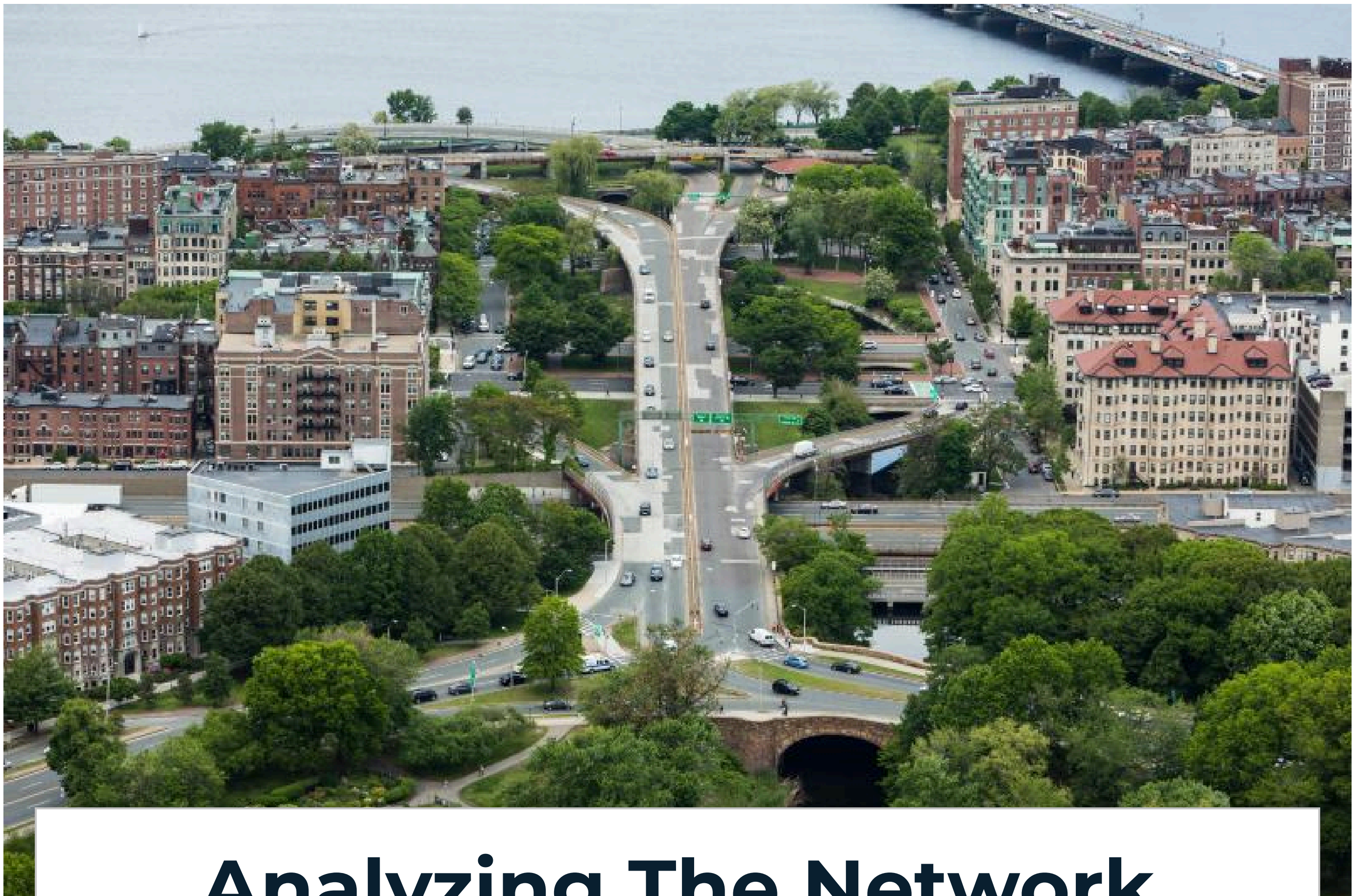


Analyzing The Network

FENWAY TRANSPORTATION ACTION PLAN (FTAP)

FTAP Existing/Future Analysis

The FTAP team has completed the analysis of existing and future (+15 years & Full Build) transportation network conditions, and a game day analysis scenario for Fenway Park events. These analytical tools **will allow the City to proceed with developing and testing transportation network improvements** to the three study design areas of Kenmore Square, Brookline Avenue and Ipswich/Van Ness Streets.

The analysis identifies the transportation demand today, and the anticipated development and transportation network changes in the Study Area in about 15 years and the longer term "Full Build" condition. With 14 million square feet of anticipated new buildings under review, permitted, or under construction, neighborhood development **impacts cannot be assessed in isolation**. The consolidated analysis found that:

Trips by all modes of travel (vehicles, pedestrians, bike, transit riders) that start and end in Fenway are projected to rise by over 50% due to the increase in retail, residential, office, academic, and medical institutional uses.

No mode experiences as significant growth in the study area in the next **15 years as walking**.

The analysis incorporates the projected growth of trips that pass through the study area by utilizing the Boston region's travel demand model (Boston's Metropolitan Planning Organization maintains a travel demand model, called TDM23, for all of eastern Massachusetts which simulates and forecasts highway, transit, bicycle, and pedestrian activity out to the year 2050.)

Multi-lane roadways like Beacon Street, Park Drive, and The Fenway are projected to experience the most traffic within the next 15 years but they have some existing capacity to absorb additional traffic associated with future development.

Many intersections will not see a significant change in the future as they are already approaching capacity and are metered by other intersections. Much of the **growth in the study area will be handled by inter-neighborhood walking, biking and transit trips** from new development.

Previously planned improvements to the Green Line and MBTA Bus Network will **deliver enough transit capacity** to absorb significant future transit demand. However, **efficient bus service and improved access to transit stations is needed** to ensure safe, accessible and reliable operations.

Based on analysis, current 7:10PM Fenway Park events bring an average of approximately **3,000 additional private vehicle and rideshare vehicle trips** through the FTAP network on top of the baseline traffic patterns.

The results from the analysis above then highlight where demand outstrips capacity on the study area's transportation network, and will be the tool that changes to the transportation network are **tested against to understand impacts.** The baseline traffic analysis for the FTAP is for a typical weekday though Fenway Park regularly causes changes in travel patterns in the neighborhood which regularly change traffic patterns. In partnership with the Fenway Sports Group, the FTAP team developed an **event day analysis framework** that will be used to consider each of the project's proposed design interventions.

Analyzing the network:

The Fenway transportation network has experienced a lot of recent and ongoing change. These transportation improvements aim to create better and safer multimodal connections to, from, and through the Fenway neighborhood.

With each new transportation and development project, the neighborhood evolves and adapts. With 14 million square feet of anticipated new buildings under review, permitted, or under construction, neighborhood development impacts cannot be assessed in isolation.

ARTICLE 80 DEVELOPMENT STATUS
第80条发展现状 | 第八十條 發展現狀 |
ARTÍCULO 80 ESTADO DE DESARROLLO

Development under review
正在审查的发展 | 發展正在審查中 | *Desarrollo bajo revisión*

Board approved development
董事会批准的开发 | 董事會批准的開發 |
Desarrollo aprobado por la junta

Development under construction
正在建设中的开发项目 | 開發建設中 | *Desarrollo en construcción*

Design Area
设计范围 | 設計地區 | *Área de diseño*

Roxbury-Fenway Connector
罗克斯伯里-芬威连接器 | 羅克斯伯里-芬威連接器 |
Conector Roxbury-Fenway

The City of Boston has created a multimodal transportation model to provide a holistic understanding of the cumulative effect of this growth, which in turn will help understand the kind of policy and infrastructure investments that may be needed to achieve the multimodal priorities related to the public realm, bicycle network, bus network, and the curb.

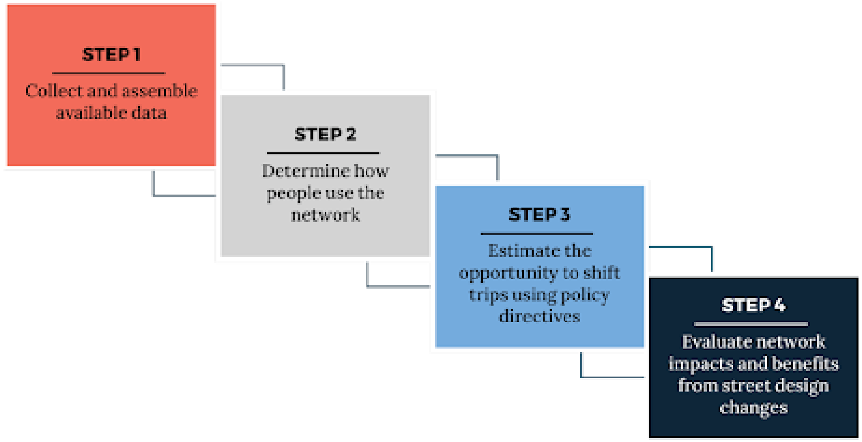
What is the model?

The Action Plan's multimodal transportation model is a set of interconnected tools and datasets that analyze existing and anticipated future transportation conditions in the neighborhood. The multimodal model will help residents and City staff understand the combined effects of each individual land use development and infrastructure change, and analyze the collective effect on the Fenway neighborhood's transportation network.

What is the methodology?

The City published a comprehensive multimodal modeling methodology for analyzing expected transportation and land use changes in the Fenway neighborhood. The model analyzes three conditions including "business as usual" land use conditions including existing conditions, near-term (next 10-15 years), and far future (2050). The full methodology is available online and has **four steps**:

- Step 1: Collect and assemble available data
- Step 2: Determine how people use the network
- Step 3: Estimate the opportunity to shift trips using policy directives
- Step 4: Evaluate network impacts and benefits from street design changes



Intersection user count data—the number of pedestrians, bicyclists, vehicles, and buses passing through each intersection—were compiled from previous City and State transportation projects, as well as Article 80 development filings within the Analysis Area. This data was consolidated into a Synchro model to estimate the existing peak-hour, or most congested period, traffic volumes at each Analysis Area intersection. (Synchro is a network model that documents existing multimodal user counts and intersection operations.) Roadway segment volumes for peak hour and daily volume from a variety of resources were compared to ensure the alignment between key components of the data sources.

TDM23, the most recent regional transportation demand model, was prepared by the Boston Region Metropolitan Planning Organization's Central Transportation Planning Staff and provided the total number of trips traveling through and in the Analysis Area. The forecasted future volumes were adjusted by applying the aspirational future mode shares, or how many people will be driving, walking, biking and taking transit in the future. This determined the number of trips to and from each Transportation Analysis Zone (TAZ) Level by mode, which are relatively small zones that transportation planners use to analyze travel trends. TDM23 was used to evaluate all projected near-term trips by AM and PM peak periods by mode in the Fenway neighborhood's 43 TAZs including:

- All trips to and from the Analysis Area

- All trips that begin and end within the Analysis Area, also called intra-Analysis Area trips

Using this trip data, the neighborhood's trip growth and mode choice by the near-term can be evaluated at a granular level. The analysis was based on trips during the afternoon peak period (3PM to 7PM). For transit, after forecasting the number of trips to, from, and through the Analysis Area, trips for each origin-destination TAZ pair were assigned to the transit network on specific rail lines and/or bus routes.

What are the implications to Fenway in the near-term without any design changes to the network?

