes entries at Government Center for passengers who may have boarded the Green Line and entries at State for passengers who may have boarded the Orange Line. Note that no adjustment is
Travel behavior change

- ~40,000 daily travelers primarily changed routes, not modes
- Mode shift to transit starkest where most competitive with driving
- Limited impact of parking mitigations
- Weekend growth outpaced weekdays; increase in social trip-taking on Blue Line

Breakdown of Sumner-diverted trips by mode
Total diverted trips: 40,000

77% Driving
10% Transit
14% No trip / other
Travel behavior change

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Travel behavior change

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Findings

T behavior changes

• Largest increases on rail on weekends

  - BL: +13% (+5,000 pax)
  - OL: +23% (+5,600 pax)
  - +41% (+3,700 pax)

• Ridership on transit serving Sumner-affected areas saw increases above the rest of the system

  - BL: +7% (+3,600 pax)
  - OL: +4% (+1,700 pax)
  - Newburyport/Rockport: +17% (+1,700 pax)
  - 111, 112, 114, 116, 117: +3% (+555 pax)
  - SL: +2% (+229 pax)
  - SL3: +72% (+350 pax)
  - East Boston ferry: +72% (+350 pax)

Weekday ridership changes

Across both directions of travel. Compared to ridership numbers we would expect to see if the Sumner had not closed this summer.
Significant T service improvements

Increased service

**Blue Line** – *more trains* (6-minute headways at peak)

**Orange Line** – *more trains* (10-, 11-minute headways at peak)

Ferry – two additional ferry lines

Improved transit **reliability**

- Blue Line – reduction of dropped trips by 12.6 percentage points
- Orange Line – reduction of dropped trips by 1.8 percentage points
  (Red Line dropped trips increased 0.8 percentage points)
Increase in congestion made driving more difficult

- Longer travel times to downtown
- More variable, less predictable travel times

From East Boston, AM peak to downtown on the Blue Line took *half as long* as driving – 14 minutes by Blue Line versus 28 by car.
Parking usage

• Some Blue Line parking went up where ridership went down: Orient Heights and Wonderland saw ridership drop more than parking increased

• Commuter Rail saw more parking at free lots, but limited increase at reduced-price lots

• Not all lots have data available
Questions?
Appendix

- Subway
- Commuter Rail
- Bus
- Ferry
- Transit competitiveness
- Methods
Subway

- Ridership
- Service improvements
- Parking

Except State, Gov’t Center

State and points north
Appendix: Subway

Ridership

Highest **absolute weekday ridership growth** of all T services
Appendix: Subway

Ridership

<table>
<thead>
<tr>
<th>Station</th>
<th>Ridership Weekday</th>
<th>Ridership Weekend</th>
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<tbody>
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<td>+456</td>
<td>+376</td>
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<td>+1,031</td>
</tr>
<tr>
<td></td>
<td>-640</td>
<td>+92</td>
</tr>
</tbody>
</table>

DRAFT; FOR POLICY DEVELOPMENT ONLY
Appendix: Subway

BL Ridership

**Weekday**
- **Ridership**
  - BOWDOIN: +25% n/a +4% +16% +14% +30% +4% -2% +1% +7% +16% -13%
  - WONDERLAND: +35% -21% +34% +43%
- **Parking**
  - BOWDOIN: n/a
  - WONDERLAND: n/a

**Weekend**
- **Ridership**
  - BOWDOIN: +47% n/a +23% +24% +18% +34% -7% +6% -33% +5% +48% +3%
  - WONDERLAND: +60% -28% +62% +121%
- **Parking**
  - BOWDOIN: n/a
  - WONDERLAND: n/a
Ridership

Increase in Blue Line social trips during closure

- **Work**: 63%
- **School**: 8%
- **Other**: 8%
- **Errands**: 7%

Social activity: 14%

- **During Closure**: 60%
  - Social activity: 21%
  - Other: 4%
  - School: 1%
  - Work: 14%
Strategic operational improvements

- **Speed restrictions reduction**, especially between Airport and Bowdoin (-7 speed restrictions since May)

- **Increased service frequency**
  - + 1-2 trains during peak + 3 trains midday

- New summer **schedules better matched actual run-times**, so reliability increased
  - 16% of spring trips were dropped, but only
  - 2% of Sumner closure trips were dropped

- Operational changes to improve reliability and **decrease chance of service disruptions**

Dropped trip rates across heavy rail
Blue and Orange Line improvements in service since April

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Free parking did not necessarily drive ridership – likely used to access other services/locations.