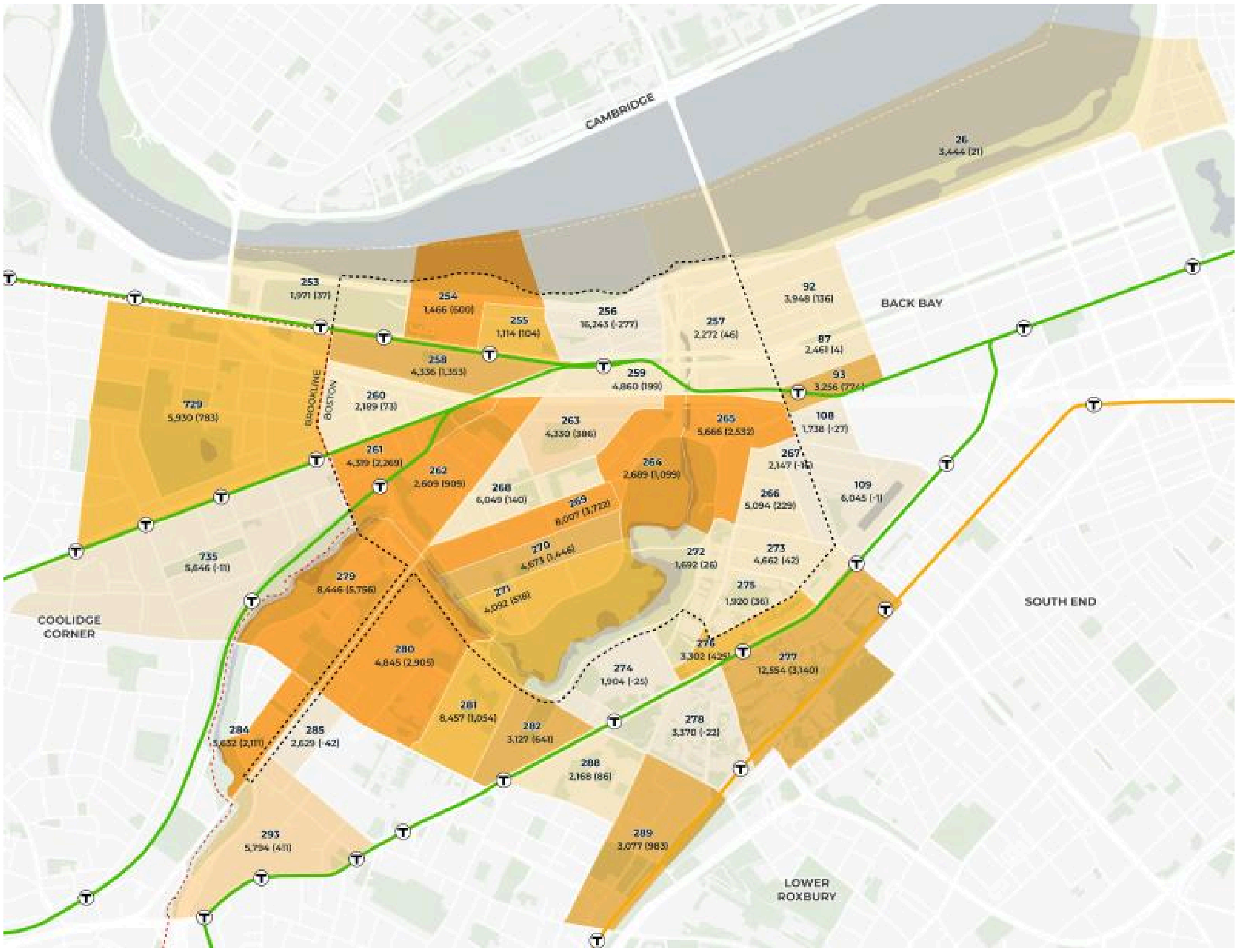
The growth for all modes is highest in the Design Areas, and along neighborhood corridors identified in the High Crash Network. The trends are associated with the neighborhood's large development pipeline and the increase in retail and office uses. For transit, a significant portion of trips can also be attributed to the service changes available in the area, notably improvements in bus, subway, and commuter rail service.

Within the Analysis Area, no mode experiences as significant of growth between the existing condition and the near-term as walking. While other modes of transportation have no near-term trip growth in certain Analysis Area TAZs, near-term AM walk trips are projected to increase in every Analysis Area TAZ. The near term PM walk trips are projected to increase in all but two Analysis Area TAZs.

TDM23 also shows trips that start and end in the Analysis Area by mode and peak hour. These trips are called intra-Analysis Area trips. The neighborhood's near-term intra-Analysis Area trip growth follows the same geographic growth patterns, by mode, as all estimated near-term trips to, from, and through the Fenway neighborhood. The increase in trips align with planned developments lining the Action Plan's Design Areas and within TAZs along neighborhood corridors identified in the High Crash Network. The percentage growth of near-term (or next 10-15 years) intra-Analysis Area trips relative to the existing condition is highest in the following areas in both the AM and PM peak periods:

- Along Brookline Avenue in the LMA
- Along Ipswich Street east of Fenway Park
- Along and south of Boylston Street
- Along the west side of Kenmore Square

Intra-Analysis Area walk, transit, bike and vehicle trips are projected to rise by over 50% due to the increase in retail, office, academic, and medical institutional uses. There are some notable high trip growth areas by mode. For example, bike trips near Northeastern University are projected to grow by 76%. Near-term intra-Analysis Area trip growth is typically lower in the TAZs outside of the Analysis Area, where there is significantly less planned development. There is less than 10% growth in TAZs along the eastern boundary of the Analysis Area during both the AM and PM peak periods.


CAMBRIDGE
26
3,444 (21)
253
1,971 (37)
254
1,466 (600)
255
1,114 (104)
256
16,243 (-277)
257
2,272 (46)
92
3,948 (136)
BACK BAY
87
2,461 (4)
258
4,336 (1,353)
259
4,860 (199)
93
3,256 (774)
BROOKLINE
BOSTON
729
5,930 (783)
260
2,189 (73)
263
4,330 (386)
265
5,666 (2,532)
108
1,738 (-27)
261
4,319 (2,269)
262
2,609 (909)
264
2,689 (1,099)
267
2,147
268
6,049 (140)
269
8,007 (3,722)
266
5,094 (229)
109
6,045 (-1)
735
5,646 (-11)
270
4,673 (1,446)
272
1,692 (26)
273
4,662 (42)
279
8,446 (5,756)
271
4,092 (518)
275
1,920 (36)
SOUTH END
COOLIDGE
CORNER
280
4,845 (2,905)
276
3,302 (425)
277
12,554 (3,140)
274
1,904 (-25)
281
8,457 (1,054)
284
5,632 (2,111)
285
2,629 (-42)
282
3,127 (641)
278
3,370 (-22)
288
2,168 (86)
293
5,794 (411)
289
3,077 (983)
LOWER
ROXBURY

PERCENT CHANGES IN TRIPS TO AND FROM THE ANALYSIS AREA INCLUDING MODE SHARE (A.M.)

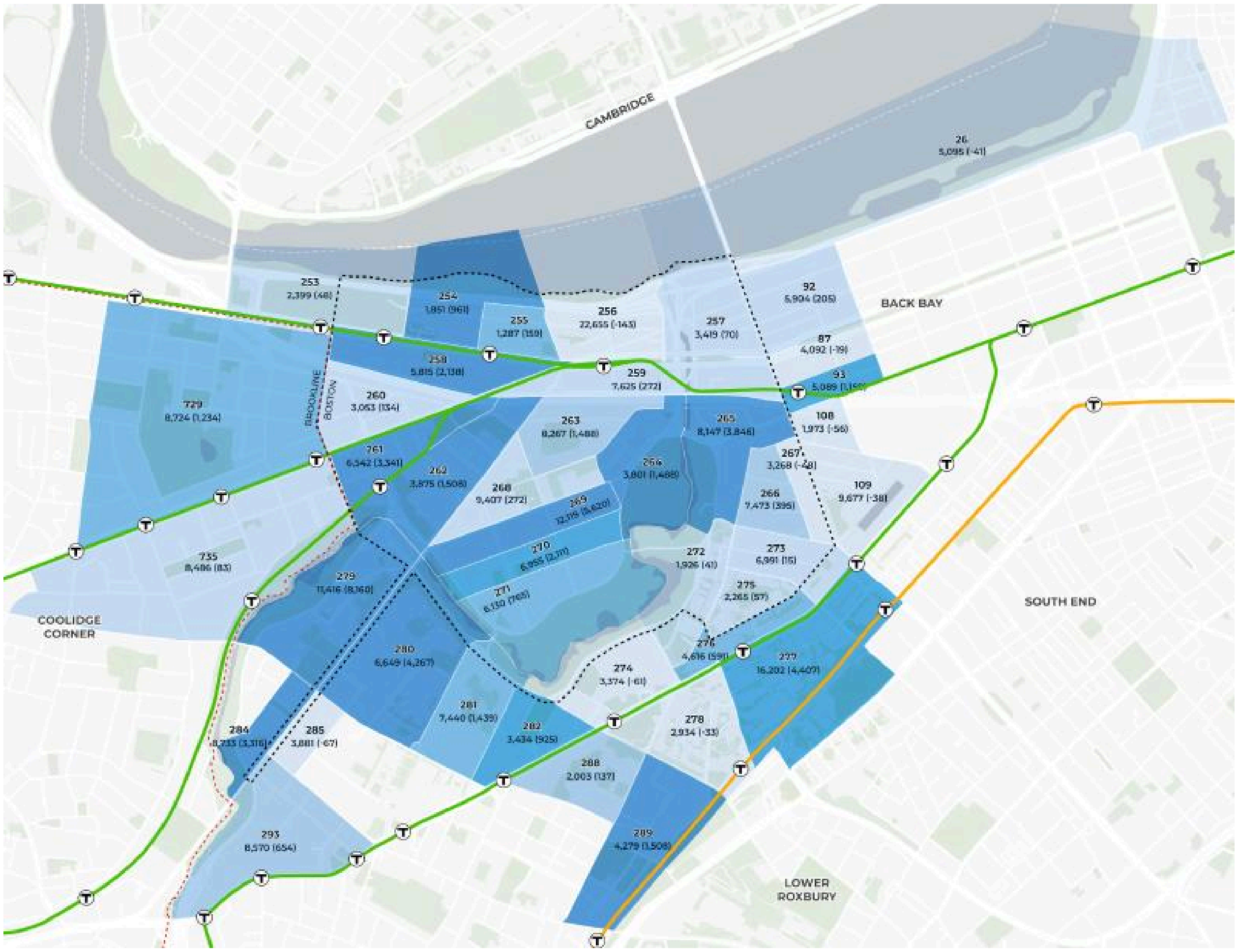
往返分析区早高峰出行量变化百分比（含共享出行方式）|
往返分析區早高峰出行量變化百分比（含共乘出行方式）|

PORCENTAJES DE USO EN VIAJES DE IDA AL ÁREA DE ANÁLISIS, INCLUIDO EL PORCENTAJE DE USO DE CADA MODE DE TRANSPORTE (A.M.)

AM
早 | 早 | *Mañana*

Top **#** = *Transportation Analysis Zone*
Bottom **#** = *Total Trips (Change in Trips)*
顶部编号 = 交通分析区
底部编号 = 出行总量（出行变化）|
頂部編號 = 交通分析區
底部編號 = 出行總量（出行變化）|
Número superior = Zona de análisis de transporte
Número inferior = Total de viajes (Cambio en los viajes)

- 51%+
- 26% to 50%
- 11% to 25%
- 6% to 10%
- 1% to 5%
- No Change
- *Design Area* | 设计区域 | 設計區域 | *Área de diseño*



CAMBRIDGE
26
5,095 (-41)
253
2,399 (48)
254
1,851 (961)
255
1,287 (159)
256
22,655 (-143)
257
3,419 (70)
92
5,904 (205)
BACK BAY
87
4,092 (-19)
258
5,815 (2,138)
259
7,625 (272)
93
5,089 (1,159)
BROOKLINE
BOSTON
729
8,724 (1,234)
260
3,063 (134)
263
8,267 (1,488)
265
8,147 (3,846)
108
1,973 (-56)
761
6,342 (3,341)
262
3,875 (1,508)
264
3,801 (1,488)
267
3,268 (-48)
268
9,407 (272)
269
12,118 (8,620)
266
7,473 (396)
109
9,677 (-38)
735
8,486 (83)
270
6,955 (2,111)
272
1,926 (41)
273
6,991 (15)
279
11,416 (8,160)
271
6,130 (765)
275
2,265 (57)
SOUTH END
COOLIDGE
CORNER
276
4,616 (591)
277
16,202 (4,407)
280
6,649 (4,267)
274
3,374 (-61)
281
7,440 (1,439)
278
2,934 (-33)
284
8,733 (3,316)
285
3,881 (-67)
282
3,434 (925)
288
2,003 (137)
293
8,570 (654)
289
4,279 (1,508)
LOWER
ROXBURY

PERCENT CHANGES IN TRIPS TO AND FROM THE ANALYSIS AREA INCLUDING MODE SHARE (P.M.)

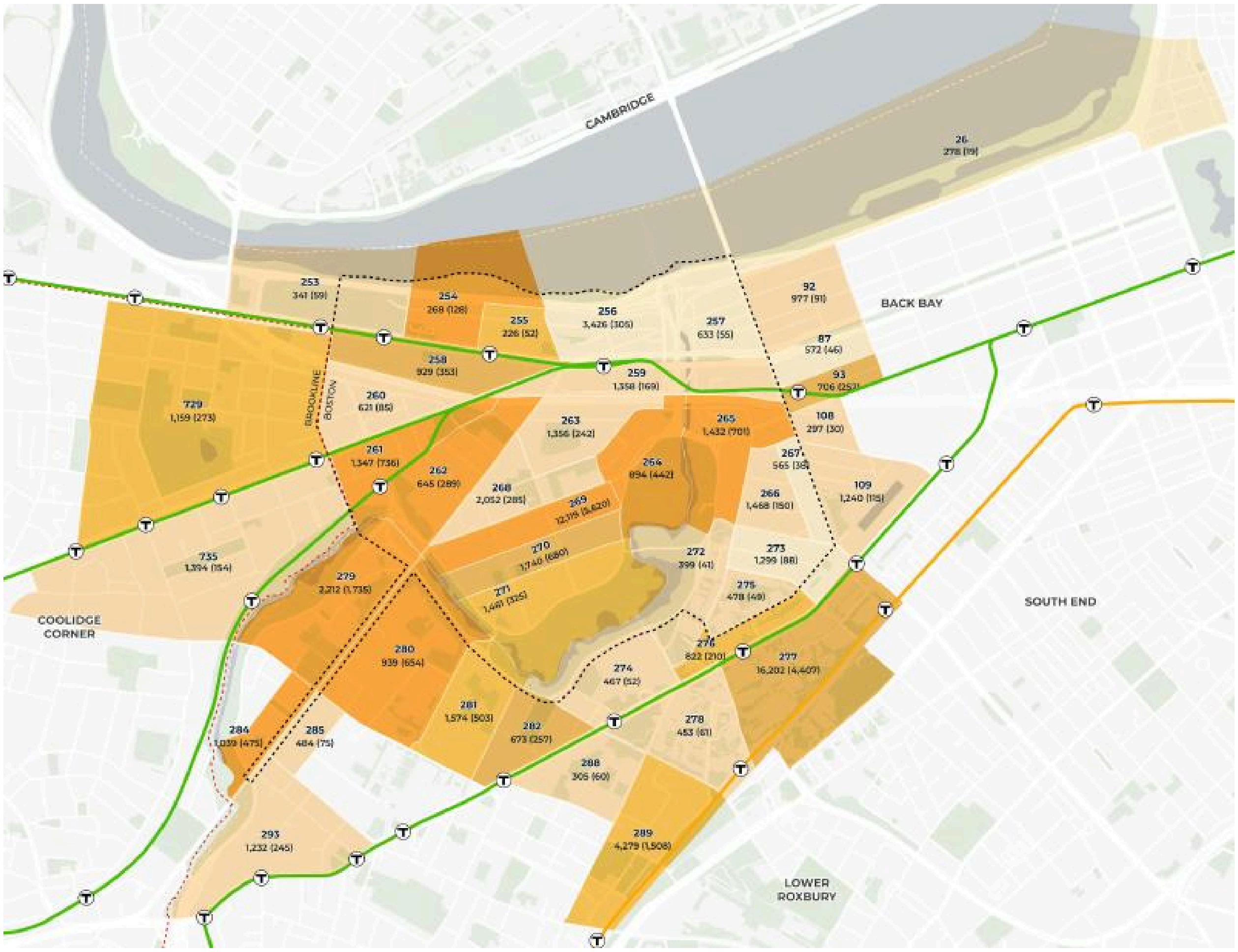
往返分析区晚高峰出行量变化百分比（含共享出行方式）|
往返分析區晚高峰出行量變化百分比（含共乘出行方式）|

PORCENTAJES DE USO EN VIAJES DE IDA AL ÁREA DE ANÁLISIS, INCLUIDO EL PORCENTAJE DE USO DE CADA MODE DE TRANSPORTE (P.M.)

PM
晚 | 晚 | *Tarde*

Top **#** = *Transportation Analysis Zone*
Bottom **#** = *Total Trips (Change in Trips)*
顶部编号 = 交通分析区
底部编号 = 出行总量（出行变化）|
頂部編號 = 交通分析區
底部編號 = 出行總量（出行變化）|
Número superior = Zona de análisis de transporte
Número inferior = Total de viajes (Cambio en los viajes)

- 51%+
- 26% to 50%
- 11% to 25%
- 6% to 10%
- 1% to 5%
- No Change
- *Design Area* | 设计区域 | 設計區域 | *Área de diseño*


CAMBRIDGE
26
278 (19)
BACK BAY
253
341 (59)
254
268 (128)
255
226 (52)
256
3,426 (305)
257
633 (55)
92
977 (91)
87
572 (46)
258
929 (353)
259
1,358 (169)
93
706 (252)
BROOKLINE
BOSTON
729
1,159 (273)
260
621 (85)
263
1,356 (242)
265
1,432 (701)
108
297 (30)
261
1,347 (736)
262
645 (289)
264
894 (442)
267
565 (38)
268
2,052 (285)
269
12,119 (5,620)
266
1,468 (150)
109
1,240 (115)
270
1,740 (680)
272
399 (41)
273
1,299 (88)
735
1,394 (154)
279
2,212 (1,735)
271
1,461 (325)
275
478 (48)
SOUTH END
COOLIDGE
CORNER
280
939 (654)
274
467 (52)
276
822 (210)
277
16,202 (4,407)
281
1,574 (503)
282
673 (257)
278
453 (61)
284
1,039 (475)
285
484 (75)
288
305 (60)
293
1,232 (245)
289
4,279 (1,508)
LOWER
ROXBURY

PERCENT CHANGE FOR INTRA-ANALYSIS AREA TRIPS INCLUDING MODE SHARE (A.M.)

分析区内部早出行百分比变化（含共享出行方式）|

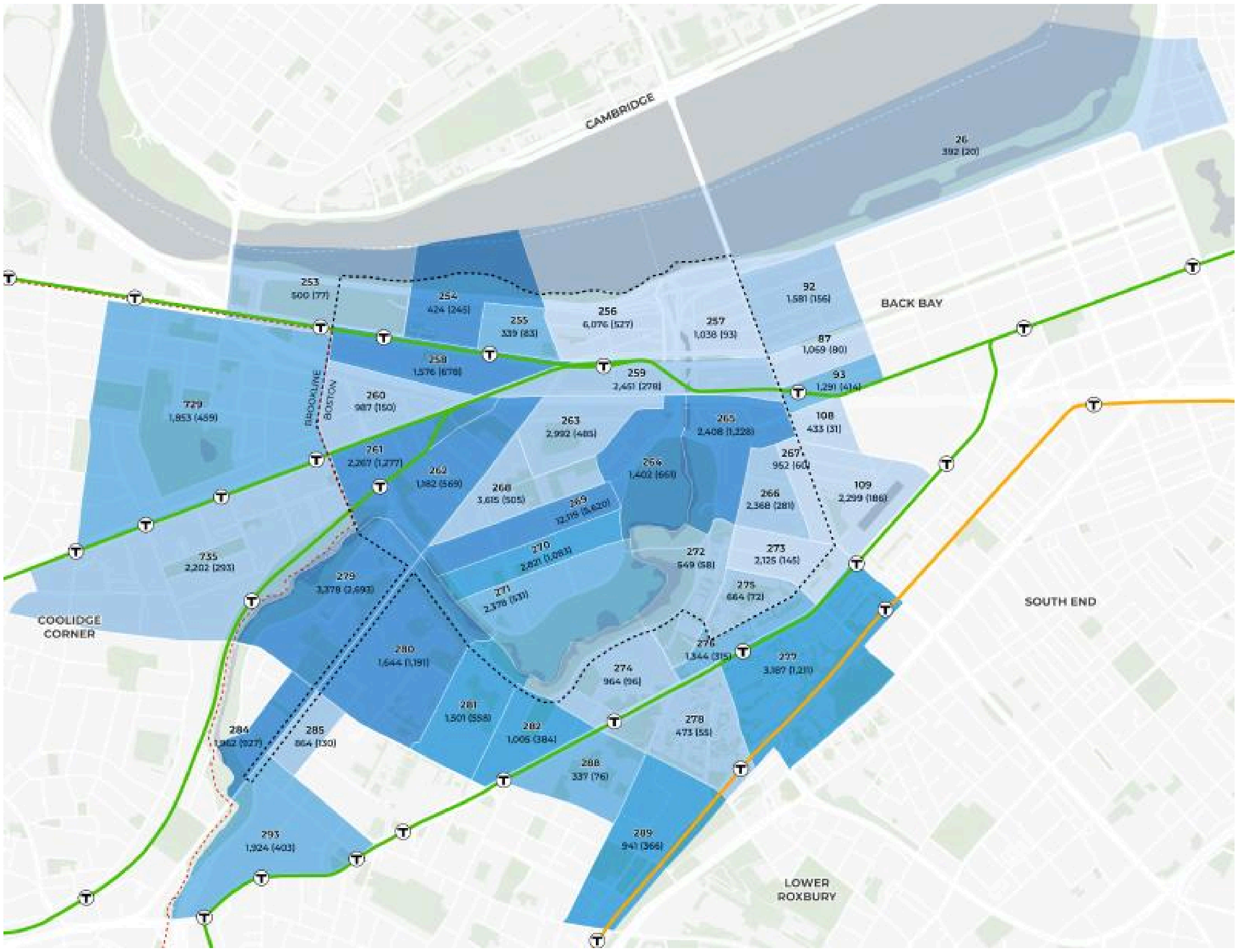
分析區内部早出行百分比變化（含共乘出行方式）|

PORCENTAJE DE CAMBIO PARA VIAJES DENTRO DEL DE ANÁLISIS, INCLUIDO EL PORCENTAJE DE USO DE CADA MODE DE TRANSPORTE EN LA MAÑANA (A.M.)

AM
早 | 早 | *Mañana*

Top **#** *= Transportation Analysis Zone*
Bottom **#** *= Total Trips (Change in Trips)*
顶部编号 = 交通分析区
底部编号 = 出行总量（出行变化）|
頂部編號 = 交通分析區
底部編號 = 出行總量（出行變化）|
Número superior = Zona de análisis de transporte
Número inferior = Total de viajes (Cambio en los viajes)

- *76%+*
- *51% to 75%*
- *26% to 50%*
- *11% to 25%*
- *1% to 10%*
- *Design Area* | 设计区域 | 設計區域 | *Área de diseño*



CAMBRIDGE
26
392 (20)
BACK BAY
253
500 (77)
254
424 (245)
255
339 (83)
256
6,076 (527)
257
1,038 (93)
92
1,581 (156)
87
1,069 (80)
258
1,576 (678)
259
2,461 (278)
93
1,291 (414)
BROOKLINE
BOSTON
729
1,853 (459)
260
987 (150)
263
2,992 (485)
265
2,408 (1,228)
108
433 (31)
261
2,267 (1,277)
262
1,182 (569)
268
3,615 (505)
264
1,402 (661)
267
952 (60)
266
2,368 (281)
109
2,299 (186)
269
12,118 (5,620)
735
2,202 (293)
270
2,821 (1,083)
272
549 (58)
273
2,125 (145)
279
3,378 (2,693)
271
2,378 (531)
275
664 (72)
SOUTH END
COOLIDGE
CORNER
280
1,644 (1,191)
276
1,344 (315)
277
3,187 (1,211)
274
964 (96)
281
1,501 (558)
278
473 (55)
284
1,962 (927)
285
864 (130)
282
1,005 (384)
288
337 (76)
293
1,924 (403)
289
941 (366)
LOWER
ROXBURY

PERCENT CHANGE FOR INTRA-ANALYSIS AREA TRIPS INCLUDING MODE SHARE (P.M.)

分析区内部晚出行百分比变化（含共享出行方式）|
分析區內部晚出行百分比變化（含共乘出行方式）|

PORCENTAJE DE CAMBIO PARA VIAJES DENTRO DEL DE ANÁLISIS, INCLUIDO EL PORCENTAJE DE USO DE CADA MODE DE TRANSPORTE POR LA TARDE (P.M.)