Wonderland and Orient Heights saw ridership decline, despite attracting more parked cars.
  - Wonderland ridership decreased by 600 riders (12%) but increased parking by 600 cars.
  - Orient Heights ridership decreased by 100 riders (3%) but increased parking by 150 cars.

Use at Wonderland peaked on July 30th at 80% and 93% capacity – coinciding with the Revere Beach International Sand Sculpting Festival.
Ridership

- Highest growth on weekends, both relatively and absolutely
- Wellington, Malden Center, and downtown stations saw highest growth
Appendix: Subway

**Ridership**

**OAK GROVE**

<table>
<thead>
<tr>
<th>Location</th>
<th>Weekday Ridership</th>
<th>Weekend Ridership</th>
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<tbody>
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<td>+98</td>
</tr>
<tr>
<td>Wellington</td>
<td>+359</td>
<td>+558</td>
</tr>
<tr>
<td>Assembly</td>
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<td>-77</td>
</tr>
<tr>
<td>Sullivan Sq</td>
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<td>+36</td>
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<td>Community College</td>
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<td>-375</td>
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<tr>
<td>North Station</td>
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<td>+2,124</td>
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<tr>
<td>Haymarket</td>
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<td>n/a</td>
</tr>
<tr>
<td>State</td>
<td>+356</td>
<td>+1,058</td>
</tr>
</tbody>
</table>
Appendix: Subway

Ridership

OAK GROVE

OL

WEEKDAY ridership

-3% +6% +13% -1% -5% -34%

WEEKEND ridership

+6% +17% +21% -3% +1% -35%

North Station

+6% n/a +4%

Haymarket

+38% n/a +61%

State
Service delivery improvements

- Improvement in scheduled service delivered and dropped trip rates
- Orange Line’s dropped trip rate declined, from an average of 3% during the spring to 1.5% during the summer.
- Added an additional train during peak periods (from 10 to 11 trains)
Commuter Rail
Newburyport/Rockport
Lowell
Haverhill

• Ridership
• Parking
Appendix: Commuter Rail

Ridership

- Newburyport/Rockport Line had Zone 1A fares and covers geographies most likely impacted by Sumner detour traffic.
- Lowell Line may see increase from North Shore drivers avoiding Sumner runoff traffic via I-95 and the Anderson-Woburn station.

Daily ridership: Newburyport/Rockport Line
Average daily ridership growth from estimated baseline

- Estimated baseline ridership
- Ridership during shutdown

Weekday:
- 22,359
- 24,399 (9% increase)

Saturday:
- 10,752
- 14,973 (39% increase)

Sunday:
- 7,419
- 10,569 (42% increase)
Ridership

North Shore Commuter Rail ridership
Weekday change in ridership against June 2023 baseline

Newburyport/Rockport
Lowell
Haverhill

Week of 07/03 07/10 07/17 07/24 07/31 08/07 08/14 08/21 08/28
Parking: Newburyport/Rockport

- Limited availability of parking data
- Growth across all Commuter Rail lots
- Free parking lots saw greater relative usage growth
- Salem (reduced price) saw highest absolute growth (+31 cars/day)
Appendix: Commuter Rail

Parking: Rockport

Commuter Rail parking lot usage: free lots
Rockport branch

- Beverly Depot
  - % of lot capacity
  - Summer closure
  - Pre-closure average: 20%

- Montserrat
  - % of lot capacity
  - Pre-closure average: 9%

- West Gloucester
  - % of lot capacity
  - Pre-closure average: 7%

- Gloucester
  - % of lot capacity
  - Pre-closure average: 6%
Appendix: Commuter Rail

Parking: Newburyport

Commuter Rail parking lot usage: free lots
Newburyport branch

- North Beverly: 7% pre-closure average, 11% in August
- Hamilton/Wenham: 20% in June, 40% in July, 60% in August
- Rowley: 5% in July, 10% in August
- Newburyport: 8% in June, 11% in July, 15% in August
Bus

Fare free:

- SL3
- 111
- 112
- 114
- 116/117
Ridership on Sumner-alternative bus routes

- Highest ridership increases for buses traveling across the Tobin Bridge
- Dedicated bus lane on Tobin Bridge save around 10 minutes of on-bridge delay during non-Sumner shutdown
Appendix: Bus