PM
晚 | 晚 | *Tarde*

Top **#** = *Transportation Analysis Zone*
Bottom **#** = *Total Trips (Change in Trips)*
顶部编号 = 交通分析区
底部编号 = 出行总量（出行变化）|
頂部編號 = 交通分析區
底部編號 = 出行總量（出行變化）|
Número superior = Zona de análisis de transporte
Número inferior = Total de viajes (Cambio en los viajes)

76%+

51% to 75%

26% to 50%

11% to 25%

1% to 10%

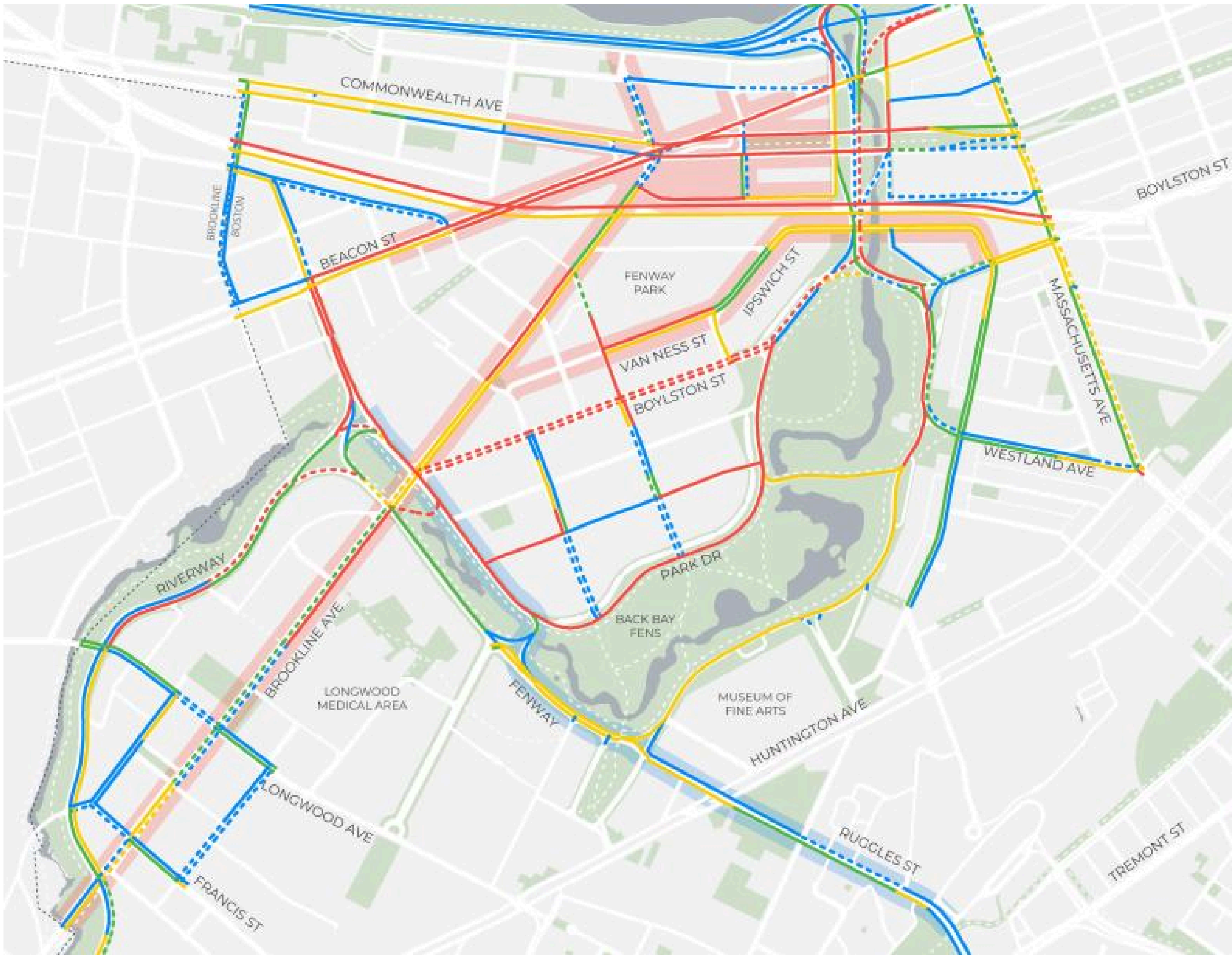
Design Area | 设计区域 | 設計區域 | *Área de diseño*

How did the models work together?

TDM23 simulates travel demand across a network — how many vehicles are expected to travel between different origins and destinations during a time period. It provides segment-level volumes, or how many vehicles are expected to travel along a section of road. Synchro is used to understand the volumes at specific intersections, and works with intersection turning movement counts such as how many vehicles go left, straight, or turn right. To apply the TDM23 2.0 future volumes to the existing peak hour volumes in Synchro, the estimated changes in traffic volumes between the existing condition and the near-term condition for each roadway segment were applied to each study intersection approach based on existing turning movement patterns and anticipated changes to traffic flows.

This established the near-term "no-build" peak hour volumes at each Analysis Area intersection.

How do traffic volumes change by roadway segment?



TDM23 EXISTING VS. NEAR-TERM HOURLY CHANGE IN VEHICLE TRIPS (A.M.)

TDM23 现有与短期小时变化对比

TDM23 現有與短期小時變化對比

TDM23: CAMBIOS POR HORA EXISTENTES Y A CORTO PLAZO

AM
早 | 早 | *Mañana*

More than 100

50 to 100

25 to 50

1 to 25

-25 to 0

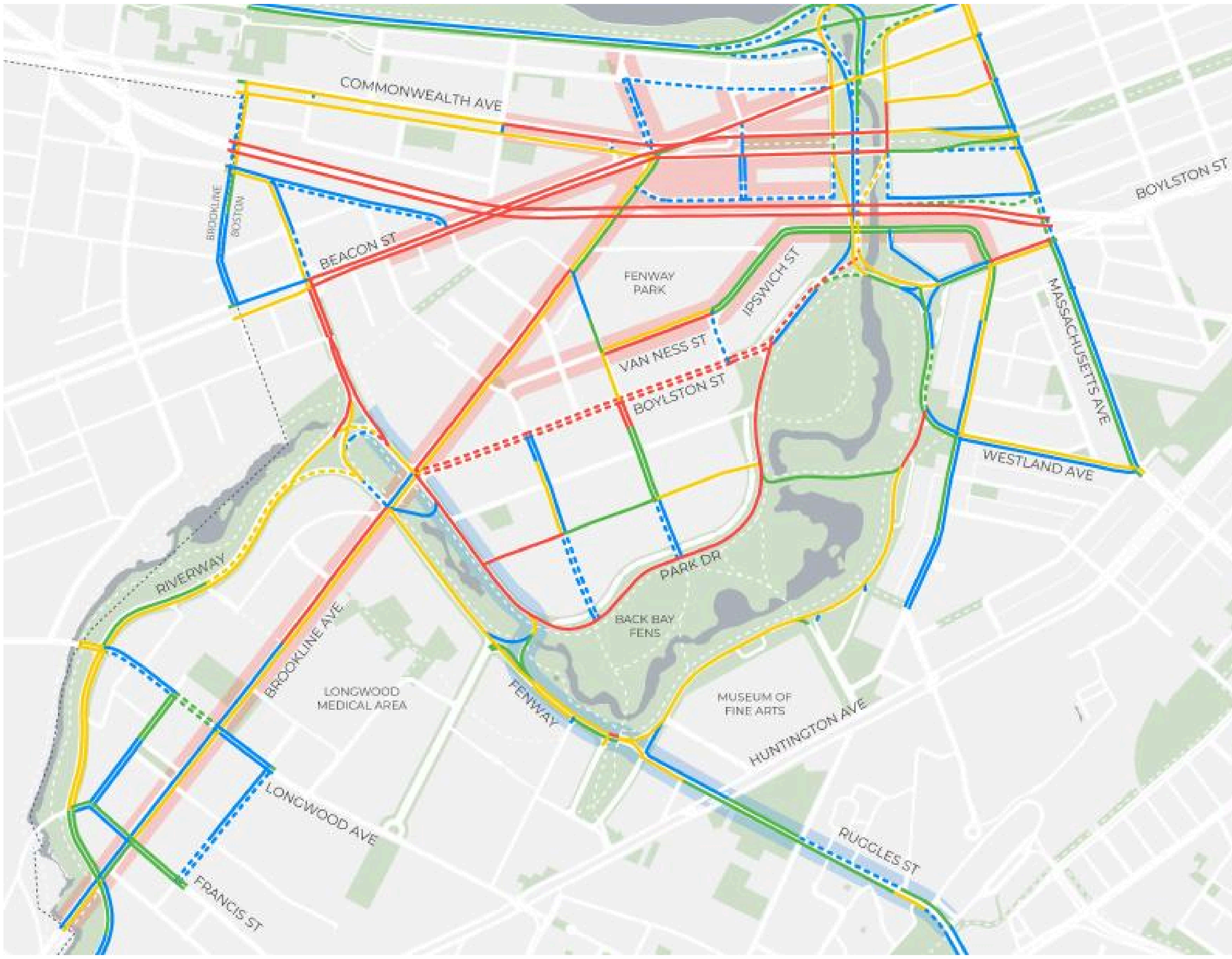
-50 to -25

-100 to -50

Less than -100

Design Area
设计区域 | 設計區域 | *Área de diseño*

Roxbury-Fenway Connector
罗克斯伯里-芬威连接线 | 羅克斯伯里-芬威連接器 |
Conector Roxbury-Fenway



COMMONWEALTH AVE
BOYLSTON ST
BROOKLINE
BOSTON
BEACON ST
FENWAY PARK
IPSWICH ST
MASSACHUSETTS AVE
VAN NESS ST
BOYLSTON ST
WESTLAND AVE
PARK DR
RIVERWAY
BROOKLINE AVE
BACK BAY FENS
LONGWOOD MEDICAL AREA
FENWAY
MUSEUM OF FINE ARTS
HUNTINGTON AVE
LONGWOOD AVE
RUGGLES ST
FRANCIS ST

TDM23 EXISTING VS. NEAR-TERM HOURLY CHANGE IN VEHICLE TRIPS (MIDDAY)

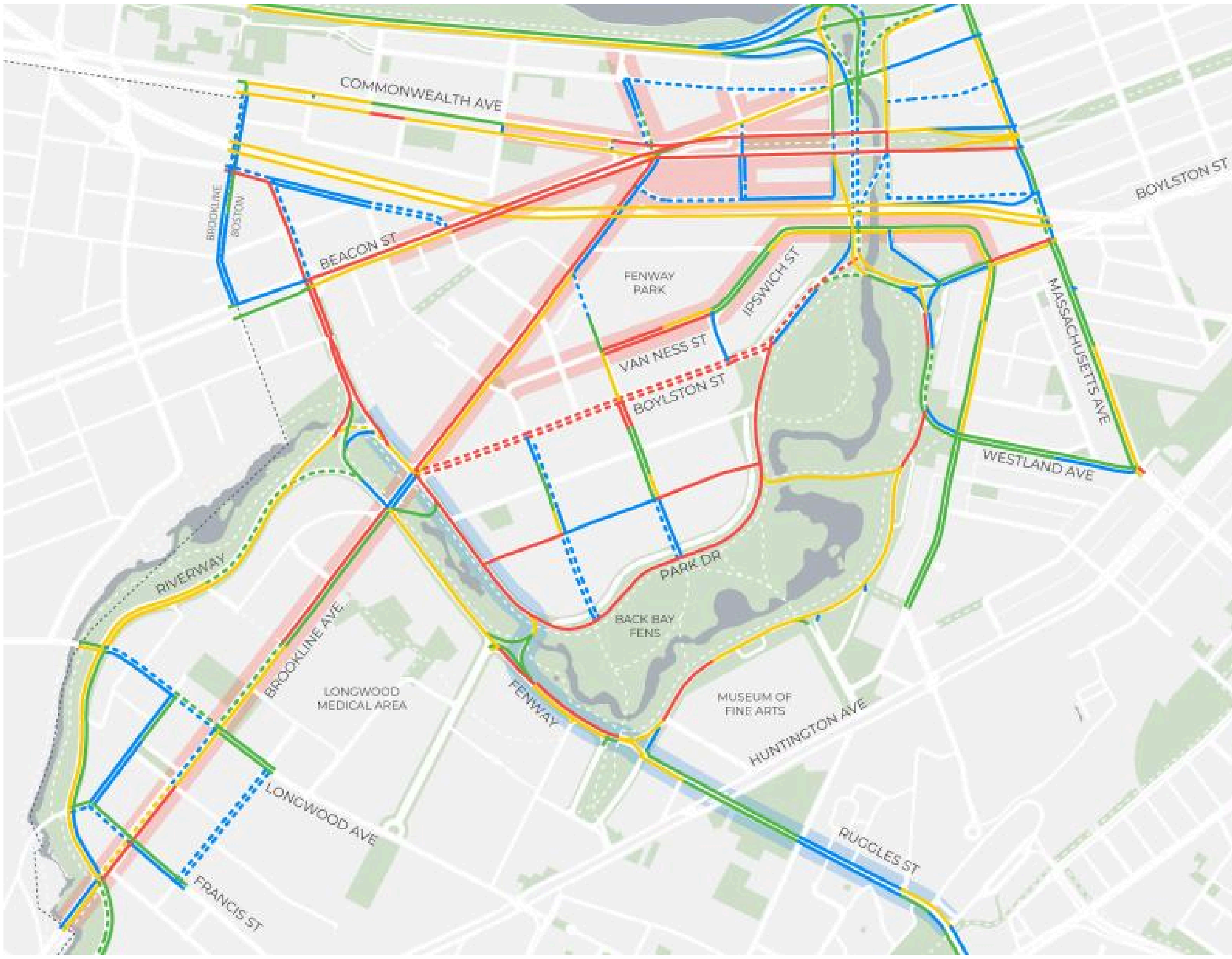
TDM23 现有与短期小时变化对比 |

TDM23 現有與短期小時變化對比 |

TDM23: CAMBIOS POR HORA EXISTENTES Y A CORTO PLAZO

Midday
白天 | 白天 | *Mediodía*

- *More than 100*
- *50 to 100*
- *25 to 50*
- *1 to 25*
- *-25 to 0*
- *-50 to -25*
- *-100 to -50*
- *Less than -100*
- *Design Area*
  设计区域 | 設計區域 | *Área de diseño*
- *Roxbury-Fenway Connector*
  罗克斯伯里-芬威连接线 | 羅克斯伯里-芬威連接器 |
  Conector Roxbury-Fenway


COMMONWEALTH AVE
BOYLSTON ST
BROOKLINE
BOSTON
BEACON ST
FENWAY PARK
IPSWICH ST
VAN NESS ST
BOYLSTON ST
MASSACHUSETTS AVE
WESTLAND AVE
RIVERWAY
PARK DR
BACK BAY FENS
BROOKLINE AVE
LONGWOOD MEDICAL AREA
FENWAY
MUSEUM OF FINE ARTS
HUNTINGTON AVE
LONGWOOD AVE
RUGGLES ST
FRANCIS ST

TDM23 EXISTING VS. NEAR-TERM HOURLY CHANGE IN VEHICLE TRIPS (P.M.)

TDM23 现有与短期小时变化对比 ｜
TDM23 現有與短期小時變化對比 ｜
TDM23: CAMBIOS POR HORA EXISTENTES Y A CORTO PLAZO

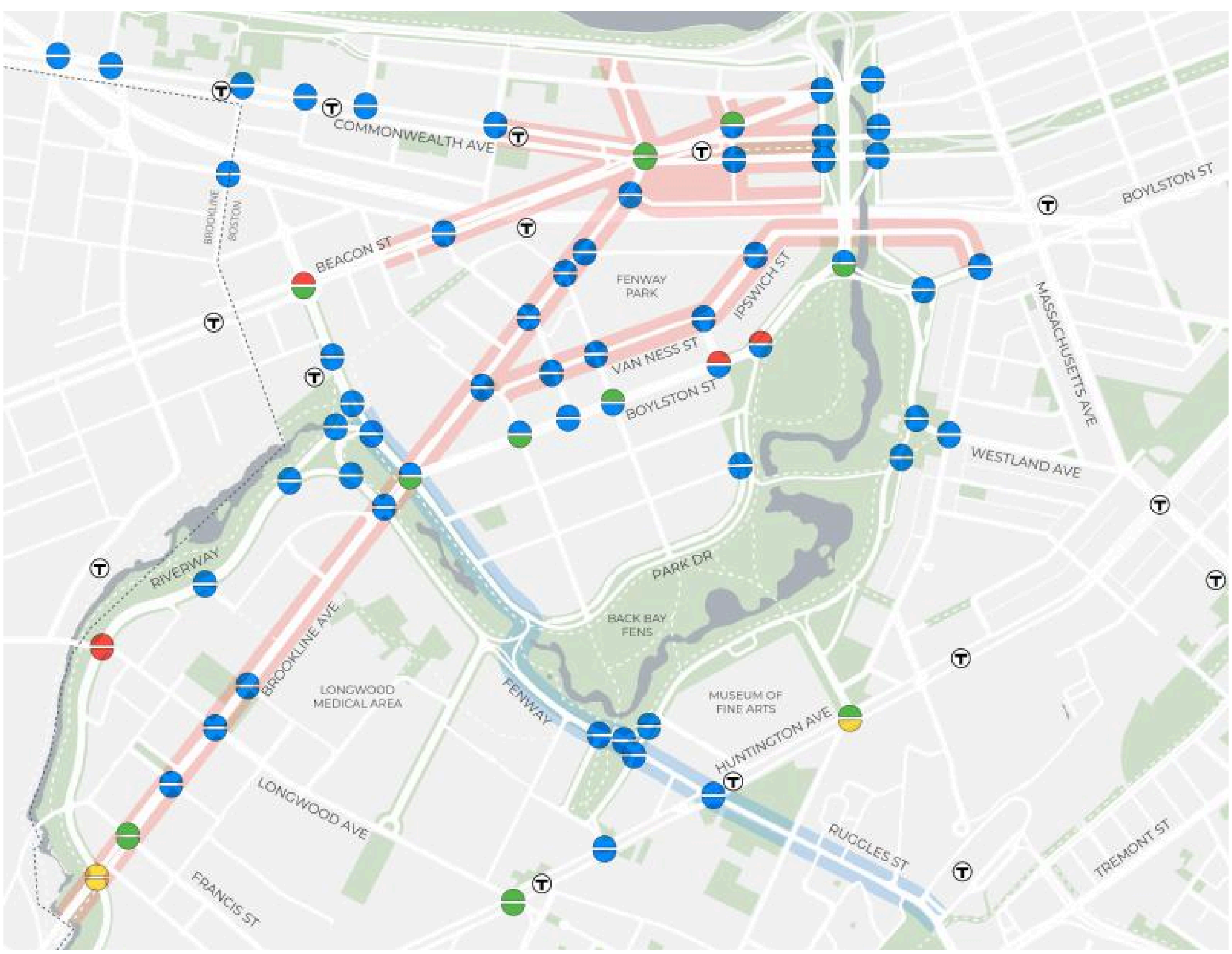
Beacon Street, Park Drive, and Fenway are projected to experience the most consistent increases in traffic within the Analysis Area in the near-term. This trend suggests that these multi-lane roadways have some existing capacity to absorb additional traffic associated with future development.

Other key roadways including Brookline Avenue and the Riverway are also expected to experience more moderate increases in traffic volumes, reflecting anticipated growth in travel demand to and from these areas. This would be a challenge for transit service reliability for both MBTA services and shuttle buses operated by the Longwood Collective.

In contrast, Boylston Street and Charlesgate are projected to experience a decrease in traffic volumes, which can be attributed to reduced capacity in the future and locally destined trips displacing vehicle trips passing through.

How does intersection capacity change?

Intersection capacity utilization (ICU) is a metric used to evaluate how much of an intersection's potential capacity is being used during peak traffic conditions. It quantifies how much traffic is moving through the intersection compared to how much traffic the intersection can handle, based on signal timing, lanes, and volumes. It is reflected as a percentage value, which represents the combined demand of all movements (like through, left, and right turns) at the intersection relative to the intersection's overall capacity. ICU was reviewed for the Analysis Area intersections for both the existing condition and near-term conditions. This shows the impact traffic volume changes have on overall capacity to process vehicle traffic. It also flags intersections that may require operational improvements.



EXISTING INTERSECTION CAPACITY UTILIZATION

现有交叉路口容量利用率 |

現有交叉路口容量利用率 |

USO DE LA CAPACIDAD DE LA INTERSECCIÓN EXISTENTE

A.M. | 早 | 早 | *Mañana*
P.M. | 晚 | 晚 | *Tarde*

Greater than 96%, Constrained Capacity
超过 96%, 超过容量限制 | 超過 96%, 超過容量限制 |
Más del 96 %: capacidad restringida

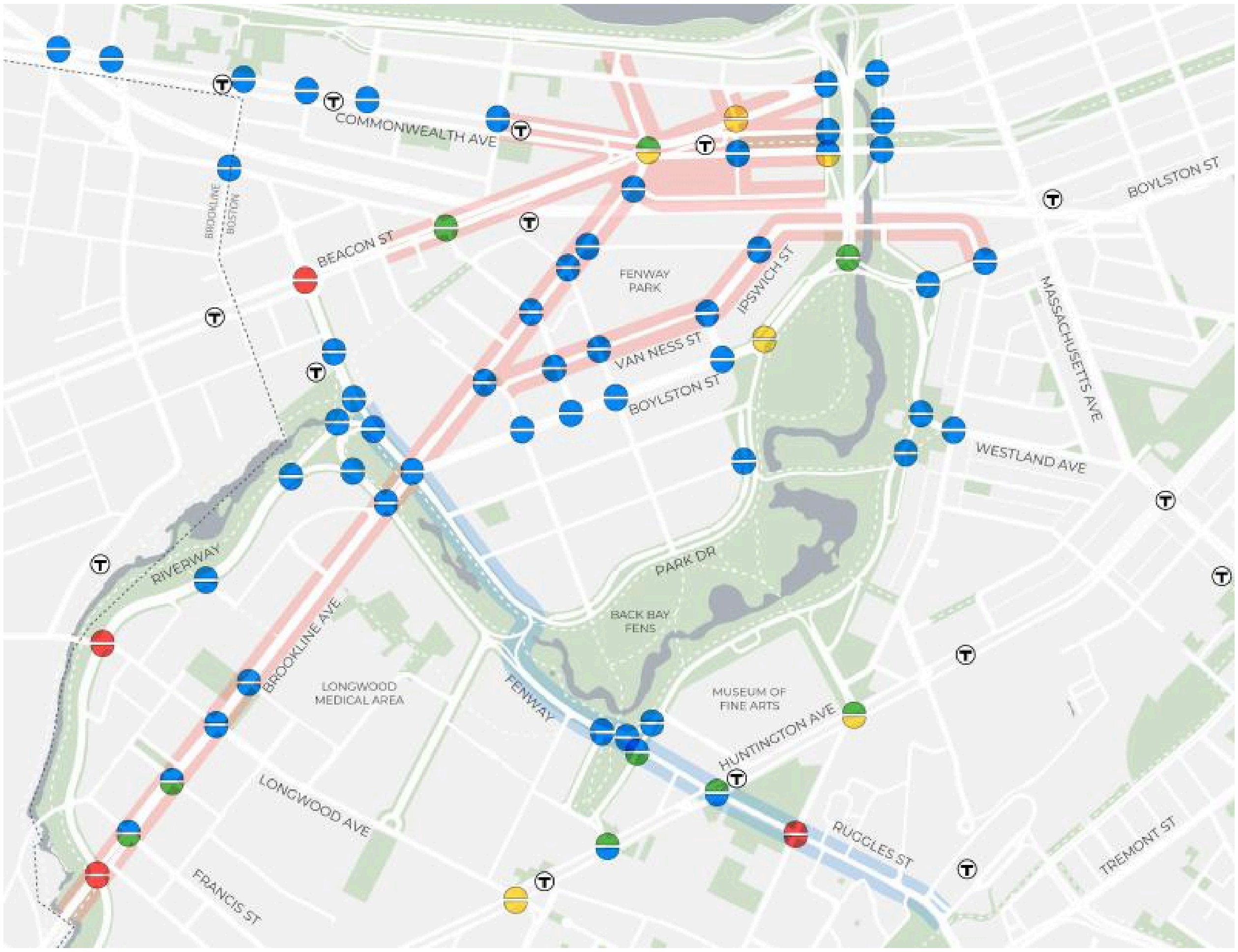
86% to 95% Limited Capacity
86%-95%, 容量受限 | 86%-95%, 容量受限 |
Del 86 % al 95 %: capacidad limitada

80% to 85% Target Capacity
80%-85%, 目标容量 | 80%-85%, 目標容量 |
Del 80 % al 85 %: capacidad objetivo

79% or Lower, Excess Capacity
79 % 及以下, 有剩余容量 | 79 % 及以下, 有剩餘容量 |
79 % o menos: capacidad superada

Design Area
设计区域 | 設計區域 | *Área de diseño*

Roxbury-Fenway Connector
罗克斯伯里-芬威连接线 | 羅克斯伯里-芬威連接器 |
Conector Roxbury-Fenway


COMMONWEALTH AVE
BOYLSTON ST
BROOKLINE
BOSTON
BEACON ST
FENWAY PARK
IPSWICH ST
MASSACHUSETTS AVE
VAN NESS ST
BOYLSTON ST
WESTLAND AVE
PARK DR
RIVERWAY
BACK BAY FENS
BROOKLINE AVE
LONGWOOD MEDICAL AREA
MUSEUM OF FINE ARTS
FENWAY
HUNTINGTON AVE
LONGWOOD AVE
RUGGLES ST
TREMONT ST
FRANCIS ST

NEAR-TERM INTERSECTION CAPACITY UTILIZATION

短期交叉路口容量利用率 |
短期交叉路口容量利用率 |

USO DE LA CAPACIDAD DE LA INTERSECCIÓN A CORTO PLAZO

A.M. | 早 | 早 | *Mañana*
P.M. | 晚 | 晚 | *Tarde*

Greater than 96%, Constrained Capacity
超过 96%, 超过容量限制 | 超過 96%, 超過容量限制 |
Más del 96 %: capacidad restringida

86% to 95% Limited Capacity
86%-95%, 容量受限 | 86%-95%, 容量受限 |
Del 86 % al 95 %: capacidad limitada

80% to 85% Target Capacity
80%-85%, 目标容量 | 80%-85%, 目標容量 |
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79% or Lower, Excess Capacity
79 % 及以下, 有剩余容量 | 79 % 及以下, 有剩餘容量 |
79 % o menos: capacidad superada