Ridership

Daily change in bus ridership on Sumner-alternative routes, compared to baseline

[Graph showing daily change in ridership for weekdays, Saturdays, and Sundays with percentage changes and baseline vs. closure ridership numbers]
Ferry

Fare-free

- East Boston
  *est. fall 2022, no parking*

Zone 1A/$2.40

- Lynn
  *est. summer 2023, free parking*

- Winthrop
  *est. summer 2023, no parking*
Appendix: Ferry

Ridership

Average weekday boardings for Lynn, Winthrop, and East Boston ferries, July-August 2023

<table>
<thead>
<tr>
<th></th>
<th>East Boston</th>
<th>Lynn</th>
<th>Winthrop</th>
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<tbody>
<tr>
<td>Week of 7/7</td>
<td>660</td>
<td>450</td>
<td>200</td>
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<tr>
<td>Week of 7/17</td>
<td>740</td>
<td>410</td>
<td>210</td>
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<tr>
<td>Week of 7/27</td>
<td>900</td>
<td>500</td>
<td>230</td>
</tr>
<tr>
<td>Week of 8/6</td>
<td>930</td>
<td>470</td>
<td>250</td>
</tr>
<tr>
<td>Week of 8/16</td>
<td>780</td>
<td>410</td>
<td>190</td>
</tr>
<tr>
<td>Week of 8/26</td>
<td>830</td>
<td>340</td>
<td>210</td>
</tr>
</tbody>
</table>

Average entries

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Appendix: Ferry

Ridership

- 17% of trips from 7-9am
- Lynn had most balanced AM/PM ridership, likely a function of service availability
- 10% of East Boston trips from 7-9am
Appendix: Ferry

Ridership

East Boston Ferry weekday growth in ridership from June 2023
Baseline weekday ridership ~ 350 passengers

Week of 07/03 07/10 07/17 07/24 07/31 08/07 08/14 08/21 08/28

47% 63% 60% 106% 100% 73% 46% 72% 46%
Transit competitiveness
Appendix: Transit competitiveness

East Boston to downtown

Morning peak travel across Boston Harbor on the Blue Line consistently took *half as long* as driving during the Sumner closure—14 minutes by Blue Line versus 28 by car.

When the tunnel is open, driving downtown during the morning rush typically takes only around *two* more minutes than transit trips.
Appendix: Transit competitiveness

Transit competitiveness

Based on the difference in travel times in the morning and evening, we can see that transit is **more reliable** in its travel, even if it takes longer than driving.

Riders likely experience a more predictable journey than drivers.
Appendix: Transit competitiveness

Transit competitiveness

For some trips, while transit is more reliable than driving, it also takes *nearly the same time* as driving during the morning peak.
Appendix: Transit competitiveness

Transit competitiveness

For East Boston trips, not only is transit more predictable in travel time than driving, it’s flat-out faster.

These are also the stations along the Blue Line with the most pronounced ridership increases.

(And two of only four East Boston Blue Line stops that posted only average daily ridership gains, no losses.)
To account for both the steady increase trip-taking by all modes over the past year, as well as traditional summer declines in Boston-area travel, this memo uses a hypothetical baseline that blends travel growth over the past year with seasonal July and August travel declines. For transit in particular, this baseline is an estimate based on the average percentage change in ridership between June and July-August across all subway lines in 2022 and 2019 (excluding the Orange Line during August 2022 construction closure).
Literature sources

Highway closures:

*Unexpected – significant disruption*

- Philadelphia, I-95 (2023)
- Oakland, I-880 (1998)

*Expected – minimal disruption*

- Portland, I-5 (2020)
- New York City, 14th Street (2019+)
- Seattle, Hwy 99 (2019)

Transit service vs. fare elasticity:


Communication efforts

• Marketing & communication affects travelers’ ability to plan ahead and avoid or alter trips
• Extensive outreach, including:
  • Multimodal Twitter updates
  • Real-time transit information on VMS
  • Emails to all Boston-Logan travelers
  • Advertisement via planned parking & fare reductions
Multimodal impacts

Breakdown of non-Sumner trips by modes
The total diverted trips: 40,000
Acknowledgements

OPMI

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Corey O’Connor, Adam Contrino
About OPMI
Office of Performance Management and Innovation

We are a shared service in MBTA and MassDOT focusing on Performance Management, Data Strategy, Research & Analysis. Contact: opmi@mbta.com

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Tracker, the annual report card of MassDOT

MBTA Back on Track, a public facing daily dashboard on MBTA metrics

Open Data Portal, a public repository of downloadable data