Design Area
设计区域 | 設計區域 | *Área de diseño*

Roxbury-Fenway Connector
罗克斯伯里-芬威连接线 | 羅克斯伯里-芬威連接器 |
Conector Roxbury-Fenway

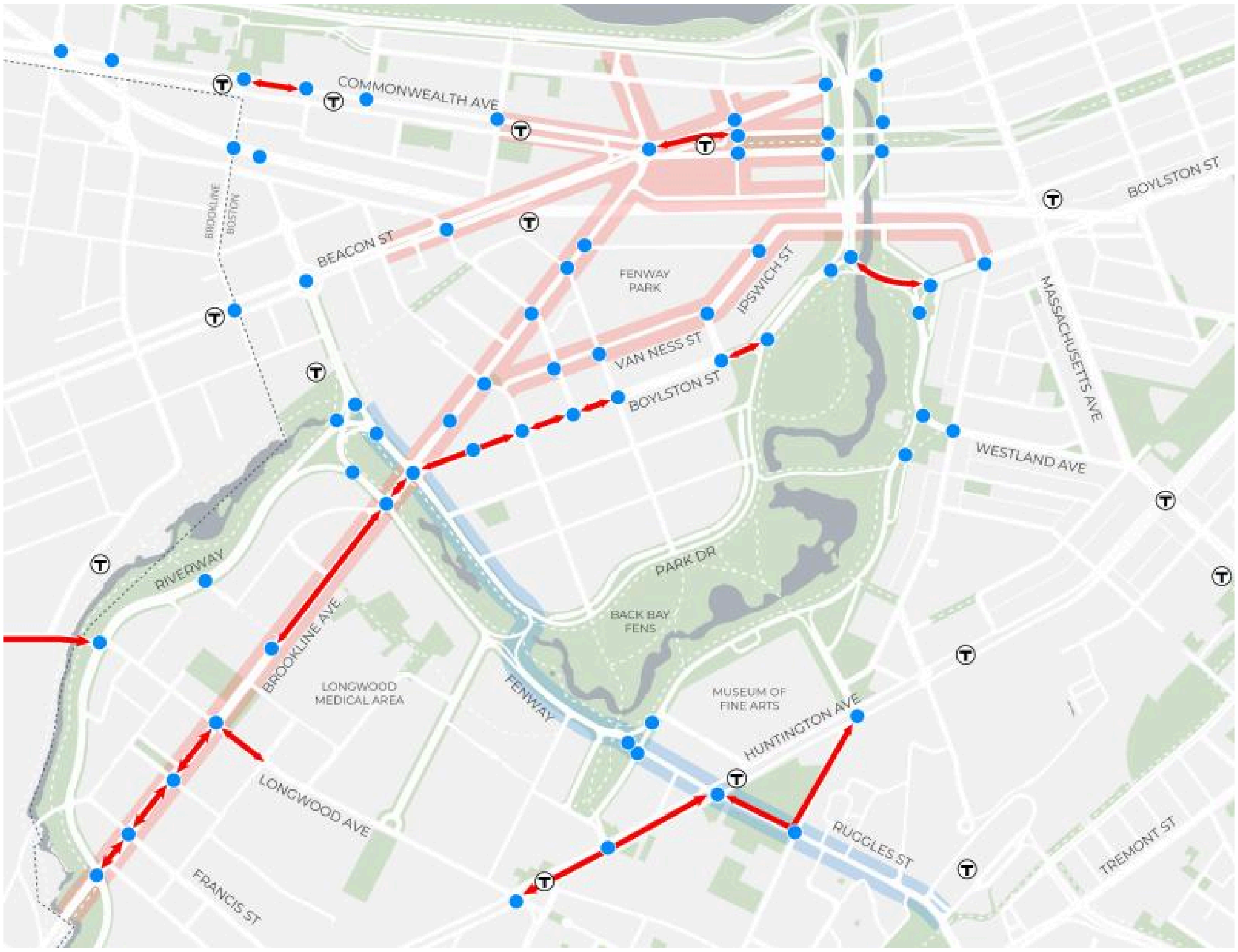
The study intersections experiencing the most significant changes in ICU between the existing condition and the near-term are primarily located along Brookline Avenue, Huntington Avenue, and Beacon Street. These changes can be attributed to increases in vehicle trips due to nearby development with limited available roadway capacity on adjacent roadways and intersections.

A majority of the intersections throughout the Analysis Area do not show a significant change in ICU under the projected future conditions. Many locations are already approaching capacity or are metered by other intersections that are at capacity. Intersections that are approaching or exceeding their available capacity may benefit from targeted improvements or strategic redistribution of traffic volumes.

How does queuing change along specific corridors?

Queue spillback occurs when vehicles waiting at a red light are unable to proceed once the signal turns green due to queues that have not cleared from an upstream intersection. To explain this further, this occurs when there are two or more intersections in a row, and the light turns green at the intersection you are stopped at but the next intersection on the road has a queue that is blocking you from being able to drive. This can reduce intersection efficiency and affect intersecting streets, leading to increased delays and longer travel times. These spillbacks can be caused by poor signal coordination, insufficient storage capacity, or high vehicle volumes.

The 95th percentile queue represents a queue that will be at or below the specific length 95% of the time. Analyzing the 95th percentile queues under existing conditions, queue spillback is observed along Brookline Avenue through the Longwood Medical Area, as well as along Boylston Street and Huntington Avenue. Under projected near-term conditions, queue spillback along these corridors is expected to increase, with queues extending to adjacent intersections, resulting in compounding vehicle delays.



EXISTING VEHICLE QUEUES AT INTERSECTIONS

现有交叉路口排队情况 |

現有交叉路口排隊情況 |

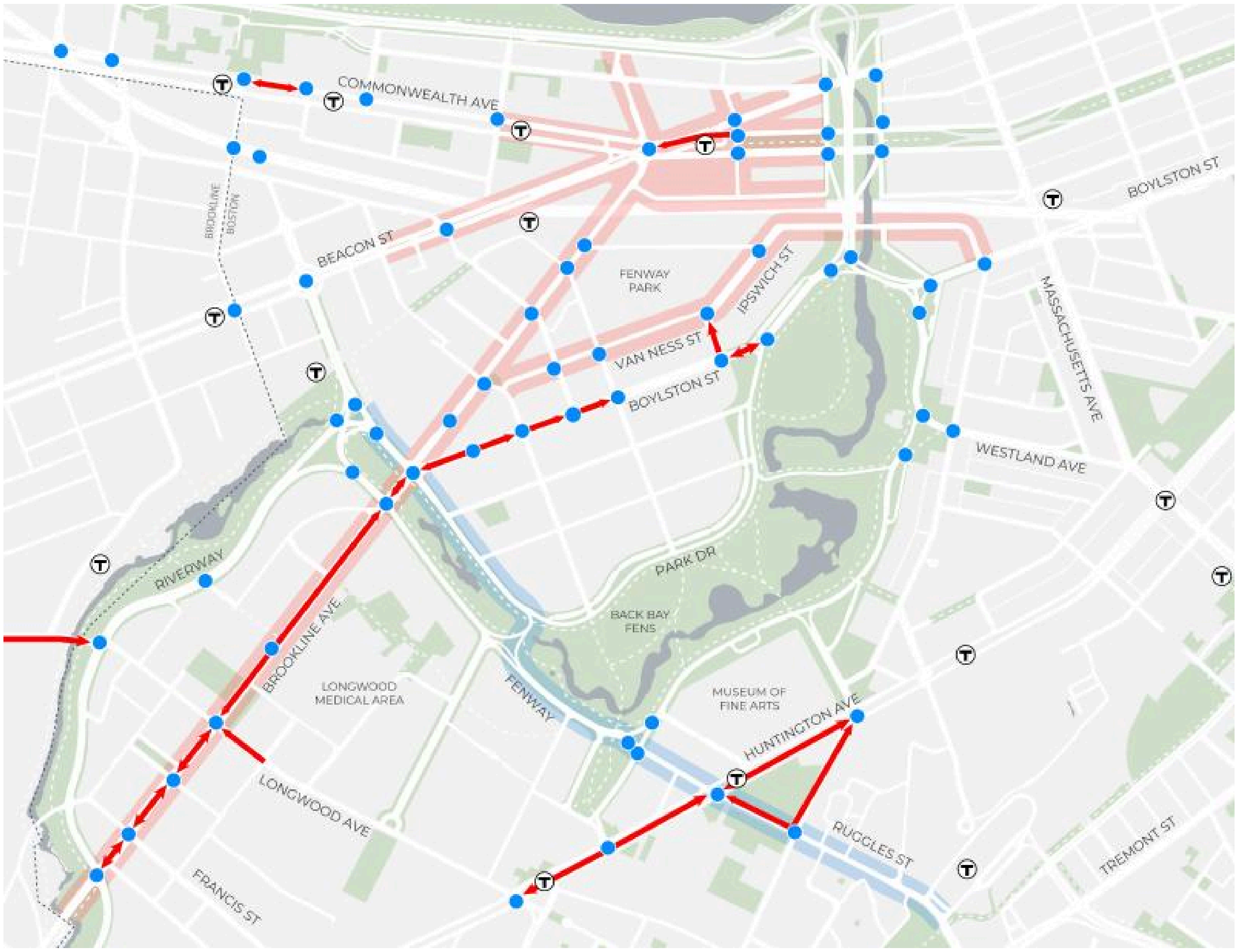
FILAS DE VEHÍCULOS EXISTENTES EN LAS INTERSECCIONES

Queue Spillback To Signalized Intersection
排队回流至有信号灯的交叉路口 | 排隊回流至有信號燈的交叉路口 |
Embotellamiento en intersección señalizada

Study Area Intersections
研究区域交叉路口 | 研究區域交叉路口 |
Intersecciones del área de estudio

Design Area
设计区域 | 設計區域 | *Área de diseño*

Roxbury-Fenway Connector
罗克斯伯里-芬威连接线 | 羅克斯伯里-芬威連接器 |
Conector Roxbury-Fenway



NEAR-TERM VEHICLE QUEUES AT INTERSECTIONS

现有交叉路口排队情况 |

現有交叉路口排隊情況 |

FILAS DE VEHÍCULOS EN LAS INTERSECCIONES A CORTO PLAZO

Queue Spillback To Signalized Intersection
排队回流至有信号灯的交叉路口 | 排隊回流至有信號燈的交叉路口 |
Embotellamiento en intersección señalizada

Study Area Intersections
研究区域交叉路口 | 研究区域交叉路口 |
Intersecciones del área de estudio

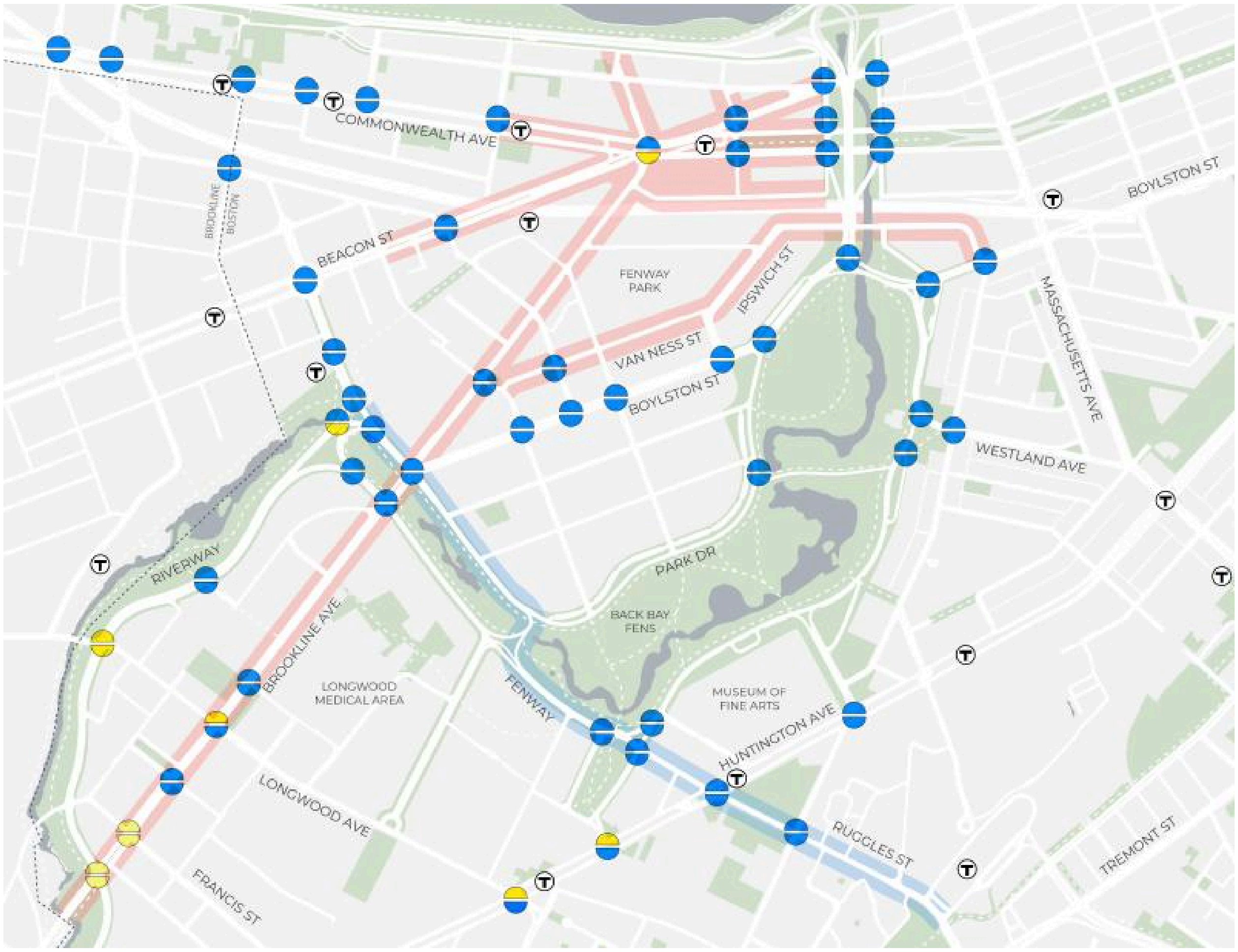
Design Area
设计区域 | 設計區域 | *Área de diseño*

Roxbury-Fenway Connector
罗克斯伯里-芬威连接线 | 羅克斯伯里-芬威連接器 |
Conector Roxbury-Fenway

How does the delay at intersections for vehicles change?

Level of Service (LOS) describes a vehicle-specific performance measure that evaluates the driver delay at intersection by approach, and movement. LOS is based on the average delay experienced per vehicle, while ICU assesses overall intersection performance.

The intersections along Boylston Street, Huntington Avenue, and in the vicinity of Charlesgate are projected to experience the most notable changes in driver delay between the existing condition and the near-term. Along Boylston Street and Huntington Avenue, these changes may be attributed to the reduction in travel lanes and intersection changes made to prioritize pedestrian safety over throughput, which could contribute to increased delays for drivers in motor vehicles. In the Charlesgate area, increased vehicle volumes are likely the cause for the increase in delay. Other locations—such as along Brookline Avenue, the Riverway and within Kenmore Square—that experience delays under existing conditions, for future conditions the analysis does not show significant changes to LOS due to limited available capacity to accommodate increases in vehicle trips at these locations.



EXISTING INTERSECTION VEHICLE LEVEL OF SERVICE

现有交叉路口容量利用率 |

現有交叉路口容量利用率 |

USO DE LA CAPACIDAD DE LA INTERSECCIÓN EXISTENTE

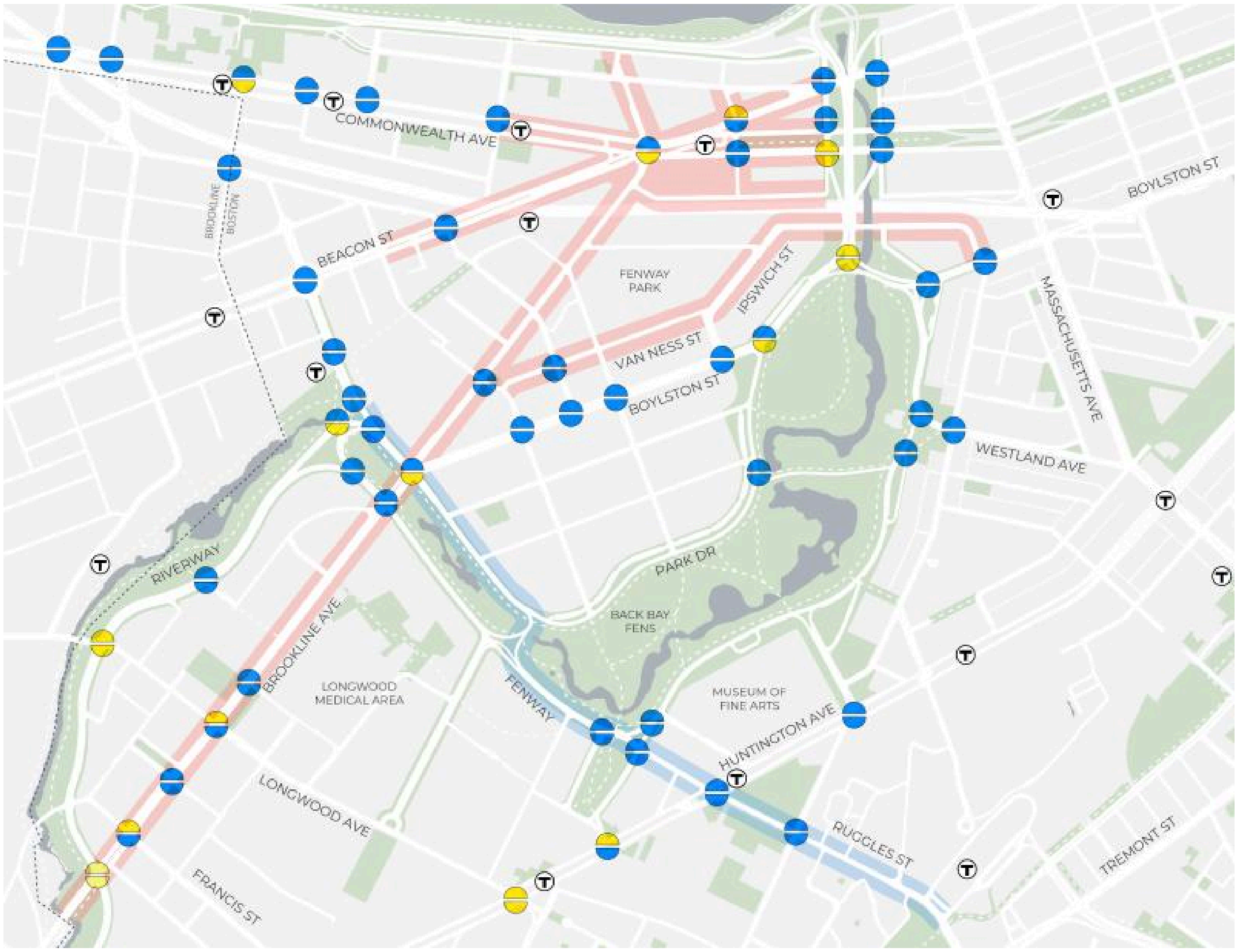
A.M. | 早 | 早 | *Mañana*
P.M. | 晚 | 晚 | *Tarde*

Free flow to stable intersection operations
自由流至稳定交叉路口运行 | 自由流至穩定交叉路口運行 |
Circulación libre por operaciones de intersección estables

More vehicles access the intersection than can be processed leading to unstable intersection operations
进入交叉路口的车辆超过处理能力，导致交叉路口运行不稳定。|
進入交叉路口的車輛超過處理能力，導致交叉路口運行不穩定。|
Acceso de más vehículos a la intersección de los que pueden procesarse, lo que resulta en operaciones de intersección inestables

Design Area
设计区域 | 設計區域 | *Área de diseño*

Roxbury-Fenway Connector
罗克斯伯里-芬威连接线 | 羅克斯伯里-芬威連接器 |
Conector Roxbury-Fenway


COMMONWEALTH AVE
BOYLSTON ST
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BEACON ST
FENWAY PARK
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MASSACHUSETTS AVE
VAN NESS ST
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PARK DR
BACK BAY FENS
BROOKLINE AVE
LONGWOOD MEDICAL AREA
FENWAY
MUSEUM OF FINE ARTS
HUNTINGTON AVE
LONGWOOD AVE
RUGGLES ST
TREMONT ST
FRANCIS ST

NEAR-TERM INTERSECTION VEHICLE LEVEL OF SERVICE

短期交叉路口车辆服务水平 |
短期交叉路口車輛服務水準 |
NIVEL DE SERVICIO DE VEHÍCULOS EN INTERSECCIONES A CORTO PLAZO

A.M. | 早 | 早 | *Mañana*
P.M. | 晚 | 晚 | *Tarde*

Free flow to stable intersection operations
自由流至稳定交叉路口运行 | 自由流至穩定交叉路口運行 |
Circulación libre por operaciones de intersección estables

More vehicles access the intersection than can be processed leading to unstable intersection operations
进入交叉路口的车辆超过处理能力，导致交叉路口运行不稳定。|
進入交叉路口的車輛超過處理能力，導致交叉路口運行不穩定。|
Acceso de más vehículos a la intersección de los que pueden procesarse, lo que resulta en operaciones de intersección inestables

Design Area
设计区域 | 設計區域 | *Área de diseño*

Roxbury-Fenway Connector
罗克斯伯里-芬威连接线 | 羅克斯伯里-芬威連接器 |
Conector Roxbury-Fenway

How does transit support the future demand?

No transit routes directly within the Analysis Area are forecasted to be over-capacity. This is based on the volume-to-capacity analysis for transit lines in the Analysis Area including service on the future transit network, including the bus service changes and improvements associated with Bus Network Redesign (BNR). The network can accommodate forecasted growth in the area and the shift of more trips to transit. Some routes that are adjacent to the Analysis Area, such as Route 1 on Massachusetts Avenue and Route 47 on Boston University Bridge, are over-capacity. This analysis was limited to MBTA services; shuttle buses operated by the Longwood Collective were not included in the analysis.

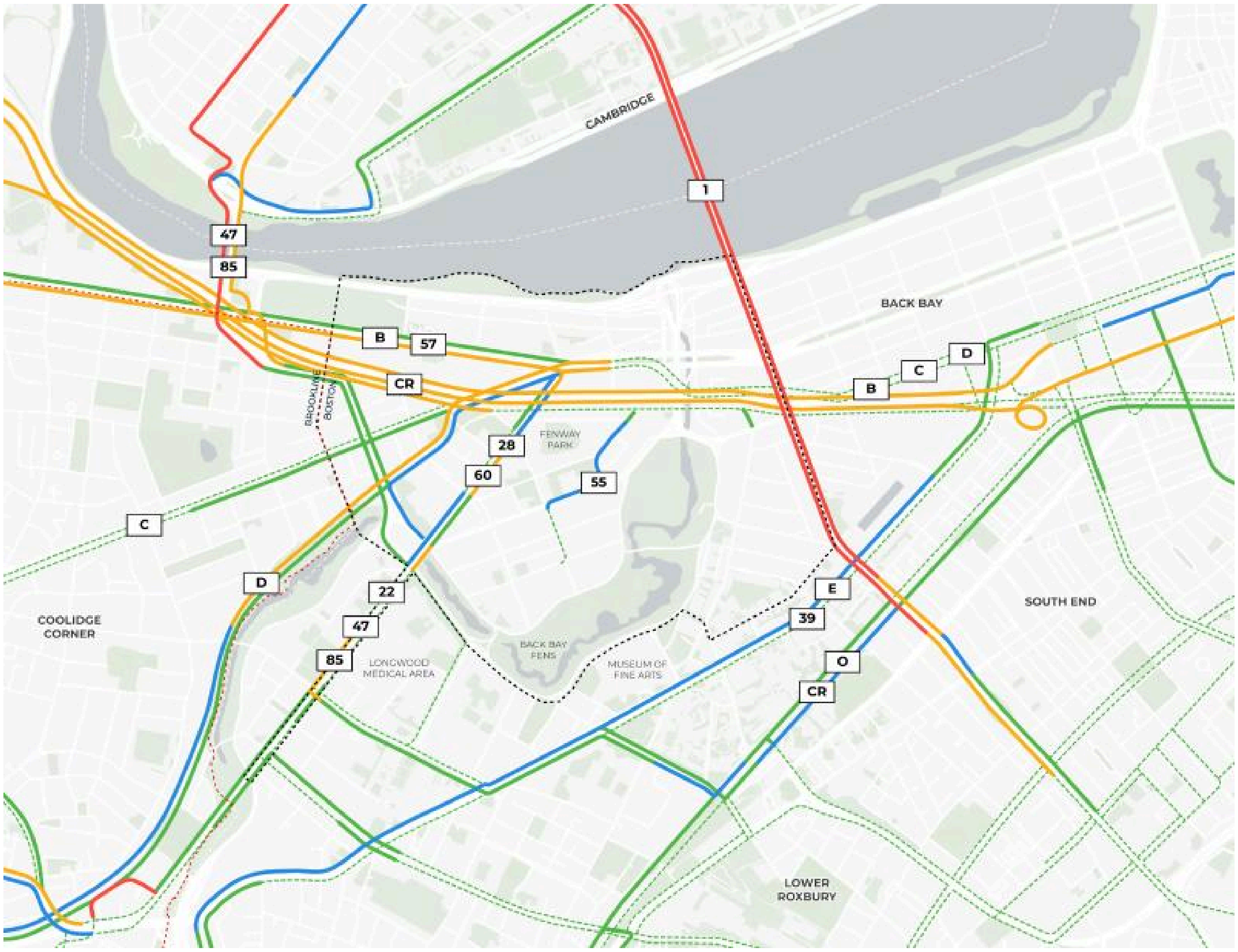
NO-BUILD TRIP VOLUMES BY TRANSIT LINE

按公交线路划分的无建设方案出行量 |

按公交線路劃分的無建設方案出行量 |

VOLÚMENES DE VIAJES ACTUALES POR LÍNEA DE TRANSPORTE

- # *Transit Line*
- *Greater than 100%*
- *61% to 99%*
- *41% to 60%*
- *21% to 40%*
- *Less than 20%*
- *Design Area* | 设计区域 | 設計區域 | *Área de diseño*



NEAR-TERM VOLUME TO CAPACITY BY TRANSIT LINE

按公交线路划分的短期容量与流量比 |

按公交線路劃分的短期容量與流量比 |

VOLUMEN A CAPACIDAD A CORTO PLAZO POR LÍNEA DE TRANSPORTE

- # *Transit Line*
- *Greater than 100%*
- *61% to 99%*
- *41% to 60%*
- *21% to 40%*
- *Less than 20%*
- *Design Area* | 设计区域 | 設計區域 | *Área de diseño*

What transit routes by segments are experiencing crowding?

There are a few lines within the Analysis Area that show higher volume-to-capacity:

- The Green Line within the Analysis Area has relatively higher volume-to-capacity with the maximum volume-to-capacity at 86%. The higher frequency and overall capacity of Green Line service can absorb some volume on parallel bus service.
- Route 57 along Commonwealth Avenue has a volume-to-capacity between 60% and 80%. The parallel Green Line B branch has capacity to help absorb travel volumes from Route 57 if needed.
- Multiple bus routes run along Brookline Avenue, including the 22, 28, 47, 60, and 85. A few blocks show cumulative volume-to-capacity in the 60-80% range, specifically north of Kilmarnock, while others are mainly below 40-60%.

Some key service improvements that are part of BNR will help ensure there is enough transit capacity to meet the demand. These improvements include:

- The extension of Route 28 to Kenmore adds more frequent service on Brookline Avenue, especially from Park Drive to Kenmore
- Increased frequency on Route 47 along Brookline Avenue, especially south of Park Drive
- Increased frequency of Route 57 on Commonwealth Avenue
- Increased frequency of Route 60 on Brookline Avenue
- Increased service hours of Route 50 between Copley and West Fens

For rapid transit, improving PM-peak frequencies on the Green Line from 6-8 minutes to 5 minutes will also be crucial to meeting demand for transit trips in the Analysis Area, especially on the B and D branches which will see the most travel volume increases.

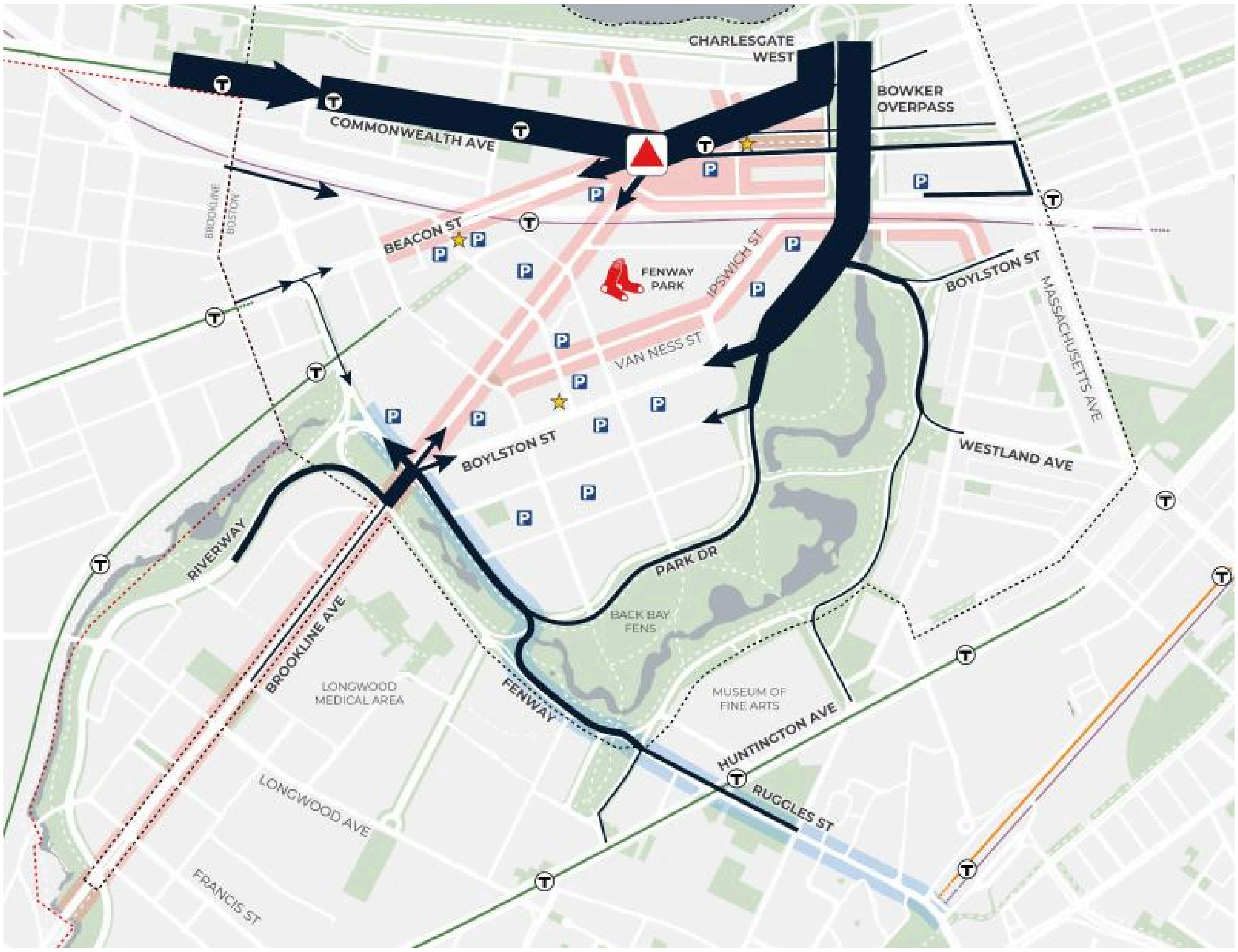
What are the trends for the future of people walking and biking?

Pedestrian and bicycle trips traveling to and from the Analysis Area are expected to increase substantially with the proposed level of development under near-term conditions. Locations on both sides of Brookline Avenue are shown to experience the highest increases in the number of people walking and biking. In some neighborhoods, new development is projected to generate thousands of additional pedestrian trips during the weekday morning and afternoon peak periods. Growth in the number of people biking is shown to be more modest, but would also result in hundreds of additional people biking along key corridors during peak periods.

Layering in the expected increase in people walking and biking associated with the area development further highlights the need to address specific areas identified in the neighborhood's multimodal priorities. Additional and improved bike network connections between Brookline Avenue to the Riverway and the Fens, for example, would help provide necessary access for the increased volumes of people walking and biking, and incorporate additional protections.

How does the network change when there are events at Fenway Park?

The baseline traffic analysis for the FTAP is for a typical weekday. Fenway Park regularly causes changes in travel patterns in the neighborhood. Fenway Park is home to over 80 Red Sox games each year, as well as regular post-season games, concerts, and other entertainment events. It's critical to understand how neighborhood travel patterns change during these events and how those changes could be affected by the Action Plan's design interventions. In partnership with the Fenway Sports Group, the FTAP team developed an event day analysis framework that will be used to consider each of the project's proposed design interventions. Traffic volumes associated with a 7:10PM game at Fenway Park overlap with general commuter traffic of people leaving work, which exacerbates capacity constraints that come along with a typical weekday. This required an event day specific analysis.



CHARLESGATE WEST
BOWKER OVERPASS
COMMONWEALTH AVE
BEACON ST
FENWAY PARK
IPSWICH ST
BOYLSTON ST
MASSACHUSETTS AVE
VAN NESS ST
BOYLSTON ST
WESTLAND AVE
BROOKLINE
BOSTON
RIVERWAY
PARK DR
BACK BAY FENS
BROOKLINE AVE
LONGWOOD MEDICAL AREA
FENWAY
MUSEUM OF FINE ARTS
HUNTINGTON AVE
RUGGLES ST
LONGWOOD AVE
FRANCIS ST

EVENT-DAY ADDED TRIPS TO ANALYSIS AREA ACCESS POINTS
活动日出行量 | 活動日出行量 |
VIAJES A EVENTOS

Entering Event Day Volume
活动日进入流量 | 活動日進入流量 |
Volumen de ingresos por eventos

- *100 or less*
- *101 to 200*
- *201 to 300*
- *301 to 400*
- *More than 400*

Rideshare Drop-Off
共享车下车点 | 共乘車下車點 |
Descenso de vehículos compartidos

Parking Facility
停车设施 | 停車設施 | *Estacionamiento*

Design Area
设计区域 | 設計區域 | *Área de diseño*

Roxbury-Fenway Connector
罗克斯伯里-芬威连接线 | 羅克斯伯里-芬威連接器 |
Conector Roxbury-Fenway

Traffic volumes associated with a 7:10PM game at Fenway Park overlap with general commuter traffic of people leaving work, which exacerbates capacity constraints that come along with a typical weekday. Event-related trips were assigned to entry points to the Analysis Area based on existing travel patterns (like vehicles driving in from I-93, or Storrow Drive) and distributed through the street network based on access to nearby parking facilities or designated rideshare drop-off locations. The greatest impacts are expected along the Boylston Street and Brookline Avenue corridors, which have multiple parking lots and serve as key rideshare drop-off points. Kenmore Square and Charlesgate East are also expected to experience a surge in traffic during event conditions, as both locations are key entry points for vehicles arriving from regional routes.

What's Next?

The next step is to figure out how to safely accommodate the people wanting to move through, to, and within the Fenway neighborhood. Capital infrastructure interventions concentrated within the Action Plan's three Design Areas— Kenmore Square, Brookline Avenue, and the Van Ness/Ipswich Street corridor— will be developed. Then, each design's potential to improve the overall transportation network's efficiency will be evaluated in an iterative process.

A capacity analysis using Synchro will be used to identify the volume of traffic that could be accommodated on key streets with the implementation of the design alternatives and identified operational improvements under the future near-term conditions. For vehicle trips that exceed the available roadway capacity, our priority will be to assess how these trips could be accommodated by other modes, routes, or changes. Understanding the scale of these potential shifts will help evaluate the viability of the design alternatives.

The Synchro capacity analysis will be supplemented, as needed, with a more detailed assessment of multimodal operations using a tool called VISSIM. VISSIM is a traffic simulation model that is able to model individual vehicle, bus, bicycle, and pedestrian movements at select locations within the Fenway area. Unlike Synchro, which provides intersection-level results based on set conditions, VISSIM is able to evaluate how the different modes interact within a simulation model. This level of detail can be particularly valuable for assessing the operational impacts of design changes, identifying potential conflicts between roadway users, and will especially help in optimizing multimodal performance at complex intersections.

To test each design's effects on the neighborhood's transit network, the demand for transit service will be compared to the expected level of transit service (Green and Orange Line rapid transit, commuter rail service to the Lansdowne and Ruggles stations, and MBTA and shuttle bus service). The unmet demand will be quantified and enhancements to transit service will be identified as needed.

The designs will also be assessed for how they could affect neighborhood travel conditions on event days. Using the near-term event day volume changes, each design intervention for the three Design Areas will be tested to see how the neighborhood transportation network for vehicles and transit responds. This analysis will assess how each design change could affect travel patterns on event days. The goal with this work will be to look for design interventions that will optimize the flow of people, and prioritize safety.

When will this work take place?

With the completion of the multimodal model, the FTAP process will follow three steps:

- Design interventions for each Design Area will be developed and informed by the model for each project's potential to improve the overall neighborhood transportation network.
- Next the project designs will be shared with the community, and this feedback will help further refine the design of these improvements.
- Finally, the Action Plan will finalize concept design recommendations for the three Design Areas with future implementation timelines.